

# Stem cell research research paper

[Health & Medicine](#), [Body](#)



## **Stem Cell Research**

Stem cells are possess the ability to develop into different cell types in the body. They can also serve as a repair mechanism, dividing several times to replenish damage tissue. Stem cells are unspecialized cells, which can renew themselves through cell division, sometimes, even after a long period of inactivity. Stem cells can also be induced, under physiologic or experimental conditions to produce tissue specific or organ specific cells (News Medical, 2012).

Embryonic stem cells are stem cells derived from the early stage of division of human embryos shortly after fertilization. They are isolated from the inner cell mass of the blastocyst. Adult stem cells, on the other hand are found in various tissues of the body. They act as a repair system for the body, replenishing adult tissues. Induced pluripotent cells are normal adult epithelial cells, which have been reprogrammed to possess pluripotent capabilities, meaning that they can divide into cells that are more specialized (NIH, 2012).

Adult therapies like bone marrow transplant have been successfully carried out to treat leukemia, a form of cancer of the blood cells. Other potential uses of stem cells are in the treatment of diseases like Parkinson's disease, spinal cord injuries, Multiple sclerosis and cancers (NIH, 2012).

The stem cell controversy is concerned with the use of embryonic stem cells (News Medical, 2012). The issues concern the creation, treatment and destruction of these human embryos from which the cells are derived (NIH, 2012). The creation of human embryos requires their destruction after the stem cells have been harvested. This has led some people to speak out

about the fact that it violates the right to life of the embryo. I am in favor of stem cell research because of the potentials it possesses in the treatment of many medical conditions. However, if this would be the case, there needs to be a tight regulation into the use of stem cells so that it is not used for purposes other than this.

Embryonic stem cell research poses a lot of moral dilemmas to researchers. As a result of this fact, researchers have looked to other areas in which stem cell research would be less controversial. In view of this, other sources of stem cells include Human amniotic membrane. The Human amniotic membrane is a ready source of human tissue and it is highly abundant. (Diaz-Prado et al, 2011). The amniotic tissue is said to have characteristics such as low immunogenicity, anti-inflammatory properties and cells can easily be isolated from the membrane use in cell therapy and regenerative medicine (Diaz-Prado et al, 2011). The human amniotic membrane has two different types of cell populations. They include the Human amnion epithelial cells, which are derivatives of the embryonic ectoderm while the other cell population are the human amnion mesenchymal stromal cells, which are also derivatives of the embryonic mesoderm (Diaz-Prado et al, 2011). Both of these cell types are multipotent and also have a similar immunotype and can easily differentiate into different tissue types in the mesodermal lineage. These cells are a huge potential source of stem cells for use in the field of regenerative medicine to regenerate tissues that are either diseased, malformed or even totally absent (Diaz-Prado et al, 2011).

Nagata et al (2009) reports that there are in fact, clinical applications for induced pluripotent stem cell (iPSC) technologies. The researchers

demonstrated that newborn human and mouse extra-embryonic yolk sac and amnion cells can be reprogrammed to human pluripotent stem cells and mouse pluripotent stem cells respectively. The researchers stated that these cells cannot be distinguished from embryonic stem cells in characteristics such as expression of pluripotency markers, clonal morphology, global gene expression profile and other characteristics. Moreover, these cells can be collected as a non-invasive procedure and stored for a long time without the need to re-culture them periodically. Because of these attributes, these cells are an ideal source for cell banking and de novo generation of human pluripotent stem cells for use in such fields of medicine as regenerative medicine and in pharmaceutical applications.

Another source of stem cells is cord blood. The cord blood collected after birth poses no harm to both the mother and the child. Cord blood is a rich source of pluripotent cells that have the potential of differentiating into tissues like hepatic, neural and pancreatic tissues. In recent times, advances have been made in the use of cord blood for the treatment of blood disorders. Although the application has been extended to more controversial interventions such as the treatment of type 1 diabetes mellitus. A lot of clinical trials are still on going to perfect this technology. The future of this source of stem cell seems to be guaranteed, as it does not seem to have a lot of moral and ethical issues like the use of embryonic stem cells.

(McGuckin & Forraz, 2008).

Umbilical cord blood contains both stem cells and progenitor cells. The use of autologous hematopoietic stem cell transplantation for the treatment of a wide range of diseases has grown in recent years. Cells derived from human

cord umbilical cord blood are immature. Therefore, rejection of the cells and tissue after transplantation into a mismatched host is reduced. In addition, these cells can potentially differentiate into a number of tissue lines including cardiac, neural, hepatic, dermal and epithelial tissues. Moreover, this source of stem cells remains an alternative source that is widely ethically acceptable and widely supported by the public as opposed to the use of embryonic stem cells. (Lee et al 2010)

## References

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