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Sequencing of the bacterium *Clostridium difficile* (*C. difficile*)

Status	Current
Competition	Other
Sector	Health
Genome Centre	Genome Quebec
Project Leaders	Ken Dewar

Press Release: Canada's New Government Invests \$200,000 for Genome Research to Control *Clostridium Difficile*

GENOME CANADA AND GÉNOME QUÉBEC INVOLVED IN PROJECT

MONTRÉAL, DECEMBER 20, 2006 — The Honourable Maxime Bernier, Minister of Industry together with Dr. Calvin Stiller, Chair of the Board of Directors of Genome Canada, and Mr. Paul L'Archevêque, President and CEO of Génome Québec, today announced a large-scale genome research project to sequence multiple strains of the bacterium *Clostridium difficile* (*C. difficile*). The research will cost \$388,625, to be funded equally by Genome Canada and Génome Québec. In addition, the Canadian Institutes of Health Research and partners are offering a post-doctoral fellowship to a scientist who will participate in the study.

Clostridium difficile-associated disease (CDAD) is a major problem in the health sector and an ongoing and serious concern throughout Canada. This 18-month research project will accomplish the complete genome sequencing of eight isolates of *C. difficile*. It will:

- measure genetic diversity within and between strains;
- construct catalogues for genes and proteins;
- search for other genes that might contribute to increased virulence and/or antimicrobial resistance; and
- begin to determine how different toxins and genes correlate with disease-causing ability.

"Today's announcement is wholly in keeping with the spirit of the objectives outlined in our recent economic plan, Advantage Canada. It solidifies the commitment of Canada's New Government to support research excellence, and to ensure that research findings are translated into socio-economic outcomes for Canadians and concrete solutions that improve their health," said Minister Bernier.

"This initiative represents the collaboration and investments of all stakeholders, including the federal and Quebec governments. Partnerships are essential, and it is vital that we continue with this approach. It is a tangible demonstration of the open federalism being practiced by our government", he added.

“C. difficile has long been a sporadic low-level problem. However, more virulent strains have emerged in recent years and the incidence of disease has increased. We do not know what makes these new variants of the organism more aggressive. The proposed genome sequencing studies will dramatically enhance our ability to understand their unusual virulence,” said Dr. Stiller.

According to Paul L’Archevêque, President and CEO of Génome Québec, there is no doubt that the interdisciplinary approach has again proven itself. “In addition to the very promising science advanced by Dr. Dewar, the beauty of this project lies in the relationship between many research efforts,” said Mr. L’Archevêque. He added that Génome Québec and Genome Canada are supporting these complementary efforts by contributing to this project, initiated by the Fonds de la recherche en santé du Québec. “By promoting a multidisciplinary and concerted approach, we have successfully combined our efforts for the greatest benefit of the population,” he added.

Ultimately, the project will allow Canadian and international researchers to develop better tests for C. difficile detection and diagnosis; describe factors that may influence virulence; and plan future experiments for identifying causative genes and their roles in pathogenesis. These are necessary steps toward devising new strategies for disease control and treatment.

“It may take time to develop therapy or preventative measures based on the information gained in our study. Still, this research will undoubtedly lead to more effective ways of identifying hypervirulent C. difficile strains,” concluded Dr. Ken Dewar, the project’s leader.