

**LifeCell – Daily News Update**

**August 6 , 2009**

**Direct News:**

Publication	hindu.com
Headline	<a href="#"><u>Bone marrow stem cell treatment saves legs</u></a>
Gist of the article	<p>The results of a clinical trial to save volunteers' leg from amputation by injecting stem cell concentrate to the limb affected by thrombo angitis obliterance (TAO) have been encouraging. The stem cells were taken from the patients' bone marrow.</p> <p>The clinical trial is being conducted on patients suffering from blocks in the artery of the leg. Sixty patients were enrolled in the trial, and all of them were smokers. Some had diabetes as well.</p> <p>Thirty nine of the 44 patients who had already undergone the mandatory 6-month follow-up did not require amputation following stem cell injection to the affected legs. Follow-up of the remaining 16 patients is under way.</p> <p>The last patient, enrolled on May 25, will complete his six-month follow up in November.</p> <p>"We have got very good results," said Dr. K.S. Vijayaragavan. "The legs of 89 per cent of the patients have been saved." Dr. Vijayaragavan, Head of the Department of Vascular Surgery, Sri Ramachandra University, Chennai, is conducting the trial.</p> <p>According to him, the failure to save the leg of five patients was because they continued to smoke even after stem cell injection. Immediate and complete cessation of smoking is the most basic and important requirement for saving the leg. Diabetes should also be under control.</p> <p>Unlike in the case of atherosclerosis caused by cholesterol, blocks seen in legs are caused mainly by nicotine. Nicotine in the blood causes the muscles of the arteries to constrict. It also damages the vessel's inner lining. The problems get compounded if the patient has diabetes.</p> <p>While nicotine damages all of the body's arteries equally, the legs are affected the most. That is because the legs depend on one narrow artery for blood supply and there are fewer smaller vessels branching off from the artery (collaterals).</p>

	<p>Tobacco in any form can cause TAO. And TAO very often affects younger people around 40 years of age.</p> <p>The injection of stem cells would therefore help in creating new collaterals and these would provide the vital conduit for blood flow to the parts of the leg below the block. "The stem cells injected help in angiogenesis," said Dr. Vijayaragavan.</p> <p>"We did not see any great difference in angiogenesis between the two groups [one that got stem cell injections very close to the blood vessel, and the second group that got injections close to the vessel and as well as into the main artery above the block]," he said.</p> <p>Despite the success of the current trial, Dr. Vijayaragavan insists that stem cell injection should be the last option.</p> <p>"The first line of treatment is a by-pass," he said. "Angioplasty is not recommended as the first-line treatment. The success rate [of angioplasty] is less than 50 per cent."</p> <p>Despite the success seen so far in this trial, more such trials involving more volunteers are necessary before this treatment can be offered as a regular treatment modality.</p> <p>The Chennai based LifeCell International, a private cord blood bank, is an equity partner at TRICell Stem Cell Centre, which is based at the Sri Ramachandra University, where the trial is being conducted.</p>
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**Key Industry News:**

Publication	citizenlink.org
Headline	<a href="#"><b>Adult Stem Cells Help Grow Teeth</b></a>
Gist of the article	<p>Japanese researchers have made teeth from adult stem cells. They grew a tooth bud and implanted it in a laboratory mouse. In seven weeks a new tooth had grown.</p> <p>The teeth were "fully-functional," sensitive to pain and chewed food easily.</p> <p>Ben Kinchlow, founder and co-chair of the Adult Stem Cell Information Coalition, said the discovery highlights the superiority of the noncontroversial research.</p> <p>"Adult stem cells, which are produced in your own body, can be taken and transplanted in your own body to create many of these things like new</p>

	organs or to repair damaged organs," he said.
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Publication	emaxhealth.com
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Headline	<a href="#"><u>Researching Stem Cells For Cardiac Treatment</u></a>
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Gist of the article	<p>As the debate over using stem cells for medical research continues at the national level, researchers and clinicians at The Ohio State University Medical Center are studying the effectiveness of using non-embryonic stem cells to regenerate heart muscle to improve outcomes for patients.</p> <p>Earlier this year, Ohio State researchers found that "pretreating" adult stem cells with an anti-angina drug allows them to better adapt to the harsh environment of their transplantation site. Scientists are studying whether transplanted cells eliminate or slow the tissue deterioration that would lead to heart failure.</p> <p>In research published in the Journal of Pharmacology and Experimental Therapeutics, adult stem cells from the bone marrow of rats were pretreated with the drug trimetazidine, or TMZ. The stem cells were then grown under low oxygen conditions to mimic their native and destination environments, and then exposed to stressful conditions that exist in the damaged heart tissue. The pretreated stem cells provided a substantially better therapeutic effect in restoring heart function.</p> <p>"Transplanted stem cells can repair many types of damaged tissue, including heart tissue," says Dr. Periannan Kuppusamy, associate director of the Ohio State Medical Center's Dorothy M. Davis Heart and Lung Research Institute. "However, most of the stem cells transplanted in the heart die within a few days due to lack of oxygen and nutrients."</p> <p>Stem cell-based cardiac therapy is an experimental procedure in which stem cells are transplanted to the damaged region of the heart in patients who have suffered a heart attack. Funding from the National Institutes of Health supported Kuppusamy's research.</p> <p>In early 2008, OSU Medical Center's Richard M. Ross Heart Hospital began collaborating with Arteriocyte, a biotechnology company created at Case Western Reserve University, to develop stem-cell therapies for human use.</p> <p>"The biggest challenge is that heart muscle doesn't typically regenerate," says Dr. Vincent Pompili, Ohio State's director of cardiovascular cell-based therapies, who previously served at University Hospitals Case Medical Center. "These studies are allowing us to study individual disease processes and identify ways to accelerate the body's healing mechanisms."</p> <p>Two recent Phase I trials offer a glimpse into the potential of stem-cell therapy. The first infused a very low dose of umbilical cord blood stem cells</p>
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	<p>into patients with chronic ischemia, a condition characterized by a constant lack of blood and oxygen supply to the heart. After receiving the stem cells, a significant number of trial participants saw improved blood flow to the heart. According to Pompili, this resulted from the stem cells' ability to help the body repair itself.</p> <p>The second study examined the effect of human umbilical cord blood stem cells in genetically-engineered mice experiencing a chronic lack of blood flow to one of their limbs. One month after stem cell infusion, researchers noted nearly normal blood flow in the mice limbs.</p> <p>"Although this research is still in its early stages, it holds great promise as a potential therapy for patients suffering from a chronic lack of blood flow to and from the heart," adds Pompili, who also serves as Ohio State's section director of interventional cardiology. "Ohio State's partnership with biotechnology companies illustrates our commitment to offering stem cell therapies in cardiovascular medicine."</p>
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Publication	physorg.com
Headline	<a href="#">Researchers learn how blood cells 'talk'</a>
Gist of the article	<p>Researchers at the University of Toronto have developed a new model that explains how cells communicate and specifically reveals how blood cells "talk" to each other. The result could help transform treatments for diseases such as leukemia.</p> <p>The paper, published online by the journal Molecular Systems Biology, details how a team led by Canada Research Chair in Stem Cell Bioengineering Professor Peter Zandstra (Institute of Biomaterials and Biomedical Engineering, Department of Chemical Engineering and Applied Chemistry) revealed a new mathematical model that links functional cellular assays to specific model outputs, defines cell-level kinetic parameters such as cell cycle rates and self-renewal probabilities as functions of culture variables, and simulates feedback regulation using cell-cell interaction networks.</p> <p>Blood stem cell transplantation is used to treat and cure genetic blood diseases, such as anemia, and blood cancers like leukemia and lymphoma. Usually, the more blood stem cells you have to transplant, the better the outcome. But while there is great demand, there is not a large supply, primarily because it is so hard to grow blood stem cells in vitro. Scientists have been working for years to expand these cells, but nobody has yet been able to find a robust and reliable method.</p> <p>"The goal of our study was to understand what regulated human blood stem cell growth outside of the body," said Daniel Kirouac, lead author and a PhD student in the Institute for Biomaterials and Biomedical Engineering.</p> <p>"In the human body, cells talk to each other using secreted factors. Sometimes they send messages that encourage cell growth and sometimes they send messages that disrupt cell growth," said Zandstra, who is also</p>

	<p>affiliated with the Terrence Donnelly Centre for Cellular and Biomolecular Research and the R. Samuel McLaughlin Centre for Molecular Medicine at the University of Toronto and McEwen Centre for Regenerative Medicine at the University Health Network. "Our model provides a formal framework to try to understand the codes that cells use in this communication system."</p> <p>The team tested their model predictions by culturing umbilical cord blood stem cells and measured the effects of specific manipulations on blood stem and progenitors cell output. They found that they could influence communication between cells, disrupting cellular cross-talk that hindered growth and encouraging cross-talk that stimulated growth. The new model is a useful tool to simulate blood culture outputs and to test, in computer simulations, new ideas about how to improve blood stem cell growth.</p> <p>"We've applied this model to cell cultures in various configurations, and also expanded it to provide insight into how blood stem cells may be regulated in humans under normal and abnormal conditions, such as in patients with leukemia. We can use a computer to predict conditions for enhanced blood stem cell growth outside of the body," says Prof. Zandstra. This should contribute towards efforts to generate a greater supply of blood stem cells for transplantation, which would greatly impact the hundreds of thousands of people suffering from blood diseases and cancers around the world.</p>
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Publication	isracast.com
Headline	<a href="#"><u>Bone Marrow Transplantation Center, National Umbilical Cord Blood Bank</u></a>
Gist of the article	<p>The Bone Marrow Transplantation Department at Hadassah Hebrew University Medical Center operates as a national center for bone marrow transplantation and stem-cell-based medicine. The department uses stem cells from various sources including bone marrow, peripheral blood, umbilical cord blood and the placenta.</p> <p>The department treats patients of all ages who are in need of bone marrow transplantation. Treatment is provided within an integrated setting including both inpatient and ambulatory treatment centers. The department includes a laboratory complex which is affiliated with the Hebrew University's School of Medicine.</p> <p>The laboratory's team, headed by Prof. Reuven Or, includes a number of highly respected and accomplished scientists who conduct advanced research with a focus on the immuno-biological mechanism of stem cells derived from cord blood and bone marrow.</p>

Publication	hindu.com
Headline	<a href="#"><u>They learnt the hard way</u></a>
Gist of the article	G. Ranganathan, a 50-year-old man from Thanjavur district, Tamil Nadu, is one of the 44 patients whose leg has been saved by stem cell treatment.

He had already lost his right leg due to TAO. He has been smoking for the last 25-odd years.

“My right leg was amputated in 2005 and doctors had advised me to stop smoking. But I started smoking for 6-months after stopping it for nearly one-and-half years,” he said.

Though his leg has been saved, the toes could not be saved.

He has no pain while resting. “I can walk for about 20 feet. But the shoe hurts me when I walk,” he said.

Just like Ranganathan, V. Malliswaran of Vellore, Tamil Nadu, also has no toes in his left leg that has been saved by the stem cell treatment.

A smoker for the last 15 years, the 38-year-old Malliswaran has quit smoking after the treatment.

Fifty-nine-year old S. Mohammed Ibrahim of Vellore, Tamil Nadu, is lucky, though. “Before the [stem cell] treatment I could not walk more than 20 feet,” he said, “but today I can walk for even 1 km.”

“I have no pain in my leg after the treatment,” he said. “I am able to go to work.”

He has stopped smoking after the treatment, though he once used to smoke 50-60 cigarettes a day. He started smoking when he was 18 years old.

His toes had no nails and he had boils on his toes before the stem cell treatment. “All my toes have nails now and there are no boils,” Ibrahim said.