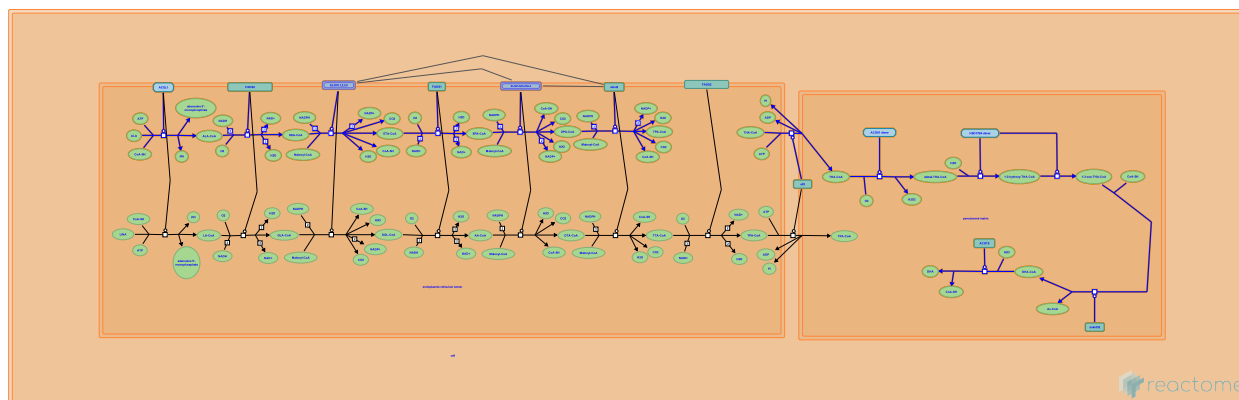


# alpha-linolenic acid (ALA) metabolism



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.

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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- 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. [↗](#)

Reactome database release: 74

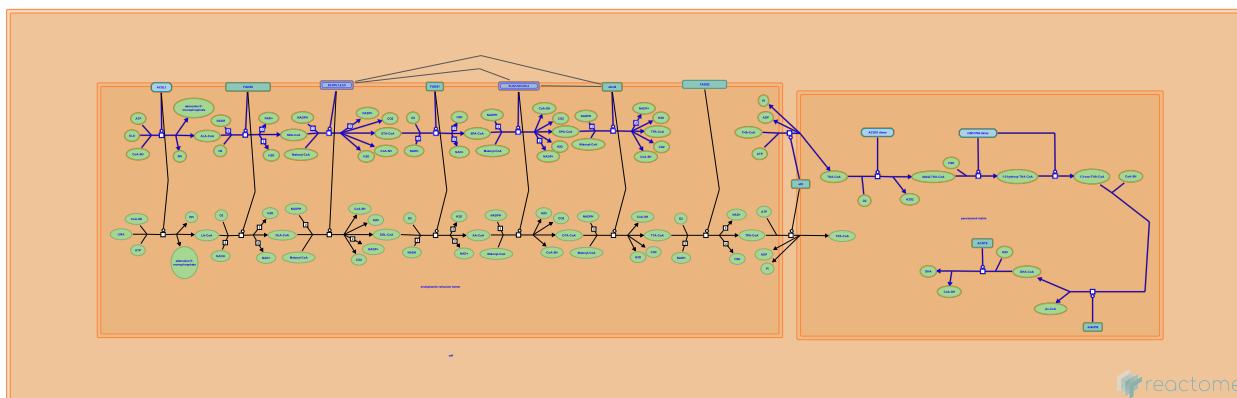
This document contains 1 pathway and 12 reactions ([see Table of Contents](#))

## alpha-linolenic acid (ALA) metabolism ↗

**Stable identifier:** R-XTR-2046106

**Compartments:** endoplasmic reticulum lumen, endoplasmic reticulum membrane, peroxisomal matrix, peroxisomal membrane

**Inferred from:** [alpha-linolenic acid \(ALA\) metabolism \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

## Activation of alpha-linolenic acid to alpha-linolenoyl-CoA ↗

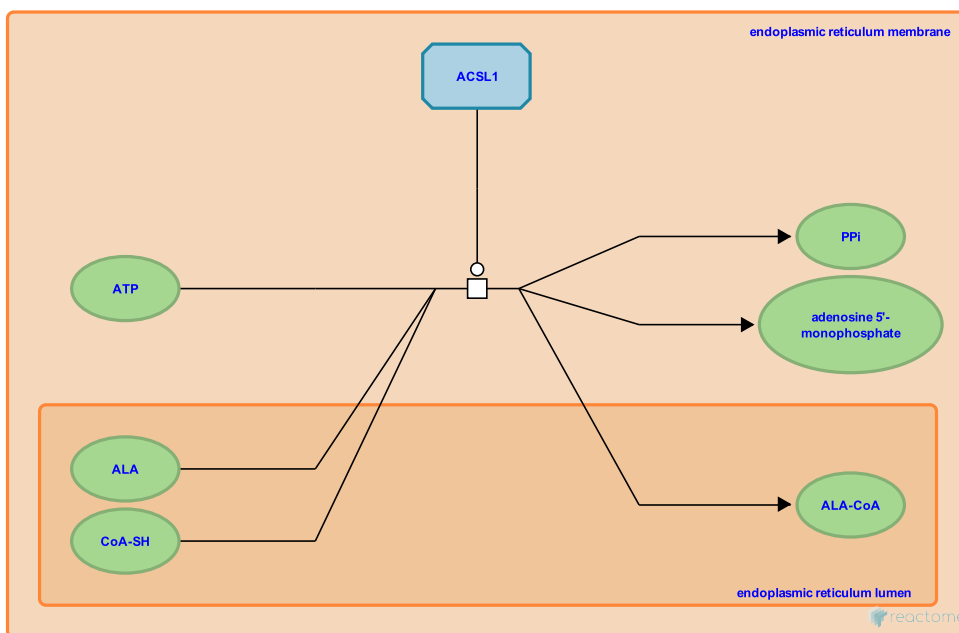
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2046085

**Type:** transition

**Compartments:** endoplasmic reticulum membrane, endoplasmic reticulum lumen

**Inferred from:** [Activation of alpha-linolenic acid to alpha-linolenoyl-CoA \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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**Followed by:** [Desaturation of alpha-linoleoyl-CoA to Stearidonoyl-CoA](#)

## Desaturation of alpha-linoleoyl-CoA to Stearidonoyl-CoA ↗

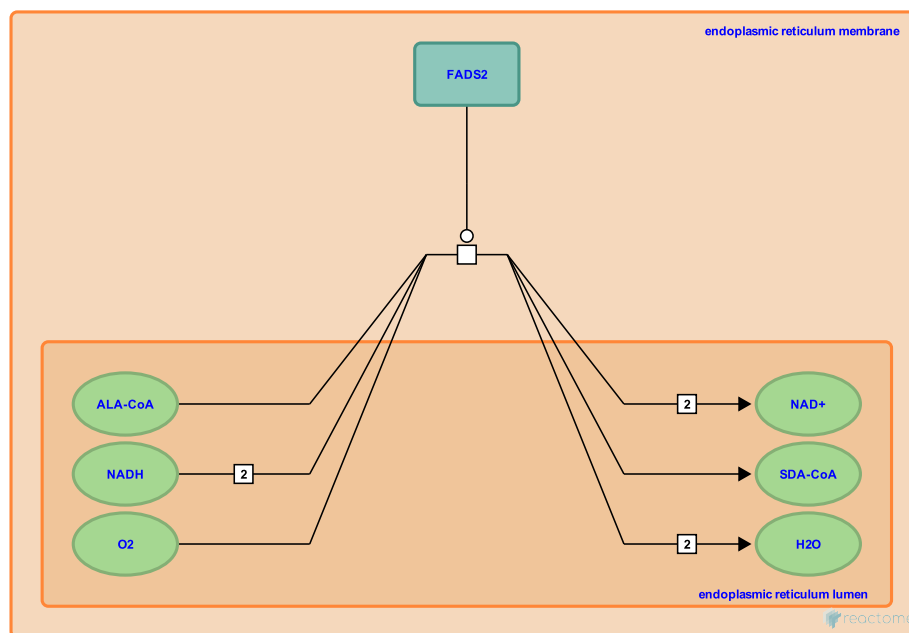
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2046084

**Type:** transition

**Compartments:** endoplasmic reticulum membrane, endoplasmic reticulum lumen

**Inferred from:** [Desaturation of alpha-linoleoyl-CoA to Stearidonoyl-CoA \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Activation of alpha-linolenic acid to alpha-linolenoyl-CoA](#)

**Followed by:** [Elongation of stearidonoyl-CoA to eicosatetraenoyl-CoA](#)

## Elongation of stearidonoyl-CoA to eicosatetraenoyl-CoA ↗

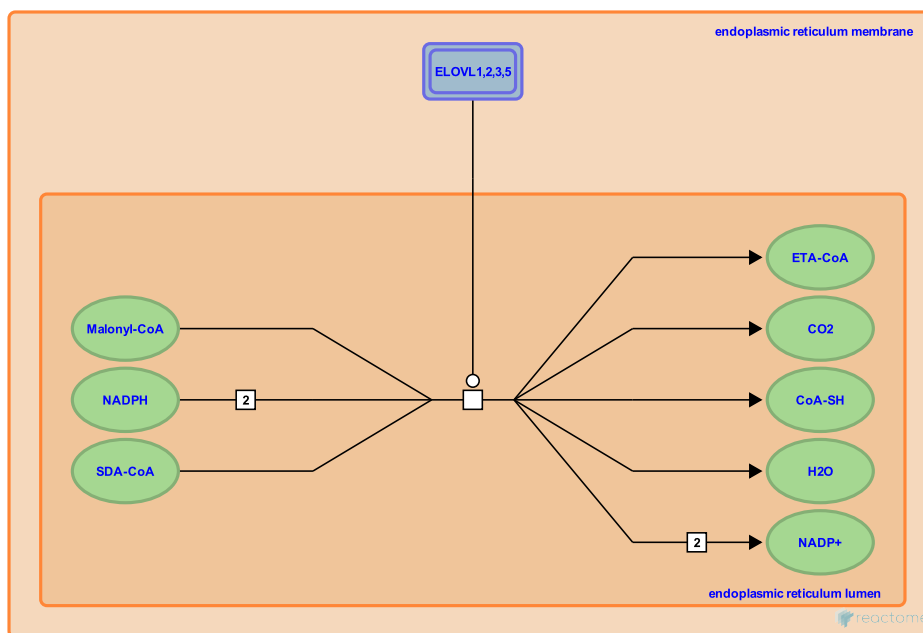
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2046088

**Type:** transition

**Compartments:** endoplasmic reticulum lumen, endoplasmic reticulum membrane

**Inferred from:** [Elongation of stearidonoyl-CoA to eicosatetraenoyl-CoA \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Desaturation of alpha-linoleoyl-CoA to Stearidonoyl-CoA](#)

**Followed by:** [Desaturation of eicosatetraenoyl-CoA to eicosapentaenoyl-CoA](#)

## Desaturation of eicosatetraenoyl-CoA to eicosapentaenoyl-CoA ↗

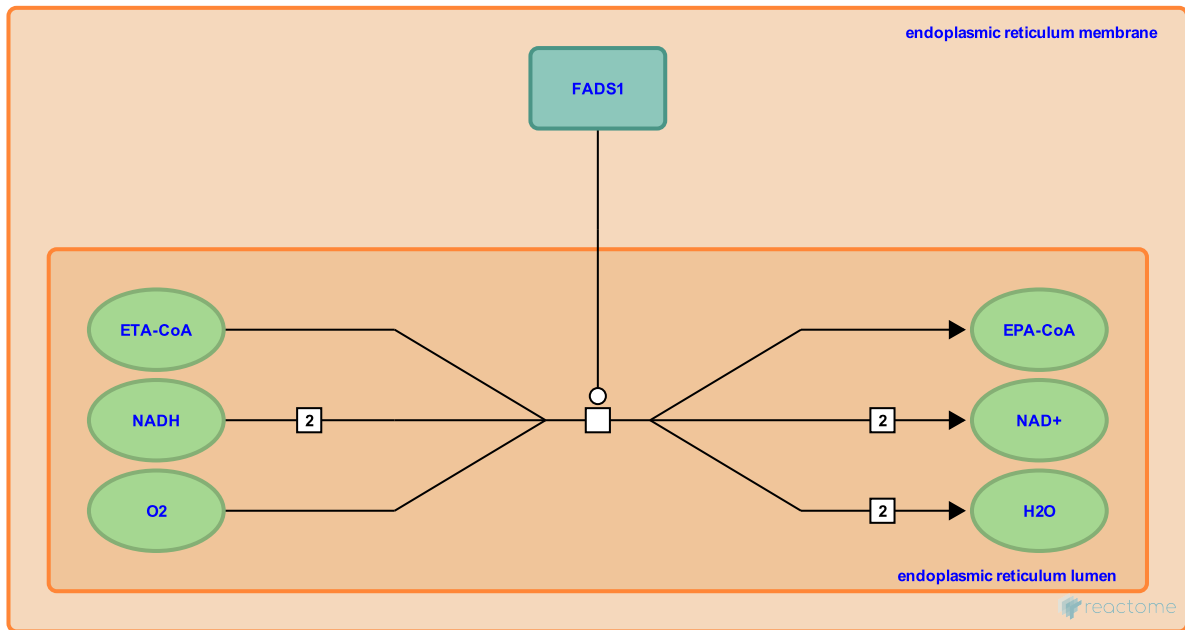
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2046089

**Type:** transition

**Compartments:** endoplasmic reticulum lumen, endoplasmic reticulum membrane

**Inferred from:** [Desaturation of eicosatetraenoyl-CoA to eicosapentaenoyl-CoA \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Elongation of stearidonoyl-CoA to eicosatetraenoyl-CoA](#)

**Followed by:** [Elongation of eicosapentaenoyl-CoA to docosapentaenoyl-CoA](#)

## Elongation of eicosapentaenoyl-CoA to docosapentaenoyl-CoA ↗

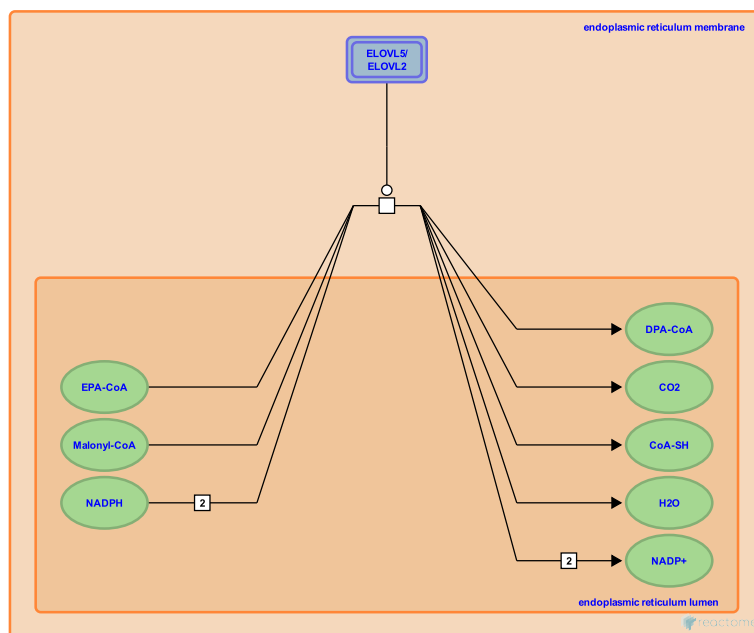
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2046100

**Type:** transition

**Compartments:** endoplasmic reticulum membrane, endoplasmic reticulum lumen

**Inferred from:** [Elongation of eicosapentaenoyl-CoA to docosapentaenoyl-CoA \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Desaturation of eicosatetraenoyl-CoA to eicosapentaenoyl-CoA](#)

**Followed by:** [Elongation of docosapentaenoyl-CoA to tetracosapentaenoyl-CoA](#)



## Elongation of docosapentaenoyl-CoA to tetracosapentaenoyl-CoA ↗

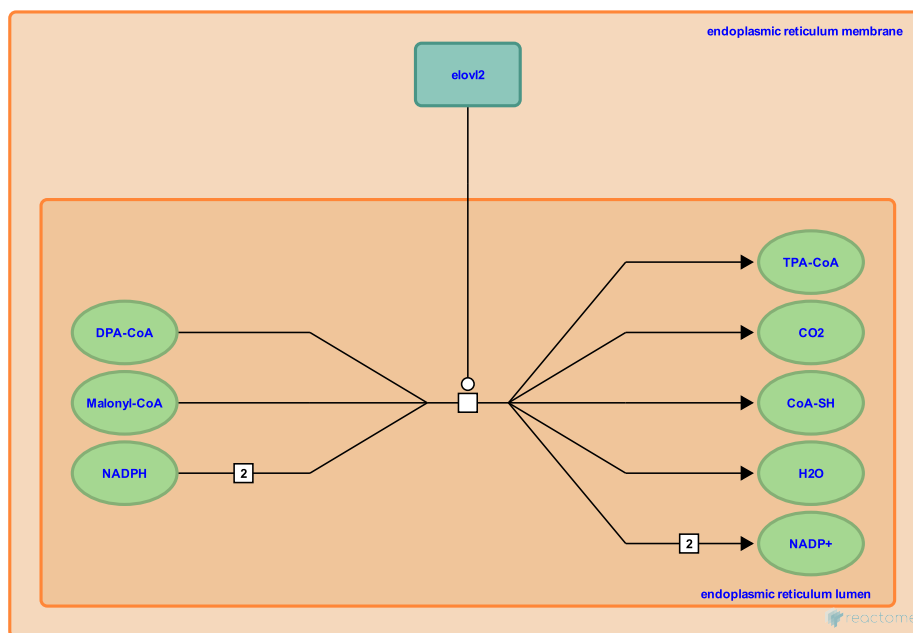
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2046090

**Type:** transition

**Compartments:** endoplasmic reticulum lumen, endoplasmic reticulum membrane

**Inferred from:** [Elongation of docosapentaenoyl-CoA to tetracosapentaenoyl-CoA \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Elongation of eicosapentaenoyl-CoA to docosapentaenoyl-CoA](#)

## Translocation of tetracosahexaenoyl-CoA to peroxisomes ↗

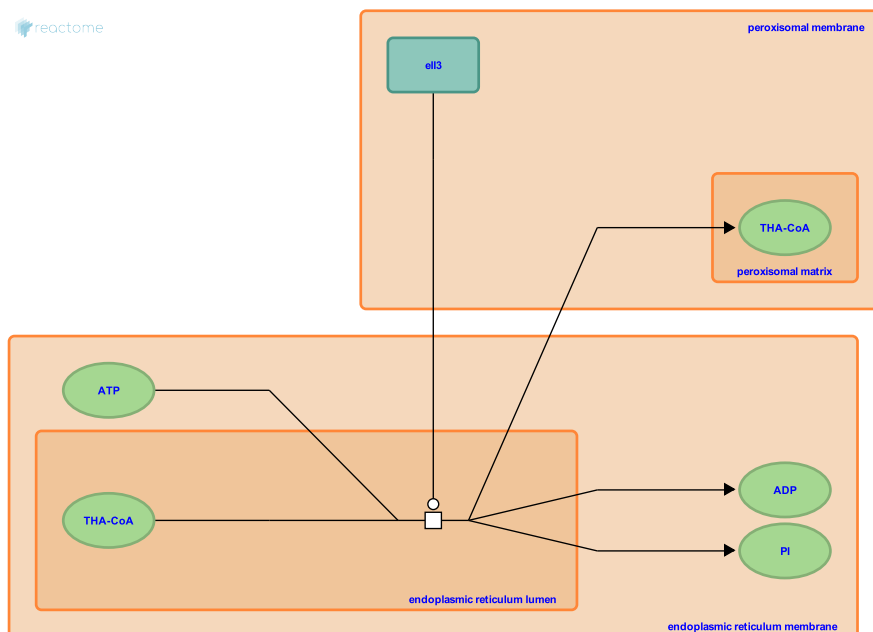
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2046087

**Type:** transition

**Compartments:** endoplasmic reticulum lumen, endoplasmic reticulum membrane, peroxisomal membrane, peroxisomal matrix

**Inferred from:** [Translocation of tetracosahexaenoyl-CoA to peroxisomes \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Followed by:** [Oxidation of tetracosapentaenoyl-CoA to delta2-tetracosahexaenoyl-CoA](#)

## Oxidation of tetracosapentaenoyl-CoA to delta2-tetracosaeptaenoyl-CoA ↗

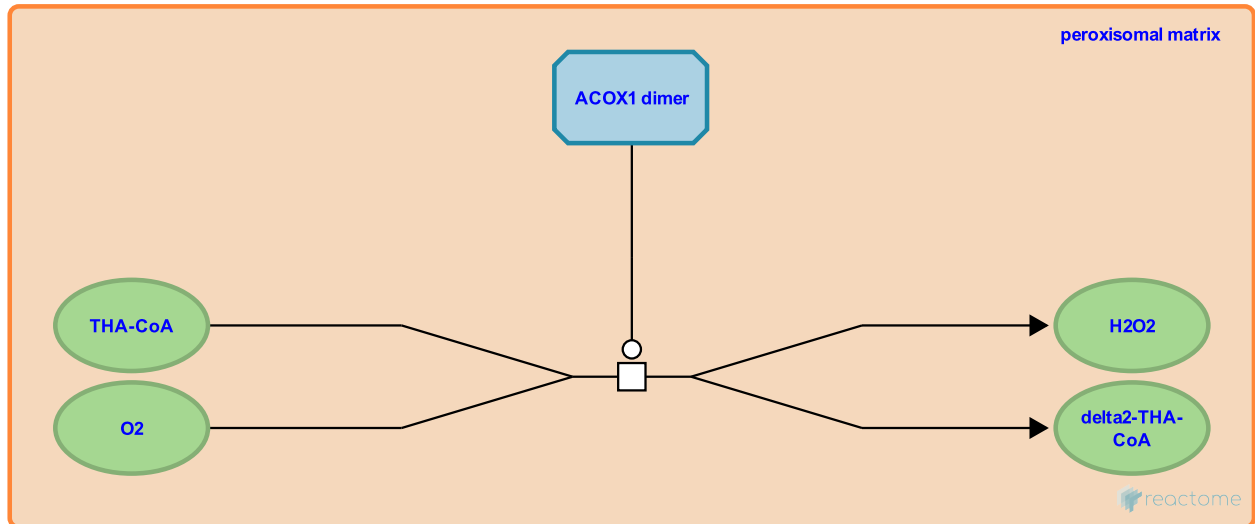
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2066787

**Type:** transition

**Compartments:** peroxisomal matrix

**Inferred from:** [Oxidation of tetracosapentaenoyl-CoA to delta2-tetracosaeptaenoyl-CoA \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Translocation of tetracosahexaenoyl-CoA to peroxisomes](#)

**Followed by:** [Hydration of delta2-tetracosaeptaenoyl-CoA to 3-hydroxy tetracosahexaenoyl-CoA](#)

## Hydration of delta2-tetracosaeptaenoyl-CoA to 3-hydroxy tetracosahexaenoyl-CoA



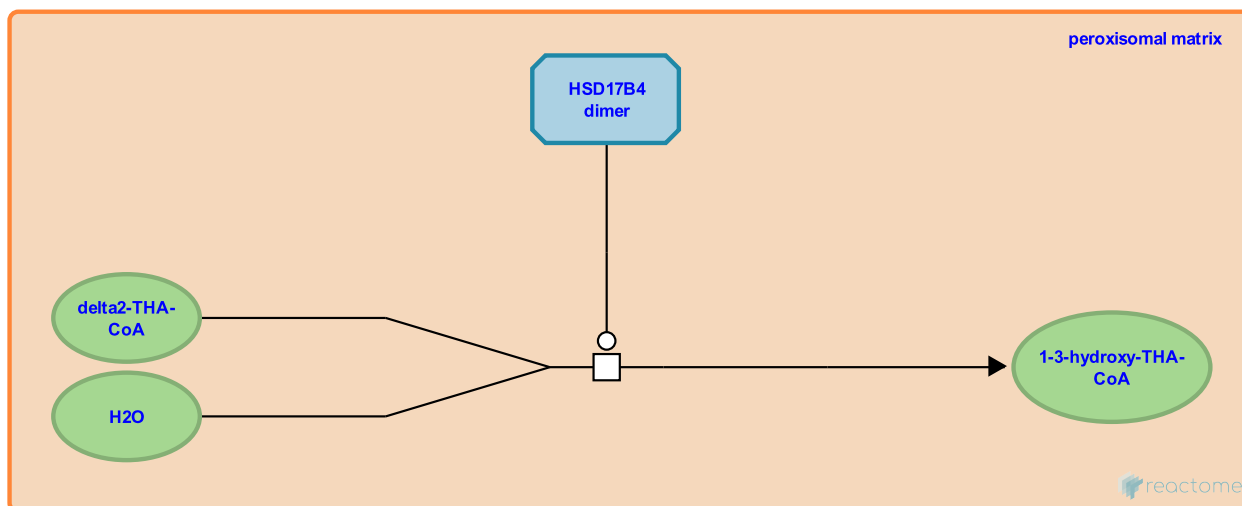
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2066778

**Type:** transition

**Compartments:** peroxisomal matrix

**Inferred from:** [Hydration of delta2-tetracosaeptaenoyl-CoA to 3-hydroxy tetracosahexaenoyl-CoA \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Oxidation of tetracosapentaenoyl-CoA to delta2-tetracosaeptaenoyl-CoA](#)

**Followed by:** [Dehydrogenation of 3-hydroxy tetracosahexaenoyl-CoA](#)

## Dehydrogenation of 3-hydroxy tetracosahexanoyl-CoA ↗

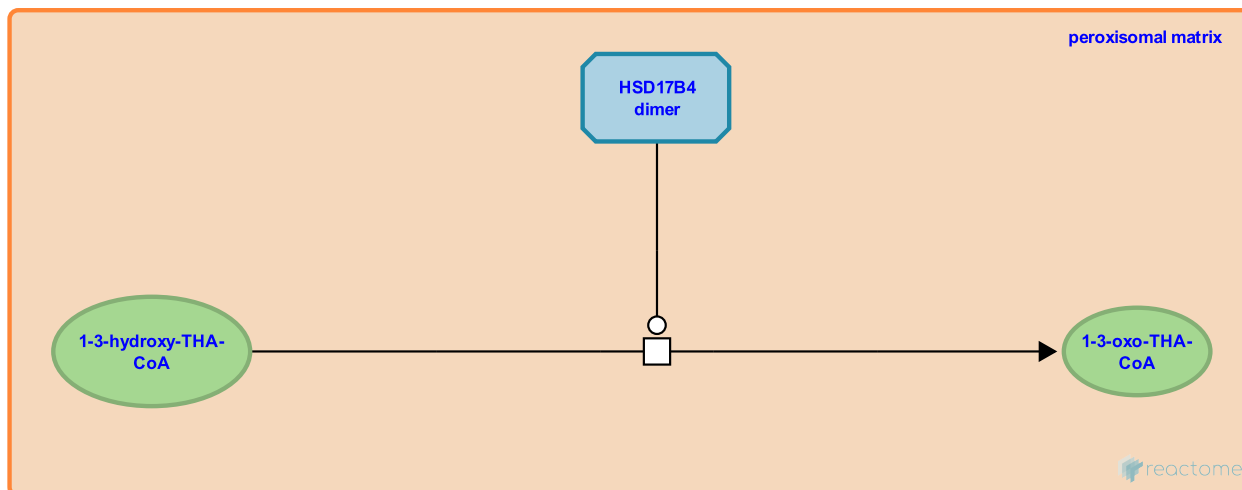
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2066780

**Type:** transition

**Compartments:** peroxisomal matrix

**Inferred from:** [Dehydrogenation of 3-hydroxy tetracosahexanoyl-CoA \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Hydration of delta2-tetracosahexanoyl-CoA to 3-hydroxy tetracosahexanoyl-CoA](#)

**Followed by:** [Formation of DHA-CoA catalysed by 3-ketoacyl-CoA thiolase](#)

## Formation of DHA-CoA catalysed by 3-ketoacyl-CoA thiolase ↗

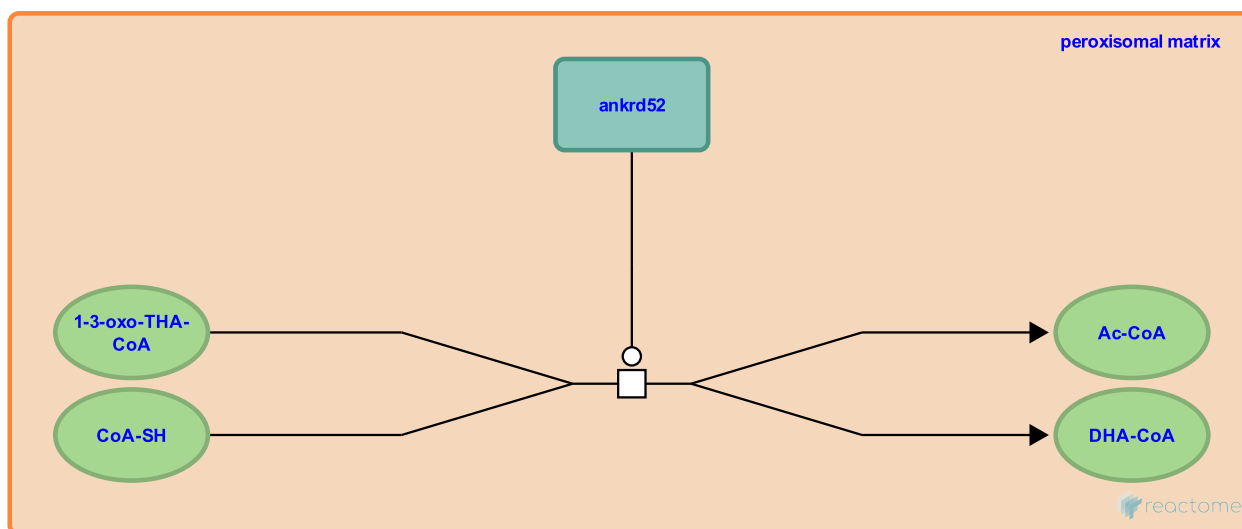
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2066788

**Type:** transition

**Compartments:** peroxisomal matrix

**Inferred from:** [Formation of DHA-CoA catalysed by 3-ketoacyl-CoA thiolase \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Dehydrogenation of 3-hydroxy tetracosahexaenoyl-CoA](#)

**Followed by:** [Conversion of DHA-CoA to docosahexaenoic acid \(DHA\)](#)

## Conversion of DHA-CoA to docosahexaenoic acid (DHA) ↗

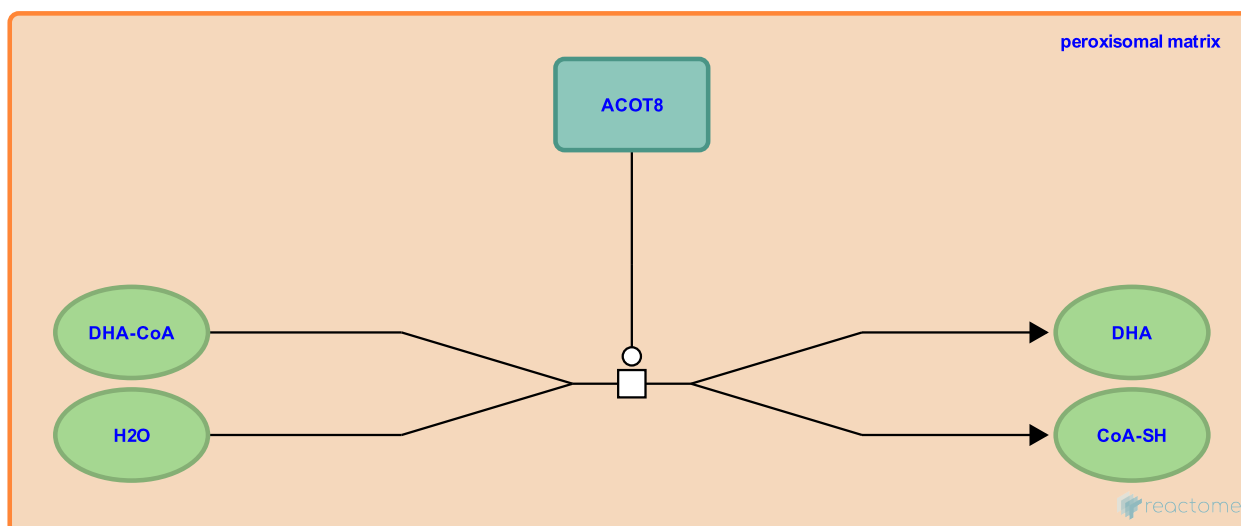
**Location:** [alpha-linolenic acid \(ALA\) metabolism](#)

**Stable identifier:** R-XTR-2066779

**Type:** transition

**Compartments:** peroxisomal matrix

**Inferred from:** [Conversion of DHA-CoA to docosahexaenoic acid \(DHA\) \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

**Preceded by:** [Formation of DHA-CoA catalysed by 3-ketoacyl-CoA thiolase](#)

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