McGill UNIVERSITY

Department of
Anatomy & Cell Biology

"Pushing the Cellular Envelope: Combining electron cryotomography and solid-state NMR spectroscopy to study bacterial membrane proteins in their native environment"

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The interplay between membranes and their embedded and associated proteins underlies many cellular functions, including metabolism, environmental sensing, and motility. This dynamic nature, however, causes significant challenges for traditional structural biology methods that rely on over-expression and purification of proteins. To embrace the biology beneath these challenges, we have developed an experimental system using cryogenic electron tomography (cryoET) and solid-state nuclear magnetic resonance spectroscopy (ssNMR) to study membrane proteins from *Escherichia coli* in their native cellular envelope, without extraction from the membrane. This talk will discuss the strengths and challenges of such a system and the recent technological improvements that make it possible, and describe our recent experiments to study the inner membrane protein YidC. Unexpected features of the nature and morphology of native *E. coli* membranes will be discussed, as well as the potential for future experiments.

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11:30 am

Strathcona Anatomy Building
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