Nanoscale

ARTICLE

Electronic Supplementary Information

Graphene as a photothermal actuator for control of lipid mesophase structure

Received 20th September 2016,
Accepted 00th October 2016

DOI: 10.1039/x0xx00000x

www.rsc.org/

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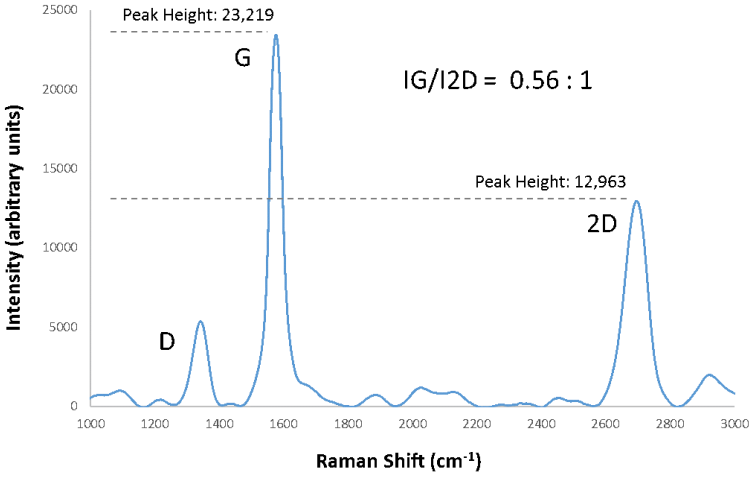

Fig. S1 Raman spectra for exfoliated F108-graphene sample showing the peak intensity ratios between G and 2D indicating highly exfoliated graphene.

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† Electronic Supplementary Information (ESI) available: [Additional materials and experimental details including further graphene characterization data, blank lipid SAXS patterns, initial graphene loaded SAXS patterns, and lipid chemical structures.]. See DOI: 10.1039/x0xx00000x

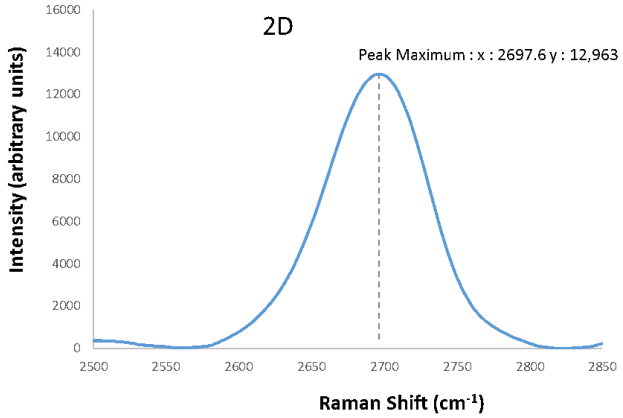

Fig. S2 F108-graphene 2D peak enlarged showing symmetry and Raman shift position.

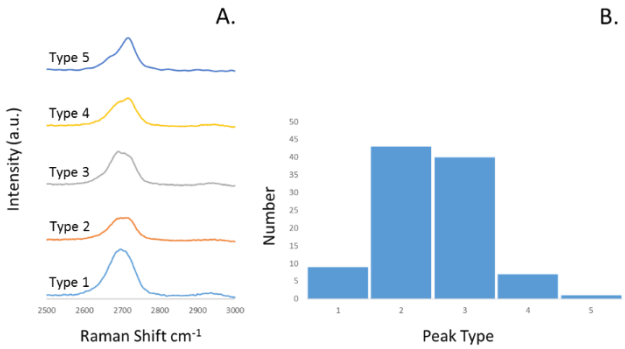

Fig. S3 (A) 2D peak change in shape with sheet thickness with (B) the sheet thickness distribution based on 2D peak shape.

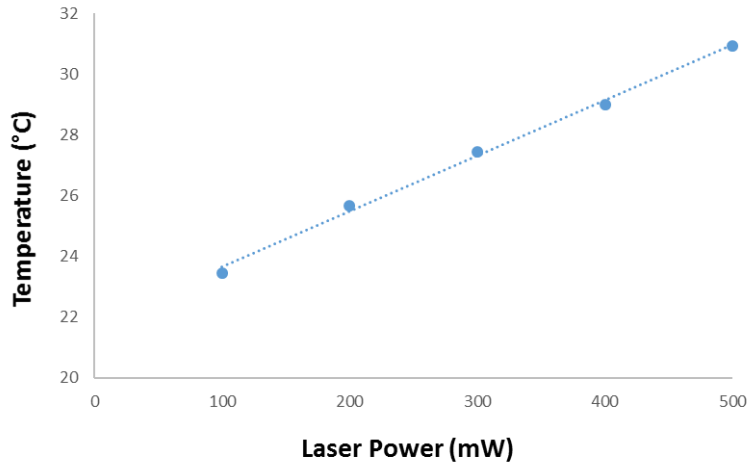

Fig. S4 Maximum bulk temperature of 0.1 mg ml^{-1} F108-graphene suspensions as a function of 808 nm laser power. Demonstrating the linear relationship between laser power and photothermal transduction.

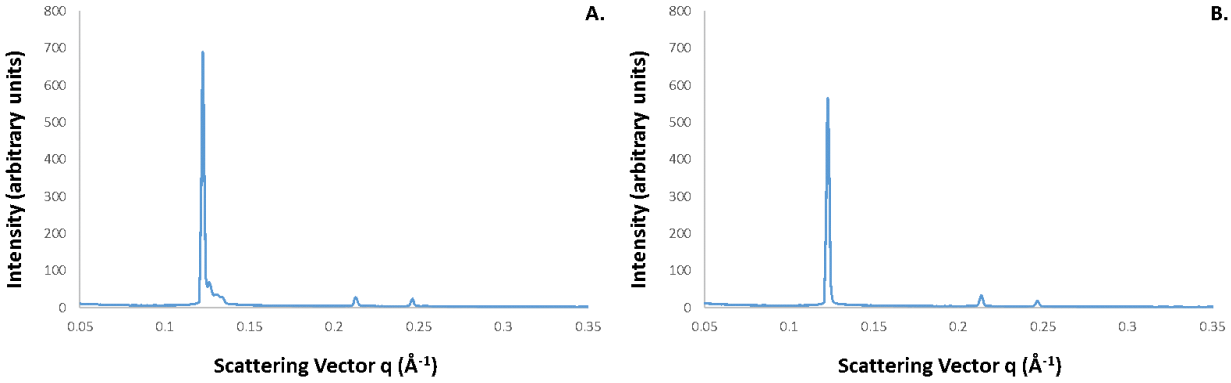

Fig. S5 Glyceryl monoether samples with (S5A) no graphene present and (S5B) 0.5 mg ml^{-1} present.

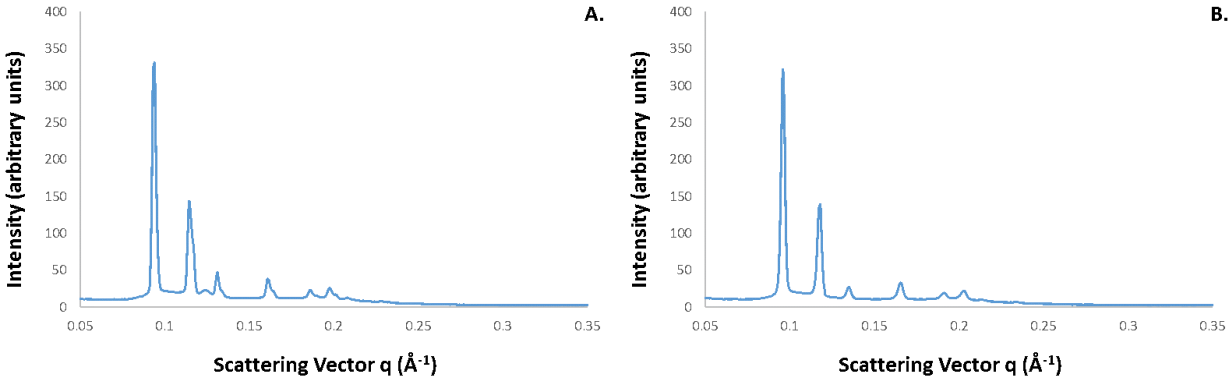

Fig. S6 Glyceryl monooleate samples with (S6A) no graphene present and (S56B) 0.5 mg ml^{-1} present.

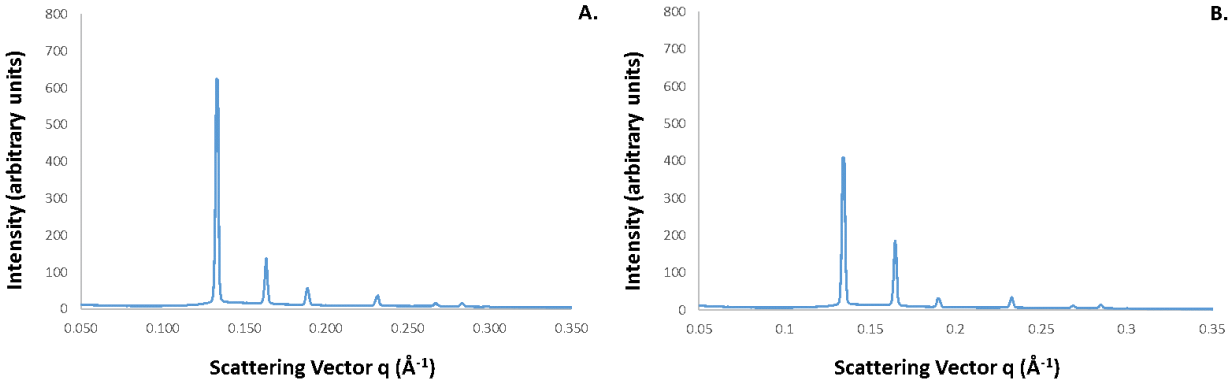

Fig. S7 Phytantriol samples with (S7A) no graphene present and (S7B) 0.5 mg ml^{-1} present.

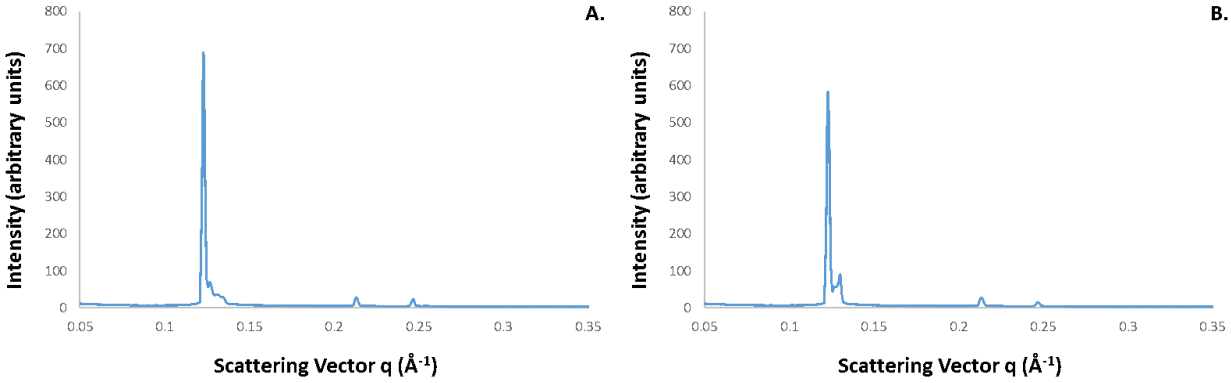

Fig. S8 Unloaded glyceryl monoether sample (S8A) prior to NIR exposure and (S8B) after 60 seconds of exposure.

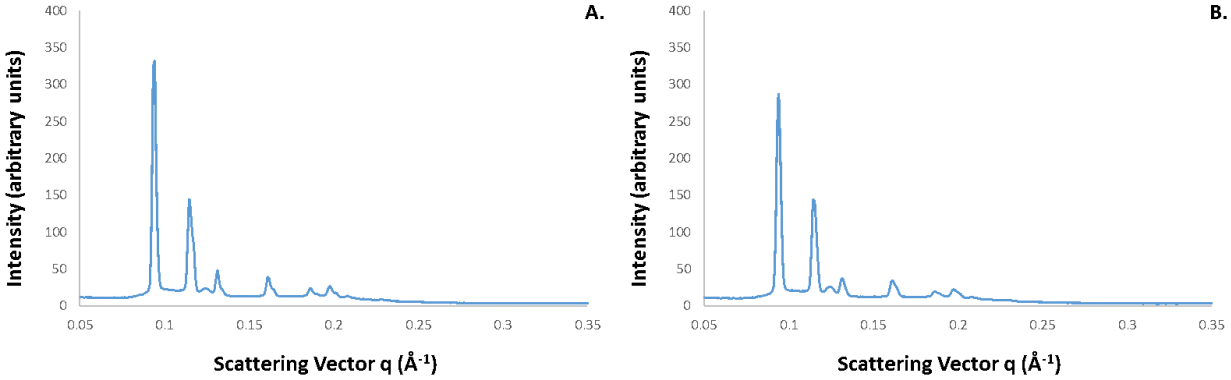

Fig. S9 Unloaded glyceryl monooleate sample (S9A) prior to NIR exposure and (S9B) after 60 seconds of exposure.

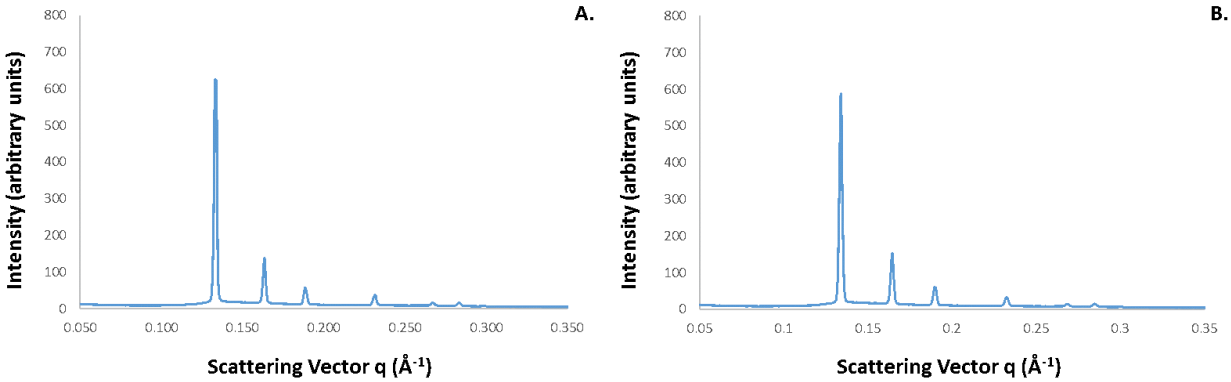

Fig. S10 Unloaded phytantriol sample (S10A) prior to NIR exposure and (S10B) after 60 seconds of exposure.

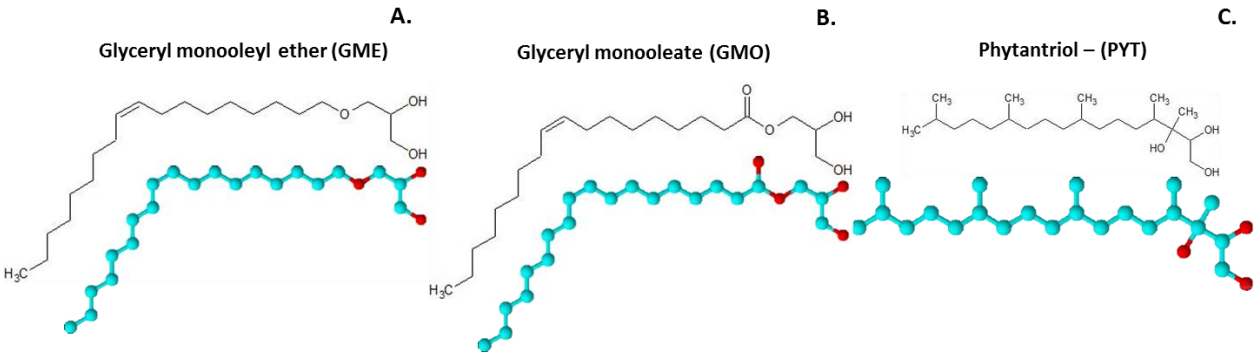

Fig. S11 Chemical structure of (S11A.) glyceryl monoether, (S11B.) glyceryl monooleate and (S11C.) phytantriol with carbons blue and oxygens red. Drawn using ACD/ChemSketch (Freeware), version 14.1, Advanced Chemistry Development, Inc., Toronto, ON, Canada, www.acdlabs.com, 2015.

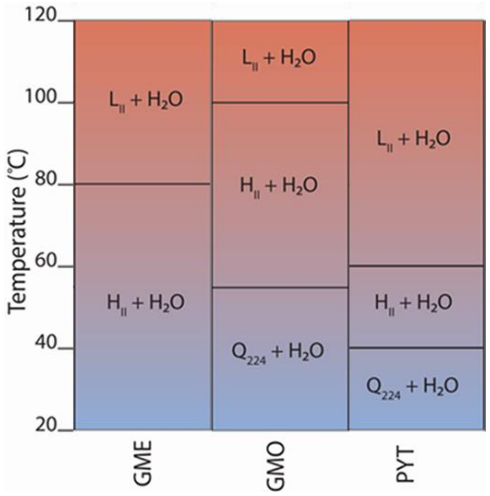

Fig. S12 Phase diagram at 50 %w/w for each of the three lipid systems explored within this study.