

Stem Cells to Take Focus at DNC

By MALCOLM RITTER, AP Science Writer

NEW YORK - Stem cell research, a topic that long ago spread beyond the laboratory and into politics, will catch the spotlight briefly on Tuesday at the Democratic National Convention.

A speech by Ron Reagan, a son of the late President Reagan, will be just the latest development that has kept attention on this difficult and controversial field.

Of course, Reagan's death from Alzheimer's disease ([news](#) - [web sites](#)) in June gave a new push to the stem cell advocacy by his widow, Nancy Reagan. Soon afterward, Cambridge University announced it would open a major center for research into stem cells.

Earlier this year, the British government opened a national stem cell bank and American researchers announced they'd created new collections of embryonic stem cells, the kind of stem cell most of the hubbub is about. Those steps added to what many scientists call the inadequate inventory approved by the White House for federally funded research.

John Kerry ([news](#) - [web sites](#)), the presumed Democratic nominee, has already said that if elected he'd overturn those funding restrictions. Kerry was among 58 senators who recently urged President Bush ([news](#) - [web sites](#)) to relax his policy, which forbids federal funding for research on embryonic stem cell lines created after Aug. 9, 2001. Bush said he won't change his mind.

More stem cell politics are on the horizon. In November, California voters will decide whether to approve a \$3 billion bond issue to finance stem cell research. Also this year, the United Nations ([news](#) - [web sites](#)) will revisit the issue of whether to propose an international treaty to ban "therapeutic" cloning — which produces stem cells from cloned embryos — as well as "reproductive" cloning, which makes babies.

Embryonic stem cells are prized because of their ability to morph into all the cell types found in the body. So scientists are eager to learn how to use them. The most publicized use would be the treatment of diseases like diabetes, Parkinson's and spinal cord injury by coaxing the cells into becoming replacement parts for damaged tissue.

"Of course we don't know whether it will work. If we did know, we wouldn't have to do the experiments," Harvard researcher Douglas Melton told a meeting of U.N. delegates recently. "We cannot promise we will succeed," he said, but the cells are "one of the best chances we have."

The controversy arises because of where the cells come from. When an embryo is about five days old, it's a sphere composed of about 200 cells, just barely visible to the naked eye. Embryonic stem cells come from the interior of this sphere, and to get them, the embryo has to be destroyed. That's abhorrent to people who consider an embryo to be a developing human life that must be protected.

As for cloning to produce an embryo, that's "wrong because it treats human life as an object of manufacture," Cardinal William H. Keeler of the U.S. Conference of Catholic Bishops said recently.

The controversy is not going away anytime soon. So let's look at some basic questions behind this confusing topic:

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Q. Nancy Reagan's advocacy put the focus on using stem cells to treat Alzheimer's. Will they be useful there?

Maybe. But most scientists say that because of the way Alzheimer's attacks the brain, it would be too much of a challenge to try cell replacement therapy, at least in the near future.

"It's not where I'm putting my money at the moment," said Lawrence Goldstein of the University of California, San Diego, who hopes to use the cells instead as a laboratory tool to study Alzheimer's.

He plans to introduce Alzheimer's-promoting mutations into human stem cells and then turn them into brain cells in a dish. That way, he says, he can study the very earliest steps that eventually wreck healthy brain cells.

After all, he says, studying the ravaged cells of an Alzheimer's patient is like inspecting debris from an airplane crash when "what you really want is the black box." Work like his could be useful for developing and testing drugs, he said.

Other scientists say similar work could be applied to other illnesses.

Q. Why use therapeutic cloning to get stem cells?

In this procedure, scientists remove the DNA of an egg and replace it with that of another person. The egg is allowed to develop into an embryo. Stem cells from that embryo, a clone, would provide a genetic match to the person who donated the DNA.

So, such cells could be turned into brain tissue or insulin-producing pancreatic cells, for example, which could be transplanted into that person without rejection by the immune system. Or, in a variation on Goldstein's plan, the cells could be studied in the lab for insights into the person's disease.

Scientists who support therapeutic cloning stress that it's different from "reproductive cloning," in which the embryo would be implanted into a woman to grow into a baby. Most scientists oppose that, calling it risky and unethical.

Q. How long would it take therapeutic cloning to create cells for treating a patient?

Current lab procedures take too long to be practical, and it would take a lot of work to shrink the process to perhaps one to three months, said Dr. Rudolf Jaenisch of the Whitehead Institute for Biomedical Research in Cambridge, Mass. He said he didn't know if or when that's possible.

Time is an important factor. John Gearhart of Johns Hopkins University figures it could take months to a year, which he called too long if the cells are needed for victims of spinal cord injury, stroke or heart attack. Chronic diseases might leave enough time, he said, but there's still the question of which patients could afford it. Just the wealthy?

So some experts are looking at other stem-cell strategies, regarding therapeutic cloning as just an interim step. One idea is developing banks of diverse stem cell lines with carefully chosen immunological traits, so that lots of patients could find a close match and minimize rejection risk.

Q. Aren't there alternatives to destroying embryos?

Yes. The best-known alternative is adult stem cells, which are found in various tissues. Recent studies suggest these cells are remarkably versatile too and may provide another source of cells for therapy.

"We clearly have to explore both adult stem cells and embryonic stem cells," says Dr. John Wagner of the University of Minnesota's Stem Cell Institute. Each type might be better for treating some conditions than the other, and "we need to figure out where the embryonic stem cells are better than the adult stem cells, and maybe vice versa."

Eventually, Gearhart and others say, scientists hope to learn enough to be able to reprogram ordinary cells to take on the primitive, blank-slate condition stem cells present. Then nobody will need to destroy any embryos to get stem cells.