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## From human MSCs to IPCs

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We have succeeded in the production of Insulin producing cells (IPCs) from human MSCs by a process of directed differentiation. Although the yield following directed differentiation of adult human MSCs to form IPCs is modest, yet transplantation of these cells in diabetic mice resulted in their cure. We have tried to provide an explanation for this observation. Differentiated MSCs, were transplanted under the renal capsule of diabetic mice. The kidneys were harvested after 1, 2, 4 and 12 weeks. The insulin producing cells were counted and the relative expression of relevant endocrine genes determined. The proportion of IPCs increased to reach a maximum of ~ 20% at 4 weeks. There was no change thereafter. There was a parallel increase in the relative expression of endocrine genes. In order to study the efficiency of these cells in treatment of larger animals and identify their functional longevity, we have induced diabetes in 6 dogs (15 – 20 Kg) by a mixture of alloxan and STZ. 50-80 million differentiated human cells were encapsulated and transplanted beneath the rectums sheath. 6 dogs are currently under follow up. 3 had completed a 6 months follow up. 2 became euglycemic with normal glucose tolerance curve. The third is on the hyperglycemic side although the profile of its glucose tolerance resembles a normal one. A harvested capsule after 6 months form transplantation was histologically examined and the relative expression of pancreatic endocrine genes determined. By immunofluorescence, insulin +ve cells were seen, and co-expression with c-peptide was seen. The proportion of insulin +ve cells was again in the range of ~ 20%. In conclusion, insulin producing cells can be formed by directed differentiation from of MSCs. After their transplantation, these cells undergo further differentiation in vivo. Evidence was provided that these cells can cure chemically induced diabetes in small as well as large animals..

## Biography

Mohamed A Ghoneim is Professor of Urology and Nephrology Center at the University of Mansoura, Egypt. He has published more than 300 papers in reputed Journals.

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