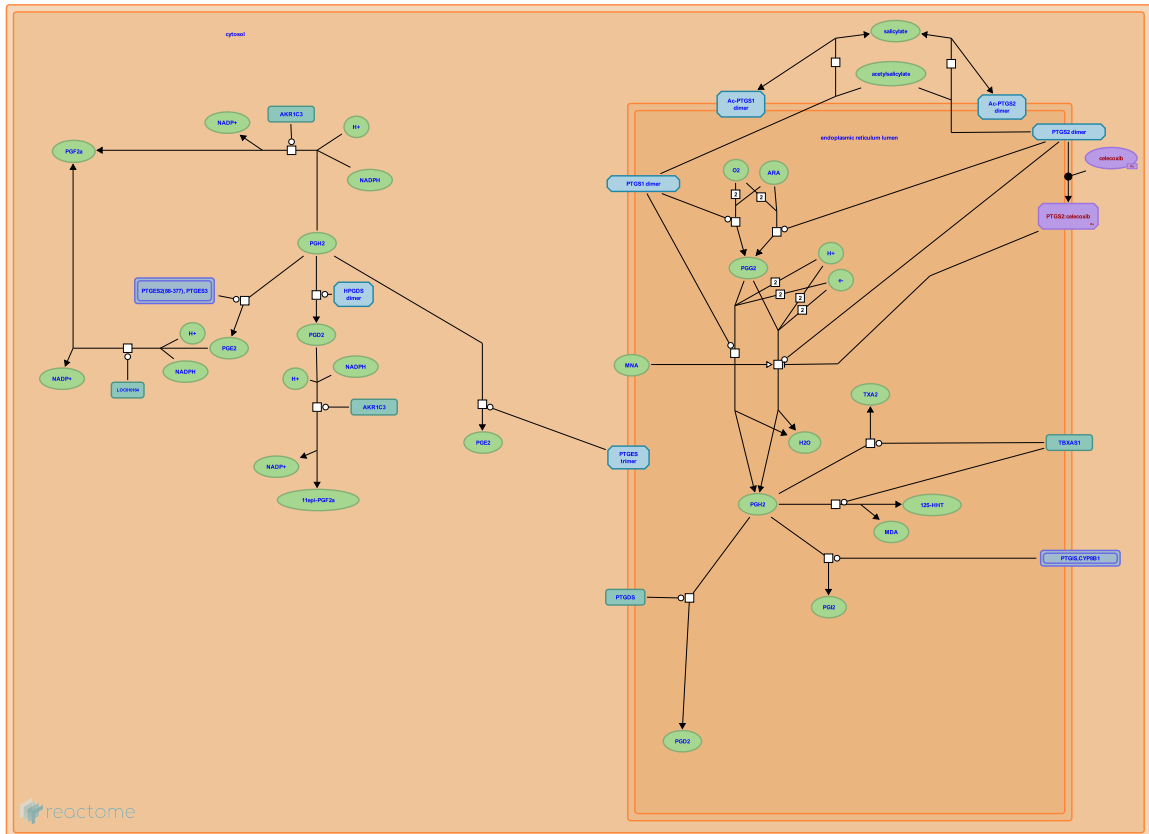


# Synthesis of Prostaglandins (PG) and Thromboxanes (TX)



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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- Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics*, 33, 3461-3467. [↗](#)
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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. [↗](#)

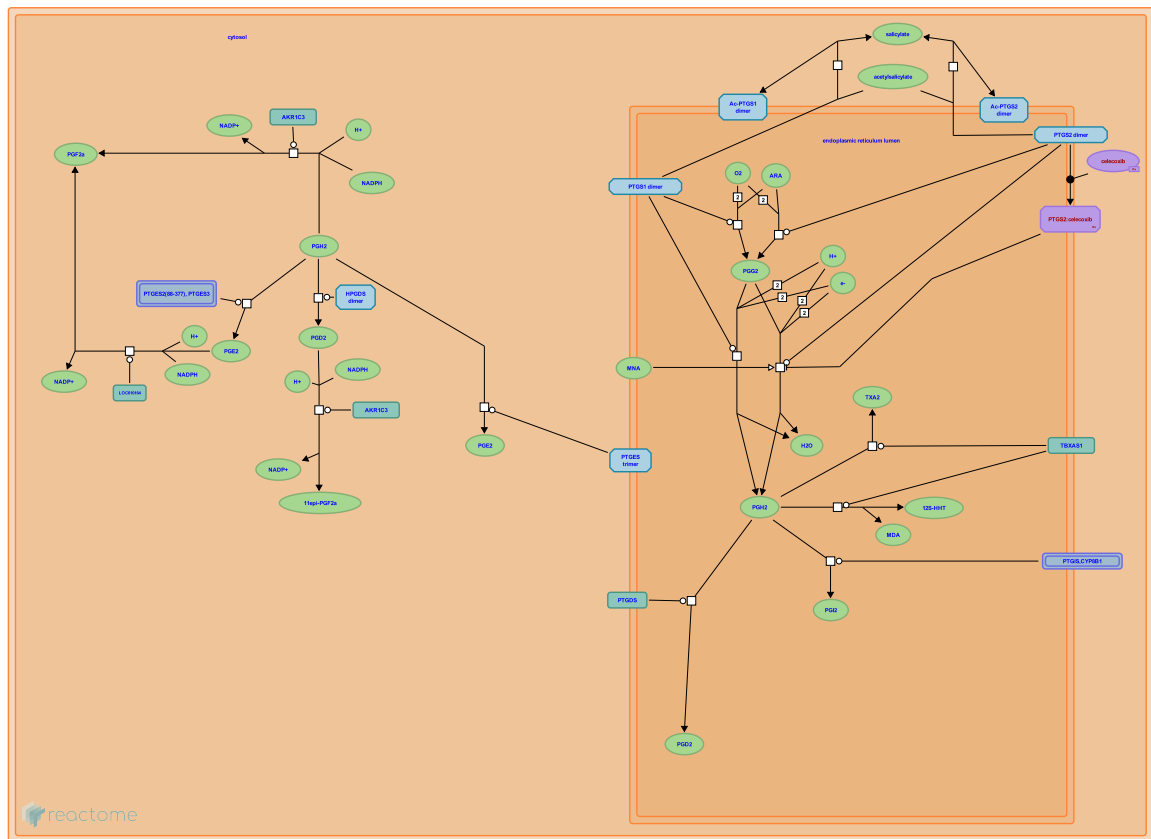
Reactome database release: 74

This document contains 1 pathway and 17 reactions ([see Table of Contents](#))

## Synthesis of Prostaglandins (PG) and Thromboxanes (TX) ↗

Stable identifier: R-CFA-2162123

Inferred from: Synthesis of Prostaglandins (PG) and Thromboxanes (TX) (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>

## PTGS2 dimer binds celecoxib ↗

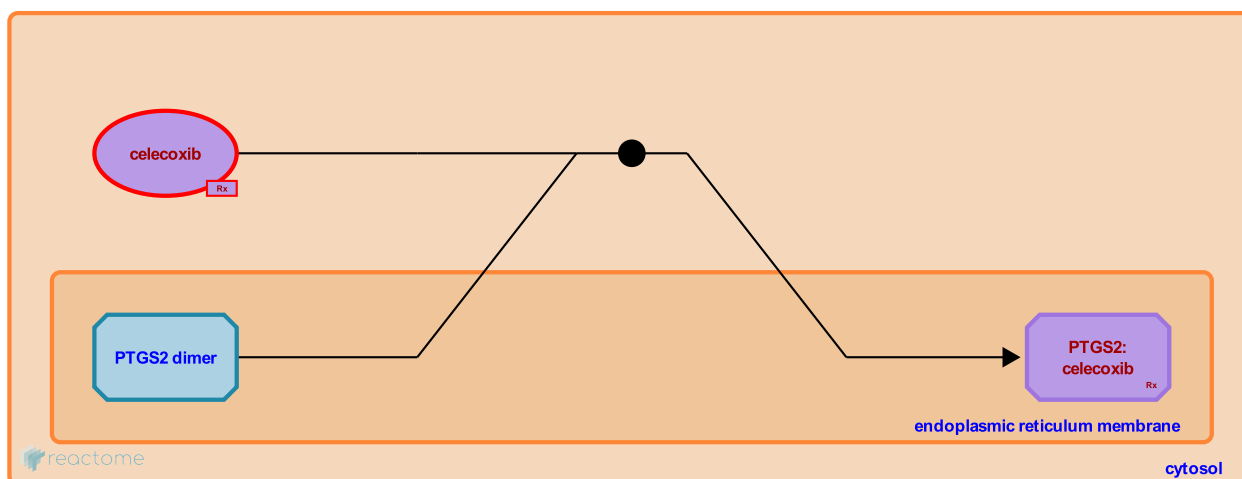
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2309779

**Type:** binding

**Compartments:** cytosol, endoplasmic reticulum membrane

**Inferred from:** [PTGS2 dimer binds celecoxib \(Homo sapiens\)](#)



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>

## Aspirin acetylates PTGS1 ↗

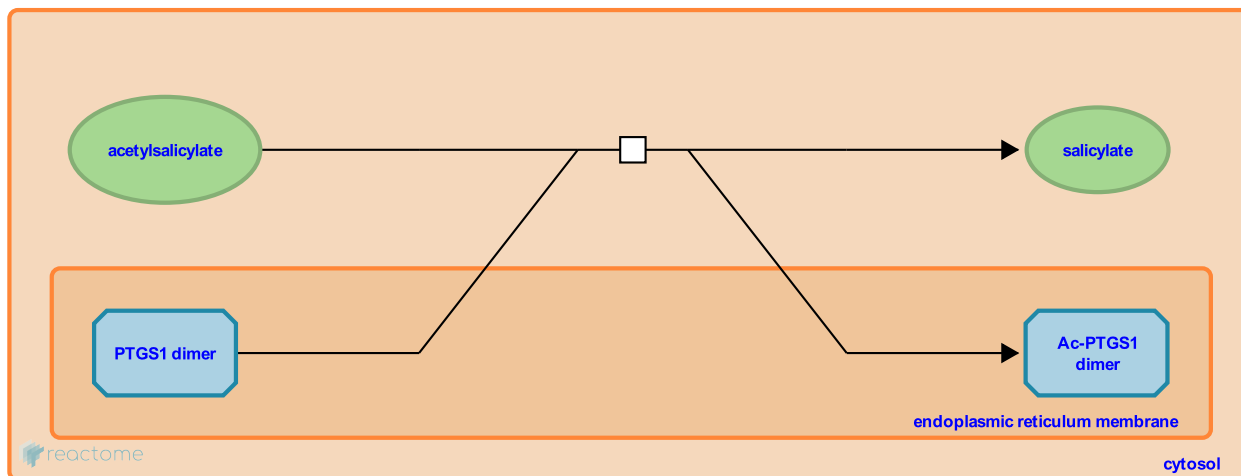
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2314678

**Type:** transition

**Compartments:** cytosol, endoplasmic reticulum membrane

**Inferred from:** [Aspirin acetylates PTGS1 \(Homo sapiens\)](#)



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>

## Aspirin acetylates PTGS2 ↗

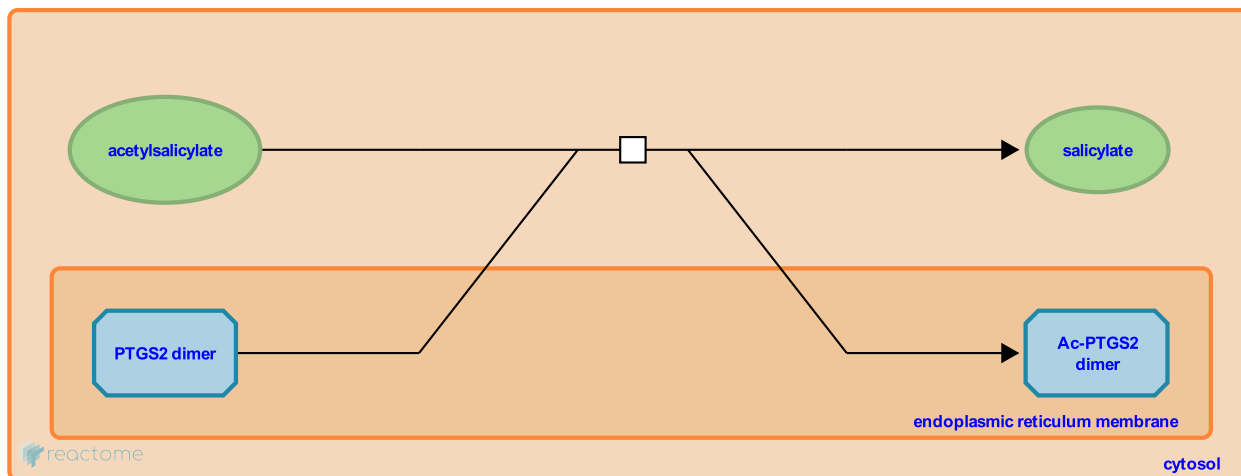
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2314686

**Type:** transition

**Compartments:** cytosol, endoplasmic reticulum membrane

**Inferred from:** [Aspirin acetylates PTGS2 \(Homo sapiens\)](#)



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>

## Arachidonic acid is oxidised to PGG2 by PTGS1 ↗

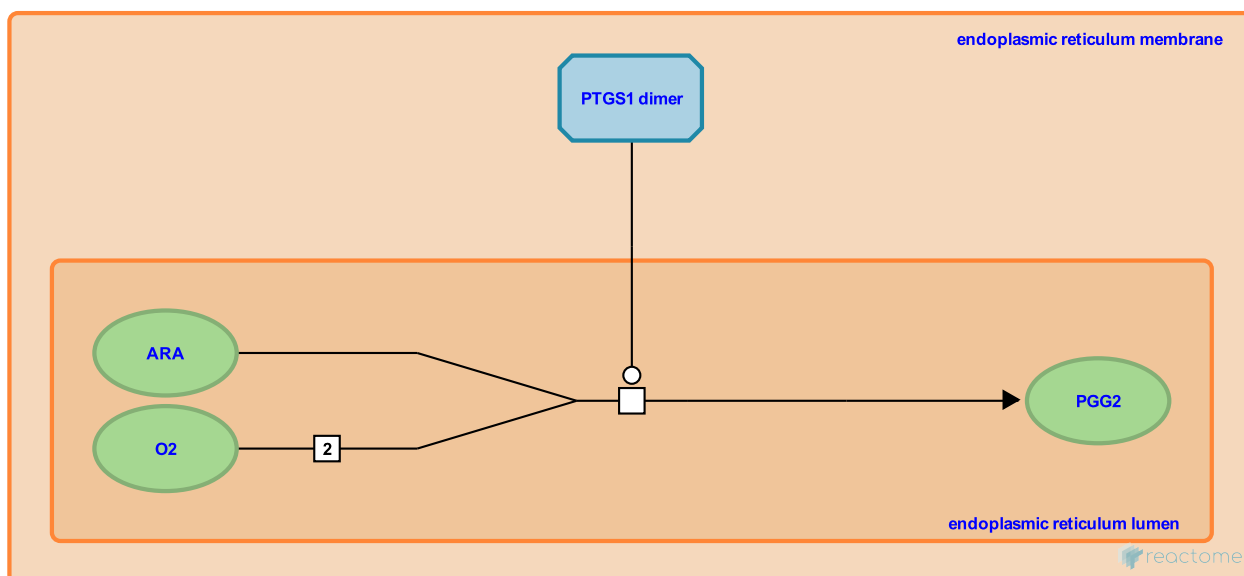
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-140355

**Type:** transition

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

**Inferred from:** [Arachidonic acid is oxidised to PGG2 by PTGS1 \(Homo sapiens\)](#)



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:** [PGG2 is reduced to PGH2 by PTGS1](#)

## Arachidonic acid is oxidised to PGG2 by PTGS2 ↗

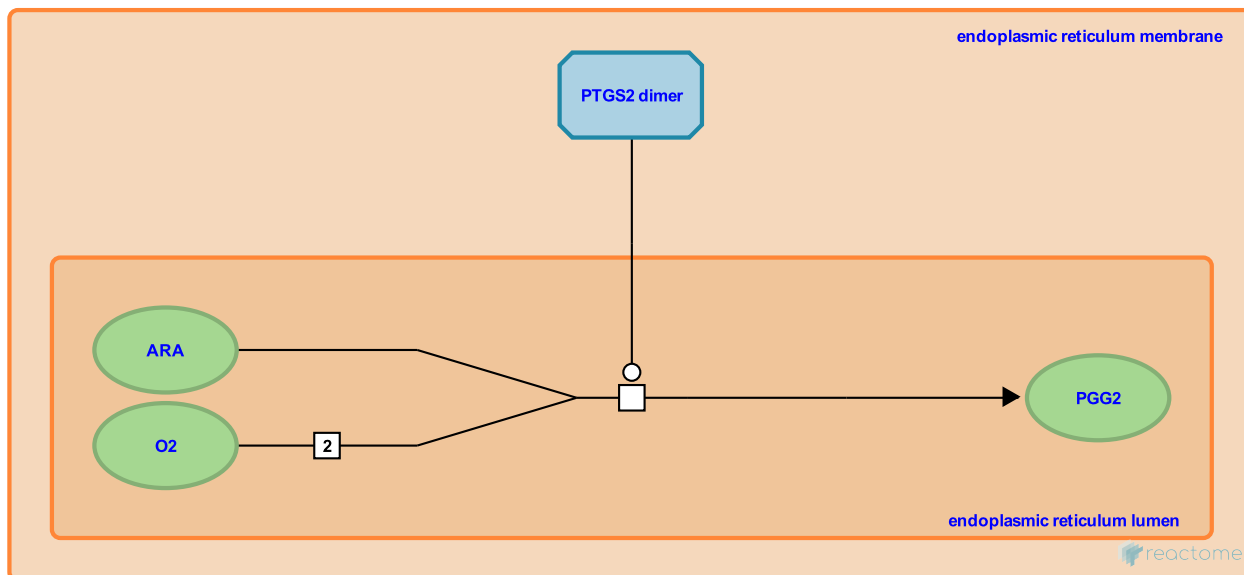
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2309787

**Type:** transition

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

**Inferred from:** [Arachidonic acid is oxidised to PGG2 by PTGS2 \(Homo sapiens\)](#)



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:** [PGG2 is reduced to PGH2 by PTGS2](#)



## PGG2 is reduced to PGH2 by PTGS1 ↗

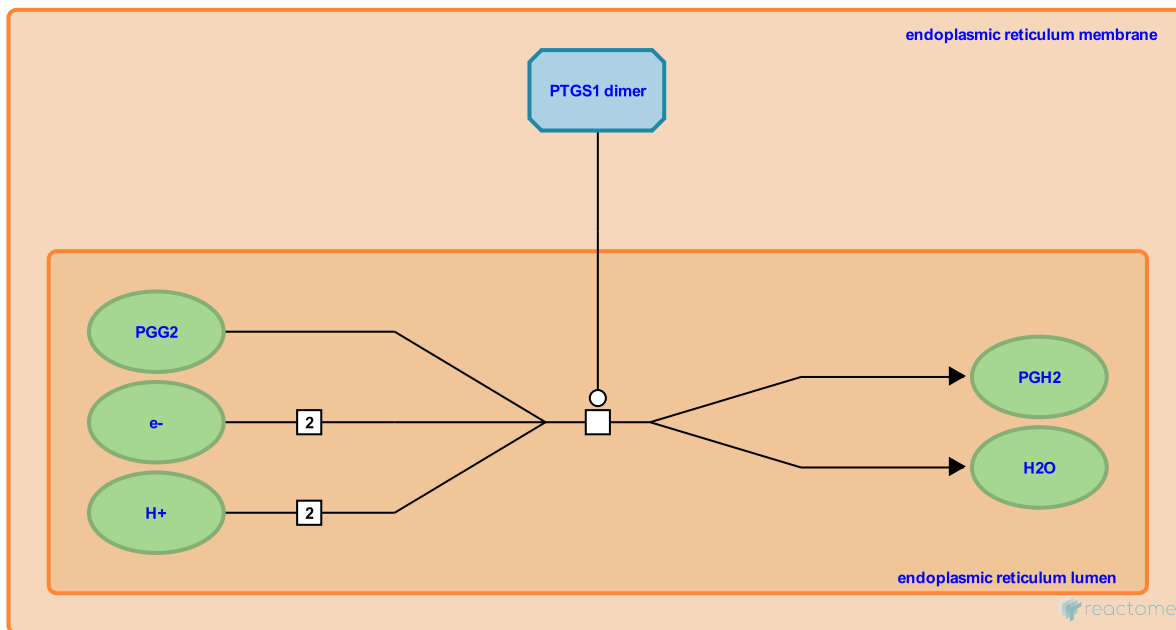
**Location:** Synthesis of Prostaglandins (PG) and Thromboxanes (TX)

**Stable identifier:** R-CFA-140359

**Type:** transition

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

**Inferred from:** PGG2 is reduced to PGH2 by PTGS1 (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:** Arachidonic acid is oxidised to PGG2 by PTGS1

**Followed by:** PGH2 is degraded to 12S-HHT and MDA by TBXAS1, PGH2 is isomerised to PGD2 by PTGDS, TBXAS1 isomerises PGH2 to TXA2, PTGIS, CYP8A1 isomerise PGH2 to PGI2

## PGG2 is reduced to PGH2 by PTGS2 ↗

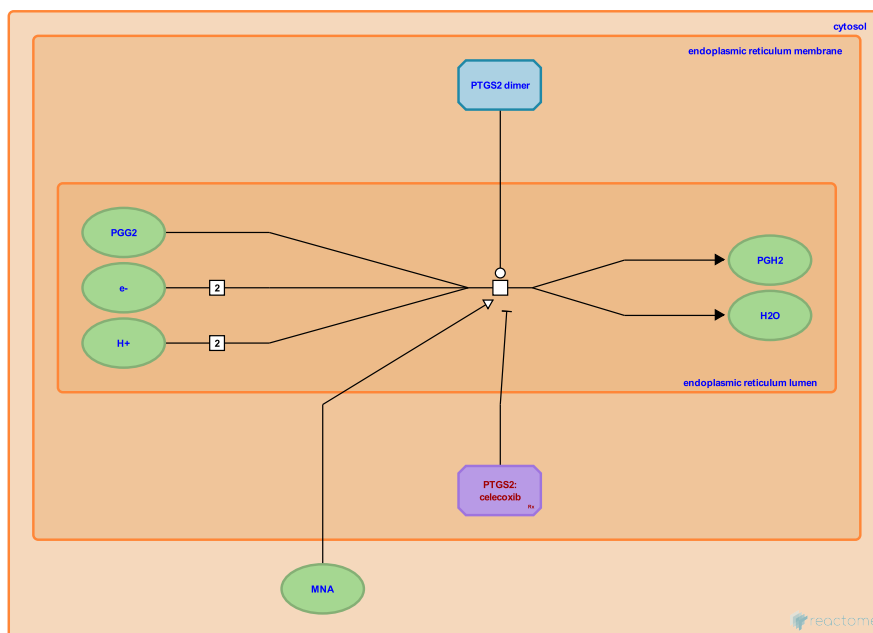
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2309773

**Type:** transition

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

**Inferred from:** [PGG2 is reduced to PGH2 by PTGS2 \(Homo sapiens\)](#)



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:** [Arachidonic acid is oxidised to PGG2 by PTGS2](#)

**Followed by:** [PGH2 is degraded to 12S-HHT and MDA by TBXAS1](#), [PGH2 is isomerised to PGD2 by PTGDS](#), [TBXAS1 isomerises PGH2 to TXA2](#), [PTGIS](#), [CYP8A1 isomerise PGH2 to PGI2](#)

## PGH2 is reduced to PGF2a by AKR1C3 ↗

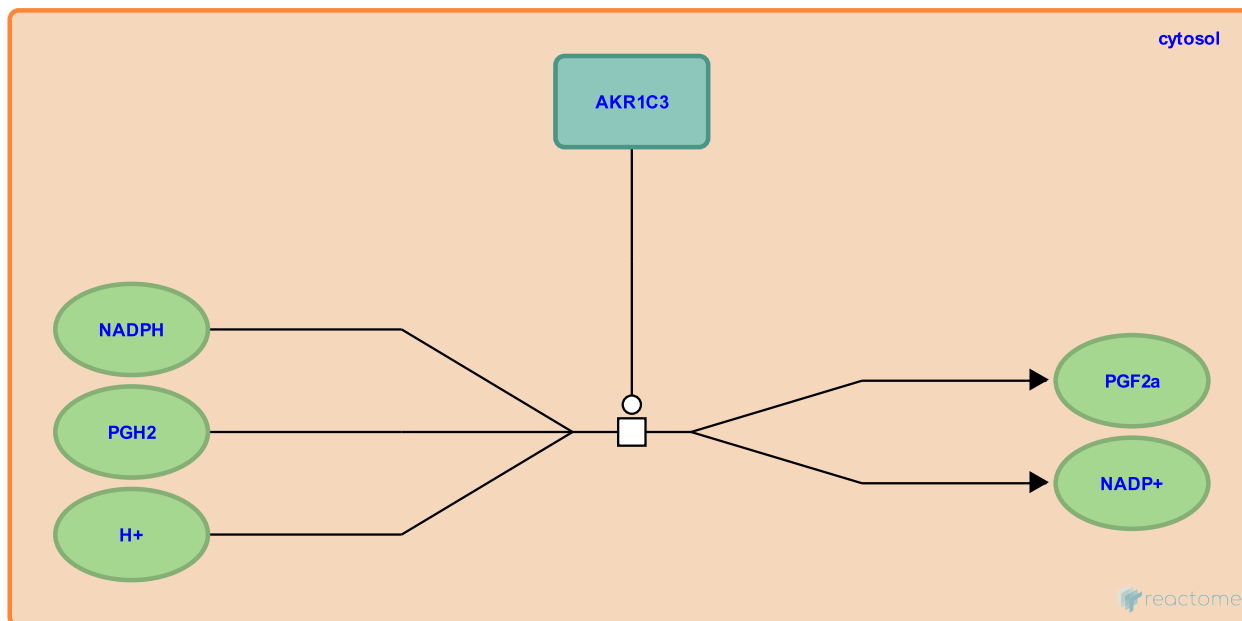
**Location:** Synthesis of Prostaglandins (PG) and Thromboxanes (TX)

**Stable identifier:** R-CFA-2161549

**Type:** transition

**Compartments:** cytosol

**Inferred from:** PGH2 is reduced to PGF2a by AKR1C3 (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>

## PGH2 is isomerised to PGE2 by PTGES ↗

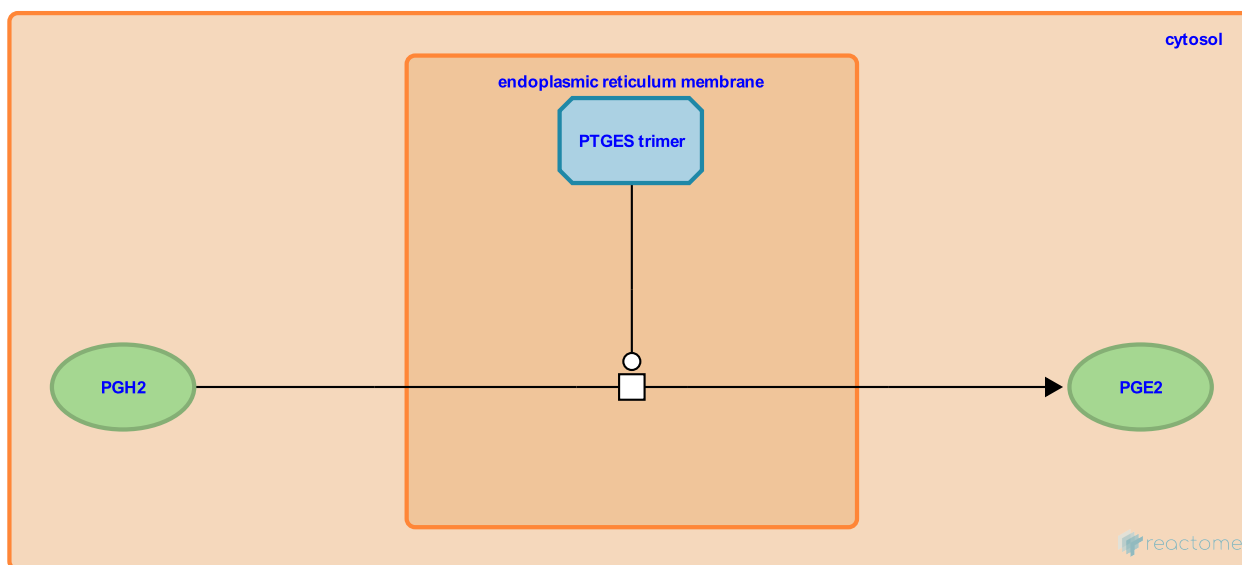
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2161660

**Type:** transition

**Compartments:** endoplasmic reticulum membrane, cytosol

**Inferred from:** [PGH2 is isomerised to PGE2 by PTGES \(Homo sapiens\)](#)



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>

## Prostaglandin E synthase isomerizes PGH2 to PGE2 ↗

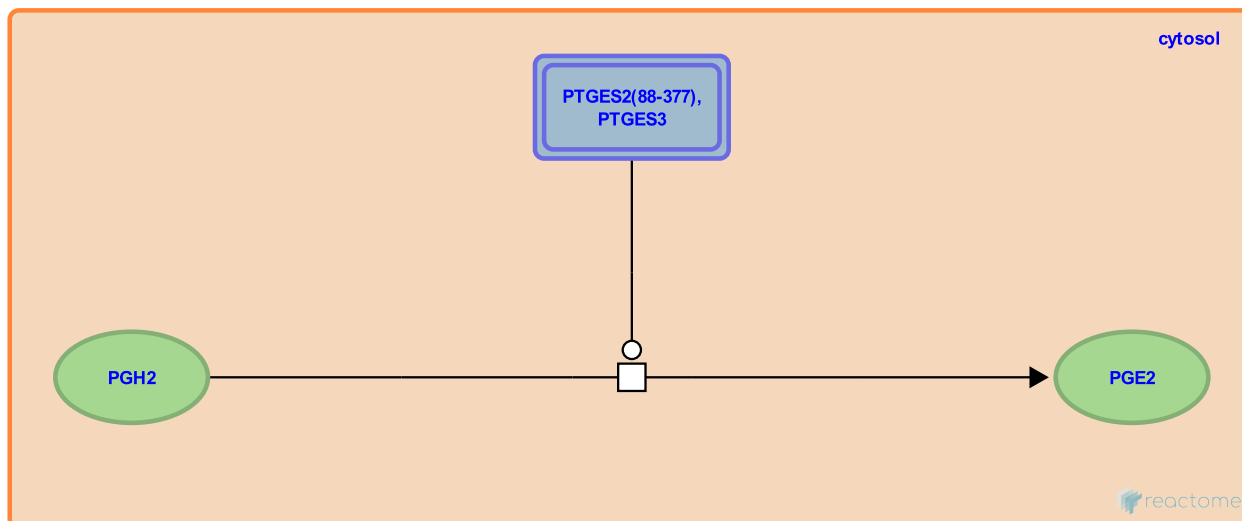
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-265295

**Type:** transition

**Compartments:** cytosol

**Inferred from:** [Prostaglandin E synthase isomerizes PGH2 to PGE2 \(Homo sapiens\)](#)



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>

## PGE2 is converted to PGF2a by CBR1 ↗

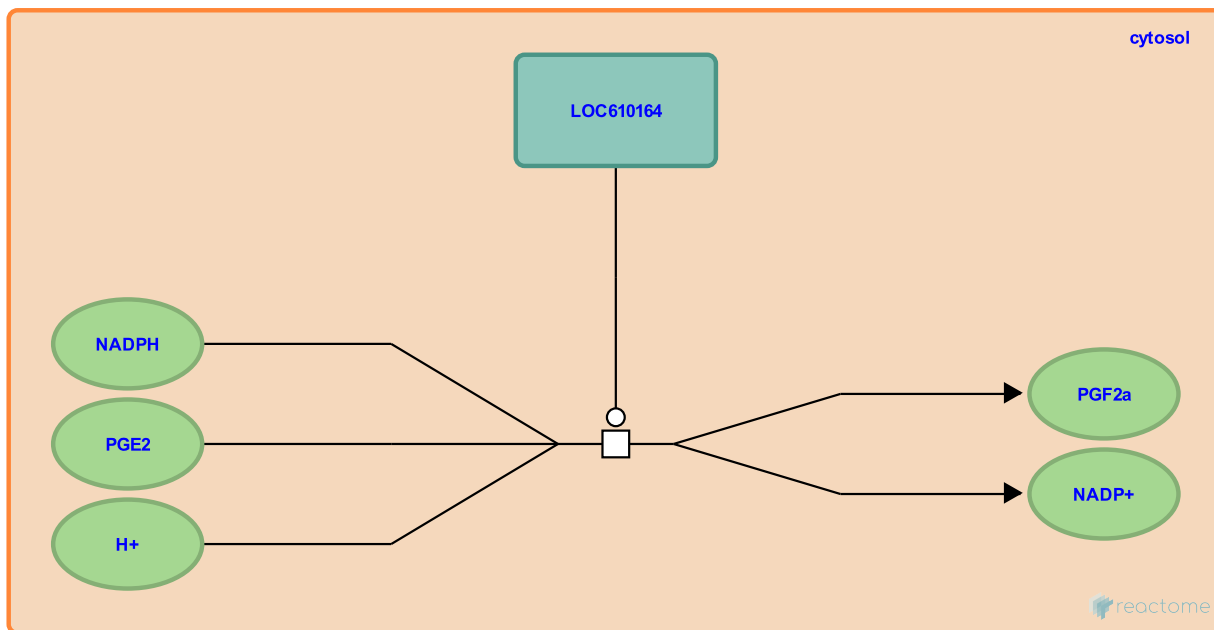
**Location:** Synthesis of Prostaglandins (PG) and Thromboxanes (TX)

**Stable identifier:** R-CFA-2161651

**Type:** transition

**Compartments:** cytosol

**Inferred from:** PGE2 is converted to PGF2a by CBR1 (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>

## PGH2 is isomerised to PGD2 by PTGDS ↗

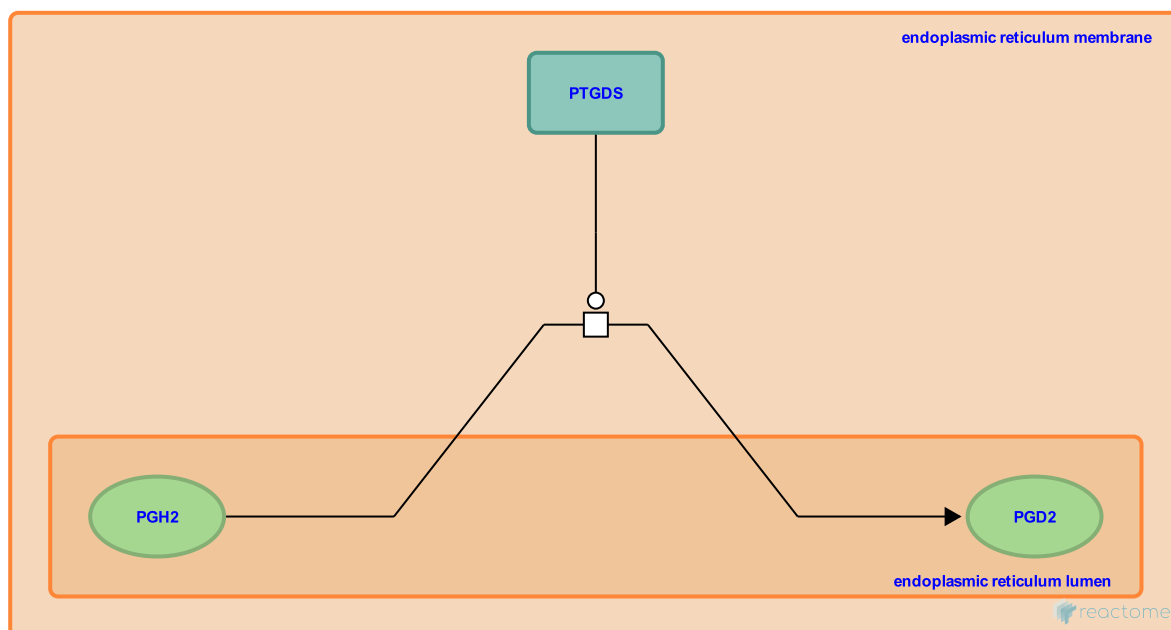
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2161620

**Type:** transition

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

**Inferred from:** [PGH2 is isomerised to PGD2 by PTGDS \(Homo sapiens\)](#)



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:** [PGG2 is reduced to PGH2 by PTGS1](#), [PGG2 is reduced to PGH2 by PTGS2](#)

## PGH2 is isomerised to PGD2 by HPGDS ↗

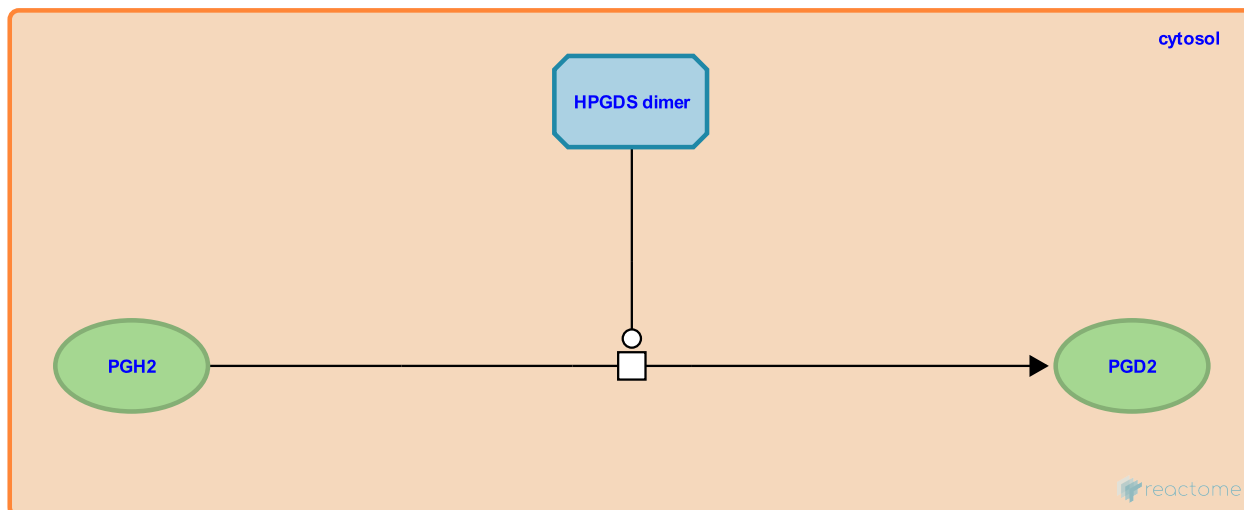
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2161701

**Type:** transition

**Compartments:** cytosol

**Inferred from:** [PGH2 is isomerised to PGD2 by HPGDS \(Homo sapiens\)](#)



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:** [PGD2 is reduced to 11-epi-PGF2a by AKRIC3](#)



## PGD2 is reduced to 11-epi-PGF2a by AKRIC3 ↗

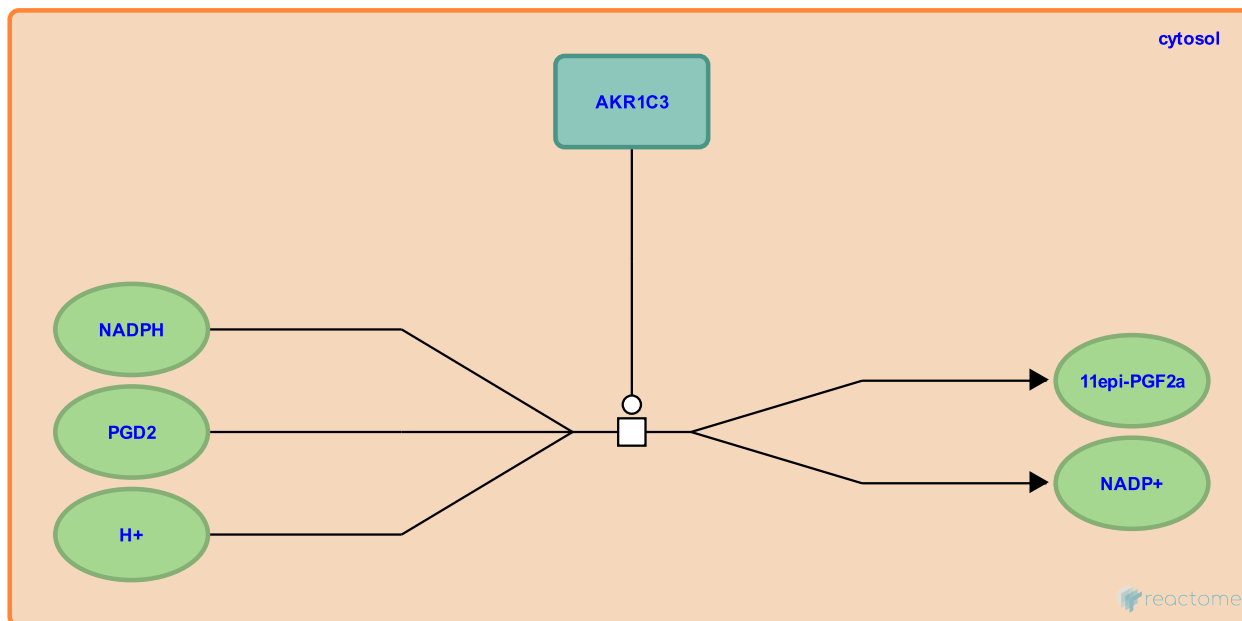
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2161614

**Type:** transition

**Compartments:** cytosol

**Inferred from:** [PGD2 is reduced to 11-epi-PGF2a by AKRIC3 \(Homo sapiens\)](#)



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:** [PGH2 is isomerised to PGD2 by HPGDS](#)

## PTGIS, CYP8A1 isomerise PGH2 to PGI2 ↗

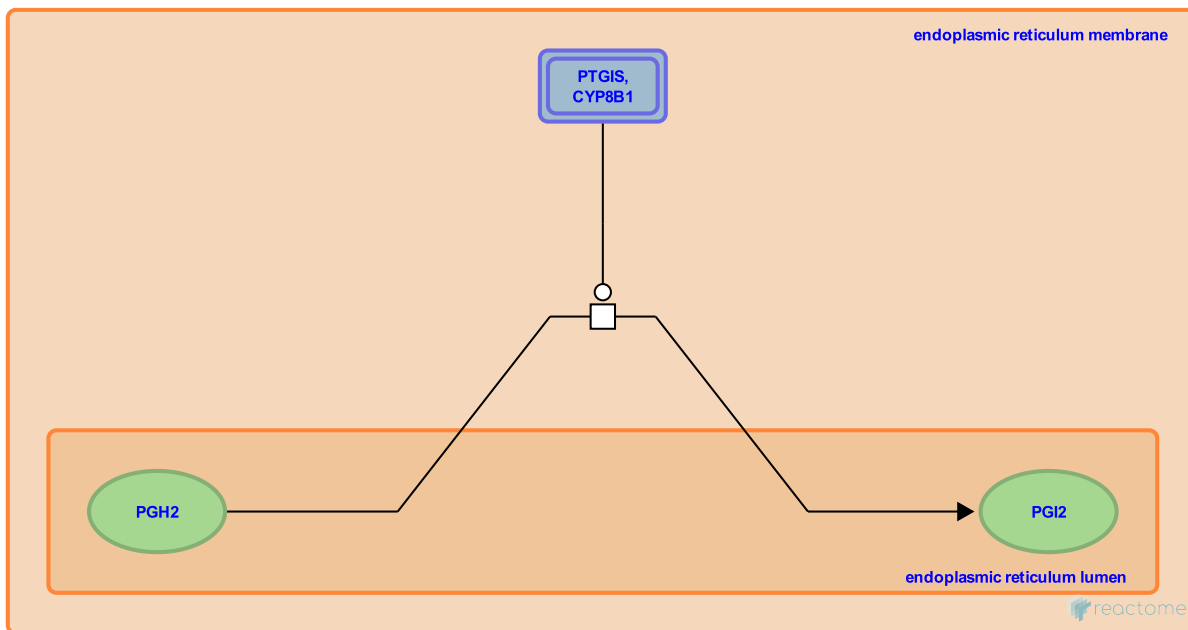
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-76496

**Type:** transition

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

**Inferred from:** [PTGIS, CYP8A1 isomerise PGH2 to PGI2 \(Homo sapiens\)](#)



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:** [PGG2 is reduced to PGH2 by PTGS1](#), [PGG2 is reduced to PGH2 by PTGS2](#)

## TBXAS1 isomerises PGH2 to TXA2 ↗

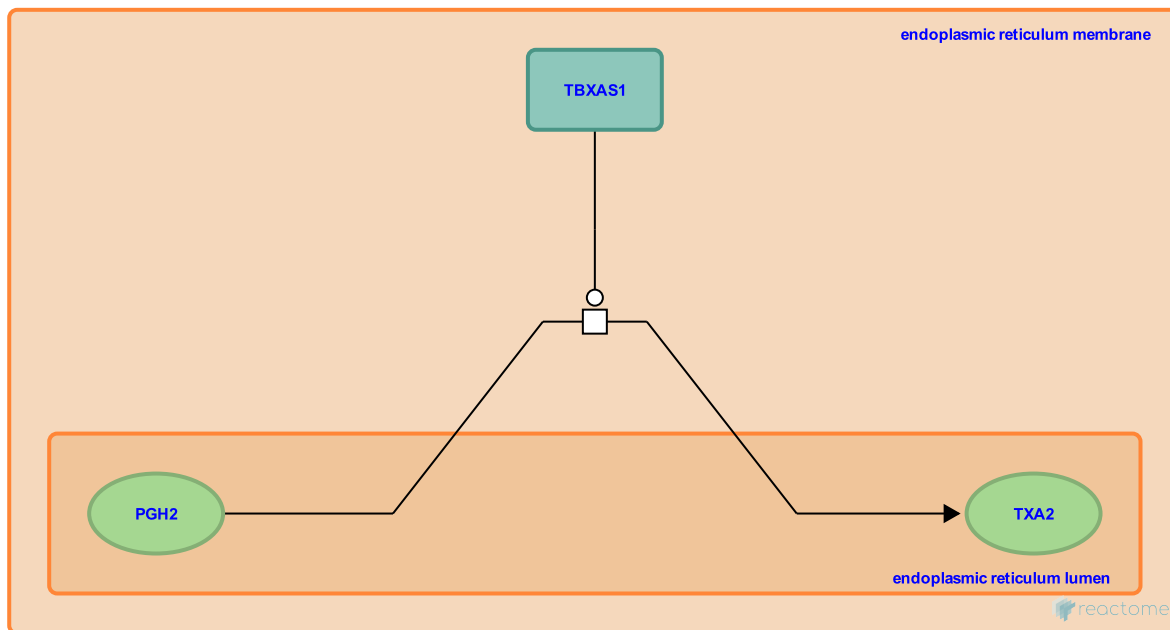
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-76500

**Type:** transition

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

**Inferred from:** [TBXAS1 isomerises PGH2 to TXA2 \(Homo sapiens\)](#)



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:** [PGG2 is reduced to PGH2 by PTGS1](#), [PGG2 is reduced to PGH2 by PTGS2](#)

## PGH2 is degraded to 12S-HHT and MDA by TBXAS1 ↗

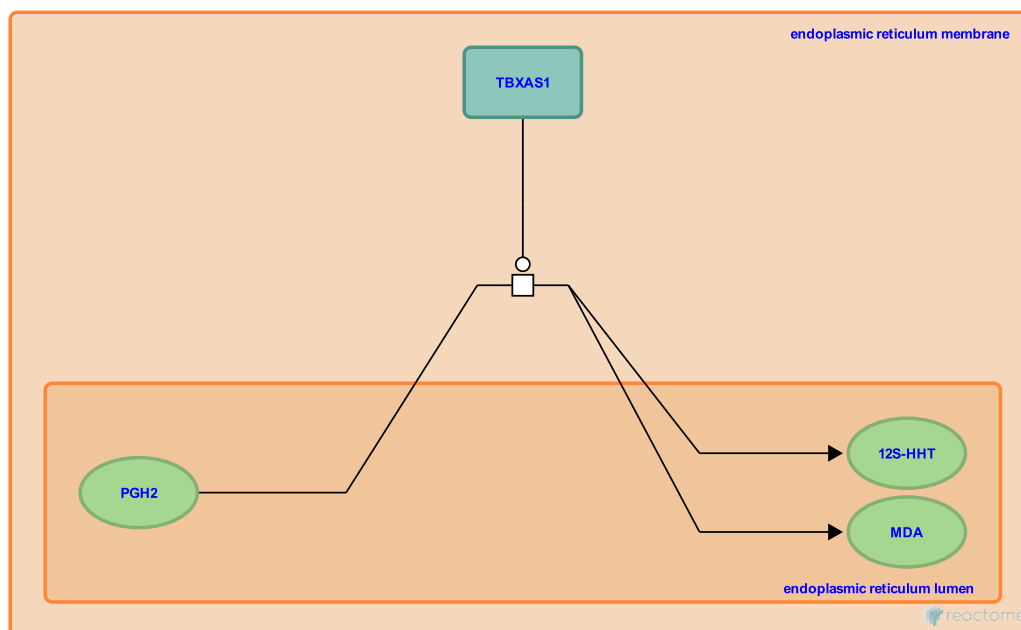
**Location:** [Synthesis of Prostaglandins \(PG\) and Thromboxanes \(TX\)](#)

**Stable identifier:** R-CFA-2161613

**Type:** transition

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

**Inferred from:** [PGH2 is degraded to 12S-HHT and MDA by TBXAS1 \(Homo sapiens\)](#)



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:** [PGG2 is reduced to PGH2 by PTGS1](#), [PGG2 is reduced to PGH2 by PTGS2](#)

# Table of Contents

Introduction	1
☰ Synthesis of Prostaglandins (PG) and Thromboxanes (TX)	2
↳ PTGS2 dimer binds celecoxib	3
↳ Aspirin acetylates PTGS1	4
↳ Aspirin acetylates PTGS2	5
↳ Arachidonic acid is oxidised to PGG2 by PTGS1	6
↳ Arachidonic acid is oxidised to PGG2 by PTGS2	7
↳ PGG2 is reduced to PGH2 by PTGS1	8
↳ PGG2 is reduced to PGH2 by PTGS2	9
↳ PGH2 is reduced to PGF2a by AKR1C3	10
↳ PGH2 is isomerised to PGE2 by PTGES	11
↳ Prostaglandin E synthase isomerizes PGH2 to PGE2	12
↳ PGE2 is converted to PGF2a by CBR1	13
↳ PGH2 is isomerised to PGD2 by PTGDS	14
↳ PGH2 is isomerised to PGD2 by HPGDS	15
↳ PGD2 is reduced to 11-epi-PGF2a by AKR1C3	16
↳ PTGIS, CYP8A1 isomerise PGH2 to PGI2	17
↳ TBXAS1 isomerises PGH2 to TXA2	18
↳ PGH2 is degraded to 12S-HHT and MDA by TBXAS1	19
Table of Contents	20