Confocal Raman Microscope with FTIR (Renishaw in Via)	**Category:** A. Particle Synthesis and/or B. Particle Labelling and/or C. Particle Characterisation in and ex-situ and/or D. In-vitro toxicity studies **Institute:** CIC biomaGUNE **Location:** Paseo Miramón 182 C 20009 San Sebastian, Gipuzkoa, Spain **Contact Details of Technology Expert:** Dr.Irantzu Llarena **E-mail:** illarena@cicbiomagune.es

Short technology description/Overview:

Scattering occurs when an electromagnetic wave encounters a molecule, or passes through a lattice. When light encounters a molecule, the vast majority of photons (>99.999%) are elastically scattered; this Rayleigh scattering has the same wavelength as the incident light. However, a small proportion (<0.001%) will undergo inelastic (or Raman) scattering where the scattered light undergoes a shift in energy; this shift is characteristic of the species present in the sample. The Raman effect is complementary to infrared spectroscopy. Molecular vibrations are sampled in both techniques, however different fundamental selection rules regarding the activity of specific vibrations results in the spectra of each giving different information. More specifically infrared spectroscopy requires a dipole moment change through the vibration, whilst Raman requires a change in polarisability. That is, the distortion of the molecule's electron cloud during the vibration must cause the molecule to interact differently with the electric field of the incoming photon

Main Features (Equipment Capabilities):

Renishaw in Via microscope collects Raman spectra at standard or high confocality mode, giving high spatial resolution (<1µm lateral). Raman microscope is fitted with interchangeable objective lenses of different magnifications: ×10, ×50, ×100 and ×40 water immersion, two lasers 532nm and 785nm, CCD camera, internal calibration source, motorized stage controlled by Wire 2.0 software. Fourier transform infrared spectroscopy is combined with Raman microscope in a single instrument.

Typical Samples & Images:

Since vibrational information is specific to the chemical bonds and symmetry of molecules, Raman spectra provides a fingerprint by which the molecule can be identified. Therefore, Raman spectroscopy is suitable for the microscopic examination of minerals, materials such as polymers and ceramics, cells and proteins.

Raman microscope offers direct imaging of the whole field of view that is examined for scattering over a small range of wavenumbers (Raman shifts). The other approach is hyperspectral imaging or chemical imaging, in which several Raman spectra are acquired from all over the field of view (area or volume). The data can then be used to generate images showing the location and amount of different components
Any further Information: