

## **Supporting information**

### **Self-assembled fibrillar network (SAFiN) hydrogels with $\beta$ -sheet-like domains: Properties**

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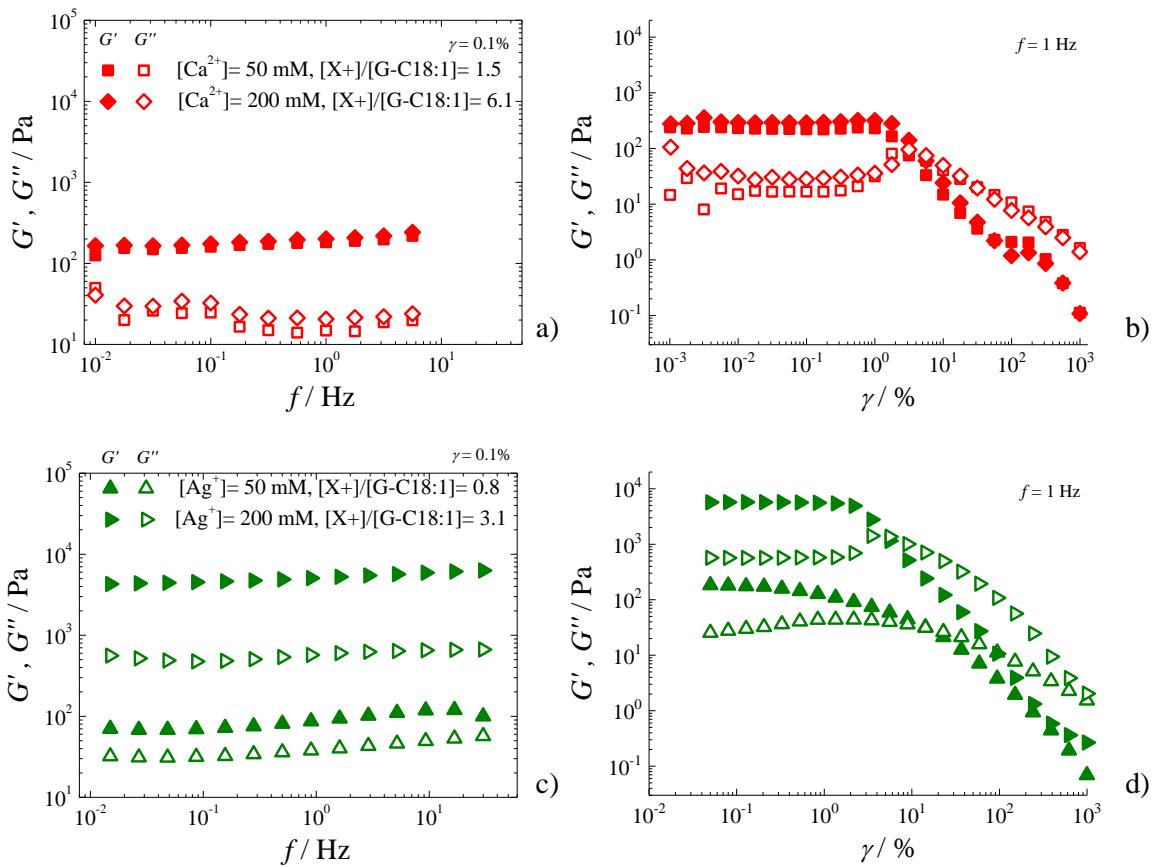
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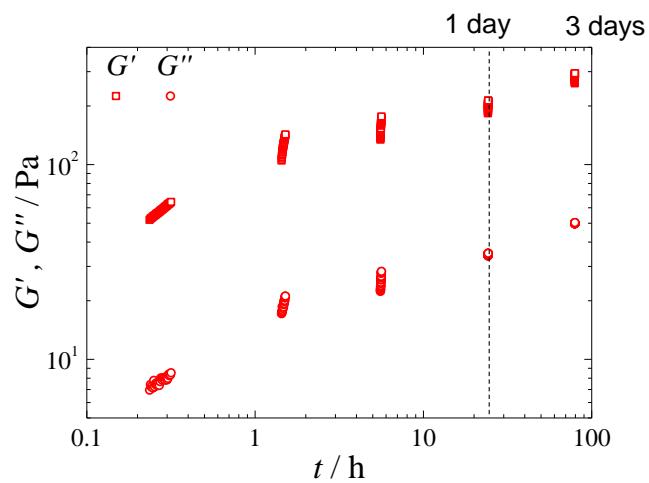
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**Table S 1 – Literature survey based on the scattering (SAXS or SANS) data reported in each cited article.** Articles cited under *SAFiN with disordered fibers* report a typical scattering profile of the fiber alone, with or without a structure peak. 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  *$\beta$ -sheet-like gel (“nano-fishnet”)* report those hydrogels characterized by entanglement and  $\beta$ -sheet or  $\beta$ -sheet-like structure.

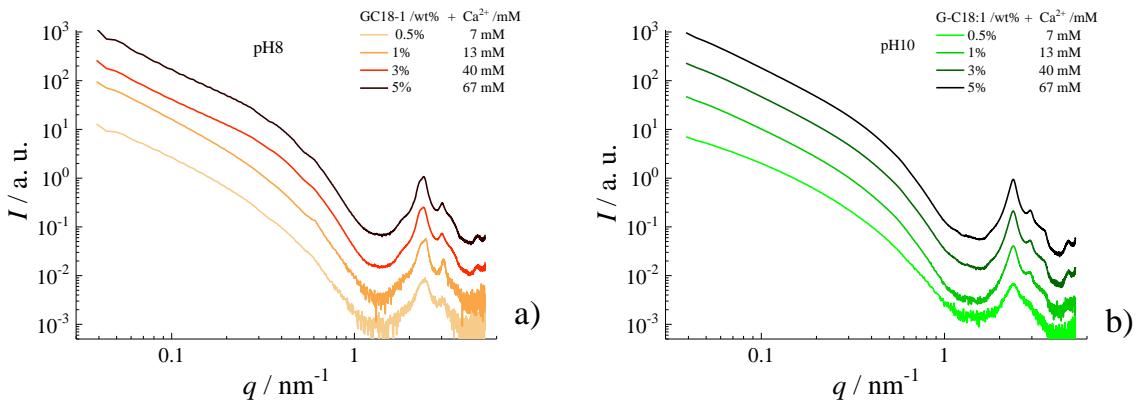
<b>SAFiN with disordered fibers</b>	
Not gelled	(1–4)
Gels	(5,6,15–17,7–14)
<b>SAFiN with suprafibrillar assembly</b>	
Hexagonal bundles/Columnar hexagonal	(18–23)
Raft-like/lamellar (solution, not gelled)	(24,25)
<b><math>\beta</math>-sheet-like gel (“nano-fishnet”)</b>	
Biopolymers (fibroin, actin)	(26–33)
SAFiN	This work



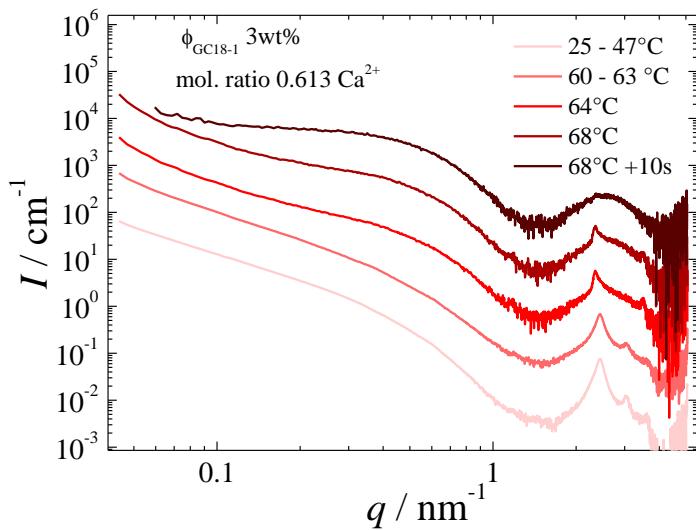
**Figure S 1 - Elastic and viscous moduli,  $G'$  and  $G''$ , of a,b)  $\{Ca^{2+}\}G-C18:1$  (red square) or c,d)  $\{Ag^+\}G-C18:1$  (green triangle) hydrogels ( $C_{G-C18:1} = 3$  wt%, pH 10). Ion concentrations in the lipid solution are 50 mM and 200 mM.**



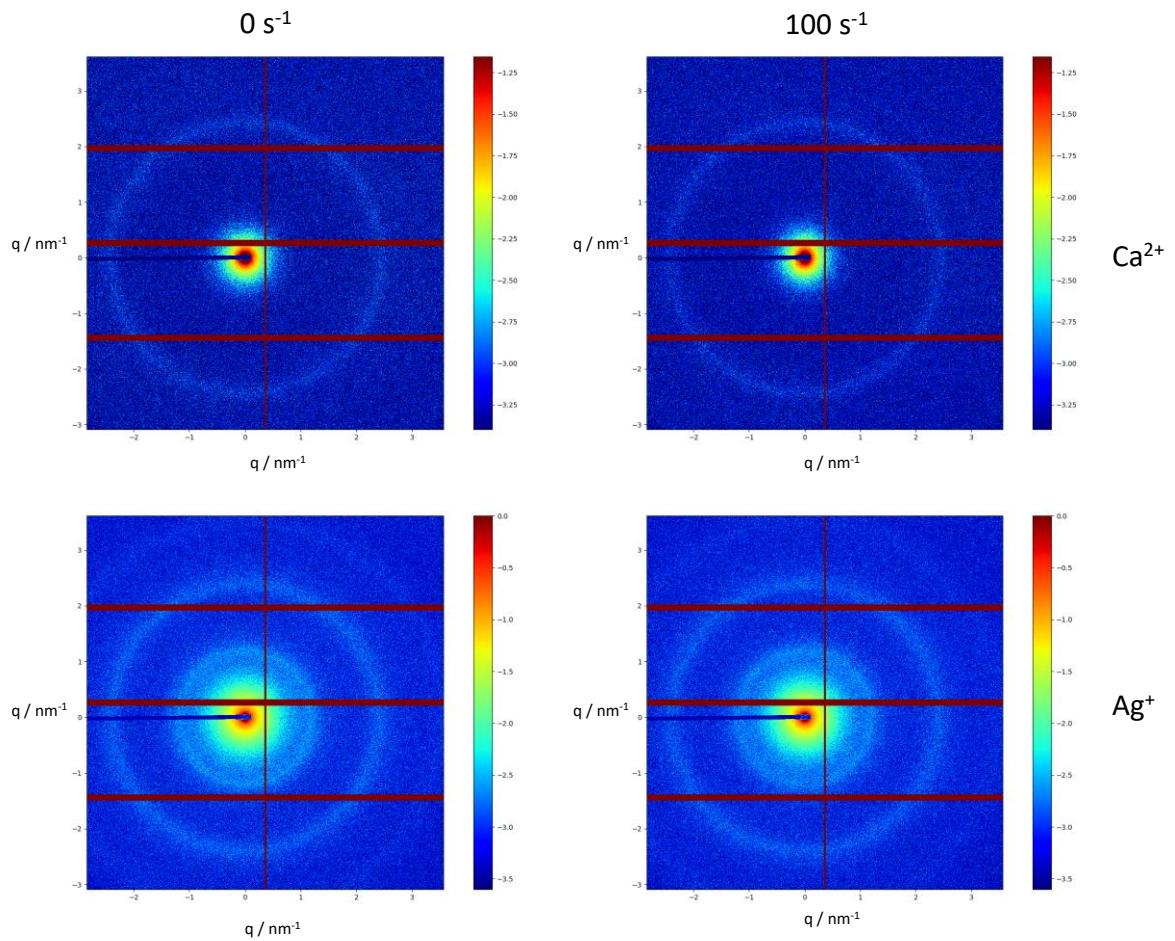
**Figure S 2 – Time-dependency of the gelation ( $\gamma = 0.3\%$ ,  $f = 1 \text{ Hz}$ ) of  $\{\text{Ca}^{2+}\}\text{G-C18:1}$  hydrogels ( $C = 3 \text{ wt\%}$ , pH 10). The charge ratio is  $[\text{Ca}^{2+}]/[\text{G-C18:1}] = 0.61$ . Hydrogel is left in a closed sample-holder and sampled at regular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



**Figure S 3 – SAXS spectra of a  $\{\text{Ca}^{2+}\}$ G-C18:1 hydrogels at a molar ratio 0.61 for different surfactant concentrations, at a) pH8, b) pH10. The charge ratio is  $[\text{Ca}^{2+}]/[\text{G-C18:1}] = 0.61$ . 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  $\{\text{Ca}^{2+}\}\text{G-C18:1}$  gel at 3 wt%, basic pH and  $[\text{Ca}^{2+}]/[\text{G-C18:1}] = 0.61$ . 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  $\{\text{Ca}^{2+}\}$  (molar ratio 0.61) or  $\{\text{Ag}^+\}$  (molar ratio 1.0) G-C18:1 hydrogel ( $C_{\text{G-C18:1}} = 3\%$ ) at pH 10 sheared at  $0 \text{ s}^{-1}$  or  $100 \text{ s}^{-1}$**

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