

Will label-free hyperspectral imaging become a routine technique in living cells?

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Abstract

Imaging centers in research institutions – like the UMCG Microscopy and Imaging Center (UMIC)- have been offering (fluorescent) light microscopy and electron microscopy to scientists and industrial partners alike. UMIC's imaging systems range from state-of-the art to cutting edge applications, and include 2-photon confocal, fast wide field, high throughput and light sheet imaging. Also, an increasing number of markers for both light and electron microscopy are available. In addition, label-free techniques become increasingly available, both in electron microscopy (presented by Duinkerken et al.) as well as light microscopy. Here, we show second-harmonics imaging, stimulated Raman scattering and Coherent anti-Stokes Raman spectroscopy as they are currently being established at UMIC. While the signal to noise ratio as well as the identification of molecules will be challenging, label-free imaging does bypass the need for labeling with genetically-encoded tags or affinity approaches, showing great potential for in vivo imaging of non-modified biological material.