Supplementary Information

Thermoresponsive structured emulsions based on fibrillar self-assembly of natural saponin glycyrrhizic acid

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Fig. S1 (A) Interfacial tension as a function of time (30 min) for the GA solutions (0, 0.025, 0.05, and 0.1 wt%) at the oil-water interface. (B) Lissajous plots of surface pressure versus deformation obtained during amplitude sweep (10%) of the oil-water interface stabilized by 0.1 wt% GA fibril solution.

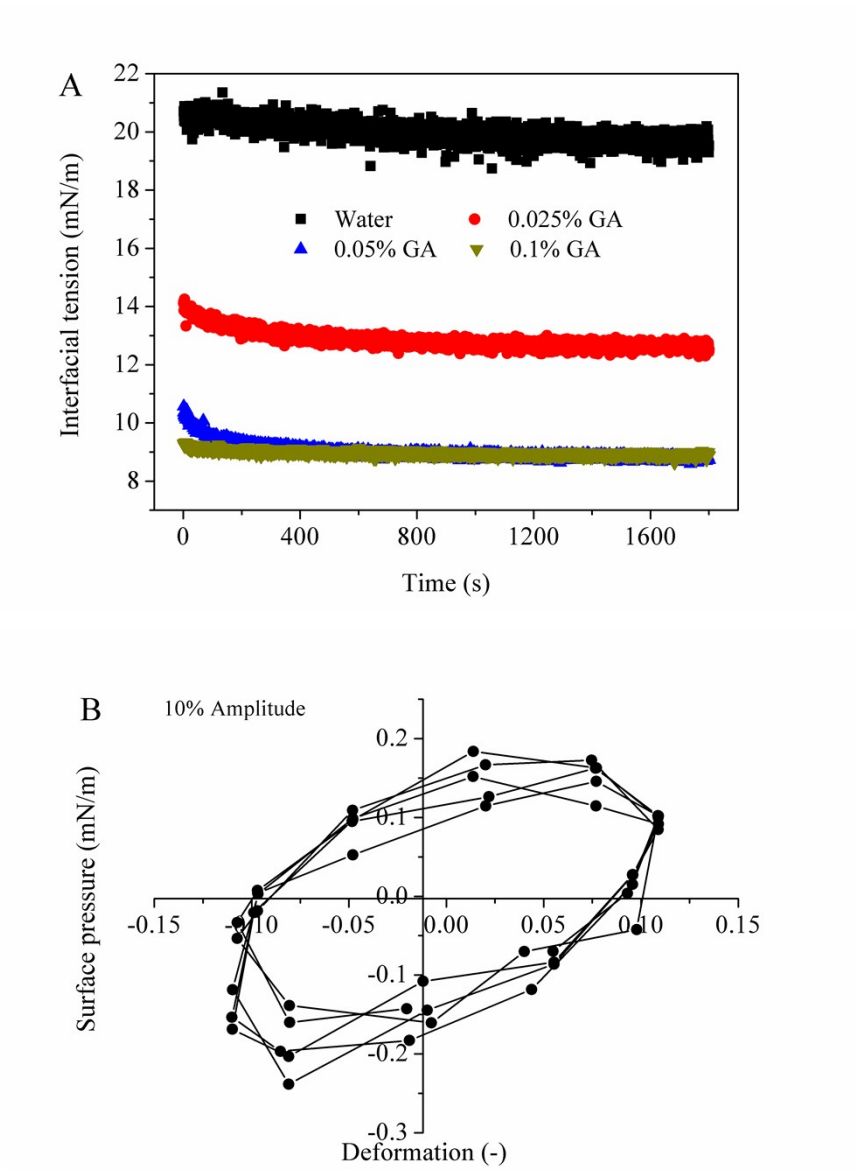

Fig. S2 (A) Photographs (above) of GA solutions (0.1-4 wt%) after storage at room temperature (25 °C) for 12 h, and a transparent hydrogel is formed at the low GA fibril concentration of 0.5 wt% (marked by red arrows); AFM (below) height image with corresponding AFM peak force error image of a thin layer of the 1 wt % GA hydrogel. (B) Amplitude and (C) frequency sweeps for the hydrogels prepared at different GA fibril concentrations (1, 2, and 4 wt%). G′ and G″ are shown as filled and open symbols, respectively.

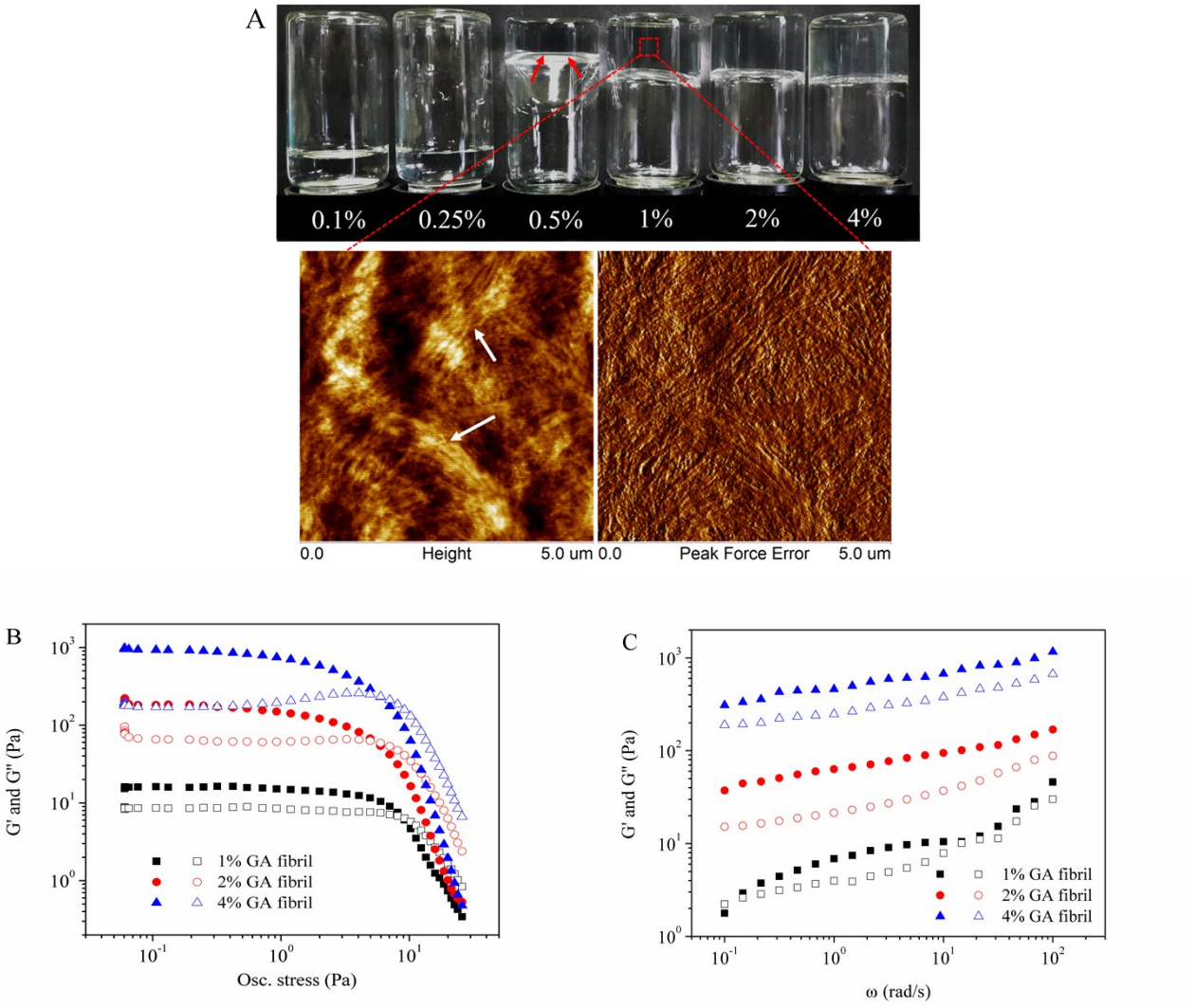

Fig. S3 Spread-like appearance and optical microscopy image (scale bar = 30 μm) of the emulsion gel (60 wt% olive oil) stabilized by 4 wt% GA fibril.

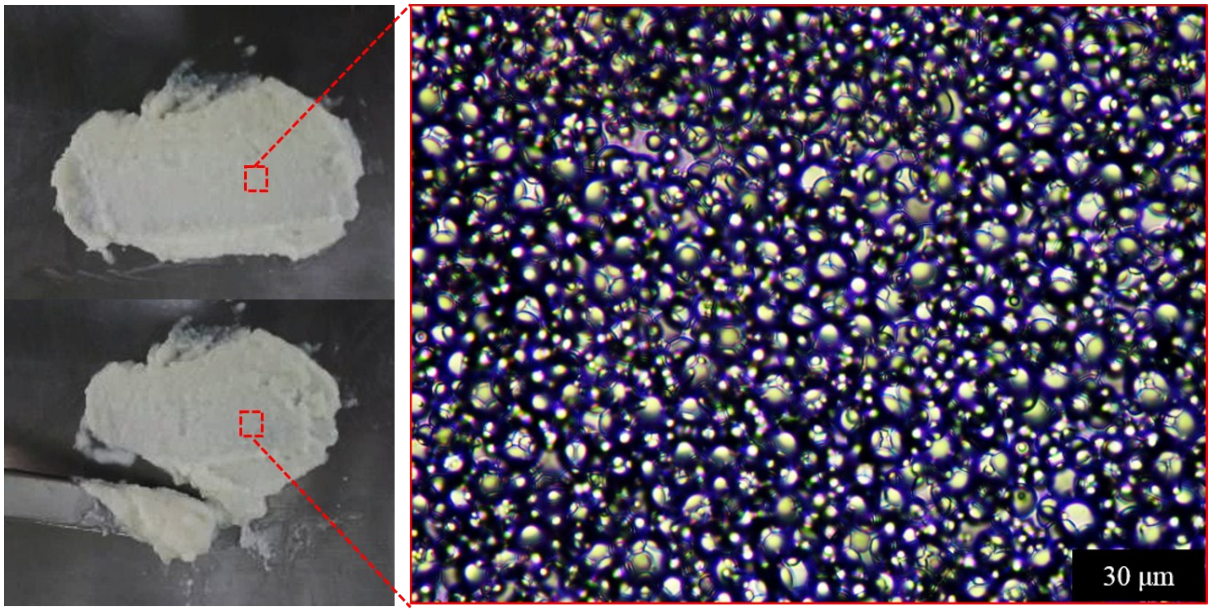

Fig. S4 Force-relative displacement curves (A) and yield force (hardness) values (B) for emulsion gels (60 wt% olive oil) stabilized by different GA fibril concentrations (1-4 wt%).

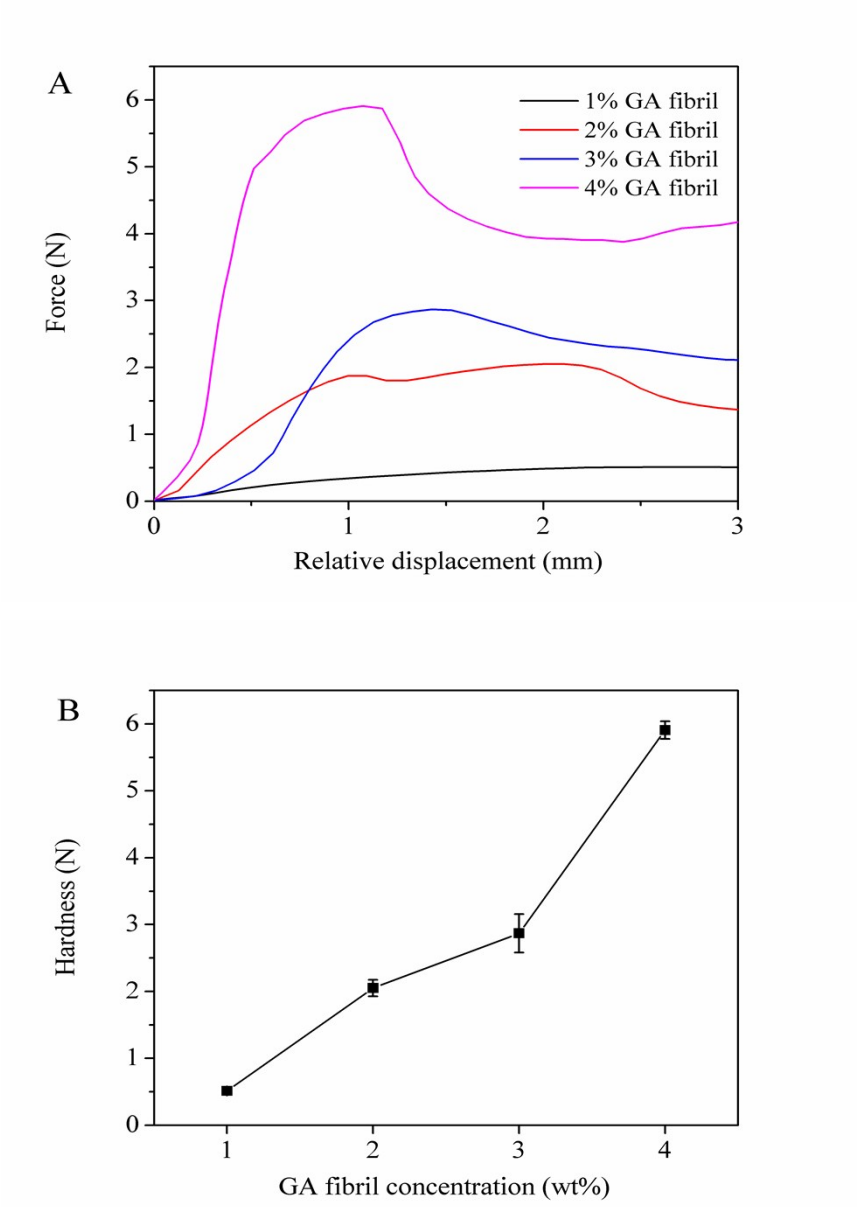

Fig. S5 Storage modulus (G′) and loss modulus (G″) of emulsion gels containing 60 wt% olive oil prepared using 1 (A) and 3 wt% (B) GA fibrils, measured during the heating (red line) and cooling (blue line) cycles. (Insets) Photographs of respective emulsion gels during heating and cooling. G′ and G″ are shown as filled and open symbols, respectively. (C) PLM images of the 4 wt% GA fibril-stabilized emulsion gel observed during heating and cooling processes.

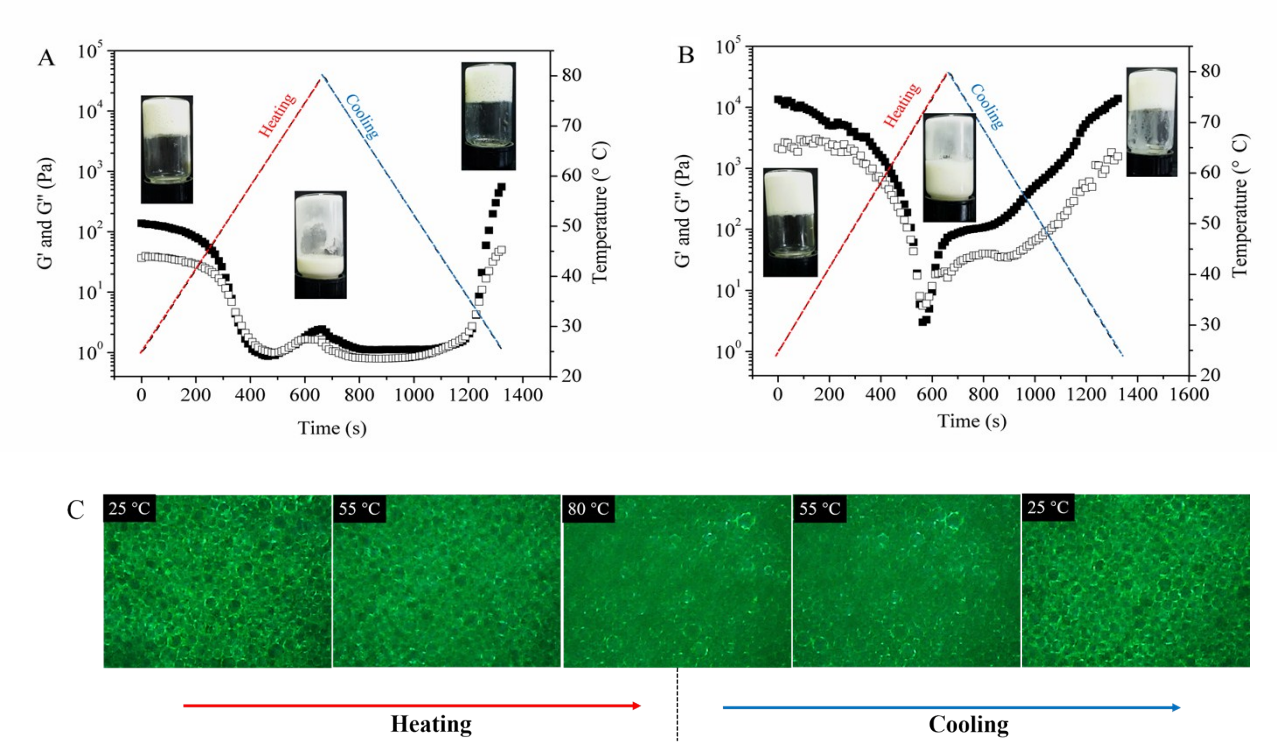

Fig. S6 (A) Storage modulus (G′) and loss modulus (G″) versus frequency for emulsion gels (60 wt% olive oil) prepared at different GA fibril concentrations (1-4 wt%) during 30 days of storage at room temperature (25 °C). G′ and G″ are shown as filled and open symbols, respectively. Photographs of these emulsion gels at initial (0 day) and after 30 days of storage at room temperature (25 °C). (B) The dried oil products containing nearly 94 wt% liquid oil obtained by freeze-drying of the 4 wt% GA fibril-stabilized emulsion gel. (C) Storage modulus (G′) and loss modulus (G″) as a function of frequency for the 4 wt% GA fibril-stabilized emulsion gel (60 wt% olive oil) with β-carotene (0.1 wt% of oil) during storage for 30 days. Photographs of emulsion gels (60 wt% olive oil) prepared at different GA fibril concentrations (1-4 wt%) with β-carotene (0.1 wt% of oil) at initial (0 day) and after 30 days of storage at room temperature (25 °C).