Electronic Supplementary Material (ESI) for Analyst.

Raman spectroscopy compatible PDMS droplet microfluidic culture and analysis platform towards on-chip lipidomics

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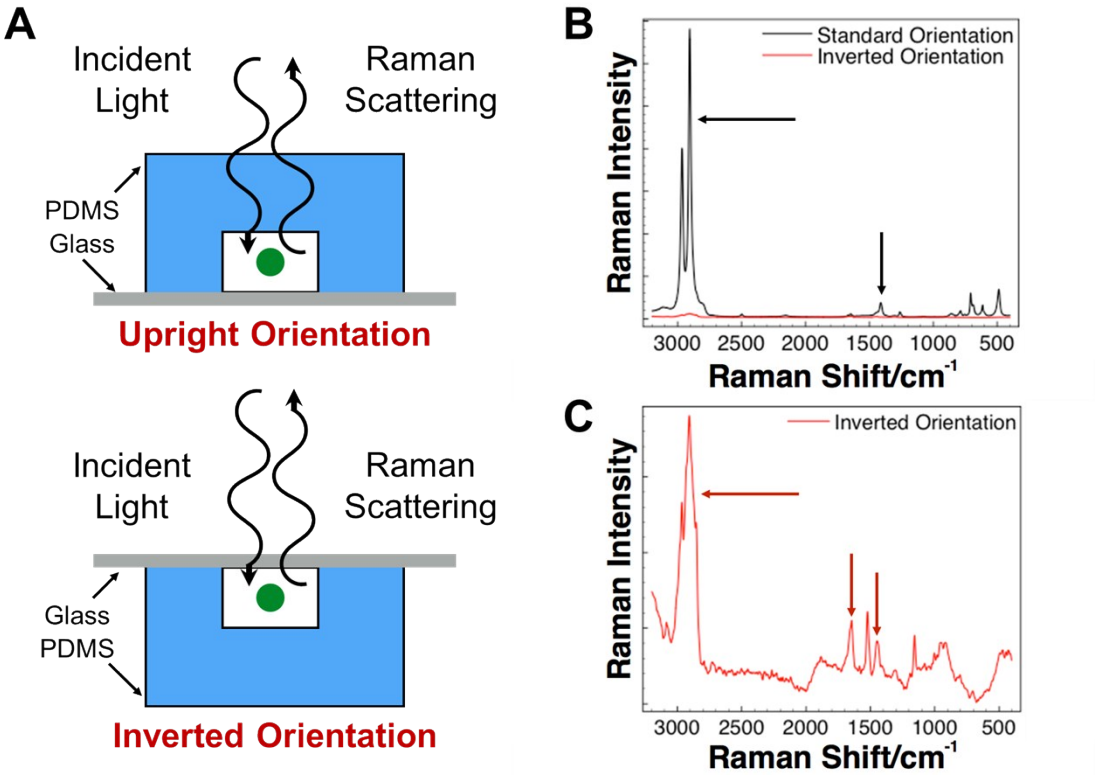
Supplementary Information	Raman spectra background reduction via device reorientation
Supplementary Figure S1	PDMS background reduction via device reorientation

Supplementary Information

Raman spectra background reduction via device reorientation

The Raman spectra of the microalga *Botryococcus braunii* inside PDMS devices was collected in both a standard upright orientation and an inverted orientation to compare the effect of PDMS thickness that the incident light must travel through on the Raman spectra (Supplementary Fig. S1A). The peak intensity resulting from PDMS was several orders of magnitude higher than those resulting from microalgal cells when using the standard upright device orientation (Supplementary Fig. S1B). As shown in previous studies[1,2], the inversion of the culture device drastically reduced the Raman scattering resulting from PDMS, thereby allowing for the *in vivo* microalgal lipid spectra to be accurately visualized (Supplementary Fig. S1C).



Supplementary Figure S1. PDMS background reduction via device reorientation. (A) Device layout for upright and inverted orientations. (B) Raman spectra of *B. braunii* in a PDMS channel measured through the upright orientation (black) and the inverted orientation (red). (C) Enlarged view of Raman spectra in the inverted orientation, clearly showing the peaks of *B. braunii* lipid resulting from significant background reduction. Raman peaks derived from PDMS scattering are marked with black arrows whereas red arrows indicate peaks resulting from lipid molecules.

References

1. Y. Geng, L. Chen, G. Chen, W. Bi, S. Xu, H. Cui and W. Xu, *The Review of scientific instruments*, 2015, **86**, 056109.
2. B. M. Liszka, H. S. Rho, Y. Yang, A. T. M. Lenferink, L. W. M. M. Terstappen and C. Otto, *RSC Advances*, 2015, **5**, 49350-49355.