LifeCell – Daily News Update
July 1, 2009

Publication	**visitbulgaria.info**
Headline	**Fixing The Heart With Stem Cells**
Gist of the article	In a heart attack, when a blood clot in a clogged artery cuts-off the blood supply to a part of the heart, it leads to scarring of the heart muscle, resulting in reducing the heart's ability to pump blood efficiently. So far, all doctors have been able to do is try to limit the damage with the help of certain drugs, or by opening up the clogged artery immediately. However, one day it will be possible for a damaged heart to grow its own muscle tissue, with the help of a patient's own cardiac stem cells. In a first of its kind, CBS News correspondent Bill Whitaker reports that doctors in Los Angeles this week, gave 39-year-old Ken Milles, a heart attack patient, an infusion of stem cells grown from his own heart muscle. Milles suffered a serious heart-attack mid-May, and was told by doctors that his heart had been permanently damaged, reducing his life span. The construction company employee with a wife and two teen-aged boys to support, decided to participate in a cutting-edge clinical trial at the Cedars-Sinai Heart Institute, one of 24-recent heart attack patients who had volunteered to get an infusion of their own heart stem cells. Stem cells, the body's master cells are being increasingly used by doctors, as they can transform into different kinds of tissue. Other stem cells types like bone marrow, have been studied with mixed results for heart repair, however, animal studies indicate heart stem cells do a better job. But, the problem is that the heart has such few stem cells, researchers have no option but to grow more by under local anesthesia, first sending a catheter with little pincers that snip out bits of healthy heart tissue. This is then sent to the laboratory, and coaxed in to manufacturing as many as 25,000,000 stem cells, which grow spontaneously from the specimens. Eventually, forming into clusters called 'cardio-spheres', they even begin to beat in the dish, and within 4 to 6-weeks, one can have millions of stem cells. A few days ago, doctors went back up Ken Milles' artery and deposited his own laboratory-grown stem and support cells into the damaged area of his

	heart, in the hope it will repair itself and begin pumping blood effectively. It will be 6-months before doctors know if Milles' heart has repaired itself, and with sufficient funding clinical trials should be completed within three to four years.

Publication	**ft.com**
Headline	**GE unit teams up with Geron to develop stem cell technology**
Gist of the article	General Electric yesterday unveiled an exclusive alliance with Geron, the US biotechnology company, which could lead to the first significant commercial application of stem cells as soon as next year. GE Healthcare will develop Geron's expertise to build tests for medicines derived from human embryonic stem cells. The tests are designed to identify any toxic effects of experimental medicines, and will be sold to drug developers. The move marks fresh momentum in long-term efforts by biotechnology groups to shift away from a heavy reliance on animal testing for new treatments. The tests could thus save time and costs in drug development, as well as ease criticism from animal rights activists. It comes at a time when a number of biotech companies including iZumi Bio and Cellular Dynamics International are developing stem cell-related technology which could be used to help improve drug development by identifying the risks of treatment. Other groups are using highly complex computer models in early tests to simulate the reaction of humans to new drugs as an alternative, although there is no prospect in the coming years that either approach would entirely replace tests on animals. GE's new alliance represents the most ambitious partnership so far using stem cell technology, signifying its confidence in what is still a niche market. It is part of an expanding range of its offerings for drug developers. "This will be the first real economic application of stem cells," said Konstantin Fiedler, general manager of cell technologies at GE Healthcare. "We'll not be the only one out there but we're very confident we will be one of the main players. We see a significant market opportunity." Geron this year became the first company to win US regulatory approval for a clinical trial examining its stem cell treatment in humans - those with severe spinal cord injuries. The group has well-established expertise in this field, allowing it to manufacture and differentiate human embryonic stem cells into specific cell types.

	The initial tests of experimental drugs developed by the two companies for launch next year will help identify any effects on the heart, and a second test will look at effects on the liver - two vital organs studied closely by pharmaceutical companies and regulators. GE and Geron would not disclose the financial terms of their alliance, which will involve some upfront payments by GE, as well as milestones and royalties for successful development and sale of the products. David Earp, senior vice-president of business development at Geron, said: "Geron is intensely focused on developing human embryonic stem cell-based therapies and the expertise we have developed in scaleable manufacturing and differentiation .is directly applicable to the production of these cells for drug discovery."

Publication	**cbsnews.com**
Headline	**Fixing The Heart With Stem Cells**
Gist of the article	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. 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. This week doctors in Los Angeles have given a heart attack patient an infusion of stem cells grown from his own heart muscle. 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." 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.

	"We seek to actually reverse the injury that has been caused by the heart 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. 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." 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. 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. 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. 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. 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.

Publication	**genomeweb.com**
Headline	**Japanese Researchers Use Fluidigm's BioMark Platform for Stem Cell Expression Studies**
Gist of the article	Fluidigm last week said that two leading Japanese stem cell experts have adopted its integrated fluidic circuit-based BioMark System for genetic analysis. Toshio Suda of Keio University's Graduate School of Medicine will use the BioMark to survey expression of mouse hematopoietic single stem cells, Fluidigm said. Shinya Yamanaka of Kyoto University's Institute for Integrated Cell-Material Sciences will use the system to analyze selected genes in induced pluripotent stem cells and quantify copies of specific genes transferred into a cell to generate iPS cells.

Suda and Yamanaka are "two of the most important stem-cell researchers and [are] at the very top of the list for Japan," according a Fluidigm spokesperson. She said the deals contributed to a recent "surge in Japanese sales."

Though Fluidigm has maintained a subsidiary in Tokyo since 2004 and has a "small sales team" to "work directly with customers," its actual sales in the country are coordinated through distributors, the spokesperson told BioArray News this week.

Founded in 1999, Fluidigm has commercialized three research platforms based on its IFC technology, which is a silicon-enclosed microfluidic chip designed to assay hundreds of reactions.

The three are: its TOPAZ system, which enables researchers to study protein crystallization; its EP1 system, which supports SNP genotyping and qPCR; and its BioMark system, which allows users to run qPCR, genotyping, and expression experiments on its 96.96 Dynamic Arrays. According to the firm, the arrays can produce up to 9,216 data points within single cells. Users can also perform digital PCR on the BioMark using Fluidigm's Digital Array chips.

Single-cell expression is a feature application for the platform and stem cell customers like Yamanaka and Suda choose the BioMark system because of this ability, the spokesperson said.

"Single-cell gene expression, stem cell, T cells in immunology, and more [research areas] are focused on understanding the variability of each individual cell," she said.

Keio and Kyoto

Suda and Yamanaka are both "important" in the Japanese stem cell research community, but have different research interests, Fluidigm's spokesperson said.

According to Fluidigm, Suda, who is part of Keio's 21st Century Center of Excellence Program, will use the BioMark to analyze selected genes in mouse hematopoietic stem cells. The interaction of HSCs within their particular microenvironment, known as the stem cell niche, is critical for adult hematopoiesis in bone marrow. He will explore how these niches maintain a balance between self-renewal and differentiation, information he hopes will ultimately lead to techniques for niche-based therapy, Fluidigm said.

Suda, who plans to use Fluidigm's Digital and Dynamic Arrays in his study,

	told BioArray News in an e-mail this week that prior to adopting BioMark, he had used quantitative PCR and microarrays to perform gene-expression profiling of HSCs and iPS cells. He said that he decided to adopt BioMark because the cost of running arrays is "expensive" so his lab "cannot repeat the experiments." Suda added that "stem cell genes are already known," and there is a need to "clarify which genes are most interesting" in a setting where monitoring the expression of a small number of cells is possible. In addition to studying HSC expression, Suda said that he plans to conduct epigenetic analyses on iPS cells. Meantime, Yamanaka and his group have developed a method to turn adult skin cells into the equivalent of human embryonic stem cells without using an actual embryo He hopes eventually to channel his efforts into treatments by growing replacement tissues for patients, Fluidigm said. Yamanaka, who is the director of Kyoto's Center for iPS Cell Research and Application, plans to use the BioMark to analyze selected genes in iPS cells and quantify copies of specific genes transferred into a cell to generate iPS cells. Yamanaka declined an interview. Suda and Yamanaka are not the first researchers to use the BioMark system for stem cell profiling. Other customers who have used the platform for surveying stem cells include Stanford University researchers Stephen Quake, Irving Weissman, and Mylene Yao, as well as Mikael Kubista, an investigator at the TATAA Biocenter in Göteborg, Sweden, according to the firm's spokesperson.

Publication	**businesswire.com**
Headline	**Rubicon Genomics Introduces PicoPlex Single Cell Whole Genome Amplification Kit for Pre-Implantation Genetic Diagnostics and Stem Cell and Cancer Cell Research**
Gist of the article	Rubicon Genomics, Inc., a developer of pre-amplification products that enable optimal performance of the most advanced genetic analysis tools, announced today the release of its PicoPlex™ Single Cell Whole Genome Amplification (WGA) kit—a more rapid, accurate and reproducible method for amplifying single genomes than current technologies. This product targets the pre-implantation genetic diagnostics (PGD), cancer research and stem cell research markets, which require rapid, reproducible amplification to profile patient genotypes, karyotypes and mutations. PicoPlex enables reference labs to begin qPCR, microarray or sequencing analysis less than three hours after collecting patient cells. "With the PicoPlex Single Cell WGA kit, researchers can now obtain the same amount of genomic information from one cell as they do from 10,000

cells," said James Koziarz, acting president and CEO of Rubicon Genomics.

"We use the PicoPlex Single Cell WGA technology because it reproducibly amplifies a large percentage of the genome every time," said Mark Hughes, CEO of Genesis Genetics Institute, a pioneer in pre-implantation genomics diagnostics that has evaluated dozens of single cell WGA technologies over the past 16 years. "And the few genomic alleles that are under-represented in the one-cell WGA are predictable, making the data sets easy to anticipate and accommodate. We like the predictability of this product when examining many alleles from single haploid and diploid cells."

Researchers can use the PicoPlex Single Cell WGA kits to reliably extract more genetic information from single cells with minimal background. Specifically, the kit reproducibly amplifies total DNA one million-fold from single cells to produce five micrograms of amplified DNA in less than three hours.

Current single-cell WGA kits using molecular displacement amplification (MDA) technology do not offer reproducible amplification of whole genomes, causing sporadic allele and locus dropouts, which seriously compromise results in PGD. Hence, microarray and qPCR genetic analysis of single cells using MDA-amplified DNA is noisy and produces unreliable data.

Fluorescence In Situ Hybridization (FISH) technology has historically been used to examine the chromosomes in PGD, but many laboratories are moving away from this subjective assessment of one cell. Newer technologies employ qPCR and comparative genomic hybridization (CGH) on microarrays. These require high fidelity, genome-wide DNA amplification technology. With PicoPlex Single Cell WGA, researchers can now confidently employ microarrays and qPCR for more accurate genotyping, karotyping and copy number variation analysis from single cells.

PicoPlex's ability to amplify genomic DNA from single cells opens new avenues for research on embryos, stem cells and cancer cells. For oncologists, the PicoPlex Single Cell WGA kit may enable more specific diagnosis or prognosis using a patient's circulating cancer cells. Additionally, it enables the study of heterogeneity of cancer cells creating a better understanding of the broader range of gene expression in each cell, helping researchers potentially identify more specific cancer biomarkers.