

## UCLA doctors test stem-cell therapy to improve blood flow in angina patients

November 13 2013, by Rachel Champeau

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Marty Greenfield lives with crushing pain every day due to angina, a condition that is caused by an inadequate supply of blood to the heart. He has suffered a heart attack, and a coronary bypass procedure and angioplasty have provided little relief. His doctor referred him to UCLA to be considered for a heart transplant.

Dr. Jonathan Tobis, a UCLA clinical professor of cardiology, performed an angiogram and angioplasty on Greenfield, 64, but found that the patient was not a candidate for a [heart transplant](#) because his [heart muscle](#) function was still good.

Instead, Tobis suggested that Greenfield consider participating in a Phase 3 clinical trial that uses a patient's own blood-derived stem cells to try to restore circulation to the heart. The procedure uses the latest technology to map the heart in 3-D and guides the doctor to deliver the stem-cell injections to targeted sites in the heart muscle.

On Oct. 17, Greenfield became the first patient at UCLA to participate in the multicenter clinical trial. He said he jumped at the chance to help, even though the study is double blind, which means that neither the patients nor the researchers know who is receiving stem-cell injections and who is receiving placebos.

"This just isn't about me," said Greenfield, a married father of two sons who lives near Las Vegas. "If I can help move this research forward so that it helps just one person, it will be worth it."

According to UCLA researchers, the trial is one of the most advanced studies using stem cells to treat cardiac patients who are either unable to receive Food and Drug Administration–approved standard of care therapy or have already received standard of care therapy but did not get better.

"We're hoping to offer patients who have no other options a treatment that will alleviate their severe chest pain and improve their quality of life," said Dr. Ali Nsair, an assistant professor in residence of cardiology at the David Geffen School of Medicine at UCLA and the study's co-principal investigator.

Before injecting either the stem cells or placebo into his heart, researchers first mapped Greenfield's heart with colorful 3-D images that enabled them to study motion of the muscle and the voltage it was generating. Damaged areas do not produce as much energy and movement as the undamaged areas.

"We are able to tell by the voltage levels and motion which area of the muscle is scarred or abnormal and not getting enough blood and oxygen," said Tobis, director of interventional cardiology research at the Geffen School of Medicine and the UCLA Health System. "We then target the injections to the areas just adjacent to the scarred and abnormal heart muscle to try to restore some of the blood flow."

For the study, researchers take blood from the patient and isolate [stem cells](#) that express the CD34 protein, known as CD34+ cells. These pluripotent cells—meaning that they have the capability of turning into other cells—are then purified and injected into the patient's heart using a catheter inserted into a groin artery.

The UCLA team hopes these cells will either become new and healthy [heart muscle cells](#) or that they will stimulate the growth of new blood

vessels, a process called angiogenesis. The new blood vessels could provide better [blood](#) flow and oxygen to the heart muscle adjacent to the abnormal tissue.

"We will be tracking patients like Mr. Greenfield to see how they're doing," said Dr. William Suh, assistant clinical professor of medicine in the division of cardiology at the Geffen School of Medicine.

The study seeks to enroll 444 [patients](#) nationwide. The three-armed study comprises the double-blind group of 222 receiving stem-cell therapy, 111 receiving a placebo and 111 who are being treated according to the current standard of care.

Provided by University of California, Los Angeles

Citation: UCLA doctors test stem-cell therapy to improve blood flow in angina patients (2013, November 13) retrieved 18 April 2024 from <https://medicalxpress.com/news/2013-11-ucla-doctors-stem-cell-therapy-blood.html>

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