

# A gut feeling

Bruce Verchere gets to the root of what's causing diabetes

By Rosalind Stefanac



Bruce Verchere



Centre: Bruce Verchere at the launch of the CDA's Diabetes Charter for Canada. Above: Members of his lab include (from left to right) Paul Orban, Loraine Bischoff, Galina Soukhatcheva, Clara Westwell-Roper, Derek Dai, Jaques Courtade, Joel Montane, Sigrid Alvarez, Merce Obach, and Bruce Verchere.

**Y**ou could say Bruce Verchere has always followed his gut. When he started his graduate studies at the University of British Columbia (UBC) in 1985 and first began exploring the hormones that exist in our intestines, he had a feeling it would be an area worth researching further. “The intestinal tract is a fascinating endocrine organ, and these molecules in the gut attracted me because they circulate in such small amounts but have profound effects on our mood, appetite, sexuality, and metabolism,” he says.

Eventually, this Vancouver resident began to appreciate the relationship of the gut, or intestines, to diabetes in particular. “I became more and more interested in how these hormones act on beta cells to stimulate insulin secretion,” he says. “By the time I finished my PhD, I was pretty convinced that I wanted to stay in diabetes, especially in researching the pancreatic islets where insulin-producing beta cells live.”

“Canada has an incredible research history in insulin and diabetes as it relates to islets, starting with Banting and Best.”

– Bruce Verchere, researcher

Today, as head of the diabetes research program at the Child & Family Research Institute (CFRI) in Vancouver, Mr. Verchere has managed to do just that. His research has been dedicated to figuring out why beta cells don't work properly or die in people with type 1 and 2 diabetes, and to finding new ways of protecting these beta cells to slow down or prevent the onset of the disease.

He and his team are also looking at ways to improve beta cell survival following the transplant of islets into people with diabetes so they no longer need to take insulin. “Beta cell replacement and islet transplantation is potentially a way to cure people with type 1 diabetes,” says Mr. Verchere. “It gives us the potential to get people off insulin with better glucose control.”

“The islet beta cell is really central to both type 1 and 2 diabetes. We're trying to find ways to target these cells prior to the onset of diabetes to slow the attack.”

– Bruce Verchere, researcher

Given that most people with type 1 diabetes need several islet transplants and that the number of donors is limited, he is looking at other sources of beta cells, such as human stem cells or pig islets. “One idea is that if we can cultivate cells that mimic human beta cells [work being pioneered by Vancouver researcher Tim Kieffer], we could have an unlimited source to draw from,” he says. “But we still have to find ways to protect these cells following their transplantation so that people don't need multiple operations or have to take drugs for the rest of their lives so their bodies don't reject the transplanted cells.”

Mr. Verchere's work is important for people with type 2 diabetes, too. “All people with the disease have a dysfunction of their beta cells, so we're starting to identify what prompts this decline so we can find ways to slow it down.” One key discovery: A protein called IAPP, which is produced by beta cells, causes inflammation in the pancreatic islet, leading to beta cell dysfunction.

Photo by: photosbykathryn.com

Photo (far right) by: Ianick Leroux

“Dr. Bruce Verchere's work opens up so many doors for dealing with the problem of the death of islet cells in people with type 1 or type 2 diabetes, which could help slow down or prevent this disease in future.”

– Dr. Jan Hux, chief science officer, Canadian Diabetes Association

His research could also have an impact on the lives of children with diabetes. “We're seeing more and more kids who are obese and at risk for developing type 2 diabetes,” he says. “We realize how important it is for these kids to find a diabetes management plan that preserves the functioning of their pancreas as long as possible.”

Dr. Jan Hux, chief science officer at the Canadian Diabetes Association (CDA), says the key thing that Bruce Verchere is doing is asking the question, “Why?” “People have documented that beta cells die early and what impact this has on the progression of the disease, but his research focuses on why these cells die, and that's fundamental to both types of diabetes.”

Mr. Verchere credits the CDA for having supported him all along the way, most significantly by helping foster a strong diabetes research community. “Vancouver is now one of the hubs of islet research,” he says. “I'm really proud of what we've built here with our diabetes program.”

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## BRUCE VERCHERE AT A GLANCE

- > Awarded Queen Elizabeth II Diamond Jubilee Medal for his contribution to the diabetes community (2012)
- > Became a member of the Canadian Diabetes Association (CDA) national board of directors (2012)
- > Helped raise \$1.2 million in partnership with CDA and the University of British Columbia to recruit three young diabetes researchers to Vancouver, who have now established their own research laboratories at the Child & Family Research Institute (2009-2011)
- > Awarded CDA Young Scientist award (2006)

## Did you know?

- The beta cells of the pancreas, which make insulin, are found in tiny patches in the Islets of Langerhans.
- In March 1999, a group of eight researchers in Edmonton successfully performed the first islet transplant using a new method. This became known as the Edmonton Protocol, and transplant centres around the world now use it. To read more from “Progress in Research,” visit [diabetes.ca/researchprogress](http://diabetes.ca/researchprogress).