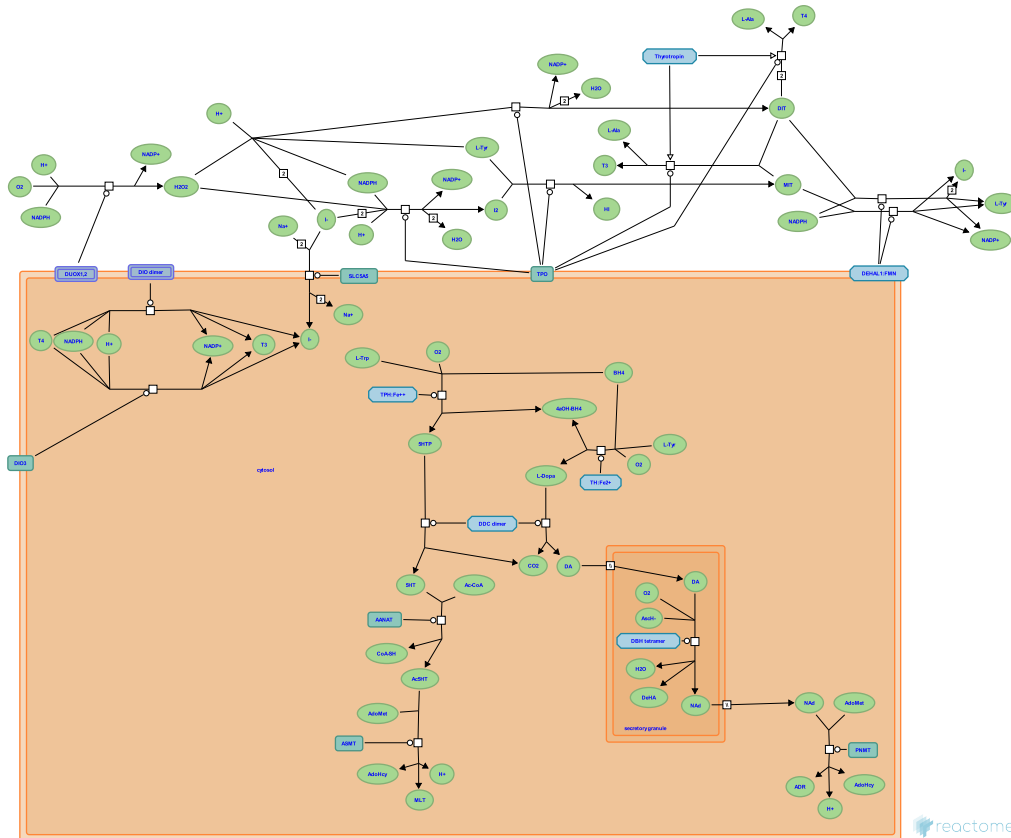


Metabolism of amine-derived hormones



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This is just an excerpt of a full-length report for this pathway. To access the complete report, please download it at the [Reactome Textbook](https://reactome.org/textbook/).

29/04/2024

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

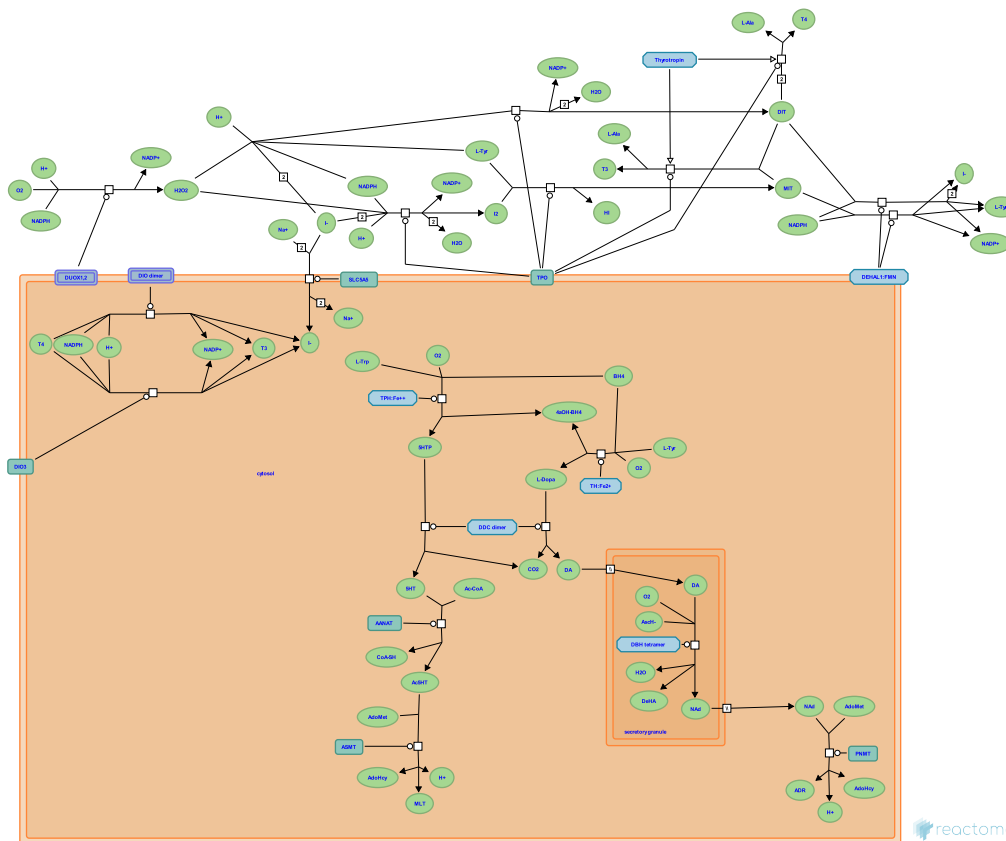
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Reactome database release: 88

This document contains 4 pathways ([see Table of Contents](#))

Metabolism of amine-derived hormones ↗

Stable identifier: R-HSA-209776



Catecholamines and thyroxine are synthesized from tyrosine, and serotonin and melatonin from tryptophan.

Literature references

- Hesch, RD., Köhrle, J., Brabant, G. (1987). Metabolism of the thyroid hormones. *Horm Res*, 26, 58-78. ↗
- Rook, GA., Lowry, CA., Lightman, SL., Evans, AK., Nutt, DJ., Ruddick, JP. (2006). Tryptophan metabolism in the central nervous system: medical implications. *Expert Rev Mol Med*, 8, 1-27. ↗
- Flatmark, T. (2000). Catecholamine biosynthesis and physiological regulation in neuroendocrine cells. *Acta Physiol Scand*, 168, 1-17. ↗

Editions

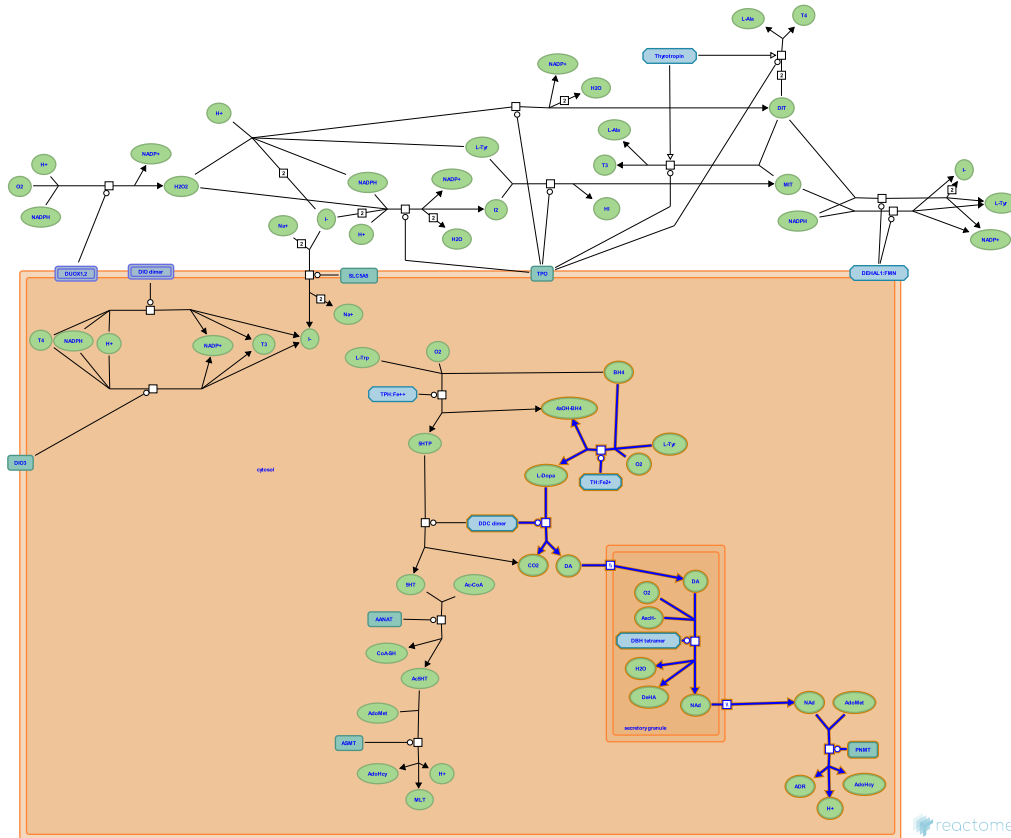
2008-01-08	Edited	Jassal, B.
2008-05-28	Reviewed	D'Eustachio, P.
2008-10-01	Authored	Jassal, B.

Catecholamine biosynthesis [↗](#)

Location: Metabolism of amine-derived hormones

Stable identifier: R-HSA-209905

Compartments: cytosol



The catecholamine neurotransmitters dopamine, noradrenaline and adrenaline are found in nervous tissue of animals. They are synthesized in catecholaminergic neurons by four enzymes from tyrosine to adrenaline: tyrosine hydroxylase (TH); aromatic L-amino acid decarboxylase (AADC); dopamine beta-hydroxylase (DBH); and phenylethanolamine N-methyltransferase (PNMT).

Literature references

Laverty, R. (1978). Catecholamines: role in health and disease. *Drugs*, 16, 418-40. [↗](#)

Nagatsu, T. (1991). Genes for human catecholamine-synthesizing enzymes. *Neurosci Res*, 12, 315-45. [↗](#)

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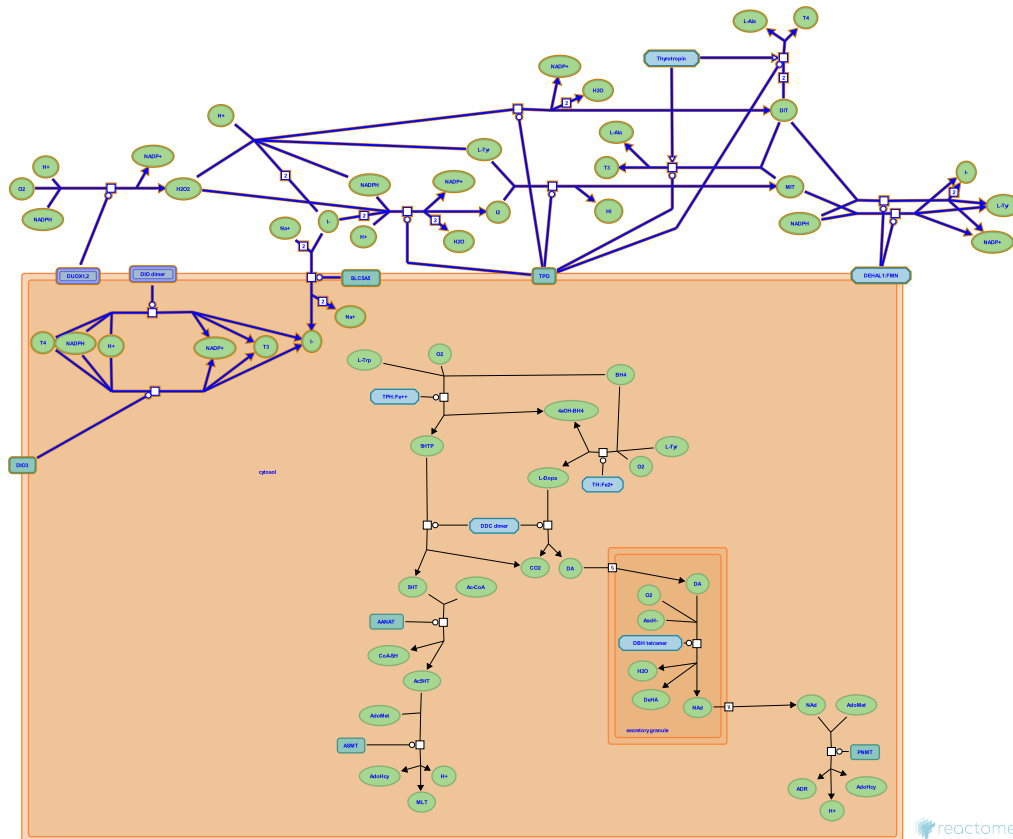
Editions

2008-05-28	Reviewed	D'Eustachio, P.
2008-05-28	Edited	Jassal, B.
2008-10-01	Authored	Jassal, B.

Thyroxine biosynthesis ↗

Location: Metabolism of amine-derived hormones

Stable identifier: R-HSA-209968



Thyroxine (3,5,3',5'-tetraiodothyronine, T4) promotes normal growth and development. It also regulates heat and energy production. T4 is released from the thyroid gland, the largest endocrine organ in the human body. The primary hormone released is T4 although T3 (3,5,3'-triiodothyronine) is also released in small quantities. Tyrosine residues in thyroglobulin (a glycoprotein scaffold containing many tyrosine residues) are iodinated to form mono- or diiodo-tyrosine which can then couple to form either T3 or T4.

Literature references

Hesch, RD., Köhrle, J., Brabant, G. (1987). Metabolism of the thyroid hormones. *Horm Res*, 26, 58-78. ↗

Editions

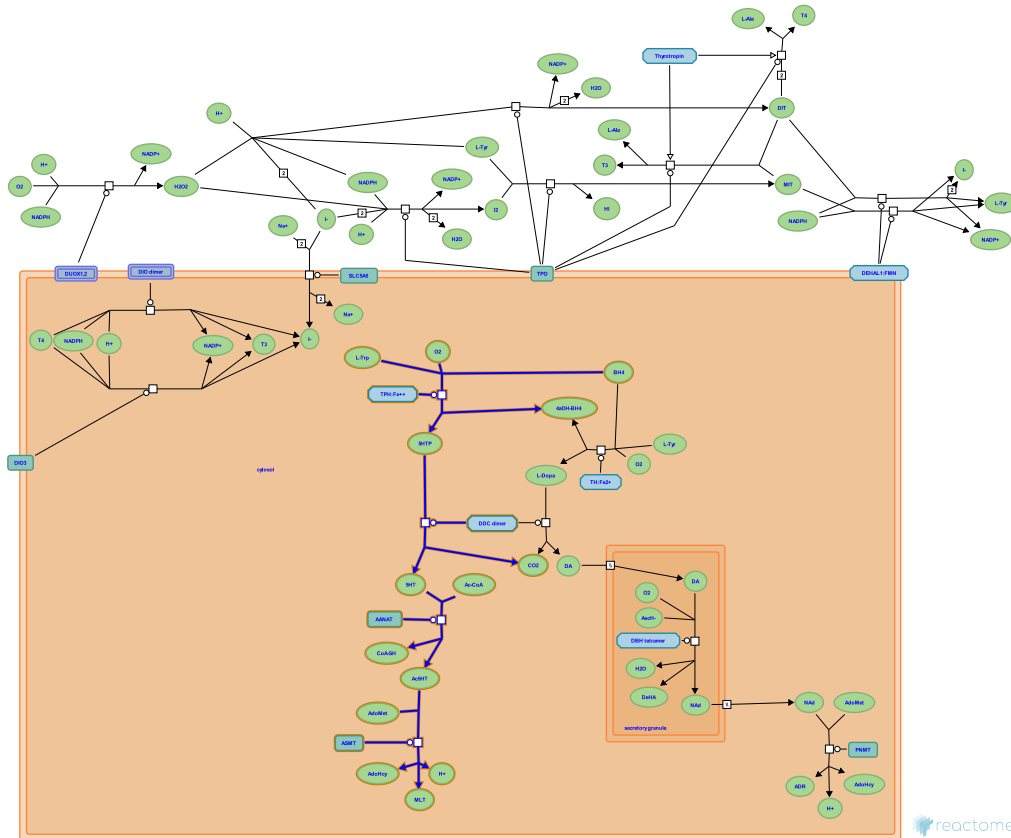
2008-05-28	Reviewed	D'Eustachio, P.
2008-05-28	Edited	Jassal, B.
2008-10-01	Authored	Jassal, B.

Serotonin and melatonin biosynthesis ↗

Location: Metabolism of amine-derived hormones

Stable identifier: R-HSA-209931

Compartments: cytosol



Serotonin (5-HT) is a hormone and neurotransmitter used for regulatory purposes in animal CNS. In the human brain, serotonin is involved in many physiological functions such as sleep, pain, mood and is the precursor to melatonin, a hormone produced in the pineal gland.

Literature references

Wortsmann, J., Slominski, A., Zmijewski, MA., Paus, R., Tobin, DJ. (2008). Melatonin in the skin: synthesis, metabolism and functions. *Trends Endocrinol Metab*, 19, 17-24. ↗

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Editions

2008-05-28	Reviewed	D'Eustachio, P.
2008-05-28	Edited	Jassal, B.
2008-10-01	Authored	Jassal, B.

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