NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

VIRTUAL BIOLOGY COLLOQUIUM

Friday, 29 Jan 2021 | 4pm | Online Zoom Session

Hosted by A/P Lu Gan

When and How Are Centromeres Established and Maintained?

By **Karen Wing Yee Yuen**

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The centromere is the unique region on each chromosome that assembles the kinetochore, which then attaches to microtubules and ensures accurate chromosome segregation in mitosis and meiosis. There should be one and only one centromere on each chromosome, even though the size of the centromere varies widely, ranging from ~125-bp point centromeres in budding yeast, to megabase-size regional centromeres in human cells, to holocentromeres along the chromosome in nematodes, some plants and insects. Having no centromere or more than one centromere will be detrimental, leading to chromosome missegregation and potentially chromosome instability. How centromere function is regulated by genetic and epigenetic means is not fully understood. How new centromeres can be formed in pathological conditions or on newly introduced artificial chromosomes is not clear. Our lab utilizes the budding yeast and *C. elegans* as model organisms, and we have discovered that centromere transcription contributes to the epigenetic environment and plays an important role in both centromere maintenance and establishment in different contexts. Too little or too much centromere transcription in budding yeast will disrupt centromere function. I will discuss how we visualize centromeric RNA in budding yeast, and how the chromatin environment dynamically changes during centromere establishment in *C. elegans.*

About the Speaker

Dr. Yuen is currently an Associate Professor in School of Biological Sciences at the University of Hong Kong. She completed her PhD in Phil Hieter's Laboratory in Department of Medical Genetics at University of British Columbia, Canada. Then, she received Hong Kong Croucher Fellowship to pursue post-doctoral training in Arshad Desai's Laboratory at Ludwig Institute for Cancer Research/University of California, San Diego, USA. Her research focuses on conserved cellular mechanisms that ensure faithful chromosome segregation, including epigenetic regulation of centromere, kinetochore, and sister chromatid cohesion. Her lab applies cell biology, genetic, genomics and synthetic biology approaches in different models to answer these fundamentally important and medically relevant questions. Dr. Yuen's work will facilitate the understanding of the causes of chromosome instability in diseases and advance the engineering of stable artificial chromosomes as cloning vectors.

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