

Detection of *bacilli* spores with Surface Enhanced Raman Spectroscopy (SERS) simulating a biological threat.

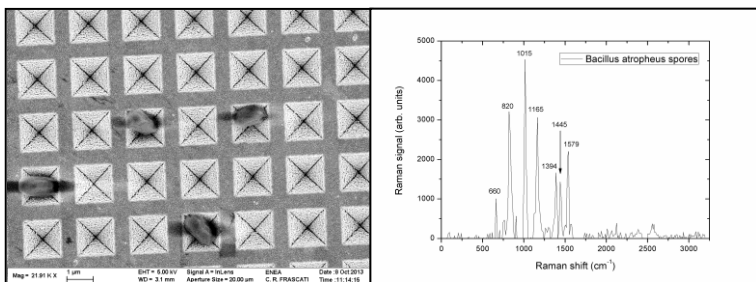
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It is well known that Surface Enhanced Raman Spectroscopy (SERS) can amplify nonlinearly the inherently weak Raman signal by several orders of magnitude and it is a fast and sensitive tool for the detection and classification of biological threats [1-2].

In this work we report on the application of the SERS technique for the rapid identification of *Bacillus atropheus* spores, as part of the RAMBO project (Rapid-Air Monitoring particle against biological threats) using commercially available SERS substrates. The characteristics vibrational bands of the spores were identified and interpreted scanning few spores for few seconds. Scanning electron microscopy (SEM) was also used to characterize the samples and the substrates. These results show how SERS is suitable as an effective and fast technique for early warning of biological threats, as it has been considered in the RAMBO project.



[1] M. Zourob, S. Elwary, A. Turner, Principles of bacteria detection, Biosensors, Recognition Receptors and Microsystems, First Edition, Springer, 2008, pp 525–560.

[2] E. Le Ru. P. Etchegoin, Principles of Surface Enhanced Raman Spectroscopy and related plasmonic effects, First Edition, Elsevier, 2009.