News Article Name	Highlights
◆ **Teeth stem cell raises hopes for stroke victims**	Simon Kobla, neurologist at the Queen Elizabeth Hospital and a neuroscientist at Adelaide University's Centre for Stem Cell Research says his research shows that stem cells from human teeth could be used to repair the brains of stroke victims
◆ **Researchers Launch Phase II Trial of Stem Cells and Acute Heart Attack**	The second phase of a clinical trial testing a new stem-cell-based therapy on injured heart muscle has been launched by researchers at The University of Texas Medical School at Houston
◆ **Gene Therapy and Stem Cells Save Limb**	Now, using mice as their model, researchers at Johns Hopkins have developed therapies that increase blood flow, improve movement and decrease tissue death and the need for amputation in diabetes
◆ **Stem cell therapy in Mumbai raises hopes**	A smile spreads across Margaret Advani's face as she gingerly walks up three steps of a Chembur building on Thursday, supported by a crutch and husband Venu's arm

1. Teeth stem cell raises hopes for stroke victims

7th December, 2009

An Adelaide doctor says his research shows that stem cells from human teeth could be used to repair the brains of stroke victims.

Simon Koblar is a neurologist at the Queen Elizabeth Hospital and a neuroscientist at Adelaide University's Centre for Stem Cell Research.

He will present his findings from eight years of research to a public lecture at Adelaide University.

Associate Professor Koblar says the treatment has the potential to dramatically improve the quality of life for stroke victims.

"Often people even in their 70s with good hygiene still have teeth, so it would be plausible to consider that if we find the benefit with these types of stem cells that you could even take people's teeth and grow their own stem cells which would be a major advantage," he said.

"Just a small increase in function can mean the difference between someone being employed or unemployed on disability so, because we're starting at such a poor base that we can do so little, a small increment of improvement would be absolutely fantastic."

Professor Koblar says human trials are still needed.

Source: ABC News

2. Researchers Launch Phase II Trial of Stem Cells and Acute Heart Attack

8th December, 2009

Results from Phase I of the trial are published in the Journal of the American College of Cardiology. Researchers reported that patients were treated safely with intravenous adult human mesenchymal stem cells (Prochymal) after a heart attack. In addition, they had fewer arrhythmias, improved heart and lung function, and improvement in overall condition.

"We are able to use a stem cell product that is on the shelf without prior preparation of anything from the patient, and this product appears to be able to help the heart muscle recover after a heart attack," said Ali E. Denktas, M.D., the trial's Houston site principal investigator and assistant professor of cardiology at the UT Medical School at Houston. "This means patients have the potential to recover quicker with less risk of an immediate secondary attack."

In many cell-based therapies, doctors harvest the patient's own cells, process them and then return them to the patient. Prochymal, developed by Osiris Therapeutics, Inc., contains adult mesenchymal stem cells from healthy donors. The cells can be stored at an emergency center until needed. For purposes of the Phase II study, Prochymal must be administered within seven days of a heart attack.

Researchers have just enrolled the first patient for the Phase II study at the Houston site. Heart attack patient Melvin Dyess, 49, received an intravenous infusion of either the stem cells or placebo as part of the protocol of the double-blind study. The procedure took place at the Memorial Hermann Heart & Vascular Institute-Texas Medical Center. Denktas said UT Medical School researchers will continue to enroll willing patients into the Phase II study who are admitted to Memorial Hermann-Texas Medical Center. Neither patients nor their physicians know whether they received the stem cell drug.

Affecting 1.1 million Americans every year, heart attacks are caused by disruptions to the heart's blood supply. Muscle cells can die within minutes of the blood being reduced or cut off. The body has a limited capacity to regenerate new heart muscles and repair wounds to the heart.

Denktas said while cell-based therapies including Prochymal appear to work, researchers are not sure why. Previous studies have shown that adult stem cells have a "homing device" that sends them to the point of injury in the human body.

"Studies with acute myocardial infarction (heart attack) show that if you give cells of some sort to the heart relatively quickly, five to 10 days after the heart attack, they nest themselves in the heart and the heart improves. But, why it improves is debatable," Denktas said. Adult mesenchymal stem cells appear to have anti-inflammatory, anti-fibrotic, and tissue regenerative capacities, as shown in both animal studies and human clinical trials, according to Osiris Therapeutics, Inc.

Lead author of the study is Joshua M. Hare, M.D., of the Cardiovascular Division and the Interdisciplinary Stem Cell Institute of the Miller School of Medicine at the University of Miami. In addition to UT Medical School, institutions involved in the Phase I study, which was funded by Osiris Therapeutics, Inc., included Minneapolis Heart Institute, Arizona Heart Institute, The Johns Hopkins Hospital, University of California San Diego, Heart Hospital of Austin, The Care Group in Indianapolis, Swedish Medical Center in Seattle, Rush University Medical Center and New York Presbyterian Hospital.

Source: Science Daily

3. Gene Therapy and Stem Cells Save Limb

8th December, 2009

Blood vessel blockage, a common condition in old age or diabetes, leads to low blood flow and results in low oxygen, which can kill cells and tissues. Such blockages can require amputation resulting in loss of limbs. Now, using mice as their model, researchers at Johns Hopkins have developed therapies that increase blood flow, improve movement and decrease tissue death and the need for amputation. The findings, published online last week in the early edition of the Proceedings of the National Academy of Sciences, hold promise for developing clinical therapies.

"In a young, healthy individual, hypoxia -- low oxygen levels -- triggers the body to make factors that help coordinate the growth of new blood vessels but this process doesn't work as well as we age," says Gregg Semenza, M.D., Ph.D., professor of pediatrics and genetic medicine and director of the vascular biology program at the Johns Hopkins Institute for Cell Engineering. "Now, with the help of gene therapy and stem cells we can help reactivate the body's response to hypoxia and save limbs."

Previously, Semenza's team generated a virus that carries the gene encoding an active form of the HIF-1 protein, which turns on genes necessary for building new blood vessels. When injected into the hind legs of otherwise healthy mice and rabbits that had been treated to reduce blood flow, the HIF-1 virus treatment partially restored blood flow.

In the current study, the team asked if the same gene therapy treatment could improve reduced blood flow associated with advanced age. Comparing 13 month old mice to 3 month old mice, blocking the femoral artery in the hind leg causes all older mice to lose their legs while only about a third of younger mice have to lose their legs. The research team treated young and old mice with the HIF-1 virus and examined blood flow and tissue health. They found that while treatment improved young mice, it did not make a noticeable difference in the older mice.

But, it was known that when HIF-1 normally activates signals in the body to build new vessels, one of the many types of cells recruited to the site of new vessel growth is a population of stem cells from the bone marrow, which are called bone marrow-derived angiogenic cells. So the team isolated these cells from mice and grew them under special conditions that would turn on HIF-1 in these cells.

When the researchers treated the mice with both the HIF-1 virus and simultaneously injected bone marrow-derived angiogenic cells, treated, older mice were less likely to lose their legs compared to their untreated counterparts.

Further study of these mice showed that activating HIF-1 in the cells appeared to turn on a number of genes that help these cells not only home to the ischemic limb, but to stay there once they arrive. To figure out how the cells stay where they're needed, the research team built a tiny microfluidic chamber and tested the cells' ability to stay stuck with fluid flowing around them at rates mimicking the flow of blood through vessels in the body. They found that cells under low oxygen conditions were better able to stay stuck only if those same cells had HIF-1 turned on.

"Our results are promising because they show that a combination of gene and cell therapy can improve the outcome in the case of critical limb ischemia associated with aging or diabetes," says Semenza. "And that's critical for bringing such treatment to the clinic."

The diabetes study was funded by The American Diabetes Association and the Johns Hopkins Institute for Cell Engineering. Authors on the paper are Kakali Sarkar, Karen Fox-Talbot, Charles Steenbergen, Marta Bosch-Marce and Semenza all of Johns Hopkins.

The aging study was funded by the National Institutes of Health, the Gene Therapy Resource Program of the National Heart, Lung and Blood Institute, the Chilean Ministry of Planning and the Department of Nephrology of the School of Medicine at Pontificia Universidad Catolica de Chile. Authors on the paper are Sergio Rey, KangAe Lee, Joanne Wang, Kshitiz Gupta, Shaoping Chen, Alexandra McMillan, Nupura Bhise, Andre Levchenko and Semenza, all of Johns Hopkins.

Source: Science Daily

4. Stem cell therapy in Mumbai raises hopes

8th December, 2009

"I had been waiting for this day for six years," said the 60-year-old Karachi resident, who had been paralysed neck-down after a fall severed a part of her spinal cord.

Physiotherapy and treatment at a rehabilitation centre in Toronto had failed to improve her condition. Venu brought Margaret to NeuroGen Brain and Spine Institute in Mumbai for stem cell therapy as a last resort. Stem cells extracted from Advani's hip bone marrow were injected into her spinal fluid three weeks ago at the Chembur centre.

The couple knew they had made the right decision when Margaret felt the doctor's hand on her arm a day after the procedure. "I had had no sensation in that arm for years," she said.

Margaret is among a growing number of people opting for stem cell therapy for incurable conditions like spinal cord injury and multiple sclerosis.

The wait-list of over 200 patients at the civic-run Sion Hospital, which offers the expensive treatment for free, includes names from the US and the UK. This, perhaps, indicates India's growing expertise in the field.

"We are getting 15 to 20 enquiries every month now compared to around 10 when we started in October 2008," said Dr Alok Sharma, who heads the Sion Hospital centre.

Despite lack of comprehensive studies on the efficacy of the treatment, people are queuing up. Advani plans to return to Mumbai in February for a second shot of stem cells. "Next time, I will come on my own feet, not in a wheelchair," she said.

Source: Hindustan Times