Cleavage of S protein into S1:S2

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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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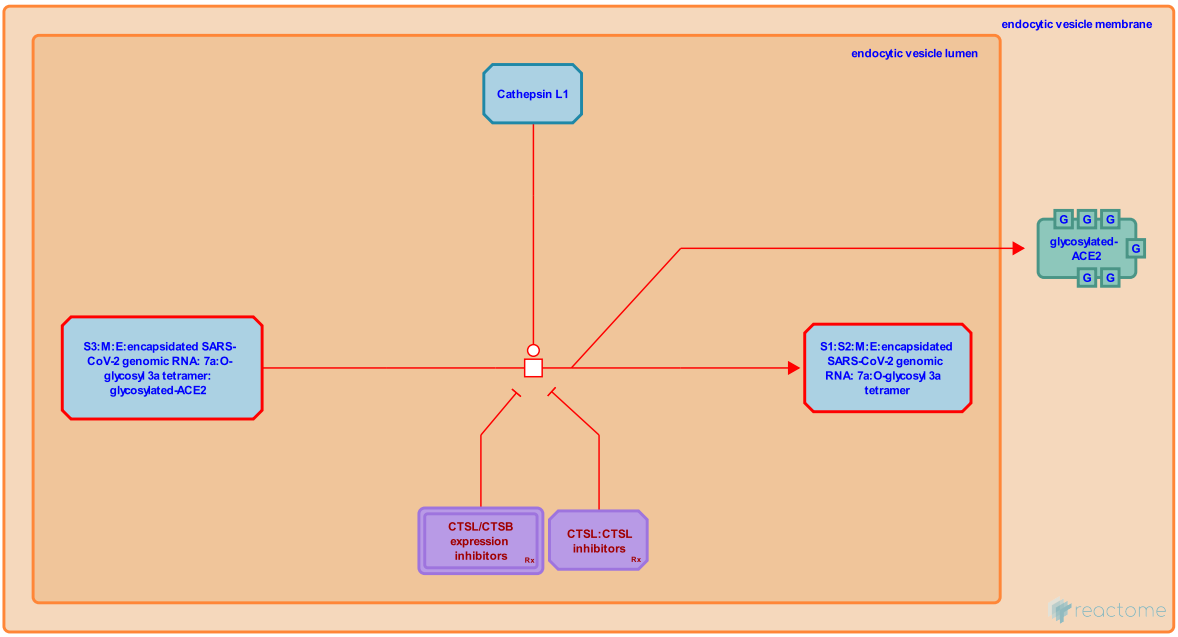
Stable identifier: R-HSA-9694287

Type: transition

Compartments: endocytic vesicle lumen

Diseases: COVID-19



Within the host cell endocytic vesicle, SARS-CoV-2 Spike (S) protein is cleaved, probably between residues 815 and 816 by cathepsin L1 (CTSL) (Zhao et al, 2021; Huang et al. 2006). 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 Jackson et al, 2021, and Trbojević-Akmačić et al, 2021. The CTSL/CTSB expression inhibitor amantadin is an approved generic drug with mild side effects used as a preventive agent for influenza and for Parkinson's disease. Amantadine inhibited CTSL enzyme activity in the setting of SARS-CoV-2 pseudovirus infection and significantly inhibited SARS-CoV-1 and SARS-CoV-2 cell entry with little cytotoxicity (Zhao et al, 2021). Several clinical studies with amantadine for COVID-19 treatment are in the recruiting stage (NCT04952519, NCT04894617, NCT04854759).

Literature references

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Editions

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