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Apoptosis in vivo in adult pancreatic cell and the implication in type 2 diabetes

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Beta-cell mass is the result of the overall balance between beta cell proliferation (replication and neogenesis) and apoptosis. When the apoptotic rate exceeds the rate of beta-cell proliferation, insulin secretion become inadequate and hyperglycemia ensues. While the loss of pancreatic beta-cells in type 2 diabetes is well documented the pathophysiological mechanism(s) responsible for the loss of beta cell mass remain poorly defined. Type 2 diabetic patients also are characterized by hyperglucagonemic and enhanced hepatic glucose production in response to glucagon. Progression from normal glucose tolerance to impaired glucose tolerance to type 2 diabetes is characterized by a progressive decline in insulin secretion/plasma insulin concentration and progressive rise in plasma glucagon concentration. We postulate that the alpha cell is more resistant to apoptosis than the pancreatic beta cell. If this hypothesis is correct, one can ask what are the anti-apoptotic mechanism(s) that protects alpha cells from cell death in contradistinction to beta cells? We have developed a unique *in vivo* model that allows us to study the apoptotic signaling events that are involved in the regulation of adult endocrine pancreatic cell mass/function. Our technique, which allows us to deliver lentivirus shRNA specifically into the mouse pancreas *in vivo*, provides evidence that GRB10 is critically involved in alpha cell survival and, as a result, plays an important role in regulating basal glucagon secretion and glucose tolerance in adult mice. The understanding of apoptotic signaling in the pancreas can open the door to new treatment or prevention in diabetes

Biography

Bruno Doiron has completed his Ph.D from University of Paris Rene Descartes, France and worked as a Director in the biotechnology sector in France and Canada and as an academic researcher in France and USA at Institute Cochin of Genetic Molecular, Paris, France; Institute of Biology in Lille, France and Mount Sinai School of Medicine, NY, USA. He is currently Assistant Professor at the University of Texas Health Science Center at San Antonio in the Dept of Medicine – Diabetes Division and Assistant Professor at University of Texas at San Antonio in the Dept of Biology

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