

# MBG FOCUS TALK

Hosted by Torben Heick Jensen

**Monday 30 September 2024 @ 13:00-13:45**  
Faculty Club (1870-816)



## Laura Lorenzo-Orts

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### Molecular mechanisms of egg dormancy

Eggs are quiescent cells that contain all the components needed to sustain the first embryonic divisions. In particular, the storage of maternal ribosomes and mRNAs in the egg is critical for early development, as transcription is silenced in the oocyte and resumes only later in the embryo. During my postdoc, I have identified two mechanisms that contribute to the storage of ribosomes and mRNAs in the zebrafish oocyte and early embryo. Using mass spectrometry, cryo-electron microscopy and functional assays, we identified four conserved factors that bind to maternal ribosomes and contribute to their repression and stability, defining a new developmentally programmed state of the ribosome. In a second line of investigation, I studied how maternal mRNAs, which are largely deadenylated during oogenesis, are stored in the oocyte. While deadenylation is coupled to mRNA decay in somatic cells, poly(A) tail shortening of maternal mRNAs does not affect mRNA stability, but translation. We have discovered an essential role for the germline-specific cap-binding protein eIF4E1b in the storage of maternal mRNAs with short poly(A) tails in P-bodies. Overall, my research provides new mechanistic insights into post-transcriptional gene regulation and opens new possibilities for studying translational dynamics during early vertebrate development.