



PREDAVANJE/LECTURE

## Dr. Ira Alexandra IOSUB

The Francis Crick Institute, London, UK  
UK Dementia Research Institute, London, UK

**Petek / Friday, 9.12.2022 ob / at 15:00**

Velika predavalnica / Great Lecture Hall  
Kemijski inštitut / National Institute of Chemistry, Ljubljana

### **Computational approaches for exploring functional relationships between 3'UTR structure and mRNA metabolism**

The structure of mRNA molecules plays an important role in its interactions with RNA binding proteins (RBPs). However, current transcriptome-wide experimental methods to chart these interactions, including hiCLIP (that maps RNA duplexes bound to RBPs), are limited by their poor sensitivity.

We present Tosca, a Nextflow computational pipeline for the processing, analysis and visualisation of proximity ligation sequencing data generally. Using this pipeline, we extended hiCLIP atlas of duplexes bound by Staufen1 (STAU1) ~10-fold, through careful consideration of experimental assumptions. We discovered novel insights into the RNA selectivity of STAU1, revealing the importance of structural symmetry and duplex-span-dependent nucleotide composition. Furthermore, we identified heterogeneity in the relationship between STAU1-bound 3' UTRs and metabolism of the associated RNAs that we relate to RNA structure: transcripts with short-range proximal 3' UTR duplexes have high degradation rates, but those with long-range duplexes have low rates. Overall, our work enables the integrative analysis of proximity ligation data delivering insights into specific features and effects of RBP-RNA structure interactions.



Info: [jernej.ule@ki.si](mailto:jernej.ule@ki.si) and [tajda.klobucar@ki.si](mailto:tajda.klobucar@ki.si)

Vljudno vabljeni / Kindly invited