Stem Cells
science and ethics

Match up the keywords to their definitions
Each term on this page matches a definition on this page

Term	Definition
Alzheimer's disease	The tissue that fills the cavities in the centre of bones. The formation of blood cells (red blood cells, white blood cells and platelets) occurs in the bone marrow. Haematopoietic stem cells are also found in the bone marrow.
Animal-human hybrid	The replacement of cells damaged by disease or injury, with new healthy ones derived from stem cells. The ability of stem cells to self-renew and differentiate into particular cell types offers the potential to culture stem cells in the lab to become replacements. Where the original stem cells are derived from the patient, there is the potential to avoid immune rejection. Also referred to as cell transplantation therapy or stem cell therapy.
Asymmetric division	The removal of myelin, an insulating and protective protein which coats neurons.
Atrophy	The process by which live cells are grown in the laboratory. The cells are placed in a petri dish and given a mixture of nutrients so that they can survive and divide.
Beta cell	The process by which cells become specialised to perform certain tasks. When a cell can differentiate no more it is said to be terminally differentiated.
Blastocyst	Stem cells from the inner cell mass of the blastocyst which will go on to produce every cell in the human body.
Bone marrow	Division and resulting multiplication of cells in the early embryo.
Cancer	A ball of around 250 cells formed around five days after fertilisation.
Cell culture	Cell division resulting in two daughter cells with different properties. Observed in some but not all stem cells.
Cell line	Blood from the umbilical cord of a new-born baby; a particularly rich source of stem cells, especially haematopoietic stem cells.
Cell replacement therapy	Any malignant growth or tumour caused by abnormal and uncontrolled cell division.
Cleavage	An embryo which is a mixture of both human and animal tissue, created by inserting human DNA into an animal egg.
Clinical trial	An agreement between states or nations.
Cloned embryo	Acronym for European Community regulation for Registration, Evaluation, Authorisation and Restriction of Chemical substances. The law came into effect on 1st June 2007 and regulates chemicals and their safe use (EC 1907/2006).
Convention	A wasting or decrease in size of a body organ, tissue or part, owing to disease, injury, or lack of use.
Cord blood	A term used to describe an embryo produced using nuclear replacement.
Demyelination	A research study in human subjects to answer specific questions about vaccines, new therapies or new ways of using known treatments. Clinical trials are used to determine whether or not new drugs or treatments are both safe and effective. Trials take place in four phases: Phase I tests a new drug or treatment in a small group; Phase II expands the study to a larger group of people; Phase III expands the study to an even larger group of people; and Phase IV takes place after the drug or treatment has been licensed and marketed.
Diabetes	A progressive neurological disease of the brain that leads to the irreversible loss of neurons and dementia.
Differentiation	A population of cells all carrying the same genes, grown in the laboratory through many cycles of growth and division over many generations of cells.
EC REACH	A condition where the amount of glucose in the blood is too high, due to the pancreas not producing enough of the hormone insulin (which helps glucose get into the cells of the body) or insulin not working properly.
Embryonic stem cells (ES cells)	A cell type found in the pancreas (specifically in the islets of Langerhans) that produces the hormone insulin.

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Endogenous	Developing or originating within an organism.
Gastrulation	Stage of embryo development occurring in the third week following fertilisation when the inner cell mass forms three layers (the ectoderm, mesoderm and endoderm) which will become different areas of the embryo.
Germ cells	A biological specimen which simulates the processes of, for example, a human disease, so that it can be used for research instead of a human with that disease. Models could be cultures of cells, animals or even computer-based.
Haematopoietic stem cells (HS cells)	Stem cells found in the bone marrow or blood that give rise to all the blood cell types.
Hepatocyte	A degenerative joint disease caused by gradual loss of cartilage.
HFE Act 2008	The name given to a proposed technique involving treating a patient by producing genetically matched somatic cells or stem cells. These replacement cells would be derived from an intermediate embryo or blastocyst, created for the purpose by nuclear replacement, using cells taken from the patient.
Hypertension	A technique in which the process of fertilisation of an egg with a sperm is carried out in the laboratory. A resulting embryo is then placed into the womb to develop into a pregnancy.
Immune rejection	A type of cell which sheaths the axons of neurons with myelin, an insulating and protective protein.
In-vitro fertilisation (IVF)	A type of stem cell which is artificially made from an adult somatic cell (e.g. a skin cell) by switching on four specific genes. The non-pluripotent cell is therefore induced to become pluripotent.
Induced pluripotent stem (iPS) cells	The reproductive cells in multicellular organisms such as the sperm and egg.
Lobbying	An auto-immune disease where the body's own immune system attacks the protective coating around nerves called myelin. MS can cause physical or cognitive (learning or reasoning) disability.
Macular degeneration	An eye disease caused by the degeneration of cells in a part of the retina called the macula lutea. It results in blurred vision and in some cases blindness.
Model	An observable characteristic (trait) of an organism or tissue.
Motor neurondisease (MND)	The main cell type found in the liver. Hepatocytes are the functional cell in the liver and constitute 70-80% of the cells found in the liver.
Multiple sclerosis (MS)	High blood pressure.
Multipotent cells	Human Fertilisation and Embryology Act 2008 was an amendment to the Human Fertilisation and Embryology Act 1990 and the Surrogacy Arrangements Act 1985.
Nuclear replacement	Motor neuron disease is a disease that causes damage to motor neurons. It can lead to wasting of muscles which in turn causes loss of mobility and difficulties with swallowing, speech and breathing. In most cases the cause of MND is unknown.
Oligodendrocyte	The practice of influencing decisions made by the government (in groups or individually). It includes all attempts to influence legislators and officials, whether by other legislators, constituents, or organized groups.
Organogenesis	The process whereby the nucleus of an egg is removed and replaced with the nucleus of another cell, which could be a germ cell or a somatic cell.
Osteoarthritis	Where the imuune system attacks foreign tissue introduced into the body, e.g. grafts and transplants
Parthenogenesis	Stem cells which are able to give rise to a subset of fully differentiated cells.
Patient-specific stem cell therapy	The activation of an egg without the involvement of sperm. So that the egg starts to develop as if it had been fertilised when actually it has not.
Phenotype	The formation of specific organs in the developing embryo.

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Pluripotent cells	A structure formed in the embryo during gastrulation which in humans signifies the start of development of the nervous system.
Primitive streak	Capable of giving rise to all the cell types of a mature organism but not able to support the development of an embryo.
Primordia	Cells which can no longer divide or change function any further.
Regenerative pharmacology	The re-generation of myelin, an insulating and protective protein which coats neurons, which have been damaged in diseases such as multiple sclerosis (MS).
Remyelination	Reconstruction of diseased or injured tissue by activation of resident cells using pharmacological methods.
Reprogramming	A cell that can divide indefinitely to either produce more stem cells or a variety of different cell types (specialised cells).
Self-renewal	Altering the state of differentiation in a cell as happens in the production of iPS cells.
Somatic cell	The term used to describe a particular strain (or family) of constantly-dividing stem cells. Each stem cell line has its own unique name, such as 'Shef 1' or 'Nott 2', and will have been derived from an initial starter (or parent) culture of isolated ES cells, iPS cells or tissue stem cells.
Specialised cell	The ability of a stem cell to divide and produce copies of itself for an indefinite period of time. This is the defining property of stem cells.
Stem cell	Stem cells found in some adult (and foetal) tissue, used to replenish cells in the body, replacing those which naturally wear out. Tissue stem cells are sometimes referred to as adult stem cells.
Stem cell line	Cells which possess the ability to develop into an embryo which can then develop into a complete organism (including generation of a placenta).
Stroke	Organs at their most early and basic stage of development.
Terminally differentiated	Cells which are specific to, or exclusively found in, a single tissue in the body.
Tissue stem cells	Any cell in a plant or animal other than germ cells.
Tissue-specific cells	An organisation of independent states formed in 1945 to promote international peace and security.
Totipotent cells	An agreement under international law entered into by sovereign states and international organisations.
Treaty	A stroke occurs when a blood clot forms and blocks the passage of blood to the brain. It can lead to loss of brain function.
United Nations	A diploid, totipotent cell created when an egg and sperm fuse.
Zygote	A cell that is suited to a specific job. Skin cells, red blood cells, neurons, hepatocytes, beta cells are all types of specialised cells. Stem cells are unspecialised.