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Pancreatic progenitor cells from the islets of diabetic monkey models

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Despite recent success in islet transplantation for the treatment of type 1 diabetes, the lack of a surrogate source of donor cells that can express insulin remains a major obstacle. The present study aims to identify stem cells/progenitors directly from adult monkey islets and to assess the proliferation and differentiation potential of such cells. Our results indicate that there are pancreatic progenitor cells in the adult pancreatic islets in both normal and type 1 diabetic animals. The isolated pancreatic progenitor cells can be greatly expanded in culture. Upon the removal of growth medium, these cells spontaneously form islet-like cell clusters (ICCs), which could be further induced to secrete insulin by inductive factors. Furthermore, the secretion of insulin and C-peptide from the ICCs responds to glucose and other stimuli, indicating that the differentiated cells not only resemble β-cells but also possess the unique biological function of β-cells. In our initial autologous transplantation experiments in which ICCs were infused into the portal vein of the liver of diabetic monkeys, the elevated blood glucose levels were lowered for extended periods of time, accompanied by an increase of both insulin and C-peptide levels in the blood. This study provides a foundation for further characterization of adult pancreatic progenitor cells and autologous transplantation using pancreatic progenitor cells in treating diabetic monkeys.

***Keywords*:** type 1 diabetes, progenitor cells, autologous transplantation, primates

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