

LOPS® 20244th Edition of Annual Conference on**LASERS, OPTICS, PHOTONICS,
SENSORS, BIO PHOTONICS &
ULTRAFAST NONLINEAR OPTICS**

JUNE 07-10, 2024



Raman spectroscopy is a technique that can detect molecular vibrational, rotational, and other low-frequency modes in a substance. It is commonly used to identify molecules based on the spectral fingerprints. When used for optical biopsy, Raman spectroscopy uses intrinsic biomarkers and can operate in situ and in real time, which leads to rapid progress in research and clinical applications in cancer diagnosis. But most reports in the literature which demonstrated spectral differences between normal and cancerous tissues used near-infrared (NIR) laser excitation. Since Raman scattering is very weak, some researchers used high power (e.g. 300mW) and long signal collection time (e.g. minutes). Such approaches have limitations for practical applications. We have developed a visible resonance Raman (VRR) spectroscopy technique using 532nm excitation which can provide resonance-enhanced Raman signals from various large biomolecules and facilitate the study of the presence of compounds at low concentrations. Therefore, VRR can overcome the limitations of the conventional Raman technique and has great potential for various applications. In this talk, I will report the results from different studies on brains using VRR as a technique to distinguish glioma and meningioma from normal brain tissues, detect Alzheimer's disease using brain tissues and cerebrospinal fluid, and detect rapid metabolic molecular changes during embryonic development which is essential for early-stage neural development.

Biography

Dr. Binlin Wu is currently an Assistant Professor in the Physics Department at Southern Connecticut State University. Dr. Wu earned his PhD degree from City College of New York. After that, he did two-year postdoc at Weill Cornell Medical College. Dr. Wu's research is focused on biomedical optical imaging and spectroscopy mainly for cancer imaging and diagnosis. Dr. Wu has expertise in diffuse optical imaging, fluorescence spectroscopy, Raman spectroscopy, multiphoton imaging, and machine learning.

**VISIBLE RESONANCE RAMAN
SCATTERING IN BRAINS****Binlin Wu**

Department of Mathematics Southern Connecticut State University,
501 Crescent Street, New Haven, CT 06515, USA.