NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

SEMINAR

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Hosted by Dr Lu Gan

Mechanisms regulating microtubules in mitosis.



From the Welburn lab website: *Julie did her PhD in Structural Biology of the regulation of cell cycle complexes in the LMB, University of Oxford with Prof Jane Endicott and Prof Martin Noble. She spent one year in Eva Nogales's laboratory at UC Berkeley to further study mitotic protein complexes by electron microscopy. She joined the Cheeseman lab, at the Whitehead Institute and MIT, Boston, in 2008 to pursue cell biology and biochemical studies on mitosis. Julie moved in April 2012 to the Wellcome Trust Centre for Cell Biology, Edinburgh to start the lab and continues to work on cell division. She is also uncovering mechanisms of molecular transport.*

By **Julie Welburn**

Wellcome Trust Centre for Cell Biology, University of Edinburgh, Scotland, UK

Mitosis is a highly regulated process that allows equal distribution of the genetic material to the daughter cells. Chromosome segregation requires the formation of a bipolar mitotic spindle composed of highly dynamic microtubule polymers, and assembly of a multi-protein structure termed the kinetochore to mediate attachments between the condensed chromosomes and spindle microtubules. The regulation of microtubules to ensure the capture, alignment and segregation of chromosomes is critical to maintaining genomic integrity. Our work focuses on the molecular mechanisms underlying microtubule and motors function to ensure faithful mitosis. I will present our work on how mitotic microtubule motors control microtubule length, spindle shape and positioning. We recently discovered that motors cooperate in human cells, to generate a microtubule-length dependent regulation of microtubules, challenging the current models that predict how microtubule length is controlled. This discovery explains how cells can dramatically remodel their cytoskeleton as the cells enter mitosis.

Artwork by Ann Nee, DBS, NUS