UNIVERSITY of GUELPH

COLLEGE of BIOLOGICAL SCIENCE

DEPARTMENT OF MOLECULAR AND CELLULAR BIOLOGY

Seminar SPEAKER SERIES

2022-2023

NOV **WED 23** **1 30 PM** | **SSC 2315**

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Topic: Exploring conformational dynamics of biological supramolecular machines using methyl-TROSY NMR spectroscopy

Dr. Rui Huang received her BSc degree in Chemistry from Peking University, China, and completed her PhD at the University of Michigan where she was trained in protein NMR spectroscopy under the supervision of Prof. Ayyalusamy Ramamoorthy. She then continued her postdoctoral research under a CIHR fellowship in Prof. Lewis Kay's laboratory at the University of Toronto. Dr. Huang joined the Department of Chemistry at the University of Guelph as an Assistant Professor in 2020.

Cellular activities reply on proper functioning of a myriad of large biomolecular complexes. To understand the mechanisms by which these molecular machines work, it is crucial to obtain structural information as well as detailed characterization of their conformational dynamics. Conventional solution nuclear magnetic resonance (NMR) spectroscopy is limited to biomolecules with an upper size limit of ~40kDa; yet, with the development of solution NMR methodology and isotope labeling schemes in the recent decades, we can tackle large biomolecular complexes of up to 1 MDa molecular weight, allowing investigation into challenging biological supramolecular machines. Here we will present examples of using methyl-TROSY NMR to uncover structural and mechanistic details of large biomolecular complexes. We will focus on our previous and on-going work on an AAA+ protein, p97, which is a highly conserved molecular machine involved in a number of cellular functions and has emerged as a promising target for cancer therapy. We have revealed cooperative conformational interconversion of its N-terminal domain and the implication in cofactor binding. We also characterized the complex between p97 and its adaptor protein p47, the complex of which plays an indispensable role in Golgi membrane fusion after mitosis. In addition, we will present our current efforts towards further defining the assembling and subunit exchange process of the p97 complex, as well as probing the mechanisms of two other AAA+ machines, human mitochondrial AAA proteases and bacterial DnaA.

All welcome to attend

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