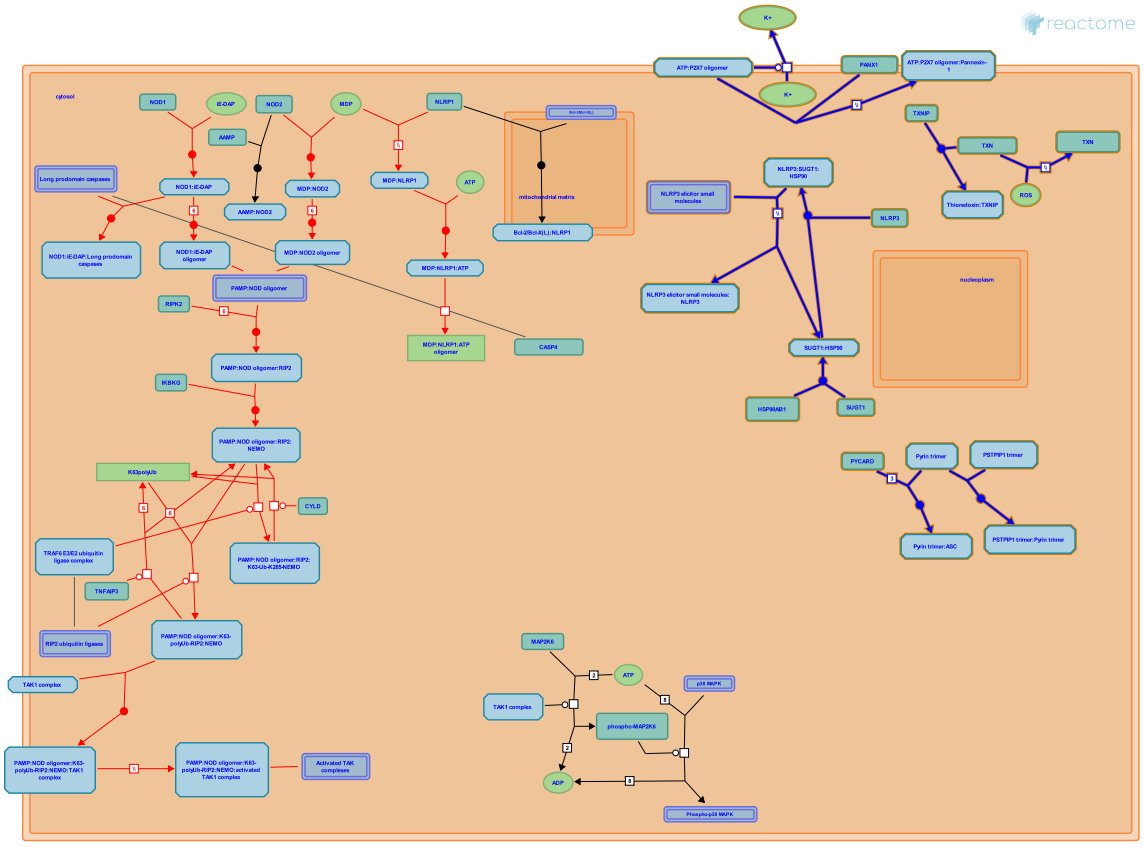
The NLRP3 inflammasome



European Bioinformatics Institute, New York University Langone Medical Center, Ontario Institute for Cancer Research, Oregon Health and Science University.

20/05/2024

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.
The development of Reactome is supported by grants from the US National Institutes of Health (P41 HG003751), University of Toronto (CFREF Medicine by Design), European Union (EU STRP, EMI-CD), and the European Molecular Biology Laboratory (EBI Industry program).

Literature references

Fabregat, A., Sidiropoulos, K., Viteri, G., Forner, O., Marin-Garcia, P., Arnau, V. et al. (2017). Reactome pathway analysis: a high-performance in-memory approach. *BMC bioinformatics, 18*, 142. ↗

Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics, 33*, 3461-3467. ↗

Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res, 46*, D649-D655. ↗

Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology, 14*, e1005968. ↗

Reactome database release: 88

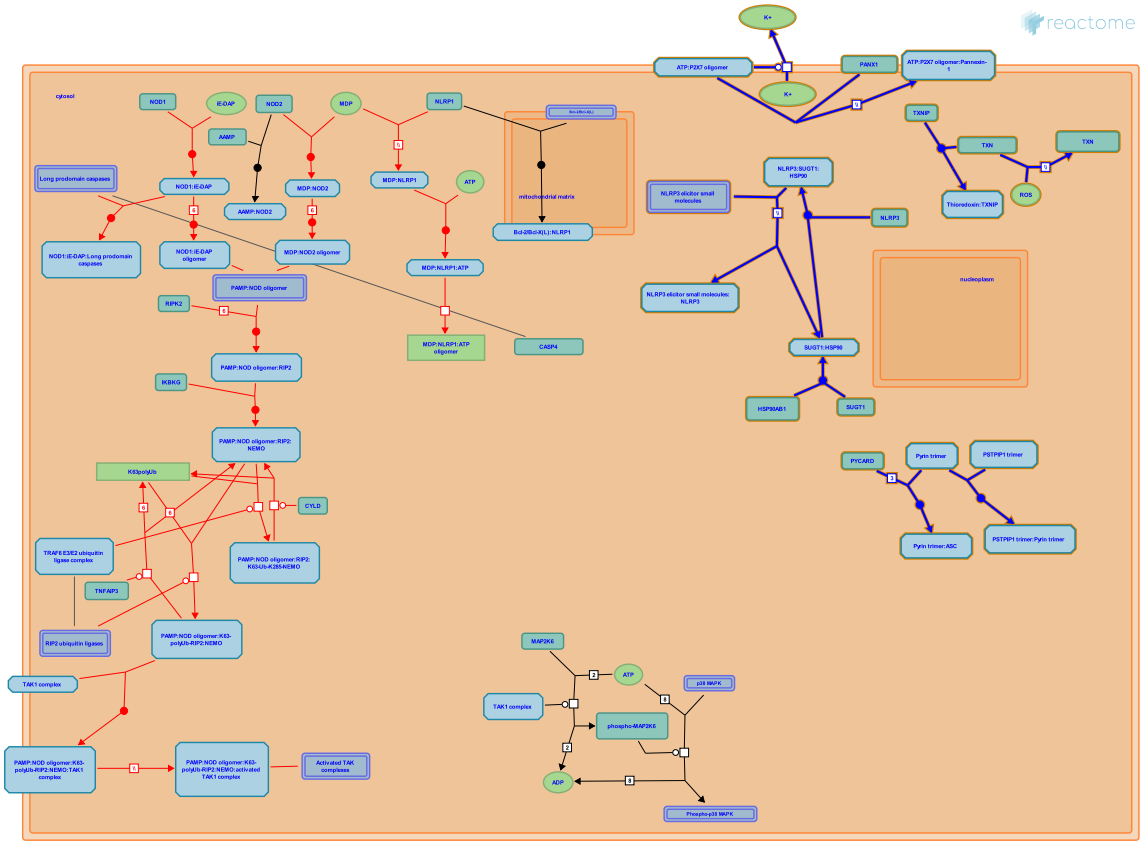
This document contains 1 pathway and 9 reactions (see Table of Contents)

The NLRP3 inflammasome ↗

Stable identifier: R-CFA-844456

Compartments: cytosol

Inferred from: The NLRP3 inflammasome (Homo sapiens)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

More details and caveats of the event inference in Reactome. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

P2X7 mediates loss of intracellular K+ ↗

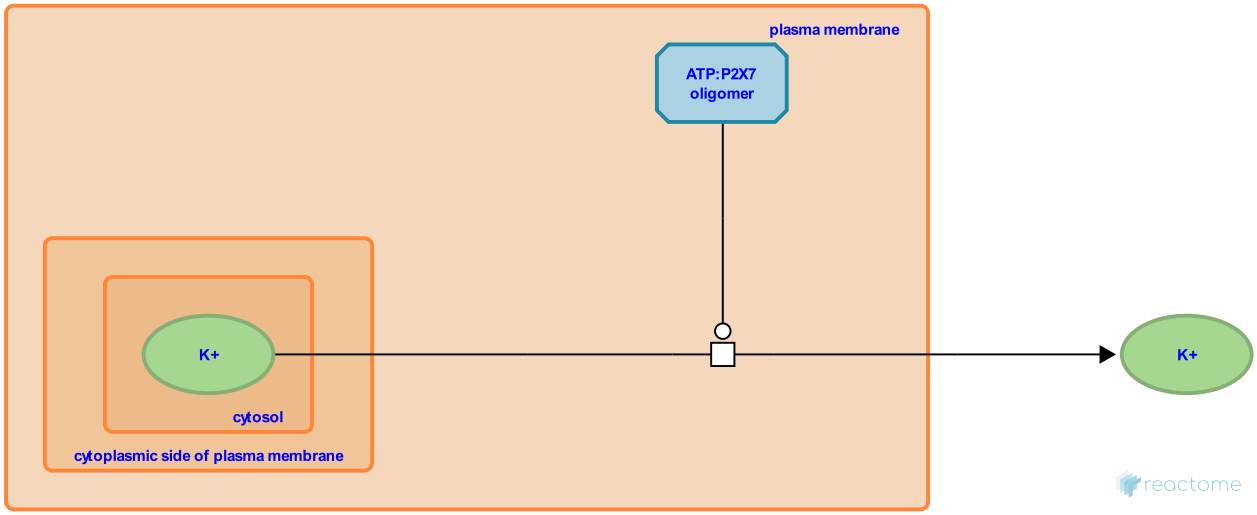
Location: The NLRP3 inflammasome

Stable identifier: R-CFA-877187

Type: transition

Compartments: plasma membrane, extracellular region, cytosol

Inferred from: P2X7 mediates loss of intracellular K+ (Homo sapiens)



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Followed by: NLRP3 activation by small molecules

P2X7 mediates membrane pores that include pannexin-1 ↗

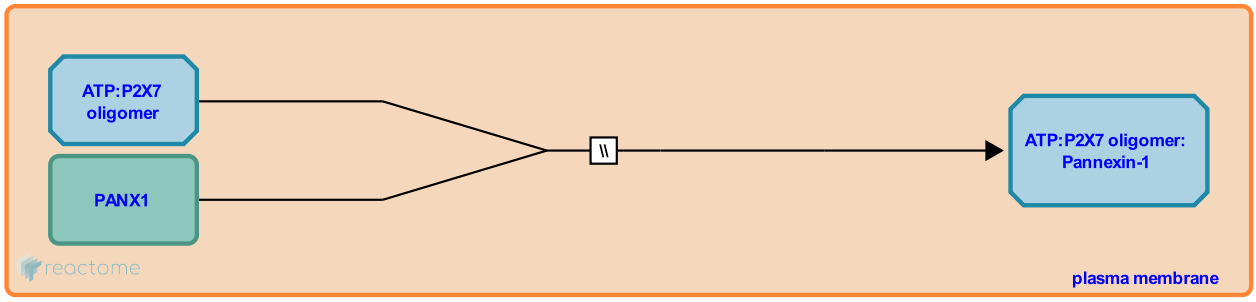
Location: The NLRP3 inflammasome

Stable identifier: R-CFA-877198

Type: omitted

Compartments: plasma membrane

Inferred from: P2X7 mediates membrane pores that include pannexin-1 (Homo sapiens)



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Followed by: NLRP3 activation by small molecules

SGT1 binds HSP90 ↗

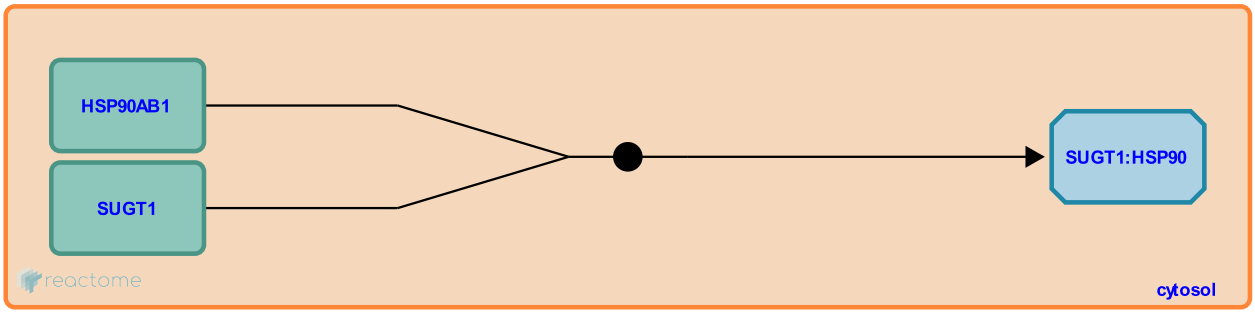
Location: The NLRP3 inflammasome

Stable identifier: R-CFA-874087

Type: binding

Compartments: cytosol

Inferred from: SGT1 binds HSP90 (Homo sapiens)



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Followed by: SGT1:HSP90 binds inactive NLRP3

SGT1:HSP90 binds inactive NLRP3 ↗

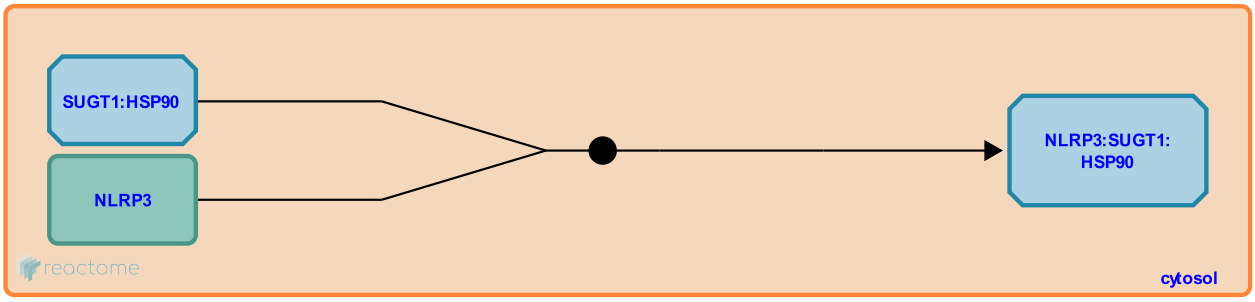
Location: The NLRP3 inflammasome

Stable identifier: R-CFA-873951

Type: binding

Compartments: cytosol

Inferred from: SGT1:HSP90 binds inactive NLRP3 (Homo sapiens)



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Preceded by: SGT1 binds HSP90

Followed by: NLRP3 activation by small molecules

TXNIP binds reduced thioredoxin ↗

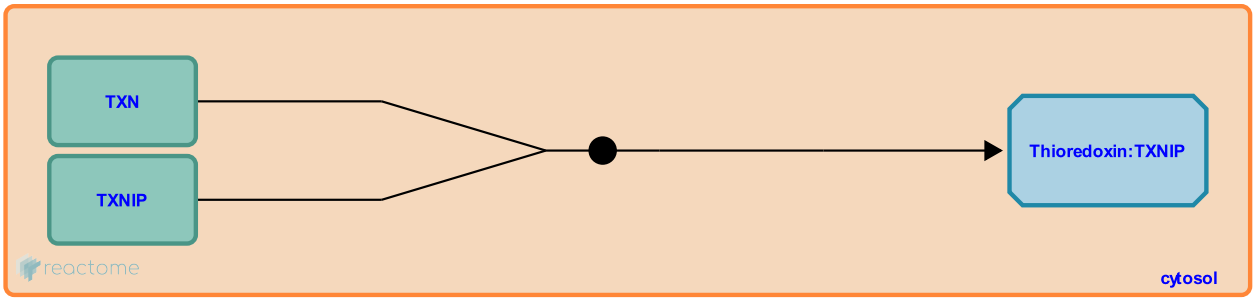
Location: The NLRP3 inflammasome

Stable identifier: R-CFA-1250264

Type: binding

Compartments: cytosol

Inferred from: TXNIP binds reduced thioredoxin (Homo sapiens)



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ROS oxidize thioredoxin ↗

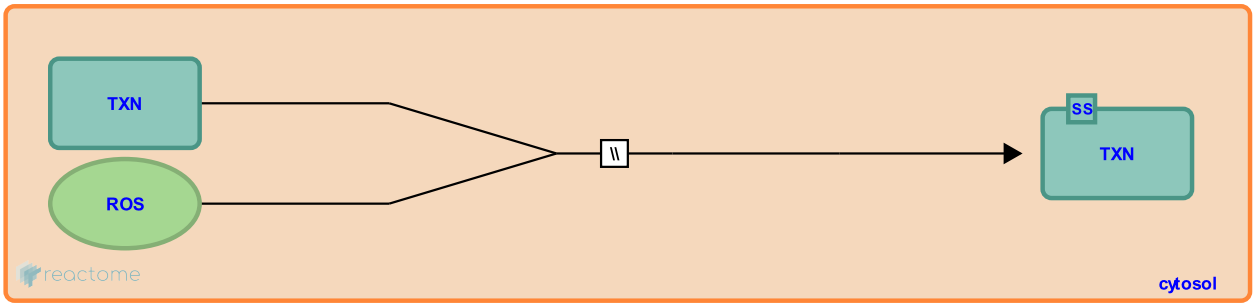
Location: The NLRP3 inflammasome

Stable identifier: R-CFA-1250280

Type: omitted

Compartments: cytosol

Inferred from: ROS oxidize thioredoxin (Homo sapiens)



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NLRP3 activation by small molecules ↗

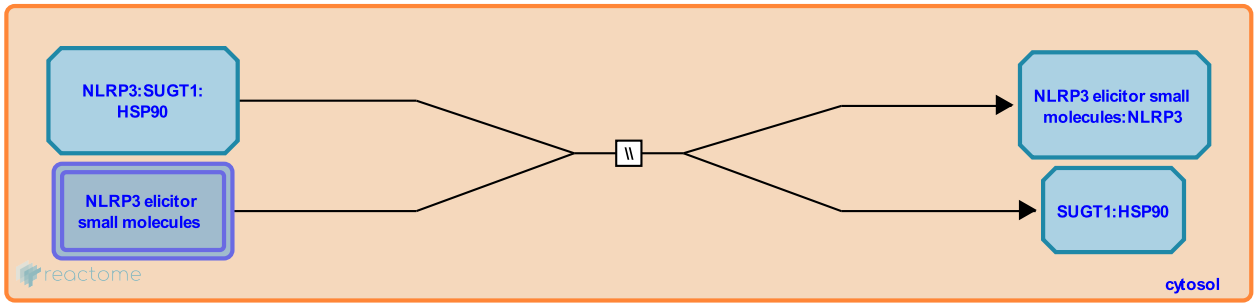
Location: The NLRP3 inflammasome

Stable identifier: R-CFA-1306876

Type: omitted

Compartments: cytosol

Inferred from: NLRP3 activation by small molecules (Homo sapiens)



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Preceded by: P2X7 mediates membrane pores that include pannexin-1, SGT1:HSP90 binds inactive NLRP3, P2X7 mediates loss of intracellular K+

PSTPIP1 binds Pyrin ↗

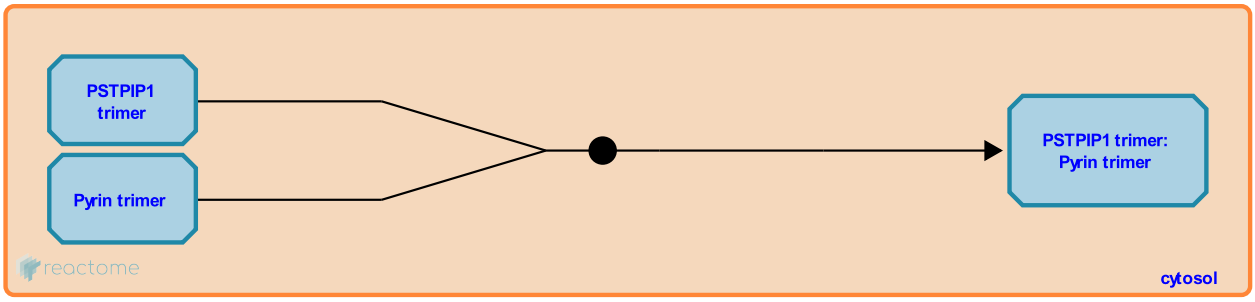
Location: The NLRP3 inflammasome

Stable identifier: R-CFA-879221

Type: binding

Compartments: cytosol

Inferred from: PSTPIP1 binds Pyrin (Homo sapiens)



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More details and caveats of the event inference in Reactome. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Followed by: Pyrin binds ASC

Pyrin binds ASC ↗

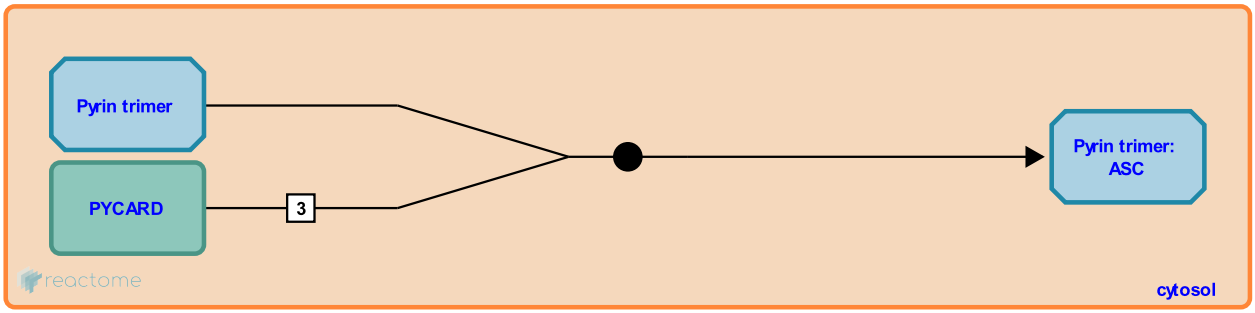
Location: The NLRP3 inflammasome

Stable identifier: R-CFA-877361

Type: binding

Compartments: cytosol

Inferred from: Pyrin binds ASC (Homo sapiens)



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Preceded by: PSTPIP1 binds Pyrin

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