

The Goodman Cancer Research Centre Seminar Series 2016-17

Invited Seminar Speaker

Thursday, June 22, 2017
12:00 PM – 1:00 PM
Cancer Research Building
Karp Conference Room 501



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Translational control of cancer associated cell stress responses

A major theme of my laboratory is to study how different stresses of the tumour microenvironment, including oxidative stress, hypoxia, nutrient deprivation, and genotoxic stress, affect the progression of childhood cancers. Each stress form is potentially lethal unless tumour cells can acutely adapt to it. However, effective stress adaptation can render cells hardier, potentially leading to the emergence of clones with aggressive phenotypes, including metastatic capacity. Adaptation has been widely attributed to genetic and epigenetic mechanisms. However, recent studies including our own suggests that acute stress adaptation occurs in large part through rapid changes in mRNA translation, the last step of protein synthesis. We postulate that adaptation of tumour cells to microenvironmental stress through altered mRNA translation and protein synthesis leads to clonal selection and increased metastatic capacity. We have therefore been probing mechanisms by which childhood cancer cells activate stress responses as an adaptive response, focusing on the role of stress granules by the YB-1 RNA binding protein and altered translation elongation by the eEF2K translation inhibitor in this process. We hope that by studying these mechanisms, we will be able to identify new therapeutic targets in aggressive childhood cancers that might not otherwise be evident using genomic methodologies.