BIOCHEMISTRY SEMINAR SERIES

Midstream Presentation - Spring 2021

Nicole Lynn

Torres Group

"Functional characterization of the mammalian family of Katanin microtubule-severing enzymes"

The katanin-family of microtubule-severing enzymes are critical to the cytoskeletal rearrangements required in cellular processes like division, signaling, migration, and homeostasis. Katanin is a heterodimeric severing protein containing the catalytic A- and regulatory B- subunits, whose longitudinal attack on the microtubule can increase both microtubule polymer length, and density. Due to their diverse cellular roles, katanin dysfunction, loss, or aberrant expression has been linked to developmental, proliferative, and neurodegenerative disorders. Currently, research has only assessed katanin loss or dysfunction by observing one subunit at a time, which often leads to mild mitotic and cellular defects. Many vertebrates, including humans, contain multiple A- and B- katanin subunits, which can suggest redundancy or unique functions in cells. In this talk I will discuss the current efforts I have made in characterizing this family of microtubule-severing enzymes through the creation of CRISPR-Cas9 inducible, single, double, and triple A-, B-, and A-B combinatorial knockouts. I will also discuss my efforts in characterizing the KATNAL2 subunit, which is less similar from the canonical A1 subunit and AL1 isoform. Lastly, I will discuss my efforts in elucidating the full-length structures of KATNAL2 and the A-B katanin holoenzyme, both of which have yet to be solved using structural techniques. In characterizing this family of enzymes, we hope to deepen our understanding of their mechanisms, intracellular roles, and phenotypes as they relate to disease.

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via Zoom

3:30 pm

More information: marla@chem.ucla.edu

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