



## The Age of Therapeutic Cloning Dawns

Font Size: ↑ ↓ ☒

By Ronald Bailey

Published 05/19/2005

"Humankind has now embarked into the 'Age of Therapeutic Cloning.' This is a scientific revolution of the first rank," asserts Bernard Siegel, executive director of pro-embryonic stem cell research [Genetics Policy Institute](#) in a press release. "This is a huge step forward on a par with the first isolation of human embryonic stem cells in 1998," declares, Daniel Perry, president of the [Coalition for the Advancement of Medical Research](#) (CAMR).

Siegel and Perry are hailing the announcement today in *Science* by Korean researchers that they have created eleven cloned human embryonic stem cell lines that are matched to eleven individual patients. This achievement comes only 14 months after the same team of Korean researchers led by [Woo Suk Hwang](#) created the [first cloned human embryo](#).

The researchers used [somatic cell nuclear transfer](#) (SCNT) to create these cloned human embryonic stem cell lines. They began with 185 eggs donated by 18 women who produced about 10 eggs per induced superovulation cycle. The researchers removed the nuclei from each egg and inserted skin cell nuclei from each patient into the enucleated eggs. From these 185 eggs, 129 successfully fused with the skin cell nuclei and 31 developed into [blastocysts](#). Eleven different patient matched human embryonic stem cell lines were successfully derived from the 31 blastocysts. The stem cell lines were derived for both males and females and from patients suffering from juvenile diabetes, congenital immunodeficiency disease and spinal cord injuries.

Amazingly, Hwang and his team were able to derive stem cells from 34 percent of the cloned blastocysts which is a higher rate than other researchers have been able to derive stem cell lines from donated blastocysts left over from in vitro fertilization efforts. It turns out that eggs donated by women under age 30 work much better for creating cloned blastocysts. Taking into account only those eggs donated by younger women, the researchers conclude, "We have shown the establishment of patient-specific [cloned human embryonic stem cells] with high success rates, i.e., average rates indicating that each oocyte donation cycle leads to the establishment of one patient specific [stem cell] line." In other words, on average, using eggs from donors under age 30, it is possible to create a patient specific stem cell line per each egg donation cycle. The researchers note, "These rates of [cloned stem

cell] establishment, combined with less than one-year timeframe from skin biopsy and oocyte donation to [cloned stem cells], might be clinically relevant if therapeutic cloning were shown to be of medical value." This means that creating transplantable tissues could take less than a year per patient.

Embryonic stem cells have the capacity to perpetually self-renew and to differentiate into any of the more than 200 different cell types that make up the human body. The goal of therapeutic cloning is to produce tissues and organs for transplantation that are perfectly matched to each patient's immune system. The Korean researchers allowed the stem cells to differentiate into various cell types including skin, nerve, kidney and muscle cells. The stem cells produced by Hwang and his team are immunological matches for specific patients, and that means that if they were transplanted that they would not cause immune rejection. While this research is a tremendous breakthrough, the researchers hasten to point out that it is too early to consider actually transplanting the cells into patients. First, because some of the cloned stem cell lines carry the defective genes that led to diabetes and immunodeficiency disease. Second, because researchers still have to learn how to safely and stably transform stem cells into specific cell types, say, pancreatic [islet cells](#) to treat diabetes.

This Korean stem cell breakthrough is certain to be a bombshell in the ongoing political debate over human embryonic stem cell research in the United States. In August, 2001, President George W. Bush [limited](#) federal funding for human embryonic stem cell research to those cell lines that had already been derived. He argued that this limitation, "allows us to explore the promise and potential of stem cell research without crossing a fundamental moral line, by providing taxpayer funding that would sanction or encourage further destruction of human embryos that have at least the potential for life." So far only [22 stem cell lines](#) that qualify for federal research funding under President Bush's restrictions are available to American researchers. In response to these federal limitations, various privately funded efforts have been launched and in 2004 California voters approved an initiative to create an [Institute for Regenerative Medicine](#) that will spend \$3 billion on stem cell research over the next ten years.

The House of Representatives has twice voted to [criminalize](#) precisely this research, proposing to toss therapeutic cloning researchers into prison for up to ten years and fine them one million dollars. In fact, if this effort to criminalize research on cloned human stem cells were to succeed, Americans who go abroad to seek cloned stem cell treatments, say, to cure their diabetes, could be jailed for up to ten years for illegally "importing" cloned stem cells. The Bush Administration was also pushing the United Nations to adopt a [treaty](#) to outlaw both cloning to produce transplants and reproductive cloning.

The Korean announcement is likely to have a big impact on the upcoming vote in the House of Representatives on the [Stem Cell Research Enhancement Act](#). The House Republican leadership has reluctantly agreed to allow a vote on this bill that would lift President Bush's restrictions and permit federal funding for research on all human embryonic stem cell lines derived from blastocysts leftover from fertility treatments. The bill was jointly introduced by Representative Mike Castle (R-Del.) and Representative Diana DeGette (D-Colo.) and now has 202 co-sponsors. There are 23 co-sponsors in the Senate for an identical bill. It takes only 218 votes to pass a bill in the House.

CAMR's Daniel Perry believes that today's Korean stem cell announcement will increase the pressure in Congress to pass the Stem Cell Research Enhancement Act. Genetic Policy Institute director, Bernard Siegel, asserts, "The opponents of embryonic stem cell research will be up in arms, but the public is beginning to recognize that the cloning of stem cells is not the same as cloning babies. The opponents' scare tactics will ultimately fail, as we bring this closer to clinical applications." Here's hoping that Perry and Siegel are right.

*Ronald Bailey is Reason magazine's science correspondent. His book, [Liberation Biology: The Scientific and Moral Case for the Biotech Revolution](#) will be published by Prometheus Books in June. His email is [rbailey@reason.com](mailto:rbailey@reason.com).*

Copyright © 2005 Tech Central Station - [www.techcentralstation.com](http://www.techcentralstation.com)