Professor Lewis: Decoding metabolic evolution by high-resolution mass spectrometry

June 29th, 2016 9:00AM – 9:45 WB Walberg Building Room 219

Abstract
The fundamental nutritional requirements of cells are common to almost all living organisms. However, evolutionary pressures have radically diversified the strategies organisms use to meet these demands. One of the most extreme contrasts in nutritional strategies can be found in host-pathogen metabolic exchanges. Host organisms supply a predictable supply of nutrients to their cells despite dietary diversity, unpredictable energy output, and famine. Pathogens, by contrast, avoid nutritional adversity by stealing from their host. The nutrients pathogens come to rely on, and their strategies for acquiring these molecules, have a direct bearing on the severity and clinical presentation of infections. The Lewis laboratory specializes in unraveling these complex host/pathogen metabolic interactions using high-resolution mass spectrometry and multidimensional nuclear magnetic resonance spectroscopy. I will discuss the unique challenges one must overcome when unravelling these complex multi-organism metabolic systems and describe how the unique metabolic selective forces have shaped the evolution of human pathogens.

Biography
Dr. Ian Lewis is an Assistant Professor and Alberta Innovates—Health Solutions (AIHS) Translational Health Chair in the Department of Biological Sciences at the University of Calgary. The Lewis laboratory specializes in harnessing metabolomics technology to understand the role metabolism plays in infectious diseases. The Lewis group addresses this challenge using state-of-the-art mass spectrometry (MS) and nuclear magnetic resonance (NMR) technology. Recently, Dr. Lewis launched the Calgary Metabolomics Research Facility (CMRF)–a mass spectrometry facility that was designed specifically to meet the unique challenges faced in metabolomics.