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1. **Researchers Use Single Gene To Create Embryonic Stem Cells**

31 August, 2009

Researchers have successfully reprogrammed human nerve cells back to an embryo-like state by using just a single gene.

It is known that embryonic stem cells are pluripotent - they can develop into any of the body's cell types.

But such cells are not available in large numbers, as they can only be harvested from a donated egg or embryo, and, for ethical reasons, most countries have laws restricting their use.

In 2006, Shinya Yamanaka and his colleagues at Kyoto University in Japan successfully made mouse cells pluripotent by reprogramming skin cells into a state like embryo cells.

They did so by using retroviruses to insert four genes - known as "factors" - into the cells' DNA.

They repeated the trick a year later with human cells.

However, using genes and retroviruses in this way increases the risk of the cell becoming cancerous, not just because tinkering with DNA has that effect, but also because two of the four factors are known to cause cancer.

In a bid to make these promising cells in a safe way, Hans Scholer's team at the Max Planck Institute for Molecular Biomedicine in Münster, Germany, has been working to achieve pluripotency using fewer factors.

Last year, they did this with the two factors that do not cause cancer, and now they have simplified the recipe further, doing it with just one.

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2. **Stem cells to be used for treating chronic spinal injury**

25 August, 2009

The use of stem cells to treat range of diseases is increasing day by day. Now scientists are going to test use of stem cells in treating chronic spinal injuries. Stem cells can be acquired from various sources like bone marrow, umbilical cord blood and fetus, but in the recent study research team is going to use stem cells from umbilical cord blood.

Research team led by Dr Wise Young, research professor at WM Keck centre for collaborative neurosciences at Rutgers University, New Jersey will conduct human trails to prove efficacy of stem cells from umbilical cord blood along with Lithium in treating chronic spinal injury in India. The trails will include 80 chronic spinal injury patients.

Animals studies have shown that Lithium helps in stimulating the regeneration of umbilical cord blood stem cells (UCBSC) leading to faster recovery. Lithium, is a commonly prescribed for depression and bipolar disorders, with little side effects.

Dr. Wise Young said: "We will inject UCBSC on the periphery of the injury site and will put patients on Lithium for six weeks. The dose of Lithium will be closely monitored. As it mixes in the blood stream, it will help stimulate the stem cells to regenerate, thereby, building a bridge of healthy cells over the injury site."

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3. Retina cells grown from skin-derived stem cells

25 August, 2009

Research on induced pluripotent stem (iPS) cells has been progressing feverishly since 2006, when Japanese researcher, Shinya Yamanaka of Kyoto University, first managed in 2006 to make skin cells behave like embryonic stem cells.

The latest success comes from the University of Wisconsin School of Medicine and Public Health. They have been able to grow multiple types of retinal cells from both embryonic stem cells and iPS cells.

The results have been published in the latest issue of the *Proceedings of the National Academy of Sciences* (PNAS).

In normal human development, embryonic stem cells begin to differentiate into more specialised cell types about five days after fertilization. The retina develops from a group of cells that arise during the earliest stages of the developing nervous system. The Wisconsin team has been able to use embryonic stem cells as well as pluripotent stem cells to trigger the development of retinal cell types.

Till date, researchers have been unable to produce "a highly enriched population of cells at the earliest stage of retinal specification that can progress through each of the major developmental stages" to become the retina.

The researchers from the University of Wisconsin have succeeded in doing this — studying all of the key events that lead to the generation of specialised neural cells. The highlight has been their ability to do it using both the embryonic stem cells and the iPS cells.

They first tried it out using embryonic stem cells and replicated the process using iPS cells. They were able to produce cells that expressed morphological features and/or markers of the eye field, retinal pigment epithelium, photoreceptors precursors etc.

The researchers were able to get a clear understanding of the time course through which cells differentiate to become the retina using both embryonic stem cells and iPS cells.

This is a landmark achievement as it will provide an ideal opportunity for studying and understanding the fundamental questions of human retinal development. A more practical application will be the use of iPS cells to produce pluripotent stem cell derivatives for testing drugs by pharmaceutical companies.

Studying retinal development in detail and treating conditions that are genetically linked will now become possible, by using the iPS-cell route. For example, skin from a patient with retinitis pigmentosa could be reprogrammed into iPS cells, and then into retina cells, which would allow researchers to screen large numbers of potential drugs for treating or curing the condition.

There is also a possibility, though distant at this stage, of repairing a damaged retina by using iPS cells produced from the patient's skin cells.

Keywords: Retinal cells, Stem cells, Embryonic stem cells, induced pluripotent stem cells, iPS cells, University of Wisconsin,

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4. Stem cell firm plans Russia's 1st post-crisis IPO

25 August, 2009

Russia's Stem Cell Institute is seeking to attract some 150 million roubles ($4.75 million) from investors in what would be the country's first initial public offering in more than a year, the firm's head said on Tuesday.

The news comes as Russia's economy is showing early signs of starting to recovering from recession while some of its larger companies again begin to attract funding on domestic and international markets.

The Stem Cell Institute, which has been valued at 500 million roubles, plans to place 25 percent of its capital in mid-November on the innovation and developing companies sector of Russia's MICEX exchange.

"We are counting on fairly major investors. Now there is a big number of well-to-do people who are looking for direction for their investments," said Maxim Dryomin, corporate finance director at Alor Group, which is organizing the placement.

The institute, which was founded in 2003, has its own bank of stem cells and develops its own medicines. Cash raised from the IPO will be spent on new projects in Russia and the CIS, and on the development of new products.

Artur Isayev, the company's general director and main shareholder, told Reuters he expects profits will rise 30-40 percent a year and sales at a similar pace.

Globally the institute has two competitors -- Cryo-Cell International (CCEL.OB) and Cryo-Save Group (CRYG.L) -- but neither develops medicines, he said.

Investors who look beyond Russia's main stock market and private equity investors remain keen on technology companies which often capitalize on Soviet-era scientific prowess.

The Russian government is also keen to diversify the economy from natural resources, the collapse in prices for which in the second half of 2008 helped push the country into recession.

Last summer, Russian fertilizer company Acron (AKRN.MM) postponed a London float, opting instead for a placement of Global Depository Receipts (GDRs).

Since then, state rail monopoly Russian Railways said its IPO will be delayed until at least 2011, and iron ore and steel firm Metalloinvest and Russian billionaire Oleg Deripaska's Strikeforce Mining and Resources scrapped placement plans.

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5. **New drug helps in reducing difficulty in collection of stem cells for treatment**

26 August, 2009

More and more doctors are using stem cell therapies to treat people suffering from cancer of blood. Doctors have to face difficulty in collecting enough stem cells from about one in 10 cancer patients to undergo treatment due to one reason or the other.

The new drug, Plerixafor, has solved many problems of doctors by contributing in collection of stem cells. The new drug has led to an improvement in stem cell treatment in cancer patients. The new drug has shown 100% success rate, giving new hope to many cancer patients.

This drug has successfully helped 13 patients in undergoing stem cell treatment. Plerixafor is presently used at the Beatson West of Scotland Cancer Centre in Glasgow but it is not yet licensed.

Blood specialist, Dr Kenneth Douglas explained that the drug works by blocking a chemical scent that stem cells sniff for that tells them they're in the bone marrow.

He said: "If you block that chemical scent they get confused and agitated and they think they are not in the bone marrow any more and they start wandering into the blood stream looking for the bone marrow."

Doctors are able to collect these wandering stem cells in the blood stream which can be later used for treatment.

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6. Wilmot Cancer Center Performs 1st Outpatient Stem Cell Transplant

26 August, 2009

The James P. Wilmot Cancer Center recently provided the first outpatient stem cell transplant in the Rochester area, a progressive move for a Bloomfield man who was able to recuperate at home, rather than in the hospital.

Marty Wheeler's outpatient transplant was a first of its kind in the region and was possible because of constant communication between caregivers and Wheeler's wife, Barbara, who oversaw his follow-up care at home.

The move opens the door for some people with cancer to receive the transplants without being hospitalized, said Gordon L. Phillips II, M.D., Ph.D., director of theSamuel E. Durand Blood and Marrow Transplant Program at the Wilmot Cancer Center, the only program in the Rochester and Finger Lakes region

"This is a significant step forward that we've been able to make because of the safety measures and support systems we've put in place for our patients," Phillips said. He praised the program's doctors, nurses and support staff for their work building systems to support future patients who can benefit from this.

Wheeler was diagnosed with multiple myeloma, a cancer of plasma cells, in January 2008 by Clifton Springs oncologist Bruce Yirinec, M.D. After a regimen of chemotherapy, Wheeler was referred to the Wilmot Cancer Center for his first autologous stem cell transplant in December 2008. Doctors used Wheeler's own healthy cells, collected earlier, to perform the transplant.

"When we first came to the Wilmot Cancer Center we were very impressed with the team of people who met with us, reviewed the whole process and answered all of our questions," Wheeler said.

He was hospitalized and "breezed through" that transplant with minimal side effects and was pleased to return to work quickly. He's a member of the human resources team at Thermo Fisher Scientific.

Wheeler's disease returned and Wilmot Cancer Center doctors began preparing for a second transplant in April. It's common practice for people with multiple myeloma to undergo tandem, or back-to-back, stem cell transplants, Phillips said.

"It was an ideal situation. He is a relatively healthy individual with a great home-based support system who had already done well with the first transplant," he said. "Our team created a solid education program for them and was in constant contact to ensure that Mr. Wheeler progressed well."

Heather Menchel, R.N., B.S.N., O.C.N., nurse manager for the Blood & Marrow Transplant Program, said there was a lot of responsibility for Barbara Wheeler, who took on the role of caretaker. She was constantly watching for signs of complications.

"We made it through because he's got a great attitude," Barbara Wheeler said of her husband. "And we agreed that although this is part of our life, it's not going to take over all aspects of our lives."

The Wilmot Cancer Center's Blood and Marrow Transplant Center performs about 130 transplants per year and is the second largest program in New York, behind Memorial Sloan Kettering Cancer Center.

People with a variety of cancers are able to get two types of transplants: autologous transplants using a person's own stem cells or marrow removed previously or allogenic transplant using cells or marrow from a matched or an unrelated donor.

The program was launched in 1989 and the team has performed more than 2,000 transplants. The center has seen significant success, with 100-day survival rates exceeding national benchmarks in all categories for marrow and stem cell transplants.

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7. Practice of storing teeth for stem cells sparks debate

24 August, 2009

The California Institute for Regenerative Medicine (CIRM) announced that it has awarded more than 10 million U.S. dollars in grants to promote stem cell research.

The grants, which will go to three universities in Southern California, are intended to generate new ideas for future therapies and lead to advances in understanding the basic mechanisms underlying stem cell biology, cellular plasticity and cellular differentiation,the CIRM said.

Alan Trounson, CIRM president, said the grants will help maintain the flow of ideas entering the research pipeline.

"These basic biology grants will generate new ideas for future therapies and also provide information to help overcome barriers in bringing therapies to patients," he said.

Grants of at least 1.3 million dollars each were awarded to the University of California in Los Angeles (USLA), the University of Southern California (USC) and the University of California in San Diego (UCSD), the CIRM said.

Pera, director of the Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC, said the funds should give new insight into how embryonic stem cells multiply in the laboratory and how they become specialized tissues.

"The scientists will also learn more about the reverse of this process, specifically how cells from adult tissues can undergo conversion to a state resembling embryonic cells," he said. "These findings will help in large-scale production of various specialized cells for use in research or the treatment of disease. "

Given their unique regenerative abilities, stem cells offer potential for treating diseases such as diabetes and heart disease.

CIRM was established in 2004 with the passage of Proposition 71, the California Stem Cell Research and Cures Act.

The statewide ballot measure, which provided three billion dollars in funding for stem cell research at California universities and research institutions, was approved by voters, and called for the establishment of an entity to make grants and provide loans for stem cell research, research facilities, and other research opportunities.

To date, the CIRM governing board has approved 294 research and facility grants totaling more than 761 million dollars, making CIRM the largest source of funding for human embryonic stem cell research in the world, the CIRM said.

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