

MTHFD1L ligates HCOOH to THF to form 10-formyl-THF

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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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Reactome database release: 74

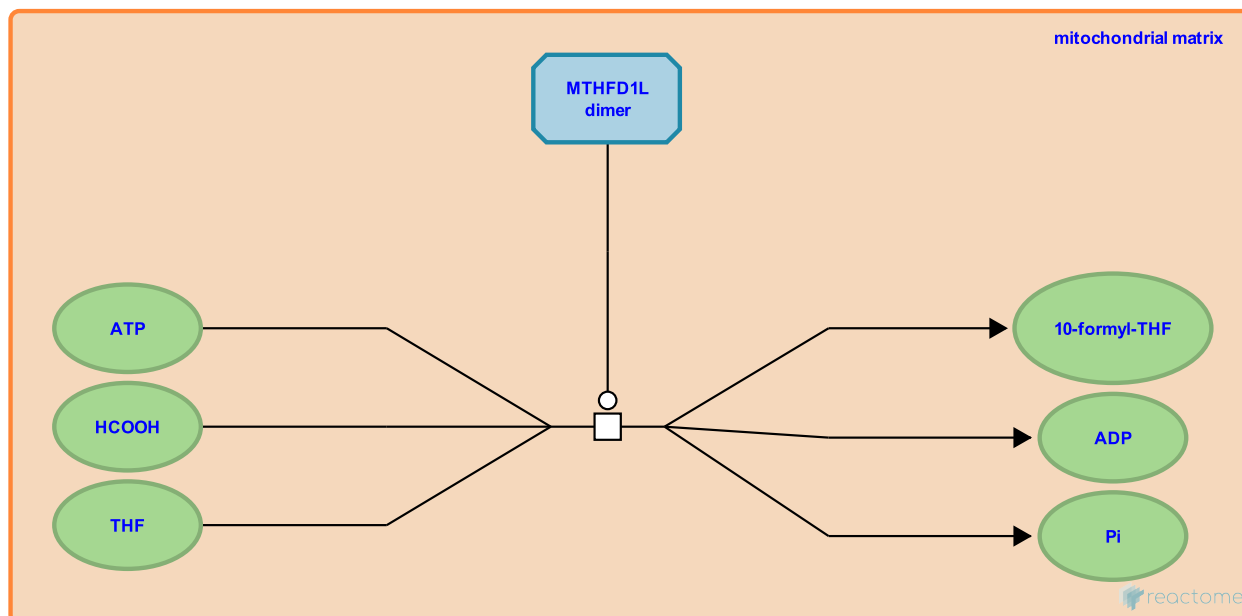
This document contains 1 reaction ([see Table of Contents](#))

MTHFD1L ligates HCOOH to THF to form 10-formyl-THF ↗

Stable identifier: R-HSA-5696839

Type: transition

Compartments: mitochondrial matrix



All C1-tetrahydrofolate (C1-THF) synthases characterised to date are trifunctional, containing the activities of 5,10-methylene-THF dehydrogenase, 5,10-methenyl-THF cyclohydrolase, and 10-formyl-THF synthetase. Mitochondrial monofunctional C1-tetrahydrofolate synthase (MTHFD1L) only possesses 10-formyl-THF synthetase activity and it reversibly ligates formate (HCOOH) to tetrahydrofolate (THF), forming 10-formyltetrahydrofolate (10-formyl-THF) (Prasannan et al. 2003, Walkup & Appling 2005). MTHFD1L is functional as a homodimer and could be a missing reaction in one-carbon folate metabolism linking the metabolism of formate from the cytosol to mitochondria (Pike et al. 2010).

Literature references

Walkup, AS., Appling, DR. (2005). Enzymatic characterization of human mitochondrial C1-tetrahydrofolate synthase. *Arch. Biochem. Biophys.*, 442, 196-205. ↗

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Pike, ST., Rajendra, R., Artzt, K., Appling, DR. (2010). Mitochondrial C1-tetrahydrofolate synthase (MTHFD1L) supports the flow of mitochondrial one-carbon units into the methyl cycle in embryos. *J. Biol. Chem.*, 285, 4612-20. ↗

Editions

2015-06-01	Authored, Edited	Jassal, B.
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