Purdue-based startup shines light on heart disease severity, location

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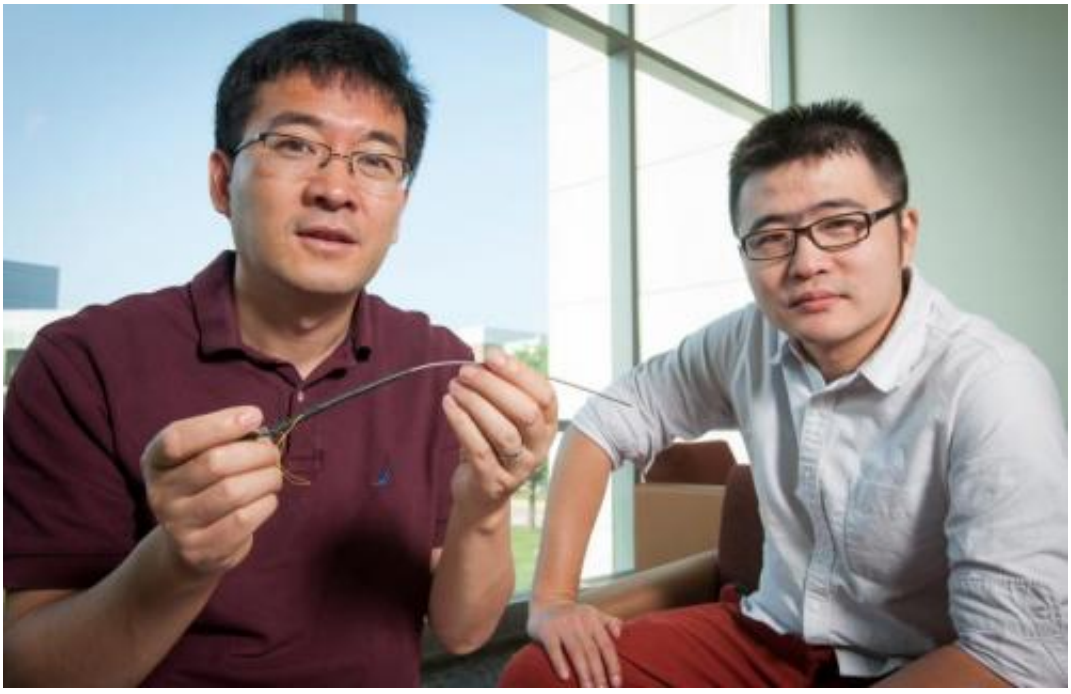

Vibronix officials Ji-Xin Cheng, left, and Pu Wang are developing an intravascular sensor that could help cardiologists know the quantity and location of lipid buildup on the heart's arterial wall. Vibronix is one of more than 20 startups created in fiscal year 2014 from Purdue University innovations. Credit: Purdue Research Foundation photo

Officials at a life sciences startup based on a Purdue University innovation say their company could help cardiologists improve the diagnosis of heart disease, which the World Health Organization listed as

the leading cause of death in the world in 2012.

Ji-Xin Cheng, co-founder and president of Vibronix Inc., said one challenge that physicians face is that the severity and location of a patient's heart disease cannot be precisely tracked with traditional diagnostic tools.

"There are no methods to quantify the amount of lipids inside the arterial wall. These lipids, caused by cholesterol, build on the wall and slow down or block blood flow to the heart. A heart attack results when blood supply to the heart is completely blocked," said Cheng, who is a Purdue professor of biomedical engineering and chemistry. "There also are no methods to locate where lipids are located. If a person with chest pain visits a cardiologist, the cardiologist may give a stint that releases the pain, but it doesn't reduce the probability of a heart attack."

Purdue researchers led by Cheng have developed technology that could help cardiologists better understand the severity and location of plaque buildup on arterial walls. The technology has been licensed to Vibronix through the Purdue Office of Technology Commercialization. More than 20 startups based on Purdue intellectual property were launched in the 2014 fiscal year. A video about Vibronix is available at youtu.be/Min7qjanJOQ.

Pu Wang, who was a doctoral student in Cheng's laboratory when the technology was discovered, is Vibronix's chief technology officer. He said the company has developed an intravascular sensor that is inserted into the femoral artery using a common procedure to identify stressors on the heart.

"The sensor, which is around one millimeter in size, emits light onto the arterial wall. Only the lipid component inside the arterial wall responds to the light. It emits acoustic signals that are detected by the sensor and

sent to another system," Wang said. "We rotate and pull back the sensor in the artery, which creates a three-dimensional view that shows where high-density lipid sections have developed on the arterial wall."

Wang said Vibronix's sensor technology also could help researchers and contract research organizations develop new treatments for heart disease and determine the efficacy for currently available treatments.

Cheng said Vibronix will focus on validating the technology by working with research and industrial partners on the beta prototype.

"We will need to raise money for additional work, and we are looking for a chief executive officer who will lead the company's business side," he said.

Provided by Purdue University