

## AgNFs/2D hybrid nanomaterials as multi-wavelength SERS active platforms for sensing applications.

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Silver nanoflowers (AgNFs) are plasmonic materials offering a huge surface area for molecular interactions, high sensitivity and low detection limits in photo-based sensing applications. Active sites on their surface easily immobilize target species by chemical and electrostatic interactions, facilitating the detection by Surface Enhanced Raman Spectroscopy (SERS). The possibility to amplify Raman signals is not only linked to the morphology of the particle but also to the excitation wavelength of the laser interacting with the SER platform [1]. In order to explore novel nanomaterials with high enhancement in a wide range of excitation wavelengths, we propose AgNFs anchored to 2D materials (GO, r-GO, MoS<sub>2</sub>, h-BN). While silver AgNFs were prepared by chemical synthesis, commercial GO, MoS<sub>2</sub> and h-BN layers were employed as is. r-GO was obtained by laser irradiation of commercial GO, a defect-induced physical procedure promoting the interaction with AgNFs. SERS properties were studied using a standard molecule 4-mercaptobenzoic acid (4-MBA) as probe analyte. We were able to study the enhancement in a laser wavelength range between 532 and 785 nm, finding very high enhancement factors. [2] This suggests that AgNFs-2D materials could be excellent SERS substrates in the entire visible and near infrared spectral region, opening the possibility to investigate several biological and medical interest analytes.

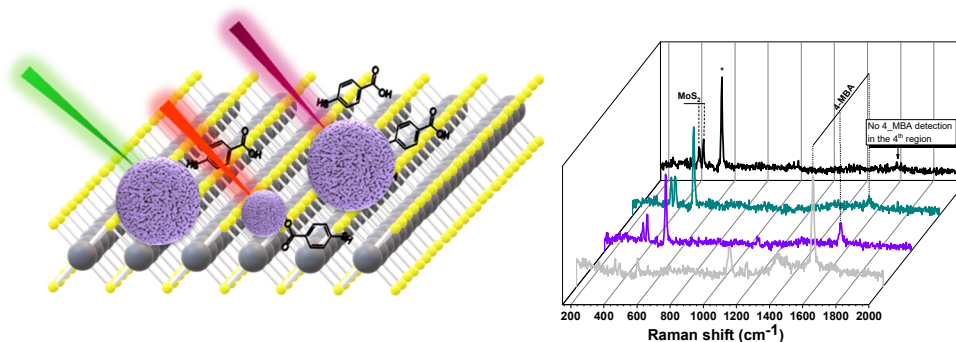


Figure: Schematic representation of multi-wavelength SERS active platforms and SERS measurements at 532 nm excitation wavelength on AgNFs/MoS<sub>2</sub> platforms.

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