Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **3408** Type: **Invited Speaker / Conférencier(ère) invité(e)**

(I) Physical mechanisms of regulating mitochondrial protein transport

Tuesday 7 June 2022 08:30 (30 minutes)

For living cells to maintain spatial organization and functional capacity, they must deliver certain proteins to particular organelles and distribute the proteins within the organelles. This talk will focus on the physics of protein localization in mitochondria, an organelle that forms dynamic spatial networks that can span much of the cell volume. I will describe how protein translation and cellular geometry combine to push localization of mRNA to mitochondria out of equilibrium. Small mRNA numbers cause the nature of mRNA association to mitochondria to impact the scale of protein concentration fluctuations within mitochondria, which can be smoothed out with the help of mitochondrial fusion and fission dynamics. From these mitochondrial dynamics emerge spatial networks, formed from extended and branched mitochondrial tubes, that facilitate protein transport. I will describe how spatial network characteristics control the diffusive search time to a target. Overall, diffusion, geometry, and nonequilibrium conditions can combine to regulate protein localization to mitochondria.

Author: BROWN, Aidan (Ryerson University)

Presenter: BROWN, Aidan (Ryerson University)

Session Classification: T1-7 Fluctuations and Disorder in Condensed Matter (DCMMP) | Fluctuations et désordre en matière condensée (DPMCM)

Track Classification: Symposia Day (Tues. June 7) / Journée de symposiums (mardi, le 7 juin): Symposia Day (DCMMP) - Fluctuations and Disorder in Condensed Matter