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Scientists make nerve stem cells

The world's first pure nerve stem cells made from human embryonic stem cells has been created by scientists at the Universities of Edinburgh and Milan.

It is hoped the newly-created cells will eventually help scientists find new treatments for diseases such as Parkinson's and Alzheimer's.

BBC science correspondent Pallab Ghosh said the cells should help researchers test the effectiveness of new drugs.

Stem cells are "master" cells that can become many kinds of tissue.

Nerve stem cells are those which help build the brain and central nervous system.

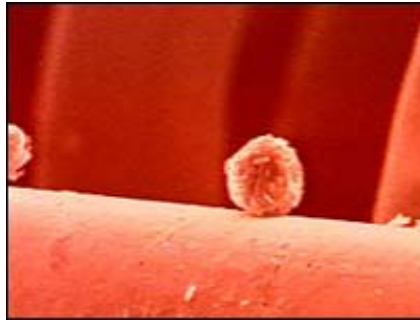
The university's Dr Steven Pollard said: "This is incredibly exciting in terms of curing disease.

"We may be able to create the disease in a dish. If we do that, we'll be able to better understand the disease and also to test drugs."

Our correspondent said the long-term aim of the Edinburgh research is for cells to be used to build replacement neural tissue for Alzheimer's and Parkinson's sufferers.

But he said the more immediate use for the artificially-created cells is to test out the effectiveness of new drugs.

Professor Austin Smith, who led the research at the University of Edinburgh, told the BBC: "We're already talking with the biotechnology and bio-pharmaceutical companies about taking



Stem cells can be programmed to become many kinds of tissue

STEM CELL MILESTONES

- ◆ **1960s:** Research begins on stem cells taken from adult tissue
- ◆ **1968:** Adult stem cells used to treat immunodeficient patient
- ◆ **1998:** US scientists grow stem cells from human embryos and germ cells, establishing cell lines still in use today
- ◆ **2001:** Embryonic stem cell turned into a blood cell
- ◆ **2004:** South Korean scientists clone 30 human embryos and develop them over several days
- ◆ **2005:** Korean team develops stem cells tailored to match individual patients

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Hear from one of the scientists who worked on the cells

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these cells into screening systems for new drugs. Hopefully that will come to pass within two to three years.

"In terms of the possibility of using the cells for transplantation, that's a much more difficult and longer term thing and I think there we're talking more of the five to ten year range."

However, critics say it is unethical to use human embryos in scientific research.

Previous attempts at creating the nerve cells have produced contaminated samples that have not been scientifically useful.

Robert Meadowcroft, of the Parkinson's Disease Society, welcomed the news: "The purity of these cells should prove particularly valuable in studying the possibilities for transplantation and replacement of damaged tissue."

The Alzheimer's Society echoed this view, saying that the inability to grow nerve cells from human embryonic stem cells had previously been a major obstacle to progress in this area.

The breakthrough comes three months after scientists at Newcastle University announced they had successfully produced a cloned embryo using donated eggs and genetic material from stem cells.

It was the first time a human cloned embryo had been created in Britain.

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Stem Cell Advance Muddles Debate

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Work May Stall Efforts To Lift Research Limits

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 By *Ceci Connolly*

Washington Post Staff Writer

Tuesday, August 23, 2005; Page A03

A Harvard University advance in generating embryonic stem cells may have the unintended consequence of hindering congressional efforts to lift research restrictions imposed by President Bush four years ago, leaders on both sides of the issue said yesterday as details of the discovery traveled through the scientific and political communities.

The news that Harvard scientists have successfully converted human skin cells into embryonic stem cells -- without using a human egg or new embryo -- is likely to muddle the already complex debate over federal stem cell research policy.

Even as they were describing the findings being published this week in the journal *Science*, the researchers cautioned yesterday that the new approach is still in the early stages. They exhorted lawmakers to press ahead with the more conventional, but controversial, technique of removing stem cells from days-old human embryos.

"This technology is not ready for prime time," said lead author Kevin Eggan. "This is not a replacement for the techniques we already have."

Embryonic stem cells hold the promise of treatment or cures for a range of

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Brad Eason Ellis

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diseases and injuries because they can grow into any type of cell or tissue. However, many conservatives, including Bush, object to the approach because existing methods of extracting the cells involve destroying young embryos called blastocysts.

In August 2001, the president announced he would limit federal research to the cell colonies, or "lines," harvested prior to that date.

In May, the House passed legislation that would ease the Bush restrictions and allow government-funded research on tens of thousands of cell lines taken from frozen embryos donated by couples who have completed fertility treatments. Senate Majority Leader Bill Frist (R-Tenn.) recently reversed himself and announced he supports the bill, raising hopes it will be acted on this fall.

The Harvard discovery complicates the Senate prospects because it offers the tantalizing, albeit distant, prospect of creating genetically tailored hybrid cells without destroying new embryos. The technique used laboratory-grown human embryonic stem cells to "reprogram" the genes in a person's skin cell, turning that skin cell into an embryonic stem cell. In the future, scientists hope to begin the process with an adult cell and convert it into an embryonic cell before fusing it.

"All this is confirmation we will see breakthroughs without compromising ethical standards," said Sen. Tom Coburn (R-Okla.), a physician who has led opposition to embryonic stem cell research. "We're not going to have to go that way if we can just be patient and fund the basic science."

On the other side, Rep. Michael N. Castle (R-Del.) conceded that the latest breakthrough will make his effort to lift the Bush limits more challenging.

"I consider this a point well struck for them," he said. "For those who just wish to oppose any use of embryonic stem cell research at all, they will say, 'Here are Harvard scientists saying this can be done.'"

Castle and others stressed, however, that for now the new Harvard procedure requires cell lines taken from a human embryo.

"It's not as if this research says there is no need for embryonic stem cells," said Sean Tipton, spokesman for the American Society for Reproductive Medicine. "It continues to show the enormous potential of stem cell research and highlights the value of embryonic stem cells as a source of research material."

When it returns next month, the Senate could face as many as a half-dozen competing bills, including one that shifts tax money to alternative forms of

research and one that bans research known as "therapeutic cloning."

Each bill has the potential to siphon support away from the Castle legislation lifting the Bush restrictions.

For lawmakers "who want to appear to support embryonic stem cell research without alienating their conservative base, it gives them something they can vote for even if it continues to trade patient interests for political symbolism," said R. Alta Charo, a professor at the University of Wisconsin medical and law schools.

"If this new avenue is useful, that's wonderful, but it would be a colossal mistake for any member of the United States Congress to pretend he or she knows enough about this process to foreclose any other process," said James C. Greenwood, president of the Biotechnology Industry Organization. "We don't think the public should allow the politicians to hide behind such thin fig leaves."

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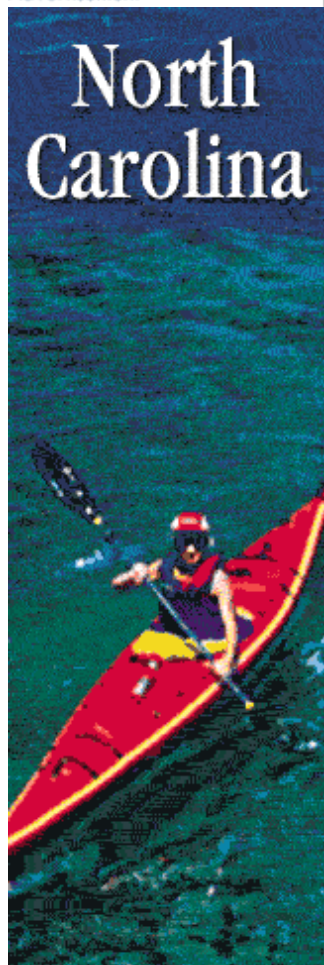
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Fetuses May Not Feel Pain in Early Months

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North Carolina

By LINDSEY TANNER
The Associated Press
Tuesday, August 23, 2005; 5:58 PM

CHICAGO -- A review of medical evidence has found that fetuses likely don't feel pain until the final months of pregnancy, a powerful challenge to abortion opponents who hope that discussions about fetal pain will make women think twice about ending pregnancies.

Critics angrily disputed the findings and claimed the report is biased.

"They have literally stuck their hands into a hornet's nest," said Dr. Kanwaljeet Anand, a fetal pain researcher at the University of Arkansas for Medical Sciences, who believes fetuses as young as 20 weeks old feel pain. "This is going to inflame a lot of scientists who are very, very concerned and are far more knowledgeable in this area than the authors appear to be. This is not the last word _ definitely not."

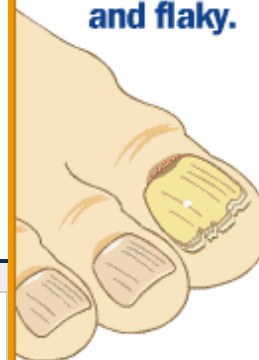
The review by researchers at the University of California, San Francisco comes as advocates are pushing for fetal pain laws aimed at curtailing abortion. Proposed federal legislation would require doctors to provide fetal pain information to women seeking abortions when fetuses are at least 20 weeks old,

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and to offer women fetal anesthesia at that stage of the pregnancy. A handful of states have enacted similar measures.

But the report, appearing in Wednesday's Journal of the American Medical Association, says that offering fetal pain relief during abortions in the fifth or sixth months of pregnancy is misguided and might result in unacceptable health risks to women.

Dr. Nancy Chescheir, chairman of obstetrics and gynecology at Vanderbilt University and a board director at the Society of Maternal-Fetal Medicine, said the article "will help to develop some consensus" on when fetuses feel pain. "To date, there hasn't been any."

The researchers reviewed dozens of studies and medical reports and said the data indicate that fetuses likely are incapable of feeling pain until around the seventh month of pregnancy, when they are about 28 weeks old.

While brain structures involved in feeling pain begin forming much earlier, research indicates they likely do not function until the pregnancy's final stages, said the report's senior author, UCSF obstetric anesthesiologist Dr. Mark Rosen.

Based on the evidence, discussions of fetal pain for abortions performed before the end of the second trimester should not be mandatory, the researchers said.

The authors include the administrator of a UCSF abortion clinic, but the researchers dispute the claim that the report is biased.

Dr. Catherine DeAngelis, JAMA's editor-in-chief, said the decision to publish the review was not politically motivated.

"Oh, please," DeAngelis said. "If I had a political agenda, I wouldn't pick fetal pain."

JAMA does not publish "politically motivated science. We publish data-based, evidence-based science," DeAngelis said.

The measure pending in Congress would affect about 18,000 U.S. abortions a year performed in the fifth month of pregnancy or later, said Douglas Johnson, legislative director of the National Right to Life Committee. He said the review is slanted.

But Rosen said the researchers "tried to review the literature in an unbiased fashion. This was a multidisciplinary effort by experts on anesthesia,



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neuroanatomy, obstetrics and neonatal development.

Rosen also said that administering anesthesia or painkillers to the fetus could pose health risks to the mother.

When doctors operate on fetuses to correct defects before birth, general anesthesia is given to the mother primarily to immobilize the fetus and to make the uterus relax, Rosen said. Anesthesia during fetal surgery increases the mother's risks for breathing problems and bleeding from a relaxed uterus, the researchers said.

Rosen said those risks are medically acceptable when the goal is to save the fetus but there's not enough evidence to show any benefit from fetus-directed anesthesia during an abortion.

Administering anesthesia directly to the fetus is also sometimes done but generally to reduce the release of potentially harmful fetal stress hormones, Rosen said. There is little research on its effects, the authors said.

Anand, the researcher from Arkansas, said the authors excluded or minimized evidence suggesting fetal pain sensation begins in the second trimester and wrongly assume that fetuses' brains sense pain in the same way as adult brains.

While Anand has testified as an expert witness for the government in court cases opposing some late-term abortions, he said he is not anti-abortion and that his views are based on years of fetal pain research.

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