



REVISTA DO HOSPITAL DE CLÍNICAS DE PORTO ALEGRE E
FACULDADE DE MEDICINA DA UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL

REVISTA HCPA 2007;27 (Supl 1) :1-292

27^a Semana Científica do Hospital de Clínicas de Porto Alegre

14º Congresso de Pesquisa e Desenvolvimento em Saúde do Mercosul
10 a 14 de setembro de 2007

Anais

Gastroenterologia

INDUCTION OF IN VITRO DIFFERENTIATION OF RAT MESENCHYMAL STEM CELLS OVEREXPRESSING BETACELLULIN INTO BETAPANCREATIC CELLS.

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In Brazil, according to the last census (IBGE- 1989), it was estimated that 8 million people have diabetes. This amount of diabetic people represents a direct cost of approximately US\$22 billions per year to the Public Health Program. A recent survey conducted in a Brazilian city, points out that at the present the prevalence of diabetes in Brazil must be much higher. In fact, the incidence and prevalence of diabetes is expected to increase around 30% by the year 2009. In type 1 or type 2 diabetes an insufficient mass of functional betapancreatic cells is the major determinant for the onset of hyperglycemia. So the restoration of beta-cells number by transplantation from exogenous sources or by endocrine pancreas regeneration would be ideal therapeutic options. However a limited supply of human donor tissues or organs induce several researches towards the establishment of an alternative source of cells. In this vein, mesenchymal stem cells obtained from bone marrow, presents the ability to differentiate into a variety of cell types, including pancreatic cells. Besides, Betacellulin, a protein member of the epidermal growth factor – EGF, expressed predominantly in pancreas, has been applied to improve glucose metabolism in diabetic mouse(Li et al., 2003). To study the capacity of betacellulin to guide the transdifferentiation of mesenchymal stem cells to beta-cells our group is working to produce overexpressing betacellulin mesenchymal stem cells. At the moment we are characterizing the mesenchymal stem cells using surface markers by flow citometry. Later the cells will be transfected with pCDNA3-BTC-EF plasmid and submitted to a differentiation protocol using 10Mm nicotinamide. After the differentiation the obtained cells will be analyzed using anti-insulin monoclonal antibodies and by RT-PCR.