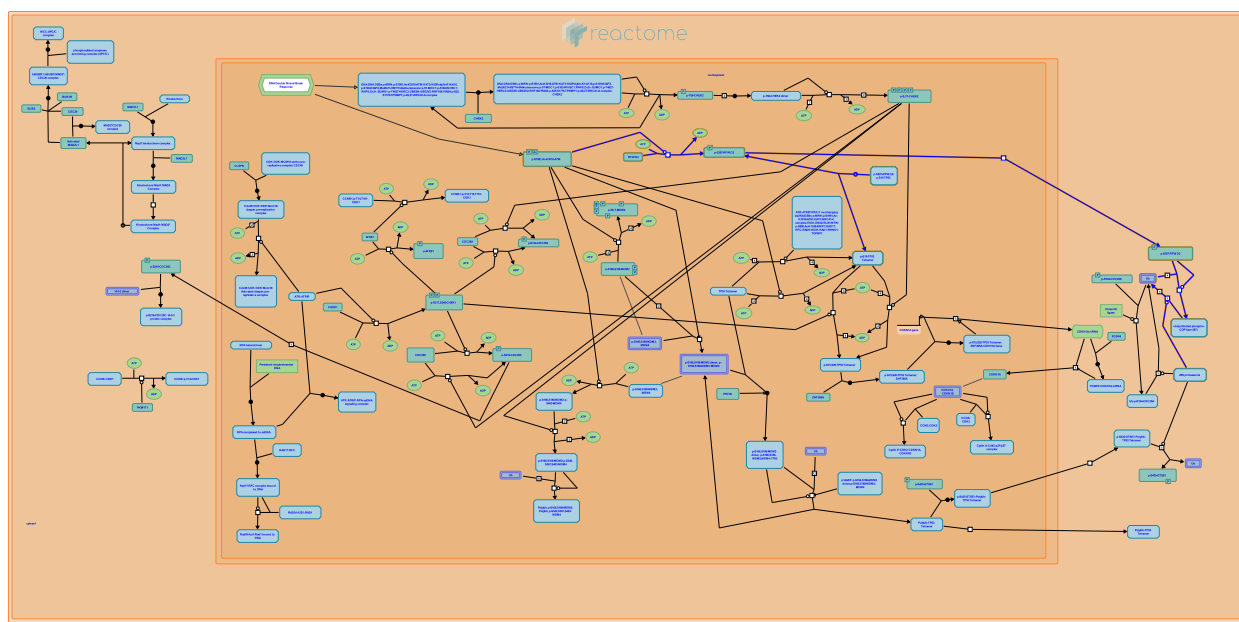


Autodegradation of the E3 ubiquitin ligase

COP1



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This is just an excerpt of a full-length report for this pathway. To access the complete report, please download it at the [Reactome Textbook](https://reactome.org/about/reactome-textbook/).

18/05/2024

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.

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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. [↗](#)

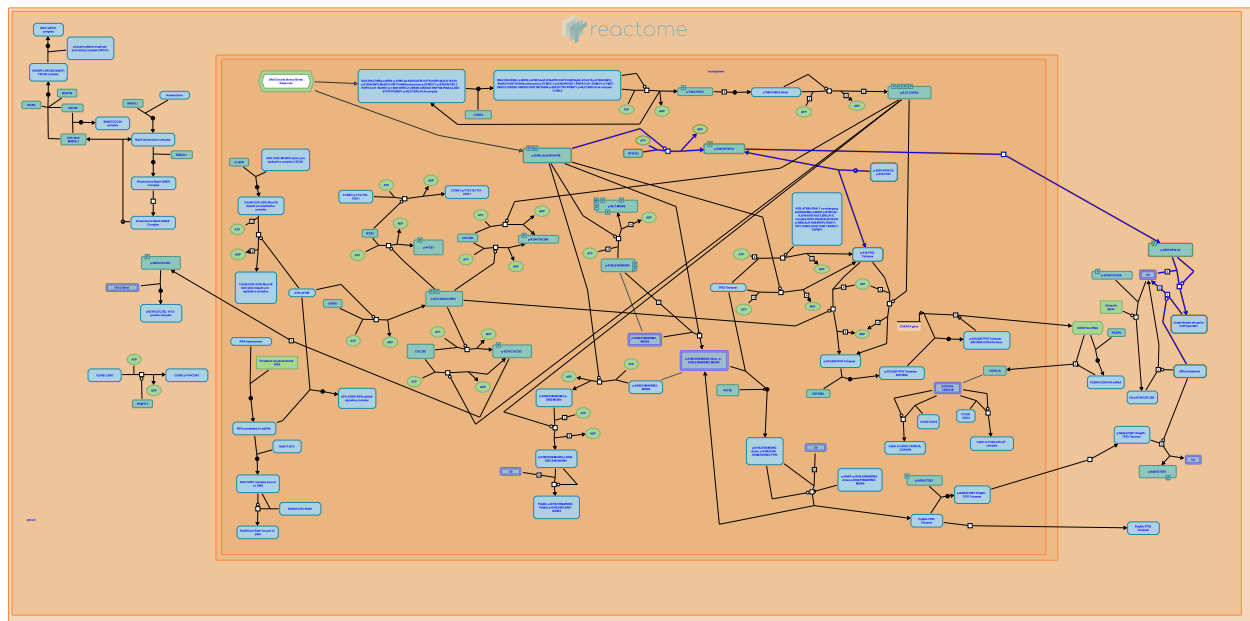
Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology*, 14, e1005968. [↗](#)

Reactome database release: 88

This document contains 1 pathway and 5 reactions ([see Table of Contents](#))

Autodegradation of the E3 ubiquitin ligase COP1 ↗

Stable identifier: R-HSA-349425



COP1 is one of several E3 ubiquitin ligases responsible for the tight regulation of p53 abundance. Following DNA damage, COP1 dissociates from p53 and is inactivated by autodegradation via a pathway involving ATM phosphorylation of COP1 on Ser(387), autoubiquitination and proteasome mediated degradation. Destruction of COP1 results in abrogation of the ubiquitination and degradation of p53 (Dornan et al., 2006).

Literature references

Dixit, VM., Shimizu, H., O'Rourke, K., Eby, M., Dornan, D., Dudhela, T. et al. (2006). ATM engages autodegradation of the E3 ubiquitin ligase COP1 after DNA damage. *Science*, 313, 1122-6. ↗

Editions

2008-06-13	Authored	Matthews, L.
2009-11-09	Edited	Matthews, L.
2009-11-17	Reviewed	Dixit, VM.

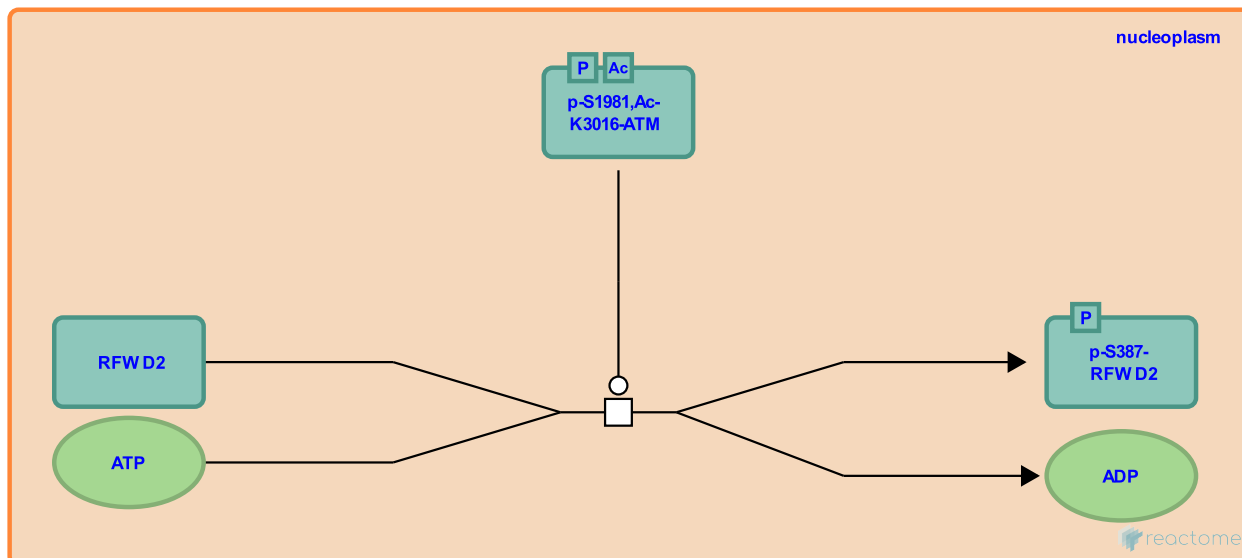
Phosphorylation of COP1 at Ser-387 by ATM ↗

Location: [Autodegradation of the E3 ubiquitin ligase COP1](#)

Stable identifier: R-HSA-349444

Type: transition

Compartments: nucleoplasm



ATM phosphorylates COP1 on Ser387 in response to DNA damage (Dornan et al., 2006).

Followed by: [Translocation of COP1 from the nucleus to the cytoplasm](#), [Dissociation of the COP1-p53 complex](#)

Literature references

Dixit, VM., Shimizu, H., O'Rourke, K., Eby, M., Dornan, D., Dudhela, T. et al. (2006). ATM engages autodegradation of the E3 ubiquitin ligase COP1 after DNA damage. *Science*, 313, 1122-6. ↗

Editions

2008-06-13	Authored	Matthews, L.
2009-10-22	Edited	Matthews, L.
2009-11-17	Reviewed	Dixit, VM.

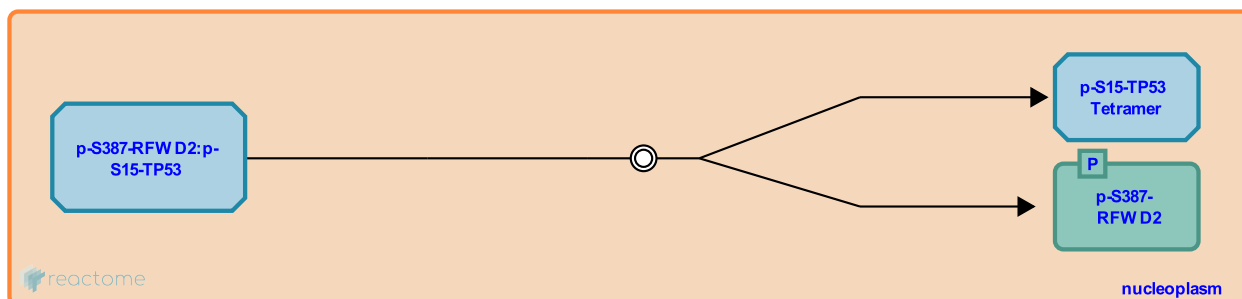
Dissociation of the COP1-p53 complex ↗

Location: [Autodegradation of the E3 ubiquitin ligase COP1](#)

Stable identifier: R-HSA-264435

Type: dissociation

Compartments: nucleoplasm



ATM-dependent phosphorylation of COP1 on Ser(387) results in disruption of the COP1-p53 complex (Dornan et al., 2006)

Preceded by: [Phosphorylation of COP1 at Ser-387 by ATM](#)

Followed by: [Translocation of COP1 from the nucleus to the cytoplasm](#)

Literature references

Dixit, VM., Shimizu, H., O'Rourke, K., Eby, M., Dornan, D., Dudhela, T. et al. (2006). ATM engages autodegradation of the E3 ubiquitin ligase COP1 after DNA damage. *Science*, 313, 1122-6. ↗

Editions

2008-06-13	Authored	Matthews, L.
2009-11-09	Edited	Matthews, L.
2009-11-17	Reviewed	Dixit, VM.

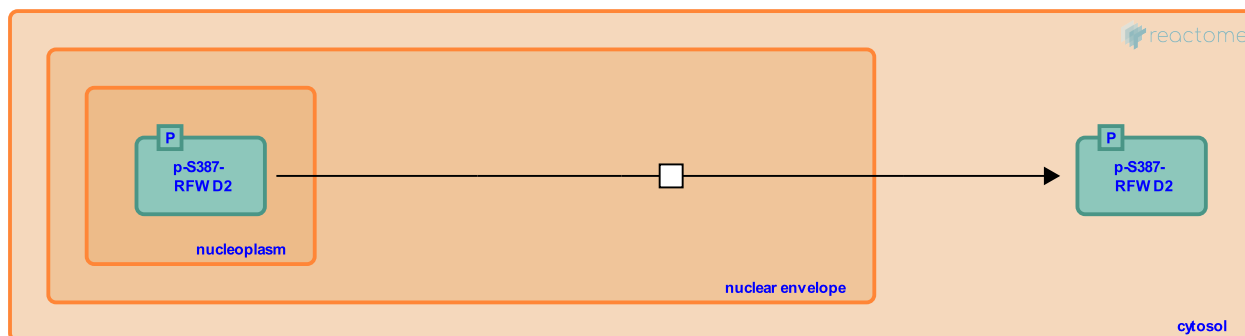
Translocation of COP1 from the nucleus to the cytoplasm ↗

Location: [Autodegradation of the E3 ubiquitin ligase COP1](#)

Stable identifier: R-HSA-264418

Type: transition

Compartments: nuclear envelope



Ionizing radiation results in an ATM-dependent movement of COP1 from the nucleus to the cytoplasm (Dornan et al., 2006).

Preceded by: [Dissociation of the COP1-p53 complex](#), [Phosphorylation of COP1 at Ser-387 by ATM](#)

Followed by: [Autoubiquitination of phospho-COP1\(Ser-387\)](#)

Literature references

Dixit, VM., Shimizu, H., O'Rourke, K., Eby, M., Dornan, D., Dudhela, T. et al. (2006). ATM engages autodegradation of the E3 ubiquitin ligase COP1 after DNA damage. *Science*, 313, 1122-6. ↗

Editions

2008-06-13	Authored	Matthews, L.
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2009-11-17	Reviewed	Dixit, VM.

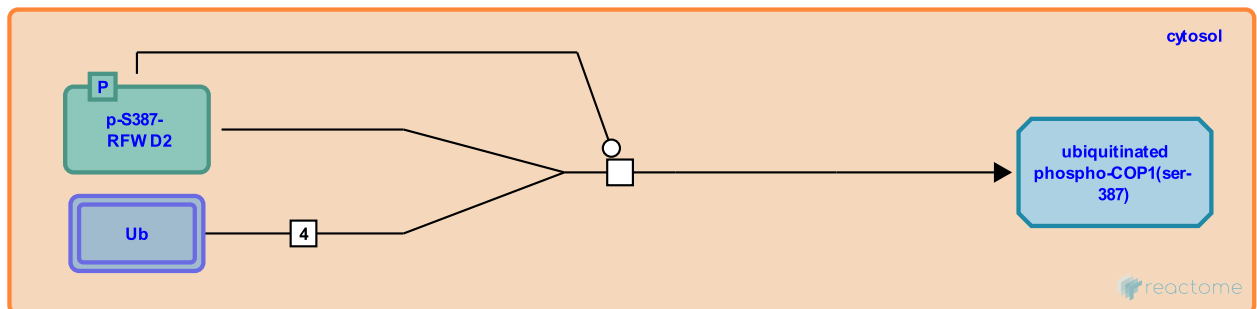
Autoubiquitination of phospho-COP1(Ser-387) [↗](#)

Location: [Autodegradation of the E3 ubiquitin ligase COP1](#)

Stable identifier: R-HSA-264444

Type: transition

Compartments: cytosol



ATM phosphorylation promotes autoubiquitination of COP1 in vitro (Dornan et al., 2006). The number of ubiquitin molecules shown in this reaction is set arbitrarily at 4.

Preceded by: [Translocation of COP1 from the nucleus to the cytoplasm](#)

Followed by: [Proteasome mediated degradation of COP1](#)

Literature references

Dixit, VM., Shimizu, H., O'Rourke, K., Eby, M., Dornan, D., Dudhela, T. et al. (2006). ATM engages autodegradation of the E3 ubiquitin ligase COP1 after DNA damage. *Science*, 313, 1122-6. [↗](#)

Editions

2008-04-30	Edited	Matthews, L.
2008-06-13	Authored	Matthews, L.
2009-11-17	Reviewed	Dixit, VM.

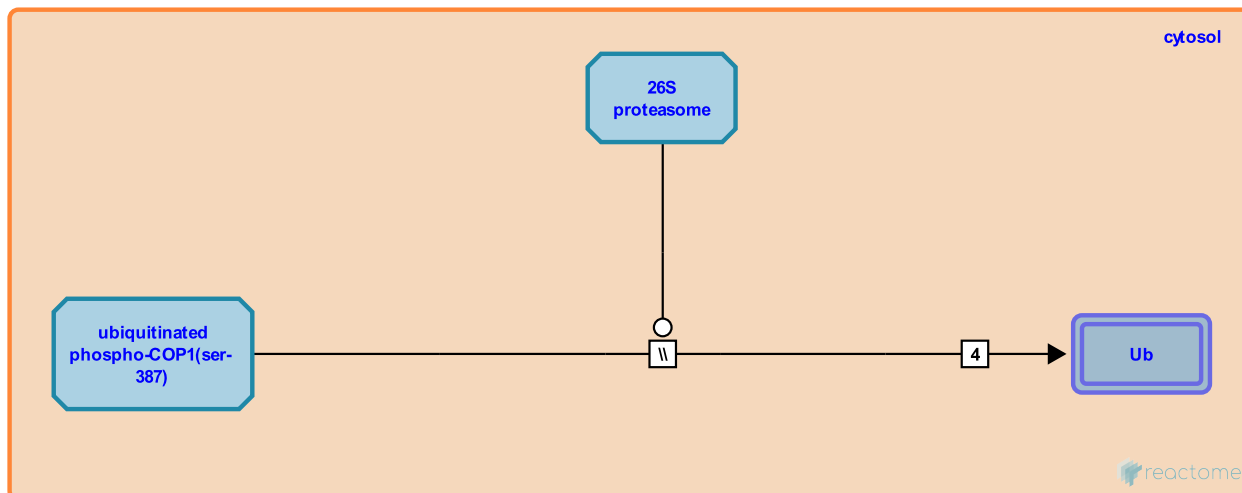
Proteasome mediated degradation of COP1 ↗

Location: [Autodegradation of the E3 ubiquitin ligase COP1](#)

Stable identifier: R-HSA-264458

Type: omitted

Compartments: cytosol



Autoubiquitinated COP1 is degraded by the proteasome. The number of ubiquitin molecules shown in this reaction is arbitrarily set at 4. (Dornan et al., 2006).

Preceded by: [Autoubiquitination of phospho-COP1\(Ser-387 \)](#)

Literature references

Dixit, VM., Shimizu, H., O'Rourke, K., Eby, M., Dornan, D., Dudhela, T. et al. (2006). ATM engages autodegradation of the E3 ubiquitin ligase COP1 after DNA damage. *Science*, 313, 1122-6. ↗

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2008-06-13	Authored	Matthews, L.
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