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## Development of Enabling Technologies for Proteomic Research

<b>Status</b>	Past
<b>Competition</b>	II
<b>Sector</b>	Development of New Technology
<b>Genome Centre</b>	Genome Prairie
<b>Project Leader</b>	William Davidson

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### Project Description

Advancements in new fields of science almost always go hand in hand with the development of new technology and the Human Genome Project is no exception. With the DNA sequence of genomes of hundreds of different organisms in hand, the next step is to turn this wealth of information into useful knowledge so that it can be applied to medical and biological advances. This research, called "functional genomics", seeks to learn how genetic information coded in DNA directs all the workings of a living organism. One of the ways to do that is to study the proteins in a cell—what they do, how they interact with one another and where they reside in the cell. This is called "proteomics".

The goal of our research group, a team of university and industrial scientists, is to develop new proteomic research instruments machines that can measure the amount and type of proteins in order to speed up basic research and clinical studies. The best way to do this currently is by using a technology called mass spectrometry in which MDS Sciex, a Canadian company, is a world-leader.

Our research team developed new methods to prepare biological samples very rapidly and with extremely small amounts. We created powerful high-performance mass spectrometry instruments with exquisite sensitivity and precision for the analysis of protein and DNA molecules. These devices are valuable for using very small samples when dealing with humans. We have devised ways to make plastic devices that can replace more-expensive glass ones. We have developed a way to locate and measure protein markers in living tissue; this may become important in the early diagnosis of disease.

## **Fast Facts**

<b><i>Highlighted outcome:</i></b>	The development of new instruments for protein analysis – miniaturization of sample preparation and more efficient mass spectrometers capable of handling minute sample amounts
<b><i>Number of research personnel employed by the project:</i></b>	268 person-years
<b><i>Number of peer reviewed publications published:</i></b>	35 plus 12 invited presentations and 3 awards
<b><i>Resources generated:</i></b>	New instruments of non-invasive clinical protein analysis for early diagnosis of disease
<b><i>Number of patents in Process or obtained:</i></b>	34 disclosures, 16 patent applications files, 1 published patent
<b><i>Co-funders:</i></b>	MDS Analytical Technologies (formerly MDS Sciex)