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Nonlinear Coherent Optical Imaging for Biomedicine: The Quest for Ultimate Sensitivity

SUNNEY XIE, Harvard University

Recent advances in nonlinear coherent optical imaging, particularly stimulated Raman scattering microscopy, have allowed highly sensitive label-free imaging of living cells and organisms based on molecular spectroscopy. Using the ultimate sensitivity of nonlinear optical microscopy, the detection of a single-molecule absorption signal at room temperature has been achieved. These unprecedented sensitivities offer exciting possibilities for biomedicine.