

# Differentiation of Stem Cells to Pancreatic Endocrine Cells

Published date: Feb. 1, 2012

## Technology description

### Summary

Diabetes, which effects 16 million people in the United States alone, results at least in part from decreased production of insulin by the pancreas. In the pancreas, insulin is produced by specialized structures called the islets of Langerhans. Adult mammalian islets are composed of four major cell types: the  $\alpha$ ,  $\beta$ ,  $\delta$  and PP cells which produce glucagons, insulin, somatostatin, and pancreatic polypeptides respectively. The physical proximity and resulting interaction of each of these modulators of carbohydrate metabolism may be necessary for the proper control of insulin secretion. The lack of tight feedback control of insulin secretion is thought to be responsible for pathologies arising after the long-term injection of insulin for diabetics.

This invention provides a method for differentiating stem cells into endocrine cells that produce insulin and other pancreatic hormones. The cells self-assemble to form three-dimensional clusters similar in topology to normal pancreatic islets. Glucose triggers insulin release from these cell clusters by mechanisms similar to those employed in vivo. When injected into experimental animals, the insulin producing cells undergo rapid vascularization and maintain an islet-like organization. These cells could provide both a model system for in vitro study of pancreatic islets and a potential therapy for replacing lost pancreatic function through transplantation.

### Institution

[NIH - National Institutes of Health](#)

## 联系我们



叶先生

电话：021-65679356

手机：13414935137

邮箱：yeyingsheng@zf-ym.com