

## **How can you not want to help Superman walk again?**

James E. Read, Ph.D.

There are lots of questions about the new biotechnology, but none is more pointed than this one. We have all seen Christopher Reeves, the actor who played Superman in the movies, confined to his wheelchair as a result of a horseback riding accident that severed his spinal cord. And we've seen Michael J. Fox, the Canadian-born actor who as a man in his prime has had to give up his career because of Parkinson's disease. We are told that human embryonic stem cell research gives them the hope of a cure. It would seem not only unchristian but downright inhuman to stand in the way!

So why do people object? Let me sketch three kinds of reasons—with an invitation to more detailed discussion at another time.

First, however, a word about what kind of biotechnology is being talked about. Most cells in our bodies are genetically "differentiated"—all the cells in one person's body have the same DNA, but genes that are active in one kind of cell are "turned off" in another kind. Which is why some cells with my DNA are bone cells, and others are skin cells, and others are nerve cells, etc. Originally, however, back in the days shortly after my conception, the cells were not differentiated. To use the language of the geneticists: the cells of my embryonic days were totipotent (able to develop into any kind of mature cell) or pluripotent (able to develop into a wide range of mature cells). From these stemmed all the cells that now make up my adult body; hence the name "embryonic stem cells."

If scientists could develop techniques by which they could instruct a stem cell to differentiate in a specific direction rather than let differentiation just happen, then, with sufficient sources of stem cells, they could grow batches of dopamine-producing brain cells to transplant into people who have Parkinson's and batches of nerve cells to transplant into people who have spinal cord injuries, etc.

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From other transplantation experience we know that there are problems of tissue rejection because the organ or tissue transplanted into the recipient has a different DNA from that of the donor. Presumably these problems could be avoided if we could somehow get the donor and recipient DNA to match up. Which is where “cloning” comes in. Properly called “somatic cell nuclear transfer,” cloning takes the DNA from the nucleus of a differentiated cell of one adult, transfers it into an egg from another person once the egg’s own nucleus has been removed, and stimulates the new hybrid cell to begin replicating. In ways not yet fully understood, it’s as if the DNA’s clock was reset, and instead of being a mature, differentiated cell, what we have is a brand new embryonic cell. Scientists have been doing this on non-human mammals for a number of years, and there’s no reason to imagine that it wouldn’t “work” with humans too.

Now back to people’s objections.

The first stems (poor pun!) from all the hype. Scientists are nowhere near the point of engineering cell differentiation for medical application—there’s simply too much basic genetic science still to be done. So it would be the height of irresponsibility for any geneticist to lead a person with a spinal cord injury (like “Superman”) to believe that a cure is just around the corner.

And yet, that’s the sort of talk one hears. In November 2001 Michael West, CEO of Boston’s Advanced Cell Technology, announced that ACT had successfully applied somatic cell nuclear transfer to humans. “We’re a bit obsessive,” he told CNN. “I’m just trying to help people who are sick, and really that’s our focus. And time is of the essence for people that are dying of life threatening disease, and that’s really what’s our time schedule. We want to apply these technologies as fast as we can....There are people who cannot wait.” One doesn’t have to be a complete cynic to suggest that ACT’s motives are more complex than that. The fame that comes with being first, and the corporate profits that will come to the company that can be the first to patent human cloning cannot be ignored.

Ever since Eden, human beings have been tempted by beautiful half-truths. Let’s not be naïve—right now the talk of embryonic stem cell therapy and therapeutic cloning is mostly talk about a dream. We’re shown the faces of the afflicted so that we’ll fund genetic research that doesn’t have sexy graphics.

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The second objection concerns “distributive justice.” We need to ask not only how much human embryonic stem cell research costs in an aggregate sense, but also who pays the costs and who stands to benefit. Is there a fair match? Discomfort about the justice of the distribution of the world’s wealth does not arise only when we get to genetic therapies, but surely Christian conscience ought to be concerned about the fact that millions of people will still be exposed to preventable life-threatening health conditions while we engage in our quest for “replacement cells and tissues.” How, we need to ask, will this work affect “the widows, the orphans, and the immigrants” of the 21<sup>st</sup> century?

Distinctive of embryonic stem cell therapies is the cost to be paid by women. It took 277 eggs to produce the Scottish sheep Dolly. How many women would have to volunteer to give up (or sell) their eggs to produce one human embryo clone? We don’t know. We know that the best source of healthy eggs would be young women who would not otherwise need to undergo the hormone manipulation involved in retrieving a quantity of eggs. We can’t tell what risks we’d be asking them to take.

David Prentice is an expert in stem cell research at Indiana State University. He has calculated that it would take 800 million eggs to generate sufficient cloned stem cells to treat the 16 million diabetics presently in the USA. 800 million eggs is equivalent to the entire reproductive capacity of 2 million women. I think we have to ask whether there are alternatives. Especially when we realize that donated eggs are only part of the story.

Embryonic stem cell research can happen only if we are prepared to destroy the human embryos from which the stem cells are extracted. And that fact is the source of the third and most important objection. Is this a way to be treating human embryos?

The answer is easy for those (like Peter Singer of Princeton University) who regard the early embryo as just one more clump of cells. They say, why not?

The answer is similarly easy for those who regard the embryo from the earliest moment as a full member of the human community. From their perspective, even the therapeutic use of embryonic stem cells (cloned or not) would necessitate killing a person; and killing people is wrong. Joni Eareckson Tada has said, “Ironically, the disabled would be the first to be threatened in a world where eugenics and the bio-tech industry set the moral agenda. It’s an impersonal world that uses the guise of ‘cure’ while devaluing the

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very human life it purports to help...As a person with a disability [Tada is immobilized because of a spinal cord injury], that's not the kind of world I want."

The discernment process is more complex for those who know that embryos are more than just a clump of cells but aren't sure that embryos are full persons. When she introduced the new federal government bill that would regulate research using embryos "left over" from IVF procedures—but *only* from that source—Anne McLellan said, "You know what happens to them [now]? They go in the garbage." Seen from this perspective, using stem cells is like "harvesting" kidneys from brain-dead accident victims. What will otherwise be simply disposed of is turned into something that has at least a faint hope of stopping disease.

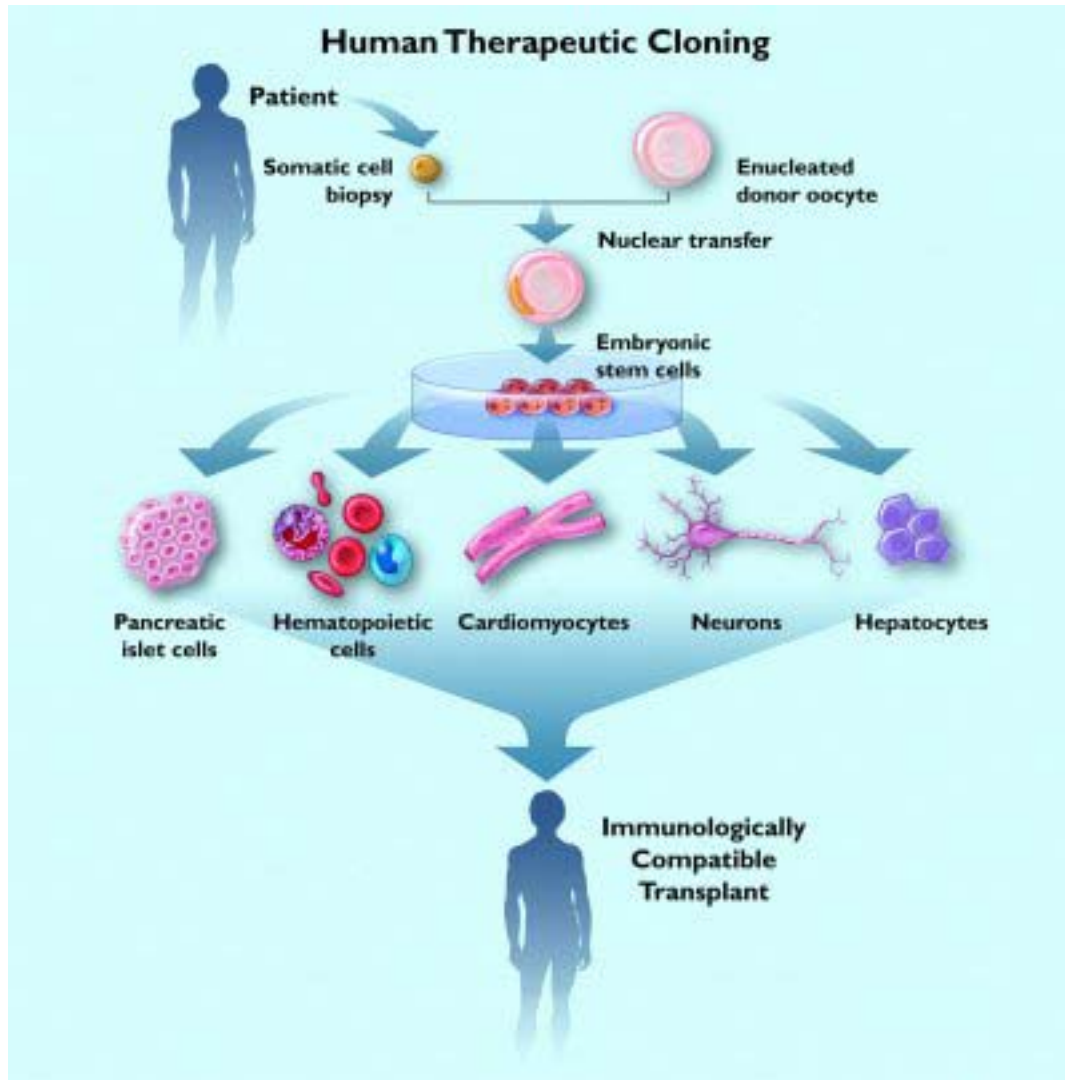
In this short article, we've only begun to scratch the surface. There is much more that is being said for, and against, human embryonic stem cell science/technology, and Christians need to be engaged in the discussion. Christians will disagree with other equally mature, equally grounded Christians on many aspects of the discussion, but I hope there is one thing we can be agreed on. One thing we can all bring to the table is our conviction that humans are creatures, not the Creator.

No matter what "cell technology" enthusiasts might say, Christians know that we don't actually *make* human life but rather that we are "fearfully and wonderfully made" by God. Human DNA and cells are not just more gears in a big machine that we are at liberty to invent and reinvent, replace or dispose of, according to some quality control imperative. Our very smartest scientists and our very best-intentioned doctors need to stand in awe of that fact and regard themselves as accountable to God for what they do with his creation.

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A graphic from ACT, illustrating their hypothesis concerning embryonic stem cell therapy



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