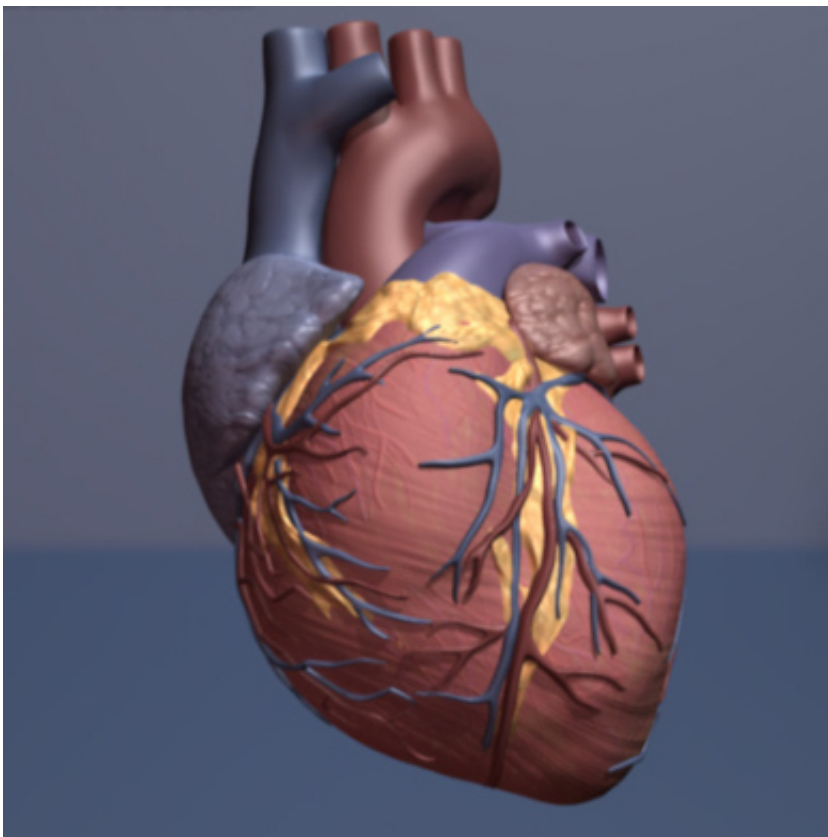


Study shows that the heart's own immune cells hold potential for the treatment of heart failure

November 12 2021, by Lily Hart



Human heart. Credit: copyright American Heart Association

According to the Centers for Disease Control and Prevention, heart failure affects more than 6 million Americans and is the main cause of death for one in eight patients.

A new study led by University of Minnesota Medical School researcher Xavier Revelo, Ph.D., an assistant professor of integrative biology and physiology, in collaboration with Jop van Berlo, MD, Ph.D., an associate professor of medicine, was recently published in *Circulation Research*. They suggest that a type of white blood cells known as macrophages play a role in protecting the [heart](#) after injury. Their findings could lead to targeted therapies for heart failure.

"The heart contains various types of [immune cells](#) that we studied simultaneously using advanced research techniques," Revelo said. "We discovered a large increase in the number of macrophages early in the response to a cardiac injury similar to high blood pressure."

The research team's primary findings were:

- A cardiac injury similar to [high blood pressure](#) leads to a quick increase in the number of cardiac macrophages
- These cardiac macrophages are important to stimulate new blood vessel formation in the heart
- Macrophages that reside in the heart are important to prevent scarring or fibrosis of the heart, a process where excessive proteins are deposited around cardiac muscle cells which leads to stiffening of the heart
- The early increase in macrophages was important to prevent the development of heart failure

Immune cells in the heart are important players in the progression of heart failure and scarring of the heart. While there is currently no cure for heart failure, immune cell targeted therapies hold promise for new treatment avenues for cardiac disease. The results of this study point to a critical role for macrophages in the heart's healing process.

"Immune cells such as macrophages are integral components of the heart

where they exert profound effects in healthy and diseased conditions," van Berlo said. "Our new study shows that macrophages that reside in the cardiac tissue, but not those from blood origins, protect the failing heart."

Further research is required to identify the specific means by which the [macrophages](#) protect the heart and to determine if immunomodulatory therapies are a viable therapeutic option in treating [heart failure](#). Revelo says their team has already begun working on those questions.

Study co-authors include U of M graduate students Preethy Parthiban, Chen Chen, Fanta Barrow, Gavin Fredrickson and Doğacan Yücel, Minnesota Supercomputing Institute Analyst Adam Herman, Ph.D., and postdoctoral fellow Haiguang Wang, Ph.D.

More information: Xavier Revelo et al, Cardiac Resident Macrophages Prevent Fibrosis and Stimulate Angiogenesis, *Circulation Research* (2021). [DOI: 10.1161/CIRCRESAHA.121.319737](https://doi.org/10.1161/CIRCRESAHA.121.319737)

Provided by University of Minnesota Medical School

Citation: Study shows that the heart's own immune cells hold potential for the treatment of heart failure (2021, November 12) retrieved 7 May 2024 from <https://medicalxpress.com/news/2021-11-heart-immune-cells-potential-treatment.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.