

LifeCell- Daily News Update

June 30, 2009

Key Industry News:

Publication	nst.com.my
Headline	Stem cell option
Gist of the article	<p>STEM cells obtained from umbilical cord blood is emerging as a treatment option for patients with thalassaemia, the most common inherited single gene disorder in the world.</p> <p>According to statistics released by the Ministry of Health, one in twenty Malaysians are carriers of the thalassaemic trait. The World Health Organisation estimates that Malaysia will have over 250,000 symptomatic thalassaemia patients diagnosed over the next few decades.</p> <p>“The first successful case of bone marrow (stem cell) transplant for thalassaemia was reported in 1981, and this method became increasingly popular. The first case where cord blood was used for thalassaemia was in Thailand, in 1995,” said Prof Dr Aw Tar Choon, chief medical officer of StemLife, a Malaysian-based company providing stem cell-banking storage services.</p> <p>He said cord blood stem cells were first used for a thalassaemia patient in Malaysia in 1997 and as of 2006, 120 stem cell transplants have been done for haemoglobinopathies in Malaysia, as noted in the Ministry of Health’s 3rd Report of National Transplant Registry 2006. StemLife itself released two cord blood units for transplant for two thalassaemia patients; one in 2006, and the other in 2008.</p> <p>Dr Aw said the number of transplants conducted for this condition, using cord blood stem cells, are still low due to the lack of awareness and the lack of availability of a stem cell source.</p> <p>“Today, there are still many patients being treated through blood transfusions and iron chelation drugs, limiting the patient’s lifespan to around 40 years old.</p> <p>“Cord blood is known to have a lower risk of inducing graft versus host disease in patients, compared to bone marrow. Another advantage is that tissue matching when using cord blood does not need to be perfect, (a 4/6 match is still acceptable) enabling the use of cord blood for a wider range of</p>

	<p>individuals. Cord blood is also easily collected, unlike bone marrow, where the donor has to undergo surgery for the extraction of cells. Cord blood is collected upon delivery, by a simple and painless collection procedure through the umbilical vein.”</p> <p>Although the process can be done to reverse thalassemia in adults when a tissue match is found, there will be higher success rates in younger patients. Dr Aw said the outcome may not be as high in older patients as the patient’s body may be compromised by the iron overload from the regular blood transfusions.</p> <p>Patients who successfully undergo the process will be cured completely.</p> <p>“For the first year, as the patient is being given cells that are not from himself, he will be given medication to suppress immunity and minimise the risk of ‘graft versus host disease’, and to allow the cord blood stem cells to engraft and reconstitute the marrow. After 12 months, this medication can be tailed off. No more blood transfusions will be required.”</p>
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Publication	cbsnews.com
Headline	<u>Fixing The Heart With Stem Cells</u>
Gist of the article	<p>In a heart attack, the blood supply to part of the heart is shut off by a clot in a clogged artery - causing scarring of the heart muscle, which reduces the ability of the heart to pump.</p> <p>The best that doctors have been able to do is to promptly open up the clogged artery and limit the damage with drugs. But one day, there may be a way to get that damaged heart to grow its own brand-new muscle tissue. How? By using the patient's own cardiac stem cells.</p> <p>This week doctors in Los Angeles have given a heart attack patient an infusion of stem cells grown from his own heart muscle.</p> <p>It's a first, as CBS News correspondent Bill Whitaker reports. It was mid-May when 39-year-old Ken Milles was blindsided by a serious heart attack - and the doctor's bad news. Milles said, "When he told me that there was permanent damage and that the duration of my life was reduced - that freaked me out."</p> <p>Especially since the construction company employee has a wife and two teen-aged boys. So he volunteered be one of 24 recent heart attack patients in a cutting-edge clinical trial at the Cedars-Sinai Heart Institute - becoming the first person ever to get an infusion of his own heart stem cells.</p> <p>"We seek to actually reverse the injury that has been caused by the heart</p>

	<p>attack, by re-growing new heart muscle to at least partially replace the scar that's formed," says Dr. Eduardo Marban of Cedars-Sinai Heart Institute.</p> <p>Doctors are using stem cells, the body's master cells, because they can transform into different kinds of tissue. Marban says, "These cells that we're putting in come from the heart itself, and are predestined to generate heart muscle and blood vessels."</p> <p>Other types of stem cells, like bone marrow, have been studied for heart repair, but with mixed results. Animal studies indicate heart stem cells do a better job. The problem is: the heart has so few stem cells that researchers have to grow more.</p> <p>Using local anesthesia, doctors first send a catheter with little pincers to snip out bits of healthy heart tissue. They're sent to the laboratory where they're coaxed to manufacture as many as 25,000,000 stem cells.</p> <p>In a trailblazing procedure new cells grow spontaneously from the specimens eventually forming into clusters called "cardio-spheres" that can even start beating in the dish. In 4 to 6 weeks, there are millions of stem cells.</p> <p>A few days ago, doctors went back up an artery to deposit Ken Milles's own laboratory-grown stem and support cells into the damaged area of his heart -- hoping it'll repair itself and pump more blood. "If this works, it's gonna help so many people. It's gonna change everything," said Milles.</p> <p>In 6 months, doctors will know if Ken's heart has begun to repair itself. Clinical trials should be completed in three to four years.</p>
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Publication	aish.com
Headline	<u>Is the destruction of preexisting pre-embryos permitted for stem cell research?</u>
Gist of the article	<p>Today, a man lies dying of liver failure in a hospital. There is little expectation that he will be one of the lucky few to receive a transplant before he becomes too ill to save. Even if he did receive a transplant, he will be burdened with taking multiple anti-rejection drugs for the rest of his life, which in and of themselves would significantly compromise his health.</p> <p>Tomorrow, scientists develop a method to build this man a new liver, one that would be a perfect match for him, requiring no anti-rejection drugs whatsoever. There is a catch. To perfect such a solution would require the destruction of other lives. Would Judaism sanction such a solution?</p> <p>Jewish law clearly forbids the taking of one life to save another. The Talmud forbids saving one's life at the expense of another by asking how one knows that his life is more valuable than his neighbor's. Perhaps your neighbor's life is more valuable.</p>

	<p>WHEN THE FETUS IS A THREAT TO LIFE</p> <p>One may kill someone who is unjustly pursuing a third party to kill him. But, what if the life that would need to be sacrificed was that of a fetus? May we permit abortion to save the life of an already born person? The Mishna clearly states that if the life of a woman in labor is threatened by her fetus, the fetus should be aborted. But once a portion of the baby has emerged, we may not abort the fetus, because "one may not set aside one person's life for the sake of another." The principle behind this ruling is that one may kill someone who is unjustly pursuing a third party to kill him. Since the fetus, who is not yet considered a "complete" person, is "pursuing" the mother in a way that will inevitably result in her death, we may kill it first. But, once it has even partially emerged, it is considered a full-fledged person. Now we are faced with a dilemma, states Rabbi Moshe Feinstein, one of the most respected rabbis of the 20th century: who is pursuing whom?</p> <p>WHEN PURSUING EACH OTHER</p> <p>Imagine that you are transported back in time to Weehawken, New Jersey, on July 11, 1804. As you step out of the time machine you see Aaron Burr, pulling out a revolver to shoot Alexander Hamilton, Former United States Secretary Of The Treasury. Simultaneously, you see Hamilton also drawing his revolver to kill Burr! What should you do? Kill Burr? Kill Hamilton? Jewish law would rule that you may kill neither, because they are pursuing each other and you do not know which one, if either, is an innocent party. In our case of the baby struggling to be born at the expense of the mother and the mother struggling to survive at the expense of the fetus, are not the baby and the mother each "pursuing" the other? In such a case, the general rule is that we may not choose either, since each is a complete and autonomous person, and each is both the pursuer and the pursued. Luckily for us, these scenarios are very rare occurrences in our day thanks to Caesarian sections.</p> <p>A life-threatening situation for another adult would not justify our killing a fetus.</p> <p>But, since the rationale for abortion in Jewish law is based on the fetus being a pursuer of the mother, a life-threatening situation for another adult would not justify our killing a fetus, since the fetus does not threaten the life of anyone except the mother. Therefore, we cannot allow abortion, even to save the life of our patient with liver failure.</p>
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Publication	columbiatribune.com
Headline	Pig tissues offer stem cell hope
Gist of the article	<p>University of Missouri researchers have become some of the first in the world to transform connective tissue cells from a pig into stem cells capable of becoming any part of the anatomy.</p> <p>The achievement, published in the scientific journal PNAS, comes within weeks of two separate Chinese research groups publishing similar findings on pig stem cells. This flurry of discoveries mark the first steps in what will</p>

likely be a long road of trial and error needed to produce a safe, effective method to induce adult pig cells to become stem cells that can be used to grow or repair organs.

The method used by the MU researchers was to remove the connective tissue cells, known as fibroblasts, from a pig fetus and transfer them to a controlled medium. Researchers then used a specially designed retrovirus to insert four “reprogramming” genes into the cells’ DNA. These four genes reprogrammed the cells to behave like stem cells. The cells then continued to reproduce at a normal rate, and a small percentage of them exhibited the attributes of stem cells, including the presence of the protein OCT4, a key marker for “undifferentiated cells.”

The key attribute of these stem cells and what gets scientists most excited is that they are “pluripotent,” meaning they are capable of differentiating into any of the 250 types of cells — nerve, heart or muscle — found in an adult pig. These stem cells are nearly identical to those found in embryos, which later differentiate inside the mother’s womb to become different parts of the body.

But R. Michael Roberts, an MU curator’s professor of animal science and biochemistry and one of the co-authors of the research, downplayed the significance of what his team has done. He said the important work is yet to come.

“There was nothing, basically, really innovative about the approach,” said Roberts, who said the real breakthrough occurred three years ago when two Japanese researchers discovered that reprogramming of fibroblasts was possible. “That was a bombshell,” he said.

The key advance by the MU researchers was applying this reprogramming method to the pig, a complex animal genetically similar to humans.

“This is a major step forward,” said Randall Prather of the MU Division of Animal Sciences, who has done research on adult pig stem cells. “Pigs are often the species of choice to use to study what might happen in humans. A prime example is cardiovascular disease. The other species that are often used for research just don’t mimic the human system the way a pig does.”

Pigs, Prather said, are about three times closer to a human than the mouse, which has been the focus of much of the research to this point. Pigs might someday serve as hosts producing tissue and organ transplants for humans, Prather said.

But Roberts said there is much work to be done before that can be considered. The next step will be figuring out a way to remove the four reprogramming genes after they’ve done their jobs. These genes continue to

	<p>express themselves as the stem cells divide, and their existence might prevent proper cell differentiation.</p> <p>“Ultimately, we’re going to have to go back and do this without using retroviruses or using retroviruses and then coming back and clipping them out,” Roberts said. The job of developing a vector that can remove these genes will be the job of Toshihiko Ezashi, a research assistant professor of animal sciences at MU and lead author on the study.</p> <p>But despite the many unknowns, there are two main reasons the research is noteworthy. First, the cells are not harvested from embryos and do not involve cloning, so the research avoids ethical questions related to such stem cell use. And second, because the connective tissue cells could be taken from a patient, reprogrammed, differentiated into a new type of tissue and then grafted back into the same patient, it makes it much less likely that the patient’s body would reject the new tissue. It would be like getting a transplant from yourself.</p> <p>But there is still a long road before any of that happens, Roberts said.</p> <p>“Everybody is talking about stem cells, saying, ‘They’re wonderful; they’re going to be used for tissue regeneration; they’re going to be used to graft this and that,’ ” he said. “But you’d be crazy to do this” on humans “until you know the safety risks.”</p>
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Publication	dailyrecord.co.uk
Headline	New hope for diabetics after stem cell discovery
Gist of the article	<p>A DRUG said to cure diabetes could mean that sufferers will no longer need to take daily insulin injections.</p> <p>The treatment uses stem cells made from human bone marrow and has been tested on patients suffering from Type 1 diabetes - which affects about 900,000 people in Britain.</p> <p>Diabetes causes the immune system to attack the pancreas, the organ that makes insulin, which then controls blood-sugar levels.</p> <p>Sufferers must take insulin injections to stay alive because if blood-sugar levels are allowed to rise too high or get too low, they could fall into a coma and die.</p> <p>But early trials by American scientists have shown that the drug Prochymal can stop the immune system destroying the pancreas.</p> <p>It is hoped the drug could be on the market in less than two years.</p> <p>Professor Aaron Vinik, a hormone specialist in Norfolk, Virginia, said the cure could change diabetes sufferers' lives.</p> <p>He said: "This is a very exciting discovery.</p> <p>Shock "When people get told they have diabetes, it comes as a tremendous shock. "They have to live with having to take insulin injections for the rest of</p>

their lives."In future, we will have a cure that will stop the disease in its tracks."

Prochymal has proved effective because stem cells in the drug form a barrier to protect the pancreas from attack. This allows the organ to recover and to continue making insulin.

The stem cells are taken from volunteers and then multiplied in the lab to produce hundreds of millions of cells.

In early tests, patients have been given three infusions of the cells into their bloodstream over 60 days.It has been tested on 60 patients with early diabetes.Those already on insulin were able to reduce the amount as the stem cells started saving the pancreas.

Prof Vinik said most patients would still need insulin at first but would probably be off it "in a matter of months".