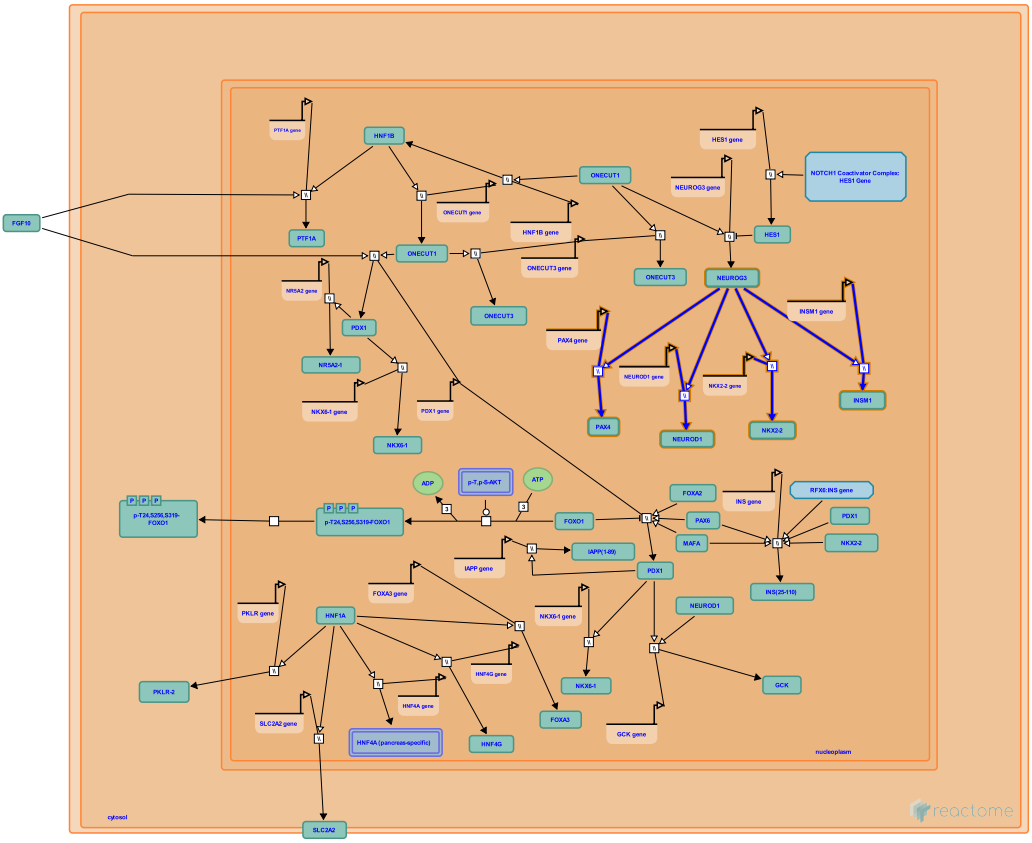
Regulation of gene expression in endocrine-committed (NEUROG3+) progenitor cells



D'Eustachio, P., Ferrer, J., Jensen, J., Tello-Ruiz, MK.

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30/04/2024

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.
The development of Reactome is supported by grants from the US National Institutes of Health (P41 HG003751), University of Toronto (CFREF Medicine by Design), European Union (EU STRP, EMI-CD), and the European Molecular Biology Laboratory (EBI Industry program).

Literature references

Fabregat, A., Sidiropoulos, K., Viteri, G., Forner, O., Marin-Garcia, P., Arnau, V. et al. (2017). Reactome pathway analysis: a high-performance in-memory approach. *BMC bioinformatics, 18*, 142. ↗

Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics, 33*, 3461-3467. ↗

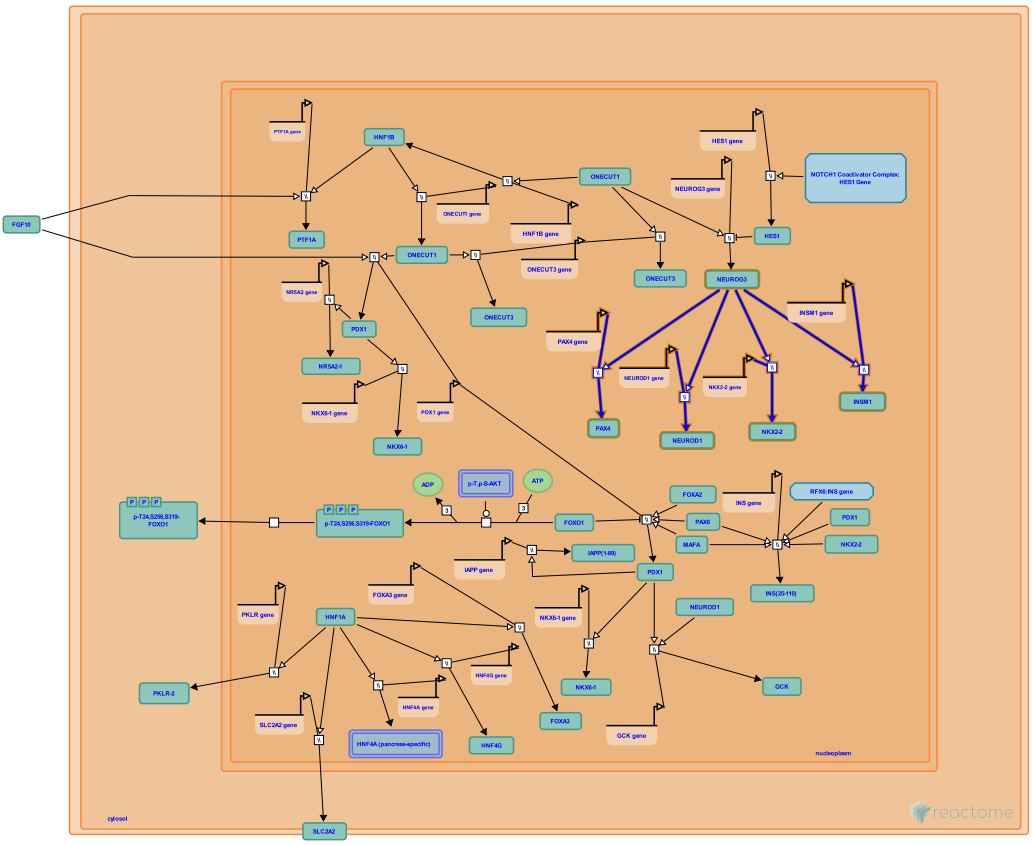
Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res, 46*, D649-D655. ↗

Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology, 14*, e1005968. ↗

Regulation of gene expression in endocrine-committed (NEUROG3+) progenitor cells

↗

Stable identifier: R-HSA-210746



Studies in mouse model systems indicate that the transcription factor neurogenin 3 plays a central role in the induction of endocrine differentiation in the developing pancreas (Servitja and Ferrer 2004; Chakrabarti and Mirmira 2003). In both mice and humans critical events in this induction process include the neurogenin 3 (NEUROG3)-dependent transcription of PAX4, NEUROD1, NKX2-2, and INSM1.

Literature references

Servitja, JM., Ferrer, J. (2004). Transcriptional networks controlling pancreatic development and beta cell function. *Diabetologia, 47*, 597-613. ↗

Chakrabarti, SK., Mirmira, RG. (2003). Transcription factors direct the development and function of pancreatic beta cells. *Trends Endocrinol Metab, 14*, 78-84. ↗

Editions

2008-05-13	Edited	D'Eustachio, P.
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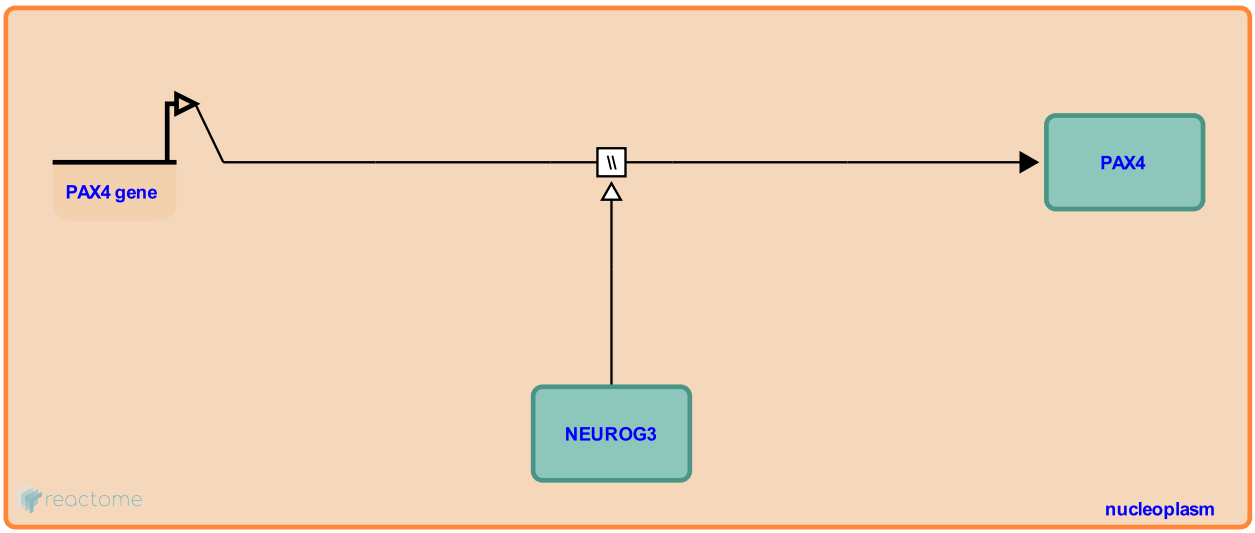
NEUROG3-dependent synthesis of PAX4 protein ↗

Location: Regulation of gene expression in endocrine-committed (NEUROG3+) progenitor cells

Stable identifier: R-HSA-210886

Type: omitted

Compartments: nucleoplasm



The PAX4 gene is transcribed, its mRNA is translated, and the protein product is transported to the nucleus. PAX4 transcription requires the activity of the NEUROG3 transcription factor (Heremans et al. 2002; Mellitzer et al. 2006).

Literature references

Mellitzer, G., Lan, M., Mansouri, A., Lee, J., Lenne-Samuel, N., Luco, RF. et al. (2006). IA1 is NGN3-dependent and essential for differentiation of the endocrine pancreas. *EMBO J, 25*, 1344-52. ↗

Serup, P., Madsen, OD., Gradwohl, G., Van De Casteele, M., Pipeleers, D., in't Veld, P. et al. (2002). Recapitulation of embryonic neuroendocrine differentiation in adult human pancreatic duct cells expressing neurogenin 3. *J Cell Biol, 159*, 303-12. ↗

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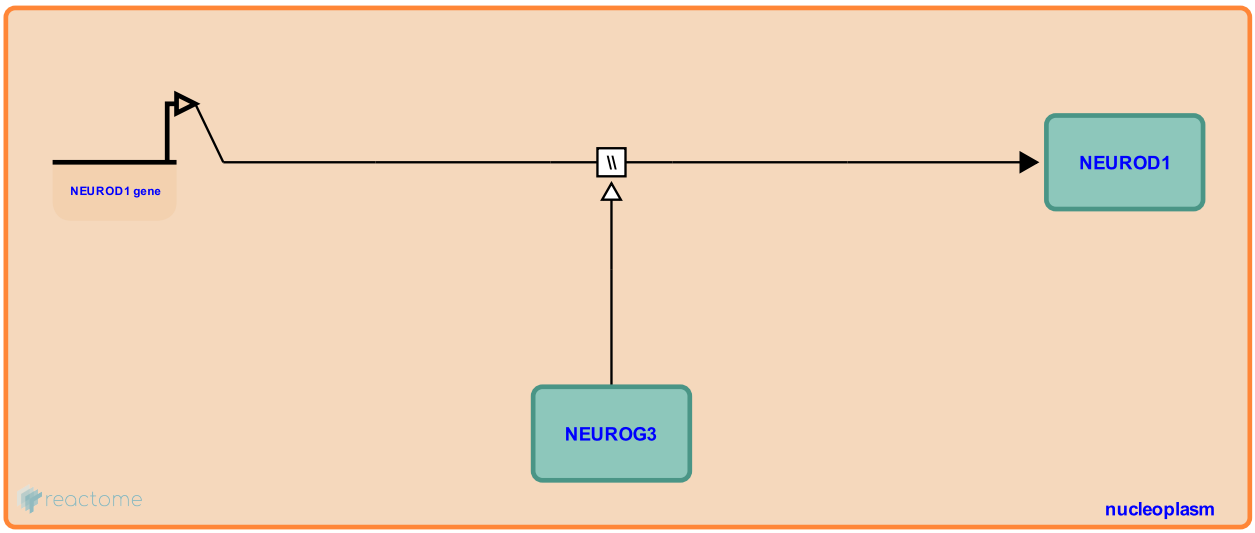
NEUROG3-dependent synthesis of NEUROD1 ↗

Location: Regulation of gene expression in endocrine-committed (NEUROG3+) progenitor cells

Stable identifier: R-HSA-210920

Type: omitted

Compartments: nucleoplasm



The NEUROD1 gene is transcribed, its mRNA is translated, and the protein product is transported to the nucleus. NEUROD1 transcription requires the activity of the NEUROG3 transcription factor (Heremans et al. 2002; Mellitzer et al. 2006).

Literature references

Mellitzer, G., Lan, M., Mansouri, A., Lee, J., Lenne-Samuel, N., Luco, RF. et al. (2006). IA1 is NGN3-dependent and essential for differentiation of the endocrine pancreas. *EMBO J, 25*, 1344-52. ↗

Serup, P., Madsen, OD., Gradwohl, G., Van De Casteele, M., Pipeleers, D., in't Veld, P. et al. (2002). Recapitulation of embryonic neuroendocrine differentiation in adult human pancreatic duct cells expressing neurogenin 3. *J Cell Biol, 159*, 303-12. ↗

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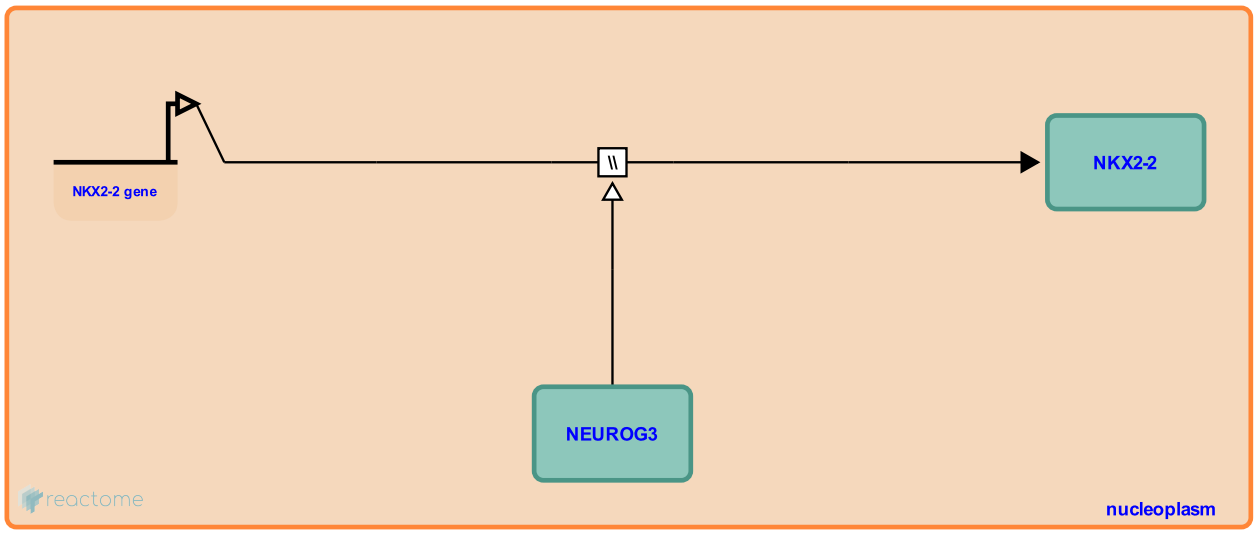
NEUROG3-dependent synthesis of NKX2-2

Location: Regulation of gene expression in endocrine-committed (NEUROG3+) progenitor cells

Stable identifier: R-HSA-210921

Type: omitted

Compartments: nucleoplasm



The NKX2-2 gene is transcribed, its mRNA is translated, and the protein product is transported to the nucleus. NKX2-2 transcription requires the activity of the NEUROG3 transcription factor (Heremans et al. 2002; Mellitzer et al. 2006).

Literature references

Mellitzer, G., Lan, M., Mansouri, A., Lee, J., Lenne-Samuel, N., Luco, RF. et al. (2006). IA1 is NGN3-dependent and essential for differentiation of the endocrine pancreas. *EMBO J, 25*, 1344-52.

Serup, P., Madsen, OD., Gradwohl, G., Van De Casteele, M., Pipeleers, D., in't Veld, P. et al. (2002). Recapitulation of embryonic neuroendocrine differentiation in adult human pancreatic duct cells expressing neurogenin 3. *J Cell Biol, 159*, 303-12.

Editions

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NEUROG3-dependent synthesis of INSM1 ↗

Location: Regulation of gene expression in endocrine-committed (NEUROG3+) progenitor cells

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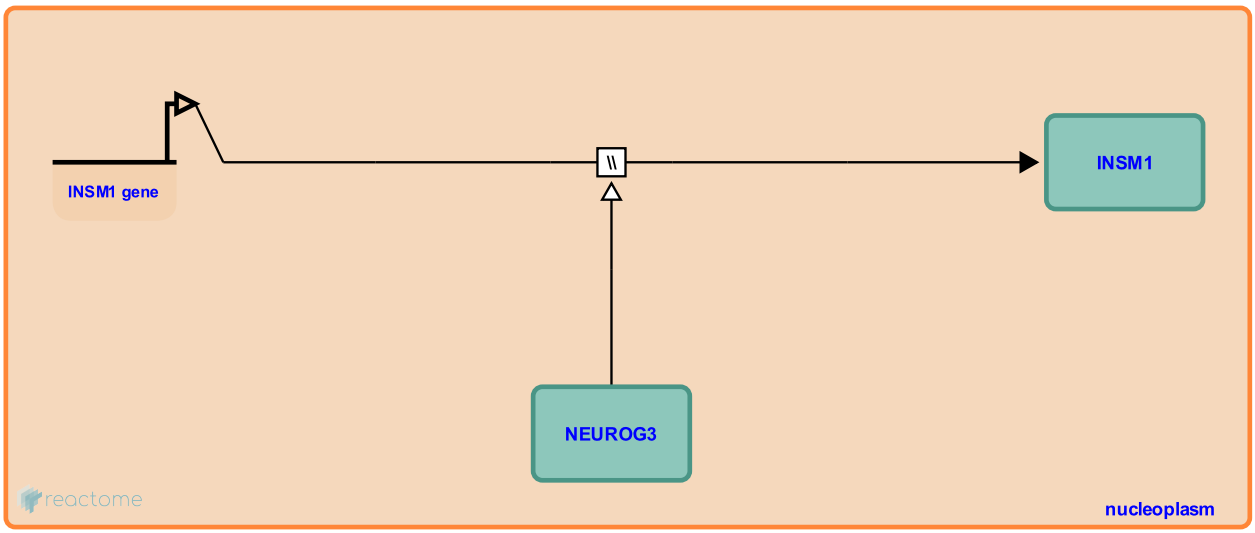
Type: omitted

Compartments: nucleoplasm



The INSM1 gene is transcribed, its mRNA is translated, and the protein product is transported to the nucleus. INSM1 transcription requires the activity of the NEUROG3 transcription factor (Mellitzer et al. 2006).

Literature references

Mellitzer, G., Lan, M., Mansouri, A., Lee, J., Lenne-Samuel, N., Luco, RF. et al. (2006). IA1 is NGN3-dependent and essential for differentiation of the endocrine pancreas. *EMBO J, 25*, 1344-52. ↗

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