

**Thursday , 11th December 2008 15:00-16:00 FC D 24**

**PROTECTING CANADA'S DRINKING WATER:  
DEVELOPING REAL-TIME, EARLY-WARNING  
BIOMONITORING TECHNOLOGY (O)**

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Our research addresses the necessity of developing an early-warning strategy to detect potential threats to drinking water sources. Natural bodies of water that ultimately constitute some of Canada's drinking water supply can contain a variety of pollutants such as heavy metals, PAHs, halogenated organic molecules, pharmaceuticals, and pathogens. While the associated health risks of some of these components are already known, there remains an alarming lack of research in many other areas. We are developing a holistic, multi-organism-based system to measure stress reactions in the aquatic community and are monitoring these stress responses in real-time. We will also develop ecotoxicity models based on dose-responses of individual organisms to specific classes of stressors (chemical and biological). These models will aid in the interpretation of the data and will provide information for water-utilities managers about the nature of the stressor. The ultimate goal of our research is the development and implementation of an early-warning system in real-time for drinking-water facilities that would detect chemical contaminants and pathogens using biomonitoring organisms. Our study is/will: 1) measuring responses in aquatic plants and invertebrates to chemical stressors at environmentally-relevant concentrations, and to pathogens; 2) developing a microarray-based test that can be used to directly detect pathogenic organisms; 3) build and test a flow-through system in a drinking-water facility for stress-response determinations in real-time; and 4) develop methods of stereotyped responses for the whole suite of biomonitoring organisms to chemical contaminants and pathogens.