Gold coated carbon black particles for amplification of Surface Enhanced Raman Scattering from analytes

Tania T. S. de Oliveira[1], Akram Abbasi[2], Irene Andreu[1] & Arijit Bose[1]

[1]*University of Rhode Island*
[2]*Brown University*

Inelastic light scattering from molecules produces unique Raman shifts allowing these analytes to be detected with specificity. Surface-enhanced Raman Scattering (SERS) has been used as a technique for the detection of a variety of analytes. Using simple solution-based colloidal processing techniques, we have fabricated gold-coated carbon black nanoparticles (AuCB NP) that show improved Raman activity. By varying the synthesis parameters, we create particles of different surface morphologies, allowing control over the peak wavelength for localized surface plasmon resonance (LSPR). By matching the LSPR wavelength to the incident laser wavelength, we get the highest signal from two model analytes – 4-nitrobenzenethiol and Congo Red.