Is Pleased to Announce A Seminar
Presented By
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Monday, October 7, 2019
At 4:00 pm
SLSRC 3410/3430

Regulated Protein Degradation During Bacteria Growth
and Stress Responses

Energy dependent proteolysis is essential in all kingdoms of life. In bacteria, ATP-dependent AAA+ proteases destroy normal and damaged proteins to maintain proper growth and stress responses. The Lon protease is a highly conserved member of this family known for degrading misfolded proteins to maintain cellular quality control. In recent work we have discovered two broadly applicable aspects of Lon biology. First, we find that DNA binding by the Lon protease is needed for tolerance of DNA damage, but not toxicity from protein misfolding. We propose that Lon evicts persistently bound proteins, which is especially important during genotoxic stresses and show that this property is conserved in mitochondria, suggesting that this property has been retained in the endosymbiotic transition from the ancestral bacterium to the modern organelle. Second, we find that in Caulobacter crescentus, Lon controls dNTP pools dependent on protein folding load. We show that during stress, titration of the normal degradation of a transcription factor by Lon by misfolded proteins results in increased dNTP pools that are critical for robust growth. Together, these studies demonstrate how a promiscuous quality control AAA+ protease contributes to tolerance of both genotoxic and proteotoxic stresses.

Refreshments will be served at 3:45 pm