

# What does stem cell therapy mean research paper samples

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According to the Merriam-Webster dictionary, stem cell is an undifferentiated cell that can generate other cells which makes up specialized organs and tissues in living organisms. Stem cells are of two major types namely; adult stem cells and embryonic stem cells. Embryonic stem cells are found inside an embryo that is in its earliest developmental stage i. e. blastocyst, these stem cells eventually give rise to the adult organisms. The adult cells helps in the regeneration of worn out tissues and are located in some of the tissues in the body of living things e. g. the intestine lining, the skin' s epidermis, the bone marrow and so on. These adult cells are harvested from the bone marrow and instilled into patients who require blood cells replacement via radiation therapy or chemotherapy. The reason behind the great arousal of interest in these stem cells especially the embryonic stem cells are simply due to their ability to be used to treat a great number of conditions which includes, but not limited to; Spinal cord damage, Parkinson's disease, and severe burns. They can also be used to create genetically modified lab mice that are used for carrying out researches on human diseases.

Stem cell therapy can therefore be defined as an intervention strategy which is aimed at introducing newly harvested adult stem cells into damaged organs or tissues to treat a defect caused by diseases or injury. These treatments are widely believed by many medical researchers to have the ability to alleviate human suffering by changing the face of human disease. Several of these therapies now exist but, most (excluding bone marrow transplants) are still at the experimental stage. Many medical researchers have a strong believe that very soon both the adult and embryonic stem cells will be treating diseases like cancer, cardiac failure, Huntington's

disease, type one diabetes mellitus, neurological disorders, Parkinson's disease and several others effectively. However, before these therapies can start getting applied to patients in the medical centres there is still a need for more research so as to understand the way they would behave after the transplantation and their mechanism of interaction with microenvironment of the affected part.

For several years, umbilical-cord stem cells and bone marrow have been employed for the treatments of patients having lymphoma and leukaemia but most of the growing cells end of getting killed by the cytotoxic agents during chemotherapy since these agents does not possess the ability to differentiate between neoplastic cells of the leukaemia itself and the bone marrow's hematopoietic stem cells. Stem cell transplant has the potential to reverse these side effects of conventional chemotherapy owing to the fact that the infused bone marrow from the donor provides functional stem cells that replaces the lost cells in the host's body during the chemotherapy treatments.

## **History and Advancement of Stem Cell Therapy in the World**

The history of stem cells has been tainted with several debates and controversies. In the mid-1800s discovery was made that the building blocks of life are cells and that some of these cells possess the ability to generate other cells. However, it was claimed that the very first use of stem cell was in 1896 though other records shows that in the early 1900s efforts were made to get mammalian eggs fertilized outside of the human body which led to the discovery that some cells possess the potential to produce blood cells. The

first successful bone marrow transplant was carried out in 1968 on two siblings having severe combined immunodeficiency. Stem cells were first discovered in the human cord blood in 1978 and the first in vitro stem cell was developed using mice in 1981. Stem cells were successfully produced from a hamster in 1988 and the first embryonic stem cells to be derived from a primate were in 1995. In 1997, the origin of leukaemia was discovered to be haematopoietic stem cell indicating that there might be an existence of cancer stem cells. In 1997 also, some lambs were successfully cloned from stem cells while in 1998 the first embryonic stem cells lines was developed by Thompson of the University of Wisconsin who was able to isolate cells from the inner cell mass of early embryos, also, Gearhart of Johns Hopkins University was able to derive stem cells from cells found in the tissues of foetal gonad, these two discoveries lead to the development of pluripotent stem cell lines. In the years 1999 and 2000, it was discovered that different cell types can be generated from adult mouse tissues meaning that liver or nerve cells can be generated from bone marrow cells and that other cell types could also be generated from the cells in the brain. These landmark discoveries in the field of stem cell research has gone a long way to ascertain that scientist will soon have greater control over the proliferations and differentiations of stem cells.

Some unfortunate events have also been recorded in the course of history whereby some unscrupulous scientist fabricates studies and findings. One of such events occurred in between 2004 and 2005; a Korean scientist with the name Hwang Woo Suk claimed that he was able to generate stem cell lines from unfertilised human eggs. It was later discovered that his claims were

false; this led to a great international scandal that made the people lose trust in the efficacy of the stem cells research. Also, in 2005, there was a report that scientists at the Kingston University in England discovered a different category of stem cells generated from umbilical cord blood which they named cord blood embryonic-like stem cells, they went further to suggest that these cells can be differentiated into more cell types than the adult stem cells. In early 2007, Dr Anthony Atala and his team of researchers claimed to have successfully isolated a new type of stem cell from amniotic fluid.

Today, though researchers still have a long way to go in order to have total control over the behaviour of the stem cells, there has been a dramatic progression in the research on stem cells and its therapy. Huge numbers of research studies gets published on a daily basis in scientific journals. Aside that, many leukaemia and heart disease conditions are already being treated using adult stem cells.

## References

- Stem Cell Basics: Introduction. In Stem Cell Information [World Wide Web site]. Bethesda, MD: National Institutes of Health, U. S. Department of Health and Human Services, 2002 [cited Wednesday, November 13, 2013] Available at

- " Stem Cell." Merriam-Webster. com. Merriam-Webster, n. d. Web. 14 Nov. 2013.

.

- Bone Marrow Transplantation and Peripheral Blood Stem Cell

Transplantation in National Cancer Institute Fact Sheet web site. Bethesda,

<https://assignbuster.com/what-does-stem-cell-therapy-mean-research-paper-samples/>

MD: National Institutes of Health, U. S. Department of Health and Human Services, 2010. Cited November 13, 2013

- Explore stem cells: History of Stem Cell Research [World Wide Web site].

Ian Murnaghan, 2013 [cited Wednesday, November 13, 2013] Available at