

Enhancing Raman spectroscopy for the rapid identification of microorganisms

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Raman spectroscopy has recently been shown to be a potentially powerful whole-organism fingerprinting technique and is attracting interest within microbial systematics for the rapid identification of bacteria and fungi [1]. However the drawback of the technique lies in the low probability of a Raman scattering event occurring, with typically only 1 in 10^8 photons being inelastically scattered. Despite some good technological advances, alternative approaches to the normal Raman technique exist in the form of a variety of Raman enhancement methods, amongst which are surface-enhanced Raman scattering (SERS) and UV resonance Raman (UVR).

This presentation will detail our work on both UVR and SERS for the enhancement of the Raman effect making measurements from bacteria in a few seconds. For UVR we have used excitation at 244 nm which preferentially enhances nucleic acids and proteins. Whilst for SERS, we have employed aggregated silver colloid substrates. Examples will be given for the characterisation and identification of *Bacillus* species [2] and hospital isolates from patients with urinary tract infection [3]. Finally, we will also briefly introduce a scanning electron microscope (SEM) interface for SERS [4].

References

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