



Prof. Mustafa Culha

Department of Genetics and Bioengineering,
Faculty of Engineering,
Yeditepe University, Ataşehir, Istanbul 34755,
Turkey

Email: mculha@yeditepe.edu.tr

TOPIC:

Surface-Enhanced Raman Scattering: From Protein Detection to Cancer Diagnosis

ABSTRACT:

Surface-enhanced Raman scattering (SERS) has increasingly been used for the solution several problems in medicine and biomedical applications. The reason behind this increased interest is due to its high sensitivity, rapid spectral acquisition limited sample preparation step and specificity of the provided molecular information. However, the technique suffers from irreproducibility originating from the experimental parameters such as nature of the substrate and interactions of molecule or molecular structures with the substrate. The performance of SERS for possible quantitative and qualitative applications in biomedicine from protein detection and identification to cancer diagnosis without using an external label is demonstrated. Although the technique has great potential for development of new approaches for either replacement of an existing conventional technique or in support of a current technique, it has also fundamental limitations. In this presentation, the strength and the limitations of the technique are presented with the data obtained from proteins to living cells to tissue in our laboratory. The author acknowledge the financial support from The Scientific and Technological Council of Turkey (TUBITAK) (Project No: 105T135 and 109T941) and Yeditepe University.

PROFILE:

Professor Mustafa Culha obtained his Ph.D. in chemistry from the University of Tennessee-Knoxville in 2002. Then, he joined to Advanced Biomedical Research Group as a post-doctoral researcher at Oak Ridge National Laboratory (2002-2003) before joining to Schering-Plough Corporation. In 2004, he accepted a faculty position in Genetics and Bioengineering Department of Yeditepe University, Istanbul, Turkey. The utility of spectroscopic techniques such as surface-enhanced Raman scattering (SERS) to shed light onto living-nonliving interactions, development of novel detection and diagnostic tools for medical and biomedical applications are ongoing research projects in his laboratories. He authored of more than 70 papers in refereed international journals, several book chapters and patents in the area of

bioanalytical chemistry, and nanotechnology. He is the editor of a special issue for Surface-enhanced Raman Scattering of Journal of Nanotechnology, and NanoBio special issue for Journal of Nanoparticle Research. He is on the editorial board of Applied Spectroscopy.