Biomedical Sciences Institutes
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p53 Laboratory Seminar Announcement

- All Are Welcome -



Speaker: **Prof Ian Hickson**
Director, Centre for Chromosome Stability,
University of Copenhagen, Denmark

Title : **Defining How Problematic DNA Replication Impacts On Chromosome Segregation**

Date : **6 February 2018 (Tuesday)**

Time : **10am – 11am**

Venue : **Breakthrough Theatrette, Matrix Level 4, Biopolis**

Host : **Dr Cheok Chit Fang**
Principal Investigator, Institute of Molecular and Cell Biology (IMCB)

Abstract:
Research in the Hickson Laboratory is focused on understanding how chromosomal instability impacts on human disease. They study genes in human cells that, when mutated, lead to defective genome maintenance and high rates of cancer, neurodegeneration or infertility. Many of the genes studied play roles in DNA repair, but others are regulators of stress responses that arise when the genome is damaged. In recent years, his research has focused on understanding how problems arising during DNA replication generate aneuploidy and other mitotic abnormalities. This work led to the discovery of ultra-fine DNA bridges (UFBs), which are thin threads of DNA that connect the separating sister DNA masses in anaphase. They cannot be stained with DNA dyes and do not contain histones, making their detection problematic and dependent on immunofluorescence for associated proteins such as PICH or BLM (the Bloom's syndrome gene product). However, they are very abundant, and are a feature of all anaphases. UFBs arise from specific loci that are characterized by the unusual sequence or structure: most notably, centromeres, the rDNA, telomeres and common fragile sites (CFSs). We are conducting a detailed analysis of two aspects of UFB biology: modeling the association of proteins to UFBs *in vitro* using optical tweezers, and investigating how unresolved UFBs affect cell division. In addition, through analysis of the underlying basis of UFB formation in human cells, we identified that CFSs and telomeres are still undergoing DNA synthesis in early mitosis in a process we term MiDAS. MiDAS depends upon a subset of homologous recombination factors, such as RAD52, and appears to be a form of break-induced replication. The latest progress on these projects will be presented.

About the Speaker:
Prof Ian Hickson was trained at the Universities of Leicester and Newcastle upon Tyne, UK, and took up his first independent group leader position in the Cancer Research Unit at Newcastle University. He then moved to the University of Oxford to become a Senior Scientist in the Weatherall institute of Molecular Medicine, before becoming the Deputy Director of the Oxford Cancer Centre and Professor of Molecular Oncology. In 2010, he moved to the University of Copenhagen, Denmark, to take up the position of Professor of Molecular Aging and Programme Leader in the Centre for Healthy Ageing. In 2015, he became the Director of the Centre for Chromosome Stability (CCS) there. Ian Hickson has published over 250 articles, and has accumulated more than 13,000 citations (with an H-index of 79). He has received several awards, the most important of which are his election to The European Molecular Biology Organization (EMBO), and to Fellowships with the Academy of Medical Sciences (UK) and The Royal Society (UK). His research is funded largely by the Danish National Research Foundation, who established the CCS as a Center of Excellence. He also holds an Advanced Grant from the European Research Council.