

# The Huffington Post

## Hope, Science and Tomorrow: Stem Cell Research in 2009

Posted March 5, 2009 | 02:41 PM (EST)

*By: Ryan Mehl*

In January, the U.S. Food and Drug Administration approved the world's first human trials of a therapy derived from human embryonic stem cells. The treatment, intended to repair spinal-cord injury, should be celebrated for the future it gives humankind.

The year 2008 was filled with fear and doubt about the future and the strength of humanity, yet the science community still made astonishing advances. With science funding at an all-time low, we managed to successfully cure a 2-year-old's fatal genetic disease and to remove HIV and leukemia from a 42-year-old using stem-cell transplants.

Scientists also used a dying woman's own stem cells to build her a new trachea, transplanted it back into her body and saved her life.

The advances of 2008 spring from a synergy of technological improvements across many disciplines. The business of quickly identifying the sequence of DNA has become super-charged in the last five years because chemists and biologists have joined forces with computer scientists. The technology of digitizing DNA has provided doctors with the knowledge of which genes need to be replaced and enables them to perform stem-cell transplants with success. Sequencing human genes is now, amazingly, considered run-of-the-mill.

Yet there are plenty of ethical issues related to sharing stem cells between people. Some perceive that embryonic research destroys the human potential of the embryo. They are concerned that once we enter this new territory, it is only a matter of time before we are struggling with unacceptable moral and cultural dilemmas.

The ethical and scientific problems of using embryonic stem cells will soon be a moot point. Scientific advances are giving us other options to heal the sick without using embryos, but for these options to thrive, scientists need to be supported politically.

For example, pluripotent stem cells, like embryonic stem cells, can be turned into every cell type found in the body but without the ethical concerns of using embryos or human eggs. Last year scientists took normal skin cells, reprogrammed them into pluripotent stem cells and turned them into beating heart tissue.

In addition, the technology we have to use a person's own stem cells to fix his or her body carries with it fewer ethical problems.

By appreciating the medical advances of last year, we can see the promise for 2009. A massive sequencing effort will identify most of the human genetic glitches and dormant diseases that today are commonplace. This will allow doctors to locate the sick genes in human bodies and create needed organs and treatments from a patient's own cells before they get sick.

The potential for emerging scientific and medical advances to save lives and prevent disease, pain and suffering is just the start. Such advances could also have a major impact on the health care system as a whole by minimizing sick leave and recovery time and preventing billions in medical costs. But this can happen only with stem-cell research.

The days of cautiously taking care of ourselves will wane as we move medicine, politics and society forward. By embracing stem-cell research as a well-accepted medical practice, we will see the many troubles of aging and disease disappear.

*Ryan Mehl engineers proteins with unnatural amino acids to improve their use in science and society. He is Associate Professor of Chemistry at Franklin & Marshall College in Lancaster, Pa.*