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Study emulsions using the inVia™ confocal Raman microscope

Chemical sciences

The Renishaw inVia confocal Raman microscope is the ideal system for the complete 2D and 3D chemical analysis of emulsions and colloids.

Emulsions are liquid-in-liquid colloids used throughout a range of varied industries including cosmetics (e.g. skin creams), food (e.g. yoghurts) and chemicals. The study of emulsions is important to provide information on interactions, separation, network connections and the role of emulsifiers. These are key to ensure the emulsion is stable and suited to its specific role.

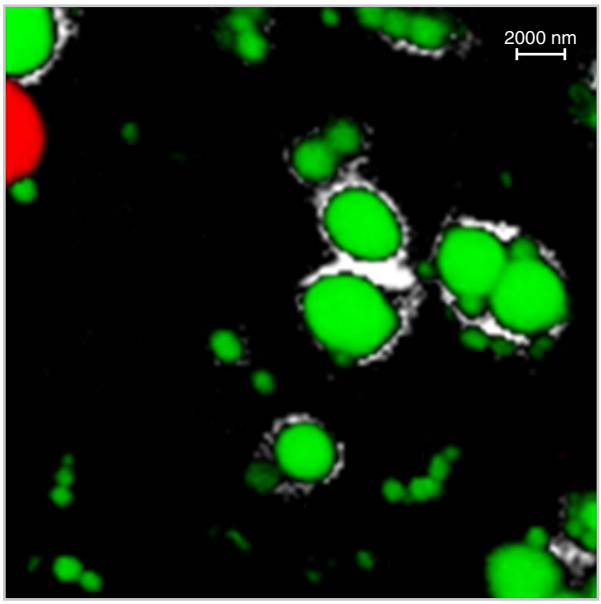
The inVia microscope provides incredible chemical specificity and sensitivity, generating detailed confocal chemical images in 2 and 3 dimensions.

High resolution confocal emulsion analysis:

- Reveal the location of oils, water and emulsifiers
- Determine domain size information at sub-micrometre spatial resolution
- Study instabilities such as coalescence and flocculation
- Investigate emulsions in 3D to reveal droplet sizes and depth separation
- Use a range of configurable dry and immersion objectives to optimise confocal performance for a range of emulsions

Investigate emulsified products:

- Applicable to dairy products such as yoghurts
- Reveal the distribution of components such as glucose, carotenoids, proteins and lipids
- Study protein-lipid networks and lipid packing order
- Understand and improve the quality of products
- Guide the development of formulations and help optimise manufacturing processes



Moisturising hand cream emulsion revealing distribution, domain size (ranging from 0.5 µm to 4.0 µm) and emulsifier;

- *Poly(dimethylsiloxane) – silicone oil serving as an anti-foaming agent and skin protectant by forming a hydrating barrier (red)*
- *Alkyl benzoate – skin conditioner (green)*
- *Glyceryl stearate – emulsifier (white) coating skin conditioner*
- *Aqueous dispersion medium (black)*

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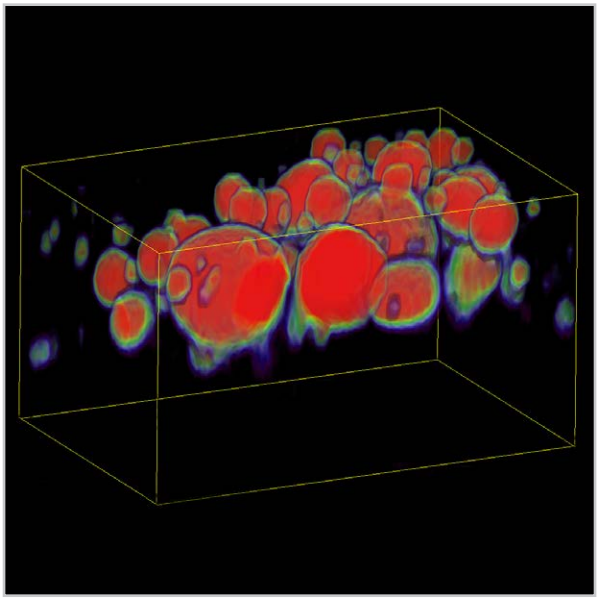
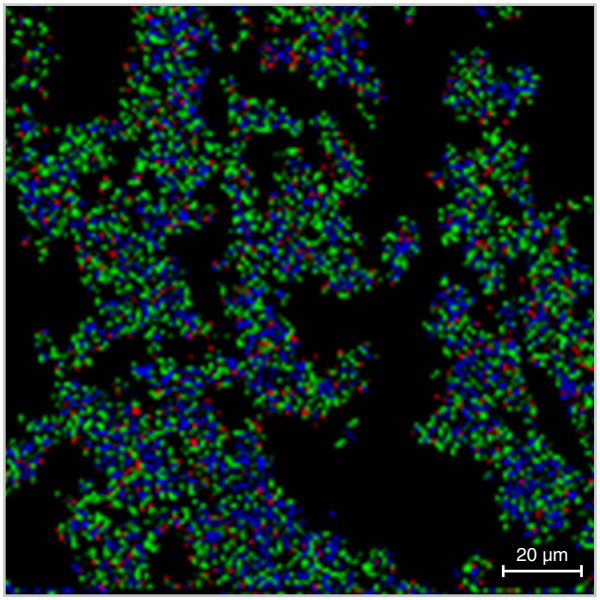


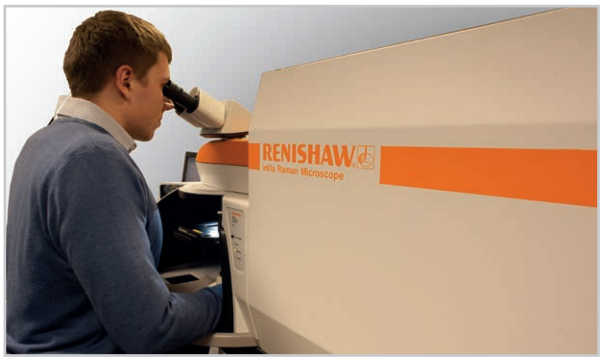
Moisturising body cream emulsion revealing 3D distribution and particle size of dispersed oil phase.



Lipid packing order in yoghurt emulsion (from high to low) red, green and blue.

Renishaw inVia: ideal for studying emulsions

- Research grade confocal Raman microscope
- Sub-micrometre resolution using StreamHR™ confocal mapping
- Configurable for different microscope objectives, including high NA and refractive index matching options
- 2D image and 3D volume options
- Fast, easy and targeted chemical image generation



The Renishaw inVia confocal Raman microscope

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/chemicals for more information.