UC MERCED | CHEMISTRY & BIOCHEMISTRY

DATE 09/20/2024 | TIME 10:30am | LOCATION GLCR 150

CHEMISTRY & BIOCHEMISTRY SEMINAR SERIES:

Studying the molecular mechanisms of temperature sensing by human CDC2-like-kinase 1 (CLK1)

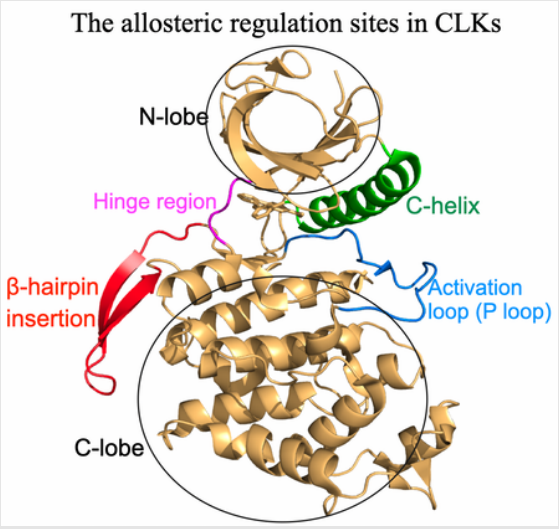
Abstract:

Variations in body temperature require organisms to regulate their physiology. One such regulatory mechanism involves Cdc2-like kinases (CLKs), which are found in diverse species and known to regulate gene expression as internal body temperature fluctuates. Specifically, the activity of CLKs controls alternative splicing via temperature-dependent phosphorylation of SR protein substrates. While the role of CLKs in regulating gene expression as a function of physiological temperature has been explored biochemically, further studies are required to fully understand the molecular mechanisms underlying phosphorylation of splicing factors by CLKs in response to physiological temperature changes. Preliminary crystal structures of human CLK1 determined across the physiological temperature range reveal temperature-dependent conformational changes in the kinase. However, the specific details of how these observed structural changes couple to catalytically important regions of the kinase, such as the C-helix and A-loop, have not been elucidated. In this seminar, I will discuss previous research results from the Thompson and Heyd labs, as well as my own future research directions. To address open questions about CLK regulation, I plan to study the conformational ensemble of human CLK1 as a function of temperature, using solution phase experiments including paramagnetic relaxation enhancement NMR (PRE-NMR) and double electron-electron resonance (DEER) spectroscopies. The results we generate will illuminate the fundamental biology of temperature homeostasis.

Leila Mahrokh

Graduate Student, Chemistry & Biochemistry

UC Merced



About the Speaker:

Leila earned her Master of Science in biophysics from the University of Tehran. She worked on the bacterial extracellular electron transfer by linking intracellular reactions to external electrode surfaces. She is passionate about knowing the structure and function of proteins as the building blocks of life. She is currently a graduate student in the Thompson lab, where she is employing cutting-edge techniques to understand the structural dynamics of the enzyme CLK1 at physiological temperatures.

For more info, contact: Michael Thompson mthompson30@ucmerced.edu