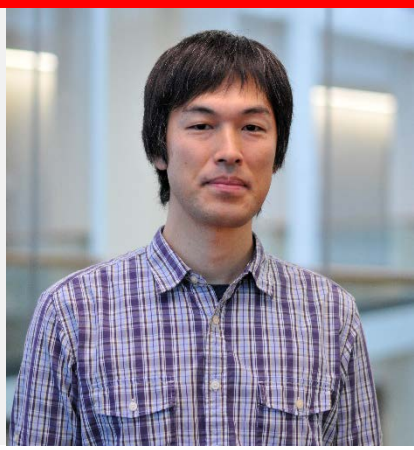
McGill

Department of Anatomy and Cell Biology

Recruitment Seminar



HIROSHI YAMAMOTO, PhD

Charité - Universitätsmedizin Berlin *(Berlin University of Medicine)*
Institute of Medical Physics and Biophysics

Wednesday, April 3, 2019

11:30 am

Room 2/36
Strathcona Anatomy Building
3640 University Street

"Mechanism of ribosome, a macromolecular machine, in protein synthesis"

Translation is the conversion of genetic information encoded in mRNA into protein by the ribosome, with domain and species-specific adaptations at the structural and functional levels. The 80S eukaryotic ribosome is composed of a small and a large subunit (40S and 60S, respectively), which undergo four general translation steps: initiation, elongation, termination and recycling. Initiation is a particularly regulated step in the eukaryotic system, where at least twelve eukaryotic initiation factors (eIFs) are necessary to convert the 40S subunit to an elongation-competent 80S complex. The bacterial system requires only three initiation factors.

In contrast to the high degree of initiation-assisted translation required by most eukaryotic cellular mRNAs, the translation of hepatitis C virus (HCV) and cricket paralysis virus (CrPV) RNA requires reduced set or none of eIFs, instead of employing a special cis-acting RNA element - internal ribosome entry site (IRES). IRES RNAs form a tertiary structure and directly bind to the 40S subunit upstream of the AUG start codon, bypassing the requirement for eIFs during 40S scanning to find the AUG. In this seminar, I will talk about the impact of viral IRES RNA binding to the ribosome during the translation initiation from current structures.