Initiation of Nuclear Envelope Reforma-
tion

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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.

The development of Reactome is supported by grants from the US National Institutes of Health (P41 HG003751), University of Toronto (CFREF Medicine by Design), European Union (EU STRP, EMI-CD), and the European Molecular Biology Laboratory (EBI Industry program).

Literature references


Reactome database release: 69

This document contains 1 pathway and 3 reactions (see Table of Contents)

https://www.reactome.org
Initiation of Nuclear Envelope Reformation

Stable identifier: R-HSA-2995383

Reassembly of the nuclear envelope is initiated at late anaphase/early telophase when BANF1 (BAF) accumulates on the decondensing chromosome mass close to the spindle ('core' region), together with EMD (emerin), TMPO (LAP2beta), LEMD3 (MAN1), LEMD2 (LEM2) and lamin A (Haraguchi et al. 2008, reviewed by Guttinger et al. 2009).

Literature references


Editions

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ANKLE2 binds VRK1 or VRK2

**Location:** Initiation of Nuclear Envelope Reformation

**Stable identifier:** R-HSA-2995389

**Type:** binding

**Compartments:** cytosol, endoplasmic reticulum membrane

ANKLE2 (LEM4) is required for nuclear envelope formation in *C. elegans* and its function appears to be conserved in human cells. Both human LEM4 and the *C. elegans* ortholog bind VRK1 (and possibly VRK2), the kinase responsible for phosphorylation of BANF1 (BAF) in mitotic prophase, and inhibit VRK1 catalytic activity (Asencio et al. 2012).

**Literature references**


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**PP2A dephosphorylates BANF1**

**Location:** Initiation of Nuclear Envelope Reformation

**Stable identifier:** R-HSA-2995388

**Type:** transition

**Compartments:** cytosol, endoplasmic reticulum membrane

The PP2A complex that contains the regulatory subunit B55-alpha (PPP2R2A) is the only phosphatase essential for mitotic exit (Schmitz et al. 2010). The PP2A complex is necessary for BANF1 (BAF) dephosphorylation in late mitotic anaphase. ANKLE2 (LEM4) binds the PP2A complex that contains the B55-alpha regulatory subunit and facilitates BANF1 dephosphorylation, but as ANKLE2 does not interact with BANF1 (BAF) directly, the exact mechanism has not been determined (Asencio et al. 2012).

**Followed by:** BANF1 binds chromatin, EMD/TMPO/LEMD3/LEMD2 and lamins

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BANF1 binds chromatin, EMD/TMPO/LEMD3/LEMD2 and lamins

Location: Initiation of Nuclear Envelope Reformation

Stable identifier: R-HSA-2995376

Type: binding

Compartments: cytosol, chromosome, nuclear envelope

In late anaphase/early telophase, dephosphorylated BANF1 (BAF) accumulates at a specialized region of the separated chromosome mass, close to the spindle. This region is known as the 'core' and is the central region of the assembling nuclear rim. At the 'core', BANF1 (BAF) binds chromatin, LEM-domain proteins of the inner nuclear membrane (EMD i.e. emerin, TMPO i.e. LAP2beta, LEMD3 i.e. MAN1, LEMD2 i.e. LEM2) and lamins, which initiates the reassembly of the nuclear envelope around separated sister chromatids. LEM-domain proteins and lamin A accumulate at the 'core' in a BANF1-dependent manner (Haraguchi et al. 2001, Haraguchi et al. 2008, Asencio et al. 2012).

Preceded by: PP2A dephosphorylates BANF1

Literature references


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Table of Contents

Introduction

- Initiation of Nuclear Envelope Reformation
  - ANKLE2 binds VRK1 or VRK2
  - PP2A dephosphorylates BANF1
  - BANF1 binds chromatin, EMD/TMPO/LEMD3/LEMD2 and lamins

Table of Contents