SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING

CENTER FOR BIOINFORMATICS RESEARCH TALK

Peter Unrau

Simon Fraser University

Thursday, April 4, 2019

3:00 pm

Maple Room (IMU)

Using *in vitro* selection to understanding biologically important RNAs and to develop RNA based tools

Abstract: RNA is a remarkably versatile molecule that plays fundamental roles in the transfer of information from DNA to protein. It is also used extensively in biology to regulate biological processes. As RNA is a plastic molecule, regulatory RNAs often change secondary structures to perform their functions. This makes the study of regulatory RNAs challenging as a single sequence of RNA will often make use of more than one functionally relevant fold. To further complicate the study of RNA in cells, it is not intrinsically fluorescent. Thus in contrast to proteins, where the development fluorescent protein tags has greatly aided the study of expression and localization, RNA is challenging to study *in vivo*.

To address these problems we have been using *in vitro* RNA selection. This iterative process is capable of screening over 1015 distinct sequences for specific user defined functions. We have been using this powerful technology to characterize the bacterial 6S regulatory RNA and to build highly fluorogenic RNA aptamer tags that can be used to image and/or purify RNA protein complexes. I will discuss our recent progress in both of these areas.

Biography: Peter Unrau's education includes a B.Sc. in Physics and Mathematics from McMaster University (1992) and a Ph.D. in Theoretical Physics from MIT (1996). Following his graduation from MIT, Peter became interested in the emerging field of RNA catalysis and decided to join David Bartel's laboratory as a postdoctoral fellow at the Whitehead Institute for Biomedical Research. His work there, which includes isolating the first RNA nucleotide synthase ribozyme, has been cited numerous times in the literature as a highly significant contribution to the RNA catalysis field.

In 2001, Peter joined the faculty at Simon Fraser University where, with the help of his bright and energetic lab members, he runs an active research program in the area of RNA catalysis. He is currently Professor in the Department of Molecular Biology and Biochemistry at Simon Fraser University, a Michael Smith Foundation Senior Scholar, and a member of the Faculty of 1000.

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