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I.27 The electromagnetic separation principle: a basis for human pancreatic islet transplantation

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Successful human islet transplantation requires large amounts of viable islets which must be depleted of the strongly immunogenic exocrine tissue. The well established method of hand-picking in rodent models is far too laborious and time-consuming for the number of islets needed in human transplantation. In earlier studies, we adapted our magnetic microspheres (MMS) to large scale purification of collagenase-digested rat islets by construction of a specific MMS-lectin complex which binds selectively to rat exocrine tissue and showed that the separated islets remained *in vivo* functionally intact. We investigated lectins for their binding specificity to human exocrine tissue.

Results: 1) Ulex europaeus agglutinin I (UEA-I), which proved to be highly selective for rat exocrine tissue, is unsuitable in the human as it also binds strongly to endocrine cells. 2) Of the other 18 lectins tested in immunofluorescence studies, 8/18 do not react with either exocrine or endocrine tissue, 9/18 show weak reactivity with exocrine tissue and only one reacts strongly and selectively with exocrine tissue. 3) Only the strongly selective lectin can be coupled to MMS without loss of function. 4) This particularly useful MMS-lectin complex appears to be similarly effective at electromagnetic separation in the human as UEA-I is in the rat 5) The viability of islets after separation is over 90 %.

Conclusions: 1) Our experience with lectins in rat and human pancreas studies show that each islet donor species requires a thorough search for a selectively binding lectin. 2) The electromagnetic separation principle is effective, simple, and fast and may solve the problems of quantity and purity in human islet transplantation.

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I.28 Sequence analysis of class I cDNA clones of the rat major histocompatibility complex

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Two groups of class I genes can be distinguished in the rat major histocompatibility complex (RT1), which are separated from each other by the class II gene cluster encompassing DP, A, and E-like genes and the class III region with the C4 and Bf genes. The RT1.A region determines classical class I antigens and the RT1.C region H-2Qa-like molecules. For further characterization of class I genes, six different class I cDNA clones have been isolated from an expression library constructed from poly(A^+) mRNA of mitogen-stimulated T lymphocytes. Clone-specific sequences have been subcloned from the 3' end of the clones and four of them could be mapped to the RT1.C region. Sequence comparison reveals strong homology to class I genes of other species. One of these clones (11/3) carries a long insert – 2.4 kb instead of 1.0 to 1.3 kb found for the other inserts. Clone 11/3 has an open reading frame of 1.3 kb, which is followed by a 3' untranslated region of 1.1 kb. The coding region shows a mosaic-like