

Combining AFM and Raman: TERS on biological macromolecules

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Tip-Enhanced Raman Spectroscopy (TERS) is an analytical technique that combines the molecular specificity and huge signal enhancement of surface-enhanced Raman spectroscopy with the nanometric spatial resolution of scanning probe microscopies to achieve molecular information at the nanoscale. The key component of a TERS experiment is a plasmonic-active tip that simultaneously acts as Raman signal amplifier and topography scanner. The exceptional spatial resolution of this technique has led to unique results in the study of biological macromolecules, spanning from the mapping of protein fibrils with single amino acid resolution to the sequencing of nucleic acids.

In this talk, after discussing the basic principles of TERS and describing the experimental setup, I will focus on the potentialities of this technique for the investigation of amyloid structures showing a novel nanoscale spectroscopic approach for the study of the interaction between gold nanoparticles and lysozyme amyloid fibrils.