BIOCHEMISTRY SEMINAR SERIES

Midstream Presentation - Spring 2021

Dylan Valencia

Quinlan Group

"Biochemical Characterization of Mammalian Formin FHOD3 in Cardiomyocytes"

Actin is central to development, muscle contraction, and cell motility, among other functions. Actin assembly involves both nucleation and elongation, where the initial step of nucleation is kinetically unfavorable. Actin nucleators in the cell help stimulate the formation of actin filaments. One class of actin nucleators is known as formins, which are distinguished by the other two classes of actin nucleators in that they also modulate elongation rates of actin filaments. My research focuses on the Formin HOmology Domain (FHOD)-containing family of proteins. One of the two FHOD family formin genes in mammals is FHOD3. FHOD3 encodes two splice isoforms. The longer isoform, FHOD3L, is distinguished from FHOD3S by three additional exons. FHOD3L is primarily expressed in striated muscle cells, whereas FHOD3S is more widely expressed. FHOD3L is crucial for both the development and maintenance of the contractile machinery, known as sarcomeres, in cardiomyocytes. Further, FHOD3 is implicated in cardiomyopathies. For example, mutations in the FHOD3 gene are estimated to account for 1-2% of hypertrophic cardiomyopathy cases. With our collaborators in the Nakano lab, I use stem cell-derived cardiomyocytes that freely proliferate in culture, unlike normal heart tissue, as my in vivo system to study FHOD3L function and how it affects sarcomere integrity. In this collaborative project, I hope to elucidate the specific functions of FHOD3L that are necessary or sufficient for proper sarcomere function in cardiomyocytes through rescue experiments and to further characterize function-separating FHOD3L mutants through various in vitro assays that isolate a formin's nucleation or elongation ability.

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via Zoom

3:30 pm

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