

P002 Beta-cells can be derived from mesenchyme during pancreatic development

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It is well established that Insulin-producing pancreatic β -cells arise from the fore-gut epithelium of the developing pancreas. Moreover, inductive interactions between mesenchymal and fore-gut epithelium are crucial for normal pancreatic development. Recently, however, the elucidation of novel ways to recapitulate β -cell neogenesis has involved the use of alternate transcriptional networks. Here, we provide evidence that foregut mesenchymal cells have the ability to differentiate into pancreatic β -cells (islet mesenchymal-to-epithelial transition, iMET). When chick embryonic pancreatic epithelium is cultured with quail foregut mesenchyme in a 3-dimensional system, we find a rapid down-regulation of the transcriptional factor *Barx1*, a gene specific for stomach mesenchyme. This is followed by β -cell differentiation in the quail derived mesenchymal cells. These mesenchymal derived islets express the master pancreatic gene, *Pdx-1* as well as the secreted hormone, Insulin. This iMET model demonstrates a novel pathway of β -cell differentiation which could prove to be advantageous in generating islet cells for transplantation.