



BiophysTO Lunchtime Seminar Series

Date

March 11 2021
12:00 – 1:00 pm

Prof. Aidan Brown

Department of Physics, Ryerson University

Nonequilibrium and geometric effects control mRNA localization to mitochondria

Many mitochondrial genes are encoded in the nucleus, translated in the cytosol, and the proteins imported into mitochondria. Some nuclear-encoded mRNA switch from low to high mitochondrial localization as the mitochondrial volume fraction increases, while the localization of other genes remains consistently low or high. mRNA can be effectively tethered to mitochondria via the mitochondrial import of nascent, incompletely translated polypeptides, enhancing mitochondrial localization. To understand the distinct localization behaviours for mRNA of nuclear-encoded mitochondrial genes, we use a quantitative model of mRNA diffusion around the cell and protein translation along mRNA. Using this model, we explain how the nonequilibrium nature of protein translation combines with geometry-dependent asymmetric diffusive search times to change mRNA localization behaviour.

Host: Anton Zilman

Zoom Link:

<https://us02web.zoom.us/j/89407663380?pwd=OFBMczlhWVZKbUswQzk3VXNkLzhGdz09>



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