Aberrant: A growth that deviates from the normal or usual type; as exceptional growths (aberrations) which occur in some tissue cultures.

Adaptation: Induction or repression of synthesis of a macromolecule (usually a protein) in response to a stimulus; e.g., enzyme adaptation: an alteration in enzyme activity brought about by an inducer or repressor and involving an altered rate of enzyme synthesis or degradation.

Adherent cells: The cells which grow adhering to cell culture vessel and are adherent dependent are called adherent cells.

Adult stem cell: An undifferentiated cell found in a differentiated tissue that can renew itself and (with certain limitations) differentiate to yield all the specialized cell types of the tissue from which it originated.

Aerate: To supply with or mix with air or gas. The process is aeration.

Age: 1. The period in the life cycle of an organism; the process of growing older, mature. 2. The state of being old or senescent. 3. Culture age is a function of the number of subcultures and the time after subculture.

Agenesis: The absence of development.

Aliquot or aliquot part: An evenly divided unit, portion or sample (fraction) of the whole.

Alkylating agents: Chemicals that transfer alkyl (methyl, ethyl, etc.) groups to the bases in DNA.

Ambient temperature: Air temperature at a given time and place; not radiant temperature.

Amniocentesis: A procedure for obtaining amniotic fluid from a pregnant mammal for the diagnosis of some diseases in the unborn foetus. Cells are cultured, and metaphase chromosomes are examined for irregularities (e.g., Down syndrome, spina bifida, etc., in humans). Prenatal sampling of the amniotic cavity.

AMP: Adenosine monophosphate.

Anchorage dependant: Requiring attachment to a solid substrates.

Armyworm: Caterpillars (pupae) of the Lepidopteran insect *Pseudaletia unipuncta* family; most of which are harmful to crops (e.g., wheat, corn/maize, etc.) grown by humans. Armyworms are susceptible to some of the “cry” proteins (e.g., they are killed if they eat plants genetically engineered to contain Cry1A (b), Cry9C, or Cry1F proteins.

Aromatic: A molecular compound that consists of carbon and other atoms and forms a ring structure.

Ascites: Liquid accumulations in the peritoneal cavity. Used as an input in one of the
methods for producing monoclonal antibodies.

**Asepsis:** Without infection or contaminating microorganisms.

**Aseptic:** Free of pathogens, contaminants, algae, bacteria, fungi, viruses, etc.; absence of all microorganisms.

**Aseptic technique:** Procedure used to prevent the introduction of fungi, bacteria, viruses, mycoplasma or other microorganism into cell, tissue and organ cultures.

**Asian Corn Borer:** Also known by its Latin name, *Ostrinia furnacalis* is an insect (originally from Asia) whose larvae (caterpillars) eat and bore into the corn/maize (*Zea mays L.*) plant. In doing so, they can act as vectors (carriers) of the fungi known as *Aspergillus flavus* (a source of aflatoxin).

**Aspirate:** To draw something in or out, up or through using suction or a vacuum; as aspiration (vacuum) may be used in the disinfection process to draw disinfectant into the surface layers of tissue.

**Assay:** 1. To test or evaluate. 2. The substance to be analyzed or the process of examining or testing it.

**Attachment efficiency:** The percentage of cell plated (seed inoculated) which attach to the surface of the culture vessel within a specified period of time. The conditions, under which such a determination is made, should always be stated.

**Axenic:** A pure culture of one species. This implies that cultures are free of microorganisms (aseptic or germ free).

**Axenic culture:** A culture without foreign or undesired life forms. An axenic culture may be including the purposeful co-cultivation of different types of cells, tissues or organisms.

**Biolistics (from biological + ballistics):** A technique to insert DNA into cells. The DNA is mixed with small metal particles usually tungsten or gold a fraction of a micrometre across. These are then fired into a cell at very high speed. They puncture the cell and carry the DNA into the cell. Biolistics has an advantage over transfection, transduction, etc., because it can apply to any cell, or indeed to parts of a cell. Thus use of biolistics has inserted DNA into animal, plant and fungal cells, and into mitochondria inside cells.

**Biosilk:** A biomimetic, man-made fiber produced by 1. Sequencing the “dragline silk” protein that is produced by the orb-weaving spider. 2. Synthesizing genes to code for the “dragline silk” protein (components). 3. Expressing those genes in a suitable host (i.e., yeast, bacteria) to cause production of the protein(s). 4. Dissolving the protein in a solvent, and then “spinning” the protein into fiber form by passing the liquid (dissolved protein) through a small orifice, followed by drying to remove the solvent.

**Biotechnology:** The industrial application of biological processes, particularly recombinant DNA technology and genetic engineering.

**Blastocyst (also blastocist):** A mammalian embryo (fertilized ovum) in the early stages of development, approximately up to the time of implantation. It consists of a hollow ball of cells.

**Blastomere:** Any one of the cells formed from the first few cleavages in animal embryology. The embryo usually divides into two, then four, then eight blastomeres, and so on.

**BSE:** Bovine spongiform encephalopathy. A neurodegenerative disease of cattle.

**Burgeon:** To flourish, bud, sprout or grow.

**Callipyge (means beautiful buttocks in Greek):** An inherited trait in livestock (e.g., sheep) that results in thicker, meatier hind quarters. First identified as a genetic trait in 1983, this desirable trait results in a higher meat yield per animal.

**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.

**Cell count:** The number of cells per unit suspension volume or callus weight. Tissue
is treated with chromic acid (5-8%) or pectinase (0.25%) for up to 15 minutes followed by mechanical dispersion, and then cell numbers are estimated with a hemocytometer (haemocytometers).

**Cell culture:** Growth of cells in vitro on an artificial medium for experimental research.

**Cell fusion:** Formation of a single cell body by the fusion of two other cells, either spontaneously or, more often, by induced fusion with inactivated sendai virus or polyethylene glycol.

**Cell hybridization:** Formation of synkarons, viable cell hybrids produced through cell fusion. They are identifiable by their increased chromosome number compared to the parent cells and the possession of characters found in one or another of the parental cells.

**Cell line:** Developmental history or descent, through cell division from a single original cell; as callus may constitute a group of cell, all descendants from a single cell plating. Numerous cell lines may be present in a culture. Any deviation in culture technique may favour one cell line over another.

**Cell number:** The absolute number or approximation of the number of cells per unit area of a culture or medium volume.

**Cell strain:** A characterized cell line derived by selection or cloning.

**CentiMorgan (cM):** One percent recombination between two loci.

**Cerebrospinal fluid:** A blood serum-like fluid that bathes parts of the brain and the interior cavity of the spinal cord.

**Chorionic villi sampling:** Sampling of the fluid from the chorionic villi in the placenta.

**Chromic acid or chromium trioxide (CrO3 mw 100.01):** This compound exists only in solution and is made by mixing potassium dichromate and concentrated sulphuric acid. A dilute solution may be used to prepare tissues for hemocytometer counts to determine cell numbers in cell suspension cultures. Concentrated solutions were once used for cleaning new or dirty glassware but have now been supplemented by detergents.

**Cloaca:** Terminal region of the gut of most vertebrates into which kidney and reproductive ducts open. There is only one posterior opening to the body, the cloaca aperture, instead of separate anus and urogenital openings (e.g. placental mammals). Also terminal part of intestine of some invertebrates, e.g., sea cucumbers.

**Clone:** A group of cells or organisms that are genetically identical as a result of asexual reproduction, breeding of completely inbred organisms, or forming genetically identical organisms by nuclear transplantation. A line of cells that is genetically identical to the originating cell; in this case, a stem cell. Cloning by nucleus transfer involves the transfer of a donor cell from (cultured).

**Closed continuous culture:** A cell suspension culture with a continuous influx of fresh medium, maintained at constant volume by the efflux of spent medium. All cells are retained within the unit.

**Coefficient:** A number expressing the amount of some change or effect under certain conditions (e.g., the coefficient of inbreeding).

**Colony:** 1. A group of interdependent cells or organisms. 2. An aggregate of cells developed from a single cell; as in single cell platings, a clone composed of one cell line.

**Commitment:** Irreversible progression from a stem cell to a particular defined lineage ending the cell with potential to express a limited repertoire of properties.

**Confluent:** A monolayer of cells in which all cells are in contact with other cells all around their periphery, and no available substrates is left uncovered.

**Constitutive:** Expressed by a cell in the absence of external regulation.

**Contact inhibition:** Inhibition of plasma membrane ruffling and cell motility when
cells are in complete contact with adjacent cells, as in a confluent culture; often precedes, but is not necessarily causally related to, cessation of cell proliferation.

**Continuous cell line or cell strain:** Cell line or strain having the capacity for infinite survival. Previously known as “established” and often referred to as “immortal”.

**Continuous culture:** A cell suspension culture with a continuous influx of fresh medium maintained at constant volume by the efflux of spent medium (closed continuous) or with the efflux of cells and spent medium (open continuous).

**Cryoprotectant:** An agent able to prevent freezing and thawing damage to cells as they are frozen or defrosted. These substances have high water solubility and low toxicity. They are classified either as permeating (glycerol and dimethyl sulfoxide) or non-permeating (sugars, dextran, ethylene glycol, polyvinyl pyrolidone and hydroxyethyl starch) agents.

**Culture alteration:** A persistent change in a cultured cell or tissue anatomy or physiology, including a change in one or more nutritional requirements or a change in its proliferative capacity.

**Differentiation (L. differre, to carry different ways):** A process in which unspecialized cells develop structures and functions characteristic of a particular type of cell. Development from one cell to many cells, accompanied by a modification of the new cells for the performance of particular functions. In tissue culture, the term is used to describe the formation of different cell types.

**Dimethyl sulfoxide; dimethyl sulfoxide (C$_2$H$_6$OS; m.w. 78.13):** A highly hygroscopic liquid and powerful solvent with little odour or colour. It is an organic co-solvent used in small quantities to dissolve neutral organic substances in tissue culture media preparation. DMSO also has uses as a cryoprotectant.

**Dolly:** The first mammal (sheep) cloned by Wilmut and Campbell in 1997.

**Dome:** A hemicystic or blister-like structure in a confluent epithelial monolayer implying ion transport across the monolayer and resulting in the accumulation of water below the monolayers.

**Dry ice:** Frozen (solid) carbon dioxide (CO$_2$). It is commonly used as a refrigerant.

**Ectoderm:** The outer germ layer of the embryo, giving rise to the epithelium of the skin.

**Elite germplasm:** Refers to germplasm that is adapted (selectively bred) and optimized to new surroundings (i.e., environment).

**Embryo:** (a) 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. (b) The developing organism from the time of fertilization until significant differentiation has occurred, when the organism becomes known as a fetus. An organism in the early stages of development.

**Embryo culture:** 1. Denotes a culture in which the explant was an embryo. Embryo cultures have been used to obtain viable offspring from seeds with a tendency for embryo abortion or when viable seed are limited in number. 2. Cultures in which embryos are induced to form (embryogenesis) whether in suspension or on a variety of explants or cultures on solidified media. More correctly, these nonzygotic or somatic embryos are termed embryoids.

**Embryo transfer:** The process of implantation of embryos from a donor animal or developed by *in vitro* fertilization into the uterus of a recipient animal.

**Embryonic germ cells:** Cells found in a specific part of the embryo/fetus called the gonadal ridge that normally develops into mature gametes.

**Embryonic induction:** The interaction (often reciprocal) of cells from two different germ layers promoting differentiation.

**Embryonic stem cell line:** Embryonic stem cells, which have been cultured under
in vitro conditions that allow proliferation without differentiation for months to years.

**Embryonic stem cells:** Primitive (undifferentiated) cells from the embryo that have the potential to become wide variety of specialized cell types.

**Endoderm:** The innermost germ layer of the embryo, giving rise to the epithelial component of organs such as the gut, liver and lungs.

**Endoskeleton:** Skeleton lying within the body. Vertebrate cartilage and bone provide support, protection and a system of levers enabling manipulation of the external environment; arthropods have internal projections of their cuticle (apodemes) for muscle attachment; echinoderms and annelids, among other invertebrates, use a hydrostatic skeleton to greater or lesser extent, and these too are endoskeletons.

**Endothelium:** An epithelial-like cell layer lining spaces within mesodermally derived tissues, such as blood vessels, and derived from the mesoderm of the embryo.

**Enhancer element:** These are short regions of DNA which have the effect of increasing the levels of transcription, but unlike promoters, they affect genes from chromosomal loci at a long distance.

**Environmental chamber:** A controlled environment cabinet (incubator) in which temperature, light quality, intensity and duration; and preferably also the relative humidity and air flow are controlled.

**Epithelial:** Cells derived from epithelium but often used more loosely to describe any cells of a polygonal shape with clear, sharp boundaries between them. More correctly, the latter should be referred to as epithelial-like or epithaloid.

**Epithelium:** A covering or lining of cells, as in the gut, usually derived from the embryonic endoderm or ectoderm, but sometimes derived from mesoderm, as with kidney tubules and mesothelium lining body cavities.

**Epizootic:** The term used for an epidemic that occurs within an animal population.

**European Corn Borer (ECB):** Also known as pyralis. Latin name *Ostrinia nubilalis*, it is an insect whose larvae (caterpillars) eat and bore into the corn/maize plant (*Zea mays L.*).

**Fate (of cell progeny):** The normal outcome of differentiation of a cell’s progeny.

**Feeder layer:** Cells used in co-culture to maintain pluripotent stem cells. Cells usually consist of mouse embryonic fibroblasts.

**Fertilization:** The process whereby male and female gametes unite.

**Fibroblast:** A proliferating precursor cell of the mature differentiated fibrocyte.

**Fibroblastic:** Resembling fibroblast (i.e., spindle shaped (bipolar) or stellate (multipolar); usually arranged in parallel arrays at confluence if contact is inhibited. Often, the term is used indiscriminately for undifferentiated mesodermal cells, regardless of their relationship to the fibrocyte lineage; implies a migratory type or cell with processes exceeding the nuclear diameter by threshold or more. More correctly, fibroblast like or fibroblastoid.

**Ficoll-paque:** Density medium made up of ficoll combined with a radio-opaque iodinated substance, such as sodium metrizoate.

**Filter sterilize:** To sterilize by passing a solution through a porous material capable of separating out suspended microbes or their spores; as heat-labile components of nutrient media are sterilized.

**Finite cell line:** A culture that has been propagated by subculture, but is capable of only a limited number of cell generations in vitro before dying out.

**Fixative:** A compound that stabilizes sets or fixes other compounds or structures securely so that their structural integrity is retained; as the process of fixation utilizes chemical agent to permanently prepare cells or tissues for microscopy.
**Floccule:** An aggregation (coalescence) of microorganisms or colloidal particles floating in or on a liquid. Flocculation is seen in some contaminated liquid media appearing as a cloud.

**Flow cytometer:** An instrument providing quantitative and qualitative analysis of individual cells in a population by scanning a single cell stream with a laser, or with multiple lasers of different wavelengths, and recording the light that is scattered or the fluorescence that is emitted.

**Fluorescent-activated cell sorter (FACS):** A cell separation device based on electromagnetic sorting of a single-cell suspension by means of the scattering of light or the fluorescent properties of individual cells revealed by a laser scanning a single cell stream.

**Freeze-dry or lyophilize:** To dry in a frozen state under vacuum; as tissues are freeze-dried to obtain a dry weight or to preserve them for analysis.

**Gel:** A lyophilic colloid that has coagulated to a rigid or jelly-like solid. It is used for the electrophoretic separation of nucleic acids or proteins, and for encapsulation.

**Generative:** Refers to a somatic cell or tissue.

**Germ cell:** Any cell in the series of cells (the germ line) that eventually produces gametes. In mammals, germ cells are found in the germinal epithelium of the ovaries and testes.

**Germ layers:** The three initial tissue layers arising in the embryo-endoderm, mesoderm, and ectoderm — from which all other somatic tissue-types develop.

**Gonad:** An organ that produces sex cells (testes or ovaries).

**Gonadal ridges:** Embryonic structures arising in humans at about five weeks, eventually developing into gonads (either testes or ovaries).

**Green fluorescent protein:** 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.

**Growth factor:** Any of various chemicals, particularly polypeptides that have a variety of important roles in the stimulation of new cell growth and cell maintenance. They bind to the cell surface on receptors. Specific growth factors can cause new cell proliferation.

**Growth medium:** The medium used to propagate a particular cell line; usually a basal medium with additives such as serum or growth factors.

**Hela cell:** Cell from human cell line widely used in study of cancer. Original source was Helen Lane, a carcinoma patient, in 1952. A pure cell line of human cancer cells used for the cultivation of viruses.

**Heliothis virescens (H. virescens):** Known as the tobacco budworm (when it is on tobacco plants), this is one of three insect species that is called “bollworms”.

**Hematopoietic stem cell:** A stem cell from which all red and white blood cells develop.

**Heredity:** Resemblance among individuals related by descent; transmission of traits from parents to offspring.

**Holding medium:** Medium, usually without serum and growth factors, or with minimal serum, designed to maintain cells in a viable state without proliferation (e.g., for collecting biopsies or maintaining cells at a plateau with no further cell proliferation).

**Homograft (Allograft):** A graft derived from a genetically different donor of the same species as the recipient.

**Homokaryon:** Cell containing two or more genetically identical nuclei; usually a product of cell fusion.

**Hybrid (L. hybrida):** 1. The offspring of two parents that are genetically different. A cross between two genetically unlike individuals.
Hybrid cell: Mononucleate cell that result from the fusion of two different cells, leading to the formation of a synkaryon.

Hybridization: 1. Interbreeding of species, races, varieties and so on, among plants or animals; a process of forming a hybrid by cross pollination of plants or by mating animals of different types. 2. The production of offspring of genetically different parents, normally from sexual reproduction, but also asexually by the fusion of protoplasts or by transformation. 3. The pairing of two polynucleotide strands, often from different sources, by hydrogen bonding between complementary nucleotides.

Hybridoma: A clone of hybrid cells produced by fusion of a myeloma cell with an antibody producing cell. Each hybridoma produces only one type of monoclonal antibody.

Hydrophobic interactions: Association of non-polar groups with each other when present in aqueous solutions because of their insolubility in water.

Hypochlorite: A salt of hypochlorous acid (sodium hypochlorite, potassium hypochlorite or calcium hypochlorite). All are oxidizing agents used for disinfecting and for bleaching.

Ideogram: The arrangements of the chromosome of a cell in order by size and morphology so that the karyotype may be studied and genetically analyzed.

Immortalization: The acquisition of an infinite life span. May be induced in finite cell lines by transfection with telomerase, oncogenes, or the large T-region of the SV40 genome, or by infection with SV40 (whole virus) or Epstein-Barr virus (EBV). Immortalization is not necessarily a malignant transformation.

In both cases, the DNA fragments are separated according to length by polyacrylamide gel electrophoresis, enabling the sequence to be read directly from the gel.

**In vitro fertilization (IVF):** The union of an egg and sperm, where the event takes place outside the body and in an artificial environment (the literal meaning of “in vitro” is “in glass”; for example, in a test tube).

**In vivo:** Experimentation on organisms under natural condition within intact living organism.

Inbred line: The product of inbreeding, i.e., the mating of individuals that have ancestors in common; in plants and laboratory animals, it refers to populations resulting from at least 6 generations of selfing or 20 generations of brother-sister mating, that are for all practical purposes, completely homozygous. In farm animals, the term is sometimes used to describe populations that have resulted from several generations of the mating of close relatives, without having reached complete homozygosity.

Inbreeding: Matings between individuals that have one or more ancestors in common, the extreme condition being self-fertilization, which occurs in many plants and some primitive animals.

Induction: An increase in effect produced by a given stimulus.

Induction media: 1. Media that can induce or other structures to form. 2. Media that will cause variation or mutation in the tissues exposed to it.

Infection: Transfer of genomic DNA with a retroviral construct containing the DNA sequence under investigation, usually packaged with a promoter sequence and a reporter gene, such as β-galactosidase; the product of an infection may be detected by staining with a chromogenic substrate.

Inner cell mass: The cluster of cells inside the blastocyst. These cells give rise to the embryonic disk of the later embryo and, ultimately, the fetus.

Insectivora: A order of placental mammals (e.g. moles, shrews, hedgehogs); a primitive insect-eating or omnivorous group
resembling and probably phylogenetically close to Cretaceous ancestors of all placents. Have small, relatively un-specialized teeth (but incisors tweezer-like). Tree shrews and elephant shrews tend now-a-days to be placed in separate orders, Macroscelidia and Scandentia respectively.

**IUCN:** International Union for the Conservation of Nature and Natural Resources with headquarters at Gland, Switzerland. It was founded in 1948 and has published Red Data Book on rare and threatened plant and animal species.

**Jasmonic acid:** Jasmonic Acid is a signaling molecule in Systemic Acquired Resistance (SAR) when SAR is triggered in plants (via spray application of harpin protein to various plants, via chewing of insects on the leaves of certain plants, and/or via the entry-into plant of certain pathogenic bacteria/fungi, etc.).

**Knock out mouse:** A genetically altered mouse lacking the genes for an entire organ or organ system.

**Liposome:** A microscopic artificial membrane vesicle consisting of a spherical phospholipid bilayer. Liposomes can be incorporated into living cells and used to transport relatively toxic drugs into diseased cells, where they can exert their maximum effect. DNA molecules may be entrapped in, or bound to the surface of, the vesicles, and subsequent fusion of the liposome with the cell membrane will deliver the DNA into the cell. Liposomes have been used to develop an efficient transfection procedure for *Streptomyces* bacteria.

**Liquid nitrogen:** Nitrogen gas condensed to a liquid with a boiling point of about –196°C. Very commonly the medium in which containers of genetic material are stored.

**Long terminal repeat (LTR):** A string of bases that occurs at each end of the “genome” of a retrovirus that has become integrated into the host genome. Involved in the integration process.

**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.

**Magnetic stirrer:** An apparatus used for stirring solutions. A magnetic stir bar is placed at the bottom of the container and is twirled in the solution that requires mixing by an electrically driven, rotating magnet below the platform of the apparatus.

**Membrane filter:** A screenlike material with pores small enough to retain microorganisms.

**Mesenchymal stem cells:** Cells from the immature embryonic connective tissue. A number of cell types come from mesenchymal stem cells, including chondrocytes, which produce cartilage.

**Model organism:** Refers to an organism that is utilized (e.g., in scientific experiments) to conduct tests, etc. in an attempt to infer results applicable to larger, more complex organisms. For example, the use of the microscopic roundworm *C. elegans* in high through put screening to attempt to find pharmaceuticals that will be useful for humans.

**Molecular pharming:** Use of Transgenic animals to obtain products of medicinal commercial purposes through recombinant DNA technology.

**Monarch butterfly:** Refers to the insect (Lepidoptera: *Danaidae* or *Danaus plexippus*) whose pupae (caterpillars) feed exclusively on tissue of the plant known as common milkweed (*Asclepias syriaca*), and whose territory extends from northern Mexico to approximately Canada’s southern border.

**Multipotent:** As applied to stem cells, the ability to differentiate into at least two more differentiated descendant cells.

**Nutrient:** A substance that promotes growth and healthy biological function.
Organ culture: The maintenance or growth of organ promordia or the whole or parts of an organ in vitro in a way that may allow differentiation and preservation of the architecture or function of the organ.

Ovum: Unfertilized, non-motile, egg cell. In many animals it is an oocyte product of an ovary.

Packaging cell line: A cell line that is designed to produce viral particles that do not contain nucleic acid. After transfection of these cells with a full-size viral genome, fully infective viral particles are assembled and released.

Parasexual hybridization: Refers to genetic recombination by means other than through fertilization of germ cells (parasexual) leading to hybrid cells or individuals; as in hybrid cells or plants derived from somatic cell fusion.

Passage number: The interval between subcultures or the culture period.

Passage: The transfer or subculture of cells from one culture vessel to another; usually, but not necessarily, involves the subdivision of a proliferating of a cell line or cell strain.

Pavement-like: Cells in a regular monolayer or polygonal cells. More correctly, epithelioid or epithelial like.

PCV: Packed cell volume.

PEG: Polyethylene glycol.

Periclinal chimera: Refers to a condition in which geno-typically or cytoplasmically different tissues are arranged in concentric layers.

Periodontium: Tissue that anchors teeth in the jaw. Regrowth of periodontal tissue can be stimulated by a combination of platelet derived growth factor and insulin-like growth factor-1.

Plasmotype: A cell type displaying features which are expressions of cytoplasmic, rather than nuclear inheritance.

Polyethylene glycol (PEG) or carbowax: A fusion-inducing agent (fusogen) for agglutinating protoplasts which is used in somatic hybridization studies. This compound is also sometimes used in media as a non-metabolite osmoticum and is available in various molecular weights, ranging from ca. 200 to 6,000.

Polypropylene: A strong, flexible, transparent thermoplastic formed by the polymerization of propylene. It is used in many labware products.

Population doubling time: The interval required for a cell population to double at the middle of the logarithmic phase of growth.

Prefilter: A coarse filter (furnace filter) such as those used in a laminar air flow cabinet to screen out large particles before air is forced through a much finer filter (HEPA filter).

Primary cells: The eukaryotic cells taken directly from an animal for culture purpose.

Premix: To mix before use; as nutrient mixtures are commercially available as dry powders of preweighed ingredients, which are put into solution when required.

Primordial germ cell: A gamete, that is, a sperm or egg or a primordial cell that can mature into a sperm or egg.

Pro-nucleus: Either of the two haploid gamete nuclei just prior to their fusion in the fertilized ovum.

Pure culture: Axenic culture.

Pure line: All cell or individual members are homozygous for one or more characters or genes and will give rise to more cells or organism with the characters under consideration.

Pyralis: An insect that is also known as the European corn borer (Ostrinia nubialis).

Redifferentiation: Cell or tissue reversal in differentiation from one type to another type of cell or tissue.

Repelcote: The brand name of a material (dimethyl dichloro-silane) used to coat glassware (soda glass); for tissue culture containers and for other purposes.

Rut: The period of maximum testicular activity in male mammals; the term particularly
applied to the period of sexual activity in deer; compare estrus cycle.

Salivary gland: One of several pairs of glands in the mouth that secrete saliva.

Saturation density: Maximum number of cells attainable per cm² or per ml under specified conditions.

Sebaceous gland: Mammalian holodrine skin gland opening into hair follicle. Secretes oily lipid-containing sebum that helps to waterproof fur and epidermis. Epidermal in origin but projecting into dermis.

Seeding efficiency: The percentage of the inoculum that attaches to the substrate within a stated period of time.

Selectable marker: A gene whose expression allows the identification of a triat suitable for artificial selection.

Selection culture: Utilizes difference(s) in environmental conditions or more usually in culture medium composition, such that preferred variant cells or cells lines (presumptive or putative mutants) are favoured over other variants or the wild type.

Selection unit: Single cells or small clusters, units of optimum size for isolating and regenerating variants or mutants; the minimum number of cells effective in the screening process.

Semicontinuous culture: The maintenance of cells in a culture vessel in an actively dividing state by periodically draining the medium and fresh medium.

Senescence: Ageing of any cells of organs including plants and animals.

Sense organ: Group of sensory receptors and associated non sensory tissues specialized for detection of one sensory modality (e.g., light in the eyes, sound in the ears, etc.).

Serology: Diagnostic clinical immunology serotype (also called a serovar). A taxonomic category identified by serology.

Serum: The cell-free liquid component of blood, not including clotting proteins.

Serum killing-power test: A procedure in which a patient’s drug-containing serum is tested for its ability to kill the infecting microorganism.

Serum resistance: Inherent ability of certain bacteria to avoid destruction by serum.

Serum sickness: A type III hypersensitivity reaction that sometimes occurs when proteins from animal serum are used in medical therapy.

Shot gun approach: A technique for sequencing of genome in which the molecules to be sequenced are randomly broken down into fragments, which are then individually sequenced.

Sickle cell: Crescent-shaped red blood cells that contain mutant (sickle cell) hemoglobin.

Sickle cell anemia: The diseases caused by the presence of sickle cell hemoglobin in the red blood cells.

Single-cell clone: 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.

Somaclonal variation: The genetic variations found in the cultured plant cells when compared to a pure breeding strain.

Somatomedins: A family of peptides that mediates the action of growth hormone on skeletal tissue, and stimulates bone formation.

Somite: One of the longitudinal series of segments into which the body of many animals (including vertebrates) is divided.

Split ratio: The divisor of the dilution ratio of a cell culture at subculture.

Stationary culture: A non-agitated culture.

Stem cell: An undifferentiated active somatic cell that undergoes division and gives rise to other stem cells or to cells that differentiate to form specialized cells. A progenitor cell that is capable of dividing continuously throughout the life of an organism.

Sterilization: The act of sterilizing.
Sterilize: 1. The process of elimination of micro-organisms, such as by chemicals, heat, irradiation or filtration.

Stock: 1. The root and a portion of the stem (root stock) of a plant to which is grafted a part of the same or another plant. 2. A group of closely related plants.

Subconfluent: Less than confluent; not all of the available substrate is covered.

Subculture or passage: A culture derived from another culture or the aseptic division and transfer of a culture or a portion of that culture (inoculum) to fresh nutrient medium. Sub-culturing is usually done at set time intervals, the length of which is called the subculture intervals, the length of which is called the subculture interval or passage time.

Subline: A cell line regenerated from a unique cell line of a hybrid callus colony.

Substrate: The matrix or solid underlay upon which a monolayer culture grows.

Superovulation: The process of inducing more ovarian follicles to ripen and produce more eggs.

Supraoptimum: An amount (level) greater than required; as an inhibitory concentration of an exogenous growth factor.

Syngamy: The coming together of the egg and sperm at fertilization.

Synthesize: The act of making new products, either biologically or chemically.

Tissue slice technique: This technique was introduced by Warburg (1923) it is mainly used for in vitro studies of cells. A thin slice cut from a tissue using sharp implement such as a microtome. Because the thin size only contains very large portion of damaged cells.

Trachea, plural tracheae: (1) in air-breathing vertebrates, the windpipe. (2) In insects, a tube distributing air to internal cells.

Transdifferentiation: Cells from one lineage acquiring the ability to differentiate into cells of a different lineage.

Transfer room: A small room, sometimes sterilized internally by a bactericidal lamp (u.v. irradiation) and provided with clean filtered air; employed for sterile transfer work.

Transgene: A gene from one genome that has been incorporated into the genome of another organism. Often refers to a gene that has been introduced into a multi-cellular organism.

Transgenic: An organism in which a foreign gene (a transgene) is incorporated into its genome. The transgene is present in both somatic and germ cells, is expressed in one or more tissues, and is inherited by offspring in a Mendelian fashion.

Transgenic animal: Animal containing new genetic material in its germ cell.

Transgenic organism: An organism whose genome has been altered by the incorporation of foreign or exogenous DNA.

Transient: Of short duration.

Trophoblast: The extraembryonic tissue responsible for implantation, developing into the placenta and controlling the exchange of oxygen and metabolites between mother and embryo.

Umblical cord: Connection between ventral surface of the embryo of placental mammal and placenta. Consists mainly of allantoic mesoderm and blood vessels (umbilical artery and, veins), covered by amniotic epithelium. Surrounded by amniotic fluid, it usually breaks.

Uricotelic: Of animals whose main nitrogenous waste is uric acid; e.g., snakes, lizards, a few mammals (some desert rodents), embryonic and adult birds, terrestrial gastropods, and insects.

Utility: One of the legal terms used in patent law suggesting that the invention has a use that is new or different from any other invention.

V/v: On a volume per volume basis; the percent of the volume of a constituent in 100 units of volume, e.g., (ml/100 ml) × 100.
Vagina: Duct of female mammal connecting uteri with the exterior via short vestibule. Usually single and median due to fusion of lower part of in the embryo. Receives the male's penis during copulation. Lined with stratified non-glandular epithelium, which may undergo cyclical changes during oestrous cycle under the influence of sex hormones.

Variance: In statistics the sum of the squared deviations, divided by one less than the number of observations. A statistical measure of variation in a population.

Variant: A cell line expressing a stable phenotype that is different from the parental culture from which it was derived.

Variation: Differences between individuals within a population or among populations.

Ventral: Generally the surface resting on, or facing, the sub stratum. In chordates, body surface furthest from nerve cord.

Vertebrate: An animal having a backbone made of bony segments called vertebrae, such as fish, amphibia, reptiles, birds and mammals. In addition, they characterized by having a skull which surround a well-developed brain and a bony or cartilaginous skeleton.

Virus: (L. virus, a poisonous or slimy liquid): An infectious particle composed of a protein capsule and a nucleic acid core (DNA or RNA), which is dependent on a host organism for replication. The DNA or a double-stranded DNA copy of an RNA virus genome is integrated into the host chromosome during lysogenic infection or replicated during the cystic cycle.

Virus elimination: Thermotheraphy, chemotheraphy and meristem or meristem tip culture, used alone or in combination have been employed for the elimination of systemic viruses from plants.

Virus-tested or virus-free: A plant that appears healthy and repeatedly tests negatively for the presence of one or more identifiable viruses. Such a plant may then be used as a stock or donor plant (explant source) for propagation purposes, and may be certified as virus tested (certified virus tested). The term virus-free is incorrect in most cases, as such a plant may contain one or more viruses which have not been assayed.

Xenopus laeves: A species of frog, not a toad; frequently used in studies of early vertebrate development; also used to test for pregnancy in women; injections of urine from a pregnant woman results in egg-laying in the frog.

Yield test: Productivity assessment.

Yolk: Store of food material, mainly protein and fat, in eggs.

Zygote (Gr. zygon, a yoke): A diploid cell formed by the fusion of two haploid gametes during fertilization in eukaryotic organisms with sexual reproduction. It is the first cell of the new individual, cellular product of gametic union, usually diploid. Zygotene stage in the first prophase of meiosis.