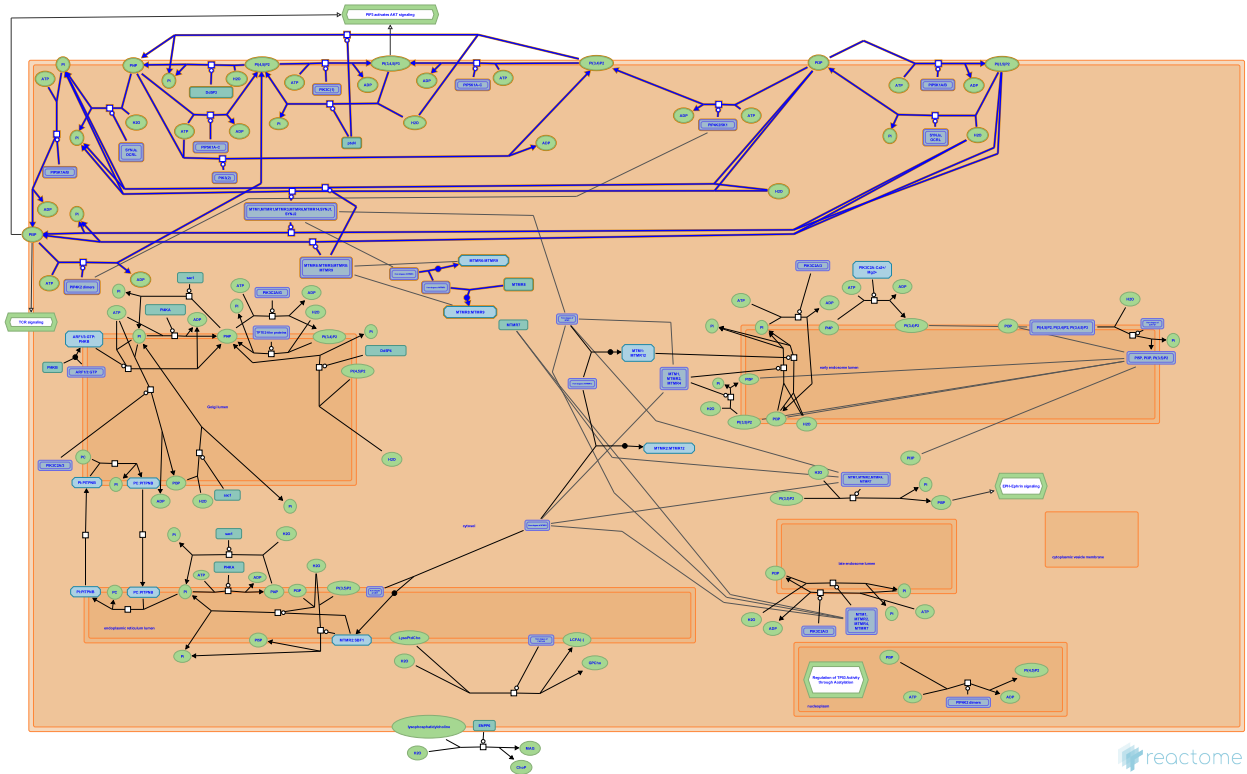


Synthesis of PIPs at the plasma membrane



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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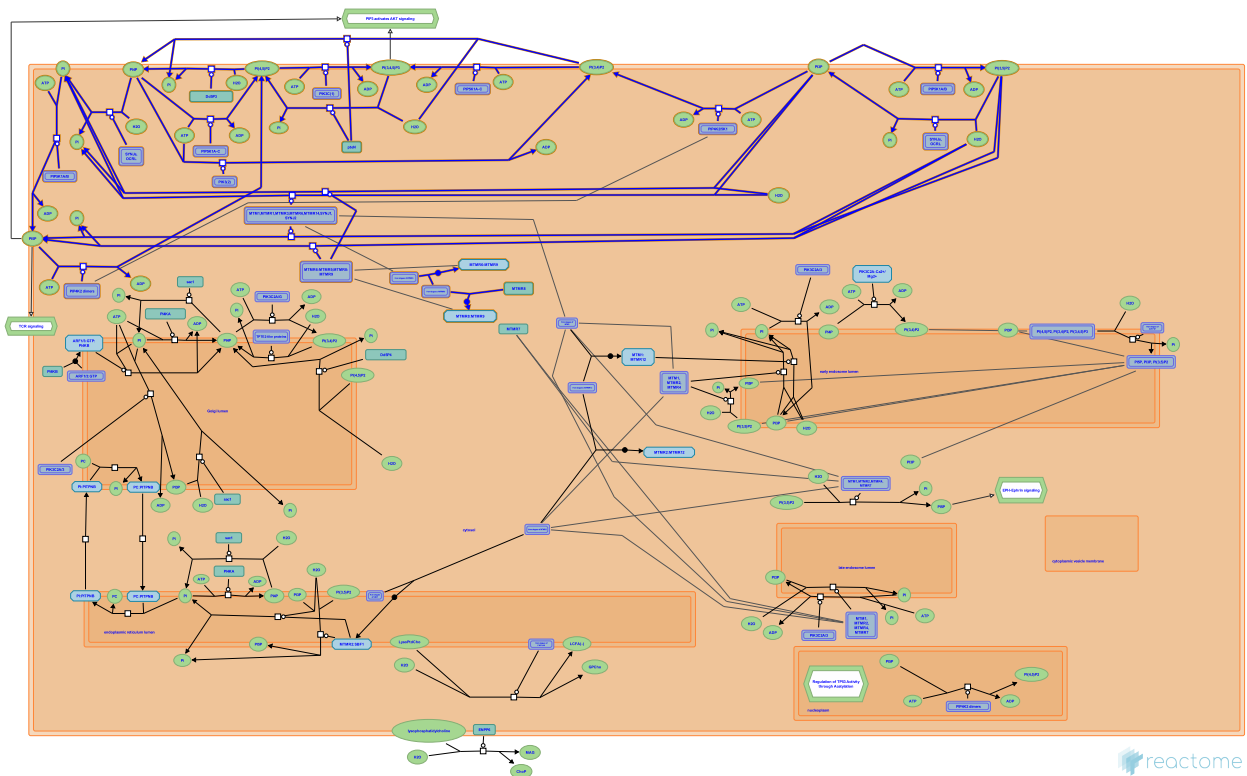
Reactome database release: 74

This document contains 1 pathway and 19 reactions ([see Table of Contents](#))

Synthesis of PIPs at the plasma membrane ↗

Stable identifier: R-DDI-1660499

Inferred from: [Synthesis of PIPs at the plasma membrane \(Homo sapiens\)](#)



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>

PI4P is phosphorylated to PI(4,5)P2 by PIP5K1A-C at the plasma membrane ↗

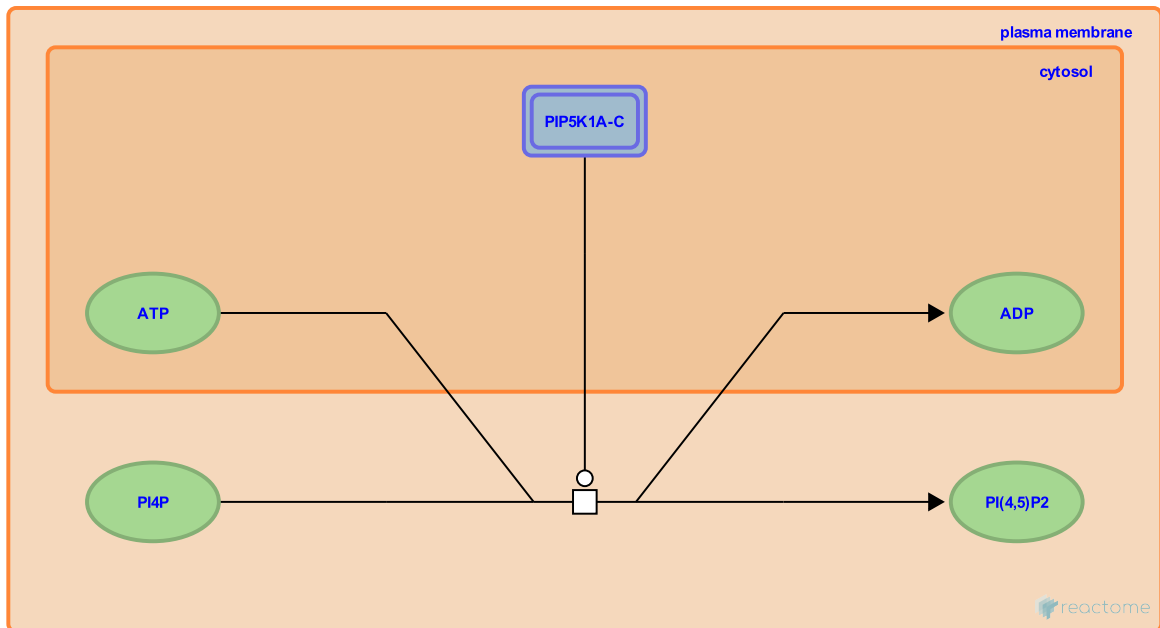
Location: Synthesis of PIPs at the plasma membrane

Stable identifier: R-DDI-1676082

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: PI4P is phosphorylated to PI(4,5)P2 by PIP5K1A-C at the plasma membrane (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: PI(4,5)P2 is dephosphorylated to PI4P by SYNJ/INPP5[1] at the plasma membrane, PI(3,4)P2 is dephosphorylated to PI4P by PTEN at the plasma membrane

Followed by: PI(4,5)P2 is dephosphorylated to PI4P by SYNJ/INPP5[1] at the plasma membrane, PI(4,5)P2 is phosphorylated to PI(3,4,5)P3 by PIK3C[1] at the plasma membrane

PI(4,5)P2 is dephosphorylated to PI4P by SYNJ/INPP5[1] at the plasma membrane ↗

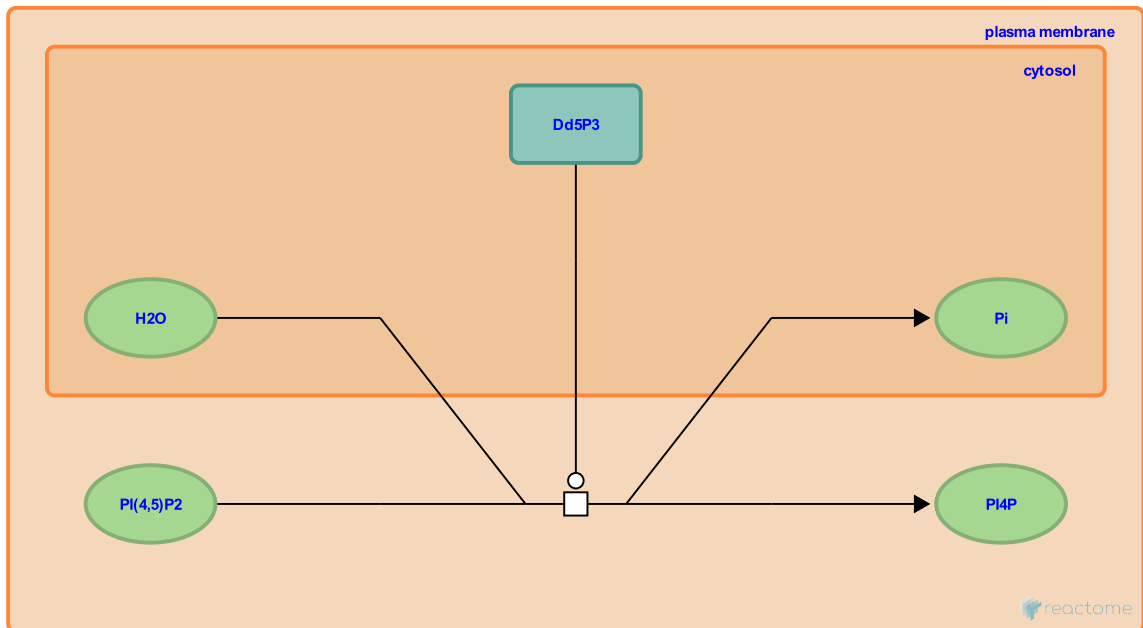
Location: Synthesis of PIPs at the plasma membrane

Stable identifier: R-DDI-1676177

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: PI(4,5)P2 is dephosphorylated to PI4P by SYNJ/INPP5[1] at the plasma membrane (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: PI4P is phosphorylated to PI(4,5)P2 by PIP5K1A-C at the plasma membrane, PTEN dephosphorylates PIP3, PI5P is phosphorylated to PI(4,5)P2 by PIP4K2 dimers at the plasma membrane

Followed by: PI4P is dephosphorylated to PI by SYNJ at the plasma membrane, PI4P is phosphorylated to PI(3,4)P2 by PI3K3C[2] at the plasma membrane, PI4P is phosphorylated to PI(4,5)P2 by PIP5K1A-C at the plasma membrane

PI(4,5)P2 is phosphorylated to PI(3,4,5)P3 by PIK3C[1] at the plasma membrane ↗

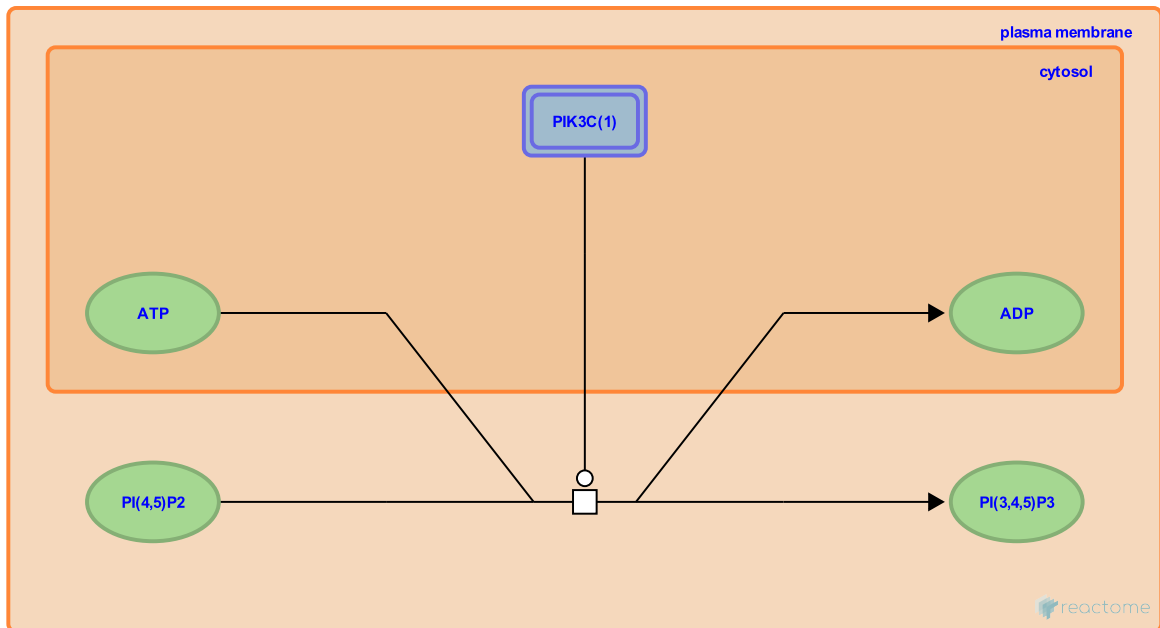
Location: Synthesis of PIPs at the plasma membrane

Stable identifier: R-DDI-1676048

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: PI(4,5)P2 is phosphorylated to PI(3,4,5)P3 by PIK3C[1] at the plasma membrane (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: PI4P is phosphorylated to PI(4,5)P2 by PIP5K1A-C at the plasma membrane, PTEN dephosphorylates PIP3, PI5P is phosphorylated to PI(4,5)P2 by PIP4K2 dimers at the plasma membrane

Followed by: PTEN dephosphorylates PIP3

PTEN dephosphorylates PIP3 ↗

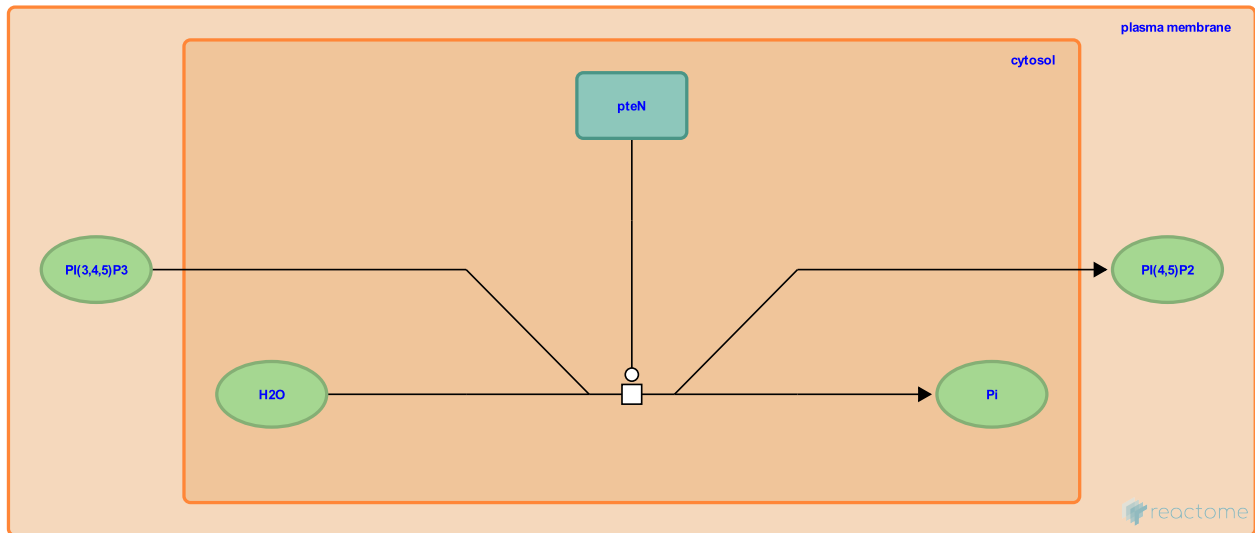
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-199456

Type: transition

Compartments: cytosol, plasma membrane

Inferred from: [PTEN dephosphorylates PIP3 \(Homo sapiens\)](#)



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: [PI\(4,5\)P2 is phosphorylated to PI\(3,4,5\)P3 by PIK3C\[1\] at the plasma membrane](#), [PI\(3,4\)P2 is phosphorylated to PI\(3,4,5\)P3 by PIP5K1A-C at the plasma membrane](#)

Followed by: [PI\(4,5\)P2 is dephosphorylated to PI4P by SYNJ/INPP5\[1\] at the plasma membrane](#), [PI\(4,5\)P2 is phosphorylated to PI\(3,4,5\)P3 by PIK3C\[1\] at the plasma membrane](#)

PI(3,4)P2 is phosphorylated to PI(3,4,5)P3 by PIP5K1A-C at the plasma membrane ↗

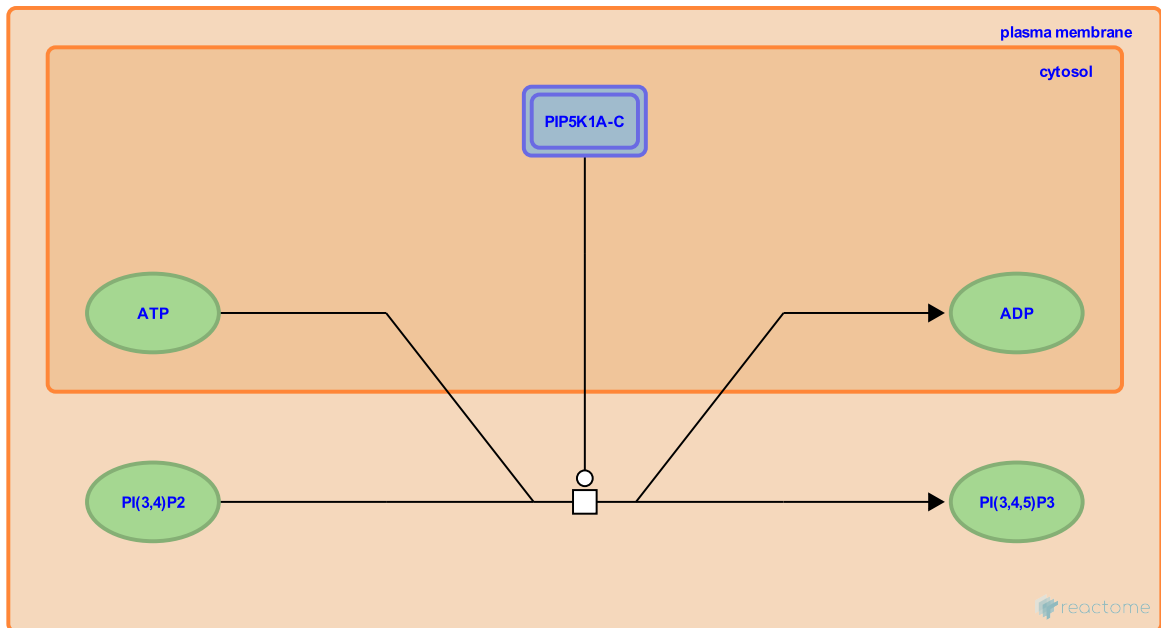
Location: Synthesis of PIPs at the plasma membrane

Stable identifier: R-DDI-1675773

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: PI(3,4)P2 is phosphorylated to PI(3,4,5)P3 by PIP5K1A-C at the plasma membrane (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: PI4P is phosphorylated to PI(3,4)P2 by PI3K3C[2] at the plasma membrane, PI3P is phosphorylated to PI(3,4)P2 by PIP4K2/5K1 at the plasma membrane

Followed by: PTEN dephosphorylates PIP3

PI4P is phosphorylated to PI(3,4)P2 by PI3K3C[2] at the plasma membrane ↗

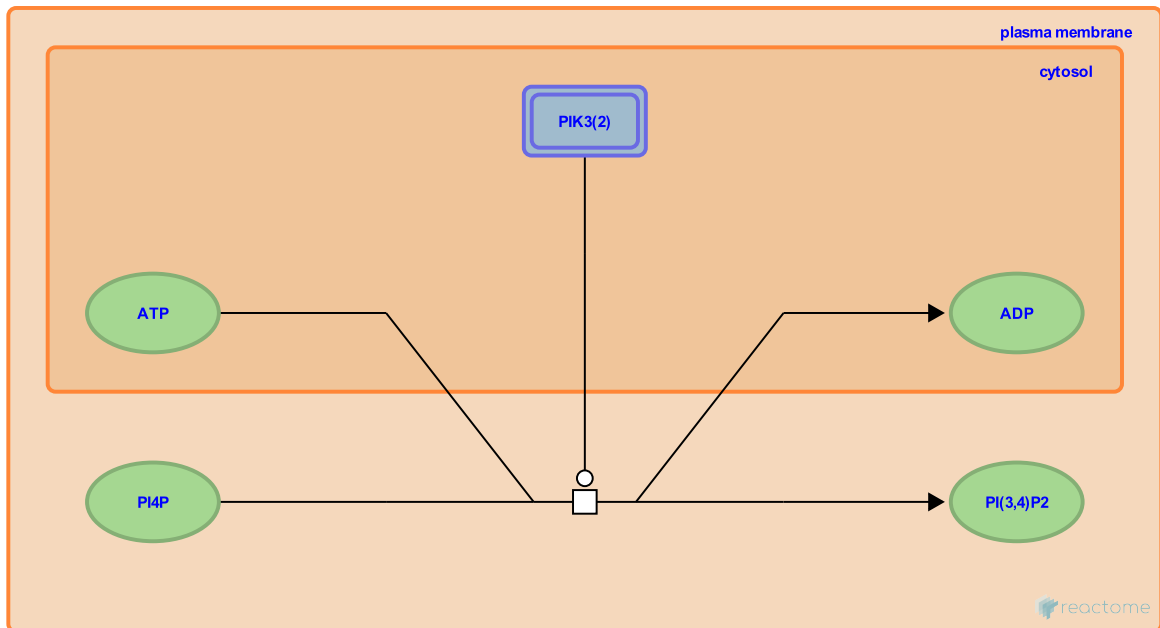
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-1676109

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [PI4P is phosphorylated to PI\(3,4\)P2 by PI3K3C\[2\] at the plasma membrane \(Homo sapiens\)](#)



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: [PI\(4,5\)P2 is dephosphorylated to PI4P by SYNJ/INPP5\[1\] at the plasma membrane](#), [PI\(3,4\)P2 is dephosphorylated to PI4P by PTEN at the plasma membrane](#)

Followed by: [PI\(3,4\)P2 is dephosphorylated to PI4P by PTEN at the plasma membrane](#), [PI\(3,4\)P2 is phosphorylated to PI\(3,4,5\)P3 by PIP5K1A-C at the plasma membrane](#)

PI(3,4)P2 is dephosphorylated to PI4P by PTEN at the plasma membrane [↗](#)

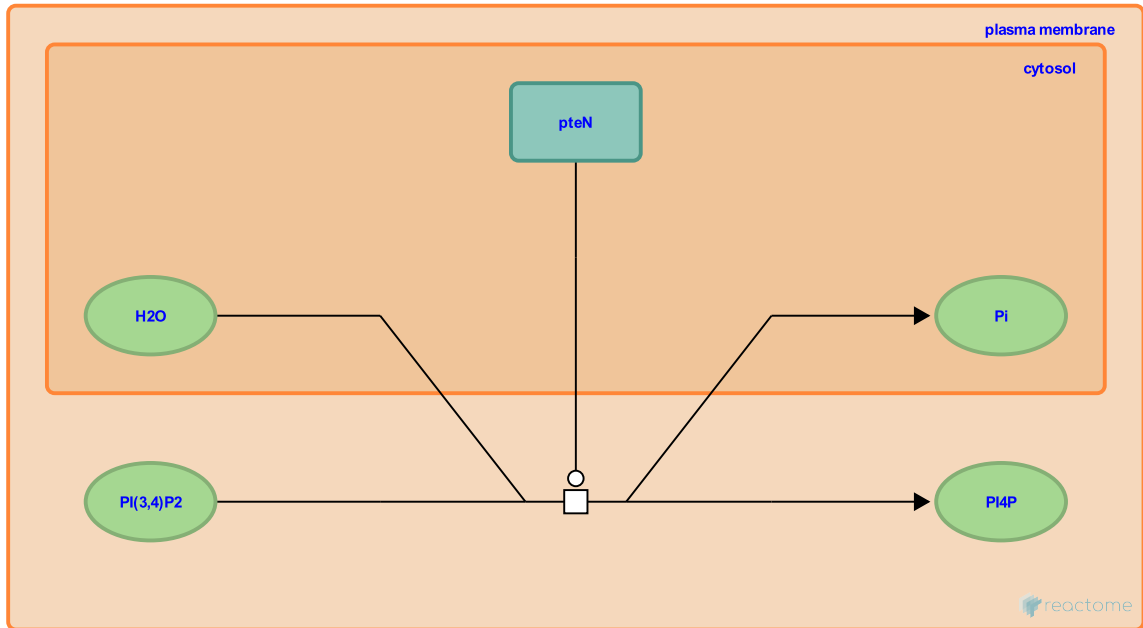
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-1676149

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [PI\(3,4\)P2 is dephosphorylated to PI4P by PTEN at the plasma membrane \(Homo sapiens\)](#)



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: [PI4P is phosphorylated to PI\(3,4\)P2 by PI3K3C\[2\] at the plasma membrane](#), [PI3P is phosphorylated to PI\(3,4\)P2 by PIP4K2/5K1 at the plasma membrane](#)

Followed by: [PI4P is dephosphorylated to PI by SYNJ at the plasma membrane](#), [PI4P is phosphorylated to PI\(4,5\)P2 by PIP5K1A-C at the plasma membrane](#), [PI4P is phosphorylated to PI\(3,4\)P2 by PI3K3C\[2\] at the plasma membrane](#)

PI3P is phosphorylated to PI(3,4)P2 by PIP4K2/5K1 at the plasma membrane [↗](#)

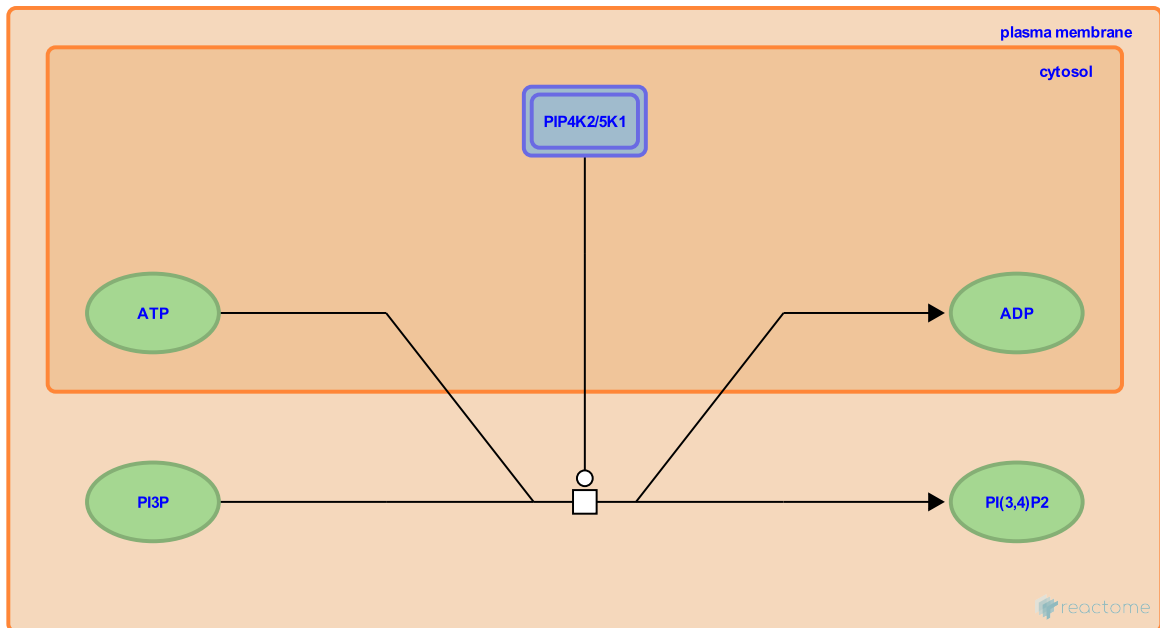
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-1676145

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [PI3P is phosphorylated to PI\(3,4\)P2 by PIP4K2/5K1 at the plasma membrane \(Homo sapiens\)](#)



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: [PI\(3,5\)P2 is dephosphorylated to PI3P by SYNJ at the plasma membrane](#)

Followed by: [PI\(3,4\)P2 is phosphorylated to PI\(3,4,5\)P3 by PIP5K1A-C at the plasma membrane](#), [PI\(3,4\)P2 is dephosphorylated to PI4P by PTEN at the plasma membrane](#)

PI3P is dephosphorylated to PI by SYNJ/MTMs at the plasma membrane ↗

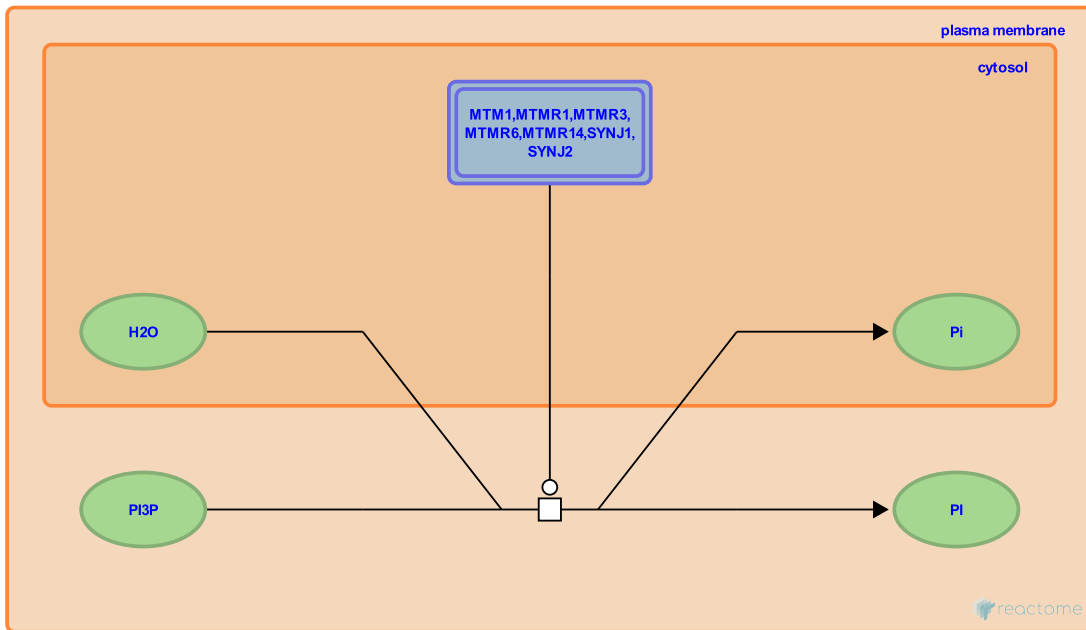
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-1675994

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [PI3P is dephosphorylated to PI by SYNJ/MTMs at the plasma membrane \(Homo sapiens\)](#)



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: [PI\(3,5\)P₂ is dephosphorylated to PI3P by SYNJ at the plasma membrane](#)

Followed by: [PI is phosphorylated to PI5P by PIP5K1A/B at the plasma membrane](#)

MTMR6 binds MTMR9 ↗

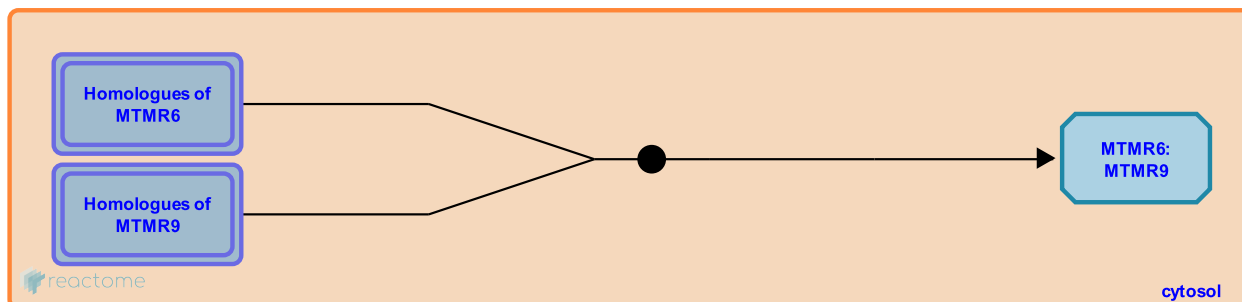
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-6809309

Type: binding

Compartments: cytosol

Inferred from: [MTMR6 binds MTMR9 \(Homo sapiens\)](#)



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>

MTMR8 binds MTMR9 ↗

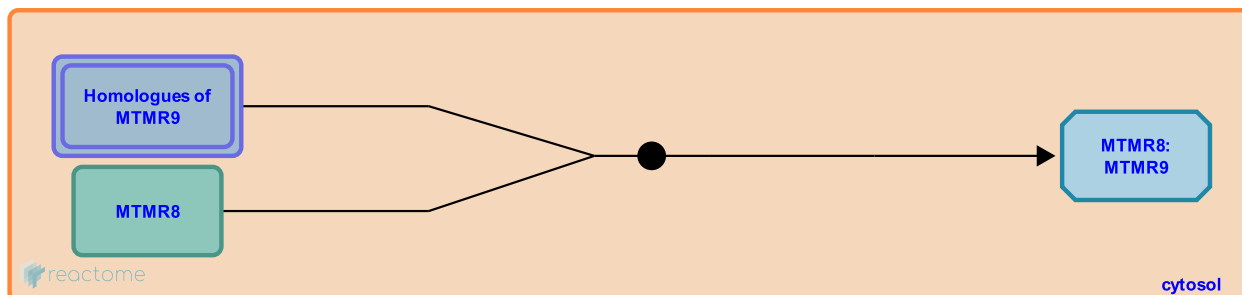
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-6809254

Type: binding

Compartments: cytosol

Inferred from: [MTMR8 binds MTMR9 \(Homo sapiens\)](#)



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>

PI3P is dephosphorylated to PI by MTMR9-bound MTMR8 or MTMR6 at the plasma membrane [↗](#)

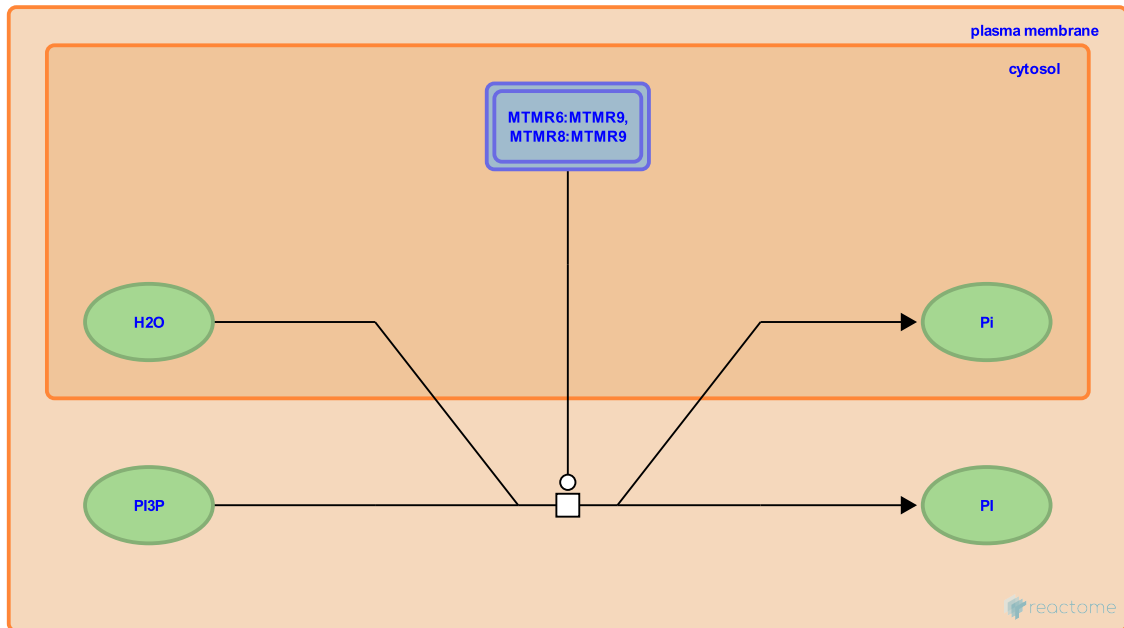
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-6809325

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [PI3P is dephosphorylated to PI by MTMR9-bound MTMR8 or MTMR6 at the plasma membrane \(Homo sapiens\)](#)



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: [PI\(3,5\)P2 is dephosphorylated to PI3P by SYNJ at the plasma membrane](#)

PI is phosphorylated to PI5P by PIP5K1A/B at the plasma membrane ↗

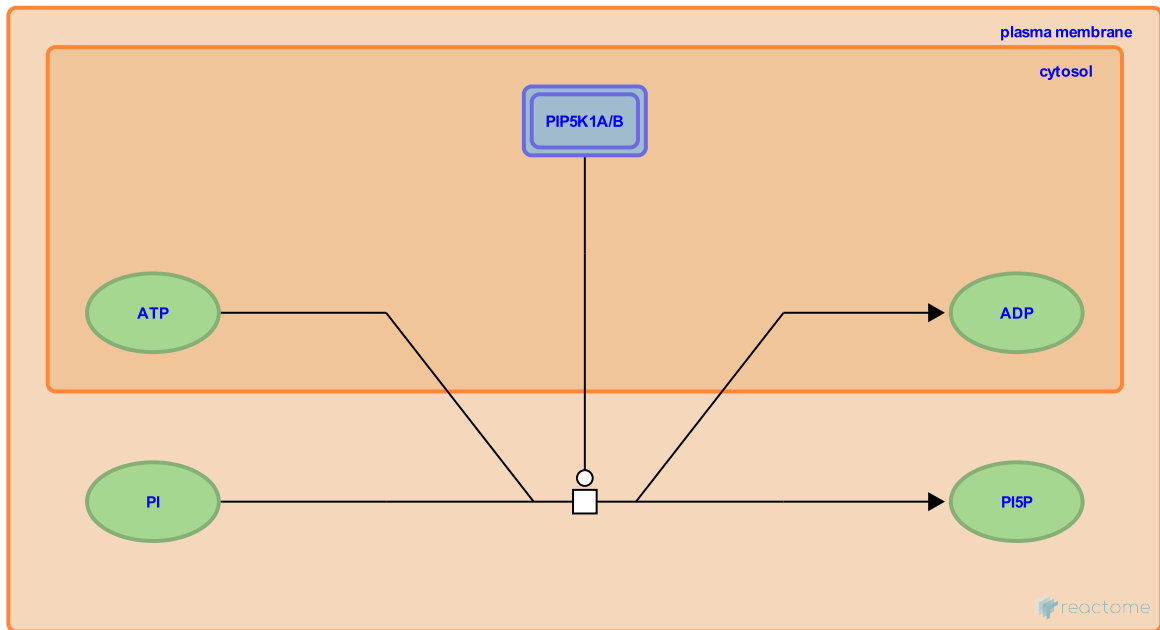
Location: Synthesis of PIPs at the plasma membrane

Stable identifier: R-DDI-1675810

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: PI is phosphorylated to PI5P by PIP5K1A/B at the plasma membrane (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: PI3P is dephosphorylated to PI by SYNJ/MTMs at the plasma membrane, PI4P is dephosphorylated to PI by SYNJ at the plasma membrane

Followed by: PI5P is phosphorylated to PI(4,5)P2 by PIP4K2 dimers at the plasma membrane

PI3P is phosphorylated to PI(3,5)P2 by PIP5K1A/B at the plasma membrane [↗](#)

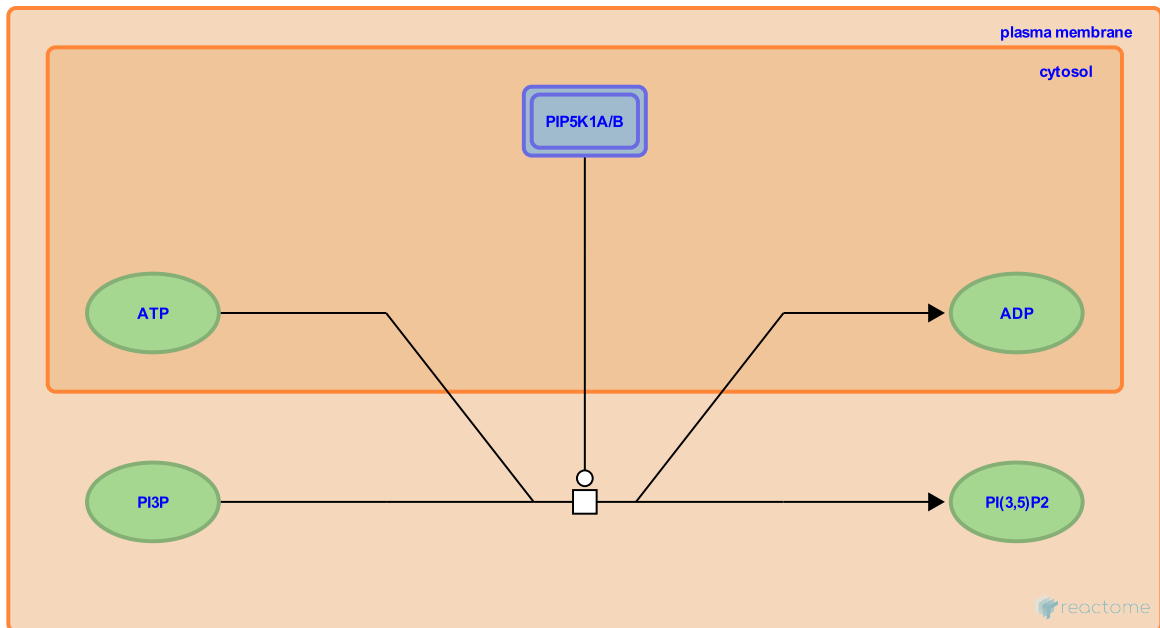
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-1676134

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [PI3P is phosphorylated to PI\(3,5\)P2 by PIP5K1A/B at the plasma membrane \(Homo sapiens\)](#)



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: [PI\(3,5\)P2 is dephosphorylated to PI3P by SYNJ at the plasma membrane](#)

Followed by: [PI\(3,5\)P2 is dephosphorylated to PI5P by MTMR9-bound MTMR6 or MTMR8 at the plasma membrane](#), [PI\(3,5\)P2 is dephosphorylated to PI5P by SYNJ/MTMs at the plasma membrane](#), [PI\(3,5\)P2 is dephosphorylated to PI3P by SYNJ at the plasma membrane](#)

PI(3,5)P2 is dephosphorylated to PI5P by SYNJ/MTMs at the plasma membrane [↗](#)

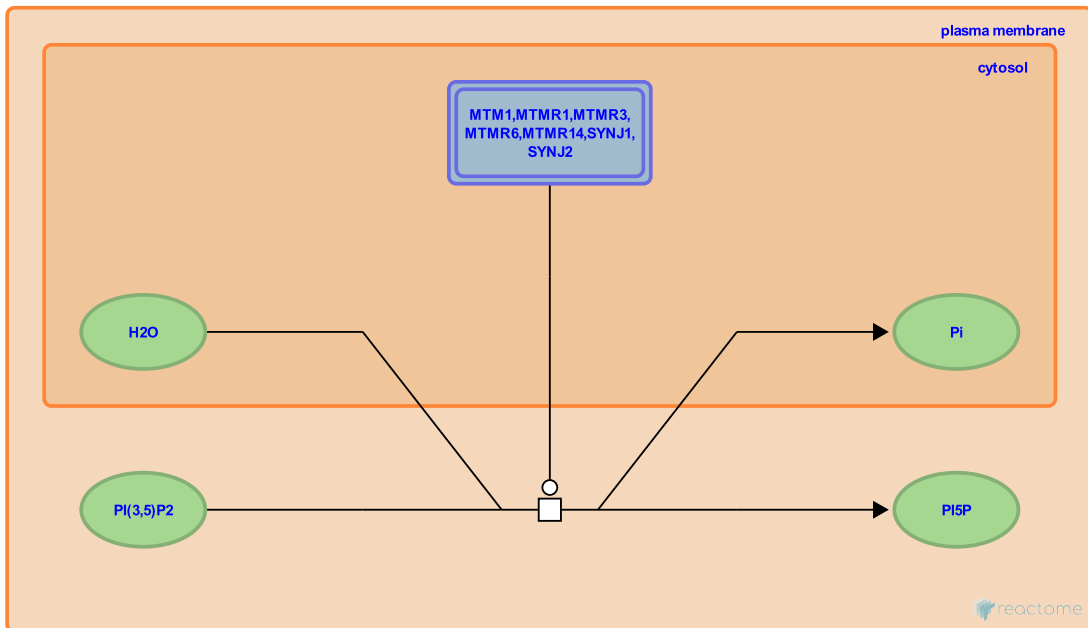
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-1676203

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [PI\(3,5\)P2 is dephosphorylated to PI5P by SYNJ/MTMs at the plasma membrane \(Homo sapiens\)](#)



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: [PI3P is phosphorylated to PI\(3,5\)P2 by PIP5K1A/B at the plasma membrane](#)

Followed by: [PI5P is phosphorylated to PI\(4,5\)P2 by PIP4K2 dimers at the plasma membrane](#)

PI(3,5)P2 is dephosphorylated to PI5P by MTMR9-bound MTMR6 or MTMR8 at the plasma membrane ↗

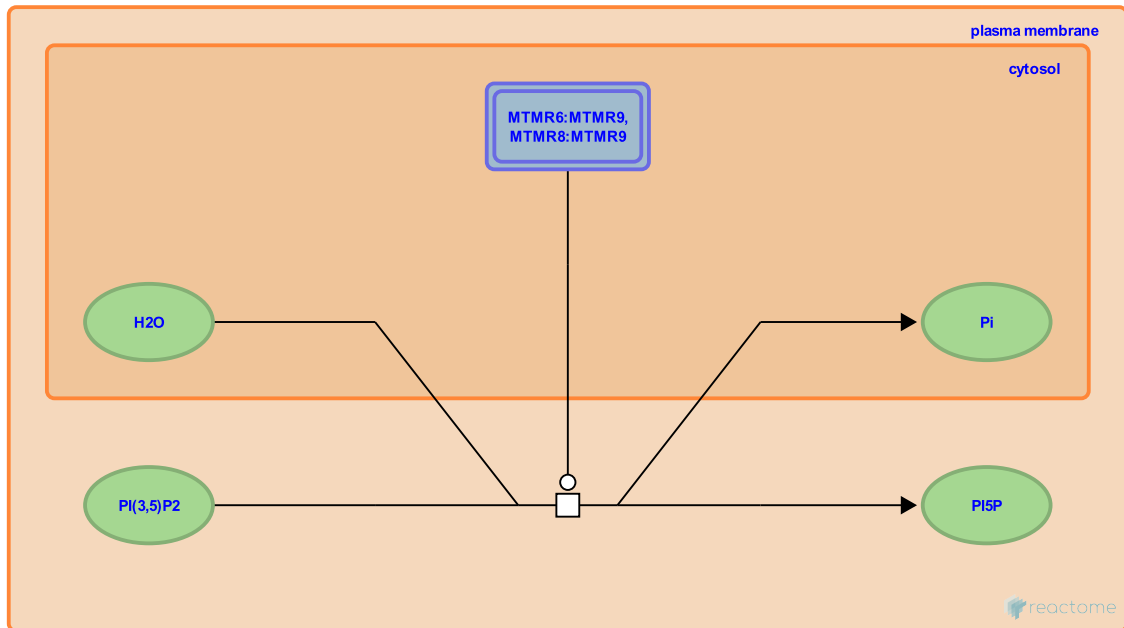
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-6809320

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [PI\(3,5\)P2 is dephosphorylated to PI5P by MTMR9-bound MTMR6 or MTMR8 at the plasma membrane \(Homo sapiens\)](#)



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: [PI3P is phosphorylated to PI\(3,5\)P2 by PIP5K1A/B at the plasma membrane](#)

PI5P is phosphorylated to PI(4,5)P2 by PIP4K2 dimers at the plasma membrane ↗

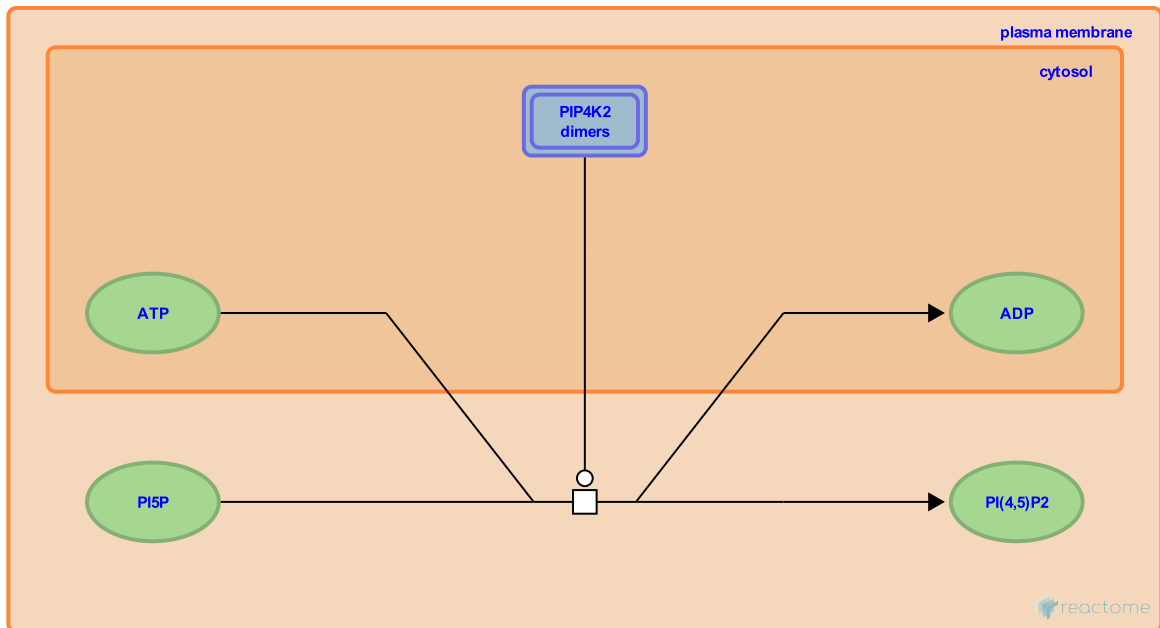
Location: Synthesis of PIPs at the plasma membrane

Stable identifier: R-DDI-1675776

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: PI5P is phosphorylated to PI(4,5)P2 by PIP4K2 dimers at the plasma membrane (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: PI is phosphorylated to PI5P by PIP5K1A/B at the plasma membrane, PI(3,5)P2 is dephosphorylated to PI5P by SYNJ/MTMs at the plasma membrane

Followed by: PI(4,5)P2 is phosphorylated to PI(3,4,5)P3 by PIK3C[1] at the plasma membrane, PI(4,5)P2 is dephosphorylated to PI4P by SYNJ/INPP5[1] at the plasma membrane

PI4P is dephosphorylated to PI by SYNJ at the plasma membrane ↗

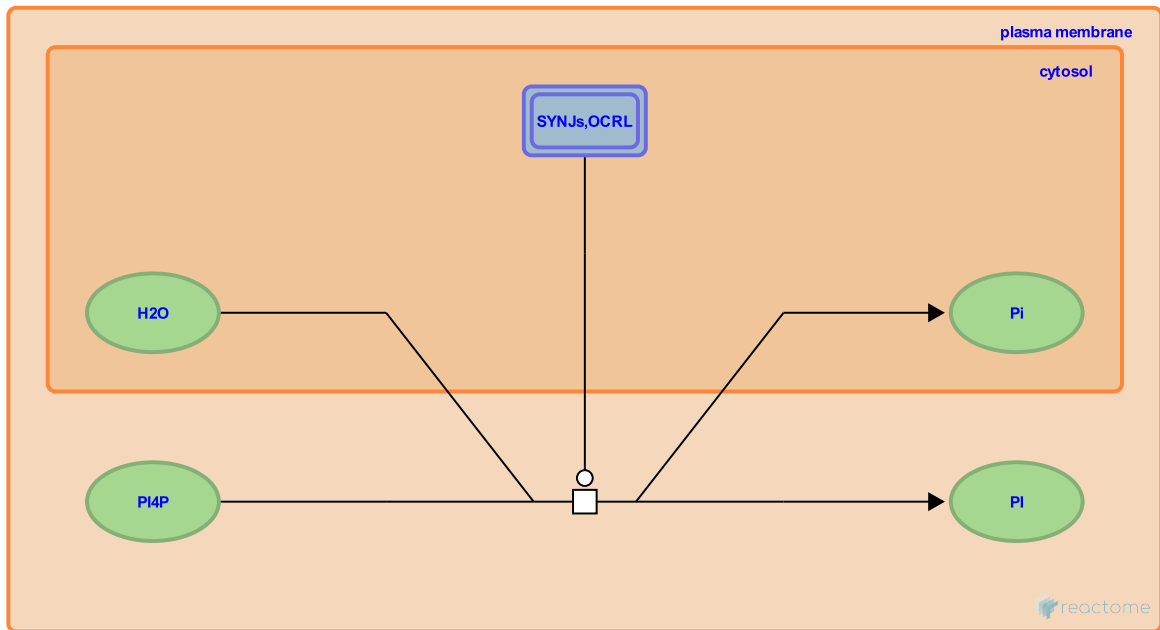
Location: [Synthesis of PIPs at the plasma membrane](#)

Stable identifier: R-DDI-1675988

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [PI4P is dephosphorylated to PI by SYNJ at the plasma membrane \(Homo sapiens\)](#)



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: [PI\(4,5\)P₂ is dephosphorylated to PI4P by SYNJ/INPP5\[1\] at the plasma membrane](#), [PI\(3,4\)P₂ is dephosphorylated to PI4P by PTEN at the plasma membrane](#)

Followed by: [PI is phosphorylated to PI5P by PIP5K1A/B at the plasma membrane](#)

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