

# The Great Stem Cell Debate: Understanding the Basics

## What are stem cells?

Stem cells are the cells from which all other cells originate. In a human embryo, a large portion of the embryo's cells are stem cells. As the child grows in her mother's womb, most of these cells begin to differentiate and become the heart, liver, kidneys and all of the more than 200 kinds of tissue found in the body. While most of these stem cells become differentiated, all humans retain stem cells located in tissues like blood, bone marrow, fat and brains. Stem cells are incredibly versatile cells that can replicate indefinitely. These cells, with the correct cues, can develop into specialized cells. Since stem cells are so versatile and there are many diseases that result from the lack of or dysfunction of a single type of cell, there is hope that some day stem cells can be reprogrammed to cure various diseases.<sup>1</sup>

## What is embryonic stem cell research?

This research involves the extraction of embryonic stem cells from a human embryo, which kills an innocent human being. It forces one human being to sacrifice her life without consent in the vague hope that her cells might one day cure another human being. Research with embryonic stem cells has shown that these cells are often difficult to control and can form tumors when injected into animals or patients.<sup>2</sup> Embryonic stem cells also face the risk of immune rejection because they come from the body of another human being and have different DNA.<sup>3</sup> Embryonic stem cell research has yet to cure a single patient of any disease.

## What is adult stem cell research?

This research involves using stem cells from adult patients and does not result in harming human life. The term "adult" can be misleading, because these cells are found in many places like baby teeth and umbilical cord blood. These cells are already naturally programmed to repair specific damaged tissue in the body. Adult stem cells have been used successfully in treating more than 70 conditions<sup>4</sup> and are being used in new clinical trials and experiments.

## What are induced pluripotent stem cells?

Induced pluripotent stem cells (iPS cells) are ordinary human skin cells that have been reverted back to an embryonic-like state by genetic reprogramming. Creating iPS cells does not harm the patient. These cells have the potential to change into any type of tissue in the body.<sup>5</sup> The process for making iPS cells was discovered in November of 2007 and experiments are ongoing.

## What are the ethics involved?

Proponents of embryonic stem cell research often cite all the potentials of the research, but they usually fail to mention that a human life is destroyed every time stem cells are removed from an embryo. The goals of this research are noble, but that doesn't mean that we should abandon our respect for human life to attain these goals. It is never ethically correct to sacrifice the life of one human for research to save another without her consent. This kind of utilitarian thinking was the same kind of rationale used by Nazi scientists and during syphilis experiments on African-Americans in Tuskegee, Alabama.

One of the main arguments behind embryonic stem cell research is that there are many "leftover" embryos from IVF treatments that will be destroyed anyway. Why not use them to help cure diseases? Fortunately, these unique individuals don't need to die. Some adoption agencies specialize in helping couples adopt "leftover" embryos. Parents of children who were adopted as embryos testified in Michigan before Michigan's House Health Policy Committee to show Michigan legislators that "leftover" embryos are members of the human family and deserving of the right to life.

With treatments from adult stem cells already being used and advances in iPS cell research showing great potential, human life does not need to be destroyed for stem cell treatments or cures.

# Comparing embryonic stem cell research to ethical alternatives

## Human embryonic stem cell research

The extraction of embryonic stem cells from a human embryo kills the human embryo, an innocent human being. Embryonic stem cell research forces human beings to sacrifice their life without consent in the vague hope that their cells might one day cure another human being.

Embryonic stem cell research has yet to cure a single patient of any disease. To get people to support this kind of destructive research, proponents have created a fairy tale that cures are at the fingertips of scientists.

Research with embryonic stem cells has shown that these cells are often difficult to control and animal and human experiments show they can form tumors called teratomas when injected into patients.

Embryonic stem cells face the risk of rejection and Graft vs. Host disease because they come from the body of another human being and have different DNA. Many researchers would like to get around this problem by creating cloned human embryos whose DNA would match the patient's DNA.<sup>6</sup>

## Ethical stem cell alternatives

The extraction of stem cells from patients or saving of umbilical cord blood after birth causes no harm to the patient. Creating induced pluripotent stem cells (iPS cells) also causes no harm. These are completely life-affirming options of research. Treatments and cures can be discovered without killing human beings.

Research using stem cells obtained from adults and umbilical cord blood has been used to help thousands of people with various ailments. Clinical trials and experiments are ongoing with adult stem cells and iPS cells.

Research and treatments using adult stem cells and umbilical cord blood have shown that these cells aren't likely to form tumors.

Adult stem cells and iPS cells can be taken from a patient's own body. They have the same DNA as the patient so they don't face the risk of being rejected by the patient's body. iPS cells show the same potential as embryonic stem cells to turn into all tissue types found in the body.

### References:

<sup>1</sup> "Stem Cell Basics," *National Institutes of Health*, 28 April 2009. [stemcells.nih.gov/info/basics/Pages/Default.aspx](http://stemcells.nih.gov/info/basics/Pages/Default.aspx)

<sup>2</sup> Ibid.

<sup>3</sup> Nikhil Swaminathan, "Body May Reject Transplanted Human Embryonic Stem Cells," *Scientific American*, 19 August 2008. [www.scientificamerican.com/article/body-rejects-transplant-human-embryonic-stem-cells](http://www.scientificamerican.com/article/body-rejects-transplant-human-embryonic-stem-cells)

<sup>4</sup> "Benefits of Stem Cells to Human Patients," *Do No Harm*. [www.stemcellresearch.org/stem-cell-research-treatments](http://www.stemcellresearch.org/stem-cell-research-treatments)

<sup>5</sup> Rob Stein, "Researchers May Have Found Equivalent of Embryonic Stem Cells," *The Washington Post*, 24 July 2009. [www.washingtonpost.com/wp-dyn/content/article/2009/07/23/AR2009072301786.html](http://www.washingtonpost.com/wp-dyn/content/article/2009/07/23/AR2009072301786.html)

<sup>6</sup> Andrew Pollack, "Cloning Is Used to Create Embryonic Stem Cells," *The New York Times*, 15 May 2013. [www.nytimes.com/2013/05/16/science/scientists-use-cloning-to-create-embryonic-stem-cells.html?\\_r=0](http://www.nytimes.com/2013/05/16/science/scientists-use-cloning-to-create-embryonic-stem-cells.html?_r=0)



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