Bio Phys TO Lunchtime Seminar Series

WHEN?
February 6, 2025
12:00-1:00PM

WHERE?
McLennan Physical Laboratories
255 Huron Street
Rm. 202

WHY?
Join us for pizza and an opportunity to learn and engage with members of the UofT Biophysics community!

SPEAKER

Prof. Victor Sourjik

Department of Systems and Synthetic Microbiology, Max Planck Institute for Terrestrial Microbiology& Center for Synthetic Microbiology (SYNMIKO)

Physics meets physiology: bacterial strategies of resource investment into swimming motility

Although all biological systems must obey the laws of physics, specific examples of physical limitations on the performance of biological systems remain sparse. Bacterial motility is among the quantitatively best-understood biological behaviors, as it has long served as a model of how physics can help to understand bacterial ability to move and follow chemical gradients in the environment (chemotaxis). Using the example of Escherichia coli, I will discuss how physical limits might have shaped the evolution of bacterial motility and of the chemotaxis system. Our recent work suggests that physical limitations on bacterial swimming, along with fitness tradeoffs associated with investment of limited cellular resources in motility, can be sufficient to quantitatively explain regulation of motility gene expression in E. coli. Morever, the physics of motility also determines performance of bacterial microswimmers that could be used for various biotherapeutic applications, and taking physics into account is important for their rational engineering.

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