

IL34 dimer binds CSF1R

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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: 88

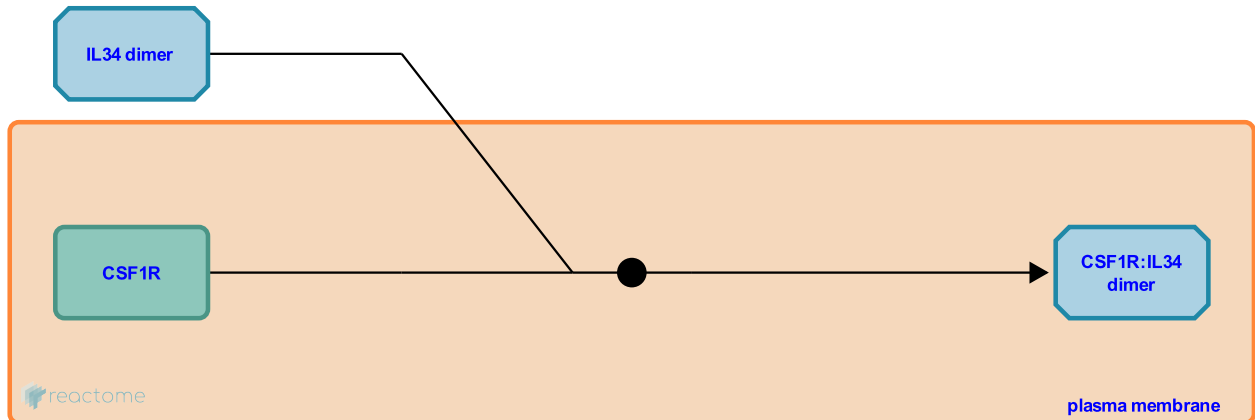
This document contains 1 reaction ([see Table of Contents](#))

IL34 dimer binds CSF1R [↗](#)

Stable identifier: R-HSA-6787820

Type: binding

Compartments: plasma membrane, extracellular region



The receptor for Interleukin-34 (IL34) is colony stimulating factor 1 receptor (CSF1R), also called macrophage colony stimulating factor receptor (M-CSF-R). Dimeric IL34 and CSF1 bind the same general region of CSF1R, interacting with overlapping but distinct epitopes. Ligand binding leads to receptor dimerisation (Ma et al. 2012, Liu et al. 2012). Like CSF1, IL34 stimulation of CSF1R leads to phosphorylation of extracellular signal-regulated kinase (ERK) 1 and 2 in human monocytes (Lin et al. 2008). CSF1R activates several signaling pathways including JAK-STAT3, 5A/B, phosphorylation of PIK3R1, PLCG2, GRB2, SLA2 and CBL. PLCG2 phosphorylation leads to increased production of the cellular signaling molecules diacylglycerol (DAG) and inositol 1,4,5 trisphosphate (IP3), which activate protein kinase C family members, especially PRKCD. Phosphorylation of PIK3R1, the regulatory subunit of phosphatidylinositol 3 kinase, leads to activation of the AKT1 signaling pathway. Activated CSF1R also mediates activation of MAPK1 (ERK2) or MAPK3 (ERK1) and the SRC family kinases SRC, FYN and YES1. Activated CSF1R binds GRB2 and promotes tyrosine phosphorylation of SHC1 and INPP5D (SHIP1). Signaling is down regulated by protein phosphatases such as INPP5D that can dephosphorylate the receptor and its downstream effectors.

Literature references

Leo, C., Halenbeck, R., Linnemann, T., Doberstein, SK., Lin, H., Williams, LT. et al. (2008). Discovery of a cytokine and its receptor by functional screening of the extracellular proteome. *Science*, 320, 807-11. [↗](#)

Editions

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