ROS oxidize thioredoxin and activate MAP3K5

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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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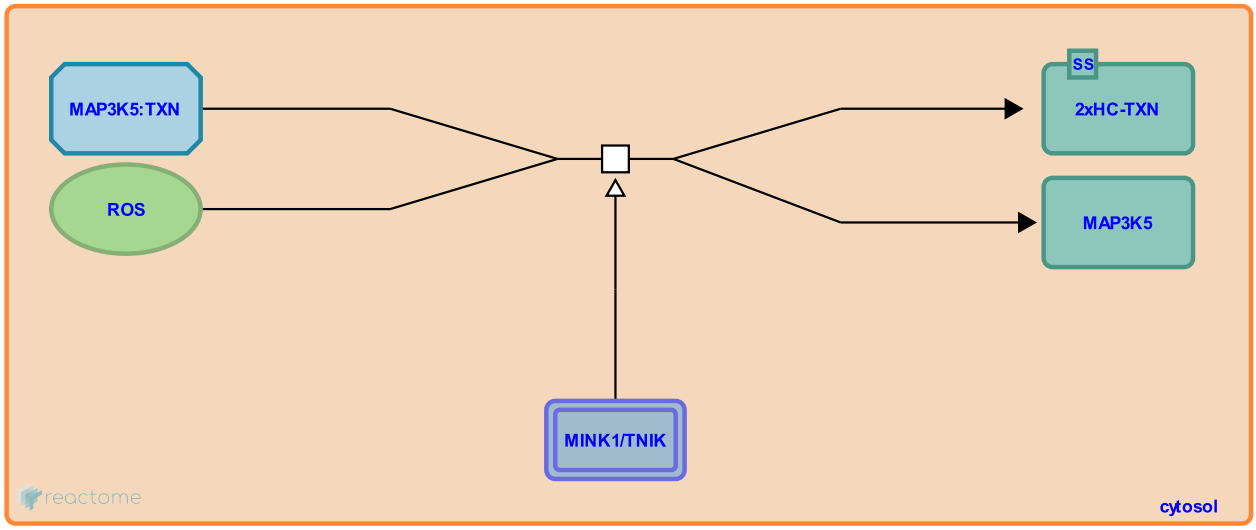
Stable identifier: R-HSA-3225851

Type: transition

Compartments: cytosol



When in reduced form, TXN (thioredoxin) binds the amino terminus of MAP3K5 (ASK1) and inhibits its kinase activity. Once reactive oxygen species (ROS) oxidize TXN, TXN dissociates from MAP3K5, enabling MAP3K5 to phosphorylate downstream targets (Saitoh et al. 1998). Increased expression and activity of MINK1 (MINK) (and possibly other Ste20 family kinases TNIK and MAP4K), which is induced by ROS generated as a consequence of oncogenic RAS signaling, may contribute to MAP3K5 activation (Nicke et al. 2005).

Literature references

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Editions

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