

Adult stem cells from liposuction used to create blood vessels in the lab

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Adult stem cells extracted during liposuction can be used to grow healthy new small-diameter blood vessels for use in heart bypass surgery and other procedures, according to new research presented at the American Heart Association's Basic Cardiovascular Sciences 2012 Scientific Sessions.

Millions of cardiovascular disease patients are in need of small-diameter vessel grafts for procedures requiring blood to be routed around blocked arteries.

These liposuction-derived vessels, grown in a lab, could help solve major problems associated with grafting blood vessels from elsewhere in the body or from using artificial blood vessels that are not living tissue, said Matthias Nollert, Ph.D., the lead author of the study and associate professor at the University of Oklahoma School of Chemical, Biological and Materials Engineering, in Norman, Okla.

"Current small-diameter vessel [grafts](#) carry an inherent risk of clotting, being rejected or otherwise failing to function normally," Nollert said. "Our engineered blood vessels have good mechanical properties and we believe they will contract normally when exposed to hormones. They also appear to prevent the accumulation of [blood platelets](#) — a component in blood that causes arteries to narrow."

In this study, [adult stem cells](#) derived from fat are turned into smooth muscle cells in the laboratory, and then "seeded" onto a very thin

collagen membrane. As the stem cells multiplied, the researchers rolled them into tubes matching the diameter of small blood vessels. In three to four weeks, they grew into usable blood vessels.

Creating blood vessels with this technique has the potential for "off-the-shelf" replacement vessels that can be used in graft procedures, Nollert said.

The researchers hope to have a working prototype to test in animals within six months.

Provided by American Heart Association

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