

# DON'T DENY HOPE

SAVING AND IMPROVING LIVES THROUGH STEM CELL RESEARCH

## Somatic Cell Nuclear Transfer (SCNT) - MYTH vs. FACT

**MYTH: Cloning is cloning is cloning. It's all the same.**

**FACT:** Not all cloning is the same. Scientists do many kinds of cloning every day, most of which is commonly accepted. Cloning has allowed scientists to develop powerful new drugs and to produce insulin and useful bacteria in the lab. It also allows researchers to track the origins of biological weapons, catch criminals, and free innocent people.

There's a world of difference between reproductive cloning - something that should be banned right away - and therapeutic cloning, also known as somatic cell nuclear transfer (SCNT). Therapeutic cloning is the transplanting of a patient's own DNA into an unfertilized egg in order to grow stem cells that could cure devastating diseases. Reproductive cloning is the use of cloning technology to create a child. CAMR, along with leading scientists and most Americans, oppose reproductive cloning.

**MYTH: SCNT will never cure any diseases - it holds no hope for medical research.**

**FACT:** SCNT holds great promise for treating and curing patients by creating tailor-made, genetically identical cells that their bodies won't reject. In fact, proof of principle for SCNT has been established in published research on disease in mice. (March 2002 issue of Cell.)

Many of the most debilitating diseases and conditions are caused by damage to cells and tissue. When combined with stem cell research, SCNT could be used to develop new and innovative treatments - such as replacement cells and tissue - that allow organs to function again and restore hope to millions of families. SCNT is also integral to improving scientists' understanding of how stem cells develop. This new knowledge could speed the search for new treatments - and possibly cures - for some of the most complex diseases that plague our society.

In particular, SCNT could allow researchers to move stem cell research to a new level, developing stem cell therapies that are specifically tailored to an individual's medical condition. Moreover, SCNT could help scientists develop stem cells that will not be attacked and destroyed by the body's immune system. This holds particular promise for patients who suffer from diabetes, heart disease, and spinal cord injuries.

**MYTH: Therapeutic cloning is a slippery slope that leads to reproductive cloning. There is no dividing line between the two forms of cloning.**

**FACT:** Therapeutic cloning produces stem cells, not babies. With therapeutic cloning,

there is no fertilization of the egg by sperm, no implantation in the uterus and no pregnancy. Dr. Harold Varmus, the former head of the National Institutes of Health (NIH) and a Nobel laureate, says there is a profound distinction between cloning with the intent of making a human being and research cloning to help understand and treat life-threatening diseases and conditions.

Implantation into a womb is the clear, bright line that divides reproductive and non-reproductive technologies. Without implantation, no new human life is possible. This is where society can and must draw the line.

**MYTH: There are more than enough stem cells for research already. Plus, adult stem cells are more promising than embryonic stem cells. We don't need to use SCNT.**

**FACT:** We do not have enough stem cells for research. There are only a limited number of NIH-approved stem cell lines available to government-supported researchers and not enough to proceed at full pace with extensive research into treatments and cures. There certainly are not enough to turn research into treatments.

Adult stem cell research shows promise in some areas and should be pursued. However, our nation's top scientists, the National Institutes of Health, and the National Academy of Sciences all agree that embryonic stem cells have greater potential - they are "pluripotent" (can make any cell in the body) and "immortal" (can be grown in a lab indefinitely) - than adult cells.

Another important use of SCNT is to create new embryonic stem cells. The cells currently available to researchers are insufficient because: 1) they do not allow full investigation of the genetic causes of disease (e.g., scientists need to create new cells that actually contain genetic diseases in order to study how these diseases affect the growth and development of other cells and tissue), and 2) they are not sufficiently racially or ethnically diverse (e.g., certain diseases are more prevalent in people of particular races - like sickle cell disease - and by creating new stem cells from people of specific races, scientists could help unravel the causes of these diseases.) The bottom line is that scientists need more cell lines to fulfill the enormous promise of embryonic stem cell research.

**MYTH: A temporary moratorium on cloning is a reasonable solution, and it isn't a complete ban. The research could eventually be reinstated.**

**FACT:** Simply put, a "temporary" moratorium equals a ban. And it would be reasonable if this weren't a life and death matter. We should be giving our top scientists and doctors every possible tool to push for breakthroughs in treating cancer, Alzheimer's Disease, Parkinson's Disease, juvenile diabetes, spinal cord injuries, stroke and a multitude of other diseases. Furthermore, a moratorium is unnecessary because the National Academy of Sciences has already studied the potential of therapeutic cloning and issued a recent report validating this research.

A moratorium would set up political hurdles down the road because lifting a Congressional ban is more complicated and time-consuming than it sounds. Further, it would send the wrong signals to our scientists, telling them that therapeutic

cloning should not be pursued and that the research is suspect. It would put life-saving medical breakthroughs on indefinite hold. A moratorium would allow other countries to take the lead in cutting edge research resulting in the development of cures and treatments elsewhere - Americans would, therefore, have less access to breakthrough drugs and products. For the 100 million of Americans suffering from diseases, a moratorium could be a death sentence.

**MYTH: Therapeutic cloning will just lead to the exploitation of women, including creating a market for their eggs.**

**FACT:** There won't be a market for eggs. The main purpose of SCNT is to perform research to understand how cells develop. Once that is understood, the process can be replicated in a laboratory and there will be no need for new eggs.

Under the terms of Senate legislation that CAMR supports (see below), all research must be reviewed by an independent review board to ensure that the research will be done according to the highest ethical standards including: protection of women, informed consent, and no undue financial inducements.

**MYTH: There isn't a way to ban human reproductive cloning, and stop unethical rogue scientists from this practice, while allowing therapeutic cloning for medical research. We need to ban it all.**

**FACT:** There is a way. CAMR supports the immediate creation and enforcement of strict regulations to supplement existing FDA regulations, including a complete ban on reproductive cloning, stiff penalties for breaking the law, and rules to ensure that therapeutic cloning occurs under a comprehensive oversight system.

We actively support bi-partisan legislation - the Human Cloning Ban and Stem Cell Research Protection Act (S. 303) - co-authored by Senators Orrin Hatch (R-UT), Dianne Feinstein (D-CA), Arlen Specter (R-PA), Ted Kennedy (D-MA), Tom Harkin (D-IA), and Zell Miller (D-GA). This bill is carefully worded so that human reproductive cloning would clearly be banned while the development of therapies for millions of Americans would be allowed to continue.

Their legislation reflects the approach recommended by several blue-ribbon scientific and medical panels, including the National Academy's Panel on Scientific and Medical Aspects of Human Cloning and the California Advisory Committee on Human Cloning, as well as 40 Nobel laureates and, perhaps most importantly, millions of patients and their families.

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