Bruno Doiron, J Diabetes Metab 2016, 7:5(Suppl)
http://dx.doi.org/10.4172/2155-6156.C1.042

9th Diabetologists Conference

The challenge and hype of stem cells research to replace insulin injection: Many hurdles remain

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The quest to replace insulin injection treatment has focused on two strategies: *In vivo* islet transplantation and *in vitro* nuclear reprogramming to produce differentiated beta cells. Ultimately, both strategies rely on encapsulation to implant islets or culture cells into the human body. The many hurdles involved with islet transplantation have yet to be overcome and, even if successful, the paucity of pancreatic donors limits this approach. An alternative approach has attempted to recapitulate the embryonic development of pancreatic beta cell *in vitro* using stem cells. However, the stem cell approach requires *in vitro* cell culture and still has to overcome the hurdle of encapsulation. Beyond the capsulation hurdle, there remains a lack of knowledge about the basic molecular/cellular events via which a completely undifferentiated cell can be transformed into a functioning tissues/organ which can be integrated into whole body homeostasis. Mark Twain said: "What gets us into trouble is not what we don't know; it's what we know for sure that just isn't so."

Biography

Bruno Doiron is a Faculty Member at the University of Texas Health Science Center at San Antonio. He has received his undergraduate degree from University of Moncton, Canada and graduate degrees from University of Montreal, Canada and University of Paris Descartes, Paris, France. As Project Leader he has made major discoveries in the field of gene regulation by nutrients and has 4 patents on the modulation of glucose metabolism as it relates to the treatment diabetes and cancer. He has extensive experience in basic research at the physiologic and molecular levels and in respective applications to the biotechnology field.

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