

## PLENARY LECTURE P3

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### Design of peptides and small molecules that interact with membranes and membrane proteins

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This talk will highlight the design of molecules that target membranes and membrane proteins. Topics will include: 1) *Design and characterization of mimics of antimicrobial peptides*. We have designed a number of small molecules that are currently being tested in clinical trials. Their mechanisms of action will be discussed. 2) *The role of transmembrane helix-helix interactions in mediating protein-protein interactions in membranes*. We have developed computational methods to design peptides that target the transmembrane domains of proteins in much the same way that antibodies target water-soluble regions of proteins. This approach has been used to probe the mechanisms by which integrins are activated to adhere to extracellular ligands. 3) *The mechanism of action and inhibition of a viral proton channel*. The M2 proton channel is the target of the anti-influenza drug amantadine, which was used for three decades until resistance reached over 90%. Our recent electrophysiological (with L. Pinto and R. Lamb), crystallographic, and spectroscopic studies have provided insight into the function of the channel, and led to new small molecules that inhibit resistant forms of the channel.