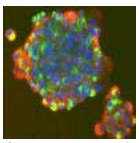
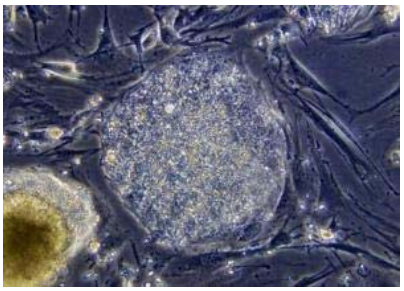


Science New Ageless, More Elastic Stem Cells Developed
Tiffany Kaiser - October 4, 2010 11:37 AM



Stem cell embryo (Source: sciencecases.org)

Discovery of ageless stem cells and more elastic stem cells could lead to stem cell use in clinical applications

University at Buffalo biomedical researchers have created adult stem cells that do not age, and have the ability to grow continuously in culture.

Techung Lee, PhD, leader of the study and associate professor of biochemistry and biomedical engineering in the School of Medicine and Biomedical Sciences and the School of Engineering and Applied Sciences at University at Buffalo, along with his team, has genetically altered mesenchymal stem cells in an effort to grow adult stem cells for clinical purposes.

The problem with using mesenchymal stem cells that are not genetically altered is that they have a short life span in lab cultures. When using these mesenchymal stem cells, doctors and scientists must continuously replenish the samples in order to use fresh, new stem cells. But the stem cells come from bone marrow donors, and the need to use new samples all the time can be difficult, time-consuming and expensive.

But now, the University at Buffalo researchers have engineered new cell lines that they are calling "MSC Universal," which work exactly like normal mesenchymal stem cells, but do not age in lab cultures.

"Our stem cell research is application-driven," said Lee. "If you want to make stem cell therapies feasible, affordable and reproducible, we know you have to overcome a few hurdles. Part of the problem in our health care industry is that you have a treatment, but it often costs too much. In the case of stem cell treatments, isolating stem cells is very expensive. The cells we have engineered grow continuously in the laboratory, which brings down the price of treatments."

In addition, Lee's discovery will consist of injecting the altered mesenchymal stem cells directly into skeletal muscle, which is a "less invasive procedure" than have the cells injected right into the damaged organ. Lee has also proved that this type of injection improves heart chamber function and reduces scar tissue.

But the creation of ageless stem cells isn't the only hot news that could make stem cells clinically-friendly. Researchers from the Centenary Institute, the University of Sydney and Royal Prince Alfred Hospital have to stretch stem cell growth, allowing the number of blood-forming stem cells to increase. To do this, researchers replicated the environment where stem cells live inside the body, mixed cell hormones with tropoelastin, which is a new elastic-like substance, to coat the plates where the stem cells were grown, and then allowed the stem cells to pull on the stretchy surface, expanding the number of cells by up to three times more than traditional methods. This particular study was published in the journal *Nature Biotechnology*.

"Our research has, for the first time, successfully demonstrated that physical forces created by elasticity play a key role in blood-forming cell growth and may mimic the environment of stem cells inside our body," said Professor John Rasko, Centenary Institute Head of Gene and Stem Cell Therapy. "What we've discovered is that blood-forming stem cells like it to be super stretchy because, like a cat on a sofa, they like to pull on their environment."

By both expanding the number of stem cells used and creating ageless mesenchymal stem cells, researchers are coming closer to allowing these cells to be used clinically because these two new discoveries make it cheaper and easier for people to utilize.

"We are going to continue to work with them to make sure they understand the reality of the Internet.Â A lot of these people don't have Ph.Ds, and they don't have a degree in computer science." -- RIM co-CEO Michael Lazaridis