Scaffolding as a Platform for Cell Delivery for Abdominal Aortic Aneurysm Therapy *By Amanda Chase, PhD*

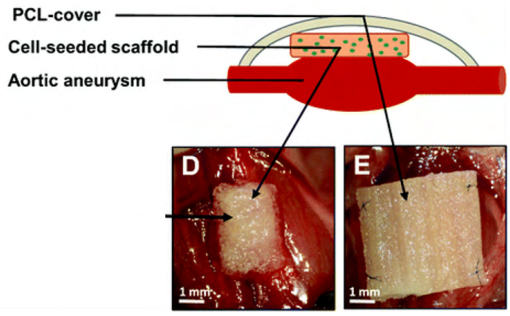
Abdominal Aortic Aneurysm (AAA) is diagnosed in about 200,000 individuals in the US per year. When the wall of the aorta weakens, it gradually bulges - becoming an aneurysm. Larges can burst, which can be life-threatening. Targeted treatment to slow aneurysm progression would have a profound impact on the lives of patients with AAA.

AAAs occur when the artery becomes weaker because of the loss of smooth muscle cells (SMCs) that help the aorta contract, along with degradation of the extracellular matrix (ECM) components. An attractive AAA therapy, therefore, is to regrow and deliver parts of the cell and ECM components. A group researchers, led by first authors Joscha Mulorz and Mahdis Shayan and senior author Ngan F. Huang, recently highlighted a promising means of cell delivery to serve as a therapeutic strategy for AAA treatment in a study published in Biomaterials Science. In a mouse model, they showed that primary SMCs delivered by these collagen scaffolds, which provide ECM-like cues, could decrease the rate of aneurysm expansion. This technique has potential for the future of slowing AAA disease progression using a minimally invasive procedure.

Joscha Mulorz, MD

Mahdis Shayan, PhD

Ngan Huang, PhD



Overview of cell-seeded scaffold on the aortic aneurysm. The scaffold with cells was implanted onto an AAA (D) and a protective cover was added (E).

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Machine-learning to predict right ventricular heart failure in LVAD patients *By Roxanna Van Norman*

A Stanford study found using a deep learning system could predict right ventricular failure after cardiac surgery, significantly outperforming a team of human experts conducting the same evaluation.

While a heart transplant remains the gold standard for treating patients with end-stage heart failure, an alternative is receiving an LVAD, a battery-powered mechanical pump implanted in the patient. Unfortunately, a third of all patients implanted with LVADs develop a clinically significant degree of RV failure soon after the procedure. “We wanted to know if there is a way to figure out, before we even take anybody into the operating room, which patients are more likely to suffer from these right-sided heart problems,” said William Hiesinger, MD, senior author on the study.

Rohan Shad, MD

William Hiesinger, MD

The research team looked at various clinical scoring systems to identify patients at risk for RV failure in LVAD candidates. The team then compared the performance of their AI system against clinical risk scores. By training their artificial intelligence (AI) system to identify abnormal motions in the heart videos, it could conclude who was more likely to suffer from right heart failure after surgery. “What excites me the most is thinking about where we can go from here and how we can design deep learning systems that can better represent these complex diseases,” said Dr. Rohan Shad, lead author on the study. This study was published in *Nature Communications*.