PEG Grafting on the Collagen Matrix of Islets for Prolongation of Islet Allografts Survival and Reduction of the Cyclosporine A Dosage

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Transplanted islets are rejected by host's immune rejection due to the recognition as a foreign material. In this study, to prevent the rejection of islets, biocompatible polyethylene glycol (PEG) was grafted onto the collagen matrix of islets and also low dose of cyclosporine A (CsA), one of immunosuppressive durgs, was daily administered into the diabetic rats after PEG-grafted islet transplantation. The mean survival time (MST± s.e., n=7) of PEG-grafted islets and free islets was 8.3 ± 0.7 and 7.6 ± 0.6 days, respectively. When 3 mg/kg of CsA was administered for 2 weeks, the MST of PEG-grafted islets or free islets was 55.3 ± 15.8 and 12.8 ± 0.6 days, respectively. However, when 0.5 or 1 mg/kg of CsA was continuously administered after 3 mg/kg of CsA administration for 2 weeks, PEG-grafted islets of all recipients survived for more than 100 days. In the histological analysis, immune cells infiltrated into the free islets but did not infiltrate into the PEG-grafted islets. Also, insulin-positive islets were shown on the all PEG-grafted islets. Thus, these results show that the grafted PEG could significantly reduce the dose of immunosuppressive drugs and the PEG-grafted islets could survive for long period. Therefore, the PEG grafting might be a useful tool for immune suppression *in vivo*.