LifeCell – Daily News Update
October 21, 2009

Key Industry News:

Publication	**Wndu.com**
Headline	Infusing stem cells to heal heart
Gist of the article	Infusing stem cells to heal the heart find out how doctors are doing it without surgery, in Tuesday's Medical Moment. Some are calling it the next big frontier in cardiac treatment injecting stem cells to regenerate the heart. But, the experimental procedure means major surgery. Now doctors are opening the door for heart patients who want to test the benefits of stem cells without an operation. One heart attack behind him, Max Eaton is now struggling with heart failure. He's hoping stem cells are the answer to heal his ailing heart. "Happened to run into this article which was the second or third time I heard about this stem cell research and decided nothing ventured, nothing gained," Max said. Instead of surgery where the chest is opened and stem cells are injected into the heart. Dr. Alan Heldman delivers the cells through a catheter that's threaded through the groin. The spiral-shaped needle at the tip is screwed into the heart. "We can now inject the cells exactly where we want to in the inside part of the heart, and we can do it in multiple different locations," Dr. Joshua Hare, Cardiologist at the University of Miami said. Doctors say it's a more efficient way of delivering stem cells. "By using this needle that has a corkscrew-shaped tip, we have some evidence that the fraction of cells that actually stay in the heart as opposed to leaking out through the injection tract is much higher," Dr. Alan W. Heldman, Interventional Cardiologist at the University of Miami said. Dr. Hare says, using a catheter could allow millions more people to be

	treated who aren't strong enough for surgery. "This could become an outpatient procedure or maybe a one night in the hospital type of procedure," Hare said Max was eager to be first in line despite risks like damage to the heart and blood vessels. "The small risk of doing something and perhaps maintaining a reasonable lifestyle a little seemed well worth it," Max said Now, he's hoping his wager on stem cells pays off. Doctors say Max is responding well to his stem cell treatment. All of the stem cells being used in this trial are adult stem cells. Studies have shown injecting heart attack patients with adult stem cells increased the pumping power of the heart.

Publication	**news.ucdavis.edu**
Headline	**Growing Cartilage from Stem Cells**
Gist of the article	Damaged knee joints might one day be repaired with cartilage grown from stem cells in a laboratory, based on research by Professor Kyriacos Athanasiou, chair of the UC Davis Department of Biomedical Engineering and his colleagues. Using adult stem cells from bone marrow and skin as well as human embryonic stem cells, Athanasiou and his group have already grown cartilage tissue in the lab. Now they are experimenting with various chemical and mechanical stimuli to improve its properties. Cartilage is one of the very rare tissues that lacks the ability to heal itself. When damaged by injury or osteoarthritis, the effects can be long-lasting and devastating. “If I cut a tiny line on articular cartilage (the cartilage that covers the surfaces of bones at joints), it will never be erased,” Athanasiou said. “It’s like writing on the moon. If I go back to look at it a year later, it will look exactly the same.” Work that Athanasiou's group began in the early 1990s at Rice University has resulted in the only FDA-approved products for treatment of small lesions on articular cartilage. (In total, Athanaisou’s patents have resulted in 15 FDA-approved products.) "This will be live, biological cartilage that will not only fill defects,

	but will potentially be able to resurface the entire surface of joints that have been destroyed by osteoarthritis," Athanasiou said. Currently, joint replacements using metal and plastic prosthetics are the only recourse for the one in five adults who will suffer major joint damage from osteoarthritis.

Publication	**blogs.sciencemag.org**
Headline	**iPS Cells and the Peak of Inflated Expectations**
Gist of the article	If you've been reading science news stories for the past couple of years, you've probably heard that induced pluripotent stem (iPS) cells are the next big thing. They have many of the same talents as embryonic stem cells, but they don't carry the ethical baggage. That's because iPS cells don't require the destruction of embryos: They can be created by reprogramming skin or other cells from any adult--including patients with nervous system disorders. Although iPS cells may one day be used as treatments, right now many researchers are using them primarily as research tools. This morning I stopped by a session on iPS cells to get a sense of how things are progressing. Allison Ebert of the University of Wisconsin gave a nice overview of a flurry of recent papers demonstrating the use of iPS cells derived from neurological patients. The first was a 2008 Science paper that used skin cells taken from an 82 year old woman with amyotrophic lateral sclerosis to create iPS cells and coax them to differentiate into motor neurons. Earlier this year, Ebert and colleagues reported in Nature that they'd derived iPS cells and created motor neurons from a patient with another neuromuscular disorder, spinal motor ataxia (SMA). She and her colleagues are studying these cells for clues about why motor neurons die off in SMA. One early hint, she reported, is that genes involved in apoptosis, or programmed cell death, seem to be upregulated in these cells. Ricardo Dolmetsch of Stanford spoke about his group's efforts to create iPS cells from patients with a range of different autism-related disorders and examine the resulting neurons for abnormalities in gene expression, fine-scale anatomy and electrophysiology. Jason Chiang, a fifth year graduate student at Johns Hopkins University, described his work with iPS cells from two people with trisomy 13, a profoundly debilitating neurodevelopmental disorder for which there is no good animal model. Chiang presented evidence that defects in cell signaling pathways involving Wnt proteins, key regulators of neural development, may be involved in the neurological aspects of the disorder. Dolmetsch summed up the state of the field at the end of his talk, throwing up a slide from a tech consulting firm that traces (in a slightly tongue-in-cheek fashion) the stages of a new technology as it

	progresses from the "peak of inflated expectations" to the "trough of disillusionment" to the "slope of enlightenment," finally arriving at the "plateau of productivity." Dolmetsch used a laser pointer to indicate where he sees the field: just beginning to come down from the peak. That seems about right. Despite the great potential iPS cells hold for unraveling the biology of neuropsychiatric disorders and testing potential treatments, many serious questions remain, not the least is how well the findings will translate to real patients. As Dolmetsch said: "I hope the trough isn't too deep."

Publication	**news.scotsman.com**
Headline	**Scottish scientists grow liver cells from skin in search for new drugs**
Gist of the article	A MAJOR stem-cell breakthrough by Scottish scientists could revolutionise the development of new treatments for liver disease. Researchers have, for the first time, managed to turn adult skin cells into liver cells. The study, led by Edinburgh University's Medical Research Council Centre for Regenerative Medicine, paves the way for a "library" of liver cells to be createADVERTISEMENT d so new drugs can be easily tested. In future, it is hoped the cells could also be used in therapies for patients suffering from liver diseases. The research, published in journal Hepatology, used a technique to create induced pluripotent stems cells (iPS cells). The technology involved manipulating adult skin cells to resemble embryonic stem cells, which have the ability to turn into other types of cells. But iPS cells are seen as less controversial because they do not involve the use of embryonic tissue, which campaigners have opposed. The Edinburgh researchers, working with Harvard Medical School in the US, were able to use the technique to create liver cells specific to different ethnic groups. They said the findings were important because the livers of different ethnic groups process drugs in different ways, with some more prone to adverse reactions than others. The scientists now want to create a library of cell lines which can be used to test new drugs for liver diseases.

Liver cells currently used in testing are often of poor quality because they are taken from dead or donor tissue. The cells do not survive long and do not multiply, making them less reliable for drug testing.

A cell library would enable scientists to weed out chemical compounds that cause adverse reactions at a much earlier stage in the costly process of drug development.

Gareth Sullivan, from the MRC Centre for Regenerative Medicine, said: "Different populations have varying prevalence of disease and genetic differences with regards to how they process drugs.

"What we have been able to do will help drug discovery because it means we are able to represent different populations and make sure the drugs being developed do not have adverse reactions."

As well as using liver cells created from stem cell lines to test drugs, it is hoped the cells could eventually be used in therapies for liver disease. They could also help other research into liver disease.

Leading stem-cell researcher Professor Ian Wilmut said the results of the research were an "exciting opportunity".

"We are now looking for ways to bring this technology into routine use for drug testing," Prof Wilmut said.

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