Research Theme:
Research Project Title: **Multidisciplinary approach to redefine chromosome condensation models**
Principal Investigator/Supervisor: A/P Li Hoi Yeung
Co-supervisor/ Collaborator(s) (if any):
Project Description Successful completion of mitosis largely depends on the dramatic reorganization of chromatin at the start of the cellular division process. Chromosomes were discovered as subcellular structures more than a century ago. Even so, the chromosome structure as well as the mechanisms governing the compaction of the chromosomes remain ambiguous. Previous models of chromosome organization have been postulated based on commonly used techniques like the light and electron microscopy as well as standard biochemical tests. However, findings from recent studies of the mitotic chromosome using new approaches have put these classical models into question. Current models theorizing the patterns and phases of chromosome compaction and reorganization during mitosis is still under debate. In this study, we want to decipher the macromolecular architecture of the mitotic chromosomes and the condensation process by studying the spatial and temporal recruitment of condensins to the chromosome and how it correlates with the compaction and structural transitions of chromosomes during early stages of mitosis. By combining super-resolution microscopy together with electron microscopy and computational modeling, we hope to provide new insights to this process and also to better understand the roles of condensin I in the early stages of mitosis.
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