Lunenfeld-Tanenbaum Research Institute
Sinai Health System

UNIVERSITY OF TORONTO

Principal Investigator Candidate Seminar Series For Molecular, Cell and Systems Biology

Dr. Tzachi Hagai

Wellcome Sanger Institute & European Bioinformatics Institute
Cambridge, UK

Title:

Caught between pathogens and autoimmunity: The evolution of our immune system

Monday, January 14, 2019
9:30 a.m.

Location:
Princess Margaret Cancer Centre
6th floor Auditorium, Rm 6-604
610 University Ave, 6th floor

Hosts: Dr. Anne-Claude Gingras & Dr. Daniel Schramek

Dr. Hagai received his PhD in chemistry in 2012 with Prof. Yaakov Levy, at the Weizmann Institute (Israel). There, he explored the biophysics and evolution of multi-domain proteins, and performed bioinformatics and molecular dynamics of protein ubiquitination. He demonstrated that ubiquitination alters the thermal stability of proteins and contributes to their unfolding, and that this is critical to the degradation of numerous proteins in addition to shaping the evolution of ubiquitination sites (e.g. PMID: 20080694). His postdoctoral research, split between the groups of virologist Prof. Raul Andino at UCSF and computational biologist Prof. Sarah Teichmann at the Wellcome Sanger Institute has focused on exploring the evolutionary arms race between viruses and their hosts. He demonstrated on the side of the virus a common peptide motif mimicry employed by viruses to interact with the host cellular machineries (Cell Reports; PMID: 24882001). He next explored the evolution of innate immunity on the host side, demonstrating in a 2018 Nature publication that regulatory constraints to avoid immune disorders, as well as viral interactions with immune proteins, have shaped the evolution of the immune system (PMID:30356220). His future lab will combine comparative genomics and single cell transcriptomics with immunological stimulations to compare the immune response across species. The ultimate goal will be to harness diverse defense mechanisms to develop new therapeutics against pathogens.