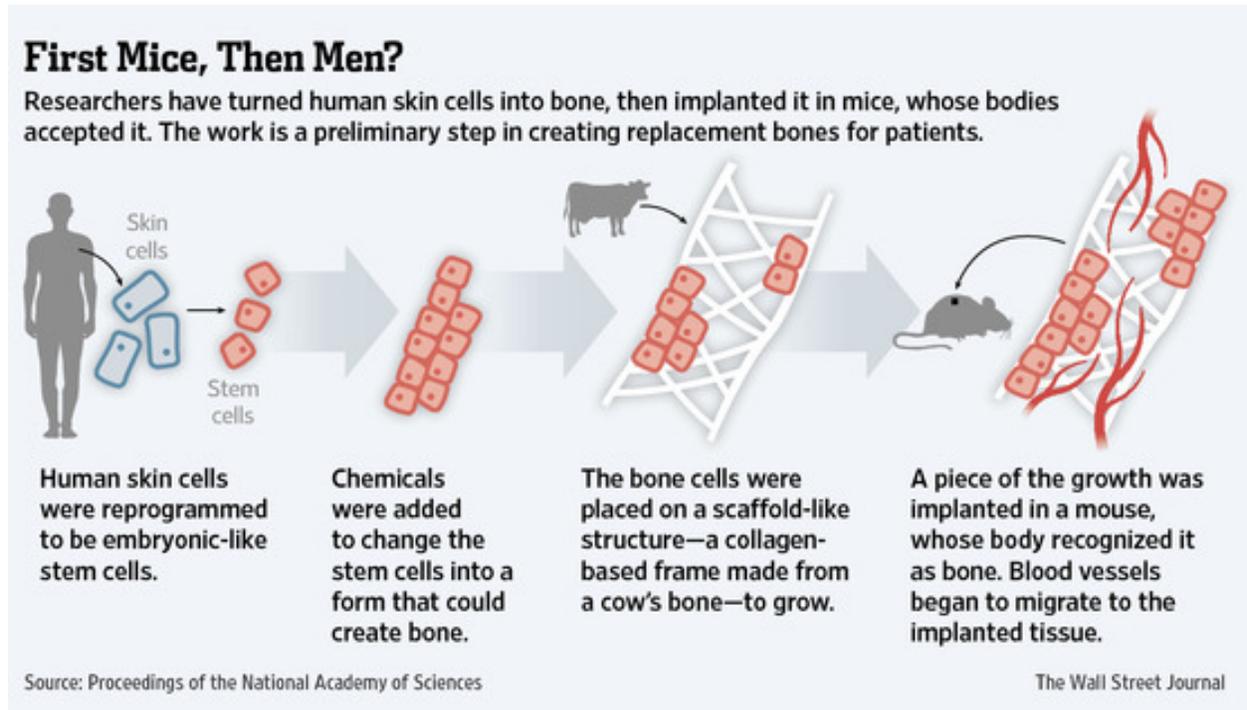


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Scientists Make Human Bone From Skin Cells

By Gautam Naik

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Researchers have made bits of human bone in a laboratory dish and successfully transplanted them into mice, an early step in the quest to grow replacement bones for patients.

Doctors have tried for years to repair bone injuries or defects with synthetic materials or bone taken from other parts of the body. But those methods have limitations.

A more ambitious approach is to build new bones from stem cells, a method that already has been used to make basic human parts including arteries and windpipes.

As populations around the world get older, “more and more people will need treatment to fix bone defects” related to aging and injuries, said Giuseppe Maria de Peppo, a tissue engineer at The New York Stem Cell Foundation and a researcher involved in the study.

The experiment was published Monday in the *Proceedings of the National Academy of Sciences*.

Dr. de Peppo and his colleagues used a method known as reprogramming to transform human skin cells into embryonic-like stem cells, which then can become all other cells in the body.

When certain chemicals were added, the stem cells became cells that can go on to form bone. The bone cells were placed on a scaffold, a sort of frame where they could grow and achieve a three-dimensional structure. The scaffold had been made by washing a cow's bones in chemicals, which left behind a collagen-based structure.

After the scaffold was seeded with the bone cells, it was put in a bioreactor, a tabletop device that provides nutrients and removes waste. As a result, bits of bone, each about 16 square millimeters (0.63 inches) in size, grew on the scaffold.

As a test, a piece of the lab-made bone was surgically placed under the skin of a mouse that lacked an immune system, which could have rejected the bone. Soon, blood vessels began to migrate from the animal's body to inside the bone.

“The [mouse] body recognized the bone as part of the body and started integrating it,” said Dr. de Peppo.

The researchers hope to make other pieces of bone in the lab, complete with blood vessels, and see if they can repair injuries in animals. If the method works, it may be tried in people, though that remains several years away.

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