

**orotate + 5-phospho-alpha-D-ribose 1-diphosphate (PRPP)  $\rightleftharpoons$  orotidine 5'-monophosphate (OMP) + pyrophosphate**

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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

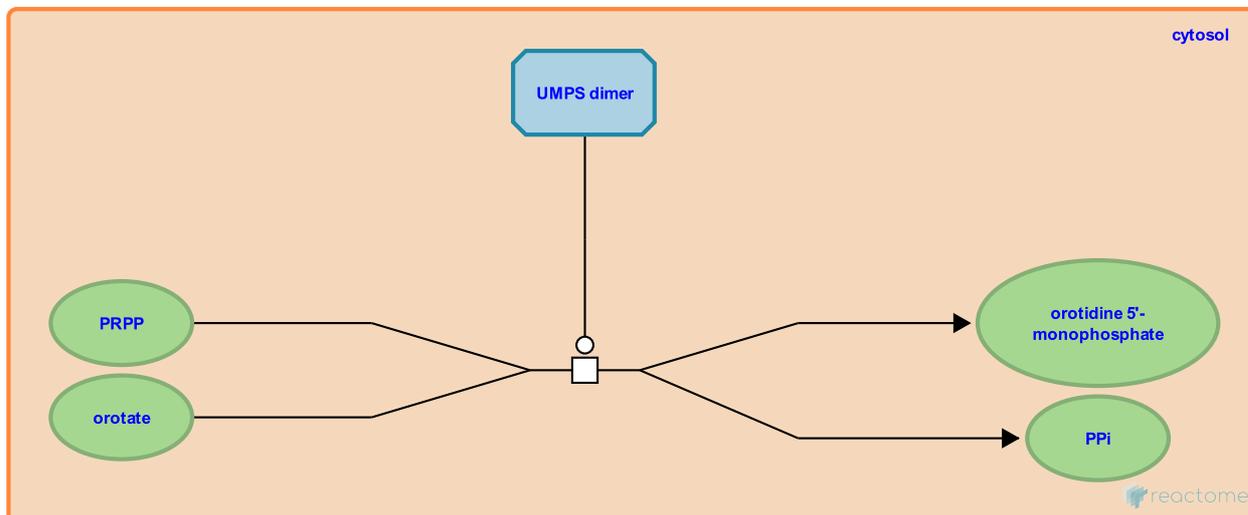
This document contains 1 reaction ([see Table of Contents](#))

## orotate + 5-phospho-alpha-D-ribose 1-diphosphate (PRPP) $\rightleftharpoons$ orotidine 5'-monophosphate (OMP) + pyrophosphate [↗](#)

**Stable identifier:** R-HSA-73567

**Type:** transition

**Compartments:** cytosol



The synthesis of orotidine 5'-monophosphate (OMP) from orotate and 5-phospho-alpha-D-ribose 1-diphosphate (PRPP) is catalyzed by the orotate phosphoribosyltransferase activity of the bifunctional "uridine monophosphate synthetase (orotate phosphoribosyl transferase and orotidine 5'-decarboxylase)" protein. The reaction itself is freely reversible, but is pulled in the forward direction in vivo by the irreversible hydrolysis of pyrophosphate. While purified human protein has not been characterized in detail, the close similarity of the human gene to that encoding the well-studied hamster protein, and the demonstration that mutations in the human gene are associated with failure to convert orotate to UMP in vivo, provide convincing evidence that the human uridine monophosphate synthetase protein indeed catalyzes these two reactions (McClard et al. 1980; Suchi et al. 1997). The active form of the human protein is a dimer (Yablonski et al. 1996; Wittmann et al. 2008).

### Literature references

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## Editions

2003-06-17	Authored	Jassal, B.
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