

# In Situ Biosynthesis of Photothermal Parasite for Fluorescence Imaging-Guided Photothermal Therapy of Tumors

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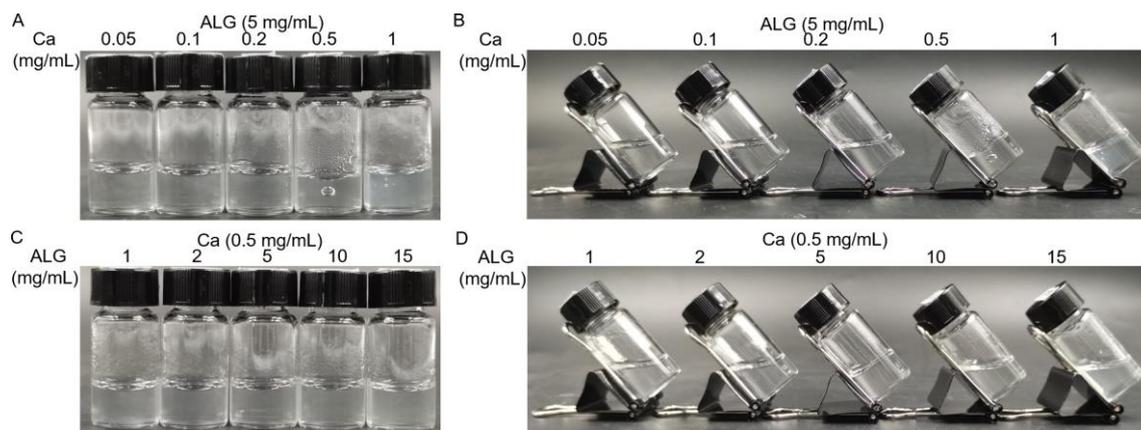
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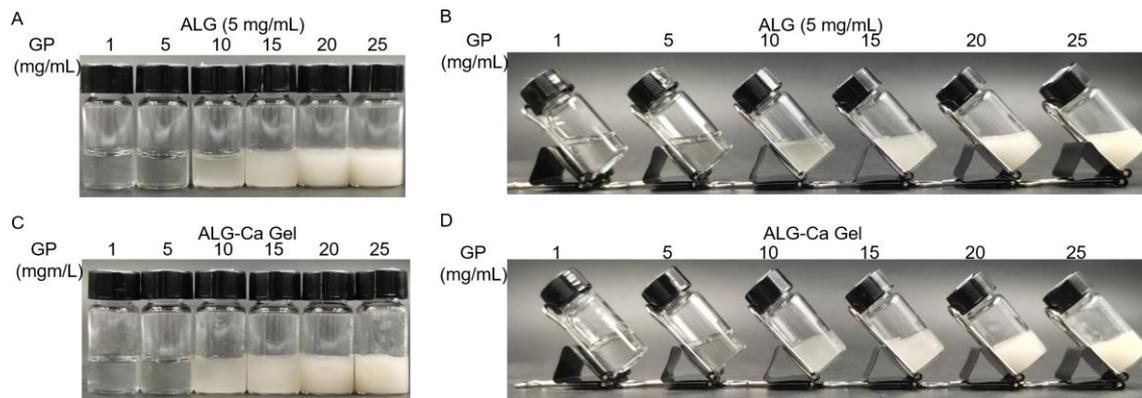
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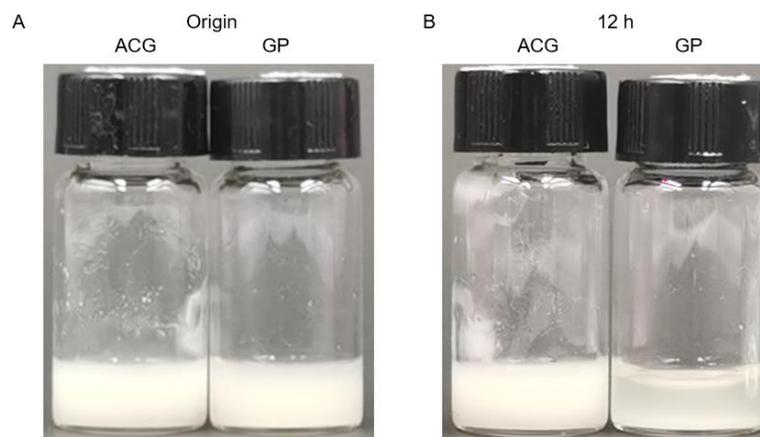
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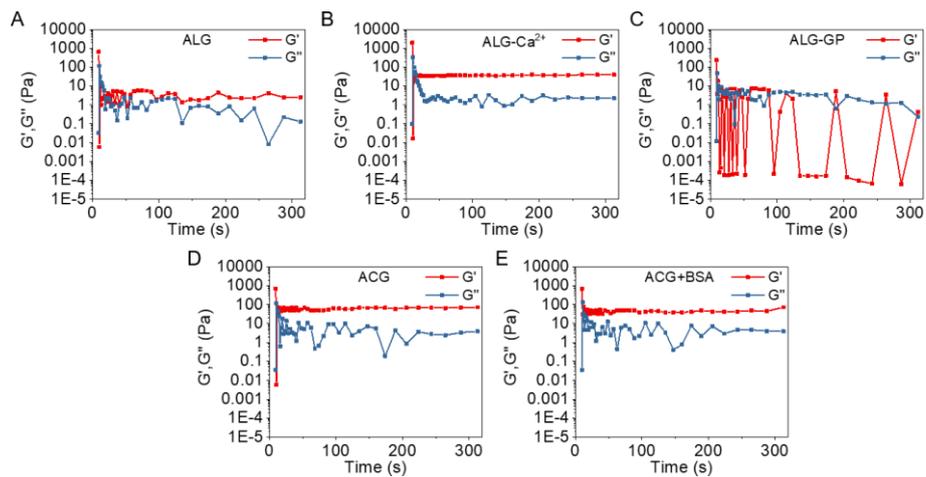
**Figure S1.** Optimization for the fabrication of ALG-Ca hydrogel. Vertically (A) and obliquely (B) placed mixture of ALG solution (5 mg/mL) and CaCl<sub>2</sub> solution (from left to right: 0.05, 0.1, 0.2, 0.5, and 1 mg/mL). Vertically (C) and obliquely (D) placed mixture of CaCl<sub>2</sub> solution (0.5 mg/mL) and ALG solution (from left to right: 1, 2, 5, 10, and 15 mg/mL).



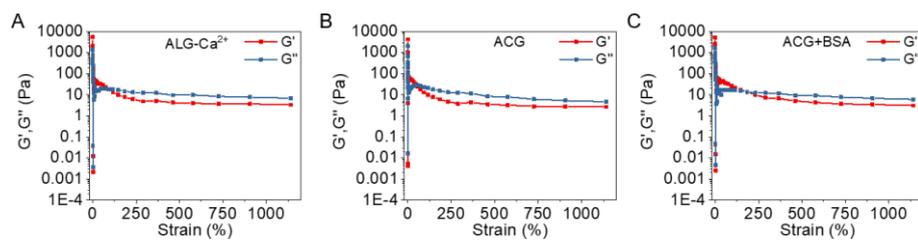
**Figure S2.** Optimization for the fabrication of ACG hydrogel. Vertically (A) and obliquely (B) placed mixture of ALG solution (5 mg/mL) and GP solution (from left to right: 1, 5, 10, 15, 20, and 25 mg/mL). Vertically (C) and obliquely (D) placed mixture of ALG-Ca hydrogel (5 mg/mL ALG and 0.5 mg/mL  $\text{CaCl}_2$ ) and GP solution (from left to right: 1, 5, 10, 15, 20, and 25 mg/mL).



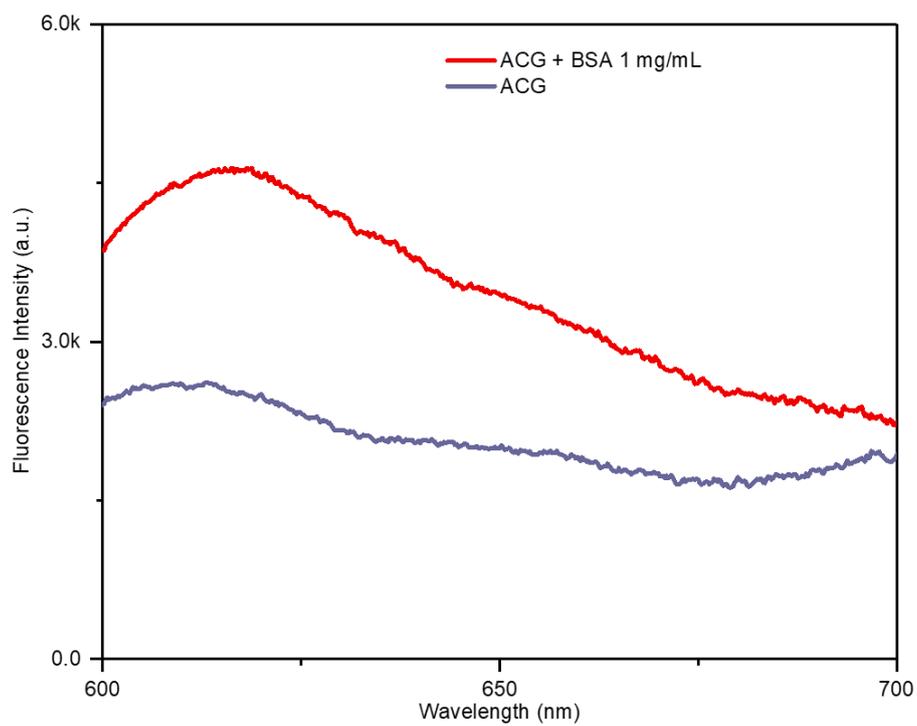
**Figure S3.** The comparison of the dispersive capacity of ACG hydrogel and GP solution (20 mg GP/mL). (A) The original state of ACG hydrogel and GP solution. (B) The state of ACG hydrogel and GP solution after 12 h of immobility.



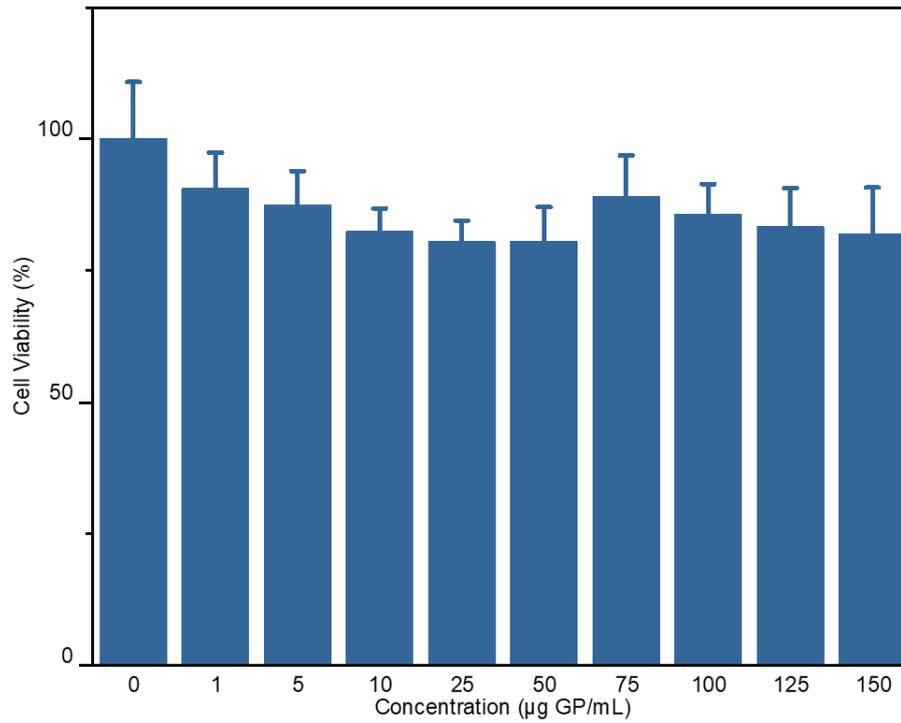
**Figure S4.** Dynamic oscillatory time sweep measurements of ALG solution (A), ALG-Ca<sup>2+</sup> hydrogel (B), ALG-GP solution (C), ACG hydrogel (D) and ACG+BSA hydrogel (E) with a strain amplitude of 1% and an angular frequency of 1 rad/s. G': storage modulus, G'': loss modulus.



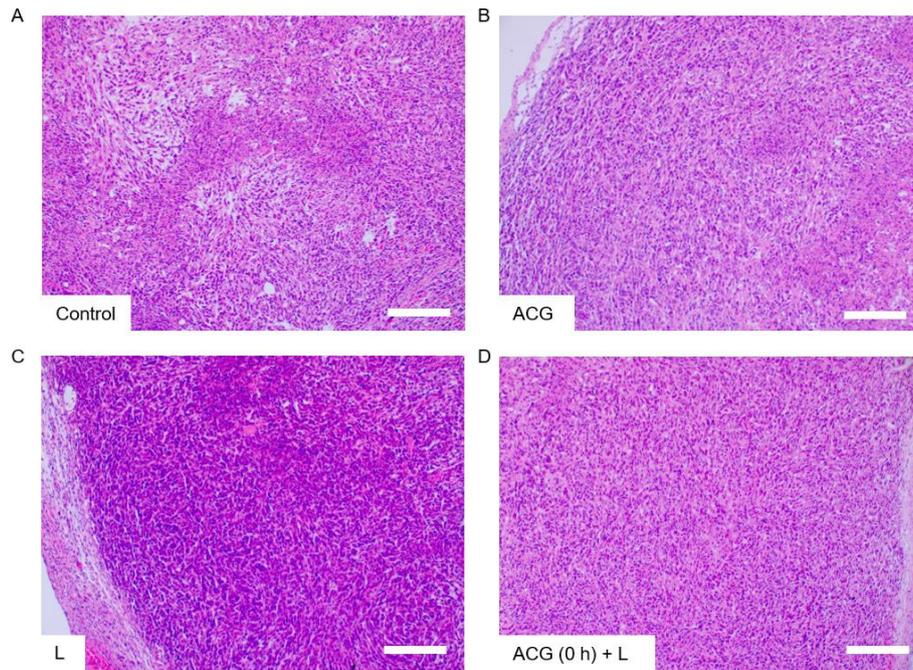
**Figure S5.** Shear strain tests of ALG- $\text{Ca}^{2+}$  hydrogels (A), ACG hydrogels(B) and ACG+BSA hydrogels (C) with a shear rate from 0.1% to 1140%.  $G'$ : storage modulus,  $G''$ : loss modulus.



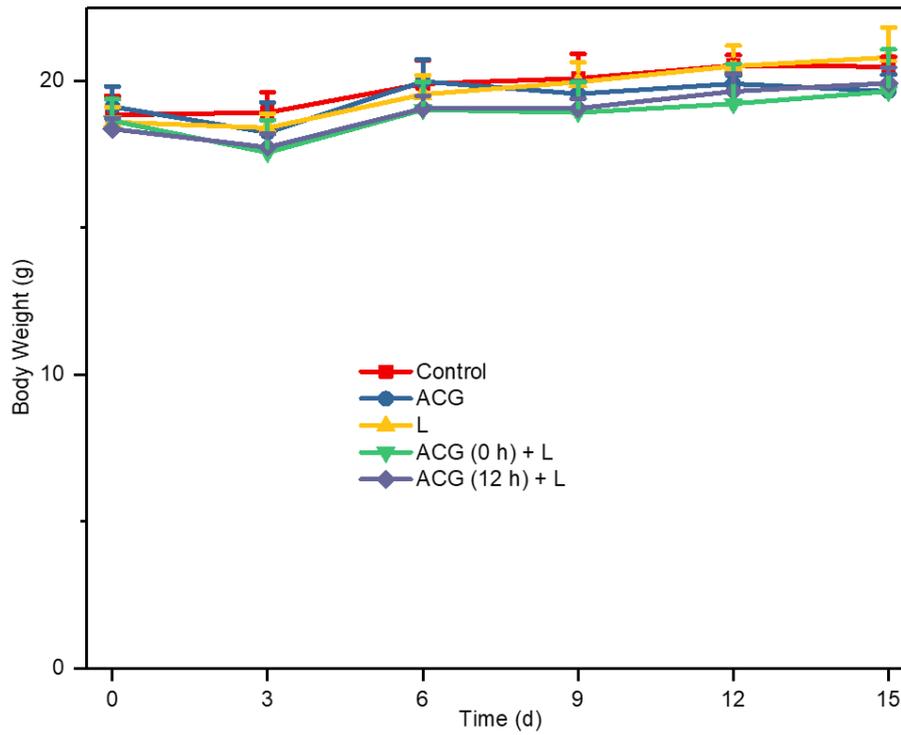
**Figure S6.** Fluorescence emission spectra of ACG hydrogel and ACG hydrogel mixed with BSA (1 mg/mL).



**Figure S7.** MTT assay of 4T1 tumor cells after incubation with ACG hydrogel (0 to 150 µg GP/mL), shown as means  $\pm$  SD, n = 6.



**Figure S8.** Representative hematoxylin and eosin (H&E) stained tumor tissue sections in photothermal therapy experiments *in vivo*. (A) Control group. (B) ACG group. (C) L group. (D) ACG (0 h) + L group. Scale bar: 200  $\mu\text{m}$ . ACG: intratumoral injection of 50- $\mu\text{L}$  ACG hydrogel. L: 808 nm laser irradiation (2  $\text{W}/\text{cm}^2$ , 10 min). ACG (0 h) + L: intratumoral injection of 50- $\mu\text{L}$  ACG hydrogel followed by immediate laser irradiation (2  $\text{W}/\text{cm}^2$ , 10 min).



**Figure S9.** The average body weight of the mice, shown as means  $\pm$  SD,  $n = 5$ . ACG: intratumoral injection of 50- $\mu$ L ACG hydrogel. L: 808 nm laser irradiation (2 W/cm<sup>2</sup>, 10 min). ACG (0 h) + L: intratumoral injection of 50- $\mu$ L ACG hydrogel followed by immediate laser irradiation (2 W/cm<sup>2</sup>, 10 min). ACG (12 h) + L: intratumoral injection of 50- $\mu$ L ACG hydrogel followed by 12-h delayed laser irradiation (2 W/cm<sup>2</sup>, 10 min).