

# MOLECULAR STRUCTURE AND FUNCTION PROGRAM SEMINAR

## Dr. Jean-Philippe Julien

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*Dr. Julien is a candidate for a staff position in the Molecular Structure & Function Program*

### ***Structure of the HIV-1 Env Glycoprotein Trimer: a Blueprint for Immunogen Development***

**Abstract:** The envelope glycoprotein (Env) trimer is the only virally encoded antigen on the surface of HIV-1, the pathogen that causes AIDS, and is responsible for viral entry into host CD4+ cells. Functional cleaved Env trimers have been extremely challenging to characterize structurally. For this purpose, we engineered a cleaved, stabilized recombinant HIV-1 Env construct, termed the BG505 SOSIP.664 gp140 trimer that has highly desirable properties, including near-native antigenicity. Its crystal structure at 4.7 Å has at last unveiled valuable information about the overall architecture of Env, insights into the Env fusion machinery, as well as how close association between the component gp120 and gp41 subunits holds the Env trimer in its prefusion conformation. Crystal structures, electron microscopy (EM) reconstructions and other integrative approaches have also enabled us to substantially advance our understanding of HIV-1 Env recognition by human antibodies, how HIV-1 Env is presented to the immune system and how it can be potently and broadly neutralized. Together, this wealth of structural information provides a blueprint for structure-based vaccine design against the key sites of vulnerability on the HIV-1 Env trimer. Vaccine development strategies will be discussed, including the design of precursor B cell-targeting antigens multimerized on nanoparticles.

**Date :** Thursday, February 6, 2014

**Time :** 1:00 - 2:00 pm

**Location :** Room 02.9320 (Event Room 1, 2<sup>nd</sup> Floor)  
SickKids Peter Gilgan Centre for Research and Learning (PGCRL),  
686 Bay Street

**Host: Dr. P. Lynne Howell**

**Pizza lunch will be provided**

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