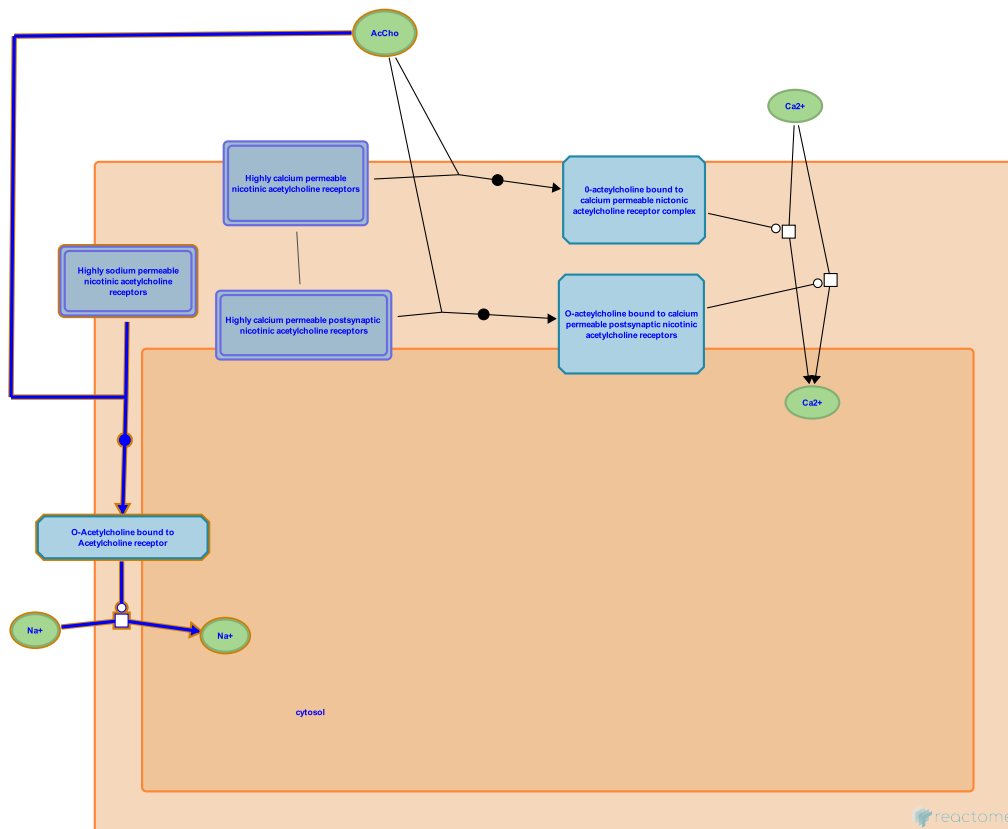


Highly sodium permeable acetylcholine nicotinic receptors



Cooper, E., Gillespie, ME., Mahajan, SS., Orlic-Milacic, M.

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.

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Literature references

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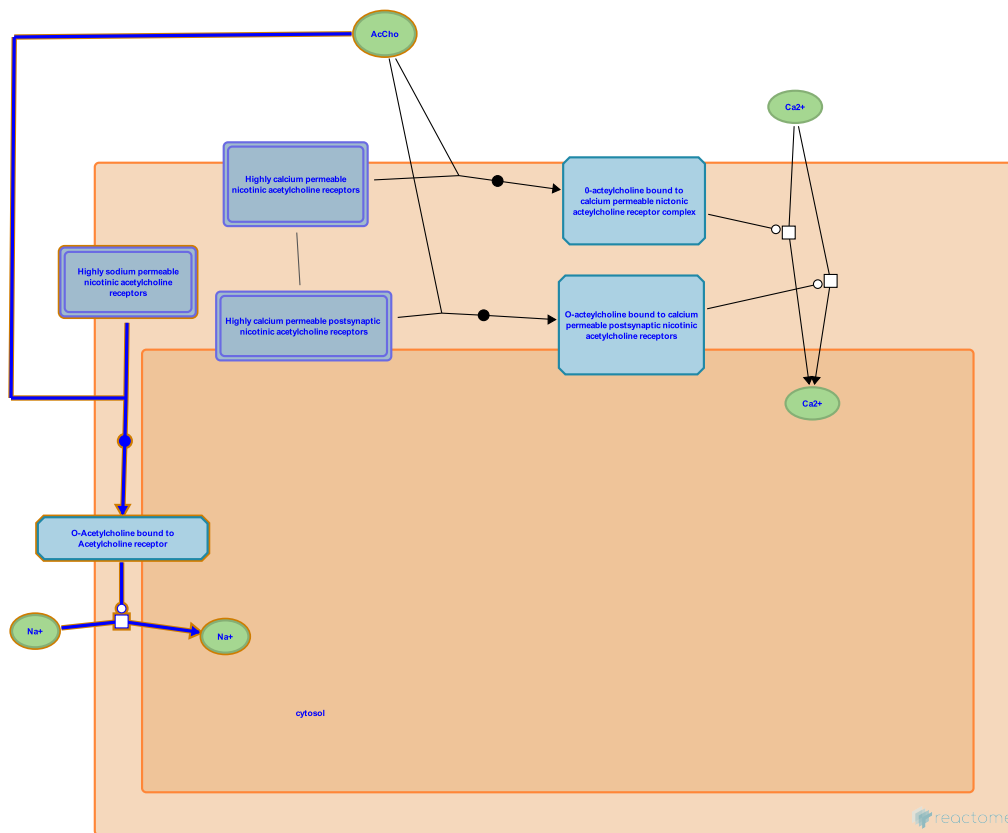
Reactome database release: 70

This document contains 1 pathway and 2 reactions ([see Table of Contents](#))

Highly sodium permeable acetylcholine nicotinic receptors [↗](#)

Stable identifier: R-HSA-629587

Compartments: cytosol, extracellular region, plasma membrane



Nicotinic acetylcholine receptors that have low Ca²⁺ permeability allow the influx of Na⁺ which causes depolarization of the membrane initiating voltage dependent responses such as activation of voltage dependent opening of Ca²⁺ channels and thus eliciting an increase in Ca²⁺ and downstream signaling. These receptors could be found in both presynaptic and postsynaptic terminals.

Literature references

Haass, M., Kübler, W. (1997). Nicotine and sympathetic neurotransmission. *Cardiovasc Drugs Ther*, 10, 657-65. [↗](#)

Editions

2010-04-26	Authored	Mahajan, SS.
2010-05-18	Edited	Gillespie, ME.
2010-05-24	Reviewed	Cooper, E.

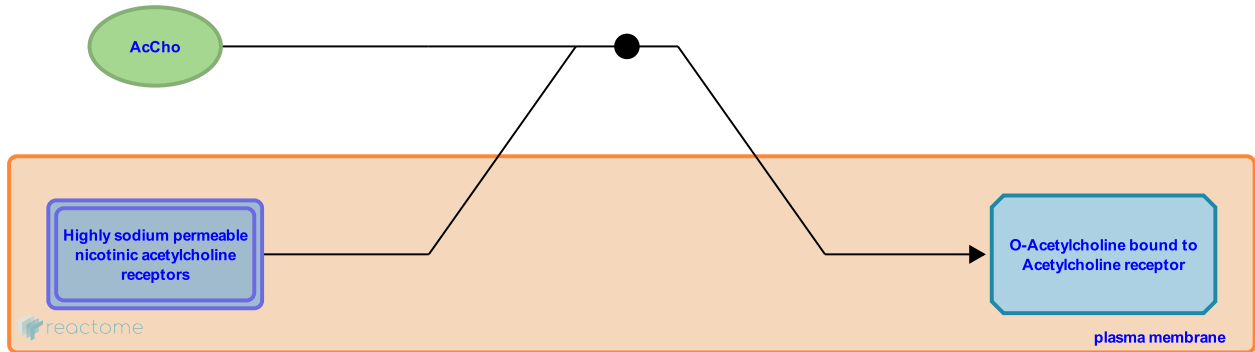
Binding of acetylcholine to highly sodium permeable acetylcholine receptors ↗

Location: [Highly sodium permeable acetylcholine nicotinic receptors](#)

Stable identifier: R-HSA-629588

Type: binding

Compartments: extracellular region, plasma membrane



Nicotinic acetylcholine receptors bind two molecules of ligand, acetylcholine, in the alpha beta interface in receptors containing heteromeric subunits or in the interface of 2 alpha subunits in receptors containing homomeric subunits.

Followed by: [Activation of highly sodium permeable nicotinic acetylcholine receptors](#)

Literature references

Zouridakis, M., Zisimopoulou, P., Eliopoulos, E., Poulas, K., Tzartos, SJ. (2009). Design and expression of human alpha7 nicotinic acetylcholine receptor extracellular domain mutants with enhanced solubility and ligand-binding properties. *Biochim Biophys Acta*, 1794, 355-66. ↗

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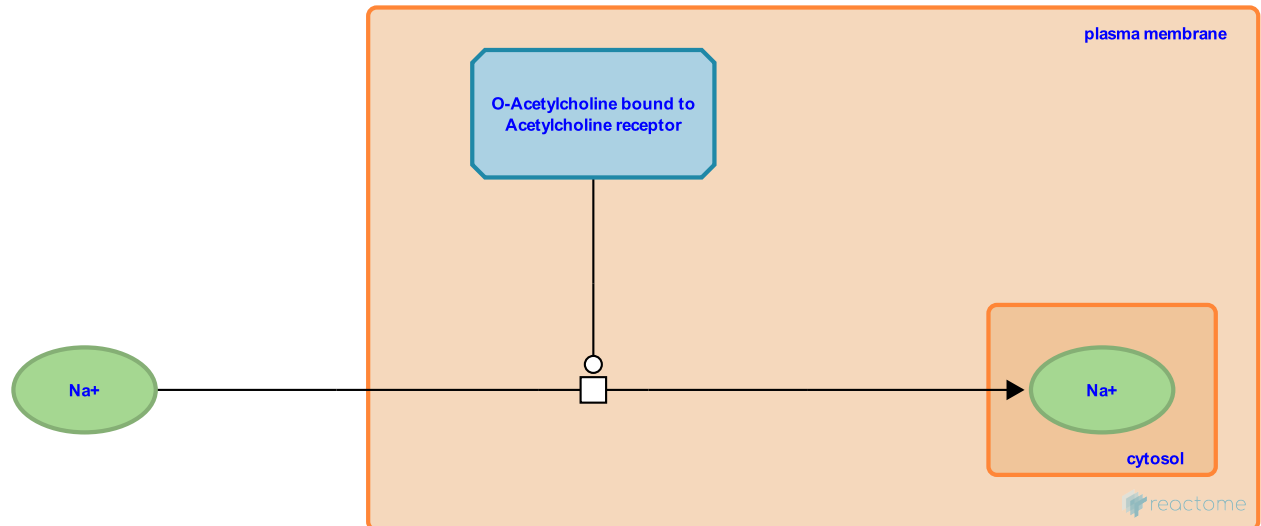
Activation of highly sodium permeable nicotinic acetylcholine receptors [↗](#)

Location: [Highly sodium permeable acetylcholine nicotinic receptors](#)

Stable identifier: R-HSA-622325

Type: transition

Compartments: plasma membrane, cytosol, extracellular region



Nicotinic acetylcholine receptors containing alpha4(2) beta2 (3) and alpha3(2) beta4(3) are selectively highly Na⁺ permeable upon activation of these receptors by acetylcholine.

Preceded by: [Binding of acetylcholine to highly sodium permeable acetylcholine receptors](#)

Literature references

Buisson, B., Gopalakrishnan, M., Arneric, SP., Sullivan, JP., Bertrand, D. (1996). Human alpha4beta2 neuronal nicotinic acetylcholine receptor in HEK 293 cells: A patch-clamp study. *J Neurosci*, 16, 7880-91. [↗](#)

Editions

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Table of Contents

Introduction	1
⚡ Highly sodium permeable acetylcholine nicotinic receptors	2
➤ Binding of acetylcholine to highly sodium permeable acetylcholine receptors	3
➤ Activation of highly sodium permeable nicotinic acetylcholine receptors	4
Table of Contents	5