

Raman Spectroscopy for Cancer Detection in Biological Tissues

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Abstract

Raman spectroscopy has a strong potential for becoming a routine analytical tool for identifying normal and cancerous tissues. It can provide information about the chemical constituents of biological tissue. The recent developments in optical fiber Raman probes and portable spectrometers has opened the possibility of clinical applications. In this presentation basic principles of Raman scattering, instrumentation and its capability to distinguish normal and malignant tissues will be presented. The Raman spectroscopy results of a pilot study on cancer induced in mice and a comparison with the corresponding histopathological studies will be presented.

Background information

Ratna Naik got her Masters degree in Physics from Mysore University, India and her Ph. D degree from West Virginia University. She held post doctoral positions at Texas A&M university and Argonne National lab; and as well as teaching positions at University of Wisconsin-Platteville and University of Michigan-Dearborn, until she joined Wayne State University (WSU) as a faculty member in 1989. Currently she is a professor of physics with research interests in materials in SSIM (Smart Sensors and Integrated Microsystems) program at WSU involving deposition, process and characterization of wideband gap nitride semiconductors, electroceramics (oxides), and magnetic thin film materials for various sensing devices; synthesis of iron oxide nanoparticles, processing microelectrode arrays and piezoelectric detector arrays for biomedical applications; cancer detection in biological tissues using Raman spectroscopy etc. She has won WSU President's Award for Excellence in Teaching, Career Development Chair Award and College of Science Teaching Award. She was also honored for Outstanding Scholarship Achievements during Women History Month at WSU. She has co-authored more than 90 research publications and is a member of APS, AVS and MRS.