

Time-resolved Conformational Analysis during GPCR-Gs Coupling

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Protein-protein interactions and conformational changes of a signaling protein are major mechanisms of cellular signal transduction. To understand the precise signaling mechanism, studies have investigated the structural mechanism of signaling proteins using various biochemical and/or biophysical techniques such as X-ray crystallography, nuclear magnetic resonance (NMR), electron microscopy, and electron paramagnetic resonance. In addition to these techniques, surface labeling mass spectrometry has been successfully used for conformational analysis of signaling proteins. Exposed or flexible regions have higher labeling rates and buried or ordered regions have lower labeling rates. Although surface labeling mass spectrometry does not provide 3D structural information, it analyzes dynamic protein conformations that are difficult to be analyzed with other techniques. GPCR signal transduction involves extensive protein-protein interactions and conformational changes of related signaling proteins. In this seminar, I will discuss the conformational mechanisms of GPCR signaling analyzed by surface labeling mass spectrometry.