

Applications of coherent anti-Stokes Raman scattering (CARS) microscopy to cell biology

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Recent developments have improved coherent anti-Stokes Raman scattering (CARS) microscopy to such an extent that rapid vibrational imaging of live cells has become feasible [1,2]. Applications of CARS microscopy to compelling problems in cell biology are beginning to emerge. For example, the high contrast obtained at benign illumination levels has enabled the mapping of the dynamic translocation of triglyceride droplets in living cells under physiological conditions [3].

To further increase the molecular selectivity of CARS microscopy, deuterium labels can be used [4]. In this presentation we show the first CARS imaging studies of deuterated compounds in live cells. By making use of cholesterol esters with deuterated acyl chains, the cellular uptake of cholesterol could be followed in detail.

In addition, we present several instrumental advancements of the CARS microscope, which allow high speed image acquisition and superior sensitivity.

References

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