

## RESEARCH UPDATE

## 2010 Canadian Diabetes Association Young Scientist Award Winner: Dr. Timothy J. Kieffer

The National Research Council of the Canadian Diabetes Association (CDA) is pleased to announce that Dr. Timothy J. Kieffer is the 2010 recipient of the CDA's Young Scientist Award (Figure 1).

The CDA established the Young Scientist Award in 1987 for the purpose of encouraging, by appropriate recognition, outstanding research conducted in Canada by young scientists (not past their 45th birthday) in the field of diabetes.

Dr. Kieffer is a professor in the Department of Cellular & Physiological Sciences and the Department of Surgery at the University of British Columbia. From 2001 to 2008, Dr. Kieffer held several volunteer roles for the CDA, including Peer Review Committee member, vice-chair, and chair; National Research Council member; and Clinical & Scientific Section Professional Conference Program Committee member. He continues to volunteer as a guest speaker for CDA events in Vancouver and nationally.

Dr. Kieffer is widely known as a highly innovative leader in the field of diabetes research, whose groundbreaking research has led to changes in the fields of diabetes research and treatment. He also believes strongly in the next generation of diabetes researchers, providing a rich training environment for several new rising stars.

Dr. Kieffer was presented with the Young Scientist Award at the 2010 Professional Conference and Annual Meetings in Edmonton, Alberta. Dr. Kieffer gave his award lecture, Cell-based Insulin Replacement for Diabetes, on Friday, October 22, 2010. Dr. Kieffer's lecture focused on his research, which has been supported by the CDA, among other funders.

Normally, glucose levels are maintained in the body through a complex interplay of several hormones. When a person with diabetes needs exogenous insulin, it must be provided by insulin injection. People with diabetes are challenged to regulate their blood glucose levels with replacement insulin without risking either the complications associated with hyperglycemia or the risks of hypoglycemia. Dr. Kieffer is searching for ways to improve treatments for people with diabetes in order to reduce these complications.

The fat-derived protein leptin has profound glucose-lowering actions. Leptin-deficient mice develop hyperglycemia that can be corrected by leptin replacement, and it appears that weakened leptin action can cause insulin resistance (1). Dr. Kieffer's team aims to determine the mechanism by which leptin regulates glucose homeostasis. The team proposes that providing leptin therapy in conjunction with



Figure 1. Tim Kieffer (left) receiving the Young Scientist Award from Bruce Verchere, Chair, National Research Council

insulin therapy may allow for better control of blood glucose for people with diabetes.

Any therapy, no matter how good, cannot compete with the healthy body's natural ability to control blood sugar. Dr. Kieffer envisions therapies that will negate the need for daily therapies for diabetes. Islet cell transplantation can result in long-term insulin independence, but the therapy is limited owing to the few cadaver donors available and the need for chronic immune suppression in recipients (2). Stem cells could offer an unlimited source for pancreatic cells that would reduce the reliance on cadaver sources. Dr. Kieffer's team has developed a protocol to differentiate stem cells into clusters of alpha cells and beta cells that resemble islets. These islets secrete both insulin and glucagon, but lose beta cell insulin expression upon transplant. However; the cells retain appropriate production and release of glucagon after transplantation (3). Dr. Kieffer's team now aims to revise this protocol to preserve the insulin-producing function of the beta cells rather than the glucagon-producing function of the alpha cells. If this protocol is successful, it will also be necessary to determine a way to protect these transplanted beta cells from immune attack.

In order to circumvent the need for immune suppression, Dr. Kieffer's team is also exploring the possibility of influencing non-beta cells to produce insulin. Previously, Dr. Kieffer's team introduced an insulin gene into gut K cells. In animals, this protected them from developing diabetes when beta cells were destroyed. The protection was extended even when beta cells were destroyed by autoimmune processes in a model of type 1 diabetes (4). This discovery led to the creation of a biotechnology company that devised a non-viral gene delivery approach that allows K cells to produce insulin over the long term in small and large animals. Studies are currently in the preclinical dosing phase to determine the safety and efficacy of this approach to treat diabetes.

The CDA would like to congratulate Dr. Kieffer on his accomplishments and for being the recipient of the 2010 CDA's Young Scientist Award.

Polly VandenBerg BSc(hon)  
 Manager, Research  
 Canadian Diabetes Association  
 Toronto, Ontario, Canada

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## Become a Community Pharmacy Outreach Program Partner

By partnering with the Canadian Diabetes Association (CDA) through the Community Pharmacy Outreach Program (CPOP), pharmacies are aligning themselves with a world class expert in diabetes education and a trusted source of information for people with diabetes.

### Some of the new and enhanced CPOP partnership benefits include

- a 1-year Diabetes Educator Section membership for 1 pharmacist at a participating CPOP pharmacy
- a discount of 25% towards the purchase of *Building Competency in Diabetes Education: the Essentials* and *Building Competency in Diabetes Education: Advancing Practice* materials to enhance your knowledge of supporting patients with diabetes and help you prepare for becoming a Certified Diabetes Educator
- CPOP being featured on diabetes.ca with a postal code search locator tool that will identify participating pharmacies from coast to coast

For more CPOP partnership benefits visit [www.diabetes.ca/cpop](http://www.diabetes.ca/cpop). These benefits are all included in the program for a yearly fee for qualifying pharmacies.



For more information about this unique community partnership opportunity, visit [www.diabetes.ca/cpop](http://www.diabetes.ca/cpop) or call 1-800-BANTING and we will connect you with the Association office in your community.

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