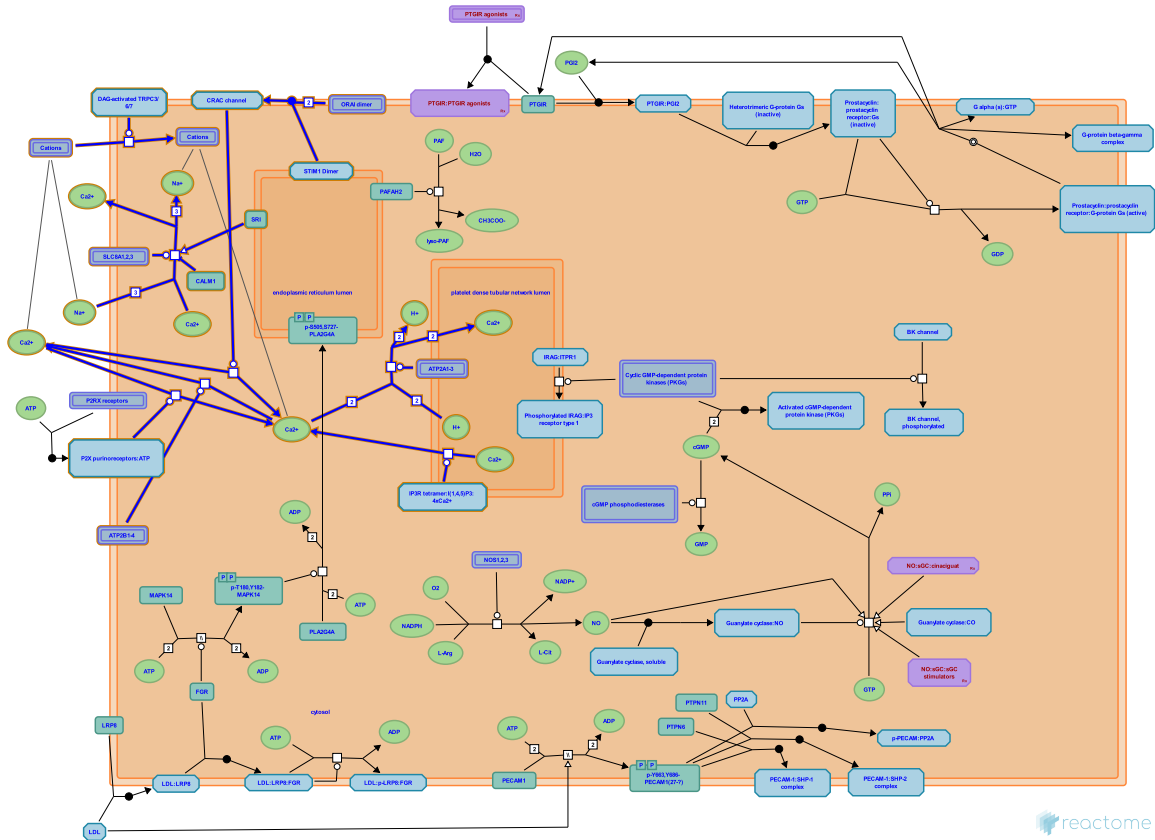


# Platelet calcium homeostasis



## 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

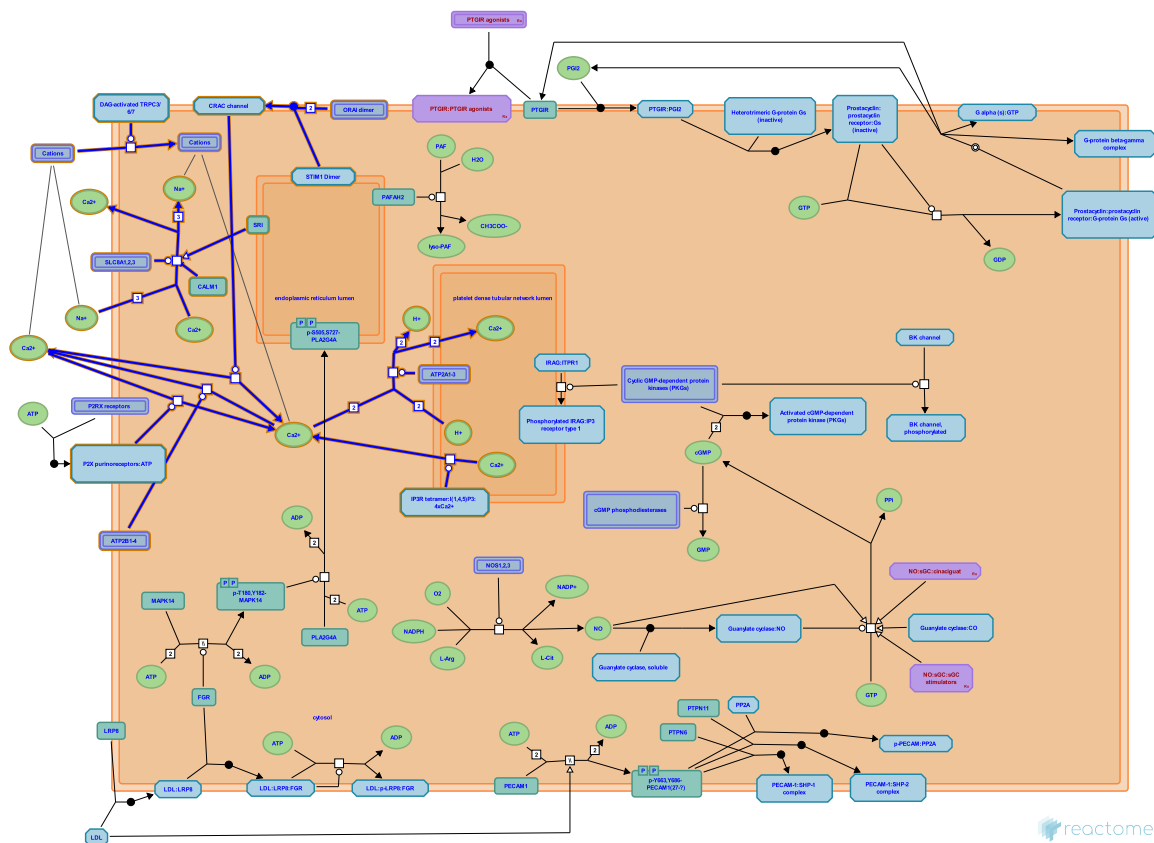
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Reactome database release: 88

This document contains 3 pathways ([see Table of Contents](#))

# Platelet calcium homeostasis ↗

Stable identifier: R-HSA-418360



Ca<sup>2+</sup> homeostasis is controlled by processes that elevate or counter the elevation of cytosolic Ca<sup>2+</sup>. During steady state conditions, cytoplasmic Ca<sup>2+</sup> is reduced by the accumulation of Ca<sup>2+</sup> in intracellular stores and by Ca<sup>2+</sup> extrusion. The primary intracellular calcium store in platelets is the dense tubular system, the equivalent of the ER system in other cell types. Ca<sup>2+</sup> is extruded by Ca<sup>2+</sup>-ATPases including plasma membrane Ca<sup>2+</sup> ATPases (PMCA) and sarco/endoplasmic reticulum Ca<sup>2+</sup> -ATPase isoforms (SERCAs).

Activation of non- excitable cells involves the agonist-induced elevation of cytosolic Ca<sup>2+</sup>, an essential process for platelet activation. It occurs through Ca<sup>2+</sup> release from intracellular stores and Ca<sup>2+</sup> entry through the plasma membrane. Ca<sup>2+</sup> store release involves phospholipase C (PLC)-mediated production of inositol-1,4,5-trisphosphate (IP3), which in turn stimulates IP3 receptor channels to release Ca<sup>2+</sup> from intracellular stores. This is followed by Ca<sup>2+</sup> entry into the cell through plasma membrane calcium channels, a process referred to as store-operated calcium entry (SOCE). Stromal interaction molecule 1 (STIM1), a Ca<sup>2+</sup> sensor molecule in intracellular stores, and the four transmembrane channel protein Orai1 are the key players in platelet SOCE. Other major Ca<sup>2+</sup> entry mechanisms are mediated by the direct receptor-operated calcium (ROC) channel, P2X1 and transient receptor potential channels (TRPCs).

## Literature references

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Jardin, I., López, JJ., Rosado, JA., Salido, GM., Pariente, JA. (2008). Intracellular calcium release from human platelets: different messengers for multiple stores. *Trends Cardiovasc Med*, 18, 57-61. ↗

## Editions

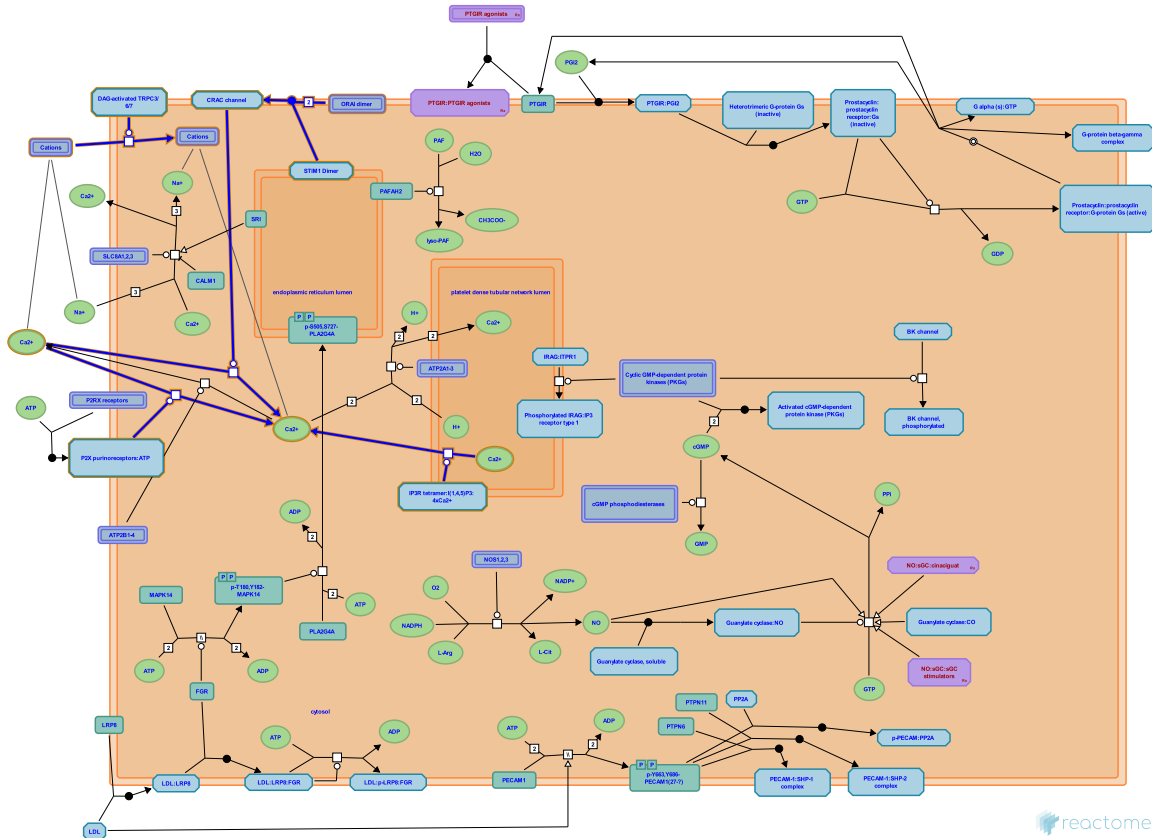
2009-06-03	Authored	Akkerman, JW.
2010-06-07	Edited	Jupe, S.
2010-06-07	Reviewed	Kunapuli, SP.

# Elevation of cytosolic Ca<sup>2+</sup> levels ↗

**Location:** Platelet calcium homeostasis

**Stable identifier:** R-HSA-139853

**Compartments:** cytosol



Activation of non- excitable cells involves the agonist-induced elevation of cytosolic Ca<sup>2+</sup>, an essential process for platelet activation. It occurs through Ca<sup>2+</sup> release from intracellular stores and Ca<sup>2+</sup> entry through the plasma membrane. Ca<sup>2+</sup> store release involves phospholipase C (PLC)-mediated production of inositol-1,4,5-trisphosphate (IP<sub>3</sub>), which in turn stimulates IP<sub>3</sub> receptor channels to release Ca<sup>2+</sup> from intracellular stores. This is followed by Ca<sup>2+</sup> entry into the cell through plasma membrane calcium channels, a process referred to as store-operated calcium entry (SOCE). Stromal interaction molecule 1 (STIM1), a Ca<sup>2+</sup> sensor molecule in intracellular stores, and the four transmembrane channel protein Orai1 are the key players in platelet SOCE. Other major Ca<sup>2+</sup> entry mechanisms are mediated by the direct receptor-operated calcium (ROC) channel, P2X1 and transient receptor potential channels (TRPCs).

## Literature references

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