

SHARE ETHICAL LIFESAVING RESEARCH

Please help Minnesota Citizens Concerned for Life share this information with more people. Contact us at MCCL@mccl.org or 612-825-6831.

Learn more by visiting the following educational websites:

- stemcellresearch.org
- stemcellresearchfacts.org
- stemcellresearchcures.com
- snowflakes.org
- embryooption.org
- embryodonation.org



Minnesota Citizens Concerned for Life

4249 Nicollet Ave.
Minneapolis MN 55409
612.825.6831
MCCL@mccl.org

The mission of Minnesota Citizens Concerned for Life is to secure protection for innocent human life from conception until natural death through effective education, legislation and political action.



www.mccl.org

Copyright © 2011 MCCL

STEM CELL RESEARCH & HUMAN CLONING

*Promising research can proceed
without destroying young
human life.*

MINNESOTA CITIZENS CONCERNED FOR LIFE



Barry Goudy of Michigan was successfully treated for multiple sclerosis with adult stem cells.

WHAT IS A STEM CELL?

A stem cell is an unspecialized cell with two unique abilities:

- to divide and make copies of itself; and
- to become different types of specialized cells, such as heart, muscle and nerve cells.

There are **two broad categories** of human stem cells: embryonic and adult.

EMBRYONIC STEM CELLS (ESCs) are taken from human embryos, killing the embryo in the process. The embryos may be “leftover” from in vitro fertilization (IVF), or they may be created through cloning or other methods specifically for use in research.

ADULT STEM CELLS (ASCs, non-embryonic) have many sources, including umbilical cord blood, placentas, amniotic fluid and various adult tissues — bone marrow, skin, fat, etc. No harm is done in gathering these cells from donors.

HOW ARE STEM CELLS USED?

Scientists are currently conducting research with both kinds of stem cells. The primary goal of this research is to develop medical therapies for a variety of conditions. Researchers aim to transform stem cells into the specific tissue types targeted by disease or injury and then transplant them into the body, where the cells can work to repair damaged organs and body systems.

As adult stem cell
treatments
save lives,
scientific advances
have made
embryonic stem cell
research obsolete.

WHY ADULT STEM CELL RESEARCH IS SUPERIOR

ESCs were once thought to have greater potential than ASCs for producing medical benefits for human patients. This is mainly because ESCs are **pluripotent**: they have the ability to generate all the cells of the body. Most ASCs are multipotent, able to form many but not all tissue types.

But difficult problems such as **tumor formation, genetic instability and immune rejection** have hindered the use of ESCs for medical applications. No patients have yet been helped by ESCs.

By contrast, adult stem cells already have proven to be very therapeutically useful. ASCs do not form tumors and are not genetically unstable. They have **treated thousands of human patients with dozens of different conditions**, including arthritis, diabetes, lupus, multiple sclerosis, brain cancer, breast cancer, ovarian cancer, leukemia, lymphoma, heart disease, sickle cell anemia, stroke damage, Parkinson's disease and spinal cord injury.



Amy Daniels (Wis.), Carron Morrow (Ala.) and Stephen Sprague (N.Y.) were successfully treated for life-threatening systemic scleroderma, heart disease and leukemia, respectively, with their own adult stem cells or donated cord blood stem cells.

WHAT ARE INDUCED PLURIPOTENT STEM CELLS?

Scientists can now produce pluripotent stem cells without using human embryos. Researchers genetically “reprogram” normal cells to become functionally equivalent to ESCs. These **induced pluripotent stem cells** (iPSCs) offer the same potential benefits as ESCs,

The advent of iPSCs has effectively rendered obsolete any therapeutic or research justification for the destruction of human embryos.

but acquiring them is easier, more efficient and ethically unproblematic.

In addition, because iPSCs can be derived from a patient's own body, there potentially may be no risk of immune rejection, eliminating the main rationale for human cloning (see below). The advent of iPSCs has effectively rendered obsolete any therapeutic or research justification for the destruction of human embryos.

HOW IS CLONING INVOLVED?

Many advocates of ESC research want to create new human embryos, using the process of cloning, in order to harvest their stem cells. ESCs taken from cloned embryos would be genetically virtually identical to the patient from whom genetic material was taken (i.e., the person who was cloned). This could theoretically solve the problem of immune rejection.

WHAT IS CLONING?

Living organisms can be cloned using a technique called **somatic cell nuclear transfer** (SCNT). This is how Dolly the sheep was famously created in 1996.

In SCNT, the nucleus of a somatic cell (a regular body cell) is inserted into an egg from which the nucleus has been removed. With stimulation, the result (if successful) is a

new organism at the earliest stages of development who is genetically virtually identical to the donor of the somatic cell.

In the debate over human cloning, so-called “**reproductive cloning**” refers to human SCNT with the intention of implanting the cloned embryo in a woman's uterus and allowing him or her to develop toward maturity. So-called “**therapeutic cloning**” refers to human SCNT with the intention of killing the cloned embryo for research.

ESC research advocates have pursued the latter. Using somatic cells from patients, they hope to create cloned embryos whose stem cells are genetically matched to



These three children were all adopted as embryos through the Snowflakes Frozen Embryo Adoption Program.

those patients. But technical problems have stalled human cloning efforts. To date, no cloned human embryos have successfully developed to the point at which the derivation of stem cells is possible.

WHY KILLING EMBRYOS IS WRONG

As a matter of biological fact, a human embryo — whether a result of natural fertilization, IVF or SCNT (cloning) — is a distinct, living and whole (though immature) human organism. The embryo is an individual **member of the species *Homo sapiens*** at the embryonic stage of his or her development. Each of us was once an embryo.

Moreover, every human being — **regardless of age, size, appearance, location (e.g., a Petri dish) and**

level of development — is valuable and deserving of respect and protection. This is a foundational moral principle. It is therefore unjust to kill some innocent human beings for the possible benefit of others. Embryo-destructive research relegates the youngest and most vulnerable members of the human family to the status of mere raw material we may harvest for our own ends.

WON'T THE IVF EMBRYOS BE DISCARDED ANYWAY?

So-called “excess” embryos created through IVF need not be discarded or killed for research — they can be **adopted by loving parents**. The Snowflakes Frozen Embryo Adoption Program and others have been very successful in facilitating the adoption of frozen human embryos.



Even assuming that embryos will soon die, we

are not justified in slicing them up for experimentation. No one suggests that we kill and extract organs from terminally ill patients, death row inmates or dying soldiers on the battlefield, even though they are “going to die anyway.” Human beings ought to be treated with **dignity and respect**, not farmed for their useful parts.

“We should offer these extra embryos to infertile couples to implant and allow them to be born, and not kill them either by experimentation or by disposal,” says Dr. Micheline Mathews-Roth of Harvard Medical School.

PROMISING RESEARCH CAN PROCEED

Embryonic stem cell research requires the killing of young members of our species. It is therefore a profound violation of the equal dignity and rights of human beings. Far more promising and already effective work can continue with ethical adult stem cell research.