



# BiophysTO Lunchtime Seminar Series

## Date

Thursday, Feb 1<sup>st</sup> 2024  
12:00 – 1:00 pm

## Location

McLennan Physical  
Laboratories, 60 St  
George street.  
Room: MP606

## Dr. Taufik Valiante

Department of Surgery, University of Toronto  
Krembil Brain Institute, University Health  
Network

### **Resiliency of cortical dynamics through cellular diversity**

Diversity is inherent in nature. In this talk, I will explore the concept of cellular biophysical diversity that refers to heterogeneity/variability of the active and passive properties of neurons that belong to a single 'type'. Modern genetic techniques like single-cell RNA sequencing are revealing cellular diversity at an unprecedented scale, a diversity that is thought to represent biological 'noise.' We propose that far from being biological noise, it is a necessary design feature of the brain, providing it with 'dynamical' resiliency to insults. I will use epilepsy as a starting point for this exploration and explain how the study of epilepsy led us towards embracing cellular diversity/heterogeneity/variability as an important variable in the design of the brain. I will cover our experimental work using whole-cell patch clamp technique in human brain tissue, transcriptomics, and the computational and mathematical treatment of this problem in "models" of brain circuits.

**Host: Dr. Anton Zilman**



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