

P008 Differentiation of feeder-free human embryonic stem cells towards an endoderm lineage

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Human embryonic stem cells (hESC) differentiated to a β -cell lineage could potentially be used in the future for cell therapy to treat diabetes. In this study we aimed to differentiate hESC grown on feeder cells, or in a novel feeder-free system, towards a definitive endoderm fate, following the normal *in vivo* plan of pancreatic development.

Differentiation of the HUES-7 hESC line was induced using a variety of growth factors (activin A, Wnt3a, FGF2, FGF10, and EGF) in order to generate endoderm. Differentiation was monitored using RT-PCR and immunofluorescence for markers of mesoderm, endoderm, ectoderm and extra-embryonic lineages. Upon differentiation using feeder-maintained and feeder-free hESC, an up-regulation of mesendoderm and endoderm-related genes was observed in response to growth factor treatment. In contrast, only limited expression of ectoderm and extra-embryonic-related genes was observed. Feeder-free differentiation resulted in gene expression profiles which more closely recapitulated *in vivo* development and led to an enhanced expression of endoderm over mesoderm-related genes.

In conclusion, our results support the use of activin A, Wnt3a and other growth factors, in a novel feeder-free system to generate mesendoderm and endoderm cell-types from the HUES-7 hESC line.