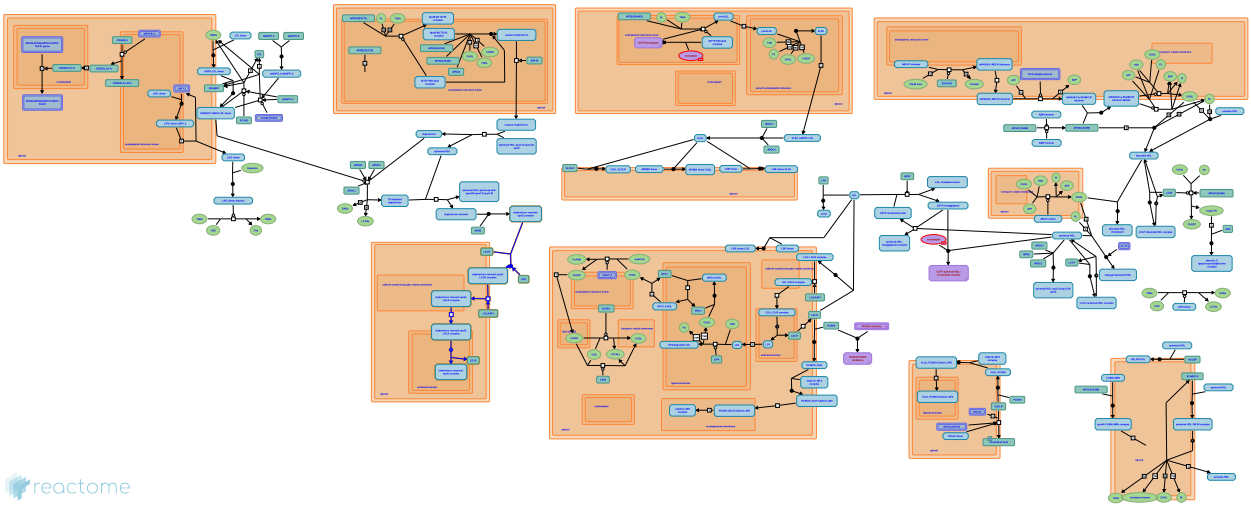
Chylomicron clearance



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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.

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. ↗

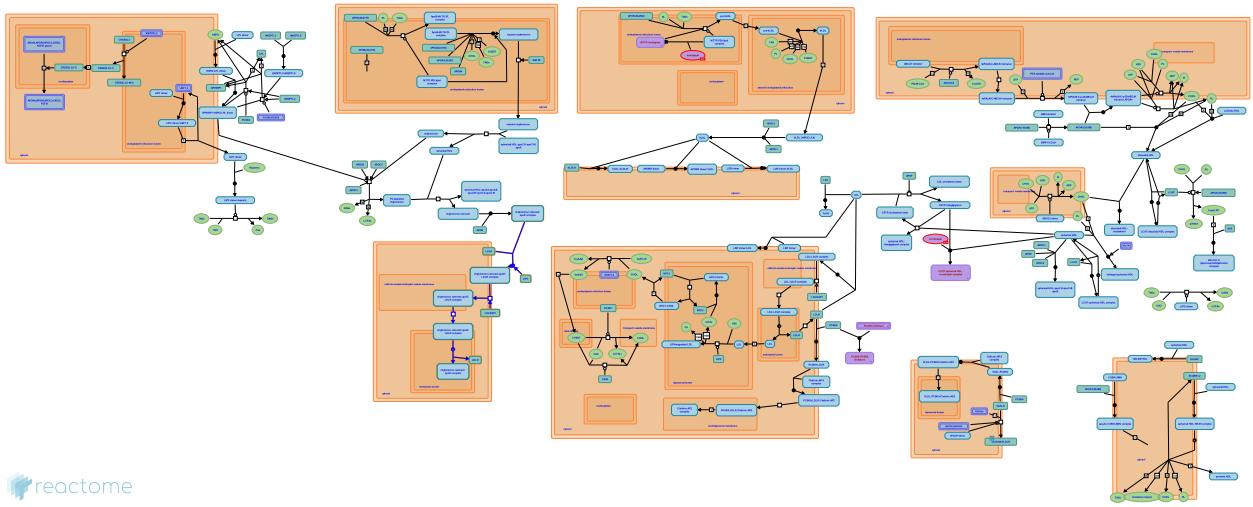
Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics, 33*, 3461-3467. ↗

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. ↗

Chylomicron clearance ↗

Stable identifier: R-HSA-8964026



Circulating chylomicrons acquire molecules of apolipoproteins C and E and through interaction with endothelial lipases lose a large fraction of their triacylglycerol. These changes convert them to chylomicron remnants which bind to LDL receptors, primarily on the surfaces of liver cells, clearing them from the circulation.

This binding and clearance process involves several steps and requires the presence of heparan sulfate proteoglycan (HSPG)-associated hepatic lipase (HL). The molecular details of LDLR binding, and of the following steps of remnant endocytosis, are inferred from those of the coorresponding step of LDLR-mediated low-density lipoprotein (LDL) endocytosis (Redgrave 2004).

Literature references

Redgrave, TG. (2004). Chylomicron metabolism. *Biochem. Soc. Trans., 32*, 79-82. ↗

Editions

2007-04-30	Authored, Edited	D'Eustachio, P.
2016-01-27	Reviewed	Jassal, B.

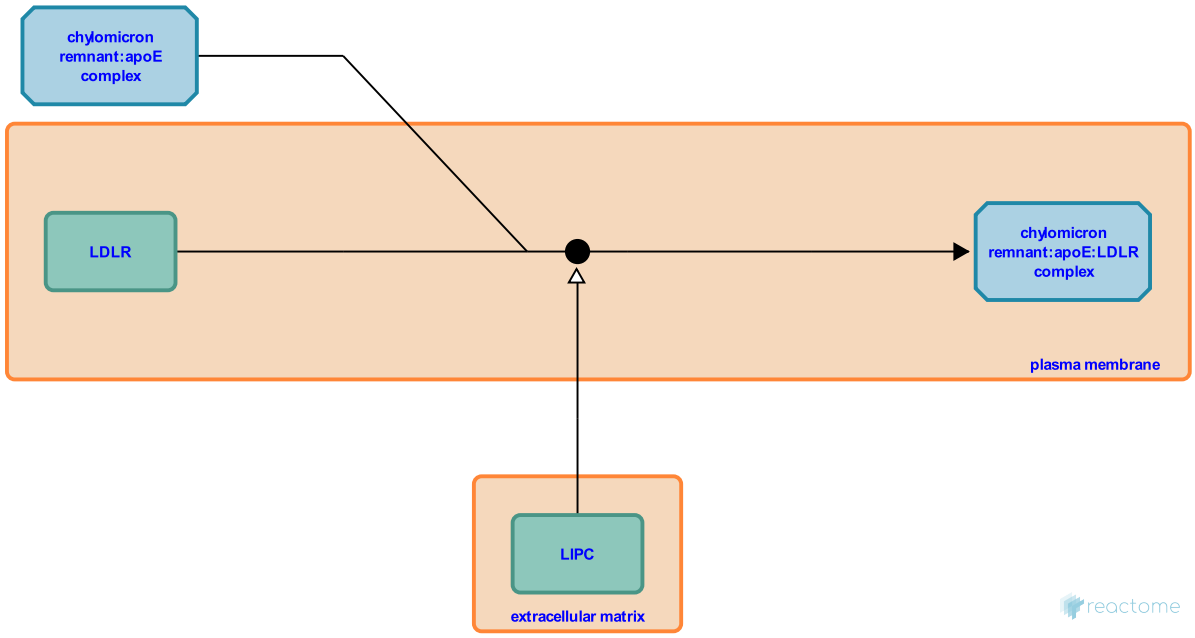
chylomicron remnant:apoE complex + LDLR => chylomicron remnant:apoE:LDLR complex ↗

Location: Chylomicron clearance

Stable identifier: R-HSA-174657

Type: binding

Compartments: plasma membrane



Chylomicron micron remnants containing apolipoprotein E associate with the surfaces of cells in a process that probably involves several steps and that requires the presence (but not the catalytic activity) of heparan sulfate proteoglycan (HSPG)-associated hepatic lipase (HL). This process ultimately results in binding of the remnant to cell-surface LDL receptors (LDLR) (Ji et al. 1994). The molecular details of LDLR binding, and of the following steps of remnant endocytosis, are inferred from those of the coorresponding step of LDLR-mediated low-density lipoprotein (LDL) endocytosis. In the body, this process occurs in the liver.

Followed by: chylomicron remnant:apoE:LDLR complex [plasma membrane] => chylomicron remnant:apoE:LDLR complex [clathrin-coated vesicle] (LDLRAP1-dependent)

Literature references

Ji, ZS., Mahley, RW., Fazio, S., Lee, YL. (1994). Secretion-capture role for apolipoprotein E in remnant lipoprotein metabolism involving cell surface heparan sulfate proteoglycans. *J Biol Chem, 269*, 2764-72. ↗

Editions

2006-02-20	Edited	D'Eustachio, P.
2007-04-30	Authored	D'Eustachio, P.

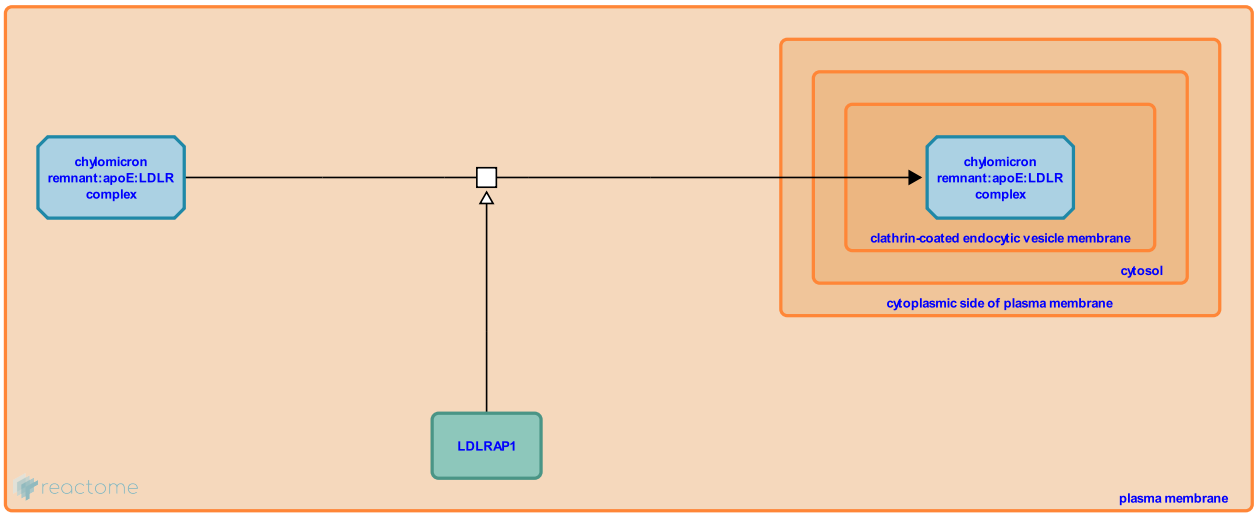
chylomicron remnant:apoE:LDLR complex [plasma membrane] => chylomicron remnant:apoE:LDLR complex [clathrin-coated vesicle] (LDLRAP1-dependent) ↗

Location: Chylomicron clearance

Stable identifier: R-HSA-174706

Type: transition

Compartments: plasma membrane



The molecular details of this event are inferred from those of LDLR-mediated low-density lipoprotein (LDL) endocytosis into coated vesicles (Ji et al. 1994).

Preceded by: chylomicron remnant:apoE complex + LDLR => chylomicron remnant:apoE:LDLR complex

Followed by: chylomicron remnant:apoE:LDLR complex [coated vesicle membrane] => chylomicron remnant:apoE:LDLR complex [endosome membrane]

Literature references

Ji, ZS., Mahley, RW., Fazio, S., Lee, YL. (1994). Secretion-capture role for apolipoprotein E in remnant lipoprotein metabolism involving cell surface heparan sulfate proteoglycans. *J Biol Chem, 269*, 2764-72. ↗

Editions

2006-02-20	Edited	D'Eustachio, P.
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chylomicron remnant:apoE:LDLR complex [coated vesicle membrane] => chylomicron remnant:apoE:LDLR complex [endosome membrane] ↗

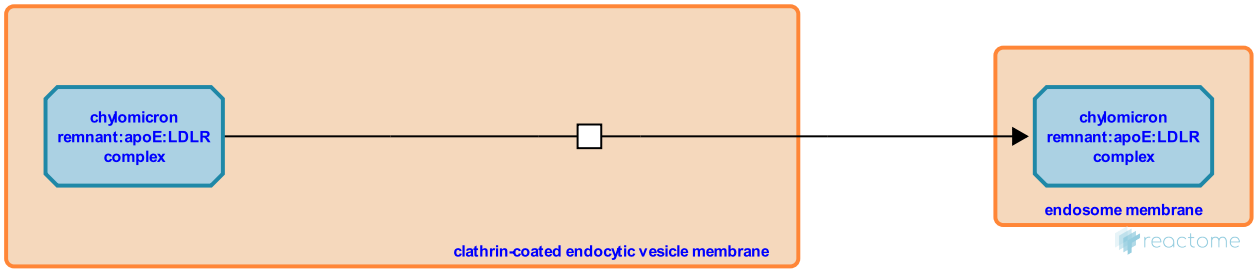
Location: Chylomicron clearance

Stable identifier: R-HSA-174808

Type: transition

Compartments: clathrin-coated endocytic vesicle membrane

Inferred from: LDLR:LDL complex [coated vesicle membrane] => LDLR:LDL complex [endosome membrane] (Homo sapiens)



The molecular details of this event are inferred from those of LDLR-mediated low-density lipoprotein (LDL) transport from coated vesicles to endosomes.

Preceded by: chylomicron remnant:apoE:LDLR complex [plasma membrane] => chylomicron remnant:apoE:LDLR complex [clathrin-coated vesicle] (LDLRAP1-dependent)

Followed by: chylomicron remnant:apoE:LDLR complex => chylomicron remnant:apoE + LDLR

Editions

2006-02-20	Edited	D'Eustachio, P.
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chylomicron remnant:apoE:LDLR complex => chylomicron remnant:apoE + LDLR ↗

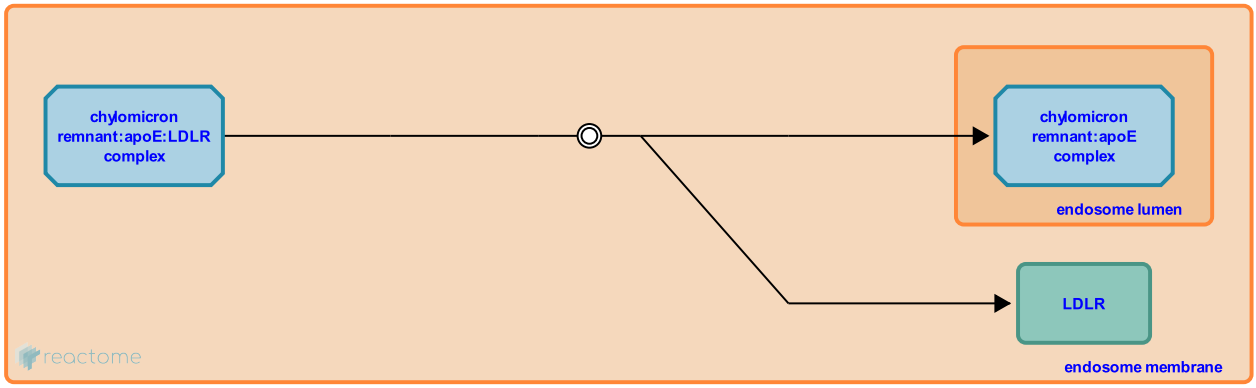
Location: Chylomicron clearance

Stable identifier: R-HSA-174624

Type: dissociation

Compartments: endosome membrane, endosome lumen

Inferred from: LDLR:LDL complex => LDLR + LDL (Homo sapiens)



The molecular details of this event are inferred from the dissociation of the LDL:LDLR complex in the endosome.

Preceded by: chylomicron remnant:apoE:LDLR complex [coated vesicle membrane] => chylomicron remnant:apoE:LDLR complex [endosome membrane]

Editions

2006-02-20	Edited	D'Eustachio, P.
2007-04-30	Authored	D'Eustachio, P.

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