ATXN3 family cleave Ub chains

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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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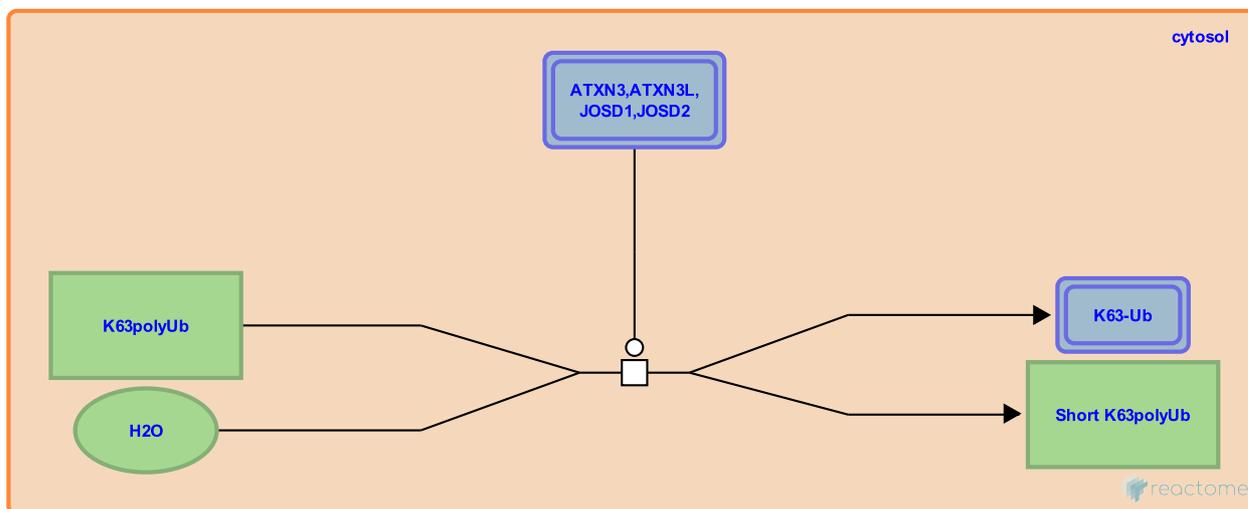
Reactome database release: 76

This document contains 1 reaction (see Table of Contents)

ATXN3 family cleave Ub chains ↗

Stable identifier: R-HSA-5688797

Type: transition

Compartments: cytosol

Ataxin-3 (ATXN3) has an N-terminal Josephin domain (JD) that is conserved within a family of around 4 ubiquitin proteases. ATXN3, the best studied, can bind long chains of lysine-63 (K63)-linked and K48-linked poly-ubiquitin (poly-Ub), but its activity is highest for ubiquitin chains with at least four molecules of ubiquitin. It preferentially cleaves linkages between ubiquitin molecules linked through K63 rather than K48 (Winborn et al. 2008). In effect this trims longer polyubiquitin chains down to approximately four residues (Burnett et al. 2003). The other three human JD-containing proteins also have demonstrated deubiquitinase (DUB) activity (Tzvetkov & Breuer 2007). In vitro ATXN3 kinetics are slow when compared to other well-studied deubiquitinating enzymes (Nicastro et al. 2010) but become much faster when ATXN3 is activated by VCP (Laco et al. 2012). JOSD1 partially localizes to the plasma membrane (Seki et al. 2013).

Literature references

Tzvetkov, N., Breuer, P. (2007). Josephin domain-containing proteins from a variety of species are active de-ubiquitination enzymes. *Biol. Chem., 388*, 973-8. ↗

Editions

2015-04-16	Authored	Jupe, S.
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