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Mass Spectrometer-based Flow Cytometer, Methods and Applications

Status	Current
Competition	Applied Genomics and Proteomics Research in Human Health
Sector	Health
Genome Centre	Ontario Genomics Institute
Project Leader	John Dick

Project Description

Developing tools to identify rare cancer stem cells

There is mounting evidence to suggest that many types of cancer are in fact stem cell diseases involving rare cancer stem cells. Leukemia and skin, colon, breast and brain cancers are among the diseases scientists are now studying as stem cell diseases.

Led by Dr. Dick, the Mass Spectrometer-based Flow Cytometer, Methods and Applications project is developing tools to identify rare cancer stem cells in patient samples, and to examine the distinct cancer pathways within these stem cells for different types of cancer.

Most current approaches to treating cancer make no attempt to identify and exploit the unique cellular properties of diseased cells. Cancer stem cells have been poorly characterized because they are rare and difficult to isolate by conventional means, and because relevant assay methods are not available. This inability to deliver appropriate therapy to specific patients is one of the major limitations of modern cancer therapy. The Mass Spectrometer-based Flow Cytometer, Methods and Applications project will help physicians make personalized diagnoses that can be used to deliver the correct therapy for specific diseases. The benefit for cancer patients will be significant, including timely and effective treatment with minimized debilitating side-effects.

The project will lead to the development of new diagnostic tools that will define a higher benchmark in the standard of care offered by hospitals, clinics and research departments world-wide. Industrial participation throughout the project will transform the science into real products within five years. These commercial tools will not only amount to significant cost savings in providing health care to people around the world, but will lead to many new highly skilled jobs for Canadians and will create millions of dollars of new revenue. The success of this project will advance international awareness of Canada as a leader in bioanalytical research.