

Stem Cells: The Medical Jack of all Trades

By Rachel Michael

Rumor has it, stem cells have been used to make the blind see and the disabled walk. We explore how stem cells may be used to cure cancer, correct spinal injuries, treat Parkinson's Disease, delay aging, and more. While stem cells have the potential to save lives, there are many ethical issues surrounding their use in research or in clinical trials, prompting society to question when moral lines must be drawn. Many conflicts arise from the use of embryonic stem cells, and we will investigate how new developments in genetic engineering may solve this dilemma.

Properties of stem cells

- Undifferentiated
- Can become specialized
- Can replicate indefinitely

Totipotent vs. Pluripotent vs. Multipotent

Totipotent:

- This cell can differentiate to become a new organism
- e.g. a zygote, or fertilized egg

Pluripotent:

- This type can differentiate into any tissue or body cell
- e.g. an embryonic stem cell

Multipotent:

- This cell type can differentiate into specific tissue types, depending on its location in the body
- e.g. a stem cell found in the stomach lining

Cons/reasons its unethical

- Fetuses have the potential for life, and an "identity"
- Religious reasons
- Consent was not obtained from the fetus itself
- Cloning is unethical

Embryonic Stem Cell research can be justified and ethical if the following rules are followed

1. The blastocyst must be treated with respect appropriate to early human embryonic tissue.
2. Women/couples donating blastocysts produced in the process of in vitro fertilization must give full and informed consent for the use of the blastocyst in research and in the development of cell lines from that tissue.
3. The research will not involve any cloning for purposes of human reproduction, any transfer to a uterus, or any creation of chimeras.
4. Acquisition and development of the feeder layer necessary for the growth of human embryonic stem cell lines in vitro must not violate accepted norms for human or animal research.
5. All such research must be done in a context of concern for global justice.
6. All such research should be approved by an independent Ethics Advisory Board in addition to an Institutional Review Board.

There still remains no clear solution for ethically performing embryonic stem cell research without compromise. Both sides will believe that their morals are compromised, so since there are immediate issues that need to be solved, we are forced to choose the best option for the time being. Since genetic modification and Induced Pluripotent Stem Cell research are not advanced enough, we must continue on with embryonic stem cell research. Of course, this must be done with the utmost respect and for the betterment of humanity.