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

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Publication

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

Synopsis
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
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:

<table>
<thead>
<tr>
<th>Foxa2(loxP/loxP);Pdx1-CreERT2 versus Wild Type - Adult Mouse Islets</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Fold Change) Greater Than: 1.5</td>
</tr>
<tr>
<td>Confidence Level: High</td>
</tr>
<tr>
<td>Reference (Denominator): Wild Type</td>
</tr>
</tbody>
</table>

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.

### 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**

- **Stock**: Not provided
- **Availability Notes**: Not provided

### Comments

There are no comments for this entry.