PP2A-B56 dephosphorylates centromeric cohesin

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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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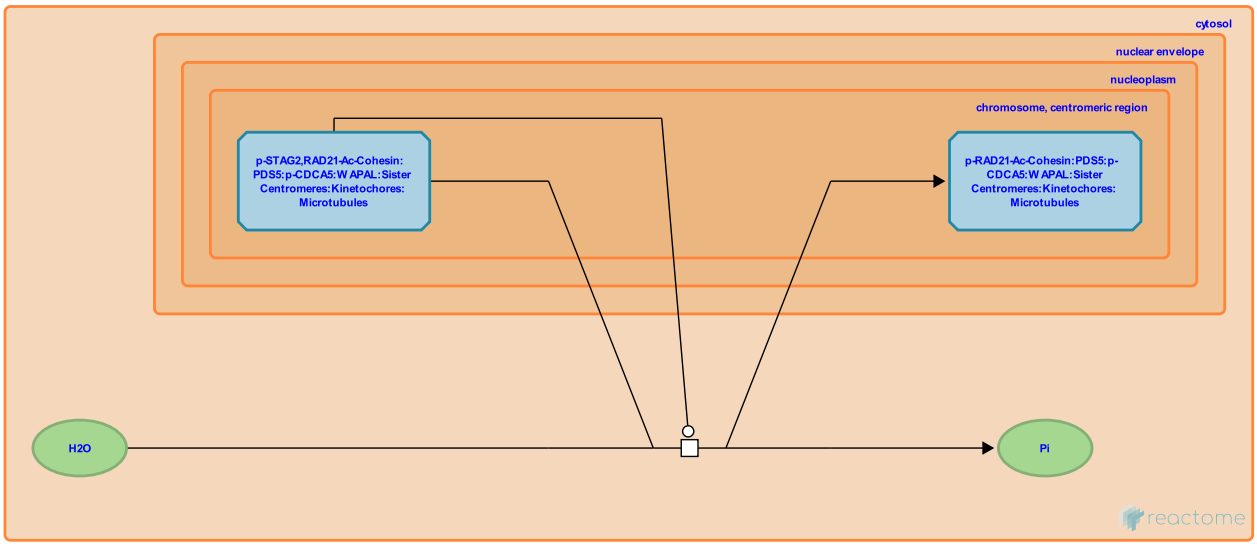
Stable identifier: R-HSA-1638821

Type: transition

Compartments: cytosol, chromosome



PLK1-mediated phosphorylation of the STAG2 subunit of centromeric cohesin (Hauf et al. 2005) is counteracted by the kinetochore PP2A phosphatase, containing the 56 kDa regulatory B subunit (PP2A-B56 i.e. PP2A-PPP2R5). PP2A-B56 is recruited to the centromeric cohesin complex by shugoshin proteins (SGOL1 and SGOL2) (Kitajima et al. 2006), which are also kinetochore constituents (Cheeseman and Desai 2008). SGOL1 localization to centromeres is sustained by the interaction with histone H2A possessing the phosphorylation of T120 which is introduced by the protein kinase BUB1, and heterochromatin protein HP1 (Kitajima et al. 2005, Kawashima et al. 2010, Yamagishi et al. 2008). Shugoshin- and PP2A-B56-regulated dephosphorylation of centromeric STAG2 ensures that the cohesin complex remains bound to centromeres throughout prometaphase and metaphase, thereby preventing premature separation of sister chromatids (Salic et al. 2004, Kitajima et al. 2004, Kitajima et al. 2005, Kitajima et al. 2006).

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Editions

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