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Researchers Create 'Immortal' Adult Stem Cells

By Jesse Emspak

A team at the State University of New York at Buffalo has come up with a way to grow adult stem cells continuously, offering a way to speed development of regenerative therapies.

One of the obstacles in studying adult stem cells has always been that they tend to die after only a few weeks. Techung Lee, UB associate professor of biochemistry and biomedical engineering, said he and his students were growing frustrated by that, so he decided it was time to solve that problem once and for all. "We were annoyed by the inconvenience of harvesting bone marrow," he said.

Stem cells are the building blocks of tissue and organs and are an integral part of the body's repair system. Unlike other cells, they haven't differentiated to perform specific functions and can become any type of cell. Adult stem cells are usually extracted from bone marrow, but every kind of tissue in the body has its own associated stem cells. Lee's team used cells from the bone marrow called mesenchymal stem cells, which can differentiate into bone, muscle, cartilage, fat, and pancreatic cells.

By altering the genomes of the stem cells at a specific time, usually within a week, Lee produced a set of cells that will live in culture indefinitely. He declined to say exactly what part of the genome he worked on as he has filed for a patent on the process.

The stem cells Lee altered still age in the culture but they do so more slowly. With an essentially "immortal" line of cells, he and other scientists will be able to study them and get consistent experimental results, he said. Stem cell samples from many different people and different cell cultures might not perform the same way, and having a single cell line solves that problem.

Adult stem cells also have advantages over their more famous counterparts, embryonic stem cells. Embryonic cells, Lee said, sometimes grow uncontrollably, and would form tumors.

With adult stem cells to study, it will be easier to develop therapies, Lee said. Currently there are trials for stem cell therapies for heart disease and diabetes. Lee hopes to be able to expand that. "One biotechnology company has already contacted us," he said.

Lee's next set of experiments will be to see if he can produce a similar line of cells from other types of tissue. Eventually, Lee says, stem cell therapies could be used in many diseases associated with aging, such as macular degeneration or heart disease.