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Project title: Microtubule-mediated mitochondrial dynamics in Fission Yeast

SUMMARY:

Microtubules have been known to mediate dynamics of mitochondria in mammalian cells. They are also known to mediate an ordered mechanism of inheritance of mitochondria by daughter cells when a mammalian cell undergoes division by mitosis. However, the precise mechanism of mitochondrial partitioning during mitosis have not been studied much. Fission yeast cells employing the unique mechanism of closed mitosis for cell division act as an ideal model organism to understand and characterize the effect on mitochondrial dynamics caused due to absence of microtubules, observed during elongation of mitotic spindle in closed mitosis and also to understand the mechanism of inheritance of equal number of mitochondria by the daughter cells upon cell division. Long microtubules are suspected to affect the mitochondrial dynamics of cells. Hydroxyurea (HU) when administered in low doses to cells with deletions of Kinesin-8 Klp5 and Klp6 proteins from their genome, leads to formation of long cells, long microtubules and suppressed mitochondrial dynamics. Thus, such cells act as model systems for the study of the effect of dynamics of long microtubules on the mitochondrial dynamics.