Transfer of lipid between triglyceride dispersions and lyotropic liquid crystal nanostructured particles using time-resolved SAXS - Supplementary Information

Adam J. Tilley[a,d], Yao-Da Dong[a], Josephine Y.T. Chong[a,d], Tracey Hanley[b], Nigel Kirby[c], Calum J. Drummond[d], Ben J. Boyd[a*]
[a]Monash Institute of Pharmaceutical Science, 381 Royal Pde, Parkville, VIC, Australia
[b]Bragg Institute, ANSTO, New Illawarra Road, Lucas Heights, NSW, Australia
[c]SAXS/WAXS beamline, Australian Synchrotron, 800 Blackburn Rd, Clayton, VIC, Australia
[d]CSIRO Materials Science and Engineering, Private Bag 10, Clayton VIC 3169, Australia

SI 1. Calibration of Pressure Ultrafiltration (PUF) membranes for determination of F127 retention to membranes

Solutions of varying F127 concentrations were filtered via PUF using Millipore regenerated cellulose membranes. The obtained filtrate was analysed via colorimetric assay to determine the amount of F127 which passed through the membrane. From this plot two linear relationships were established between F127 in the solution being filtered ($F127_{total}$) and F127 in filtrate ($F127_{filtrate}$). The point at which these relationships meet, 0.41% w/v, is close to the CMC for F127 (0.3% w/v F127) We therefore attribute the increase in F127 retained beyond 0.41% w/v F127 to be due to micelle formation.

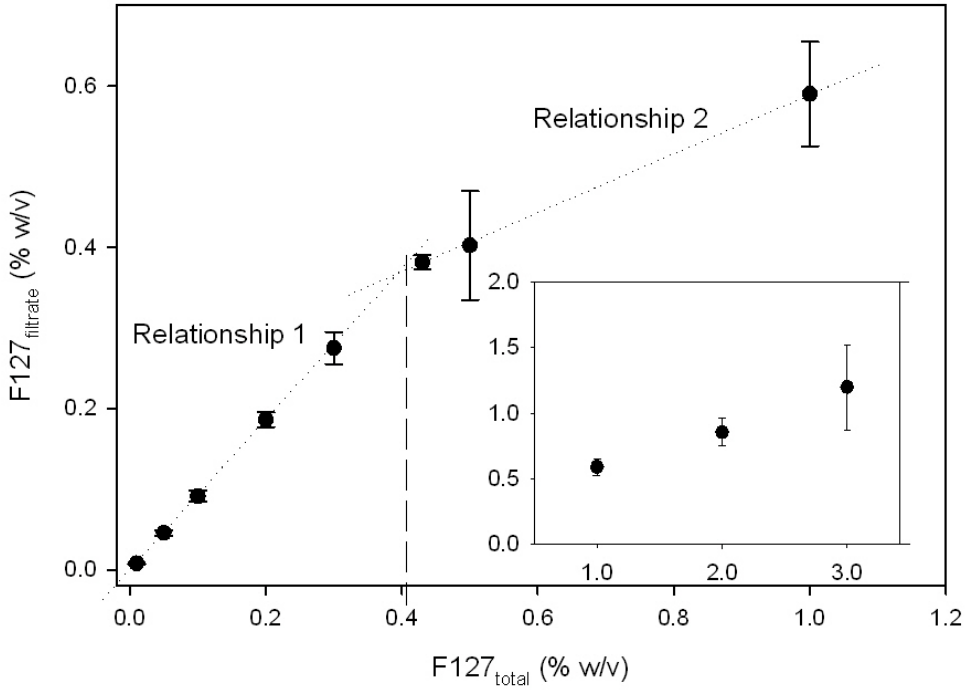

Figure SI 1. Calibration curve for F127 filtered through Millipore regenerated cellulose membranes (NWML 30000, 25 mm diameter, n=3 ± s.d.). The dotted lines represent the observed linear relationships between filtered F127 solutions and F127 in the filtrate. The dashed line represents the point at which relationship 1 = relationship 2 at $F127_{total}$ = 0.41% w/v.

SI 2. Calibration of F127 colorimetric assay

The F127 colorimetric assay was calibrated for 0.005 – 0.040 % w/v F127 solutions. Assays were performed using a series of standards of 0.005, 0.007, 0.010, 0.020 and 0.040 % w/v F127. An example of the standard curve obtained is shown below (Figure SI 2).

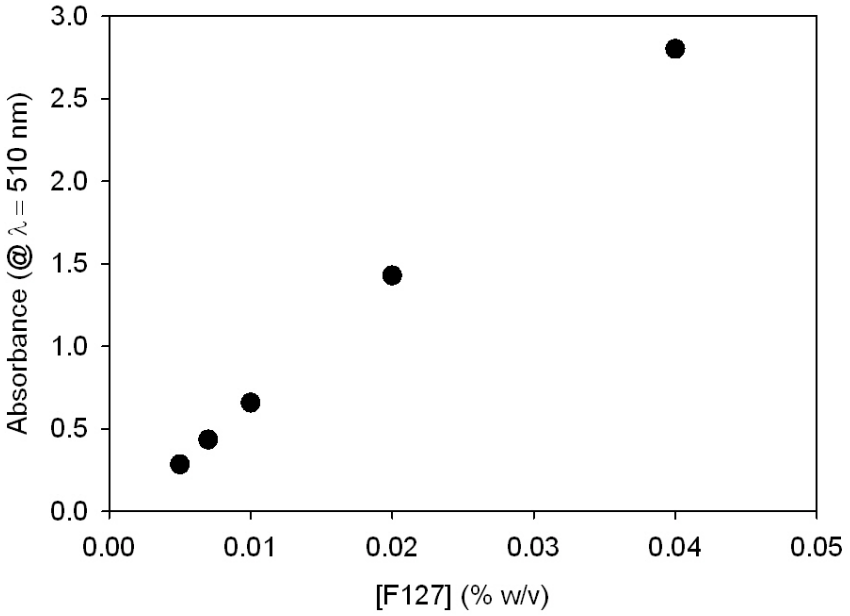

Figure SI 2. A typical standard curve for the F127 colorimetric assay with 0.005 – 0.040% w/v F127 standards.

SI 3. Transfer of lipid between phytantriol:vitEA hexosomes and triglyceride dispersions

Hexosomes of phytantriol:vitEA (9:1 w/w) were mixed with triglyceride dispersions and the nanostructure of the hexosomes was followed over time using time-resolved SAXS.

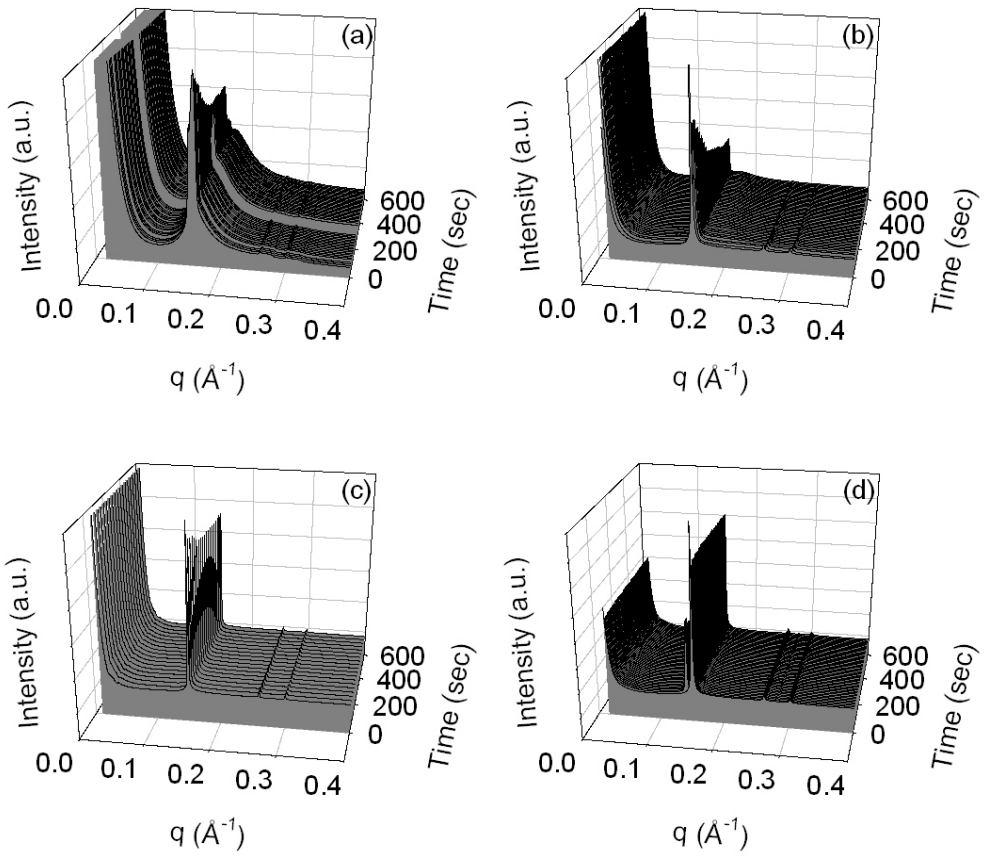

Figure SI 3. Time resolved synchrotron SAXS patterns for phytantriol:vitEA hexosomes when mixed with (a) TC, (b) TL, (c) TM and (d) TS dispersions. Note; The gap seen in (a) is due to SAXS patterns not been acquired during this short period of time.