

Activation of Ca permeable AMPA receptors

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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: 81

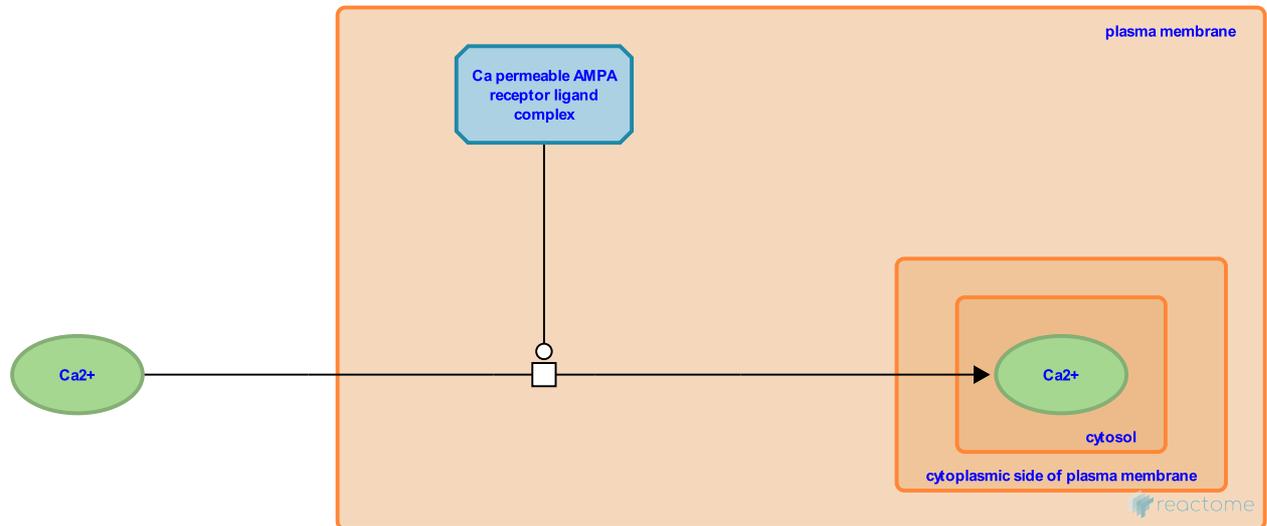
This document contains 1 reaction ([see Table of Contents](#))

Activation of Ca permeable AMPA receptors ↗

Stable identifier: R-HSA-399712

Type: transition

Compartments: plasma membrane



Each AMPA receptor subunit binds one glutamate molecule in the ligand binding site in the N terminus. Each receptor is capable of binding four glutamate molecule, however, channel opens when two sites are occupied by the ligand and the current increases with increased ligand binding. Ca permeable AMPA receptors containing homomers of GluR1 or heteromers containing GluR1, GluR3 and GluR4 conduct Ca upon glutamate or agonist namely AMPA (alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid) binding. Calcium permeable AMPA receptors conduct Ca and other cations such as Na. The ionic flux leads to Ca or Na currents that leads to either increase in the intracellular Ca concentration leading to further Ca-dependent signaling or increase in depolarization that opens voltage gated channels such as NMDA receptors that require both membrane depolarization and glutamate binding for activation.

Literature references

Kurihara, H., Tamura, M., Sasaki, T., Nakazato, Y., Yamada, N., Miwa, A. et al. (2002). Blockage of Ca(2+)-permeable AMPA receptors suppresses migration and induces apoptosis in human glioblastoma cells. *Nat Med*, 8, 971-8. ↗

Editions

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