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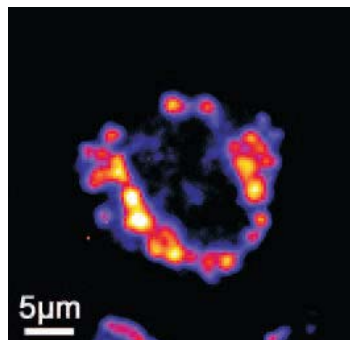
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Wide-field CARS-Microscopy: chemically sensitive microscopic imaging within nanoseconds

Coherent anti-Stokes Raman Scattering (CARS) microscopy is a newly emerging microscopy technique that allows chemical imaging with high spatial and spectral resolution. Recently we have developed a non-scanning version of CARS-microscopy, using nanosecond laser pulses and a special excitation geometry that is designed to satisfy the phase matching condition over the whole field of view. This allows fast image acquisition, even "snapshots" with a single shot of laser pulses are possible.

The performance and the potential of wide-field CARS-microscopy are demonstrated by various examples: The spatial resolution is sufficient for chemically selective imaging of (sub-)micron intracellular vesicles, containing e.g. lipids or lung surfactant. Moreover, the good spectral resolution of 5 wavenumbers and the low non-resonant background allow one to visually differentiate the small differences in the lipid composition inside living adipocyte cells that result from a diet on saturated versus unsaturated fatty acids.



CARS image of a living lung cell containing
small vesicles of unstained pulmonary surfactant

Reference:

Heinrich C., A. Hofer, A. Ritsch, C. Ciardi, S. Bernet, M. Ritsch-Marte: **Selective imaging of saturated and unsaturated lipids by wide-field CARS-microscopy**, Opt. Express **16**, 2597-2708 (2008)

Donnerstag, 26. Juni 2008, 16:30 Uhr
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1. Stock, Seminarraum von VERA