

# A comprehensive guide for the stem cell research

## Abstract

Journal of stem cell research and therapeutics (JSRT) is being published by Medcrave Publishers. This group has the history of publishing many internationally acclaimed peer reviewed open access journals. Medcrave has chosen to remain open access to reach the vast community of students and readers, who can get benefited by their versatile publications. In this series, JSRT is a newly launched journal which involves manuscripts published from all aspects of stem cell research. The established contributors are from all around the globe working in the field of stem cell research. This journal assembles the best scientific contributions for all its readers to view, share and read. The articles which are considered for publication involve almost all aspects of stem cell research like, embryonic stem cells, Mesenchymal stem cells, hematopoietic stem cell etc. Most importantly articles can be accessed and downloaded free of charge.

**Keywords:** stem cell, mesenchymal stem cell, embryo, medcrave

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## Introduction

Stem cells are undifferentiated cells classified into two groups, a) stem cells from embryos formed during the blastocyst phase of an embryological development and b) stem cells of an adult. Embryonic stem cells are derived from a 4-5 day old human embryo that is in the blastocyst phase of a development.<sup>1</sup> Adult stem cells exist throughout the body after embryonic development and are found inside of different types of tissues. Adult bone marrow and fat have stem cells along with other tissues.<sup>2</sup> Apart from these two types there is also embryonic germ cells which are collected from the fetus later in developmental process from gonadal ridge.<sup>3</sup> Adult stem cell serve as fresh source of cells in living organism. They replace the cells that need to be replaced on regular basis like blood and other connective tissue.<sup>4</sup> Stem cell technology is rapidly growing in the field of regenerative medicine.<sup>5</sup> According to Patil AM, stem cell research has offered a new viable therapeutic option for degenerative diseases, injuries and other diseased condition. Stem cells are called as master cells with ability to grow into more than 200 cell types.<sup>6,7</sup> Based on their capacity to divide and differentiate they may be totipotent, pluripotent or multipotent.<sup>5</sup>

## Discussion

Stem cell research has become a burning topic for investigations in recent years. There are various merits and demerits in stem cell research.<sup>5</sup> Some of the merits include the reprogramming of the adult stem cells which are less likely to be rejected when used in transplantation procedure. Embryonic stem cells have the capabilities of growing when established protocols are used.<sup>6</sup> Some of the demerits include adult stem cells which have limited ability to differentiate from others and are extremely hard to grow in culture. Even though they have the ability to repair damaged tissues but do not rapidly replace damaged tissue in degenerative diseases. The fat stem cells do not release at all.<sup>2</sup> Embryonic stem cells may not be accepted when used in transplants because there is no tool to regenerate them.<sup>6</sup> Human embryonic stem cells (hESC) are derived from the inner cell mass of the human blastocyst. Blastocyst is formed after the fertilization of human egg by the sperm after 5 days.<sup>5</sup> According to Lo and co-workers, there are various ethical issues raised by the expected use of

the hESC. To minimize the risk of hESC transplantation, donors will have to update their medical history and screening.<sup>8</sup>

The primary cause of controversy remains the use and destruction of the human embryos to derive the stem cells or create hESC lines.<sup>9</sup> Internationally many legal systems have established their own guidelines to deal with this controversial issue. Canada is the only country that has introduced dual review procedure for stem cell research. Canadian institute of health research (CIHR)'s stem cell oversight committee (2002) is responsible for implementing the guidelines. Moreover institutional research ethic board (REB) and animal care committee (2002) are also responsible bodies. In addition to this India also have special committee for approval of the stem cell research.<sup>9</sup>

In view of the strong ethical, political and social hindrance in the stem cell research, the public trust for stem cell therapy should not be lost. Therefore to keep researchers aware of the new additions to stem cell research globally, Medcrave publications are doing an excellent job. Addition of this new publication (Journal of Stem Cell Research and Therapeutics) in their various peer reviewed journals is a strong step in next generation stem cell research.

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## Conflict of interest

The author declares no conflict of interest.

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