PADI4 deiminates Histones

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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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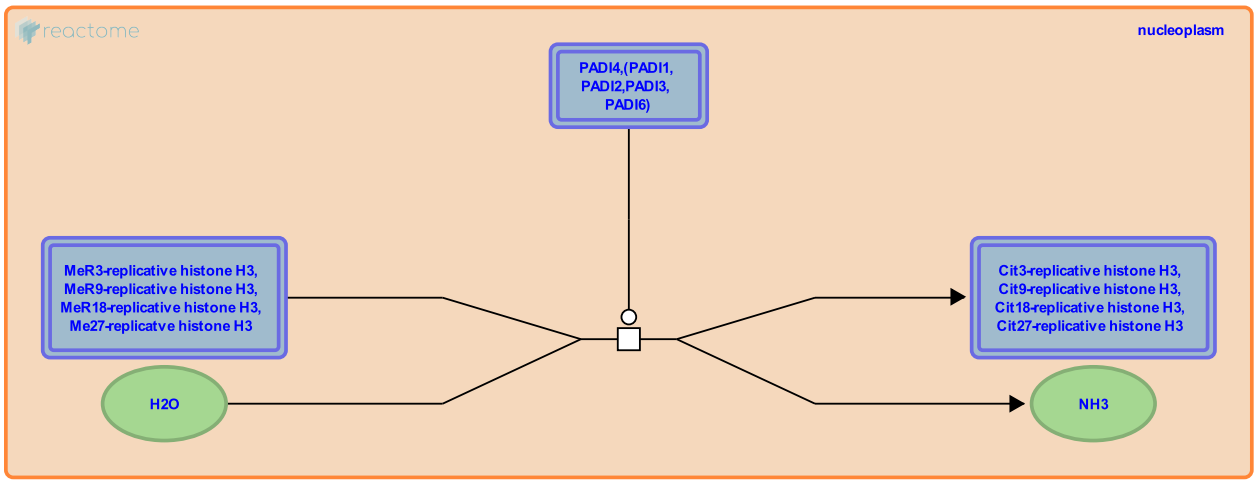
Stable identifier: R-HSA-3247569

Type: transition

Compartments: nucleoplasm



Peptidyl arginine deiminase (PADI) 4, PADI2 and PADI3 are able to convert peptidyl arginine to peptidyl citrulline. The guanidino group of arginine is hydrolyzed, yielding a ureido group and ammonia. This deimination (citrullination) mechanism is proposed as an alternative pathway for the reversal of arginine methylation (Cuthbert et al. 2004, Wang et al. 2004), whereby the methyl group was removed from a monomethylarginine residue by conversion of the residue to citrulline, releasing methylamine instead of ammonia. PADI4 was reported to specifically deiminate methylated arginine residues 3, 9, 18, and 27 in Histone H3, preventing arginine methylation by CARM1 (Cuthbert et al. 2004). Deimination may stabilize interactions between Histone H2A and H2B (Shimoyama et al. 2010).

Dysregulation of PADI activity is associated with a range of diseases, including rheumatoid arthritis (RA), multiple sclerosis, ulcerative colitis, neural degeneration, COPD, and cancer (Lange et al. 2011, McElwee et al. 2012).

Literature references

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Editions

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