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Abstract for an Invited Paper
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Advanced Infrared Spectroscopy for Time-Resolved Structural Investigation of Protein Structure and Function[1]

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The human genome encodes approximately 30,000 different proteins. A single mutation at a critical site of one protein can cause serious diseases, such as cardiac failure and cancer. This illustrates the significant role of protein structures in protein functions. In order to obtain a fundamental understanding of protein structure-function relation, we must develop and employ both physical theories and experimental techniques. In my talk, I will report both experimental and computational studies on vibrational structural markers for advanced infrared spectroscopy, slaved protein structural dynamics, and "electrostatic epicenter" model as a general mechanism for activation of receptor proteins in cell signaling.

[1]In collaboration with Anupama Thubagere, Lorand Kelemen, Beining Nie, Sandip Kaledhonkar, and Edward Manda, Oklahoma State University.