MOLECULAR SPECTROSCOPY OF LIVING SYSTEMS

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Molecular spectroscopy has been a powerful tool in the study of molecules in gas phase, condensed phase, and at interfaces. The transition from in vitro spectroscopy to spectroscopic imaging of living systems is opening new opportunities to reveal cellular machinery and to enable molecule-based diagnosis (Science 2015, 350: 1054). Such a transition involves more than a simple combination of spectrometry and microscopy. In this presentation, I will discuss the most recent efforts that have pushed the physical limits of spectroscopic imaging in terms of spectral acquisition speed, detection sensitivity, spatial resolution and imaging depth. I will further highlight significant applications in functional analysis of single cells and in label-free detection of diseases.