SUMO-p-N protein dimer binds genomic RNA

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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


Reactome database release: 77

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N protein is synthesized in the cytosol of the host cell and then moves adjacent to the endoplasmic reticulum-Golgi intermediate compartment (ERGIC) membrane, where mature virions are assembled. The primary function of the SARS-CoV nucleocapsid (N) protein is to encapsulate the positive-strand 5'-capped genomic RNA into a nucleocapsid for export. Nucleocapsid formation is dependent on multiple weak protein-protein and protein-RNA interactions (reviewed in Chang et al, 2014).

The SARS-CoV N protein has globular N-terminal and C-terminal domains separated by three intrinsically disordered regions (IDRs) (Chang et al, 2006; Chang et al, 2009). N protein forms a weak dimer in the absence of RNA mediated by residues in the middle and C-terminal IDR (He et al, 2004a; Luo et al, 2006; Chang et al, 2005; Surjit et al, 2004; Yu et al, 2005; Chang et al, 2006; Chang et al, 2013; Surjit and Lal, 2008). Positive residues in the middle IDR are subject to phosphorylation, which may affect the function of N (Surjit et al, 2005; Peng et al, 2008).

Binding of the genomic RNA to one or a small number of N-N dimers may be the initiating event in nucleocapsid formation. Both the NTD and the CTD of N have been shown to have RNA-binding activity (Huang et al, 2004a; Huang et al, 2004b; Chen et al, 2007; Chang et al, 2009; Takeda et al, 2008), and the IDRs seem likely to also contribute (Chang et al, 2009). These initial binding events may nucleate nucleocapsid formation through further recruitment of N protein dimers (reviewed in Chang et al, 2014).

**Literature references**


**Editions**

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