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Foxa2 controls vesicle docking and insulin secretion in mature beta-cells - Study GBCO3042

Genomics Study Specifications

Study Name	Foxa2 controls vesicle docking and insulin secretion in mature beta-cells
Contact Name	Klaus Kaestner (University of Pennsylvania)
Publication	http://www.ncbi.nlm.nih.gov/pubmed/17908556
My Strategies	Return to My Strategies page
Classification	Targets and roles of transcriptional regulators
Links	 Biomaterials Graph  ArrayExpress
BCBC Release Date	September 17, 2007
Public Release Date	September 17, 2007
Citation	Gao N, White P, Doliba N, Golsen ML, Matschinsky FM, Kaestner KH. Foxa2 controls vesicle docking and insulin secretion in mature Beta cells . Cell Metab. 2007. 6:267-79

Synopsis**Study Description**

Goals

Approaches

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Conclusions

Related Studies

The winged helix transcription factor Foxa2 regulates Pdx1 gene expression and fetal endocrine pancreas development. We show here by inducible gene ablation that Foxa2 inactivation in mature beta-cells induces hyperinsulinemic hypoglycemia in Foxa2loxP/loxP, Pdx1-CreERT2 adult mice. Mutant beta-cells exhibited a markedly increased pool of docked insulin granules, some of which were engaged in sequential or compound exocytosis, consistent with an increased first phase glucose-stimulated insulin secretion. Expression of multiple genes involved in vesicular trafficking, membrane targeting and fuel-secretion pathways is dependent on Foxa2. In addition, impaired cytosolic Ca²⁺ oscillations and elevated intracellular cAMP production accompanied this secretory defect, and were likely contributors to the sensitization of the exocytotic machinery. Thus, in the absence of Foxa2, alterations in intracellular second messenger signaling redistribute the insulin granules into the readily releasable pool. We conclude that Foxa2 is required both for the fetal pancreas development and for the function of mature beta-cells.

Platform types Expression, Expression microarray

Platforms [Show platform Mouse PancChip](#)

Study Design Type


- genetic_modification_design

Study Factors [Show study factors](#)


Study Assays [Show study assays](#)

Access to Study Data

Access Status

 This resource is publicly viewable.

Request this Resource

 Request from a repository

Primary contributor: [Kaestner Lab](#)

Co-contributed by:

- [Stoeckert Lab](#)

Resource Tags

forkhead box A2, Foxa2, hyperinsulinemic hypoglycemia, Mouse PancChip 6.1


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Resource History & Actions

Approved on Sep 17, 2007

Last modified on Aug 02, 2011

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Related resources

BCBC

No matching resources

Other Consortia

No matching resources

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

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:

Foxa2(loxP/loxP);Pdx1-CreERT2 versus Wild Type - Adult Mouse 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): Wild Type

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

Kaestner Lab


 Request this resource

Stock #: *Not provided*

Availability Notes: *Not provided*

Comments

There are no comments for this entry.

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