BiophysTO Lunchtime Seminar Series

Date
Thursday, April 7, 2022
12:00 – 1:00 pm

Location
Virtual via zoom

Dr. Joaquin Ortega

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Centre for Structural Biology
McGill University

Identifying critical steps in the ribosome assembly process using cryo-EM

Ribosomes in bacteria form quickly (to support cellular growth demands) and accurately (to ensure proper translation of the genetic code). During assembly, ribosomal particles fold according to energy landscapes comprised of multiple parallel pathways to become mature ribosomal subunits. Particularly the late stages of maturation are aided by assembly factors that enable rapid and efficient biogenesis. We recently identified a critical maturation step in the late assembly stages of the large 50S ribosomal subunit. This step represents a merging point where all parallel assembly pathways of the ribosomal particles converge. At this critical step, the convergent assembly intermediate that accumulates in cells exists in a 'locked' state, and its maturation is paused. We found that at least three essential GTPases, RbgA, YphC and YsxC, must act on this critical assembly step to 'unlock' the last maturation steps involving the functional sites of the subunit. In the absence of any of these three GTPases, the 50S subunit does not complete its assembly, and cells die due to a lack of functional ribosomes to synthesize proteins. My talk will discuss recent work from the lab to identify how RbgA, YphC and YsxC contribute individually and collectively to unlock the convergent assembly intermediate and license further maturation steps to convert this particle into a mature 50S subunit. The importance of the proposed research is that the identification of this critical step and characterization of the maturation events that occur creates the necessary platform to use the ribosome assembly process as a new antimicrobial target.

Zoom Link
https://utoronto.zoom.us/j/83645315834

Host: Dr. Walid A. Houry

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