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TEMASEK LIFESCIENCES LABORATORY

27 August 2019 (Tuesday), 3.30pm
The Auditorium (Level 1)

Hosted by: Dr Naweed Naqvi

Structural and functional properties of fungal centromeres

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Kaustuv Sanyal obtained Master of Science in Biotechnology from Madurai Kamaraj University, the PhD degree from Bose Institute (Kolkata) and a postdoctoral fellowship at the University of California, Santa Barbara, USA. He is professor in Molecular Biology and Genetics Unit at the JN Centre for Advanced Scientific Research. The major focus of his research is to understand the mechanism of chromosome segregation using various yeasts, both pathogenic and non-pathogenic, as model systems. He is also interested in the mechanism of genome indexing in unicellular organisms by histone variants and had contributed significantly in these research areas by publishing several papers and reviews.

In spite of performing the conserved function of chromosome segregation, centromeres are known to be evolving rapidly in all forms of life. Centromeres are not only species-specific but also often lack any centromere-specific DNA sequence across chromosomes in a given species. Hence, the process of centromere formation relies on the transfer of epigenetic information from one generation to the next. One of the key molecules that defines centromeres in most organisms is a centromere-specific histone variant CENP-A. I will describe three short stories based on our work on centromeres in a number of pathogenic fungal species. First, I will provide evidence that suggests that the CENP-A recruitment at the centromeres in *Candida albicans* (phylum Ascomycota) is spatiotemporally defined. Second, studies from centromeres of several related *Malassezia* species (phylum Basidiomycota), we identified an evolutionary transition event that caused 'death' of a centromere during speciation. Finally, I will describe centromere features of an ancient basal fungus *Mucor circinelloides* (phylum Mucoromycota). *Mucor* lost CENP-A, but unlike many CENP-A-less insects, did not transition to holocentricity.

Recent Publications:

1. Rai L, Singha M, Sanchez H, Chakraborty T, Chand B, Bacheller-Bassi S, Chowdhury S, d'Enfert C, Andes D, **Sanyal K** (2019) **PLOS Biology** 17: e3000422

2. Yadav V, Fan Y, Reza H, Liu S, Valent B, **Sanyal K**, Naqvi, N (2019) **mBIO** 10: 201581-19

3. Varshney N, Som S, Chatterjee S, Sridhar S, Bhattacharyya D, Paul R, **Sanyal K** (2019) **PLOS Genetics** 15: e1007959