

**Single-Molecule Imaging in Live Cells:
Visualization and Quantitative Analysis of Protein Dynamics**

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We are interested in the development and application of both single-molecule fluorescence imaging and single-molecule force spectroscopy methods to investigate biomolecular interaction and dynamics in live cells. This talk will focus on our recent work on single-molecule imaging of protein dynamics for signal transduction study: (1) Tracking the lateral diffusion of the membrane proteins to study the receptor activation and endocytosis; (2) Studying the stoichiometry of the receptors under different activation and physiological conditions by taking advantage of single-molecule sensitivity; (3) Monitoring the docking and dissociation of the intracellular protein on the cell membrane to study the downstream protein activation; (4) Monitoring the internalized receptor to study its intracellular trafficking. Live-cell imaging at the single-molecule level provides new and quantitative information for the better understanding of the molecular mechanism underlying signal transduction.