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**DAY 1**

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# Lab Industry News

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## Raman Microscopy On the Move

BioTools' new family of portable Raman microscopes bridges the gap between microscopy and spectroscopy, bringing microRaman out of the lab and into the world at large. Mobile  $\mu$ Raman and  $\mu$ -BioRaman open new opportunities for doing the same analyses in different locations with the same instrumentation. They will be finding

happy homes in industry and pharma, academe and forensics, doctor's offices and infusion clinics, food and water safety testing.



**Mobile  $\mu$ Raman and  $\mu$ -BioRaman: A View Under the Hood**  
With dimensions smaller than a

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### **BIOTOOLS**

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portable sewing machine and an optional battery pack, Mobile  $\mu$ Raman and  $\mu$ -BioRaman integrate the power of multiple modes of sample handling (microscope slide, cuvette, vial or syringe) and a fast scanning PZT stage for Raman mapping. The flip-up hood, shown raised here, retains their small footprint.

### **The Value of Portability**

Normally a movement toward a smaller, simpler system dictates a loss of capability. Ironically, this new configuration enables expanded capabilities utilizing shorter light paths, lower laser power, and faster scanning. High NA objectives (40x, 50x, and 100x) are complimented by a cooled 2048x1 pixel back-thinned

array detector to maximize signal and assure a superb signal-to-noise ratio that produces both clean imaging and clear spectra. When combined with SERS, these instruments can collect high fidelity spectra within 10 seconds, requiring only 4-8 spectra on average for a clean Raman signature.

A unique PZT stage and SameSpot optical system are both standard issue on all BioTools' portable Raman microscopes. As a result, Raman spectra are collected precisely from the area being viewed. The stage has a comfortable 10mm travel in X, Y, and Z with 10nm step size that guarantees accurate positioning for single spectra and rapid scanning for Raman maps.

### **SERS Enabled**

While the new portable Raman micro-

scopes are built to gather conventional Raman spectra, new opportunities unfold when they are used with Surface Enhanced Raman Spectroscopy (SERS) substrates or capillaries. Data collection speeds up, sensitivity spikes, and fluorescence disappears. The enhanced sensitivity allows for "trace" detection of entities such as body fluids at crime scenes and much greater spectral discrimination, even enabling clinical differentiation between different strains of bacteria.

### **Integrated Libraries Facilitate Spectral Interpretation**

For contaminants and identification, Mobile  $\mu$ Raman interfaces with BioRad's KnowItAll Raman ID Expert, a database containing nearly 10,000 Raman spectra ([www.knowitall.com](http://www.knowitall.com)). If KnowItAll can't find a direct match, it analyzes the spectra

for problems then suggests ways to fix them. For structural studies of proteins using  $\mu$ -BioRaman, BioTools' offers their own, world-class library, covering protein spectra in both solution and solid form.

### **Raman on the Go!**

In addition to being excellent microscopes for the teaching and shared facilities, Mobile  $\mu$ Raman and  $\mu$ -BioRaman lend themselves to protein, particle and fiber characterization; bacteria analyses and cancer diagnostics; a wide range of body fluid and trace evidence analyses; and food and water safety. These flexible, multi-purpose portable systems are on the move, from classroom to lab, pilot plant, doctor's office, or crime scene.

For more information, stop by Booth #1247.