MMRI Publishes Breakthrough Study Detailing a Novel Approach to Minimize Damage After a Heart Attack

Jason R. McCarthy, Ph.D., published a manuscript about the potential to improve the healing response following a heart attack.

Jason McCarthy, Ph.D., associate professor of biomedical research and translational medicine

UTICA, NEW YORK, UNITED STATES, December 20, 2023 / EINPresswire.com/ -- Jason R. McCarthy, Ph.D., associate professor of biomedical research and translational medicine and scientific operations director at MMRI, recently published an innovative manuscript titled, Biomimetic Nanomaterials for the Immunomodulation of the Cardiosplenic Axis Post-Myocardial Infarction. The manuscript details how, when targeted specifically to the spleen, histone deacetylase (HDAC) inhibitors, chemical compounds that can be used to treat cancers and other diseases, have the potential to improve the healing response following a heart attack.

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Normally after a heart attack, immune cells migrate from the spleen to the heart in response to injury. Here, McCarthy and his team found that they could design nanomaterials that mimic dead and dying red blood cells, causing them to be retained in the spleen and enabling them to deliver inhibitors that modulate the inflammatory response. Notably, this targeting strategy results in a significant decrease in cardiac scar size and a preservation of heart function, even after just one dose, when given within two hours of heart attack injury.

According to the CDC, heart disease is the leading cause of death in the United States, which

affects approximately one in five Americans. As a result of McCarthy's findings, there is a potential for his strategy to be used more clinically, to significantly reduce cardiac damage and possibly prevent a second event or an arrhythmia following a heart attack.

MMRI scientists who contributed to the study include Jason R. McCarthy, Ph.D., Rajendran JC Bose, Ph.D., Chase W. Kessinger, Ph.D., Khanh Ha, Ph.D., Bing Xu, Ph.D. and Maria I. Kontaridis, Ph.D. This work was a collaboration with scientists at the Medical University of South Carolina, Charleston, South Carolina; McMaster University, Hamilton, Ontario; the Ralph H. Johnson Veterans Affairs Medical Center, Charleston, South Carolina; and Stanford University School of Medicine, Stanford, California.

"We are thrilled to have our study published in Advanced Materials, one of the leading journals in this field of research," said McCarthy. "This novel concept may have far-reaching applicability for the treatment of a number of both acute and chronic conditions where the spleen may be involved."

Looking ahead, McCarthy and his team will use these findings to focus on the mechanisms leading to this therapeutic effect, as well as investigate these materials in several other diseases, such as lupus and pneumonia.

To learn more, visit mmri.edu.

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