

Supporting Information

Thermo-Responsive Hemostatic Hydrogel with Biomimetic Nanostructure Constructed from Aggregated Collagen Nanofibers

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1. Measurements

Tissue adhesive strength tests Analysis of hydrogels structure. Lap shear tests were conducted to measure the tissue adhesive strength using a universal test machine with a crosshead speed of 10 mm/min. Pre-dehydrated porcine skin (in 0.01 M PBS, pH 7.4 for 1 h) slides with a size of 30 mm × 10 mm × 1 mm were used as the adherends. The hydrogel samples were prepared in situ between the test materials, and the overlap area was 10 mm × 10 mm × 1 mm. Specifically, the pre-gel mixtures were placed between the adherends and cured for 5 s with 5N pressure, and then allowed to cure for 60 mins at 37 °C in calorstat. Three samples for each group (n=3) were used in the lap shear test. The tests were repeated three times to confirm the reproducibility of the adhesion strength data. The adhesion strength was calculated using the following equation:

$$Pa = \frac{N}{m^2}$$

where N refer to the maximum load (force) and m2 refer to the overlapping contact area, respectively.

2. Supplementary Figures

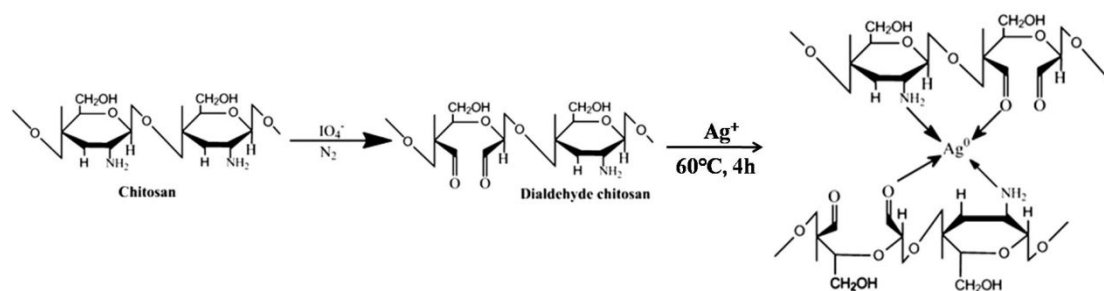


Figure S1. Schematic diagram showing the synthesis of AgNPs. ¹

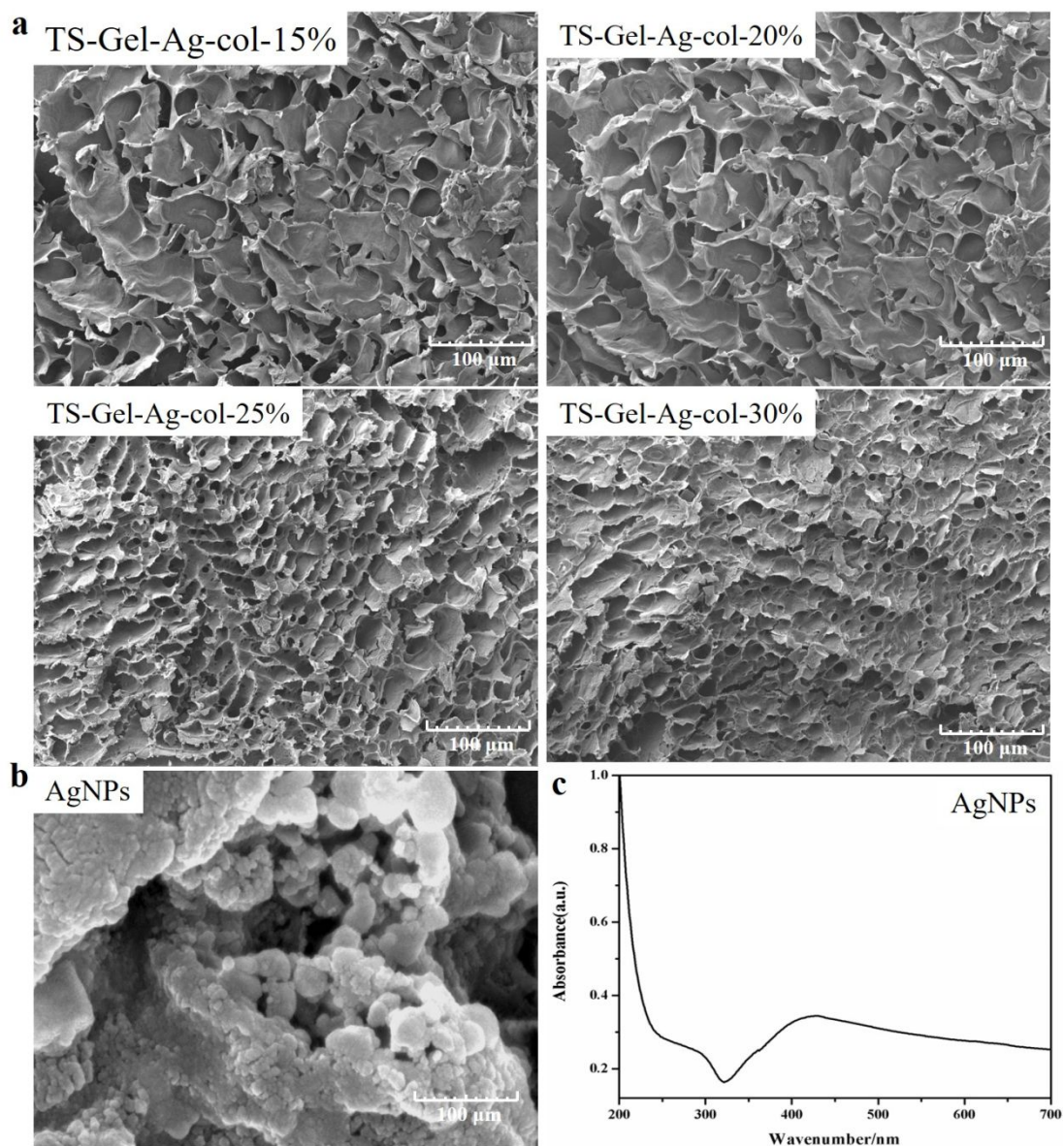


Figure S2. (a) SEM images of the cross sections of TS-Gel-Ag-col with different F-107 contents; (b) SEM images of AgNPs; (c) UV-vis spectra of AgNPs.

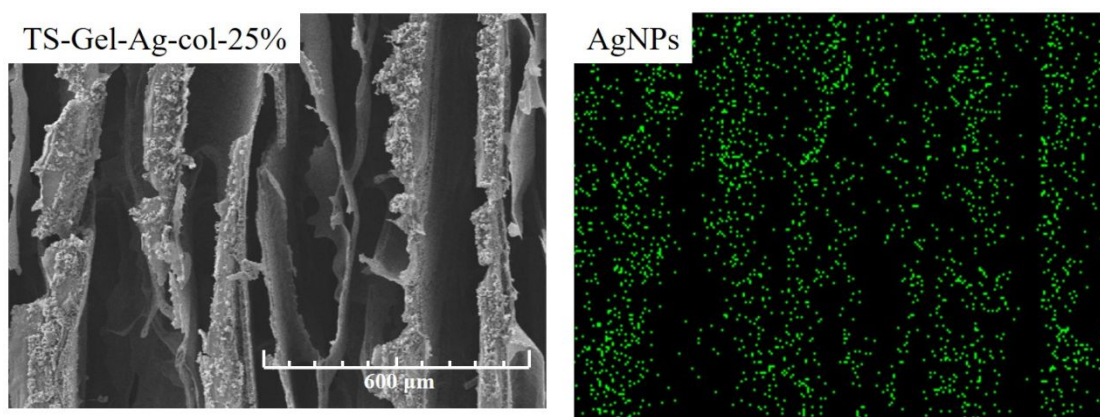


Figure S3 SEM images and EDX mapping of the longitudinal sections of TS-Gel-Ag-col.

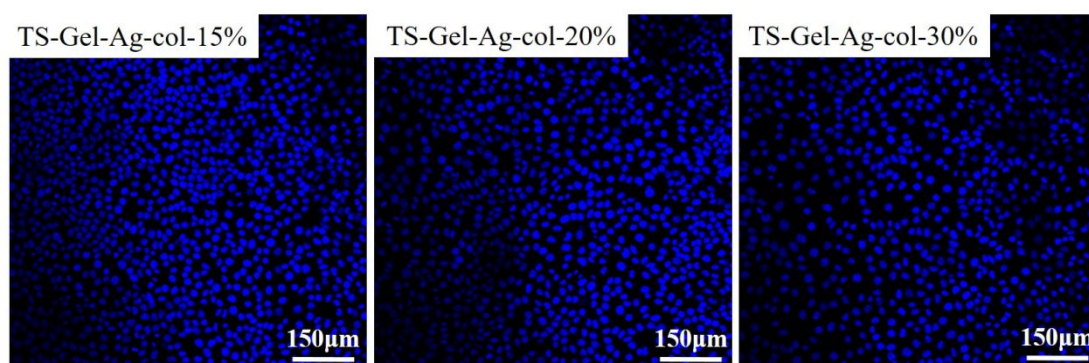


Figure S4 CLSM images of fibroblasts on TS-Gel-Ag-col with different F-107 contents at day 3.

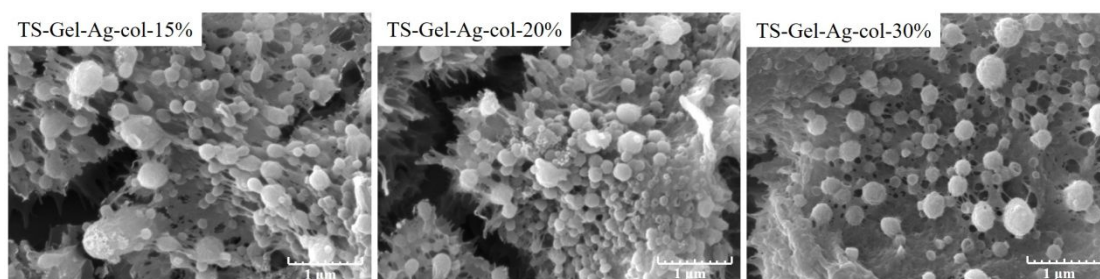


Figure S5 SEM images of TS-Gel-Ag-col blood clots with different F-107 contents.

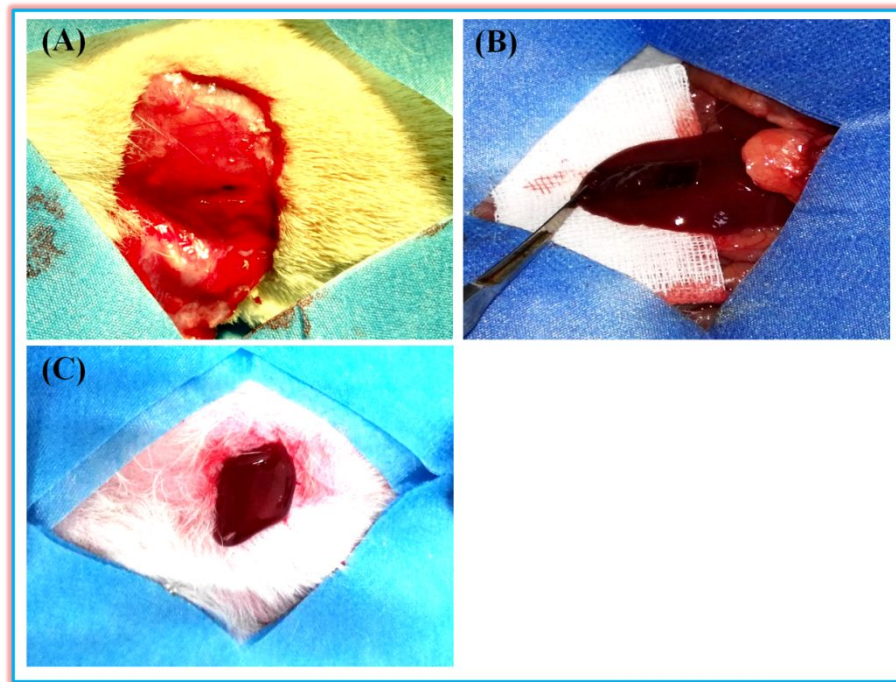


Figure S6 Illustration of the in vivo animal bleeding molding (A) Bleeding in sacrospinal muscle, (B) Bleeding in the cut liver, (C) Bleeding in rabbits cut ear artery.

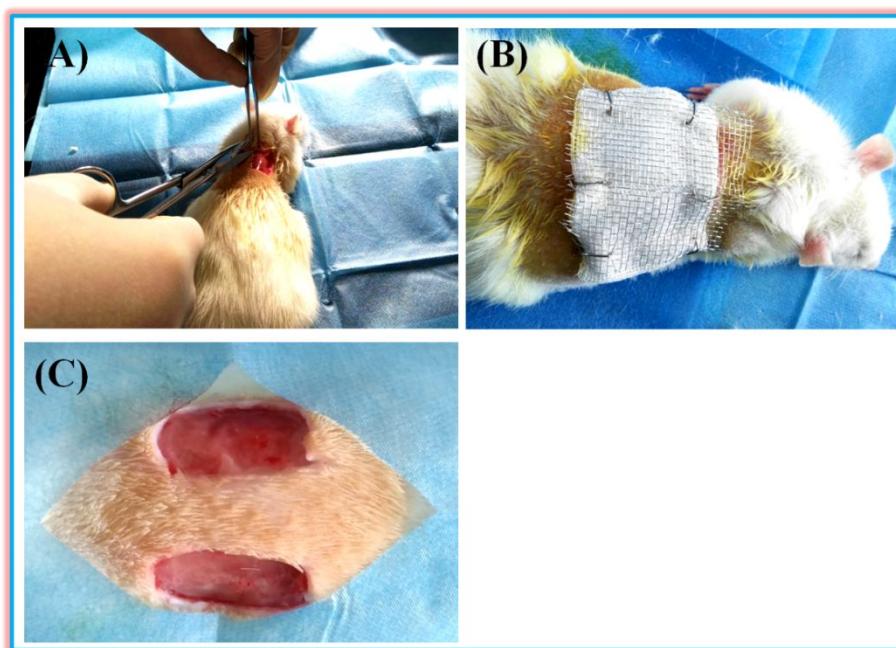


Figure S7. Illustration of the in vivo animal molding (A) Incising the skin, (B) wound bandaging, (C) Shape of the wound

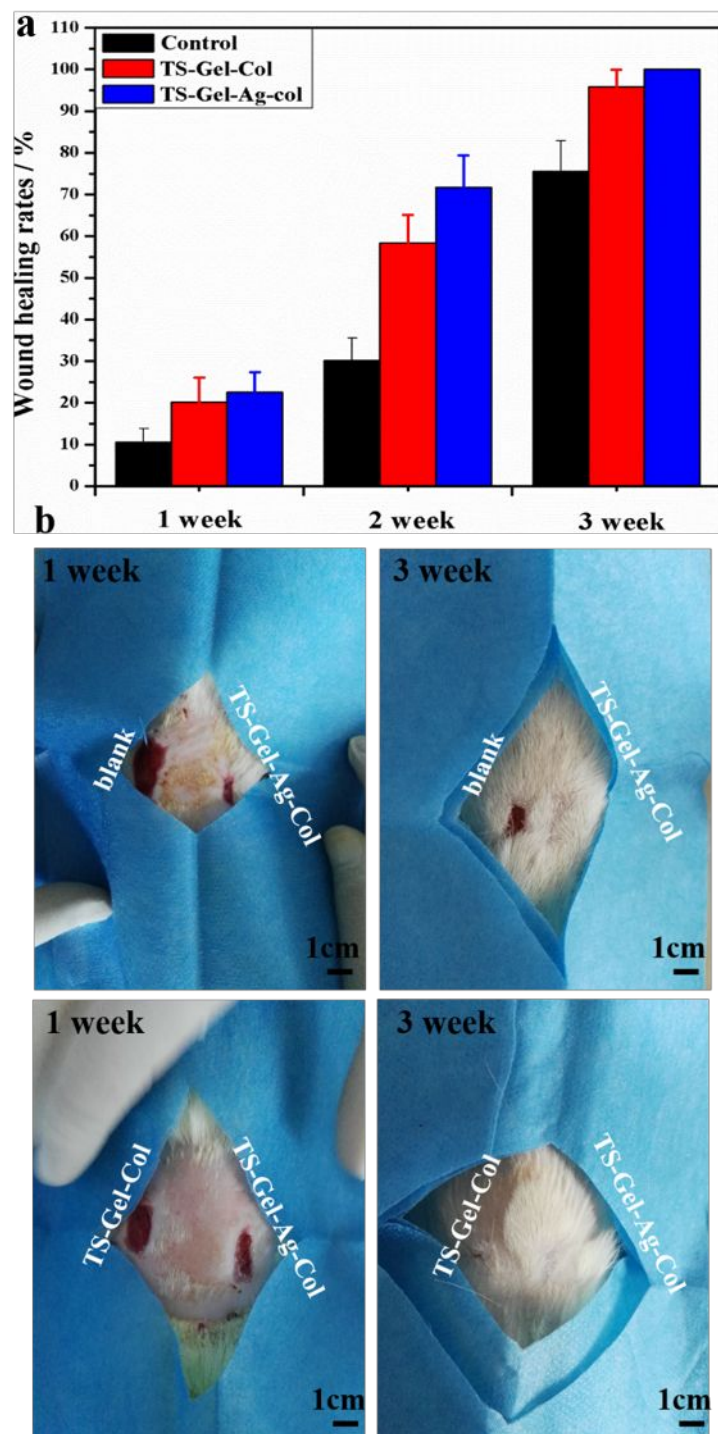


Figure S8 (a) The effect of TS-Gel-Ag-col and TS-Gel-col on the wound healing rates of the rats;
 (b) Photographic images showing healing pattern of wounds on different weeks (TS-Gel-Ag-col-
 25%)

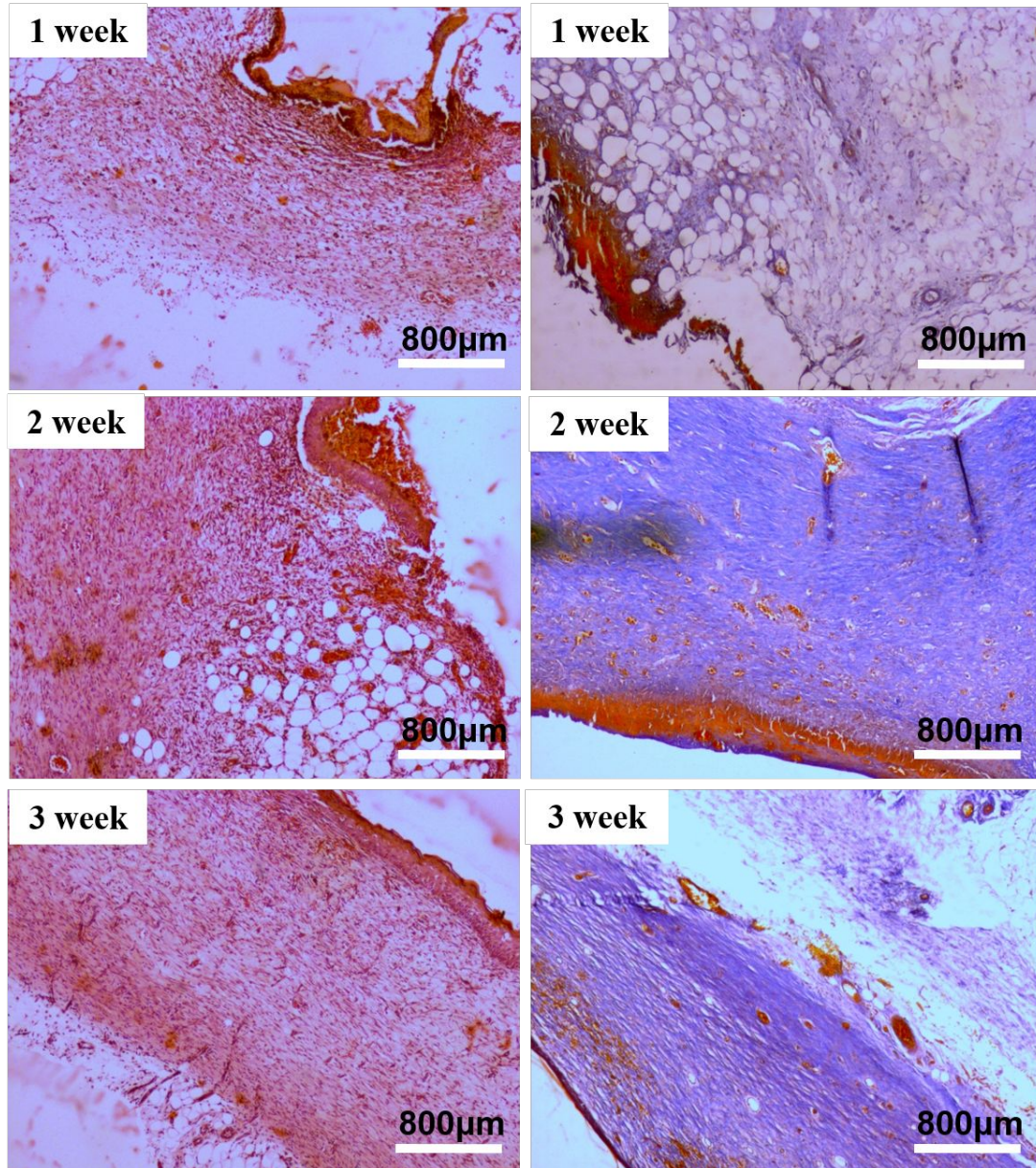


Figure S9 HE and Masson staining for blank group postoperatively (1 weeks, 2 weeks and 3 weeks).

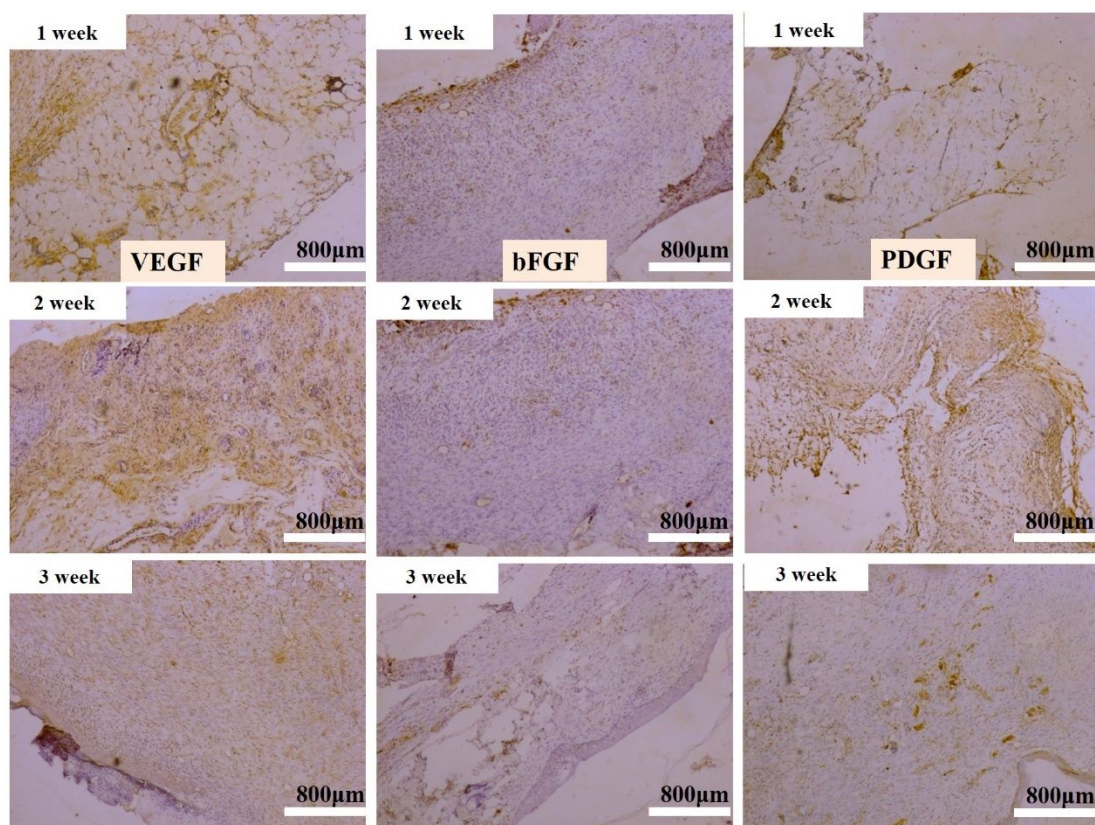


Figure S10 Immunohistochemical analysis of blank group postoperatively (1 weeks, 2 weeks and 3 weeks).

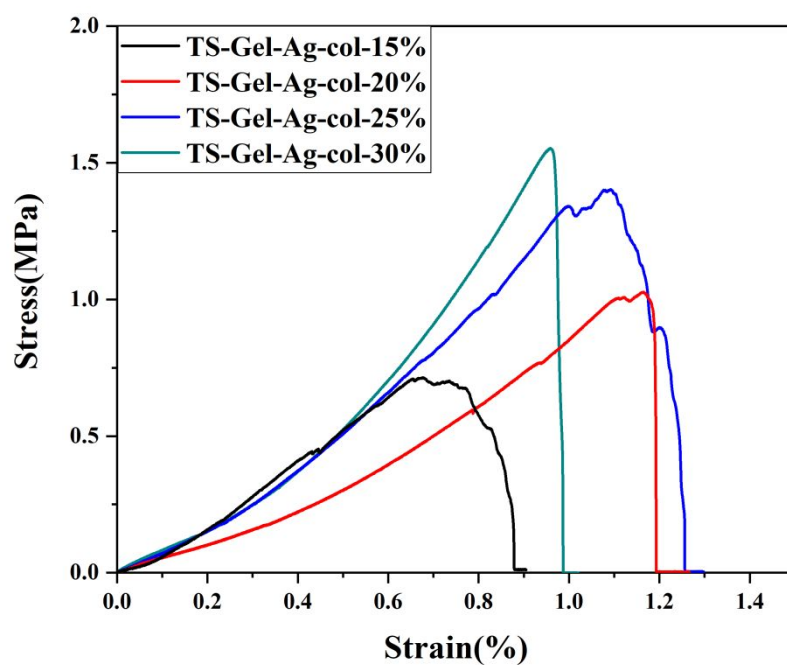


Figure S11 The adhesive strength of TS-Gel-Ag-col with different F-107 contents.

3. References

- (1) Annadhasan, M.; Sankarbabu, V. R.; Naresh, R.; Umamaheswari, K.; Rajendiran, N. A sunlight-induced rapid synthesis of silver nanoparticles using sodium salt of N-cholyl amino acids and its antimicrobial applications. *Colloid Surface B* **2012**, *96*, 14-21.