REGIONAL CENTRE FOR BIOTECHNOLOGY
Seminar series

Chemistry, Biology and the Interface

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Seminar Room

I aspire to lead an innovative interdisciplinary research program at the interface of chemistry and biology. The major underlying philosophy of my future research plan is to synergistically combine my Ph.D. training in synthetic organic chemistry and chemical biology with my postdoctoral training in electrophysiology and ion channel biology to answer fundamental questions in membrane protein and lipid biology. I will discuss these research goals and some collaborative ideas thereof, in my talk. Additionally, I will outline some of the highlights of my uniquely diverse research training that has drawn from a wide range of fields including synthetic organic chemistry, physical organic chemistry, protein modification, surface chemistry, molecular biology, membrane protein biology, and electrophysiology. I will first focus on my chemistry-centric Ph.D. work on "Bioconjugation", a term that refers to the covalent derivatization of proteins, DNA, RNA, and carbohydrates for applications such as ligand discovery, disease diagnosis, high-throughput screening, and biochemical assays for studying biological processes. I will briefly outline my work on the characterization of the hydrolytic stability of some of the commonly used bioconjugation linkages that inform on their proper use in addition to providing fascinating mechanistic insights. Additionally, I will discuss my work that resulted in the development of novel methods for rapid and stable protein bioconjugation. Finally, I will discuss my biology-centric postdoctoral work on ion channel biology involving electrophysiology and molecular biology. In particular, I will focus on my work that resulted in the elucidation of the mechanism by which the simple molecule, guanidine, inhibits voltage-gated potassium channels. The mechanistic insights obtained from this study provide a foundation for the design of guanidine analogs for treating neuromuscular diseases—a goal that I wish to pursue in my independent career.