Novel research set to pinpoint risk of heart attacks and strokes

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A simple blood test is all it could take to tell if you are going to have a heart attack or stroke. A team of international scientists have discovered more than 10 types of unique proteins which are commonly present in the blood of a person who recently suffered a stroke or heart attack.

The breakthrough is a result of an international collaboration led by Nanyang Technological University (NTU)'s lead scientist, Assistant Professor Newman Sze, and the Interuniversity Cardiology Institute of the Netherlands (ICIN)'s lead cardiology scientist, Professor Dominique de Kleijn, who have been working together for more than five years. Lead clinicians Professor Lee Chuen Neng and Dr. Vitaly Sorokin of the National University Hospital (NUH) joined the research team in 2010 to provide medical expertise, clinical samples and data.

The team will now expand their research to study the existence of these proteins, also known as bio-markers, in Singapore's multi-racial population.

Their research is expected to result in the development of a sensitive diagnostic tool - possibly in the form of a simple blood test - which can detect these bio-markers so as to help pinpoint the risk of heart diseases in a person before it happens. This is because the more such biomarkers are found in the blood, the higher the risk of a heart attack or stroke.

As these biomarkers are newly discovered, specialised instruments are needed for further research. To this end, Agilent Technologies Inc. (NYSE: A), the world's premier measurement company and a technology leader in communications, electronics, life sciences and chemical analysis, will be partnering NTU to provide top-of-the-line equipment to NTU.

The equipment is used to identify and validate more protein biomarkers associated with cardiovascular diseases. Known as the Agilent HPLC-Chip LC/MS Triple Quadrupole system, this equipment works much faster than other existing methods as it can measure all the biomarkers of interest in a sample at once, speeding up the research process from five years down to one year.

As the cutting-edge equipment is able to process multiple samples simultaneously, the team will also be able to validate over 100 biomarkers in one year, as compared to 10 biomarkers over five years using the conventional method.

Assistant Professor Newman Sze, from NTU's School of Biological Sciences, lead researcher of the project, said the local study will take one year and will involve some 2,000 samples collected in Singapore and the Netherlands.

"After discovering that such biomarkers exist, we need to validate them further to ascertain that people with these proteins are really at a risk of heart attack and stroke. This approach is expected to lead to the development of new and improved tools for early diagnosis of heart attack and stroke patients, way before the diseases strike," said Prof. Sze.

Dr. Vitaly Sorokin, part of the team at the NUH involved in this research, said that Singapore is a good place to validate these biomarkers, as this is a unique opportunity to involve and compare results among the multi-racial population.

"This biomarkers which allows prediction of major cardiovascular events, carries great benefits for

the doctors, and will likely lead to the development of prevention strategies or algorithm which will give us a chance to stop heart complications from happening or to improve the clinical outcome of treatment," said Dr. Sorokin, a Russian.

"Having the opportunity to screen and diagnose condition like myocardial infarction and stroke, will give doctors time to prevent the complication of atherosclerosis - the hardening of arteries which causes heart attacks and strokes. With such a technology, patients with known conditions like ischemic heart disease and cerebro-vascular disease can be monitored more effectively."

Coronary heart disease and stroke are major worldwide health problems. In Singapore, it accounts for more than 30 per cent of all deaths, with about 15 people dying daily because of heart attack and stroke. This research innovation is the latest in a series of healthcare breakthroughs by NTU. Future Healthcare is one of NTU's Five Peaks of Excellence which the university aims to make its mark globally under NTU 2015 five year strategic plan. The other four peaks include sustainability, new media, the best of the East and West, and innovation.

Provided by Nanyang Technological University

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