Expression of and regulation by *nanos* in *Drosophila* early embryos

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Abstract

Post-transcriptional regulation plays a fundamental role to ensure that proteins are precisely produced in both time and space. Three categories of cytoplasmic post-transcriptional regulation that modulate mRNA stability, subcellular localization, and translation are coordinated to precisely control when and where a protein is expressed. In *Drosophila*, subcellular mRNA localization and local translation occur during oogenesis and early embryogenesis playing fundamental roles in determining the body axes and specifying the germline. Nanos protein is one of the determinants of early body pattern and germ cell function whose subcellular localization is accomplished through local translation of its transcripts in the posterior germ plasm. I quantified Nanos protein in early embryos at closely spaced stages and revealed that *nanos* mRNA is indeed translated at the posterior pole of embryos. I then tested the role of an RNA binding protein, Staufen, as an activator of *nos* translation and my data suggest competitive binding of the RNA-binding protein Smaug and Staufen to *nanos* mRNA. I further started to uncover the role of Nanos in target transcript regulation as a co-factor together with the RNA-binding proteins Pumilio and Brain Tumor.