



Liposuction Fat Turns to Stem Cells Quicker Than Skin in Study

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By Rob Waters

Sept. 7 (Bloomberg) -- Human fat, widely available and easily harvested with liposuction, morphed into stem cells more efficiently than skin cells in a study, giving scientists an alternative to the use of embryonic cells.

Three years ago, [Shinya Yamanaka](#), of Kyoto University in Japan, showed that skin cells could be genetically manipulated to become any other cell type, much like embryonic stem cells. This process was hailed as avoiding the destruction of embryos and letting scientists create new therapies by making stem cells from patients who are ill.

Since then, researchers have sought to overcome two drawbacks to Yamanaka's method. One is that the viruses and genes used to reprogram skin cells can trigger tumor growth. The second is that the process is inefficient, with less than 1 percent of skin cells becoming all-purpose cells. The new research, published today in the [Proceedings](#) of the National Academy of Sciences, may solve the second problem.

"We aspirate the fat, we isolate the cells, we put them in an incubator and the next day we can start the reprogramming process," said [Michael Longaker](#), a plastic surgeon and stem cell researcher at Stanford University in Stanford, California, in a Sept. 4 telephone interview.

Longaker and [Joseph Wu](#), a colleague who studies genetics and stem cells, collaborated on the research.

The two scientists followed Yamanaka's original recipe, using viruses to insert four genes into the cells they were trying to reprogram, Longaker said. The difference was they started with fat cells liposuctioned from four middle-aged patients, rather than skin.

At Every Step

The process was faster at every step, he said. Skin cells take three to six weeks to replicate in sufficient numbers to begin trying to reprogram them, while fat cells are plentiful from the start, Longaker said. Stem cell colonies begin to form 15 to 16 days after adding the genes when fat cells are used, compared with a month when using skin cells, the study found.

Finally, fat cells formed stem cells at 20 times the rate that skin cells do, with 60 to 90 colonies of the IPS, or induced pluripotent stem, cells showing up in a dish of transformed fat, and just three or four in the dish of skin cells, Wu said.

Longaker and Wu, in a joint telephone call, said they are now tackling the other big drawback of the original Yamanaka technique, eliminating genes and viruses.

"Ten years from now," when the U.S. Food and Drug Administration "is ready to allow this type of approach in human trials, our process will offer easier, faster derivation of stem cells," Wu said.

To contact the reporter on this story: [Rob Waters](#) in San Francisco at rwaters5@bloomberg.net.

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