Ph.D. Program in Biochemistry Dissertation Defense

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THE DEFENSE WILL ALSO BE AVAILABLE VIA ZOOM:
Click here for Zoom link:
Meeting ID: 853 5655 7143
Passcode: Roksana

zoom

SCAN ME

August 24, 2023
1:00 PM

ASRC
85 St. Nicholas Terrace,
1st Floor Auditorium
New York, NY 10031

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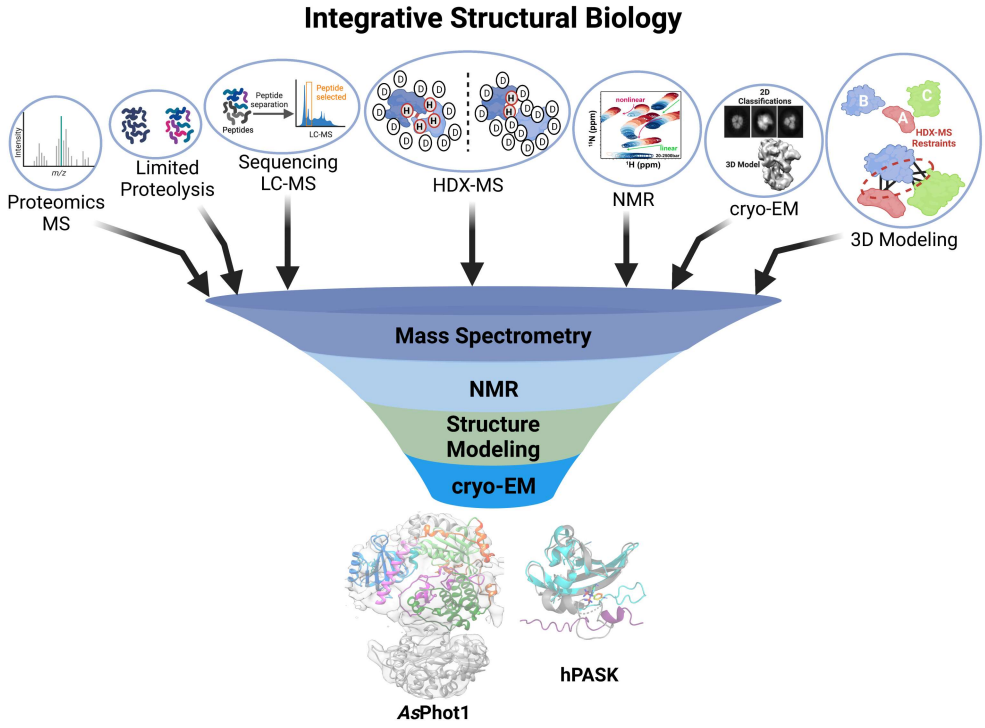

Structural basis of signal transduction within environmental sensing PAS regulated Ser/Thr kinases

ABSTRACT My thesis research focuses on the superfamily of **PAS** (**P**er-**A**RNT-**S**im) sensory domains and their regulatory control of **STK** (**S**er/**T**hr **K**inase). Typically, protein kinases are characterized alone, which isn't sufficient to understand how they control vast signaling pathways. To address these, I investigated the PAS-STK of hPASK in human, an important regulator of cellular metabolic pathways and stem cells differentiation, and the **LOV** (**L**ight-**O**xygen-**V**oltage (LOV)-type PAS domains)-STK of AsPhot1, a key player in plant physiology in response to blue light. I used complementary biochemical and biophysical tools, including NMR, HDX-MS, X-ray Crystallography, and cryo-EM to study the signal transduction from PAS/LOV to the STKs domain. My research structurally and functionally characterizes the allosteric regulation of PAS to control the kinase function and highlights key residues and interaction sites within the kinase and sensory domain that might hold the key for their downstream function and regulation. Findings from my work will aid in the development of new optogenetic tools and therapeutics for metabolic diseases (e.g., diabetes and obesity) related to mammalian PAS-regulated kinases.