

Raman micro-spectrometer

For Raman measurements of live cells under physiological conditions (culture medium, 37°C temperature, 5% CO₂), a Raman micro-spectrometer equipped with an environmental enclosure (Solent, Segensworth, UK) was used. The instrument was based on an inverted microscope (IX 71, Olympus, Essex, UK) with a 60×/NA 0.9 water-immersion objective (Olympus), a 785 nm ~170 mW diode laser (before objective) (Toptica Photonics, Munich, Germany), a spectrometer equipped with a 830 lines/mm grating and cooled deep-depletion back-illuminated CCD detector (Andor Technologies, Belfast, UK) and an automated step-motor stage (Prior, Cambridge, UK). The instrument was calibrated prior to each experiment using a standard 1,4 BSMB (Sygma-Aldrich, UK) sample and the spectral resolution in the 600-1800cm⁻¹ region was ~2.5cm⁻¹. Purpose designed titanium cell-chambers were built (25mm diameter and 15mm height), which incorporated an MgF₂ coverslip (0.17 mm thick) at the bottom to enable acquisition of Raman spectra of the cells using the inverted optical configuration.

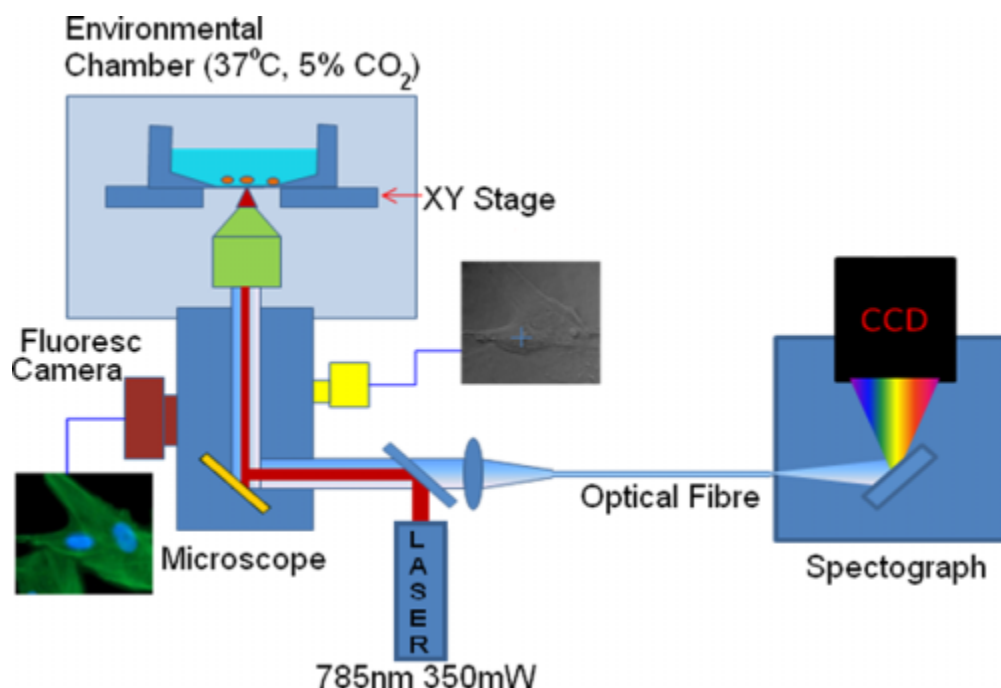


Fig. S1. Schematic description of the Raman micro-spectrometer. The integration of the inverted microscope and environmental enclosure allows time-course Raman spectral imaging over extended periods of time.