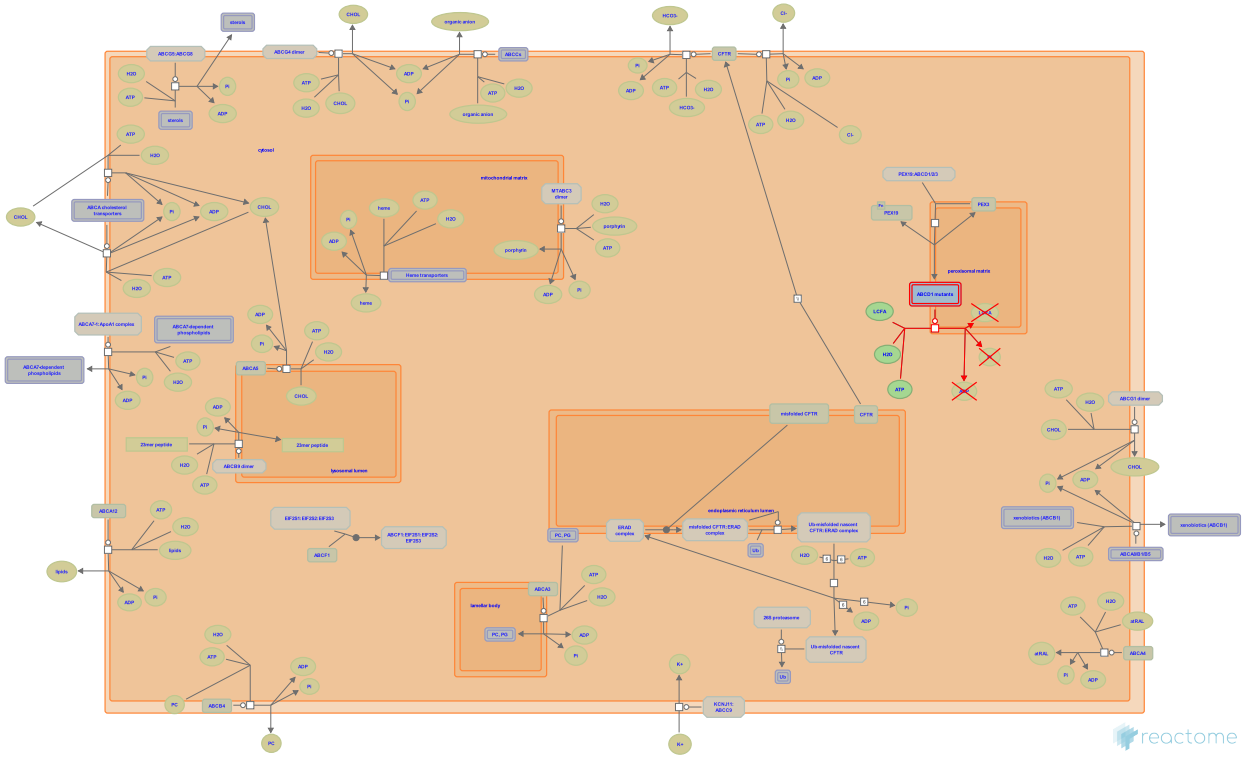
Defective ABCD1 causes ALD



Jassal, B., Shukla, S.

European Bioinformatics Institute, New York University Langone Medical Center, Ontario Institute for Cancer Research, Oregon Health and Science University.

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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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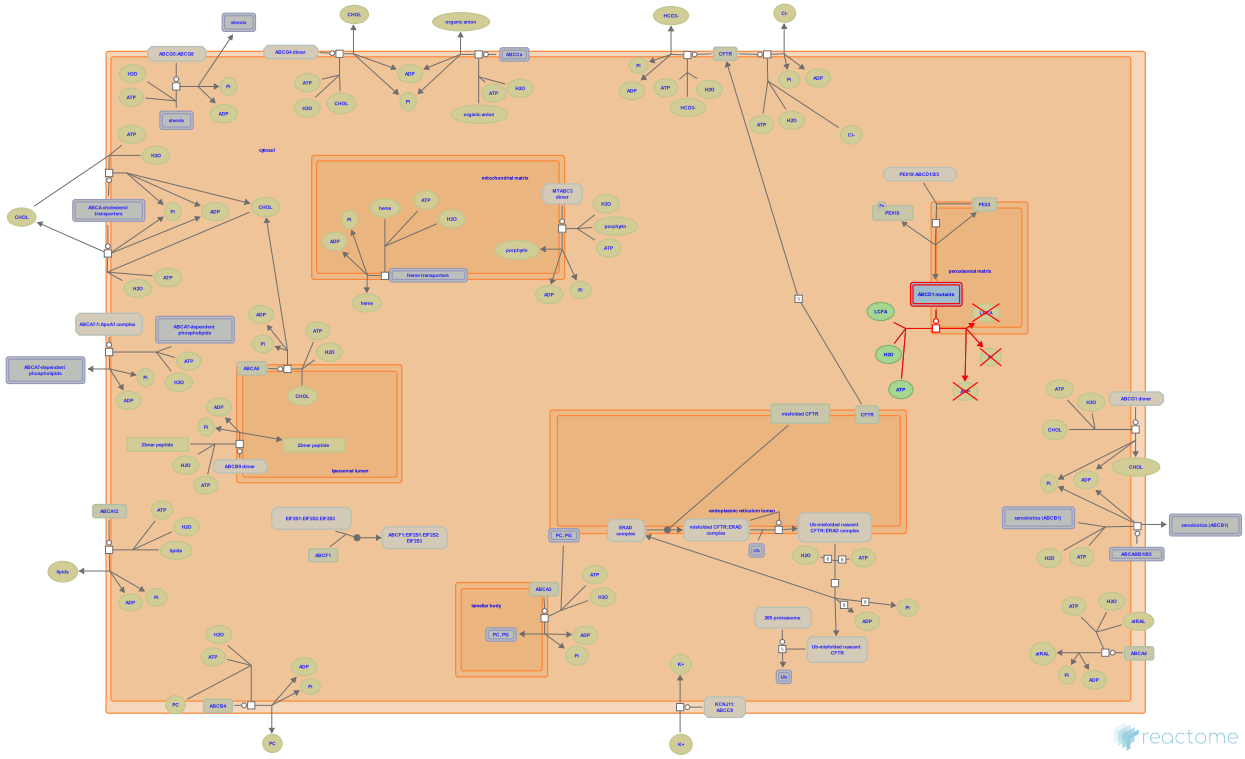
Defective ABCD1 causes ALD ↗

Stable identifier: R-HSA-5684045

Diseases: adrenoleukodystrophy



The 70-kDa peroxisomal membrane protein (PMP70) and the adrenoleukodystrophy protein (ALDP aka ABCD1) are half ATP binding cassette (ABC) transporters in the peroxisome membrane. They are involved in metabolic transport of long and very long chain fatty acids into peroxisomes. Mutations in the ALD gene result in the X-linked neurodegenerative disorder adrenoleukodystrophy (ALD; MIM:300100). ABCD1 deficiency impairs the peroxisomal beta-oxidation of very long-chain fatty acids (VLCFA) and facilitates their further chain elongation by ELOVL1 resulting in accumulation of VLCFA in plasma and tissues. While all patients with ALD have mutations in the ABCD1 gene, there is no general genotype-phenotype correlation. In addition to ABCD1, other genes and environmental factors determine clinical features of ALD (Kemp et al. 2012, Berger et al. 2014).

Literature references

Berger, J., Eichler, FS., Forss-Petter, S. (2014). Pathophysiology of X-linked adrenoleukodystrophy. *Biochimie, 98*, 135-42. ↗

Aubourg, P., Berger, J., Kemp, S. (2012). X-linked adrenoleukodystrophy: clinical, metabolic, genetic and pathophysiological aspects. *Biochim. Biophys. Acta, 1822*, 1465-74. ↗

Editions

2015-03-18	Authored, Edited	Jassal, B.
2015-09-15	Reviewed	Shukla, S.

Defective ABCD1 does not transfer LCFAs from cytosol to peroxisomal matrix ↗

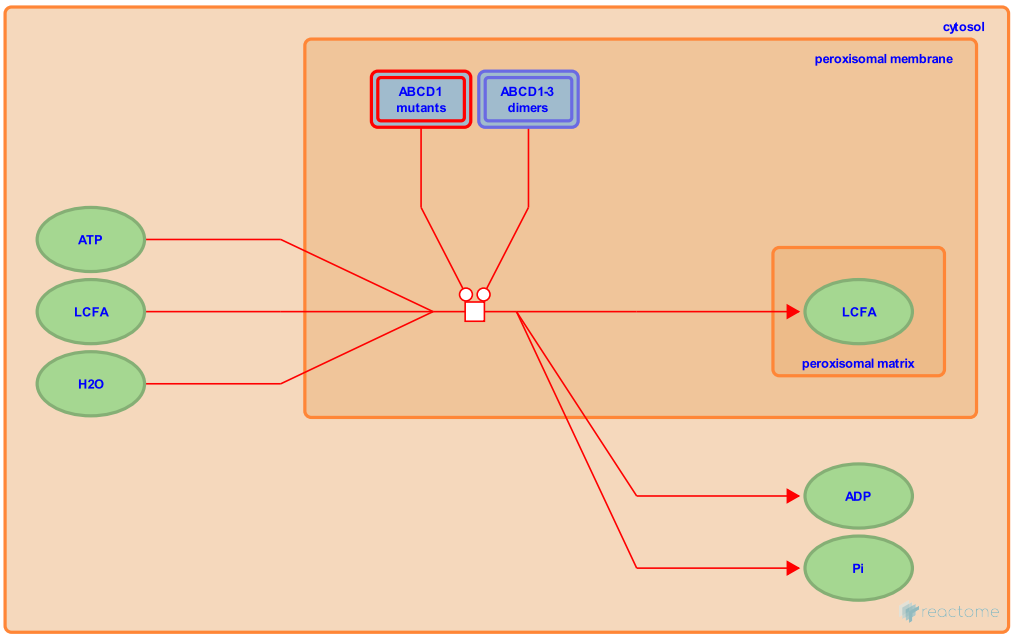
Location: Defective ABCD1 causes ALD

Stable identifier: R-HSA-5684043

Type: transition

Compartments: peroxisomal membrane, cytosol

Diseases: adrenoleukodystrophy



The 70-kDa peroxisomal membrane protein (PMP70) and the adrenoleukodystrophy protein (ALDP aka ABCD1) are half ATP binding cassette (ABC) transporters in the peroxisome membrane. They are involved in metabolic transport of long and very long chain fatty acids into peroxisomes. Mutations in the ALD gene result in the X-linked neurodegenerative disorder adrenoleukodystrophy (ALD; MIM:300100). ABCD1 deficiency impairs the peroxisomal beta-oxidation of very long-chain fatty acids (VLCFA) and facilitates their further chain elongation by ELOVL1 resulting in accumulation of VLCFA in plasma and tissues. While all patients with ALD have mutations in the ABCD1 gene, there is no general genotype-phenotype correlation. Mutations causing ALD include R617C, S606L, M1V, G277R, R554H and W77_L82del (Krasemann et al. 1996, Fanen et al. 1994, Engelen et al. 2011, Coll et al. 2005, Park et al. 2014).

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Camps, C., Pàmpols, T., Girós, M., Coll, MJ., Palau, N., Ruiz, M. (2005). X-linked adrenoleukodystrophy in Spain. Identification of 26 novel mutations in the ABCD1 gene in 80 patients. Improvement of genetic counseling in 162 relative females. *Clin. Genet., 67*, 418-24. ↗

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Editions

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