

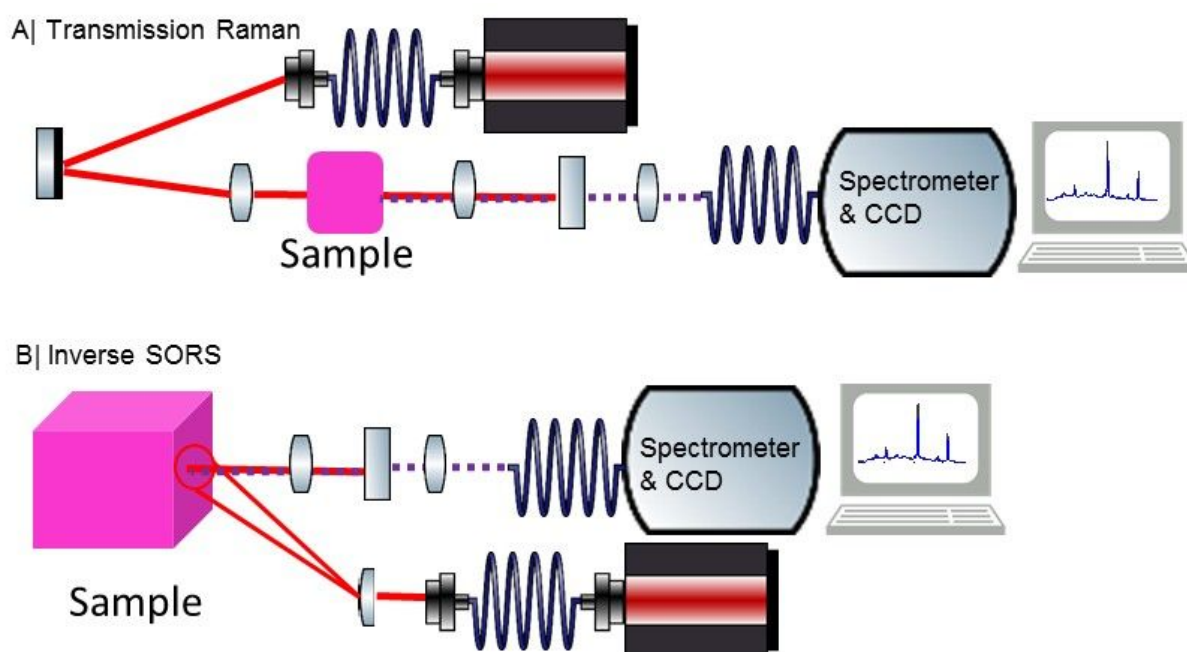
# Supporting Information – Sub-surface Chemically Specific Measurement of pH Levels in Biological Tissues using Combined Surface Enhanced and Deep Raman Spectroscopy

## Spectroscopy

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Scheme 1 - Schematic representation of the two spatially offset Raman modalities, transmission Raman (**A**) and inverse spatially offset Raman spectroscopy (**B**). In transmission Raman (**A**) the laser beam is focused onto one side of the sample and signal is collected on the other side. The Raman and elastically scattered light is collected by a 50 mm diameter  $f=60$  mm lens, then filtered by a Kaiser 830 nm notch filter, the light is then focused by another 50 mm diameter ( $f=60$  mm) lens onto a custom made bundle (Ceramoptic, USA), the circular pattern of fibres is translated into a line of fibres for matched entry into the Kaiser spectrometer coupled with the CCD. In inverse SORS (**B**) the laser beam passes through an axicon creating the ring illumination on the sample surface, and the Raman signal is collected at the centre of the ring with the same collection optics as described for Transmission Raman (**A**).