

**High-aspect-ratio water-dispersed gold nanowires incorporated  
within gelatin methacrylate hydrogel for constructing cardiac tissues  
*in vitro*<sup>†</sup>**

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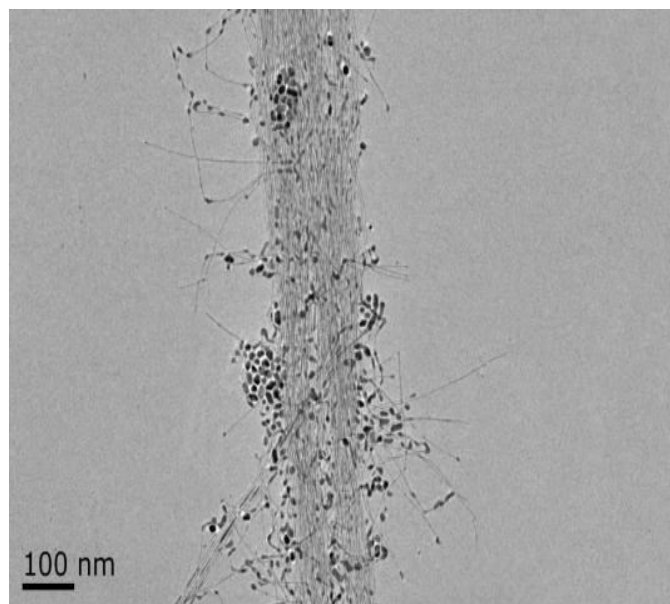
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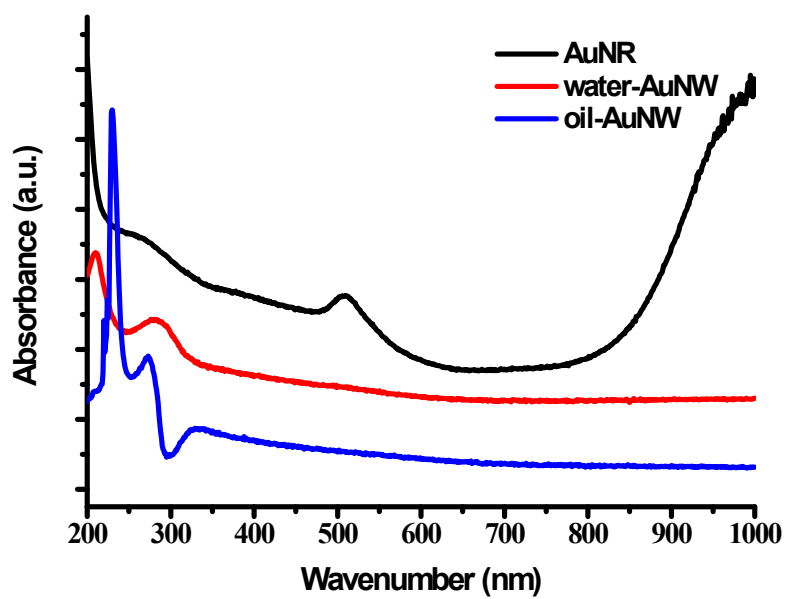
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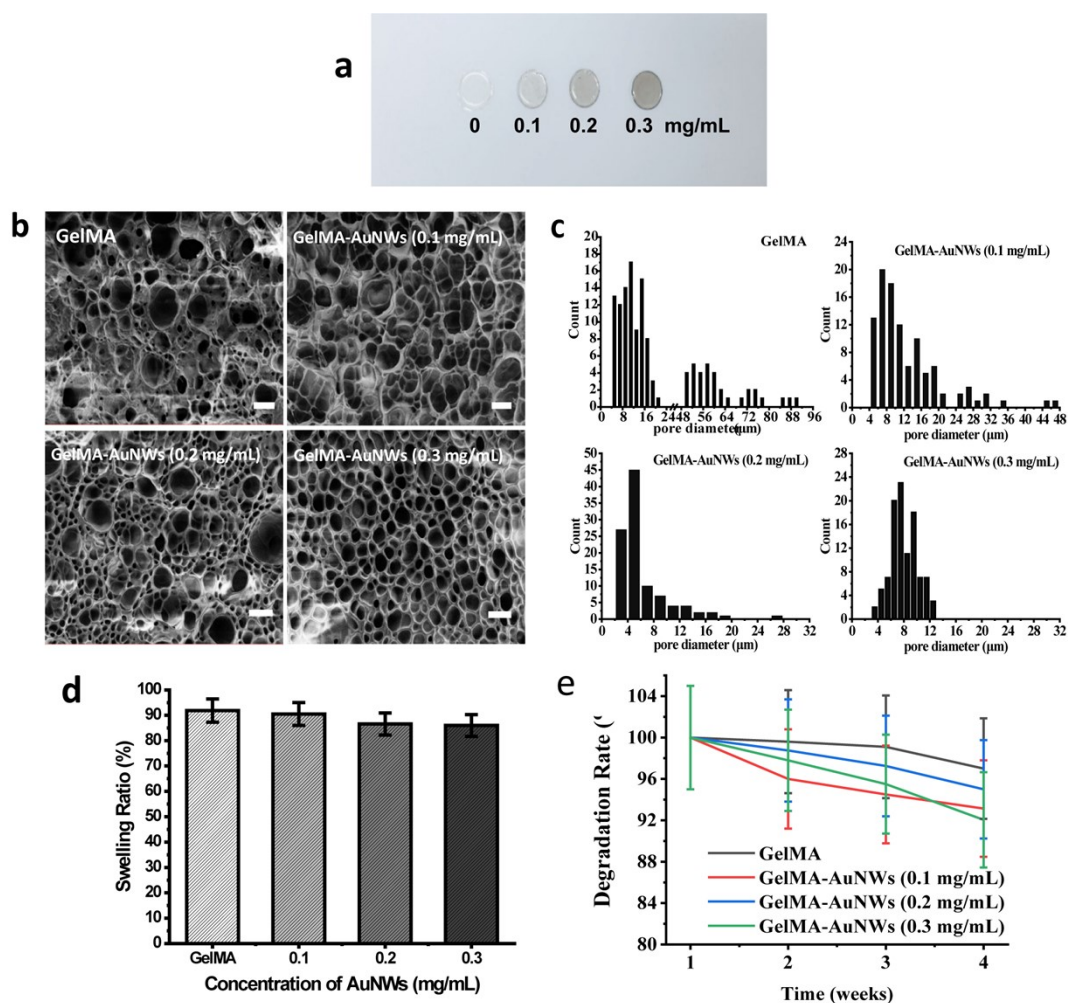
## Supporting Information



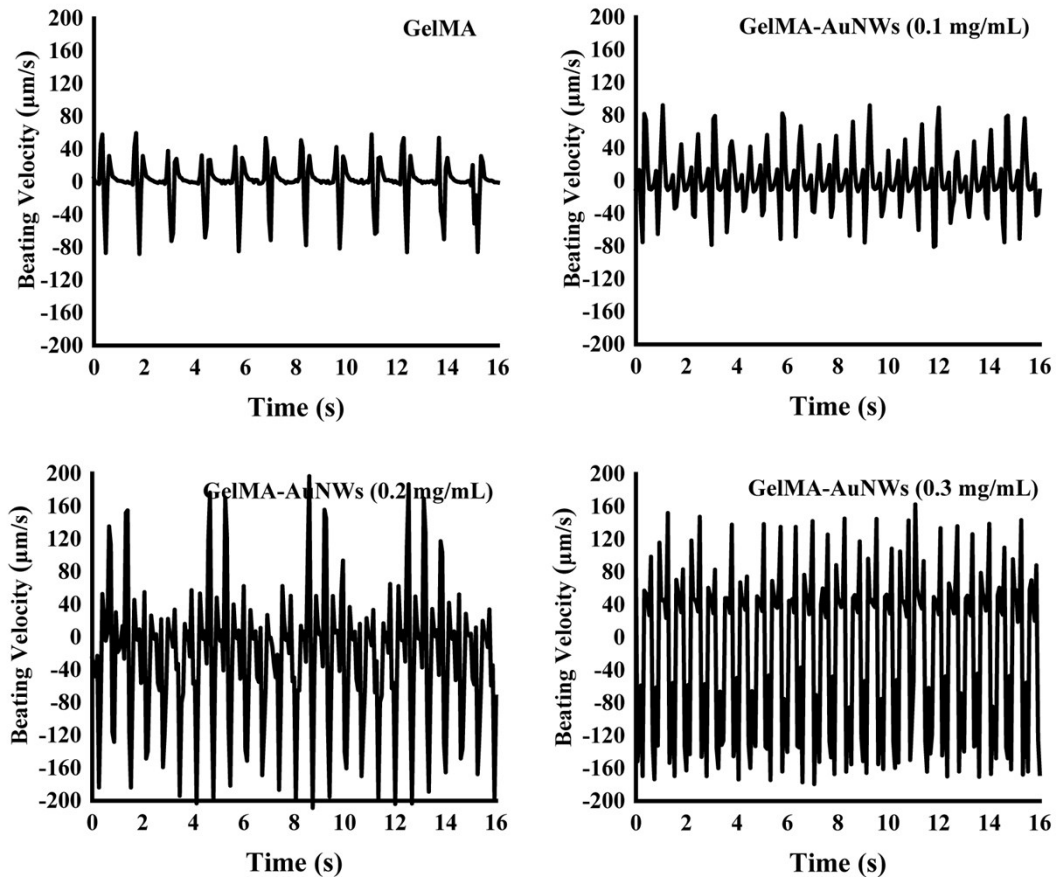
**Figure S1.** The TEM image of oil-dispersed AuNWs.



**Figure S2.** The UV-Vis spectrum of water-dispersed AuNRs, and AuNWs dispersed in oil phase and water phase.



**Figure S3.** Physical characterization of GelMA and GelMA-AuNWs hybrid hydrogels. (a) Optical image of GelMA and GelMA-AuNWs hybrid hydrogels containing 0.1, 0.2, and 0.3 mg/mL AuNWs. Scale bar: 1 cm. (b) SEM images of GelMA and GelMA-AuNWs hybrid hydrogels. Scale bars: 50  $\mu$ m. (c) Statistical diagram of aperture size distribution of GelMA-AuNWs hybrid hydrogels. (d) Swelling ratio of GelMA-AuNWs hybrid hydrogels at different AuNWs concentrations, demonstrating lower swelling with increase in AuNWs concentration. (e) Degradation properties of GelMA-AuNWs hybrid hydrogels. \* $p < 0.05$ .



**Figure S4.** Representative beating signal graphs from cardiomyocytes on GelMA and GelMA-AuNWs hybrid hydrogels containing 0.1, 0.2, and 0.3 mg/mL AuNWs on day 7 of culture.

#### **Supplementary movies:**

Movie S1: Representative video of cardiomyocytes beating on GelMA and GelMA-AuNWs hybrid hydrogels containing 0.1, 0.2, and 0.3 mg/mL AuNWs on day 3 of culture.

Movie S2: Representative video of cardiomyocytes beating on GelMA and GelMA-AuNWs hybrid hydrogels containing 0.1, 0.2, and 0.3 mg/mL AuNWs on day 5 of culture.

Movie S3: Representative video of cardiomyocytes beating on GelMA and GelMA-AuNWs hybrid hydrogels containing 0.1, 0.2, and 0.3 mg/mL AuNWs on day 7 of culture.

Movie S4: Representative video illustrating spontaneous  $\text{Ca}^{2+}$  dynamics of cardiomyocytes on GelMA and GelMA-AuNWs hybrid hydrogels containing 0.3 mg/mL AuNWs on day 3 of culture.