CHEMISTRY & BIOCHEMISTRY COLLOQUIUM: Non-Canonical Allosteric Regulation of SIRT1

Ningkun Wang
San Jose State University
Assistant Professor, Chemistry Department

Date:
9/23/2022

Time:
10:30 AM-11:50 AM

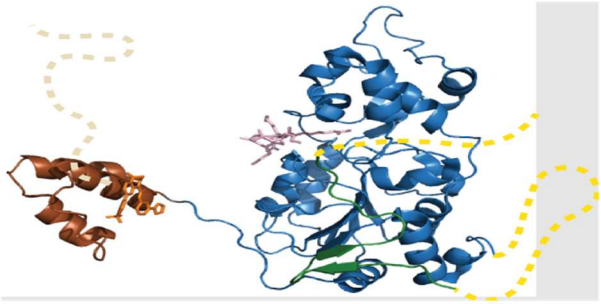
Location:
COB 110

About The Speaker:

Dr. Ningkun Wang is an assistant professor of biochemistry at San José State University, a primarily undergraduate institute.

Ningkun received her PhD degree in 2013 from Anna Mapp's lab at the University of Michigan, where she specialized in studying the kinetics and conformational dynamics of protein-protein interactions. Following her graduation, she spent one year as a joint teaching post doc in Anna Mapp and Carol Fierke's lab, where she conducted research on the substrate specificity of lysine deacetylases and lectured for organic chemistry and general chemistry courses. From there Ningkun moved to California in 2014 for a post doc position in Michelle Chang's lab at UC Berkeley, where she studied the structural mechanisms for substrate specificity of a fluoroacetyl-CoA thioesterase.

In 2017, Ningkun joined the faculty of the Chemistry department at San José State University. She teaches lecture and lab classes for Biochemistry, and maintains a research lab consisting of undergraduate students and a small number of master's students. Her research is currently focused on combining biochemistry and biophysical methods to study indirect allosteric effects on the activity and substrate specificity of enzymes. In her spare time, Ningkun enjoys hiking (not the intense kind) and camping in the surrounding areas; as well as trying to figure out "what the young kids do these days" with their tik toks and instas.



Abstract:

SIRT1, an NAD+ dependent lysine deacetylase, deacetylates many protein substrates central to transcriptional regulation and various other cellular pathways. This enigmatic enzyme has a well-studied structured catalytic core and intrinsically disordered or conformationally dynamic regions in the N- and C-terminal ends that are less explored. Many allosteric or direct regulators of SIRT1 have been studied, including native proteins as well as natural or synthetic small molecules. Our group focuses on the lesser-known mechanisms of non-canonical allosteric regulations of SIRT1. Amongst our interests are how resveratrol, a well-studied sirtuins activating compound (STAC), can also act as an inhibitor, or have no effect on SIRT1 activity at all, depending on the amino acid sequence of the enzyme substrate. And how motif A, an intrinsically disordered region within the N-terminus of SIRT1, can activate the enzyme seemingly through an intramolecular binding interaction. W e use biochemical and biophysical methods to elucidate the role of protein conformational dynamics and structural propensity in these intriguing allosteric regulation mechanisms. We hope that our findings could provide further insight for the intricate web of regulation on SIRT1 activity within the cell.

For more information, contact : Mike Thompson
mthompson30@ucmerced.edu