Study on the Mechanism Underlying CENP-E Mediated Mitochondrial Movement in Mitosis

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The purpose of this project is to reveal the mechanism of CENP-E (a microtubule dynamic protein) mediated mitochondrial dynamics during mitotic process, and to interpret the difference between the two inhibitors of CENP-E. We use Delta Vision for live cell imaging experiment and we use drug treatment to observe the mitotic process under inhibitor conditions. Based on the live cell imaging we use plasmid transfection to introduce GFP-mito (to locate the mitochondria) and mCherry-H2B (to locate chromosomes) into the cells. We found that CENP-E activity is inhibited by two structurally unrelated chemicals, but the accurate mechanism remains unclear. Besides, the chemical-biology analysis through Molecular Docking implied that there may be differences in the mechanism of these two CENP-E inhibitors, GSK923295 and Syntelin function. Using these chemical tools, we are going to explore the mechanism underlying CENP-E mediated organelle movement. In conclusion, our preliminary work established a platform to study CENP-E function in mitochondrial dynamics. Our future plan is to explore how CENP-E operates mitochondrion movements in mitosis and delineate the function.