Category	Category 1: occupational disease, injury and health services
Year Funded:	2011-2013
Budget:	$30,000
Investigators:	Dr David Broadhurst, Ryan T McKay – University of Alberta
Funding Agency:	Workers' Compensation Board-Alberta
Title:	Non-invasive diagnostic for the quantitative and qualitative assessment of disease and injury: prevention/recovery via magnetic resonance imaging and metabolomics
Issue/Rationale:	Metabolomics involves the identification and quantitative measurement of small physiological compounds in human bio-fluids (e.g., urine, blood, cerebrospinal fluid), and determines how the presence and/or concentrations of compounds change in healthy and disease states. Team members have previously used these changes in the type and concentrations of compounds to diagnose diseases of the lung and brain through a relatively inexpensive and efficient analysis of patient urine samples. We have preliminary data clearly establishing the ability to detect injury due to surgery and inflammation from human and animal urine samples. Along this same avenue, we now propose to follow and subsequently predict an individual's likelihood of developing and recovering from chronic or incidental injury by applying our metabolomics analysis to an individual's urine.
Objectives:	-We wish to ascertain if conditions leading up to imminent injury can be observed and quantified prior to injury onset (e.g., severe overtraining or chronic conditions such as lower back inflammation due to arthritis) in a small set of high-performance athletes. -Additionally, we want to use NMR spectroscopy to follow the potential chemical signatures involved in returning to a normal state.
Anticipated Results/Impact:	-Obtaining improved clinical outcomes by quantifying recovery and treatment performance -Ensuring optimal return to work outcomes for claimants thereby reducing recovery time, avoiding re-injury and loss of work-related skills -Improving the efficiency of claims management through reducing unnecessary burdens on caregivers and service capacity and reducing administrative costs -Provide a deterrent in potential litigation if measurable and quantifiable evidence of injury is available
Keywords:	Metabolomics, Incidence of injury, Recovery, Treatment, Return to work