

# PTEN dephosphorylates PIP3

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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

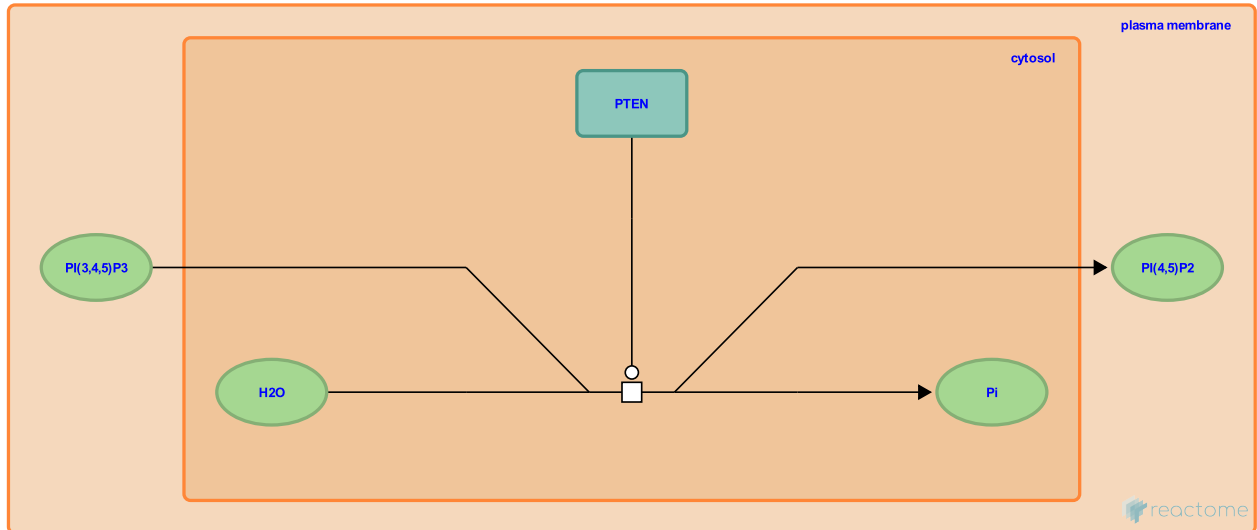
This document contains 1 reaction ([see Table of Contents](#))

## PTEN dephosphorylates PIP3 ↗

**Stable identifier:** R-HSA-199456

**Type:** transition

**Compartments:** cytosol, plasma membrane



At the plasma membrane, phosphatidylinositol-3,4,5-trisphosphate 3-phosphatase and dual-specificity protein phosphatase aka phosphatase and tensin homolog (PTEN) dephosphorylates phosphatidylinositol 3,4,5-trisphosphate (PI(3,4,5)P3) to phosphatidylinositol 4,5-bisphosphate (PI(4,5)P2) (Maehama & Dixon 1998, Myers et al. 1998, Das et al. 2003). The PI3K network is negatively regulated by phospholipid phosphatases that dephosphorylate PIP3, thus hampering AKT activation (Myers et al. 1998). The tumour suppressor PTEN is the primary phospholipid phosphatase.

Early studies indicated that magnesium ion, Mg<sup>2+</sup>, was needed for the catalytic activity of PTEN isolated from bovine thymus (Kabuyama et al. 1996). Subsequent studies have shown that PTEN was catalytically active in buffers free of magnesium and magnesium was not detected as part of the PTEN crystal (Lee et al. 1999).

### Literature references

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## Editions

2006-10-10	Authored	Annibali, D., Nasi, S.
2007-11-08	Reviewed	Greene, LA.
2012-05-14	Reviewed	Wakelam, M.
2012-07-18	Revised	Orlic-Milacic, M.
2012-08-13	Reviewed	Zhao, JJ., Yuzugullu, H., Thorpe, L.
2016-09-30	Reviewed	Leslie, N., Kriplani, N.