

Tissue imaging with the inVia Raman microscope

Life sciences

Raman tissue imaging is a unique method that can simultaneously describe the molecular composition and the distribution of multiple chemical species in tissues at a high spatial resolution, without labelling.

Raman imaging uses a laser to provide a chemical fingerprint at each point of the analysed area. You can process the data to reveal a multitude of information, such as:

Discriminate diseased and healthy tissues

- Distinguish tissue types by their overall chemical signatures – fluorescent or colorimetric labelling not required
- Differentiate diseased and healthy tissues objectively and accurately
- No need for disease marker discovery and targeting

Demarcate tissue regions chemically

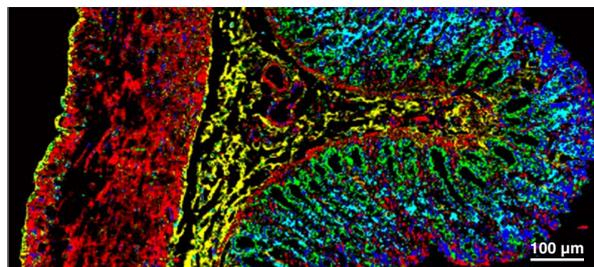
- Visualise anatomical layers and cell types
- Produce detailed chemical images with sub-micrometre spatial resolution
- Reveal important zonal information:
 - complexity of the tissue organisation
 - relative abundance and distribution of chemical species
 - boundary and size of diseased area
 - tumour infiltration
- Unveil the chemical and morphological changes in different samples

Potential pathology tool

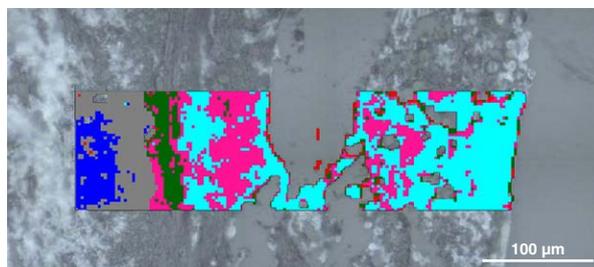
- Discriminate cancer stages with high sensitivity and specificity
- Establish early onset disease markers
- Identify biochemical changes associated with cancer formation and progression
- Provide histological images without labelling
- Define tumour margin

The ideal technique for biological research

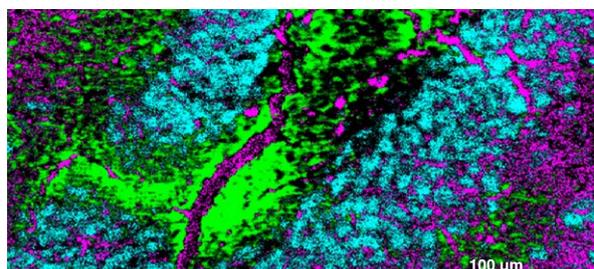
- Study the concentration, distribution, conformation, redox and spin states, and orientation of biomolecules
- Compare these properties between samples
- Obtain valuable insight and better understand the biological system of interest



Clearly visualise the tissue organisation with Raman images - healthy rat colon crypt



Understand cancer progression - examine melanoma invasion in skin construct



Reveal the distribution of cells and assess their molecular profiles - neurons and glial cells in the rat brain displaying different cytochrome levels and redox states

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inVia. The ideal Raman tissue imaging tool

- Research grade Raman microscope
- StreamLine™ imaging technology for high speed mapping without tissue damage
- Surface option to obtain the best images from uneven surfaces
- StreamLine imaging with Slalom for a quick overview of the tissue samples
- High confocality StreamHR™ imaging to scrutinise small details
- Flexibility to switch between high and standard confocal imaging
- Queue up measurements to maximise data collection



The Renishaw inVia Raman microscope

Relevant reading:

- Kalkanis et al, 2014, J Neurooncol 116(3):477-85
- Lloyd et al, 2013, Analyst 138(14):3900-3908
- Bonifacio et al 2010, Analyst 135:3193-3204
- Stone et al 2002, J Raman Spectrosc 33(4): 564-573

A range of related Renishaw literature is available. Please ask your local Renishaw representative for more information.

Renishaw. The Raman innovators

Renishaw manufactures a wide range of high performance optical spectroscopy products, including confocal Raman microscopes with high speed chemical imaging technology, compact process monitoring Raman spectrometers, structural and chemical analysers for scanning electron microscopes, solid state lasers for spectroscopy and state-of-the-art cooled CCD detectors, for both end-user and OEM applications.

Offering the highest levels of flexibility, sensitivity and reliability, across a diverse range of fields and applications, the instruments can be tailored to your needs, so you can tackle even the most challenging analytical problems with confidence.

A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Please visit www.renishaw.com/tissue for more information.