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REVIEW ARTICLE

Enhancing Clinical Islet Transplantation through Tissue Engineeering Strategies

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Abstract

Clinical islet transplantation (CIT), the infusion of allogeneic islets within the liver, has the potential to provide precise and sustainable control of blood glucose levels for the treatment of type 1 diabetes. The success and long-term outcomes of CIT, however, are limited by obstacles such as a nonoptimal transplantation site and severe inflammatory and immunological responses to the transplant. Tissue engineering strategies are poised to combat these challenges. In this review, emerging methods for engineering an optimal islet transplantation site, as well as novel approaches for improving islet cell encapsulation, are discussed.

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Abbreviations: (APC) antigen-presenting cell, (CIT) clinical islet transplantation, (ECM) extracellular matrix, (IBMIR) instant blood-mediated inflammatory reaction, (IL) interleukin, (PEG) polyethylene glycol, (PLL) poly-lysine, (T1DM) type 1 diabetes mellitus, (TNF) tumor necrosis factor

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