CDKN1A gene expression is stimulated by TFAP2A and repressed by TFAP2C

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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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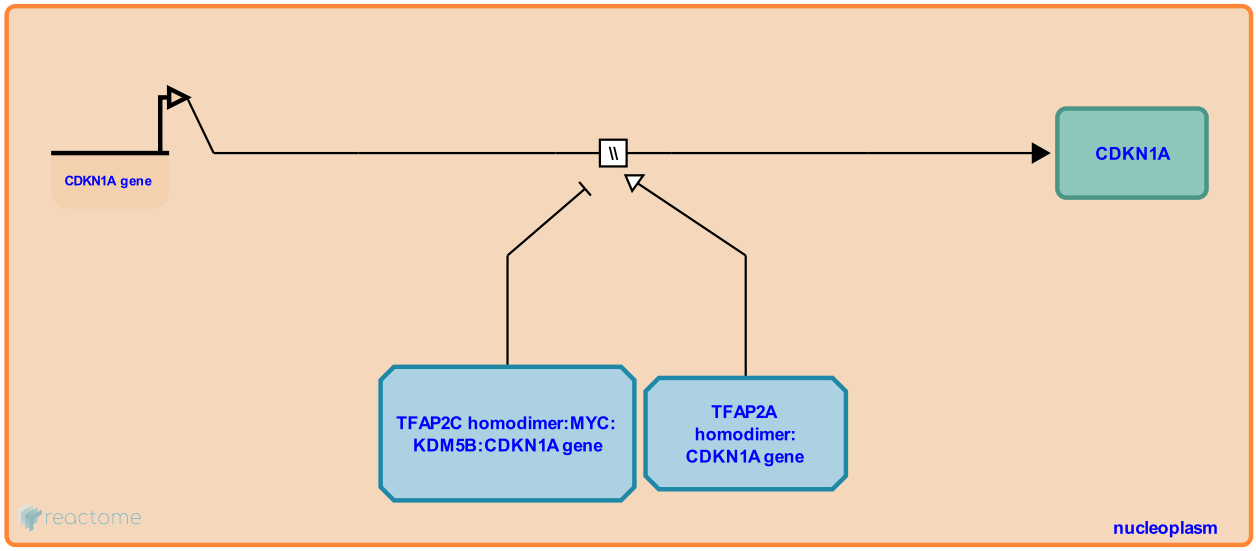
Stable identifier: R-HSA-8865256

Type: omitted

Compartments: nucleoplasm



The CDKN1A gene encodes cyclin dependent kinase inhibitor also known as p21 or WAF1 which can induce G1 cell cycle arrest.

Binding of TFAP2A (AP-2 alpha) transcription factor to the CDKN1A promoter results in the activation of CDKN1A expression in a TP53 (p53) independent manner, which may be important during development and differentiation (Zeng et al. 1997, Williams et al. 2009, Scibetta et al. 2010).

Binding of TFAP2C (AP-2 gamma) transcription factor to the proximal AP-2 response element in the CDKN1A promoter (Scibetta et al. 2010) results in repression of CDKN1A transcription. TFAP2C may recruit histone deacetylases, such as HDAC2 to the CDKN1A promoter (Williams et al. 2009). TFAP2C cooperates with its interaction partners MYC and KDM5B in repression of the CDKN1A gene transcription. The mechanism may involve KDM5B-mediated removal of activating histone methylation mark at H3K4 from nucleosomes at the CDKN1A promoter. In the absence of TFAP2C, MYC can recruit KDM5B to the CDKN1A promoter via an AP-2 independent MYC-binding site, but this results in a lower level of CDKN1A gene repression. TFAP2C-mediated repression of CDKN1A transcription promotes G1/S transition (Wong et al. 2012). In contradiction, it has been reported that TFAP2C may induce, instead of repress CDKN1A transcription (Li et al. 2006).

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Editions

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