Pozvánka na přednášku

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From DNA to Protein I a II

3. a 4. května od 13:00 v přednáškovém sále UMG AV ČR v Krči.

Ukázka některých prací autorky:

Nuclear retention of mRNAs - quality control, gene regulation and human disease. Wegener M, Müller-McNicoll M., Semin Cell Dev Biol. 2017 Nov 21.

Nuclear retention of incompletely spliced or mature mRNAs emerges as a novel, previously underappreciated layer of gene regulation, which enables the cell to rapidly respond to stress, viral infection, differentiation cues or changing environmental conditions. We discuss recent insights into the mechanisms and functions of nuclear retention, describe retention-promoting features in protein-coding transcripts and propose mechanisms for their regulated release into the cytoplasm. We discuss examples of how aberrant nuclear retention of mRNAs may lead to human diseases.

Fractionation iCLIP detects persistent SR protein binding to conserved, retained introns in chromatin, nucleoplasm and cytoplasm. Brugiolo M, Botti V, Liu N, Müller-McNicoll M, Neugebauer KM., Nucleic Acids Res. 2017

RNA binding proteins (RBPs) regulate the lives of all RNAs from transcription, processing, and function to decay. How RNA-protein interactions change over time and space to support these roles is poorly understood. Towards this end, we sought to determine how two SR proteins-SRSF3 and SRSF7, regulators of pre-mRNA splicing, nuclear export and translation-interact with RNA in different cellular compartments. To do so, we developed Fractionation iCLIP (Fr-iCLIP), in which chromatin, nucleoplasmic and cytoplasmic fractions are prepared from UV-crosslinked cells and then subjected to iCLIP. As expected, SRSF3 and SRSF7 targets were detected in all fractions, with intron, snoRNA and lncRNA interactions enriched in the nucleus. Cytoplasmically-bound mRNAs reflected distinct functional groupings, suggesting coordinated translation regulation. Surprisingly, hundreds of cytoplasmic intron targets were detected. These cytoplasmic introns were found to be highly conserved and introduced premature termination codons into coding regions. However, many intron-retained mRNAs were not substrates for nonsense-mediated decay (NMD), even though they were detected in polysomes. These findings suggest that intron-retained mRNAs in the cytoplasm have previously uncharacterized functions and/or escape surveillance.