BUILDING SUCCESS IN

FIGHTING HEART FAILURE

As many as one in five Canadians die of heart failure. That dismal figure is unacceptable to HSRLCE scientists Dr. Anthony Gramolini, a scientist at the Toronto General Research Institute (TGRI), Canada Research Chair in Cardiovascular Proteomics and Molecular Therapeutics and associate professor in the Department of Physiology at the University of Toronto, and Dr. Thomas Kislinger, an associate professor in the Department of Medical Biophysics at the University of Toronto. They are joining efforts to unravel the cellular pathways and molecular changes that underlie heart failure to facilitate earlier diagnosis and better patient outcomes. With the incidence of heart failure quickly reaching epidemic proportions, theirs is an urgent task. "National data suggests that once heart failure is diagnosed, the five-year mortality rate is more than 50 percent. Our focus is delaying disease progression," says Dr. Gramolini.

The Gramolini and Kislinger labs have been collaborating for over a decade, seeking novel methods to investigate general events in cardiac development and disease progression in cardiomyopathies using proteomic analyses of mouse models of cardiac disease. Joining their complementary expertise, Dr. Gramolini is focused on identifying novel proteins and signalling pathways in cardiac tissue involved in heart pathologies. Meanwhile, Dr. Kislinger uses methodologies in proteomics and informatics to analyze the large proteomic data sets generated.

The idea is that "obtaining novel insights into disease mechanisms will help to identify potential blood based biomarkers," Dr. Kislinger explains. They have been making significant strides already, as evidenced by a recent licensing agreement struck with Roche Diagnostics for a patented biomarker called biglycan. The vital discovery stems from research supported by a 2010 Genome Canada grant, led by fellow HSRLCE scientist Dr. Peter Liu. The project used mass spectrometry as a tool to identify and quantify novel cardiac membrane proteins to find blood-based early markers of heart disease.

The biomarker assay and platform for assessing heart failure will be made commercially available as a clinical tool in hospitals to help diagnose and manage heart failure patients. While earlier diagnosis and intervention are the ultimate aim, the biomarker's current indication is to measure therapeutic response and prognostic monitoring. "With such high mortality, current therapies are moderate, but there are always new opportunities to identify patients who are responding to therapy compared to those who are not," says Dr. Gramolini. Coming later this year are licences for two more biomarkers that are likely to predict early disease, as well as outcome, which are two important factors in managing heart failure.

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PHOTO: ROB WAYMEN

Dr. Thomas Kislinger (L)
and Dr. Anthony Gramolini (R)