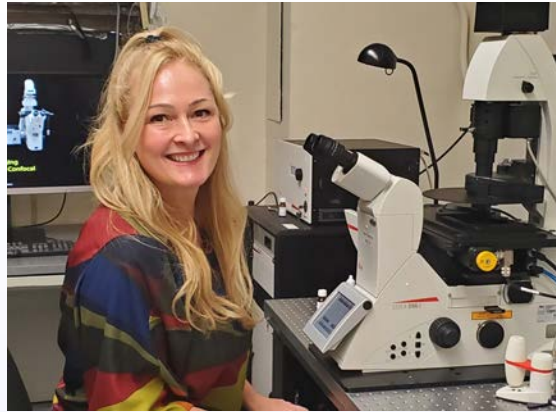


Hunter College of the City University of New York
Department of Biological Sciences
Fall 2023 Inga Richter Seminar Series

Livia Bayer, PhD
Hunter College



Cup is essential for *oskar* mRNA translational repression during early *Drosophila* oogenesis

In eukaryotic cells, a large discrepancy between the transcriptome and the proteome underlies the need to better understand gene regulation at the post-transcriptional level. Regulation of messenger RNAs (mRNA) begins in the nucleus, continues through export into the cytoplasm and ultimately ends in translation. In the Bratu lab, we use the fruit fly egg chambers to better understand the regulation of mRNAs at the post transcriptional level. In *D. melanogaster*, the posterior mRNA determinant, *oskar*, is transcribed maternally but translated only when properly localized at the oocyte's posterior cortex. Two effector proteins, Bruno1 and Cup, mediate steps of *oskar* mRNA regulation. The previous/current model in the field identified Bruno1 as necessary for Cup's recruitment to *oskar* mRNA and indispensable for *oskar*'s translational repression. I will share our results based on which we propose a new model where even though these factors stably associate with the *oskar* mRNA throughout oogenesis, Cup, not Bru1, is the essential factor in the repression of *oskar* mRNA translation. Furthermore, Bru1 and Cup ensure each other's appropriate expression at both mRNA and protein levels. I will also share our findings that Cup is necessary for mRNA stability and P-bodies maintenance. P-bodies, which are cytoplasmic biomolecular condensates, are crucial members of the growing array of membraneless organelles, evidenced by the recent report that as many as one-third of mRNAs localize into P-bodies. Initially identified as sites of mRNA turnover, more recent work has also revealed their role in mRNA storage. Since P-body dysregulation has been associated with numerous diseases and proper development, it is crucial for us to better understand how these membraneless organelles form and function, which is the current interest of our lab.

Monday, Nov. 20, 2023 @12:30pm
Hunter North Room 926
Host: Diana Bratu