



40th TBI

Winterseminar in Bled

In silico identification of peptides encoded by small ORFs contained in lncRNAs

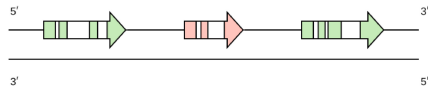
Rafael T. do Nascimento

PhD candidate

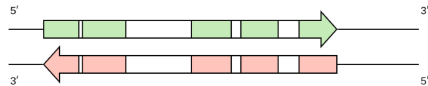
Department of Biochemistry - Institute of Chemistry
University of São Paulo

February 12, 2025

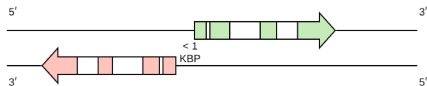
Background



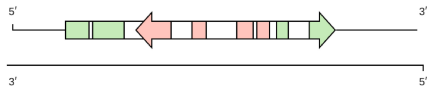
a. Long Intergenic Noncoding RNA (LincRNA)



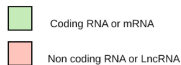
b. Antisense RNA



c. Bidirectional RNA



d. Intronic RNA



Background

5'-UTR of mRNAs



Overlapping with mRNAs



3'-UTR of mRNAs



Pri-miRNAs



Circular RNAs



Long non-coding RNAs

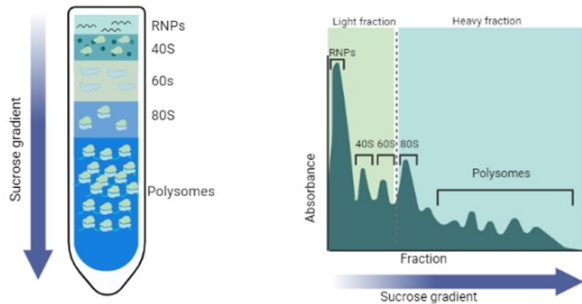


Ribosomal RNAs



Background

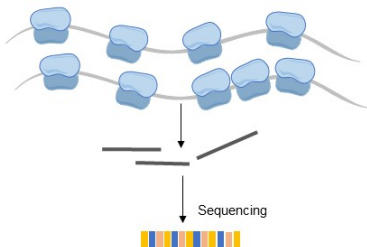
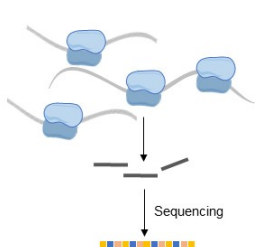
A



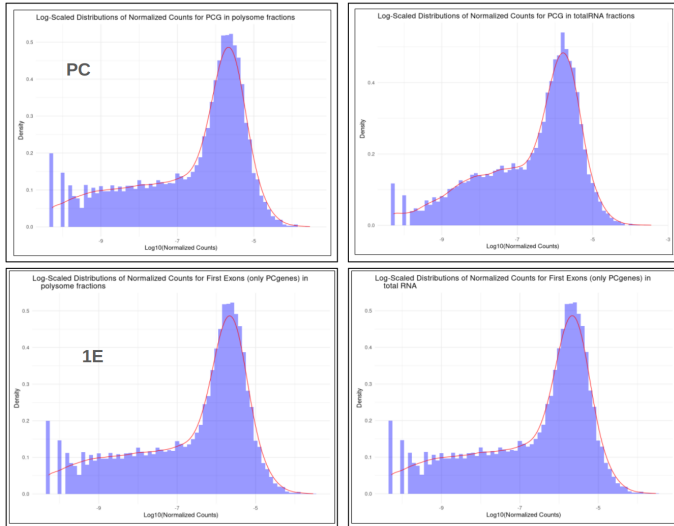
B

Light fraction

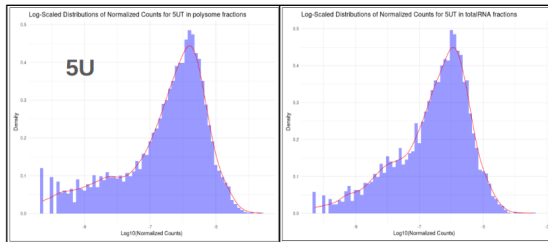
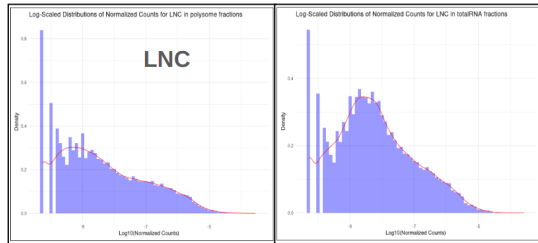
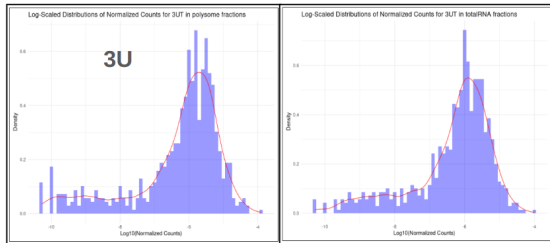
Heavy fraction



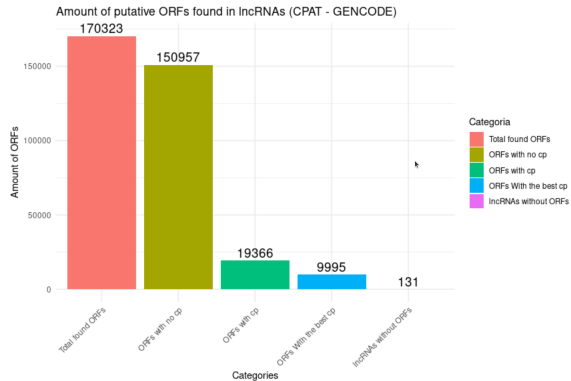
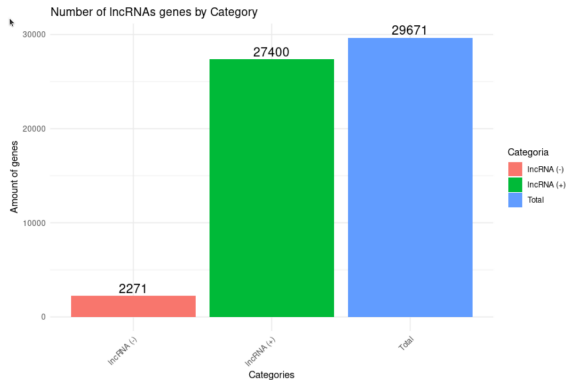
Some Results - Looking for translation signs



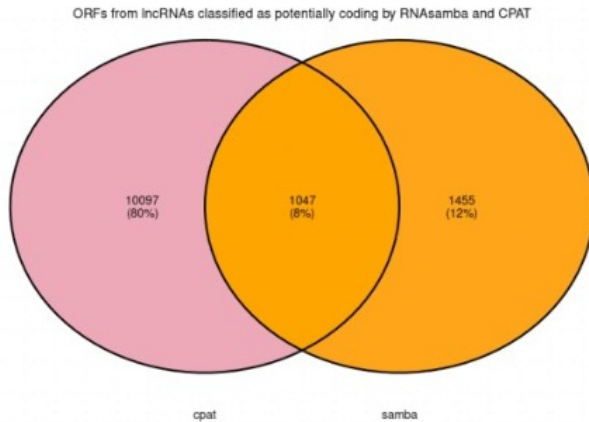
Some Results - Looking for translation signs



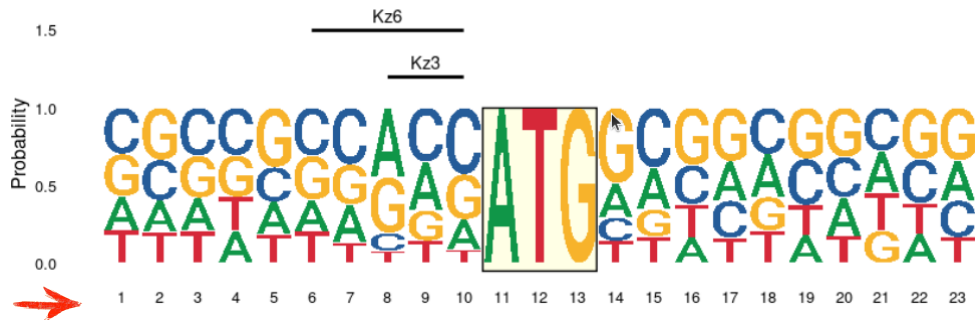
Some Results - Coding Potential - IncRNA



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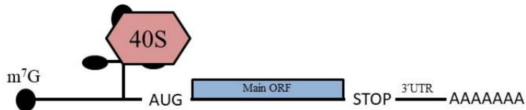


Some Results - RNA motifs as Features: Kozak sequeces

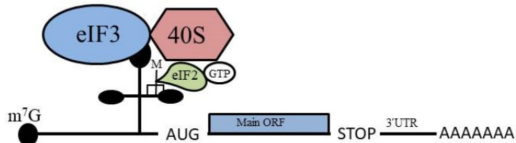


Some Results - RNA motifs as Features: IRES sequences

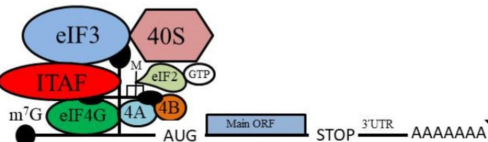
A



B



C

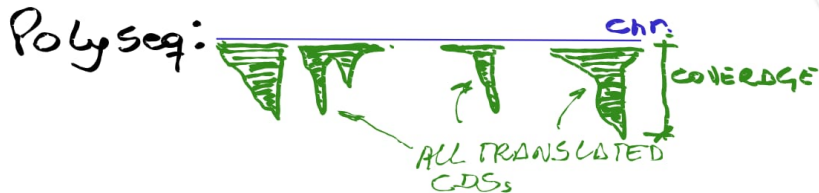
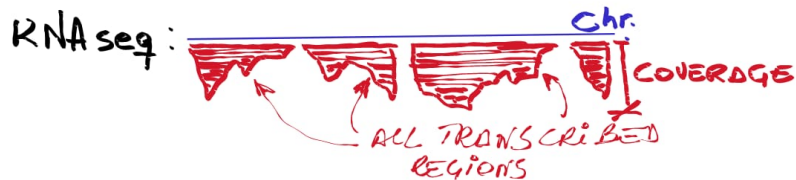


Decreased IRES structure

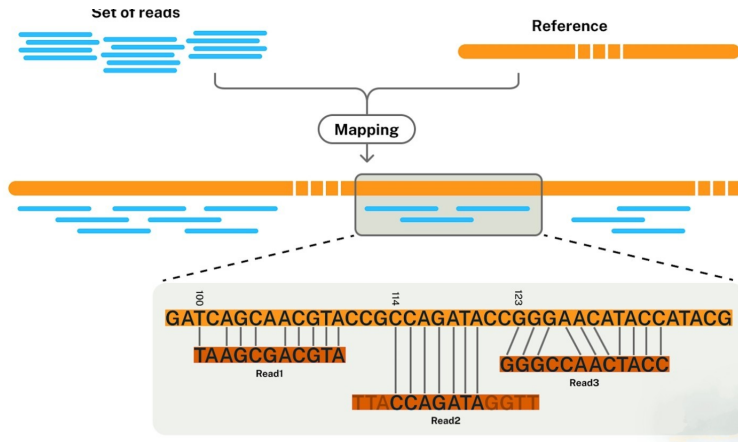
Increased need for *trans*-acting factors

The trick of the trade - polysome-based features

IN GENERAL:



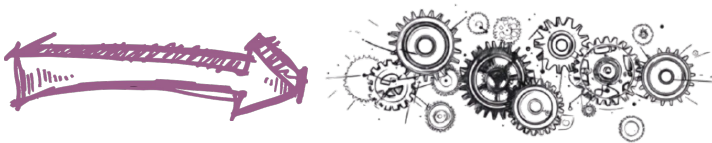
The trick of the trade - polysome-based features



The trick of the trade - Polysome-based features

ML models training

Features



Our goal is to create a ML model to distinguish between SEP-encoding lncRNAs in a regular RNAseq data, since the training will be based on experimentally validated peptides and polyseq data.

Thanks to Collaborators and Research Funding Agencies



Prof. Dr. Joao Carlos Setubal



Prof. Dr. Peter F. Stadler



1



Prof. Dr. Eduardo E. M. Reis



Dr. rer. nat. Stephan Bernhart



Perrita and Hannah also say
'Thank you for
your attention;

