

Clinical Xenotransplantation of Alginate Encapsulated Porcine Islets and its Immunological Challenges

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ABSTRACT

Alginate encapsulation provides a way to prevent immune recognition and destruction of transplanted islets. This technique has recently been used in the treatment of type 1 diabetes, to replace the beta-cells lost from autoimmune destruction. The success of this protection in preventing graft destruction depends on presence of immunogenic impurities, certain polymer compositions, surface characteristics, release of membrane-permeable antigens, as well as Damage Associated Molecular Patterns (**DAMPs**) by the islets in the alginate. There is no standard for these factors at the present that has been defined to minimize graft destruction. However, various groups have reported prolonged graft survival and improved protection from immune-mediated graft destruction, dependent on improvements that affect multiple targets in the islet - alginate encapsulation process. The progress in the varying pathways that lead to improved graft survival assists us in understanding the mechanisms that lead to the varying immunogenicity of alginate