

The Riha lab, as part of the INTEG-RNA project, aimed to decipher the role of the evolutionarily conserved helicase UPF1 in regulating translation processes in plants. Our strategy is centred on employing cutting-edge technology to investigate RNA-protein interactions in plant systems. Specifically, we took on the challenge of implementing advanced methods, including ribosome profiling (Ribo-seq), RNA-protein interaction analyses (RIP/CRAC), and single-molecule RNA fluorescence in situ hybridisation (RNA-FISH). We conducted Ribo-seq and RNA-seq experiments in plants using wild-type (control) and UPF1-null plants to generate libraries for high-throughput sequencing of ribosome-bound RNA fragments. Simultaneously, RNA-seq libraries were prepared from the same experiment.

Despite the formidable challenges encountered in establishing Ribo-seq in plants, significant progress was achieved, providing valuable insights even from unsuccessful attempts. Our future efforts will concentrate on optimizing this experiment, and we plan to continue our collaborative work with Junior-Prof. Dr. Marie-Luise Winz to enhance the effectiveness of Ribo-seq in plant systems. Additionally, we successfully established an RNA-protein interaction method (RIP-seq) in the lab, which will contribute to understanding the RNA partners binding to UPF1 in future studies. Within the project's vision, the lab successfully implemented single-molecule RNA FISH in plant protoplasts in collaboration with an external partner, Yiliang Ding from the UK.

The lab showcased its work at international conferences, with Vivek Raxwal and Neha Shukla presenting their findings in Croatia at the EMBO workshop titled "RNA meet protein turnover" on May 23-26, 2023. Vivek received the best poster presentation award at this meeting. Furthermore, Surendra Sadala and Jana Faturova presented their work at the Biochemical Society meeting "RNA Granules 2023" in the UK on October 9-11, 2023, and abstract of Jana Faturova was selected for oral presentation. PhD students from the lab also presented their work and engaged with peers during the institute's postdoc-PhD retreat. On August 3-4, 2023, Neha Shukla participated in a professional development conference hosted by The Institute of Molecular Biology in Mainz, Germany. The conference provided comprehensive training in diverse job sectors, equipping attendees with the skills to excel in interviews and compose effective cover letters and CVs tailored for various scientific positions.