

# PRC2-EZH2 trimethylates nucleosomes associated with CDKN2A promoter

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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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Reactome database release: 74

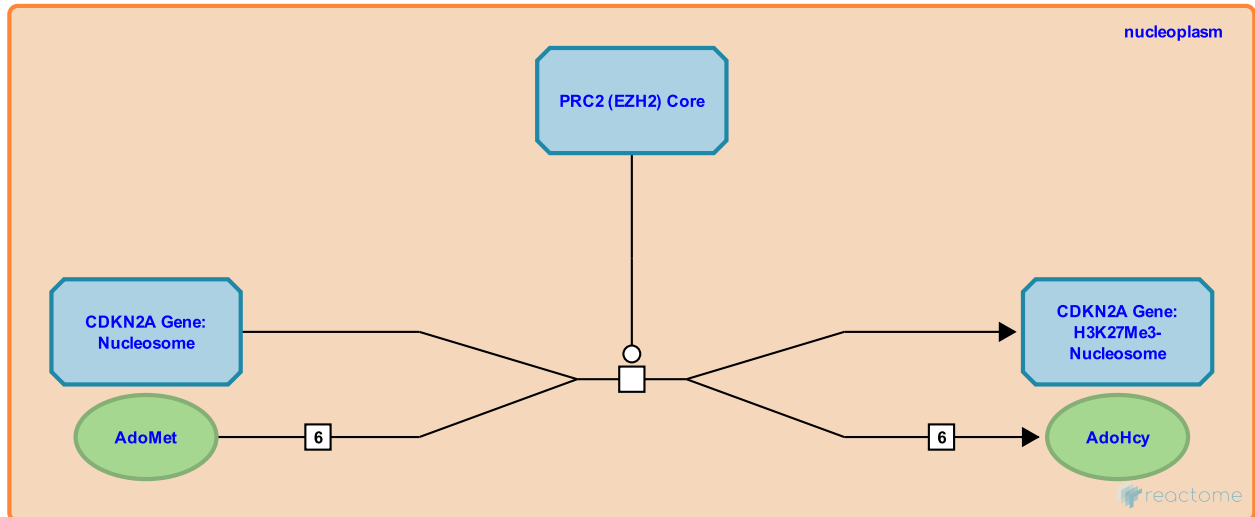
This document contains 1 reaction ([see Table of Contents](#))

## PRC2-EZH2 trimethylates nucleosomes associated with CDKN2A promoter [↗](#)

**Stable identifier:** R-HSA-3240295

**Type:** transition

**Compartments:** nucleoplasm



The Polycomb repressor complex 2 (PRC2) trimethylates histone HIST1H3A (H3) on lysine residue 28, producing an H3K27Me3 mark along the CDKN2A locus. The H3K27Me3 subsequently serves as a docking site for the PRC1.4 complex that includes BMI1 and CBX8 or CBX7 and acts to repress p16INK4A and, probably p14ARF transcription (Bracken et al. 2007). Proteins of the RB family may be involved in the regulation of enzymatic activity or the recruitment of PRC2 to the CDKN2A locus (Kotake et al. 2007). Conflicting results exist on the regulation of p14ARF expression by Polycomb group (PcG) proteins involved in the formation of PRC2 and PRC1. While p14ARF does not seem to be regulated by PcGs in human fibroblasts, in contrast to mouse embryonic fibroblasts - MEFs (Bracken et al. 2007), experiments on human CD34+ bone marrow cells (Bracken et al. 2007) and U2OS osteosarcoma cell line (Voncken et al. 2005) implicate PcGs in the regulation of p14ARF transcription.

### Literature references

Kotake, Y., Cao, R., Viatour, P., Sage, J., Zhang, Y., Xiong, Y. (2007). pRB family proteins are required for H3K27 trimethylation and Polycomb repression complexes binding to and silencing p16INK4alpha tumor suppressor gene. *Genes Dev.*, 21, 49-54. [↗](#)

Bracken, AP., Kleine-Kohlbrecher, D., Dietrich, N., Pasini, D., Gargiulo, G., Beekman, C. et al. (2007). The Polycomb group proteins bind throughout the INK4A-ARF locus and are disassociated in senescent cells. *Genes Dev.*, 21, 525-30. [↗](#)

### Editions

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