Alex Thomas
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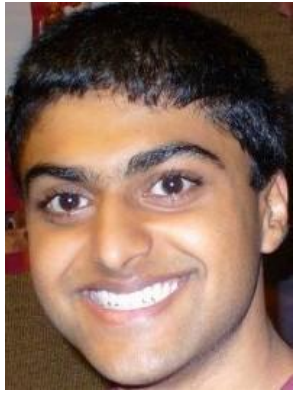
Mentor: Judith Berman; Genetics, Cell Biology and Development

Motor Protein Dynamics During Cell Division Metaphase



Microtubules (MTs) are essential for cellular development. They provide structure and transport for organelles in the cell in addition to having a fundamental role in mitosis, the process by which the genetic material in the eukaryotic cell is separated during cell division. This research project explores the molecular dynamics of the mitotic spindles and will attempt to understand the role of several MT motor proteins during cell reproduction. MT dynamics have been extensively studied in the model yeast *Saccharomyces cerevisiae.* Several proteins have been identified and well documented to assist the mitotic spindle. One pair of these proteins is the kinesin-5 motor proteins, Kip1 and Cin8. The presence of at least one of the two is essential for the cell to divide. Studies with *S. cerevisiae* developed the hypothesis that kinesin-5 motor proteins largely influence the length of mitotic spindles during cell division. This project uses a similar yeast, *Candida Albicans,* which can form longer cell shapes than *S. cerivisiae. C. albicans* adds the extra dimension of providing the more quantitative measurements of mitotic spindle length regulation in the presence and absence of kinesin-5 proteins. The project consists of creating *C. albicans* strains expressing different levels of Kip1 and then using microscopy to measure fluorescently tagged microtubules during cell division metaphase. Wild type Kip1 strains have been analyzed in *C. albicans* in bud and hyphal (long and narrow cells) forms. The microscopy and measurements conducted will be important in testing the generality of the hypothesis that the role of kinesin-5 regulates spindle length.

Poster Number: Session: