

## Controversies concerning stem cell therapy

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Stem cells have created a revolution in regenerative medicine research with their ability to promote the repair response of diseased, dysfunctional or injured tissue. They can develop into different types of cells, such as muscle, bone, neuron, cartilage, etc. Stem cells are of four main types, namely embryonic stem cells, adult stem cells, induced pluripotent stem cells and perinatal stem cells. The most controversial out of these four types is the human embryonic stem cells. They are procured from embryos in their early stages. The controversies deal with laws and beliefs regarding in vitro fertilisation, abortion and contraceptives. The inner cell mass from the blastocyst is the region where the stem cells are obtained from and these blastocysts are donated by couples who have received successful treatments and have excess embryos. However, the main problem is whether to regard the human embryo as a human being with moral and legal rights. When the inner cell mass is taken out, the blastocysts stop developing and are discarded. Many people believe that human life starts at the moment when the zygote is formed after fertilisation and therefore requires protection. Therefore, to prevent such issues from arising, most researchers resort to using adult stem cells or induced pluripotent stem cells (iPSCs) with the latter being more popular as adult stem cells are not that versatile. They are ethically unproblematic as they are derived from somatic cell donors. However, factors, such as the cost of developing iPSCs and the time that they take to characterise and bank them limit the adoption of iPSC technology. Also, there are few concerns associated with iPSCs. For instance, donors consent for sensitive downstream research. Thus, all the laws and regulations encourage and prompt scientists to be morally ethical and responsible while dealing with any stem cell.

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