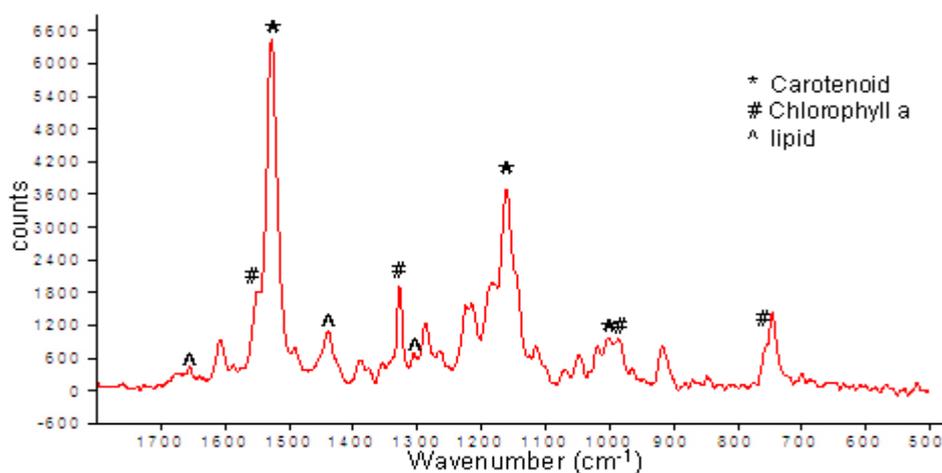


Raman micro-spectroscopy of Chromera velia, a photosynthetic alveolate closely related to apicomplexan parasites

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The malarial parasite *Plasmodium falciparum* contains an unpigmented chloroplast remnant termed an apicoplast which is a target for malaria treatment. Recently a very close relative, *Chromera velia*, with a photosynthetic plastid has been found¹. This organism provides a powerful model with which to study parasitism and its evolution and is a potential model for the study of antimalarial drug interactions. We have recently found micro-Raman spectroscopy to be a valuable tool in following chemical change within single live microalgae and single viable *Plasmodium*-infected red blood cells, so have carried out a micro-Raman study of live *Chromera velia* in order to ascertain the usefulness of Raman in chemically characterizing this organism, spatially locating the plastid and understanding how the organism and its chemistry develops under varying conditions. Preliminary spectra with 780nm excitation (~1 mW, 10sec) taken on single cells in a stressed population showed spectra with variations in levels of chlorophyll *a*, carotenoids and lipid. Subsequent spectra taken on a population grown under controlled laboratory conditions to mid-exponential growth showed consistent spectra and an example is shown in the figure below. With 514nm excitation spectra showing only carotenoids could be obtained provided the power at the sample was reduced to <60 μ W and the cells irradiated for 10secs only. Higher power or longer irradiation resulted in significant photo-chemical or thermo-chemical changes. The results of an experiment comparing the spectra of cells grown in full light conditions and dark conditions will be presented.



References:

- [1] Moore, R, Oborník, M, Janouskovec, J, Chrudimský, T, Vancová, M, Green, D, Wright, S, Davies, N, Bolch, C, Heimann, K, Slapeta, J, Hoegh-Guldberg, O, Logsdon, J, Carter, D. A photosynthetic alveolate closely related to apicomplexan parasites. *Nature* 451, 959-63 (2008).