

Tissue-engineering approaches in pancreatic islet transplantation

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Pancreatic islet transplantation is a promising alternative to whole-pancreas transplantation as a treatment of type 1 diabetes mellitus. This technique has been extensively developed during the past few years, with the main purpose of minimizing the complications arising from the standard protocols used in organ transplantation. By using a variety of strategies used in tissue engineering and regenerative medicine, pancreatic islets have been successfully introduced in host patients with different outcomes in terms of islet survival and functionality, as well as the desired normoglycemic control. Here, we describe and discuss those strategies to transplant islets together with different scaffolds, in combination with various cell types and diffusible factors, and always with the aim of reducing host immune response and achieving islet survival, regardless of the site of transplantation. © 2018 Wiley Periodicals, Inc.

biomaterials

islet transplantation

tissue engineering

type 1 diabetes

Biomaterials

Tissue

Tissue engineering

Diffusible factors

Host immune response

Islet transplantation

Pancreas transplantation

Pancreatic islet

Standard protocols

Type 1 diabetes

Type 1 diabetes mellitus

Scaffolds (biology)

animal

human

insulin dependent diabetes mellitus

mouse

pancreas islet transplantation

tissue engineering

tissue scaffold

Animals

Diabetes Mellitus, Type 1

Humans

Islets of Langerhans Transplantation

Mice

Tissue Engineering

Tissue Scaffolds