

April 21, 2017 · 11 am · Lynch Lecture Hall



University of Pennsylvania
Association for Cultural Diversity in Chemistry Presents

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Please join us
after the talk for
lunch and poster
session



Proteins as pH Sensors and Switches

Tight regulation of pH and other ionic components of the cellular milieu is the trait that is common to all living systems. Dysregulation of pH homeostasis, in turn, is the hallmark of cancer and other diseases. We are studying the roles of proteins as biological pH sensors and switches. In this lecture I will focus on our efforts to engineer protein pH sensors. Specifically, I will describe our studies of ionizable groups buried in dry or hydrophobic environments in proteins. These buried ionizable groups can have highly anomalous properties that are essential for all forms of biological energy transduction, and which can also be harnessed to engineer pH sensors and pH-driven switches. I will describe structural and energetic consequences of burial and ionization of groups buried in hydrophobic environments in proteins, consequences on the conformational landscapes, challenges to theory and simulations, and implications for the evolution and engineering of novel enzymes, pH sensors, and pH-driven switches.