Cancer Science Institute of Singapore

Distinguished Speakers' Series 2017

Anindya Dutta

Harry F. Byrd Professor and Chair
Biochemistry and Molecular Genetics
University of Virginia School of Medicine



ORC, MCM9 and microDNAs: Questioning Paradigms

Date: **Mon, 25 Sept 2017**
Time: **11am – 12pm**
Venue: **Auditorium, Level 1, Clinical Research Centre (MD11)**
(10 Medical Drive, Singapore 117597)
Host: **Dr Sudhakar Jha**

Abstract:

The six-subunit origin recognition complex (ORC) is the bed-rock on which rests all current models of DNA replication initiation. MCM8-9, close homologs of the MCM2-7 replicative helicase, have themselves been implicated in DNA replication. All the nuclear DNA in our cells is encoded in long unchanging chromosomes faithfully passed from mother to daughter cells. I will discuss whether we need to revise all three of these paradigms central for genomic stability. Genetic studies in mammalian cancer cells identifies cells that can survive and replicate without ORC2, or ORC5, two of the central subunits of ORC. Mice and cancer cells can survive and replicate without MCM9, and reveal an unexpected role of MCM9 not in supporting DNA replication, but in supporting homologous recombination. Finally, the discovery of tens of thousands of small extrachromosomal circles of DNA, microDNAs, identifies a new repository of DNA in our cells and of inter-cellular variation of the genome.

Biography:

Dr. Dutta is the Harry F. Byrd Professor and Chair of Biochemistry and Molecular Genetics and Professor of Pathology at the University of Virginia School of Medicine. He has trained at Christian Medical College, Vellore (M.B.B.S.), Rockefeller University (Ph.D.) , Cold Spring Harbor Laboratory (Postdoctoral Fellow) and Brigham and Women's Hospital, Harvard Medical School (Residency in Pathology). He was Asst. and Assoc. Professor of Pathology at BWH before moving to UVA. His research interests cover genomic instability in cancer cells and noncoding RNAs in differentiation and cancer. His laboratory identified many of the replication initiation proteins in human cells, used genomics technology to identify hundreds of origins of replication in human chromosomes, discovered a major mechanism by which human cells prevent over-replication of their DNA, and identified a novel class of circular DNA present in normal mammalian cells His laboratory has also discovered many microRNAs and long noncoding RNAs that regulate cancer progression or promote differentiation and discovered a novel class of small RNAs called tRFs. He has trained over thirty scientists who continue research in academia or industry, and has received the following honors: Elected Fellow of the AAAS, Ranbaxy Award for studies on genome instability and the Outstanding Investigator Award of the American Society for Investigative Pathology.