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18 August 2022 (Thursday), 4pm
The Auditorium (Level 1)

Hosted by: Dr Naweed Naqvi

A novel phylogenetically restricted mitotic progression factor is essential for viability of the human pathogen Candida albicans

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Chromosomal instability is a major cause of antifungal drug resistance in human pathogens. I will present our recent effort in identifying potential mechanisms underlying such instability by conducting a medium throughput gene overexpression screen monitoring chromosomal stability in the human fungal pathogen Candida albicans. Analysis of more than a thousand genes uncovers six potential regulators. We termed them as chromosomal stability (CSA) genes, five of which are known to be associated with cell division in other organisms. The sixth gene, CSA6, appears to be present only in species belonging to the CUG-Ser clade, which includes C. albicans and other human fungal pathogens. The protein encoded by CSA6 localizes to the spindle pole bodies and induces a checkpoint-dependent metaphase arrest upon overexpression. On the other hand, cells depleted of Csa6 are unable to exit mitosis. Together, Csa6 is an essential cell cycle progression factor that is restricted to the CUG-Ser fungal clade and could therefore be explored as a potential antifungal target.

Kaustuv Sanyal is JC Bose National Fellow, Professor and Chair of the Molecular Biology and Genetics Unit at the JN Centre for Advanced Scientific Research in Bengaluru. He is also a visiting professor at Osaka University. His laboratory studies chromatin organization, chromosome structure-function and molecular factors that regulate high fidelity chromosome segregation. He has been working in these areas for more than two decades and contributed significantly. He is an elected fellow of the American Academy of Microbiology, Indian National Science Academy, Indian Academy of Sciences, the National Academy of Sciences. He is a nominated member of the faculty of 1000 (F1000Prime), UK. He has been awarded the Tata Innovation Fellowship (2017 – 2020) and the National Bioscience Award and research grant (2012 – 2015) by the Department of Biotechnology (India). Currently, he leads a group consisting of graduate students and postdoctoral researchers, and actively collaborates with many scientists across disciplines.

Recent Publications:

1. Jaitly P, Legrand M, Das A, Patel T, Chauvel M, Maufrais C, d'Enfert C, **Sanyal K**; A phylogenetically-restricted essential cell cycle progression factor in the human pathogen Candida albicans. Nature Communications (2022) in press
2. Sridhar S, Hori T, Nakagawa R, Fukagawa T, **Sanyal K;** Bridgin connects the outer kinetochore to centromeric chromatin. Nature Communications (2021) 12: 146.
3. Sreekumar L, Kumari K, Guin K, Bakshi A, Varshney N, Thimmappa BC, Narlikar L, Padinhateeri R, Siddharthan R, **Sanyal K;** Orc4 spatiotemporally stabilizes centromeric chromatin. Genome Research (2021) 31:607- 621.