

The Multidirectional Pathway taken up by Stem Cells to develop into Organs and Tissues

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Introduction

Cells are known to be a unit of life which undergoes many chemical and physiological processes to be able to perform a particular task. They are different types of cells that perform its task according to the gene encoded or the proteins formed. One of the well-known cells is the stem cells which are to be also known as the "Blank" cells as they are the only cells that are undifferentiated and are present at the embryo phase of an individual as well as in the bone marrow.

They are considered to be "Blank" cells as they have the ability of developing any kind of the cells that are able to serve to the function of the different parts of the body. However, majority of the cells of an individual are differentiated and thus are destined to work and grow accordingly. For example, Red Blood cells are responsible only for carrying the oxygen via the blood. The beginning of the life of an individual starts with the single cell which is known as the zygote. This singled cell zygote divides into two daughter cells, then to four and then the cycle continues. This process is known as the differentiation.

Whereas, stem cells are the cells which doesn't undergoes any of the differentiation process at the embryonic phase. They consist of the ability to divide in the numerous cell copies. In the same time cells other than the stem cells are can replicate to the definite number of replicas before they under goes cytosis process. After getting breakdown in number of copies, some cells gets involved in the stem cells and other gets involved in the differentiation procedure.

As its unique ability of stem cells to develop into the variety of the different types of cells, it can be believed that they can be used for many purposes such as the Growing of new cells types from the stem cells to eradicate the damaged tissues/organs, replacement of the non-functional organs, study of stem cells led to the acknowledgement of the different usage of the stem cells and the organs/tissues formed by the stem cells can also be used for the testing of the drugs as it to determine its safety and effectiveness.

Adult stem cells don't present any ethical problems. However, in recent years, there has been controversy surrounding the way human embryonic stem cells are obtained. During the process of harvesting embryonic stem cells, the embryo is destroyed. This raises ethical concerns for people who believe that the destruction of a fertilized embryo is morally wrong. Opponents believe that an embryo is a living human being. They don't think the fertilized eggs should be used for research. They argue that the embryo should have the same rights as every other human and that these rights should be protected. Supporters of stem cell research, on the other hand, believe that the embryos are not yet humans. They note that researchers receive consent from the donor couple whose eggs and sperm were used to create the embryo. Supporters also argue that the fertilized eggs created during in-vitro fertilization would be discarded anyway, so they might be put to better use for scientific research.

A primary goal of research on embryonic stem cells is to learn how undifferentiated stem cells turn into differentiated stem cells that form specific tissues and organs. Researchers are also interested in figuring out how to control this process of differentiation. Over the years, scientists have developed methods to manipulate the stem cell process to create a particular cell type. This process is called directed differentiation. A recent study also discovered the first steps in how stem cells transform into brain cells and other types of cells. More research on this topic is ongoing.

Conflict of Interest

We have no conflict of interests to disclose and the manuscript has been read and approved by all named authors.

Acknowledgement

The Authors are very thankful and honored to publish this article in the respective Journal and are also very great full to the reviewers for their positive response to this article publication.

How to cite this article: Mottes M. "The Multidirectional Pathway taken up by Stem Cells to develop into Organs and Tissues" J Genet Genom 5 (2021) e116.

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Received date: 28 July, 2021; **Accepted date:** 11 August 2021, **Published date:** 18 August, 2021