

# Seminar Notice

Lunenfeld-Tanenbaum Research Institute Seminar Series  
Presents:

## Shamil Sunyaev, PhD

Professor, Department of Medicine, Harvard Medical School  
Geneticist, Department of Medicine and Genetics, Brigham & Women's Hospital

Title:

### 'Complex genetic models for simple traits and simple models for complex traits'

Abstract: We attempt to combine statistical genetics with evolutionary and functional genomics to understand the relationship between genotype and phenotype. The effect of even simple Mendelian mutations may depend on genetic background and environment. For example, an appreciable fraction of disease-causing alleles are fixed in the genomes of other species, suggesting a role for genomic context. We developed a model of genetic interactions that predicts most of these to be simple pairwise compensations. Functional testing of this model on known and one newly discovered human disease genes revealed discrete *cis* amino acid residues that, although benign on their own, could rescue the human mutations *in vivo*. For genetically complex phenotypes, the degree of polygenicity, the distribution of effect sizes and the underlying biology all remain unknown. With the help of evolutionary models, we demonstrate that not all plausible genetic architectures are compatible with the observed phenotypic distributions. We use genetics of gene expression and other endophenotypes to reveal biology behind genetic association signals.

**Wednesday February 10, 2016 at 12:00 p.m.**

**Location:**

**Mount Sinai Hospital  
60 Murray St. Level 3 Conference Rooms  
L3-201-202-203\***

**Host: Dr. Fritz Roth**

\*located on the 3<sup>rd</sup> floor of 60 Murray St. just before the double doors leading into the Cooper Center

\*\* LTRI is a University of Toronto affiliated Research Institute.