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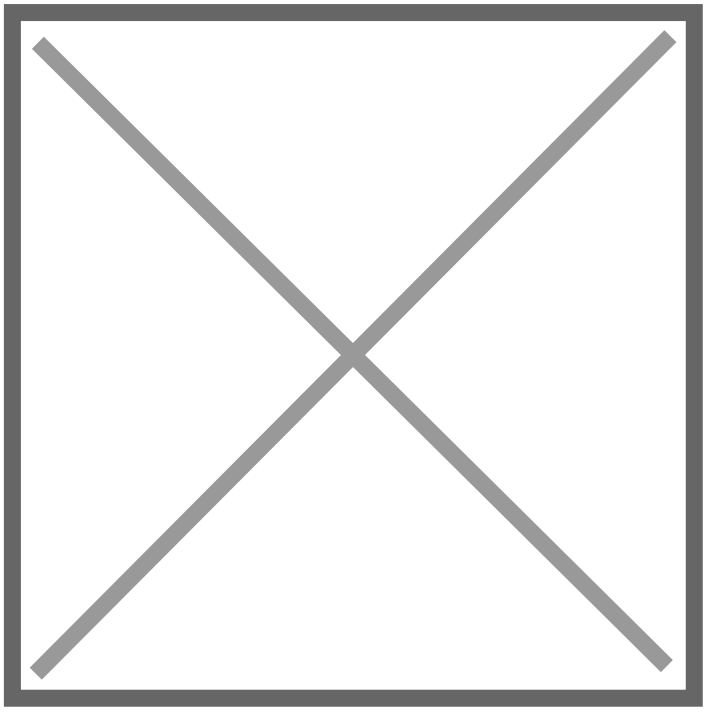
South Korea, the new Bio-IT convergence hub

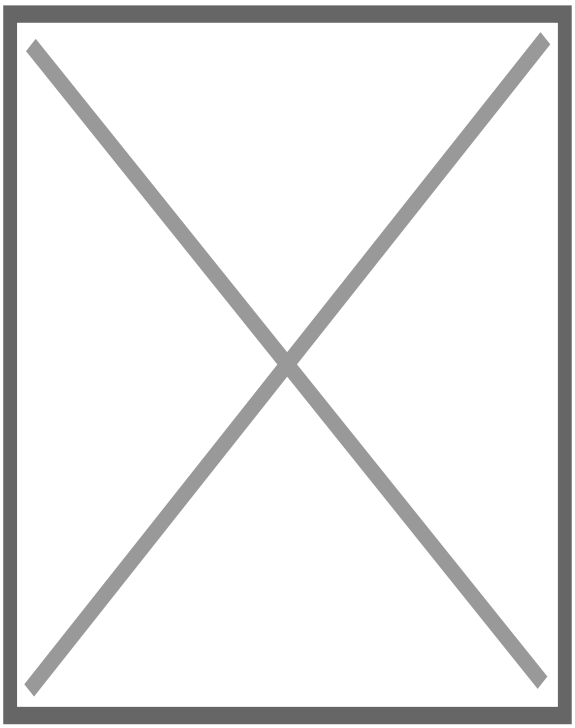
04 October 2007 | News



South Korea, the new Bio-IT convergence hub

Korea gets ready to ride the next big wave.

South Korea is making an all-out attempt to power its economy with the IT-BT convergence. Leveraging on its superior Information Technology (IT), the country is looking at creating synergistic combination of biotechnology, IT and nanotechnology.



In the Incheon Free Economic Zone, the country's two best universities, Seoul National University (SNU) and Korea Advanced Institute of Science & Technology (KAIST) have mapped out an ambitious $1 billion project called the Emile Project, in the

Cheongna District.

Also, referred to as the BIT Port, the five-year project (2008-2012) aims to create infrastructure for the next generation scientific R&D by building a BIT complex. This will include a biotechnology complex, IT complex, common facility complex, education and business complex along with a BIT test bed residence and a research-oriented international hospital.

The aim is to develop new technology and products through international cooperation model between university, laboratory and the industrial world at home and abroad. Led by KAIST and SNU, this project will take the country among top 10 globally in the field of Bio-IT convergence technologies
and products.

Just to give you some idea on how big is this Bio-IT convergence industry. According to Korea IT Times, the medical gadget and electronics medical gadgets that comprise most of Bio-IT industry in the existing market is said to be about 10 percent of the medical gadget market and is estimated to be worth $16 billion annually. While bioinformatics and biochip market is said to be $20 billion and $5 billion respectively.

In the future, diagnosis and medical treatment will be possible in real time through cutting edge IT technology-based medical gadgets. And Korea is working towards strengthening its position in that future.

At the recently concluded, Korean bio-industry showcase event, BioKorea 2007, there was a prototype to the effect on show at the Korea Research Institute of Bioscience and Biotechnology (KRIBB) booth. An enterprising scientist Dr Bong Hyun Chung has gone ahead and integrated the glucose-monitoring device with the mobile phone, which in real time via Internet can transmit the data to the physician. Given that diabetes is acquiring epidemic proportions across Asia the device could be a runaway hit, provided a healthcare infrastructure that supports it is in place. While this prototype awaits commercialization a number of such innovative applications are said to be in development in various labs across the country.

Mobile life care and ubiquitous healthcare are the buzzwords in Seoul social circles. According to Korea National Statistical Office, of the country's estimated 50 million population about 16 percent are over the age of 65, and by 2050 this figure will rise to close to 40 percent of the total population. As an ageing society, the country needs huge investments in healthcare infrastructure to meet the needs of such a society. Korea's U-Healthcare System is an effort to address the healthcare challenges of the ageing society. The country's bio-industry is also rising to meet the challenge.

In the following pages, BioSpectrum brings you some snapshots from BioKorea 2007, held in Seoul from September 12-14, 2007. The event in its second edition has scaled up in participation and showcases the work that is happening in the industry.

BHM gives Korea its first cGMP certified facility

Just a day before the country's largest biotech show-BioKorea 2007-kicked off, on September 11, 2007, BioHeart Manufacturing (BHM) inaugurated its cGMP certified cell culture facility in Seoul. This is South Korea's first such facility.

How does MyoCell work?

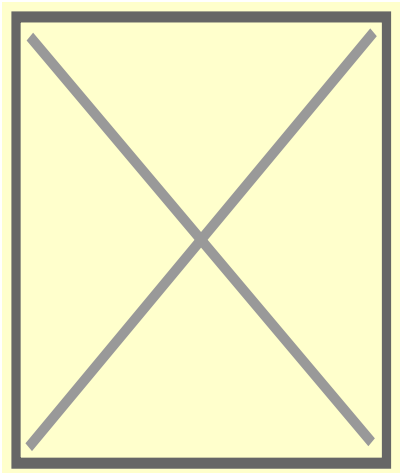
Step 1: A five to 10 gram muscle biopsy from the patient's thigh is performed under local anesthesia, placed in transport media, and shipped to a BioHeart controlled cell culturing facility.

Step 2: In the following two-three weeks. The satellite cells are enzymatically dissociated and pure myoblasts are expanded in vitro. After a few passages, myoblast cells are then transferred to increase production.

Step 3: Final product MyoCell is then packaged in sterile bags and then shipped to the transplantation site. MyoCell has a shelf life of approximately four days.

Step 4: In a surgical cell transplantation procedure lasting 30 minutes Bioheart SR-200 catheter is inserted intravascularly and the cells are injected to the damaged portion of the heart.

Result: The damaged heart muscle is partially regenerated with healthy tissue. The implanted myoblast cells proliferate in a controlled manner, contained in the infracted area. The cells are inherently resistant to ischemia and thrive in the oxygen-deprived environment.



Jong Weon Choi, CEO & President, BHK

Built at an investment of $22 million, the BHM facility is a joint venture between Seoul-headquartered BHK Inc and US-based aBioHeart Inc, with BioHeart holding 18 percent stake in the venture.

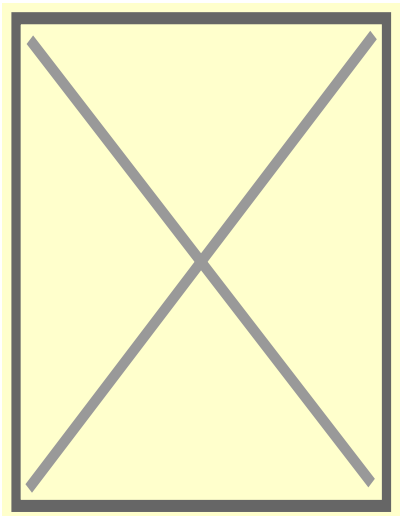
The facility will primarily manufacture MyoCell, BHK's human adult stem cell medicine. Currently, MyoCell is in phase II clinical trials for NDA. "The trials are on at three sites in Korea and 40 sites in the US," informed Jong Weon Choi, CEO and President, BHK.

Keeping in view the fact that it will easily take 6-8 months before MyoCell gets registered in various countries and the manufacturing can begin, Mr Choi has already rolled in motion a plan to utilize the capacities by operating the BHM facility until then as a contract manufacturing organization (CMO) for other products-be it for regulatory approvals or for the market.

Talking about the future outlook, Choi elaborated that the goal at BHK is to become a leader in the bio artificial organ industry by consolidating cell therapy, artificial organ technology and digital technology.

The company already has artificial heart, lung machine, artificial kidney and liver in the market. Of these, the first two apart from Korea are also being marketed in China, Europe and Netherlands. Recently, BHK
tied-up with Getz Medical to distribute its products in the Asian markets and the regulatory approvals in various countries for the purpose are in process.

Mobile to revolutionize healthcare in Korea



Dr Bong Hyun Chung

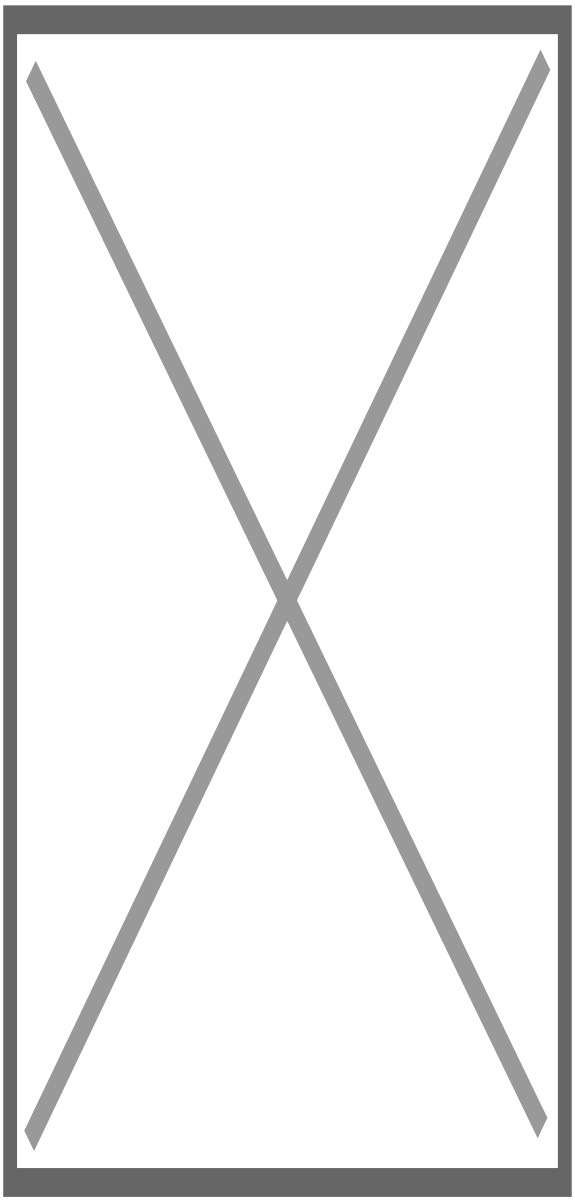
Korea's ubiquitous healthcare system has the potential to provide cheaper and smarter ways to manage and care for patients suffering from age-related chronic diseases. In the ubiquitous healthcare system (U-Healthcare System), sensor devices for measuring a bio signal or environment information communicate with the mobile system for collecting bio signals and environment information by wireless personal area network.

A number of applications are under development since the announcement of Korea "U-Healthcare System". This national project promising anytime, anywhere healthcare has caught the imagination of the Korean bio-industry. As the mobile healthcare system gets commercialized we will get to see more applications like the one in the picture here.

The one shown in the picture is a prototype of a mobile phone, which has a glucose monitoring function via a protein chip integrated into the device. It has the capability to transmit the data to the physician via Internet.

Korea's biotech show scales up

South Korea's largest biotech-show BioKorea 2007 in its second edition, this year, recorded over 3,000 participants from across the globe. Close to 150 speakers shared their knowledge and experience with the local industry in the conference session organized in parallel tracks on subjects ranging from contract manufacturing, drug discovery, bioinformatics to technology transfer in Asia. Of these speakers, close to 50 percent were from overseas. This apart, 108 companies participated in the one-to-one business forum partnering meetings.



The conference and trade show area packed with industry leaders and students from the many Korean universities showcased the excitement and optimism that is running through the biotechnology industry at this point of time.

The government in South Korea has identified biotechnology as the key growth engine for the country. Most recently, the "biomedicine and organ project" has been included among the 10 next generation growth engines, for which the government support and funding has been stepped up. To strengthen South Korea's R&D and infrastructure, the government has made an annual commitment of over $60 billion spread across segments.

The country's biotechnology industry comprises 600-odd companies, spread across four regional bio-clusters and 25 centers. Of these, 71 percent companies are working in the area of biomedicine followed by bio-processing and equipment.

The plenary session of the conference saw an encouraging announcement. The next edition of BioKorea would be held in October 2008 at Osong Bio-Technopolis located in Chungbuk, Korea. Osong complex is the country's first bioengineering cluster. Launched in 2003, the project is scheduled to finish and be ready for occupation by December 2007. About 22 companies, including CJ Corp., and Jeil Pharm have signed contracts to move into the complex.

This cluster, part of a long-term development plan to help the country join the ranks of the world's top 10 bio-science powerhouses by 2010, will also house the nation's four largest state-run health and medical bodies-the Korean Food and Drug Administration, the National Institute for Toxicological Research, the Korea Center for Disease Control and Prevention (KCDC) and the Korean Health Industry Development Institute (KHIDI).

Nandita Singh in Seoul, Korea