

Glossaries of Life Science

Ma Hongbao *, Yan Yang **

* Brookdale University Hospital & Medical Center, Brooklyn, NY 11212, USA; ** Queens, New York 11418, USA
mahongbao@gmail.com

Abstract: This glossary collects 4080 words and phrases in life science fields, especially in the field of stem cells. The glossary contents come from Internet and other related dictionaries.

[Ma Hongbao, Yan Yang. **Glossaries of Life Science**. *Stem Cell* 2016;7(3):76-180]. ISSN: 1945-4570 (print); ISSN: 1945-4732 (online). <http://www.sciencepub.net/stem>. 14. doi:[10.7537/marscj070316.14](https://doi.org/10.7537/marscj070316.14).

Keywords: life; science; dictionary; glossary; word

Glossaries of Life Science

- 1 5-alpha reductase (5AR): Enzymes that convert testosterone to dihydrotestosterone.
- 2 5-alpha reductase inhibitor: A drug used to block the conversion of testosterone to dihydrotestosterone.
- 3 5-alpha-dihydrotestosterone: Usually known as dihydrotestosterone.
- 4 5-fluorouracil (5FU) (Adrucil®): A drug in the group of cancer-fighting medicines known as antineoplastics, which interferes with the growth of cancer cells. It is approved for palliative management of colon, rectum, breast, stomach and pancreatic cancer.
- 5 a1-antichymotrypsin (ACT): One of the many serine protease inhibitors or serpins (short for serine protease inhibitor) which are proteins that inhibit peptidases (proteases). Serine proteases are defined by the presence of a serine (an amino acid) residue in their active domain.
- 6 abdomen (adj, abdominal): The part of the body below the ribs and above the pelvic bone that contains organs like the intestines, the liver, the kidneys, the stomach, the bladder, and the prostate. In vertebrates, the portion of the trunk containing visceral organs other than heart and lungs; in arthropods, the posterior portion of the body, made up of similar segments and containing the reproductive organs and part of the digestive tract.
- 7 abiotic: Nonliving; specifically, the nonliving components of an ecosystem, such as temperature, humidity, the mineral content of the soil, etc.
- 8 ablation: Relating to the removal or destruction of tissue or a system; androgen ablation refers to blocking the effects of androgens by surgical or chemical means.
- 9 abscess: A localized collection of pus caused by suppuration buried in tissues, organs or confined spaces. Usually due to an infective process.
- 10 abscisic acid (ABA): A plant hormone that generally acts to inhibit growth, promote dormancy, and help the plant tolerate stressful conditions.
- 11 abscission: In plants, the dropping of leaves, flowers, fruits, or stems at the end of a growing season, as the result of formation of a two-layered zone of specialized cells (the abscission zone) and the action of a hormone (ethylene).
- 12 abscopal effect: In cancer treatment, an abscopal effect occurs when a particular treatment has an impact on a tumor that was not treated - "ab-" being the Latin prefix for "away from", and "scopus" the word for "target".
- 13 absolute neutrophil count (ANC): A common blood cell count measured after stem cell transplant. Neutrophils are responsible for much of the body's protection against infection.
- 14 absorption spectrum: The range of a pigment's ability to absorb various wavelengths of light.
- 15 absorption: (a) In physiology: a process by which nutrients move from the lower digestive tract (small and large intestine or colon) into the blood stream to be utilized by the body. (b) In spectroscopy: the interaction between atoms and radiation (light, X-rays, UV, infrared), where some of the energy of the radiation is absorbed by the electrons of the atoms, increasing their energy content. The loss of intensity of the radiation can be measured and is an indicator of the structural state of the molecules that absorb the radiation.
- 16 abyssal zone: The portion of the ocean floor where light does not penetrate and where temperatures are cold and pressures intense.
- 17 acclimatization: Physiological adjustment to a change in an environmental factor.
- 18 accommodation: The automatic adjustment of an eye to focus on near objects.
- 19 acetyl CoA: The entry compound for the Krebs cycle in cellular respiration; formed from a fragment of pyruvate attached to a coenzyme.
- 20 acetylcholine: One of the most common neurotransmitters; functions by binding to receptors and altering the permeability of the postsynaptic membrane to specific ions, either depolarizing or hyperpolarizing the membrane.
- 21 achalasia: Constriction of the lower portion of the food pipe (oesophagus) due to inability of the sphincter muscles to relax. Symptoms include difficulty swallowing, chest pain, vomiting and heartburn.
- 22 achlorhydria: The absence of hydrochloric acid from the gastric juice.
- 23 acid precipitation: Rain, snow, or fog that is more acidic than pH 5.6.
- 24 acid α -galactosidase or acid-maltase: An enzyme that breaks down a particular type of fatty substances, Pompe disease is characterized by its absence.
- 25 acinus: Any of the small saclike structures that terminate the ducts of some glands, also called alveolus; ACINAR: of, relating to or comprising an acinus.
- 26 acoelomate: A solid-bodied animal lacking a cavity between the gut and outer body wall.
- 27 acquired immunodeficiency syndrome (AIDS): The name of the late stages of HIV infection; defined by a specified reduction of T cells and the appearance of characteristic secondary infections.
- 28 acronym: An abbreviation formed from the initial letters of a name.
- 29 acrosome: An organelle at the tip of a sperm cell that helps the sperm penetrate the egg.
- 30 actin: A globular protein that links into chains, two of which twist helically about each other, forming microfilaments in muscle and other contractile elements in cells.

- 31 action potential: A rapid change in the membrane potential of an excitable cell, caused by stimulus-triggered, selective opening and closing of voltage-sensitive gates in sodium and potassium ion channels.
- 32 activation energy: The energy that must be possessed by atoms or molecules in order to react.
- 33 active objectified surveillance: Active observation and regular monitoring of a patient without actual treatment; also called watchful waiting.
- 34 active site: The specific portion of an enzyme that attaches to the substrate by means of weak chemical bonds.
- 35 active transport: The movement of a substance across a biological membrane against its concentration or electrochemical gradient, with the help of energy input and specific transport proteins.
- 36 acupuncture: Acupuncture-related therapies stimulate specific skin points by inserting needles, applying heat or pressure, or through contemporary energy-emitting devices. This stimulation promotes the health-enhancing life-force energy called qi.
- 37 acute injury: The early stages of an injury.
- 38 acute lymphoblastic leukemia (ALL): A fast growing cancer of the lymphocytes, one of the white blood cells. Also called acute lymphocytic leukemia. Appears most often in children, but can occur in adults.
- 39 acute myelogenous leukemia (AML): A cancer of the myelocytes, one of the white blood cells. AML occurs in all ages and is the more common acute leukemia in adults. AML affects a different type of white cells than those affected by ALL.
- 40 acute non-lymphocytic leukemia (ANLL): Another way of saying acute myelogenous leukemia.
- 41 acute urinary retention: The sudden inability to urinate, causing pain and discomfort. Causes can be related to an obstruction in the urinary system, stress, neurologic problems, or certain medications.
- 42 acute: Beginning quickly and sharp or severe. Of abrupt onset, in reference to a disease. Acute often also connotes an illness that is of short duration, rapidly progressive, and in need of urgent care.
- 43 adaptation: A process in biological evolution as the result of natural selection where a species becomes better adjusted to the living conditions of its environment (temperature, food sources, and predators). In adaptation, individuals that have the most offspring contribute more of their genetic makeup to the next generation.
- 44 adaptive peak: An equilibrium state in a population when the gene pool has allele frequencies that maximize the average fitness of a population's members.
- 45 adaptive radiation: The emergence of numerous species from a common ancestor introduced into an environment, presenting a diversity of new opportunities and problems.
- 46 adenocarcinoma: A form of cancer that develops from a malignant abnormality in the cells lining a glandular organ such as the prostate; almost all prostate cancers are adenocarcinomas.
- 47 adenoma: A benign tumor of a glandular structure.
- 48 adenosine diphosphate (ADP): A nucleotide consisting of adenine, ribose, and two phosphate groups; formed by the removal of one phosphate from an ATP molecule.
- 49 adenosine monophosphate (AMP): A nucleotide consisting of adenine, ribose, and one phosphate group; can be formed by the removal of two phosphates from an ATP molecule; in its cyclic form, functions as a "second messenger" for a number of vertebrate hormones and neurotransmitters.
- 50 adenosine triphosphate (ATP): A nucleotide and universal energy currency for metabolism. Almost all caloric content of food is converted into ATP before it can be utilized for tissue growth, muscle work and other physiological processes.
- 51 adenovirus: A (20 sided) virus that contains DNA; there are over 40 different adenovirus varieties, some of which cause the common cold. Modified versions have shown some ability to cause apoptosis in laboratory testing.
- 52 adenylyl cyclase: An enzyme that converts ATP to cyclic AMP in response to a chemical signal.
- 53 adhesion molecules membrane: Expressing molecules that mediate interactions of stem cells and progenitors with stromal cells or with extracellular matrix proteins in the bone marrow microenvironment.
- 54 adhesion: a band of scar tissue abnormally joining two surfaces.
- 55 adipocyte: The functional cell type of fat, or adipose tissue, which is found throughout the body particularly under the skin. Adipocytes store and synthesize fat for energy, thermal regulation and cushioning against mechanical shock.
- 56 adipogenesis: A fat cell develops as internally produced lipid droplets coalesce into a single large mass.
- 57 adipose tissue: A type of connective tissue that stores fat.
- 58 adjuvant chemotherapy: Drugs used to kill cancer cells. They are given with other treatments, such as surgery or radiation, to destroy areas of tumor.
- 59 adjuvant: An additional treatment used to increase the effectiveness of the primary therapy; radiation therapy is often used as an adjuvant treatment after a radical prostatectomy if the surgical margins are involved by PC.
- 60 adrenal androgen (AA): A male hormone produced by the adrenal glands; actually, the adrenal makes AA precursors such as DHEA and androstenedione that are metabolized to androgens within the prostate.
- 61 adrenal cortex: The outer portion of the adrenal gland; it secretes various hormones.
- 62 adrenal gland: An endocrine gland located adjacent to the kidney in mammals. The two adrenal glands are located above the kidneys; they produce a variety of different hormones, including cortisol, adrenal androgens and hormones important in blood pressure control and electrolyte balance.
- 63 adrenalectomy: The surgical removal of one or both adrenal glands.
- 64 adrenaline: A hormone, produced by the medulla of the adrenal gland, that increases the concentration of glucose in the blood, raises blood pressure and heartbeat rate, and increases muscular power and resistance to fatigue; also a neurotransmitter across synaptic junctions. Also called epinephrine.
- 65 adrenocorticotrophic hormone (ACTH): Adrenal corticotrophic hormone; a pituitary hormone that stimulates the outer portion of the adrenal glands to secrete various hormones including cortisol, DHEA and androstenedione.
- 66 adriamycin® (doxorubicin): A genotoxic drug, a chemotherapy agent that affects DNA and alters its function.
- 67 adult (or somatic) stem cell: An undifferentiated cell found in a differentiated tissue that can renew itself and differentiate (with certain limitations) to give rise to all the specialized cell types of the tissue from which it originated. It is important to note that scientists do not agree about whether or not adult stem cells may give rise to cell types other than those of the tissue from which they originate.
- 68 adventitia: The outermost connective tissue covering of any organ, vessel, or other structure not covered by a serosa; instead, the covering is properly derived from without and does not form an integral part of such organ or structure.
- 69 adventitious: Referring to a structure arising from an unusual place, such as roots growing from stems or leaves.
- 70 adverse reaction: A harmful or unexpected effect of a medication or treatment.

- 71 aerobic: Containing oxygen; referring to an organism, environment, or cellular process that requires oxygen.
- 72 aerobic: In biochemistry, reactions that need oxygen to happen or happen when oxygen is present.
- 73 afferent: Bringing inward to a central part, applied to nerves and blood vessels.
- 74 aflatoxins: A harmful substance made by certain types of mold (*Aspergillus flavus* and *Aspergillus parasiticus*) that is often found on poorly stored grains and nuts. Consumption of foods contaminated with aflatoxin is a risk factor for primary liver cancer.
- 75 agar: A gelatinous material prepared from certain red algae that is used to solidify nutrient media for growing microorganisms.
- 76 age-adjusted: Modified to take account of the age of an individual or group of individuals.
- 77 age-structure: The relative number of individuals of each age in a population.
- 78 agnathan: A member of a jawless class of vertebrates represented today by the lampreys and hagfishes.
- 79 agonist: A drug or other chemical that can combine with a receptor on a cell to produce a physiologic reaction typical of a naturally occurring substance.
- 80 agonistic behavior: A type of behavior involving a contest of some kind that determines which competitor gains access to some resource, such as food or mates.
- 81 albumin: A class of simple, water-soluble proteins that can be coagulated by heat and precipitated by strong acids and are found in egg white, blood serum, milk, and many other animal and plant juices and tissues.
- 82 aldehyde: An organic molecule with a carbonyl group located at the end of the carbon skeleton.
- 83 aldosterone: An adrenal hormone that acts on the distal tubules of the kidney to stimulate the reabsorption of sodium (Na⁺) and the passive flow of water from the filtrate.
- 84 alendronate sodium: A drug that affects bone metabolism used in treating osteoporosis and being studied in the treatment of hypercalcemia (abnormally high levels of calcium in the blood) and in treating and reducing the risk of bone pain caused by cancer; active ingredient in Fosamax®.
- 85 aleurone layer: The outermost cell layer of the endosperm of the grains (seeds) of wheat and other grasses; when acted upon by gibberellin, the aleurone layer releases enzymes that digest the stored food of the endosperm into small nutrient molecules that can be taken up by the embryo.
- 86 alga (pl. algae): A photosynthetic, plantlike protist.
- 87 alginate: A polysaccharide from algae.
- 88 algorithm: Procedure or formula for solving a problem; for a set of computer programs that provide algorithms relating to prostate cancer.
- 89 alkaline phosphatase (ALP): An enzyme in blood, bone, kidney, spleen, and lungs; used to monitor bone or liver metastasis when elevated.
- 90 alkaline: Pertaining to substances that increase the relative number of hydroxide ions (OH⁻) in a solution; having a pH greater than 7; basic; opposite of acidic.
- 91 alkaloid: A member of a large group of chemicals that are made by plants and have nitrogen in them - some alkaloids have been shown to work against cancer.
- 92 alkylating agent: An anticancer drug that interferes with cancer cell division by binding to DNA. A class of cytotoxic drugs that damage DNA, causing the cell to undergo apoptosis. Particularly effective against rapidly dividing cancer cells, they are not targeted and also affect normal cells, which can lead to significant toxicity.
- 93 allantois: One of four extraembryonic membranes; serves as a repository for the embryo's nitrogenous waste.
- 94 allele frequency: The proportion of a particular allele in a population.
- 95 allele: One of two or more alternative forms of a gene. A person may have two copies of the same allele (homozygous) or two different forms (heterozygous). Different alleles arise from changes in the base sequence of that gene through mutations. For example, the gene for eye colour has different alleles resulting in blue or brown eyes.
- 96 allergic reaction: An inflammatory response triggered by a weak antigen (an allergen) to which most individuals do not react; involves the release of large amounts of histamine from mast cells.
- 97 allogeneic bone marrow transplant: Any bone marrow/blood stem cell transplant in which the cells come from another person rather than the patient's own cells. The donated cells can come from a related or unrelated donor.
- 98 allogeneic cell transplantation: Transplantation of cells from one individual to another of the same species.
- 99 allogeneic stem cell transplant: Transplantation of stem cells from either a relative or an unrelated volunteer donor.
- 100 allogeneic stem cells: Stem cells that are used clinically to augment, repair, replace or regenerate organs and tissues and are derived from a cell source that is genetically different from the host/recipient. A hematopoietic stem cell transplant (bone marrow transplant) is an example of a clinical allogeneic transplant in which the patient receives blood-forming hematopoietic stem cells from a genetically similar, but not identical, donor. Allogeneic hematopoietic stem cells are derived from donated bone marrow or umbilical cord blood. An autologous stem cell transplant uses the patient's own cells to augment, repair, replace or regenerate diseased and/or damaged organs and tissues. There are currently no autologous stem cell therapies in clinical use.
- 101 allogeneic stem cell transplant: A transplant involving the infusion of a donor's genetically matched bone marrow or stem cells to produce new, healthy marrow.
- 102 allogeneic: Biological materials such as genes, proteins, cells, tissues, or organs used for transplantation and derived from another donor individual of the same species as the recipient.
- 103 allogeneic stem cells: Stem cells that are harvested from another individual and re-implanted into a patient.
- 104 allogeneic transplantation: A procedure in which a patient receives bone marrow from another person other than an identical twin.
- 105 allogenic: Two or more individuals (or cell lines) are stated to be allogenic to one another when the genes at one or more loci are not identical in sequence in each organism.
- 106 allometric growth: The variation in the relative rates of growth of various parts of the body, which helps shape the organism.
- 107 allopatric speciation: A mode of speciation induced when the ancestral population becomes segregated by a geographical barrier.
- 108 allopolyploid: A common type of polyploid species resulting from two different species interbreeding and combining their chromosomes.
- 109 all-or-none event: An action that occurs either completely or not at all, such as the generation of an action potential by a neuron.
- 110 allosteric site: A specific receptor site on an enzyme molecule remote from the active site. Molecules bind to the allosteric site and change the shape of the active site, making it either more or less receptive to the substrate.
- 111 allozymes: Slightly different versions of the same enzyme, distinguishable via gel electrophoresis.
- 112 alopecia: A partial or complete hair loss, usually a temporary side effect of the chemotherapy.

- 113 alpha-blockers: pharmaceuticals that act on the prostate by relaxing certain types of muscle tissue; these pharmaceuticals are often used in the treatment of BPH; examples are Flomax®, Cardura® and Hytrin®.
- 114 alpha-helix: A spiral shape constituting one form of the secondary structure of proteins, arising from a specific hydrogen-bonding structure.
- 115 alpha-receptors: A cell site that responds to adrenaline (epinephrine) or adrenaline-like substances, causing various physiological changes related to blood vessels getting smaller.
- 116 alprostadil: A prostaglandin that relaxes the smooth muscles of the penis, enhancing blood flow, and producing erection; first produced as Caverject®, an injectable Prostaglandin E1
- 117 alternation of generations: A life cycle in which there is both a multicellular diploid form, the sporophyte, and a multicellular haploid form, the gametophyte; characteristic of plants.
- 118 alternative splicing: In alternative splicing, the same pre-mRNA molecule, which consists of introns and exons, is spliced in different ways to produce mature mRNAs of different lengths and different functionality.
- 119 altruistic behavior: The aiding of another individual at one's own risk or expense.
- 120 alveolus (pl. alveoli): (1) One of the deadend, multilobed air sacs that constitute the gas exchange surface of the lungs. (2) One of the milk-secreting sacs of epithelial tissue in the mammary glands.
- 121 Alzheimer's disease: A degenerative brain disease, beginning with memory loss, and progressing to dementia.
- 122 amine: A chemical substance in the body whose structure is similar to ammonia; a family of hormones (adrenal medulla - epinephrine & norepinephrine) or neurotransmitters in brain (dopamine, norepinephrine, epinephrine, serotonin).
- 123 amino acid (aa): Building block of proteins and enzymes. Dietary proteins need to be broken into their amino acid components before they can be used by the body. Note that there are 20 amino acids found in proteins. Many nutritional lists describe only 18 including glutamine and asparagine. Their values are included in those reported for the acidic forms glutamate and aspartate.
- 124 amino group: A functional group that consists of a nitrogen atom bonded to two hydrogen atoms; can act as a base in solution, accepting a hydrogen ion and acquiring a charge of +1.
- 125 amino terminal fragment (ATF): Highly active part of the uPA molecule.
- 126 aminoacyl: tRNA synthetases. A family of enzymes, at least one for each amino acid, that catalyze the attachment of an amino acid to its specific tRNA molecule.
- 127 aminogluethimide (AG): A drug that blocks the production of adrenal hormones such as DHEA, androstenedione and also cortisol.
- 128 amitotic: Relating to or marked by amitosis - an unusual form of nuclear division, in which the nucleus simply constricts, rather like a cell without chromosome condensation or spindle formation. Partitioning of daughter chromosomes is haphazard.
- 129 ammonification: The process by which decomposers break down proteins and amino acids, releasing the excess nitrogen in the form of ammonia (NH₃) or ammonium ion (NH₄⁺).
- 130 amniocentesis: A procedure used for prenatal diagnosis, which involves insertion of a needle through the abdomen into the amniotic fluid. This procedure is performed using ultrasound guidance, and allows the physician to obtain a small amount of amniotic fluid which can then be used for testing. Amniocentesis is usually performed between 16 and 18 weeks of pregnancy, but some centers offer "early amnio" at 14 weeks of pregnancy.
- 131 amnion: Innermost of the extra-embryonic membranes enveloping the embryo in utero and containing the amniotic fluid.
- 132 amniote: A vertebrate possessing an amnion surrounding the embryo; reptiles, birds, and mammals are amniotes.
- 133 amniotic egg: A shelled, water-retaining egg that enables reptiles, birds, and egg-laying mammals to complete their life cycles on dry land.
- 134 amniotic fluid: Amniotic cavity fluid is which is produced by the amnion and fetal lungs and kidneys and is used for prenatal testing of the fetus.
- 135 amniotic stem cells: cells found in the amniotic fluid that surrounds a fetus. They are not pluripotent like embryonic stem cells, but research has shown that they can differentiate into more cell types than adult stem cells.
- 136 amoeboid: Resembling an amoeba specifically in moving or changing in shape by means of protoplasmic flow.
- 137 amphibia: The vertebrate class of amphibians, represented by frogs, salamanders, and caecilians.
- 138 amphiesma: The outer covering of a dinoflagellate, consisting of several membrane layers.
- 139 amphipathic molecule: A molecule that has both a hydrophilic region and a hydrophobic region.
- 140 amplicon: The DNA product of a PCR reaction, usually an amplified segment of a gene or DNA.
- 141 ampulla: A saccular anatomic swelling or pouch.
- 142 amylase: Enzyme, also called diastase. It is found in both plants and animals.
- 143 amyotrophic lateral sclerosis (ALS): A progressive, usually fatal, neurodegenerative disease caused by the degeneration of motor neurons, the nerve cells in the central nervous system that control voluntary movement - sometimes called Lou Gerhig's Disease after the famous baseball player who died from the disorder.
- 144 anabolic steroids: Synthetic chemical variants of the male sex hormone testosterone; they produce increased muscle mass but also suppress testosterone production, leading to shrinkage of the testes, growth of the breasts, and premature baldness; long-term use increases the risk of kidney and liver damage and of liver cancer.
- 145 anabolism: Within a cell or organism, the sum of all biosynthetic reactions (that is, chemical reactions in which larger molecules are formed from smaller ones).
- 146 anaemia: A condition caused by a reduced number of red blood cells or haemoglobin. This results in reduced oxygen-carrying capacity of the blood, and reduced aerobic activity in body cells.
- 147 anaerobic: Lacking oxygen; referring to an organism, environment, or cellular process that lacks oxygen and may be poisoned by it.
- 148 anagenesis: A pattern of evolutionary change involving the transformation of an entire population, sometimes to a state different enough from the ancestral population to justify renaming it as a separate species; also called phyletic evolution.
- 149 anal verge: The external or distal boundary of the anal canal.
- 150 analgesia: Pain relief without loss of consciousness
- 151 analgesic: A drug that alleviates pain without causing loss of consciousness.
- 152 analog: A synthetic chemical or pharmaceutical that behaves like a normal chemical in the body, e.g., LHRH analogs such as Lupron® or Zoladex®.
- 153 analogous: Applied to structures similar in function but different in evolutionary origin, such as the wing of a bird and the wing of an insect.

- 154 analogy: The similarity of structure between two species that are not closely related; attributable to convergent evolution.
- 155 anandron®: Trade or brand name for nilutamide, an antiandrogen; in the USA this is called Nilandron®.
- 156 anaphase: The third stage of mitosis, beginning when the centromeres of duplicated chromosomes divide and sister chromatids separate from each other, and ending when a complete set of daughter chromosomes are located at each of the two poles of the cell.
- 157 anaphylaxis: Almost 100 years ago Prince Albert I of Monaco invited two Parisian scientists to perform studies on the toxin produced by the tentacles of a local jellyfish, the Portuguese Man of War. Charles Richet and Paul Portier were able to isolate the toxin and tried to vaccinate dogs in the hope of obtaining protection, or "prophylaxis," against the toxin.
- 158 anaplasia: Lack of differentiated features in a cancer cell, characterized by cellular pleomorphism (variation in size and shape of cells and their nuclei), enlarged and hyperchromatic nuclei, prominent nucleoli, atypical mitoses, and bizarre cells, including giant cells.
- 159 anastomosis (pl. anastomoses): The connection of separate parts of a branching system to form a network, as of blood vessels; also the surgical connection of separate or severed tubular hollow organs to form a continuous channel, as the severed urethra in radical prostatectomy.
- 160 anastrozole (Arimidex®): An aromatase inhibitor that reduces the level of estrogen in the body
- 161 Androcur®: Trade name for cyproterone, an antiandrogen with progestational activity; also called CPA for cyproterone acetate (not available in USA).
- 162 androgen ablation therapy (AAT): Preferred terms might be androgen deprivation therapy (ADT) or hormone therapy.
- 163 androgen dependent PC (ADPC): PC cells that depend on androgens for continued cell growth and vitality.
- 164 androgen deprivation syndrome (ADS): A number of side effects associated with elimination or blockage of androgens from ADT.
- 165 androgen deprivation therapy (ADT): A prostate cancer treatment that eliminates or blocks androgens to the PC cell; includes diverse mechanisms such as surgical or chemical castration, antiandrogens, 5 AR inhibitors, estrogenic compounds, agents that interfere with adrenal androgen production, agents that decrease sensitivity of the androgen receptor (AR).
- 166 androgen independent prostate cancer (AIPC): PC cells that do not depend on androgen for growth
- 167 androgen receptor (AR): A structural entity that is the site of interaction of a chemical substance called a ligand as is a lock and key; a docking site for a ligand.
- 168 androgen receptor mutation (ARM): A mutation in the gene located on the androgen receptor that allows the antiandrogen to stimulate PC growth rather than block growth; a paradoxical effect usually occurring in about 30% of patients on long-term antiandrogen therapy in the setting of a rising PSA with a castrate testosterone level.
- 169 androgen: A hormone which is responsible for male characteristics and the development and function of male sexual organs (e.g., testosterone) produced mainly by the testicles but also in the cortex of the adrenal glands; androgens have far reaching effects on blood formation, muscle and bone mass, cognitive function, emotional lability, skin and hair, etc.
- 170 androgen-dependent PC (ADPC): PC cells that depend on androgens for continued cell growth and vitality.
- 171 androgenesis: Development in which the embryo contains only paternal chromosomes.
- 172 androgen-independent PC (AIPC): PC cells that do not depend on androgen for growth.
- 173 androgenones: Paternally-derived genome.
- 174 androstenedione: An adrenal androgen precursor that is transformed to testosterone by 3 beta hydroxysteroid dehydrogenase within the prostate cell; testosterone can also be oxidized to androstenedione by 17 beta hydroxysteroid dehydrogenase.
- 175 anemia: Reduction in total circulating red blood cell mass, diagnosed by a decrease in hemoglobin concentration. Anemic patients have low oxygen-carrying capacity of the blood, with resultant tissue hypoxia. The clinical symptoms are related to the severity of the anemia, and may include pallor, tachycardia, angina, light-headedness and fatigue. Anemia may be due to increased blood loss, decreased red blood cell production, or increased red blood cell destruction.
- 176 anesthetic, anesthesia: A drug that produces general or local loss of physical sensations, particularly pain; a "spinal" is the injection of a local anesthetic into the area surrounding the spinal cord.
- 177 aneuploid: Having an abnormal number of sets of chromosomes; for example, tetraploid means having two paired sets of chromosomes, which is twice as many as normal; aneuploid cancer cells tend not to respond well to androgen deprivation therapy; aneuploidy refers to the state of being aneuploid.
- 178 aneuploidy: A chromosomal aberration in which certain chromosomes are present in extra copies or are deficient in number.
- 179 angiogenesis: A key process involved in the growth of new blood vessels after wounds and injuries. Nervous-system regeneration in the spinal cord may be dependent upon such angiogenesis.
- 180 angiography: An X-ray study of the inside of the heart and/or blood vessels.
- 181 angiokeratoma: Purplish-blue skin rash that may be a symptom with several LSDs. Angiokeratomas are small dark red to purple raised spots. They may also have a rough scaly surface. They are composed of surface blood vessels (dilated capillaries). Often unnoticed, they may become crusty and bleed if accidentally scratched or damaged, or a harmless clot may form in the lesion (thrombosis), changing the color to dark purple or black overnight.
- 182 angiosarcoma: Angiosarcomas are uncommon malignant neoplasms characterized by rapidly proliferating, extensively infiltrating anaplastic cells derived from blood vessels and lining irregular blood-filled spaces. Specialists apply the term angiosarcoma to a wide range of malignant endothelial vascular neoplasms that affect a variety of sites. Angiosarcomas are aggressive and tend to recur locally, spread widely, and have a high rate of lymph node and systemic metastases.
- 183 angiosperm: A flowering plant, which forms seeds inside a protective chamber called an ovary.
- 184 animal cloning: The making of essentially genetically exact copies of animals.
- 185 animal model: A laboratory animal with a specific disease that researchers experiment with to find out more about the causes of a disease, its diagnosis in humans, and to investigate or trial new treatments or preventative actions. Animal models of disease may occur naturally in an animal population, be bred using techniques such as genetic engineering, or by exposing animals to environments that induce that disease to develop.
- 186 anion: A negatively charged ion.
- 187 ankle-foot orthotic (AFO): An externally applied orthopedic appliance which is designed to protect, support and prevent or correct deformity of the foot, ankle and lower leg complex.
- 188 annual: A plant that completes its entire life cycle in a single year or growing season.

- 189 anomaly: A marked deviation from the normal standard, especially as a result of congenital defects.
- 190 anorexia: The uncontrolled lack or loss of the appetite for food.
- 191 antacids: Medications that balance acids and gas in the stomach.
- 192 antagonist: An agent or drug that does not initiate a biological response itself upon binding to a receptor but blocks the response from the active substance.
- 193 antennae: Long, paired sensory appendages on the head of many arthropods.
- 194 anterior visceral endoderm (AVE): Specific tissue structure arising in the early embryo that helps establish the anterior-posterior axis of the organism.
- 195 anterior: The front; for example, the anterior of the prostate is the part of the prostate that faces forward.
- 196 anterolateral: A situated or occurring in front and to the side from the midpoint.
- 197 anther: The terminal pollen sac of a stamen, inside which pollen grains with male gametes form in the flower of an angiosperm.
- 198 antheridium (pl. antheridia): In plants, the male gametangium, a moist chamber in which gametes develop.
- 199 anthocyanin: Natural water-soluble pigments of blue, purple or red which are dissolved in the cell-sap vacuole of plant cells.
- 200 anthropocentrism: A view that regards humans as the central element of the universe. Proponents believe that we should only protect and replenish the environment so that it serves human purposes such as producing food and drugs, and that the fate of animals and plants are not morally significant except in terms of sustaining human wellbeing.
- 201 anthropoid: A higher primate; includes monkeys, apes, and humans.
- 202 antiandrogen monotherapy (AAM): The use of an antiandrogen to block the androgen receptors of the cancer cells as a single therapy to reduce the side-effects normally associated with androgen deprivation therapy.
- 203 antiandrogen withdrawal response (AAWR): A decrease in PSA seen upon stopping an antiandrogen such as Flutamide® or Casodex®; it is believed that this occurs because the antiandrogen has induced a mutation in the androgen receptor (AR) which is allowing the antiandrogen to stimulate PC growth rather than inhibit it.
- 204 antiandrogen: A compound (usually a synthetic pharmaceutical) that blocks or otherwise interferes with the normal action of androgens at cellular receptor sites.
- 205 antiangiogenesis: Prevention of the growth of new blood vessels.
- 206 antibiotic: A chemical that kills bacteria or inhibits their growth, such as penicillin or streptomycin, produced by or derived from microorganisms that can destroy or inhibit the growth of bacteria causing infectious disease.
- 207 antibody: A protein produced by a specific white blood cell, known as a B-cell, in response to a foreign molecule or invading microorganism. Antibodies bind to proteins with high specificity, thereby inactivating the molecule or microorganism or marking it for destruction by the body's immune system. Because antibodies bind to specific proteins, they are commonly used in the lab to detect particular proteins of interest. Cell biologists isolate stem cells from heterogenous cell populations by engineering antibodies that are coupled to a microscopic fluorescent probe.
- 208 anticholinergic: An agent that blocks certain receptors on the nerves, lessens muscle spasms and reduces release of liquids by the stomach, mouth, sweat glands, etc.
- 209 anticoagulant: A pharmaceutical that helps to stop the blood from clotting.
- 210 anticodon: A sequence of three bases in a molecule of transfer RNA (tRNA) that binds to a complementary codon in messenger RNA (mRNA). Each anticodon designates a specific amino acid to be added to a growing polypeptide.
- 211 antidiuretic hormone (ADH): A hormone important in osmoregulation.
- 212 anti-emetic: Medication that prevents or alleviates vomiting.
- 213 antiestrogen: A substance capable of preventing full expression of the biological effects of an estrogen.
- 214 antigen presenting cells (APCs): One of a variety of cells within the body that can process antigens and display them on their surface in a form recognizable by T cells.
- 215 antigen: Any substance that stimulates the production of antibodies in the body. For example, pollen grains, dust, bacteria and viruses are recognised by the body as being foreign and it responds by producing specific antibodies to the antigen.
- 216 antigenic determinant: The individual surface feature of an antigen that elicits the production of a specific antibody in the course of the immune response. Each antigenic determinant, typically a few amino acids in size, causes the synthesis of a different antibody and thus exposure to a single antigen may result in the expression of a number of antibodies.
- 217 antigen-presenting cell (APC): A type of cell that provokes an immune response from T-cells by binding foreign antigens to its own surface and then interacting with the T-cells. Also known as antigen-processing cell.
- 218 antineoplastic: Inhibiting or preventing the development of abnormal tissue growth, checking the maturation and proliferation of malignant cells.
- 219 antioxidant: A molecule that protects cells from oxidative damage of oxygen and free radical molecules that are chemically unstable and cause random reactions damaging proteins, nucleic acids, and cell membranes. Examples of dietary antioxidants are vitamins C, E, and K, and diverse plant products such as lycopene, a nutraceutical found in tomatoes.
- 220 antipsychotic medication: Drugs to treat psychosis. These include atypical or typical antipsychotics.
- 221 antrectomy: Removal of the walls of an antrum.
- 222 antrum: A general term for cavity or chamber which may have specific meaning in reference certain organs or sites in the body. The antrum of the stomach (gastric antrum) is a portion before the outlet which is lined by mucosa which does not produce acid. The paranasal sinuses can be referred to as the frontal antrum, ethmoid antrum, and maxillary antrum.
- 223 anus: The opening of the rectum through which solid waste leaves the body.
- 224 aorta: The largest artery in the body which has its origin at the heart. It gives off branches to the extremities, neck and major organs for the purpose of supplying oxygenated blood.
- 225 aperiodic: Refers to the lack of symmetry in molecular structures or functions. An important insight into the mechanism of biological structures is their aperiodic composition and distribution of atoms causing the extraordinary complexity of cells.
- 226 aperture: Small opening, for example the opening in the test of a foram.
- 227 apex, apical: The tip or bottom of the prostate, e.g., the part of the prostate farthest away from the bladder; the top of the prostate is called the base.
- 228 apheresis: A painless procedure, similar to a blood transfusion, designed to remove certain components of a person's blood, like platelets or stem cells, and return the remaining blood product back into the person's body.

- 229 aphotic zone: The part of the ocean beneath the photic zone, where light does not penetrate sufficiently for photosynthesis to occur.
- 230 apical dominance: Concentration of growth at the tip of a plant shoot, where a terminal bud partially inhibits axillary bud growth.
- 231 apical meristem: Embryonic plant tissue in the tips of roots and in the buds of shoots that supplies cells for the plant to grow in length.
- 232 aplastic anemia: A condition where the bone marrow makes too few white blood cells, red blood cells and platelets.
- 233 aplastic: Lacking in cell production, as in aplastic anaemia.
- 234 apomorphic character: A derived phenotypic character, or homology, that evolved after a branch diverged from a phylogenetic tree.
- 235 apoplast: In plants, the nonliving continuum formed by the extracellular pathway provided by the continuous matrix of cell walls.
- 236 apoptosis: A form of cell death in which a programmed sequence of events leads to the elimination of cells without releasing harmful substances into the surrounding area. Apoptosis plays a crucial role in developing and maintaining health by eliminating old cells, unnecessary cells, and unhealthy cells. The human body replaces perhaps a million cells a second. Too little or too much apoptosis plays a role in a great many diseases. When programmed cell death does not work right, cells that should be eliminated may hang around and become immortal.
- 237 aposematic coloration: The bright coloration of animals with effective physical or chemical defenses that acts as a warning to predators.
- 238 appeal: Application for review of records, medical history, insurance claim.
- 239 aquaporin: A transport protein in the plasma membranes of a plant or animal cell that specifically facilitates the diffusion of water across the membrane (osmosis).
- 240 aqueous solution: A solution in which water is the solvent.
- 241 arachidonic acid: An omega-6 fatty acid that has been shown to be a stimulator of PC growth; found in egg yolk, animal red meat, organ meats; has free-radical generating properties
- 242 arachnoid: One of the three layers of the spinal cord meninges, interposed between the dura and pia mater, and separated from the pia mater by the subarachnoid space.
- 243 archaea: A prokaryotic form of life that forms a domain in the tree of life. There are three domains: bacteria, archaea, and eukarya. Bacteria are also prokaryotic organisms. Eukaryotes include animals, plants, fungi, and protozoa and have very different cell structures, bigger and with internal membrane bound structures (organelles). While bacteria and archaea look similar in structure, they have very different metabolic and genetic activity. One defining physiological characteristic of archaea is their ability to live in extreme environments. They are often called extremophiles and unlike bacteria and eukarya depend on either high salt, high or low temperature, high pressure, or high or low pH.
- 244 archegonium (pl. archegonia): In plants, the female gametangium, a moist chamber in which gametes develop.
- 245 archenteron: The endoderm-lined cavity, formed during the gastrulation process, that develops into the digestive tract of an animal.
- 246 archezoa: Primitive eukaryotic group that includes diplomonads, such as Giardia; some systematists assign kingdom status to archezoans.
- 247 arcus tendinous: A thickened whitish band of the pelvic fascia.
- 248 aromatase: An enzyme that converts testosterone to estrogen (estradiol or estrone).
- 249 arteriole: A very small artery.
- 250 arteriosclerosis: A chronic disease characterized by abnormal thickening and hardening of the arterial walls
- 251 artery: A vessel that carries blood away from the heart to organs throughout the body.
- 252 arthritis: Inflammation of a joint. When joints are inflamed they can develop stiffness, warmth, swelling, redness and pain. There are over 100 types of arthritis.
- 253 artial voluming: the presence of different tissue types (e.g. healthy and malignant) within a spectroscopic volume leading to an averaging of the resulting spectra - a loss of resolution due to excessively large voxels, typically caused by scan slices that are too thick
- 254 artificial insemination: The placement of sperm inside the female reproductive tract to improve the chances of fertilisation and pregnancy occurring. Artificial insemination is also called intrauterine insemination.
- 255 artificial organ: A device that performs the function of a natural organ, such as an artificial heart or ventricular assist device, artificial liver, and artificial lung.
- 256 artificial selection: The selective breeding of domesticated plants and animals to encourage the occurrence of desirable traits.
- 257 ascites: Abnormal buildup of fluid in the abdomen. Ascites can occur as a result of severe liver disease.
- 258 ascus (pl. asci): A saclike spore capsule located at the tip of the ascocarp in dikaryotic hyphae; defining feature of the Ascomycota division of fungi.
- 259 asexual reproduction: A type of reproduction involving only one parent that produces genetically identical offspring by budding or by the division of a single cell or the entire organism into two or more parts.
- 260 ashworth scale: Commonly used as an indicator of spasticity, measures the resistance of a muscle being stretched with a five-point scale ranging from 1 (no increase in tone) to 5 (limb rigid in flexion or extension).
- 261 aspiration: The inhalation of either food or stomach contents into the lower airways. This can lead to aspiration pneumonia and aspiration pneumonitis. Although these two diagnoses are managed differently, they are often interchangeably referred to as aspiration pneumonia.
- 262 assay: a method of performing a standard test for the quality or quantity of a substance. Assay results may vary depending on the methods, reagents and equipment used.
- 263 assimilation: The energy-requiring process by which plant cells convert nitrate ions (NO₃⁻) taken up by the roots of plants into ammonium ions (NH₄⁺), which can then be used in the synthesis of amino acids and other nitrogenous compounds.
- 264 assisted reproductive technology: Fertility treatments that involve a laboratory handling eggs or embryos, such as in vitro fertilization.
- 265 associative learning: The acquired ability to associate one stimulus with another; also called classical conditioning.
- 266 assortative mating: A type of nonrandom mating in which mating partners resemble each other in certain phenotypic characters.
- 267 astenic: Slender, weak, and lightweight.
- 268 astrocyte: A type of supporting (glial) cell found in the nervous system. A star-shaped cell that supports the tissue of the central nervous system.
- 269 asymmetric cell division: Type of cell division distinctive to stem cells. The cell divides into two cells that are different-one a stem cell like its parent, the other a more mature cell.
- 270 asymmetric division: One daughter cell quiescent and the other proliferating and moving away from site of division.
- 271 asymmetric carbon: A carbon atom covalently bonded to four different atoms or groups of atoms.
- 272 asymmetric cell division: The process where a stem cell undergoes mitotic cell division yielding two daughter cells.

- One daughter cell has much developmental potential as the mother cell to create another stem cell. The second daughter cell is more differentiated than the mother cell, and therefore has less developmental potential than the mother cell.
- 273 asymptomatic: Descriptive term for a person who does not appear to be affected by their disease (i.e., displays no symptoms); in the context of genetic diseases an "asymptomatic" patient may be a carrier.
- 274 atelectasis: Absence of air in the alveolar spaces resulting in incomplete expansion of the lungs at birth or collapse of the lungs of an adult.
- 275 athermal: Without heat.
- 276 atherosclerosis: A disorder of the arteries leading to reduced blood flow caused by the narrowing of blood vessels due to the accumulation of plaques composed up of cholesterol and fats.
- 277 atmospheric pressure: The weight of the Earth's atmosphere over a unit area of the Earth's surface.
- 278 atom (atomistic): The smallest unit of matter as recognized by chemical properties of molecules. Atoms are composed of protons, neutrons and electrons. The latter provide all properties described by molecular interactions and chemical reactions that are essential processes in biology.
- 279 atomic number: The number of protons in the nucleus of an atom, unique for each element and designated by a subscript to the left of the elemental symbol.
- 280 atomic weight: The total atomic mass, which is the mass in grams of one mole of the atom.
- 281 ATP synthase: A cluster of several membrane proteins found in the mitochondrial cristae (and bacterial plasma membrane) that function in chemiosmosis with adjacent electron transport chains, using the energy of a hydrogen-ion concentration gradient to make ATP. ATP synthases provide a port through which hydrogen ions diffuse into the matrix of a mitochondrion.
- 282 atrioventricular node: A group of slow-conducting fibers in the atrium of the vertebrate heart that are stimulated by impulses originating in the sinoatrial node (the pacemaker) and that conduct impulses to the bundle of His, a group of fibers that stimulate contraction of the ventricles.
- 283 atrioventricular valve: A valve in the heart between each atrium and ventricle that prevents a backflow of blood when the ventricles contract.
- 284 atrium [pl. atria]: A chamber that receives blood returning to the vertebrate heart.
- 285 atrophic: Undergoing atrophy or shrinkage in size and usually function.
- 286 atrophy: A wasting or decrease in size of a body organ, tissue, or part owing to disease, injury, or lack of use; muscular atrophy of a person affected with paralysis, a wasting away, deterioration, or diminution; intellectual atrophy.
- 287 attentive DRE: A DRE described for PCA3 test as applying firm digital pressure to the prostate from base to apex and from the lateral to the median line for each lobe with exactly three strokes per lobe.
- 288 atypia: State of being not typical.
- 289 atypical hyperplasia (atypia): Non typical enlargement of an organ or tissue.
- 290 AUA Symptom Score: An evaluation of the lower urinary tract symptoms (LUTS) based on questions published by the American Urological Association.
- 291 autoantibody: An antibody that reacts with antigens found on the cells and tissues of an individual's ownbody. Autoantibodies can cause autoimmune diseases.
- 292 autocrine signaling: Signaling in which a cell secretes a hormone or chemical messenger that binds to a cell surface receptor on the same cell that produced it.
- 293 autocrine: Of, relating to, promoted by, or being a substance secreted by a cell and acting on surface receptors of the same cell.
- 294 autogenesis model: According to this model, eukaryotic cells evolved by the specialization of internal membranes originally derived from prokaryotic plasma membranes.
- 295 Autoimmune disease: A condition that results from T cells and/or antibodies that attack the cells or tissues of an individual's own body.
- 296 autoimmune disease: A disease where one own body starts attacking itself and destroying its own cells.
- 297 autoimmune: A condition where the immune system attacks some part of the body that it should not consider as foreign, eg, rheumatoid arthritis.
- 298 autologous bone marrow transplant: A bone marrow/blood stem cell transplant in which the patient's own cells are used.
- 299 autologous stem cells: Stem cells that are used to augment, repair, replace or regenerate organs and tissues and are genetically identical to the recipient. A hematopoietic stem cell transplant (bone marrow transplant) that uses the patient's own hematopoietic stem cells is a clinical example of an autologous transplant in which the patient uses his or her own blood-forming hematopoietic stem cells to treat the disease. Autologous hematopoietic stem cells are derived from the patient's own bone marrow or umbilical cord blood. An allogeneic stem cell transplant uses cells from a donor other than the patient to augment, repair, replace or regenerate diseased and/or damaged organs and tissues.
- 300 autologous regenerative medicine: Transplantation of cells, tissues, or organs derived from and genetically essentially identical to the recipient himself.
- 301 autologous transplantation: Cell, tissue, or organ transplants from one person back to the same person. Such transplants from self do not induce an immune response and are not rejected. In one example, a cancer patient may have her HSC or bone marrow removed and stored during treatment with sufficient radiation or chemical therapy to kill all blood-forming cells (and, perhaps, all cancer cells), and then her blood-forming capacity is rescued with autologous HSC or bone marrow.
- 302 autologous: Biological materials such as cells, tissues, or organs used for transplantation and derived from the recipient himself.
- 303 autonomic dysreflexia: A condition associated with damage to the spinal cord above the mid thoracic level characterized by a marked increase in the sympathetic response to minor stimuli such as bladder or rectal distention or a pressure ulcer. Symptoms can include sweating, high blood pressure, headache, heart rate changes, and flushing of the skin.
- 304 autonomic nervous system: A subdivision of the motor nervous system of vertebrates that regulates the internal environment; consists of the sympathetic and parasympathetic divisions.
- 305 autophagy: self-eating cells: Delivery of cytoplasmic constituents such as whole organelles to the lysosome for degradation. Occurs during starvation, aging and development. It is a recycling process.
- 306 autopolyploid: A type of polyploid species resulting from one species doubling its chromosome number to become tetraploid, which may self-fertilize or mate with other tetraploids.
- 307 autosomal dominant: Some forms of CMD, in particular Ullrich and lamin A/C related CMD, may be inherited in an autosomal dominant fashion. Autosomal dominant means you need only one mutation to have the disease. Autosomal dominant diseases usually have an affected parent, because the parent carries one mutated copy of the gene which then gets passed to the child who has the disease. More often in

- families with a child affected by CMD, the mutation will be a de novo mutation, meaning it has arisen spontaneously, and the parent does not have it, but the child does.
- 308 autosomal recessive: Most forms of CMD are inherited in an autosomal recessive fashion. This means both parents contribute a mutation in the same gene to their child. The child must have both mutations to have CMD. The parents are both carriers of CMD and are unaffected. The child may inherit a different mutation from each parent in the same gene (heterozygous). If the child inherits the same mutation from both parents, it is called homozygous.
- 309 autosomal: Refers to genes that are not found on the sex chromosomes. Those chromosomes that are not XX and XY, i.e. sex-linked.
- 310 autosome: A chromosome that is not directly involved in determining sex, as opposed to the sex chromosomes. These determine the unique human characteristics. There are 22 from each parent and thus we inherit certain characteristics from each of them while at the same time being physically unique, not to mention the unique souls. Autosomes carry genes that determine human physical, physiological and biochemical makeup. There are about 40,000 genes in each human.
- 311 autotroph: An organism that obtains organic food molecules without eating other organisms. Autotrophs use energy from the sun or from the oxidation of inorganic substances to make organic molecules from inorganic ones.
- 312 auxin: A class of plant hormones, including indoleacetic acid (IAA), having a variety of effects, such as phototropic response through the stimulation of cell elongation, stimulation of secondary growth, and the development of leaf traces and fruit.
- 313 auxotroph: A nutritional mutant that is unable to synthesize and that cannot grow on media lacking certain essential molecules normally synthesized by wild-type strains of the same species.
- 314 aves: The vertebrate class of birds, characterized by feathers and other flight adaptations.
- 315 avian influenza: Referred to as the "bird flu", this is a highly contagious influenza virus that can infect any bird.
- 316 avulse: To pull off or tear away.
- 317 axial spin-echo T1 weighted image: An image acquired in the axial plane using a pulse-sequence that weights the signal intensity of each pixel to the T1 (the time it takes for water protons to return to thermal equilibrium) relaxation of water.
- 318 axillary bud: An embryonic shoot present in the angle formed by a leaf and stem.
- 319 axis: A straight line passing through a spherical body between its two poles. The central line of the body or any of its parts. The vertebral column. The central nervous system. An artery that when created, immediately divides into a number of branches.
- 320 axon: The cell extension of a neuron (nerve cell) that carries an electrical signal to synapses which are secreting chemical signaling molecules called neurotransmitters to stimulate/inhibit receiving cells.
- 321 ayurvedic medicine: The traditional medicine of India.
- 322 azotemia: Elevation in blood nitrogen level due to dehydration or kidney dysfunction; in laboratory tests this manifests as elevation in BUN and/or creatinine.
- 323 B cell: A lymphocyte (a type of white blood cell) derived from stem cells in the bone marrow. Each B Cell has a unique set of receptor molecules on its surface designed to recognize a specific antigen(substances, usually protein, that the body regards as foreign).
- 324 baby aspirin: Low dose aspirin (80-100 mg) used in infertility treatment to increase blood flow to the uterus. Often used in conjunction with Heparin in patients with immune problems.
- 325 bacillus thuringiensis: A species of soil bacterium that possess genes for a group of insecticides (Bt toxins). Different strains of the bacterium produce different Bt toxins. Some organic farmers use this bacterium as an alternative to using chemicals to control pest insects. The genes for Bt toxins have been added to GM cotton plants so that the plants produce the insecticides.
- 326 bacteria: Microorganisms that consist of a single cell. Bacteria, like all living things, have their own genomes. They also have the ability to exchange genes with other bacteria. This "swapping" of DNA may help explain how genes that confer resistance to anti-bacterial drugs have spread among many species.
- 327 bacterial artificial chromosome (BAC): A molecule, derived from bacteria, used to carry the DNA of humans or another species in genetics research.
- 328 bacterial vaginosis: It occurs when the normal balance of bacteria in the vagina changes and an overgrowth of some bacteria normally found in the vagina occurs. It is associated with infertility, miscarriage, pre-term birth, and low-birth weight babies.
- 329 bacterial: Of or pertaining to bacteria. For example, a bacterial lung infection.
- 330 bacteriophage: Virus which infects and destroys a bacterial host. Some phages, however, will incorporate their DNA into that of their host, and remain dormant for an extended period. For this reason, they have become essential tools of genetic engineers.
- 331 bacterium (pl. bacteria): A prokaryotic microorganism in Domain Bacteria.
- 332 baculovirus: A type of virus that specifically infects insect cells.
- 333 bagasse: The dry, fibrous residue that remains after the stalks of sugar cane have been crushed and all the juice extracted. It can be used as a source of cellulose for some paper products.
- 334 balanced polymorphism: A type of polymorphism in which the frequencies of the coexisting forms do not change noticeably over many generations.
- 335 balanced translocation (BT): Is when a person has the correct number of chromosomes, but the pieces are joined up incorrectly. The problem can be inherited from one parent and then balanced out by the other. If both partners have similar problems, recurrent miscarriage may occur.
- 336 barium enema: A radiographic diagnostic procedure that involves the introduction of a barium containing contrast material into the lower gastrointestinal tract via the anus. X-rays taken after instillation of the barium will outline the course and anatomy of the lower GI tract.
- 337 bark: All tissues external to the vascular cambium in a plant growing in thickness, consisting of phloem, phelloderm, cork cambium, and cork.
- 338 barr body: A dense object lying along the inside of the nuclear envelope in female mammalian cells, representing an inactivated X chromosome.
- 339 barrett esophagus: A change in the cells of the tissue that lines the bottom of the esophagus. The esophagus may become irritated when the contents of the stomach back up (reflux). Reflux that happens often over a period of time can lead to Barrett's esophagus.
- 340 basal and squamous cell carcinoma: Most cancer registries in North America do not register cases of basal and squamous cell carcinoma. Most often, basal and squamous cell carcinomas pose little harm to the individuals if they are detected early and treated properly. Mortality from basal and squamous cell carcinoma is low.
- 341 basal body temperature (BBT): The body temperature when taken at its lowest point, usually in the morning before getting out of bed. Charting BBT is used to predict ovulation. BBTs are not very reliable while taking fertility

- medications. Biphasic: A BBT pattern consistent with ovulation and the formation of the corpus luteum, which secretes progesterone. This hormone will elevate the basal body temperature about one-half degree during the latter half of the menstrual cycle. Monophasic: An anovulatory BBT pattern where the temperature remains relatively constant throughout the cycle. Triphasic: Similar to a biphasic BBT pattern, but adds a jump to a third level of temperatures around the time implantation should occur and may indicate pregnancy.
- 342 basal body: A eukaryotic cell organelle consisting of a 9 + 0 arrangement of microtubule triplets; may organize the microtubule assembly of a cilium or flagellum; structurally identical to a centriole.
- 343 basal metabolic rate (BMR): The minimal number of kilocalories a resting animal requires to fuel itself for a given time.
- 344 base pairs: Pairs of complementary bases that form each rung of the DNA double helix. Adenine pairs with thymine and cytosine pairs with guanine.
- 345 base sequence: The order of the chemical units (bases) adenine, thymine, cytosine and guanine in DNA that forms the genetic code. The sequence of the bases will determine what protein is produced.
- 346 base: Part of 4 types of simple molecules or nucleotides (adenine, thymine, cytosine and guanine) that are the sub-units (building blocks) of DNA and RNA.
- 347 baseline PSA (bPSA): The PSA level before a new treatment has begun; used to establish efficacy of a therapy based on response of the PSA to the treatment; can also be used in principle with any other marker, radiologic imaging study or any finding that shows pathology relating to PC.
- 348 basement membrane: Basement membrane is a structure that supports an overlying epithelium or endothelium. Keratinocytes, glandular cells, and endothelial cells reside on basement membranes. Basement membrane consists of an electron dense membrane called basal lamina, about 300-700 angstrom in thickness, and an underlying network of reticular collagen fibrils which average 300 angstrom in diameter. This network is 0.1-2 micron in thickness.
- 349 basement membrane: The floor of an epithelial membrane on which the basal cells rest.
- 350 base-pair substitution: A point mutation; the replacement of one nucleotide and its partner from the complementary DNA strand by another pair of nucleotides.
- 351 base-pairing principle: In the formation of nucleic acids, the requirement that adenine must always pair with thymine (or uracil) and guanine with cytosine.
- 352 basidium (pl. basidia): A reproductive appendage that produces sexual spores on the gills of mushrooms. The fungal division Basidiomycota is named for this structure.
- 353 basophil: A type of white blood cell that contain granules filled with chemicals toxic to other cells and used to destroy invading bacteria and other pathogens. They belong to a group of leukocytes known as granular leukocytes or granulocytes. Basophils: Heavily involved in the inflammatory response and allergic reactions. They destroy pathogens by engulfing them and then releasing their toxic granules in a process known as phagocytosis. Basophils are manufactured and matured in the bone marrow. When triggered they release a number of immune system mediators. Basophils make up less than 1% of the white blood cells. They are active in inflammation.
- 354 batesian mimicry: A type of mimicry in which a harmless species looks like a different species that is poisonous or otherwise harmful to predators.
- 355 Bcl-2: An anti-apoptotic protein that protects cells from programmed cell death by preventing the activation of pro-apoptotic proteins.
- 356 behavior: All of the acts an organism performs, as in, for example, seeking a suitable habitat, obtaining food, avoiding predators, and seeking a mate and reproducing.
- 357 behavioral ecology: A heuristic approach based on the expectation that Darwinian fitness (reproductive success) is improved by optimal behavior.
- 358 Benadryl®: Antihistamine often used to treat allergic reactions involving the nasal passages (hay fever) and also to treat motion sickness.
- 359 benign prostatic hyperplasia (BPH): A benign condition in which an overgrowth of prostate tissue pushes against the urethra (which passes through the prostate) and the bladder, blocking the release of urine.
- 360 benign prostatic hypertrophy (BPH): Similar to benign prostatic hyperplasia, but caused by an increase in the size of cells rather than the growth of more cells.
- 361 benign: Relatively harmless; not cancerous; not malignant.
- 362 benthic zone: The bottom surfaces of aquatic environments.
- 363 benzene: A colorless and flammable toxic liquid used in organic synthesis, as a solvent, and as a motor fuel. Exposure to benzene can increase the risk of cancer and lead to anemia and a decrease in blood platelets.
- 364 Beta-HCG test: A blood test used to detect very early pregnancies and to evaluate embryonic development. A beta test usually refers to a quantitative hCG in which the units of hCG are counted, but it sometimes refers to a qualitative (yes/no) test that reads to an hCG level under 50 (level is lab dependent).
- 365 Beta-particle: A charged particle (electron or positron) that is emitted by the decay of certain radioactive atoms.
- 366 bevacizumab (Avastin®): An anti-angiogenesis drug used in treatment of cancer. It is used in combination with standard chemotherapy drugs in patients with metastatic colorectal cancer.
- 367 bicalutamide (Casodex®): A nonsteroidal antiandrogen available in the USA and some European countries for the treatment of advanced prostate cancer.
- 368 bicornuate uterus: A congenital malformation of the uterus where the upper portion (horn) is duplicated.
- 369 bid or b.i.d.: To be taken twice a day (morning and evening); stands for "bis in die" (in Latin, 2 times a day)
- 370 biennial: A plant that requires two years to complete its life cycle.
- 371 big pharma: The giant pharmaceutical corporations of the world, who seek to control all access to health, and to limit the use of healing practices that they do not control.
- 372 bilateral symmetry: Characterizing a body form with a central longitudinal plane that divides the body into two equal but opposite halves.
- 373 bilateria: Members of the branch of eumetazoans possessing bilateral symmetry.
- 374 bile: A yellow secretion of the vertebrate liver, temporarily stored in the gallbladder and composed of organic salts that emulsify fats in the small intestine.
- 375 bi-level positive airway pressure: Form of noninvasive ventilation respiratory support providing oxygen and pressure to the lungs to make it easier for a patient to breathe. With BiPAP therapy, there are two different pressure settings for the patient. The bipap machine is able to detect how much pressure a patient needs and supply the adequate amount of air pressure on inhalation and exhalation. The dual settings of the BiPAP machine, allows patients to get more air into, and out of the lungs without the normal muscular activity needed to do so.
- 376 billroth operation I (Billroth I anastomosis): Excision of the pylorus with end-to-end anastomosis of stomach and duodenum.
- 377 billroth operation II (Billroth II anastomosis): Resection of the pylorus with the greater part of the lesser curvature of

- the stomach, closure of the cut ends of the duodenum and stomach, followed by a gastrojejunostomy.
- 378 bimix, bi-mix: Usually refers to a mixture of papaverine and phentolamine that is injected into the penis to cause an erection.
- 379 binary fission: The type of cell division by which prokaryotes reproduce; each dividing daughter cell receives a copy of the single parental chromosome.
- 380 binet: A staging system for lymphomas.
- 381 binomial: The two-part Latinized name of a species, consisting of genus and specific epithet.
- 382 biochemical control: Control of a biochemical marker, such as an antigen (ex: PSA), antibody, abnormal enzyme (ex: PAP), or hormone that is sufficiently altered in a disease to serve as an aid in diagnosing or in predicting susceptibility to the disease.
- 383 biochemical failure: Loss of biochemical control.
- 384 biochemical pathway: An ordered series of chemical reactions in a living cell, in which each step is catalyzed by a specific enzyme; different biochemical pathways serve different functions in the life of the cell.
- 385 biochemical: Involving chemical processes in living organisms.
- 386 biocide: Any chemical agent that can kill a living organism. For example, pesticides kill insects.
- 387 biocontainment: A process aimed at keeping biological organisms within a limited space or area. For example, if an outbreak of a cow disease is found on one farm, a biocontainment process would aim at stopping the disease from spreading to other farms.
- 388 biodiesel: An alternative fuel for use in diesel engines that is made from natural renewable sources such animal fats or vegetable oils, and does not contain petroleum. It has similar properties to petroleum but releases fewer environmental pollutants in its emissions. Biodiesel can be used in diesel engines with little or no modifications, either as a diesel fuel substitute, or added to petroleum-based fuels to reduce their polluting effect. Examples include oils from soybeans, rapeseed, sunflowers or animal tallow.
- 389 biodiversity hotspot: A relatively small area with an exceptional concentration of species.
- 390 bioenergetics: The study of how organisms manage their energy resources.
- 391 bioethics: The study of the ethical and moral implications of applications of biomedical research and biotechnology.
- 392 Biofeedback: A procedure that uses electrodes to help people gain awareness and control of their pelvic muscles.
- 393 biofouling: Living organisms that attach to and start living on any object that is submerged in the sea. Commonly seen as barnacles attached to the hulls of ships or the bodies of whales.
- 394 biogeochemical cycles: The various nutrient circuits, which involve both biotic and abiotic components of ecosystems.
- 395 Biogeography: The study of the past and present distribution of species.
- 396 Bioimpedence: Measures the resistance to the flow of electrical current through various tissues of the body and can be used to measure the density of bone or bone substitutes.
- 397 bioinformatics: The range of approaches that are used to further biological understanding, such as statistical techniques, database analysis and algorithms.
- 398 biological clock: Proposed internal factor(s) in organisms that governs functions that occur rhythmically in the absence of external stimuli.
- 399 biological control: The control of a population of one organism by another organism. Generally the controlling organism is a predator or disease-causing organism of the species being controlled.
- 400 biological magnification: A trophic process in which retained substances become more concentrated with each link in the food chain.
- 401 biological species: A population or group of populations whose members have the potential to interbreed.
- 402 biomarker: A protein that can latch onto the surface of a cell like a key in a lock. If the structure on the outside of the cell matches then the biomarker attaches itself to the cell membrane. Different cells have different structures on their membranes, so the presence of a biomarker helps in identifying a cell type or in isolating the cell type when trying to purify a culture. Cell sorting techniques are based on the presence of cellular biomarkers.
- 403 biomarker: A specific biochemical in the body which is useful for measuring the progress of disease or the effects of treatment.
- 404 biomass: The dry weight of organic matter comprising a group of organisms in a particular habitat.
- 405 biomaterial: A material which is in whole or in part composed of living matter, such as a polymer scaffolding perfused with cells. Biomaterials may be used as a medical device which augments or replaces natural tissue for therapeutic effect. The combination of synthetic and living material derived from stem cells could enable the repair of heart valves, bone, cartilage and other tissues by replacing or patching the damaged parts with materials that are genetically identical to the patient, and therefore safe from immunological rejection.
- 406 biome: One of the world's major communities, classified according to the predominant vegetation and characterized by adaptations of organisms to that particular environment.
- 407 biopsy: A procedure used to remove cells or tissues in order to look at them under a microscope to check for signs of disease.
- 408 bioreactor: A laboratory system in which cells can be cultured for use in tissue engineering.
- 409 bioremediation: The use of plants and micro-organisms to consume or otherwise help remove materials (such as toxic chemical wastes and metals) from contaminated sites (especially from soil and water). A natural process in which environmental problems are treated by the use of bacteria or other micro-organisms that break down a problem substance, such as oil, into less harmful molecules.
- 410 biosafety cabinet: A cabinet that filters air to prevent biohazards from escaping or contamination of the culture from outside air. If the cabinet has a higher safety rating, it can be used in more clinical settings so that a patient's cells remain safe.
- 411 bioscience: The science of biology. In the case of Regenecell - human biology and medicine.
- 412 biosphere: The entire portion of Earth that is inhabited by life; the sum of all the planet's communities and ecosystems.
- 413 biosynthesis: Formation by living organisms of organic compounds from elements or simple compounds.
- 414 biotech: The use of biological knowledge, microorganisms and biological processes in industrial or manufacturing processes. Examples include synthetic hormones, bacteria to clean up oil spills, genetic engineering, as well as cell and tissue cultures.
- 415 biotechnologists: Scientists who use biological processes to develop novel products.
- 416 biotechnology: (1) A broad term generally used to describe the use of biology in industrial processes such as agriculture, brewing and drug development. The term also refers to the production of genetically modified organisms or the manufacture of products from genetically modified organisms. (2) The use of plants, animals and micro-organisms to create products or processes. Traditional applications include animal breeding, brewing beer with

- yeast, and cheese making with bacteria. Recent developments include the use of enzymes or bacteria in a wide range of applications, including waste management, industrial production, food production and remediation of contaminated land. Modern biotechnology also includes the use of gene technology, which allows us to move genetic material from one species to another.
- 417 biotic: Pertaining to the living organisms in the environment.
- 418 biotinylation: The attachment of biotin to chemical sites can be used to study various processes including protein interactions and DNA transcription.
- 419 biotreatment: The treatment of a waste or hazardous substance using organisms such as bacteria, fungi and protozoa.
- 420 bipedal: Walking upright on two feet.
- 421 biphasic: Having two phases. Used to describe BBT charts that show a clear shift from the follicular phase (before ovulation) to the luteal phase (after ovulation).
- 422 bisphosphonates (BPs): Any of a group of carbon-substituted analogs of pyrophosphate that are potent inhibitors of osteoclast-mediated bone resorption.
- 423 bladder: The hollow organ in which urine is collected and stored in the body.
- 424 blade: (1) The broad, expanded part of a leaf. (2) The broad, expanded photosynthetic part of the thallus of a multicellular alga or a simple plant.
- 425 blast cells: Cells that are not fully formed.
- 426 blast crisis: The stage of chronic myelogenous leukemia when large amounts of blast cells are found in the blood.
- 427 blastic: Having a dense appearance on a plain x-ray; associated with increased density of bone involved by prostate cancer and looking whiter on an ordinary x-ray; prostate cancer bone metastases are usually blastic; breast cancer metastases are usually lytic (showing evidence of less bone density in areas of cancer)
- 428 blastocoel: The fluid-filled cavity that forms in the center of the blastula embryo.
- 429 blastocyst stage: An early stage in the development of embryos, when (in mammals) the embryo is a spherical body comprising an inner cell mass that will become the fetus surrounded by an outer ring of cells that will become part of the placenta. (CR)
- 430 blastocyst transfer: Allowing in vitro fertilized embryos to reach blastocyst stage, usually 5 days, before transferring the embryos into the uterus.
- 431 blastocyst: An embryo that has developed for five days after fertilization. At this point the embryo has two different cell types and a central cavity. The surface cells (trophoblast) will become the placenta, and the inner cell mass, will become the fetus. A healthy blastocyst should hatch from the zona pellucida by the end of the sixth day. Within about 24 hours after hatching, it should begin to implant into the lining of the uterus. The human blastocyst is an embryo at an early stage of development, it is formed about five days after fertilization and is made of about 70-100 cells.
- 432 blastodisc: Disklike area on the surface of a large, yolky egg that undergoes cleavage and gives rise to the embryo.
- 433 blastomere: Early in development, the daughter cells resulting from the cell divisions stick together, each individual cell is a blastomere.
- 434 blastopore: The opening of the archenteron in the gastrula that develops into the mouth in protostomes and the anus in deuterostomes.
- 435 blastula: An early stage in the development of an ovum consisting of a hollow sphere of cells enclosing a cavity called the blastocoel.
- 436 blighted ovum: A pregnancy that stops developing very early on. The amniotic sac may only contain fluid and no fetal tissue when the miscarriage occurs.
- 437 bloating: A condition in which the abdomen feels full and tight; often caused by excessive intestinal gas.
- 438 blood cancer: A malignant growth, usually caused by a combination of genetic and environmental factors. In cancer, abnormal cells usually proliferate without responding to the normal signals that stop growth, and spread to tissues and organs beyond the original site.
- 439 blood cell separator: A machine, used in apheresis, which distinguishes the small fraction of stem cells in the blood from all other blood cells, so that the stem cells may be collected for transplant.
- 440 blood chemistry: Measured concentrations of many chemicals in the blood; abnormal values can indicate spread of cancer or side effects of therapy.
- 441 blood count: Analysis of blood cells including white blood cells, red blood cells and platelets; abnormal values can indicate cancer in the bone or side effects of therapy.
- 442 blood glucose (BG): Blood sugar. Affected by food that is consumed.
- 443 blood pressure: The hydrostatic force that blood exerts against the wall of a vessel.
- 444 blood stem cells: Cells found in the blood that can grow into a red blood cell, a white blood cell or a platelet. Also called hematopoietic stem cells.
- 445 blood transfusion: The transfer of blood or blood products from one person to another.
- 446 blood type: The major blood types identify the presence or absence of three proteins on the outside of blood cells. These proteins are called "A", "B", and "Rh". Although it has not been demonstrated to be necessary, umbilical cord blood transfusions are generally matched according to ABO and Rh blood type.
- 447 blood urea nitrogen (BUN): A reflection of kidney function.
- 448 blood: A circulating tissue composed of fluid plasma and cells (red blood cells, white blood cells and platelets).
- 449 blood-borne diseases: Infectious diseases which can be transmitted by exposure to infected blood. Some of these types of diseases are HIV/AIDS, hepatitis B and C, cytomegalovirus, Syphilis, etc. These are infectious, not inherited diseases. StemTech Labs checks all donated blood and tissues for blood borne illnesses at a US lab.
- 450 blood-brain barrier: A functional barrier between the circulatory system and the spinal fluid that bathes and nourishes the brain. This barrier prevents passage of many toxic substances into the brain. It may be a barrier to migration of stem cells from the bloodstream into the brain, but some studies have demonstrated the passage of neuronal stem cells through the blood brain barrier. Some stem cell therapist use the sugar mannitol to make the blood brain barrier more permeable and help the stem cells to cross into the brain.
- 451 bloom syndrome: Congenital telangiectatic erythema, primarily in butterfly distribution, of the face and occasionally of the hands and forearms, with sensitivity of skin lesions and dwarfism with normal body proportions except for a narrow face and dolichocephalic skull; chromosomes are excessively fragile; autosomal recessive inheritance.
- 452 blot: A nitrocellulose sheet that contains spots of immobilized macromolecules or their fragments and that is used to identify specific components of the spots by applying a suitable molecular probe.
- 453 bluestein tables: Tables containing algorithms which use the variables clinical stage, Gleason grade, and PSA to predict high vs low risk for lymph node involvement with prostate cancer.

- 454 B-mode acquisition and targeting (BAT): An ultrasound evaluation of the prostate localizing it prior to each and every RT therapy treatment; currently used in conjunction with IMRT and mechanically integrated into the treatment program.
- 455 bond energy: The quantity of energy that must be absorbed to break a particular kind of chemical bond; equal to the quantity of energy the bond releases when it forms.
- 456 bond strength: The strength with which a chemical bond holds two atoms together; conventionally measured in terms of the amount of energy, in kilocalories per mole, required to break the bond.
- 457 bone marrow (stem cell transplants): The spongy tissue which occupies the central cavity of bones and which plays a major role in the development of blood cells. After puberty, marrow in the spine, ribs, breast bone, hip, shoulders, and skull are most active in blood cell formation.
- 458 bone marrow aspiration: A procedure involving a fine needle used to remove a sample of liquid bone marrow for review under a microscope.
- 459 bone marrow biopsy: The removal of a sample of tissue from the bone marrow with a needle for examination under a microscope.
- 460 bone marrow cell: Refers to both hematopoietic cells and mesenchymal (stromal) cells.
- 461 bone marrow harvest: a surgical procedure used to collect bone marrow. The bone marrow harvest takes place in a hospital operating room, usually under general anesthesia. The bone marrow is extracted with a needle and syringe.
- 462 Bone marrow stem cell (BMSC): The most primitive cells in the bone marrow. From them, all the various types of blood cells are descended. Often referred to as an Adult Stem Cell. Bone Marrow stem cells are considered to be pluripotent.
- 463 Bone marrow stromal cell: Also known as mesenchymal stem cells, bone marrow stromal cells are a mixed population of cells derived from the non-blood forming fraction of bone marrow. Bone marrow stromal cells are capable of growth and differentiation into a number of different cell types including bone, cartilage and fat.
- 464 bone marrow transplant (BMT): A procedure developed to treat some forms of cancer and other diseases. There are several types of BMT's, depending on who donates the marrow. Stem cells are removed from the bone marrow for transplant.
- 465 bone marrow transplant: A procedure in which bone marrow that is diseased or damaged is replaced with healthy bone marrow. The bone marrow to be replaced may be deliberately destroyed by high doses of chemotherapy and/or radiation therapy.
- 466 bone marrow transplantation (BMTx): Trans-plantation of bone marrow from one individual to another. Autologous BMTx is a process in which a patient's healthy bone marrow is withdrawn and preserved, then injected back into the patient to restore the production of healthy blood and immune cells by the bone marrow. This strategy is often used in patients with certain types of cancer who have undergone radiation therapy or chemotherapy that destroys the bone marrow cells.
- 467 bone marrow: The reddish substance found in the central canals of many bones. Bone marrow functions to produce blood cells. Bone marrow is often damaged by chemotherapy or radiotherapy in cancer treatment, and can be reconstituted by transplanting bone marrow or umbilical cord blood cells.
- 468 bone mineral density (BMD): A measure of the strength of bones, androgen deprivation can cause the loss of BMD resulting in osteoporosis, usually BMD is tested by dual-energy absorption x-ray (DEXA) or quantitative CAT scan (qCT) methods
- 469 bone morphogenetic proteins (BMPs): Proteins that are involved in the formation of embryonic bone. BMPs operate at several stages in this formation of bone, beginning with the early stages of morphogenesis and continuing to late postnatal life. BMPs also play a critical role in the development of the central nervous system.
- 470 bone scan: A technique more sensitive than conventional x-rays which uses a radiolabelled agent to identify abnormal or cancerous growths within or attached to bone; in the case of prostate cancer, a bone scan is used to identify bony metastases which are definitive for cancer which has escaped from the prostate; metastases appear as "hot spots" on the film; however the absence of hot spots does not prove the absence of tiny metastases.
- 471 bone: The hard skeleton that forms the structure of the body, composed of calcium phosphate and calcium carbonate.
- 472 bone-marrow stem cells: Stem cells produced by the bone marrow, including hematopoietic and mesenchymal stem cells.
- 473 book lungs: Organs of gas exchange in spiders, consisting of stacked plates contained in an internal chamber.
- 474 boosting: Using a medication to increase blood levels of another medication.
- 475 bortezomib: The first anti-cancer treatment to block the proteasome enzyme complex. In MM cells, this unique mechanism of action can lead to apoptosis in a number of ways.
- 476 botany: The study of plants.
- 477 bottleneck effect: Genetic drift resulting from the reduction of a population, typically by a natural disaster, such that the surviving population is no longer genetically representative of the original population.
- 478 bowel preparation: The cleaning of the bowels or intestines that is normal prior to abdominal surgery such as radical prostatectomy.
- 479 bowel: Small or large intestine. The small intestine is sometimes called the small bowel. The large intestine is also called the colon.
- 480 Bowman's capsule: A cup-shaped receptacle in the vertebrate kidney that is the initial, expanded segment of the nephron where filtrate enters from the blood.
- 481 box: A small portion of a gene or protein that appears in many genes or proteins that are related in structure; the box usually has some specific function, sometimes called a "motif", like binding DNA or interacting with specific proteins or other molecules.
- 482 brachial plexus: A network of nerves that conducts signals from the spine to the shoulder, arm, and hand. Brachial plexus injuries are caused by damage to those nerves.
- 483 brachytherapy: A form of radiation therapy in which radioactive seeds or pellets which emit radiation are implanted within the prostate in order to destroy PC.
- 484 brain natriuretic peptide: A measurement of this hormone in the blood can determine the presence of and monitor the progress in a patient in cardiac failure.
- 485 brain stem: The stemlike part of the brain that is connected to the spinal cord. Or conversely, the extension of the spinal cord up into the brain. The brain stem is small but important. It manages messages going between the brain and the rest of the body, and it also controls basic body functions such as breathing, swallowing, heart rate, and blood pressure. The brain stem also controls consciousness and determines whether one is awake or sleepy.
- 486 brain: The master control center in an animal; in vertebrates, the brain and spinal cord make up the central nervous system.
- 487 brain-derived neurotrophic factor (BDNF): A growth factor synthesized in the brain that stimulates neurite outgrowth and supports survival of neurons.

- 488 brainstem: The hindbrain and midbrain of the vertebrate central nervous system. In humans, it forms a cap on the anterior end of the spinal cord, extending to about the middle of the brain.
- 489 BRCA1: BRCA1 or "Breast Cancer 1," is a genetic mutation that is present in about two-thirds of heritable breast cancers and a smaller number of heritable ovarian cancers. Only about 5% of the female breast cancer in the world is attributable to having the BRCA1 mutation.
- 490 breunner tumor: Brenner tumors are comprised of solid to partly cystic epithelial nests surrounded by stroma composed of bundles of tightly packed spindle-shaped cells. The epithelial cells are polygonal and of squamoid type, with pale, eosinophilic cytoplasm and oval nuclei with distinct nucleoli and longitudinal grooving, which is commonly described as "coffee-bean" in appearance.
- 491 bromocriptine (Parlodel): An oral medication used to reduce prolactin levels and reduce the size of a pituitary tumor when present. This medication often causes dizziness and upset stomach and must be started with a small dose which is gradually increased as needed. This medication is equally effective when the tablet is placed into the vagina.
- 492 bronchitis: Infection of the airways (bronchi) leading to the lungs.
- 493 bronchus (pl. bronchi): One of a pair of respiratory tubes branching into either lung at the lower end of the trachea; it subdivides into progressively finer passageways, the bronchioles, culminating in the alveoli.
- 494 bryophyte: The mosses, liverworts, and hornworts; a group of nonvascular plants that inhabit the land but lack many of the terrestrial adaptations of vascular plants.
- 495 b-symptoms: Drenching night sweats, unexplained loss of 10% of body weight, marked weakness, and a fever of more than 100°F (38°C) lasting for more than a week.
- 496 Bt crops: Crop plants that contain genes for Bt toxins. Examples are Bollgard® cotton and Ingard® cotton.
- 497 Bt toxins: Insecticidal proteins produced by the soil microorganism called *Bacillus thuringiensis*. Bt is an abbreviation of *Bacillus thuringiensis*.
- 498 bud: (1) In plants, an embryonic shoot, including rudimentary leaves, often protected by special bud scales. (2) In animals, an asexually produced outgrowth that develops into a new individual.
- 499 budding: An asexual means of propagation in which outgrowths from the parent form and pinch off to live independently or else remain attached to eventually form extensive colonies.
- 500 buffer: A substance that consists of acid and base forms in solution and that minimizes changes in pH when extraneous acids or bases are added to the solution.
- 501 buffy coat: The WBC layer that contains the stem cells. The name "white cells" derives from the fact that after centrifugation of a blood sample, the white cells are found in the 'buffy coat', a thin layer of nucleated cells between the sedimented red blood cells and the blood plasma which is white in color.
- 502 bulb: A modified bud with thickened leaves adapted for underground food storage.
- 503 bulbourethral gland: One of a pair of glands near the base of the penis in the human male that secrete fluid that lubricates and neutralizes acids in the urethra during sexual arousal.
- 504 bulk flow: The movement of water due to a difference in pressure between two locations.
- 505 bundle of His: In the vertebrate heart, a group of muscle fibers that carry impulses from the atrioventricular node to the walls of the ventricles; the only electrical bridge between the atria and the ventricles.
- 506 Burkitt's Lymphoma: Burkitt's lymphoma is a solid tumor of B lymphocytes, the lymphocytes that the immune system uses to make antibodies. Burkitt's lymphoma is a form of cancer that primarily affects children living in certain areas of Africa. Burkitt's lymphoma is also found in North America, but it is rare.
- 507 buserelin: A long-acting GnRH available in Europe as a nasal spray and used to create the pseudomenopause desirable for reducing the size and number of endometriotic lesions. It can also be used to treat fibroid tumors, PMS, hirsutism, ovulation induction and for in vitro fertilization.
- 508 by-pass: Surgical formation of a passage (anastomosis) between two normally distinct spaces or organs. For example, a shunt to divert blood from one part of the body to the other is a by-pass. A colostomy to short circuit the GI tract, when there is an obstruction of the colon, is a by-pass.
- 509 C3 plant: A plant that uses the Calvin cycle for the initial steps that incorporate CO₂ into organic material, forming a three-carbon compound as the first stable intermediate.
- 510 C4 pathway: The set of reactions by which some plants initially fix carbon in the four-carbon compound oxaloacetic acid; the carbon dioxide is later released in the interior of the leaf and enters the Calvin cycle.
- 511 C4 plant: A plant that prefaces the Calvin cycle with reactions that incorporate CO₂ into four-carbon compounds, the end-product of which supplies CO₂ for the Calvin cycle.
- 512 CA 125 (Cancer Antigen 125): CA 125 is a protein made by certain cells in the body which include those of the uterus, uterine tubes, cervix, abdomen, and chest (pleura and lungs). Elevated CA 125 can be caused by many conditions such as peritonitis, pleuritis, menstruation, pregnancy, endometriosis, liver disease, benign ovarian growths, and by cancers of the uterine tubes, endometrium, lung, breast, and gastrointestinal tract.
- 513 cachexia: Physical wasting with loss of weight and muscle mass caused by disease.
- 514 calcification: Impregnation with calcium or calcium salts. Also called calcareous infiltration.
- 515 calcitonin: A hormone produced by the thyroid that plays a role in regulating calcium levels.
- 516 calcitriol (1,25-dihydroxycholecalciferol): A hormone related to vitamin D that is synthesized in the liver and kidney and stimulates the intestinal absorption of calcium and phosphorus.
- 517 calcium: A silver-white bivalent metallic element of the alkaline-earth group occurring only in combination.
- 518 calicivirus: The virus that causes rabbit calicivirus disease (RCD) in rabbits. It is spread by mosquitoes and fleas.
- 519 callus: In plants, undifferentiated tissue; a term used in tissue culture, grafting, and wound healing.
- 520 calmodulin: An intracellular protein to which calcium binds in its function as a second messenger in hormone action.
- 521 calorie (cal): The amount of heat energy required to raise the temperature of 1 g of water 1°C; the amount of heat energy that 1 g of water releases when it cools by 1°C. The Calorie (with a capital C), usually used to indicate the energy content of food, is a kilocalorie.
- 522 calvin cycle: The second of two major stages in photosynthesis (following the light reactions), involving atmospheric CO₂ fixation and reduction of the fixed carbon into carbohydrate.
- 523 calyx: Collectively, the sepals of a flower.
- 524 CAM plant: A plant that uses crassulacean acid metabolism, an adaptation for photosynthesis in arid conditions, first discovered in the family Crassulaceae. Carbon dioxide entering open stomata during the night is converted into organic acids, which release CO₂ for the Calvin cycle during the day, when stomata are closed.
- 525 cambrian explosion: A burst of evolutionary origins when most of the major body plans of animals appeared in a relatively brief time in geological history; recorded in the fossil record about 545 to 525 million years ago.

- 526 cAMP (cyclic adenosine monophosphate): A molecular mediator or messenger of important cellular and neuronal processes.
- 527 cancer cells: Uncontrolled growth of abnormal cells in the body. Cancer cells can grow, divide, and invade normal tissue in the body.
- 528 cancer control: Cancer Control is the conduct of research and the translation of knowledge from research into strategies and actions to prevent cancer and to increase survival and quality of life for those touched by cancer. A simplified definition of "cancer control" is: Any activity that reduces the morbidity (sickness, disease) or mortality (death) from cancer.
- 529 cancer prevention: Cancer prevention research involves the development and evaluation of strategies for reducing cancer incidence. Such strategies could be aimed at preventing the initiation of the neoplastic process or at avoiding the progression to malignancy of already initiated cells. These efforts, which may be multidisciplinary and multifactorial, can involve a broad range of studies at the molecular, cellular, organismal and population levels.
- 530 cancer stem cell self: Renewing cell responsible for sustaining a cancer and for producing differentiated progeny that form the bulk of the cancer. Cancer stem cells identified in leukaemias and certain solid tumours are critical therapeutic targets.
- 531 cancer stem cell: Stem cells, which make up only a very small percentage of the total tumor mass, have been found to be the source of some, and possibly most cancers. The cancer stem cell hypothesis states that certain stem cells remain in tissues to replenish them after injury or disease, yet because they are self-renewing and can survive for a longer period of time, the adult stem cells can also accumulate mutations which would cause them to spin off cells that divide uncontrollably, forming a tumor. Since current cancer treatments reduce tumor mass but might not affect the stem cells seeding the tumor, new therapeutic strategies may be directed at the cancer-causing stem cells.
- 532 cancer: Cancer is a group of more than 100 different diseases. Benign tumours are not cancer; malignant tumours are cancer. Most cancers are named for the type of cell or the organ in which they begin. When cancer spreads (metastasizes), the new tumour has the same name as the original (primary) tumour.
- 533 cancer-initiating cell: General term that encompasses both cancer cell of origin and cancer stem cell.
- 534 candidiasis (yeast): An infection that may be uncomfortable and itchy and may impair fertility.
- 535 cannula: A hollow tube like that used for insemination.
- 536 capacitation: A process that sperm undergo as they travel through the woman's reproductive tract. Capacitation enables the sperm to penetrate the egg.
- 537 capecitabine (trade name Xeloda®): A drug first used to treat metastatic breast cancer in patients who had not responded well to chemotherapy. In some patients, capecitabine helps shrink tumor size by killing cancer.
- 538 capillary action: The movement of water or any liquid along a surface; results from the combined effect of cohesion and adhesion.
- 539 capillary: A microscopic blood vessel that penetrates the tissues and consists of a single layer of endothelial cells that allows exchange between the blood and interstitial fluid.
- 540 capsid: The protein shell that encloses the viral genome; rod-shaped, polyhedral, or more completely shaped.
- 541 capsular penetration: Tumor extends through the wall of the prostate.
- 542 capsule: (1) A slimy layer around the cells of certain bacteria. (2) The sporangium of a bryophyte.
- 543 carbohydrate: A chemical compound that contains only carbon (C), hydrogen (H), and oxygen (O) and has the general formula $C_x(H_2O)_y$. Examples include sugars, starches and cellulose. Plant carbohydrates constitute a major food class and are a basic source of energy for all animals.
- 544 carbon cycle: Worldwide circulation and reutilization of carbon atoms, chiefly due to metabolic processes of living organisms. Inorganic carbon, in the form of carbon dioxide, is incorporated into organic compounds by photosynthetic organisms; when the organic compounds are broken down in respiration, carbon dioxide is released. Large quantities of carbon are "stored" in the seas and the atmosphere, as well as in fossil fuel deposits.
- 545 carbon fixation: The incorporation of carbon from CO_2 into an organic compound by an autotrophic organism (a plant, another photosynthetic organism, or a chemoautotrophic bacterium).
- 546 carbonyl group: A functional group present in aldehydes and ketones, consisting of a carbon atom double-bonded to an oxygen atom.
- 547 carboplatin: A platinum based compound that is used as a cancer chemotherapeutic agent.
- 548 carboxyl group: A functional group present in organic acids, consisting of a single carbon atom double-bonded to an oxygen atom and also bonded to a hydroxyl group.
- 549 carcino-embryonic antigen (CEA): A protein produced in the fetus but not in normal adult life. Produced by some carcinomas, particularly of the colon, it is an insensitive marker of malignancy. CEA is an oncofetal antigen that is used as a tumor marker.
- 550 carcinoembryonic: Relating to a carcinoma-associated substance present in embryonic tissue, as a carcinoembryonic antigen.
- 551 carcinogen (adj. carcinogenic): A cancer-causing substance or agent.
- 552 carcinogenesis: Process that leads to formation of cancer from normal cells or tissues.
- 553 carcinoid tumor: A small tumor (benign or malignant) arising from the mucosa of the gastrointestinal tract; usually associated with excessive secretion of serotonin.
- 554 carcinoma: Carcinoma is a cancer found in body tissues that cover or line surfaces of organs, glands, or body structures.
- 555 cardiac failure: A condition in which the heart muscle deteriorates progressively until the heart cannot pump effectively and blood collects in the vascular system. Water oozes out of the blood and congests organs. This condition causes breathlessness, fatigue and palpitations and is an extremely unstable cardiac state if not controlled. It cannot be cured and generally deteriorates over time, dependent on the cause.
- 556 cardiac muscle: A type of muscle that forms the contractile wall of the heart; its cells are joined by intercalated discs that relay each heartbeat.
- 557 cardiac output: The volume of blood pumped per minute by the left ventricle of the heart.
- 558 cardiomegaly: Abnormal enlargement of the heart.
- 559 cardiomyocytes: The functional muscle cell type of the heart that allows it to beat continuously and rhythmically.
- 560 cardiovascular system: A closed circulatory system with a heart and branching network of arteries, capillaries, and veins.
- 561 cardiovascular: Relating to the heart and blood vessels (arteries, veins, and capillaries); the circulatory system.
- 562 carnivore: An animal, such as a shark, hawk, or spider, that eats other animals.
- 563 carotenoid: Orange, yellow or red-colored accessory photosynthetic pigments, related to vitamin A, found in higher plants and photosynthetic bacteria.

- 564 carotenoids: Accessory pigments, yellow and orange, in the chloroplasts of plants; by absorbing wavelengths of light that chlorophyll cannot, they broaden the spectrum of colors that can drive photosynthesis.
- 565 carpel: The female reproductive organ of a flower, consisting of the stigma, style, and ovary.
- 566 carrier testing: Carrier testing can determine if a person carries one of the altered genes that cause a recessive disease. DNA carrier testing establishes the presences or absences of particular mutation(s). Enzymatic testing evaluates the level of activity of an enzyme, which when absent causes disease. In some diseases the enzyme test is not sensitive enough to determine carrier status.
- 567 carrier: A person who possesses at least one gene that may contribute to disease in offspring. Carriers may not develop the disease themselves, but they can transmit it by passing the mutated gene (or genes) to their offspring.
- 568 cartilage: A type of connective tissue that is firm but resilient. It is found in joints and also as supportive structure, for example in the ears.
- 569 casefinding cycle: Identifying source documents; determine reporting methods (active, passive, or a combination); linking the identified cases Monitoring completeness of casefinding.
- 570 casefinding: Casefinding is a system for locating every patient - inpatient or outpatient, public or private - who is diagnosed and/or treated with a reportable malignancy.
- 571 casodex®: Brand or trade name of bicalutamide in the USA, a non-steroidal antiandrogen.
- 572 casparian strip: A water-impermeable ring of wax around endodermal cells in plants that blocks the passive flow of water and solutes into the stele by way of cell walls.
- 573 castrate: A level associated with what occurs after castration; traditionally surgical removal of the testicles; a castrate testosterone is defined by most physicians as less than 20 ng/ml or less than 0.69 nM/L; (nM/L x 28.8 = ng/dl).
- 574 castration: The use of surgical or chemical techniques to eliminate testosterone produced by the testes.
- 575 castration-resistant prostate cancer: Progression of disease with serum testosterone controlled below a castrate level.
- 576 catabolic pathway: A metabolic pathway that releases energy by breaking down complex molecules into simpler compounds.
- 577 catabolism: Within a cell or organism, the sum of all chemical reactions in which large molecules are broken down into smaller parts.
- 578 catabolite activator protein (CAP): In *E. coli*, a helper protein that stimulates gene expression by binding within the promoter region of an operon and enhancing the promoter's ability to associate with RNA polymerase.
- 579 catalyst: A substance that lowers the activation energy of a chemical reaction by forming a temporary association with the reacting molecules; as a result, the rate of the reaction is accelerated. Enzymes are catalysts.
- 580 catecholamine: Any of various amines (as epinephrine, norepinephrine, and dopamine) that function as hormones or neurotransmitters or both.
- 581 category: In a hierarchical classification system, the level at which a particular group is ranked.
- 582 catheter: a hollow (usually flexible plastic) tube which can be used to drain fluids from or inject fluids into the body; in the case of prostate cancer, it is common for patients to have a transurethral catheter to drain urine for some time after treatment by surgery or some forms of radiation therapy.
- 583 cation exchange: A process in which positively charged minerals are made available to a plant when hydrogen ions in the soil displace mineral ions from the clay particles.
- 584 cation: An ion with a positive charge, produced by the loss of one or more electrons.
- 585 cauda Equina: Because spinal cord ends far above the tailbone, long nerve extensions, collectively called the cauda equina, are required to reach the lower segments of the spine.
- 586 caudal: An anatomical term relating to the tail or hind part (opposite of rostral). For example, caudal to the injury site would mean below the injury site.
- 587 cauterize, cauterization: Sear with heat or a caustic substance.
- 588 cautery: The application of a caustic substance, a hot instrument, an electric current, or other agent to destroy tissue.
- 589 cavernous nerves: Nerves that facilitate penile erection.
- 590 cavitation: A process that occurs during the formation of the blastocyst and establishes the polarity of embryonic cells.
- 591 CD (cluster of differentiation): Used with a number (eg, CD34) to name a specific antigenic marker found on lymphocytes.
- 592 CD 34 + stem cells: Stem cells found in cord blood that have 10 times the potency of bone marrow stem cells in terms of their proliferation potential. This cell forms the main part of the Regeneccell treatment regimen. CD stands for "cluster of differentiation" molecule and is the molecule found on the surface of the cell, which enables identification of this cell type.
- 593 CD cluster designation: Used with a number to indicate a cell surface marker.
- 594 CD133: Also referred as Prominin. A marker of LHSC.
- 595 CD33: Present on committed progenitors in the myeloid lineages.
- 596 CD38: Not detectable on Lymphohematopoietic stem cells but begin to appear as the cells commit towards a lineage.
- 597 CD4: Another name for a "helper" T-cell. In humans, it is a receptor for HIV, enabling the virus to gain entry into its host.
- 598 CD4: Helper T cells that are instrumental in initiating an immune response by supplying help in the form of special cytokines to both CD 8 cytotoxic T cells and B cells.
- 599 CD8: Cytotoxic (killer) T cells that are capable of killing infected cells once activated by cytokines secreted by antigen-specific CD4 helper T cells.
- 600 CDK-1 (cyclin-dependent kinase inhibitor): A regulator of cell growth; an enzyme inhibitor.
- 601 celecoxib (Celebrex®): An FDA-approved drug for the treatment of rheumatoid arthritis, osteoarthritis and pain; it has also been reported to block Akt function and cause the death of human prostate cancer cell lines.
- 602 celiac disease: A disorder in children and adults; inability to tolerate wheat protein (gluten); symptoms include foul-smelling diarrhea and emaciation; often accompanied by lactose intolerance.
- 603 cell based therapies: This is the treatment in which stem cells are induced to differentiate into the specific cell type required to repair damaged or depleted adult cell populations or tissues. Many degenerative diseases, as well as damage to organs, may be treated this way.
- 604 cell center: A region in the cytoplasm near the nucleus from which microtubules originate and radiate.
- 605 cell characterization: Identification of cells as those of a particular type, such as mesenchymal stem cells, muscle cells, blood cell precursors, etc. Since most stem cells and cell precursors look the same under the microscope, characterization of stem cells usually calls for the use of specialized molecular probes and sophisticated instruments, like a flow cytometer.

- 606 cell culture: The growth of cells in the laboratory in an artificial medium for the purposes of experimental research.
- 607 cell cycle: The cell cycle, or cell-division cycle, is the series of events that takes place in a cell that lead to the replication of its DNA and the division of the parent cell into two daughter cells. In cells without a nucleus (prokaryotes), the cell cycle occurs via a process termed binary fission. In cells with a nucleus (eukaryotes), the cell cycle consists of 4 phases: G1 phase (growth), S phase (synthesis), G2 phase (collectively known as interphase) and M phase (mitosis). One of the hurdles facing the therapeutic use of iPS cells is their tumorigenic potential, which is caused by the up-regulation or over-expression of the known proto-oncogene (increasing cell cycle) and reprogramming factor, c-Myc. Recent scientific evidence has shown that c-Myc is a dispensable reprogramming factor, bringing the field one step closer to therapeutic application. Many research groups have demonstrated that reprogramming efficiency is greatly improved when tumor suppressor proteins, such as p53, are temporarily down-regulated. This finding further supports the importance of an active cell cycle for the reprogramming process.
- 608 cell division: The method by which a single cell divides to create two cells. There are two main types of cell division depending on what happens to the chromosomes: mitosis and meiosis.
- 609 cell fate: In developmental biology, cell fate describes what a particular cell at a given stage of development will eventually give rise to.
- 610 cell fractionation: The disruption of a cell and separation of its organelles by centrifugation.
- 611 cell fusion: Merging of two cells into one, creating a hybrid cell. The hybrid usually takes on characteristics from both of the original cells.
- 612 cell line: Cells of a particular type that can be maintained and grown in culture, outside the body in a Petri dish. Culture conditions can vary widely for different cell types, with many factors adjusted to enable the cells to thrive and divide. These factors may include temperature, gas composition, pH, glucose concentration, and the presence of growth factors and other nutrients. Cell lines can be used in biological assays to decipher molecular pathways or screen for new therapeutics, greatly facilitating the study of natural and disease biology in the laboratory.
- 613 cell membrane: The outer membrane of a cell, which separates it from the environment. Also called a plasma membrane or plasmalemma.
- 614 cell migration: Cell acquire motility and move to a different location
- 615 cell passaging: In order to grow cells for extended periods scientists passage or split groups up. In the case of embryonic stem cells, passaging helps to keep the cells in their primitive state.
- 616 cell plate: A double membrane across the midline of a dividing plant cell, between which the new cell wall forms during cytokinesis.
- 617 cell release: Movement of bone marrow cells out of the sinus into the peripheral circulation.
- 618 cell replacement therapy: Reconstitution of tissue by functional incorporation of transplanted stem-cell progeny. Distinct from 'bystander' trophic, anti-inflammatory, or immunomodulatory effects of introduced cells.
- 619 cell theory: All living things are composed of cells; cells arise only from other cells. No exception has been found to these two principles since they were first proposed well over a century ago.
- 620 cell type: A specific subset of cells within the body, defined by their appearance, location and function. E.g. heart cells, liver cells, nerve cells etc.
- 621 cell wall: A protective layer external to the plasma membrane in plant cells, bacteria, fungi, and some protists. In the case of plant cells, the wall is formed of cellulose fibers embedded in a polysaccharide-protein matrix. The primary cell wall is thin and flexible, whereas the secondary cell wall is stronger and more rigid, and is the primary constituent of wood.
- 622 cell: The cell is the basic structural and functional unit in people and all living things. Each cell is a small container of chemicals and water wrapped in a membrane. Each cell in the human body — there are 100 trillion cells in each of us — contains the entire human genome, all the genetic information necessary to build a human being. This information is encoded within the cell nucleus in 6 billion base pairs, subunits of DNA, packaged in 23 pairs of chromosomes, one chromosome in each pair coming from each parent. Each of the 46 human chromosomes contains the DNA for thousands of individual genes, the units of heredity.
- 623 cell-based therapies: Involve transplanting stem cells into damaged tissues to regenerate the various cell types of that tissue. For example, bone marrow transplants are a form of cell-based therapy that have been used to treat leukaemia for more than 30 years. New stem cell research may lead to cell-based therapies to treat a range of conditions, including heart disease, spinal injuries, diabetes and Parkinson disease.
- 624 cell-cycle control system: A cyclically operating set of proteins that triggers and coordinates events in the eukaryotic cell cycle.
- 625 cell-mediated immunity: Immunity dependent upon T-cells' recognition of an antigen and their subsequent destruction of cells bearing the antigen
- 626 cell-mediated immunity: The type of immunity that functions in defense against fungi, protists, bacteria, and viruses inside host cells and against tissue transplants, with highly specialized cells that circulate in the blood and lymphoid tissue.
- 627 cellular aging: Most cells in the human body can replicate only a finite number of times and then cease dividing in what is called cell aging, or cell senescence.
- 628 cellular differentiation: The structural and functional divergence of cells as they become specialized during a multicellular organism's development; dependent on the control of gene expression.
- 629 cellular plasticity: Plasticity refers to the ability of differentiated cells to undergo transdifferentiation; this takes place when an already differentiated stem cell creates cells outside its already established differentiation.
- 630 cellular reprogramming: Cellular reprogramming describes the process where a fully differentiated, specialized cell type is induced to transform into a different cell type that they would not otherwise become under normal physiological conditions. Cellular reprogramming has been achieved using a variety of methods, including somatic cell nuclear transfer, cell-cell fusion and, most recently, through the introduction of 4 transcription factors. Most scientists have focused on reprogramming somatic cells into pluripotent stem cells, but recently some researchers have begun to focus on reprogramming somatic cells into multipotent stem cells, which have a more restricted developmental potential and are closer to the cell population the researcher ultimately wants to engineer.
- 631 cellular respiration: The most prevalent and efficient catabolic pathway for the production of ATP, in which oxygen is consumed as a reactant along with the organic fuel.
- 632 cellular therapy: A field of medicine that uses cells to repair tissues that have been damaged by human disease or to generate new tissues with desired functional activities.

- 633 cellulose: A structural polysaccharide of cell walls, consisting of glucose monomers joined by (1-4) glycosidic linkages.
- 634 celsius scale: A temperature scale (°C) equal to 5/9 (°F – 32) that measures the freezing point of water at 0°C and the boiling point of water at 100°C.
- 635 central line or central venous catheter: A small, plastic tube inserted in a large vein to inject or remove fluids. The central line used in stem cell transplant allows blood samples to be drawn, drugs to be given, and the actual transplant to occur with little discomfort.
- 636 central line: A small, soft plastic tube inserted into the large vein above the heart through which medication can be given and blood drawn without multiple needle sticks.
- 637 central nervous system: The brain and the spinal cord. Receives sensory impulses from the rest of the nervous system and then controls the body's response to those impulses.
- 638 central pattern generator: A spinal-cord neuronal circuit responsible for coordinated rhythmic activity, such as walking.
- 639 central venous catheter (CVC): a tubular device typically inserted into a large vein in the neck. A CVC can also be inserted into the chest or the groin. A CVC is used to administer multiple medications, intravenous fluids, and to draw blood samples to perform tests.
- 640 centrifuge: A device which spins at a high rate of speed, causing centrifugal force to be exerted on objects placed in it. A centrifuge is often used to separate stem cell-containing layers from other cells.
- 641 centriole: A cylinder-shaped organelle composed of microtubules and found in the nucleus of a cell. During nuclear division it forms the spindle, which ensures that the duplicated chromosomes are equally divided between the daughter cells.
- 642 centromere: The most condensed and constricted region of a chromosome. Joins the two chromatids of the chromosome and is also the attachment point of spindle fibres during cell division when the two chromatids separate.
- 643 centrosome: Material present in the cytoplasm of all eukaryotic cells and important during cell division; also called microtubule-organizing center.
- 644 cephalic: Of or relating to the head.
- 645 cephalochordate: A chordate without a backbone, represented by lancelets, tiny marine animals.
- 646 cerclage: A surgical stitch (suture) used to try to keep cervix tightly closed. Used for women with Incompetent Cervix.
- 647 cerebellum: Part of the vertebrate hindbrain (rhombencephalon) located dorsally; functions in unconscious coordination of movement and balance.
- 648 cerebral cortex: The surface of the cerebrum; the largest and most complex part of the mammalian brain, containing sensory and motor nerve cell bodies of the cerebrum; the part of the vertebrate brain most changed through evolution.
- 649 cerebral palsy: It is a persistent brain disorder that presents before the age of 3 and is due to brain damage. It is not progressive and has no treatment except for the symptoms. It effects mainly movement and muscle flexibility, but can have cognitive disability and epilepsy. Stem cell therapy seems to elicit a response in more than 90% of these patients under the age of 4. The results in some of these patients have been dramatic.
- 650 cerebrospinal fluid: A blood serum-like fluid that bathes parts of the brain and the interior cavity of the spinal cord.
- 651 cerebrum: The dorsal portion, composed of right and left hemispheres, of the vertebrate forebrain; the integrating center for memory, learning, emotions, and other highly complex functions of the central nervous system.
- 652 cervical cancer: A malignant disease in the neck of the womb located at the top of the vagina.
- 653 cervical cap: A small, rubber, contraceptive barrier device that fits over the cervix. It is smaller than the diaphragm and is held in place by suction.
- 654 cervical Mucus: A viscous fluid plugging the opening of the cervix. Most of the time this thick mucus plug prevents sperm and bacteria from entering the womb. However, at midcycle, under the influence of estrogen, the mucus becomes thin, watery, and stringy to allow sperm to pass into the womb.
- 655 cervical region: Corresponding to the neck region. The cervical spine begins at the base of the skull and is composed of seven vertebrae and eight pairs of cervical nerves.
- 656 cervical smear: A sample of the cervical mucus examined microscopically to assess the presence of estrogen (ferning) and white blood cells, indicating possible infection.
- 657 cervical stenosis: A blockage of the cervical canal from a congenital defect or from complications of surgical procedures.
- 658 cervicitis: An inflammation of the cervix.
- 659 cervix: The opening between the uterus and the vagina. The cervical mucus plugs the cervical canal and normally prevents foreign materials from entering the reproductive tract. The cervix remains closed during pregnancy and dilates during labor and delivery to allow the baby to be born.
- 660 chakras: In Eastern healing traditions, chakras are tornado-like energy vortexes, which convert higher vibrational energy into energy that the body can assimilate.
- 661 chaparral: A scrubland biome of dense, spiny evergreen shrubs found at midlatitudes along coasts where cold ocean currents circulate offshore; characterized by mild, rainy winters and long, hot, dry summers.
- 662 character displacement: A phenomenon in which species that live together in the same environment tend to diverge in those characteristics that overlap; exemplified by Darwin's finches.
- 663 characterizing stem cells: Determining how a cell grows, where the cell came from, how it was derived, and if there are any chromosomal abnormalities.
- 664 chediak-higashi syndrome: A generalized cellular disorder which affects all granule-containing cells resulting in recurrent infections and ocular, neurological, and skin manifestations.
- 665 chemical bond: An attraction between two atoms resulting from a sharing of outer-shell electrons or the presence of opposite charges on the atoms; the bonded atoms gain complete outer electron shells.
- 666 chemical equilibrium: In a reversible chemical reaction, the point at which the rate of the forward reaction equals the rate of the reverse reaction.
- 667 chemical pregnancy: A pregnancy where hCG levels are detected, but the pregnancy is lost before a heartbeat is seen on an ultrasound. This is a very early miscarriage -- often before the woman misses a period.
- 668 chemical reaction: A process leading to chemical changes in matter; involves the making and/or breaking of chemical bonds.
- 669 chemiosmosis: The production of ATP using the energy of hydrogen-ion gradients across membranes to phosphorylate ADP; powers most ATP synthesis in cells.
- 670 chemiosmotic coupling: The mechanism by which ADP is phosphorylated to ATP in mitochondria and chloroplasts. The energy released as electrons pass down an electron transport chain is used to establish a proton gradient across an inner membrane of the organelle; when protons

- subsequently flow down this electrochemical gradient, the potential energy released is captured in the terminal phosphate bonds of ATP.
- 671 chemoattractant: A factor that attract a cell, e.g., a cytokine or a chemokine.
- 672 chemoautotroph: An organism that needs only carbon dioxide as a carbon source but that obtains energy by oxidizing inorganic substances.
- 673 chemomobilization: A treatment that the doctor may utilize which uses chemotherapy (typically followed by growth factor) as a catalyst to move stem cells from bone marrow to circulating blood.
- 674 chemoprevention: The use of a pharmaceutical or other substance to prevent the development of cancer.
- 675 chemoreceptor: A receptor that transmits information about the total solute concentration in a solution or about individual kinds of molecules.
- 676 chemosynthetic: Applied to autotrophic bacteria that use the energy released by specific inorganic reactions to power their life processes, including the synthesis of organic molecules.
- 677 chemotaxis: Attraction of a cell to an area where there is a gradient increase of a particular factor.
- 678 chemotherapeutic: related to the use of chemotherapy.
- 679 chemotherapy: Chemotherapy is the treatment of cancer with drugs that can destroy cancer cells. These drugs often are called "anticancer" drugs. Anticancer drugs destroy cancer cells by stopping them from growing or multiplying. Healthy cells can also be harmed, especially those that divide quickly. Harm to healthy cells is what causes side effects. These cells usually repair themselves after chemotherapy. The term chemotherapy was coined in this regard by Paul Ehrlich (1854-1915).
- 680 cherry-red spot: The term 'cherry red spot' describes the appearance of the retina when viewed by an eye specialist that is associated with metabolic neurological disorders like Tay-Sachs, Sandhoff, GM-1, Niemann-Pick, MPS and other similar disorders. Warren Tay described the cherry red spot in Symmetrical changes in the region of the yellow spot in each eye of an infant, published in Transactions of Ophthalmology Society UK in 1881: "...in the region of the yellow spot in each eye there was a conspicuous, tolerably defined, large white patch, more or less circular in outline, and showing at its centre a brownish-red, fairly circular spot, contrasting strongly with the white patch surrounding it.
- 681 chiasma (pl. chiasmata): The X-shaped, microscopically visible region representing homologous chromatids that have exchanged genetic material through crossing over during meiosis.
- 682 chimera: An organism composed of cells derived from at least two genetically different zygotes, from the same or different species. Chimerism can be produced experimentally at different stages of development, from embryo through to adult.
- 683 chiropractic: Focuses on diagnosing and treating musculoskeletal disorders that affect the nervous system.
- 684 chitin: A structural polysaccharide of an amino sugar found in many fungi and in the exoskeletons of all arthropods.
- 685 chlamydia: A common bacterial sexually transmitted disease that can lead to Pelvic Inflammatory Disease.
- 686 chlorophyll: A green pigment located within the chloroplasts of plants.
- 687 chloroplast: An organelle found only in plants and photosynthetic protists that absorbs sunlight and uses it to drive the synthesis of organic compounds from carbon dioxide and water.
- 688 chocolate cyst: A cyst in the ovary that is filled with old blood; endometrioma. Occurring when endometriosis invades an ovary, it causes the ovary to swell. Frequently, patients with large endometriomas do not have any symptoms. If the cyst ruptures or the ovary containing the cyst twists, emergency surgery may be necessary. Usually treatment can be carried out through the [laparoscope](#).
- 689 cholangiocarcinoma: Cholangiocarcinoma is a malignant (cancerous) growth in one of the ducts that carries bile from the liver to the small intestine.
- 690 cholecystokinin: A hormone secreted especially by the duodenal mucosa that regulates the emptying of the gallbladder and secretion of enzymes by the pancreas and that has been found in the brain.
- 691 cholesterol: A long-chain molecule that is absorbed from food in the intestine or produced in the liver. It is needed as a part of blood plasma and of cell membranes.
- 692 choline: A B-complex vitamin that is a constituent of lecithin; essential in the metabolism of fat.
- 693 chondrichthyes: The vertebrate class of cartilaginous fishes, represented by sharks and their relatives.
- 694 chondrin: A protein-carbohydrate complex secreted by chondrocytes; chondrin and collagen fibers form cartilage.
- 695 chondrocyte: The functional cell type that makes cartilage for joints, ear canals, trachea, epiglottis, larynx, the discs between vertebrae and the ends of ribs.
- 696 chordate: A member of a diverse phylum of animals that possess a notochord; a dorsal, hollow nerve cord; pharyngeal gill slits; and a postanal tail as embryos.
- 697 chorion (adj. chorionic): The highly vascular outer embryonic membrane of reptiles, birds, and mammals that in placental mammals is associated with the allantois in the formation of the placenta.
- 698 chorionic villae sampling (CVS): An alternative to amniocentesis that can be done earlier in the pregnancy. It is a biopsy of the placenta that is used to check for genetic abnormalities in the fetus.
- 699 chorionic villi: Tiny membrane projections in the developing placenta (the tissue that connects the umbilical cord to the uterus). Cells samples can sometimes be obtained from the chorionic villi and used for prenatal diagnosis of certain LSDs.
- 700 chorionic villus sampling (CVS): A technique for diagnosing genetic and congenital defects while the fetus is in the uterus. A small sample of the fetal portion of the placenta is removed and analyzed.
- 701 chromatid: Either of the two strands of a replicated chromosome, which are joined at the centromere.
- 702 chromatin: The complex of DNA and DNA-binding protein that makes up a eukaryotic chromosome. The DNA is wrapped around histone proteins, each of which is composed of 4 core histones, H2A, H2B, H3 and H4. The wrapping of the DNA around histones effectively packages over 2 meters of human DNA into compacted nucleosomes. The chromatin can exist in two forms: tightly coiled chromatin called heterochromatin that is not actively transcribed or loosely coiled chromatin called euchromatin that is actively transcribed. In mature, fully differentiated somatic cells, several of the genes that encode for the iPS reprogramming factors are located within the heterochromatin and are therefore considered transcriptionally silent. Because the reprogramming factors are not actively expressed, scientists must induce the expression of these genes artificially using transgenic strategies. International research efforts are currently exploring alternative methods to help unlock necessary reprogramming genes that are located within the tightly packed heterochromatin.
- 703 chromista: In some classification systems, a kingdom consisting of brown algae, golden algae, and diatoms.
- 704 chromogranin A (CGA): A small cell prostate cancer or neuroendocrine cell marker; a progressive increase in CGA

- indicates an aggressive clone of PC cells that often metastasizes to lymph nodes, liver and lungs.
- 705 chromosome map: A diagram of the linear order of the genes on a chromosome.
- 706 chromosome synapsis: Close side-by-side position of homologous chromosomes before cell division. In synapsis the homologous chromosome pairs join.
- 707 chromosome: Structures found in the nucleus of the cell, which are visible under a microscope and which contain genetic (inherited) information. Human cells contain 46 chromosomes, which come in pairs. There are twenty-two pairs of chromosomes which are referred to as autosomes, because they do not determine the sex of an individual. The twenty-third pair are referred to as the sex chromosomes, and are called the X and Y chromosomes. Each chromosome contains thousands of individual genes, which will in turn determine an individual's characteristics.
- 708 chromotubation/chromopertubation: This test is usually done in combination with a diagnostic laparoscopy. It involves injecting colored liquid through the fallopian tubes and watching the ends of the tubes for the dye. Spillage of dye indicates patent (open) tubes.
- 709 chronic injury: Long-term injury, a term often used for people injured more than a year.
- 710 chronic lymphocytic leukemia: A cancer of the blood caused by the accumulation of affected B cells in the body that typically progresses slowly.
- 711 chronic myelogenous leukemia (CML): Chronic myelogenous leukemia (CML) is a malignant cancer of the bone marrow that causes rapid growth of the blood forming cells (known as myeloid precursors) in the bone marrow, peripheral blood, and body tissues.
- 712 chronic wound: An injury that does not completely heal. Chronic wounds are common in patients with diabetes and other conditions that impair healing capacity.
- 713 chronic: Referring to a disease or condition that develops slowly and persists over a long period of time
- 714 chyme: The semifluid mass of partly digested food expelled by the stomach into the duodenum.
- 715 chytrid: Fungus with flagellated stage; possible evolutionary link between fungi and protists.
- 716 cilia: Tiny hairlike projections lining the inside surface of the fallopian tubes. The waving action of these "hairs" sweeps the egg toward the uterus.
- 717 cilium (pl. cilia): A minute, short hairlike process often forming part of a fringe; especially: one on a cell that is capable of lashing movement and serves especially in free unicellular organisms to produce locomotion or in higher forms a current of fluid.
- 718 ciprofloxacin (trade name Cipro®): An antibiotic used in various infections including urinary tract infections (UTI) and prostatitis.
- 719 circadian rhythm: A daily rhythmic activity cycle based on a 24 hour interval.
- 720 circadian rhythms [L. circa, about + dies, day]: A physiological cycle of about 24 hours, present in all eukaryotic organisms, that persists even in the absence of external cues.
- 721 cirrhosis: A chronic disease interfering with the normal functioning of the liver; the major cause is chronic alcoholism.
- 722 citrate: A salt or ester of citric acid.
- 723 C-kit protein: Receptor for Stem cell factor.
- 724 cladistics: A taxonomic approach that classifies organisms according to the order in time at which branches arise along a phylogenetic tree, without considering the degree of morphological divergence.
- 725 cladogenesis: A pattern of evolutionary change that produces biological diversity by budding one or more new species from a parent species that continues to exist; also called branching evolution.
- 726 cladogram: A dichotomous phylogenetic tree that branches repeatedly, suggesting a classification of organisms based on the time sequence in which evolutionary branches arise.
- 727 class: A taxonomic grouping of related, similar orders; category above order and below phylum.
- 728 classical conditioning: A type of associative learning; the association of a normally irrelevant stimulus with a fixed behavioral response.
- 729 classification scheme: A logical system for the arrangement of knowledge. A fully developed classification scheme specifies categories of knowledge and provides the means to relate the categories to each other and to specify in the classification number all or the most important of the aspects and facets of a subject.
- 730 cleavage: The process of cytokinesis in animal cells, characterized by pinching of the plasma membrane; specifically, the succession of rapid cell divisions without growth during early embryonic development that converts the zygote into a ball of cells.
- 731 cline: Variation in features of individuals in a population that parallels a gradient in the environment.
- 732 clinical practice: Treatments and procedures performed by doctors.
- 733 clinical stage: Staging of prostate cancer as determined by the digital rectal examination.
- 734 clinical translation: The process of taking a treatment that has been proven in the laboratory to testing in human volunteers.
- 735 clinical trial: A carefully planned process by which researchers evaluate experimental new therapies and drugs through an orderly series of phases. Phase I trials evaluate how a new therapy or drug should be given, how often, and what dose is safe. Phase II trials continue to test safety but also begin to evaluate how well it works. Phase III trials test a new therapy or drug in comparison to the current standard of care. Participants are randomly assigned to the standard or new therapy. A placebo is only used when there is no standard therapy for comparison. Placebos are not used in Phase I or II. Phase IV trials are required when a drug manufacturer wishes to test an approved therapy for a different condition or with a different formulation.
- 736 clinical: Used in medical practice, as opposed to just in research. Clinical trials are trials of the actual use of a therapy in people, rather than in a test tube.
- 737 clinicopathological: Relating to or concerned both with the signs and symptoms directly observable by the physician and with the results of laboratory examination.
- 738 ClinMACS® machine: A cell sorting machine used by scientists to achieve pure cultures of a particular type of cell that is sorted according to the biomarker that binds to it.
- 739 cloaca: A common opening for the digestive, urinary, and reproductive tracts in all vertebrates except most mammals.
- 740 clomid: A brand name of clomiphene citrate.
- 741 clomiphene citrate challenge test (CCCT, CCT): This test entails the oral (by mouth) administration of 100 milligrams of clomiphene citrate on menstrual cycle days 5-9. Blood levels of FSH are measured on cycle day 3 and again on cycle day 10. Elevated blood levels of FSH on cycle day 3 or cycle day 10 are associated with very low pregnancy.
- 742 clomiphene citrate: A fertility drug that stimulates ovulation through the release of gonadotropins from the pituitary gland.
- 743 clonal analysis: Investigation of properties of single cells. Essential for formal demonstration of self-renewal and potency.

- 744 clonal selection: The mechanism that determines specificity and accounts for antigen memory in the immune system; occurs because an antigen introduced into the body selectively activates only a tiny fraction of inactive lymphocytes, which proliferate to form a clone of effector cells specific for the stimulating antigen.
- 745 clonality derived stem cell: A cell is said to be clonally derived or to exhibit clonality if it was generated by the division of a single cell and is genetically identical to that cell.
- 746 clonality: A line of cells that is genetically identical to the originating cell; in this case, a stem cell.
- 747 clone: (v) To generate identical copies of a region of a DNA molecule or to generate genetically identical copies of a cell, or organism; (n) The identical molecule, cell, or organism that results from the cloning process. (1) In reference to DNA: To clone a gene, one finds the region where the gene resides on the DNA and copies that section of the DNA using laboratory techniques. (2) In reference to cells grown in a tissue culture dish: a clone is a line of cells that is genetically identical to the originating cell. This cloned line is produced by cell division (mitosis) of the original cell. (3) In reference to organisms: Many natural clones are produced by plants and (mostly invertebrate) animals. cloning (Reproductive): the cloned embryo is replaced into the uterus of a mature female of the species where it may implant and grow.
- 748 cloning reproductive: Sometimes used to refer to cloning of an embryo for transplantation into a uterus with the intent of producing offspring genetically identical to the nuclear donor.
- 749 cloning therapeutic: The cloned embryo is grown in the laboratory. The cells from the inner cell mass of the blastocyst when grown in tissue culture can sometimes produce a stem cell line. As with reproductive cloning, the success rate is low for the production of stem cell lines. However, if a stem cell line is produced, these cells are very primitive and totipotent which means that they have the potential to develop into any and all of the different cell types in the body. Also, the stem cell line is a perfect genetic match to the parent.
- 750 cloning vector: An agent used to transfer DNA in genetic engineering, such as a plasmid that moves recombinant DNA from a test tube back into a cell, or a virus that transfers recombinant DNA by infection.
- 751 cloning: The process in which an organism produces one or more genetically alike copies of itself by asexual means. Cloning may occur by propagation of cuttings, as in the case of plants; continual budding, as in the case of hydra; fission, as in the case of bacteria and protozoa; parthenogenic asexual reproduction as in the case of aphids; or somatic cell nuclear transfer, as in the case of higher order animals such as mammals. The term cloning can also be applied to a group of cells undergoing replication by repetitive mitoses (cell divisions).
- 752 cloning: The process of producing a genetically identical copy. Genes can be cloned, as well as cells and whole organisms. A clone is produced from one individual cell through an asexual process.
- 753 closed circulatory system: A type of internal transport in which blood is confined to vessels.
- 754 cluster of differentiation (CD): Used with a number (eg, CD52) to name a specific antigenic marker found on lymphocytes.
- 755 c-Myc: A well known proto-oncogene. The c-Myc gene codes for a transcription factor that regulates the expression of many genes involved in the control of cell proliferation, growth, differentiation and apoptosis. Abberant expression of c-Myc on the other hand is associated with tumor formation and cancer. c-Myc is one of four factors originally used by the Yamanaka group to reprogram somatic cells into pluripotent stem cells. Recent studies have demonstrated that c-Myc is not an essential reprogramming factor, but does greatly improve reprogramming efficiency.
- 756 cnidocyte: A stinging cell containing a nematocyst; characteristic of cnidarians.
- 757 coagulate: Change from liquid to solid, ex. blood clotting.
- 758 coaptation: Joining together or fitting of two surfaces.
- 759 coarsening of the facial features: Short noses, flat faces and large head is often described as coarsening of facial features.
- 760 coccyx: The coccyx or tailbone is the final segment of vertebral column composed of typically four fused vertebrae.
- 761 cochlea: The complex, coiled organ of hearing that contains the organ of Corti.
- 762 codominance: A phenotypic situation in which both alleles are expressed in the heterozygote.
- 763 codon: A three-nucleotide sequence of DNA or mRNA that specifies a particular amino acid or termination signal; the basic unit of the genetic code.
- 764 coelom: A body cavity completely lined with mesoderm.
- 765 coelomate: An animal whose body cavity is completely lined by mesoderm, the layers of which connect dorsally and ventrally to form mesenteries.
- 766 coenocytic: Condition in which an organism consists of filamentous cells with large central vacuoles, and whose nuclei are not partitioned into separate compartments. The result is a long tube containing many nuclei, with all the cytoplasm at the periphery.
- 767 coenzyme Q10 (COQ10): important in cardiac function; a substance that energizes the mitochondria within the heart cells and allows them to function better; an anti-oxidant that protects LDL cholesterol from oxidation.
- 768 coenzyme: An organic molecule serving as a cofactor. Most vitamins function as coenzymes in important metabolic reactions.
- 769 coevolution: The mutual influence on the evolution of two different species interacting with each other and reciprocally influencing each other's adaptations.
- 770 cofactor: Any nonprotein molecule or ion that is required for the proper functioning of an enzyme. Cofactors can be permanently bound to the active site or may bind loosely with the substrate during catalysis.
- 771 cognition: Cognition is the process of knowing and, more precisely, the process of being aware, knowing, thinking, learning and judging. Some types of CMD do not affect cognition, other types of CMD may impair cognitive abilities.
- 772 cognitive: Relating to, or being conscious intellectual activity (as thinking, reasoning, remembering, imagining, or learning words).
- 773 cohesion species concept: The idea that specific evolutionary adaptations and discrete complexes of genes define species.
- 774 cohesion: The binding together of like molecules, often by hydrogen bonds.
- 775 cohesion-tension theory: A theory accounting for the upward movement of water in plants. According to this theory, transpiration of a water molecule results in a negative (below 1 atmosphere) pressure in the leaf cells, inducing the entrance from the vascular tissue of another water molecule, which, because of the cohesive property of water, pulls with it a chain of water molecules extending up from the cells of the root tip.
- 776 cohort: A group of individuals having a statistical factor (as age or risk) in common.

- 777 cold acclimation response: The process by which plants increase their tolerance to freezing by exposure to low, nonfreezing temperatures.
- 778 coleoptile: The sheath enclosing the apical meristem and leaf primordia of a germinating monocot.
- 779 collagen: A glycoprotein in the extracellular matrix of animal cells that forms strong fibers, found extensively in connective tissue and bone; the most abundant protein in the animal kingdom.
- 780 collagen: A glycoprotein of the extracellular matrix in animal cells that forms strong fibers and is found extensively in connective tissue and bone. Collagen is the most abundant protein in the animal kingdom.
- 781 collecting duct: The location in the kidney where filtrate from renal tubules is collected; the filtrate is now called urine.
- 782 Collection Center-National Marrow Donor Program: accredited hospitals with experience and facilities to collect stem cells and care for stem cell donors before and after the stem cell donation procedure.
- 783 collenchyma cell: A flexible plant cell type that occurs in strands or cylinders that support young parts of the plant without restraining growth.
- 784 collimator: A device used to define the size and shape of a radiation beam in radiation therapy treatment machines; A collimator typically consists of large blocks of heavy metals, such as steel or tungsten, moved by mechanical motors to define rectangular fields.
- 785 colon: the part of the large intestine that extends to the rectum.
- 786 colonial: Condition in which many unicellular organisms live together in a somewhat coordinated group. Unlike true multicellular organisms, the individual cells retain their separate identities, and usually, their own membranes and cell walls.
- 787 colony stimulating factors (CSF): Generally referred to groups of cytokines and other growth factors that can stimulate Lymphohematopoietic stem cells and bone marrow progenitors. (In general, they are the hematopoietic stimulators).
- 788 colony-forming cells: Groups of cells growing on a solid nutrient surface with each group being created from the multiplication of an individual cell.
- 789 colony-stimulating factors: Diffusible proteins that stimulate the proliferation of hematopoietic stem cells.
- 790 color Doppler ultrasound (CDU): an ultrasound imaging technology utilizing sound waves that can simultaneously show blood flow superimposed on detailed gray scale anatomic images – “power Doppler” and “tissue harmonic” are enhancements to basic CDU.
- 791 colorectal: Relating to the colon and rectum, or to the entire large bowel (large intestine).
- 792 color-flow Doppler ultrasound: An ultrasound method that more clearly images tumors by observing the Doppler shift in sound waves caused by the rapid flow of blood through tiny blood vessels that are characteristic of tumors.
- 793 colostomy: A surgical opening in the abdomen to bypass a portion of the colon.
- 794 colposcope: A magnifying and photographic device used as an aid in the diagnostic examination of the vaginal and cervical epithelia.
- 795 colposcopy: Use of a scope to examine the cervix for abnormal cells.
- 796 combidex: (also called Ferumoxtran-10) – an investigational imaging agent consisting of iron oxide nanoparticles used in conjunction with magnetic resonance imaging (MRI) to aid in the differentiation of cancerous from normal lymph nodes.
- 797 combination hormone blockade (CHB): Also referred to as CHT, MAB, TAB or ADT (androgen deprivation therapy); therapy usually involving an LHRH agonist and an antiandrogen; may involve other agents such as Proscar® or prolactin inhibitors such as Dostinex®; preferred term is ADT with number attached to show number of agents e.g. ADT3 (Flutamide®, Lupron®, Proscar®) or ADT3 (FLP).
- 798 combined hormonal therapy (CHT): The use of more than one variety of hormone therapy; especially the use of LHRH analogs (e.g., Lupron®, Zoladex®) to block the production of testosterone by the testes, plus antiandrogens (e.g., Casodex® (bicalutamide), Eulexin® (flutamide), Anandron® (nilutamide), or Androcure® (cyproterone)) to compete with DHT and with T (testosterone) for cell androgen receptors thereby depriving cancer cells of DHT and T needed for growth; also referred to as CHB, MAB, TAB; the preferred term is ADT.
- 799 combined therapy: ADT with designation ADT1 vs ADT2 or ADT3 is preferred since this communicates the number of drugs used in the androgen deprivation therapy; ADT also more clearly communicates the mechanism of this form of treatment.
- 800 commensal: A kind of symbiotic relationship which benefits one organism while the other is unharmed. Commensal bacteria in the human gut are totally dependent on nutrition, but they don't harm the human.
- 801 commensalism: A symbiotic relationship in which the symbiont benefits but the host is neither helped nor harmed.
- 802 commercializing: Bringing a product or technology to market or making it commercially viable.
- 803 commitment: Engaging in a programme leading to differentiation. For a stem cell, this means exit from self-renewal.
- 804 community genomics: The study of communities of organisms in nature using the tools of genomics. Sequencing the DNA of microorganisms found in a liter of ocean water is an example of community genomics.
- 805 community screenings: Organized carrier testing outreach events to educate high risk ethnic groups on the importance of genetic screening and to provide convenient free or reduced cost testing.
- 806 community: All the organisms that inhabit a particular area; an assemblage of populations of different species living close enough together for potential interaction.
- 807 comorbidity: A condition that exists along with and usually independently of another medical condition.
- 808 companion cell: A type of plant cell that is connected to a sieve-tube member by many plasmodesmata and whose nucleus and ribosomes may serve one or more adjacent sieve-tube members.
- 809 comparative genomics: The science of comparing the genome sequences of humans and other species in order to discover similarities and differences in biology. For instance, scientists who study evolution might compare the genomes of humans and chimpanzees, while scientists who study the bacterium *E. coli* might compare strains that harm humans and those that do not.
- 810 competition: Interaction between members of the same population or of two or more populations using the same resource, often present in limited supply.
- 811 competitive exclusion principle: The concept that when the populations of two species compete for the same limited resources, one population will use the resources more efficiently and have a reproductive advantage that will eventually lead to the elimination of the other population.
- 812 competitive inhibitor: A substance that reduces the activity of an enzyme by entering the active site in place of the substrate whose structure it mimics.
- 813 complement fixation: An immune response in which antigen-antibody complexes activate complement proteins.
- 814 complement system: A group of at least 20 blood proteins that cooperate with other defense mechanisms; may

- amplify the inflammatory response, enhance phagocytosis, or directly lyse pathogens; activated by the onset of the immune response or by surface antigens on microorganisms or other foreign cells.
- 815 complementary DNA (cDNA): A DNA molecule made in vitro using mRNA as a template and the enzyme reverse transcriptase. A cDNA molecule therefore corresponds to a gene, but lacks the introns present in the DNA of the genome.
- 816 complete blood count (CBC): A blood test done in a laboratory to find out the number of red blood cells (RBC's), white blood cells (WBC's), platelets, hemoglobin, and hematocrit in your blood. These blood cells are made in the marrow of your bones.
- 817 complete digestive tract: A digestive tube that runs between a mouth and an anus; also called alimentary canal. An incomplete digestive tract has only one opening.
- 818 complete flower: A flower that has sepals, petals, stamens, and carpels.
- 819 complete injury: Loss of all function below the injury site.
- 820 complete response (CR): Total disappearance of all evidence of disease using physical examination, laboratory studies and radiologic imaging; a criterion for evaluating the efficacy of a particular anti-cancer therapy.
- 821 complete response: The disappearance of all signs of cancer in response to treatment. This does not always mean the cancer has been cured.
- 822 complex disorder: A disease that involves multiple genetic and environmental factors. Obesity, heart disease, and schizophrenia are examples of diseases that have multiple causes.
- 823 complexed PSA: PSA molecules which are bound to a protease inhibitor such as a1-antichymotrypsin.
- 824 compliance: The extent to which a patient follows the recommendations of a doctor or healthcare professional, particularly with respect to medication or other treatments.
- 825 complication: an unexpected or unwanted effect of a treatment, pharmaceutical or other procedure.
- 826 compound eye: A type of multifaceted eye in insects and crustaceans consisting of up to several thousand light-detecting, focusing ommatidia; especially good at detecting movement.
- 827 compound: A chemical combination, in a fixed ratio, of two or more elements.
- 828 computerized axial tomography (CAT Scan): is a method of combining images from multiple x-rays under the control of a computer to produce cross-sectional or three-dimensional pictures of the internal organs which can be used to identify abnormalities; the CAT scan can identify prostate enlargement but is not always effective for assessing the stage of prostate cancer; for evaluating metastases of the lymph nodes or more distant soft tissue sites, the CAT scan is significantly more accurate.
- 829 concentration gradient: A regular increase or decrease in the intensity or density of a chemical substance. Cells often maintain concentration gradients of H⁺ ions across their membranes. When a gradient exists, the ions or other chemical substances involved tend to move from where they are more concentrated to where they are less concentrated.
- 830 conception: The fertilization of an egg by sperm that leads to the creation of a new being.
- 831 concordance: The agreement in findings that support the accuracy of a particular investigation or treatment; concordance is a critical concept in studies to diagnose, stage and treat PC.
- 832 condensation reaction: A reaction in which two molecules become covalently bonded to each other through the loss of a small molecule, usually water; also called dehydration reaction.
- 833 conditioning regimen: Chemotherapy or radiation that is administered prior to transplant to kill any remaining cancer cells and to make room for new stem cells.
- 834 conditioning: A phase in the bone marrow/stem cell transplant process designed to destroy cancer cells more chemotherapy. Conditioning involves combining high doses of chemotherapy and/or radiation.
- 835 condom therapy: Therapy prescribed to reduce the number of sperm antibodies in the woman by using a condom during intercourse for six months or more and by the woman refraining from all skin contact with the husband's sperm. The woman's antibody level may fall to levels that will not adversely affect the sperm.
- 836 cone biopsy: A surgical procedure used to remove precancerous cells from the cervix. The procedure may damage the cervix and thus disrupt normal mucus production or cause an incompetent cervix, which may open prematurely during pregnancy.
- 837 cone cell: (1) In plants, the reproductive structure of a conifer. (2) In vertebrates, a type of photoreceptor cell in the retina, concerned with the perception of color and with the most acute discrimination of detail.
- 838 confidential: Spoken or written in secret and intended to be kept secret. In the cancer registry, all identifiable data is considered to be confidential.
- 839 confirmatory typing (CT): A repeat tissue typing test done to make sure the donor and patient match. This is one of the final tests done before transplant.
- 840 confirmatory typing (CT): This test confirms the HLA compatibility of the donor and the patient and is performed on all potential family or unrelated donors.
- 841 confluent monolayer: An unbroken layer of cells, one cell thick
- 842 conformal therapy: the use of careful planning and delivery techniques designed to focus external radiation on the areas of the prostate and surrounding tissue which need treatment and protect areas which do not need treatment; three-dimensional conformal radiation therapy (3DCRT) is a sophisticated form of this method.
- 843 conformality: Pertaining to the ability to achieve conformal therapy.
- 844 congenital adrenal hyperplasia: A congenital condition characterized by elevated androgens which suppress the pituitary gland and interfere with spermatogenesis or ovulation. Women may have ambiguous genitalia from the excess production of male hormone.
- 845 congenital defect: A birth defect, acquired during pregnancy but not necessarily hereditary.
- 846 congenital disorder: Any disorder present at birth.
- 847 congenital hypothyroidism: An inherited trait that results in reduced activity of the thyroid gland, generally due to reduced production of thyroid stimulating hormone. The trait reduces the base rate of the body's chemical reactions, and results in tissue swelling and weight gain. It can cause neurological and development problems.
- 848 congenital: Existing at birth; referring to certain mental or physical traits, malformations, or diseases, which may be hereditary or due to an influence occurring during gestation (in utero).
- 849 congenital: Present at birth.
- 850 conidium (pl. conidia): A naked, asexual spore produced at the ends of hyphae in ascomycetes.
- 851 conifer: A gymnosperm whose reproductive structure is the cone. Conifers include pines, firs, redwoods, and other large trees.
- 852 conization: Surgery to remove a cone-shaped piece of tissue from the cervix and cervical canal. Conization may be used to diagnose or treat a cervical condition. Also called cone biopsy.

- 853 conjugation: In bacteria, the transfer of DNA between two cells that are temporarily joined.
- 854 connective tissue: The supporting or framework tissue of the body, formed of fibrous and ground substance with more or less numerous cells of various kinds; it is derived from the mesenchyme, and this in turn from the mesoderm; the varieties of connective tissue are: areolar or loose; adipose; dense, regular or irregular, white fibrous; elastic; mucous; and lymphoid tissue; cartilage; and bone; the blood and lymph may be regarded as connective tissues the ground substance of which is a liquid.
- 855 conservation biology: A goal-oriented science that seeks to counter the biodiversity crisis, the current rapid decrease in Earth's variety of life.
- 856 consumer, in ecological systems: A heterotroph that derives its energy from living or freshly killed organisms or parts thereof. Primary consumers are herbivores; higher-level consumers are carnivores.
- 857 continental drift: The gradual movement of the Earth's continents that has occurred over hundreds of millions of years.
- 858 continuing infertile: Someone who has gone through primary infertility, successfully given birth, and is trying for another child.
- 859 continuous variation: A gradation of small differences in a particular trait, such as height, within a population; occurs in traits that are controlled by a number of genes.
- 860 contraception: The prevention of pregnancy.
- 861 contractile vacuole: In many protists, a specialized vacuole with associated channels designed to collect excess water in the cell. Microtubules periodically contract to force this excess water out of the cell, regulating the cell's osmotic balance.
- 862 contracture: A contracture is a condition of abnormal shortening or shrinkage of a muscle, tendon, etc., often with persistent flexion or distortion at a joint. People affected with neuromuscular disease often develop contractures over time. A physical or occupational therapist will probably be able to teach stretches that, when done regularly, can help decrease contractures.
- 863 contraindication: any condition which renders some particular line of treatment improper or undesirable.
- 864 contrast agent: A dye or other substance that helps show abnormal areas inside the body.
- 865 control group: participants in a clinical trial who are receiving placebo or current standard of care for comparison to those receiving the new therapy being evaluated.
- 866 controlled ovarian hyperstimulation (COH): Using fertility medications to stimulate the growth of multiple follicles for ovulation. Also called Superovulation.
- 867 contusion injury: A common injury due to impact, which bruises the spinal cord.
- 868 conus medullaris: The terminal end of the spinal cord.
- 869 convection: The mass movement of warmed air or liquid to or from the surface of a body or object.
- 870 convergent evolution: The independent development of similarity between species as a result of their having similar ecological roles and selection pressures.
- 871 cooley's anemia: Another name for thalassemia major.
- 872 cooperativity: An interaction of the constituent subunits of a protein causing a conformational change in one subunit to be transmitted to all the others.
- 873 coordinating center: The NMDP Coordinating Center, office located in Minneapolis, Minnesota, establishes standards, policies, and procedures for its Network of Transplant, Donor, Apheresis and Collection Centers, Cord Blood Banks, Recruitment Groups and Cooperative Registries. From this office, Network Centers performance is monitored; patients' searches for compatible unrelated donors are coordinated; and communication between Network members is facilitated. The scheduling, coordination, transport and tracking of unrelated stem cell collections are managed by the Coordinating Center.
- 874 Cord Blood Bank: An organization that helps to collect and store umbilical cord blood for transplant.
- 875 cord blood stem cell: A stem cell collected from the umbilical cord at birth that can produce all of the blood (hematopoietic) cells in the body. Cord blood is currently used to treat patients who have undergone chemotherapy to destroy their bone marrow due to cancer or other blood-related disorders.
- 876 cord blood transplant: A procedure where umbilical blood stem cells are used in a stem cell transplant.
- 877 cord blood: Stem cells can be derived from blood the umbilical cord at the time of birth. Umbilical cord stem cells are rich in hematopoietic stem cells, which normally reside in the bone marrow and can be used for the treatment of leukemia and other blood diseases. Numerous public and private cord blood banks have emerged to collect and store neonatal cord blood as future "insurance" against diseases that might be treatable using a stem cell approach.
- 878 cord: The blood that remains in the umbilical cord and placenta following birth.
- 879 core biopsy: Similar to needle biopsy, but a larger needle is used because actual tissue is removed, rather than a tiny sampling of cells. A sample of the tumor is removed, but not the whole tumor. The types of core biopsies include ultrasound-guided core biopsy and stereotactic biopsy.
- 880 core: A tissue sample removed during biopsy.
- 881 cork cambium: A cylinder of meristematic tissue in plants that produces cork cells to replace the epidermis during secondary growth.
- 882 cork: A secondary tissue that is a major constituent of bark in woody and some herbaceous plants; made up of flattened cells, dead at maturity; restricts gas and water exchange and protects the vascular tissues from injury.
- 883 cornea: Transparent tissue at the front of the eye.
- 884 corolla: Petals, collectively; usually the conspicuously colored flower parts.
- 885 coronal: an imaging plane bisecting the body into top and bottom parts perpendicular (rotated 90°) to the long axis of the human body
- 886 coronavirus: A single-stranded RNA virus that resembles a crown when viewed under an electron microscope because of its petal-shaped projections. Of the more than 30 isolated strains of coronavirus, three or four infect humans and may cause respiratory diseases such as SARS and gastroenteritis. They are believed to cause a large percentage of all common cold cases in humans.
- 887 corpora cavernosa: Two cavities in the upper portion of a man's penis that fill with blood when he is sexually excited, giving the organ the stiffness required for intercourse.
- 888 corpus callosum: In the vertebrate brain, a tightly packed mass of myelinated nerve fibers connecting the two cerebral hemispheres.
- 889 corpus callosum: The great band of commissural fibers uniting the cerebral hemispheres of higher mammals including humans.
- 890 corpus cavernosa: Cylindrical, sponge-like regions on each side of the penis shaft that become engorged with blood in erectile tumescence.
- 891 corpus luteum: The yellow-pigmented glandular structure that forms from the ovarian follicle following ovulation. The gland produces progesterone, which is responsible for preparing and supporting the uterine lining for implantation. Progesterone also causes the half-degree or more basal temperature elevation noted after ovulation. If the corpus luteum functions poorly, the uterine lining may not support a pregnancy. If the egg is fertilized, a corpus

- luteum of pregnancy forms to maintain the endometrial bed and support the implanted embryo. A deficiency in the amount of progesterone produced (or the length of time it is produced) by the corpus luteum can mean the endometrium is unable to sustain a pregnancy.
- 892 corpus spongiosum: A spongy chamber in the lower portion of a man's penis that surrounds the urethra and fills with blood when he is sexually excited, providing additional stiffness required for intercourse.
- 893 cortex: (1) The outer, as opposed to the inner, part of an organ, as in the adrenal gland. (2) In a stem or root, the primary tissue bounded externally by the epidermis and internally by the central cylinder of vascular tissue.
- 894 corticospinal tract: A collection of axons that travel between the brain's cerebral cortex and the spinal cord.
- 895 corticosteroid: A steroid hormone produced by the adrenal cortex or synthesized; administered as drugs they reduce swelling and decrease the body's immune response; adrenal cortical steroids treat several conditions.
- 896 cortisol: A steroid hormone, produced by the adrenal cortex, that promotes the formation of glucose from protein and fat; also suppresses the inflammatory and immune responses.
- 897 cotransport: The coupling of the "downhill" diffusion of one substance to the "uphill" transport of another against its own concentration gradient.
- 898 cotyledon: The one (monocot) or two (dicot) seed leaves of an angiosperm embryo.
- 899 cough assist machine: The Cough Assist Machine helps to clear secretions from the lungs by helping you with your breathing. When you breathe in (inspiration), the machine gives you air (positive pressure) to help expand your lungs. When you blow out (expiration), the machine creates a sucking force (negative pressure) that pulls the air out of your lungs. This rapid change in pressure during the two phases of breathing (inspiration and exhalation) helps make your cough stronger and more effective.
- 900 countercurrent exchange: The opposite flow of adjacent fluids that maximizes transfer rates; for example, blood in the gills flows in the opposite direction in which water passes over the gills, maximizing oxygen uptake and carbon dioxide loss.
- 901 coupled reactions: In cells, the linking of endergonic (energy-requiring) reactions to exergonic (energy-releasing) reactions that provide enough energy to drive the endergonic reactions forward.
- 902 covalent bond: A chemical bond formed as a result of the sharing of one or more pairs of electrons.
- 903 Cowper's glands: A pair of pea-sized glands that lie beneath the prostate gland, named after the English surgeon William Cowper (1660-1709). Cowper's glands secrete an alkaline fluid that forms part of the semen. This fluid neutralizes the acidic environment of the urethra, thereby protecting the sperm.
- 904 Cox-2 inhibitor: Drugs for inflammation that selectively block the COX-2 (cyclooxygenase-2) enzyme.
- 905 C-peptide: Is the connecting piece between insulin molecules. The C-peptide level can be used to gauge insulin production in the body.
- 906 craniosacral system: A physiological system surrounding the brain and spinal cord.
- 907 craniosacral therapy: A gentle hands-on procedure for evaluating and enhancing the function of the craniosacral system.
- 908 cranium: The bones of the skull which contain the brain, the brain case.
- 909 crassulacean acid metabolism: A process by which some species of plants in hot, dry climates take in carbon dioxide during the night, fixing it in organic acids; the carbon dioxide is released during the day and used immediately in the Calvin cycle.
- 910 C-reactive protein (CRP): A plasma protein that can be a marker for inflammatory activity.
- 911 creatine kinase: Any of three enzymes found especially in skeletal and heart muscle and the brain that accelerate the transfer of a high-energy phosphate group and typically occur in elevated levels in the blood following injury to brain or muscle tissue.
- 912 creatine: A compound which is made by the body and is used to store energy in the form of phosphate molecules.
- 913 creatinine: A chemical substance resulting from the metabolism of creatine, that is found in muscle tissue and blood; creatinine is normally excreted in the urine as a metabolic waste; when elevated in the blood it indicates impairment of kidney function.
- 914 cripto: Transcription factor expressed by pluripotent stem cells and early embryos.
- 915 crista (pl. cristae): An infolding of the inner membrane of a mitochondrion that houses the electron transport chain and the enzyme catalyzing the synthesis of ATP.
- 916 cRNA: Complementary RNA.
- 917 crohn disease: Crohn disease is an inflammatory bowel disease (IBD); it is the general name for diseases that cause inflammation in the intestines. Crohn disease causes inflammation in the small intestine. Crohn's disease usually occurs in the lower part of the small intestine, called the ileum, but it can affect any part of the digestive tract, from the mouth to the anus.
- 918 crossed phrenic pathway: A normally dormant, backup pathway that can be used to restore some respiratory function after cervical injury.
- 919 cross-fertilization: Fusion of gametes formed by different individuals; as opposed to self-fertilization.
- 920 crossing over: The reciprocal exchange of genetic material between nonsister chromatids during synapsis of meiosis I.
- 921 cryobag: An alternative to storage with cryovials; a cryobag is a small storage "bag" designed for storing cells in extremely low temperatures. Cryobags can be created by fusing the two sides together which causes them to be "seamed", or, they can be blowmolded and "seamless".
- 922 cryogenic: Storage at very low temperatures (below -150 degrees Celsius).
- 923 cryogenics: Extreme cold. Cells may be frozen by special techniques, and kept at extremely cold temperatures until needed. They are then thawed out and injected or infused.
- 924 cryopreservation: Freezing quickly and then storing, as in sperm, embryos, and, more recently, unfertilized eggs.
- 925 cryopreserved embryos: Embryos, generally those produced by in vitro fertilization exceeding the number that can be transferred for uterine implantation, that have been frozen.
- 926 cryoprobe: A surgical instrument used to apply extreme cold to tissues during cryosurgery.
- 927 cryosurgery: The use of liquid nitrogen probes to freeze a particular organ to extremely low temperatures to kill the tissue, including any cancerous tissue; When used to treat prostate cancer, the cryoprobes are guided by transrectal ultrasound (TRUS).
- 928 cryovial: Small storage unit specifically designed for storing cells in extremely low temperatures.
- 929 cryptic coloration: A type of camouflage that makes potential prey difficult to spot against its background.
- 930 cryptorchidism: A condition in which one or both testicles fail to move from the abdomen, where they develop before birth, into the scrotum. Cryptorchidism may increase the risk for development of testicular cancer. Also called undescended testicles.

- 931 CT scan: A type of imaging scan that shows the internal structure of a person's brain.
- 932 C-terminus/N-terminus: On a protein or polypeptide. One end of the amino acid chain that ends in a free carboxyl group. The end of the chain that ends in an amine group. N-terminus contains targeting signals and C-terminus contains retention signals for protein sorting.
- 933 culdoscopy: The introduction of a viewing tube through the end of the vagina into the cul-de-sac. The cul-de-sac is also called the rectouterine pouch, an extension of the peritoneal cavity between the rectum and back wall of the uterus.
- 934 culture medium: The broth that covers cells in a culture dish, which contains nutrients to feed the cells as well as other growth factors that may be added to direct desired changes in the cells.
- 935 culture plate: A flat, transparent dish capable of holding some sort of liquid (medium) on which cells are grown.
- 936 cumulus cell: The nutrient cells that surround the egg (ova).
- 937 cumulus oophorus: The protective layer of cells surrounding the egg.
- 938 curanderismo: Traditional Mexican-American healing.
- 939 curcumin: a biologically active substance derived from the *curcuma longa* plant; found within the Indian spice called turmeric; curcumin and its curcuminoid polyphenols have anti-prostate cancer activity against both AIPC and ADPC.
- 940 cushing's syndrome: A condition characterized by an overproduction of adrenal gland secretions. The person will suffer from high blood pressure and water retention as well as a number of other symptoms. A concurrent elevation of adrenal androgens will suppress pituitary output of LH and FSH and result in low sperm production or ovulatory failure. A woman may also develop male secondary sex characteristics, including abnormal hair growth. Cushing's Disease is another condition in which these same symptoms occur, but as the result of a pituitary tumor.
- 941 cutaneous: Pertaining to the skin, dermal, dermic.
- 942 cuticle: (1) A waxy covering on the surface of stems and leaves that acts as an adaptation to prevent desiccation in terrestrial plants. (2) The exoskeleton of an arthropod, consisting of layers of protein and chitin that are variously modified for different functions.
- 943 cyanobacteria: Photosynthetic, oxygen-producing bacteria (formerly know as blue-green algae).
- 944 cycle day: The day of a woman's menstrual cycle. The first day (day 1) is when full flow starts before mid-afternoon.
- 945 cyclic AMP: Cyclic adenosine monophosphate, a ring-shaped molecule made from ATP that is a common intracellular signaling molecule (second messenger) in eukaryotic cells, for example, in vertebrate endocrine cells. It is also a regulator of some bacterial operons.
- 946 cyclic electron flow: A route of electron flow during the light reactions of photosynthesis that involves only photosystem I and produces ATP but not NADPH or oxygen.
- 947 cyclin: A regulatory protein whose concentration fluctuates cyclically.
- 948 cyclin-dependent kinase (Cdk protein): Protein kinase that has to be complexed with a cyclin protein in order to act; different Cdk-cyclin complexes are thought to trigger different steps in the cell-division cycle by phosphorylating specific target proteins.
- 949 cyclin-dependent kinase (Cdk): A protein kinase that is active only when attached to a particular cyclin.
- 950 cyproterone: an antiandrogen with progestational activity.
- 951 cyst: A fluid-filled sac.
- 952 cystic fibrosis: An inherited disease resulting in abnormal mucus secretion, which produces severe respiratory problems, incomplete digestion and increased salt secretion in sweat.
- 953 cystic-relating to a cyst: any closed cavity or sac that is lined by epithelium often contains liquid or semi-solid material.
- 954 cystitis: Inflammation of the bladder that may be caused by infection or chemical injury or radiation; characterized by increased urinary frequency, discomfort on urination and often red blood cells, white blood cells and/or bacteria in the urine.
- 955 cystoscope: An instrument used by physicians to look inside the urethra and the bladder.
- 956 cystoscopy: The use of a cystoscope to look inside the urethra and the bladder.
- 957 cystosol: The soluble components of the fluid matter enclosed within the cellular membrane.
- 958 Cytadren®: The trademarked name for aminogluthethimide.
- 959 cytochrome C: A protein that carries electrons released from the mitochondria to to initiate cell death.
- 960 cytochrome P-450 dependent 14-demethylation: an enzyme system that is important in the endocrine pathways of hormone production and activation.
- 961 cytochrome: An iron-containing protein, a component of electron transport chains in mitochondria and chloroplasts.
- 962 cytogenetics: The study of chromosomes, the visible carriers of DNA, the hereditary material. Cytogenetics is a fusion science due to joining of cytology (the study of cells) with genetics (the study of inherited variation).
- 963 cytokine: Soluble protein substances produced by cells that are critical to the development and functioning of the immune response. Each cytokine binds to a specific cell-surface receptor. Cytokines have been variously named as lymphokines, interleukins and chemokines.
- 964 cytokinesis: The division of the cytoplasm to form two separate daughter cells immediately after mitosis.
- 965 cytokinin: A class of related plant hormones that retard aging and act in concert with auxins to stimulate cell division, influence the pathway of differentiation, and control apical dominance.
- 966 cytology: Science that deals with the structure and function of cells.
- 967 cytomegalovirus (CMV): A group of viruses that cause enlargement of cells of various organs. Infection in a fetus can cause jaundice, high-tone deafness, eye problems, malformation, or fetal death.
- 968 cytometry: Cell measurement.
- 969 cytoplasm: The cytoplasm is found in a compartment of the cell that is enclosed within the plasma membrane, excluding the nucleus. In eukaryotic cells, the cell nucleus is a distinct compartment of the cell that is encased by the nuclear membrane. The cytoplasm is comprised mostly of fluid called the cytosol. Also contained within the cytoplasm are cytoskeletal proteins and membrane-bound organelles such as the mitochondria, endoplasmic reticulum, and Golgi bodies. The cytoplasm is the site where most cellular activities occur, including glycolysis and protein translation.
- 970 cytoplasmic determinants: In animal development, substances deposited by the mother in the eggs she produces that regulate the expression of genes affecting the early development of the embryo.
- 971 cytoplasmic streaming: A circular flow of cytoplasm, involving myosin and actin filaments, that speeds the distribution of materials within cells.
- 972 cytoplasmic transfer: An extension of in vitro fertilization which takes the genetic material from a mother's egg and combines it with the cytoplasm of a donor egg. Two methods of cytoplasm transfer were developed, one which transfers a small amount of cytoplasm by tiny needle from the donor to the recipient egg, the other transfers a larger

- amount of cytoplasm which is then fused to the recipient cytoplasm with electricity.
- 973 cytoskeleton (adj. cytoskeletal): The internal scaffolding of cells which determines cell shape, and organizes structures within cells.
- 974 cytoskeleton: Integrated system of molecules within eukaryotic cells which provides them with shape, internal spatial organization, motility, and may assist in communication with other cells and the environment. Red blood cells, for instance, would be spherical instead of flat if it were not for their cytoskeleton.
- 975 cytosol: The semifluid portion of the cytoplasm.
- 976 cytotoxic T cell (TC): A type of lymphocyte that kills infected cells and cancer cells.
- 977 cytotoxin, cytotoxic: chemicals that have direct toxicity to cancer cells, preventing their reproduction or growth. Cytotoxic agents can, as a side effect, damage healthy, non-cancerous tissues or organs which have a high proportion of actively dividing cells, for example, bone marrow and hair follicles.
- 978 Cytosan®: A genotoxic drug, a chemotherapy agent that affects DNA and alters its function.
- 979 D34: Present on Lymphohematopoietic stem cells and their progenitors. Express at high densities in the most primitive cells and become dim as the cells mature towards differentiation.
- 980 dalton: The atomic mass unit; a measure of mass for atoms and subatomic particles.
- 981 Daoyin: Physical and mental activities simultaneously carried out in conjunction with acupunctural procedures to direct the qi energy to affected body areas.
- 982 Darwinian fitness: A measure of the relative contribution of an individual to the gene pool of the next generation.
- 983 data set: A data set is a named collection of data that contains individual data units organized (formatted) in a specific and prescribed way.
- 984 daughter cell: A cell that is the offspring of a cell that has undergone mitosis or meiosis. The term "daughter" does not indicate the sex of the cell.
- 985 daughterless carp: Carp which only produce male fish. This slows the growth of the population with the aim of reducing overall carp numbers. Since all fish embryos start life as males, the technology works by silencing or switching off the gene responsible for stimulating the development of female embryos.
- 986 day-neutral plant: A plant whose flowering is not affected by photoperiod.
- 987 death clearance: The process of linking a file of known decedents against a cancer registry file in order to determine all deaths among registrants and to identify deaths from cancer among persons previously unknown to the registry.
- 988 debility: The state of being weak or feeble; infirmity.
- 989 debulking: Reduction of the volume of cancer by one of several techniques; most frequently used to imply surgical removal.
- 990 decidual cells: A cellular matrix that first surrounds an implanted embryo and later occupies most of the endometrium.
- 991 deciduous: Refers to plants that shed their leaves at a certain season.
- 992 decomposers: Saprotrophic fungi and bacteria that absorb nutrients from nonliving organic material such as corpses, fallen plant material, and the wastes of living organisms, and convert them into inorganic forms.
- 993 decompression: A surgical procedure in which various tissue or bone fragments that compress the spinal cord and, in turn, compromise cord function are removed.
- 994 de-differentiation: Backward movement of differentiated cells to immature types.
- 995 dedifferentiation: The process by which a cell reverts to a less specialized, progenitor state.
- 996 deep vein thrombosis: A blood clot that forms in a deep vein of usually the leg. This clot potentially can dislodge and travel to the lungs, where it can create a life-threatening pulmonary embolism.
- 997 definitive local treatment: Generally that treatment which includes generally accepted procedures necessary to ultimately produce recovery of the patient. For prostate cancer this is usually considered to include radical prostatectomy, radiation therapy, and cryosurgery.
- 998 degenerative disease: A disease in which the function or structure of the affected tissues or organs will progressively deteriorate over time, whether due to normal bodily wear or lifestyle choices such as exercise or eating habits.
- 999 degradation: A gradual wearing down or away. Also, with regard to soil, a lowering of the nutrient content and associated ability to support continuing crop growth.
- 1000 dehydration reaction: A chemical reaction in which two molecules covalently bond to one another with the removal of a water molecule.
- 1001 deletion mutation: DNA is the genetic language and is read from left to right in 3 letter words.
- 1002 deletion: (1) A deficiency in a chromosome resulting from the loss of a fragment through breakage. (2) A mutational loss of a nucleotide from a gene.
- 1003 demography: The study of statistics relating to births and deaths in populations.
- 1004 demyelination: The conduction-compromising loss of the insulating myelin around nerves due to injury or disease.
- 1005 denaturation: For proteins, a process in which a protein unravels and loses its native conformation, thereby becoming biologically inactive. For DNA, the separation of the two strands of the double helix. Denaturation occurs under extreme conditions of pH, salt concentration, and temperature.
- 1006 dendrite: Extension of a nerve cell, typically branched and relatively short, that receives stimuli from other nerve cells.
- 1007 dendrite: One of usually numerous, short, highly branched processes of a neuron that conveys nerve impulses toward the cell body.
- 1008 dendritic cells (DC): Cells that process antigens (proteins) and present them to immune lymphocytes called T cells playing a major role in the initiation of the immune response against tumor and other types of abnormal cells; antigen presenting cells; e.g. Provenge® is an investigational therapy employing DC.
- 1009 denervation: The loss of nerve connection to, for example, a muscle.
- 1010 denitrification: The process by which certain bacteria living in poorly aerated soils break down nitrates, using the oxygen for their own respiration and releasing nitrogen back into the atmosphere.
- 1011 denonvillier's fascia: Thin layer of connective tissue that separates prostate and seminal vesicles from rectum.
- 1012 De-novo: In a new form or manner.
- 1013 de-novo-Latin: New. Anew, afresh. A "trial de novo" is a retrial.
- 1014 density gradient cell separation: A blood separation technique that accomplishes separation based on the density and size differences in a mixture of blood components. Ficoll-Hypaque is a density gradient cell separation method.
- 1015 density gradient centrifugation: A method for separating materials of differing densities that involves spinning them at high speed
- 1016 density: The number of individuals per unit area or volume.
- 1017 density-dependent factor: Any factor influencing population regulation that has a greater impact as population density increases.

- 1018 density-dependent inhibition: The phenomenon observed in normal animal cells that causes them to stop dividing when they come into contact with one another.
- 1019 density-independent factors: Any factor influencing population regulation that acts to reduce population by the same percentage, regardless of size.
- 1020 dental pulp: The soft part inside a tooth, containing blood vessels and nerves.
- 1021 dental stem cells: Adult stem cells found in both baby teeth and wisdom teeth. Dental stem cells have been shown to be able to differentiate into a wide variety of tissues such as dental tissue, bone, cartilage, and muscle. Some evidence suggests that these cells may be capable of differentiating into neural tissue. These stem cells have potential applications in both medicine and dentistry. The collection, processing and cryostorage of dental stem cells is primary service offered by StemStore Technologies for your young child.
- 1022 deoxyribonucleic acid (DNA): A double-stranded, helical nucleic acid molecule capable of replicating and determining the inherited structure of a cell's proteins.
- 1023 deoxyribose: The sugar component of DNA, having one less hydroxyl group than ribose, the sugar component of RNA.
- 1024 dependent variable: In an experiment, the dependent variable is the factor that responds when another factor is manipulated.
- 1025 depolarization: An electrical state in an excitable cell whereby the inside of the cell is made less negative relative to the outside than at the resting membrane potential. A neuron membrane is depolarized if a stimulus decreases its voltage from the resting potential of -70 mV in the direction of zero voltage.
- 1026 deposit-feeder: A heterotroph, such as an earthworm, that eats its way through detritus, salvaging bits and pieces of decaying organic matter.
- 1027 deriving: The creation of a cell line from one original cell or set of cells.
- 1028 dermal tissue system: The protective covering of plants; generally a single layer of tightly packed epidermal cells covering young plant organs formed by primary growth.
- 1029 dermatome map: A body map that shows skin sensitivity associated with various levels of spinal cord injury.
- 1030 dermatophytes: A parasitic fungus that attacks and causes a disease of the skin.
- 1031 dermis: The inner layer of the skin, beneath the epidermis.
- 1032 desmosome: A type of intercellular junction in animal cells that functions as an anchor.
- 1033 determinate cleavage: A type of embryonic development in protostomes that rigidly casts the developmental fate of each embryonic cell very early.
- 1034 determinate growth: A type of growth characteristic of animals, in which the organism stops growing after it reaches a certain size.
- 1035 determination: The progressive restriction of developmental potential, causing the possible fate of each cell to become more limited as the embryo develops.
- 1036 detritivores: Organisms that live on dead and discarded organic matter; include large scavengers, smaller animals such as earthworms and some insects, as well as decomposers (fungi and bacteria).
- 1037 detritus: Dead organic matter.
- 1038 detrusor muscle: Contracts when urinating to squeeze out urine.
- 1039 deuterostome: One of two distinct evolutionary lines of coelomates, consisting of the echinoderms and chordates and characterized by radial, indeterminate cleavage, enterocoelous formation of the coelom, and development of the anus from the blastopore.
- 1040 development: The progressive production of the phenotypic characteristics of a multicellular organism, beginning with the fertilization of an egg.
- 1041 developmental biology: The study of the process by which organisms grow and develop, including the formation and specialization of cells and tissues, from embryo to adulthood. Modern research in developmental biology examines the processes of cell growth and differentiation, and the roll in which stem cells seed and control the development of tissues and organs.
- 1042 DEXA (dual energy X-RAY absorptiometry): A type of bone mineral density radiologic examination using x-ray absorption.
- 1043 dexamethasone: A powerful oral steroid drug that has an anti-cancer effect and has an important role in the treatment of MM.
- 1044 dextrans: a group of glucose polymers made by certain bacteria.
- 1045 diabetes: The disease that occurs when the body does not properly produce or use insulin (a hormone required to convert food to energy). Diabetes is classified as Type 1 or Type 2. Type 1 diabetes (formerly known as insulin-dependent diabetes), is characterized by loss of the insulin: producing beta cells of the islets of Langerhans of the pancreas leading to a deficiency of insulin. Diet and exercise cannot reverse or prevent type 1 diabetes. Type 2 diabetes (previously known as adult: onset diabetes) is due to a combination of defective insulin secretion and insulin resistance or reduced insulin sensitivity. Type 2 diabetes is usually first treated by attempts to change physical activity (generally an increase is desired), the diet (generally to decrease carbohydrate intake), and weight loss.
- 1046 diagnosis (Dx): The evaluation of signs, symptoms and selected test results by a physician to determine the physical and biological causes of the signs and symptoms and whether a specific disease or disorder is involved
- 1047 diapause: A period of suspended growth and development requiring very specific conditions to trigger it and then to release the organism from it. Embryonic diapause is also known as "delayed implantation." There is a cessation of metabolic activity.
- 1048 diapedesis: Passage of blood cells (especially white blood cells) through intact capillary walls and into the surrounding tissue.
- 1049 diaphragm: The diaphragm is the primary muscle of inspiration. It is a thin, dome-shaped sheet of muscle that inserts into the lower ribs. When it contracts, it pushes downward and spreads out, increasing the vertical dimension of the chest cavity and driving up abdominal pressure. This increase in pressure drives the abdominal contents down and out, which in turn increases the transverse size of the chest cavity.
- 1050 diarrhea: Frequent, loose, and watery bowel movements. Common causes include gastrointestinal infections, irritable bowel syndrome, medicines, and malabsorption.
- 1051 diastole: The stage of the heart cycle in which the heart muscle is relaxed, allowing the chambers to fill with blood.
- 1052 diastolic pressure: The pressure in an artery during the ventricular relaxation phase of the heart cycle.
- 1053 dicot: A subdivision of flowering plants whose members possess two embryonic seed leaves, or cotyledons.
- 1054 dicotyledon: A member of the class of flowering plants having two seed leaves, or cotyledons, among other distinguishing features; often abbreviated as dicot.
- 1055 diethylstilbestrol (DES): A drug given to pregnant women from the early 1940s until 1971 to help with common problems during pregnancy. The drug has been linked to cancer of the cervix or vagina in women whose mother took the drug while pregnant.

- 1056 differential: In performing the blood count, a total of 100 cells are counted. The percent of each type found in these 100 cells is the cell "differential" for each type.
- 1057 differentiation: (1) The process by which cells become progressively more specialized; a normal process through which cells mature. This process of specialization for the cell comes at the expense of its breadth of potential. Stem cells can, for example, differentiate into secretory cells in the intestine. (2) In cancer, differentiation refers to how mature (developed) the cancer cells are in a tumor. Differentiated tumor cells resemble normal cells and tend to grow and spread at a slower rate than undifferentiated or poorly differentiated tumor cells, which lack the structure and function of normal cells and grow uncontrollably.
- 1058 diffusion: The spontaneous tendency of a substance to move down its concentration gradient from a more concentrated to a less concentrated area.
- 1059 digestive tract: The organs that are involved in digestion, including the mouth, salivary glands, oesophagus, stomach, pancreas, liver, gallbladder, small intestine, and large intestine.
- 1060 digital rectal examination (DRE): The use by a medical provider of a lubricated and gloved finger inserted into the rectum to feel for abnormalities of the prostate and rectum.
- 1061 dihybrid cross: A breeding experiment in which parental varieties differing in two traits are mated.
- 1062 dihybrid: A hybrid individual that is heterozygous for two genes or two characters.
- 1063 dihydrotestosterone (DHT or 5 alpha-dihydrotestosterone): A male hormone more potent than testosterone that is converted from testosterone within the prostate by 5 alpha reductase.
- 1064 dikaryotic: Having two different and distinct nuclei per cell; found in the fungi. A dikaryotic individual is called a dikaryon.
- 1065 dimensional conformal radiation therapy (3DCRT): An external radiation treatment approach that focuses on directing the radiation energy to the tumor target while sparing the surrounding normal tissues.
- 1066 dimer: A chemical or biological entity consisting of two subunits, monomers, held together by intramolecular forces.
- 1067 dimethyl sulfoxide (DMSO): A cryoprotectant used in small amounts for long term cryopreservation storage of stem cells. It helps to prevent cellular injury during ice crystal formation. It can cause problems in transplant patients if not properly removed when the cells are thawed for transplant.
- 1068 dimorphism: Displaying two separate growth forms.
- 1069 dioecious: Referring to a plant species that has staminate and carpellate flowers on separate plants.
- 1070 diploid: Having one complete set of normally paired chromosomes, i.e., a normal amount of DNA; diploid cancer cells tend to grow slowly and respond well to hormone therapy; a diploid number of chromosomes would equal 46, a haploid set would equal 23.
- 1071 direct reprogramming: The process of taking fully mature, differentiated stem cells and inducing them to become another cell type without going through a stem cell (iPS) state. The transition from one cell type directly to another is referred to as "transdifferentiation." In the case of pancreatic cells, the method employs three developmental factors (different from the ones used to create iPS cells) causing acinar cells to switch directly to a insulin producing beta cells.
- 1072 directed differentiation (Homing): Whatever processes are needed in manipulating stem cell culture conditions to induce differentiation into a particular cell type. Certain chemicals can force the cells to become pre-defined specialized cells.
- 1073 directed differentiation: Manipulating stem cell culture conditions to induce differentiation into a particular cell type.
- 1074 directed molecular evolution: A laboratory version of evolution at the molecular level that can produce "designer molecules." A large starting population of molecules (typically nucleic acids) that varies randomly in base sequence and shape is subjected to replication with variation, followed by selection. After several cycles of replication and selection, the population of molecules will evolve toward one containing a high proportion of molecules well adapted to the selection criterion applied.
- 1075 directional selection: Natural selection that favors individuals on one end of the phenotypic range.
- 1076 disaccharide: A double sugar, consisting of two monosaccharides joined by dehydration synthesis.
- 1077 disease index: A computerized listing of patients seen in a hospital (inpatient and outpatient) organized by discharge diagnosis code. For example: unspecified hypertension is coded 401.9 (in ICD-9, but is I10 in ICD-10) and malignant neoplasm of the central portion of the female breast is coded 174.1 (in ICD-9, but is C50.1 in ICD-10).
- 1078 disease registry: An organized system for the collection, storage, analysis, and interpretation of data on persons with the particular disease of concern.
- 1079 dispersion: The distribution of individuals within geographical population boundaries.
- 1080 dissection: The cutting apart of an organism to examine its structure.
- 1081 distal: Points away from the center of the body. Distal muscles are in the limbs, opposite of proximal.
- 1082 distended abdomen-alternate names: Swollen belly; Swelling in the abdomen; Abdominal distention
- 1083 distensibility: The ability to enlarge or distend.
- 1084 diuretic: A substance which increases the production and elimination of urine
- 1085 diurna: Applied to organisms that are active during the daylight hours.
- 1086 diurnal: Pertaining to the day; having a cyclic nature involving the 24-hour day; prolactin levels are at their peak in the early morning- they have a diurnal variation; calcium utilization appears highest in the evening close to bedtime.
- 1087 diversifying selection: Natural selection that favors extreme over intermediate phenotypes.
- 1088 diverticulum: A small sac-like structure that sometimes forms in the walls of the intestines, diverticula can trap particles of food (especially small seeds and undigested grains) and become very inflamed and painful (this condition is called diverticulitis).
- 1089 division: A taxonomic grouping of related, similar classes; a high- level category below kingdom and above class. Division is generally used in the classification of prokaryotes, algae, fungi, and plants, whereas an equivalent category, phylum, is used in the classification of protozoa and animals.
- 1090 DNA (deoxyribonucleic acid): A chemical found primarily in the nucleus of cells. DNA carries the instructions or blueprint for making all the structures and materials the body needs to function. DNA consists of both genes and non-gene DNA in between the genes.
- 1091 DNA analysis: DNA analysis looks for particular or known mutations in the genome or genetic make up.
- 1092 DNA based HLA typing: Determining a person's HLA type by direct examination of the DNA. DNA-based typing is favored by the NMDP because it is very accurate and efficient.
- 1093 DNA carrier -1: Substance or particle that can transfer genes into a cell. These include viruses, liposomes (fat globules) and artificial chromosomes (sequences of DNA

- created in a laboratory) that can transport large amounts of DNA.
- 1094 DNA fingerprinting / profiling: A genetic tool used to compare and contrast DNA sequences using electrophoresis. DNA profiling is used in forensic science and to help in establishing parentage.
- 1095 DNA methylation: A type of chemical modification of DNA that can be inherited and subsequently removed without changing the original DNA sequence.
- 1096 DNA microarray (Also called gene chip): A device for monitoring the activity of genes. Most DNA microarrays are glass slides or microchips "embedded" with thousands of genes. DNA microarrays have many applications in research and have been used, for instance, to identify genes involved in cancer and to develop drugs.
- 1097 DNA polymerase: An enzyme that catalyzes the elongation of new DNA at a replication fork by the addition of nucleotides to the existing chain.
- 1098 DNA probe: A chemically synthesized, radioactively labeled segment of nucleic acid used to find a gene of interest by hydrogen-bonding to a complementary sequence.
- 1099 DNA sequence: The sequence of genetic "letters," or nucleotides, in a piece of DNA.
- 1100 DNA vaccine: Enables a broad range of applications, including the induction of protective immunity against viral, bacterial, and parasitic infections, and open up new perspectives for the treatment of cancer. Furthermore, based on their Th1-promoting properties, DNA vaccines also balance Th2-mediated immune reactions, which renders them a promising alternative for immunotherapy against allergy.
- 1101 docetaxel (Taxotere®): one of a type of chemotherapy agents called taxanes that block microtubule formation during cell division.
- 1102 Dolly sheep: The first mammal cloned using somatic cell nuclear transfer (SCNT). Dolly was a female domestic sheep born on July 5, 1996 and was cloned by Ian Wilmut and his team at the Roslin Institute, which is located just outside Edinburgh, Scotland. Dolly sheep lived from July 5, 1996 to Feb. 14, 2003. The success of SCNT and the cloning of Dolly proved that a somatic cell's genetic material can be reprogrammed to an embryonic state by epigenetic factors. This hypothesis that cells only differentiate unidirectionally towards terminal differentiation was challenged in 1962 by John Gurdon's pioneering work in nuclear transfer and also with the historic birth of Dolly the Sheep in February of 1997 via somatic cell nuclear transfer (SCNT). Somatic cell nuclear transfer, or SCNT, requires the injection of a nucleus from a somatic cell into an enucleated oocyte to form a pluripotent cell capable of developing into an entire organism. The success of SCNT stimulated developmental biologists to begin exploring the possibility of creating pluripotent stem cells (e.g. induced pluripotent stem cells) through cellular reprogramming of fully differentiated somatic cells.
- 1103 domain: A taxonomic category above the kingdom level; the three domains are Archaea, Bacteria, and Eukarya.
- 1104 dominance hierarchy: A linear "pecking order" of animals, where position dictates characteristic social behaviors.
- 1105 dominant allele: In a heterozygote, the allele that is fully expressed in the phenotype.
- 1106 dominant inheritance: A pattern of inheritance whereby a single gene mutation may lead to a specific genetic disease. Children of an individual affected with a dominantly inherited condition (often referred to as autosomal dominant if the gene is not located on the X or Y chromosomes) have a 50% chance to inherit the gene mutation.
- 1107 dominant negative: This describes the mechanism by which a dominant mutation can cause disease. A mutation whose gene product adversely affects the normal (wild type) gene product within the same cell. The mutated copy may associate with the normal copy and cause dysfunction of both. In some cases, such as collagen (Ullrich CMD), one dominant negative mutation may be more harmful than having one mutation causing the production of no gene product (null mutation or null alleles), which only cause disease when present in both gene copies so that absolutely no product can be made.
- 1108 dominant: A dominant gene will almost always be expressed and lead to a specific physical characteristic. A dominant trait will be expressed in individuals that are either homozygous or heterozygous.
- 1109 donor: The person from whom bone marrow is harvested. Donors are referred to as "related" if he or she is a brother or sister of the patient; or "unrelated" if they are not related to the patient.
- 1110 dopamine. A brain neurotransmitter (a chemical that carries messages between brain cells). In people with Parkinson's disease, their dopamine-producing cells degenerate causing loss of normal muscle function.
- 1111 doppler: a method in ultrasound imaging to monitor a moving structure or fluid (esp. blood)
- 1112 dormancy: A period during which growth ceases and metabolic activity is greatly reduced; dormancy is broken when certain requirements, for example, of temperature, moisture, or day length, are met.
- 1113 dorsal root: A collection of afferent nerves from the periphery, which brings sensory information into the spinal cord.
- 1114 dorsal: Pertaining to or situated near the back; opposite of ventral.
- 1115 dose volume histogram (DVH): A graph that displays the distribution of the absorbed radiation dose in tissue resulting from the delivery of a particular treatment plan.
- 1116 dosimetry: Relating to the doses of radiation employed in treating a tumor.
- 1117 double autologous transplant: Also known as a tandem autologous transplant; a patient undergoing 2 planned autologous stem cell transplants sequentially, using their own stem cells collected before the initial transplant.
- 1118 double blind: An investigative procedure designed to reduce experimental bias; neither subject nor patient knows who is receiving placebo or active agent.
- 1119 double circulation: A circulation scheme with separate pulmonary and systemic circuits, which ensures vigorous blood flow to all organs.
- 1120 double fertilization: A mechanism of fertilization in angiosperms, in which two sperm cells unite with two cells in the embryo sac to form the zygote and endosperm.
- 1121 double helix: Twin, parallel spirals that form the backbone of DNA. The backbone is formed from alternating sugar and phosphate groups.
- 1122 double membrane: In mitochondria and plastids, there is a two-layered membrane which surrounds the organelle. This is believed to be the result of endosymbiosis, with the outer membrane coming from the eukaryotic cell, and the inner membrane belonging to the original prokaryote which was "swallowed".
- 1123 double-blind: A form of clinical trial in which neither the physician nor the patient knows the actual treatment which any individual patient is receiving; double-blind trials are a way of minimizing the effects of the personal opinions of patients and physicians on the results of the trial.
- 1124 doubling time: The time that it takes a value to double.
- 1125 down syndrome: A combination of birth defects caused by the presence of an extra #21 chromosome in each cell of the body. Many children with Down syndrome also have

- congenital heart disease—usually atrioventricular canal defect.
- 1126 down-regulation: The process of reducing or suppressing a response to a stimulus; specifically reduction in a cellular response to a molecule (as insulin) due to a decrease in the number of receptors on the cell surface.
- 1127 downsizing: The use of hormonal or other forms of management to reduce the volume of prostate cancer in and/or around the prostate prior to attempted curative treatment.
- 1128 downstaging: The use of hormonal or other forms of management in the attempt to lower the clinical stage of prostate cancer prior to attempted curative treatment (e.g., from stage T3a to stage T2b); this technique is highly controversial.
- 1129 doxorubicin (trade name Adriamycin®): an anticancer drug that belongs to the family of drugs called anti-tumor antibiotics. It is an anthracycline.
- 1130 dry orgasm: ejaculation without the release of semen.
- 1131 dsDNA: Double-stranded DNA.
- 1132 ductal: a tubular bodily canal or passage, especially one for carrying a glandular secretion: a tear duct.
- 1133 duodenum: The first section of the small intestine, where acid chyme from the stomach mixes with digestive juices from the pancreas, liver, gallbladder, and gland cells of the intestinal wall.
- 1134 duplication: An aberration in chromosome structure resulting from an error in meiosis or mutagens; duplication of a portion of a chromosome resulting from fusion with a fragment from a homologous chromosome.
- 1135 dura mater: The tough and fibrous outer membrane of the three membranes (i.e., meninges) that cover the spinal cord.
- 1136 dutasteride (trade name Avodart®): An inhibitor of the enzyme (5 alpha-reductase or 5AR) that stimulates the conversion of testosterone to DHT.
- 1137 Dx: standard abbreviation for diagnosis.
- 1138 dynein: A large contractile protein forming the sidearms of microtubule doublets in cilia and flagella.
- 1139 dysarthria: Speech that is characteristically slurred, slow, and difficult to produce (difficult to understand). The person with dysarthria may also have problems controlling the pitch, loudness, rhythm, and voice qualities of their speech.
- 1140 dysfunction: Abnormal or impaired functioning, especially of a bodily system or organ
- 1141 dysplasia: Premalignant change characterized by alteration in the size, shape and organization of the cellular components of a tissue.
- 1142 dystrophin: This is a vital part of a protein complex that connects the cytoskeleton of a muscle fiber to the surrounding extracellular matrix through the cell membrane. A deficiency of dystrophin is one of the main causes of muscular dystrophy.
- 1143 dysuria: Painful urination.
- 1144 ecdysone: A steroid hormone that triggers molting in arthropods.
- 1145 echocardiogram: An ultrasound of the heart to determine the ability to pump blood. It is given as a percentage called an ejection fraction. Recent stem cell treatments have significantly improved ejection fraction in cardiac failure patients.
- 1146 echography: Echography (ultrasound, ultrasonography or sonography) is a diagnostic test using high frequency sound waves that is utilized by many medical specialties.
- 1147 ecocentrism: The view that considers the whole environment or ecosphere as important and deserving of consideration, without giving preference to organisms such as animals and humans. It states that all elements of the environment have worth and should be valued and cared for.
- 1148 ECOG performance status: Criteria used by doctors and researchers to assess how a patient's disease is progressing, assess how the disease affects the daily living abilities of the patient, and determine appropriate treatment and prognosis. ECOG is Eastern Cooperative Oncology Group, one of the clinical trials groups.
- 1149 ecological efficiency: The ratio of net productivity at one trophic level to net productivity at the next lower level.
- 1150 ecological niche: The sum total of an organism's utilization of the biotic and abiotic resources of its environment.
- 1151 ecological pyramid: A graphic representation of the quantitative relationships of numbers of organisms, biomass, or energy flow between the trophic levels of an ecosystem. Because large amounts of energy and biomass are dissipated at every trophic level, these diagrams nearly always take the form of pyramids.
- 1152 ecological succession: Transition in the species composition of a biological community, often following ecological disturbance of the community; the establishment of a biological community in an area virtually barren of life.
- 1153 ecology: The study of how organisms interact with their environments.
- 1154 ecosystem: A level of ecological study that includes all the organisms in a given area as well as the abiotic factors with which they interact; a community and its physical environment.
- 1155 ecotype: A locally adapted variant of a species, differing genetically from other ecotypes of the same species.
- 1156 ectoderm: The ectoderm is the outer layer of cells produced from the inner cell mass of a blastocyst (early stage human embryo). The sensory organs (eyes, ears, etc.) nervous system, skin and other structures are created from the ectoderm.
- 1157 ectodermal layer: Here the original stem cells have differentiated to become primitive cells that make up the skin and its appendages (oil and sweat glands, hair and nails). It is from an off shoot of this layer that the Neurectoderm arises and is the progenitor of the brain, spinal cords and peripheral and autonomic nervous system.
- 1158 ectopic expression: The expression of a gene in an abnormal place in an organism. This can be caused by a disease, or it can be artificially produced as a way to help determine what the function of that gene is.
- 1159 ectopic pregnancy: A pregnancy that occurs outside of the uterus. The large majority of ectopic (tubal) pregnancies occur in the fallopian tube, but some can occur in the abdominal cavity as well.
- 1160 ectotherm: An animal such as a reptile, fish, or amphibian, that must use environmental energy and behavioral adaptations to regulate its body temperature.
- 1161 edema: Swelling of the spinal cord after injury due to the accumulation of fluids.
- 1162 Edmonton protocol: A procedure (developed in Canada) for transplanting pancreatic islet cells to the liver of a patient with Type I diabetes.
- 1163 efferent: Moving or carrying outward or away from a central part. Refers to vessels, nerves, etc. For example: blood vessels carrying blood away from the heart or nerves carrying signals from the brain
- 1164 efficacy: The greatest ability of a drug of treatment to produce a result, regardless of dosage
- 1165 egg cylinder: An asymmetric embryonic structure that helps to determine the body plan of the mouse.
- 1166 egg: A female gamete, which usually contains abundant cytoplasm and yolk; nonmotile and often larger than a male gamete.
- 1167 eicosanoid: Any of a class of compounds derived from polyunsaturated fatty acids and involved in cellular activity.

- 1168 eicosapentenoic acid (EPA): A fish oil supplement, an omega 3 fatty acid that inhibits the delta 5 desaturase enzyme that converts DGLA (dihomo-gamma-linolenic acid) to arachidonic acid.
- 1169 ejaculation: The release of semen through the penis during orgasm; ejaculation may be termed "dry" if there is scanty or no fluid component to the ejaculate resulting from radiation therapy or surgery.
- 1170 ejaculatory duct: In the male, a duct from each testis that join to form the urethra.
- 1171 ejection-fraction: The measurement of the left ventricle's ability to pump blood and is a good predictor of longevity in patients. It needs to be above 55% in females and above 63% in males.
- 1172 electric potential: The difference in the amount of electric charge between a region of positive charge and a region of negative charge. The establishment of electric potentials across the plasma membrane and across organelle membranes makes possible a number of phenomena, including the chemiosmotic synthesis of ATP, the conduction of nerve impulses, and muscle contraction.
- 1173 electrochemical gradient: The diffusion gradient of an ion, representing a type of potential energy that accounts for both the concentration difference of the ion across a membrane and its tendency to move relative to the membrane potential.
- 1174 electroencephalography (EEG): A test in which electrodes are placed on the scalp to measure electrical activity produced by the brain.
- 1175 electrogenic pump: An ion transport protein generating voltage across the membrane.
- 1176 electrolyte: A substance that, when dissolved in a suitable solvent or when fused, becomes an ionic conductor.
- 1177 electromagnetic spectrum: The entire spectrum of radiation; ranges in wavelength from less than a nanometer to more than a kilometer.
- 1178 electromyography (EMG): The electrical recording of muscle activity for diagnostic purposes.
- 1179 electron acceptor: Substance that accepts or receives electrons in an oxidation-reduction reaction, becoming reduced in the process.
- 1180 electron carrier: A molecule that conveys electrons; one of several membrane proteins in electron transport chains in cells. Electron carriers shuttle electrons during the redox reactions that release energy used to make ATP.
- 1181 electron donor: Substance that donates or gives up electrons in an oxidation-reduction reaction, becoming oxidized in the process.
- 1182 electron microscope (EM): A microscope that focuses an electron beam through a specimen, resulting in resolving power a thousandfold greater than that of a light microscope. A transmission electron microscope (TEM) is used to study the internal structure of thin sections of cells. A scanning electron microscope (SEM) is used to study the fine details of cell surfaces.
- 1183 electron shell: An energy level at which an electron orbits the nucleus of an atom.
- 1184 electron transport chain: A sequence of electron-carrier molecules (membrane proteins) that shuttle electrons during the redox reactions that release energy used to make ATP.
- 1185 electronegativity: The tendency for an atom to pull electrons toward itself.
- 1186 electrophoresis: Using an electric charge to separate molecules in a solution or gel according to size. It is routinely used to separate fragments of DNA.
- 1187 electrophysiology: The study of electrical activity or conduction in nerves.
- 1188 electroporation: Method of introducing DNA into a cell.
- 1189 element: Any substance that cannot be broken down to any other substance.
- 1190 ELISA: Enzyme-linked immunosorbent assay; a sensitive immunoassay that uses an enzyme linked to an antibody or antigen as a marker for the detection of a specific protein, especially an antigen or antibody; often used as a diagnostic test to determine exposure to a particular infectious agent, such as the AIDS virus, by identifying antibodies present in a blood sample.
- 1191 emboli: Material, usually blood clot but may be fat, bone fragment, nitrogen bubble or bullet, that travels through the circulation, eventually obstructing blood flow through a smaller calibre vessel (for example stroke, pulmonary embolism, central retinal artery occlusion).
- 1192 embolus: A mass, such as an air bubble, a detached blood clot, or a foreign body, that travels through the bloodstream and lodges so as to obstruct or occlude a blood vessel.
- 1193 embryo provider: A couple (occasionally an individual) having custody of an embryo and the authority to make decisions regarding its disposition; not always the biological parent(s) of the embryo.
- 1194 embryo sac: The female gametophyte of angiosperms, formed from the growth and division of the megaspore into a multicellular structure with eight haploid nuclei.
- 1195 embryo: An animal in the early stages of growth and differentiation that are characterized by cleavage, laying down of fundamental tissues, and the formation of primitive organs and organ systems; especially the developing human individual from the time of implantation to the end of the eighth week after conception, after which stage it becomes known as a fetus.
- 1196 embryo: In humans, the developing organism from the time of fertilization until the end of the eighth week of gestation, when it becomes known as a fetus.
- 1197 embryoid bodies (EBs): Spheroid colonies seen in culture produced by the growth of embryonic stem cells in suspension. Embryoid bodies are of mixed cell types, and the distribution and timing of the appearance of specific cell types corresponds to that observed within the embryo.
- 1198 embryonal carcinoma (EC) cells: A type of pluripotent stem cell derived from teratocarcinoma (usually a testis tumor).
- 1199 embryonic germ cell: An embryonic germ cell is derived from fetal tissue. Specifically, they are isolated from the primordial germ cells of the gonadal ridge of the 5 -to 10 week fetus. Later in development, the gonadal ridge develops into the testes or ovaries and the primordial germ cells give rise to eggs or sperm. embryonic stem and embryonic germ cells are pluripotent but are not identical in the properties.
- 1200 embryonic pluripotent stem cell: Cell lines derived from early embryos before formation of the tissue germ layers.
- 1201 embryonic stem cell (ESC): Primitive (undifferentiated) cell derived from a preimplantation embryo (up to nine days after fertilization in humans) that has the potential to become a wide variety of specialized cell types. ESCs are self-renewing (can replicate themselves), pluripotent (can form all cell types found in the body), and can divide indefinitely in culture.
- 1202 embryonic stem cell line: Embryonic stem cells, which have been cultured under in vitro conditions that allow proliferation without differentiation for months to years.
- 1203 embryonic stem cell: Pluripotent stem-cell lines derived from preimplantation embryos before the formation of the tissue germ layers. Primitive (undifferentiated) cells derived from a 5-day preimplantation embryo that are capable of dividing without differentiating for a prolonged period in culture, and are known to develop into cells and tissues of the three primary germ layers.

- 1204 embryonic: Stem cells derived from the inner cell mass of a 4–5 day post fertilization egg (blastocyst) at which time they consist of 50–150 cells.
- 1205 enantiomer: One of a pair of molecules that are mirror-image isomers of each other.
- 1206 endangered species: A species that is in danger of extinction throughout all or a significant portion of its range.
- 1207 endangered: A species with such a low population number that it is in danger of extinction.
- 1208 endemic species: Species that are confined to a specific, relatively small geographic area.
- 1209 endemic: An organism found only in one particular location.
- 1210 endergonic reaction: A nonspontaneous chemical reaction in which free energy is absorbed from the surroundings.
- 1211 endocrine gland: A ductless gland that secretes hormones directly into the bloodstream.
- 1212 endocrine system: The internal system of chemical communication involving hormones, the ductless glands that secrete hormones, and the molecular receptors on or in target cells that respond to hormones; functions in concert with the nervous system to effect internal regulation and maintain homeostasis.
- 1213 endocrine: A system in the body in which substances (hormones) are made and released (secreted) in the body. If the endocrine system is affected by certain drugs then there can be changes in hormones which can affect growth or sexual development and functions.
- 1214 endocrine: Pertaining to ductless glands that secrete hormones into the blood stream.
- 1215 endocrinology: the study of hormones, their function, the organs that produce them and how they are produced.
- 1216 endocytosis: The cellular uptake of macromolecules and particulate substances by localized regions of the plasma membrane that surround the substance and pinch off to form an intracellular vesicle.
- 1217 endoderm: The innermost of the three primary germ layers in animal embryos. The endoderm gives rise to the liver, pancreas, lungs, and the lining of the digestive track in species that have these structures. Induced pluripotent stem cells and embryonic stem cells are capable of differentiating into cell types of all three germ layers—endoderm, ectoderm and mesoderm.
- 1218 endodermal layer: Here lay the precursor cells of the GI tract, liver, gall bladder, pancreas and kidneys.
- 1219 endodermal: The epithelial lining of the body including the digestive tube, glands which open into the digestive tube gland (liver and pancreas) and other bodily tissues (epithelium).
- 1220 endodermis: The innermost layer of the cortex in plant roots; a cylinder one cell thick that forms the boundary between the cortex and the stele.
- 1221 endogenous stem cells: Stem cells that are already present in the body.
- 1222 endogenous: Inherent naturally to the organism; originating or produced within an organism, tissue, or cell, e.g. endogenous secretions.
- 1223 endomembrane system: The collection of membranes inside and around a eukaryotic cell, related either through direct physical contact or by the transfer of membranous vesicles.
- 1224 endometrium: The inner lining of the uterus, which is richly supplied with blood vessels.
- 1225 endoplasmic reticulum: A system of interconnected vesicular and lamellar cytoplasmic membranes that functions especially in the transport of materials within the cell and that is studded with ribosomes in some places.
- 1226 endorectal coil: A device that is inserted into a patient's rectum beneath the prostate and is used to acquire spectroscopy for prostate MRI/MRSI exams.
- 1227 endorectal MRI: Magnetic resonance imaging performed with a coil placed in the rectum, may be combined with endorectal magnetic resonance spectroscopy.
- 1228 endorectal: Within the rectum.
- 1229 endorphin: A hormone produced in the brain and anterior pituitary that inhibits pain perception.
- 1230 endoscope: An instrument for examining visually the interior of a bodily canal or hollow organ such as the colon, bladder, or stomach.
- 1231 endoscopic biopsy: Endoscopic biopsy is done through an endoscope (a fiber optic cable for viewing inside the body) which is inserted into the body along with sampling instruments. The endoscope allows the physician to visualize the abnormality and guide the sampling.
- 1232 endoscopy: The use of an endoscope, a flexible, lighted tube, for examining the inside of the body.
- 1233 endoskeleton: A hard skeleton buried within the soft tissues of an animal, such as the spicules of sponges, the plates of echinoderms, and the bony skeletons of vertebrates.
- 1234 endosperm: A nutrient-rich tissue formed by the union of a sperm cell with two polar nuclei during double fertilization, which provides nourishment to the developing embryo in angiosperm seeds.
- 1235 endospore: A thick-coated, resistant cell produced within a bacterial cell exposed to harsh conditions.
- 1236 endosymbiotic theory: A hypothesis about the origin of the eukaryotic cell, maintaining that the forerunners of eukaryotic cells were symbiotic associations of prokaryotic cells living inside larger prokaryotes.
- 1237 endothelial cells: Cells that line blood vessels. Endothelial cells line the entire circulatory system, from the heart to the smallest capillary.
- 1238 endothelial: Relating to a flat layer of cells lining the heart, for example, or blood vessels.
- 1239 endothelin: A receptor: involved in facilitating several aspects of prostate cancer progression, including proliferation, escape from apoptosis, invasion, and new bone formation when activated by endothelin-1.
- 1240 endothelin-1 (ET-1): a prostate cell product that stimulates osteoblasts, acts as a vasoconstrictor (narrows blood vessels) and may be responsible for bone pain in metastatic prostate cancer; blockers of the receptor for ET-1 are in clinical trials e.g. Atrasentan®.
- 1241 endothelium: The innermost, simple squamous layer of cells lining the blood vessels; the only constituent structure of capillaries.
- 1242 endotoxin: A component of the outer membranes of certain gram-negative bacteria responsible for generalized symptoms of fever and ache.
- 1243 energy fields: Higher level electromagnetic fields that surround the physical body, which it is believed is composed of at least seven consecutive layers of increasing vibrational energy.
- 1244 energy of activation (EA): The amount of energy that reactants must absorb before a chemical reaction will start.
- 1245 energy: The capacity to do work by moving matter against an opposing force.
- 1246 engraftment: The process by which collected stem cells received during transplant start to grow and make new blood cells. The definition of engraftment in transplant is very specific and relates to a neutrophil and platelet count recovery. Neutrophil engraftment is defined as the first day of three consecutive days where the neutrophil count (absolute neutrophil count) is 500 cells/mm³ (0.5 x 10⁹/L) or greater. Platelet engraftment is defined as 20,000/mm³ (20 x 10⁹/L) unsupported by a platelet transfusion.

- 1247 enhancer: A DNA sequence that recognizes certain transcription factors that can stimulate transcription of nearby genes.
- 1248 entropy: A quantitative measure of disorder or randomness, symbolized by S.
- 1249 enucleated cell: A cell whose nucleus has been removed.
- 1250 enucleation: The removal of the nucleus from a cell. Because the egg cells often used in cloning are in a special stage called MII oocytes and don't actually have a nucleus, but rather have free chromosomes, the term is used loosely for the removal of the nuclear DNA.
- 1251 environmental genomics (Also called Community Genomics): The study of communities of organisms in nature using the tools of genomics. Sequencing the DNA of microorganisms found in a liter of ocean water is an example of environmental genomics.
- 1252 environmental grain: An ecological term for the effect of spatial variation, or patchiness, relative to the size and behavior of an organism.
- 1253 environmental stewardship: The view that humans have a duty to manage and care for the whole natural environment; that we are responsible for the continued health of the whole ecosystem, not just the parts that benefit the human race. It involves integrating and applying environmental values into a process.
- 1254 enzyme assay: Definitive test used to diagnose most LSDs. Enzyme levels are analyzed in a tissue sample taken from the patient and compared to known normal levels. Lower-than-normal levels for certain enzymes provides a conclusive diagnosis for the LSD associated with the enzyme. Measurement of enzyme activity with particular substrate, for example an enzyme assay for Tay-Sachs disease measures the Hex A activity with GM2 gangliosides.
- 1255 enzyme replacement therapy (ERT): A form of treatment used for some LSDs in which patients get an intravenous infusion to replace the missing or faulty enzyme causing the LSD.
- 1256 enzyme: A protein molecule which assists in a change in another molecule or molecules. Enzymes are like catalysts, in that they cause a reaction to occur at a higher rate, without becoming used up in the reaction. Enzymes are used in most, but not all, chemical reactions in life. Some enzymes are used in stem cell processing to release stem cells from their culture containers, or to release them from the tissues in which they are found.
- 1257 enzyme-linked immunosorbent assay (ELISA): A sensitive immunoassay that uses an enzyme linked to an antibody or antigen as a marker for the detection of a specific protein, especially an antigen or antibody; often used as a diagnostic test to determine exposure to a particular infectious agent, such as the AIDS virus, by identifying antibodies present in a blood sample.
- 1258 eosinophil: A type of leukocyte (white blood cell) with coarse round granules of uniform size within its cytoplasm and typically a two-lobed nucleus. Eosinophils normally constitute 1 to 3% of the peripheral blood leukocytes. The eosinophil count in the blood often rises above the normal range with allergic reactions and parasitic infections.
- 1259 eosinophilia: Elevated eosinophil count in the circulating blood. Commonly associated with chronic parasite infections.
- 1260 EPCA-2: A novel biomarker associated with prostate cancer that has high sensitivity and specificity and accurately differentiates between men with organ-confined and non-organ-confined disease.
- 1261 epiblast stem cell (EpiSC): A type of stem cell derived from an early post-implantation mouse embryo (epiblast) that has some properties of embryonic stem cells, but not the level of pluripotency associated with embryonic stem cells. EpiSCs are cultured under the same conditions required for human embryonic stem cell culture.
- 1262 epiblast: Gives rise to the ectoderm and mesoderm. The mesoderm then displaces the hypoblast cells and forms the endodermal cell layer on its inner surface.
- 1263 epidemiology: the branch of medicine that deals with the study of the causes, distribution, and control of disease in populations.
- 1264 epidermal growth factor (EGF): A polypeptide hormone that stimulates cell proliferation by binding to receptor proteins on the cell surface. A cell messenger protein that has effects including stimulation of epidermal development, in newborn animals it hastens eyelid-opening and tooth-eruption.
- 1265 epidermal stem cell: A stem cell from the skin able to produce hair follicle, epidermal or sebaceous gland tissue.
- 1266 epidermis: (1) The dermal tissue system in plants. (2) The outer covering of animals.
- 1267 epididymis: tightly coiled, thin-walled tube that conducts sperm from the testes to the vas deferens and provides for the storage, transmission, and maturation of sperm; inflammation of the epididymis is called epididymitis.
- 1268 epidural anesthesia: A form of anesthesia for which medication is inserted into the outer (epidural) layer of the spinal cord to block any painful sensations from the point of insertion to the lower extremities. The donor is awake with this form of anesthesia. About 20 percent of NMDP stem cell donors receive epidural anesthesia. Epidural anesthesia is a form of regional anesthesia.
- 1269 epidural: Outside the outer membrane surrounding the brain or spinal column.
- 1270 epigallocatechin gallate (EGCG): The active ingredient of green tea that relates to the potency of the green tea product.
- 1271 epigenesis: The progressive development of form in an embryo.
- 1272 epigenetic: Alterations in gene-expression patterns, without changes in DNA sequence. This could occur by modification of proteins that surround the genomic DNA: Cytosine DNA methylation (a methyl group is transferred from S-adenosylmethionine to C-5 position of cytosine by a family of cytokine-methyltransferases).
- 1273 epinephrine: a hormone and neurotransmitter (Also called adrenaline); one of the secretions of the adrenal glands. It helps the liver release glucose (sugar) and limit the release of insulin; it also makes the heart beat faster and can raise blood pressure.
- 1274 epiphyte: A plant that nourishes itself but grows on the surface of another plant for support, usually on the branches or trunks of tropical trees.
- 1275 episome: A plasmid capable of integrating into the bacterial chromosome.
- 1276 epistasis: A phenomenon in which one gene alters the expression of another gene that is independently inherited.
- 1277 epithelial cell: In PC the cells within the prostate that line the ducts and functionally secrete chemicals such as PSA into the blood stream or into the duct openings or lumen
- 1278 epithelial stem cells: These are stem cells found in the digestive tract. They give rise to absorptive cells, paneth cells, goblet cells, and enteroendocrine cells.
- 1279 epithelial tissue: Sheets of tightly packed cells that line organs and body cavities.
- 1280 epithelial: Mesenchymal Transition: Program of development characterized by loss of cell adhesion, repression of E-Cadherin expression and increased cell mobility. This process is essential for mesoderm formation and neural tube formation.
- 1281 epithelium: Layers of cells in various organs, such as the epidermis of the skin or the lining of the gut. These cells serve the general functions of protection, absorption, and

- secretion, and play a specialized role in moving substances through tissue layers. Their ability to regenerate is excellent; the cells of an epithelium may replace themselves as frequently as every 24 hours from the pools of specialized stem cells.
- 1282 epitope: A localized region on the surface of an antigen that is chemically recognized by antibodies; also called antigenic determinant.
- 1283 epothilones: A new class of natural and potent agents that stabilize microtubules to inhibit the growth and spread of malignant cells.
- 1284 equilibrium species: Species characterized by low reproduction rates, long development times, large body size, and long adult life with repeated reproductions.
- 1285 equilibrium: The state of a system in which no further net change is occurring; result of counterbalancing forward and backward processes.
- 1286 erectile dysfunction (ED): An inability to get or maintain an erection.
- 1287 ergometer: A device for evaluating the amount of work done by a muscle or group of muscles.
- 1288 ergotamine: An alkaloid derived from ergot that is less toxic than ergot; causes constriction of blood vessels and is used to treat migraine.
- 1289 erum glutamic pyruvic transaminase: A liver cell enzyme; elevation of SGOT is seen as an effect of liver cell injury by drugs, alcohol and viruses.
- 1290 erythrocyte: A red blood cell. Erythrocytes are responsible for transporting oxygen throughout the body.
- 1291 erythropoiesis: Development of red blood cells.
- 1292 erythropoietin: A glycoprotein hormone produced primarily by cells of the peritubular capillary endothelium of the kidney that is responsible for the regulation of red blood cell production.
- 1293 esophagus: A channel that conducts food, by peristalsis, from the pharynx to the stomach.
- 1294 essential amino acids: The amino acids that an animal cannot synthesize itself and must obtain from food. Eight amino acids are essential in the human adult.
- 1295 ester: Any of a class of organic compounds corresponding to the inorganic salts and formed from an organic acid and an alcohol, usually with the elimination of water.
- 1296 estivation: A physiological state characterized by slow metabolism and inactivity, which permits survival during long periods of elevated temperature and diminished water supplies.
- 1297 estradiol: The most potent naturally occurring estrogen. In men it is naturally produced in small amounts.
- 1298 estramustine phosphate sodium (EMCYT): A chemotherapeutic agent; a hybrid drug combination of nitrogen mustard and estrogen that disrupts cytoplasmic microtubules.
- 1299 estramustine: A nitrogen mustard linked to estradiol, usually as phosphate; used to treat prostatic neoplasms; also has radiation protective properties.
- 1300 estrogen receptor (ER): The docking site on the cell or in the cell for estrogen.
- 1301 estrogen: Any of various natural steroids (as estradiol) that are formed from androgen precursors, that are secreted chiefly by the ovaries, placenta, adipose tissue, and testes, and that stimulate the development of female secondary sex characteristics and promote the growth and maintenance of the female reproductive system.
- 1302 estrous cycle: A type of reproductive cycle in all female mammals except higher primates, in which the nonpregnant endometrium is reabsorbed rather than shed, and sexual response occurs only during midcycle at estrus.
- 1303 ethics: A branch of philosophy that deals with morality. It is concerned with distinguishing between right and wrong human actions, both at an individual and societal level.
- Ethics may also apply to the rules or standards that specify how particular members of an organisation should conduct themselves.
- 1304 ethology: The comparative study of patterns of animal behavior, with emphasis on their adaptive significance and evolutionary origin.
- 1305 ethylene: The only gaseous plant hormone, responsible for fruit ripening, growth inhibition, leaf abscission, and aging.
- 1306 etidronate: A white disodium bisphosphonate salt $C_2H_6Na_2O_7P_2$ used to treat osteoporosis called also etidronate disodium.
- 1307 etiolation: In plants, a condition characterized by stem elongation, poor leaf development, and lack of chlorophyll; occurs in plants growing in the dark or with greatly reduced light.
- 1308 etiology: the study of all of the factors involved in the development of a disease.
- 1309 etoposide: A genotoxic drug, a chemotherapy agent that affects DNA and alters its function.
- 1310 euchromatin: The more open, unraveled form of eukaryotic chromatin, which is available for transcription.
- 1311 eukaryote: An organism whose cells have cytoskeletons for support and their DNA contained in a nucleus, separated from the other contents of the cell; e.g., protists, plants, animals, and fungi; eukaryotic-adj.
- 1312 eukaryotic cell: A type of cell with a membrane-enclosed nucleus and membrane-enclosed organelles, present in protists, plants, fungi, and animals; also called eukaryote.
- 1313 eukaryotic: A single-celled or multicellular organism whose cells contain a distinct membrane-bound nucleus.
- 1314 Eulexin®: The brand or trade name of flutamide in the USA.
- 1315 eumetazoa: Members of the subkingdom that includes all animals except sponges.
- 1316 eusocial: Applied to animal societies, such as those of certain insects, in which sterile individuals work on behalf of reproductive individuals.
- 1317 eutherian mammals: Placental mammals; those whose young complete their embryonic development within the uterus, joined to the mother by the placenta.
- 1318 eutrophic lake: A highly productive lake, having a high rate of biological productivity supported by a high rate of nutrient cycling.
- 1319 eutrophication: A process in which an aquatic environment accumulates high nutrient levels due to factors such as industrial or urban pollution or run-off of fertilizers from nearby agricultural lands. The nutrients lead to dense blooms of algae and aquatic plants that cloud lake water, deplete specific minerals and dissolved gases, and can cause natural plant and animal populations to decline.
- 1320 eutrophication: Death of organisms in a lake or pond due to an overabundance of algae that consume all of the dissolved oxygen in the water. This usually happens when the water becomes rich in mineral and organic nutrients, often due to fertiliser run off from farms.
- 1321 evaporative cooling: The property of a liquid whereby the surface becomes cooler during evaporation, owing to a loss of highly kinetic molecules to the gaseous state.
- 1322 evoked potentials: Measures nerve-fiber viability by sending an electromagnetic signal from the brain and recording the signal after it passes through the cord.
- 1323 evolution: All the changes that have transformed life on Earth from its earliest beginnings to the diversity that characterizes it today.
- 1324 evolutionary species concept: The idea that evolutionary lineages and ecological roles can form the basis of species identification.
- 1325 ex vivo: Treatments or experiments performed in or on living tissue in an environment outside the organism.

- 1326 exaptation: A structure that evolves and functions in one environmental context but that can perform additional functions when placed in some new environment.
- 1327 excise: Surgically remove, removal.
- 1328 excision: Surgically remove, removal.
- 1329 excisional biopsy: Also known as a surgical or open biopsy, the purpose of an excisional biopsy is to attempt to remove the entire mass or a large portion of the mass. The tissue that is removed is then sent to the pathologist for diagnosis.
- 1330 excitatory amino acids: Amino acid neurotransmitters (e.g., glutamate) released from a pre-synaptic neuron that promulgates the nerve impulse in a nearby post-synaptic neuron.
- 1331 excitatory postsynaptic potential (EPSP): An electrical change (depolarization) in the membrane of a postsynaptic neuron caused by the binding of an excitatory neurotransmitter from a presynaptic cell to a postsynaptic receptor; makes it more likely for a postsynaptic neuron to generate an action potential.
- 1332 excitotoxicity: The process by which nerve cells are damaged by glutamate and similar substances.
- 1333 excretion: The disposal of nitrogen-containing waste products of metabolism.
- 1334 excretory system: The organ system that disposes of nitrogen-containing metabolic wastes.
- 1335 exergonic reaction: A spontaneous chemical reaction in which there is a net release of free energy.
- 1336 exocrine glands: Glands, such as sweat glands and digestive glands, that secrete their products into ducts that empty onto surfaces, such as the skin, or into cavities, such as the interior of the stomach.
- 1337 exocytosis: The release of cellular substance contained in cell vesicles by fusion of the vesicular membrane with the plasma membrane and subsequent release of the contents to the exterior of the cell.
- 1338 exogenous: developed or originating outside the organism, as exogenous disease.
- 1339 exon/intron: An exon is the part of the gene that codes for the actual protein. On the chromosome the exons that make up the coding sequence for the protein are separated by introns. Upon reading of the gene, the cell cuts out the introns and puts the exons together (a process called splicing) so that the exons are now continuous with all the information necessary to make a protein. Mutations usually affect the information in exons or the way they are spliced together.
- 1340 exon: The coding region of a eukaryotic gene that is expressed. Exons are separated from each other by introns.
- 1341 exophthalmus: An abnormal protrusion of the eyeball(s).
- 1342 exoskeleton: A hard encasement on the surface of an animal, such as the shells of mollusks or the cuticles of arthropods, that provides protection and points of attachment for muscles.
- 1343 exotoxin: A toxic protein secreted by a bacterial cell that produces specific symptoms even in the absence of the bacterium.
- 1344 expansion: Increasing the numbers of a particular line of stem cells by growing them out in cell culture. Expansion allows the administration of increased numbers of cells, thus increasing the probability that the stem cells will successfully repair the lesions in the body.
- 1345 experimental: An unproven (or even untested) technique or procedure; note that certain experimental treatments are commonly used in the management of prostate cancer.
- 1346 exponential growth: In populations, the increasingly accelerated rate of growth due to the increasing number of individuals being added to the reproductive base. Exponential growth is very seldom approached or sustained in natural populations.
- 1347 expression vector: A vector that allows a DNA sequence cloned into it to be transcribed when the vector is introduced into a cell.
- 1348 expression: The process by which a gene's coded information is converted into the structures present and operating in the cell. Expressed genes include those that are transcribed into mRNA and then translated into protein and those that are transcribed into RNA but not translated into protein.
- 1349 expressivity: In genetics, the degree to which a particular genotype is expressed in the phenotype of individuals with that genotype.
- 1350 extension: The movement of a joint that results in increased angle between two bones or body surfaces at a joint.
- 1351 extent of disease (EOD): Part of what should be a standard approach to staging the bone scan; after work by Soloway.
- 1352 external beam radiation therapy (EBRT): External beam radiation treatment that can include conventional photons, or use protons, neutrons, or electrons. This may be given conventionally or with 3D conformal techniques.
- 1353 extinct: No longer existing.
- 1354 extra-capsular extension (ECE): Cancer extending beyond the prostate capsule.
- 1355 extracellular matrix (ECM): Region outside of metazoan cells which includes compounds attached to the plasma membrane, as well as dissolved substances attracted to the surface charge of the cells. The ECM functions both to keep animal cells adhered together, and well as buffering them from their environment.
- 1356 extracellular: outside a cell or cells.
- 1357 extraembryonic membranes: Four membranes that support the developing embryo in reptiles, birds, and mammals.
- 1358 extraembryonic tissues: Intrauterine tissues that support the embryo's placenta, umbilical cord, and amniotic sac.
- 1359 extramedullary: Outside the bone marrow.
- 1360 extraprostatic: Located outside the prostate.
- 1361 extrapyramidal symptoms: A group of side effects from medication. Includes symptoms such as uncontrollable restlessness (i.e. finding it difficult to stand still), muscle stiffness, shaking and other uncontrollable movements.
- 1362 extravasation: Movement of a cell in or out of the bone marrow through endothelial barrier. Chemotaxis cannot account for this type of movement.
- 1363 extravascular compartment: Areas in the bone marrow microenvironment that are not blood vessels.
- 1364 extremophile: An organism that lives in an extreme environment such as ice in Antarctica, Chilean deserts, and thermal vents deep in the ocean. Most extremophiles are microorganisms, but a few species of plants and animals, including certain worms and snails, endure extremely harsh conditions.
- 1365 eyespot: Light-sensitive organelle found in many groups of protists, and in some metazoans.
- 1366 F factor: A fertility factor in bacteria, a DNA segment that confers the ability to form pili for conjugation and associated functions required for the transfer of DNA from donor to recipient. May exist as a plasmid or integrated into the bacterial chromosome.
- 1367 F1 (first filial generation): The first filial or hybrid offspring in a genetic cross-fertilization.
- 1368 F2 (second filial generation): Offspring resulting from interbreeding of the hybrid F1 generation.
- 1369 facet joints: Small stabilizing joints located between and behind adjacent vertebrae.
- 1370 facilitated diffusion: The spontaneous passage of molecules and ions, bound to specific carrier proteins, across a biological membrane down their concentration gradients.
- 1371 factor VIII and IX: Soluble blood proteins that form part of the cascade of the 12 reactions of blood clotting. Factor

- VIII deficiency is associated with haemophilia A while factor IX deficiency is associated with haemophilia B.
- 1372 facultative anaerobe: An organism that makes ATP by aerobic respiration if oxygen is present but that switches to fermentation under anaerobic conditions.
- 1373 false negative: An erroneous negative test result; for example, an imaging test that fails to show the presence of a cancer tumor later found by biopsy to be present in the patient is said to have returned a false negative result
- 1374 false positive: A positive test result mistakenly identifying a state or condition that does not in fact exist
- 1375 familial polyposis: Hereditary, autosomal dominant precancerous syndrome characterized by innumerable adenomatous polyps of the colon.
- 1376 family: A taxonomic grouping of related, similar genera; the category below order and above genus.
- 1377 fanconi anemia (congenital pancytopenia): A rare congenital anemia characterized by pancytopenia and hypoplasia of the bone marrow.
- 1378 fanconi anemia: A rare, inherited type of aplastic anemia. Found most often in young children.
- 1379 fascia: Fascia, a connective tissue, is the packing material of the body. It envelops the muscles, bones and joints and holds us together supporting the body structure and giving us our shape. Fascia organizes and separates: it provides protection and autonomy for the individual muscles and viscera. It joins and bonds these separate entities and establishes spatial relationships. Chemically it is the collagen in the fascia that enables it to change.
- 1380 fasciculations: Muscle twitches are fine or tiny uncontrollable movements of a small area of muscles. Some are common while others are associated with neurological disease.
- 1381 fast echo spin (FSE): In MRI, echo sequence is characterized by a series of rapidly applied 180° rephasing pulses and multiple echoes
- 1382 fat: A biological compound consisting of three fatty acids linked to one glycerol molecule.
- 1383 fate (of cell progeny): The normal outcome of differentiation of a cell's progeny.
- 1384 fatty acid: A long carbon chain carboxylic acid. Fatty acids vary in length and in the number and location of double bonds; three fatty acids linked to a glycerol molecule form fat.
- 1385 FDA: The Food and Drug Administration, an agency within the U.S. Public Health Service, which is a part of the Department of Health and Human Services.
- 1386 feedback inhibition: A method of metabolic control in which the end-product of a metabolic pathway acts as an inhibitor of an enzyme within that pathway.
- 1387 feedback systems: Control mechanisms whereby an increase or decrease in the level of a particular factor inhibits or stimulates the production, utilization, or release of that factor; important in the regulation of enzyme and hormone levels, ion concentrations, temperature, and many other factors.
- 1388 feeder layer: Cells used in co-culture to maintain pluripotent stem cells. For human embryonic stem cell culture, typical feeder layers include mouse embryonic fibroblasts (MEFs) or human embryonic fibroblasts that have been treated to prevent them from dividing.
- 1389 feral: Domestic or introduced animals living in wild conditions, or plants that have become wild.
- 1390 fermentation: A catabolic process that makes a limited amount of ATP from glucose without an electron transport chain and that produces a characteristic end-product, such as ethyl alcohol or lactic acid.
- 1391 ferritin: An iron-containing protein complex, found principally in the intestinal mucosa, spleen and liver that functions as the primary form of iron storage in the body.
- 1392 fertilization: The process of union of two gametes whereby the somatic chromosome number is restored and the development of a new individual is initiated.
- 1393 fetal calf serum: A type of culture medium often used in the culture of stem cells. It provides a number of growth factors.
- 1394 fetal stem cells: Stem cells processed from aborted human fetuses. These usually are of two types, "somatic" stem cells, from the liver of the fetus, and "neuronal" stem cells, from the fetal brain.
- 1395 fetal tissue: Tissues obtained from therapeutic termination of pregnancies between 8–20 weeks' of gestation.
- 1396 fetus: The unborn offspring from the end of the 8th week after conception (when the major structures have formed) until birth. Up until the eighth week, the developing offspring is called an embryo.
- 1397 feulgen stain: A histology stain used in microscopy to identify chromosomal material or DNA.
- 1398 FGF: Fibroblast growth factor (contributes to blood vessel development).
- 1399 FGF-1 to FGF-10: Fibroblast growth factor 1 to 10. A growth factor molecule.
- 1400 fiber: A lignified cell type that reinforces the xylem of angiosperms and functions in mechanical support; a slender, tapered sclerenchyma cell that usually occurs in bundles.
- 1401 fibril: A small thread-like structure that is often part of a cell.
- 1402 fibrin: The activated form of the blood-clotting protein fibrinogen, which aggregates into threads that form the fabric of the clot.
- 1403 fibroblast: A type of cell that synthesizes and maintains the extracellular matrix of many animal tissues. Fibroblasts provide a structural framework (stroma) for many tissues, and play a critical role in wound healing.
- 1404 fibrosis: Refers to the presence of scar tissue or collagen fibers in any tissue. In the liver, fibrosis or scarring of the liver damages the architecture and thus the functionality of the organ. Fibrosis, combined with the liver's ability to regenerate, causes cirrhosis (regeneration within the scar tissue).
- 1405 fibrous protein: Insoluble structural protein in which the polypeptide chain is coiled along one dimension. Fibrous proteins constitute the main structural elements of many animal tissues.
- 1406 fiducial: Used as a fixed standard of reference for comparison or measurement.
- 1407 filament: Long chain of proteins, such as found in hair, muscle, or in flagella.
- 1408 filgrastim: A protein that helps bone marrow make more white blood cells. Filgrastim is also known as G-CSF (granulocyte-colony stimulating factor) or by the tradename Neupogen®. It is given to donors who have agreed to donate peripheral blood stem cells. This moves blood stem cells from the marrow into the blood stream so that they can be collected by apheresis. It is also given to patients to help increase their white blood cell count after the transplant.
- 1409 filtrate: Fluid extracted by the excretory system from the blood or body cavity. The excretory system produces urine from the filtrate after extracting valuable solutes from it and concentrating it.
- 1410 filtration: The first stage of kidney function; blood plasma is forced, under pressure, out of the glomerular capillaries into Bowman's capsule, through which it enters the renal tubule.
- 1411 finasteride (Proscar®): An inhibitor of the enzyme (5 alpha-reductase or 5AR) that stimulates the conversion of testosterone to DHT; used to treat BPH.

- 1412 fine motor: Fine motor refers to functions which require tiny muscle movements. For example, writing or typing would require fine motor movement.
- 1413 first filial generation (F1): The first filial or hybrid offspring in a genetic cross-fertilization.
- 1414 first law of thermodynamics: The principle of conservation of energy. Energy can be transferred and transformed, but it cannot be created or destroyed.
- 1415 first-degree relatives: Children, parents, brothers, and sisters.
- 1416 fission: Division of single-celled organisms, especially prokaryotes, in which mitosis does not occur. Also used to refer to mitosis in certain unicellular fungi.
- 1417 fistula: In medicine, a fistula is an abnormal channel that creates an open passageway between two bodily structures that do not normally connect.
- 1418 fitness: The genetic contribution of an individual to succeeding generations relative to the contributions of other individuals in the population.
- 1419 fixed action pattern: A highly stereotypical behavior that is innate and must be carried to completion once initiated.
- 1420 flaccid limp: Walled cells are flaccid in isotonic surroundings, where there is no tendency for water to enter.
- 1421 flagellum (pl. flagella): A long cellular appendage specialized for locomotion, formed from a core of nine outer doublet microtubules and two inner single microtubules, ensheathed in an extension of plasma membrane.
- 1422 flagellum: Hair-like structure attached to a cell, used for locomotion in many protists and prokaryotes. The prokaryotic flagellum differs from the eukaryotic flagellum in that the prokaryotic flagellum is a solid unit composed primarily of the protein flagellin, while the eukaryotic flagellum is composed of several protein strands bound by a membrane, and does not contain flagellin. The eukaryotic flagellum is sometimes referred to as an undulipodium.
- 1423 flare reaction: The transient increase in serum testosterone for the first few weeks after starting an LHRH agonist. This increase in testosterone can potentially worsen the signs and symptoms of disease, especially in those patients with vertebral metastases and/or urinary obstruction; may be prevented by taking an antiandrogen (Casodex® or Eulexin®) several days before starting an LHRH agonist or by the use of an LHRH antagonist such as abarelix (Plenaxis®).
- 1424 flavin adenine dinucleotide (FAD): A coenzyme that functions as an electron acceptor in the Krebs cycle.
- 1425 flexion: The bending of a joint so that the bones forming the joint are brought closer together.
- 1426 flow cytometry: Counting and measurement of cells as they flow past a laser light. The amount and direction of reflection of light from a laser, and the activation of fluorescent dyes tagging the cell, are detected as the cell moves by in a stream of fluid. This is the primary means of identifying, characterizing, and counting different cell types.
- 1427 flower: The reproductive structure of angiosperms; a complete flower includes sepals, petals, stamens (male structures), and carpels (female structures).
- 1428 fludarabine therapy: A form of CLL treatment that involves a chemotherapy that interferes with the making of DNA so new leukemia cells cannot grow and shortens the life of existing leukemia cells.
- 1429 fluence: Particles per unit time; similar to current only the particles are photons.
- 1430 fluid-feeder: An animal that lives by sucking nutrient-rich fluids from another living organism.
- 1431 fluorescein isothiocyanate (FITC): Use to tag other proteins for immunofluorescence.
- 1432 fluorescence activated cell sorter (FACS): An indispensable instrument in stem cell research, FACS enables the rapid characterization, counting and isolation of cells suspended in a stream of fluid. The technology employs a laser beam of a single wavelength directed into the stream and fluorescence detectors that measure the scattered light. If a fluorescing molecule is detected in the stream (such as a tagged antibody attached to the surface of a stem cell), the data is recorded, and optionally, the stream briefly diverted to collect the tagged cell.
- 1433 fluorescence-activated cell sorting (FACS): A technique that can separate and analyze cells, which are labeled with fluorochrome-conjugated antibody, by their fluorescence and light scattering patterns.
- 1434 fluorescent marking: Marking the specific proteins on the outside of a cell with antibodies tagged with a fluorescent dye. This dye will glow in a characteristic color when exposed to ultraviolet light, causing the marked protein to show up as a colored spot. Fluorescent marking is one of the common tools used in characterization of cells.
- 1435 fluorescent: Glowing under ultraviolet (UV) light. Fluorescent dyes are used to mark specific proteins that identify or characterize cell types.
- 1436 fluoroscope: A device consisting of a fluorescent screen, used in conjunction with an X-ray tube, that shows the images of objects between the tube and the screen.
- 1437 fluorouracil: An antineoplastic chemotherapy agent that inhibits certain DNA building blocks, used especially in the treatment of cancers of the skin, breast, and digestive system.
- 1438 flutamide (Eulexin®): An antiandrogen used in the palliative hormonal treatment of advanced prostate cancer and in the adjuvant and neoadjuvant hormonal treatment of earlier stages of prostate cancer; normal dosage is 2 capsules three times a day.
- 1439 focal therapy: A more localized treatment directed at the cancerous foci within the gland, rather than removing or destroying the entire prostate.
- 1440 focus (pl. foci): Group of cells, identifiable by distinctive distribution or structure.
- 1441 foetus: A developing human baby evolved from the embryo at about two months after conception and continues to birth.
- 1442 foley: A transurethral (Foley) catheter.
- 1443 follicle stimulating hormone (FSH): A protein hormone secreted by the anterior pituitary that stimulates the production of eggs by the ovaries and sperm by the testes.
- 1444 follicle stimulating hormone (FSH): In the male, stimulates the Sertoli cells of the testicle to make sperm.
- 1445 follicle: A microscopic structure in the ovary that contains the developing ovum and secretes estrogens.
- 1446 follicular stem cells: Stem cells that give rise to hair follicles and the epidermis (skin).
- 1447 follistatin: An inhibitory factor produced during embryonic development that affects the growth and differentiation of the pancreas.
- 1448 Food and Drug Administration (FDA): A federal agency of the United States government. Charged with protecting the public from adulterated food and dangerous drugs, this agency has transmogrified into a front for the big pharmaceutical corporations. Through a "revolving door" system, FDA researchers and lawyers tend to leave the agency for better paying jobs in industry. Rather than protect the public against dangerous drugs, FDA employees approve drugs whenever possible, thus preserving their chances at a more lucrative job with industry. They also have restricted use of natural, unpatentable therapies, in favor of synthetic, patentable therapies profitable to Big Pharma.

- 1449 food chain: The pathway along which food is transferred from trophic level to trophic level, beginning with producers.
- 1450 foramen magnum: The opening in the skull through which the spinal cord passes to become the medulla oblongata.
- 1451 formal search: A search becomes formal when a physician at an NMDP-accredited Transplant Center asks that one or more volunteer stem cell donors who are potential matches for a patient be contacted to undergo additional compatibility testing. The Donor Center where volunteer stem cell donors are registered contacts them to arrange collection of blood samples. Once a search is formal, regular reports of the search status are sent to the Transplant Center.
- 1452 fossa: A cavity, or depression; as the location from which the prostate was removed.
- 1453 fossil: The remains of an organism, or direct evidence of its presence (such as tracks). May be an unaltered hard part (tooth or bone), a mold in a rock, petrification (wood or bone), unaltered or partially altered soft parts (a frozen mammoth).
- 1454 founder effect: A cause of genetic drift attributable to colonization by a limited number of individuals from a parent population.
- 1455 founder/ancestor/precursor cell: General terms for cell without self-renewal ability that contributes to tissue formation. In some cases they generate tissue stem cells.
- 1456 fovea: A small area in the center of the retina in which cones are concentrated; the area of sharpest vision.
- 1457 fraction: The portion of a fractionated radiation treatment that is delivered in a single session.
- 1458 fragile X syndrome: A hereditary mental disorder, partially explained by genomic imprinting and the addition of nucleotides to a triplet repeat near the end of an X chromosome.
- 1459 frameshift mutation: A mutation occurring when the number of nucleotides inserted or deleted is not a multiple of 3, thus resulting in improper grouping into codons.
- 1460 frameshift mutation: DNA is the genetic language and is read from left to right in 3 letter words.
- 1461 frankel scale: A predecessor to the ASIA-impairment scale that measure neurological status after spinal cord injury.
- 1462 free energy of activation: The initial investment of energy necessary to start a chemical reaction; also called activation energy.
- 1463 free energy: A quantity of energy that interrelates entropy (S) and the system's total energy (H); symbolized by G. The change in free energy of a system is calculated by the equation $G = \Delta H - T \Delta S$, where T is absolute temperature.
- 1464 free PSA %: reports the percentage of free-PSA and usually expressed as a percentage based on free PSA divided by total PSA x 100; one study showed that men with free PSA % > 25% had low risk of PC while those with < 10% free PSA % were more likely to have PC.
- 1465 free PSA: PSA molecules in the blood stream that are not "bound" to other proteins.
- 1466 free radical: An atom or group of atoms that has at least one unpaired electron and is therefore unstable and highly reactive. In animal tissues, free radicals can damage cells and are believed to accelerate the progression of cancer, cardiovascular disease, and age-related diseases.
- 1467 freestanding facility: A diagnosing or treatment facility which is not owned by a hospital and owns/maintains its own patient records.
- 1468 frequency: The need to urinate often.
- 1469 frequency-dependent selection: A decline in the reproductive success of a morph resulting from the morph's phenotype becoming too common in a population; a cause of balanced polymorphism in populations.
- 1470 frontotemporal dementia: A group of rare brain disorders that involves shrinking (atrophy) of tissues in the frontal and temporal lobes of the brain. Symptoms include disturbances in speech, personality and behavior, and usually begin between ages 40 and 64. The memory of people with FTD isn't impaired initially.
- 1471 frozen section: A technique in which removed tissue is frozen, cut into thin slices, and stained for microscopic examination; a pathologist can rapidly complete a frozen section analysis, and for this reason, it is commonly used during surgery to quickly provide the surgeon with vital information such as a preliminary pathologic opinion of the presence or absence of prostate cancer.
- 1472 fruit: A mature ovary of a flower that protects dormant seeds and aids in their dispersal.
- 1473 frustule: The mineral "skeleton" of a diatom or other unicellular organism.
- 1474 fulguration: Destroying tissue using an electric current.
- 1475 function: Characteristic role or action of a structure or process in the normal metabolism or behavior of an organism.
- 1476 functional electrical stimulation (FES): The use of low levels of electrical current to stimulate physical or bodily functions lost through nervous-system impairment.
- 1477 functional genomics: Study of the role of a particular gene product in the organism.
- 1478 functional group: A specific configuration of atoms commonly attached to the carbon skeletons of organic molecules and usually involved in chemical reactions.
- 1479 functional independence measure: A predictor of the amount of assistance or adaptive equipment an individual may need in everyday life.
- 1480 functional magnetic stimulation (FMS): The use of magnetic fields to promote functional benefits.
- 1481 fungicide: A substance or chemical that kills fungi.
- 1482 fusion: Combining two or more inputs of data so that they can be overlaid one upon another to provide a sense of agreement or concordance; fusion imaging studies such as ProstaScint-CT-PET are examples
- 1483 G protein: A GTP-binding protein that relays signals from a plasma-membrane signal receptor, known as a G-protein linked receptor, to other signal-transduction proteins inside the cell. When such a receptor is activated, it in turn activates the G protein, causing it to bind a molecule of GTP in place of GDP. Hydrolysis of the bound GTP to GDP inactivates the G protein.
- 1484 G0 Phase: A phase of the cell cycle.
- 1485 G0G1 growth phase: with G0 being the relatively dormant phase of the cell growth cycle and G1 the phase just preceding DNA synthesis or S-phase.
- 1486 G1 arrest: Arrest or halting the cell cycle at the stage of G1; the normal sequence is G1-S-G2-M.
- 1487 G1 phase: The first growth phase of the cell cycle, consisting of the portion of interphase before DNA synthesis begins.
- 1488 G2 phase: The second growth phase of the cell cycle, consisting of the portion of interphase after DNA synthesis occurs.
- 1489 gait trainer: A gait trainer is a type of walker, which provides considerable postural support for patients who require moderate to maximum support for ambulation. Gait trainers come in a variety of sizes to meet the needs of small children up through adults. A gait trainer may be considered medically necessary for children and adults who require moderate to maximum support for walking and when the patient is unable to ambulate independently due to a chronic neuromuscular condition.
- 1490 gametangium (pl. gametangia): The reproductive organ of bryophytes, consisting of the male antheridium and female

- archegonium; a multichambered jacket of sterile cells in which gametes are formed.
- 1491 gamete provider: A person who is a biological parent of the embryo, but does not necessarily have custody of the embryo or any authority to make decisions regarding its disposition.
- 1492 gamete: A haploid egg or sperm cell; gametes unite during sexual reproduction to produce a diploid zygote.
- 1493 gametophyte: The multicellular haploid form in organisms undergoing alternation of generations, which mitotically produces haploid gametes that unite and grow into the sporophyte generation.
- 1494 gamma globulin: Component of blood serum (plasma) containing antibodies.
- 1495 gamma ray: A highly energized, deeply penetrating photon that radiates from the nucleus during fission and frequently accompanies radioactive decay.
- 1496 gamma-interferon: A type of small protein with antiviral activity, made by T lymphocytes.
- 1497 ganglion (pl. ganglia): A mass of nerve tissue containing nerve cells external to the brain or spinal cord.
- 1498 ganglioside: Any of a group of glycolipids that yield a hexose sugar on hydrolysis and are found especially in the plasma membrane of cells of the gray matter.
- 1499 gantry: Radiation therapy hardware from which the linear accelerator delivers its energy; the multileaf collimator MLC is attached to the gantry and modulates the radiation beam as it exits
- 1500 gap junction: A type of intercellular junction in animal cells that allows the passage of material or current between cells.
- 1501 gap phases: In the cell cycle, the phases that precede (G1) and follow (G2) the synthesis (S) phase in which DNA is replicated; in the G1 phase, the cell doubles in size, and its enzymes, ribosomes, and other cytoplasmic molecules and structures increase in number; in the G2 phase, the replicated chromosomes begin to condense and the structures required for mitosis or meiosis are assembled.
- 1502 gastrectomy: A surgical procedure where all or a portion of the stomach is removed.
- 1503 gastric: Relating to the stomach.
- 1504 gastrin: A digestive hormone, secreted by the stomach, that stimulates the secretion of gastric juice.
- 1505 gastrointestinal: Adjective referring collectively to the stomach and small and large intestines.
- 1506 gastropylorotomy: Excision of the pylorus.
- 1507 gastrostomy: The operation of making a permanent opening into the stomach, for the introduction of food.
- 1508 gastrovascular cavity: The central digestive compartment, usually with a single opening that functions as both mouth and anus.
- 1509 gastrula: Animal embryo at an early stage of development in which cells are enclosed in a sheath to form the beginning of a gut cavity.
- 1510 gastrulation: The formation of a gastrula from a blastula.
- 1511 GATA4: Transcription factor. Important in embryonic stem differentiation into yolk sac endoderm.
- 1512 GATA6: Important for embryonic stem cell differentiation into heart smooth muscle.
- 1513 gated ion channel: A specific ion channel that opens and closes to allow the cell to alter its membrane potential.
- 1514 Gdf-5: Growth/differentiation factor-5. A growth factor molecule.
- 1515 GDNF: Glial cell-derived neurotrophic factor. A growth factor molecule.
- 1516 gefitinib (Iressa®): a drug that blocks cancer cell growth signals caused by an enzyme called tyrosine kinase. Iressa® blocks several of these tyrosine kinases, including one associated with Epidermal Growth Factor Receptor (EGF).
- 1517 gel electrophoresis: The separation of nucleic acids or proteins, on the basis of their size and electrical charge, by measuring their rate of movement through an electrical field in a gel.
- 1518 gene amplification: The selective synthesis of DNA, which results in multiple copies of a single gene, thereby enhancing expression.
- 1519 gene bank: A collection of cells or artificial chromosomes containing known genetic information.
- 1520 gene chip (Also called DNA microarray): A device for monitoring the activity of genes. Most DNA microarrays are glass slides or microchips "embedded" with thousands of genes. DNA microarrays have many applications in research and have been used, for instance, to identify genes involved in cancer and to develop drugs.
- 1521 gene cloning: The production of multiple copies of a gene.
- 1522 gene expression profiling: A technique for classifying cells, such as tumor cells, based on the activity of their genes. Research physicians use the technique in diagnosing disease and in selecting therapies for patients. Eventually this technique may be useful in the general practice of medicine.
- 1523 gene expression: The translation of information encoded in a gene into protein or RNA. Expressed genes include genes that are transcribed into messenger RNA (mRNA) and then translated into protein, as well as genes that are transcribed into types of RNA such as transfer RNA (tRNA) and ribosomal RNA (rRNA) that are not translated into protein. Gene expression is a highly specific process in which a gene is switched on at a certain time and "speaks out."
- 1524 gene flow: The loss or gain of alleles from a population due to the emigration or immigration of fertile individuals, or the transfer of gametes, between populations.
- 1525 gene mapping: The process of determining where genes are located on individual chromosomes, their position in relation to other genes and the distance between them.
- 1526 gene pool: All of the genetic information, including all variations, contained within a population of a particular species at a particular time.
- 1527 gene splicing: A technique used to join segments of DNA to form a new genetic combination.
- 1528 gene target: A gene or its product (protein) which plays a critical role in disease.
- 1529 gene testing: Methods that identify the presence, absence or mutation of a particular gene in an individual.
- 1530 gene Therapy: An experimental field of medicine that aims to treat disease by delivering to patients new copies of a gene that is missing or not working properly in their bodies. To date there have been no unqualified successes in gene therapy, and the field has struggled to find safe and effective methods of delivering therapeutic genes to where they are needed in the body.
- 1531 gene: A discrete amount of information encoded on a portion of DNA. The genetic information is encoded in its own language. The genetic information on genes is first transcribed from DNA to RNA. The RNA is then used to make cellular proteins. There are multiple genes on each chromosome. Each human has 23 pairs of chromosomes. If the analogy is building a tower with legos, each lego (of different lengths) is a gene, when you stack the legos on top of each other, you are linking the genes and the stack of legos equals a chromosome. Each chromosome has a matching chromosome and forms a pair.
- 1532 general anesthesia: This form of anesthesia causes stem cell donors to lose consciousness, so they are unaware of the surgical procedure that removes their marrow or any other sensations. General anesthesia is used for about 75 percent of NMDP collections.
- 1533 genes: Pieces of DNA that occupy specific locations on chromosomes and that control different activities and

- details of a person's makeup and function (e.g., eye color, production of certain enzymes, etc.).
- 1534 genetic code: The system of nucleotide triplets in DNA and RNA that carries genetic information; referred to as a code because it determines the amino acid sequence in the enzymes and other protein molecules synthesized by the organism.
- 1535 genetic counselling: Counselling individuals and prospective parents who are at risk of a particular genetic disease (either themselves or their potential child). Provides them and their families with education and information about genetic-related conditions such as the probabilities, dangers, diagnosis and treatment, and helps them make informed decisions.
- 1536 genetic counselor: A specialist in genetic disorders who provides information about the risk, inheritance, and genetic basis of a disorder to patients or relatives in families as an aid to decisions about marriage, children, early diagnosis, and prognosis.
- 1537 genetic disorder: A hereditary condition that results from a defective gene or chromosome.
- 1538 genetic drift: Changes in the gene pool of a small population due to chance.
- 1539 genetic engineering: A term covering all laboratory or industrial techniques used to alter the genetic material of organisms. These techniques assist organisms to produce new substances or perform new functions, for example increase yields of compounds already produced by the organism, form new compounds, or allow organisms to adapt to drastically altered environments.
- 1540 genetic factor: A characteristic or trait that is influenced or encoded by one or more genes.
- 1541 genetic map: An ordered list of genetic loci (genes or other genetic markers) along a chromosome.
- 1542 genetic marker: A sequence of DNA with a known location on a chromosome and is known to be associated with a particular gene or trait. Some genetic markers are associated with certain diseases. Detecting these genetic markers in the blood can be used to determine whether an individual is at risk of developing the disease. They are also used as a reference point for mapping other genes.
- 1543 genetic modification (GM): Any process that alters the genetic material of living organism. This includes duplicating, deleting or inserting one or more new genes or altering the activities of an existing gene. It can be performed on microbes, plants or animals (humans included). Where this is done in humans, it is gene therapy, and only human genes are used.
- 1544 genetic programming: The precise engineering of the genome of animals.
- 1545 genetic recombination: The general term for the production of offspring that combine traits of the two parents.
- 1546 genetic reprogramming: The forced expression of genes either on viruses, plasmids or other genetic material to turn a mature, differentiated adult cell into an iPS cell.
- 1547 genetic screening: Testing a population for alterations in the activity (mutations) of particular genes.
- 1548 genetic: Having to do with inherited traits, or the DNA and chromosomes on which they are inherited. Stem cells can cure genetic disorders by replacing cells with abnormal genes with cells that have normal genes.
- 1549 genetically modified organism (GMO): An organism (plant, animal, bacteria, or virus) that has had its genetic material altered, either by the duplication, insertion or deletion of one or more new genes, or by changing the activities of an existing gene.
- 1550 geneticist: A physician who specializes in genetics, the study of heredity and variation of organisms.
- 1551 genetics: The study of genes and how they are inherited. Traditionally, genetic studies have focused on one gene at a time, while genomics is the study of large numbers of genes.
- 1552 genital ridge: Formation of a genital ridge requires at least two genes, WT-1, which is also important in early kidney formation, and SF-1, required for the development of both the gonads and adrenal glands.
- 1553 genital system: The biological system that, in males, includes the testicles, the vas deferens, the prostate and the penis.
- 1554 genitourinary system (GU system): In the male, pertaining to the organs comprising the genital and urinary system. This includes the testicles, penis, seminal vesicles, urethra, bladder, ureters and kidneys.
- 1555 genome sequence: The sequence of consecutive DNA "letters" spanning all the chromosomes of a cell from start to finish.
- 1556 genome: A collection of genes. The human genome is the collection of human genes, just as the dog genome is the collection of dog genes. All living things have genomes. Plants, animals and bacteria included. A genome contains the biological information for building, running, and maintaining an organism—and for passing life on to the next generation. Nearly every cell in your body contains a complete copy of your genome; so, in fact, you actually have a trillion genomes because scientists believe the human body contains about a trillion cells. The German botanist Hans Winkler coined the term genome in 1920 by combining the words GENE and chromosOME. A precise definition of genome is "all the DNA in a cell" because this includes not only genes but also DNA that is not part of a gene, or non-coding DNA.
- 1557 genomic imprinting: The parental effect on gene expression. Identical alleles may have different effects on offspring, depending on whether they arrive in the zygote via the ovum or via the sperm.
- 1558 genomic instability: The instability of genetic material as a result of destructive chemical processes that lead to mutation.
- 1559 genomic library: A set of thousands of DNA segments from a genome, each carried by a plasmid, phage, or other cloning vector.
- 1560 genomics: The science of identifying the sequence of DNA in various species, and subsequent processing of that information.
- 1561 genotype: The genetic make-up of an individual's cells. The genotype together with the biologic environment produce the phenotype, or the outward manifestations.
- 1562 genus (pl. genera): A taxonomic category above the species level, designated by the first word of a species' binomial Latin name.
- 1563 geographical range: The geographic area in which a population lives.
- 1564 geological time scale: A time scale established by geologists that reflects a consistent sequence of historical periods, grouped into four eras: Precambrian, Paleozoic, Mesozoic, and Cenozoic.
- 1565 George Nicolas Papanicolaou: George Nicolas Papanicolaou was a Greek physician, anatomist, and cytologist in the United States.
- 1566 germ cell: A gamete, that is, a sperm or egg, or a cell that can become a sperm or egg. All other body cells are somatic cells.
- 1567 germ layer lineage stem cells (GLSCs): A germ layer lineage stem cell (GLSC) is derived from a single cell, it has unlimited proliferation potential and forms all cell types within a single germ layer lineage, i.e., ectoderm, mesoderm, and endoderm.
- 1568 germ layer: In early development, the embryo differentiates into three distinct germ layers (ectoderm, endoderm, and

- mesoderm), each of which gives rise to different parts of the developing organism.
- 1569 germ line: The cell lineage from which the oocyte and sperm are derived.
- 1570 germinal cells: In embryos, cells destined to develop into the germ cells of the gonads in the future organism i.e. egg cells in the female and sperms in the male.
- 1571 germinate: Seeds starting to grow by putting out shoots and roots (can also apply to fungi).
- 1572 germination: In plants, the resumption of growth or the development from seed or spore.
- 1573 germline cells: Cells that arise from the inner cell mass and are irreversibly committed to give rise to eggs or sperm. Primitive germline cells (which are germline stem cells) migrate from the posterior of the early postimplantation embryo to the developing gonads, known as genital ridges, where they commit to spermatogenesis (in testes) and oogenesis (in ovaries).
- 1574 germline stem cells: Stem cells that give rise to gametes. They are found in children and in adults.
- 1575 germline: Germline cells are reproductive cells - the egg and the sperm. The line or sequence of germ cells that contain genetic material that can be passed on to children. Sperm and eggs are part of the germline.
- 1576 gestation: The period of development of an organism from fertilization of the ovum until birth.
- 1577 GFP: Green fluorescent protein.
- 1578 gibberellin: A class of related plant hormones that stimulate growth in the stem and leaves, trigger the germination of seeds and breaking of bud dormancy, and stimulate fruit development with auxin.
- 1579 gill: A localized extension of the body surface of many aquatic animals, specialized for gas exchange.
- 1580 gland volume (GV): The size in cubic centimeters or grams of the prostate gland.
- 1581 gland: A structure or organ that produces a substance which is used in another part of the body.
- 1582 glans penis: Cap-shaped expansion at the end of the penis, having the urethral opening at the center.
- 1583 gleason grade: A widely used method for classifying prostate cancer tissue for the degree of loss of the normal glandular architecture (size, shape and differentiation of glands); a grade from 1-5 is assigned successively to each the two most predominant tissue patterns present in the examined tissue sample and are added together to produce the Gleason score; high numbers indicate poor differentiation and therefore more aggressive cancer.
- 1584 gleason score: Two Gleason Grade numbers are added together to produce the Gleason Score. The first Gleason Grade number indicates the Gleason Grade of the cancer cells found most commonly within the sample, the second number the second most commonly found grade. For example, a Gleason Score of 4+3=7 means that Gleason Grade 4 is the most commonly found type of cell, Gleason Grade 3 the second most commonly found, producing a total Gleason Score of 7.
- 1585 Gleason: Name of physician who developed the Gleason grading system commonly used to grade prostate cancer.
- 1586 glia cells: Neuronal support cells, such as oligodendrocytes and astrocytes in the spinal cord, and Schwann cells in the peripheral nervous system.
- 1587 glia: Supportive tissue of the brain. There are three types of glial tissue: astrocytes, oligodendrocytes and microglia. Glial cells do not conduct electrical impulses, as do neurons.
- 1588 glial cell: A nonconducting cell of the nervous system that provides support, insulation, and protection for the neurons.
- 1589 glial fibrillary acidic protein (GFAP): A structural protein specifically produced by astrocytes. GFAP is often used as a marker of astrocytes.
- 1590 globular protein: A polypeptide chain folded into a roughly spherical shape.
- 1591 glomerulus: A ball of capillaries surrounded by Bowman's capsule in the nephron and serving as the site of filtration in the vertebrate kidney.
- 1592 glossitis: Inflammation of the tongue.
- 1593 glucagon: A protein hormone that is produced especially by the islets of Langerhans and that promotes an increase in the sugar content of the blood by increasing the rate of glycogen breakdown in the liver.
- 1594 glucocerebrosidase: The glucocerebrosidase enzyme is necessary for the breakdown of a particular fatty substance, glucocerebroside into glucose and ceramide. Gaucher disease is characterized by its absence.
- 1595 glucocerebroside: A type of fat (lipid) molecule accumulates in individuals with Gaucher disease and is used as a building block to make certain cell membranes. When the cells wear out, the glucocerebroside can be recycled. This recyclable material comes mainly from the breakdown of old red and white blood cells. In the brain, glucocerebroside comes from the processing of lipids during brain development and the formation of the myelin sheath (the fatty coating around each nerve fiber).
- 1596 glucocorticoid: Any of a group of anti-inflammatory steroid like compounds, such as hydrocortisone, that are produced by the adrenal cortex, are involved in carbohydrate, protein, and fat metabolism, and are used as anti-inflammatory agents.
- 1597 glucose: An optically active sugar C₆H₁₂O₆ that has an aldehydic carbonyl group; especially: the sweet colorless soluble dextrorotatory form that occurs widely in nature and is the usual form in which carbohydrate is assimilated by animals.
- 1598 glutathione S-transferase: A protein which plays an important role in inactivating chemicals that are able to cause gene damage and promote genetic instability. A recent study has shown that this protein is deactivated very early in the development of prostate cancer.
- 1599 glutathione: A compound of the amino acids glycine, cystine, and glutamic acid occurring widely in plant and animal tissues and forming reduced and oxidized forms important in biological oxidation-reduction reactions.
- 1600 glycerol: A three-carbon molecule with three hydroxyl (OH) groups attached; a glycerol molecule can combine with three fatty acid molecules to form a fat or an oil.
- 1601 glycocalyx: A fuzzy coat on the outside of animal cells, made of sticky oligosaccharides.
- 1602 glycogen storage disorders: A class of disorders characterized by the build-up of glycogen causes progressive muscle weakness throughout the body and affects various body tissues, particularly in the heart, skeletal muscles, liver, and nervous system.
- 1603 glycogen: An extensively branched glucose storage polysaccharide found in the liver and muscle of animals; the animal equivalent of starch.
- 1604 glycolipids: Organic molecules similar in structure to fats, but in which a short carbohydrate chain rather than a fatty acid is attached to the third carbon of the glycerol molecule; as a result, the molecule has a hydrophilic "head" and a hydrophobic "tail." Glycolipids are important constituents of the plasma membrane and of organelle membranes.
- 1605 glycolysis: The splitting of glucose into pyruvate. Glycolysis is the one metabolic pathway that occurs in all living cells, serving as the starting point for fermentation or aerobic respiration.
- 1606 glycoprotein: A molecule that consists of a carbohydrate plus a protein. Glycoproteins play essential roles in the body. For instance, in the immune system almost all of the

- key molecules involved in the immune response are glycoproteins.
- 1607 GM2 Ganglioside: A fatty substance or lipid that is part of normal metabolism, in Tay-Sachs and Sandhoff lack of enzyme function causes the GM2 gangliosides to accumulate which is toxic and eventually causes cell death.
- 1608 GM-CSF: A cytokine, Granulocyte-Macrophage colony stimulating factor: Growth factors for Lymphohematopoietic stem cells.
- 1609 goblet cell: A mucus-secreting epithelial cell (as of intestinal columnar epithelium) that is distended at the free end.
- 1610 goiter: Goiter is an enlargement of the thyroid gland. The resulting bulge on the neck may become extremely large, but most simple goiters are brought under control before this happens. Occasionally a simple goiter may cause some difficulty in breathing and swallowing.
- 1611 Golgi apparatus: Eukaryotic organelle which package cell products, such as enzymes and hormones, and coordinate their transport to the outside of the cell.
- 1612 gonad ridge: Within an embryo, the area of cells that will develop into the gonads of foetus. This usually develops around 32 days after fertilisation.
- 1613 gonad: An organ that produces sex cells (testes or ovaries).
- 1614 gonadal ridge: Embryonic structures arising in humans at about five weeks, eventually developing into gonads (either testes or ovaries).
- 1615 gonadotropins: Hormones that stimulate the activities of the testes and ovaries; a collective term for follicle-stimulating and luteinizing hormones.
- 1616 gonads: The embryonic sex gland before it becomes a definitive testis or ovary.
- 1617 Gonadotropin (adj. Gonadotropic): A hormone secreted by the pituitary gland that stimulates gonads.
- 1618 Goosecoid: A signaling molecule. Gene that encodes a transcription factor that is important for determining craniofacial orientation and features in the vertebrate embryo.
- 1619 goserelin acetate (Zoladex®): a luteinizing hormone releasing hormone (LHRH) analog used in the hormonal treatment of advanced prostate cancer and in the adjuvant and neoadjuvant hormonal treatment of earlier stages of prostate cancer.
- 1620 Gp130: Glycoprotein. Signal transducing receptor of cytokines.
- 1621 G-protein linked receptor: A signal receptor protein in the plasma membrane that responds to the binding of a signal molecule by activating a G protein.
- 1622 grade: A means of describing the potential degree of severity of a cancer.
- 1623 graded potential: A local voltage change in a neuron membrane induced by stimulation of a neuron, with strength proportional to the strength of the stimulus and lasting about a millisecond.
- 1624 gradualism: A view of Earth's history that attributes profound change to the cumulative product of slow but continuous processes.
- 1625 graft failure: Complication after a transplant in which the stem cells do not grow in the recipient's bone marrow and do not produce new white blood cells, red blood cells, and platelets.
- 1626 graft versus host disease: A transplantation syndrome wherein mature T lymphocytes from an allogeneic donor undergo an immune response against tissues and organs of the host. These immune responses can vary in degree, from mild skin, gut, and liver damage to lethal disease. The usual circumstance is an allogeneic bone marrow (BM) or mobilized peripheral blood (MPB) transplant from healthy donors to hosts who have received substantial pre-transplant conditioning, which prevents host immune rejection of donor cells. In that circumstance, donor mature T lymphocytes are present as contaminants of HSC and blood progenitors. Pure allogeneic HSC transplants do not cause graft versus host disease.
- 1627 gram stain: A staining method that distinguishes between two different kinds of bacterial cell walls.
- 1628 granule: A small quantity of a solid substance, smaller than a grain.
- 1629 granulocyte colony stimulating factor (G-CSF): Used to mobilize bone marrow in the periphery and to differentiate granulocyte precursor to neutrophils.
- 1630 granulocyte: A type of white blood cell responsible for engulfing and digesting micro-organisms. Granulocytes consist of three types of phagocytic, or cell-eating, cells: basophils, eosinophils and neutrophils.
- 1631 granulocyte-colony stimulating factor (G-CSFs): also known as growth factors, are molecules that stimulate cell growth. There are 2 types of G-CSFs – white cell G-CSFs and red cell G-CSFs. White cell G-CSFs stimulate the production of neutrophils and red cell G-CSF stimulate the production of RBCs.
- 1632 granulose cells: Cells surrounding and maintaining the ovarian follicle.
- 1633 granum (pl. grana): A stacked portion of the thylakoid membrane in the chloroplast. Grana function in the light reactions of photosynthesis.
- 1634 grave's disease: Also known as myasthenia gravis, Grave's disease is a defect in the immune system which causes production of immunoglobulins (antibodies) which stimulate and attack the thyroid gland, causing hyperthyroidism (abnormal growth of the thyroid gland) and overproduction of thyroid hormone. Similar antibodies also attack the tissues in the eye muscles (causing exophthalmus).
- 1635 gravitropism: A response of a plant or animal in relation to gravity.
- 1636 gray (Gy): The SI (Système International) unit of absorbed radiation dose: 1 Gy = 1 joule/kg = 100 rads, 1/100 Gy = 1 centigray (cGy).
- 1637 gray matter: The portion of the spinal cord comprised mainly of neuronal cell bodies and dendrites, and not myelinated axons.
- 1638 green fluorescent protein (GFP): A protein naturally occurring in some animals including jelly fish that spontaneously fluoresces. It can be used as a noninvasive marker in living cells by attaching it to different proteins and then letting it fluoresce so as to track the cell.
- 1639 greenhouse effect: The warming of planet Earth due to the atmospheric accumulation of carbon dioxide, which absorbs infrared radiation and slows its escape from the irradiated Earth.
- 1640 gross motor: Gross motor refers to functions which require large muscle movements. For example, walking or jumping would require gross motor movement.
- 1641 gross primary productivity (GPP): The total primary productivity of an ecosystem.
- 1642 gross productivity: A measure of the rate at which energy is assimilated by the organisms in a trophic level, a community, or an ecosystem.
- 1643 ground meristem: A primary meristem that gives rise to ground tissue in plants.
- 1644 ground tissue system: A tissue of mostly parenchyma cells that makes up the bulk of a young plant and fills the space between the dermal and vascular tissue systems.
- 1645 growth factor: A substance that promotes the growth of cells. Growth factors include epidermal growth factor (EGF), fibroblast growth factor (FGF), erythropoietin (EPO), hematopoietic cell growth factor (HCGF), platelet-derived growth factor (PDGF), stem cell factors, and neurotrophins. Growth factor is produced by normal cells

- during embryonic development, tissue growth, and wound healing. Tumors, however, produce large amounts of growth factors.
- 1646 growth hormone: A pituitary hormone shown to stimulate amino acid uptake into tissues, promote DNA and RNA and protein synthesis, have a role in cell division and hypertrophy and increase bone growth and lean body mass
- 1647 guard cell: A specialized epidermal plant cell that forms the boundaries of the stomata.
- 1648 guttation: The exudation of water droplets caused by root pressure in certain plants.
- 1649 gymnosperm: A vascular plant that bears naked seeds not enclosed in any specialized chambers.
- 1650 gynecomastia: Enlargement or tenderness of the male breasts or nipples; a possible side effect of hormonal therapy which leads to increased levels of estrogens as seen with DES, antiandrogen monotherapy (Flutamide® or Casodex®) or the combination of the latter with Proscar®.
- 1651 gynogenones: Maternally-derived genome.
- 1652 H-2 blockers: Blockers of histamine, a substance responsible for gastric acidity among other functions.
- 1653 habitat: The place in which individuals of a particular species can usually be found.
- 1654 habituation: A simple kind of learning involving a loss of sensitivity to unimportant stimuli, allowing an animal to conserve time and energy.
- 1655 haematopoietic stem cell transplantation: The transplantation of haematopoietic stem cells which have the ability to form blood. Haematopoietic stem cells provide rapid and sustained reconstitution of blood formation and are found in adult bone marrow, umbilical cord blood, peripheral blood and in foetal liver.
- 1656 haematopoietic stem cell: A stem cell from which all red and white blood cell develop. The precursors of mature blood cells that are defined by their ability to replace the bone marrow system, following damage or disease, and are able to continue producing mature blood cells. Now commonly recognised as stem cells collected from the peripheral blood.
- 1657 haemodialysis: A method used to filter the blood when the kidneys are not working properly. It involves the blood passing from the person's body through a tube to a machine called an artificial kidney or dialyser. The blood flows past a membrane in the machine, which allows waste products to be removed from the blood, across the membrane into a special fluid on the other side. The purified blood is then returned to the body.
- 1658 haemoglobin: The part of the red blood cells that carries oxygen.
- 1659 haemophilia: An inherited disease that is due to a deficiency or lack of certain compounds, such as factor VIII or IX, in the blood. This results in excessive internal or external bleeding due to impaired blood clotting.
- 1660 haemorrhage: The loss of large amounts of blood from the blood vessels.
- 1661 hairy cell leukemia (HCL): A rare type of chronic leukemia usually found in middle-aged men. HCL rarely requires BMT as a treatment.
- 1662 half life: The time it takes for half of the nuclei of a radioactive substance to decay or the amount of time required to reduce a drug level to one half of the initial value
- 1663 hallucinations: A sensory experience in which a person can see, hear, smell, taste, or feel something that is not there.
- 1664 hanging drop method: A technique used to culture embryonic stem cells so that they develop into embryoid bodies.
- 1665 haploid cell: A cell containing only one set of chromosomes (n).
- 1666 haploid human cell: A cell such as an egg or sperm that contains only twenty-three chromosomes.
- 1667 haploid: Having a single set of chromosomes in the nucleus of each cell. Mosses, and many protists and fungi, are haploid, as are some insects, bryophytes, and the gametes of all organisms. Contrast with diploid.
- 1668 haplotype: A collection of variable DNA sequences that tend to be inherited together.
- 1669 hapMap Project: An international effort to identify variable DNA sequences across the human genome in different ethnic populations. The project is mapping collections of DNA variations, or haplotypes. When complete, the "Hap Map" will be used to study genetic variations associated with disease and the different responses people have to drugs.
- 1670 haptonema: Peg-like structure unique to the Prymnesiophyta; its function is not known.
- 1671 hardy-Weinberg equilibrium: The steady-state relationship between relative frequencies of two or more alleles in an idealized population; both the allele frequencies and the genotype frequencies will remain constant from generation to generation in a population breeding at random in the absence of evolutionary forces.
- 1672 Hardy-Weinberg theorem: An axiom maintaining that the sexual shuffling of genes alone cannot alter the overall genetic makeup of a population.
- 1673 harvesting: Collecting bone marrow cells for transplantation
- 1674 haustorium (pl. haustoria): In parasitic fungi, a nutrient-absorbing hyphal tip that penetrates the tissues of the host but remains outside the host cell membranes.
- 1675 Haversian system: One of many structural units of vertebrate bone, consisting of concentric layers of mineralized bone matrix surrounding lacunae, which contain osteocytes, and a central canal, which contains blood vessels and nerves.
- 1676 HDL cholesterol: High density lipoprotein cholesterol; a beneficial cholesterol composed of a high proportion of protein (with little triglyceride and cholesterol) and that is associated with decreased probability of developing atherosclerosis.
- 1677 healing touch: An energy therapy in which practitioners consciously use their hands in an in a heart-centered and intentional way to support and facilitate physical, emotional, mental, and spiritual health.
- 1678 heart disease: Any disorder that affects the heart. Sometimes the term "heart disease" is used narrowly and incorrectly as a synonym for coronary artery disease. Heart disease is synonymous with cardiac disease but not with cardiovascular disease which is any disease of the heart or blood vessels. Among the many types of heart disease, see, for example: Angina; Arrhythmia; Congenital heart disease; Coronary artery disease (CAD); Dilated cardiomyopathy; Heart attack (myocardial infarction); Heart failure; Hypertrophic cardiomyopathy; Mitral regurgitation; Mitral valve prolapse; and Pulmonary stenosis.
- 1679 heart: The muscle that pumps blood received from veins into arteries throughout the body. It is positioned in the chest behind the sternum (breastbone); in front of the trachea, esophagus, and aorta; and above the diaphragm muscle that separates the chest and abdominal cavities. The normal heart is about the size of a closed fist, and weighs about 10.5 ounces. It is cone-shaped, with the point of the cone pointing down to the left. Two-thirds of the heart lies in the left side of the chest with the balance in the right chest.
- 1680 heat of vaporization: The amount of heat required to change a given amount of a liquid into a gas; 540 calories are required to change 1 gram of liquid water into vapor.

- 1681 heat: The total amount of kinetic energy due to molecular motion in a body of matter. Heat is energy in its most random form.
- 1682 heat-shock protein: A protein that helps protect other proteins during heat stress, found in plants, animals, and microorganisms.
- 1683 hEG cells: Human embryonic germ cells
- 1684 Helicase: A class of enzymes vital to all living organisms. Helicases are often utilized to separate strands of a DNA double helix.
- 1685 helminthes: Species such as flukes, tape worms, and hook worms; most are parasitic to humans.
- 1686 helper T cell (TH): A type of T cell that is required by some B cells to help them make antibodies or that helps other T cells respond to antigens or secrete lymphokines or interleukins.
- 1687 hemagram: The official name for a blood test.
- 1688 hemangioblast: This is a multipotent cell, a common precursor to hematopoietic and endothelial cells.
- 1689 hematopoietic stem cell (HSC): A stem cell from which all red and white blood cells evolve.
- 1690 hematocrit (Hct): a measure of the number of red cells found in the blood, stated as a percentage of the total blood volume. Hematocrit is the percentage of the volume of a blood sample occupied by cells, as determined by a centrifuge or device which separates the cells and other particulate elements of the blood from the plasma. The remaining fraction of the blood sample is called plasmocrit (blood plasma volume).
- 1691 hematogenous: Originating in the blood or spread through the bloodstream.
- 1692 hematologic: Pertaining to the blood and bone marrow.
- 1693 hematological oncologist: A medical doctor who specializes in diagnosing and treating malignancies, or cancers, of the blood and blood-forming tissues.
- 1694 hematologist: A medical doctor who specializes in diagnosing and treating medical diseases of the blood and blood-forming tissues.
- 1695 hematology: A medical science that deals with the blood and blood-forming organs.
- 1696 hematopoetic stem cell: An adult stem cell from which all white and red blood cells evolve.
- 1697 hematopoetic: Blood Forming. Most of the research on Umbilical Cord Stem Cells has been on the hematopoetic stem cells found among them. Because these are the cells important in reconstituting blood marrow after chemotherapy and radiotherapy, and because there is lots of money for cancer research, these cells were extensively studied, long before the current wave in stem cell research.
- 1698 hematopoiesis: Formation of 8 distinct lineages from a Lymphohematopoietic Stem Cell (LHSC).
- 1699 hematopoietic cell transplantation (HCT): Transplantation of cells with blood-forming potential, usually bone marrow (BM). HSC are the only cells in HCT that provide rapid and sustained reconstitution of blood formation. HSC are found in adult BM, umbilical cord blood, mobilized peripheral blood (MPB), the nucleated cell fraction of blood after treatment of the donor with agents that increase the passage of HSC from BM to blood), and in fetal liver.
- 1700 hematopoietic cell: The functional cell type that makes blood. Hematopoietic cells are found within the bone marrow of adults. In the fetus, hematopoietic cells are found within the liver, spleen, bone marrow and support tissues surrounding the fetus in the womb.
- 1701 hematopoietic stem cell: A stem cell from which all red and white blood cell develop. The precursors of mature blood cells that are defined by their ability to replace the bone marrow system, following damage or disease, and are able to continue producing mature blood cells. Now commonly recognized as stem cells collected from the peripheral blood.
- 1702 hematopoietic: Pertaining to hematopoiesisImmune: Protected against infection. The Latin immunis means free, exempt.
- 1703 hematospermia: The occurrence of blood in the semen.
- 1704 hematuria: The occurrence of blood in the urine.
- 1705 heme: The iron-containing group of heme proteins such as hemoglobin and the cytochromes.
- 1706 hemi-ablation: Destruction of tissue of one half of the prostate
- 1707 hemigastrectomy: Excision of the distal one-half of the stomach.
- 1708 hemiprostate: The left or right side of the prostate
- 1709 hemizygous: A genetic term that describes people who have only one copy of a chromosome pair rather than the usual two.
- 1710 hemoglobin (Hb or Hgb): A bright red substance that gives red cells their color. It transports oxygen and carbon dioxide between the lungs and all of the body's other organs. When the hemoglobin level drops, the condition is known as anemia.
- 1711 hemolymph: In invertebrates with an open circulatory system, the body fluid that bathes tissues.
- 1712 hemophilia: A group of hereditary disorders characterized by failure of the blood to clot and consequent excessive bleeding from even minor wounds.
- 1713 hemorrhage: To undergo heavy or uncontrollable bleeding.
- 1714 hemostatic: An agent that shortens the clotting time of blood.
- 1715 hematopoiesis (Adj. Hematopoietic): The formation of blood or of blood cells in the living body.
- 1716 heparin: A drug given directly into a vein that thins the blood when there is a danger of clotting (an anticoagulant)
- 1717 hepatic flexure: The hepatic flexure is situated between the ascending and the transverse part of the colon, beneath the liver.
- 1718 hepatic: Pertaining to the liver.
- 1719 hepatitis: Liver inflammation usually caused by a virus.
- 1720 hepatocyte: The functional cell type of the liver that makes enzymes for detoxifying metabolic waste, destroying red blood cells and reclaiming their constituents, and the synthesis of proteins for the blood plasma.
- 1721 hepatomegaly: Enlargement of the liver; may be a symptom with several LSDs.
- 1722 hepatosplenomegaly: Enlargement of the liver and spleen; may be a symptom with several LSDs.
- 1723 herbaceous: In plants, nonwoody.
- 1724 herbicide: A substance that kills plants. Used in agriculture, horticulture and gardening. Can be selective (kill selected species) or non-selective (broad spectrum - kill all plants).
- 1725 herbivore: A heterotrophic animal that eats plants.
- 1726 Herceptin®: The trade name for trastuzumab.
- 1727 hereditary disorder: A pathological condition due to changes in individual genes, or groups of genes or in sections of chromosomes or whole chromosomes. These changes may be passed from parents to offspring.
- 1728 hereditary: inherited from one's parents and earlier generations.
- 1729 heredity: The historical distribution of biological characteristics through a group of related individuals via their DNA.
- 1730 hermaphrodite: An individual that functions as both male and female in sexual reproduction by producing both sperm and eggs.
- 1731 hermetically: To form an airtight closure. A vessel or tube is hermetically sealed when it is closed completely against the passage of air or another fluid by fusing the extremity.

- 1732 hernia: The bulging of an internal organ through a weak area or tear in the muscle or other tissue that holds it in place. Most hernias occur in the abdomen.
- 1733 hES cell: Human embryonic stem cell; a type of pluripotent stem cell.
- 1734 Hex1: Pituitary transcription factor.
- 1735 heterochromatin: Eukaryotic chromatin that remains highly compacted during interphase and is generally not transcribed. As embryonic stem cells differentiate into mature specialized cell types, many pluripotency-related genes are silenced or down regulated because of their location within the highly compacted heterochromatin. Research efforts are currently exploring alternative methods to uncoil the tightly wound DNA into less condensed euchromatin to unlock necessary reprogramming genes located within the tightly packed heterochromatin.
- 1736 heterochrony: Evolutionary changes in the timing or rate of development.
- 1737 heterocyst: A specialized cell that engages in nitrogen fixation on some filamentous cyanobacteria.
- 1738 heterodimer: When two different molecules are held together.
- 1739 heterogeneous (heterogeneity): Non-uniform; composed of mixtures of different kinds; in reference to tumors meaning composed of different clones of cells.
- 1740 heterologous transplants: These are from a different species. The pig valve transplants to replace damaged human heart valves (mitral) are one example.
- 1741 heterologous: Not homologous or uniform. In the context of cells, heterologous is a mixed or divergent cell population or of a divergent origin.
- 1742 heterotroph: An organism that obtains organic food molecules by eating other organisms or their by-products.
- 1743 heterozygote advantage: A mechanism that preserves variation in eukaryotic gene pools by conferring greater reproductive success on heterozygotes over individuals homozygous for any one of the associated alleles.
- 1744 heterozygote: A diploid organism that carries two different alleles at one or more genetic loci.
- 1745 heterozygous: Having two different forms of a particular gene, one inherited from each parent. For example, a person with brown eyes may also carry a gene for blue eyes.
- 1746 hex: Hexosaminidase. Enzyme for processing lipid (fat).
- 1747 hexosaminidase A: Tay-Sachs is caused by a mutation in the Hex A gene on chromosome 15. The Hex A gene codes for the alpha subunit of the hexosaminidase A enzyme which is necessary for breaking down GM2 gangliosides in nerve cells. When there is a mutation in the coding for alpha subunit of the hexosaminidase A it does not function properly and leads to an accumulation of GM2 which is toxic and eventually causes cell death. Sandhoff is characterized by loss of function of both the alpha and beta subunit of hexosaminidase A enzyme.
- 1748 hexosaminidase B: Sandhoff is caused by a mutation in the Hex B gene on chromosome 5. The Hex B gene codes for part of two essential nervous system enzymes: the beta subunit of hexosaminidase A and the beta subunit of hexosaminidase B. When there is a mutation in the coding for beta subunit of hexosaminidase A and the beta subunit of hexosaminidase B both enzymes do not function properly and lead to an accumulation of GM2 which is toxic and eventually causes cell death. Tay-Sachs is characterized by loss of function of only the alpha subunit of the hexosaminidase A enzyme.
- 1749 Hiatal Hernia: A type of hernia that occurs when a portion of the stomach protrudes through the diaphragm (where the oesophagus normally passes through).
- 1750 hibernation: A physiological state that allows survival during long periods of cold temperatures and reduced food supplies, in which metabolism decreases, the heart and respiratory system slow down, and body temperature is maintained at a lower level than normal.
- 1751 high dose radiation: radiation delivered by temporary insertion of radioactive Iridium wire into flexible needles placed in the prostate through the perineum.
- 1752 high throughput screening: Technology that employs automation and robotics to conduct hundreds or thousands of biological assay experiments within a short period of time. Typically, high throughput screening (HTS) systems will use rectangular plastic trays containing 96, 384, 1536, or 3456 wells (or more in microfluidic systems), where each well may hold a small amount of liquid sample containing cells. Automated liquid handling can add factors or compounds to test the effect on the cells. HTS can be used (for example) to screen hundreds of thousands of chemical compounds as potential drug candidates, or to identify factors that determine the ultimate fate of a differentiating stem cell.
- 1753 high-intensity focused ultrasound (HIFU): A procedure which utilizes transrectal ultrasound that is highly focused into a small area, creating intense heat which is lethal to prostate cancer tissue.
- 1754 highly active antiretroviral therapy (HAART): A combination of anti-HIV medications designed to keep the virus from making copies of itself, while minimizing potential side effects and pill burden.
- 1755 hilum: a shallow depression in one side of a lymph node through which blood vessels pass and efferent lymphatic vessels emerge.
- 1756 hippotherapy: Uses equine rhythmic movement to help individuals with a variety of neurological disorders, including SCI.
- 1757 histamine: Histamine is a chemical present in cells throughout the body that is released during an allergic reaction. Histamine is one of the substances responsible for the symptoms on inflammation and is the major reason for running of the nose, sneezing, and itching in allergic rhinitis. It also stimulates production of acid by the stomach and narrows the bronchi or airways in the lungs.
- 1758 histiocytosis: A rare and often fatal blood disease. A type of white blood cell called a histiocyte grows wildly and attacks body organs.
- 1759 histocompatibility antigens: Glycoproteins on the surface membranes of cells that enable the body's immune system to recognize a cell as native or foreign and that are determined by the major histocompatibility complex.
- 1760 histocompatibility: A system that determines how closely the patient and donor blood stem cells match.
- 1761 histocompatible: A tissue or organ from a donor (the person giving the organ or tissue) that will not be rejected by the recipient (the patient in whom the tissue or organ is transplanted). Rejection is caused because the immune system of the recipient sees the transplanted organ or tissue as foreign and tries to destroy it. Tissues from most people are not histocompatible with other people. In siblings, the probability of histocompatibility is higher, while identical twins are almost always histocompatible.
- 1762 histological studies: The anatomical study of the microscopic structure of tissues. Such studies are often carried out in SCI research to evaluate the neuroprotective impact of various interventions at the injury site.
- 1763 histology: The study of the appearance and behavior of tissue, usually carried out under a microscope by a pathologist (who is a physician) or a histologist (who is not necessarily a physician).
- 1764 histomorphometry: The quantitative measurement and characterization of the microscopic organization and

- structure of a tissue especially by computer-assisted analysis of images.
- 1765 histone: A small protein with a high proportion of positively charged amino acids that binds to the negatively charged DNA and plays a key role in its chromatin structure.
- 1766 histopathologic: Tissue changes that affect a part or accompany a disease
- 1767 HIV/AIDS virus: Human immunodeficiency virus that causes AIDS. People with AIDS suffer infections, malignancies and neurologic disease.
- 1768 HIV: Abbreviation of human immunodeficiency virus, the infectious agent that causes AIDS; HIV is an RNA retrovirus.
- 1769 HLA (human leukocyte antigens): These are identification proteins found on the outside of cells, including white blood cells, that allow the immune system to recognize tissues as “self” or “non-self”. HLA proteins are responsible for rejection of transplanted organs, as well as for ejection of splinters and other foreign materials from the body. HLA typing is thus extremely important in transplantation of most organs or tissues. Bone marrow replacement with HLA-matched umbilical cord blood stem cells is recommended to prevent graft vs host disease in the recipient, but HLA-unmatched transplantation of umbilical cord stem cells in persons with an intact immune system does not trigger a rejection response, unlike other cells or tissues. This is a major reason that umbilical cord stem cells are preferable to adult stem cells.
- 1770 HLA typing laboratories: Laboratories under contract with the National Marrow Donor Program to perform HLA typing on donor or recipient blood and cell samples.
- 1771 HLA typing: The identification of a person’s key antigens used for identifying compatible donors.
- 1772 hoarseness: Abnormally rough or harsh-sounding voice caused by vocal abuse and other disorders.
- 1773 Hodgkin disease: A lymphoma that most often occurs in young adults. Hodgkin disease that does not respond to chemotherapy may be treated by an autologous marrow or blood stem cell transplant and less often by an allogeneic marrow or blood stem cell transplant. Also called Hodgkin lymphoma.
- 1774 Hoechst dye: A dye used to identify hematopoietic stem cells (HSCs).
- 1775 Hofmeister-Finsterer Operation: Partial gastrectomy with closure of a portion of the lesser curvature and retrocolic anastomosis of the remainder to the jejunum.
- 1776 holoblastic cleavage: A type of cleavage in which there is complete division of the egg, as in eggs having little yolk (sea urchin) or a moderate amount of yolk (frog).
- 1777 homeobox: A 180-nucleotide sequence within a homeotic gene encoding the part of the protein that binds to the DNA of the genes regulated by the protein.
- 1778 homeopathy: A system of healing that normally involves remedies being administered in reduced doses.
- 1779 homeosis: Evolutionary alteration in the placement of different body parts.
- 1780 homeostasis: The ability or tendency of an organism or cell to maintain internal equilibrium by adjusting its physiological processes.
- 1781 homeotherm: An organism, such as a bird or mammal, capable of maintaining a stable body temperature independent of the environment.
- 1782 homeotic gene: Genes that control the overall body plan of animals by controlling the developmental fate of groups of cells.
- 1783 homing: Occurs when new, infused stem cells begin traveling through the circulatory system and to the bone marrow.
- 1784 hominid: Humans and closely related primates; includes modern and fossil forms, such as the australopithecines, but not the apes.
- 1785 hominoid: Hominids and the apes.
- 1786 homodimer: When two identical molecules are held together.
- 1787 homogeneous (homogeneity): Uniform; composed of the same element; in reference to a tumor cell population meaning that the cells are of the same clone in contrast to a mixed cell population that would exhibit heterogeneity or be heterogeneous.
- 1788 homologous chromosomes: Chromosome pairs of the same length, centromere position, and staining pattern that possess genes for the same characters at corresponding loci. One homologous chromosome is inherited from the organism’s father, the other from the mother.
- 1789 homologous recombination: A technique used to inactivate a gene and determine its function in a living animal. The process of homologous recombination is more efficient in embryonic stem cells than in other cell types. It is achieved by introducing a stretch of DNA that is similar or identical (homologous) to part of a gene and to some of the DNA surrounding the gene, but different (not homologous) to a specific section of the gene. The DNA is then introduced into the stem cells and the stretch of homologous DNA will recognize the similar sequences of the gene within the cell, and replace it. But the cell is then left with a piece of DNA in the gene that has the wrong sequence and this interrupts the function of the gene. The gene is then said to be knocked out. From these embryonic stem cells, an entire mouse can be made by injecting the altered stem cells into a blastocyst, and implanting the blastocyst into a female mouse. This is one way to make genetically manipulated mice and other animals with altered gene function. These experiments are crucial to understand how specific genes work and interact in living animals.
- 1790 homologous: Similar or uniform, often used in the context of genes and DNA sequences. In the context of stem cells, the term homologous recombination is a technique used to disable a gene in embryonic stem cells.
- 1791 homology: Similarity in characteristics resulting from a shared ancestry.
- 1792 homosporous: Referring to plants in which a single type of spore develops into a bisexual gametophyte having both male and female sex organs.
- 1793 homozygote: A diploid organism that carries identical alleles at one or more genetic loci.
- 1794 homozygous: Having two forms of a particular gene that are the same, one inherited from each parent. For example, a person with brown eyes who carries another gene for brown eyes - two of the same forms of the eye colour gene.
- 1795 hormonal therapy: Treatment of cancer by alteration of the hormonal balance. Some cancer will only grow in the presence of certain hormones.
- 1796 hormone refractory PC (HRPC): A loosely used term that really should apply to progressive PC in the setting of a testosterone level less than 20 ng/dl and when an ARM has been excluded; the preferred term is AIPC or androgen independent PC.
- 1797 hormone therapy (HT): The use of hormones, hormone analogs, and certain surgical techniques to treat disease (in this case prostate cancer) either on their own or in combination with other hormones or in combination with other methods of treatment; because prostate cancer is usually dependent on male hormones (ex: testosterone) to grow, hormone blockade or deprivation (also called androgen deprivation therapy) can be an effective means of alleviating symptoms and retarding the development of the disease

- 1798 hormone: Biologically active chemicals that are responsible for the development of secondary sexual characteristics and other biologic activities
- 1799 host: An animal or plant on which, or in which, a parasite lives. While the parasite receives nourishment and support from the host, the host does not benefit and is often harmed by the association.
- 1800 hot flush: A sudden flash of heat particularly affecting the face, neck and chest and lasting from a few seconds to several minutes.
- 1801 hox genes: Consists of at least 38 encoded nucleotides that contain genes found in four clusters on four different chromosomes. An important function of hox genes in blood is the regulation of cell proliferation.
- 1802 human embryonic stem cell (hES cell): A stem cell that is derived from the inner cell mass of a blastocyst and can differentiate into several tissue types in a dish. They are similar to embryonic stem cells from the mouse; however, in the mouse, it is possible to inject those cells into a blastocyst, to make a new mouse, while this is not, and should not, be possible in humans for ethical reasons. Human embryonic stem cells are harder to grow than mouse embryonic stem cells.
- 1803 human fertilisation and embryology authority (HFEA): The governmental authority in the United Kingdom that regulates in vitro fertilization and embryo research.
- 1804 Human genome: The project that has identified and located all of the genes in human DNA, and determined the sequences of the chemical bases that make up human DNA. This information is stored in computer databases.
- 1805 human immunodeficiency virus (HIV): The infectious agent that causes AIDS; HIV is an RNA retrovirus.
- 1806 human leukocyte antigen (HLA): Antigens found on a person's cells that help the body to identify its own cells from invading or foreign cells.
- 1807 human serum albumin: Soluble blood proteins that make up about 55% of plasma proteins. They are involved in maintaining fluid balance in the blood.
- 1808 human T-Cell lymphotropic virus (HTLV): A rare virus transmitted by cellular components of blood. Two forms of the virus have been identified, HTLV-I and HTLV-II.
- 1809 humoral immunity: The type of immunity that fights bacteria and viruses in body fluids with antibodies that circulate in blood plasma and lymph, fluids formerly called humors.
- 1810 Huntington disease: An inherited disease due to a defective gene on the short arm of chromosome 4. It results in loss of motor control and mental deterioration. Symptoms frequently do not appear until after reproductive age, meaning the defective gene may already have been passed on to offspring when symptoms develop.
- 1811 Huntington's chorea: Huntington's disease or Huntington's chorea is an inherited disorder characterized by abnormal body movements called chorea, and loss of memory.
- 1812 hurler syndrome: A heritable condition involving deficiency of an enzyme (alpha-L-iduronidase), leading to abnormal accumulations of materials inside cells, then resulting in abnormal development of cartilage and bone and other systems.
- 1813 hyaline: Transparent or nearly so and usually homogeneous.
- 1814 hybrid zone: A region where two related populations that diverged after becoming geographically isolated make secondary contact and interbreed where their geographical ranges overlap.
- 1815 hybrid: Something of mixed origin or composition. In the case of a plant or animal, a hybrid is produced by breeding together plants or animals of different varieties, species or race. A hybrid is the offspring of genetically dissimilar parents.
- 1816 hybridization protection assay (HPA): A process that hybridizes the amplicon to singlestranded nucleic acid probes that are labeled with an Acridinium Ester (AE) molecule and then it selects and detects the hybridized probes.
- 1817 hybridoma: A hybrid cell produced by the fusion of an antibody-producing cell and a multiple myeloma cell. The cell has the capability to produce a continuous supply of identical antibodies.
- 1818 hydatidiform mole: In human pregnancy, abnormal growth of the chorion, the outermost vascular membrane that in a normal pregnancy would enclose the embryo and ultimately give rise to the placenta. In the situation in which the hydatidiform mole develops, the embryo is usually either absent or dead.
- 1819 hydrocarbon: An organic molecule consisting only of carbon and hydrogen.
- 1820 hydrocortisone (HC): A steroid compound synthesized in the adrenal cortex and vital to survival.
- 1821 hydrogen bond: A type of weak chemical bond formed when the slightly positive hydrogen atom of a polar covalent bond in one molecule is attracted to the slightly negative atom of a polar covalent bond in another molecule.
- 1822 hydrogen ion: A single proton with a charge of +1. The dissociation of a water molecule (H₂O) leads to the generation of a hydroxide ion (OH⁻) and a hydrogen ion (H⁺).
- 1823 hydrolysis: A chemical process that lyses or splits molecules by the addition of water; an essential process in digestion.
- 1824 hydrolyze: Undergo hydrolysis; decompose by reacting with water.
- 1825 hydronephrosis: Abnormal enlargement of a kidney, may occur secondary to acute ureteral obstruction or chronic kidney disease.
- 1826 hydrophilic: Literally means 'water-loving'. This can describe a molecule or part of a molecule that has an affinity for water, or a substance that readily absorbs or dissolves in water.
- 1827 hydrophobic: Literally means 'water hating'. This describes a molecule or part of a molecule that prefers to be in an environment where there is no water. It means repelling, tending not to combine with, or incapable of dissolving in water.
- 1828 hydrostatic skeleton: A skeletal system composed of fluid held under pressure in a closed body compartment; the main skeleton of most cnidarians, flatworms, nematodes, and annelids.
- 1829 hydroxyapatite: A crystal structure that is a building block for bone; principal bone salt, Ca₅(PO₄)₃OH, which provides the compressional strength of vertebrate bone.
- 1830 hydroxyflutamide: The active metabolite of flutamide.
- 1831 hydroxyl group: A functional group consisting of a hydrogen atom joined to an oxygen atom by a polar covalent bond. Molecules possessing this group are soluble in water and are called alcohols.
- 1832 hyperbaric oxygen: The use of pressurized oxygen to treat oxygen-deprived CNS tissue resulting from injury.
- 1833 hypercalcemia: Abnormally high concentrations of calcium in the blood, indicating leeching of calcium from bone (tumors raise serum calcium levels by destroying bone or by releasing PTH or a PTH-like substance, osteoclast-activating factor, prostaglandins, and perhaps, a vitamin D-like steroid). Symptoms of hypercalcemia may include: feeling tired, difficulty thinking clearly, lack of appetite, abdominal pain, frequent urination, increased thirst, constipation, nausea, and vomiting.

- 1834 hyperechoic: Denoting a region in an ultrasound image in which the echoes are stronger than normal or than surrounding structures; the opposite of hypoechoic.
- 1835 hyperintensity: a term used to describe light areas of a scan image due to a increased enhancement of that region.
- 1836 hyperlipidemia, hyperlipemia: An excess of fats (or lipids) in the blood.
- 1837 hyperplasia: Enlargement of an organ or tissue because of an increase in the number of cells in that organ or tissue.
- 1838 hyperpolarization: An electrical state whereby the inside of the cell is made more negative relative to the outside than at the resting membrane potential. A neuron membrane is hyperpolarized if a stimulus increases its voltage from the resting potential of -70 mV, reducing the chance that the neuron will transmit a nerve impulse.
- 1839 hypersensitive PSA (ultrasensitive PSA): A laboratory assay for PSA that is more sensitive to detection of low levels of PSA than a standard assay; these assays allow for earlier detection of recurrence and can distinguish an excellent response to ADT from a mediocre response; DPC Immulite® 3rd generation and Tosoh are two examples of hypersensitive PSA assays available
- 1840 hypertension: Arterial disease in which chronic high blood pressure is the primary symptom.
- 1841 hyperthermia: Treatment that uses heat; for example heat produced by microwave radiation.
- 1842 hypertonic solution: A solution with a greater solute concentration than another, a hypotonic solution.
- 1843 hypertrophy: The enlargement or overgrowth of a part or organ, not due to tumor formation. Hypertrophy denotes greater bulk through increase in size, but not in number, of cells or other individual tissue elements.
- 1844 hypervascular: Containing an excessive number of blood vessels .
- 1845 hypha: A filament that collectively makes up the body of a fungus.
- 1846 hypoallergenic: Non-allergy producing. A term applied to a preparation in which every possible care has been taken in formulation and production to ensure minimum allergic reactions.
- 1847 hypoblast: The inner cell layer, or endoderm, which develops during the formation of the embryonic germ layers.
- 1848 hypocalcemia: Low blood calcium; symptoms may include irritability, muscle spasms or contractions of hands, feet or legs.
- 1849 hypochromic Anemia: Anemia characterized by a decrease in the concentration of corpuscular hemoglobin.
- 1850 hypodermis: The layers beneath the epidermis, comprising thick-walled sclerenchymatous cells.
- 1851 hypoechoic: A region in an ultrasound image in which the echoes are weaker or fewer than normal or in the surrounding regions; the opposite of hyperechoic.
- 1852 hypofractionated: A radiation treatment that is divided into fewer individual sessions (but correspondingly higher doses of radiation) than usual.
- 1853 hypoglycemia: Less than normal level of sugar in the blood.
- 1854 hypointensity: A term used to describe dark areas of a scan image due to a decreased enhancement of that region.
- 1855 hypotension: Arterial disease in which chronic low blood pressure is the primary symptom.
- 1856 hypothalamus (adj. hypothalamic): A portion of the brain which secretes substances that control metabolism by exerting an influence on pituitary gland function.
- 1857 hypothalamus: The ventral part of the vertebrate forebrain; functions in maintaining homeostasis, especially in coordinating the endocrine and nervous systems; secretes hormones of the posterior pituitary and releasing factors, which regulate the anterior pituitary.
- 1858 hypothermia therapy: The use of cooling procedures, which potentially preserve post-injury neurological function by reducing the cord's metabolic and energetic requirements.
- 1859 hypothesis: A temporary working explanation or supposition based on accumulated facts and suggesting some general principle or relation of cause and effect; a postulated solution to a scientific problem that must be tested and if not validated, discarded.
- 1860 hypotonia: A condition of diminished tone of the skeletal muscles, and the reduced resistance of muscles to passive stretching; may be a symptom with several LSDs.
- 1861 hypotonic solution: A solution with a lesser solute concentration than another, a hypertonic solution.
- 1862 hypotonic: Hypotonic or hypotonia means having less than normal tone or tension. Children with CMD are often hypotonic at, or shortly after, birth.
- 1863 hypoventilation: The state in which a reduced amount of air enters the alveoli in the lungs, resulting in decreased levels of oxygen and increased levels of carbon dioxide in the blood. Hypoventilation can be due to breathing that is too shallow (hypopnea) or too slow (bradypnea) or to diminished lung function.
- 1864 hypoxia: A deficiency in oxygen reaching tissues.
- 1865 ichthyologist: Biologists who specialize in the study of fish behavior, anatomy, physiology, and evolution.
- 1866 ICM cells: Cells from the inner cell mass, a population of cells inside the blastula that give rise to the body of the new organism rather than to the chorion or other supporting structures.
- 1867 identical twinning: Process in which genetically identical organisms arise from symmetrical division and separation of totipotent cells.
- 1868 idiopathic: Refers to a disease or condition of unknown cause or origin.
- 1869 IgE antibodies: A type of immunoglobulin whose overproduction by plasma cells results in allergic reactions.
- 1870 IL-1 (interleukin-1): A cell product involved in the immune response (cytokine) which facilitates osteoblast growth among its many functions.
- 1871 IL-6 (interleukin-6): A cytokine that stimulates osteoclast precursors and mature osteoclasts among its many functions.
- 1872 iliac bone: The largest bone of the pelvis, which is a source of autologous, bone-marrow stem cells.
- 1873 imaginal disk: An island of undifferentiated cells in an insect larva, which are committed (determined) to form a particular organ during metamorphosis to the adult.
- 1874 imaging: A radiology technique or method allowing a physician to see a graphic representation of something that would not normally be visible.
- 1875 imbibition: The capillary movement of water into germinating seeds and into substances such as wood and gelatin, which swell as a result.
- 1876 immortal strand: The hypothesis of selective retention of parental DNA strands during asymmetric self-renewal. Potential mechanism to protect stem cells from the mutations associated with replication.
- 1877 immortalization: While human cells generally have a finite capacity to divide, they can occasionally be made to divide without limit, usually by restoring telomeres through the protein telomerase. Cells that divide without limit are said to be immortal. The process of transforming a mortal cell to immortality is immortalization.
- 1878 immulite®: Laboratory console manufactured by Diagnostics Products Company (DPC) that evaluates biomarkers such as ultrasensitive PSA.
- 1879 immune compromised: A condition in which the patient has a much higher risk of infection due to a weak immune system.

- 1880 immune privilege: Certain organs are not easily accessible to immune cells and are referred to as immune privileged sites e.g. eye
- 1881 immune reaction: A bodily defense reaction that recognizes an invading substance (an antigen: such as a virus or fungus or bacteria or transplanted organ) and produces antibodies specific against that antigen.
- 1882 immune rejection: Can occur as a result of a transplant when the donor type of cell or organ is not a close enough match to the recipient type. Drugs to suppress the patient's immune system help reduce this problem.
- 1883 immune response: A highly specific defensive reaction of the body to invasion by a foreign substance or organism; consists of a primary response in which the invader is recognized as foreign, or "not-self," and eliminated and a secondary response to subsequent attacks by the same invader. Mediated by two types of lymphocytes B cells, which mature in the bone marrow and are responsible for antibody production, and T cells, which mature in the thymus and are responsible for cell-mediated immunity.
- 1884 immune system ablation: The destruction of the patient's immune system by medication, in order to create a "compartment" (blood space) for new cells to fit into and to minimize rejection risk. This carries a significant risk of mortality and is unnecessary in certain conditions. Diseases that were previously treated after ablation, now respond to stem cell therapy without this procedure.
- 1885 immune system cells: White blood cells or leukocytes that originate from the bone marrow. They include antigen-presenting cells, such as dendritic cells, T and B lymphocytes, and neutrophils, among many others.
- 1886 immune system modulation: The response of the immune system, sometimes to mesenchymal stem cells, that is characterised by reduction of immune system over-activity and significant amelioration of the affected disease state.
- 1887 immune system: An intricate system of cellular and chemical responses designed to protect the body from foreign substances and prevent recurrent illness by counteracting previous diseases through immunity. Bone marrow represents the body's primary producer of immune cells.
- 1888 immune-function assay: A general term for a number of tests based on an immune cell's ability to carry out a particular immune function.
- 1889 immunoassay: A laboratory technique that makes use of the binding between an antigen and its homologous antibody in order to identify and quantify the specific antigen or antibody in a sample.
- 1890 immunoblot: A blot in which a radiolabeled antibody is used as the molecular probe.
- 1891 immunocompromised mice: These genetically altered mice are used for transplantation experiments because they usually do not reject the transplanted tissue.
- 1892 immunocontraception: A method (not currently used) of reducing fertility of a pest species by controlling or preventing conception and pregnancy.
- 1893 immunodeficient mice: Genetically altered mice used in transplantation experiments because they usually do not reject transplanted tissue.
- 1894 immunodeficient: Unable to develop a normal immune response to, for example, a foreign substance.
- 1895 immunofluorescence: The detection of antibodies by using special proteins labeled with fluorescein. When present, the specific organism or antibody is observed as a fluorescent material when examined microscopically while illuminated with a fluorescent light source.
- 1896 immunogenic: Anything that can evoke an immune response or produce immunity.
- 1897 immunoglobulin: An antibody or, more generally, antibodies which provide protection against infectious agents. Immunoglobulins are produced by lymphocytes of the B cell type in response to the stimulation of infectious agents or the contents of vaccines. Immunoglobulins are soluble proteins present in blood serum and other body fluids. Temporary protection via immunoglobulins can be transferred to another person through injection of a purified portion of a donor's serum.
- 1898 immunohistochemistry: Of or relating to the application of tissue chemistry and immune reaction methods to analysis of living cells and tissues
- 1899 immunohistology: Examination of tissues through specific immunostaining techniques.
- 1900 immunoperoxidase: Stains which are used in the microscopic examination of tissues. These stains are based on antibodies which will bind to specific antigens, usually of protein or glycoprotein origin.
- 1901 immunophenotyping: Identification of various types of immune cells by sorting them according to their cell-surface markers.
- 1902 immunopositive: A positive result is observed on immunostaining for the target substance.
- 1903 immunostaining: The staining of a specific substance by using an antibody against it which is complexed (formed into a complex) with a staining medium.
- 1904 immunosuppression: The artificial suppression of the immune response, usually through drugs, so that the body will not reject a transplanted organ or tissue. Drugs commonly used to suppress the immune system after transplant include prednisone, azathioprine (Imuran), cyclosporin, OKT3 and ALG.
- 1905 immunosuppressive drugs: Drugs that prevent or interfere with the development of an immunologic response. After a transplant, immunosuppressive drugs are usually necessary in order to prevent the recipient from rejecting the transplant.
- 1906 immunosuppressive: Suppressing a natural immune response.
- 1907 immunotherapy: Treatment of disease by stimulating the body's own immune system. This is a type of therapy currently being researched as a treatment for cancer.
- 1908 implant: A device that is inserted into the body; e.g., a tiny container of radioactive material inserted in or near a tumor; also a device inserted in order to replace or substitute for an ability which has been lost; for example, a penile implant is a device which can be surgically inserted into the penis to provide rigidity for intercourse.
- 1909 implantation: The process by which the embryo attaches itself to the wall of the maternal uterus, enabling growth beyond the blastocyst.
- 1910 impotence: the inability to have or to maintain an erection satisfactory for intercourse; also known as ED or erectile dysfunction
- 1911 imprinted gene: A gene that behaves one way when inherited from the father and another way when inherited from the mother. For example, the paternal copies of some imprinted genes are never "turned on," or activated.
- 1912 imprinting: Suppression or silencing of genes depending on which parent they were received from. When DNA is passed to daughter cells after fertilisation of an egg by a sperm, certain alleles can become active only if they were received from the mother, others only if they came from the father. If a gene is suppressed through imprinting from one parent, and the allele from the other parent is not expressed because of mutation, neither allele can be expressed.
- 1913 in situ: In the natural or usual place.
- 1914 in utero: In the uterus.
- 1915 in vitro fertilisation (IVF): Methods of carrying out fertilisation outside the body, frequently used to assist couples unable to conceive naturally.

- 1916 in vitro fertilization (IVF): A laboratory procedure in which sperm are placed with an unfertilized egg in a Petri dish to achieve fertilization. The embryo is then transferred into the uterus to begin a pregnancy or cryopreserved (frozen) for future use. IVF was originally devised to permit women with damaged or absent Fallopian tubes to have a baby. Normally a mature egg is released from the ovary (ovulated), then enters the Fallopian tube, and waits in the neck of the tube for a sperm to fertilize it. With defective Fallopian tubes, this is not possible. The first IVF baby, Louise Joy Brown, was born in England in 1978.
- 1917 in vitro fertilization (IVF): A procedure where an egg cell (the oocyte) and sperm cells are brought together in a laboratory dish (i.e. in vitro), so that a sperm cell can fertilize the egg. The resulting fertilized egg, called a zygote, will start dividing and after a several divisions, forms the embryo that can be implanted into the womb of a woman and give rise to pregnancy.
- 1918 in vitro stem cell: Self-renewal ex vivo in cells that do not overtly behave as stem cells in vivo. Occurs due to liberation from inductive commitment signals or by creation of a synthetic stem-cell state.
- 1919 in vitro: Describing a process carried out in the laboratory, reflecting a similar process that occurs inside the body.
- 1920 in vivo: Latin for in the living, in the body, within the living. In vivo is used to indicate the presence of a whole/living organism (for example, in an experiment), in distinction to a partial or dead organism or a computer model. Animal testing and clinical trials are both forms of in vivo research.
- 1921 inborn errors of metabolism: The genetic absence or malformation of a certain gene, or the protein that it encodes, which causes a baby to be born without the ability to process, or metabolize, certain compounds. This kind of genetic error is not enough to cause the death of the fetus, as the mother has been able to process the compounds as long as her blood has been handling the waste in the fetal blood. But after birth, the precursor compounds to that chemical step build up in the body. The build up of these compounds causes a variety of problems, from swollen liver to blindness to death in a few months. Some of these disorders are tested at birth, for example PKU, the inability to process the amino acid phenylalanine, and Maple Sugar Urine disease, common in the Amish and Mennonite communities. These disorders can often be easily cured by administration of liver stem cells, which differentiate into normal liver cells, and take over the processing of the built-up metabolic byproducts.
- 1922 inbreeding: The mating of individuals that are closely related genetically.
- 1923 incidence: The rate at which a certain event occurs (e.g., the number of new cases of specific disease occurring during a certain period of time).
- 1924 incidental: Insignificant or irrelevant; for example, incidental prostate cancer (also known as latent prostate cancer) is a form of prostate cancer which is of no clinical significance to the patient in whom it is discovered.
- 1925 incisional biopsy: An incisional biopsy is different from an excisional biopsy because the surgeon does not attempt to remove the entire mass. An incisional biopsy is performed to obtain a fragment of tissue to send to the pathologist for diagnosis.
- 1926 inclusive fitness: The relative number of an individual's alleles that are passed on from generation to generation, either as a result of his or her own reproductive success, or that of related individuals.
- 1927 incomplete dominance: A type of inheritance in which F1 hybrids have an appearance that is intermediate between the phenotypes of the parental varieties.
- 1928 incomplete flower: A flower lacking sepals, petals, stamens, or carpels.
- 1929 incomplete injury: Some sensation or motor function below the injury site.
- 1930 incomplete metamorphosis: A type of development in certain insects, such as grasshoppers, in which the larvae resemble adults but are smaller and have different body proportions. The animal goes through a series of molts, each time looking more like an adult, until it reaches full size.
- 1931 incontinence: Loss of urinary control; there are various kinds and degrees of incontinence; overflow incontinence is a condition in which the bladder retains urine after voiding; as a consequence, the bladder remains full most of the time, resulting in involuntary seepage of urine from the bladder; stress incontinence is the involuntary discharge of urine when there is increased pressure upon the bladder, as in coughing or straining to lift heavy objects; total incontinence is the inability to voluntarily exercise control over the sphincters of the bladder neck and urethra, resulting in total loss of retentive ability.
- 1932 incubator: A sealed box used to maintain constant temperature, humidity and carbon dioxide levels. This is necessary so that the cells grow like they would in the body.
- 1933 independent variable: In an experiment, when one factor is manipulated, a second factor responds. The independent variable is the factor that is manipulated.
- 1934 indeterminate cleavage: A type of embryonic development in deuterostomes, in which each cell produced by early cleavage divisions retains the capacity to develop into a complete embryo.
- 1935 indeterminate growth: A type of growth characteristic of plants, in which the organism continues to grow as long as it lives.
- 1936 indication: Mozobil (plerixafor injection) is indicated in combination with granulocyte-colony stimulating factor (G-CSF) to mobilize hematopoietic stem cells to the peripheral blood for collection and subsequent autologous transplantation in patients with non-Hodgkin's lymphoma (NHL) and multiple myeloma (MM).
- 1937 indigenous healing: The traditional healing practices of indigenous cultures (e.g., Native American).
- 1938 individualized education program: In the United States an Individualized Education Program, commonly referred to as an IEP, is mandated by the Individuals with Disabilities Education Act (IDEA). In Canada and the United Kingdom, an equivalent document is called an Individual Education Plan. In the US, the IDEA requires public schools to develop an IEP for every student with a disability who is found to meet the federal and state requirements for special education. The IEP must be designed to provide the child with a Free Appropriate Public Education. The IEP refers both to the educational program to be provided to a child with a disability and to the written document that describes that educational program. IEPs are written for children aged 3 and older.
- 1939 indolent: Minimal disease, defined as < 0.5 cc of cancer confined to the prostate with no Gleason grade 4 or 5.
- 1940 indomethacin: An anti-inflammatory, antipain, and antifever drug. Its primary use is in rheumatoid arthritis and degenerative joint disease when aspirin-based products are ineffective or cannot be tolerated.
- 1941 induced fit: The change in shape of the active site of an enzyme so that it binds more snugly to the substrate, induced by entry of the substrate.
- 1942 induced pluripotent stem (iPS) cell: Somatic cells induced to a pluripotent embryonic stem cell-like state. The process of creating these cells, often referred to as "reprogramming" involves introducing a combination of

- three to four genes for transcription factors, delivered by retroviruses, into the somatic cell. Cells can be taken from patients with specific diseases such as ALS, Parkinson's, or cardiovascular disease and induced to form iPS cells. Multiple uses can be derived from iPS cells when they are differentiated to more specialized cell types, including the development of assays for studying disease processes, scanning drug candidates for safety and effectiveness, or application to regenerative medicine.
- 1943 induction: (1) The ability of one group of embryonic cells to influence the development of another. (2) In genetics, the phenomenon in which the presence of a substrate (the inducer) initiates transcription and translation of the genes coding for the enzymes required for its metabolism.
- 1944 inert gases: An elemental family with unique properties, which includes helium, neon, argon, krypton, and xenon.
- 1945 infection: The growth of a parasitic organism within the body. (A parasitic organism is one that lives on or in another organism and draws its nourishment therefrom.) A person with an infection has another organism (a "germ") growing within him, drawing its nourishment from the person.
- 1946 infectious disease markers: Elements in a person's blood which indicate if a person has had an infectious disease.
- 1947 infectious disease testing: The method to determine if a person has or did have an infectious disease.
- 1948 infertile: Incapable of initiating, sustaining, or supporting reproduction. Alternatively, not fertilised and therefore incapable of growing and developing.
- 1949 infiltrate (adj. infiltrative): To penetrate through a porous tissue.
- 1950 inflammation: Any form of swelling or pain or irritation.
- 1951 inflammatory response: A line of defense triggered by penetration of the skin or mucous membranes, in which small blood vessels in the vicinity of an injury dilate and become leakier, enhancing the infiltration of leukocytes; may also be widespread in the body.
- 1952 informatics: Storing, manipulating, analyzing and visualizing information using computer systems.
- 1953 informed consent: A term describing the responsibility of doctors or researchers to ensure that patients or people have an understanding of the relevant facts regarding their care or participation in research. Consumers also have a right to practice informed consent when they buy particular foods. Informed consent relies on our having access to reliable, truthful, and complete information.
- 1954 infrared: Denoting thermal radiation of wavelength greater than that of the red end of the spectrum (the recorded band of wavelengths of electromagnetic vibrations of variable light).
- 1955 infundibulum: Any of various funnel-shaped organs or parts.
- 1956 infusion: The introduction of a fluid other than blood into a vein, often over a long period of time. Many medicines (including enzyme replacement therapy) are administered by infusion.
- 1957 ingestion: A heterotrophic mode of nutrition in which other organisms or detritus are eaten whole or in pieces.
- 1958 inherited: Traits or characteristics that come from one's ancestors and are transmitted from parents to offspring through genes. The traits will therefore be present at birth.
- 1959 inhibitory postsynaptic potential (IPSP): An electrical charge (hyperpolarization) in the membrane of a postsynaptic neuron caused by the binding of an inhibitory neurotransmitter from a presynaptic cell to a postsynaptic receptor; makes it more difficult for a postsynaptic neuron to generate an action potential.
- 1960 injection: Administering a substance inside of the body, by means of a syringe and hypodermic ("under skin") needle.
- Stem cells may be injected into specific sites, or injected under the skin to allow them to migrate elsewhere.
- 1961 injury: Harm or hurt. The term "injury" may be applied in medicine to damage inflicted upon oneself as in a hamstring injury or by an external agent on as in a cold injury. The injury may be accidental or deliberate, as with a needlestick injury. The term "injury" may be synonymous (depending on the context) with a wound or with trauma.
- 1962 innate releasing mechanism: In ethology, a circuit within an animal's brain that is hypothesized to respond to a specific stimulus, setting in motion, or "releasing," the sequence of movements that constitute a fixed action pattern.
- 1963 inner cell mass (ICM): A small group of cells attached to the wall of the blastocyst (the embryo at a very early stage of development that looks like a hollow ball). Embryonic stem cells are made by isolating and culturing the cells that make up the inner cell mass. In development, it is the inner cell mass that will eventually give rise to all the organs and tissues of the future embryo and fetus, but do not give rise to the extra-embryonic tissues, such as the placenta.
- 1964 innervate: To supply with nerves; to make contact with target muscles or nerves.
- 1965 inorganic: (1) Chemicals that are not organic, that is, not manufactured within living organisms. (2) Any chemical compound not based on carbon chains or rings (except oxides, sulphides of carbon and metallic carbides that are also inorganic).
- 1966 inositol trisphosphate (IP3): The second messenger, which functions as an intermediate between certain nonsteroid hormones and the third messenger, a rise in cytoplasmic Ca²⁺ concentration.
- 1967 input traits: Traits introduced into crop plants with the aim of lowering the cost of production and improving the performance of the crop in the field. For example: pesticide resistance, herbicide tolerance and disease resistance. This is in comparison to traits introduced into the crop to produce products with improved value. These are referred to as output traits.
- 1968 insecticide: A chemical that kills insects.
- 1969 insertion mutation: DNA is the genetic language and is read from left to right in 3 letter words.
- 1970 insertion sequence: The simplest kind of a transposon, consisting of inserted repeats of DNA flanking a gene for transposase, the enzyme that catalyzes transposition.
- 1971 insertion: A mutation involving the addition of one or more nucleotide pairs to a gene.
- 1972 insight learning: The ability of an animal to perform a correct or appropriate behavior on the first attempt in a situation with which it has had no prior experience.
- 1973 insomnia: Insomnia is characterized by an inability to sleep and/or to remain asleep for a reasonable period.
- 1974 instar: The stage of an arthropod's life cycle between molts (shedding of the exoskeleton). As an example, the third instar is the stage of the life cycle between the second and third molting cycles. Some arthropods molt throughout their entire life and may have as many as 30 instars. Insects tend to have a set number of instars, the number varying by species. The instars succeed one another until the final mature instar, when the organism stops molting.
- 1975 Institutional Review Board (IRB): A group of scientists, doctors, clergy, and consumers at each health care facility that participates in a clinical trial. IRBs are designed to protect study participants. They review and must approve the action plan for every clinical trial.
- 1976 insulin growth factor1 (IGF-1): A growth factor that stimulates PC cell growth and osteoblast growth.
- 1977 insulin: A hormone produced by special cells in the pancreas. Insulin allows glucose to enter the body's cells, where it is used as an energy source. In type 1 diabetes (insulin-dependent diabetes) the body does not produce

- insulin, causing glucose to build up in the blood, giving high blood sugar levels. Type 1 diabetics can't make their own insulin so they must inject it every day..
- 1978 insulin-promoting factor 1: A transcription factor expressed in the pancreas and necessary for the production of insulin.
- 1979 insurance terms: A special glossary of health care coverage terms can be found in the Patient Resources section of this Web site.
- 1980 integrative care: At CTCA, a patient meets with both an oncologist specializing in conventional therapies as well as practitioners of complementary and alternative medicines such as nutritional, physical, psychological and spiritual therapies.
- 1981 intellectual property (IP): The content of the human intellect, or the result of intellectual effort, which is considered to be unique and original and have value in the marketplace, and therefore requires legal protection and ownership. This includes copyrighted material such as literary or artistic works, industrial processes, and trademarks and patents.
- 1982 intensity map: Representations of energy deposited per unit volume across a treatment volume when the deposition of energy is not delivered in a homogeneous manner.
- 1983 intensity modulated radiation therapy: An approach to radiation therapy allowing the treatment team to specify the tumor target dose and the amount of radiation allowable to the nearby tissues and uses sophisticated computer planning to arrive at acceptable equations; sophisticated hardware is also incorporated into this planning that allows the radiation intensity to be modulated up or down as the delivery system rotates around the patient.
- 1984 interferon: A chemical messenger of the immune system, produced by virus-infected cells and capable of helping other cells resist the virus.
- 1985 interleukin (IL): any of various compounds of low molecular weight that are produced by T-cells and macrophages and that function especially in regulation of the immune system and cell-mediated immunity
- 1986 interleukin: Interleukin-1, a chemical regulator (cytokin) secreted by macrophages that have ingested a pathogen or foreign molecule and have bound with a helper T cell; stimulates T cells to grow and divide and elevates body temperature. Interleukin-2, secreted by activated T cells, stimulates helper T cells to proliferate more rapidly.
- 1987 interleukins: A family of cytokines (chemical messengers) that include IL-1, IL-d (sometimes called T-cell growth factor), IL-10 and IL-12. Different interleukons have different functions: IL-3 promotes the growth and differentiation of several types of blood cells (red, white, and platelets). IL-4 is released by a subset of CD4 cells, and helps stimulate antibody production. IL-6 is produced by macrophages and mediates acute systemic immune responses (e.g., fever). IL-10 stimulates B-cells (which produce antibodies), modulates macrophage function, enhances humoral macrophage function, and enhances humoral immunity, while suppressing cell-mediated immune function. IL-12 is produced by various immune cells, activates natural killer cells and cytotoxic T-lymphocytes and induces the production of interferon-gamma. IL-12 is associated with the cell-mediated immune response.
- 1988 intermediate filament: A component of the cytoskeleton that includes all filaments intermediate in size between microtubules and microfilaments.
- 1989 intermittent androgen deprivation: ADT that discontinues testosterone lowering therapy with the intent to allow the patient to recover from symptoms of ADS as testosterone levels recover to normal.
- 1990 interneuron: An association neuron; a nerve cell within the central nervous system that forms synapses with sensory and motor neurons and integrates sensory input and motor output.
- 1991 internode: The segment of a plant stem between the points where leaves are attached.
- 1992 interphase: The period in the cell cycle when the cell is not dividing. During interphase, cellular metabolic activity is high, chromosomes and organelles are duplicated, and cell size may increase. Interphase accounts for 90% of the time of each cell cycle.
- 1993 interspecific: Between species.
- 1994 interstitial cells: Cells scattered among the seminiferous tubules of the vertebrate testis that secrete testosterone and other androgens, the male sex hormones.
- 1995 interstitial fluid: The internal environment of vertebrates, consisting of the fluid filling the spaces between cells.
- 1996 interstitial: Within a particular organ; for example, interstitial prostate radiation therapy is radiation therapy applied within the prostate using implanted radioactive pellets or seeds.
- 1997 intertidal zone: The shallow zone of the ocean where land meets water.
- 1998 intervertebral disc: A spongy, shock-absorbing, cartilaginous tissue lying between adjacent vertebrae.
- 1999 intestinal Stem Cell: A multipotent cell found in the intestine, giving rise to all types of cells in the gut such as enterocytes, goblet cells, paneth cells, and endocrine cells.
- 2000 intracavernosal: Within the corpus cavernosum.
- 2001 intracrinology: The part of endocrinology that focuses on the fact that, in men and women, an important proportion of androgens and estrogens are synthesized locally at their site of action in peripheral target tissues.
- 2002 intraductal: Within a duct.
- 2003 intraepithelial: Within the layer of cells that forms the surface or lining of an organ.
- 2004 intramedullary: Inside the bone marrow.
- 2005 intraoperative: Occurring, carried out, or encountered in the course of surgery.
- 2006 intraperitoneal: The injection of a substance into the peritoneum or body cavity.
- 2007 intrathecal: Inside of the spinal canal, or inside of the skull, but outside the brain, in the spinal fluid. Intrathecal injection of neuronal stem cells, placing them directly into the spinal fluid that surrounds the brain and spinal cord, is one possible route of administering them, to allow them to access spinal cord and brain lesions. Spinal puncture is the usual route for intrathecal injections.
- 2008 intravascular compartment: Blood vessels within the bone marrow microenvironment.
- 2009 intravascular: Within a vessel or vessels.
- 2010 intravenous pyelogram (IVP): A procedure that introduces an X-ray absorbing dye into the urinary tract.
- 2011 intravenous: Administered by injection into a vein.
- 2012 intrinsic rate of increase: The difference between the number of births and the number of deaths, symbolized as r_{max} ; the maximum population growth rate.
- 2013 introgression: The transplantation of genes between species resulting from fertile hybrids mating successfully with one of the parent species.
- 2014 intron: A sequence of DNA, found within a gene, which is initially copied into messenger RNA but is cut out before the messenger RNA is translated and does not have a function in coding for proteins.
- 2015 introns/exons: Genes have both noncoding (introns) and coding (exons) regions. The noncoding regions contain genetic information that gets cut out when the genetic information goes from DNA to RNA and is not integral to protein manufacture. Point mutations in the introns usually have no effect, unless they cause a shift in the reading frame through an insertion or deletion. Exons contain the actual genetic information that will be used to manufacture

- proteins. Point mutations, insertions, duplications and deletions all are types of mutations that change the genetic code and can lead to disease.
- 2016 invagination: The local infolding of a layer of tissue, especially in animal embryos, so as to form a depression or pocket opening to the outside.
- 2017 invasive: Requiring an incision or the insertion of an instrument or substance into the body.
- 2018 inverse planning: Treatment planning for radiation therapy in which various aspects of the treatment plan are generated by a computer in order to achieve the dose distribution prescribed by a physician.
- 2019 inversion: An aberration in chromosome structure resulting from an error in meiosis or from mutagens; reattachment in a reverse orientation of a chromosomal fragment to the chromosome from which the fragment originated.
- 2020 invertebrate: An animal without a backbone; invertebrates make up 95% of animal species.
- 2021 investigational: A drug or procedure allowed by the FDA for use in clinical trials.
- 2022 involution: A normal process marked by decreasing size of an organ.
- 2023 iodine-125: Radioactive source used for brachytherapy. I=125 gives off energy at a slow and continuous rate. The half life of iodine is 60 days.
- 2024 ion channel: A protein that serves as a pore in the cell membrane, allowing the regulated flow of ions (e.g., potassium, sodium, and calcium ions) across the membrane and, in turn, neuronal conduction.
- 2025 ion: Atom or molecule that has acquired an electric charge by the loss or gain of one or more electrons.
- 2026 ionic bond: A chemical bond resulting from the attraction between oppositely charged ions.
- 2027 ionize: to dissociate atoms or molecules into electrically charged atoms or radicals
- 2028 ionizing radiation: Corpuscular (e.g., neutrons, electrons) or electromagnetic (e.g., gamma) radiation of sufficient energy to ionise the irradiated material.
- 2029 iPS cell: Refers to the tightly packed homogenous cluster of induced pluripotent cells. Undifferentiated embryonic stem cells and induced pluripotent stem cells grow in colonies in vitro. As the pluripotent cells begin to differentiate, the cells will no longer form colonies and will instead appear flattened. The emergence of colonies is one of the first signs that somatic cells have been successfully reprogrammed into iPS cells.
- 2030 ipsilateral: Pertaining to, situated on, or affecting the same side of the body.
- 2031 irradiate: Application of radiation from a source (heat, light, Xrays) to a structure or organism.
- 2032 ischemia: A reduction in blood flow.
- 2033 islet cell: The functional cell of the pancreas that is responsible for secreting insulin, glucagon, gastrin and somatostatin. Together, these molecules regulate a number of processes including carbohydrate and fat metabolism, blood glucose levels and acid secretions into the stomach.
- 2034 islets of Langerhans: Also called ISLANDS OF LANGERHANS, irregularly shaped patches of endocrine tissue located within the pancreas of most vertebrates. They are named for the German physician Paul Langerhans, who first described them in 1869. The normal human pancreas contains about 1,000,000 islets.
- 2035 isodose contour: A two or three-dimensional shape that contains the volume receiving a dose greater than or equal to a specified amount.
- 2036 isodose line: A two-dimensional line that circumscribes an area receiving a dose greater than or equal to a specified amount.
- 2037 isoform: One of a set of similar proteins that have the same function but slightly different composition, e.g. free and complexed PSA.
- 2038 isogamy: A condition in which male and female gametes are morphologically indistinguishable.
- 2039 isolating mechanisms: Mechanisms that prevent genetic exchange between individuals of different populations or species; they prevent mating or successful reproduction even when mating occurs; may be behavioral, anatomical, or physiological.
- 2040 isomer: One of several organic compounds with the same molecular formula but different structures and therefore different properties. The three types are structural isomers, geometric isomers, and enantiomers.
- 2041 isomorphic generations: Alternating generations in which the sporophytes and gametophytes look alike, although they differ in chromosome number.
- 2042 isotherm: A line on a chart representing the locations of zones having a particular temperature.
- 2043 isotonic solution: Solutions of equal solute concentration.
- 2044 isotope: One of several atomic forms of an element, each containing a different number of neutrons and thus differing in atomic mass.
- 2045 iterations: Repeated series of steps, performed either by the computer or by the user, implemented to develop a treatment plan.
- 2046 Jackson-Pratt drain: a suction drain inside the body and connected to clear plastic tubing through the skin
- 2047 joint stiffness: Allied diseases often interfere with muscle control and subsequent joint movement leading to stiffness and reduced range of motion.
- 2048 joule (J): A unit of energy: 1 J = 0.239 cal; 1 cal = 4.184 J.
- 2049 junk DNA (non-coding DNA): DNA in the genome that is not directly involved in making proteins or other molecules. About 98 percent of the human genome consists of non-coding DNA. The term "junk" reflects the outdated belief that this DNA accumulated over the course of evolution and no longer serves a purpose in humans. But it's now clear that some non-coding DNA controls the activity of genes and may have other functions.
- 2050 juvenile diabetes: An autoimmune disease where the β -cells in the pancreas are destroyed and therefore the individual loses some or all of his/her ability to regulate and produce insulin. If left untreated, it can have severe side effects such as kidney failure, blindness, stroke and even death.
- 2051 juvenile hormone (JH): A hormone in arthropods, secreted by the corpora allata glands, that promotes the retention of larval characteristics.
- 2052 juxtaglomerular apparatus (JGA): Specialized tissue located near the afferent arteriole that supplies blood to the kidney glomerulus; the JGA raises blood pressure by producing renin, which activates angiotensin.
- 2053 Kahler disease: A fatal condition with occurrence of multiple malign tumours disease (multiple myeloma) in the bone marrow, causing disturbances of its function. AKA: Kahler-Bozzolo disease, Bence Jones syndrome, Huppert disease, MacIntyre syndrome, Rustitskii disease, von Rustitskii syndrome.
- 2054 Kaplan-Meier method: A statistical method that produces a graph showing the percent of a patient population surviving at various intervals of time after the start of the study or treatment.
- 2055 kaposi sarcoma: A malignant neoplastic vascular proliferation characterized by soft purplish nodules that usually occur first on the toes or feet and then slowly spread over the skin, increasing in size and number.
- 2056 karnofsky Performance Status: index that allows cancer patients to be classified using a standard way of measuring the ability to perform ordinary tasks.

- 2057 karyogamy: The fusion of nuclei of two cells, as part of syngamy.
- 2058 karyokinesis: Division of the nucleus during the cell cycle.
- 2059 karyotype: A method of organizing the chromosomes of a cell in relation to number, size, and type.
- 2060 Kegel exercises: A set of exercises designed to improve the strength of the muscles used in urinating.
- 2061 keratin: Any of various sulfur containing fibrous proteins that form the chemical basis of horny epidermal tissues (as hair and nails) and are typically not digested by enzymes of the gastrointestinal tract.
- 2062 keratinocytes: Cells that synthesize keratin and are found in the skin, hair, and nails. A fibrous protein is produced by keratinocytes and may be hard or soft. The hard keratin is found in hair and nails. The soft keratin is found in the epidermis of the skin in the form of flattened non-nucleated scales that slough continually.
- 2063 keystone predator: A predatory species that helps maintain species richness in a community by reducing the density of populations of the best competitors so that populations of less competitive species are maintained.
- 2064 keystone species: A species that is of exceptional importance in maintaining the species diversity of a community; when a keystone species is lost, the diversity of the community decreases and its structure is significantly altered.
- 2065 kidney: In vertebrates, the organ that regulates the balance of water and solutes in the blood and the excretion of nitrogenous wastes in the form of urine.
- 2066 killer cells: White blood cells that attack tumor cells and body cells that have been invaded by foreign substances.
- 2067 kilocalorie (kcal): A thousand calories; the amount of heat energy required to raise the temperature of 1 kg of water 1°C.
- 2068 kin selection: A phenomenon of inclusive fitness, used to explain altruistic behavior between related individuals.
- 2069 kinase: An enzyme that catalyzes the conversion of a proenzyme to an active enzyme.
- 2070 kinesis: A change in activity rate in response to a stimulus.
- 2071 kinetic energy: The energy of motion, which is directly related to the speed of that motion. Moving matter does work by transferring some of its kinetic energy to other matter.
- 2072 kinetics: The study of acceleration, motion or rate of change
- 2073 kinetochore: A specialized region on the centromere that links each sister chromatid to the mitotic spindle.
- 2074 kingdom: A taxonomic category, the second broadest after domain.
- 2075 Klf The Krüppel: Like family of transcription factors, named for their homology to the *Drosophila* Krüppel protein. All KLF family members are characterized by their three Cys2 His2 zinc fingers located at the C-terminus, separated by a highly conserved H/C link.
- 2076 Klinefelter syndrome: Syndrome in males that is characterized by small testes and long legs and enlarged breasts and reduced sperm production and mental retardation; a genetic defect in which an extra X chromosome (XXY) is present in the male.
- 2077 knock: Down reduction of gene expression via RNA interference, mediated by short interfering RNA (siRNA) or short hairpin (shRNA).
- 2078 knock-out mouse: A mouse that has had one or both copies of a specific gene deleted or inactivated.
- 2079 Koch's postulates: A set of four criteria for determining whether a specific pathogen is the cause of a disease.
- 2080 Krebs cycle: A chemical cycle involving eight steps that completes the metabolic breakdown of glucose molecules to carbon dioxide; occurs within the mitochondrion; the second major stage in cellular respiration.
- 2081 Kruppel-like factor 4 (Klf-4): A transcription factor that is highly expressed in undifferentiated embryonic stem cells and is also expressed elsewhere in the adult organism, including the gut, testis and lungs, and regulates proliferation, differentiation and cell survival. In 2006, the Yamanaka lab identified Klf-4 as one of the four factors that, when co-transfected and expressed in mouse adult fibroblasts, caused the fibroblasts to revert to a pluripotent-like state. One year later, the same four factors were used to successfully reprogram human adult fibroblast cells into induced pluripotent stem cells. These four factors are Oct-4, SOX2, Klf-4 and c-Myc.
- 2082 Kruppel-like factor 4 (Klf-4): A transcription factor that is highly expressed in undifferentiated ES cells and is also expressed elsewhere in the adult organism including the gut, testis and lungs and functions to regulate proliferation, differentiation and cell survival.
- 2083 K-selection: The concept that in certain (K-selected) populations, life history is centered around producing relatively few offspring that have a good chance of survival.
- 2084 label: Retaining cell candidate for adult tissue stem cell because of slow division rate and/or immortal strand retention. Interpret with caution.
- 2085 laboratory: A place for doing tests and research procedures and preparing chemicals, etc. Although "laboratory" looks very like the Latin "laboratorium" (a place to labor, a work place), the word "laboratory" came from the Latin "elaborare" (to work out, as a problem, and with great pains), as evidenced by the Old English spelling "elaboratory" designating "a place where learned effort was applied to the solution of scientific problems."
- 2086 lacteal: A tiny lymph vessel extending into the core of an intestinal villus and serving as the destination for absorbed chylomicrons.
- 2087 lactoferrin: A breast milk protein that promotes infant growth.
- 2088 Lacunae: The spaces occupied by cells (e.g., chondrocytes and osteocytes) of calcified tissues.
- 2089 LAD: A standard medical abbreviation for LymphADenopathy (lymphadenopathy) -- LAD = enlarged or swollen lymph nodes.
- 2090 lagging strand: A discontinuously synthesized DNA strand that elongates in a direction away from the replication fork.
- 2091 lamella: Layer, thin sheet.
- 2092 lamina propria: A highly vascular layer of connective tissue under the basement membrane lining a layer of epithelium.
- 2093 laminectomy: A surgical procedure which removes a portion of vertebral structures and is used for a variety of purposes, such as decompressing or accessing the spinal cord.
- 2094 Laparoscopic surgery: A surgical technique in which abdominal operations are carried out with small incisions with the assistance of a laparoscope.
- 2095 laparoscopy: A technique that allows the physician to observe internal organs directly through a piece of optical equipment inserted directly into the body through a small surgical incision.
- 2096 laparotomy: An operation in which the abdomen is opened to look for the cause of an undiagnosed illness.
- 2097 larva (pl. larvae): A free-living, sexually immature form in some animal life cycles that may differ from the adult in morphology, nutrition, and habitat.
- 2098 lasers: Amplify light by producing coherent light beams. Laser is an acronym for light amplification by stimulated emission of radiation.
- 2099 latent: (1) Insignificant or irrelevant; for example, latent prostate cancer (also known as incidental prostate cancer) is a form of prostate cancer which is of no clinical

- significance to the patient in whom it is discovered; (2) pathology, in a dormant or hidden stage.
- 2100 lateral line system: A mechanoreceptor system consisting of a series of pores and receptor units (neuromasts) along the sides of the body of fishes and aquatic amphibians; detects water movements made by an animal itself and by other moving objects.
- 2101 lateral meristem: The vascular and cork cambium, a cylinder of dividing cells that runs most of the length of stems and roots and is responsible for secondary growth.
- 2102 LDL cholesterol: Low density lipoprotein cholesterol; a lipoprotein of blood plasma that is composed of a moderate proportion of protein with little triglyceride and a high proportion of cholesterol and that is associated with increased probability of developing atherosclerosis.
- 2103 leaching: The dissolving of minerals and other elements in soil or rocks by the downward movement of water.
- 2104 leading strand: The new continuous complementary DNA strand synthesized along the template strand in the mandatory 5' to 3' direction.
- 2105 leaf: The main site of photosynthesis in a plant; consists of a flattened blade and a stalk (petiole) that joins the leaf to the stem.
- 2106 learning: The process that leads to modification in individual behavior as the result of experience.
- 2107 lefty: A developmental factor that helps determine right-left asymmetry in vertebrates.
- 2108 leiomyosarcoma: A rare malignant tumor consisting of smooth muscle cells and small cell sarcoma tumor.
- 2109 lentivirus: A genus of slow viruses of the Retroviridae family, characterized by a long incubation period. Lentiviruses can deliver a significant amount of genetic information into the DNA of the host cell, so they are one of the most efficient methods of a gene delivery vector.
- 2110 leptin: A hormone produced by the placenta and fetal tissues that acts as a growth factor and modulator of metabolic and immune functions.
- 2111 lesion: An abnormal change in structure of an organ or part due to injury or disease; especially: one that is circumscribed and well-defined.
- 2112 leukaemia: An increase in the number of ineffective and immature white blood cells, causing a weakened immune system. This leaves the body susceptible to infection.
- 2113 leukapheresis: The process of separating white blood cells from the rest of the blood.
- 2114 leukemia inhibitory factor (LIF): A growth factor necessary for maintaining mouse embryonic stem cells in a proliferative, undifferentiated state.
- 2115 leukemia simply: Cancer of the white blood cells. More technically: cancer that begins in developing blood cells in the bone marrow. As a result, large numbers of immature blood cells are produced and released into the bloodstream, and the cancer cells in the marrow crowd out normal developing cells. European physicians who, in the 19th century, observed patients with marked elevation of their white blood cells, coined the term "Weisses blut" or "white blood". Later, the term leukemia, which is derived from the Greek words "leukos" meaning "white" and "haima" meaning "blood", was used to indicate the disease. The major forms of leukemia are divided into 4 categories. Myelogenous leukemia and lymphocytic leukemia each have an acute or chronic form (therefore, there is ALL, AML, CLL, and CML). The terms myelogenous or lymphocytic denote the cell type involved. Acute leukemia is a rapidly progressing disease that affects mostly cells that are unformed or primitive (not yet fully developed or differentiated). These immature cells cannot carry out their normal functions. Chronic leukemia progresses slowly and permits the growth of greater numbers of more developed cells. In general, these more mature cells can carry out some of their normal functions.
- 2116 leukemia: Malignant proliferation of hematopoietic cells, characterized by replacement of bone marrow by neoplastic cells. The leukemic cells usually are present in peripheral blood, and may infiltrate other organs of the reticuloendothelial system, such as liver, spleen and lymph nodes. Leukemia is broadly classified into acute and chronic leukemia, with multiple distinct clinicopathologic entities subclassified in each category.
- 2117 leukocyte (white blood cell): The general name for a white blood cell. Leukocytes are responsible for maintaining the immune system's response to foreign substances and infection. Three different types of leukocytes exist: monocytes, granulocytes and lymphocytes.
- 2118 leukocytosis: A condition where the patient has elevated white blood cells in the blood.
- 2119 leukodystrophy: A group of rare genetic disorders that affect the central nervous system by disrupting the growth or maintenance of the myelin sheath that insulates nerve cells. Myelin is commonly referred to as the brain's "white matter," myelin covers nerve cells and ensures the clear transmission of nerve impulses from one part of the body to another. These disorders are progressive, meaning that they tend to get worse throughout the life of the patient. The word leukodystrophy comes from the Greek words leuko (meaning white), trophy (meaning growth), and dys (meaning ill). If you put these words together, the word leukodystrophy describes a set of diseases that affect the growth or maintenance of the white matter (myelin).
- 2120 leukotriene: A type of prostaglandin produced by various white blood cells involved in the inflammatory and immune responses and in allergic reactions.
- 2121 leuprolide acetate: A LHRH analog, one trade name is Lupron®.
- 2122 levator: A muscle that raises a structure in the body such as the muscles that support the pelvic organs.
- 2123 Lewy body dementia: A dementing illness associated with protein deposits called Lewy bodies, found in the cortex of the brain.
- 2124 Leydig cells: Cell population within the testicles that produces testosterone; the other main cell population are the Sertoli cells that make sperm.
- 2125 LFTs: A standard medical abbreviation for Liver Function Tests.
- 2126 LHRH analogs (or agonists): Synthetic compounds that are chemically similar to Luteinizing Hormone Releasing Hormone (LHRH), but are sufficiently different that they suppress testicular production of testosterone by binding to the LHRH receptor in the pituitary gland and either have no biological activity and therefore competitively inhibit the action of LHRH, or has LHRH activity that exhausts the production of LH by the pituitary; used in the hormonal treatment of advanced prostate cancer and in the adjuvant and neoadjuvant hormonal treatment of earlier stages of prostate cancer; LHRH agonist (mimics natural LHRH but then shuts down LH production after continuous exposure).
- 2127 libido: Interest in sexual activity; the psychic and emotional energy associated with instinctual biological drives.
- 2128 lichen: An organism formed by the symbiotic association between a fungus and a photosynthetic alga.
- 2129 life cycle: The entire sequence of stages in the life of an organisms, from the adults of one generation to the adults of the next.
- 2130 life table: A table of data summarizing mortality in a population.
- 2131 life-history pattern: A group of traits, such as size and number of offspring, length of maturation, age at first reproduction, and the number of times reproduction occurs,

- that affect reproduction, survival, and the rate of population growth.
- 2132 ligament: A band of fibrous tissue that connects bones or cartilages, serving to support and strengthen joints.
- 2133 ligand: An ion, a molecule, a molecular group, a substance or messenger that binds to another chemical entity at a receptor to form a larger complex which is then activated.
- 2134 ligand-gated ion channel receptor: A signal receptor protein in a cell membrane that can act as a channel for the passage of a specific ion across the membrane. When activated by a signal molecule, the receptor either allows or blocks passage of the ion, resulting in a change in ion concentration that usually affects cell functioning.
- 2135 ligase: An enzyme that is used to join fragments of DNA together, for example in gene splicing.
- 2136 light microscope (LM): An optical instrument with lenses that refract (bend) visible light to magnify images of specimens.
- 2137 light reactions: The steps in photosynthesis that occur on the thylakoid membranes of the chloroplast and convert solar energy to the chemical energy of ATP and NADPH, evolving oxygen in the process.
- 2138 light-independent reactions: The carbon-fixing reactions of the second stage of photosynthesis; energy stored in ATP and NADPH by the light-dependent reactions is used to reduce carbon from carbon dioxide to simple sugars; light is not required for these reactions.
- 2139 lignin: A hard material embedded in the cellulose matrix of vascular plant cell walls that functions as an important adaptation for support in terrestrial species.
- 2140 limbic system: A group of nuclei (clusters of nerve cell bodies) in the lower part of the mammalian forebrain that interact with the cerebral cortex in determining emotions; includes the hippocampus and the amygdala.
- 2141 Lin-28 homolog: Also known as LIN28, is a human gene. It is marker of undifferentiated human embryonic stem cells and has been used to enhance the efficiency of the formation of induced pluripotent stem (iPS) cells from human fibroblasts. It encodes a cytoplasmic mRNA-binding protein that binds to and enhances the translation of the Igf2 mRNA. Lin28 has also been shown to bind to the let-7 pre-miRNA and block production of the mature let-7 microRNA in mouse embryonic stem cells.
- 2142 lineage surface antigen (Lin): A mixture of monoclonal antibodies that are directed against antigens found on mature hematopoietic cells of different lineages. A usual Lin mix includes eight different antibodies directed against B and T cells, myeloid cells, and erythroid cells.
- 2143 lineage: The descendants of a common ancestor.
- 2144 linear accelerator: A type of high energy X-ray machine that generates radiation fields for external beam radiation therapy. A linear accelerator is typically mounted with a collimator and/or a multileaf collimator in a gantry that revolves vertically around a treatment couch
- 2145 linitis plastica: The name "Linitis plastica" is derived from a Latin word meaning "hard", which refers to gastric cancers with symptoms of the entire stomach swelling up as for an inflammation.
- 2146 linkage analysis: Linkage is the tendency for genes and other genetic markers to be inherited together because of their location near one another on the same chromosomes. Linkage analysis uses the location relationship to determine carrier status of particular genes.
- 2147 linkage group: A pair of homologous chromosomes.
- 2148 linkage map: A genetic map based on the frequencies of recombination between markers during crossing over of homologous chromosomes. The greater the frequency of recombination between two genetic markers, the farther apart they are assumed to be.
- 2149 linkage: The tendency for certain alleles to be inherited together because they are located on the same chromosome.
- 2150 linked genes: Genes that are located on the same chromosome.
- 2151 lipase: An enzyme produced by many tissues. Lipase is an important regulator of fat in the blood. A deficiency of this enzyme leads to low levels of high-density lipoproteins (HDLs).
- 2152 lipid peroxidation: A biochemical process that mediates secondary neurological damage to the injured cord.
- 2153 lipid: Any one of a group of fats or fat-like substances characterized by their insolubility in water and solubility in fat solvents such as alcohol, ether, and chloroform.
- 2154 lipomatosis: Condition characterized by abnormal localized, or tumor-like, accumulations of fat in the tissues
- 2155 lipopolysaccharides: Lipid-containing compounds; lipopolysaccharides are endotoxins and important group-specific antigens. They are often derived from the cell wall of gram-negative bacteria and induce immunoglobulin secretion. The lipopolysaccharide molecule consists of three parts: lipid a, core polysaccharide, and o-specific chains (o antigens).
- 2156 lipoprotein: A protein bonded to a lipid; includes the low-density lipoproteins (LDLs) and high-density lipoproteins (HDLs) that transport fats and cholesterol in blood.
- 2157 liposarcoma: The soft tissue sarcomas are a group of cancers which develop from a number of different supportive tissues in the body including fibrous tissue, muscle, ligaments, tendons and fat.
- 2158 liquid nitrogen: Nitrogen gas frozen into its liquid state, which is usually at 67 degrees Kelvin or -210 degrees Celsius. Liquid nitrogen is a fairly inert substance and is used to freeze tissue and fluid samples quickly, preventing the damage that often occurs when living organisms and cells are frozen slowly. Tissue and fluid samples can be kept for months or years since the super low temperature stops the tissue from aging.
- 2159 live cell therapy: A therapy used since the 1920s in Europe and other countries, wherein cells from specific fetal animal organs (usually lamb cells) are injected into humans. These cells migrate into the recipient's tissues, and stimulate them to repair or to function better. Sometimes, these animal cells continue to live in the recipient's tissues. Sometimes, they fuse with the recipient's cells to form a hybrid cell. Most of the time, the cells are rejected by the body and die, after stimulating repair and improved function of the target tissue.
- 2160 liver: An organ in the upper abdomen that aids in digestion and removes waste products and worn-out cells from the blood. The liver is the largest solid organ in the body. The liver weighs about three and a half pounds (1.6 kilograms). It measures about 8 inches (20 cm) horizontally (across) and 6.5 inches (17 cm) vertically (down) and is 4.5 inches (12 cm) thick.
- 2161 lobe: One of the two sides of an organ that clearly has two sides (e.g., the prostate or the brain).
- 2162 local therapy: Treatment that is directed at the prostate and closely surrounding tissue.
- 2163 localized: Restricted to a well defined area.
- 2164 locus (pl. loci): A particular place along the length of a certain chromosome where a given gene is located.
- 2165 logistic population growth: A model describing population growth that levels off as population size approaches carrying capacity.
- 2166 long-acting injectable: Medication or treatment that can be given by injection and which is active over a long period of time.
- 2167 long-day plant: A plant that flowers, usually in late spring or early summer, only when the light period is longer than a critical length.

- 2168 long-term reconstitution: Lifelong renewal of tissue by transplanted cells. The definitive assay for hematopoietic, epidermal, and spermatogonial stem cells. Transplantation assay may not be appropriate for all tissues.
- 2169 long-term reconstitution: Lifelong renewal of tissue by transplanted cells. The definitive assay for haematopoietic, epidermal and spermatogonial stem cells. Transplantation assay may not be appropriate for all tissues.
- 2170 long-term self-renewal: The ability of stem cells to renew themselves by dividing into the same non-specialized cell type over long periods (many months to years) depending on the specific type of stem cell.
- 2171 loop of Henle: The long hairpin turn, with a descending and ascending limb, of the renal tubule in the vertebrate kidney; functions in water and salt reabsorption.
- 2172 Lorenzo's oil: Is a combination of two fats extracted from olive oil and rapeseed oil and is specific to adrenoleukodystrophy (ALD), does not repair myelin, and does not have any known effect on other demyelinating disorders. In ALD presymptomatic boys Lorenzo's Oil often (but not always) prevents the onset of the disease by stopping the body from producing the very long chain fatty acids, whose buildup leads to demyelination.
- 2173 lorica: A vase-shaped or cup-shaped outer covering. Found in many protists, including some flagellates, ciliates, chrysophytes, and choanoflagellates, as well as in some animal cells.
- 2174 lower motor neurons: Nerves that leave the spinal cord to connect to muscles.
- 2175 lower urinary tract symptoms: include symptoms of hesitancy in initiating urination, slow urination, dribbling after urination, getting up at night to urinate (nocturia) and frequency of urination.
- 2176 low-level laser therapy: The use of coherent light beams for biostimulation.
- 2177 lumbar puncture: A procedure in which a needle is carefully inserted into the spinal canal in the back's lower lumbar area. It is a mechanism by which stem cells can be transplanted into the cerebrospinal fluid and, hopefully, be transported to the spinal-cord injury site.
- 2178 lumbar region: Corresponding to the lower back; the lumbar spine has five lumbar vertebrae.
- 2179 lumbar: Portion of body between chest and pelvis, often referring to the lower back or spine.
- 2180 lumen: The cavity of a tubular structure, such as endoplasmic reticulum or a blood vessel.
- 2181 lungs: The invaginated respiratory surfaces of terrestrial vertebrates, land snails, and spiders that connect to the atmosphere by narrow tubes.
- 2182 Lupron®: The USA trade or brand name of a leuprolide acetate, a LHRH agonist.
- 2183 luteinizing hormone (LH): A pituitary hormone that stimulates the Leydig cells of the testicles to make the male hormone testosterone.
- 2184 luteinizing hormone (LH): A protein hormone secreted by the anterior pituitary that stimulates ovulation in females and androgen production in males.
- 2185 luteinizing hormone releasing hormone (LHRH): A hormone responsible for stimulating the production of testosterone in the body by interacting with the LHRH receptor to release LH which in turn stimulates cells in the testicles (Leydig cells) to make testosterone; luteinizing hormone-releasing hormone is also known as GnRH or gonadotrophin-releasing hormone.
- 2186 luteinizing hormone-releasing hormone (LHRH, also known as GnRH or gonadotrophin releasing hormone; hormone from the hypothalamus that interacts with the LHRH receptor in the pituitary to release LH).
- 2187 LY294002: A lipid-modifying enzyme that inhibits PI3 kinase.
- 2188 lyase: An enzyme important in the adrenal androgen pathways that converts 17 alpha hydroxyprogesterone to androstenedione and also converts 17 alpha hydroxypregnenolone to DHEA.
- 2189 lycopene: A carotenoid responsible for the red color of the tomato, watermelon and pink grapefruit. Recent findings indicate that lycopene may be an important part of the human organism's natural defense mechanism that protects from harmful oxidizing agents.
- 2190 lye: A strong caustic alkaline solution of potassium salts, obtained by leaching wood ashes. It is much used in making soap, etc.
- 2191 lymph (also lymphatic fluid): The clear fluid in which all of the cells in the body are constantly bathed; carries cells that help fight infection
- 2192 lymph node: A small, bean-shaped gland responsible for filtering germs and other foreign substances from the body. Lymph nodes are clustered together with other nodes in the underarms, abdomen and groin.
- 2193 lymph: The colorless fluid, derived from interstitial fluid, in the lymphatic system of vertebrate animals.
- 2194 lymphadenectomy: also known as a pelvic lymph node dissection, this procedure involves the removal and microscopic examination of selected lymph nodes, a common site of metastatic disease with prostate cancer; this procedure can be performed during surgery prior to the removal of the prostate gland, or by means of a small incision a "laparoscopic lymphadenectomy" may be performed, a simple operation requiring only an overnight stay in the hospital.
- 2195 lymphadenopathy: Abnormally enlarged lymph nodes. Commonly called "swollen glands."
- 2196 lymphangiogram: X-rays of the lymphatic system. A dye is injected to outline the lymphatic vessels and organs.
- 2197 lymphatic system: A network of lymph vessels and nodes that drain and filter antigens from tissue fluids before returning lymphocytes to the blood.
- 2198 lymphocele: Cystic mass containing lymph from diseased lymphatic channels or following surgical trauma or other injury.
- 2199 lymphocyte: Any of the colorless weakly motile cells originating from stem cells and differentiating in lymphoid tissue (as of the thymus or bone marrow) that are the typical cellular elements of lymph, include the cellular mediators of immunity, and constitute 20 to 30 percent of the white blood cells of normal human blood.
- 2200 lymphocytopenia: An abnormally small number of lymphocytes in the circulating blood.
- 2201 lymphography: Radiologic depiction of lymphatic vessels and lymph nodes after use of a contrast material
- 2202 lymphohematopoietic (LHSC): General Bone Marrow System that generates immune and blood cells.
- 2203 lymphoid cell: Lymphocytes, cells involved in mounting an immune response.
- 2204 lymphoid: Cells derived from stem cells of the lymphoid lineage: large and small lymphocytes, plasma cells.
- 2205 lymphokine: A chemical, released by an activated cytotoxic T cell, that attracts macrophages and stimulates phagocytosis.
- 2206 lymphoma: A cancer of the lymphatic system, a network of thin vessels and nodes throughout the body. Its function is to fight infection.
- 2207 lymphopoiesis: Development of lymphoid cells: T-cell, B-cells, NK cells and Dendritic cells, DC (only if NK and DC cells are formed from the lymphoid lineages).
- 2208 lysis: Disintegration of a cell by rupture of its plasma membrane.
- 2209 lysogenic bacteria: Bacteria carrying a bacteriophage integrated into the bacterial chromosome. The virus may

- subsequently set up an active cycle of infection, causing lysis of the bacterial cells.
- 2210 lysogenic cycle: A type of phage replication cycle in which the viral genome becomes incorporated into the bacterial host chromosome as a prophage.
- 2211 lysosomal storage disorders: A class of genetic disorders caused by the deficiency or malfunction of specific enzymes found in cell lysosomes, causing accumulation of waste material in cells.
- 2212 lysosome: Eukaryotic organelle which carries digestive enzymes. The lysosome fuses with a vacuolar membrane containing ingested particles, which are then acted upon by the enzymes.
- 2213 lysozyme: An enzyme in perspiration, tears, and saliva that attacks bacterial cell walls.
- 2214 lytic cycle: A type of viral replication cycle resulting in the release of new phages by death or lysis of the host cell.
- 2215 lytic: Of, relating to, or causing a specified kind of decomposition through rupture of cell membranes and loss of cytoplasm.
- 2216 M phase: The mitotic phase of the cell cycle, which includes mitosis and cytokinesis.
- 2217 M protein: Abnormal proteins found in the blood or urine of MM patients and seen as the "M" spike or peak on electrophoresis. It is measured for diagnosis and monitoring treatment.
- 2218 M0, M1, Mx: notation of observed metastases.
- 2219 Mac-1 (CD11b): Antigen found in blood cells. Indicative of murine and progenitor cells.
- 2220 macroevolution: Evolutionary change on a grand scale, encompassing the origin of novel designs, evolutionary trends, adaptive radiation, and mass extinction.
- 2221 macroglossia: Enlargement of the tongue; may be a symptom with several LSDs.
- 2222 macromolecule: A giant molecule of living matter formed by the joining of smaller molecules, usually by condensation synthesis. Polysaccharides, proteins, and nucleic acids are macromolecules.
- 2223 macronutrient: An inorganic nutrient required in large amounts for plant growth, such as nitrogen, potassium, calcium, phosphorus, magnesium, and sulfur.
- 2224 macrophage: A lymphocyte that has left the circulation and settled and matured in a tissue. Because of their placement in the lymphoid tissues, macrophages serve as the major scavenger of the blood, clearing it of abnormal or old cells and cellular debris as well as pathogenic organisms.
- 2225 macular degeneration: Deterioration in the macula, which is the spot on the retina at the back of the eye, with the highest visual resolution, or the highest concentration of vision cells. Macular degeneration is generally associated with aging and often with arteriosclerosis. Some cases of macular degeneration have been helped by injecting neural stem cells, through a catheter, into the central retinal artery, which goes down the optic nerve into the eye.
- 2226 magnetic marking: A means of characterizing cells, magnetic marking involves attaching microscopic magnetic particles to target proteins on the cell surface, using antibodies developed against the target proteins. Once tagged with the magnetic particles, the marked cells can be removed from a suspension of cells by using a magnet.
- 2227 magnetic resonance imaging (MRI): the use of magnetic resonance with atoms in body tissues to produce distinct cross-sectional, and even three-dimensional images of internal organs
- 2228 magnetic resonance: Absorption of specific frequencies of radio and microwave radiation by atoms placed in a strong magnetic field.
- 2229 major histocompatibility complex (MHC): A large set of cell surface antigens encoded by a family of genes. Foreign MHC markers trigger T-cell responses that may lead to the rejection of transplanted tissues and organs.
- 2230 major histocompatibility complex: A group of genes that control several aspects of the immune response. They code for markers located on the surface of all body cells and are recognised by the body as 'self' (belonging to the body). These genes define a person's tissue type and are used to determine whether a transplant would be compatible.
- 2231 malaise: A vague feeling of bodily discomfort.
- 2232 malignancy: a growth or tumor composed of cancerous cells.
- 2233 malignant: cancerous; tending to become progressively worse and to result in death; having the invasive and metastatic (spreading) properties of cancer.
- 2234 malpighian tubule: A unique excretory organ of insects that empties into the digestive tract, removes nitrogenous wastes from the blood, and functions in osmoregulation.
- 2235 mammalia: The vertebrate class of mammals, characterized by body hair and mammary glands that produce milk to nourish the young.
- 2236 mammalian: The group of vertebrates that have: internal development of the embryo; mammary glands that can produce milk; live-born young with a body covering of hair or fur; a four-chambered heart; a well-developed cerebral cortex; the ability to maintain a constant body temperature; a permanent set of teeth.
- 2237 mammography: Mammography is a procedure that involves taking x-rays of the breasts to detect breast cysts or tumors, especially those that cannot be felt (palpable) by the fingers during a physical examination. A mammogram is the photographic result. The procedure does not prevent breast cancer; it is used to detect cancer early when it is more likely to be successfully treated.
- 2238 mania: A state of extreme overactivity and high mood. It is seen as the opposite of depression.
- 2239 manic-depression: Depression in bipolar disorder is a mood disorder characterized by mood swings from mania (exaggerated feeling of well-being, energy, and confidence in which a person can lose touch with reality) to depression with the current or most recent episode of illness characterized by depression.
- 2240 mantle: A heavy fold of tissue in mollusks that drapes over the visceral mass and may secrete a shell.
- 2241 margin: Edge of the tissue removed during surgery. A negative surgical margin is usually a sign that no cancer was left behind near the area it was removed from. A positive surgical margin indicates that cancer cells are found at the outer edge of the tissue removed and is usually a sign that some cancer remains in the body.
- 2242 marker: a diagnostic indication that disease may be present or may develop
- 2243 marrow donation: A surgical procedure by which a person donates a portion of their bone marrow for a patient who had diseased marrow and needs a bone marrow transplant.
- 2244 marsupial: A mammal, such as a koala, kangaroo, or opossum, whose young complete their embryonic development inside a maternal pouch called the marsupium.
- 2245 mass number: The sum of the number of protons and neutrons in an atom's nucleus.
- 2246 mast cell: A type of noncirculating white blood cell, found in connective tissue, that is the major protagonist in allergic reactions; when an allergen binds to complementary antibodies on the surface of a mast cell, large amounts of histamine are released from the cell.
- 2247 master patient index file: An alphabetized list (either card file or computerized list) maintained for all patients that have been entered into the database.
- 2248 mastigoneme: Small hair-like filaments found on the "hairy" flagellum of the Chromista.

- 2249 match: In a blood stem cell transplant, the match level explains how much alike the tissues of the patient and the donor are.
- 2250 maternal gene product: A product in the male organism of a gene from the X chromosome.
- 2251 matrix: Ground substance in which things are embedded or that fills a space (as for example the space within the mitochondrion). most common usage is for a loose meshwork within which cells are embedded (e.g. Extracellular matrix), although it may also be used of filters or absorbent material.
- 2252 matter: Anything that takes up space and has mass.
- 2253 mature: Usually referred to the differentiated cells of hematopoietic lineages.
- 2254 MCF-7: human breast cancer cell line.
- 2255 mcg (micrograms): A unit of mass equal to one thousandth (10^{-3}) of a milligram or one millionth (10^{-6}) of a gram.
- 2256 mechanoreceptor: A sensory receptor that detects physical deformations in the body's environment associated with pressure, touch, stretch, motion, and sound.
- 2257 media: A liquid or gel designed to encourage the growth of cells in a culture. The media can contain different nutrients, enzymes or stimulants, depending on what it is designed to do.
- 2258 mediastinum: The space in the chest between the pleural sacs of the lungs that contains all the viscera of the chest except the lungs and pleurae; also: this space with its contents.
- 2259 medical oncologist: A physician primarily trained in the use of medicines (rather than surgery) to treat cancer.
- 2260 medical treatment: Treatment from a trained medical practitioner for a disease or condition.
- 2261 medulla oblongata: The lowest part of the vertebrate brain; a swelling of the hindbrain dorsal to the anterior spinal cord that controls autonomic, homeostatic functions, including breathing, heart and blood vessel activity, swallowing, digestion, and vomiting.
- 2262 medulla: The inner, as opposed to the outer, part of an organ, as in the adrenal gland.
- 2263 medusa: The floating, flattened, mouth-down version of the cnidarian body plan. The alternate form is the polyp.
- 2264 megakaryocyte: Very large bone marrow cells which release mature blood platelets.
- 2265 megapascal (MPa): A unit of pressure equivalent to 10 atmospheres of pressure.
- 2266 megaspore: In plants, a haploid (n) spore that develops into a female gametophyte.
- 2267 meiosis: Meiosis is process of cellular division that reduces the number of chromosomes in a cell by half. This process always results in the formation of gametes (sperm and eggs) in animals. Meiosis results in four haploid cells because the genome of the diploid germ cell undergoes DNA replication, which is followed by TWO round of cell division.
- 2268 meiotic prophase: Part of the process of cell division. Chromosomes line up along the spindle in homologous pairs.
- 2269 melanocyte: A cell that produces the dark pigment melanin; responsible for the pigmentation of skin and hair.
- 2270 melanoma: A type of cancer that begins in the melanocytes (the skin cells that produce pigments). It can spread to other areas of the body if not detected and treated early.
- 2271 Melatonin: A hormone produced by the pineal gland and a commonly available, sleep-inducing nutritional supplement that may be neuroprotective after spinal cord injury.
- 2272 membrane potential: The charge difference between the cytoplasm and extracellular fluid in all cells, due to the differential distribution of ions. Membrane potential affects the activity of excitable cells and the transmembrane movement of all charged substances.
- 2273 membrane: In biology, a boundary layer inside or around a living cell or tissue.
- 2274 memory cell: A clone of long-lived lymphocytes, formed during the primary immune response, that remains in a lymph node until activated by exposure to the same antigen that triggered its formation. Activated memory cells mount the secondary immune response.
- 2275 memory: The ability of antigen-specific T or B cells to "recall" prior exposure to an antigen and respond quickly without the need to be activated again by CD4 helper T cells.
- 2276 Mendelian disorder (Also called single-gene disorder): A disease caused by a single gene that is inherited in a straightforward manner from parent or parents to child. Huntington's disease and cystic fibrosis are examples. The term "Mendelian" refers to Gregor Mendel, an Austrian who did pioneering work on genes and traits in ordinary garden peas by showing that a single trait, such as color, can be determined by a single gene. Compared to "complex diseases," Mendelian disorders are relatively rare.
- 2277 Mendelian inheritance: A hereditary process where genetic traits are passed from parents to offspring and are explained in terms of chromosomes separating, independent assortment of genes and the homologous exchange of segments of DNA. There are three modes of Mendelian inheritance: autosomal dominant, autosomal recessive and X-linked inheritance. Named after Gregor Mendel, who first studied and recognised the existence of genes and this method of inheritance by breeding experiments with different varieties of peas.
- 2278 Meninges: The three membranes that cover the spinal cord, including the dura (outside), arachnoid, and pia mater (inside).
- 2279 Meningioma: Common benign brain tumours that arise from the pia-arachnoid cells of the meninges. Meningiomas tend to occur along the superior sagittal sinus, along the sphenoid ridge or in the vicinity of the optic chiasm.
- 2280 Meningitis: A bacterial infection of the membranes surrounding the brain.
- 2281 Meniscus: The curved top surface of a column of liquid.
- 2282 menstrual cycle: A type of reproductive cycle in higher female primates, in which the nonpregnant endometrium is shed as a bloody discharge through the cervix into the vagina.
- 2283 Meridians: Under traditional Chinese medicine, meridians are channels for life-force energy called qi. Energy flow through these meridians can be balanced through the use of acupuncture.
- 2284 meristem: Plant tissue that remains embryonic as long as the plant lives, allowing for indeterminate growth.
- 2285 meroblastic cleavage: A type of cleavage in which there is incomplete division of yolk-rich egg, characteristic of avian development.
- 2286 mesenchymal stem cell: Also known as bone marrow stromal cells, mesenchymal stem cells are rare cells, mainly found in the bone marrow, that can give rise to a large number of tissue types such as bone, cartilage (the lining of joints), fat tissue, and connective tissue (tissue that is in between organs and structures in the body).
- 2287 mesencephalic tissue: Tissue from the mid-brain or mesencephalon.
- 2288 mesenchymal (marrow stromal) stem cell (MSC): Cells from the immature embryonic connective tissue. A number of cell types come from mesenchymal stem cells, including cartilage, bone, muscle and adipose tissue. MSC's have the capability for renewal and differentiation into various lineages of mesenchymal tissues. Mesenchymal stem cells are considered to be multipotent.
- 2289 mesenchymal cells: Stem cells which develop into connective tissue.

- 2290 mesenchymal stem cell. A type of adult stem cell found in bone marrow that gives rise to a number of different kinds of cells (eg, bone cells and fat cells). They are also known as bone marrow stromal cells.
- 2291 mesenchymal: Mesenchymal cells are also known as multipotent mesenchymal stromal cells. MSC are able to renew and differentiate into body fat, bone, and cartilage tissue.
- 2292 mesentery: The membranes, or one of the membranes (consisting of a fold of the peritoneum and inclosed tissues), which connect the intestines and their appendages with the dorsal wall of the abdominal cavity. The mesentery proper is connected with the jejunum and ilium, the other mesenteries being called mesoecum, mesocolon, mesorectum, etc.
- 2293 mesoangioblast: This is a mesenchymal-like cell, associated with the walls of the large vessels. Mesoangioblasts exhibit many similarities to pericytes found in the small vessels. Mesoangioblasts are relatively undifferentiated cells with the potential to progress down the endothelial or mesodermal lineages.
- 2294 mesoderm: The middle layer of cells produced from the inner cell mass of the blastocyst. The cells give rise to muscle, bone, connective tissue, kidneys, and other structures.
- 2295 mesodermal layer: Here the stem cells have differentiated to become the primitive cells that will ultimately differentiate further into muscle, bone, connective tissues and the cardiovascular system.
- 2296 mesokaryotic: Nuclear condition unique to the dinoflagellates in which the chromosomes remain permanently condensed.
- 2297 mesophyll: The ground tissue of a leaf, sandwiched between the upper and lower epidermis and specialized for photosynthesis.
- 2298 mesothelioma: Mesothelioma is a rare form of cancer that invades mesothelial cells, which are specialized cells that make up the membranes lining the chest and abdominal cavity. Mesothelium, or the tissue formed by mesothelial cells, helps protect the organs by producing a lubricating fluid that allows the organs to move without irritating nerves.
- 2299 messenger RNA (mRNA): Messenger RNA is transcribed from the DNA by RNA polymerase. mRNA carries the genetic information required for protein synthesis. mRNA attaches to ribosomes, where it becomes the template for protein translation. The genetic information in mRNA is organized into codons, each consisting of three nucleotide sequences (e.g. AUG, GGA). Each codon corresponds to a single amino acid. During translation, the mRNA is read in the 5' to 3' direction and the appropriate amino acid is attached to form the polypeptide chain.
- 2300 metabolic: Relating to metabolism, a term used to describe the chemical and physical changes that occur in the body when molecules are either broken down or built up in cells and tissues.
- 2301 metabolism: The totality of an organism's chemical processes, consisting of catabolic and anabolic pathways.
- 2302 metabolite: a substance necessary for or taking part in a particular metabolic (chemical) process in the body
- 2303 metachromatic leukodystrophy: A heritable metabolic disorder, usually of infancy, characterized by myelin loss and other abnormalities of the white matter of the nervous system, leading to progressive paralysis and mental retardation or dementia.
- 2304 metamorphosis: The resurgence of development in an animal larva that transforms it into a sexually mature adult.
- 2305 metanephridium (pl. metanephridia): In annelid worms, a type of excretory tubule with internal openings called nephrostomes that collect body fluids and external openings called nephridiopores.
- 2306 metaphase: Phase of mitosis, or cell division, when the chromosomes align along the center of the cell. Because metaphase chromosomes are highly condensed, scientists use these chromosomes for gene mapping and identifying chromosomal aberrations.
- 2307 metapopulation: A subdivided population of a single species.
- 2308 metastasis (plural metastases): A secondary tumor formed as a result of a cancer cell or cells from the primary tumor site (e.g., the prostate) traveling through the body to a new site and then growing.
- 2309 metastasize: Spread of a malignant tumor to other parts of the body.
- 2310 metastatic work up: A group of tests, including physical examination, bone scans, X-rays, other imaging studies and blood tests to ascertain whether cancer has metastasized.
- 2311 metastatic: Having the characteristics of a secondary tumor formed as a result of a cancer cell or cells from the primary tumor site (e.g., the prostate) traveling through the body to a new site and then growing there.
- 2312 Metastron®: The brand or trade name of strontium-89, a radioactive isotope used in the treatment of bone pain from metastatic prostate cancer.
- 2313 mg (milligram): a unit of mass equal to one thousandth (10^{-3}) of a gram.
- 2314 MHC-Class I: Major Histocompatibility Complex, Class I: Expressed on all cells.
- 2315 MHC-Class II: Major Histocompatibility Complex, Class II: Expressed on bone marrow Lymphohematopoietic stem cells, antigen presenting cells, mesenchymal stem cells, activated T-cells
- 2316 microbe: A microscopic organism.
- 2317 microchimerism: A state in an embryo, fetus, animal or person in which a small number of cells occur that have a different genome. Arises naturally because cells (rarely, stem cells) can cross between a mother and her fetus, or experimentally by introducing foreign stem cells into an embryo, usually at the stage of blastocyst, when the introduced cells become part of the inner cell mass.
- 2318 microenvironment: The molecules and compounds such as nutrients and growth factors in the fluid surrounding a cell in an organism or in the laboratory, which play an important role in determining the characteristics of the cell.
- 2319 microevolution: A change in the gene pool of a population over a succession of generations.
- 2320 microfilament: A solid rod of actin protein in the cytoplasm of almost all eukaryotic cells, making up part of the cytoskeleton and acting alone or with myosin to cause cell contraction.
- 2321 micromets, micrometastatic cells: Microscopic cancer cells in other parts of the body that are similar to those of the original tumor.
- 2322 micronutrient: An inorganic nutrient required in only minute amounts for plant growth, such as iron, chlorine, copper, manganese, zinc, molybdenum, and boron.
- 2323 Microorganisms: Organisms that can be seen only with the aid of a microscope. They are also known as microbes.
- 2324 microRNAs: Small molecules found in plants and animals that may regulate the activity of genes.
- 2325 microspore: In plants, a haploid (n) spore that develops into a male gametophyte; in seed plants, it becomes a pollen grain.
- 2326 microtubule organizing center (MTOC): MTOCs are bundles of protein tubes which may be found at the base of a eukaryotic flagellum. In animals, they also function in creating the arrays of microtubules that pull the chromosomes apart during mitosis.

- 2327 microtubule: An elongated, hollow tubular structure present in the cell. Microtubules help certain cells maintain their rigidity, convert chemical energy into work, and provide a means of transportation of substances in different directions within a cell.
- 2328 microvessel density: An objective measure of angiogenesis (blood vessel formation).
- 2329 microvilli: Thin fingerlike protrusions from the surface of a cell, often used to increase absorptive capacity or to trap food particles. The “collar” of choanoflagellates is actually composed of closely spaced microvilli.
- 2330 microvillus (pl. microvilli): One of many fine, fingerlike projections of the epithelial cells in the lumen of the small intestine that increase its surface area.
- 2331 middle lamella: A thin layer of adhesive extracellular material, primarily pectins, found between the primary walls of adjacent young plant cells.
- 2332 midgland: The section between the apex and base of the prostate.
- 2333 migration: Move from one site to the other, in the absence of a known chemoattractant.
- 2334 mimicry: A phenomenon in which one species benefits by a superficial resemblance to an unrelated species. A predator or species of prey may gain a significant advantage through mimicry.
- 2335 mineral: In nutrition, one of many chemical elements, other than carbon, hydrogen, oxygen, and nitrogen, that an organism requires for proper body functioning.
- 2336 mineralocorticoid: A corticosteroid hormone secreted by the adrenal cortex that regulates salt and water homeostasis.
- 2337 minimal genome: The smallest number of genes an organism needs to stay alive in a particular environment. A goal of research on the minimal genome is to design synthetic microorganisms that can perform useful tasks such as generating biological forms of energy.
- 2338 minimum dynamic area: The amount of suitable habitat needed to sustain a viable population.
- 2339 minimum viable population size (MVP): The smallest number of individuals needed to perpetuate a population.
- 2340 missense mutation: A missense mutation is a genetic change involving the substitution of one base in the DNA for another which results in the substitution of one amino acid in a polypeptide for another. A missense mutation is a “readable” genetic message although its “sense” (its meaning) is changed. This is in contrast to a nonsense mutation which has no meaning except to halt the reading of the genetic message.
- 2341 misstaging: The assignment of an incorrect clinical stage at initial diagnosis because of the difficulty of assessing the available information with accuracy.
- 2342 mitochondria: A spherical or elongated organ in the cytoplasm of nearly all eukaryotic cells, containing genetic material and many enzymes important for cell metabolism, including those responsible for the conversion of food to usable energy.
- 2343 mitochondrial DNA: Genetic material inside the mitochondria. Essentially all the mitochondria of an individual come from the cytoplasm of the egg, so all mitochondrial DNA is inherited through the maternal line.
- 2344 mitochondrial matrix: The compartment of the mitochondrion enclosed by the inner membrane and containing enzymes and substrates for the Krebs cycle.
- 2345 mitochondrial proteins: Proteins that are part of the mitochondria.
- 2346 mitochondrion: Complex organelle found in most eukaryotes; believed to be descended from free-living bacteria that established a symbiotic relationship with a primitive eukaryote. Mitochondria are the site of most of the energy production in most eukaryotes; they require oxygen to function.
- 2347 mitosis: Cell division following duplication of the genome and resulting in two daughter cells with an even segregation of the genetic material. Mitosis allows a population of cells to increase or, in the case of cell death, maintain their number.
- 2348 mitoxantrone (Novantrone®): A drug used to treat advanced prostate cancer that does not respond to hormones. It is also being studied in the treatment of other cancers. It belongs to the family of drugs called antitumor antibiotics.
- 2349 mixed lymphocyte culture (MLC): A test that shows if the patient's and donor's cells react to each other.
- 2350 MNC (Mononuclear Nucleated Cell): A purified subset of the TNC; stem cells are contained in the mononuclear fraction.
- 2351 mobilization: Moving more stem cells from the bone marrow into the blood stream through chemotherapy and/or a growth factor.
- 2352 modality: A therapeutic method or agent, such as surgery, chemotherapy, or electrotherapy, that involves the physical treatment of a disorder.
- 2353 model organism (Also called Animal Model): A creature, like the mouse or the fruit fly, used in the laboratory to study biology. Many genes in humans are found in other species, and biologists study model organisms to learn about how these genes might operate in the human body.
- 2354 modern synthesis: A comprehensive theory of evolution emphasizing natural selection, gradualism, and populations as the fundamental units of evolutionary change; also called neo-Darwinism.
- 2355 modified citrus pectin (MCP): A substance that is able to interfere with PC growth by preventing cell-cell interaction and adhesiveness by binding to a carbohydrate substance called galectin-3 found on the surface of tumor cells
- 2356 molarity: A common measure of solute concentration, referring to the number of moles of solute in 1 L of solution.
- 2357 mold: A rapidly growing, asexually reproducing fungus.
- 2358 mole: The number of grams of a substance that equals its molecular weight in daltons and contains Avogadro's number of molecules.
- 2359 molecular biology: The branch of biology focused on the formation, structure, and function of DNA, RNA and proteins, and their roles in the transmission of genetic information.
- 2360 molecular formula: A type of molecular notation indicating only the quantity of the constituent atoms.
- 2361 molecular HLA typing: At the level of a molecule. Molecular HLA typing is the same as DNA typing. Molecular typing is done at the smallest level of the cells.
- 2362 molecular pathway: A series of interactions between genes, proteins, and other biological factors that leads to a biological effect, such as the differentiation of one cell type to another, the division of a cell, the production of antibodies, cell homing, the formation of tissue and body patterns during development, the secretion of factors such as insulin, etc.
- 2363 molecular weight: The sum of the atomic weights of the constituent atoms in a molecule.
- 2364 molecule: The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance, consisting of a single atom or a group of atoms bonded together; e.g., Ne, H₂, H₂O.
- 2365 molting: A process in arthropods in which the exoskeleton is shed at intervals to allow growth by the secretion of a larger exoskeleton.
- 2366 monoclonal antibody (MoAb): An exceptionally pure and specific antibody derived from hybridoma cells. Because each of the clones is derived from a single B cell, all of the antibody molecules it makes are identical.

- 2367 monoclonal protein: Abnormal proteins found in the blood or urine of MM patients and seen as the “M” spike or peak on electrophoresis. It is measured for diagnosis and monitoring treatment.
- 2368 monoclonal: Formed from a single group of identical cells
- 2369 monocot: A subdivision of flowering plants whose members possess one embryonic seed leaf, or cotyledon.
- 2370 monocotyledon: A member of the class of flowering plants having one seed leaf, or cotyledon, among other distinguishing features; often abbreviated as monocot.
- 2371 monoculture: Cultivation of large land areas with a single plant variety.
- 2372 monocyte: Largest of the white blood cells which migrates into the connective tissue where it differentiates into a macrophage.
- 2373 monoecious: Referring to a plant species that has both staminate and carpellate flowers on the same individual.
- 2374 monohybrid cross: A breeding experiment that uses parental varieties differing in a single character.
- 2375 monohybrid: A hybrid individual that is heterozygous for one gene or a single character.
- 2376 monomer: The subunit that serves as the building block of a polymer.
- 2377 mononuclear fraction: The fraction of bone marrow or umbilical cord blood, obtained by centrifugation, that contains mesenchymal stem cells. MSCs adhere to plastic allowing them to be separated from other cell types in the mononuclear fraction.
- 2378 mononuclear: Having only one nucleus; used in reference to blood cells. Stem cells are found in the mononuclear cell population of the WBC.
- 2379 mononucleocyte: A cell containing a single nucleus. Generally refers to a white blood cell.
- 2380 monophyletic: Pertaining to a taxon derived from a single ancestral species that gave rise to no species in any other taxa.
- 2381 monopotent: A bone marrow progenitor that has matured but is committed towards one lineage.
- 2382 monosaccharide: The simplest carbohydrate, active alone or serving as a monomer for disaccharides and polysaccharides. Also known as simple sugars, the molecular formulas of monosaccharides are generally some multiple of CH_2O .
- 2383 monosomy: The presence of only one chromosome of a pair.
- 2384 monotherapy: A treatment that uses one major drug or one major modality of treatment; androgen deprivation therapy using only an LHRH agonist is an example of monotherapy.
- 2385 monotreme: An egg-laying mammal, represented by the platypus and echidna.
- 2386 mono-unsaturated: Molecules, such as fats, with only one double bond in their chemical structure. Some plant oils and margarines, avocados, olives, nuts and seeds contain mostly mono-unsaturated fats.
- 2387 mood-incongruent delusions: A sensory experience in which a person can see, hear, smell, taste, or feel something that isn't there.
- 2388 moral standing: To say that a group of organisms has moral standing is to say that their wellbeing must be given some consideration. It does not decide the question of whether they have the same moral standing as people (and thus have 'human' rights).
- 2389 morbidity: A diseased condition or state, the incidence of a disease or of all diseases in a population.
- 2390 morphogen: A substance, such as bicoid protein, that provides positional information in the form of a concentration gradient along an embryonic axis.
- 2391 morphogenesis: The development of body shape and organization during ontogeny.
- 2392 morphogenetic field: The electromagnetic field surrounding and interpenetrating the body, which carries the blueprint that cells follow to create the body. More specific than DNA, the morphogenetic field interacts with cellular DNA to stimulate the creation of body structures. It appears that ORMUS increases stem cell ability to repair body structures and follow the morphogenetic field.
- 2393 morphological species concept: The idea that species are defined by measurable anatomical criteria.
- 2394 morphological: Pertaining to form and structure, at any level of organization.
- 2395 morphology, morphologic: A branch of biology that deals with the form and structure of animals and plants
- 2396 morphometry, morphometric: the quantitative measurement of the form and distribution of parts, especially in living systems
- 2397 morphospecies: A species defined by its anatomical features.
- 2398 mortality rate: Death rate.
- 2399 mortality: (1) The quality of being subject to death; (2) the number of deaths in a given time or place or the proportion of deaths to population
- 2400 morula: A solid mass of 12 or more cells that resembles a mulberry, occurring at 3 to 4 days after fertilization and that results from the cleavage of the zygote.
- 2401 mosaic development: A pattern of development, such as that of a mollusk, in which the early blastomeres each give rise to a specific part of the embryo. In some animals, the fate of the blastomeres is established in the zygote.
- 2402 mosaic evolution: The evolution of different features of an organism at different rates.
- 2403 motility: The ability to move spontaneously
- 2404 motor evoked potentials: Electrophysiological response recorded from muscles following direct electromagnetic stimulation of brain.
- 2405 motor neuron: A nerve cell that transmits signals from the brain or spinal cord to muscles or glands.
- 2406 motor unit: A single motor neuron and all the muscle fibers it controls.
- 2407 motor: Any of various power units that develop energy or impart motion.
- 2408 mouse embryonic fibroblast (MEF): Mouse embryonic fibroblast cells are used as feeder cells when culturing pluripotent stem cells.
- 2409 mouse model: A laboratory mouse is useful for medical research because it has specific characteristics that resemble a human disease or disorder. Strains of mice having natural mutations similar to human ones may serve as models of such conditions. Scientists can also create mouse models by transferring new genes into mice or by inactivating certain existing genes in them.
- 2410 MPC or MAPC: Multiple progenitor or multiple adult progenitor: These are terminologies used by Dr. C. Verfaillie (Univ. of Minnesota) to describe her stem cell that others referred as mesenchymal stem cell.
- 2411 MPF (M-phase promoting factor): A protein complex required for a cell to progress from late interphase to mitosis; the active form consists of cyclin and cdc2, a protein kinase.
- 2412 MR4: Metabolic regulator. Important for electron transport and ATP synthesis.
- 2413 MRI (magnetic resonance imaging): Medical imaging that allows a noninvasive view of the internal organs, including bone marrow. Sometimes used to aid in the monitoring of LSDs.
- 2414 MRI/MRSI: The integration of magnetic resonance imaging with magnetic resonance spectroscopic imaging.
- 2415 MRI: A diagnostic procedure that uses a magnetic field to provide three-dimensional images of internal body structures.

- 2416 MRI: A standard abbreviation for Magnetic Resonance Imaging.
- 2417 MRI: Magnetic resonance imaging; a medical imaging technique that uses strong magnetic fields and high-frequency radio waves to form very clear pictures of the inside of the body that can be viewed in any direction.
- 2418 mucin: The main part of mucus that protects body surfaces from rubbing or wearing down.
- 2419 mucosa (pl. mucosae): A moist tissue layer that lines hollow organs (stomach, etc.) and body cavities.
- 2420 mucosa: superficial lining cells involving body cavities like the mouth, rectum, bladder; a membrane lining all body passages that communicate with the air, such as the respiratory and alimentary tracts, and having cells and associated glands that secrete mucus.
- 2421 mucosal linings: Inner lining of the mouth, nasal passages, etc.
- 2422 mucositis: The inflammation of the mucous membranes lining the digestive tract including the mouth, the windpipe, the stomach and the anus.
- 2423 Müllerian mimicry: A mutual mimicry by two unpalatable species.
- 2424 multicellular: Any organism which is composed of many cells is termed multicellular.
- 2425 multi-drug resistance gene (MDR gene): A gene that cells utilize to pump substances such as chemotherapy out of the cell across the cell membrane. The increase in the MDR gene is felt to be a tumor mechanism to overcome the effect of chemotherapy. Nizoral® and tamoxifen decrease MDR activity.
- 2426 multifocal, multifocality: Arising from or pertaining to many locations.
- 2427 multigene family: A collection of genes with similar or identical sequences, presumably of common origin.
- 2428 multileaf collimator (MLC): A type of collimator that can define irregularly shaped radiation fields. An MLC has two rows of narrow metal blocks (leaves) that can be independently driven in or out of the radiation beam from opposite sides under computer control.
- 2429 multileaf intensity modulating collimator (MIMiC): A multileaf collimator designed specifically for intensity modulated radiotherapy. The MIMiC treats two slices, each 1 or 2 cm thick with a fan beam of radiation, when the linear accelerator gantry rotates through an arc around the patient. The patient couch is moved to treat adjacent slices if the target is too large to treat with a single arc.
- 2430 multiple myeloma: Blood cancer caused by the proliferation and spread of abnormal plasma cells in the bone marrow, causing bone destruction at many sites (hence "multiple" myeloma).
- 2431 multiple sclerosis: A disease of the central nervous system (CNS), wherein the nerve fibers lose the "insulation" or myelin sheath surrounding them, causing diminished transmission of nerve impulses, and diminished function of the brain and spinal cord. This degenerative process seems to be caused by the immune system attacking the nerve tissue, and may be related to hidden or latent infections with viruses such as measles, poliomyelitis, and human herpesvirus type 6. Transplantation of umbilical cord blood stem cells has regulated the immune system attack on the CNS, and neuronal stem cells have repaired much of the damage, giving increased function to MS patients.
- 2432 multiplicity of infection (MOI): Represents the average number of viral particles per single cell. The MOI is calculated by dividing the total number of transducing units by the number of cells plated.
- 2433 multipotential stem cells: Bone marrow stem cells always retain the capacity and information necessary to become any one of four types of bone marrow cells. Red blood cells (erythrocytes) that carry oxygen, white blood cells of two types. They are B-lymphocytes, some of which transform into plasma cells and produce antibodies and some of which remain B-lymphocytes to fight viral infections and inflammation. They are also T-lymphocytes which go to the thymus gland in the chest where they are processed to become either "helper" T-cells.
- 2434 multipotent adult progenitor cells (MAPC): Cells isolated from bone marrow that can be differentiated into cells with characteristics of cartilage, fat, and bone.
- 2435 multipotent stem cells: Stem cells whose progeny are of multiple differentiated cell types, but all within a particular tissue, organ, or physiological system. For example, blood-forming (hematopoietic) stem cells (HSC) are single multipotent cells that can produce progeny that include HSC, blood cell-restricted oligopotent progenitors, and all cell types and elements (e.g., platelets) that are normal components of the blood.
- 2436 multipotent: A multipotent cell is not a stem cell but is close to a stem cell with regards to cell maturation. Thus, a multipotent cell has less potential to survive for a long period as compared to a pluripotent stem cell. These types of cells are considered as 'cell in transition'.
- 2437 murine: From or pertaining to mice
- 2438 muscle biopsy: A muscle biopsy is a minor surgical procedure done under general or local anesthetic, using a needle or a small incision to remove a small sample of muscle. The procedure may be done to confirm a clinical diagnosis, distinguish between nerve and muscle disorders, identify a metabolic defect of muscle, diagnose diseases of connective tissue and blood vessels, detect muscle inflammation, or rule out muscle disease. Afterwards, there may be minor discomfort and bruising at the biopsy site which usually takes a week to heal fully.
- 2439 muscle fiber: Muscle cell; a long, cylindrical, multinucleated cell containing numerous myofibrils, which is capable of contraction when stimulated.
- 2440 muscle: Muscle is the tissue of the body which primarily functions as a source of power. There are three types of muscle in the body. Muscle which is responsible for moving extremities and external areas of the body is called "skeletal muscle." Heart muscle is called "cardiac muscle." Muscle that is in the walls of arteries and bowel is called "smooth muscle."
- 2441 Muscular Dystrophy Association (MDA): The MDA is a national voluntary health agency working to defeat neuromuscular diseases through worldwide research, comprehensive services, and public health education. The MDA is dedicated to conquering more than 40 neuromuscular diseases.
- 2442 Muscular Dystrophy Coordinating Committee (MDCC): Plan devised in August 2005, by recognized experts in all the muscular dystrophies. The Action Plan serves as a roadmap to identify and prioritize high yield research objectives for the scientific community and all organizations targeting the muscular dystrophies. The Action Plan specifically addresses the following areas: disease mechanisms, diagnosis and screening, therapy, living with muscular dystrophy and research infrastructure. Cure CMD mission and goals are closely aligned with the MDCC Action Plan and seek to build the infrastructure to support these goals. These goals are: identification of therapeutic targets; support for basic science research; support to translate basic science research into therapeutic targets; support to test therapeutic targets in animal models graduating to clinical trial format where applicable; support for registry development and establishment of biorespository and longitudinal data base.
- 2443 muscularis propria: The muscular wall typically made up of two layers of smooth muscle, an inner circular layer and an outer longitudinal layer.

- 2444 mutagen: A chemical or physical agent that interacts with DNA and causes a mutation.
- 2445 mutagenesis: The creation of mutations.
- 2446 mutagenicity: Tendency to promote mutations, that is, genetic alterations.
- 2447 mutant: An organism carrying a gene that has undergone a mutation.
- 2448 mutate: Change form.
- 2449 mutation: A change in the genetic code, either brought about spontaneously, though chemicals or radiation or inherited. Point mutations refer to changes in a single nucleotide, such as the insertion of an adenine for a guanine. Point mutations can either be silent (meaning they do not cause a change in the triplet/codon resulting in no net change in amino acid insertion), nonsense (a nucleotide change that results in a stop codon, thus a shortened or truncated often nonfunctional protein) and a missense mutation (a nucleotide change that results in a substitution for a different amino acid, leading to a structurally misshapen but possibly still somewhat functional protein). Other mutations result from insertions or deletions during replication or transcription.
- 2450 mutualism: A symbiotic relationship in which both the host and the symbiont benefit.
- 2451 myalgia: Muscle aches, pain or tenderness.
- 2452 Myc (c-Myc): An oncogene that codes for a protein that binds to the DNA of other genes. When c-Myc is mutated, or overexpressed, the protein doesn't bind correctly, and often causes cancer.
- 2453 mycelium: The densely branched network of hyphae in a fungus.
- 2454 mycoplasma: A general category of microorganisms that shares some characteristics of bacteria.
- 2455 mycorrhizae: Mutualistic associations of plant roots and fungi.
- 2456 mycosis fungoides: A type of non-Hodgkin's lymphoma that first appears on the skin. Also called cutaneous T-cell lymphoma.
- 2457 myelin basic protein (MPB): A structural protein within the myelin sheath surrounding neurons.
- 2458 myelin sheath: Insulating layer of specialized cell membrane wrapped around vertebrate axons. This sheath is produced by oligodendrocytes in the central nervous system and by Schwann cells in the peripheral nervous system.
- 2459 myelin: Is the white matter coating our nerves, enabling them to conduct impulses between the brain and other parts of the body. It consists of a layer of proteins packed between two layers of lipids. Myelin is produced by specialized cells: oligodendrocytes in the central nervous system, and Schwann cells in the peripheral nervous system. Myelin sheaths wrap themselves around axons, the threadlike extensions of neurons that make up nerve fibers. Each oligodendrocyte can myelinate several axons. Oligodendrocytes produce the myelin sheath, which wraps in layers around axons. Myelin is produced by specialized cells: oligodendrocytes in the central nervous system, and Schwann cells in the peripheral nervous system. Myelin sheaths wrap themselves around axons, the threadlike extensions of neurons that make up nerve fibers. Each oligodendrocyte can myelinate several axons.
- 2460 myelodysplasia: Myelodysplasia is a diagnosis that includes several subcategories with very different findings and different prognoses.
- 2461 myelodysplastic syndrome or disorder: Formerly called pre-leukemia or 'smoldering' leukemia. It is a disease of the bone marrow in which too few platelets, red blood cells and white blood cells are made.
- 2462 myelofibrosis: A disease that causes scar tissue to form in the bone marrow. As a result of the scar tissue, normal blood cell production is blocked. Normal blood cell production then moves to the spleen which then becomes enlarged. Anemia results because blood production in the spleen does not work as well as in the bone marrow.
- 2463 myelography: A form of x-ray examination of the spinal cord using an injected dye for contrast.
- 2464 myeloid precursor cell: Myeloid-committed stem cells in the spleen which replenish mature myeloid lineage (tissue within the bone marrow that produces blood cells). These are basically precursor blood cells.
- 2465 myeloid stem cells: Precursors to the other lines of blood cells: erythrocytes, granulocytes, monocytes, and platelets. The second-generation cells are still pluripotent but their developmental potency is limited because neither can form an offspring of the other type.
- 2466 myeloid: A collective term for the non-lymphocyte groups of white blood cells. It includes cells from the granulocyte, monocyte, and platelet lineages.
- 2467 myelomeningocele: A neural tube birth defect in which some of the spinal cord protrudes through the vertebral column.
- 2468 myelopoiesis: Lineages distinct from the lymphoid lineages.
- 2469 myeloproliferative disorder: A group of disorders caused by increased production of blood cells by the bone marrow. The four types of Myeloproliferative Disorders are: Polycythemia Vera: too many red blood cells; Chronic Myelomonocytic Leukemia: too many white blood cells; Primary Thrombocythemia: too many platelets; Myelofibrosis: a disease that causes scar tissue to form in the bone marrow.
- 2470 myelotomy: Surgical incision of the spinal cord.
- 2471 Myf-5: Myogenic regulatory factor molecule.
- 2472 myoblast: This is a kind of stem cell found in muscle. When they fuse together they can form skeletal muscle fibers, which help us move.
- 2473 myocardial infarction: Commonly called heart attack. Myocardial infarction results in a disruption of blood supply to the cells in the affected area of the heart.
- 2474 myocardiocytes: Heart muscle cells (cardiac myocytes).
- 2475 myocardium: Muscle tissue of the heart made up of involuntary muscle cells
- 2476 myocyte: The functional cell type of muscles.
- 2477 MyoD1: A group of four basic myogenic regulatory factors (helix-loop-helix transcription) and a newly discovered factor called muscle enhancer factor-2 which appears to work away from the other three factors. However, all four of the factors in this MyoD family have the capacity of converting nonmuscle cells into cells expressing the full range of muscle proteins.
- 2478 myofibril: A fibril collectively arranged in longitudinal bundles in muscle cells (fibers); composed of thin filaments of actin and a regulatory protein and thick filaments of myosin.
- 2479 myogenic: Originating in or able to form in muscle cells.
- 2480 myoglobin: An oxygen-storing, pigmented protein in muscle cells.
- 2481 myometrium: Uterine smooth muscle.
- 2482 myosin light chain: There are four light chain subunits containing complex molecules that form contractile units in skeletal muscle.
- 2483 myosin: A type of protein filament that interacts with actin filaments to cause cell contraction.
- 2484 myxoma: A virus that causes myxomatosis in rabbits. It is carried by mosquitos and fleas.
- 2485 myxomatosis: A disease of rabbits caused by the myxoma virus. It is an early form of biological control.
- 2486 N0, N1, Nx: notation of lymph nodes metastasis.
- 2487 N-acetyl-a-acid (NAA): Aspartoacylase breaks down NAA into aspartic acid (an amino acid used in making proteins)

- and acetic acid. The cycle of production and breakdown of NAA appears to be critical for maintaining the brain's white matter, which consists of nerve fibers covered by myelin. NAA is likely essential for making certain fats (lipids) that are used to produce myelin.
- 2488 NAD⁺ (nicotinamide adenine dinucleotide): Abbreviation of nicotinamide adenine dinucleotide, a coenzyme present in all cells that helps enzymes transfer electrons during the redox reactions of metabolism.
- 2489 nadir: The lowest point.
- 2490 NADP: Abbreviation of nicotinamide adenine dinucleotide phosphate, a coenzyme that functions as an electron acceptor in the lightdependent reactions of photosynthesis.
- 2491 nanoengineering: The practice of engineering in the field of nanotechnology, or the control of matter on the molecular level in scales smaller than one billionth of a meter.
- 2492 nanog: A transcription factor critically involved with self-renewal of undifferentiated embryonic stem cells.
- 2493 nano-gel: A nano-engineered material containing molecules programmed to come together into nano-structures. When exposed to living tissues, it triggers the self-assembly of the molecules and is transformed into a gel. When the gel is injected, it then self-assembles into a scaffold that will allow axons to grow down the spinal cord.
- 2494 nanometer: A unit of measure; one millionth (10⁻⁹) of a meter.
- 2495 nanotechnology: The control of matter on an atomic and molecular scale.
- 2496 National Institutes of Health (NIH): An agency of the Department of Human and Health Services, its mission is the pursuit of knowledge about nature and behavior of living systems. It provides leadership and direction to programs designed to improve health by conducting and supporting research: in the causes, diagnosis, prevention, and cure of human diseases; in the processes of human growth and development; in the biological effects of environmental contaminants; in the understanding of mental, addictive and physical disorders; in directing programs for the collection, dissemination, and exchange of information in medicine and health, including the development and support of medical libraries and the training of medical librarians and other health information specialists.
- 2497 native: Organisms that have not been recently introduced into an ecosystem.
- 2498 natural killer cell: A cell type of the immune system that destroys tumor cells and cells infected with some types of organisms.
- 2499 natural killer cells: Natural killer cells are large lymphocytes. They are the first line of defense against viruses and other invaders because they do not need to wait for an antibody response to identify foreign cells and invaders.
- 2500 natural logarithm: The logarithm (log) to base e where $e \approx 2.718$. The natural logarithm is represented by the symbol ln.
- 2501 natural selection: Differential success in the reproduction of different phenotypes resulting from the interaction of organisms with their environment. Evolution occurs when natural selection causes changes in relative frequencies of alleles in the gene pool.
- 2502 naturopathy: Treatment of disease using natural agents and physical manipulation; avoids drugs and surgery.
- 2503 nausea: An unpleasant sensation in the stomach usually accompanied by the urge to vomit. Common causes are early pregnancy, sea and motion sickness, emotional stress, intense pain, food poisoning, and various stomach infections.
- 2504 necrosis (adj. necrotic): Death of cells or tissues through injury or disease.
- 2505 necrosis: The sum of the morphological changes indicative of cell death and caused by the progressive degradative action of enzymes, it may affect groups of cells or part of a structure or an organ.
- 2506 nectar: A sugary fluid that attracts insects to plants.
- 2507 needle biopsy: Needle biopsy is a procedure using a needle to take a sample of tissue or fluid. The procedure is also called fine needle aspiration.
- 2508 negative feedback: A primary mechanism of homeostasis, whereby a change in a physiological variable that is being monitored triggers a response that counteracts the initial fluctuation.
- 2509 negative predictive value: Refers to the chance that a negative test result will be correct.
- 2510 negative: The term used to describe a test result which does not show the presence of the substance or material for which the test was carried out; for example, a negative bone scan would show no sign of bone metastases.
- 2511 nematocyst: A threadlike stinger, containing a poisonous or paralyzing substance, found in the endocyste of cnidarians.
- 2512 neoadjuvant hormone blockade (NHB): Use of ADT prior to other therapies such as radiation therapy, surgery or possibly chemotherapy to reduce tumor volume and/or prostate gland volume with the goal to allow these other therapies to work better; also called NHT (Neoadjuvant Hormone Therapy)
- 2513 neonate: Newborn. Neonatal, adj.
- 2514 neoplasm: Also called tumor. Any new and abnormal growth; specifically a new growth of tissue in which the growth is uncontrolled and progressive. Malignant neoplasms are distinguished from benign in that the former show a greater degree of anaplasia and have the properties of invasion and metastasis.
- 2515 neoplastic: Having the characteristic of a potentially malignant growth.
- 2516 nephridium (pl. nephridia): A tubular excretory structure found in many invertebrates.
- 2517 nephron: The nephron is the functional unit of the kidney that is responsible for the actual purification and filtration of the blood. About one million nephrons are in the cortex of each kidney, and each one consists of a renal corpuscle and a renal tubule which carry out the functions of the nephron.
- 2518 nephrostomy: Establishment of an opening for a catheter from the kidney to the exterior of the body.
- 2519 neritic zone: The shallow regions of the ocean overlying the continental shelves.
- 2520 nerve fiber: A filamentous process extending from the cell body of a neuron and conducting the nerve impulse; an axon.
- 2521 nerve impulse: A rapid, transient, self-propagating change in electric potential across the membrane of an axon.
- 2522 nerve radicles: Small nerve roots that are seen microscopically within specific tissue, like the prostate
- 2523 nerve sparing: Term used to describe a type of prostatectomy in which the surgeon saves the nerves that affect sexual and related functions.
- 2524 nerve: A bundle of fibers that uses chemical and electrical signals to transmit sensory and motor information from one body part to another.
- 2525 nervous system: All the nerve cells of an animal; the receptor-conductor-effector system; in humans, the nervous system consists of the central nervous system (brain and spinal cord) and the peripheral nervous system.
- 2526 nestin: An intermediate filament protein found in cells such as neural and pancreatic precursors.
- 2527 net primary production: In a community or an ecosystem, the increase in the amount of plant or algal material between the beginning and end of a specified time period, such as a growing season.

- 2528 net primary productivity (NPP): The gross primary productivity minus the energy used by the producers for cellular respiration; represents the storage of chemical energy in an ecosystem available to consumers.
- 2529 net productivity: In a trophic level, a community, or an ecosystem, the amount of energy (in calories) stored in chemical compounds or the increase in biomass (in grams or metric tons) in a particular period of time; it is the difference between gross productivity and the energy used by the organisms in respiration.
- 2530 Neumega® (oprelvekin): A medication which helps the body produce more platelets in the blood.
- 2531 neural crest: A band of cells that extend lengthwise along the neural tube of an embryo and give rise to cells that form the cranial, spinal, and autonomic ganglia, as well as becoming odontoblasts, which form the calcified part of the teeth.
- 2532 neural groove: Dorsal, longitudinal groove that forms in a vertebrate embryo; bordered by two neural folds; preceded by the neural-plate stage and followed by the neural-tube stage.
- 2533 neural plate: Thickened strip of ectoderm in early vertebrate embryos that forms along the dorsal side of the body and gives rise to the central nervous system.
- 2534 neural stem cell (NSC): A stem cell found in adult neural tissue that can give rise to neurons and glial (supporting) cells. Neural stem cells are considered to be multipotent.
- 2535 neural tube: Primitive, hollow, dorsal nervous system of the early vertebrate embryo; formed by fusion of neural folds around the neural groove.
- 2536 neural: Related to the cells of the nervous system.
- 2537 neurilemma: The plasma membrane surrounding a Schwann cell of a myelinated nerve fiber and separating layers of myelin.
- 2538 neurite: Any process, including both dendrites and axons, growing out of a neuron. The term is often used when referring to immature or developing neurons, especially when grown in culture, where it is difficult to distinguish axons from dendrites.
- 2539 neuroblastoma: A childhood tumor that arises in the adrenal gland or in tissue in the nervous system that is related to the adrenal gland.
- 2540 neurodegenerative diseases: Diseases of the nervous system characterized by gradual and progressive loss of neural tissue resulting in increasing debility.
- 2541 neurodegenerative diseases: Diseases of the nervous system characterized by gradual and progressive loss of neural tissue resulting in increasing debility. These are the diseases most commonly treated with stem cells.
- 2542 neurodegenerative: Describes a process which degrades neurones (nerves) so they do not conduct messages optimally.
- 2543 neuroectoderm: The central region of the early embryonic ectoderm, which later forms the brain and spinal cord, as well as evolving into nerve cells of the peripheral nervous system.
- 2544 neuroendocrine: Descriptive of cells that release a hormone into the circulating blood in response to a neural stimulus. Such cells may comprise a peripheral endocrine gland (e.g., the insulin-secreting beta cells of the islets of Langerhans in the pancreas and the adrenaline-secreting chromaffin cells of the adrenal medulla); others are neurons in the brain (e.g., the neurons of the supraoptic nucleus that release antidiuretic hormone from their axon terminals in the posterior lobe of the hypophysis).
- 2545 neuroendocrine: Pertaining to the relationships between the nervous and the endocrine systems.
- 2546 neuroepithelium: A specialized epithelial structure that forms the termination of a nerve of a special sense, i.e., olfactory cells, hair cells of the inner ear, and the rods and cones of the retina. It is the embryonic layer of the epiblast that develops into the cerebrospinal axis.
- 2547 neurofibromatosis: A disorder inherited as an autosomal dominant and characterized especially by brown spots on the skin, neurofibromas of peripheral nerves, and deformities of subcutaneous tissue and bone.
- 2548 neurofilament (NF): A type of intermediate filament found in nerve cells.
- 2549 neurogenesis: Is the process by which neurons are created.
- 2550 neurogenic: Capable of generating neurons. Neuronal precursors or neuronal stem cells. Also means coming from or caused by the nervous system.
- 2551 neuroglia: Supporting tissue intermingled with the essential elements of nervous tissue especially in the brain, spinal cord, and ganglia.
- 2552 neurohormone: Any of a group of substances produced by specialized cells (neurosecretory cells) structurally typical of the nervous (rather than of the endocrine) system, but that serve as a link between the two systems.
- 2553 neurologic: Of or relating to the central nervous system.
- 2554 neurologist: A physician trained to specialize in diseases affecting the nervous system. These diseases include the muscular dystrophies, Lou Gehrig's (ALS), Parkinsons, dementia, stroke and neuropathies. For the first time, this year, the American Academy of Psychiatrists and Neurologists is offering special board certification in the muscle diseases. This is a voluntary certification and would probably indicate a special interest on the part of that physician to pursue further certification. Because the CMD's are rare diseases, it is possible that your local neurologist will not have seen a child or adult with CMD before. Especially in the early stages of diagnosis, it is important to find a knowledgeable neurologist to guide testing and diagnosis. Contacting the MDA, can be a resource to find a neurologist with expertise in CMD.
- 2555 neuromodulator: A chemical agent that is released by a neuron and diffuses through a local region of the central nervous system, acting on neurons within that region; generally has the effect of modulating the response to neurotransmitters.
- 2556 neuromuscular disorder: A disorder involving the relationship between nerves and muscles, and especially the weakening or dysfunction of the muscles.
- 2557 neuromuscular junction: The junction between an axon terminal of a motor neuron and a muscle fiber innervated by that motor neuron; the axon terminal of a motor neuron is typically branched, forming neuromuscular junctions with a number of different muscle fibers.
- 2558 neuron: The functional cell type of the brain that is specialized in conducting impulses; the principal functional units of the nervous system. A neuron consists of a cell body and its processes—an axon and one or more dendrites. Neurons transmit information to other neurons or cells by releasing neurotransmitters at synapses.
- 2559 neuronal stem cells: Stem cells that are precursors for brain or nerve cells. They may be harvested from fetal brains, or produced by differentiation of more primitive precursors. Neuronal stem cells often differentiate into a mixture of neurons, and glial cells and oligodendrocytes, the neuron's support cells.
- 2560 neuronal/neural stem cells: cells capable of becoming tissues of the brain and central nervous system.
- 2561 neuronopathic: A word used to describe a disorder that affects the brain or nervous system. Many LSDs have both neuronopathic and non-neuronopathic types.
- 2562 neurons: Nerve cells, the structural and functional unit of the nervous system. A neuron consists of a cell body and its processes, an axon, and one or more dendrites. Neurons function by the initiation and conduction of impulses and

- transmit impulses to other neurons or cells by releasing neurotransmitters at synapses.
- 2563 neuropathy: Peripheral neuropathy is a condition of the nervous system that usually begins in the hands or feet with symptoms of numbness, tingling, burning and/or weakness.
- 2564 neurosecretory cells: Hypothalamus cells that receive signals from other nerve cells, but instead of signaling to an adjacent nerve cell or muscle, they release hormones into the bloodstream.
- 2565 neurosphere: A primitive neural tissue that arises when embryonic stem cells are grown in certain culture conditions.
- 2566 neurotoxicity: Toxicity to nervous tissue (both brain and peripheral nerves).
- 2567 neurotransmitter: A chemical that acts as messenger between cells in the brain and nervous system; it transmits impulses across the gap from a neuron to another neuron, a muscle, or a gland.
- 2568 neurotrophic factors: Hormones which help growth of neurons, also called nerve growth factors.
- 2569 neurovascular bundles: Two bundles of nerves between the prostate and the rectum that control erection
- 2570 neurovascular: To both the neurologic and vascular systems or structures.
- 2571 neutral variation: Genetic diversity that confers no apparent selective advantage.
- 2572 neutron: A neutron is a subatomic particle found in the nucleus of every atom except that of simple hydrogen. The particle derives its name from the fact that it has no electrical charge; it is neutral.
- 2573 neutron: An electrically neutral particle (a particle having no electrical charge), found in the atom.
- 2574 neutropenia, neutropenic: A deficiency of neutrophils. A person is considered neutropenic when their white blood cell count drops below 1000.
- 2575 neutropenia: A blood condition caused by a large decrease in a type of white blood cell called a neutrophil. This decrease can occur when leukemia cells infiltrate and overcrowd the bone marrow, or during the high-dose chemotherapy regimen administered before a bone marrow transplant.
- 2576 neutrophil: The most abundant type of white blood cells (70% of WBC population are neutrophils) and form an integral part of the immune system. Neutrophils deal with bacterial infection and are usually first responders to bacterial infection, their activity and death in large numbers forms pus. Neutrophil count is used as a measure of engraftment success in transplants.
- 2577 niches: Places in the body where adult stem cells can be found. This microenvironment is a storage space for stem cells and will ultimately determine what the stem cell will become. The niche contains stimulants that either instruct the stem cell to self-maintain or turn into various cells of the organ where the niche is located.
- 2578 NIH: National Institutes of Health is a part of the U.S. Department of Health and Human Services, and is the primary Federal agency for conducting and supporting medical research. NIH is composed of 27 Institutes and Centers, the NIH provides leadership and financial support to researchers in every state and throughout the world. There are 4 institutes that primarily follow quality of medical care and research funding for muscular dystrophies: NINDs, NIAMS, NICHD and NHLBI. Together with the department of defense, CDC, and advocacy groups, these institutes sit on MDCC and direct and implement goals and strategies to improve funding and patient care.
- 2579 nilutamide (Nilandron®): A non-steroidal antiandrogen.
- 2580 nitrification: The oxidation of ammonia or ammonium to nitrites and nitrates, as by nitrifying bacteria.
- 2581 nitrogen cycle: Worldwide circulation and reutilization of nitrogen atoms, chiefly due to metabolic processes of living organisms; plants take up inorganic nitrogen and convert it into organic compounds (chiefly proteins), which are assimilated into the bodies of one or more animals; bacterial and fungal action on nitrogenous waste products and dead organisms return nitrogen atoms to the inorganic state.
- 2582 nitrogen fixation: The assimilation of atmospheric nitrogen by certain prokaryotes into nitrogenous compounds that can be directly used by plants.
- 2583 nitrogenase: An enzyme, unique to certain prokaryotes, that reduces N₂ to NH₃.
- 2584 nitrogenous base: An organic base that contains the element nitrogen.
- 2585 Nizoral®: The brand name of ketoconazole; a medication that blocks testicular and adrenal androgen production while having a direct cytotoxic effect on the PC cell; Nizoral® also is synergistic with certain chemotherapy agents and inhibits the development of the MDR gene.
- 2586 NMDA receptor: N-methyl-D-aspartate receptor. A neurotransmitter receptor for excitatory synapses.
- 2587 nocturia: the act of needing to getting up at night to urinate. This is usually scored as nocturia x number of times on average patient awakens to urinate. Nocturia x 3, for example, means getting up at night 3 times
- 2588 nocturnal: Applied to organisms that are active during the hours of darkness.
- 2589 node: A point along the stem of a plant at which leaves are attached.
- 2590 nodes of ranvier: The small gaps in the myelin sheath between successive glial cells along the axon of a neuron; also, the site of high concentration of voltage-gated ion channels.
- 2591 nodule: A growth or lump that may be cancerous or noncancerous.
- 2592 nomogram: A chart representing numerical relationships.
- 2593 nomograph: A graph that allows a third variable to be measured when the values of two related variables are known.
- 2594 non-coding DNA (Also called Junk DNA): DNA in the genome that is not directly involved in making proteins or other molecules. About 98 percent of the human genome consists of non-coding DNA. The term "junk" reflects the belief that the DNA, which is often repetitive, no longer serves a purpose in humans. But it's now clear that some non-coding DNA controls the activity of genes and may have other functions.
- 2595 Non-coding RNA: A non-coding RNA (ncRNA) is any RNA molecule that is not translated into a protein. A previously used synonym, particularly with bacteria, was small RNA (sRNA).
- 2596 noncoding: In genetics, noncoding DNA describes DNA which does not contain instructions for making proteins (or other cell products such as RNAs).
- 2597 noncompetitive inhibitor: A substance that reduces the activity of an enzyme by binding to a location remote from the active site, changing its conformation so that it no longer binds to the substrate.
- 2598 noncyclic electron flow: A route of electron flow during the light reactions of photosynthesis that involves both photosystems and produces ATP, NADPH, and oxygen; the net electron flow is from water to NADP⁺.
- 2599 noncyclic photophosphorylation: The production of ATP by noncyclic electron flow.
- 2600 nondisjunction: An accident of meiosis or mitosis, in which both members of a pair of homologous chromosomes or both sister chromatids fail to move apart properly.
- 2601 Non-Hodgkin lymphoma: A cancer that is found in the lymph tissue.

- 2602 noninvasive ventilation: Noninvasive ventilation is the delivery of ventilatory support without the need for an invasive artificial airway. Such ventilation has a role in the management of acute or chronic respiratory failure in many patients and may have a role for some patients with heart failure. Noninvasive ventilation can often eliminate the need for intubation or tracheostomy and preserve normal swallowing, speech, and cough mechanisms. There are several types of noninvasive ventilation; including negative pressure ventilation, bilevel positive airway pressure (BIPAP or bilevel ventilator) device, or a continuous positive airway pressure (CPAP) device. The use of noninvasive positive-pressure ventilation (NPPV) in acute hospital settings and at home has been steadily increasing.
- 2603 noninvasive: Not requiring any incision or the insertion of an instrument or substance into the body
- 2604 Non-Myeloablative Transplant ('Mini' or Low Intensity Regimen): A type of transplant that uses lower doses of chemotherapy and/or radiation to prepare a patient for transplant. It relies on the immune system to kill the disease. It may be a treatment option for older patients or those with other health problems because lower doses of chemotherapy/radiation are easier for the patient to handle.
- 2605 nonpolar covalent bond: A type of covalent bond in which electrons are shared equally between two atoms of similar electronegativity.
- 2606 Nonsense mutation (premature stop codon): Nonsense mutation: a nonsense mutation refers to a point mutation that changes a genetic sequence into a 3 letter code for a stop sign. If a stop sign arises in the middle of a gene because of a mutation, then when the gene encodes first mRNA and then a protein, a truncated or shortened protein will be made. Most of these shortened proteins are not functional and are destroyed by the cell.
- 2607 noradrenaline: A hormone, produced by the medulla of the adrenal gland, that increases the concentration of glucose in the blood, raises blood pressure and heartbeat rate, and increases muscular power and resistance to fatigue; also one of the principal neurotransmitters; also called norepinephrine.
- 2608 NORD (National Organization for Rare Disorders): A federation of voluntary health organizations dedicated to helping people with rare "orphan" diseases and assisting the organizations that serve them. NORD is committed to the identification, treatment, and cure of rare disorders through programs of education, advocacy, research, and service. NORD is not a government agency. It is a non-profit, voluntary health agency that exists to serve rare-disease patients and their families
- 2609 norm of reaction: The range of phenotypic possibilities for a single genotype, as influenced by the environment.
- 2610 notochord: An axial mesodermal tissue found in embryonic stages of all chordates and protochordates, often regressing as maturity is approached. Typically a rod shaped mass of vacuolated cells. It lies immediately below the nerve cord and may provide mechanical strength to the embryo.
- 2611 nuclear envelope: The membrane in eukaryotes that encloses the nucleus, separating it from the cytoplasm.
- 2612 nuclear medicine: Nuclear medicine is a medical specialty that uses very small amounts of radioactive materials or radiopharmaceuticals to diagnose and and treat disease. It is safe, painless, and cost-effective.
- 2613 nuclear membrane: The double membrane which surrounds the eukaryotic nucleus. It has many pores in its surface which regulate the flow of large compounds into and out of the nucleus.
- 2614 nuclear transfer (NT): Replacing the nucleus of one cell with the nucleus of another cell.
- 2615 nuclear transfer technology: A method of cloning a living organism. The process involves removing the nucleus of an egg cell and replacing it with a nucleus from any cell of the organism being cloned.
- 2616 nuclear transfer: For the generation of embryonic stem cells, the process by which the DNA-containing nucleus of any specialized cell (except eggs and sperm) is transferred into an oocyte whose own nuclear genome has been removed. The egg is activated to develop and will divide to form a blastocyst with genetic material identical to those of the donor of the specialized cell and not those of the donor of the oocyte. This process was used to generate Dolly the sheep.
- 2617 nucleated: Formed into a nucleus.
- 2618 nucleic acid probe: In DNA technology, a labeled single-stranded nucleic acid molecule used to tag a specific nucleotide sequence in a nucleic acid sample. Molecules of the probe hydrogen-bond to the complementary sequence wherever it occurs; radioactive or other labeling of the probe allows its location to be detected.
- 2619 nucleic acid: A polymer consisting of many nucleotide monomers; serves as a blueprint for proteins and, through the actions of proteins, for all cellular activities. The two types are DNA and RNA.
- 2620 nucleoid region: The region in a prokaryotic cell consisting of a concentrated mass of DNA.
- 2621 nucleoid: Region in prokaryotes where the DNA is concentrated. Unlike a nucleus, it is not bound by a membrane.
- 2622 nucleolus: A specialized structure in the nucleus, consisting of chromatin regions containing ribosomal RNA genes, along with ribosomal proteins imported from the cytoplasmic site of rRNA synthesis and ribosomal subunit assembly.
- 2623 nucleosome: The basic, beadlike unit of DNA packaging in eukaryotes, consisting of a segment of DNA wound around a protein core composed of two copies of each of four types of histone.
- 2624 nucleotide: The subunit of nucleic acids, DNA and RNA, that consists of a 5-carbon sugar, a phosphate group and a nitrogenous base. The bases are adenine, thymine, guanine and cytosine in DNA and adenine, uracil, guanine and cytosine in RNA.
- 2625 nucleus: A part of the cell, situated more or less in the middle of the cell, that is surrounded by a specialized membrane and contains the DNA of the cell. This DNA is packaged into structures called chromosomes, which is the genetic, inherited material of cells.
- 2626 null hypothesis: In statistical analysis, a hypothesis proposing that there is no statistically significant difference between the observed results of an experiment and the expected results.
- 2627 nutraceutical (or nutriceutical): a food or dietary supplement thought to provide a beneficial health effect
- 2628 obligate aerobe: An organism that requires oxygen for cellular respiration and cannot live without it.
- 2629 oblique: a plane or section not perpendicular to the xyz coordinate system, such as long and short axis views of the heart.
- 2630 occult: detectable only by microscopic examination or chemical analysis, as a minute blood sample.
- 2631 Occupational Therapy: A special education related service which is usually focused upon the development of a student's fine motor skills and/or the identification of adapted ways of accomplishing activities of daily living when a student's disabilities preclude doing those tasks in typical ways.
- 2632 oceanic zone: The region of water lying over deep areas beyond the continental shelf.
- 2633 Octamer Binding Factor: Important in ES and prevents differentiation.

- 2634 Octamer-4 (Oct-4): Oct-4, encoded by the gene POU5F1, is a transcription factor that is highly expressed in undifferentiated embryonic stem cells compared to other somatic cells. Oct-4 expression in embryonic stem cells is critical to maintain pluripotency. In fact, when Oct-4 expression is experimentally knocked out, ES cells spontaneously differentiate. In 2006, the Yamanaka lab identified Oct-4 as one of the four factors that, when co-transfected and expressed in mouse adult fibroblasts, caused fibroblasts to revert to an embryonic-like state. One year later, the same four factors were used to successfully reprogram human adult fibroblast cells into induced pluripotent stem cells. These four factors are Oct-4, SOX2, Klf-4 and c-Myc.
- 2635 octreotide (Sandostatin®): A synthetic protein that is similar to the naturally-occurring hormone called somatostatin. Octreotide decreases the production of many substances in the body such as insulin and glucagon (involved in regulating blood sugar), growth hormone, and chemicals that affect digestion.
- 2636 Oesophageal stricture: A narrowing of the oesophagus.
- 2637 Oesophagitis: Inflammation of the oesophagus.
- 2638 Oesophagus: The canal down through which solids and fluids pass from the mouth to reach the stomach.
- 2639 Office of the Gene Technology Regulator (OGTR): A part of the Australian Department of Health and Ageing that assists the Gene Technology Regulator, a statutory office holder, to administer the Gene Technology Act 2000 (the Act). The objective of the Act is to protect the health and safety of people and to protect the environment by identifying risks posed by, or resulting from, gene technology and by managing those risks through regulating certain dealings with genetically modified organisms.
- 2640 Olfactory bulb: A part of the brain involved in detecting and discriminating among different smells.
- 2641 Olfactory Ensheathing Cells (OECs): A part of nasal tissue, OECs appear to have special regeneration-promoting properties when transplanted into the injured spinal cord.
- 2642 Olfactory Stem Cells: An unusual source of nerve stem cells has been found in the nose, where the sensors for smell reside. Apparently, these exposed nerve cells are constantly being repaired, so they come with their own supply of stem cells. Dr. Lima of Portugal has tried transplanting the patch of olfactory cells in the nose into damaged spinal cord lesions, often with profound success. It is likely that injecting neural stem cells into the spinal cord lesions will be as effective, without need for surgery or sacrifice of the sense of smell!
- 2643 Olfactory: Pertaining to the sense of smell. Because olfactory tissue has considerable regenerative potential, it has been transplanted into the injured spinal cord.
- 2644 Oligodendrocyte: A supporting cell that provides insulation to nerve cells by forming a myelin sheath (a fatty layer) around axons.
- 2645 Oligonucleotide: Sequence of nucleic acids used as a probe in DNA based tissue typing.
- 2646 oligopotent progenitor cells: Progenitor cells that can produce more than one type of mature cell. An example is the myeloid progenitor cell which can give rise to mature blood cells of different types.
- 2647 Oligopotent progenitor cells: Progenitor cells that can produce more than one type of mature cells. For example, the clonal common myeloid progenitor is a progenitor cell which can give rise to blood granulocytes, monocytes, red blood cells, platelets, basophiles, eosinophiles and dendritic cells, but not T lymphocytes, B lymphocytes, or natural killer (NK) cells.
- 2648 Oligopotent: Able to form two or more lineages within a tissue. Example: a neural stem cell that can create a subset of neurons in the brain.
- 2649 oligotrophic lake: A nutrient-poor, clear, deep lake with minimum phytoplankton.
- 2650 Omalizumab (Xolair): A monoclonal antibody for the treatment of allergic disorders. Monoclonal means that all of the omalizumab is the same, unlike antibodies that we produce naturally in our bodies. Omalizumab is most like a human antibody but a small part (5%), similar to mouse antibody, may attach to IgE. When a substance, such as ragweed pollen, comes in contact with the mast cell, the IgE that is already on the mast cell may attach to the pollen causing the mast cell to release chemical substances, such as histamine. Omalizumab may reduce allergic reactions by causing free IgE to disappear from the body so that the IgE cannot attach to pollen (and other substances).
- 2651 omega 3 fatty acids: are nutritional elements essential to human health which cannot be produced by the body. They can be found in fish and other marine life. Also known as polyunsaturated fatty acids
- 2652 Omentum: A free fold of the peritoneum, or one serving to connect viscera, support blood vessels, etc. The great, or gastrocolic, omentum forms, in most mammals, a great sac, which is attached to the stomach and transverse colon, is loaded with fat, and covers more or less of the intestines. The lesser, or gastrohepatic, omentum connects the stomach and liver and contains the hepatic vessels. The gastrosplenic omentum, or ligament, connects the stomach and spleen.
- 2653 omnivore: A heterotrophic animal that consumes both meat and plant material.
- 2654 Oncogene: A gene found in viral or cellular genomes that is involved in triggering molecular events that can lead to cancer. c-Myc, one of the four reprogramming factors originally used by the Yamanaka group to reprogram somatic cells into induced pluripotent stem cells, is a well known proto-oncogene. The c-Myc gene codes for a transcription factor that regulates the expression of many genes involved in the control of cell proliferation, growth, differentiation and apoptosis. Abberant expression of c-Myc on the other hand is associated with tumor formation and cancer.
- 2655 oncogenesis: The process of cellular changes leading to the formation of a malignant tumor.
- 2656 Oncologist: A physician who specializes in the treatment of various types of cancer.
- 2657 oncology: the branch of medical science dealing with tumors; an oncologist is a specialist in the study of cancerous tumors
- 2658 oncolytic virus: A virus that causes death of a tumor cell; after the Greek word onkos for tumor or mass
- 2659 oncovirus: A virus associated with cancer.
- 2660 Ontogeny: The biological development or course of development of an individual organism.
- 2661 Oocyte: A female cell that develops into an ovum (egg) after meiosis; an egg before maturation.
- 2662 oogamy: A condition in which male and female gametes differ, such that a small, flagellated sperm fertilizes a large, nonmotile egg.
- 2663 oogenesis: The process in the ovary that results in the production of female gametes.
- 2664 open circulatory system: An arrangement of internal transport in which blood bathes the organs directly and there is no distinction between blood and interstitial fluid.
- 2665 operant conditioning: A type of associative learning that directly affects behavior in a natural context; also called trial-and-error learning.
- 2666 Operator: A segment of DNA that interacts with a repressor protein to regulate the transcription of the structural genes of an operon.

- 2667 operon: A unit of genetic function common in bacteria and phages, consisting of coordinately regulated clusters of genes with related functions.
- 2668 opioid: originally, a term denoting synthetic narcotics resembling opiates, but increasingly used to refer to both opiates and synthetic narcotics
- 2669 Opsonization: An immune response in which the binding of antibodies to the surface of a microbe facilitates phagocytosis of the microbe by a macrophage.
- 2670 orbital: In the current model of atomic structure, the volume of space surrounding the atomic nucleus in which an electron will be found 90 percent of the time.
- 2671 orchietomy (orchidectomy): the surgical removal of the testicles; surgical castration.
- 2672 Order: A taxonomic grouping of related, similar families; the category below class and above family.
- 2673 organ confined disease (OCD): PC that is apparently confined to the prostate clinically or pathologically; not going beyond the confines of the prostatic capsule.
- 2674 organ of Corti: The actual hearing organ of the vertebrate ear, located in the floor of the cochlear canal in the inner ear; contains the receptor cells (hair cells) of the ear.
- 2675 Organ: A relatively independent part of the body that carries out one or more special functions. The organs of the human body include the eye, ear, heart, lungs, and liver.
- 2676 organelle: A structure within a cell that performs a particular function. Examples include mitochondria, endoplasmic reticulum, vacuoles, chloroplasts and lysosomes. Organelles are like smaller versions of the organs in your body, each performing a particular function to keep the whole cell alive.
- 2677 organic chemistry: The study of carbon compounds (organic compounds).
- 2678 organic compound: A chemical compound containing the element carbon and usually synthesized by cells.
- 2679 organic: Pertaining to (1) organisms or living things generally, or (2) compounds formed by living organisms, or (3) the chemistry of compounds containing carbon.
- 2680 organ-identity gene: A plant gene in which a mutation causes a floral organ to develop in the wrong location.
- 2681 organism: A living thing that contains DNA and is capable of cell replication by itself; for example, bacteria, plants and animals.
- 2682 organogenesis: An early period of rapid embryonic development in which the organs take form from the primary germ layers.
- 2683 orgasm: The highest point of sexual excitement, characterized by strong feelings of pleasure and marked normally by ejaculation of semen by the male and by vaginal contractions in the female; also called climax
- 2684 origin of replication: A specific sequence of bases in a nucleic acid molecule to which the enzymes responsible for replicating the nucleic acid bind to initiate the copying process.
- 2685 ORMUS: A unique form of matter which seems related to life energies. Ormus or ormes appear to be di-atomic (2 atoms) forms of metallic elements, especially in the platinum group, but including precious metals such as silver and copper. Ormus appears to increase the healing abilities of the body, and to increase the ability of the stem cells to follow the morphogenetic field. www.subtleenergies.com/ormus
- 2686 ornithine decarboxylase: A rate-limiting enzyme in the pathway of mammalian polyamine biosynthesis. Polyamines affect DNA, RNA and protein synthesis. For these reasons, ODC activity is said to be closely associated with tumor promotion. Green tea polyphenols inhibit ODC resulting in a decrease in polyamine synthesis and cell growth.
- 2687 orphan drug: a category created by US FDA for medications used to treat diseases that occur rarely (less than 200,000 cases) or that there is no hope for recovery of development costs, so there is little financial incentive for industry to develop them; orphan drug status gives the manufacturer financial incentives to provide the drug.
- 2688 Orthopedic doctor: A doctor trained to specialize in bony injury. Individuals with CMD will see an orthopedic doctor to check for scoliosis and contractures. An orthopedic surgeon may perform a surgery to release a contracture or fix scoliosis. An orthopedic doctor may also write the prescription for occupational and physical therapy.
- 2689 Orthostatic hypotension: A sudden fall in blood pressure when a person stands up from the sitting position.
- 2690 orthotopic: in the normal or usual position.
- 2691 Osmoconformer: An animal that does not actively adjust its internal osmolarity because it is isotonic with its environment.
- 2692 osmolarity: Solute concentration expressed as molarity.
- 2693 Osmoregulation: Adaptations to control the water balance in organisms living in hypertonic, hypotonic, or terrestrial environments.
- 2694 Osmoregulator: An animal whose body fluids have a different osmolarity than the environment, and that must either discharge excess water if it lives in a hypotonic environment or take in water if it inhabits a hypertonic environment.
- 2695 Osmosis: Movement of a solvent through a semipermeable membrane (as of a living cell) into a solution of higher solute concentration that tends to equalize the concentrations of solute on the two sides of the membrane.
- 2696 osmotic potential: The tendency of water to move across a selectively permeable membrane into a solution; it is determined by measuring the pressure required to stop the osmotic movement of water into the solution.
- 2697 osmotic pressure: A measure of the tendency of a solution to take up water when separated from pure water by a selectively permeable membrane.
- 2698 Osmotic: Pertaining to or of the nature of osmosis.
- 2699 osseous: consisting of or resembling bone
- 2700 Osteichthyes: The vertebrate class of bony fishes, characterized by a skeleton reinforced by calcium phosphate; the most abundant and diverse vertebrates.
- 2701 osteoarthritis: noninflammatory degenerative joint disease occurring chiefly in older persons characterized by changes in the bone and cartilage of the joints and a progressive wearing down of joint surfaces.
- 2702 Osteocalcin (OC): A cytokine produced by osteoblasts that promotes bone formation.
- 2703 Osteoclast: Cells that break down bone. The relative activity of osteoblasts and osteoclasts determine the overall bone mass at any one time.
- 2704 Osteocyte: A cell from the bone tissue.
- 2705 Osteogenesis imperfecta: A large and miscellaneous group of conditions of abnormal fragility and plasticity of bone, with recurring fractures on trivial trauma.
- 2706 Osteogenesis: The process of laying down new bone material by osteoblasts.
- 2707 osteoid: Uncalcified bone matrix, the product of osteoblasts. Consists mainly of collagen.
- 2708 osteolysis: Destruction of bone.
- 2709 osteonecrosis: Condition resulting in death of bone tissue.
- 2710 osteopenia: a reduction in the bone density that is more than one standard deviation from the normal bone density; using the T score it is T=-1.0 down to T= -2.4; once the T score is less than 2.4, the patient is defined as having osteoporosis.
- 2711 Osteopetrosis: A disease of the bones where the bones get very hard and the bone marrow cannot grow.

- 2712 osteoporosis: A reduction in bone density resulting in a T score of -2.5 or less; a loss of bone due to increased osteoclastic activity leading to bone resorption.
- 2713 Osteoprogenitor: A cell-type that differentiates into a mature osteocyte.
- 2714 ostracoderm: An extinct agnathan; a fishlike creature encased in an armor of bony plates.
- 2715 Otx2: A transcription factor molecule.
- 2716 Outgroup: A species or group of species that is closely related to the group of species being studied, but clearly not as closely related as any study-group members are to each other.
- 2717 output traits: Traits produced in GM crops, which are beneficial or of direct value to the consumer. For example, improving the quality of food, increasing fibre, lowering the fat content or increasing anti-oxidant levels.
- 2718 ovarian cycle: The cyclic recurrence of the follicular phase, ovulation, and the luteal phase in the mammalian ovary, regulated by hormones.
- 2719 ovarian follicle: A developing oocyte and the specialized cells surrounding it; located near the surface of the ovary; following ovulation, forms the corpus luteum.
- 2720 Ovariectomy: Surgical removal of an ovary.
- 2721 ovary: 1) In flowers, the portion of a carpel in which the egg-containing ovules develop. (2) In animals, the structure that produces female gametes and reproductive hormones.
- 2722 Overall Response: The number of patients who had either a complete response or partial response.
- 2723 overexpress: produce in excess, as does the genetic material of cancer cells
- 2724 overstaging: the assignment of an overly high clinical stage at initial diagnosis because of the difficulty of assessing the available information with accuracy (e.g., stage T3b as opposed to stage T2b).
- 2725 oviduct: A tube passing from the ovary to the vagina in invertebrates or to the uterus in vertebrates.
- 2726 oviparous: Referring to a type of development in which young hatch from eggs laid outside the mother's body.
- 2727 ovoviviparous: Referring to a type of development in which young hatch from eggs that are retained in the mother's uterus.
- 2728 Ovulation: The release of an egg from ovaries. In humans, an ovarian follicle releases an egg during each menstrual cycle.
- 2729 ovule: A structure that develops in the plant ovary and contains the female gametophyte.
- 2730 Ovum: An egg in the ovary of the female. This egg is called the female "gamete" or sex cell. It combines with the male gamete, called a sperm, to form a zygote. This formation process is called fertilization.
- 2731 oxidant: a substance that causes another substance to combine with oxygen
- 2732 oxidation: a process where the amount of oxygen of a chemical compound is increased
- 2733 oxidative phosphorylation: The production of ATP using energy derived from the redox reactions of an electron transport chain.
- 2734 oxidizing agent: The electron acceptor in a redox reaction.
- 2735 oxygen debt: In muscle, the cumulative deficit of oxygen that develops during strenuous exercise when the supply of oxygen is inadequate for the demand; ATP is produced anaerobically by glycolysis, and the resulting pyruvic acid is converted to lactic acid, which is subsequently metabolized when adequate oxygen is available.
- 2736 Oxygen: A colorless, odorless and tasteless gas that makes up about 20% of the air we breathe (and at least half the weight of the entire solid crust of the earth) and which combines with most of the other elements to form oxides. Oxygen is essential to human, animal and plant life.
- 2737 Ozone (Medical): There is ozone and there is medical ozone, and they are very different. Ozone produced from air is toxic because of the nitrogen oxides, nitrites, nitric acids, sulphur dioxides and other compounds formed. This type of ozone is poisonous. Medical ozone is produced by passing clinical (pure) oxygen through high voltage tubes. Ozone purification treatment(s) purify toxins in the blood, tissues and organs and deliver an oxygen boost to the all the cells in the body. Ozone acts in the body in two ways: by oxidation and oxygenation. When ozone (O₃) is administered to the body, its third unstable oxygen atom readily attaches itself to bacteria, fungi, mold, parasites, and tumors, and in the process of doing this, it oxidizes or destroys them. This is oxidation. It then reverts to O₂, which adds much needed oxygen to the body. This is oxygenation. This oxygen has a high PH of between 7 and 9 needed to balance an unhealthy body. These pathogens (bacteria, fungi, mold, parasites, and tumors) are lower life organisms and are mostly anaerobic; that is, they cannot survive in an oxygen/ozone rich environment. Ozone within the body has powerful antibacterial, anti-viral, and anti-tumor benefits with very few side effects. Ozone has been used successfully on scores of diseases in Europe, especially Germany, for over 50 years. Over 6,000 articles on the medical usage's of ozone are in the world literature. Nearly every disease process responds favorably to any therapy that effectively increases cellular oxygen content. Ozone therapies are among the safest therapies ever used. One European study of over 5.5 million treatments showed a side effect rate of.0007%, probably among the lowest of any therapy known. Side effects (like fever and weakness) are minor and temporary.
- 2738 p27: A protein that helps to regulate cell growth and a loss of p27 expression is associated with poor prognosis in prostate cancer.
- 2739 p53: A protein that detects and repairs gene damage, coordinating events that cause the cell to stop its growth and repair the damage. If the damage is too great, p53 becomes the catalyst directing the damaged cell to commit suicide.
- 2740 Pacemaker: A specialized region of the right atrium of the mammalian heart that sets the rate of contraction; also called the sinoatrial (SA) node.
- 2741 Packaging plasmid: Lentiviral vectors that contain all necessary elements to efficiently generate active viral particles. For improved safety, third generation packaging plasmids have necessary element separated between 2 or 3 plasmids, eliminating the possibility of homologous recombination and generation of wild-type virus.
- 2742 paclitaxel (Taxol®): One of the chemotherapy agents called taxanes that block cell division.
- 2743 paedogenesis(pee-doh-jen-eh-sis): The precocious development of sexual maturity in a larva.
- 2744 paedomorphosis(pee-doh-mor-foh-sis): The retention in an adult organism of the juvenile features of its evolutionary ancestors.
- 2745 Page Citation: In Stem Cell Information [World Wide Web site]. Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services, 2006.
- 2746 paleontology: The scientific study of fossils.
- 2747 palisade cells: In plant leaves, the columnar, chloroplast-containing parenchyma cells of the mesophyll.
- 2748 Palladium-103: radioactive source used for brachytherapy. Pd-103 gives off energy more quickly than iodine. The radioactive half-life of palladium is 17 days.
- 2749 palliative: Designed to relieve a particular problem without necessarily solving it; for example, palliative therapy is given in order to relieve symptoms and improve quality of life, but does not cure the patient

- 2750 Palliative: Palliative means "relief of symptoms." Most often, palliation is the relief of pain.
- 2751 Pallor: An unnatural lack of colour in the skin (due to bruising, sickness or emotional distress).
- 2752 palpable: Capable of being felt during a physical examination by an experienced physician; in the case of prostate cancer, this normally refers to some form of abnormality of the prostate which can be felt during a digital rectal examination.
- 2753 palpation: Physical examination in medical diagnosis by pressure of the hand or fingers to the surface of the body especially to determine the condition (as of size or consistency) of an underlying part or organ
- 2754 Palpitation: A rapid or strong heartbeat.
- 2755 pamidronate: a disodium bisphosphonate bone-resorption inhibitor C₃H₉NNa₂O₇P₂ administered as an intravenous infusion in the treatment of hypercalcemia associated with malignancy called also pamidronate disodium
- 2756 pancreas: In vertebrates, a small, complex gland located between the stomach and the duodenum, which produces digestive enzymes and the hormones insulin and glucagon.
- 2757 Pancreatic beta cells: Cells of the pancreas (located in pancreatic islets, or islets of Langerhans) that produce insulin.
- 2758 Pancreatic polypeptide: An endocrine protein produced by islet cells of the pancreas.
- 2759 Pancytopenia: An abnormal deficiency in all blood cells (red blood cells and white blood cells and platelets); usually associated with bone marrow tumor or with aplastic anemia
- 2760 Panethnic: Affecting people of any ethnic background. Most of the LSDs are panethnic, but some of them are more common in certain ethnic groups.
- 2761 Pangaea: The supercontinent formed near the end of the Paleozoic era when plate movements brought all the land masses of Earth together.
- 2762 Panniculitis: Inflammation of subcutaneous fat.
- 2763 papaverine: A drug which causes blood vessels to expand, thereby increasing blood flow; when papaverine is injected into the penis, it produces an erection by increasing blood flow to the penis.
- 2764 Papilla (pl. papillae): A hump or swelling.
- 2765 para-aortic: Close to the aorta.
- 2766 Paracrine factors: Cytokines or hormones that act on cells or tissues within an extremely limited area.
- 2767 Paracrine regulator: A cell from a group that produces amines or peptides.
- 2768 Paracrine signaling: Cell signaling in which the cell being signaled is close to the cell doing the signaling.
- 2769 paracrine: A form of signaling in which the target cell is close to the signal-releasing cell; compare to endocrine.
- 2770 paramagnetic: A substance in which an induced magnetic field is parallel and proportional to the intensity of the magnetizing field but is much weaker than in ferromagnetic materials.
- 2771 paraphyletic: Pertaining to a taxon that excludes some members that share a common ancestor with members included in the taxon.
- 2772 Paraplegia: Spinal cord injury below the cervical level, affecting lower body function.
- 2773 parasite: An organism that lives in or on a host organism and uses it as a source of food and shelter, to the detriment of the host.
- 2774 Parasitism: A symbiotic relationship in which the symbiont (parasite) benefits at the expense of the host by living either within the host (endoparasite) or outside the host (ectoparasite).
- 2775 parasympathetic division: One of two divisions of the autonomic nervous system; generally enhances body activities that gain and conserve energy, such as digestion and reduced heart rate.
- 2776 Parasympathetic Nervous System: A part of the autonomic nervous system that serves to slow the heart rate, increase the intestinal and gland activity, and relax sphincter muscles.
- 2777 parathormone: A hormone that regulates ion levels in neurons and controls excitability of the nervous system.
- 2778 parathyroid glands: Four endocrine glands, embedded in the surface of the thyroid gland, that secrete parathyroid hormone and raise blood calcium levels.
- 2779 parathyroid hormone (PTH): one of the principal calcium-regulating hormones in the body.
- 2780 parazoa: Members of the subkingdom of animals consisting of the sponges.
- 2781 parenchyma: A relatively unspecialized plant cell type that carries most of the metabolism, synthesizes and stores organic products, and develops into more differentiated cell types.
- 2782 Parenchyma: The essential elements of an organ, used in anatomical nomenclature as a general term to designate the functional elements of an organ, as distinguished from its framework or stroma.
- 2783 parental generation: In an experimental genetic cross, the parents of the F₁ generation; homozygous for the trait(s) being studied.
- 2784 Parietal Peritoneum: The peritoneum is a thin membrane that lines the abdominal and pelvic cavities, and covers most abdominal viscera. It is composed of layer of mesothelium supported by a thin layer of connective tissue. Parietal peritoneum is that portion that lines the abdominal and pelvic cavities.
- 2785 Parkinson disease: A neurological syndrome usually resulting from deficiency of the neurotransmitter dopamine; characterized by rhythmical muscular tremors... (SMD)
- 2786 Parkinson's Disease: This disease affects about 1% of all people over 55 years of age and is due to degeneration of a portion of the brain. It is characterised by tremor, slowness of movement, rigidity and a progressive course which can eventually result in dementia and death. There is treatment for the symptoms of the disease, but no cure. It seems as if 7 out of 10 Parkinson's patients respond to stem cell therapy and booster doses might be necessary.
- 2787 Parthenogenesis: A form of reproduction where an egg develops without the fusion of sperm with the egg cell. Parthenogenesis occurs commonly among insects and other arthropods. Artificially inducing parthenogenesis with human eggs may be a means to isolate stem cells from an embryo, without fertilization.
- 2788 partial pressures: The concentration of gases; a fraction of total pressure.
- 2789 partial response (PR): A 50% or greater decline in parameters that are being used to measure anti-cancer activity; parameters include abnormalities involving physical exam findings, lab and radiologic studies.
- 2790 Partin tables: Tables constructed based on results of the PSA, clinical stage and Gleason score involving thousands of men with PC; used to predict the probability that the prostate cancer has spread to the lymph nodes, seminal vesicles, penetrated the capsule or that it remains confined to the prostate; developed by a group of scientists at the Brady Institute for Urology at Johns Hopkins University.
- 2791 Passage: In cell culture, the process in which cells are disassociated, washed, and seeded into new culture vessels after a round of cell growth and proliferation. The number of passages a line of cultured cells has gone through is an indication of its age and expected stability.
- 2792 passive transport: The diffusion of a substance across a biological membrane.
- 2793 Patency: The state of being freely open or exposed.

- 2794 patent: A grant made by a government that allows the creator of an invention the sole right to make, use, and sell that invention for a set period of time.
- 2795 pathogen (adj. pathogenic): An organism that causes disease in another organism.
- 2796 Pathogenesis: The underlying origin or cause of a disease.
- 2797 pathogenicity: The ability to cause disease.
- 2798 pathologist: a physician who specializes in the examination of tissues and blood samples to help decide what diseases are present and therefore how they should be treated.
- 2799 pathology, pathological: a science which specializes in the examination of tissues and blood samples to help decide what diseases are present and therefore how they should be treated.
- 2800 pathways: Pathway is short for signaling pathway. A signal, often from the outside, approaches a cell to tell it to perform a specific action.
- 2801 Patient advocate: A person who acts in the best interest of the patient or serves the patient's needs and may act on his/her behalf.
- 2802 pattern formation: The ordering of cells into specific three-dimensional structures, an essential part of shaping an organism and its individual parts during development.
- 2803 Pax-1 to Pax-9: Paired box 1–9. A transcription factor molecule.
- 2804 PCA3 score: ratio of PCA3 to PSA mRNA.
- 2805 PCA3: a specific gene that is profusely expressed in prostate cancer tissue, and not expressed in any other kind of human tissue.
- 2806 Pedigree: A family tree describing the occurrence of heritable characters in parents and offspring across as many generations as possible.
- 2807 pelagic zone: The area of the ocean past the continental shelf, with areas of open water often reaching to very great depths.
- 2808 Pelvic floor muscles: Muscles at the base of the pelvis that help support the bladder, uterus, urethra, vagina and rectum.
- 2809 pelvic lymph node dissection: removal of lymph nodes in the area of the pelvis to check for presence of cancer.
- 2810 Pelvis: The lower part of the abdomen, located between the hip bones.
- 2811 Penetrance: In genetics, the proportion of individuals with a particular genotype that show the phenotype ascribed to that genotype.
- 2812 penile bulb: the base of the penis that attaches to the perineal membrane.
- 2813 penile: of the penis.
- 2814 penis: the male organ used in urination and intercourse.
- 2815 peptide bond: The covalent bond between two amino acid units, formed by condensation synthesis.
- 2816 peptide: An organic compound composed of two or more amino acids linked together chemically by peptide bonds. A component of a polypeptide.
- 2817 peptidoglycan: A type of polymer in bacterial cell walls consisting of modified sugars cross-linked by short polypeptides.
- 2818 Perception: The interpretation of sensations by the brain.
- 2819 percutaneous: Through the skin.
- 2820 perennial: A plant that lives for many years.
- 2821 perfluorocarbon liquid: A colorless and odorless liquid in which all hydrogen atoms have been replaced by fluorine atoms. This liquid is injected within the MEDRAD endorectal coil instead of air to increase image and spectral quality.
- 2822 perfusion: Fluid passing through an organ or tissue.
- 2823 Perichondrium: A membrane around the surface of cartilage.
- 2824 pericycle: A layer of cells just inside the endodermis of a root that may become meristematic and begin dividing again.
- 2825 pericyte: This is an old terminology. Currently, these cells might be the recently defined mesenchymal stem cells.
- 2826 periderm: The protective coat that replaces the epidermis in plants during secondary growth, formed of the cork and cork cambium.
- 2827 perineal: An area of the body between the scrotum and the anus.
- 2828 perineum: The area of the body between the scrotum and the anus; a perineal procedure uses this area as the point of entry into the body.
- 2829 perineural invasion (PNI): PC invading the nerve sheath surrounding the nerves that enter the prostate
- 2830 Peripheral blood or peripheral blood stem cells (PBSC): Peripheral blood flows through the bloodstream in the body. Some blood stem cells are found in the peripheral blood.
- 2831 peripheral blood stem cell (PBSC) donation: Hematopoietic stem cells are collected from a donor's circulating blood through an apheresis procedure following mobilization from the marrow with Filgrastim. The stem cells are then transplanted into a recipient.
- 2832 peripheral blood stem cell transplant (PBSCT): A method of separating and collecting stem cells from the circulating blood stream using a process called pheresis. The stem cells are immediately frozen after collection, allowing the patient to receive higher-than-conventional doses of chemotherapy and/or radiation to destroy the leukemia-producing bone marrow. After completing high-dose chemotherapy or radiotherapy, the frozen stem cells are prepared and reintroduced to the patient via an intravenous, or IV, infusion.
- 2833 peripheral blood stem cells (PBSCs): Stem cells that leave the bone marrow and circulate in the bloodstream.
- 2834 peripheral nervous system: A division of the nervous system consisting of all nerves not part of the brain or spinal cord. It carries messages from all over the body to the central nervous system and vice versa.
- 2835 peripheral neuropathy (PN): Any disorder of the nervous system outside the brain and spinal column, such as tingling or numbness in the hands or feet.
- 2836 peripheral zone: the largest portion of the prostate located in the back closest to the rectum.
- 2837 peripheral: Situated away from the center, as opposed to centrally located.
- 2838 periprostatic: pertaining to the soft tissues immediately adjacent to the prostate.
- 2839 perirectal: the tissues surrounding the rectum.
- 2840 peristalsis: Rhythmic waves of contraction of smooth muscle that push food along the digestive tract.
- 2841 peritoneum: The smooth serous membrane which lines the cavity of the abdomen and covers most of the abdominal organs forming a closed, or nearly closed sac.
- 2842 peritubular capillaries: In the vertebrate kidney, the capillaries that surround the renal tubule; water and solutes are reabsorbed into the bloodstream through the peritubular capillaries and some substances are secreted from them into the renal tubule.
- 2843 permeable: Penetrable by molecules, ions, or atoms; usually applied to membranes that let given solutes pass through.
- 2844 peroxisome: A microbody containing enzymes that transfer hydrogen from various substrates to oxygen, producing and then degrading hydrogen peroxide.
- 2845 personalized cell replacement therapies: Treatment in which stem cells are created to genetically match a patient to reduce the risk of immune rejection and then induced to differentiate into a specific cell type ex vivo. These cells

- are then transplanted into the patient to repair damaged or destroyed cells or tissues.
- 2846 pesticide: A chemical that kills pests.
- 2847 petechiae: Pin-head-sized sites of bleeding in the skin. This type of bleeding results from a very low platelet count. The small punctate hemorrhages are frequently seen on the legs, feet, trunk and arms. They evolve from red to brown and are eventually disappear. They stop developing when the platelet count increases.
- 2848 petiole: The stalk of a leaf, which joins the leaf to a node of the stem.
- 2849 Peyer's patch: These are quite large aggregates of lymphoid tissue found in the small intestine, part of the lymphatic system which help to fight infection.
- 2850 pH scale: A measure of hydrogen ion concentration equal to $-\log [H^+]$ and ranging in value from 0 to 14.
- 2851 pH: A measure of acidity and alkalinity of a solution. The measure is a number on a scale on which a value of 7 represents neutrality and lower numbers indicate increasing acidity and higher numbers increasing alkalinity. On the scale, each unit of change represents a tenfold change in acidity or alkalinity.
- 2852 phage (fage): A virus that infects bacteria; also called a bacteriophage.
- 2853 phagocytic: Capable of functioning as a phagocyte. A phagocyte is a cell that is able to engulf and break down foreign particles, cell debris and disease producing micro-organisms in the body. Form an important part of the natural defence mechanism in most animals.
- 2854 phagocytosis: A type of endocytosis involving large, particulate substances.
- 2855 pharmacogenetics: The science of how a person's genes affect his or her response to drugs.
- 2856 pharmacogenomics: The science of how a person's genome affects his or her response to drugs, in either a positive or negative way. The word is used interchangeably with pharmacogenetics.
- 2857 pharmacokinetic studies: Studies which how a drug is absorbed, distributed, metabolized, and eliminated by the body.
- 2858 pharmacologic: The characteristics or properties of a drug, especially those that make it medically effective
- 2859 pharming: The process of farming GM plants or animals to be used as living pharmaceutical factories. Cows, sheep, pigs, goats, rabbits and mice can be used to produce large amounts of human proteins in their milk. Plants are being used to produce vaccines and diagnostic reagents.
- 2860 pharynx: An area in the vertebrate throat where air and food passages cross; in flatworms, the muscular tube that protrudes from the ventral side of the worm and ends in the mouth.
- 2861 Phase I Clinical Trial: A preliminary evaluation in a relatively small group of subjects to evaluate safety, determine side effects, and establish safe dosing.
- 2862 Phase II Clinical Trial: A study in which a treatment is given to a larger group of subjects to determine if it is effective and further evaluate safety.
- 2863 phenetics: An approach to taxonomy based entirely on measurable similarities and differences in phenotypic characters, without consideration of homology, analogy, or phylogeny.
- 2864 phenomics: The study of an overall organism and how the characteristics or traits of an organism that we can see (its phenotype) fits with the information we know about its genes (genomics) and proteins (proteomics).
- 2865 phenotype: A set of observable physical characteristics of an individual organism. A single characteristic can be referred to as a "trait," although a single trait is sometimes also called a phenotype. For example, blond hair could be called a trait or a phenotype, as could obesity. A phenotype can be the result of many factors, including an individual's genotype, environment, and lifestyle, and the interactions among these factors. The observed manifestation of a genotype, a phenotype may be expressed physically, biochemically, or physiologically.
- 2866 phenotypic characteristics: The genetically and environmentally determined physical characteristics of an organism.
- 2867 phenolamine: given by injection causes blood vessels to expand, thereby increasing blood flow; when injected into the penis, it increases blood flow to the penis, which results in an erection. see also papaverine, "bimix", "trimix".
- 2868 phenylketonuria (PKU): A hereditary disorder that results in reduced production of the liver enzyme phenylalanine hydroxylase. This substance is involved in the breakdown of phenylalanine in food to tyrosine. Without a modified diet, affected infants will develop severe, irreversible brain damage.
- 2869 pheochromocytoma: A tumor that is derived from chromaffin cells and is usually associated with paroxysmal or sustained hypertension.
- 2870 pheromone: A small, volatile chemical signal that functions in communication between animals and acts much like a hormone in influencing physiology and behavior.
- 2871 Philadelphia chromosome: Characteristic chromosomal abnormality in which a portion of chromosome 22 is translocated to chromosome 9. This abnormality is found in nearly all cases of chronic myeloid leukaemia and some cases of acute lymphoblastic leukaemia.
- 2872 phlebotomy: Withdrawing blood from a vein (usually a vein in the arm) usually for testing purposes.
- 2873 phloem: The portion of the vascular system in plants consisting of living cells arranged into elongated tubes that transport sugar and other organic nutrients throughout the plant.
- 2874 phosphate group: A functional group important in energy transfer.
- 2875 phosphodiesterase (PPD) inhibitors: Drugs which may help a man achieve an erection.
- 2876 phospholipids: Molecules that constitute the inner bilayer of biological membranes, having a polar, hydrophilic head and a nonpolar, hydrophobic tail.
- 2877 Phosphorylation: Addition of a phosphate group or groups to a molecule.
- 2878 phosphorylation: the addition of phosphate to an organic compound through the action of a phosphorylase or kinase.
- 2879 photic zone: The narrow top slice of the ocean, where light permeates sufficiently for photosynthesis to occur.
- 2880 photoautotroph: An organism that harnesses light energy to drive the synthesis of organic compounds from carbon dioxide.
- 2881 photon: A unit of energy of a light ray or other form of radiant energy. Most conventional radiation uses photons to deliver ionizing radiation.
- 2882 photoperiodism: A physiological response to day length, such as flowering in plants.
- 2883 photophosphorylation: The process of generating ATP from ADP and phosphate by means of a proton-motive force generated by the thylakoid membrane of the chloroplast during the light reactions of photosynthesis.
- 2884 Photoreceptor: A cell or organ capable of detecting light.
- 2885 photorespiration: A metabolic pathway that consumes oxygen, releases carbon dioxide, generates no ATP, and decreases photosynthetic output; generally occurs on hot, dry, bright days, when stomata close and the oxygen concentration in the leaf exceeds that of carbon dioxide.
- 2886 photosynthesis: The conversion of light energy to chemical energy that is stored in glucose or other organic compounds; occurs in plants, algae, and certain prokaryotes.

- 2887 photosystem: The light-harvesting unit in photosynthesis, located on the thylakoid membrane of the chloroplast and consisting of the antenna complex, the reaction-center chlorophyll a, and the primary electron acceptor. There are two types of photosystems, I and II; they absorb light best at different wavelengths.
- 2888 phototropism: Growth of a plant shoot toward or away from light.
- 2889 phrenic nerve pacing: Provides respiratory assistance for individuals with higher-level, respiration-compromising injuries by electrically stimulating diaphragmatic contractions.
- 2890 phyletic change: The changes taking place in a single lineage of organisms over a long period of time; one of the principal patterns of evolutionary change.
- 2891 phylogeny: The evolutionary history of a species or group of related species.
- 2892 phylum pl. phyla: A taxonomic category; phyla are divided into classes.
- 2893 physiatrist: Physiatrists are rehabilitation physicians. They are nerve, muscle, and bone experts who treat injuries or illnesses that affect how you move. Rehabilitation physicians have completed training in the medical specialty physical medicine and rehabilitation (PM&R).
- 2894 physical examination: A general evaluation of a person's physical condition performed by a physician or nurse.
- 2895 physical therapist: A specialist trained in the treatment of diseases and injury through exercise and physical activities; may be involved in addressing some LSD symptoms.
- 2896 physical therapy: A type of treatment or therapy designed to help an individual who has difficulty with physical movement. Physical therapists may use exercise, water, and other treatments to help improve muscle strength, range of motion, and motor skills.
- 2897 physiologic: Of or consistent with a living organism's normal functioning
- 2898 physiology: The study of function in cells, organs, or entire organisms; the processes of life.
- 2899 phytoalexin: An antibiotic, produced by plants, that destroys microorganisms or inhibits their growth.
- 2900 phytochrome: A pigment involved in many responses of plants to light.
- 2901 phytoplankton: Aquatic, free-floating, microscopic, photosynthetic organisms.
- 2902 PI3 kinase: An enzyme which influences a wide variety of cellular functions, including cell growth, differentiation and survival, glucose metabolism and cytoskeletal organization.
- 2903 pia mater: The innermost layer of the meninges, the membrane system surrounding the spinal cord.
- 2904 PICP: carboxy-terminal propeptide of type I procollagen; a bone formation marker.
- 2905 pigment: A colored substance that absorbs light over a narrow band of wavelengths.
- 2906 pigments: Chemicals that are coloured. For example, the pigment melanin determines skin colouration.
- 2907 pill burden: Refers to the total number of pills that need to be taken.
- 2908 pilus: A surface appendage in certain bacteria that functions in adherence and the transfer of DNA during conjugation.
- 2909 pineal gland: A small endocrine gland on the dorsal surface of the vertebrate forebrain; secretes the hormone melatonin, which regulates body functions related to seasonal day length.
- 2910 pinocytosis: A type of endocytosis in which the cell ingests extracellular fluid and its dissolved solutes.
- 2911 pipette: A handheld instrument with a narrow plastic or glass tube that is marked for measuring (graduated) and is used to transfer small amounts of liquids sometimes containing cells.
- 2912 pith: The core of the central vascular cylinder of monocot roots, consisting of parenchyma cells, which are ringed by vascular tissue; ground tissue interior to vascular bundles in dicot stems.
- 2913 pituitary gland: An endocrine gland at the base of the hypothalamus; consists of a posterior lobe (neurohypophysis), which stores and releases two hormones produced by the hypothalamus, and an anterior lobe (adenohypophysis), which produces and secretes many hormones that regulate diverse body functions.
- 2914 pituitary: a small gland at the base of the brain that supplies hormones that control many body processes including the production of testosterone. by the testis.
- 2915 placebo: a form of safe but non-active treatment frequently used as a basis for comparison with pharmaceuticals in research studies
- 2916 Placenta: A temporary organ joining the mother and fetus, the placenta transfers oxygen and nutrients from the mother to the fetus, and permits the release of carbon dioxide and waste products from the fetus. It is roughly disk-shaped, and at full term measures about seven inches in diameter and a bit less than two inches thick. The upper surface of the placenta is smooth, while the under surface is rough. The placenta is rich in blood vessels.
- 2917 placental mammal: A member of a group of mammals, including humans, whose young complete their embryonic development in the uterus, joined to the mother by a placenta.
- 2918 placoderm: A member of an extinct class of fishlike vertebrates that had jaws and were enclosed in a tough, outer armor.
- 2919 planimetry: The measurement of plane surfaces
- 2920 plankton: Mostly microscopic organisms that drift passively or swim weakly near the surface of oceans, ponds, and lakes.
- 2921 planning target volume (PTV): Equivalent to the clinical target volume plus a margin to account for uncertainty in immobilization and localization of the patient anatomy during treatment.
- 2922 planula: The ciliated, free-swimming type of larva formed by many cnidarians.
- 2923 plasma cell: A derivative of B cells that secretes antibodies.
- 2924 plasma membrane: The plasma membrane is made up of a lipid bilayer that acts as a selective barrier that regulates the cell's chemical composition and also plays an important role in cell transport and communication.
- 2925 plasma: The clear, yellowish fluid portion of blood, lymph, or intramuscular fluid in which cells are suspended. It differs from serum in that it contains fibrin and other soluble clotting elements.
- 2926 Plasmacytoma: Any discrete, presumably solitary, mass of neoplastic plasma cells either in bone marrow or various extramedullary sites.
- 2927 plasmid: A small ring of DNA that carries accessory genes separate from those of a bacterial chromosome. Also found in some eukaryotes, such as yeast.
- 2928 plasmodesma: An open channel in the cell wall of plants through which strands of cytosol connect from adjacent cells.
- 2929 plasmogamy: The fusion of the cytoplasm of cells from two individuals; occurs as one stage of syngamy.
- 2930 plasmolysis: A phenomenon in walled cells in which the cytoplasm shrivels and the plasma membrane pulls away from the cell wall when the cell loses water to a hypertonic environment.
- 2931 plasticity: The ability of stem cells from one adult tissue to generate the differentiated cell types of another tissue.
- 2932 plastid: Any of several pigmented cytoplasmic organelles found in plant cells and other organisms, having various

- physiological functions, such as the synthesis and storage of food.
- 2933 platelet: A particle found in the bloodstream that binds at the site of a wound to begin the blood clotting process. Platelets are formed in bone marrow.
- 2934 pleated sheet: One form of the secondary structure of proteins in which the polypeptide chain folds back and forth, or where two regions of the chain lie parallel to each other and are held together by hydrogen bonds.
- 2935 pleiotropic: When a single gene influences multiple traits.
- 2936 pleiotropy: The ability of a single gene to have multiple effects.
- 2937 pleomorphism: A hardening within the nervous system, especially of the brain and spinal cord, resulting from degeneration of nervous elements such as the myelin sheath.
- 2938 plesiomorphic character: A primitive phenotypic character possessed by a remote ancestor.
- 2939 pleura: The delicate serous membrane that lines each half of the thorax of mammals and is folded back over the surface of the lung of the same side.
- 2940 pleural effusion: A collection of fluid (or blood) in the pleural space (in one side of the chest cavity around the lung). May be secondary to trauma, cancer, nephrotic syndrome, kidney disease, pancreatitis, congestive heart failure and cirrhosis.
- 2941 pluripotent stem cells: These have the information and capacity to become any cell in the body if managed properly. The question remains as to how best manage these valuable cells.
- 2942 pluripotent: Ability of a stem cell to differentiate into cell types of the three germ layers, adjective: pluripotent.
- 2943 plexus: A structure in the form of a network, especially of nerves, blood vessels, or lymphatics.
- 2944 plicae circulares: Plicae circulares are macroscopically visible, crescent-shaped folds of the mucosa and submucosa. Plicae circulares extend around one-half to two-thirds of the circumference of the lumen of the small intestine.
- 2945 ploidy: The number of homologous sets of chromosomes in a biological cell. In humans, most cells are diploid; that is they contain one set of chromosomes from each parent.
- 2946 pluralism: The belief that there are multiple opinions about an issue, each of which contains part of the truth, but none that contain the whole truth.
- 2947 pluripotent cell: A self-renewing cell that has the capability to commit toward different cell lineages along one germ layer, e.g., hematopoietic stem cells can make immune and red blood cells. Thus, a pluripotent cell is a stem cell.
- 2948 pluripotent stem cell: Pluripotent stem cell has the ability to give rise to various types of the cells that develop from the three germ layers viz. mesoderm, endoderm and ectoderm from which all the cells of the body arise. The only known sources of human pluripotent stem cells are those isolated and cultured from early human embryos and from fetal tissues.
- 2949 pluripotent: Ability of a single stem cell to give rise to all of the various cell types that make up the body. Pluripotent cells cannot make so-called "extra-embryonic" tissues such as the amnion, chorion, and other components of the placenta. Scientists demonstrate pluripotency by providing evidence of stable developmental potential, even after prolonged culture, to form derivatives of all three embryonic germ layers from the progeny of a single cell and to generate a teratoma after injection into an immunosuppressed mouse.
- 2950 pluripotent: Able to form all the body's cell lineages, including germ cells, and some or even all extraembryonic cell types. Example: embryonic stem cells.
- 2951 pmbryonic germline (EG) cells: EG cells are pluripotent stem cell lines derived from the primitive germline cells that exist between the blastocyst stage of development until their conversion within gonads to egg or sperm stem cells. Their properties are similar to those of ES cells.
- 2952 pneumonia: An inflammatory infection that occurs in the lung.
- 2953 point mutation: A change in a gene at a single nucleotide pair.
- 2954 polar body: A polar body is a structure produced when an early egg cell, or oogonium, undergoes meiosis. In the first meiosis, the oogonium divides its chromosomes evenly between the two cells but divides its cytoplasm unequally. One cell retains most of the cytoplasm, while the other gets almost none, leaving it very small. This smaller cell is called the first polar body. The first polar body usually degenerates. The ovum, or larger cell, then divides again, producing a second polar body with half the amount of chromosomes but almost no cytoplasm. The second polar body splits off and remains adjacent to the large cell, or oocyte, until it (the second polar body) degenerates. Only one large functional oocyte, or egg, is produced at the end of meiosis.
- 2955 polar covalent bond: A type of covalent bond between atoms that differ in electronegativity. The shared electrons are pulled closer to the more electronegative atom, making it slightly negative and the other atom slightly positive.
- 2956 polar molecule: A molecule (such as water) with opposite charges on opposite sides.
- 2957 polar nuclei: In angiosperms, the two nuclei of the central cell of the female gametophyte; they fuse with a sperm nucleus to form the triploid (3n) endosperm nucleus.
- 2958 polar: Having parts or areas with opposed or contrasting properties, such as positive and negative charges, head and tail.
- 2959 polarity: The property of having two opposite poles, sides or ends (for example, humans have left-right polarity, also front-back polarity and head-tailward polarity).
- 2960 pollen: An immature male gametophyte that develops within the anthers of stamens in a flower.
- 2961 pollination: The placement of pollen onto the stigma of a carpel by wind or animal carriers, a prerequisite to fertilization.
- 2962 polyamine: Any of a group of organic compounds, such as spermine and spermidine, composed of only carbon, nitrogen, and hydrogen and containing two or more amino groups.
- 2963 polyandry: A polygamous mating system involving one female and many males.
- 2964 polygenic inheritance: An additive effect of two or more gene loci on a single phenotypic character.
- 2965 polygyny: A polygamous mating system involving one male and many females.
- 2966 polymer: A large molecule consisting of many identical or similar monomers linked together.
- 2967 polymerase chain reaction (PCR): A laboratory process in which a segment of DNA is copied multiple times using DNA polymerase.
- 2968 polymerase chain reaction (PCR): System for in vitro amplification of DNA that involves separating the DNA into its two complementary strands and using DNA enzymes to synthesize two-stranded DNA from each single strand, and repeating the process.
- 2969 polymerase: An enzyme, such as DNA polymerase or RNA polymerase, that catalyzes the synthesis of a polymer from its subunits.
- 2970 polymorphic: Referring to a population in which two or more physical forms are present in readily noticeable frequencies.

- 2971 polymorphism: The coexistence of two or more distinct forms of individuals (polymorphic characters) in the same population.
- 2972 polynucleotide: A polymer made up of many nucleotides covalently bonded together.
- 2973 polyp: The sessile variant of the cnidarian body plan. The alternate form is the medusa.
- 2974 polypectomy: Excision of a polyp.
- 2975 polypeptide: A peptide containing anywhere between 10 and 100 molecules of amino acids. Peptides can either be small proteins or part of a protein. A polypeptide is the ultimate expression product of a gene, and is folded into a functional protein after it has been assembled.
- 2976 polyphenol: Any of a class of aromatic organic compounds comprised of more than one hydroxyl group (-OH) attached directly to a benzene ring
- 2977 Polyphyletic: Pertaining to a taxon whose members were derived from two or more ancestral forms not common to all members.
- 2978 polyploid: Cell with more than two complete sets of chromosomes per nucleus.
- 2979 polyploidy: A chromosomal alteration in which the organism possesses more than two complete chromosome sets.
- 2980 polyribosome: An aggregation of several ribosomes attached to one messenger RNA molecule.
- 2981 polysaccharide: A polymer of up to over a thousand monosaccharides, formed by condensation synthesis.
- 2982 polyunsaturated fat: A fat that has more than one double bond in the molecule.
- 2983 Polyvinylchloride: A carcinogenic polymer used in plastics and is commonly known as PVC.
- 2984 population bottleneck: Type of genetic drift that occurs as the result of a population being drastically reduced in numbers by an event having little to do with the usual forces of natural selection.
- 2985 population density: The number of individuals of a population per unit area or volume of living space.
- 2986 population doublings: The number of times cells growing in vitro have increased the total number of cells by a factor of 2 compared to the initial number of cells. Primitive streak: A band of cells appearing in the embryo at the start of the third week of development, that marks the axis along which the spinal chord develops.
- 2987 population viability analysis (PVA): A method of predicting whether or not a species will persist in a particular environment.
- 2988 population: A group of individuals of one species that live in a particular geographic area.
- 2989 positional information: Signals, to which genes regulating development respond, indicating a cell's location relative to other cells in an embryonic structure.
- 2990 positive feedback: A physiological control mechanism in which a change in some variable triggers mechanisms that amplify the change.
- 2991 positive margin: The pathologic finding of cancer cells on the outer edge of the tissue removed.
- 2992 positive predictive value: refers to the chance that a positive test result will be correct.
- 2993 positive: The term used to describe a test result which shows the presence of the substance or material for which the test was carried out; for example, a positive bone scan would show signs of bone metastases.
- 2994 positron emission tomography (PET): Using a radioactive isotope that is taken up by tumor tissue showing that the tumor is functional
- 2995 post: implantation embryo: Implanted embryos in all early stages of development until the establishment of the body plan of a developed organism with identifiable tissues and organs.
- 2996 posterior: The rear; for example, the posterior of the prostate is the part of the prostate that faces a man's back
- 2997 posterolateral: Behind and to one side.
- 2998 postsynaptic membrane: The surface of the cell on the opposite side of the synapse from the synaptic terminal of the stimulating neuron that contains receptor proteins and degradative enzymes for the neurotransmitter.
- 2999 postsynaptic: Situated after a synapse. A postsynaptic cell (e.g., another neuron or a muscle cell) contains receptors that bind to neurotransmitters released by presynaptic neurons.
- 3000 postzygotic barrier: Any of several species-isolating mechanisms that prevent hybrids produced by two different species from developing into viable, fertile adults.
- 3001 potency: A general term that describes the capability of a cell (stem cell or progenitor) to differentiate into another more committed cell type.
- 3002 potential energy: The energy stored by matter as a result of its location or spatial arrangement.
- 3003 power: The term power has quite a few different meanings. For Biotechnology Online, we are referring to an organisation or individual's ability to act effectively according to their intentions, needs, or values.
- 3004 prana: Under ancient Hindu Ayurvedic and yoga philosophy, life-force energy prana is circulated throughout the body.
- 3005 preclinical testing: Laboratory tests of a new drug or a new medical device to determine the toxicity and pharmacokinetics in order to gather evidence to support a clinical trial in humans.
- 3006 preclinical: Before a disease becomes recognizable based on direct observation.
- 3007 precursor cells: In fetal or adult tissues, partly differentiated cells that divide and give rise to differentiated cells. Also known as progenitor cells.
- 3008 precursor cells: In fetal or adult tissues, these are partly differentiated cells that divide and give rise to differentiated cells. Also known as progenitor cells.
- 3009 precursor: A cell capable of differentiating into another cell type. For example, a hepatic/pancreatic cell precursor is capable of differentiating into liver cells of several types, pancreatic cells that secrete digestive juices, and pancreatic cells that produce insulin. A stem cell is a precursor to other cell types.
- 3010 predation: An interaction between species in which one species, the predator, eats the other, the prey.
- 3011 predator: An organism that eats other living organisms.
- 3012 prednisone (Orasone® or Deltasone® or Liquid Pred® or Meticorten®): A glucocorticoid steroid used to treat anorexia and cachexia and some cancers. It is similar to a steroid hormone made by the adrenal glands in the body.
- 3013 preferred provider organization: An insurance plan which allows choice of any provider in the network.
- 3014 pre-implantation embryo: Fertilized eggs (zygotes) and all of the developmental stages up to, but not beyond, the blastocyst stage. A pre-implantation embryo has not yet implanted in the wall of the uterus. Human embryonic stem cells are derived from pre-implantation-stage embryos fertilized outside a woman's body (in vitro).
- 3015 pre-implantation genetic diagnosis (PGD): Tests early-stage embryos produced through in vitro fertilization (IVF) for the presence of a variety of genetic conditions. One cell is extracted from the embryo in its eight-cell stage and analyzed. Embryos free of conditions that would cause serious disease can be implanted in a woman's uterus and allowed to develop into a child.
- 3016 preimplantation: With regard to an embryo, preimplantation means that the embryo has not yet implanted in the wall of the uterus. Human embryonic stem

- cells are derived from preimplantation stage embryos fertilized outside a woman's body (in vitro).
- 3017 preliminary Search: The process by which a patient's HLA type is sent to the NMDP and entered into the computer where it is compared to the HLA types of all volunteers listed in the Registry at that time. The patient's demographic information and basic disease status are also submitted at preliminary search. The preliminary search becomes formal when specific donors are requested for further testing on behalf of the patient.
- 3018 prenatal analysis: Refers to a variety of tests to determine the health of the fetus. In some cases of known carrier couples of genetic disease prenatal analysis can show if the fetus is affected by the disease.
- 3019 preparative regimen: Chemotherapy or radiation that is administered prior to transplant to kill any remaining cancer cells and to make a space for your new stem cells.
- 3020 President's Council on Bioethics (PCB): A committee of experts during the Bush administration that was formed in 2001 (after the NBAC was disbanded) to provide the President with advice on bioethical issues that may emerge as a result of biomedical science and technology.
- 3021 pressure-flow hypothesis: A hypothesis accounting for sap flow through the phloem system. According to this hypothesis, the solution containing nutrient sugars moves through the sieve tubes by bulk flow, moving into and out of the sieve tubes by active transport and diffusion.
- 3022 presynaptic: Situated in front of or occurring before a synapse. A presynaptic neuron releases neurotransmitters that bind with the receptors of a postsynaptic cell (e.g., another neuron or a muscle cell).
- 3023 pre-transplant Conditioning: A regimen of chemotherapy with or without radiation therapy that destroys a patient's marrow. The marrow is then restored by transplanting stem cells.
- 3024 prey: An organism eaten by another organism.
- 3025 prezygotic barrier: A reproductive barrier that impedes mating between species or hinders fertilization of ova if interspecific mating is attempted.
- 3026 priapism: A prolonged, often painful erection, in which the penis does not return to its flaccid state within about four hours due to blood retention.
- 3027 priapism: an abnormal, painful erection where the penis remains erect for an extended period of time that is usually not accompanied with sexual desire
- 3028 primary consumer: An herbivore; an organism in the trophic level of an ecosystem that eats plants or algae.
- 3029 primary germ layers: The three initial embryonic germ layers—endoderm, mesoderm, and ectoderm—from which all other somatic tissue-types develop.
- 3030 primary growth: Growth initiated by the apical meristems of a plant root or shoot.
- 3031 primary immune response: The initial immune response to an antigen, which appears after a lag of several days.
- 3032 primary producer: An autotroph, which collectively make up the trophic level of an ecosystem that ultimately supports all other levels; usually a photosynthetic organism.
- 3033 primary productivity: The rate at which light energy or inorganic chemical energy is converted to the chemical energy of organic compounds by autotrophs in an ecosystem.
- 3034 primary site: The anatomic site where the original tumor is located. Primary cancer is usually named after the organ in which it starts. For example, cancer that starts in the breast is always breast cancer even if it spreads (metastasizes) to other organs such as bones or lungs.
- 3035 primary structure: The level of protein structure referring to the specific sequence of amino acids.
- 3036 primary succession: A type of ecological succession that occurs in an area where there were originally no organisms.
- 3037 primate: A member of the order of mammals that includes anthropoids and prosimians.
- 3038 primer: An already existing short RNA chain bound to template DNA to which DNA nucleotides are added during DNA synthesis.
- 3039 primitive LHSC: Cells cannot home to the bone marrow and repopulate a host. Needs to undergo maturation on stromal cells and cytokines.
- 3040 primitive streak: The initial band of cells from which the embryo begins to develop. The primitive streak establishes and reveals the embryo's head-tail and left-right orientations.
- 3041 primitive: A term describing a cell that is less specialized, and more capable of differentiation into other cell types.
- 3042 primordial germ cell: The precursors of reproductive cells within the embryo. They are detectable in an embryo after four weeks of development and will develop into either sperm or eggs.
- 3043 primordium (pl. primordial): A cell or organ in its earliest stage of differentiation.
- 3044 principle of allocation: The concept that each organism has an energy budget, or a limited amount of total energy available for all of its maintenance and reproductive needs.
- 3045 prion: An infectious form of protein that may increase in number by converting related proteins to more prions.
- 3046 probiotic: A live microbial feed supplement which improves the host animal's intestinal microbial balance. Although referring to the supplementation of animal feeds for farm animals, the definition is easily applied to humans. The major consumption of probiotics by humans is in the form of dairy-based foods containing intestinal species of lactobacilli and bifidobacteria. It is implicit in the definition that consumption of the probiotic affects the composition of the intestinal microflora. Potential benefits of probiotics include increased resistance to infectious diseases, decreased duration of diarrhea, reduction in blood pressure, reduction in serum cholesterol concentration, reduction in allergy, and reduction in carcinogen production.
- 3047 procambium: A primary meristem of roots and shoots that forms the vascular tissue.
- 3048 process: Any marked prominence or projecting part.
- 3049 processed food: Any food product that has undergone physical or chemical treatment resulting in a substantial change in the original state of the food.
- 3050 procollagen: the soluble precursor of collagen.
- 3051 Procrit®: a recombinant human erythropoietin used to treat anemia.
- 3052 proctitis: inflammation of the rectum; in PC therapy may be associated with radiation therapy.
- 3053 producer, in ecological systems: An autotrophic organism, usually a photosynthesizer, that contributes to the net primary productivity of a community.
- 3054 profilin: A form of protein present in pollen.
- 3055 progenitor cell: A cell type that can differentiate, but cannot self-renew. As a stem cell begins to differentiate into a progenitor cell, potency and self renewal begin to lessen and cellular senescence increases. When a stem cell can no longer self-renew, but can still differentiate into multiple cell types, the stem cell has now transitioned into a progenitor cell. For example, a hematopoietic stem cell will first differentiate into a hematopoietic progenitor cell that maintains the same differentiation potential, but loses the ability to self-renew. The hematopoietic progenitor cell will then differentiate into one of two more specialized progenitor cell types: 1) lymphoid progenitor cells that will further differentiate into cells of the lymphoid lineage (b-cells, t-cells, NK cells) or 2) myeloid progenitor cells that will further differentiate into cells of the myeloid lineage (erythrocytes, platelets, macrophages, neutrophils, eosinophil, basophil).

- 3056 progesterone receptor: The docking site on a cell that interacts with progestins.
- 3057 progesterone: A female steroid sex hormone C21H30O2 that is secreted by the corpus luteum to prepare the endometrium for implantation and later by the placenta during pregnancy to prevent rejection of the developing embryo or fetus.
- 3058 prognosis: The patient's potential clinical outlook based on the status and probable course of his disease; chance of recovery.
- 3059 prognosis: The patient's potential clinical outlook based on the status and probable course of his disease.
- 3060 programming: The term which encompasses both reprogramming, differentiation and transdifferentiation.
- 3061 progression: Continuing growth or regrowth of the cancer.
- 3062 prokaryotic cell: A type of cell lacking a membrane-enclosed nucleus and membrane-enclosed organelles; found only in the domains Bacteria and Archaea.
- 3063 prokaryotic: Literally "before the nucleus", the term applies to all bacteria and archaea. Prokaryotic cells have no internal membranes or cytoskeleton. Their DNA is circular, not linear.
- 3064 prolactin (PRL): A trophic hormone produced by the pituitary that increases androgen receptors, increases sensitivity to androgens & regulates production & secretion of citrate.
- 3065 proliferation: Expansion of a population of cells by the continuous division of single cells into two identical daughter cells.
- 3066 proliferative inflammatory atrophy (PIA): Chronic inflammatory prostate lesions that may result in prostate cancer.
- 3067 prometaphase: The phase of mitosis in which the nuclear envelope breaks into fragments. Some of the spindle fibers reach the chromosomes and attach to protein structures at the centromeres, called kinetochores, while others make contact with microtubules coming from the opposite pole. The opposing spindle fibers move the chromosomes toward the metaphase plate, an imaginary plane equidistant from the poles.
- 3068 promoter: A specific nucleotide sequence in DNA that binds transcriptional machinery in the proper position to initiate transcription or the production of mRNA.
- 3069 prone: referring to the position of the body when lying face downward.
- 3070 Prophage: A phage genome that has been inserted into a specific site on the bacterial chromosome.
- 3071 prophase: The first stage of mitosis, during which duplicated chromosomes condense from chromatin, and the mitotic spindle forms and begins moving the chromosomes toward the center of the cell.
- 3072 prophylactic, prophylaxis: a drug, procedure or piece of equipment used to prevent disease
- 3073 proptosis: Forward displacement (bulging) of an organ, typically the eyeball(s).
- 3074 Proscar®: brand name of finasteride; a 5 AR inhibitor.
- 3075 prosimian: A lower primate; includes lemurs, lorises, tarsiers, and bush babies, as well as many fossil forms.
- 3076 prospective HLA-DR typing: A National Marrow Donor Program typing program that selects stored samples from donors who have been HLA-A, B typed, but not HLA-DR typed, and submits them for HLA-DR typing in advance of the donor being identified as a potential match for a specific patient. The goal of this program is to increase the number and diversity of fully HLA typed volunteer stem cell donors on the NMDP Registry, thus reducing search times and costs for patients.
- 3077 prospective: relating to or being a study (as of the incidence of disease) that starts with the present condition of a population of individuals and follows them into the future.
- 3078 prostaglandin (PG): One of a group of modified fatty acids secreted by virtually all tissues and performing a wide variety of functions as messengers.
- 3079 prostaglandin: Hormone like substances that stimulate target cells into action; they differ from hormones in that they act locally, near their site of synthesis, and they are metabolized very rapidly; any of various oxygenated unsaturated cyclic fatty acids of animals that have a variety of hormone like actions (as in controlling blood pressure or smooth muscle contraction).
- 3080 ProstaScint®: A monoclonal antibody test directed against the prostate specific membrane antigen (PSMA); seems to focus on androgen independent tumor tissue which may contain a greater amount of PSMA.
- 3081 prostate gland: A gland in human males that secretes an acid-neutralizing component of semen.
- 3082 prostate specific antigen (PSA): a protein secreted by the epithelial cells of the prostate gland including cancer cells; an elevated level in the blood indicates an abnormal condition of the prostate gland, either benign or malignant; it is used to detect potential problems in the prostate gland and to follow the progress of PC therapy.
- 3083 prostate: The gland surrounding the urethra and immediately below the bladder in males which provides fluid to nourish and transport sperm during intercourse.
- 3084 prostatectomy: Surgical removal of part or all of the prostate gland.
- 3085 prostate-specific membrane antigen (PSMA): A biomarker of prostate epithelial cell activity that is expressed in the membrane of prostate epithelial cells. PSMA is composed of a short 19 amino acid intra-cellular domain, a 24 amino acid transmembrane domain and a 707 amino acid extra-cellular domain. PSMA antigen is radiologically identified (imaged) using a monoclonal antibody attached to a radioactive Indium 111 isotope (ProstaScint scan) to allow visualization of PSMA antigen-containing tissue found within lymph nodes and/or prostate gland.
- 3086 prostatic acid phosphatase (PAP): An enzyme or biomarker secreted by prostate cells associated with a higher probability of disease outside the prostate when levels are 3.0 or higher; PAP elevations suggest that the disease is not OCD (organ confined disease).
- 3087 prostatic acid phosphatase: An enzyme or biomarker secreted by prostate cells associated with a higher probability of disease outside the prostate when levels are 3.0 or higher; PAP elevations suggest that the disease is not OCD.
- 3088 prostatic pedicle: A stalk at the base of the prostate through which the prostate receives its nourishment.
- 3089 prostatism: A symptom resulting from compression or obstruction of the urethra, due most commonly to hyperplasia of the prostate; results in urinary difficulties and, occasionally, urinary retention.
- 3090 prostatitis: Infection or inflammation of the prostate gland treatable by medication and/or manipulation; (BPH is a more permanent laying down of fibrous and connective tissue caused when the prostate tries to contain a relatively silent chronic lower-grade infection, often requiring a TURP to relieve the symptoms).
- 3091 prostatovesical junction: The area in which the prostate connects to the bladder.
- 3092 prosthesis: A manufactured device used to replace a normal body part or function.
- 3093 protease inhibitor: A substance that inhibits the action of a protease.
- 3094 protease: Any enzyme that catalyzes the splitting of proteins into smaller peptide fractions and amino acids by a process known as proteolysis.
- 3095 proteasome inhibitors: A drug that blocks the action of proteasomes. A proteasome is a large protein complex that

- helps destroy other cellular proteins when they are no longer needed. Proteasome inhibitors are being studied in the treatment of cancer.
- 3096 proteasome: An enzyme complex found in all cells, responsible for breaking down proteins involved in cell cycle regulation. Proteasome inhibition disrupts this process, leading to apoptosis or cell death.
- 3097 protein kinase: An enzyme that transfers phosphate groups from ATP to a protein.
- 3098 protein marker: Stem cells, like most cells, display a characteristic set of protein molecules on their cell surface called markers, which can be used to make a preliminary identification. Using fluorescently tagged antibodies that attach to these markers, an instrument called a fluorescence activated cell sorter (FACS) can separate and isolate the rare stem cell among a population of thousands of differentiated cells.
- 3099 protein phosphatase: An enzyme that removes phosphate groups from proteins, often functioning to reverse the effect of a protein kinase.
- 3100 protein: A large, complex molecule made up of amino acids in chains. The structures of proteins are encoded by DNA, and the proteins are manufactured, according to the DNA blueprint, by apparatus in the cell. Surface proteins on the cell identify the cells as self or non-self, and also allow researchers to identify different cell types, by identifying the proteins expressed on their surface. Antibodies are used to identify various types of proteins.
- 3101 proteoglycans: A glycoprotein in the extracellular matrix of animal cells, rich in carbohydrate.
- 3102 proteome: A collection of proteins. The human proteome is the collection of proteins found in the human body. A proteome can also refer to the set of proteins in a particular cell.
- 3103 Proteomics: The use of large scale protein separation and identification techniques to study the complete set of proteins in the body.
- 3104 protocol: a precise set of methods by which a treatment or research study is to be carried out.
- 3105 protoderm: The outermost primary meristem, which gives rise to the epidermis of roots and shoots.
- 3106 proton beam radiation therapy: a form of RT that uses the proton, a positively charged nuclear particle, to deliver ionizing radiation. The proton can be programmed to stop at a particular depth within tissue for the delivery of its radiation payload.
- 3107 proton pump inhibitors (PPI): drugs that reduce gastric acidity by inhibiting the proton pump within the gastric lining cells; examples of PPI include Prilosec® and Nexium®.
- 3108 proton pump: An active transport mechanism in cell membranes that consumes ATP to force hydrogen ions out of a cell and, in the process, generates a membrane potential.
- 3109 proton: A subatomic particle with a single positive electrical charge, found in the nucleus of the atom.
- 3110 protonephridium: An excretory system, such as the flame-cell system of flatworms, consisting of a network of closed tubules having external openings called nephridiopores and lacking internal openings.
- 3111 proton-motive force: The potential energy stored in the form of an electrochemical gradient, generated by the pumping of hydrogen ions across biological membranes during chemiosmosis.
- 3112 Proto-oncogene: A normal cellular gene that has the potential to become an oncogene. c-Myc, one of the four reprogramming factors originally used by the Yamanaka group to reprogram somatic cells into pluripotent stem cells, is a well known proto-oncogene. The c-Myc gene codes for a transcription factor that regulates the expression of many genes involved in the control of cell proliferation, growth, differentiation and apoptosis. Abberant expression of c-Myc, on the other hand, is associated with tumor formation and cancer.
- 3113 protoplasm: All the contents of a cell, including the nucleus.
- 3114 protoplast: The contents of a plant cell exclusive of the cell wall.
- 3115 protostome: A member of one of two distinct evolutionary lines of coelomates, consisting of the annelids, mollusks, and arthropods, and characterized by spiral, determinate cleavage, schizocoelous formation of the coelom, and development of the mouth from the blastopore.
- 3116 protozoa: Any of a large group of single-celled, usually microscopic, organisms such as amoeba.
- 3117 protozoan pl. protozoa: A protist that lives primarily by ingesting food, an animal-like mode of nutrition.
- 3118 provirus: Viral DNA that inserts into a host genome.
- 3119 proximal: Points near the center of the body. Proximal muscles are the trunk muscles and help maintain balance, opposite of distal.
- 3120 proximate causation: The hypothesis about why natural selection favored a particular animal behavior.
- 3121 PSA density (PSAD): The amount of PSA per unit volume of the prostate gland; the quotient of PSA divided by gland volume; a reflection of tumor density within the prostate.
- 3122 PSA doubling time (PSADT): The calculation of the time it takes for the PSA value to double based on at least three values separated by at least three months each; before diagnosis, a PSADT of less than 10 years may be an indication of the presence of PC.
- 3123 PSA failure: The ASTRO definition of PSA failure as being three consecutive increases in PSA level following treatment.
- 3124 PSA mRNA: Messenger RNA which replicates the DNA code of the PSA protein.
- 3125 PSA nadir (PSAN): the lowest value the PSA reaches during or after a particular treatment; a progressive rise after a PSA nadir has been reached usually indicates biologic activity of PC.
- 3126 PSA relapse-free survival: Survival of the PC patient that relates to no evidence of biochemical relapse based on a rising PSA as seen in 3 consecutive determinations; also called biochemical relapse-free survival (bRFS).
- 3127 PSA response: Normally referred to as a decline in PSA of > 50%.
- 3128 PSA slope: The rate of rise in the PSA level normally expressed as ng/mL per month.
- 3129 PSA velocity (PSAV): The calculation of the rate of increase in PSA levels in succeeding PSA tests; before diagnosis, a PSAV of 0.75 ng/ml/year (or higher) may be an indication of the presence of PC.
- 3130 pseudocoelom: A body cavity consisting of a fluid-filled space between the endoderm and the mesoderm; characteristic of the nematodes.
- 3131 pseudocoelomate: An animal, such as a rotifer or roundworm, whose body cavity is not completely lined by mesoderm.
- 3132 pseudogenes: A sequence of DNA that resembles a gene but is non functional and cannot be transcribed. It could be the remnant of a once-functional gene that has accumulated mutations.
- 3133 pseudopodia: Fingerlike extensions from an amoeboid cell; literally "false feet".
- 3134 pseudopodium: A cellular extension of amoeboid cells used in moving and feeding.
- 3135 pseudopregnant: Refers to a female primed with hormones to accept a blastocyst for implantation.
- 3136 PSM: prostate specific membrane; a membrane that surrounds the protoplasm (cytoplasm) of prostate cells.

- 3137 psoriasis: Psoriasis is a condition characterized by severe scaling and flakiness. Recent evidence indicates that the skin is rapidly reproducing cells creating an excess build-up because the skin cannot exfoliate normally.
- 3138 psychogenic: produced or caused by psychological or mental factors rather than organic factors; compare to neurogenic.
- 3139 psychosis: Mental state involving hallucinations (disturbances of perception) and/or delusions (false yet strongly held personal beliefs that result from an inability to separate real from unreal experiences).
- 3140 psychotic symptom: Symptoms of psychosis or the mental state involving hallucinations (disturbances of perception) and/or delusions (false yet strongly held personal beliefs that result from an inability to separate real from unreal experiences).
- 3141 psychotic: Psychosis is a loss of contact with reality, typically including delusions (false ideas about what is taking place or who one is) and hallucinations (seeing or hearing things which aren't there).
- 3142 PTEN: A gene acts as a tumor suppressor gene by deactivating Akt and rendering prostate cancer cells more susceptible to suicide.
- 3143 PTHrP: Parathyroid hormone-related protein; a protein involved in osteoblast stimulation; a product also of the PC cell elaborated by neuroendocrine cells that make CGA (chromogranin A).
- 3144 Pub Med: a Web site which allows access to thousands of published medical studies. It is a service of the National Institute of Health and can be found at www.pubmed.com.
- 3145 pubertal delay: A lack of the signs of puberty in either sex by age 14. Delayed puberty and other growth-related problems or delay can be symptoms with many LSDs.
- 3146 puberty: The condition of being or the period of becoming first capable of reproducing sexually marked by maturing of the genital organs, development of secondary sex characteristics, and in the human and in higher primates by the first occurrence of menstruation in the female.
- 3147 pubic arch: the arch formed by the inferior rami of the pubic bones.
- 3148 pubo-prostatic: Relating to the structures/supports which connects the capsule of the prostate gland to symphysis pubis.
- 3149 puerperium: The period between childbirth and the return of the uterus to its normal size.
- 3150 pulmonary artery: In birds and mammals, an artery that carries deoxygenated blood from the right ventricle of the heart to the lungs, where it is oxygenated.
- 3151 pulmonary embolism: a blood clot in a lungs, causing a severe impairment of respiratory function.
- 3152 pulmonary vein: In birds and mammals, a vein that carries oxygenated blood from the lungs to the left atrium of the heart, from which blood is pumped into the left ventricle and from there to the body tissues.
- 3153 pulmonary: Pertaining to the lungs.
- 3154 pulmonologist: A physician trained to specialize in lung diseases. These diseases include breathing problems in muscle disease, asthma and emphysema. A pulmonologist may not be familiar with how best to diagnose and treat an individual with CMD is having breathing problems.
- 3155 pulse: A measurement of heart rate; distention of an artery that can be felt each time the heart contracts.
- 3156 punctuated equilibrium: A theory of evolution advocating spurts of relatively rapid change followed by long periods of stasis.
- 3157 punnett square: The checkerboard diagram used for analysis of allele segregation.
- 3158 pupa: A developmental stage of some insects, in which the organism is nonfeeding, immotile, and sometimes encapsulated or in a cocoon; the pupal stage occurs between the larval and adult phases.
- 3159 purging: The process of removing certain types of cells from the stem cell product before transplanting it to a patient. In autologous transplants, marrow may be purged of lingering cancer cells.
- 3160 purine analog: An anticancer drug that interferes with cancer cell division and causes their death. The enzyme that is responsible for DNA replication tries to use the analog rather than the proper purine, and thus does not function correctly.
- 3161 purine: A nitrogenous base, such as adenine or guanine, with a characteristic two-ring structure; one of the components of nucleic acids.
- 3162 purpura: Hemorrhage under a surface that is about 1.0 cm. in diameter.
- 3163 pyelogram: X-ray study of the kidney especially showing the pelvis (urine-collecting basin) of the kidney and the ureter.
- 3164 pyramid of energy: A diagram of the energy flow between the trophic levels of an ecosystem; plants or other autotrophs (at the base of the pyramid) represent the greatest amount of energy, herbivores next, then primary carnivores, secondary carnivores, etc.
- 3165 pyrilinks-D (Dpd): a urine test that quantitates bone resorption; the second voided urine specimen is ideal to use; other markers of bone resorption are ICTP and N-telopeptide.
- 3166 pyrimidine: A nitrogenous base, such as cytosine, thymine, or uracil, with a characteristic single-ring structure; one of the components of nucleic acids.
- 3167 pyrophosphate: A salt or ester of pyrophosphoric acid.
- 3168 qCT: quantitative CT bone densitometry; an alternate way to evaluate bone density besides the DEXA scan; qCT is not falsely elevated due to calcium deposits in blood vessels or due to degenerative joint disease
- 3169 Qi: Under Traditional Chinese Medicine, the life-force energy that permeates all living things.
- 3170 qigong: A system of self healing encompassing gentle movements, breathing, and meditative practices.
- 3171 quadriplegia: An injury in the cervical area, affecting all four limbs.
- 3172 quality of life (QOL): An evaluation of health status relative to the patient's age, expectations and physical and mental capabilities.
- 3173 quantitative character: A heritable feature in a population that varies continuously as a result of environmental influences and the additive effect of two or more genes.
- 3174 quaternary structure: The particular shape of a complex, aggregate protein, defined by the characteristic three-dimensional arrangement of its constituent subunits, each a polypeptide.
- 3175 queen: In social insects (ants, termites, and some species of bees and wasps), the fertile, or fully developed, female whose function is to lay eggs.
- 3176 quercetin: A commonly available, antioxidant nutritional supplement found in many many foods. Inhibits damage-mediating, post-injury lipid peroxidation.
- 3177 quiescence: The G₀, or resting phase of the cell cycle, the state of a cell when it is not dividing.
- 3178 quiescent center: A region located within the zone of cell division in plant roots, containing meristematic cells that divide very slowly.
- 3179 quiescent: A cell that does not divide or replicate.
- 3180 R plasmid: A bacterial plasmid carrying genes that confer resistance to certain antibiotics.
- 3181 rabies: A viral disease of wild animals that can be transmitted to humans through the bite of an infected animal. The disease has not yet been detected in Australia.

- 3182 RAD: A unit of absorbed radiation dose, 100 rads = 1 joule/kg = 1 Gray.
- 3183 radial cleavage: A type of embryonic development in deuterostomes in which the planes of cell division that transform the zygote into a ball of cells are either parallel or perpendicular to the polar axis, thereby aligning tiers of cells one above the other.
- 3184 radial symmetry: Characterizing a body shaped like a pie or barrel, with many equal parts radiating outward like the spokes of a wheel; present in cnidarians and echinoderms.
- 3185 radiate: Members of the radially symmetrical animal phyla, including cnidarians.
- 3186 radiation cystitis: Inflammation of the bladder lining due to the ionizing effects of radiation therapy.
- 3187 radiation oncologist: A physician who has received special training regarding the treatment of cancers with different types of radiation.
- 3188 radiation proctitis: Inflammation of the rectal mucosa lining due to the ionizing effects of radiation therapy.
- 3189 radiation therapy: The use of high-energy rays to damage cancer cells, stopping them from growing and dividing. Like surgery, radiation therapy is a local treatment that affects cancer cells only in the treated area.
- 3190 radiation therapy: Treatment aimed at eliminating cancer cells, shrinking tumors or suppressing the immune system by using high-energy radiation from X-ray machines or other sources.
- 3191 radiation: (1) Rays of energy. Gamma rays and X-rays are two of the types of energy waves often used in medicine. (2) The use of energy waves to diagnose or treat disease.
- 3192 radical prostatectomy (RP): An operation to remove the entire prostate gland and seminal vesicles.
- 3193 radical: Directed at the cause of a disease; thus, radical prostatectomy is the surgical removal of the prostate with the intent to cure the problem believed to be caused by or within the prostate.
- 3194 radio sensitivity: The degree to which a type of cancer responds to radiation therapy.
- 3195 radioactive dating: A method of determining the age of fossils and rocks using half-lives of radioactive isotopes.
- 3196 radioactive isotope: An isotope, an atomic form of a chemical element, that is unstable; the nucleus decays spontaneously, giving off detectable particles and energy.
- 3197 radioactive isotope: Isotope refers to one of two or more atoms of the same element that have the same number of protons in their nucleus but different numbers of neutrons. A radioactive isotope is a natural or artificially created isotope of a chemical element having an unstable nucleus that decays, emitting alpha, beta, or gamma rays until stability is reached.
- 3198 radiobiology (adj. radiobiological): The study of the effects of radiation on living organisms.
- 3199 radiography: Producing an image by radiation other than visible light, e.g., x-rays of one's teeth is done by radiography.
- 3200 radioimmunoassay: A sensitive method of determining the concentration of a substance, particularly a protein-bound hormone, in blood plasma.
- 3201 radioimmunometric: A measurement using radioimmunity, a system for testing antigen antibody reactions using radioactive labelling of antigen or antibody to detect the extent of the reaction.
- 3202 radioisotope: A type of atom (or a chemical which is made with a type of atom) that emits radioactivity.
- 3203 radiolabeled: An antibody that has been joined with a radioactive substance.
- 3204 radiolabel: An antibody that has been joined with a radioactive substance.
- 3205 radiology: The branch of medicine that deals with radioactive substances for diagnosing and treating disease.
- 3206 radiometric dating: A method paleontologists use for determining the ages of rocks and fossils on a scale of absolute time, based on the half-life of radioactive isotopes.
- 3207 radionuclide: An unstable form of a chemical element that radioactively decays, resulting in the emission of nuclear radiation.
- 3208 radiopharmaceutical: A drug containing a radioactive substance that is used in the diagnosis and treatment of cancer and in pain management of bone metastases.
- 3209 radiotherapy: The use of radiation to kill cancer cells. X-rays and gamma-rays are the most commonly used forms.
- 3210 Rai: A staging system for lymphoma.
- 3211 ramus (pl. rami): The arch formed by the inferior rami of the pubic bones.
- 3212 randomized: The process of assigning patients to different forms of treatment in a research study in a random manner.
- 3213 rapamycin: An antibiotic that blocks a protein involved in cell division and inhibits the growth and function of certain T cells of the immune system.
- 3214 rapeseed: The seed of the rape plant, which is a source of edible oil. The rape plant is a bright yellow flowering variety of the Brassicaceae (mustard) family known as canola. It is generally grown and cultivated for animal feed, vegetable oil and biodiesel.
- 3215 rb: A protein which plays an important role in sensing whether appropriate growth factors and nutrients are present to allow for cell growth and division; loss of Rb fosters the evolution of hormone-resistant disease and may impair the response to radiation therapy.
- 3216 rDNA: Recombinant DNA.
- 3217 Reactant: A starting material in a chemical reaction.
- 3218 receptor activator of nuclear factor Kappa-B ligand: A molecule important in bone metabolism which activates osteoclasts, cells involved in bone resorption.
- 3219 receptor potential: An initial response of a receptor cell to a stimulus, consisting of a change in voltage across the receptor membrane proportional to the stimulus strength. The intensity of the receptor potential determines the frequency of action potentials traveling to the nervous system.
- 3220 receptor: A docking site which interacts with a ligand; receptors may be on the cell membrane or within the cell cytoplasm or nucleus; estrogen receptors and androgen receptors are examples; all cells have multiple receptors.
- 3221 receptor-mediated endocytosis: The movement of specific molecules into a cell by the inward budding of membranous vesicles containing proteins with receptor sites specific to the molecules being taken in; enables a cell to acquire bulk quantities of specific substances.
- 3222 receptors: Specialized structures, often on the surface of cells, that recognize molecules for signaling or for transporting into the cell.
- 3223 recessive allele: In a heterozygote, the allele that is completely masked in the phenotype.
- 3224 recessive inheritance or trait: Pattern of inheritance whereby disease results only when an individual inherits two gene mutations for the particular disease. The parents of a child who is affected are said to be "carriers" of the disease, because they have one mutation and do not manifest symptoms. If both members of a couple are carriers, there is a 1 in 4 or 25% chance in each pregnancy for a child to be affected. Also referred to as autosomal recessive inheritance if the gene is not located on the X or Y chromosomes.
- 3225 recessive: A genetic trait that is only expressed if both genes in the pair code for it; it can be "overridden"
- 3226 recessive: One of a pair of alleles that fails to be expressed in the phenotype of the organism when the dominant allele is present. Also refers to the phenotype, when an individual has only the recessive allele.

- 3227 recipient: In medicine, a recipient is someone who receives something like a blood transfusion or an organ transplant. The recipient is beholden to the donor.
- 3228 reciprocal altruism: Altruistic behavior between unrelated individuals; believed to produce some benefit to the altruistic individual in the future when the current beneficiary reciprocates.
- 3229 recognition sequence: A specific sequence of nucleotides at which a restriction enzyme cleaves a DNA molecule.
- 3230 recognition species concept: The idea that specific mating adaptations become fixed in a population and form the basis of species identification.
- 3231 recombinant DNA technology: A procedure for manufacturing proteins by manipulation of DNA segments. Used to produce large quantities of enzymes for use in enzyme replacement therapy.
- 3232 recombinant DNA: DNA formed by combining segments of DNA from different genes or different types of organisms.
- 3233 recombination: The formation of new gene combinations; in eukaryotes, may be accomplished by new associations of chromosomes produced during sexual reproduction or crossing over; in prokaryotes, may be accomplished through transformation, conjugation, or transduction.
- 3234 recruitment group: An organization affiliated with the National Marrow Donor Program that recruits donors.
- 3235 rectoprostic: The area between the prostate and its neighboring rectal wall.
- 3236 rectum (adj. rectal): The final part of the intestines that ends at the anus.
- 3237 recurrence: The reappearance of disease; this can be manifested clinically as findings on the physical examination or as a laboratory recurrence only (e.g. rise in PSA).
- 3238 red blood cell: The blood cells that carry oxygen. Red cells contain hemoglobin and it is the hemoglobin which permits them to transport oxygen (and carbon dioxide). Hemoglobin, aside from being a transport molecule, is a pigment. It gives the cells their red color (and their name).
- 3239 redox reaction: A chemical reaction involving the transfer of one or more electrons from one reactant to another; also called oxidation-reduction reaction.
- 3240 reducing agent: The electron donor in a redox reaction.
- 3241 reduction: The gaining of electrons by a substance involved in a redox reaction.
- 3242 reflex erection: A penile erection produced by touch.
- 3243 reflex: An automatic reaction to a stimulus, mediated by the spinal cord or lower brain.
- 3244 refractory period: The short time immediately after an action potential in which the neuron cannot respond to another stimulus, owing to an increase in potassium permeability.
- 3245 refractory: Resistant to therapy; e.g., hormone refractory prostate cancer is resistant to forms of treatment involving hormone manipulation.
- 3246 regeneration (vs. transplantation): Another potential application of stem cells is making cells and tissues for medical therapies. Today, donated organs and tissues are often used to replace those that are diseased or destroyed. Unfortunately, the number of people needing a transplant far exceeds the number of organs available for transplantation. Pluripotent stem cells offer the possibility of a renewable source of replacement cells and tissues to treat a myriad of diseases, conditions, and disabilities including heart disease, eye disease, liver disease, kidney disease, Parkinson's and Alzheimer's diseases, spinal cord injury, stroke, burns, diabetes, osteoarthritis and rheumatoid arthritis.
- 3247 regenerative medicine: A field of medicine devoted to treatments in which stem cells are induced to differentiate into the specific cell type required to repair damaged or destroyed cell populations or tissues. Regenerative medicine aims to repair damaged organs to replace cells and tissues damaged by aging and by disease.
- 3248 regional anesthesia: Includes both epidural and spinal.
- 3249 registry: A confidential national database of potential volunteer stem cell donors established and maintained by the National Marrow Donor Program.
- 3250 regression: reduction in the size of a single tumor or reduction in the number and/or size of several tumors
- 3251 regulative development: A pattern of development, such as that of a mammal, in which the early blastomeres retain the potential to form the entire animal.
- 3252 regulatory DNA: DNA that controls the activity of genes. In the human genome, regulatory DNA sequences tend to be short and located near the genes they control.
- 3253 regulatory viral protein (Rev) A lentiviral packaging element that binds to Rev Response Element (RRE) sequences, allowing the cytoplasmic export of viral RNAs.
- 3254 regurgitation: Return of stomach content eg food into the mouth.
- 3255 reimbursement: Refund, being paid back for monies used out of pocket.
- 3256 reinfusion: The return of healthy stem cells into the transplant recipient's body.
- 3257 rejection phenomena: Where ever an organ or tissue (I.e. blood transfusion) is given to a patient via transplantation, the patient's immune system detects that an invasion by a foreign object has occurred. The immune system then reacts by forming antibodies and killer T-cells (thymic derived lymphocytes) to destroy the "invader."
- 3258 rejection: The response of the immune system to a transplant of foreign tissue, or tissue from another person or animal as donor. Adult stem cells are much more likely to trigger rejection than fetal, embryonic or umbilical cord stem cells.
- 3259 relapse: The reappearance of a disease after a period of improvement.
- 3260 relative fitness: The contribution of one genotype to the next generation compared to that of alternative genotypes for the same locus.
- 3261 relay neuron: Neuron that transmits signals between different regions of the central nervous system.
- 3262 releaser: A signal stimulus that functions as a communication signal between individuals of the same species.
- 3263 releasing hormone: A hormone produced by neurosecretory cells in the hypothalamus of the vertebrate brain that stimulates or inhibits the secretion of hormones by the anterior pituitary.
- 3264 remission: A decrease in or disappearance of signs and symptoms of cancer. In partial remission, some, but not all, signs and symptoms of cancer have disappeared. In complete remission, all signs and symptoms of cancer that can be detected with modern technology have disappeared, although cancer still may be in the body.
- 3265 remobilization: The process of mobilization following failure of an earlier procedure.
- 3266 renal: A term that means having something to do with the kidneys. Renal failure is kidney failure.
- 3267 reparative medicine: The field of medicine that deals with the repair or replacement of lost or damaged tissue. An example of this is stem cell therapy. Reparative medicine is also referred to as regenerative medicine.
- 3268 repeat sequences: The length of a nucleotide sequence that is repeated in a tandem cluster.
- 3269 repetitive DNA: Nucleotide sequences, usually noncoding, that are present in many copies in a eukaryotic genome. The repeated units may be short and arranged tandemly (in series) or long and dispersed in the genome.

- 3270 replication fork: A Y-shaped point on a replicating DNA molecule where new strands are growing.
- 3271 replication incompetent: Lentiviral particles that are incapable of producing additional viral particles, due to the elimination of wild-type enhancers in the long terminal repeat region.
- 3272 replication: The process of making a copy of something.
- 3273 reportable list: A list that identifies all diagnoses and types of cases to be included in the cancer registry data base. For most registries in the world, the "reportable list" is everything listed in ICD-O-3 with a /2 or a /3 in the behavior code.
- 3274 reportable malignancies: Tumors required to be reported. Typically, in most cancer registries, the reportable tumors are those that are listed in the International Classification of Diseases for Oncology, Third Edition which have a behavior defined as in situ (behavior code = /2) or invasive (behavior code = /3).
- 3275 repressible enzyme: An enzyme whose synthesis is inhibited by a specific metabolite.
- 3276 repressor: A DNA-binding protein that inhibits gene transcription by binding to the operator and blocking the attachment of RNA polymerase to the promoter region of the gene.
- 3277 repressor: A protein that suppresses the transcription of a gene.
- 3278 reproductive cloning: The goal of reproductive cloning is to create an animal being identical to the animal that donated the somatic cell nucleus. The embryo is implanted in a uterus and develops into a live being. The first animal to be created by reproductive cloning was Dolly the sheep, born at the Roslin Institute in Scotland in 1996.
- 3279 reproductive isolation: Two populations of organisms are isolated if their members are unable to interbreed and produce fertile offspring. Various structural, behavioral, and biochemical features can prevent interbreeding and thus reproductively isolate populations as distinct species.
- 3280 reprogramming factors: In 2006, the Yamanaka lab identified four factors that, when co-transfected and expressed in mouse adult fibroblast cells, caused those fibroblasts to revert back to a pluripotent like state. One year later, the same four factors were used to successfully reprogram human adult fibroblast cells into induced pluripotent stem cells. These four factors are Oct-4, SOX2, c-Myc and Klf-4.
- 3281 reprogramming: The process of converting a differentiated cell to an embryonic stem cell-like state by the forced expression of proteins important for maintaining the "stemness" of embryonic stem cells. Used, for example, to generate induced pluripotent stem (iPS) cells. Alternatively, reprogramming can be described as a switch in gene expression from one kind of cell to another unrelated cell type. For example, switching of adult pancreatic exocrine (non-insulin producing) cells to pancreatic β -cells that secrete insulin. Reprogramming occurs naturally in regenerative organisms, such as planaria (flatworms), starfish, and salamanders, and is termed dedifferentiation.
- 3282 reperitoneal: Having to do with the area outside or behind the peritoneum (the tissue that lines the abdominal wall and covers most of the organs in the abdomen).
- 3283 reptilia: The vertebrate class of reptiles, represented by lizards, snakes, turtles, and crocodilians.
- 3284 rescue process: Another term for a stem cell transplant. The re-infusion of healthy stem cells following high doses of chemotherapy or radiation.
- 3285 research sample: A sample of a donor's or recipient's blood that is used in research studies. Typically, blood samples are collected for research studies but sometimes a marrow sample is requested at the time of donation.
- 3286 resection: Surgical removal.
- 3287 resectoscope: Instrument inserted through the urethra and used by a urologist to cut out tissue (usually from the prostate) while the physician can actually see precisely where he is cutting.
- 3288 residual Disease: The disease has not been eradicated.
- 3289 resistance: In cancer, the ability of a tumour or cancer cells to withstand the effects of treatment that should normally kill them.
- 3290 resolving power: A measure of the clarity of an image; the minimum distance that two points can be separated and still be distinguished as two separate points.
- 3291 resorption: Loss of bone through increased breakdown via osteoclasts or other mechanism causing a reduction in bone mass.
- 3292 resource partitioning: The division of environmental resources by coexisting species populations such that the niche of each species differs by one or more significant factors from the niches of all coexisting species populations.
- 3293 respiration: (1) In aerobic organisms, the intake of oxygen and the liberation of carbon dioxide. (2) In cells, the oxygen-requiring stage in the breakdown and release of energy from fuel molecules.
- 3294 respite care: A service provided to the families of children who require extraordinary forms of care, so that the family can take vacations, handle business affairs, and have some relief from the duties of caring for the child.
- 3295 response rate: The proportion of patients in which a treatment has an effect on cancer. Responses can be partial or complete.
- 3296 response: The disappearance of all signs of cancer in response to treatment. In the case of MM, a CR means that the M-protein has been completely eliminated. This does not always mean the cancer has been cured.
- 3297 resting potential: The membrane potential characteristic of a nonconducting, excitable cell, with the inside of the cell more negative than the outside.
- 3298 restriction enzyme: An enzyme (normally derived from bacteria) that cuts strands of DNA at particular points along its length into shorter fragments.
- 3299 restriction fragment length polymorphisms (RFLPs): Differences in DNA sequence on homologous chromosomes that result in different patterns of restriction fragment lengths (DNA segments resulting from treatment with restriction enzymes); useful as genetic markers for making linkage maps.
- 3300 restriction site: A specific sequence on a DNA strand that is recognized as a "cut site" by a restriction enzyme.
- 3301 retention: Refers to the length of time volunteer stem cell donors remain on the Registry and are able to be located, are in good health and are still willing to donate.
- 3302 reticular cell: Non-descript cells in the bone marrow that have not been characterized. Sometimes fibroblasts and mesenchymal stem cells are referred as reticular cells.
- 3303 reticular formation: A brain circuit involved with alertness and direction of attention to selected events; consists of a loose network of interneurons running through the brainstem, plus certain neurons in the thalamus that function as an extension of this network.
- 3304 reticuloendothelial system: A group of cells having the ability to take up and sequester inert particles and vital dyes, including macrophages or macrophage precursors, specialized endothelial cells lining the sinusoids of the liver, spleen, and bone marrow, and reticular cells of lymphatic tissue (macrophages) and of bone marrow (fibroblasts).
- 3305 reticuloendothelial: The widely diffused bodily system constituting all phagocytic cells except certain white blood cells

- 3306 reticulopodia: Long thread-like pseudopodia that branch apart and rejoin, forming a fine network. They are characteristic of forams.
- 3307 reticulum: A fine network (e.g., endoplasmic reticulum).
- 3308 retina: The innermost layer of the vertebrate eye, containing photoreceptor cells (rods and cones) and neurons; transmits images formed by the lens to the brain via the optic nerve.
- 3309 retinal: The light-absorbing pigment in rods and cones of the vertebrate eye.
- 3310 retinoblastoma: An ocular malignant neoplasm of the retina, usually arise in the first 2 years of life, it is the most form of intraocular malignancy in children.
- 3311 retinoic acid: A metabolite of vitamin A.
- 3312 retinoid: Derivatives of vitamin A used clinically in the treatment of severe acne and psoriasis; under investigation for treating cancer.
- 3313 retropubic prostatectomy: Surgical removal of the prostate through an incision in the abdomen above the pubic bones.
- 3314 retrospective: Relating to a study that starts with the present condition of a population of individuals and collects data about their past history to explain their present condition – compare to prospective.
- 3315 retrovirus: Any virus belonging to the viral family Retroviridae. They are enveloped viruses possessing an RNA genome, and replicate via a DNA intermediate. Retroviruses rely on the enzyme reverse transcriptase to perform the reverse transcription of its genome from RNA into DNA, which can then be integrated into the host's genome with an integrase enzyme. The virus then replicates as part of the cell's DNA.
- 3316 reverse transcriptase: A DNA polymerase enzyme that transcribes single-stranded RNA into double-stranded DNA which is then integrated into the host genome by integrase proteins. This process is the reverse of normal transcription. The retroviral vectors (retroviruses) are genetically engineered by scientists to encapsulate and deliver reverse transcriptase, integrase and the four reprogramming factors, Oct-4, SOX2, c-Myc, Klf-4 into the fibroblasts to reprogram them into induced pluripotent stem cells. These transgenes are then reverse transcribed from RNA into DNA by the enzyme reverse transcriptase and finally integrated into the host's genome by integrase proteins.
- 3317 Rh protein: A cell recognition protein found on the outside of red blood cells. This protein was first identified in Rhesus monkeys, and thus its name. Along with the "A" and "B" blood type proteins, these constitute the major blood type markers.
- 3318 rhabdomyosarcoma: Rhabdomyosarcoma tumors arise from a cell called a "rhabdomyoblast", which is a primitive muscle cell. Instead of differentiating into striated muscle cells, the rhabdomyoblasts grow out of control. Since this type of muscle is located throughout the body, the tumors can appear at numerous locations.
- 3319 rhizoid: Rootlike anchoring structure in fungi and nonvascular plants.
- 3320 rhizome: In vascular plants, a horizontal stem growing along or below the surface of the soil; may be enlarged for storage or may function in vegetative reproduction.
- 3321 rhizotomy: A neurosurgical procedure that selectively severs spinal nerve roots.
- 3322 rhodopsin: A visual pigment consisting of retinal and opsin. When rhodopsin absorbs light, the retinal changes shape and dissociates from the opsin, after which it is converted back to its original form.
- 3323 ribonucleic acid (RNA): A type of nucleic acid consisting of nucleotide monomers with a ribose sugar and the nitrogenous bases adenine (A), cytosine (C), guanine (G), and uracil (U); usually single-stranded; functions in protein synthesis and as the genome of some viruses.
- 3324 ribose: The sugar component of RNA.
- 3325 ribosomal RNA (rRNA): The most abundant type of RNA. Together with proteins, it forms the structure of ribosomes that coordinate the sequential coupling of tRNA molecules to the series of mRNA codons.
- 3326 ribosome: A cell organelle constructed in the nucleolus, functioning as the site of protein synthesis in the cytoplasm. Consists of rRNA and protein molecules, which make up two subunits.
- 3327 ribozyme: An enzymatic RNA molecule that catalyzes reactions during RNA splicing.
- 3328 rights: Entitlements. Some rights (human rights) belong to everyone by virtue of being human; some rights (legal rights) belong to people by virtue of their belonging to a particular political state.
- 3329 risk factor: that which causes an individual or group of individuals to have an increased risk of a condition or disease.
- 3330 risk: Used as a term for a danger that arises unpredictably, such as being struck by a car.
- 3331 RNA (ribonucleic acid): A type of nucleic acid consisting of nucleotide monomers with a ribose sugar and the nitrogenous base adenine (A), cytosine (C), guanine (G), or uracil (U). RNA is usually single-stranded and functions in protein synthesis, gene regulation, and often makes up the genetic material of viruses.
- 3332 RNA (ribonucleic acid): Found mostly in the cytoplasm of cells is important in the synthesis of proteins. It is a chain made up of subunits called nucleotides. Messenger RNA (mRNA) replicates the DNA code for a protein and moves to organelles (specialized cell structures) called ribosomes, which are themselves composed of protein and a type of RNA called ribosomal RNA (rRNA). At the ribosomes, transfer RNA (tRNA) assembles amino acids to form the protein specified by the messenger RNA.
- 3333 RNA interference, or RNAi: A system in cells for "turning off," or silencing, genes. Some plants use RNAi to silence the genes of invading pathogens, and some animals may as well. In the laboratory, scientists mimic RNAi to test the functions of individual genes. The system has potential as a therapy if scientists can figure out how to trigger the silencing of "overactive" genes in people, such as those involved in cancer.
- 3334 RNA polymerase: An enzyme involved in the synthesis of messenger RNA during gene transcription. RNA polymerase moves along a gene in the 5' to 3' direction and uses the genetic information encoded by the DNA to add the complementary ribonucleotides to synthesize messenger RNA.
- 3335 RNA processing: Modification of RNA before it leaves the nucleus, a process unique to eukaryotes.
- 3336 RNA splicing: The removal of noncoding portions (introns) of the RNA molecule after initial synthesis.
- 3337 RNA: Short for ribonucleic acid, a nucleic acid molecule similar to DNA but containing ribose rather than deoxyribose. RNA is formed upon a DNA template. There are several classes of RNA molecules. They play crucial roles in protein synthesis and other cell activities: Messenger RNA (mRNA) is a type of RNA that reflects the exact nucleoside sequence of the genetically active DNA. mRNA carries the "message" of the DNA to the cytoplasm of cells where protein is made in amino acid sequences specified by the mRNA. Transfer RNA (tRNA) is a short-chain type of RNA present in cells. There are 20 varieties of tRNA. Each variety combines with a specific amino acid and carries it along (transfers it), leading to the formation of protein with a specific amino acid arrangement dictated by DNA. Ribosomal RNA (rRNA) is

- a component of ribosomes. Ribosomal RNA functions as a nonspecific site for making polypeptides.
- 3338 robotic prostatectomy: A new minimally invasive type of surgery that features telemanipulation devices allowing the performance of complex surgical tasks with dexterity and minimal fatigue due to their ergonomic design. They also provide expanded degree of movements, tremor filtering, and 3-D stereoscopic visualization.
- 3339 ROC curve: Relative (or receiver) Operating Characteristic, or simply ROC curve, is a graphical plot of sensitivity vs. 1 minus specificity.
- 3340 rod cell: One of two kinds of photoreceptors in the vertebrate retina; sensitive to black and white and enables night vision.
- 3341 Roentgen: The international unit of x- or gamma-radiation, abbreviated r or R; named after the German physicist, Wilhelm Roentgen, who discovered roentgen ray in 1895.
- 3342 root cap: A cone of cells at the tip of a plant root that protects the apical meristem.
- 3343 root hair: A tiny projection growing just behind the root tips of plants, increasing surface area for the absorption of water and minerals.
- 3344 root pressure: The upward push of water within the stele of vascular plants, caused by active pumping of minerals into the xylem by root cells.
- 3345 root: The descending axis of a plant, normally below ground and serving both to anchor the plant and to take up and conduct water and dissolved minerals.
- 3346 rostral: An anatomical adjective indicating toward the head (opposite of caudal).
- 3347 rough ER: That portion of the endoplasmic reticulum studded with ribosomes.
- 3348 r-selection: The concept that in certain (r-selected) populations, a high reproductive rate is the chief determinant of life history.
- 3349 RT-PCR PSA: Reverse transcriptase-polymerase chain reaction; a blood test that detects micrometastatic cells circulating in the blood stream; may be useful as a screening tool to help avoid unnecessary invasive treatments (RP, RT, etc.) on patients with metastasized PC.
- 3350 RT-PCR: Reverse transcriptase polymerase chain reaction; a technique which allows a physician to search for tiny quantities of a protein, such as PSA, in the blood or other body fluids and tissues.
- 3351 Rubisco: Ribulose carboxylase, the enzyme that catalyzes the first step (the addition of CO₂ to RuBP, or ribulose biphosphate) of the Calvin cycle.
- 3352 rubric: A rubric is a chart or template which specifies the criteria to be used to evaluate an assignment.
- 3353 ruminant: An animal, such as a cow or a sheep, with an elaborate, multicompartimentalized stomach specialized for an herbivorous diet.
- 3354 Rx: Standard abbreviation for medication prescribed.
- 3355 S Phase: A phase of the cell cycle.
- 3356 S phase: The synthesis phase of the cell cycle, constituting the portion of interphase during which DNA is replicated.
- 3357 SA (sinoatrial) node: The pacemaker of the heart, located in the wall of the right atrium. At the base of the wall separating the two atria is another patch of nodal tissue called the atrioventricular node (AV).
- 3358 sacral region: Sacral vertebrae are situated in the spinal column below the lumbar vertebrae and above the coccyx.
- 3359 safety: Freedom from danger.
- 3360 sagittal localizer: An anatomic image which is acquired quickly to provide information about how to select high resolution images of the organ of interest - specifically, the first imaging sequence acquired for a prostate MRI/MRSI exam to determine the proper placement of the endorectal coil and prescribe other images acquired during the exam.
- 3361 sagittal: A plane, slice or section of the body cutting from front to back through the sagittal suture of the skull, and continued down through the body in the same direction, dividing it into two parts.
- 3362 salivary gland: One of several pairs of glands in the mouth that secrete saliva.
- 3363 saltatory conduction(sahl-tuh-tor-ee): Rapid transmission of a nerve impulse along an axon resulting from the action potential jumping from one node of Ranvier to another, skipping the myelin-sheathed regions of membrane.
- 3364 salvage: A procedure intended to "rescue" a patient following the failure of a prior treatment; for example, a salvage prostatectomy would be the surgical removal of the prostate after the failure of prior radiation therapy or cryosurgery.
- 3365 sample repositories: Laboratories under contract with the NMDP to store blood and cell samples from NMDP volunteer donors for later DNA-based HLA typing.
- 3366 Sanger sequencing: A widely used method of determining the order of bases in DNA.
- 3367 saprobe: An organism that acts as a decomposer by absorbing nutrients from dead organic matter.
- 3368 sarcolemma: The specialized plasma membrane surrounding a muscle cell (muscle fiber); capable of propagating action potentials.
- 3369 sarcoma: A malignant neoplasm arising in tissue of mesodermal origin (as connective tissue, bone, cartilage, or striated muscle).
- 3370 sarcomere: The fundamental, repeating unit of striated muscle, delimited by the Z lines.
- 3371 sarcoplasmic reticulum: A modified form of endoplasmic reticulum in striated muscle cells that stores calcium used to trigger contraction during stimulation.
- 3372 satellite cells: Small mononuclear progenitor cells with virtually no cytoplasm found in mature muscle.
- 3373 satellite: A chromosomal segment that branches off from the rest of the chromosome but is still connected by a thin filament or stalk.
- 3374 saturated fat: A fat that has only single bonds in the molecule.
- 3375 saturated fatty acid: A fatty acid in which all carbons in the hydrocarbon tail are connected by single bonds, thus maximizing the number of hydrogen atoms that can attach to the carbon skeleton.
- 3376 saturation biopsy: A systematic biopsy using 3-D mapping to obtain thorough coverage of a half or the full prostate involving as many as 30-80 samples, depending on gland volume.
- 3377 savanna: A tropical grassland biome with scattered individual trees, large herbivores, and three distinct seasons based primarily on rainfall, maintained by occasional fires and drought.
- 3378 saw palmetto: The dwarf palm plant indigenous to Florida that is the source of *Serenoa repens* and its lipid extract.
- 3379 scaffold: A material that spans a healing wound and provides structure for young cells as they grow into mature tissue.
- 3380 scale-up: The process of transferring a biological procedure that works in a laboratory up to a scale suitable for wider-scale therapeutic use.
- 3381 scar tissue: A type of connective tissue that results from the normal healing process. Scar tissue is not as elastic or as strong as normal, uninjured tissue.
- 3382 Schwann cell: In the embryo, Schwann cells grow around the nerve fiber, forming concentric layers of cell membrane (the myelin sheath).
- 3383 Schwann cells: A chain of supporting cells enclosing the axons of many neurons and forming an insulating layer called the myelin sheath.

- 3384 sclereid: A short, irregular sclerenchyma cell in nutshells and seed coats and scattered through the parenchyma of some plants.
- 3385 sclerenchyma cell: A rigid, supportive plant cell type usually lacking protoplasts and possessing thick secondary walls strengthened by lignin at maturity.
- 3386 Sclerosis: A hardening within the nervous system, especially of the brain and spinal cord, resulting from degeneration of nervous elements such as the myelin sheath.
- 3387 sclerotic: Tissue hardened by causes like inflammation, mineral accumulation, etc.
- 3388 SCNT: A technique whereby the nucleus of a somatic cell (any cell of the body except sperm and egg) is injected into an egg that has had its nucleus removed.
- 3389 screening: Evaluating populations of people to diagnose disease early.
- 3390 scrotum: The pouch of skin containing a man's testicles.
- 3391 search process: The process of comparing a patient's HLA antigens to those of the volunteer donors on the Registry (preliminary search) and testing potentially matched donors to identify the best donor for the patient (formal search). The search process may take from several weeks to more than a year.
- 3392 sebaceous: Relating to or being fatty material.
- 3393 seborrhoeic dermatitis: A skin disorder affecting the scalp, face and trunk causing scaly, flaky, itchy, red skin. It particularly affects the sebum-gland rich areas of skin. It is thought to be caused by a fungal infection caused by the yeast, *Pityrosporum ovale* in individuals with decreased immunity and increased sebum production.
- 3394 second filial generation (F2): Offspring resulting from interbreeding of the hybrid F1 generation.
- 3395 second law of thermodynamics: The principle whereby every energy transfer or transformation increases the entropy of the universe. Ordered forms of energy are at least partly converted to heat, and in spontaneous reactions, the free energy of the system also decreases.
- 3396 second messenger: A small, nonprotein, water-soluble molecule or ion, such as calcium ion or cyclic AMP, that relays a signal to a cell's interior in response to a signal received by a signal receptor protein.
- 3397 secondary compound: A chemical compound synthesized through the diversion of products of major metabolic pathways for use in defense by prey species.
- 3398 secondary consumer: A member of the trophic level of an ecosystem consisting of carnivores that eat herbivores.
- 3399 secondary growth: The increase in girth of the stems and roots of many plants, especially woody, perennial dicots.
- 3400 secondary immune response: The immune response elicited when an animal encounters the same antigen at some later time. The secondary immune response is more rapid, of greater magnitude, and of longer duration than the primary immune response.
- 3401 secondary injury: The physiological and biochemical changes that occur after the initial mechanical injury that further damage the spinal cord.
- 3402 secondary productivity: The rate at which all the heterotrophs in an ecosystem incorporate organic material into new biomass, which can be equated to chemical energy.
- 3403 secondary sex characteristics: Characteristics of animals that distinguish between the two sexes but that do not produce or convey gametes; includes facial hair of the human male and enlarged hips and breasts of the female.
- 3404 secondary structure: The localized, repetitive coiling or folding of the polypeptide backbone of a protein due to hydrogen bond formation between peptide linkages.
- 3405 secondary succession: A type of succession that occurs where an existing community has been severely cleared by some disturbance.
- 3406 secondary: Derived from or consequent to a primary event or thing.
- 3407 secretagogue: A substance that causes another substance to be secreted.
- 3408 secretion: 1. The process of secreting (releasing) a substance, especially one that is not a waste, from the blood or cells; 2. a substance, such as saliva, mucus, tears, bile, or a hormone, that is secreted.
- 3409 sedimentary rock: Rock formed from sand and mud that once settled in layers on the bottom of seas, lakes, and marshes. Sedimentary rocks are often rich in fossils.
- 3410 seed implantation: Insertion of radioactive seeds, usually iodine 125 or palladium 103 into the prostate tissue to destroy prostate cancer (PC).
- 3411 seed: An adaptation for terrestrial plants consisting of an embryo packaged along with a store of food within a resistant coat.
- 3412 segregation: The normal biological process whereby the two pieces of a chromosome pair are separated during meiosis and randomly distributed to the germ cells.
- 3413 seizure: A seizure is a sudden change in behavior due to an excessive electrical activity in the brain. There are a wide variety of possible symptoms of seizures, depending on what parts of the brain are affected. Many types of seizures cause loss of consciousness with twitching or shaking of the body. However, some seizures consist of staring spells that can easily go unnoticed. Occasionally, seizures can cause temporary abnormal sensations or visual disturbances.
- 3414 seizure: Abnormal electrical discharge of brain tissue, often resulting in abnormal body movements or behaviours.
- 3415 selection coefficient: The difference between two fitness values, representing a relative measure of selection against an inferior genotype.
- 3416 selection: The process by which the forms of organisms in a population that are better adapted to the environmental conditions increase in frequency relative to less well-adapted forms over a number of generations.
- 3417 selective androgen receptor modulator: A drug that selectively inhibits androgen receptors of a specific tissue(s) while allowing the normal interaction of the androgen with androgen receptors at other sites.
- 3418 selective breeding: A process in which new or improved strains of plants or animals are developed, mainly through controlled mating or crossing and selection of progeny for desired traits.
- 3419 selective permeability: A property of biological membranes that allows some substances to cross more easily than others.
- 3420 selective pressure: An environmental factor that favors the survival and reproduction of those genetic variants within a population that are better adapted to the environment.
- 3421 selenium: A relatively rare nonmetallic element found in food in small quantities that has some effect in prevention of prostate cancer.
- 3422 self pollination: The transfer of pollen from anther to stigma in the same flower or to another flower of the same plant, leading to self-fertilization.
- 3423 self regeneration: For cells, ability to divide and produce more copy of itself.
- 3424 self: Belonging to or part of the body, as opposed to foreign material or foreign proteins present in the body.
- 3425 self-fertilization: The union of egg and sperm produced by a single hermaphroditic organism.
- 3426 Self-inactivating (SIN) long terminal repeat: The basal/enhancer control elements from wild-type lentiviral promoters were replaced in the long terminal repeat by

- transcriptional control elements from heterologous viral or cellular promoters. This replacement renders the virus replication incompetent.
- 3427 self-incompatibility: The capability of certain flowers to block fertilization by pollen from the same or a closely related plant.
- 3428 self-renewal: Self-renewal describes the process where a stem cell undergoes mitotic cell division that yields at least one daughter cell with equivalent developmental potential as the mother cell - i.e. creating another stem cell. The capacity of stem cells to self-renew varies based on the type of stem cell. Induced pluripotent stem cells and embryonic stem cells maintain the ability to self-renew indefinitely under proper culture conditions. Adult stem cells have limited capacity to self-renew and proliferate. Self-renewal is a necessary cellular function that allows the body to maintain a sufficient number of stem cells within its different tissues and organs for the maintenance/repair of lost or damaged cells/tissues.
- 3429 semen: The fluid that is ejaculated by the male during orgasm; contains sperm and secretions from several glands of the male reproductive tract.
- 3430 semicircular canals: A three-part chamber of the inner ear that functions in maintaining equilibrium.
- 3431 semilunar valve: A valve located at the two exits of the heart, where the aorta leaves the left ventricle and the pulmonary artery leaves the right ventricle.
- 3432 seminal vesicle invasion or involvement (SVI): prostate cancer cells are found in the seminal vesicle(s).
- 3433 seminal vesicles (SV): Glandular structures located above and behind the prostate that secrete and store seminal fluid; the seminal vesicles connect with the ejaculatory ducts; the seminal fluid contains nutrients for the sperm that improves their viability and mobility.
- 3434 seminal: Related to the semen; for example, the seminal vesicles are structures at the base of the bladder and connected to the prostate that provide nutrients for the semen.
- 3435 seminiferous tubules: Highly coiled tubes in the testes in which sperm are produced.
- 3436 senescence: The phenomenon in which a normal diploid cell loses the ability to divide after about 50 cell divisions.
- 3437 sensation: An impulse sent to the brain from activated receptors and sensory neurons.
- 3438 sensitivity: The probability that a diagnostic test can correctly identify the presence of a particular disease assuming the proper conduct of the test; specifically, the number of true positive results divided by the sum of the true positive results and the false negative results.
- 3439 sensory neuron: A nerve cell that receives information from the internal and external environments and transmits the signals to the central nervous system.
- 3440 sensory receptor: A specialized structure that responds to specific stimuli from an animal's external or internal environment; transmits the information of an environmental stimulus to the animal's nervous system by converting stimulus energy to the electrochemical energy of action potentials.
- 3441 sepal: A whorl of modified leaves in angiosperms that encloses and protects the flower bud before it opens.
- 3442 sepsis: Systemic response to infection with fever and elevated white blood cell count.
- 3443 septicemia: A bodywide infection due to virulent bacteria entering the bloodstream from a local infection, i.e., blood poisoning.
- 3444 septum: A partition, or cross wall, that divides a structure, such as a fungal hypha, into compartments.
- 3445 Sequence (v.): To determine the sequence of genetic "letters" in a piece of DNA or an entire human genome.
- 3446 sequence assembly: A process whereby the order of multiple sequenced DNA fragments is determined.
- 3447 sequence tagged site (STS): Short (200 to 500 base pairs) DNA sequence that has a single occurrence in the human genome and whose location and base sequence are known. Detectable by polymerase chain reaction, STSs are useful for localizing and orienting the mapping and sequence data reported from many different laboratories and serve as landmarks on the developing physical map of the human genome. Expressed sequence tags (ESTs) are STSs derived from cDNAs.
- 3448 sequencing technology: The instrumentation and procedures used to determine the order of nucleotides in DNA.
- 3449 sequencing: Determining the order of bases in a length of DNA. Provides information on where genes start and stop and where mutations or changes have occurred. It also allows you to translate the sequence of bases within a gene into what amino acids it codes for, and therefore what protein is produced.
- 3450 sequential androgen blockade (SAB): A variation of ADT involving a two-medication (anti-androgen plus a 5 alpha reductase inhibitor) approach intended to stop PC growth using androgen deprivation focused at the level of the tumor cell, while at the same time maintaining normal serum testosterone levels so that the sexual function will hopefully be preserved.
- 3451 serenoa repens: The dwarf palm and source of the active herb used in saw palmetto preparations such as permixon. Serenoa blocks various pathways in testosterone metabolism such as the conversion of testosterone to androstenedione as well as the conversion of testosterone to DHT.
- 3452 serologic testing: A test using serum from the blood to find the patient's or donor's HLA typing.
- 3453 seroma: A mass or swelling caused by the localized accumulation of serum within a tissue or organ.
- 3454 serotonin: Neurotransmitter that relays impulses between nerve cells (neurons) in the central nervous system. Serotonin is involved in mood and behavior, physical coordination, appetite, body temperature, and sleep.
- 3455 serous: Of, relating to, producing, or resembling serum; especially: having a thin watery constitution.
- 3456 sertoli cells: They line the seminiferous tubes in the testes. These cells nurture the developing sperm cells.
- 3457 serum glutamic-oxaloacetic transaminase: A liver cell enzyme; elevation of SGOT is seen as an effect of liver cell injury by drugs, alcohol and viruses. Supplements such as silymarin, alpha lipoic acid and curcumin may protect and repair the liver cell and help reduce elevations of SGOT.
- 3458 Serum: The clear liquid that separates from the blood when it is allowed to clot. This fluid retains any antibodies that were present in the whole blood.
- 3459 sessile: Attached; not free to move about.
- 3460 severe acute respiratory syndrome: It is caused by a virus thought to be a combination of the Coronavirus family (a virus that is often a cause of the common cold) and the paramyxovirus family (causes measles and mumps). The syndrome includes fever and coughing or difficulty breathing, and can be fatal. It is thought to have originated in mainland China in 2003 and has spread to other countries.
- 3461 severe combined immunodeficiency disease (SCID): An inherited disease in which the immune system does not work well. It is often treated with a marrow or blood stem cell transplant.
- 3462 sex chromosomes: These determine our gender. Some congenital diseases are X-linked and only manifest in males. That is because a normal second X makes the expression recessive while the Y sex chromosome in males

- does not cancel out the expression which is thus dominant. Hemophilia is an example of an X-linked congenital disease.
- 3463 sex hormone binding globulin (SHBG): A protein that binds testosterone to make it unavailable for function; SHBG production is increased by estrogens such as DES. SHBG binds to DHT four times more avidly than to testosterone.
- 3464 sex-linked genes: Genes located on one sex chromosome but not the other.
- 3465 sex-linked trait: An inherited trait, such as color discrimination, determined by a gene located on a sex chromosome and that therefore shows a different pattern of inheritance in males and females.
- 3466 sex-linked: Traits or diseases associated with the X or Y chromosome; generally seen in males.
- 3467 sextant: Having six parts; thus, a sextant biopsy is a biopsy that takes six samples.
- 3468 sexual dimorphism: A special case of polymorphism based on the distinction between the secondary sex characteristics of males and females.
- 3469 sexual health inventory for men score: A score which quantifies sexual function based on five specific questions.
- 3470 sexual reproduction: A type of reproduction in which two parents give rise to offspring that have unique combinations of genes inherited from the gametes of the two parents.
- 3471 sexual selection: Selection based on variation in secondary sex characteristics, leading to the enhancement of sexual dimorphism.
- 3472 Sezary Disease: This is a variant of a cutaneous T-cell lymphoma. It likely represents the leukemic phase of mycosis fungoides.
- 3473 SH-2, -3, -4: Markers developed by Osiris Biotechnology to detect mesenchymal stem cells. SH-2 has the specificity as for CD105 (endoglin) and SH-4 for stro-1.
- 3474 shared follow-up: Shared follow-up is the act or process of sharing information or contacting the patient at least once per year to ascertain vial status, cancer status, and other information.
- 3475 shoot system: The aerial portion of a plant body, consisting of stems, leaves, and flowers.
- 3476 short tandem repeats: Short DNA sequences that are repeated in a head-to-tail manner. They are useful in DNA profiling.
- 3477 short-day plant: A plant that flowers, usually in late summer, fall, or winter, only when the light period is shorter than a critical length.
- 3478 shotgun method: Sequencing method that involves randomly sequenced cloned pieces of the genome, with no foreknowledge of where the piece originally came from. This can be contrasted with "directed" strategies, in which pieces of DNA from known chromosomal locations are sequenced. Because there are advantages to both strategies, researchers use both random (or shotgun) and directed strategies in combination to sequence the human genome.
- 3479 shotgun sequencing: A method of determining the DNA sequence of a genome. The first step in shotgun sequencing is to copy a genome many times, then shred the copies into fragments of DNA that can be "read" by machines. Next, computers identify the fragments that belong next to each other in the genome and assemble them into a complete genome sequence.
- 3480 sickle cell anemia: An inherited type of anemia which occurs most often in Africans and African Americans. The disease gets its name from the sickle shape (a C-shape) of the red blood cells. These cells cannot move oxygen very well. The disease is sometimes treated with a marrow or blood stem cell transplant.
- 3481 sickle cell trait: A person who has one gene for sickle cell anemia is said to have sickle cell trait. Sickle cell trait cannot change to become sickle cell anemia. A person will develop sickle cell anemia only if both parents pass on the trait (gene) to him or her.
- 3482 side effect: A reaction to a medication or treatment (most commonly used to mean an unnecessary or undesirable effect).
- 3483 side population (SP) stem cell: Two examples of multipotent stem cell populations found in bone marrow and skeletal muscle. SPs are not yet fully characterized. Their significance is their unexpected ability to differentiate into cell types that are distinct from their tissue of origin.
- 3484 sideroblast: An erythroblast having granules of ferritin.
- 3485 sieve tube member: A chain of living cells that form sieve tubes in phloem.
- 3486 sign stimulus: An external sensory stimulus that triggers a fixed action pattern.
- 3487 sign: Physical changes which can be observed as a consequence of an illness or disease.
- 3488 signal excitation: The excitation of signals using a strong magnetic field and radio frequency (RF) pulses to produce resonances or peaks due to water or other chemicals (metabolites) within tissue.
- 3489 signal peptide: A stretch of amino acids on polypeptides that targets proteins to specific destinations in eukaryotic cells.
- 3490 signal transduction pathways: Relay of a signal by the conversion from one physical or chemical form to another. In cell biology, signal transduction is the process in which a cell converts an extracellular signal into a response.
- 3491 signals: Internal and external factors that control changes in cell structure and function. They can be chemical or physical in nature.
- 3492 signal-transduction pathway: A mechanism linking a mechanical or chemical stimulus to a cellular response.
- 3493 signet ring: The early stage of trophozoite development of the malaria parasite in the red blood cell; the parasite cytoplasm stains blue around its circular margin, and the nucleus stains red in Romanowsky stains, while the central vacuole is clear, giving the ringlike appearance.
- 3494 sildenafil: The active ingredient of Viagra®, which may help to produce erections.
- 3495 silencing: A technique to stop or interrupt the expression of a particular gene, most commonly by the insertion of a reverse copy of all or part of that gene.
- 3496 single nucleotide polymorphism (SNP): A single "letter" of DNA that may vary from one person to the next. At a particular location in the genome, one person may have an "A" while another has a "T." In the human genome, a SNP occurs on average about once every thousand DNA "letters."
- 3497 single photon emission computed tomography: Tomography using emissions from radionuclides and a computer algorithm to reconstruct the image. SPECT allows visualization of the body in slices from recalculated planar views of the patient.
- 3498 single-cell cloned: A procedure pertaining to cells in vitro in which the descendants of a single cell are physically isolated from other cells growing in a dish, and then expanded into a larger population.
- 3499 single-gene disorder: A disease caused by a single gene that is inherited in a straightforward manner from parent or parents to child. Huntington's disease and cystic fibrosis are examples. The term "Mendelian" refers to Gregor Mendel, the Austrian who did pioneering work on genes and traits in ordinary garden peas by showing that a single trait, such as color, can be determined by a single gene. Compared to "complex diseases," Mendelian disorders are relatively rare.

- 3500 sink habitat: A habitat where mortality exceeds reproduction.
- 3501 sinoatrial node: Area of the vertebrate heart that initiates the heartbeat; located where the superior vena cava enters the right atrium; the pacemaker.
- 3502 sinus marrow sinus: Area of the blood vessels where the arterial and venous blood mix. Mature hematopoietic cells and other bone marrow cells exist through the sinus into the peripheral circulation.
- 3503 sinusoidal: Any of the venous cavities through which blood passes in various glands and organs, such as the adrenal gland and the liver.
- 3504 sister chromatids: Replicated forms of a chromosome joined together by the centromere and eventually separated during mitosis or meiosis II.
- 3505 sister Mary Joseph node: A malignant intra-abdominal neoplasm metastatic to the umbilicus.
- 3506 skeletal muscle: Striated muscle generally responsible for the voluntary movements of the body.
- 3507 skeletal: Related events - include bone fracture, spinal cord compression or the need for radiation or surgery for the treatment of bone metastasis.
- 3508 skin biopsy: A skin biopsy is a procedure where a piece of skin is removed to diagnose an illness. It may also be called punch biopsy. A skin biopsy can be performed in an outpatient medical setting with some local anesthetic to numb the area. Physicians who specialize in genetics or dermatologists usually perform the skin biopsy. During a skin or punch biopsy, the doctor removes a small round piece of skin using a hollow instrument. Stitches are only required if a large sample is taken. To prepare for the test, tell your doctor about all the medications you are currently taking including over the counter medications. You will feel a stinging sensation when the anesthetic is injected. You may feel a little sore in that area for several days thereafter.
- 3509 sliding-filament model: The theory explaining how muscle contracts, based on change within a sarcomere, the basic unit of muscle organization, stating that thin (actin) filaments slide across thick (myosin) filaments, shortening the sarcomere; the shortening of all sarcomeres in a myofibril shortens the entire myofibril.
- 3510 small cell PC: An aggressive variant of prostate cancer with a tendency to metastasize early due to rapidly dividing cells.
- 3511 small intestinal submucosa: A scaffold used to help heal chronic wounds, repair hernias, or form a sling for the bladder as a treatment for urinary incontinence. SIS is constructed from naturally-occurring material and is harmlessly absorbed by the body as healthy new tissue grows in to replace it.
- 3512 Small molecule drugs: Form of LSD treatment that attempts to use small molecules to administer therapies to stabilize faulty enzymes or minimize the amount of waste material that accumulates.
- 3513 small nuclear ribonucleoprotein (snRNP): One of a variety of small particles in the cell nucleus, composed of RNA and protein molecules; functions are not fully understood, but some form parts of spliceosomes, active in RNA splicing.
- 3514 smooth ER: That portion of the endoplasmic reticulum that is free of ribosomes.
- 3515 smooth muscle: A type of muscle lacking the striations of skeletal and cardiac muscle because of the uniform distribution of myosin filaments in the cell.
- 3516 smooth muscle: Also known as "involuntary muscle," these muscles perform automatic tasks such as peristalsis and blood vessel constriction. Named smooth muscle because of smooth, rather than striated, appearance under a microscope.
- 3517 social dominance: A hierarchical pattern of social organization involving domination of some members of a group by other members in a relatively orderly and long-lasting pattern.
- 3518 social hierarchy: An arrangement within a group of animals, such as rabbits, where some individuals are dominant over others. The more dominant an animal, the more likely it is to have preferred access to mates and sources of food.
- 3519 society: An organization of individuals of the same species in which there are divisions of resources, divisions of labor, and mutual dependence; a society is held together by stimuli exchanged among members of the group.
- 3520 Sociobiology: The study of social behavior based on evolutionary theory.
- 3521 sodium-potassium pump: A special transport protein in the plasma membrane of animal cells that transports sodium out of and potassium into the cell against their concentration gradients.
- 3522 solute: Substance that is dissolved in a solution.
- 3523 solution: A homogeneous, liquid mixture of two or more substances. solvent The dissolving agent of a solution. Water is the most versatile solvent known.
- 3524 somatic (adult) stem cells: A relatively rare undifferentiated cell found in many organs and differentiated tissues with a limited capacity for both self renewal (in the laboratory) and differentiation. Such cells vary in their differentiation capacity, but it is usually limited to cell types in the organ of origin. This is an active area of investigation.
- 3525 somatic (or adult) stem cell: An undifferentiated cell found in a differentiated tissue that can renew itself and differentiate (with certain limitations) to give rise to all the specialized cell types of the tissue from which it originated. It is important to note that scientists do not agree about whether or not adult stem cells may give rise to cell types other than those of the tissue from which they originate.
- 3526 somatic cell genetic mutation: A change in the genetic structure that is neither inherited nor passed to offspring. Also called acquired mutations.
- 3527 somatic cell nuclear transfer (SCNT): A laboratory technique for creating an ovum with a donor nucleus. In SCNT the nucleus, which contains the organism's DNA, of a somatic cell is removed and the rest of the cell discarded. At the same time, the nucleus of an egg cell is removed. The nucleus of the somatic cell is then inserted into the enucleated egg cell. After being inserted into the egg, the somatic cell nucleus is reprogrammed by the host cell. The egg, now containing the nucleus of a somatic cell, is stimulated with a shock and will begin to divide. After many mitotic divisions in culture, this single cell forms a blastocyst with almost identical DNA to the original organism.
- 3528 somatic cell nuclear transplant: A technique in which the nucleus of a somatic cell (any cell of the body except sperm cells and egg cells) is injected, or transplanted, into an egg, that has had its nucleus removed. If the new egg is then implanted into the womb of an animal, an individual will be born that is a clone. The clone has the identical genetic material as the somatic cell, which supplied the nucleus that carries the genetic material. This procedure is very inefficient and was first developed for agricultural purposes. However, in human medicine, this technique can be used to isolate embryonic stem cells from eggs that undergo nuclear transplant. When the somatic cell is supplied from the cells of a person, the stem cells isolated from the developing eggs can be used to make a tissue that will not be rejected by that person, because they have the same genetic material. In this way, 'customized' embryonic stem cells could be made for everyone who needed them.

- 3529 somatic stem cells: Somatic stem cells are another way of referring to adult stem cells. These cells are undifferentiated, meaning they can develop into more than one type of cell belonging to the organ from which they were taken. They can self-renew indefinitely.
- 3530 somatic: Pertaining to the body, as opposed to the brain or the spirit.
- 3531 somatosensory evoked potential: An electrophysiological measurement of spinal cord function. Recorded by stimulating peripheral nerves and measuring the response from the patient's scalp.
- 3532 somatosensory: Refers to sensory signals from all tissues of the body including skin, viscera, muscles and joints.
- 3533 somatostatin: A hormone that inhibits the secretion of insulin and gastrin.
- 3534 somatotropin: A hormone, produced by the pituitary gland, that stimulates protein synthesis and promotes the growth of bone; also known as growth hormone.
- 3535 somite: One of the longitudinal series of segments into which the body of many animals (including vertebrates) is divided.
- 3536 sonogram: An image of a structure that is produced by ultrasonography.
- 3537 source habitat: A habitat where reproduction exceeds mortality and from which excess individuals disperse.
- 3538 Southern blotting: A hybridization technique that enables researchers to determine the presence of certain nucleotide sequences in a sample of DNA.
- 3539 SOX 2 SRY (sex determining region Y): box 2, is a transcription factor that is essential to maintain self-renewal of undifferentiated embryonic stem cells. This intronless gene encodes a member of the SRY-related HMG-box (SOX) family of transcription factors involved in the regulation of embryonic development and in the determination of cell fate.
- 3540 SOX2: SOX2 is a transcription factor critical for the maintenance of pluripotency in embryonic stem cells. SOX2 and Oct-4 work in parallel to co-regulate expression of target genes involved in the maintenance of pluripotency. In 2006, the Yamanaka lab identified Oct-4 as one of the four factors that, when co-transfected and expressed in mouse adult fibroblasts, caused fibroblasts to revert to an "embryonic-like" state. One year later, the same four factors were used to successfully reprogram human adult fibroblast cells into induced pluripotent stem cells. These four factors are Oct-4, SOX2, c-Myc, Klf-4.
- 3541 spasticity: Spasticity is a condition in which certain muscles are continuously contracted. This contraction causes stiffness or tightness of the muscles and may interfere with movement, speech, and manner of walking. Spasticity is usually caused by damage to the portion of the brain or spinal cord that controls voluntary movement. Symptoms may include hypertonicity (increased muscle tone), clonus (a series of rapid muscle contractions), exaggerated deep tendon reflexes, muscle spasms, scissoring (involuntary crossing of the legs), and fixed joints. The degree of spasticity varies from mild muscle stiffness to severe, painful, and uncontrollable muscle spasms. Spasticity can interfere with rehabilitation in patients with certain disorders, and often interferes with daily activities.
- 3542 spatial-resolution: A term that refers to the number of pixels utilized in construction of a digital image - images having higher spatial resolution have a greater number of pixels.
- 3543 specialized cells: Also known as differentiated, mature or adult cells. Cells.
- 3544 specialized: (1) Of cells, having particular functions in a multicellular organism. (2) Of organisms, having special adaptations to a particular habitat or mode of life.
- 3545 speciation: The origin of new species in evolution.
- 3546 species (pl. species): A particular kind of organism; members possess similar anatomical characteristics and have the ability to interbreed.
- 3547 species diversity: The number and relative abundance of species in a biological community.
- 3548 species richness: The number of species in a biological community.
- 3549 species selection: A theory maintaining that species living the longest and generating the greatest number of species determine the direction of major evolutionary trends.
- 3550 species-specific: Pertaining to individuals of only one species. For example, a pesticide that is species-specific affects only one species.
- 3551 specific heat: The amount of heat that must be absorbed or lost for 1 g of a substance to change its temperature 1°C.
- 3552 specific: Unique; for example, the proteins in a given organism, the enzyme catalyzing a given reaction, or the antibody to a given antigen.
- 3553 specificity: The probability that a diagnostic test can correctly identify the absence of a particular disease assuming the proper conduct of the test; specifically, the number of true negative results divided by the sum of the true negative results and the false positive results; a method that detects 95% of true PC cases is highly sensitive, but if it also falsely indicates that 40% of those who do not have PC do have PC then its specificity is only 60%.
- 3554 spectral karyotype (SKY): A graphic of all an organism's chromosomes, each labeled with a different color. Useful for identifying chromosomal abnormalities.
- 3555 spectrophotometer: An instrument that measures the proportions of light of different wavelengths absorbed and transmitted by a pigment solution.
- 3556 spectroscopy: The science of measuring the emission and absorption of different wavelengths (spectra) of visible and non-visible light
- 3557 sperm: A sperm is the male "gamete" or sex cell. It combines with the female "gamete," called an ovum, to form a zygote. The formation process is called fertilization.
- 3558 spermatid: Each of four haploid (n) cells resulting from the meiotic divisions of a spermatocyte; each spermatid becomes differentiated into a sperm cell.
- 3559 spermatocytes: The diploid (2n) cells formed by the enlargement and differentiation of the spermatogonia; they give rise by meiotic division to the spermatids.
- 3560 spermatogenesis: The continuous and prolific production of mature sperm cells in the testis.
- 3561 spermatogonia: The unspecialized diploid (2n) cells on the walls of the seminiferous tubules that, by enlargement, differentiation, and meiotic division, become spermatocytes, then spermatids, then sperm cells.
- 3562 spermicide: A substance that acts to kill or immobilize sperm.
- 3563 spermidine: A polyamine compound, C₇H₁₉N₃, found in ribosomes and living tissues and having various metabolic functions. It was originally isolated from semen.
- 3564 spermine: A crystalline polyamine compound, C₁₀H₂₆N₄, present in ribosomes and found widely in living tissues along with spermidine. It is originally isolated from semen.
- 3565 sphincter: A ringlike valve, consisting of modified muscles in a muscular tube, such as a digestive tract; closes off the tube like a drawstring.
- 3566 sphingomyelin: A lipid or fat that is critical for the normal structure and function of cells and tissues. It is normally degraded into ceramide by sphingomyelinase. Niemann-Pick Types A and B are characterized by the absences of the enzyme and the accumulation of sphingomyelin.
- 3567 sphingomyelinase: An enzyme that resides within the lysosomes and is responsible for the conversion of a lipid (fat) called sphingomyelin into another type of lipid called

- ceramide. This lipid conversion is critical for the normal structure and function of cells and tissues. Niemann-Pick Type A and B are characterized by its absence and resultant accumulation of sphingomyelin.
- 3568 spina bifida: A birth defect in which the spinal cord is malformed and lacks its usual protective skeletal and tissue coverings.
- 3569 spinal Anesthesia: A form of anesthesia in which medication is inserted into the spinal column to block any painful sensations that might be felt from the point of insertion down to the lower extremities. The donor is conscious under this form of anesthesia. Nearly five percent of NMDP donors receive spinal anesthesia.
- 3570 spinal cord injury: Trauma or damage to the spinal cord, the major column of nerve tissue that is connected to the brain and lies within the vertebral canal and from which the spinal nerves emerge. The spinal cord and the brain constitute the central nervous system. The spinal cord consists of nerve fibers that transmit impulses to and from the brain. Like the brain, the spinal cord is covered by three connective-tissue envelopes called the meninges. The space between the outer and middle envelopes is filled with cerebrospinal fluid (CSF), a clear colorless fluid that cushions the spinal cord against jarring shock.
- 3571 spinal cord: The major column of nerve tissue that is connected to the brain and lies within the vertebral canal and from which the spinal nerves emerge. Thirty-one pairs of spinal nerves originate in the spinal cord: 8 cervical, 12 thoracic, 5 lumbar, 5 sacral, and 1 coccygeal. The spinal cord and the brain constitute the central nervous system (CNS). The spinal cord consists of nerve fibers that transmit impulses to and from the brain. Like the brain, the spinal cord is covered by three connective-tissue envelopes called the meninges. The space between the outer and middle envelopes is filled with cerebrospinal fluid (CSF), a clear colorless fluid that cushions the spinal cord against jarring shock. Also known simply as the cord.
- 3572 spindle: An assemblage of microtubules that orchestrates chromosome movement during eukaryotic cell division.
- 3573 spinous Process: A vertebral rearward projection that provides an attachment point for muscles and ligaments.
- 3574 spiracle: One of the external openings of the respiratory system in terrestrial arthropods.
- 3575 spiral cleavage: A type of embryonic development in protostomes, in which the planes of cell division that transform the zygote into a ball of cells occur obliquely to the polar axis, resulting in cells of each tier sitting in the grooves between cells of adjacent tiers.
- 3576 Spleen: An oblong-shaped organ situated between the heart and stomach that plays a role in the final destruction of red blood cells, filtration and storage of blood, and production of lymphocytes.
- 3577 Splenomegaly: Enlargement of the spleen; may be a symptom with several LSDs.
- 3578 Splice site: Location in the DNA sequence where RNA removes the noncoding areas to form a continuous gene transcript for translation into a protein.
- 3579 spliceosome: Complex assembly that interacts with the ends of an RNA intron in splicing RNA; releases an intron and joins two adjacent exons.
- 3580 spongy parenchyma: In plant leaves, a tissue composed of loosely arranged chloroplast-containing parenchyma cells.
- 3581 sporadic cancer: Cancer that occurs randomly and is not inherited from parents. Caused by DNA changes in one cell that grows and divides, spreading throughout the body.
- 3582 sporangiophore: A specialized hypha or a branch bearing one or more sporangia.
- 3583 sporangium (pl. sporangia): A capsule in fungi and plants in which meiosis occurs and haploid spores develop.
- 3584 spore: In the life cycle of a plant or alga undergoing alternation of generations, a meiotically produced haploid cell that divides mitotically, generating a multicellular individual, the gametophyte, without fusing with another cell.
- 3585 sporophyte: The multicellular diploid form in organisms undergoing alternation of generations that results from a union of gametes and that meiotically produces haploid spores that grow into the gametophyte generation.
- 3586 sporopollenin: A secondary product, a polymer synthesized by a side branch of a major metabolic pathway of plants that is resistant to almost all kinds of environmental damage; especially important in the evolutionary move of plants onto land.
- 3587 squamous cell carcinoma: A malignant neoplasm of squamous cells. In the white population, squamous cell carcinoma of the skin is associated with prolonged exposure to ultraviolet light and these neoplasms are slow to metastasis even after becoming invasive.
- 3588 β -cell: A cell in the pancreas which is responsible responsible for the production and regulation of insulin.
- 3589 ssparcylase: An enzyme that breaks down a N-acetylaspartate acid into parts thought to be necessary for proper myelin production and maintenance, Canavan disease is characterized by its absence.
- 3590 sspergillus: A family of fungi commonly found in soil - certain types may cause disease, especially in people who have suppressed immune systems.
- 3591 stabilizing selection: Natural selection that favors intermediate variants by acting against extreme phenotypes.
- 3592 Stage: As regards cancer, the extent of a cancer, especially whether the disease has spread from the original site to other parts of the body.
- 3593 staging: The process of determining extent of disease in a specific patient in light of all available information; it is used to help determine appropriate therapy; there are two staging methods: the Whitmore-Jewett staging classification (1956) and the more detailed TNM (tumor, (lymph) nodes, metastases) classification (1992) of the American Joint Committee on Cancer and the International Union Against Cancer. Staging should be subcategorized as clinical staging and pathologic staging. Clinical stage is based on the digital rectal exam findings. Pathologic stage usually relates to what is found at the time of surgery. The TNM system is now most commonly used.
- 3594 stamen: The pollen-producing male reproductive organ of a flower, consisting of an anther and filament.
- 3595 stander: A piece of equipment which allows a person who is unable to stand on his/her own (or has great difficulty standing) to stand upright. Standers have a variety of components providing support to necessary areas (knees, chest, hips, head, etc.) depending on each person's needs. Standing is medically beneficial for many reasons, including: bone density, stretching feet/ankles, improving digestion and improving joints.
- 3596 staple length: The length of the individual fibres of cotton. Affects the quality of the fabric that is made from it.
- 3597 starch: A storage polysaccharide in plants consisting entirely of glucose.
- 3598 startle response or Moro reflex: The startle response or reflex is a normal reflex for an infant when he or she is startled or feels like they are falling. The infant will have a "startled" look and the arms will fling out sideways with the palms up and the thumbs flexed. Presence of the startle response in babies older than a few months is abnormal and associated with neurological damage.
- 3599 stat 3: Signal transducers and activators of transcription 3.
- 3600 statocyst: A type of mechanoreceptor that functions in equilibrium in invertebrates through the use of statoliths, which stimulate hair cells in relation to gravity.

- 3601 stele: The central vascular cylinder in roots where xylem and phloem are located.
- 3602 Stem cell antigen 1 (Sca-1): Cell-surface protein on bone marrow cell, indicative of hematopoietic stem cells and mesenchymal stem cells.
- 3603 stem cell biologist: A scientist that works with stem cells.
- 3604 stem cell factor (SCF): Relatively undifferentiated cell that can continue dividing indefinitely, throwing off daughter cells that can undergo terminal differentiation into particular cell types.
- 3605 stem cell homing: The migration of stem cells through the blood or tissue to an ultimate destination where it differentiates and replaces or builds tissue. Stem cell homing is triggered by interactions between the cell surface adhesion molecules (such as selectins, integrins and ICAMs) and the cell's surrounding environment.
- 3606 stem cell line: A group of stem cells that have the following two traits: (1) They divide and make exact copies of themselves. (2) This is called self-renewal. They can change into distinct precursors of all sorts of different cells. This is called differentiation.
- 3607 stem cell niche: The microenvironment in which a stem cells is situated. During development, the niche may contain various factors and elements that alter gene expression within the stem cell, causing the cell to differentiate and proliferate into various tissues of the fetus. In developed tissue, the niche may help maintain stem cells in a quiescent state, until injury or disease signals them to self-renew and differentiate to replace the damaged tissue. Niche elements may include interactions with other cells, adhesion molecules, growth factors, cytokines and parameters such as pH, ionic strength and gas composition. Scientists study niche characteristics in order to replicate them in vitro, to control and direct the differentiation of stem cells in the laboratory.
- 3608 stem cell retrieval: The process of collecting stem cells from the circulating blood stream following administration of growth factors to increase their numbers.
- 3609 stem cell therapy: Use of stem cells to treat a disorder. Over 70 different disorders have been identified as amenable to stem cell therapy.
- 3610 stem cell transplant: The process of infusing healthy stem cells into persons who have undergone high-dose chemotherapy for one of many forms of leukemia, immunodeficiency, lymphoma, anemias, or metabolic disorders. There are three types of stem cell transplants: autologous, allogeneic and syngeneic. Healthy stem cells are collected from bone marrow, peripheral blood, and umbilical cord blood. Once the healthy stem cells are infused into the patient's blood stream, the cells move from the blood vessels to the center of the bones, where they begin making new blood cells.
- 3611 stem cell transplantation: A transfusion of bone marrow stem cells which are used to rescue marrow after very high doses of chemotherapy. Stem cells are circulating and can be mobilized so as not to require bone marrow harvesting (involves collecting stem cells with a needle placed into the soft center of the bone, the marrow).
- 3612 stem cells: A stem cell is a cell whose job in the body is not yet determined. Every single cell in the body "stems" from this type of cell, hence, the name stem cell. Stem cells are the body's "master" cells. Stem cells are formed at conception and specialize to become the various tissues of the growing embryo. They can duplicate themselves indefinitely and become or "differentiate" into many different cell types, such as blood, nerve, organ, bone, muscle, etc. These two key characteristics make stem cells different from the body's other cells, which are permanently the type of cell they have become - for example, a liver cell can only divide and generate new liver cells. The ability of stem cells to become other types of cells - their ability to "differentiate" - makes them absolutely essential for repairing and renewing body tissues throughout our lives.
- 3613 stem-cell homeostasis persistence of tissue stem: Cell pool throughout life. Requires balancing symmetric self-renewal with differentiative divisions at the population level, or sustained asymmetric self-renewal.
- 3614 stem-cell homeostasis: Persistence of tissue adult stem: cell pool throughout life. Requires balancing symmetric self-renewal with differentiative divisions at the population level or sustained asymmetric self-renewal.
- 3615 stemness: Unproven notion that different stem cells are regulated by common genes and mechanisms.
- 3616 stenosis: A narrowing, as in aortic stenosis (narrowing of the aortic valve in the heart), pulmonary stenosis (narrowing of the pulmonary valve in the heart), pyloric stenosis (narrowing of the outlet of the stomach), spinal stenosis (narrowing of the vertebral canal, often with impingement upon the spinal cord). From the Greek "stenos" meaning narrow.
- 3617 stent: A tube used by a surgeon to drain fluids.
- 3618 stepper: A motor (especially an electric motor) that moves or rotates in small discrete steps.
- 3619 step-section histopathology: The sectioning of diseased tissues into ordered slices used for microscopic analysis.
- 3620 stereoisomer: A molecule that is a mirror image of another molecule with the same molecular formula.
- 3621 stereoscopic vision: Ability to perceive a single, three-dimensional image from the simultaneous but separate images delivered to the brain by each eye.
- 3622 stereotactic biopsy: Stereotactic biopsy is a precise method of sampling a small region of brain tissue using image-guidance and minimally invasive techniques. Through only a skin puncture and tiny bony opening, an instrument is accurately passed into a brain lesion in order to determine its nature. This approach is often used to diagnose brain tumors or other disorders. CT or MRI guidance is used.
- 3623 sterile: Incapable of reproduction. Not able to germinate or bear fruit.
- 3624 steroid: Any hormone affecting the development and growth of sex organs. Testosterone and estrogen are steroids. Synthetic steroids are useful cancer treatments, but they might have undesirable side-effects.
- 3625 stigma: In plants, the region of a carpel serving as a receptive surface for pollen grains, which germinate on it.
- 3626 stimulant medication: A drug that increases the activity of the sympathetic nervous system and produces a sense of euphoria or awakeness. Stimulants can be used as recreational drugs or therapeutically to increase alertness. They are also used and sometimes abused to boost endurance and productivity as well as to suppress appetite. Examples of stimulants are caffeine, nicotine, amphetamines and cocaine.
- 3627 stimulus: Any internal or external change or signal that influences the activity of an organism or of part of an organism.
- 3628 stochastic: Random.
- 3629 stoma (pl. stomata): A microscopic pore surrounded by guard cells in the epidermis of leaves and stems that allows gas exchange between the environment and the interior of the plant.
- 3630 stool impaction: Severe constipation.
- 3631 strategy: A group of related traits, evolved under the influence of natural selection, that solve particular problems encountered by living organisms; often includes anatomical, physiological, and behavioral characteristics.
- 3632 stratified: In an analysis of data, a particular clinical or pathologic feature(s) is used as the basis for comparison, e.g. clinical stage, pathologic stage, PSA, Gleason score.

- 3633 stress incontinence: passing a small amount of urine when coughing, lifting, etc.
- 3634 striated muscle: Skeletal voluntary muscle and cardiac muscle. The name derives from the striped appearance, which reflects the arrangement of contractile elements.
- 3635 strict aerobe: An organism that can survive only in an atmosphere of oxygen, which is used in aerobic respiration.
- 3636 strict anaerobe: An organism that cannot survive in an atmosphere of oxygen. Other substances, such as sulfate or nitrate, are the terminal electron acceptors in the electron transport chains that generate their ATP.
- 3637 stricture: Scarring as a result of a procedure or an injury that constricts the flow of a fluid; for example, a urethral stricture would restrict the flow of urine through the urethra.
- 3638 stroma: The fluid of the chloroplast surrounding the thylakoid membrane; involved in the synthesis of organic molecules from carbon dioxide and water.
- 3639 stromal BPH: A non-cancerous cause of prostate enlargement within the connective tissue framework of the prostate.
- 3640 stromal cell: A non-blood cell that is derived from blood organs, such as bone marrow or fetal liver, which is capable of supporting growth of blood cells in vitro. Stromal cells that make this matrix within the bone marrow are also derived from mesenchymal stem cells.
- 3641 stromal: Relating to the stroma of an organ or other structure, that is, its framework, usually of connective tissue, rather than its specific substance.
- 3642 stromatolite: Rock made of banded domes of sediment in which are found the most ancient forms of life: prokaryotes dating back as far as 3.5 billion years.
- 3643 strontium-89: An injectable radioactive product that is used to relieve bone pain in some patients with prostate cancer that no longer responds to hormones or appropriate forms of chemotherapy.
- 3644 structural formula: A type of molecular notation in which the constituent atoms are joined by lines representing covalent bonds.
- 3645 structural gene: A gene that codes for a polypeptide.
- 3646 Structural genomics: The effort to determine the 3D structures of large numbers of proteins using both experimental techniques and computer simulation.
- 3647 style: In angiosperms, the stalk of a carpel, down which the pollen tube grows.
- 3648 subarachnoid space: A space, filled with cerebrospinal fluid, between the spinal-cord's arachnoid membrane and inner most pia mater membrane.
- 3649 subcapsular: Under the capsule; for example, a subcapsular orchiectomy is a form of castration in which the contents of each testicle is removed but the testicular capsules are then closed and remain in the scrotum.
- 3650 Subculturing: Transferring cultured cells, with or without dilution, from one culture vessel to another.
- 3651 subcutaneous: Located, found, or placed just beneath the skin.
- 3652 subcutis: Subcutis the deepest layer of skin and is also known as the subcutaneous layer.
- 3653 substitution: In genetics, a type of mutation due to replacement of one nucleotide in a DNA sequence by another nucleotide or replacement of one amino acid in a protein by another amino acid.
- 3654 substrate: (1) The substance on which an enzyme works. (2) The foundation to which an organism is attached.
- 3655 substrate: Waste material that may accumulate in cell lysosomes when it is not broken down by enzymes.
- 3656 substrate-level phosphorylation: The formation of ATP by directly transferring a phosphate group to ADP from an intermediate substrate in catabolism.
- 3657 sucrose: Cane sugar; a common disaccharide found in many plants; a molecule of glucose linked to a molecule of fructose.
- 3658 sugar: Any monosaccharide or disaccharide.
- 3659 sulcus: A groove or furrow, as one of the grooves on the surface of the cerebrum in mammals.
- 3660 sulfated proteoglycan: Molecules found primarily in connective tissues and joint fluids and that provide lubrication.
- 3661 summation: A phenomenon of neural integration in which the membrane potential of the postsynaptic cell in a chemical synapse is determined by the total activity of all excitatory and inhibitory presynaptic impulses acting on it at any one time.
- 3662 superficial: Pertaining to or situated near the surface, especially relating to the skin.
- 3663 suprolateral: Situated above and toward the side (of the prostate).
- 3664 superovulation: The stimulation of the ovary to release more than the normal number of egg cells.
- 3665 suppressor gene: A gene that can suppress the action of another gene.
- 3666 suppressor T cell (TS): A type of T cell that causes B cells as well as other cells to ignore antigens.
- 3667 suprapubic: Above the pubic bone; a suprapubic tube is placed into the bladder by puncturing the skin and soft tissue above the pubic bone.
- 3668 supraspinal: Above the spinal cord or vertebral column.
- 3669 surface antigen: Proteins on the surface of cells that are capable of detection by antibodies or other means. These may stimulate an immune response.
- 3670 surface markers: Proteins on the outside surface of a cell that are unique to certain cell types, which are visualized using antibodies or other detection methods.
- 3671 surface markers: Proteins on the outside surface of a cell that are unique to certain cell types, which are visualized using antibodies or other detection methods. CD34+ and CD133+ are cell surface markers found on hematopoietic stem cells. HLA is also a type of cell surface marker on lymphocytes with a specific role in identifying self vs non self.
- 3672 surface tension: A measure of how difficult it is to stretch or break the surface of a liquid. Water has a high surface tension because of the hydrogen bonding of surface molecules.
- 3673 surgical margins: The outer edge of the tissue removed during surgery.
- 3674 surgical: Hemostatic agent.
- 3675 surrogate: A person or animal that functions as a substitute for another. In the case of a surrogate mother, a woman or female animal carries an embryo and ultimately gives birth to a baby that was formed from the egg of another female.
- 3676 survivorship curve: A plot of the number of members of a cohort that are still alive at each age; one way to represent age-specific mortality.
- 3677 suspension-feeder: An aquatic animal, such as a clam or a baleen whale, that sifts small food particles from the water.
- 3678 sustainable agriculture: Long-term productive farming methods that are environmentally safe.
- 3679 sustainable development: An approach to development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It seeks to ensure that current development does not alter the environment's ability to recover from any damage sustained, and also makes use of renewable resources.
- 3680 sustainable development: The long-term prosperity of human societies and the ecosystems that support them.
- 3681 suture: Surgical stitching used in the closure of a cut or incision.

- 3682 swim bladder: An adaptation, derived from a lung, that enables bony fishes to adjust their density and thereby control their buoyancy.
- 3683 symbiont: The smaller participant in a symbiotic relationship, living in or on the host.
- 3684 symbiosis: An ecological relationship between organisms of two different species that live together in direct contact.
- 3685 Symmetric cell division: The process by which a stem cell undergoes mitotic cell division, yielding two identical daughter cells with the same developmental potential as the mother cell (e.g. self-renewal). During embryonic development and/or in response to an injury, certain stem cells will undergo symmetric cell division instead of asymmetric cell division. On the other hand, asymmetric cell division is the process whereby a stem cell undergoes mitotic cell division, yielding one daughter cell with equivalent developmental potential as the mother cell - i.e. another stem cell - and one daughter cell with less developmental potential than the mother cell - i.e. a progenitor cell. Symmetric and asymmetric cell division (self-renewal) are necessary cellular functions that allow the body to maintain a sufficient number of stem cells within its different tissues and organs. The stem cells are important for the maintenance/repair of lost or damaged cells/tissue. Without self-renewal, through asymmetric and symmetric cell division, the body would exhaust its population of stem cells.
- 3686 sympathetic division: One of two divisions of the autonomic nervous system of vertebrates; generally increases energy expenditure and prepares the body for action.
- 3687 sympathetic nervous system: A part of the autonomic nervous system that mobilizes energy and resources during times of stress and arousal.
- 3688 sympatric speciation: A mode of speciation occurring as a result of a radical change in the genome that produces a reproductively isolated subpopulation in the midst of its parent population.
- 3689 symphysis pubis: The rather rigid articulation of the two pubic bones in the midline of the lower anterior part of the abdomen.
- 3690 symplast: In plants, the continuum of cytoplasm connected by plasmodesmata between cells.
- 3691 symptom management: Care for LSD patients that tries to alleviate and manage their symptoms with a variety of methods (surgery, drugs, dialysis, transplantation, etc.), but does not affect the underlying cause of the disease.
- 3692 symptom: A feeling, sensation or experience associated with or resulting from a physical or mental disorder and noticeable by the patient.
- 3693 symptomatic: Having symptoms, evidence of disease.
- 3694 Synapomorphies: Shared derived characters; homologies that evolved in an ancestor common to all species on one branch of a fork in a cladogram, but not common to species on the other branch.
- 3695 synapse: The locus where one neuron communicates with another neuron in a neural pathway; a narrow gap between a synaptic terminal of an axon and a signal-receiving portion (dendrite or cell body) of another neuron or effector cell. Neurotransmitter molecules released by synaptic terminals diffuse across the synapse, relaying messages to the dendrite or effector.
- 3696 synapses: The junction between a neuron and another neuron or muscle or gland cells. At the synapse, the axon releases a neurotransmitter that diffuse across a tiny gap to a target-cell receptor, triggering a response.
- 3697 synapsis: The pairing of replicated homologous chromosomes during prophase I of meiosis.
- 3698 synaptic cleft: A narrow gap separating the synaptic knob of a transmitting neuron from a receiving neuron to an effector.
- 3699 synaptic knob: The relay point at the tip of a transmitting neuron's axon, where signals are sent to another neuron or to an effector.
- 3700 synaptic terminal: A bulb at the end of an axon in which neurotransmitter molecules are stored and released.
- 3701 syncope: Fainting or a loss of consciousness.
- 3702 syncytiotrophoblast: A multinucleated cell formed from the cells of the trophoblast. Only a small area of the syncytiotrophoblast is evident at the start of the formation of the embryo, but this cell tissue is highly invasive, quickly expands and soon surrounds the entire embryo.
- 3703 syncytium: A mass of cytoplasm containing many nuclei that are enclosed by a single plasma membrane. This is usually the result of either cell fusion or a series of incomplete division cycles in which the nuclei divide but the cell does not.
- 3704 syndrome: The group or recognizable pattern of symptoms or abnormalities that indicate a particular trait or disease.
- 3705 synergistic: Assists or adds to the activity of another substance, such as a drug.
- 3706 syngamy: The coming together of the egg and sperm at fertilization.
- 3707 syngeneic stem cell transplant: A marrow or blood stem cell transplant from one identical twin to the other.
- 3708 syngeneic transplant: The person donating the bone marrow or stem cells is an identical twin.
- 3709 syngeneic: Genetically identical members of the same species.
- 3710 synteny: Genes occurring in the same order on chromosomes of different species.
- 3711 synthesis phase: In the cell cycle, the phase in which the DNA of the chromosomes is replicated and DNA-associated proteins, such as histones, are synthesized.
- 3712 synthesis: The formation of a more complex substance from simpler ones.
- 3713 syringe: An instrument consisting of a hollow barrel and a plunger used to administer injections or to hold the liquid resulting from an aspiration.
- 3714 syringomyelia: The formation of a fluid-filled cavity or syrinx in the area of the spinal cord injury.
- 3715 systematic biopsy: Sampling of various sectors of the prostate under ultrasound guidance.
- 3716 systematics: The branch of biology that studies the diversity of life; encompasses taxonomy and is involved in reconstructing phylogenetic history.
- 3717 systemic acquired resistance (SAR): A defensive response in infected plants that helps protect healthy tissue from pathogenic invasion.
- 3718 systemic: Throughout the whole body; affecting the entire body.
- 3719 systole: The stage of the heart cycle in which the heart muscle contracts and the chambers pump blood.
- 3720 systolic pressure: The pressure in an artery during the ventricular contraction phase of the heart cycle.
- 3721 T cell: A type of white blood cell that is of crucial importance to the immune system. Immature T cells (termed T-stem cells) migrate to the thymus gland in the neck, where they differentiate into various types of mature T cells and become active in the immune system. T cells that are potentially activated against the body's own tissues are normally killed or changed ("down-regulated") during this maturation process.
- 3722 T helper cells: A type of white blood cell that is part of the body's immune response. It recognizes foreign antigens and stimulates the production of other cells to control them. Also called inducer T cell or CD4+ T cell.

- 3723 T3: Triiodothyronine. A thyroid hormone important for hematopoietic cells.
- 3724 taiga: The coniferous or boreal forest biome, characterized by considerable snow, harsh winters, short summers, and evergreen trees.
- 3725 tamoxifen: The generic name for Nolvadex®; an anti-estrogen that works by blocking the estrogen receptor (ER) on the cell.
- 3726 target capture: A process that isolates the target nucleic acid from clinical specimens and purifies the nucleic acid for amplification
- 3727 TAT: A lentiviral packaging element required for the efficient elongation of nascent viral transcripts.
- 3728 taxanes: Anticancer drugs that inhibit cancer cell growth by stopping cell division. Includes paclitaxel and docetaxel.
- 3729 taxis: A movement toward or away from a stimulus.
- 3730 taxon (pl. taxa): The named taxonomic unit at any given level.
- 3731 taxonomy: The branch of biology concerned with naming and classifying the diverse forms of life.
- 3732 Tay-Sachs disease: A lethal hereditary disease. The progressive accumulation of a substance called ganglioside in the brain causes paralysis, mental deterioration and blindness. Death usually occurs before the age of four.
- 3733 T-Cell: A type of lymphocyte responsible for attacking and destroying virus-infected cells, foreign tissue and tumor cells. Cytotoxic T- cells target a particular antigen and secrete toxic chemicals to kill the foreign cell or tissue. Other T-cells, called Helper T-cells, activate lymphocytes like B- cells and NK cells to help the body fight off invading viruses, micro- organisms and malignant cells.
- 3734 T-cells: T-cells are thymus-derived lymphocytes. T-cells are the major component of cell-mediated immunity. There are several types of T Cells: Cytotoxic T-cells destroy cancer cells and foreign invaders; helper T-cells that work in conjunction with white blood cells; and suppressor T cells that play a role in controlling white blood cell function.
- 3735 Technetium: A silvery-grey metallic element, artificially produced by bombardment of molybdenum by deuterons: used to inhibit corrosion in steel. The radioisotope technetium (Tc99m), with a half-life of six hours, is used in radiotherapy.
- 3736 telemanipulation: The direct human control of a robotic manipulator, where the operator and the manipulator are at different locations.
- 3737 Telomerase: An enzyme that catalyzes the lengthening of telomeres in eukaryotic germ cells. Embryonic stem cells have been shown to express high levels of telomerase activity, allowing embryonic stem cells to divide indefinitely or be "immortal" under proper culture conditions.
- 3738 Telomere: The end of a chromosome, associated with a characteristic DNA sequence that is replicated in a special way. A telomere counteracts the tendency of the chromosome to shorten with each round of replication.
- 3739 telophase: The fourth and final stage of mitosis, during which daughter nuclei form at the two poles of a cell. Telophase usually occurs together with cytokinesis.
- 3740 temperate bacteriophage: A bacterial virus that may become incorporated into the host-cell chromosome.
- 3741 temperate deciduous forest: A biome located throughout midlatitude regions where there is sufficient moisture to support the growth of large, broad-leaf deciduous trees.
- 3742 temperate virus: A virus that can reproduce without killing the host.
- 3743 temperature: A measure of the intensity of heat in degrees, reflecting the average kinetic energy of the molecules.
- 3744 template: A pattern or mold guiding the formation of a negative or complementary copy.
- 3745 tendon: A type of fibrous connective tissue that attaches muscle to bone.
- 3746 tenocyte: Tendon-producing cell.
- 3747 tentacles: Long, flexible protrusions located about the mouth of many invertebrates; usually prehensile or tactile.
- 3748 teratocarcinoma: An old name for a germ cell tumor that is a mixture of teratoma and embryonal carcinoma. In more modern usage, this kind of mixed germ cell tumor may be known as a teratoma with elements of embryonal carcinoma, or simply as an embryonal carcinoma.
- 3749 teratogen: A drug or other agent that raises the incidence of congenital malformations.
- 3750 teratoma: Scientists verify that they have established a human embryonic stem cell (hESC) line by injecting putative stem cells into mice with a dysfunctional immune system. Since the injected cells cannot be destroyed by the mouse's immune system, they survive and form a multi-layered benign tumor called a teratoma. Even though tumors are not usually a desirable outcome, in this test, the teratomas serve to establish the ability of a stem cell to give rise to all cell types in the body. This is because the teratomas contain cells derived from each of the three embryonic germ layers.
- 3751 terminal cell: Differentiated and specialized cell with limited or no capacity to divide, also called terminally-differentiated cell.
- 3752 terminator: A special sequence of nucleotides in DNA that marks the end of a gene; it signals RNA polymerase to release the newly made RNA molecule, which then departs from the gene.
- 3753 territory: An area or space occupied and defended by an individual or a group; trespassers are attacked (and usually defeated); may be the site of breeding, nesting, food gathering, or any combination thereof.
- 3754 tertiary consumer: A member of a trophic level of an ecosystem consisting of carnivores that eat mainly other carnivores.
- 3755 tertiary structure: Irregular contortions of a protein molecule due to interactions of side chains involved in hydrophobic interactions, ionic bonds, hydrogen bonds, and disulfide bridges.
- 3756 tesla: Unit of measurement to describe magnetic field strength.
- 3757 testcross: Breeding of an organism of unknown genotype with a homozygous recessive individual to determine the unknown genotype. The ratio of phenotypes in the offspring determines the unknown genotype.
- 3758 testis (pl. testes): The male reproductive organ, or gonad, in which sperm and reproductive hormones are produced.
- 3759 testis, (pl. testes): One of two male reproductive glands located inside the scrotum that are the primary sources of the male hormone testosterone.
- 3760 testosterone (T): The male hormone or androgen which comprises most of the androgens in a man's body; chiefly produced by the testicles but also is derived from adrenal androgen precursors such as DHEA and androstenedione. T is highly important to a man's sexual interest or libido and his ability to achieve erection. T plays a key role in virtually every tissue in the human body e.g. brain, bone, blood formation, skin, nails, muscle.
- 3761 testosterone: A hormone that is produced especially by the testes or made synthetically and that is responsible for inducing and maintaining male secondary sex characters.
- 3762 tetanus: The maximal, sustained contraction of a skeletal muscle, caused by a very fast frequency of action potentials elicited by continual stimulation.
- 3763 tetrad: In genetics, a pair of homologous chromosomes that have replicated and come together in prophase I of meiosis; consists of four chromatids.

- 3764 tetraploid complementation assay: An assay that can be used to test a stem cell's potency. Scientists studying mouse chimeras (mixing cells of two different animals) noted that fusing two 8-cell embryos produces cells with 4 sets of chromosomes (tetraploid cells) that are biased toward developing into extra-embryonic tissues such as the placenta. The tetraploid cells do not generate the embryo itself; the embryo proper develops from injected diploid stem cells. This tendency has been exploited to test the potency of a stem cell. Scientists begin with a tetraploid embryo. Next, they inject the stem cells to be tested. If the injected cells are pluripotent, then an embryo develops. If no embryo develops, or if the resultant embryo cannot survive until birth, the scientists conclude that the cells were not truly pluripotent.
- 3765 tetraploid: Individual or cell having four times the haploid number of chromosomes in the cell nucleus.
- 3766 tetrapod: A vertebrate possessing two pairs of limbs, such as amphibians, reptiles, birds, and mammals.
- 3767 TGF- β (transforming growth factor beta): A bone-derived growth factor that stimulates the PC cell and osteoblast, among many other functions
- 3768 thalamus: One of two integrating centers of the vertebrate forebrain. Neurons with cell bodies in the thalamus relay neural input to specific areas in the cerebral cortex and regulate what information goes to the cerebral cortex.
- 3769 thalassaemia: A hereditary anaemia resulting from reduced production of either alpha or beta haemoglobin. Depending on the type, the condition can be fatal before or just after birth, or can result in varying levels of anaemia and development difficulties.
- 3770 thalidomide: A drug that belongs to the family of drugs called angiogenesis inhibitors. It prevents the growth of new blood vessels into a solid tumor.
- 3771 thallus: A simple plant or algal body without true roots, leaves, or stems.
- 3772 theca: General term for any stiff outer covering of a unicellular protist, and usually made up of interlocking plates. dinoflagellates and diatoms are examples of protists with thecae.
- 3773 theory: A generalization based on many observations and experiments; a verified hypothesis.
- 3774 therapeutic cloning: The goal of therapeutic cloning is to create cells that exactly match a patient. By combining a patient's somatic cell nucleus and an enucleated egg, a scientist may harvest embryonic stem cells from the resulting nuclear transfer product that can be used to generate tissues that match a patient's body. This means the tissues created are unlikely to be rejected by the patient's immune system.
- 3775 therapeutic index: An index based on the ratio of tumor control probability (TCP) to normal tissue complication probability (NTCP) used in radiation therapy to assess the likelihood of effective treatment vs. the likelihood damage to surrounding tissues.
- 3776 therapeutic: The treatment of disease or disability.
- 3777 therapy: The treatment of disease or disability.
- 3778 thermistor or thermocouple: A thermoelectric device used to measure temperatures accurately.
- 3779 thermoablation: A procedure using heat to remove tissue or a part of the body, or destroy its function.
- 3780 thermodynamics: The study of transformations of energy. The first law of thermodynamics states that, in all processes, the total energy of a system plus its surroundings remains constant. The second law states that all natural processes tend to proceed in such a direction that the disorder or randomness of the system increases.
- 3781 thermoluminescent dosimeter: A device that registers the radiation dose (energy per unit mass) indicated by changes in color induced by temperature change. A device that directly measures absorbed dose.
- 3782 thermoregulation: The maintenance of internal temperature within a tolerable range.
- 3783 thiazolidinediones: A class of antidiabetes drugs that enhances the activity of insulin.
- 3784 thick filament: A filament composed of staggered arrays of myosin molecules; a component of myofibrils in muscle fibers.
- 3785 thigmomorphogenesis: A response in plants to chronic mechanical stimulation, resulting from increased ethylene production; an example is thickening stems in response to strong winds.
- 3786 thigmotropism: The directional growth of a plant in relation to touch.
- 3787 thinking disorder: Disorder that affects people's ability to think normally. This can often be an associated symptom in other mental disorders such as: schizophrenia or bipolar disorder.
- 3788 thoracentesis: Removal of fluid in the pleura through a needle.
- 3789 thoracic region: The 12 thoracic vertebrae are located in the chest/trunk region below the cervical vertebrae and above the lumbar vertebrae.
- 3790 thoracic: Pertaining to or affecting the chest.
- 3791 thorax: (1) In vertebrates, that portion of the trunk containing the heart and lungs. (2) In crustaceans and insects, the fused, leg-bearing segments between head and abdomen.
- 3792 threatened species: Species that are likely to become endangered in the foreseeable future throughout all or a significant portion of their range.
- 3793 threshold potential: The potential an excitable cell membrane must reach for an action potential to be initiated.
- 3794 thrombocyte (platelet): A tiny, disc-shaped blood cell responsible for controlling abnormal or excessive bleeding.
- 3795 thrombocytopenia: A condition where there are not enough platelets in the blood. Thrombocytopenia is likely to occur following a stem cell transplant and increases your chance of bleeding.
- 3796 thromboembolism, thromboembolic: The blocking of a blood vessel by a blood clot dislodged from its site of origin.
- 3797 thrombopoietin: Growth factor for the proliferation and differentiation of platelet forming cells called megakaryocytes.
- 3798 thrombosis: The formation or presence of a thrombus (a clot of coagulated blood attached at the site of its formation) in a blood vessel
- 3799 thylakoid: A flattened membrane sac inside the chloroplast, used to convert light energy to chemical energy.
- 3800 thymocytes: These are precursor T Cells which develop in the Thymus (located in upper part of chest cavity, produces hormones that stimulate production of infection-fighting cells). The Thymocytes develop into a pool of T Cells able to respond to foreign pathogens.
- 3801 thymus: An endocrine gland in the neck region of mammals that is active in establishing the immune system; secretes several messengers, including thymosin, that stimulate T cells.
- 3802 thyroid gland: An endocrine gland that secretes iodine-containing hormones (T3 and T4), which stimulate metabolism and influence development and maturation in vertebrates, and calcitonin, which lowers blood calcium levels in mammals.
- 3803 thyroid: A gland located beneath the voice box (larynx) that produces the thyroid hormone. The thyroid helps regulate growth and metabolism.

- 3804 thyroid-stimulating hormone (TSH): A hormone produced by the anterior pituitary that regulates the release of thyroid hormones.
- 3805 thyroxine: An iodine-containing hormone C₁₅H₁₁I₄NO₄ that is an amino acid produced by the thyroid gland as a product of the cleavage of thyroglobulin, increases metabolic rate, and is used to treat thyroid disorders.
- 3806 Ti plasmid: A plasmid of a tumor-inducing bacterium that integrates a segment of its DNA into the host chromosome of a plant; frequently used as a carrier for genetic engineering in plants.
- 3807 tibial: Pertaining to a tibia (the larger bone of the lower leg).
- 3808 tight junction: A type of intercellular junction in animal cells that prevents the leakage of material between cells.
- 3809 tinnitus: Noise perceived by the brain when no external sound is present. This sensation can be heard in one or both ears; it can be a sign of an underlying disorder but can occasionally occur for no apparent reason.
- 3810 tissue culture: Growth of tissue in vitro on an artificial medium for experimental research.
- 3811 tissue engineering: A field of inquiry and research that combines cell biology, engineering, and biochemistry to help replace, repair, or regrow injured or diseased tissues.
- 3812 tissue engineering: Relatively new field in which synthetic material and biomolecules are used to design a functional part of an organ.
- 3813 tissue regeneration: The concept of repairing the body by developing new tissues or organs. Stem cells have been shown to have capabilities of regrowing a variety of tissues.
- 3814 tissue stem cell: Derived from, or resident in, a fetal or adult tissue, with potency limited to cells of that tissue. These cells sustain turnover and repair throughout life in some tissues.
- 3815 tissue typing: Another term for HLA-typing.
- 3816 tissue vascularity: The state at which a tissue circulates an adequate flow of liquid components such as blood and nutrients within its vessels.
- 3817 tissue: An integrated group of cells with a common structure and function.
- 3818 tissue-specific stem cells (also referred to as somatic stem cells or adult stem cells): Undifferentiated cells found in various tissues within the human body that have the ability to self-renew and give rise to specialized cell types and tissues needed by the body. Most tissue-specific stem cells are multipotent, meaning the cells have the capacity to change into more than one type of cell within the body but not cells of all three germ layers. Multipotent stem cells have less differentiation potential than pluripotent stem cells. Examples of tissue-specific stem cells include hematopoietic stem cells, mesenchymal stem cells (bone marrow-derived mesenchymal stromal cells) and neural stem cells.
- 3819 titer: The number of transducing units per ml.
- 3820 TLR4 (toll like receptors 4): A transmembrane lipopolysaccharide receptor. Activation causes the release of antimicrobial peptides, inflammatory cytokines and chemokines, and costimulatory molecules that initiate the innate immune response to common gram-negative bacteria.
- 3821 T-lymphocyte: A cell type of the immune system that matures in the thymus and is responsible for cell-mediated immunity.
- 3822 TNF-alpha: Tumor necrosis factor alpha; a protein produced by macrophages in the presence of an endotoxin and shown experimentally to be capable of attacking and destroying cancerous tumors.
- 3823 tolerance induction: The "education" process that T cells undergo to discriminate between self and foreign proteins. This process takes place primarily in the thymus. In addition to inactivating or deleting self-reactive T cells, those T cells that can recognize the body's MHC proteins, but not be activated solely by this recognition, are also selected to leave the thymus (circulate through the body).
- 3824 tolerance: A state of specific immunologic unresponsiveness. Individuals are normally tolerant to their own cells and tissues. Autoimmune diseases occur when tolerance fails.
- 3825 toll like receptors 4 (TLR4): One in a family of receptors that provide critical links between immune stimulants produced by microorganisms and the initiation of host defenses.
- 3826 toluene: A solvent used in manufacturing perfumes, detergents, gasoline, other chemicals, and medicines. Acute exposure can irritate the nose, throat, and eyes, and cause headaches, loss of consciousness, and death. Chronic exposure can cause mutations, damage developing fetuses, and damage the liver, kidneys, brain, and bone marrow.
- 3827 tomography: A procedure where internal body images at a predetermined plane are recorded by means of the tomograph, a computer-driven device that builds the image from multiple X-ray measurements; tomography is used in CAT scan and PET scan.
- 3828 tonic-clonic seizures: In a tonic-clonic seizure, the person loses consciousness, the body stiffens, and then they fall to the ground. This is followed by jerking movements. After a minute or two, the jerking movements usually stop and consciousness slowly returns.
- 3829 tonoplast: A membrane that encloses the central vacuole in a plant cell, separating the cytosol from the cell sap.
- 3830 torpor: In animals, a physiological state that conserves energy by slowing down the heart and respiratory systems.
- 3831 total body irradiation (TBI): Radiation given to the entire body.
- 3832 total nucleated cell: Includes total nucleated red blood cells and other non-engrafting cells.
- 3833 totipotency: The ability of embryonic cells to retain the potential to form all parts of the animal.
- 3834 totipotent stem cell: Cells that can form an entire organism, including the extra embryonic tissue such as the placenta (in mammals) that do not become part of the fetus. Immediately after fertilization, a single totipotent cell (the zygote) is formed. This cell continues to divide into identical totipotent cells. About four days after fertilization and continued cell division, the totipotent cells begin to specialize into pluripotent and multipotent cells capable of generating only a specific subset of cells in the developing organism.
- 3835 totipotent: Sufficient to form entire organism. Totipotency is seen in zygote and plant meristem cells; not demonstrated for any vertebrate stem cell.
- 3836 totipotential: Ability of a stem cell to differentiate into all cell types of the organism (totipotent is the adjective).
- 3837 toxic: Poisonous.
- 3838 toxicity: The degree to which something is poisonous.
- 3839 toxicogenomics: The science of how a person's genome affects his or her response to potentially toxic substances in the environment, such as pollutants. A goal of research in toxicogenomics is to identify the genes that predispose some people to become sick when they encounter toxins in their daily lives.
- 3840 trace element: An element indispensable for life but required in extremely minute amounts.
- 3841 trachea pl. tracheae: Tiny air tubes that branch throughout the insect body for gas exchange.
- 3842 trachea: The windpipe; that portion of the respiratory tube that has C-shaped cartilaginous rings and passes from the larynx to two bronchi.

- 3843 tracheal system: A gas exchange system of branched, chitin-lined tubes that infiltrate the body and carry oxygen directly to cells in insects.
- 3844 tracheid: A water-conducting and supportive element of xylem composed of long, thin cells with tapered ends and walls hardened with lignin.
- 3845 tract: A group or bundle of nerve fibers with accompanying connective tissue, located within the central nervous system.
- 3846 traffic: Trafficking or circulation of cells refer to the movement of cells out of the bone marrow and through the periphery. The cells might return to the bone marrow.
- 3847 trait: A feature that is genetically controlled. A physical characteristic, such as red hair, that has a genetic component.
- 3848 transaction: To cut across.
- 3849 transaminase: An enzyme that catalyzes chemical reactions in the body in which an amino group is transferred from a donor molecule to a recipient molecule.
- 3850 transcription factor: A regulatory protein that binds to DNA and affects the transcription of specific genes. The four reprogramming factors, Oct-4, SOX2, Klf-4 and c-Myc function as transcription factors- they are capable of binding to the DNA to control the transcription of a unique set of genes. Together, Oct-4, SOX2, Klf-4 and c-Myc induce the expression of genes that are not normally expressed in the fibroblast, but are expressed in pluripotent stem cells. The four transcription factors continue to drive transcription of their downstream genes leading to the activation of other transcriptional networks, inducing a cascade of transcriptional activity.
- 3851 transcription mediated amplification (TMA): A process that uses two enzymes, Reverse Transcriptase and RNA Polymerase, to produce billions of copies of RNA amplified target from the purified target nucleic acid.
- 3852 transcription: The synthesis of RNA using a DNA template. During transcription, a DNA sequence is read by RNA polymerase and then transcribed into a complementary, antiparallel strand of mRNA. Transcription occurs in the nucleus of eukaryotic cells.
- 3853 transcriptomics: The study of the RNA transcripts produced from DNA.
- 3854 transdifferentiation 1: Cells in one lineage forming cells of another lineage, e.g., lymphoid cells forming myeloid type cells.
- 3855 transdifferentiation: The ability of a particular cell of one tissue, organ or system, including stem or progenitor cells, to differentiate into a cell type characteristic of another tissue, organ, or system; e.g., blood stem cells changing to liver cells.
- 3856 transducer: A substance or device that converts input energy of one form into another.
- 3857 transduction: The integration of exogenous genetic sequences into a host genome through viral particles.
- 3858 transfection: Describes the introduction of foreign material into eukaryotic cells using a virus vector or other means of transfer.
- 3859 transfer RNA (tRNA): An RNA molecule that functions as an interpreter between nucleic acid and protein language by picking up specific amino acids and recognizing the appropriate codons in the mRNA.
- 3860 transformation: (1) The conversion of a normal animal cell to a cancerous cell. (2) A phenomenon in which external DNA is assimilated by a cell.
- 3861 transfusion: The transferring of blood or blood products directly into a vein or artery.
- 3862 transgene: A gene that has been artificially introduced into a cell through genetic engineering strategies. In 2006, Shinya Yamanaka and his team determined that expression of only four genes (Oct-4, SOX2, Klf-4 and c-Myc) were necessary to reprogram mouse fibroblasts into pluripotent stem cells—otherwise known as induced pluripotent stem cells. However, these genes are highly down-regulated in fully differentiated somatic cells. To increase the expression of Oct-4, SOX2, c-Myc, and Klf-4, the team engineered Oct-4, SOX2, c-Myc, and Klf-4 transgenes and delivered them into the cell nuclei using retroviral vectors.
- 3863 transgenesis: The stable introduction of modified genes or genes from another animal or species into an animal's genome.
- 3864 transgenic animal cloning: The cloning or copying of a genetically modified animal such as a cow modified to produce pharmaceutical proteins in its milk, or a mouse modified to model a human disease.
- 3865 transgenic: Having artificially altered genetic material. A transgenic organism is one that has had its genotype altered by the introduction of a gene or DNA sequence into its genome by genetic manipulation; the introduced gene or DNA segment is called a transgene.
- 3866 transit-amplifying: Cell Proliferative stem-cell progeny fated for differentiation. Initially, it may not be committed and may retain self-renewal.
- 3867 transition zone: Area of the prostate closest to the urethra which has features that distinguish it from the much larger peripheral zone.
- 3868 translation: Process in cells in which genetic information encoded in messenger RNA is translated into a sequence of amino acids in a polypeptide chain during protein synthesis. Translation takes place outside of the nucleus.
- 3869 translational medicine: The area of focus or effort to transition basic research discoveries into clinical applications that benefit patients.
- 3870 translational research: A sharing of information between laboratory research and patient care, often referred to as “from bench to bedside”.
- 3871 translocation: (1) An aberration in chromosome structure resulting from an error in meiosis or from mutagens; attachment of a chromosomal fragment to a nonhomologous chromosome. (2) During protein synthesis, the third stage in the elongation cycle when the RNA carrying the growing polypeptide moves from the A site to the P site on the ribosome. (3) The transport via phloem of food in a plant.
- 3872 transperineal: Through the perineum.
- 3873 transpiration: The evaporative loss of water from a plant.
- 3874 transplant center-NMDP: Accredited, hospital based programs with experience, staff and facilities to perform allogeneic stem cell transplantation.
- 3875 transplant: The grafting of a tissue from one place to another, just as in botany a bud from one plant might be grafted onto the stem of another. The transplanting of tissue can be from one part of the patient to another (autologous transplantation), as in the case of a skin graft using the patient's own skin; or from one patient to another (allogenic transplantation), as in the case of transplanting a donor kidney into a recipient.
- 3876 transplantation biology: The science that studies the transplantation of organs and cells. Transplantation biologists investigate scientific questions to understand why foreign tissues and organs are rejected, the way transplanted organs function in the recipient, how this function can be maintained or improved, and how the organ to be transplanted should be handled to obtain optimal results.
- 3877 transplantation: Moving an organ, tissue or cell from one person—the donor—into another, the recipient. Transplants of organs generally involve surgery, but stem cell transplantation can be done by injecting the cells into a specific area, or by infusing them into the bloodstream and allowing them to find their way to the damaged tissues.

- 3878 transposon: A transposable genetic element; a mobile segment of DNA that serves as an agent of genetic change.
- 3879 transrectal: Through the rectum.
- 3880 transurethral resection of the prostate: A surgical procedure to remove tissue obstructing the urethra; the technique involves the insertion of an instrument called a resectoscope into the penile urethra, and is intended to relieve obstruction of urine flow due to enlargement of the prostate
- 3881 transurethral: Through the urethra.
- 3882 transverse: Acting, lying, or being across - set crosswise.
- 3883 trastuzumab (Herceptin®): A type of monoclonal antibody which blocks the effects of the growth factor protein HER2, which transmits growth signals to cancer cells.
- 3884 treat NMD: TREAT-NMD is a network that brings together people with neuromuscular diseases and specialists (scientists, healthcare professionals and pharmaceutical companies) working on treatments for these conditions.
- 3885 treatment (Tx): Administration of remedies to a patient for a disease
- 3886 trephine: An instrument for removing a circular disc of bone.
- 3887 trichocyst: Organelle in ciliates and dinoflagellates which releases long filamentous proteins when the cell is disturbed. Used as a defense against would-be predators.
- 3888 trigeminal nerve: The main sensory nerve of the face and motor nerve for the muscles of mastication.
- 3889 triiodothyronine: An iodine-containing hormone C₁₅H₁₂I₃NO₄ that is an amino acid derived from thyroxine.
- 3890 trimix: A mixture of papaverine, phentolamine and prostaglandin E-1 that is injected into the penis to cause an erection.
- 3891 triplet code: A set of three-nucleotide-long words that specify the amino acids for polypeptide chains.
- 3892 triploblastic: Possessing three germ layers: the endoderm, mesoderm, and ectoderm. Most eumetazoa are triploblastic.
- 3893 trisomy: Having three copies of a particular chromosome in each somatic (body) cell instead of the normal two copies. This leads to certain conditions, for example Down syndrome (trisomy 21) or Edwards syndrome (trisomy 18).
- 3894 trophoblast: The outer epithelium of a mamalian blastocyst that is made up of trophoblast cells. The trophoblast forms the fetal part of the placenta, supporting embryonic development but not forming part of the embryo proper. Stem cells that give rise to all cell types of the body, including the embryonic components of the trophoblast and placenta, are totipotent stem cells. These stem cells are derived from the pre-implantation embryo at the morula stage of embryonic development.
- 3895 trophic level: The division of species in an ecosystem on the basis of their main nutritional source. The trophic level that ultimately supports all others consists of autotrophs, or primary producers.
- 3896 trophic structure: The different feeding relationships in an ecosystem that determine the route of energy flow and the pattern of chemical cycling.
- 3897 trophic: The starting of cell reproduction and enlargement by nurturing and causing growth.
- 3898 trophoblast: The outer cell layer of the blastocyst. It is responsible for implantation and develops into the extraembryonic tissues, including the placenta, and controls the exchange of oxygen and metabolites between mother and embryo.
- 3899 tropic hormone: A hormone that has another endocrine gland as a target.
- 3900 tropic: Pertaining to behavior or action brought about by specific stimuli, for example, phototropic ("light-oriented") motion, gonadotropic ("stimulating the gonads") hormone.
- 3901 tropical rain forest: The most complex of all communities, located near the equator where rainfall is abundant; harbors more species of plants and animals than all other terrestrial biomes combined.
- 3902 tropism: A growth response that results in the curvature of whole plant organs toward or away from stimuli due to differential rates of cell elongation.
- 3903 true pelvis: The lower more contracted part of the pelvic cavity.
- 3904 TRUS (transrectal ultrasound): A method that uses echoes of ultrasound waves (far beyond the hearing range) to image the prostate by inserting an ultrasound probe into the rectum; commonly used to visualize and guide prostate biopsy procedures.
- 3905 trypsin: An enzyme that digests proteins. Often used to separate cells.
- 3906 T-score: A comparison of an individual's bone mass with the average bone mass of a young adult; a negative indicates a loss of bone density.
- 3907 t(Transdifferentiation 2: Stem cells in one organ forming differentiated cells of another organ, e.g., bone marrow stem cells forming hepatocytes.
- 3908 tuber: A much-enlarged, short, fleshy underground stem, such as that of the potato.
- 3909 tuberculosis: A bacterial infection that most commonly affects the lungs.
- 3910 tumor markers: Tumor markers are measurable biochemicals that are associated with a malignancy. They are either produced by tumor cells (tumor-derived) or by the body in response to tumor cells (tumor-associated). They are typically substances that are released into the circulation and thus measured in the blood. There are a few exceptions to this, such as tissue-bound receptors that must be measured in a biopsy from the solid tumor or proteins that are secreted into the urine.
- 3911 tumor suppressor gene: A gene whose protein products inhibit cell division, thereby preventing uncontrolled cell growth (cancer).
- 3912 tumor: Swelling. An abnormal mass of tissue. Tumors may be cancerous, or non-cancerous (benign). The tumors caused by embryonic stem cells are called teratomas.
- 3913 tundra: A biome at the extreme limits of plant growth; at the northernmost limits, it is called arctic tundra, and at high altitudes, where plant forms are limited to low shrubby or matlike vegetation, it is called alpine tundra.
- 3914 turgid: Firm, walled cells become turgid as a result of the entry of water from a hypotonic environment.
- 3915 turgor pressure: The force directed against a cell wall after the influx of water and the swelling of a walled cell due to osmosis.
- 3916 totipotent Stem Cells: Stem cells that can give rise to all cell types that are found in an embryo, fetus, or developed organism, including the embryonic components of the trophoblast and placenta required to support development and birth. The zygote and the cells at the very early stages following fertilization (i.e., the 2-cell stage) are considered totipotent.
- 3917 twinning: Development of monozygotic twins, that is, when a very early embryo separates into two pieces, each of which continues development, so that two embryos actually come from one zygote.
- 3918 type-1A diabetes: A form of insulin dependent diabetes, usually becoming evident in childhood, resulting from an autoimmune reaction that destroys the pancreatic beta cells, so that the body cannot produce its own insulin. In those cases where the condition is not apparent until adulthood, it is called latent autoimmune diabetes of adulthood.
- 3919 typing laboratory: A testing facility that performs HLA typing.
- 3920 tyrosine kinase receptor: A receptor protein in the plasma membrane that responds to the binding of a signal molecule by catalyzing the transfer of phosphate groups from ATP to

- tyrosines on the cytoplasmic side of the receptor. The phosphorylated tyrosines activate other signal-transduction proteins within the cell.
- 3921 tyrosine kinase: An enzyme that catalyzes the transfer of phosphate groups from ATP to the amino acid tyrosine in a substrate protein.
- 3922 ulcer: An open sore of the skin or mucus membrane characterized by sloughing of inflamed dead tissue.
- 3923 ultimate causation: The hypothetical evolutionary explanation for the existence of a certain pattern of animal behavior.
- 3924 ultrasound: A set of sound waves at a particular frequency which can be used to image internal organs, for example, a baby in the womb.
- 3925 ultrastructure: The detailed structure of a specimen, such as a cell, tissue, or organ, that can be observed only by electron microscopy. Also called fine structure. In eggshell, ultrastructure refers to the three-dimensional arrangement of mineral crystals and organic matter. It is described in terms of calcite or aragonite mineralogy and the transition between different zones of organization within the shell. Distinct zones of organization are called ultrastructure zones.
- 3926 umbilical cord blood stem cells: Stem cells collected from the umbilical cord at birth that can produce all of the blood cells in the body (hematopoietic). Hematopoietic stem cells are present in the blood of the umbilical cord during and shortly after delivery. These stem cells are in the blood at the time of delivery, because they move from the liver, where blood-formation takes place during fetal life, to the bone marrow, where blood is made after birth. Umbilical cord stem cells are similar to stem cells that reside in bone marrow, and can be used for the treatment of leukemia, and other diseases of the blood. Efforts are now being undertaken to collect these cells and store them in freezers for later use. Cord blood is currently used to treat patients who have undergone chemotherapy to destroy their bone marrow due to cancer or other blood-related disorders. However, one problem is that there may not be enough umbilical cord stem cells in any one sample to transplant into an adult.
- 3927 umbilical cord: At birth, an infant is connected via the umbilical cord to the placenta. Once the cord has been cut, the blood remaining in the cord is termed the cord blood. This blood is of interest because it contains stem cells. The gelatinous substance found inside the umbilical cord. The jelly has recently been shown to be a source of potentially pluripotent stem cells.
- 3928 umbilical stem cells: Isolated from umbilical cord blood and possessing less rejection potential than most other allogeneic donor tissue.
- 3929 understaging: The assignment of an overly low clinical stage at initial diagnosis because of the difficulty of assessing the available information with accuracy (e.g., stage T2b as opposed to stage T3b).
- 3930 undetectable PSA (UDPSA): Defined in the research as a PSA of <0.05 using a hypersensitive assay.
- 3931 undifferentiated cell: A primitive cell that does not have any tissue-specific structures that allows it to perform specialized functions. It has not changed to become a specialized cell.
- 3932 undulipodium: Another term for a eukaryotic flagellum.
- 3933 unipotent stem cells: Stem cells that self-renew as well as give rise to a single mature cell type; e.g., spermatogenic stem cells. It has now been determined that these cells can also differentiate into other types of cells.
- 3934 unipotent: Cells that can self-renew but only produce one cell type. It's self-renewal that distinguishes them from non-stem cells.
- 3935 unipotentstem cells: Stem cells that self-renew as well as give rise to a single mature cell type; e.g., spermatogenic stem cells.
- 3936 unrelated bone marrow or blood stem cell transplant: A marrow or blood stem cell transplant where the donor is not related to the patient.
- 3937 unsaturated fatty acid: A fatty acid possessing one or more double bonds between the carbons in the hydrocarbon tail. Such bonding reduces the number of hydrogen atoms attached to the carbon skeleton.
- 3938 unspecialised: Having no specific function.
- 3939 uPA: A protease or digestive enzyme that is made by the PC cell, stimulates PC cell and osteoblast growth, and is involved with invasion and metastasis.
- 3940 uPM3 urine test: A new molecular test for detecting prostate cancer cells based on PCA3, a specific gene that is profusely expressed in prostate cancer tissue. Patients who receive the uPM3(TM) undergo a thorough digital rectal prostate examination by a urologist which causes cells from the patient's prostate to be shed into the urine.
- 3941 upper motor neurons: Nerves within the spinal cord that are involved in controlling movement.
- 3942 up-regulation: The process of increasing the response to a stimulus.
- 3943 uptake: The absorption by a tissue of a substance, such as a nutrient, and its permanent or temporary retention.
- 3944 urea: A soluble form of nitrogenous waste excreted by mammals and most adult amphibians. The main nitrogen part of urine made from protein breakdown.
- 3945 uremia: The presence of excessive amounts of urea and other waste products in the blood, as occurs in kidney.
- 3946 ureter: An anatomical tube that drains urine from one of the two kidneys to the bladder.
- 3947 urethra: A tube that releases urine from the body near the vagina in females or through the penis in males; also serves in males as the exit tube for the reproductive system.
- 3948 urge incontinence: The need to urinate which is sudden and uncontrollable.
- 3949 uric acid: An insoluble precipitate of nitrogenous waste excreted by land snails, insects, birds, and some reptiles.
- 3950 urinary system: The group of organs and their interconnections that permits excess, filtered fluids to exit the body, including (in the male) the kidneys, the ureters, the bladder, the urethra and the penis.
- 3951 urinary tract infection: An infection identifiable by the presence of bacteria (or theoretically viruses) in the urine; may be associated with fever or a burning sensation on urination.
- 3952 urinate: To discharge urine, a fluid produced by the kidneys.
- 3953 urine: The liquid waste filtered from the blood by the kidney and stored in the bladder pending elimination through the urethra.
- 3954 urochordate: A chordate without a backbone, commonly called a tunicate, a sessile marine animal.
- 3955 urodynamic Studies: Diagnostic tests used to evaluate urinary-flow.
- 3956 urodynamics: The mechanical laws of fluid dynamics as they apply to urine transport
- 3957 urogynaecologists: A doctor who specialises in women's bladder and urine problems and other conditions of the urinary and reproductive systems.
- 3958 urologist: A doctor trained first as a surgeon who specializes in disorders of the genitourinary system.
- 3959 uropathy: A disorder involving the urinary tract.
- 3960 uterine: Pertaining to the uterus.
- 3961 uterus: Female reproductive organ where eggs are fertilized and/or development of the young occurs.
- 3962 vaccine: A preparation that contains either whole disease-causing organisms such as viruses which have been killed

- or weakened, or parts of such organisms, used to confer immunity against the disease that the organisms cause. Vaccine preparations can be natural, synthetic or derived by recombinant DNA technology.
- 3963 vacuole: Membrane-bound fluid-filled space within a cell. In most plant cells, there is a single large vacuole filling most of the cell's volume. Some bacterial cells contain gas vacuoles.
- 3964 vacuum erection device (VED): A device that creates an erection with vacuum; it is usually a hard, plastic device placed over the penis; a vacuum is then created by a pump, bringing blood into the penis.
- 3965 vagina: Part of the female reproductive system between the uterus and the outside opening; the birth canal in mammals; also accommodates the male's penis and receives sperm during copulation.
- 3966 vagus Nerve: Either of the 10th pair of cranial nerves that arise from the medulla and supply chiefly the viscera especially with autonomic sensory and motor fibers -- called also vagus.
- 3967 valence shell: The outermost energy shell of an atom, containing the valence electrons involved in the chemical reactions of that atom.
- 3968 value-added traits: Modified crops produced with traits such as improved taste, nutritional value, or utility to provide value for the consumer.
- 3969 valve: Fold in the lining of an organ that prevents fluid from flowing backward.
- 3970 Van der Waals interactions: Weak attractions between molecules or parts of molecules that are brought about by localized charge fluctuations.
- 3971 vaporization: The change from a liquid to a gas; evaporation.
- 3972 variation: Diversity among the members of a population. Variation among individuals can exist at many levels, including genetic, physiologic and behavioral.
- 3973 vas deferens (pl. vasa deferentia): The tube in the male reproductive system in which sperm travel from the epididymis to the urethra.
- 3974 vas deferens: Tube through which sperm travel from the testes to the prostate prior to ejaculation.
- 3975 vascular bundle: In plants, a group of longitudinal supporting and conducting tissues (xylem and phloem).
- 3976 vascular cambium: A continuous cylinder of meristematic cells surrounding the xylem and pith that produces secondary xylem and phloem.
- 3977 vascular endothelial growth factor (VEGF): A substance known to stimulate blood vessel growth or angiogenesis and hence stimulate tumor growth.
- 3978 vascular pedicle: A stalk through which the prostate receives and drains blood.
- 3979 vascular plants: Plants with vascular tissue, consisting of all modern species except the mosses and their relatives.
- 3980 vascular tissue system: A system formed by xylem and phloem throughout the plant, serving as a transport system for water and nutrients, respectively.
- 3981 vascular tissue: Plant tissue consisting of cells joined into tubes that transport water and nutrients throughout the plant body.
- 3982 vascular: Composed of, or having to do with, blood vessels.
- 3983 vascularity: Containing vessels that carry or circulate fluids, i.e. blood, lymph.
- 3984 vasculature: The arrangement or the distribution of blood vessels in an organ.
- 3985 vasculogenesis: Formation of primitive vascular networks from endothelial progenitors.
- 3986 vasectomy: Operation to make a man sterile by cutting the vas deferens, thus preventing passage of sperm from the testes to the prostate.
- 3987 vasoconstrictor: Relating to a process, condition or substance that causes a narrowing of an opening of a blood vessel.
- 3988 vasodilator: A drug which cause blood vessels to expand, thereby increasing blood flow; vasodilators are used in Viagra® and other drugs (e.g., trimix) to cause erections.
- 3989 vasomotor: Causing or regulating dilation or constriction of the blood vessels.
- 3990 vector: An organism that transmits pathogens from one host to another. Cell biologists use vectors as genetic delivery tools that transfer genetic material into a target cell. In 2006, the Yamanaka team modified viruses called retroviruses to serve as vectors that delivered the four transgenes, Oct-4, SOX2, c-Myc and Klf-4, into the fibroblast cells. The transgenes are then integrated into the host's genome, thereby permitting its long term gene expression. If all four transgenes successfully integrate into the fibroblast's genome, they will they begin to express the transgenes as functional proteins and induce pluripotency.
- 3991 vegetative reproduction: Cloning of plants by asexual means.
- 3992 VEGF (vascular endothelial growth factor): A substance known to stimulate blood vessel growth or angiogenesis and hence stimulate tumor growth.
- 3993 veil of aphrodite: A superficial membrane on the surface of the prostate critical for preservation of neurovascular bundle.
- 3994 vein: A vessel that returns blood to the heart.
- 3995 vena cava: A large vein that brings blood from the tissues to the right atrium of the four-chambered mammalian heart. The superior vena cava collects blood from the forelimbs, head, and anterior or upper trunk; the inferior vena cava collects blood from the posterior body region.
- 3996 venous: Venous refers to the system or veins by which blood is returned to the lungs for oxygenation.
- 3997 ventilation: Any method of increasing contact between the respiratory medium and the respiratory surface.
- 3998 ventilator: A mechanical device that promotes breathing in individuals with impaired diaphragm function.
- 3999 ventral Root: A collection of efferent, motor nerves that exit the spinal cord.
- 4000 ventral: Pertaining to the undersurface of an animal that holds its body in a horizontal position; to the front surface of an animal that holds its body erect.
- 4001 ventricle: A muscular chamber of the heart that receives blood from an atrium and pumps blood out of the heart, either to the lungs or to the body tissues.
- 4002 ventricular assist device: A small pump that takes over some of the heart's job of pumping blood.
- 4003 venule: A very small vein.
- 4004 vertebra: The individual bones that make up the vertebral column or spine.
- 4005 vertebral column: The backbone; in nearly all vertebrates, it forms the supporting axis of the body and protects the spinal cord.
- 4006 vertebrate: A chordate animal with a backbone: the mammals, birds, reptiles, amphibians, and various classes of fishes.
- 4007 vertigo: Dizziness or a sensation of whirling or irregular motion that arises from problems within the vestibular portion of the inner ear. Objective vertigo is the name given the sensation that the world is spinning about the patient. Subjective vertigo indicates the patient feels he is moving in space.
- 4008 very small embryonic like: Adult bone marrow derived pluripotent stem cells (VSELs), which can differentiate in vitro into several lineages, including cardiac and vascular lineages.
- 4009 vesicle: A small, intracellular membrane-bound sac.

- 4010 vessel element: A specialized short, wide cell in angiosperms; arranged end to end, they form continuous tubes for water transport.
- 4011 vessel: a tube in which a body fluid circulates
- 4012 vestigial organ: A type of homologous structure that is rudimentary and of marginal or no use to the organism.
- 4013 viable: Alive. The ability to reproduce. A viable stem cell sample is one that has the ability to be used in transplant.
- 4014 villi: Projections from the surface, especially of a mucous membrane. If the projection is minute, as in a cell surface, it is called a microvillus.
- 4015 villus (pl. villi): One of the minute finger-shaped processes of the mucous membrane of the small intestine that serve in the absorption of nutriment.
- 4016 vimentin: The major polypeptide that joins with other subunits to form the intermediate filament cytoskeleton of mesenchymal cells. Vimentin may also have a role in maintaining the internal organization of certain cells.
- 4017 vinblastine (trade name Velban®): Periwinkle plant derivative used as an antineoplastic drug that disrupts cell division.
- 4018 viral infectivity factor (VIF): A lentiviral packaging element that blocks a cellular inhibitor of viral replication.
- 4019 viral protein R (VPR): A lentiviral packaging element that participates in the viral RNA into the nucleus for chromosomal integration.
- 4020 viral protein U (VPU): A lentiviral packaging element that is localized at the cell membrane, facilitating the viral release.
- 4021 virchow node: A firm supraclavicular lymph node, especially on the left side, sufficiently enlarged that it is palpable from the cutaneous surface; such a lymph node is so termed because it may be the first recognised presumptive evidence of a malignant neoplasm in one of the viscera. A signal node that is known to contain a metastasis from a malignant neoplasm is sometimes designated by an old eponym, Troisier ganglion.
- 4022 viroid: A plant pathogen composed of molecules of naked RNA only several hundred nucleotides long.
- 4023 virulent: Capable of overcoming a host's defense mechanisms and causing a disease sometimes of rapid onset and severe symptoms.
- 4024 virus: A group of particles that do not have a cellular structure and cannot replicate outside of a host cell. They consist of a molecule of DNA or RNA surrounded by a protein coat. Viruses can only reproduce in living cells.
- 4025 viscera: The collective term for the internal organs of an animal.
- 4026 visceral muscle: Smooth muscle found in the walls of the digestive tract, bladder, arteries, and other internal organs.
- 4027 viscosity: The resistance offered by a fluid (liquid or gas) to flow. The viscosity is a characteristic property and is a measure of the combined effects of adhesion and cohesion. Hyperviscosity syndrome: Blood too thick to flow properly.
- 4028 visible light: That portion of the electromagnetic spectrum detected as various colors by the human eye, ranging in wavelength from about 400 nm to about 700 nm.
- 4029 vitalism: The belief that natural phenomena are governed by a life force outside the realm of physical and chemical laws.
- 4030 vitamin E: A lipid soluble antioxidant that protects cell membranes from the free radicals generated through lipid-peroxidation, a process that spreads damage after the initial spinal cord injury. Also called alpha-tocopherol.
- 4031 vitamin: Any of various organic substances that are essential in minute quantities to the nutrition of most animals and some plants, act especially as coenzymes and precursors of coenzymes in the regulation of metabolic processes but do not provide energy or serve as building units, and are present in natural foodstuffs or sometimes produced within the body.
- 4032 viviparous: Referring to a type of development in which the young are born alive after having been nourished in the uterus by blood from the placenta.
- 4033 voltage-gated channel: Ion channel in a membrane that opens and closes in response to changes in membrane potential (voltage); the sodium and potassium channels of neurons are examples.
- 4034 volunteer donor: A person who has agreed to donate marrow or stem cells for transplant. Volunteer donors are listed in the NMDP Registry.
- 4035 Von Recklinghausen disease: Neurofibromatosis is an inherited disorder of the nervous system.
- 4036 voxels: three-dimensional pixels (volumes) which display spectral data that consist of a series of peaks at distinct frequencies for different chemicals (metabolites) within tissue.
- 4037 Waldenstrom's Macroglobulinemia: Waldenstrom's macroglobulinemia is a cancer of white blood cells known as B lymphocytes.
- 4038 Waldeyer ring: The lymphoid ring of the nasopharynx. A ring of lymphoid tissue that encircles the nasopharynx and oropharynx. It is formed by the lymphatic tissue of the pharynx, the palatine tonsil, and the lingual tonsil, as well as other collections of lymph tissue in the area.
- 4039 walking index for spinal cord injury: A measurement which assesses the amount of assistance required for ambulation.
- 4040 watchful waiting (WW): Active observation and regular monitoring of a patient without actual treatment; also called active objectified surveillance.
- 4041 water cycle: Worldwide circulation of water molecules, powered by the sun. Water evaporates from oceans, lakes, rivers, and, in smaller amounts, soil surfaces and bodies of organisms; water returns to the Earth in the form of rain and snow. Of the water falling on land, some flows into rivers that pour water back into the oceans and some percolates down through the soil until it reaches a zone where all pores and cracks in the rock are filled with water (groundwater); the deep groundwater eventually reaches the oceans, completing the cycle.
- 4042 water potential: The physical property predicting the direction in which water will flow, governed by solute concentration and applied pressure.
- 4043 water vascular system: A network of hydraulic canals unique to echinoderms that branches into extensions called tube feet, which function in locomotion, feeding, and gas exchange.
- 4044 wavelength: The distance between crests of waves, such as those of the electromagnetic spectrum.
- 4045 WBC/HPF: White blood cells counted per high powered field during a microscopic evaluation.
- 4046 wheezing: A whistling noise in the chest which occurs during breathing when the airways are compressed.
- 4047 white blood cell (WBC): Also known as a leukocyte. These cells normally protect against infection by, for example, ingesting bacteria or secreting antibodies. White blood cells are formed from the undifferentiated stem cell that can give rise to all blood cells. Those in the spleen and lymph nodes may become lymphocytes, or monocytes, and those in the thymus can become lymphocytes (T-lymphocytes). WBCs are formed from the undifferentiated stem cell that can give rise to all blood cells. Also known as a leukocyte.
- 4048 white matter: The portion of the spinal cord that contains myelinated axons.
- 4049 WHO: The World Health Organization (WHO) is an agency of the United Nations to coordinate international health activities and to help governments improve health services.
- 4050 wild type: An individual with the normal phenotype.

- 4051 wilms tumor: Wilms' tumor is a solid tumor that originates in the kidney. It usually occurs in children under age 15 and is very different from adult kidney cancer.
- 4052 wiskott-aldrich syndrome: An inherited disease of the immune system that only occurs in boys. The white blood cells cannot fight infection. The number of platelets are low and of small size. Because of the low number of platelets, patients have many infections, bleed easily and often have a skin rash. A bone marrow transplant is the best known treatment for this disease.
- 4053 wobble: A violation of the base-pairing rules in that third nucleotide (5' end) of a tRNA anticodon can form hydrogen bonds with more than one kind of base in the third position (3' end) of a codon.
- 4054 worker: A member of the nonreproductive laboring caste of social insects.
- 4055 workup: The process that a closely matched potential donor undergoes to determine whether he or she is healthy and prepared to donate marrow or blood cells. Workup includes a detailed information session with a donor center coordinator and/or medical director, a thorough physical examination, a donation of blood samples for testing and research and usually a donation of autologous blood. er” T-cells that seek and destroy developing cancer.
- 4056 wortmannin: A lipid-modifying enzyme that inhibits PI3 kinase.
- 4057 X inactivation: The normal inactivation of one of the two X chromosomes in females.
- 4058 Xenogenic transplantation: Donor cells obtained from different species.
- 4059 xenograft or xenotransplant: A graft or transplant of cells, tissues, or organs taken from a donor of one species and grafted into a recipient of another species.
- 4060 xenograft: A graft of tissue taken from a donor of one species and grafted into a recipient of another species
- 4061 xenotransplantation: The term used to describe any procedure that involves the transplantation of live cells, tissues, or organs from one species to another, including animal-to-human transplantation.
- 4062 xenotransplantation: A transplant of tissue from an animal of one species to an animal of another species.
- 4063 xeroderma pigmentosum: Xeroderma Pigmentosum is a rare genetic condition characterized by an eruption of exposed skin occurring in childhood and photosensitivity with severe sunburn; inherited as a recessive autosomal trait in which DNA repair processes are defective so they are more likely to chromosome breaks and cancers when exposed to ultraviolet light.
- 4064 XIST: X-inactive specific transcript. Uncertain function.
- 4065 X-linked recessive disorder: A genetic disease caused by a gene mutation on an X chromosome (one of the chromosome that determines a person's gender), caused when a male inherits the mutated gene from his father or (more rarely) when a woman inherits it from both parents.
- 4066 X-ray: A type of high energy radiation that can be used at low levels to make images of the internal structures of the body and at high levels for radiation therapy.
- 4067 xylem: The tube-shaped, nonliving portion of the vascular system in plants that carries water and minerals from the roots to the rest of the plant.
- 4068 Y chromosome: The chromosome which determines male gender.
- 4069 yeast: A unicellular fungus that lives in liquid or moist habitats, primarily reproducing asexually by simple cell division or by budding of a parent cell.
- 4070 yoga: A system of exercises for attaining bodily or mental control and well-being. Derived from a Sanskrit word which means yoke or union.
- 4071 yolk sac: Vital to the embryo for the formation of primordial and other cells that form the embryo. In mammals, it is small and devoid of a yolk.
- 4072 yolk: The stored food in egg cells that nourishes the embryo.
- 4073 Zoladex®: Trade or brand name for goserelin acetate, an LHRH agonist.
- 4074 zona pellucida: Glycoprotein membrane which surrounds the plasma membrane of an oocyte.
- 4075 zone: Part or area of an organ.
- 4076 zoned reserve systems: Habitat areas that are protected from human alteration and surrounded by lands that are used and more extensively altered by human activity.
- 4077 zoology: The study of animals.
- 4078 zooplankton: A collective term for the nonphotosynthetic organisms present in plankton.
- 4079 zygote: The fertilized egg, the result of sperm/egg interactions leading to the fusion of sperm and egg nuclei. The zygote usually begins cell division to give rise to the stages of the pre-implantation embryo, from the 2 cell stage to the blastocyst; but only the fertilized egg is the zygote.
- 4080 α -galactosidase: An enzyme that breaks down a particular type of fatty substances, Fabry disease is characterized by its absence.

References

1. Baidu. <http://www.baidu.com>. 2016.
2. Google. <http://www.google.com>. 2016.
3. Ma H, Chen G. Stem cell. The Journal of American Science 2005;1(2):90-92. doi:[10.7537/marsjas010205.14](https://doi.org/10.7537/marsjas010205.14). <http://www.jofamericanscience.org/journals/am-sci/0102/14-mahongbao.pdf>.
4. Ma H, Cherng S. *Eternal Life and Stem Cell*. Nature and Science. 2007;5(1):81-96. doi:[10.7537/marsnsj050107.10](https://doi.org/10.7537/marsnsj050107.10). <http://www.sciencepub.net/nature/0501/10-0247-mahongbao-eternal-ns.pdf>.
5. Ma H, Cherng S. Nature of Life. Life Science Journal 2005;2(1):7-15. doi:[10.7537/marslsj020105.03](https://doi.org/10.7537/marslsj020105.03). <http://www.lifesciencesite.com/ljs/life0201/life-0201-03.pdf>.
6. National Center for Biotechnology Information, U.S. National Library of Medicine. <http://www.ncbi.nlm.nih.gov/pubmed>. 2016.
7. Wikipedia. The free encyclopedia. <http://en.wikipedia.org>. 2016.