

P006 Generation of insulin-synthesising pseudo-islets from adult stem cell cultures derived from human pancreas
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True normalisation of blood glucose in Type 1 diabetes can only be realized through replacement or regeneration of glucose-responsive, bioactive insulin-secreting β -cells. While possible through transplantation of deceased donor whole pancreas/isolated islets, organ availability is sufficient for <1% of potential recipients. The aim of this study was to derive and characterise proliferative progenitor cells from adult human pancreas and to explore potential for generation of new insulin-synthesising cells. A homogeneous population of proliferative adherent cells was derived from isolated human islets. Expression of stem cell and pancreatic markers was determined by RT-PCR and ICC in proliferative culture and differentiated pseudo-islets. Insulin content was quantified by ELISA. Maintained proliferative capacity was demonstrated up to passage 10 with expression of Oct4, vimentin, cytokeratin-19, Neuro-D, PDX1, Pax6, Glut2 and glucokinase. Stem cell phenotype was confirmed by positive Oct4, cytokeratin-19 and vimentin immunostaining. Differentiated pseudo-islets demonstrated positive fluorescence with Newport Green zinc indicator, characteristic of insulin-rich β -cells. Insulin storage (10-15% of primary human islets) was confirmed by ELISA specific for fully-processed human insulin. Derivation of proliferative cultures including adult stem cell phenotype from human pancreas has been confirmed, together with potential for generation of new islet-like clusters synthesising sufficient insulin for future therapeutic impact.