Department of Molecular and Cellular Biology

Graduate Seminar MCB*7500

Friday, October 16, 2020 @12:00 PM

presented by:

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"Investigating the role of FtsKN in *Escherichia Coli* cell division"

Cell division is an essential process in bacterial life. *Escherichia coli*, a model organism extensively used to study cell division, divide by forming a multiprotein complex called 'divisome' at the division site. Filamentous Temperature Sensitive protein K (FtsK) is an essential protein necessary for divisome formation. The N-terminal of FtsK ($FtsK_N$) is the only region essential for cell division, and it is proposed to oligomerize into a hexamer upon recruitment to the mid-cell. Despite the importance of $FtsK_N$ in cell division, neither its structure nor its function is fully understood. Protein-protein interactions play a crucial role in the regulation of divisome. I will use *in-vivo* UV cross-linking and mass spectrometry to identify novel cytoplasmic proteins interacting with $FtsK_N$. Past research using this technique uncovered an interaction between $FtsK_N$ and MinD, a protein involved in division site determination. I will use *in-vitro* cross-linking and *in-vivo* complementation assay to elucidate the amino acid residues involved in the $FtsK_N$-MinD interaction and characterize this interaction further. Mutation in $FtsK_N$ can interfere with proper cell division and result in elongated cells. In my proposed research, I will use Size Exclusion Chromatography-Multiple Angle Light Scattering to determine the oligomerization state of $FtsK_N$ in $FtsK_N$ variants created in our lab and known to produce elongated cells when observed by microscopy. This may help identify whether the impaired cell division is due to the inability to oligomerize properly. The data obtained from this research may enhance our current understanding of the complex role of $FtsK_N$ in cell division.

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