

O-PTIR + simultaneous Raman- New paradigms in Vibrational Micro/Nano spectroscopy! Applications from single bacteria to nanocomposite interfaces

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The Optical Photothermal Infrared (O-PTIR) spectroscopy technique has enabled for the first time, true submicron infrared microscopy, in non-contact, reflection mode measurements that generate “FTIR transmission-like” spectra, without common spectral artifacts. With the development of the mIRage™ microscope system from Photothermal Spectroscopy, this technology is now available for every lab. O-PTIR differs from traditional FTIR or other direct IR techniques by using an optical probe (532/785 laser) for detection of infrared absorbances. Sample preparation and other limitations associated with cantilever-based AFM and IR techniques are not a problem for mIRage™. The use of an optical probe is the key enabling the new architecture for the first combined (correlative) IR and Raman platform. With IR + R it is now possible to combine O-PTIR with Raman for correlative, simultaneous IR & Raman microscopy, at the same time, from the same spot, and with the same submicron spatial resolution. These exciting synergistic capabilities are spawning interest in a range of applications which are otherwise impossible with traditional FTIR or Raman microscopy used separately. We will highlight examples ranging from live cell imaging in water, ultra-high resolution IR + R images of polymeric intermixing at the submicron level, amyloid aggregates in neurons (neurites and dendritic spines), nanocomposite interfaces via IRRSM and individual isotopically labelled bacterial cells and more.