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Meta analysis of gene expression in human islets after in vitro expansion - Study GBCO3754

Genomics Study Specifications

Study Name	Meta analysis of gene expression in human islets after in vitro expansion
Contact Name	Leroy Hood (Institute for Systems Biology)
Publication	http://www.ncbi.nlm.nih.gov/pubmed/19622797
My Strategies	Return to My Strategies page
Classification	Cell differentiation; Targets and roles of transcriptional regulators; Differentiation of insulin-producing cells
Links	 Biomaterials Graph  GEO
BCBC Release Date	January 19, 2010
Public Release Date	January 19, 2010
Citation	Kutlu B, Kayali AG, Jung S, Parnaud G, Baxter D, Glusman G, Goodman N, Behie LA, Hayek A, Hood L. Meta-analysis of gene expression in human pancreatic islets after in vitro expansion . <i>Physiol Genomics</i> . 2009. 39:72-81

Synopsis**Study Description**

Goals

Approaches

Results

Conclusions


Related Studies

Pancreatic islet transplantation as a cure for type 1 diabetes (T1D) cannot be scaled up due to a scarcity of human pancreas donors. In vitro expansion of beta cells from mature human pancreatic islets provides an alternative source of insulin-producing cells. The exact nature of the expanded cells produced by diverse expansion protocols, and their potential for differentiation into functional beta cells, remain elusive. We performed a large-scale meta-analysis of gene expression in human pancreatic islet cells, which were processed using three different previously described protocols for expansion and attempted re-differentiation. All three expansion protocols induced dramatic changes in the expression profiles of pancreatic islets; many of these changes are shared among the three protocols. Attempts at re-differentiation of expanded cells induce a limited number of gene expression changes. Nevertheless, these fail to restore a pancreatic islet-like gene expression pattern. Comparison with a collection of public microarray datasets confirmed that expanded cells are highly comparable to mesenchymal stem cells. Genes induced in expanded cells are also enriched for targets of transcription factors important for pluripotency induction. The present data increases our understanding of the active pathways in expanded and re-differentiated islets. Knowledge of the mesenchymal stem cell potential may help development of drug therapeutics to restore beta cell mass in T1D patients.


Platform types

Expression microarray, Expression

Platforms**Access Status**

 This resource is publicly viewable.

Request this Resource

 Request from a repository

Primary contributor: [Stoeckert Lab](#)


Co-contributed by:

- [Stoeckert Lab](#)

Resource Tags


CDH1, CDH2, E-cadherin, Foxa2, HGU133 Plus 2.0 Affymetrix array, INHBA, ISL1, N-cadherin, NEUROD1, NKX2-2, NOG, noggin, PAX6, SNAI2, TWIST2

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 Read more about tags

Resource History & Actions

Approved on Jan 19, 2010
Last modified on Jan 17, 2012

 Login to edit or request an edit

Related resources**BCBC**

No matching resources

Other Consortia

No matching resources

Data courtesy of [dkCOIN](#). Only public resources are displayed.

Show platform Affymetrix GeneChip Human
Genome U133 Plus 2.0 Array [CDF:
HGU133Plus2_Hs_ENTREZG v11.0.1]

Study Design Type

- growth_condition_design
- time_series_design

Study Factors

Show study factors

Study Assays

Show study assays

Access to Study Data

This Study Data is publicly available to all users.

Gene List(s)

Use the following form(s) to refine the parameters and add the gene list to a strategy:

Human WHI-Expanded versus normal islets

|Fold Change| Greater Than:

Confidence Level: High Confidence All Results

For a microarray experiment a result with high confidence has a confidence level of at least 80%.

For a ChIP-chip experiment a result with high confidence has a confidence level of at least 90% and all fold changes are positive.

Reference (Denominator): normal islets

- ▶ Human NIH-Expanded versus normal islets
- ▶ Human WHI-Differentiated versus normal islets
- ▶ Human NIH-Differentiated versus normal islets
- ▶ Human WHI-Differentiated versus WHI-Expanded islets
- ▶ Human NIH-Differentiated versus NIH-Expanded islets
- ▶ Time series analysis of PPRF expansion and re-differentiation protocol for human islets.

Genome Browser

There are no genome browser tracks currently available for this study.

Lists of Locations

There are no genomic location datasets currently available for this study.

Repositories**Stoeckert Lab**

 Request this resource

Stock #: Not provided

Availability Notes: Not provided

Comments

There are no comments for this entry.

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