



BiophysTO Lunchtime Seminar Series

Date

Thursday, January 23, 2020
12:00 – 1:00 pm

Location

McLennan Physical
Laboratories
Room MP606
60 St. George Street

Dr. Gary Bader

**Computational Biology
University of Toronto**

Control of tissue development by cell-cycle dependent transcriptional filtering

Cell cycle duration changes dramatically during development, starting out fast to generate cells quickly and slowing down over time as the organism matures. The cell cycle can also act as a transcriptional filter to control expression of long genes which can't be completely transcribed in short cycles. Using mathematical simulations of cell proliferation, we identify an emergent property, that this filter can act as a tuning knob to control cell fate, cell diversity and the number and proportion of different cell types in a tissue. Our predictions are supported by comparison to single-cell RNA-seq data captured over development. Our results support the idea that cell cycle dynamics may be important across multicellular eukaryotes for controlling gene expression and cell fate.

Bio: Gary Bader is a Computational Biology Professor at The Donnelly Centre at the University of Toronto. The Bader lab uses molecular interaction, pathway and 'omics data to gain a 'causal' mechanistic understanding of normal and disease phenotypes. See <http://baderlab.org>

Host: Dr. Sid Goyal



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