

# **EXO1 interacts with MSH2:MSH3 (MutS-**

# beta) and MLH1:PMS2 (MutLalpha)

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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

- 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 data-base: Efficient access to complex pathway data. *PLoS computational biology, 14*, e1005968.

Reactome database release: 88

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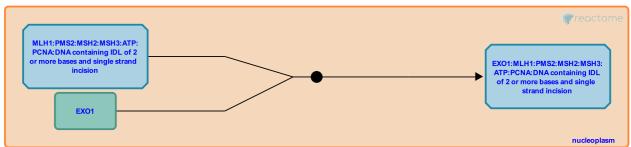
# EXO1 interacts with MSH2:MSH3 (MutSbeta) and MLH1:PMS2 (MutLalpha)

Stable identifier: R-HSA-5358545

Type: binding

**Compartments:** nucleoplasm

**Inferred from:** EXO1 interacts with MSH2:MSH6 (MutSalpha) and MLH1:PMS2 (MutLalpha) (Homo sapiens)



EXO1 interacts with MSH2 and MLH1 (and therefore is presumed to interact with their respective heterodimers MSH2:MSH3 and MLH1:PMS2), forming a ternary complex with MLH1:PMS2 (Nielsen et al. 2004). EXO1 also interacts with PCNA in S phase (Nielsen et al. 2004, Zhang et al. 2005, Constantin et al. 2005, Knudsen et al. 2007, Liberti et al. 2011)

#### Literature references

Rasmussen, LJ., Miron, S., May, A., Bohr, VA., Liberti, SE., Wang, J. et al. (2011). Bi-directional routing of DNA mismatch repair protein human exonuclease 1 to replication foci and DNA double strand breaks. *DNA Repair (Amst.)*, 10, 73-86.

Gao, Y., Zhang, Y., Li, GM., Yuan, F., Tian, K., Presnell, SR. et al. (2005). Reconstitution of 5'-directed human mismatch repair in a purified system. *Cell*, 122, 693-705.

Rasmussen, LJ., Lützen, A., Nielsen, FC., Bundgaard, JR., Jäger, AC. (2004). Characterization of human exonuclease 1 in complex with mismatch repair proteins, subcellular localization and association with PCNA. *Oncogene*, 23, 1457-68.

Kooi, K., Liberti, SE., Rasmussen, LJ., Bertelsen, R., Knudsen, NØ., Nielsen, FC. et al. (2007). Nuclear localization of human DNA mismatch repair protein exonuclease 1 (hEXO1). *Nucleic Acids Res.*, 35, 2609-19. *¬* 

Dzantiev, L., Modrich, P., Kadyrov, FA., Constantin, N. (2005). Human mismatch repair: reconstitution of a nick-directed bidirectional reaction. *J. Biol. Chem.*, 280, 39752-61.

## **Editions**

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