

FOXA2/HNF3b-, MafA-, and PAX6-dependent synthesis of Pdx1 protein

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Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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Literature references

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Reactome database release: 74

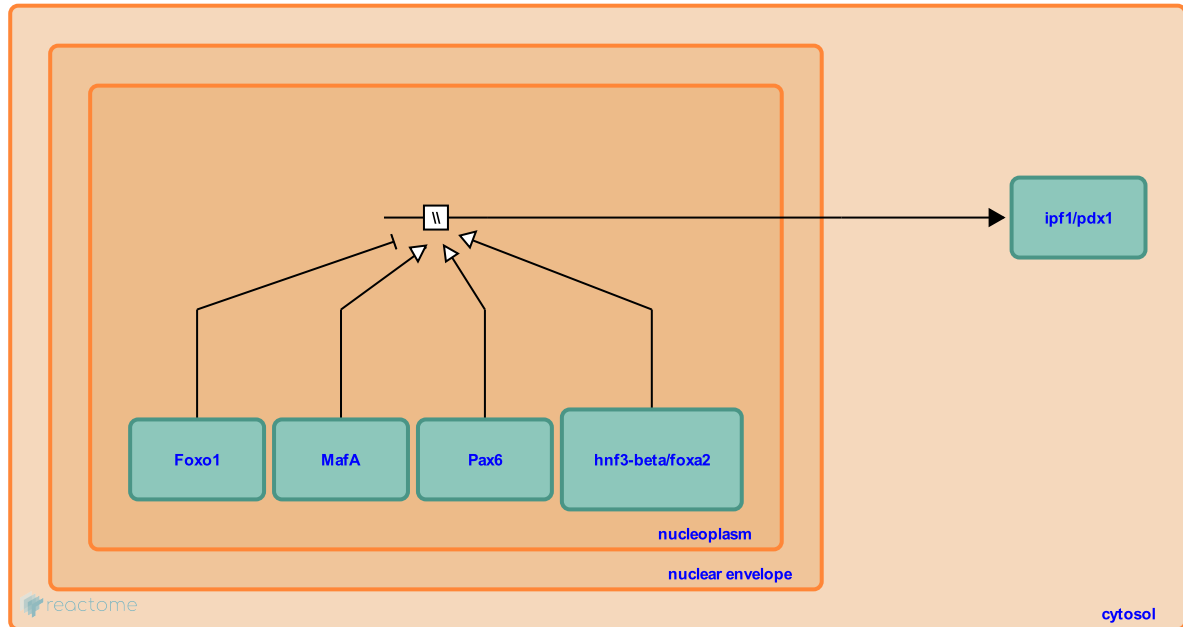
This document contains 1 reaction ([see Table of Contents](#))

FOXa2/HNF3b-, MafA-, and PAX6-dependent synthesis of Pdx1 protein ↗

Stable identifier: R-MMU-186507

Type: omitted

Compartments: nucleoplasm, cytosol



Binding of FOXa2/HNF3-beta to the 5'-flanking regions of the human, mouse and rat Pdx1 gene has been observed in vitro and in transient transfection studies (Sharma et al. 1997; Wu et al, 1997; Marshak et al. 2000; Gerrish et al. 2000; Ben-Shushan et al. 2001). Specifically, Foxa2 binding to the mouse Pdx1 distant enhancer region was shown in pancreatic beta-cells by ChIP analysis (Samaras et al. 2002). Moreover, the distant 5' flanking region of the Pdx1 gene containing a high-affinity binding site for FOXa2 is sufficient to drive beta-cell specific expression in transgenic mice (Samaras et al. 2002), and beta-cell specific ablation of Foxa2 results in down-regulation of Pdx1 mRNA and protein levels (Lee et al. 2002).

In vitro binding of MafA to a conserved 5'-flanking region of the Pdx1 and transactivation of this gene were observed in cultured beta-cell lines (Samaras et al. 2003). Deletion of MafA in mice causes decreased Pdx1 expression (Zhang et al, 2005).

Mutational analysis of the same 5'-flanking region that MafA binds on the Pdx1 gene in cultured beta-cells, indicates that PAX6 binds and transactivates Pdx1 (Samaras et al. 2002).

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Editions

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