Pros and Cons of Stem Cell Research



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Updated October 11, 2017

Debates over the ethics of [embryonic stem cell](https://www.thebalance.com/designer-babies-375701) research continue to divide scientists, politicians, and religious groups. However, promising developments in other areas of [stem cell](https://www.thebalance.com/nanotechnology-and-stem-cell-applications-375664) research might lead to solutions that bypass these ethical issues. These new developments could help win stem cell research more support from those against embryonic stem cell research since they don't require the destruction of blastocysts.

Latest Developments

The most recent research has shown that there are many options available other than working with embryonic stem cells. Stem cells can be obtained from cord blood or derived by manipulating differentiated cells (i.e., skin cells) to revert them to a pluripotent state. These are alternatives that may help broaden the acceptance of stem cell research.

Background

In November 1998 the first published research paper reported that stem cells could be taken from human embryos. Subsequent research led to the ability to maintain undifferentiated stem cell lines (pluripotent cells) and techniques for differentiating them into cells specific to various tissues and organs.

The debates over the [ethics](https://www.thebalance.com/societal-concerns-with-biotech-3973289) of stem cell research began almost immediately in 1999, despite reports that stem cells cannot grow into complete organisms.

In 2000 – 2001, governments worldwide were beginning to draft proposals and guidelines to control stem cell research and the handling of embryonic tissues and reach universal policies to prevent “brain-drains” (emigration of top scientists) between countries.

The CIHR (Canadian Institute of Health Sciences) drafted a list of recommendations for stem cell research in 2001. The Clinton administration drafted guidelines for stem cell research in 2000, but Clinton left office prior to them being released. The Bush government has had to deal with the issue throughout his administration.

Australia, Germany, UK and other countries have also formulated policies.

Pros

The excitement about stem cell research is primarily due to the medical benefits in areas of regenerative medicine and therapeutic cloning. Stem cells provide huge potential for finding treatments and cures to a vast array of diseases including different cancers, diabetes, spinal cord injuries, Alzheimer's, MS, Huntington's, Parkinson's and more.

There is endless potential for scientists to learn about human growth and cell development from studying stem cells.

Use of adult-derived stem cells, from blood, cord blood, skin and other tissues, known as IPSCs, has been demonstrated to be effective for treating different diseases in animal models. Umbilical-cord-derived stem cells (obtained from the cord blood) have also been isolated and utilized for various experimental treatments. Another option is the use of uniparental stem cells. Although these cells lines have some disadvantages or shortcomings compared to embryonic cell lines (they are shorter-lived), there is vast potential if enough money is invested in researching them further, and they are not technically considered individual living beings by pro-life advocates.

Cons

The use of embryonic stem cells for research involves the destruction of blastocysts formed from laboratory-fertilized human eggs. For those who believe that life begins at conception, the blastocyst is a human life and to destroy it is unacceptable and immoral. This seems to be the only controversial issue standing in the way of stem cell research in North America.

Where It Stands

In the summer of 2006, President Bush stood his ground on the issue of stem cell research and vetoed a bill passed by the Senate that would have expanded federal funding of embryonic stem cell research. Currently, American federal funding can only go to research on stem cells from existing (already destroyed) embryos. Similarly, in Canada, as of 2002, scientists cannot create or clone embryos for research but must use existing embryos discarded by couples.

The UK allows embryonic stem cell cloning.

Use of stem cell lines from alternative non-embryonic sources has received more attention in recent years and has already been demonstrated as a successful option for treatment of certain diseases. For example, adult stem cells can be used to replace blood-cell-forming cells killed during chemotherapy in bone marrow transplant patients. [Biotech](https://www.thebalance.com/top-common-biotech-terms-you-should-know-375754) companies such as Revivicor and ACT are researching techniques for cellular reprogramming of adult cells, use of amniotic fluid, or stem cell extraction techniques that do not damage the embryo, that also provides alternatives for obtaining viable stem cell lines.

Out of necessity, the research on these alternatives is catching up with embryonic stem cell research and, with sufficient funding, other solutions might be found that are acceptable to everyone.

On March 9, 2009, President Obama overturned Bush's ruling, allowing US Federal funding to go to embryonic stem cell research. However, the stipulation applies that normal NIH policies on data sharing must be followed. Despite the progress being made in other areas of stem cell research, using pluripotent cells from other sources, many American scientists were putting pressure on the government to allow their participation and compete with the Europeans. However, many people are still strongly opposed.