UNIVERSITY of GUELPH

COLLEGE of BIOLOGICAL SCIENCE

DEPARTMENT OF MOLECULAR AND CELLULAR BIOLOGY

MCB Guest Speaker

2017-2018

Tues. Mar. 27th, 2018
SSC 2315 @ 2:00 pm

Dr. Harold Erickson

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Duke University School of Medicine

"Can FtsZ generate the constriction force for bacterial cytokinesis? What about turgor pressure?"

In 2008 Osawa, Anderson and Erickson showed that purified FtsZ could assemble Z rings inside tubular liposomes and generate constrictions. Later work suggested constriction was achieved by curved FtsZ protofilaments bending the membrane, pulling it inward. This established FtsZ as the prime candidate for generating the force for bacterial cytokinesis. However, Coltharp and Xiao have challenged this Z-centric view. They suggested that the ~1-5 pN force that FtsZ protofilaments might generate would not be able to bend the membrane against the 3 – 20 Atm turgor force of Gram-negative and Gram-positive bacteria. They proposed that peptidoglycan assembly of the invaginating cell wall provided the major constriction force, pushing the cell membrane from the outside. In this seminar I will review the evidence for FtsZ generating a constriction force in liposomes, and I will address the question of turgor force. There is convincing evidence that in Gram-negative bacteria the periplasm is maintained at an osmolarity equal to that of the cytoplasm. In this case cytokinesis can "cheat turgor pressure" by taking place within the uniformly high osmolar environment. Surprisingly there is no comparable information for Gram-positive bacteria. However, preliminary data from our lab suggest that the Gram-positive periplasm is also isoosmolar with the cytoplasm. I conclude that bacterial cytokinesis does not have to overcome turgor pressure.

"A GREAT OPPORTUNITY TO HEAR LEADING RESEARCHERS IN THE SCIENTIFIC COMMUNITY DISCUSS THEIR WORK"

*** ALL WELCOME TO ATTEND *** *** COFFEE, TEA AND TIMBITS ***

For more information, please contact Dr. C. Khursigara (ckhursig@uoguelph.ca)
Dr. Erickson is the external examiner for Alison Berezuk's PhD Defence (March 27, 2018 @9:30 am in SSC 1511)