

# 3<sup>rd</sup> International Conference and Exhibition on **Biowaivers, Biologics & Biosimilars**

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## **In vitro quantitative and relative gene expression analysis of pancreatic transcription factors Pdx-1, Ngn-3, Isl-1, Pax-4, Pax-6 and Nkx-6.1 in trans-differentiated human hepatic progenitors**

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Diabetes is a major health concern throughout the world because of its increasing prevalence in epidemic proportions.  $\beta$ -Cell deterioration in the pancreas is a crucial factor for the progression of diabetes mellitus. Therefore, the restoration of  $\beta$ -cell mass and its function is of vital importance for the development of effective therapeutic strategies and most accessible cell sources for the treatment of diabetes mellitus. Human fetuses (12–20 weeks gestation age) were used to isolate human hepatic progenitor cells (hHPCs) from fetal liver using a two- collagenase digestion method. Epithelial cell adhesion molecule-positive (EpCAM+ve)-enriched hHPCs were cultured in vitro and induced with 5– 30 mmol/L concentration of glucose for 0–32 h. Pdx-1 expression and insulin secretion was analyzed using immunophenotypic and chemifluorescence assays, respectively. Relative gene expression was quantified in induced hHPCs, and compared with uninduced and pancreatic cells to identify the activated transcription factors (Pdx-1, Ngn-3, Isl-1, Pax-4, Pax-6 and Nkx-6.1) involved in  $\beta$ -cell production.

EpCAM+ve cells derived from human fetal liver showed high in vitro trans-differentiation potential towards the  $\beta$ -cell phenotype with 23 mmol/L glucose induction after 24 h. The transcription factors showed eminent expression in induced cells. The expression level of transcription factors was found significantly high in 23 mmol/L- induced hHPCs as compared with the uninduced cells. The present study has shown an exciting new insight into  $\beta$ -cell development from hHPCs trans-differentiation. Relative quantification of gene expression in trans-differentiated cells offers vast possibility for the production of a maximum number of functionally active pancreatic  $\beta$ -cells for a future cure of diabetes.