Activation of GABAB receptors

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20/11/2021
**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**


Reactome database release: 78

This document contains 3 pathways (see Table of Contents)
Activation of GABAB receptors

Stable identifier: R-HSA-991365

Compartments: cytosol, extracellular region

GABA B receptors are metabotropic receptors that are functionally linked to C type G protein coupled receptors.

GABA B receptors are activated upon ligand binding. The GABA B1 subunit binds ligand and GABA B2 subunit modulates the activity of adenylate cyclase via the intracellular loop.

GABA B receptors show inhibitory activity via Galpha/G0 subunits via the inhibition of adenylate cyclase or via the activity of Gbeta/gamma subunits that mediate the inhibition of voltage gated Ca2+ channels.

Literature references


Editions

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Adenylate cyclase inhibitory pathway

**Location:** Activation of GABAB receptors

**Stable identifier:** R-HSA-170670

**Compartments:** plasma membrane, cytosol

Guanine nucleotide-binding protein G(i) alpha (Gi-alpha) inhibits adenylate cyclase, thus inhibiting the production of cAMP from ATP and ultimately decreasing the activity of cAMP-dependent protein kinase.

**Literature references**


**Editions**

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**Inhibition of voltage gated Ca2+ channels via Gbeta/gamma subunits**

**Location:** Activation of GABAB receptors

**Stable identifier:** R-HSA-997272

**Compartments:** plasma membrane, cytosol

GABA B receptors are coupled to Gproteins and function by increasing the K+ and decreasing the Ca2+ inside the cell. The increase in K+ increases the negative membrane potential of the cell thereby hyperpolarizing the cell which inhibits the release of neurotransmitters. The decrease in Ca2+ also inhibits neurotransmitter in two ways; first by preventing the fusion of synaptic vesicles containing the neurotransmitter with the plasma membrane and second by decreasing the Ca2+ dependent recruitment of synaptic vesicles to the plasma membrane. In particular GABA B receptors inhibit voltage gated Ca2+ channels via the activity of Gbeta/Ggamma subunits of G proteins.

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