

# MMRI, Hamilton College researchers making strides against heart disease and stroke

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Research for fight heart disease

CLINTON, N.Y. -- A promising research project that could have major impact on heart disease and stroke was granted an American Heart Association Institutional Research Enhancement award earlier this year.

Associate Professor of Chemistry Max Majireck at Hamilton College and Postdoctoral Fellow Dr. Khanh Ha of the Masonic Medical Research Institute received a grant of about \$154,000 for CD47- Targeted Nano-Immunotherapy for Treatment of Atherosclerosis.

“In plain English, the project is to develop a new type of therapeutic strategy for targeting a disease called atherosclerosis,” Majireck said. “Atherosclerosis is one of the leading causes of death in adults. It’s a category of cardiovascular disease where the blood vessels are blocked by a plaque that builds up and can lead to heart disease or stroke.”

The goal of this project is to identify a new type of drug delivery system that targets plaques found in atherosclerosis.

Majireck and Ha said the majority of drugs on the market for this are different.

“We are looking into encouraging the body to respond to inflammation, so it would help they body clear it by itself and the cell would be encouraged to be functional again, “ Ha said.

Their teams’ research builds off previous research pursued at MMRI, where fluorescent and magnetic nano particles were designed to be delivered to macrophages, which are a key cell type in our immune system.

The research of Ha and Majireck and their team, will likely be used for others to build from.

Hamilton College students are working on the research, developing and analyzing medicinal molecules. Their aim is to expand the method of delivery in small-molecule drugs that target CD47, a protein found on the surface of many cells that may play a role in stimulating the macrophages to consume the dead cells and other debris that make up deadly atherosclerotic plaques.

The molecules are created and analyzed inside laboratories at Hamilton College.

The nano particles are used with those molecules at Masonic Medical Research Institute.

“We had the idea that we could load these nano particles developed by MMRI with small molecule drugs developed by us at Hamilton College to, in a sort of Trojan Horse strategy, deliver the drugs directly to the plaques,”Majireck said.

“The first results are very encouraging,” Ha said. “We see a positive response as well in the cells.”

The research grant (the AHA Institutional Research Enhancement Award), typically awarded to smaller institutions who miss out on National Institutes of Health funding, serves two important purposes.

“The end goal of this research is to address atherosclerosis, and the second is to develop educational and research collaborations in Central New York,” Ha said.

Many times, this research is close to the heart for the researchers and the students. In this case, it is both figuratively and literal.

“It’s important to me for a lot of reasons,” Majireck said. “Personally, I, and a lot of my students get into this type of research because we have some sort of family connection to the disease.”

For the students, both Ha and Majireck said it is important to have this educational opportunity. For the research, it could prove to be very important for people with heart disease.

From this research happening in Central New York, other researchers will be able to build their own research to add on.

As Scientist Sir Isaac Newton wrote in a letter in the 1600's, "If I have seen further... it is by standing on the shoulders of giants."

"The information is sort of a relay race taken on by other scientists and translated from the so-called bench (in the lab), to the bedside," Majireck said. "The process can sometimes span decades."

The major steps in research made today at MMRI and Hamilton college are stepping stones to the future of heart health.