Biology Seminar

Western
UNIVERSITY · CANADA

12:30 - 1:30 pm
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WSC 240

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Coping with stress and disease – co-chaperones, the unsung heroes of protein quality control

Life as we know it cannot exist without properly folded proteins as each protein needs to fold into a defined three-dimensional conformation in order to function properly. Protein folding can be challenged by numerous environmental and genetic assaults resulting in misfolded proteins that are usually dysfunctional and often toxic. Also, protein misfolding is a hallmark of many age-related neurodegenerative diseases, including Alzheimer's disease, Parkinson's disease (PD), and ALS (amyotrophic lateral sclerosis) Cellular protein quality control, i.e. all mechanisms involved in protein synthesis, maintenance, and degradation, has evolved in all living cells to protect cells from the detrimental consequences of protein misfolding. Molecular chaperones and heat shock proteins are key players in cellular protein quality control as they facilitate proper protein synthesis, maintenance, and degradation. The central molecular chaperones Hsp70 and Hsp90 function together with many specific co-chaperones. Of note, these co-chaperones control specific cellular functions and determine specific client protein interactions. Using yeast models, mammalian cells, and in vitro biochemistry, we seek to elucidate how Hsp70 and Hsp90 co-chaperones modulate protein misfolding under stress, in aged cells, and in neurodegeneration.

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