

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
2A & 2B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

Org. by

School of Mathematical & Computational Sciences

Speaker: Prof. Santanu Ghosh, Dept. of Biosciences and Bioengineering, IIT Bombay

Date & time: 17.01.2020 (Friday), 2:30 pm

Venue: C V Raman Hall

Title: Meiosis-specific functions of kinesin motors in maintenance of chromosome integrity

Abstract: Faithful chromosome segregation relies on assembly of the kinetochore complex that acts as a bridge between the centromere and the spindle microtubule. Kinesin motors provide forces at the kinetochore-microtubule interface for capturing/orientation/alignment of the sister chromatids (or homologs in meiosis) in prophase/metaphase and for poleward movement of the chromosomes during anaphase. Despite elucidation of the functions of kinesins in mitosis, their roles in meiosis are poorly explored. Given the temporal and mechanistic differences between mitosis and meiosis in spindle assembly/disassembly, kinetochore maturation and sister chromatid alignment and disjunction, we hypothesize that the kinesin motors might have some functions in meiosis not observed in mitosis. Interestingly, we found, unlike mitosis, assembly of mature kinetochore depends on the Cin8 (kinesin 5) motor in meiosis. We further observed that in contrast to mitosis, Cin8 (kinesin 5) and Kip3 (kinesin 8) together are indispensable in meiosis. Unexpectedly, examining the meiosis in *cin8Δ kip3Δ* cells, we detected chromosome breakage in the meiosis II cells. To address the reason for the breakage, we found that the double mutant exhibits delay in the cohesin removal and spindle elongation during anaphase I. Consequently, some cells abrogate meiosis II and form dyads while some, as they progress through meiosis II, cause defect in chromosome integrity. We believe that in the latter cells, an imbalance of spindle mediated force and simultaneous persistent cohesin on the chromosomes cause their breakage. We provide evidence that tension generated by Cin8 and Kip3 through microtubule cross-linking is essential for signaling efficient cohesin removal and maintenance of chromosome integrity during meiosis

All are cordially invited to attend the seminar.