SFB 960-/BZR – Kolloquium
Donnerstag, 07.03.19 14:00 Uhr
H 53 (Neubau Biologie)

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"*Insights into protein-RNA recognition from the La-related protein superfamily*"

La was first identified as a polypeptide component of ribonucleic protein complexes targeted by antibodies in autoimmune patients and is now known to be a eukaryote cell-ubiquitous protein. Structure and function studies have shown that La binds to a common terminal motif, UUU-3'-OH, of nascent RNA polymerase III (RNAP III) transcripts and protects them from exonucleolytic decay. For precursor-tRNAs, the most diverse and abundant of these transcripts, La also functions as an RNA chaperone that helps to prevent their misfolding. Related to this, we review evidence that suggests that La and its link to RNAP III were significant in the great expansions of the tRNAomes that occurred in eukaryotes. Four families of La-related proteins (LARPs) emerged during eukaryotic evolution with specialized functions. We provide an overview of the high-resolution structural biology of La and LARPs. LARP7 family members most closely resemble La but function with a single RNAP III nuclear transcript, 7SK, or telomerase RNA. A cytoplasmic isoform of La protein as well as LARPs 6, 4, and 1 function in mRNA metabolism and translation in distinct but similar ways, sometimes with the poly(A)-binding protein, and in some cases by direct binding to poly(A)-RNA. New structures of LARP domains, some complexed with RNA, provide novel insights into the functional versatility of these proteins. We also consider LARPs in relation to ancestral La protein and potential retention of links to specific RNA-related pathways. One such link may be tRNA surveillance and codon usage by LARP-associated mRNAs. WIREs RNA 2017, 8:e1430. doi: 10.1002/wrna.1430 For further resources related to this article, please visit the WIREs website.

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