



Common acronyms and glossary

ART	Assisted reproductive technology	FDA	Food & Drug Administration
ASCC	Australian Stem Cell Centre	hESC	Human embryonic stem cell
ASC	Adult stem cell	iPS	Induced pluripotent stem
CIRM	California Institute for Regenerative Medicine	MHC	Major histocompatibility complex
ESC	Embryonic stem cell	MSC	Mesenchymal stem cells
GvHD	Graft vs host disease	NIH	National Institutes of Health
HLA	Human leukocyte antigen	NHMRC	National Health and Medical Research Council
ICM	Inner cell mass	NWABR	Northwest Association for Biomedical Research
IVF	In vitro fertilisation	TGA	Therapeutic Goods Administration

Adult stem cell (also known as tissue cell) means undifferentiated cells found in the tissues and organs of the body. They are capable of self-renewal. Their differentiation is mainly restricted to forming the cell types of that tissue or organ. The chief role of adult stem cells is to maintain and repair the tissue in which they are found.

Allogeneic transplantation is a cell, tissue or organ transplant from one individual to a genetically different person.

Autologous transplantation is a cell, tissue or organ transplant from one individual back into the same individual. Such transplants are often performed with blood products or bone marrow and do not induce an immune response and are not rejected.

Blastocyst is an early stage embryo about 5–7 days post fertilisation containing about 150 cells and is the size of a pinhead. A blastocyst consists of two types of cells: the inner cell mass cells, from which embryonic stem cells are derived, gives rise to all the organs and tissues of a future embryo and foetus; and the trophoblast which forms a portion of the placenta.

Cell based therapy is a treatment that involves stem cells being induced to differentiate, or develop, into specific cell types required to repair or rebuild depleted cell populations or tissues.

Cellular differentiation is when an unspecialised cell becomes specialised into a specific cell type.

Cell division is the process by which one cell divides into two cells, thereby increasing the cell population.

Differentiation is the process whereby an unspecialised (undifferentiated) cell develops into specialised cells such as those in the liver, brain or heart.

Efficacy is the capacity to produce an effect.

Embryo is the conceptus developed from the fertilized egg (zygote) until it becomes a foetus, which in the human, is approximately eight weeks later.

Embryonic stem cells come from a 5–7 day old blastocyst (early embryo). They have the ability to form virtually any type of cell found in the human body, but are not capable of developing into a whole new organism.

Ethics Committees review all aspects of a proposed research project and determine whether the proposed research is ethical. Research involving animals, humans or human tissue require ethics approval. If the Committee do not think it is ethical, they can stop the scientist from performing his or her research.

Foetus is the conceptus that follows the embryo stage and develops till birth and displays the characteristics of the adult species.

Graft vs host disease (GvHD) is a complication that can occur after a bone marrow transplant in which the newly transplanted material attacks the transplant recipient's body.

HTLV-1 – Human T-Lymphotropic Virus Type I (HTLV-1) is a human RNA retrovirus that causes T-cell leukaemia and T-cell lymphoma in adults and may also be involved in certain demyelinating diseases, including tropical spastic paraparesis.

Haematopoietic cell is a type of cell that make blood cells.

Haematopoietic stem cell (HSC) is the parent cell or ‘precursor’ of mature blood cells and are found in adult bone marrow, umbilical cord blood, peripheral blood and foetal liver.

Induced pluripotent stem cells (iPS cells) are derived from mature/differentiated cells of the body by reprogramming through genetic manipulation, which resemble the pluripotent embryonic stem cells. The reprogramming technology is changing rapidly.

In vitro fertilisation (IVF), achieved outside the body, is an assisted reproduction technique where the egg cell and the sperm cells are brought together in a dish (i.e. in vitro), so that the sperm can fertilise the egg. The fertilised egg, a zygote, will form the embryo which can then be implanted into the womb for establishing pregnancy.

Mesenchymal stem cell is a type of adult stem cell found in several tissues of the body including bone marrow and the placenta which can give rise to a number of tissue types such as bone, cartilage, fat tissue, and connective tissue. Mesenchymal stem cells have shown promise for treatment for a number of diseases.

Multipotent is the potential of an individual stem cell to develop into a restricted number of (but not all) types of cells. Adult stem cells are examples of multipotent stem cells.

Peer review is the process of subjecting an author’s scholarly work, research, or ideas to the scrutiny of others who are experts in the same field.

Pluripotent is the ability of the stem cell to develop into many types of cells in the body. ES and iPS cells are examples of pluripotent stem cells.

Precursor cell is a cell that gives rise to other cells. A precursor cell is less specialised than other stem cells. If a painting was a specialised cell, the precursor cell would be the canvas.

Progenitor cell is a transitional form of stem cell that can differentiate, but can no longer renew itself. Progenitor cells are restricted to the generation of a few types of specialised cells.

Somatic Cell Nuclear Transfer (SCNT) refers to the removal of a nucleus, which contains the genetic material or DNA, from virtually any cell of the body and its transfer by injection into an unfertilised egg (oocyte) from which the nucleus has also been removed. The newly reconstituted egg is then stimulated to start dividing. After 5–7 days in culture, embryonic stem cells can then be removed. These embryonic stem cell lines are genetically identical to the cell from which the DNA was originally removed. To date, SCNT has not been achieved successfully in humans to create a human embryonic stem cell line.

Stem cell is an unspecialised/undifferentiated cell with the ability to renew indefinitely and to produce specialised cell types in the body.

Stem cell line refers to stem cells that have been established and propagated in culture and maintained consistent characteristics and potential.

Stem cell tourism/medical tourism is when a patient chooses to seek treatment in another country, either for cost or availability reasons. Virtually every type of health care, including plastic surgery, orthopaedic surgery, reproductive treatments, psychiatry, alternative treatments, convalescent care and dentistry are available. Some medical travel is simply a means of getting access to a widely accepted treatment at a cheaper price, or for unproven treatments generally not offered in a patient’s home country. Many patients opting for these treatments do so because they feel they have no other alternative treatments available.

Tissue stem cell (also known as adult stem cell) means undifferentiated cells found in the tissues and organs of the body. They are capable of self-renewal. Their differentiation is mainly restricted to forming the cell types of that tissue or organ. The chief role of adult stem cells is to maintain and repair the tissue in which they are found.

Totipotent refers to the cells within a 1–4 day embryo. Each cell of an embryo at this stage can theoretically make a whole new individual.

