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Dr. Zhiqiang Lin Awarded NIH Grant to Examine the Cardiac Innate Immune Response

Award will define the roles of YAP and IRF2BP2 in response to cardiac stress

UTICA, NY — In the United States, an individual will experience a heart attack every 40 seconds (CDC.gov). As a result of this damage, the body mounts an inflammatory response in an attempt to heal the injury. However, while initially protective, over time, excessive inflammation can actually cause even more damage to the tissue, contributing to heart muscle cell death and to an overall weakening of the heart itself. Dr. Zhiqiang Lin, Assistant Professor at the Masonic Medical Research Institute (MMRI), along with his colleagues, are actively investigating heart disease and inflammation. “Our research focuses on discovering new ways to prevent heart muscle death and reduce injury after a heart attack. Our ultimate goal is to discover new drugs that can reduce damage and increase healing,” said Dr. Lin.

To support this work, Dr. Lin was recently awarded a \$3.2 million grant from the National Institutes of Health (NIH), the first grant, of what will hopefully be many, for this junior investigator. The project will study the effects of two major genes in the heart: YAP and IRF2BP2, both of which are required for normal growth and survival of heart cells. Heart attacks are triggered by coronary artery disease, a condition caused by excessive plaque buildup of fatty deposits, leading to a narrowing of the arteries (atherosclerosis). “One of the most crucial steps to save someone suffering a heart attack is to re-establish blood flow to the arteries, a process called reperfusion. Unfortunately, this same process also triggers an inflammatory response to the heart. The goal of my project is to understand whether delivery of YAP and/or IRF2BP2 directly to the heart during the reperfusion process can help establish blood flow but reduce cardiac inflammation, thereby further the heart recovery process with less overall damage,” said Dr. Lin.

This project will be undertaken in collaboration with Dr. Jason McCarthy, Associate Professor at MMRI, who specializes in the development of cell-targeted therapies. “Our aim is to work with Dr. Lin to create nano-sized vehicles that will deliver modified RNA (mRNA) specifically to the heart muscle cells. The specialized delivery will ensure that the therapy goes directly to the injury site, without affecting other areas of the heart or body,” said Dr. McCarthy, “This technology has the potential to significantly improve the quality of life for patients who have suffered a heart attack.”

“Over the next 5 years – the duration of the NIH grant – my lab will continue to delve deeper into understanding the processes of heart recovery post-infarct. This grant makes it possible for

us to have the time, resources, and talent to help resolve these exciting research questions,” said Dr. Lin.

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