Sample Abstract – *Cell Biology*

Abstract Title: A novel microtubule nucleation pathway for meiotic spindle assembly in oocytes

The meiotic spindle in oocytes is assembled in the absence of centrosomes, the major microtubule nucleation sites in mitotic and male meiotic cells. A crucial, yet unresolved question in meiosis is how spindle microtubules are generated without centrosomes and only around chromosomes in the exceptionally large volume of oocytes. We hypothesized that oocytes have an alternative Augmin-independent pathway which recruits the γ-tubulin complex onto the spindle microtubules through Grip71. To test this hypothesis, an antibody was raised against Grip71 and used to immunostain mature WT oocytes which naturally arrest in metaphase I. We also hypothesized that these two pathways may act complementarily to assemble spindle microtubules. To test this, both Subito and Wac were simultaneously depleted from oocytes by expressing shRNA against Subito in ovaries of the wac null mutant. Here we report a novel oocyte-specific microtubule nucleation pathway that is essential for assembling most spindle microtubules complementarily with the Augmin pathway. This pathway is mediated by the kinesin-6 Subito/MKlp2, which recruits the γ-tubulin complex to the spindle equator to nucleate microtubules in Drosophila oocytes. Away from chromosomes, Subito interaction with the γ-tubulin complex is suppressed by its N-terminal region to prevent ectopic microtubule assembly in oocytes. We further demonstrate in vitro that the Subito complex from ovaries can nucleate microtubules from pure tubulin dimers. Collectively, microtubule nucleation regulated by Subito drives spatially restricted spindle assembly in oocytes.

KEY

Abstract contains sufficient background to understand the problem under investigation

Abstract must contain a hypothesis, objective or statement about the problem under investigation

Abstract must contain a brief statement of the experimental methods/methodology used

Essential results must be present in summary form (even if preliminary)

Abstract must contain a conclusion that explains how the work contributes to the hypothesis, objective or statement of problem

Abstract Source: Romé R. et. al. (2018). *Journal of Cell Biology* 218(8) DOI: 10.1083/jcb.201803172.