Supporting information

Shear recovery and temperature stability of Ca^{2+} and Ag^{+} glycolipid fibrillar metallogels with unusual β-sheet-like domains

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Table S 1 – Literature survey based on the scattering (SAXS or SANS) data reported in each cited article. Articles cited under *SAFiN with disordered fibers* report a typical scattering profile of the fiber alone, with or without a structure peak. Articles cited under *SAFiN with suprafibrillar assembly* report scattering profiles where the fiber's form factor is superimposed with the structure factor associated to the 3D organization of the fibers. Articles cited under *β-sheet-like gel ("nano-fishnet")* report those hydrogels characterized by entanglement and β-sheet or β-sheet-like structure.

SAFiN with disordered fibers	
Not gelled	[1–4]
Gels	[5,6,15–17,7–14]
SAFiN with suprafibrillar assembly	
Hexagonal bundles/Columnar hexagonal	[18–23]
Raft-like/lamellar (solution, not gelled)	[24,25]
β-sheet-like gel ("nano-fishnet")	
Biopolymers (fibroin, actin)	[26–33]
SAFiN	This work

The typical SAXS profiles of self-assembled fibrillar hydrogels from amphiphiles generally show an intense low-q scattering, of which the slope is related to the morphology (-1 for thin fibers and -2 for belts and ribbons[4]) and either a broad oscillation (form factor)[3] or a broad structural peak.[34] We are not aware of SAXS fingerprints of fibrillar hydrogels from low-molecular weight amphiphiles with a series of diffraction peaks in a lamellar order.

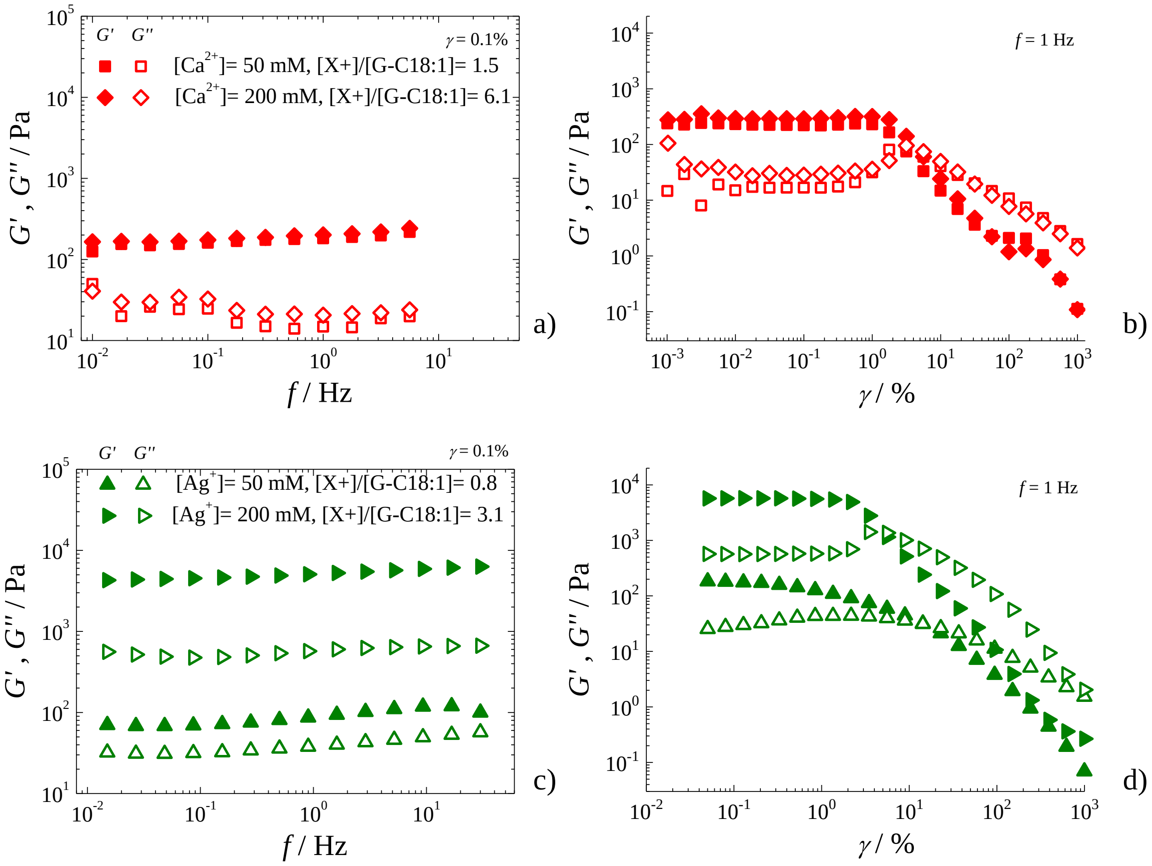


Figure S 1 - Elastic and viscous moduli, G′ and G′′, of a,b) {Ca^{2+}}G-C18:1 (red square and diamonds) or c,d) {Ag^{+}}G-C18:1 (green triangle) hydrogels ($C_{G\text{-}C18:1}$= 3 wt%, pH 10). Ion concentrations in the lipid solution are 50 mM and 200 mM.

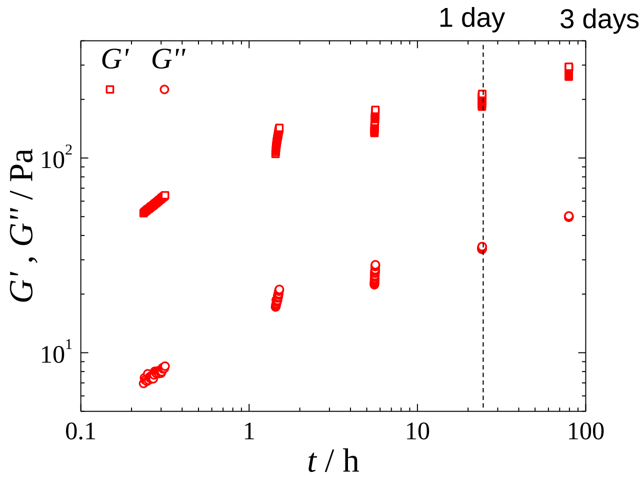
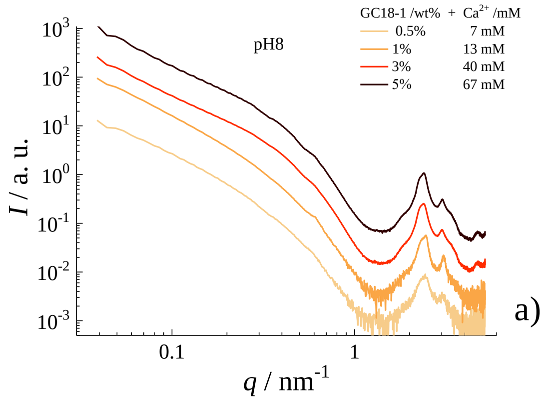


Figure S 2 – Time-dependency of the gelation (γ= 0.3%, f= 1 Hz) of {Ca^{2+}}G-C18:1 hydrogels (C= 3 wt%, pH 10). The charge ratio is [Ca^{2+}]/[G-C18:1]= 0.61. Hydrogel is left in a closed sample-holder and sampled at regular intervals, and not left under air on the rheometer geometry.



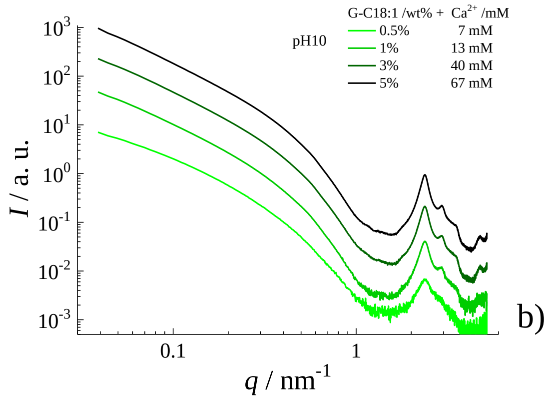


Figure S 3 – SAXS spectra of a {Ca^{2+}}G-C18:1 hydrogels at a molar ratio 0.61 for different surfactant concentrations, at a) pH8, b) pH10. The charge ratio is [Ca^{2+}]/[G-C18:1]= 0.61. Data are shifted by a factor of about 5.

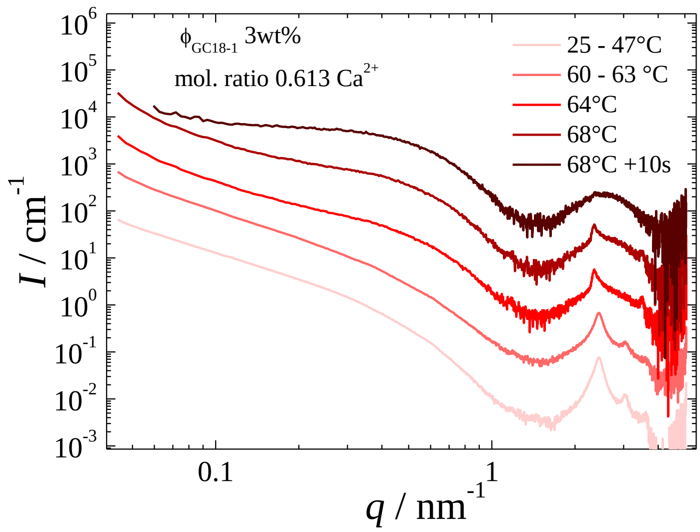


Figure S 4 - SAXS profiles recorded during temperature increase from 25°C to 70°C for a {Ca^{2+}}G-C18:1 gel at 3 wt%, basic pH and [Ca^{2+}]/[G-C18:1]= 0.61. Please note that the experimental setup in the SAXS-coupled rheometer (here, ID02, ESRF) is not suitable for a precise control over temperature. Data are shifted by a factor of about 15.

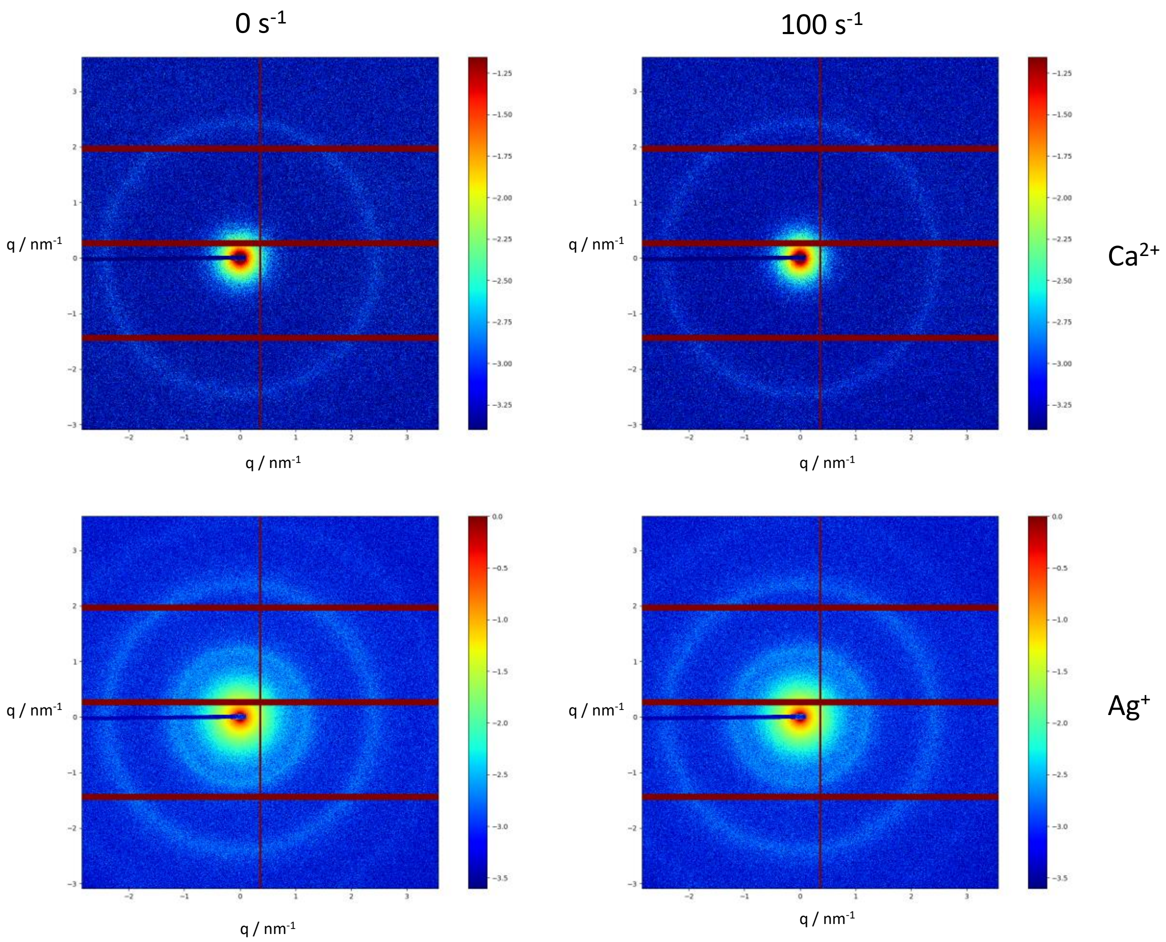


Figure S 5 – Rheo-SAXS experiment. 2D SAXS spectra of {Ca^{2+}} (molar ratio 0.61) or {Ag^{+}} (molar ratio 1.0) G-C18:1 hydrogel ($C_{G\text{-}C18:1}$ = 3%) at pH 10 sheared at 0 s^{-1} or 100 s^{-1}

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