Spike glycoprotein of SARS-CoV-2 binds ACE2 on host cell

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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


Reactome database release: 77

This document contains 1 reaction (see Table of Contents)

https://reactome.org
Spike glycoprotein of SARS-CoV-2 binds ACE2 on host cell

Stable identifier: R-HSA-9694579

Type: binding

Compartments: plasma membrane

Diseases: COVID-19

Inferred from: Spike glycoprotein of SARS coronavirus binds ACE2 on host cell (Homo sapiens)

This COVID-19 event has been created by a combination of computational inference (see https://reactome.org/documentation/inferred-events) from SARS-CoV-1 data and manual curation, as described in the summation for the overall SARS-CoV-2 infection pathway.

SARS-CoV-2 spike (S3a) protein, as a component of the S3:M:E:encapsidated SARS coronavirus genomic RNA: 7a:O-glycosyl 3a tetramer complex, binds to glycosylated angiotensin converting enzyme 2 (ACE2) associated with the human host cell plasma membrane. Structural studies of the interaction between human ACE2 protein and the receptor-binding domain of S3a protein have identified key amino acid residues in both proteins responsible for their high-affinity interaction. These residues may be a key factor determining severity (and possibly human-to-human transmission) of SARS-CoV-2 (Li et al. 2003, 2005). The roles of S protein in viral binding to the host cell membrane and fusion of viral and host cell membranes and thus the central role of S protein in determining the host range and tissue tropisms of the virus are reviewed by Belouzard et al. (2012).

Literature references


Editions

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