International Journal of Analytical Chemistry

Hindawi

Special Issue on

# Ultrasensitive, Label-Free Nanotechnology-Based Approaches for Spectral Pathology

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Spectral pathology, an emerging molecular diagnosis approach, is exploring biochemical fingerprinting via characteristic bond vibrations of the cellular components, changes in specific spectral profiles related to disease onset and progression. As intrinsic molecular information is probed by irradiation with light in particular experimental conditions or action of an electric signal, no external label is required, rendering thus ultrasensitive, spectroscopic-based diagnosis a very appealing tool.

While remarkable progress has been made in nanotechnology in the last decades, by developing various nanostructured surfaces used for nanoparticles, nanorods, dendrites, and so forth, challenges or drawbacks in real-life applications such as biomolecular screening remain to be overcome. Nanotechnology-based approaches are still in their experimental stages and require further research and validation before being considered suitable for routine analysis in point-of-care (POC) tests.

The purpose of this special issue is to publish high-quality research articles as well as reviews that seek to address recent development on molecular diagnose and spectral pathology by using label-free, ultrasensitive, nanotechnology-based detection spectroscopic techniques, as well as the relevant prospect on opportunities and challenges.

Potential topics include but are not limited to the following:

- New developments in vibrational (micro)spectroscopy of biological systems and pathology specimens
- The use of IR, confocal, or coherent anti-Stokes Raman microspectroscopy in biological and biomedical investigations
- New developments in optical spectroscopy (Surface Plasmon Resonance, fluorescence, and chemiluminescence) and their applications in biomarkers detection for spectral pathology
- New developments in electrical spectroscopy (Dielectric and Electrochemical Impedance Spectroscopy) and their use in spectral pathology and biomedical investigations
- Chasing biomarkers in health and diseases by nanotechnology-based techniques
- Chemical genetic traits and phenotypic expression revealed by using ultrasensitive, modern, and spectroscopic-based approaches
- Computational and spectroscopic studies of latest generation drugs
- Histological imaging and ultrasensitive real-time monitoring of pathology biomarkers and spectral signatures of disease grading
- Spectroscopy as a tool for studying drug-cell interaction

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/ijac/ulfn/.

**Lead Guest Editor**
Nicoleta E. Mircescu, National Institute of R&D of Isotopic and Molecular Technologies, Cluj-Napoca, Romania
*nicoleta.dina@itim-cj.ro*

**Guest Editors**
Haibo Zhou, Jinan University, Guangzhou, China
*haibo.zhou@jnu.edu.cn*

Monica Florescu, "Transilvania" University of Brasov, Brasov, Romania
*florescum@unitbv.ro*

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