Presenter: Feng Jiang

Authors: FENG JIANG, Omar Hedaya, Peng Yao

Title: mRNA translation-regulatory function of RNA-binding protein PRRC2B

Abstract

Cap-dependent translation driven by eukaryotic initiation factors EIF4G2 and EIF3 has been identified as a widespread form of translation alternative to the canonical EIF4G1-mediated cap-dependent translation. One potential protein relevant to this alternative translation is Pro-rich Coiled-coil Containing Protein 2B (PRRC2B), which interacts with translation initiation factors EIF4G2 and EIF3 but not EIF4G1. Considering that information about this protein is limited, we decided to perform extensive biochemical characterization in HEK-293T cells, which can serve as the basis for pinpointing its potential role in EIF4G2-mediated cap-dependent translation. Through UV-crosslinking co-immunoprecipitation (CLIP) of PRRC2B followed by RNase T1 digestion, we observed direct binding to RNA and association with specific cellular translation initiation factors, most notably EIF4G2 and EIF3, suggesting a potential involvement in mRNA translation. This notion is further supported by our sucrose density fractionation experiments showing the association of PRRC2B with polysomes. PRRC2B knockout and knockdown HEK-293T cells were generated by genetic manipulations to elucidate the functional role of PRRC2B in mRNA translation. Polysome profiling coupled with next-generation RNA deep sequencing studies in these cells shows an increase in mRNA translation efficiency for a cohort of mRNAs. Whether these changes are through direct regulation remains unclear; therefore, further studies are needed to identify PRRC2B bound mRNA targets and determine the molecular mechanism of translational control.