THE UNIVERSITY OF BRITISH COLUMBIA

Cellular and Physiological Sciences Seminar Series

Eric Jan, PhD

Professor
Department of Biochemistry and Molecular Biology
University of British Columbia

Thursday, February 27, 2020
12:45 - 1:45 (LSC 3)
Host: Drs. Rideout/Kopp

"Insights into viral strategies that hijak host cell functions"

RNA viruses have evolved strategies to modulate host cell functions and evade immune responses in order to promote infection. Incredibly, RNA viruses express a limited number of viral proteins to mediate these effects. This seminar will describe two directions that gain insights into these viral mechanisms.

i) Viruses have evolved translation recoding mechanisms that lead to synthesis of distinct proteins from overlapping open reading frames, thereby effectively increasing the coding capacity of viral genomes. Often, like in HIV, recoding involves RNA structures that interact with translating ribosomes to shift the reading frame. How viruses 'trick' the ribosome to recode is not understood. We have recently found that a novel viral translation mechanism where by an internal ribosome entry site within a subset of dicistroviruses can direct translation in both the 0 and +1 frames to produce distinct proteins during infection. We have evidence that these IRESs can direct translation by either i) directly place the ribosome in these alternative reading frames or ii) mediate ribosome bypassing to initiate translation downstream, thus revealing the diverse ways that ribosomes can be recruited and initiate translation on mRNAs.

ii) With a limited coding capacity, viruses can encode proteins that have multiple functions to modulate distinct host cell pathways. The viral protease is essential for viral polyprotein processing, however, it is now well established that viral proteases also target and cleave host proteins in order to modulate host cell processes and evade innate immune responses to promote infection. We have used an unbiased proteomic approach to identify host proteins that are cleaved by enterovirus proteases and identified >100 novel proteins, thus providing insights into the fundamental virus host interactions and pathways that facilitate infection.

Join us for coffee and cookies at 12:15 in LSC 1410

Contact Drs. Rideout/Kopp<elizabeth.rideout@ubc.ca><janel.kopp@ubc.ca>