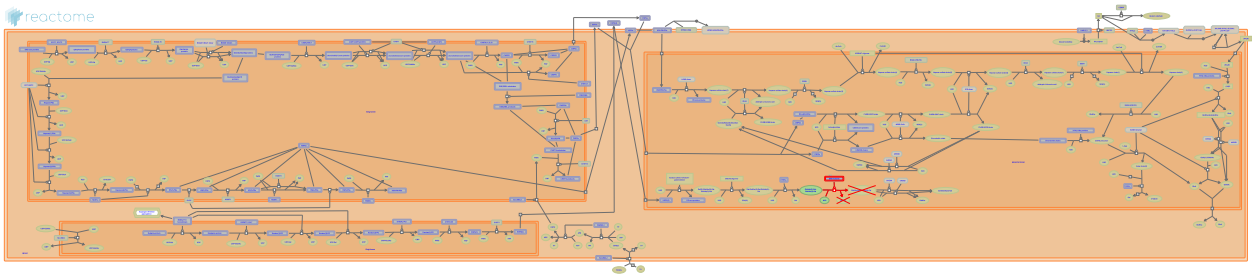
MPS IIID - Sanfilippo syndrome D



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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.

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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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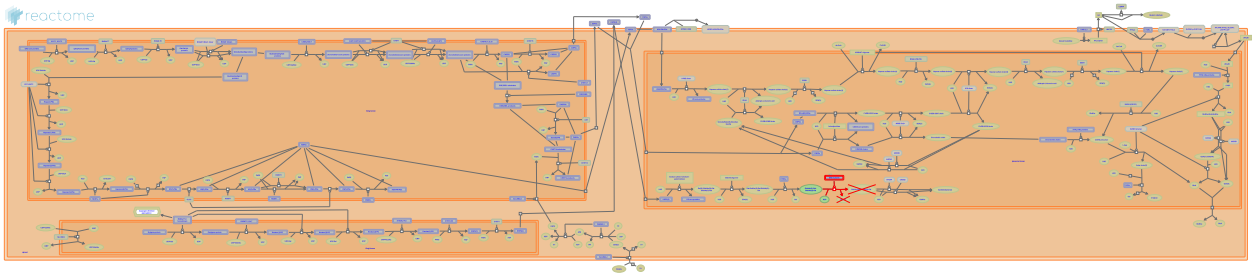
MPS IIID - Sanfilippo syndrome D ↗

Stable identifier: R-HSA-2206305

Diseases: mucopolysaccharidosis III



Mucopolysaccharidosis III (Sanfilippo syndrome) was described in 1963 by a pediatrician named Sylvester Sanfilippo (J. Pediat. 63: 837-838, 1963, no reference). Mucopolysaccharidosis type IIID (MPS IIID, Sanfilippo syndrome D, MIM:252940) is an autosomal recessive genetic disorder due to the loss of N-acetyl-D-glucosamine 6-sulfatase (GNS; MIM:607664), that hydrolyses the 6-sulfate groups of the N-acetyl-D-glucosamine 6-sulfate units of the glycosaminoglycans (GAGs) heparan sulfate and keratan sulfate. GNS is localized to chromosome 12q14 and has 14 exons spanning 46 kb (Robertson et al. 1988, Mok et al. 2003). Loss of enzyme activity leads to lysosomal accumulation and urinary excretion of heparan sulfate and N-acetylglucosamine 6-sulfate residues (Mok et al. 2003). Keratan sulphate does not accumulate in MPS IIID, as beta-linked N-acetyl-D-glucosamine 6-sulphate can be cleaved by beta-hexosaminidase A (Kresse et al. 1980). This disorder is characterized by progressive mental deterioration but only moderate physical abnormalities and death duing the second or third decade of life, presenting a phenotype similar to MPSIIIA (Jones et al. 1997, de Ruijter et al. 2011).

Literature references

Gilberg, W., Fuchs, W., von Figura, K., Paschke, E., Kresse, H. (1980). Sanfilippo disease type D: deficiency of N-acetylglucosamine-6-sulfate sulfatase required for heparan sulfate degradation. *Proc Natl Acad Sci U S A, 77*, 6822-6. ↗

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Editions

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2012-08-27	Reviewed	Coutinho, MF., Matos, L., Alves, S.

Defective GNS does not hydrolyse 6-sulfate from GlcNAc6S ↗

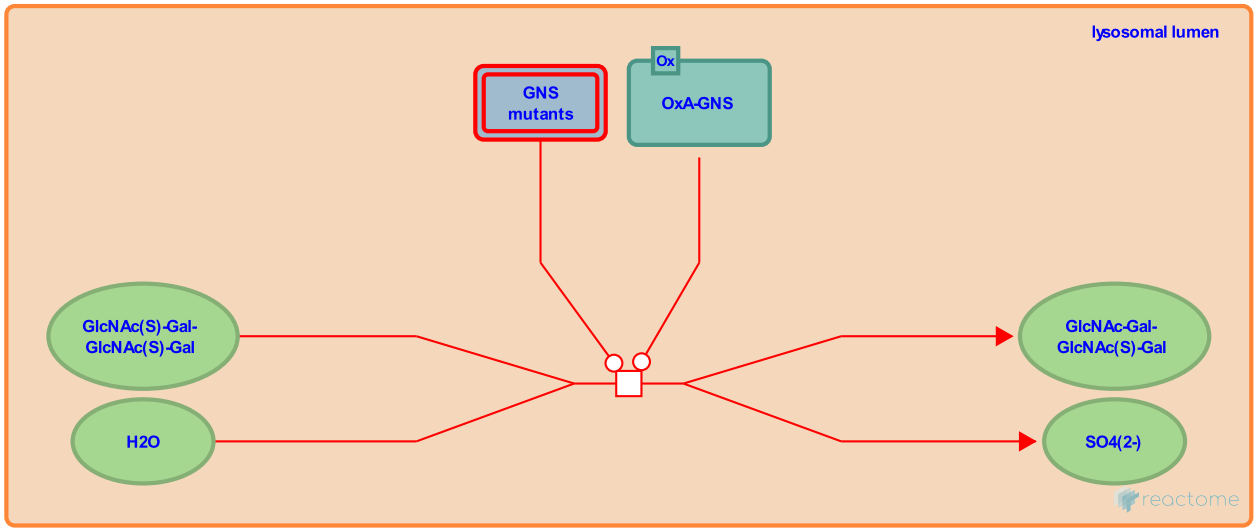
Location: MPS IIID - Sanfilippo syndrome D

Stable identifier: R-HSA-2263495

Type: transition

Compartments: lysosomal lumen

Diseases: mucopolysaccharidosis III



Due to the rarity of this disease, only approximately 20 mutations had been described. Recently a study by Valstar et al. revealed 15 of those mutations (Valstar et al. 2010). The group also conducted a literature survey of MPS IIID (MIM:252940). Mutations include R355X (Mok et al. 2003), Q390X (Jansen et al. 2007), Q272X (Beesley et al. 2007) and S94I (Valstar et al. 2010). Other mutations are not detailed here but can be referenced in the Valstar et al. review (Valstar et al. 2010).

Literature references

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