SUBCUTANEOUS AND RETROPERITONEAL ISLET TRANSPLANTATION AS A TREATMENT

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Technology description

Description

Type 1 Diabetes Mellitus (T1D) is a chronic autoimmune disease in which the immune system destroys the insulin producing beta cells in the pancreas. In the absence of insulin, the body cannot absorb glucose. Therefore, patients with T1D need daily insulin administration for survival and to monitor their glucose levels. Hyperglycemia (high glucose levels) damages organs (blindness, kidney failure, lower limb amputation, heart disease, and stroke), and hypoglycemia (low glucose levels) may lead to hypoglycemic coma and even death. A definitive treatment of T1D would be to replace the lost insulin-producing pancreatic beta cells (islet transplantation) to restore the normal function of regulating blood glucose levels and preventing the development of the long term disease complications. Currently, the islet transplantation procedure involves injection of the islet cells via a catheter into the liver of a patient. This procedure however has led to a number of complications, such as bleeding inside the abdomen and blood clots in the portal vein. Therefore, there is an urgent need to find alternative sites for islet cell transplantation. Prof. NajiÃs group has been successful in achieving normoglycemia in a mouse model with islet cell transplantation in subcutaneous and retroperitoneal space, overcoming the well known side effects of islet transplantation in the liver. Previous studies had shown that neither site were suitable for islet cell transplantation. However, islet cell transplantation success has been achieved with a unique composition that provides an ideal milieu for their survival at the transplantation site. To address the issues of long-term islet viability and suitability of the islet cell transplantation procedure in humans, Dr. NajiÃs group transplanted autologous islets cell preparation into subcutaneous space in a pancreatectomized, non-human, primate model. Skin biopsies from recipients show that transplanted islet cells survive in subcutaneous space and the transplantation site, as far out as 250 days following transplantation. They contain abundant viable insulin and glucagon producing islets, and are free of inflammation and fibrosis. Further experimentation is underway.

Institution

University of Pennsylvania

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com