

脂肪を燃焼する褐色脂肪細胞のラマン分光イメージング

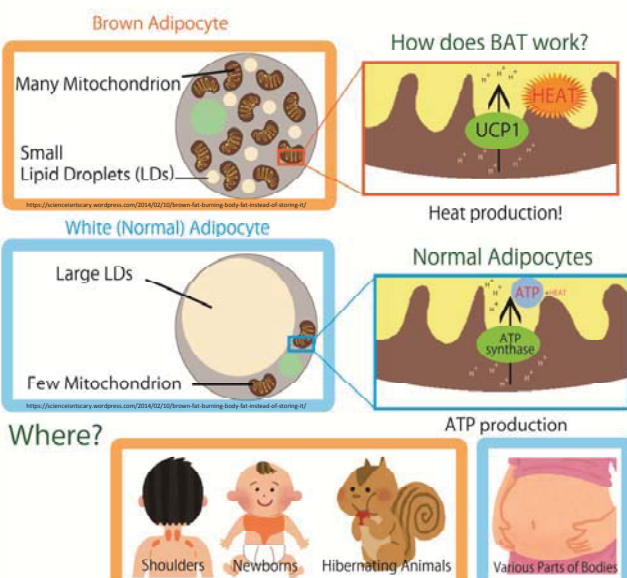
Raman spectroscopic imaging of brown adipocytes

概要

褐色脂肪細胞は、脂肪を燃焼し熱を産生する「善玉の脂肪細胞」として近年注目されているが、その特殊な脂質代謝過程は完全には解明されていない。そこで本研究では、coherent anti-Stokes Raman scattering (CARS)を用いることで、「そのまま」の細胞を非標識にて可視化し、細胞内脂質分布・脂質組成を明らかにした。We have applied coherent anti-Stokes Raman scattering (CARS) imaging to brown adipocytes in order to investigate the intracellular lipid distribution and its composition.

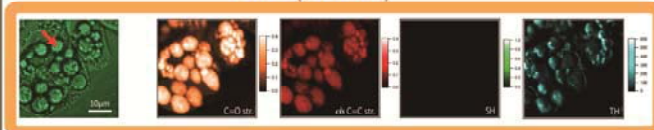
INTRODUCTION

What is BAT (Brown Adipocyte Tissue)?



RESULTS & DISCUSSION

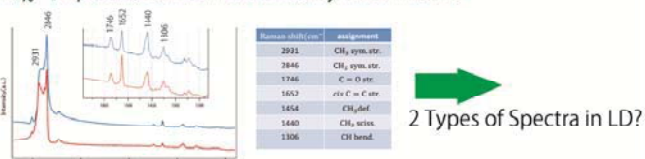
Nonlinear Multimodal Multi-photon Imaging
HB2 (Brown)



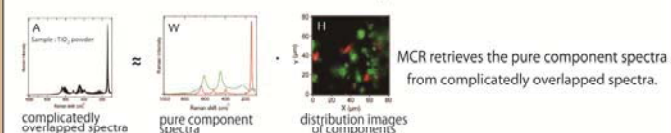
3T3-L1 (White)



Im[χ⁽³⁾] Spectra of LD Indicated by the Arrows

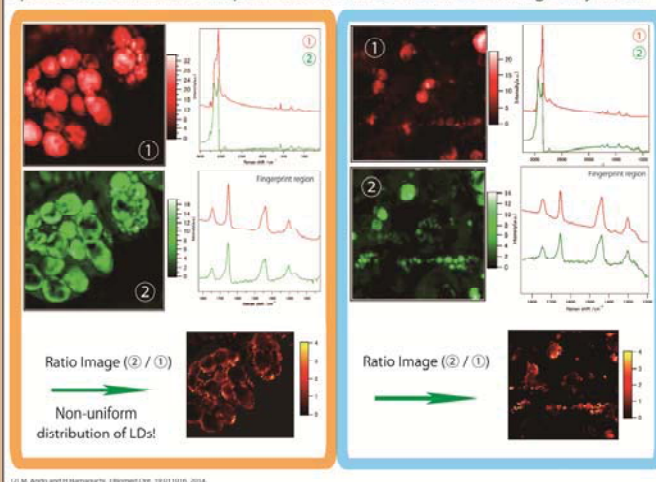


Multivariate Curve Resolution; MCR^[2]



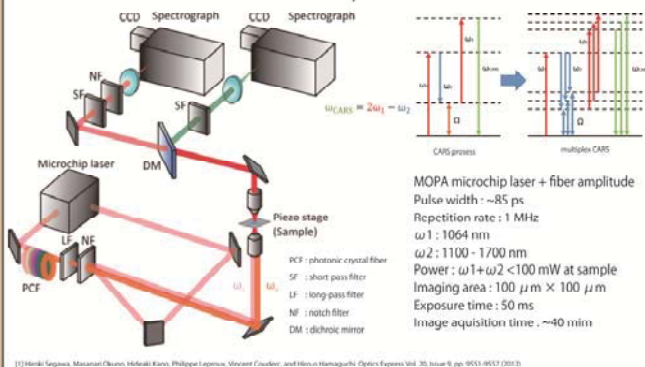
Powerful tool for studying a wide range of biomedical molecular systems!

Spectral Profiles of Components and Reconstructed Images by MCR

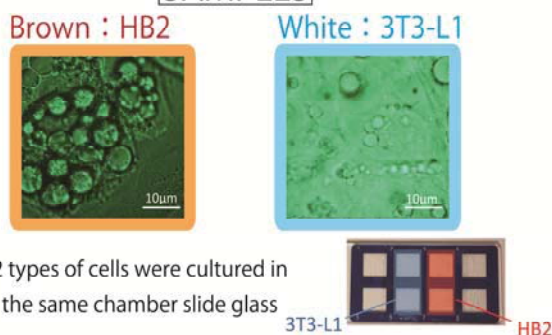


EXPERIMENTAL

Nonlinear Multimodal Microscope^[1]



SAMPLES



CONCLUSION

We performed label-free visualization and analysis of brown and white adipocytes by CARS spectroscopy.

The non-uniform distribution of LDs were found only in brown adipocytes.

