

A single blood drop could detect heart disease, cancer

January 26 2011

(PhysOrg.com) -- New proteomics technology could detect risk for heart disease and cancer from a single drop of blood.

A University of Victoria researcher hopes to change the nature of testing for [heart disease](#), cancer and drug toxicity using a highly sensitive and fast machine that would only require a single drop of blood from a patient.

Called a mass spectrometer, this machine determines the weight of [protein molecules](#) in the blood, and would allow researchers to determine if key marker proteins related to heart disease or cancer are present. The mass spectrometer being used in this research is among the most sensitive spectrometers that are commercially available, and is currently the only one of its kind in Canada.

Dr. Christoph Borchers at the University of Victoria-Genome BC Proteomics Centre will use the Agilent ion funnel 6490 mass spectrometer to develop methodologies for early diagnostic tests. These tests will detect and measure biomarkers, which are proteins in a patient's blood that can signal early and subtle health changes. Dr. Borchers hopes to apply the technology to develop inexpensive, fast, and reproducible biomarker tests for early diagnosis of cardiovascular disease (CVD), the leading cause of death in the Western hemisphere.

“When we can quantify the amount of proteins in the blood, then this can be a diagnostic tool for the doctor,” says Borchers. “If the doctor

knows how much of a certain biomarker [protein](#) is in our blood when we are healthy, he or she will be able to tell when we have an imbalance and whether that puts us at risk for heart disease.”

The project, titled the Development of a High-throughput Proteomics Platform for Biomarker Verification, received funding of \$200K from Genome BC and \$231K from the University of Victoria-Genome BC Proteomics Centre. Genome BC’s funding is part of its Strategic Opportunities Fund, which provides funding to innovative life sciences projects and aims to increase access for BC researchers to emerging technologies being developed nationally or internationally.

“This is an excellent example of a BC researcher working on tools to increase diagnostic sensitivity and move us towards a future of personalized medicine,” says Dr. Alan Winter, President and CEO of Genome BC. “The potential impact to create efficiencies in our health care system and in positive patient outcomes is significant.”

In the past, the medical community has not had access to detailed information on the number and type of proteins that are in our blood. The existing technology is slower and to date, researchers have identified only a few [biomarkers](#). “By using this new Agilent ion funnel technology, a much more sensitive [mass spectrometer](#), we can decrease the analysis time, increase the sensitivity and make it possible to analyze a large number of samples,” says Borchers. “Eventually this type of technology could be found in clinics, here in BC and in other parts of the world.”

Borchers has received local interest in his research using mass spectrometry for biomarker detection from the Vancouver Prostate Centre and Fraser Health. He also has received expressions of interest from research centres in other parts of North America and even Australia. “We are hoping to be North American leaders in this area,”

says Borchers. “Europe is already trying to integrate mass spectrometry into clinical diagnostics so we know the potential exists for this to be a rapid and efficient tool.”

Provided by University of Victoria

Citation: A single blood drop could detect heart disease, cancer (2011, January 26) retrieved 6 May 2024 from <https://medicalxpress.com/news/2011-01-blood-heart-disease-cancer.html>

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