

Trimodal Handheld Probe based on Raman Spectroscopy and Confocal Imaging for Cancer Detection

Summary

Vanderbilt researchers have developed a handheld confocal Raman spectroscopy probe integrated with confocal imaging that provides real-time histology and biochemistry of tissue. The probe provides spatial, structural as well as biochemical information about the tissue disease state and is currently being explored for skin cancer detection.

Background

- » Confocal Raman spectroscopy alone can isolate signatures from different layers of tissue but yields little information about tissue microstructure.
- » Confocal imaging alone provides structural information of the tissue.
- » Gross spatial imaging is important to register the microscope image with the lesion.

Technology Description

Raman spectroscopy is a powerful technique for probing the biochemistry of the tissue and can be used to provide accurate differential diagnosis of early disease. However, Raman spectroscopy by itself yields little information about the tissue microstructure and the signals from it are too weak for imaging. By combining Raman spectroscopy with confocal imaging, this device yields information about tissue structure and biochemistry, allowing for a complete diagnosis. A CCD camera in the probe captures large white-light images of the lesion, enabling registration between the microscope image and features of the lesion that are superficially visible. Potential applications for this instrument include non-invasive scanning for skin cancer and a variety of other organ systems.

Competitive Advantages

- » Produces real-time spectroscopic images with variable resolution (low resolution for screening, high resolution for diagnosis).
- » The handheld device's combined confocal imaging and Raman spectroscopy method provides fast and accurate diagnosis.
- » Questionable skin lesions could be diagnosed without the need for removal and biopsy.

Intellectual Property Status

- » US Utility Patent issued 10/30/12; Patent No 8,300,220; link to [Google Patent](#)
- » Vanderbilt Inventor Bio: [Dr. Anita Mahadevan-Jansen](#)
- » Link to Lab Webpage and Publications: <http://research.vuse.vanderbilt.edu/bmeoptics/index.htm>

CTTC CONTACT:

Ashok Choudhury, Ph.D.
Phone: (615) 322-2503
ashok.choudhury@vanderbilt.edu

VANDERBILT INVENTORS

Anita Mahadevan-Jansen, Ph.D.
Chad Lieber
MONTANA STATE INVENTORS
David Dickensheets

VU REFERENCE: VU08104

Link to Vanderbilt technologies available for licensing

