Pih1p-Tah1p Puts a Lid on Hexameric AAA+ ATPases Rvb1/2p

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Introduction

The baker's yeast *Saccharomyces cerevisiae* (Sc) R2TP complex affords an Hsp90-mediated and nucleotide-driven chaperone activity to proteins of small ribonucleoprotein particles (snoRNPs). The current lack of structural information on the ScR2TP complex, however, prevents a mechanistic understanding of this biological process.

Experimental

We characterized the structure of the ScR2TP complex made up of two AAA+ ATPases, Rvb1/2p, and two Hsp90 binding proteins, Tah1p and Pih1p, and its interaction with the snoRNP protein Nop58p by a combination of analytical ultracentrifugation, isothermal titration calorimetry, chemical crosslinking, hydrogen-deuterium exchange monitored by NHMFL's 21 T Fourier transform ion cyclotron resonance mass spectrometry, and cryoelectron microscopy methods..

Results and Discussion

We find that Pih1p-Tah1p interacts with Rvb1/2p cooperatively through the nucleotide-sensitive domain of Rvb1/ 2p. Nop58p further binds Pih1p-Tahp1 on top of the dome-shaped R2TP. Consequently, nucleotide binding releases Pih1p-Tah1p from Rvb1/2p, which offers a mechanism for nucleotide-driven binding and release of snoRNP intermediates.

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Reference

[1] Tian, S., *et al.*, Structure, **25**, 1519–1529.e1–e4 (2017).