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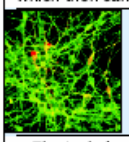
Stem cell pioneers win Nobel prize in medicine

MEDICAL MIRACLE

John Gurdon and Shinya Yamanaka share the 2012 Nobel Prize in medicine for their research on how animals develop. It offers hope for a new era of personalized medicine

- When a sperm fertilizes an egg there is just one type of cell. It multiplies and some of the resulting cells become specialized to create all the tissues of the body, including nerve and bone and skin
- Gurdon and Yamanaka found that ordinary cells can be reprogrammed into **stem cells**, which then can turn into any kind of tissue



- In 1962, Gurdon cloned a frog by transplanting the genetic material from an intestinal cell of one frog into the fertilized egg cell from another. The egg developed into a tadpole
- The technique would eventually give rise to Dolly the sheep, the first cloned mammal
- In 2006-7, instead of transferring genetic info into an egg, Yamanaka added four genes to skin cells which transformed them into stem cells, which in turn could become specialized cells
- Their research opens new frontier in regenerative medicine: a sample of a person's skin can be used to create stem cells, which can then be used to repair the heart after a heart attack or reverse the progress of diseases like Alzheimer's or Parkinson's
- Scientists want to build on the work by Gurdon and Yamanaka for studying in laboratory the roots of diseases, but without the ethical dilemma posed by embryonic stem cells

Shinya Yamanaka of Kyoto Univesrity, Japan, and John Gurdon of the Gurdon Institute in Cambridge

Stockholm: A British researcher and a Japanese scientist won the Nobel Prize in physiology or medicine on Monday for discovering that ordinary cells of the body can be reprogrammed into stem cells, which then can turn into any kind of tissue — a discovery that may led to new treatments.

Scientists want to build on the work by John Gurdon and Shinya Yamanaka to create replacement tissues for treating diseases like Parkinson's and diabetes, and for studying the roots of diseases in the laboratory — without the ethical dilemma posed by embryonic stem cells.

In announcing the $1.2 million award, the Nobel committee said the discovery has "revolutionized our understanding of how cells and organisms develop".

Gurdon showed in 1962 — the year Yamanaka was born — that the DNA from specialized cells of frogs, like skin or intestinal cells, could be used to generate new tadpoles. That showed the DNA still had its ability to drive the formation of all cells of the body.

At the time, the discovery had "no obvious therapeutic benefit at all", Gurdon told reporters in London. "It was almost 50 years before the value — the potential value — of that basic scientific research comes to light," he said. In 1997, the cloning of Dolly the sheep by other scientists showed that the same process Gurdon discovered in frogs would work in mammals. More than 40 years after Gurdon's discovery, in 2006, Yamanaka showed that a surprisingly simple recipe could turn mature cells back into primitive cells, which in turn could be prodded into different kinds of mature cells.

Basically, the primitive cells were the equivalent of embryonic stem cells, which had been embroiled in controversy because to get human embryonic cells, human embryos had to be destroyed.

Yamanaka's method provided a way to get such primitive cells without destroying embryos. "The discoveries of Gurdon and Yamanaka have shown that specialized cells can turn back the developmental clock under certain circumstances," the panel said.

Gurdon, 79, has served as a professor of cell biology at Cambridge University's Magdalene College and is currently at the Gurdon Institute in Cambridge. Yamanaka, 50, worked at the Gladstone Institute in San Francisco and Nara Institute of Science and Technology in Japan. Currently at Kyoto University, he is the first Japanese to win the Nobel medicine award since 1987. AP

Pursuing a career in science will be waste of time, tutor told Briton at 15

Veteran British scientist John Gurdon, who shared the Nobel Prize for medicine on Monday, is often described as the "godfather of cloning" for his work on stem cell research but was once told by his teacher not to pursue a career in science. Gurdon, born in 1933, rose to prominence in 1962 when he took the genetic code from a cell in a frog's intestines and transplanted it inside a frog egg, which developed into a normal tadpole. The pioneering research helped clear the way for further work on cell programming. Gurdon is fond of recalling that when he was 15, a tutor wrote in his school report that it would be a "total waste of time" if he followed a career in biology "and this whole idea should be immediately discouraged". He has said he keeps the report above his desk "for my amusement". AFP

Indian Express ND 09/10/2012P-1

Fingers crossed at AIIMS after stem cell transplant for MS, first in country

PRITHA CHATTERJEE
NEW DELHI, OCTOBER 8

DOCTORS at the All India Institute of Medical Sciences (AIIMS) have conducted a stem cell transplant on a multiple sclerosis (MS) patient. They believe this is the first recorded case of an autologous stem cell therapy—where the donor and recipient are the same person—for MS in the country.

Six months after the transplant, doctors say the spread of MS, an autoimmune disease that affects the brain and spinal cord, appears to have been contained but the therapy cannot be declared a success until the patient is monitored for at least a year.

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International trials have demonstrated that this transplant can restrict the spread of the disease in advanced patients, and may even reverse symptoms in early stages in some patients.

Thirty-two-year-old Rohit Yadav, a commerce graduate from Delhi University, was diagnosed with the neurological disorder in 2010. In March this year, after trying all possible "conventional" treatment options, doctors at AIIMS finally decided on stem cell therapy.

Dr Kameshwar Prasad, professor of neurology who has been monitoring Yadav, said: "The primary purpose of autologous stem cell transplant is to control the spread of lesions. We extract the patient's own stem cells, treat and inject the stem cells back. Ever since the procedure, the patient has been completely stable. To the best of our knowledge, this is the first case of stem cell therapy for MS."

CONTINUED ON PAGE 2

Fingers crossed after stem cell transplant

In MS, the body's own immune system attacks the myelin sheath that coats nerves, slowly destroying the central nervous system. Symptoms range from numbness and weakness in the limbs to sudden loss of balance and coordination, blurred vision and paralysis and, at the most advanced stage, disability.

There is no known permanent cure. About a dozen injectible 'disease-modifying drugs' in the broad category of interferons are available in India to control symptoms.

The only oral drug in the international market, Fingolimod, was put under restricted use by the US Food and Drug Administration (FDA) after the death of 11 patients earlier this year.

The procedure tried on Yadav has been under trial in the West, and is called autologous deceased haematopoietic stem cell transplantation.

Yadav's stem cells that generate body immunity were first extracted. He was put through a high-dose chemotherapy regimen to mitigate his faulty immune response system by destroying existing blood cells and the bone marrow which forms new blood cells.

During this period, Yadav was kept in an isolation room to ensure he did not contract any infection. After this, his own stem cells were injected back into the body. These new stem cells again formed the bone marrow and all cells in the blood, creating a new immune response system which, doctors believe, will not have the faulty autoimmune tendency.

Insisting that any improvement Yadav shows should be considered a "bonus", doctors say his speech has become clearer.

"Earlier, there was so much slurring in his speech that when I would be on the phone with him, I couldn't make out what he was saying. Now, after clinical evaluation, we find his speech is clearer," Prasad said.

Although doctors are still wary of commenting on any improvement in his motor abilities, Prasad points out that earlier a family member used to accompany Yadav to the hospital. But now, he comes to the hospital on his own.

But Prasad cautions against attributing any "magic solution" to stem cells. "A lot remains to be seen and observed. This is the first Indian MS patient who has had the stem cell transplant, so we need to see how he holds out in the long-term," he said.

Yadav told *The Indian Express* that what started as a slight limp in the left leg during his second year in college led to coordination problems in all four limbs. With time, he lost the ability to hold a pen and write. "I tried everything. Not only interferon injections, considered standard therapy for MS, but everything that anyone recommended, be it ayurveda, unani or homoeopathy. I changed my diet, stayed in a cool environment. No matter what I did, each time I had a scan, doctors said the disease was worsening," he said.

He read about stem cell therapy providing some hope to patients during trials in the West. "I had tried everything. This was the last option. I tried some private set-ups, but was not sure about their competence. At AIIMS, doctors were a little wary, given the risks associated with the long chemotherapy procedure, of contracting an infection after that."

In 2011, doctors admitted him for a stem cell procedure. But he was discharged because close evaluation of the scans of his brain and spinal cord showed no new lesions in six months. "It was heart breaking to be admitted and then discharged. But there was no use hurrying the procedure," he said.

A year later, new lesions were detected in his spinal cord, prompting doctors to admit him for the therapy. Fifty five days of hospital admission, with a week of chemotherapy to kill and build afresh his immune system, was not easy. "It was a challenging therapy, but I was prepared."

Yadav works as a receptionist at the office of Vishwas, a Gurgaon-based non-profit organisation working for the differently-abled.

"I feel a noticeable change in my speech. I used to slur a lot. But I can speak much clearer now. More importantly, the MS has not spread since March," he said.

ON NEW SHORES

IIM-I launches PG programme in Mumbai

HT Correspondent
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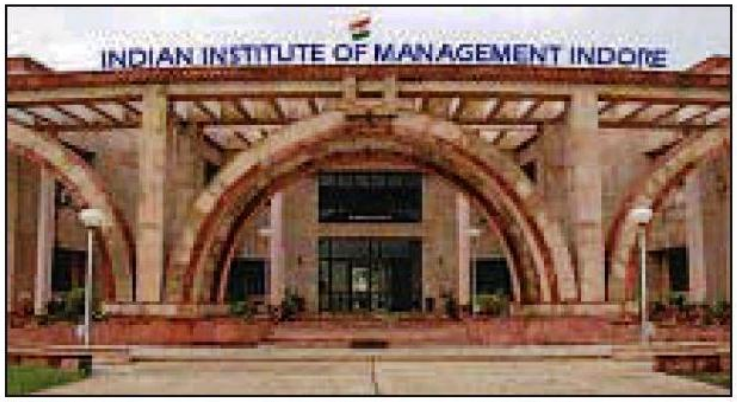
INDORE: The Indian Institute of Management Indore launched its flagship Post Graduate Programme in Management (PGP) in Mumbai on Monday.

PGP is a two-year regular and fulltime academic (non-residential) programme being offered by IIM Indore at Mumbai. Upon successful completion, the candidates will get Post Graduate Diploma in Management (PGDM) from IIM Indore (India) which is recognised by Association of Indian Universities (AIU) as equivalent to MBA degree of an Indian University.



PGP is a two-year regular, fulltime (non-residential) programme

The programme aims to groom participants into competent professional managers with a capacity to learn and adapt to national and international environment.

The two-year PGP is covered in six terms and the programme at Mumbai is similar to that at IIM Indore. The candidates admitted for PGP at Mumbai are required to complete the programme at Mumbai only.

To give PGP Mumbai participants a feel of campus life, they would visit IIM Indore campus for a term of three months in their last term.

During this campus immersion, the participants would take some elective courses along with the PGP students of IIM Indore.

While inaugurating the programme chairman IIM Indore K V Kamath gave an inspirational address and talked about the exciting future that awaits the participants.

At the same time, he observed that young leaders in an interconnected world must be sensitive to the priorities that need to be in focus for India's potential to be translated into reality.

Dainik Bhaskar, ND 9/10/2012 P-1

सीएम, केंद्रीय मंत्री उतारेंगे जमीन पर 'आकाश-2'

भास्कर एंकर ब्रांडिंग के मकसद से सिब्बल ने भेजा सबको टैबलेट, राज्यों में बढ़ सकेगा प्रचार-प्रसार, छात्रों तक नवंबर में पहुंचने की उम्मीद

पंकज कुमार पांडेय | नई दिल्ली

केंद्रीय मानव संसाधन मंत्री कपिल सिब्बल ने 'आकाश' की बड़े पैमाने पर ब्रांडिंग की शुरुआत अपने साथी केंद्रीय मंत्रियों और सभी राज्यों के मुख्यमंत्रियों को टैबलेट भेजकर की है। मानव संसाधन मंत्री की ओर से सभी राज्यों के मुख्यमंत्रियों को दो-दो टैबलेट भेजे जा रहे हैं। केंद्रीय मंत्रियों को भी ऐसे ही ट्रैबलेट भिजवाए जा रहे हैं। मानव संसाधन मंत्रालय केंद्रीय मंत्रियों और मुख्यमंत्रियों को 'आकाश' भेजने का मकसद इसके फीचर्स से उन्हें अवगत कराना बताया जा रहा है। तर्क यह भी है कि 'आकाश-2' के फीचर्स जानकर वे अपने प्रदेश में इसका प्रचार-प्रसार कर सकेंगे। सिब्बल ने इसके पहले गुजरात के मुख्यमंत्री नरेंद्र मोदी को टैबलेट भेजा था, लेकिन मोदी ने इसे स्वीकार नहीं किया। मोदी ने कटाक्ष किया था कि 'आकाश' जमीन पर नहीं उतरा। सिब्बल इस टैबलेट को देश का गौरव बताते हुए इसकी जमकर ब्रांडिंग कर रहे हैं। उनका कहना है कि टैबलेट पर पूरी दुनिया की निगाह है। सिब्बल कुछ महीने पहले अमेरिका के दौरे पर भी इस टैबलेट को लेकर गए थे और वहां भी इसे बतौर मॉडल पेश किया था। मगर छात्रों तक अभी भी यह नहीं पहुंचा है।

क्या करेंगे मंत्री जी

ज्यादातर मंत्रियों के पास आईपैड हैं। ऐसे में उनके लिए आकाश का क्या उपयोग? एक वरिष्ठ मंत्री ने कहा कि टैबलेट मंत्रियों को देने का मकसद उपयोग से ज्यादा इसकी महत्ता की पहचान करना हो सकता है।

लांच नवंबर में

मंत्रालय की योजना 11 नवंबर को टैबलेट बड़े पैमाने पर लांच करने की है। कैबिनेट में 50 लाख टैबलेट खरीदने का मसौदा जल्द पेश किए जाने की उम्मीद जाहिर की जा रही है। मंत्रालय सूत्रों का कहना है कि 'आकाश-2' टैबलेट को पूरी तरह से अपग्रेड किया गया है। 'आकाश-1' के कड़वे अनुभव से सबक लेते हुए आकाश-2 की स्क्रीन और इसमें लोड की शैक्षणिक सामग्री का कई बार परीक्षण किया गया है। आईआईटी मुंबई ने इस टैबलेट की तकनीकी क्षमता को बेहद प्रभावी बताया है।

फीडबैक का इंतजार

मंत्रालय के अधिकारियों का कहना है कि अब सभी मंत्रियों और मुख्यमंत्रियों तक यह टैबलेट पहुंचेगा तो इस पर ज्यादा से ज्यादा फीडबैक मिलेगा।

आम आदमी से जोड़

हमारी मंत्र उच्च शिक्षा के प्रत्येक छात्र के हाथ में 'आकाश' पहुंचाने की है। 'आकाश-2' इस देश में आम आदमी को सशक्त करने के प्रयास का प्रतिबिंब है। इसके जरिए विश्व स्तरीय तकनीकी को डिजिटल फॉर्म में जोड़ा जाएगा।

कपिल सिब्बल, केंद्रीय मानव संसाधन मंत्री