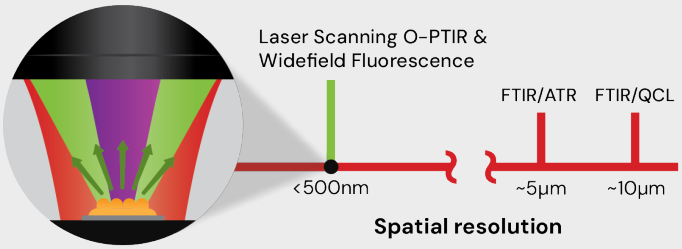
PHOTOTHERMAL
SPECTROSCOPY CORP

mIRage®-HSi

Laser Scanning O-PTIR Microscope

- >10x faster IR imaging, using laser-scanning optics, with <500nm IR imaging spatial resolution.
- Hyperspectral IR imaging in minutes and single wavenumber imaging in seconds.
- Non-contact reflection IR measurements with FTIR transmission/ATR-like spectra with no dispersive scattering artifacts.
- "Pan-and-zoom" fast real-time chemical IR imaging to quickly locate features of interest.
- Improved time-to-data and higher data throughput for research & QC.
- Automated submicron particle detection & spectroscopy with FeaturefindIR™.
- Fully integrated with widefield epi fluorescence (FL) imaging for correlative IR + FL measurements.
- Expandable to multimodal, correlative O-PTIR + Photothermal SRS (PT-SRS)



mIRage®-HSi

The new mIRage-HSi is the next evolution of Optical Photothermal Infrared (O-PTIR) spectroscopy and imaging, delivering the high-performance, sub 500 nm IR imaging and FTIR transmission/ATR-like spectra, but now with breakthrough speed.

The mIRage-HSi is based on laser-scanning microscopy, which uses synchronized fast IR & visible beams to achieve imaging speeds at least 10x faster than traditional stage scanning, reducing hyperspectral imaging time from hours to minutes and single frequency images from minutes to seconds.

This dramatic increase in imaging speed makes dynamic studies, rapid contaminant detection, and automated submicron particle identification not only feasible but practical.

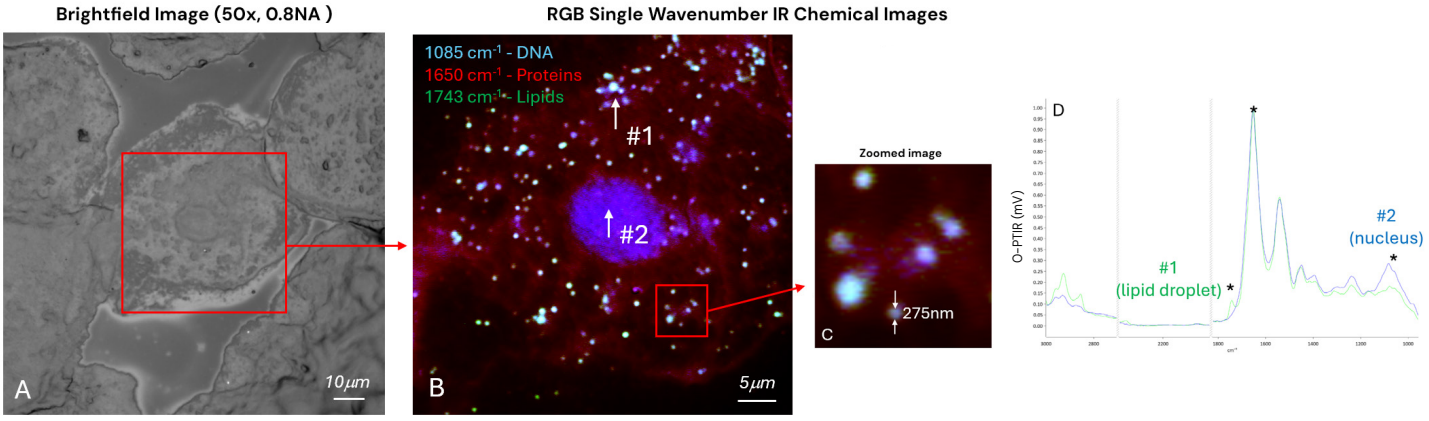
The laser scanning principle, significantly reduces mechanical stage scanning overheads, pushing the measurement data sample rate into a low noise regime, allowing for further speeds increases, whilst maintaining good image quality.

Multimodal capabilities include integrated correlative fluorescence imaging, and optional multimodal expansion to stRAMos™ for advanced Raman capabilities.

Whether for microplastics, pharma, life science, failure analysis, or materials science, mIRage-HSi delivers faster, more automated, and more productive O-PTIR workflows.

Applications Overview

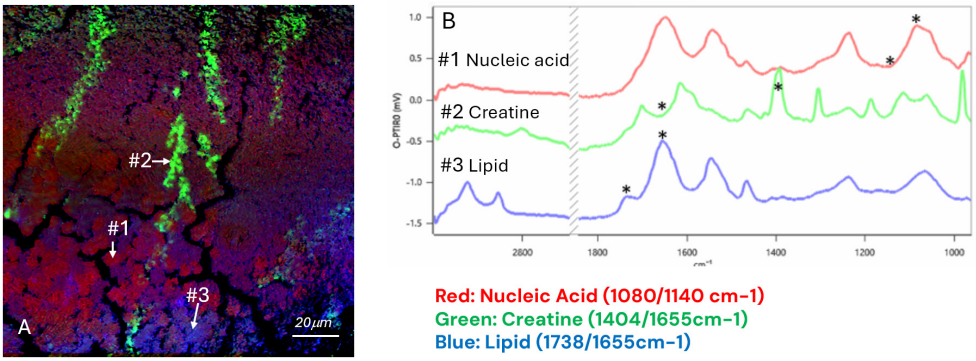
High Speed Chemical Imaging of Cheek Cells (13 sec per image measurement time)



A: *Brightfield image using a 50x, 0.8NA objective* **B:** *Single wavenumber IR chemical imaging RGB overlay, 1085cm^{-1} DNA (blue), 1650 cm^{-1} protein (red) and 1743 cm^{-1} lipid (green)* **C:** *Zoomed in image of B, showing detection of lipid droplets as small as 275nm* **D:** *O-PTIR Spectra (normalised to Amide I) from highlighted locations, spot #1 (lipid droplet) and spot #2 (nucleus). IR single wavenumber images (as in B) are market by an asterisks. Spectra are collected from a spot size of ~500nm.*

Collection conditions: *50x50μm measurement FOV, 100nm pixel step size (250,000 pixels), 13 sec per image measurement time, Counter-prop mode. Spectral acquisition total time 8 sec 50x, 0.8NA glass objective, tri-range IR QCL, 532nm probe.*

High speed multi-spectral IR imaging of mouse brain tissue (17 sec per image measurement time)



A: *Automated multiple (5) single wavenumber IR chemical imaging RGB overlay - Green (Creatine) 1404/1655cm^{-1}), Red (Nucleic Acid) 1080/1140 cm^{-1} and Blue (lipid) 1738/1655cm^{-1}* **B:** *Representative Spectra from the highlighted locations, highlighting biochemistry from areas of chemical contrast as shown in A. IR image (A) wavenumber positions are marked by an asterisks. Spectra are collected from a spot size of ~500nm.*

Collection conditions: *150x150μm measurement FOV, 250nm pixel step size (600,000 pixels), 17 sec per image measurement time, Counter-prop mode with 50x, 0.8NA glass objective, dual-range IR QCL, 532nm probe.*

Sample courtesy of Dr. Mark Hackett, Curtin University, Australia.

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For full references to the data highlighted in this document, please refer to our website.

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