Supplementary Figures

Engineering a sprayable and elastic hydrogel adhesive with antimicrobial properties for wound healing

Nasim Annabi[*], *Devyesh Rana*[1], *Ehsan Shirzaei Sani*[1], *Roberto Portillo-Lara, Jessie L. Gifford, Mohammad M. Fares, Suzanne M. Mithieux, Anthony S. Weiss,*

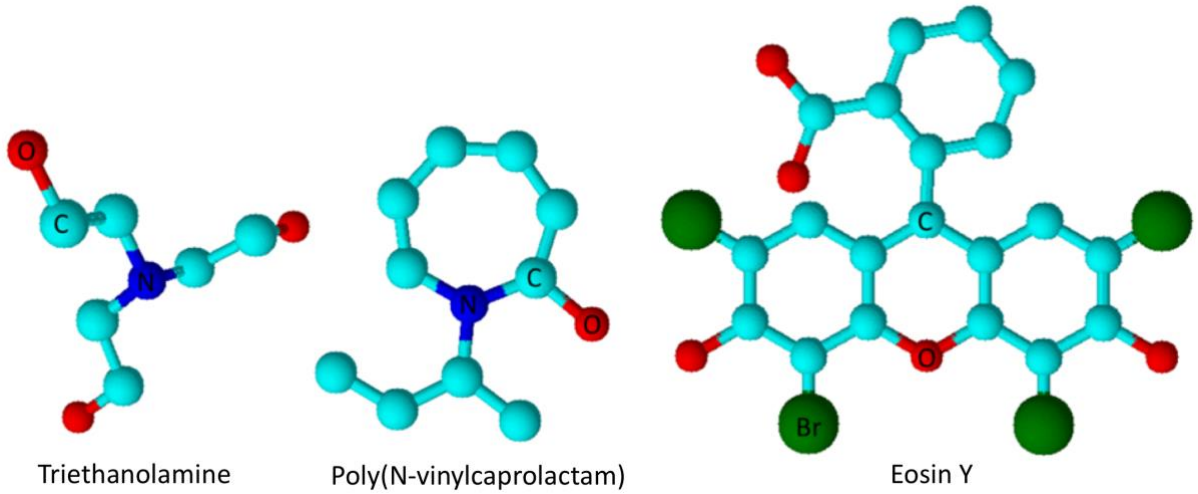

Figure S1. Schematic of triethanolamine (TEA), poly(N-vinylcaprolactam) (VC), and Eosin Y.

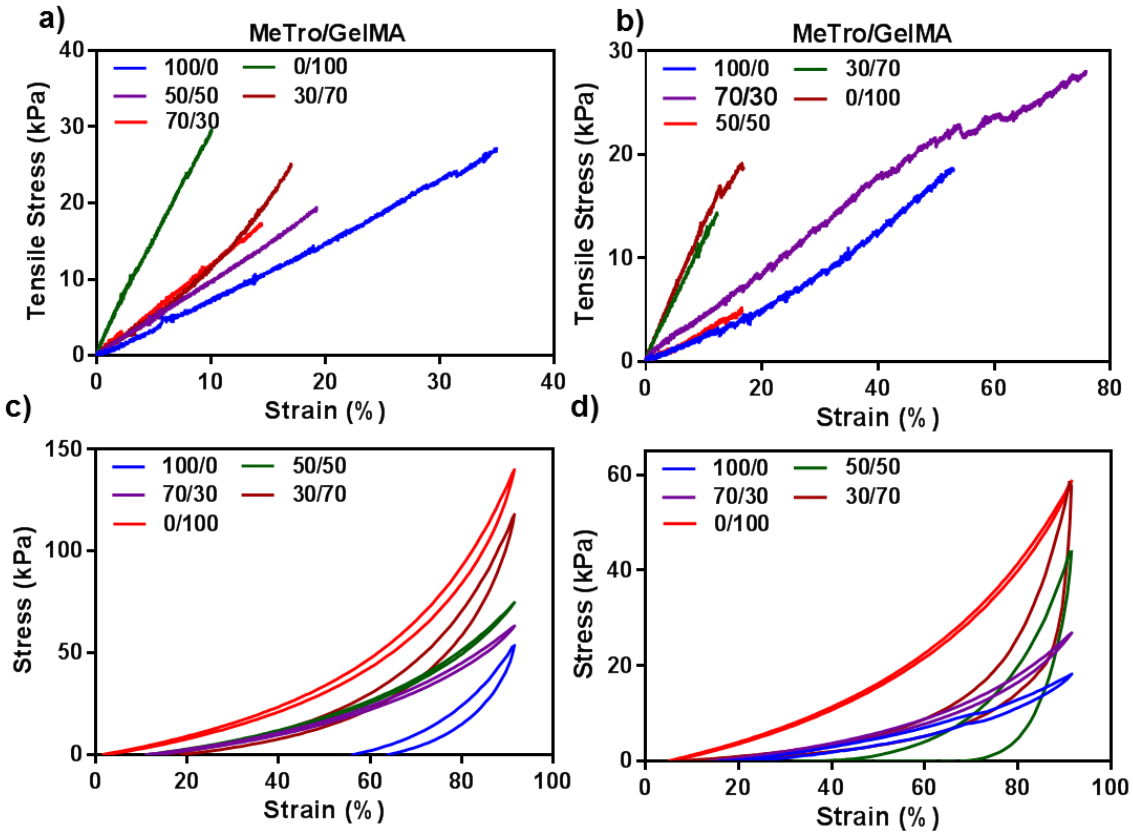

Figure S2. Mechanical characterization of MeTro/GelMA composite hydrogels. Representative tensile stress-strain curves of composite hydrogels produced by using **(a)** 20% (w/v) and **(b)** 15% (w/v) total polymer concentration and varying ratios of MeTro/GelMA. Representative compressive stress-strain curves of composite hydrogels produced by **(c)** 20% (w/v) and **(d)** 15% (w/v) total polymer concentration and varying ratios of MeTro/GelMA.

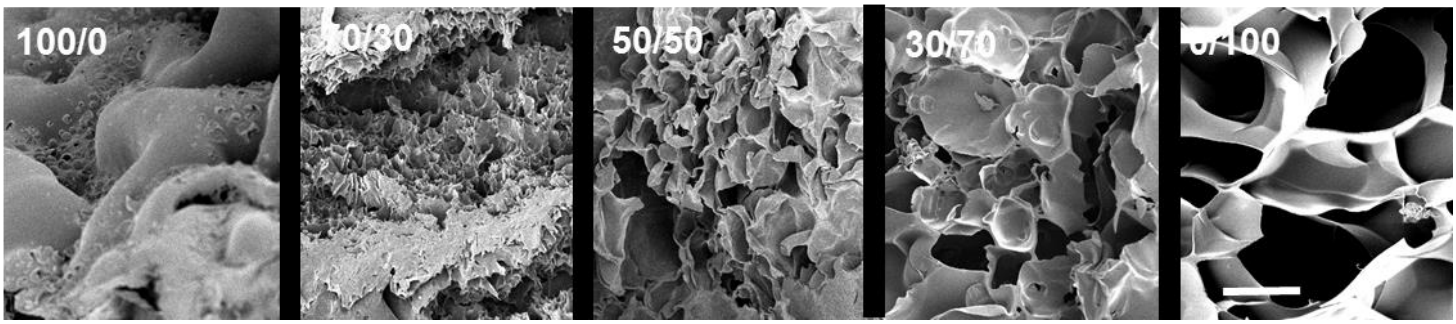

Figure S3. Pore characterization of the MeTro/GelMA composite hydrogels. Representative SEM images from cross-sections of composite hydrogels produced at 20% (w/v) total polymer concentration and varying ratios of MeTro/GelMA.

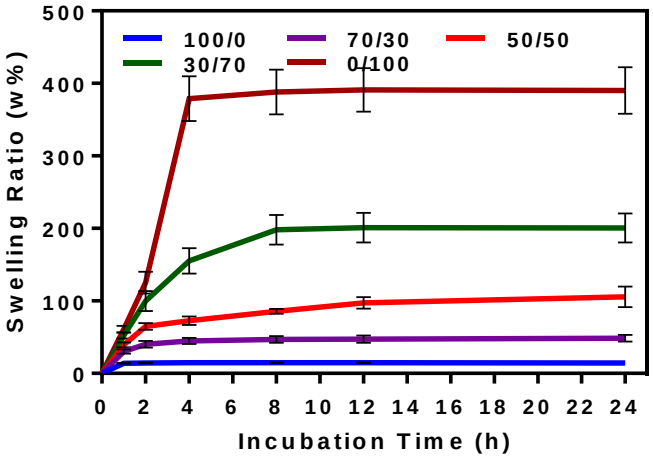

Figure S4. *In vitro* swelling ratio of MeTro/GelMA composite hydrogels produced at 20% (w/v) final polymer concentration. The graph shows the different swelling ratios of composite hydrogels produced at 20% (w/v) final polymer concentration, and varying MeTro/GelMA ratios. Data are represented as mean ± SD (*p<0.05, **p<0.01, ***p<0.001, ****p<0.0001 and n ≥ 5).

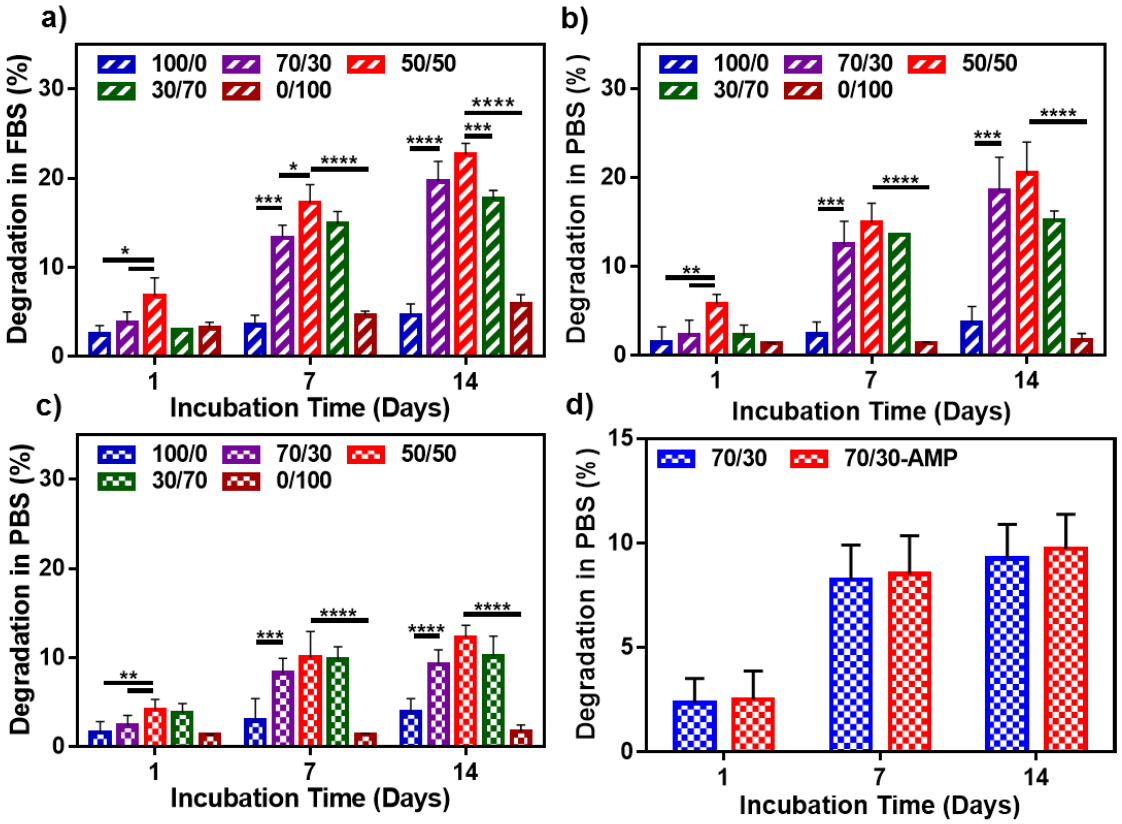

Figure S5. ***In vitro*** **degradation properties of MeTro/GelMA composite hydrogels produced by using 15% and 20% (w/v) final polymer concentration.** *In vitro* degradation properties of composite hydrogels at varying ratios of MeTro/GelMA and 20% (w/v) final polymer concentration in **(a)** FBS solution (DPBS+10%FBS), **(b)** in DPBS at 37°C. **(c)** *In vitro* degradation properties of 15% (w/v) composite hydrogels at varying ratios of MeTro/GelMA in DPBS. **(d)** *In vitro* degradation of 70/30 MeTro/GelMA hydrogels with and without AMP in DPBS at 37 °C. Data is represented as mean ± SD (*p<0.05, **p<0.01, ***p<0.001, ****p<0.0001 and n ≥ 4).

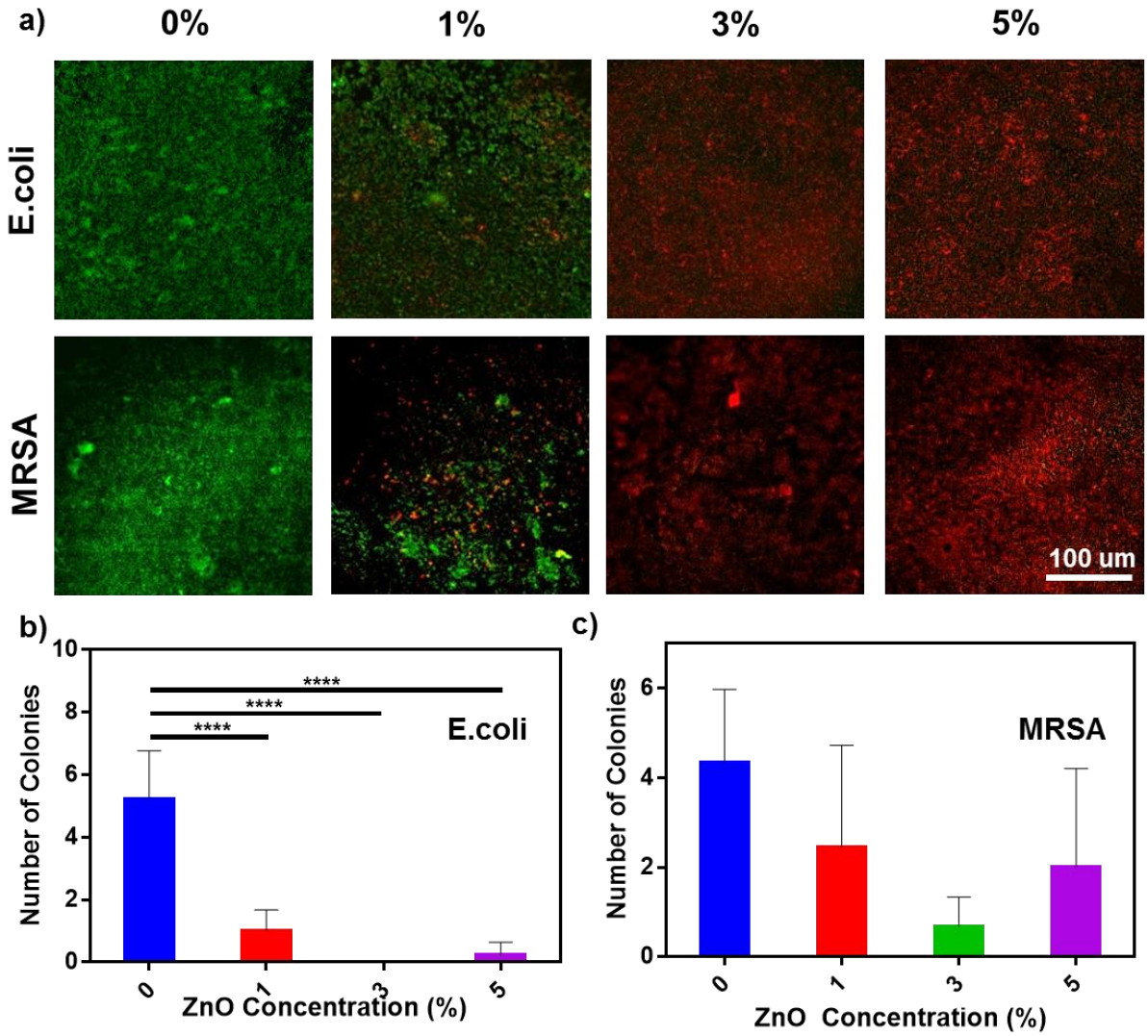

Figure S6. *In vitro* antibacterial properties of Metro/GelMA-ZnO and MeTro/GelMA (control) hydrogels. (a) Representative live/dead images from MRSA and *E. coli* seeded on MeTro/GelMA-ZnO hydrogels at different ZnO concentrations (0% as a control, 1%, 3% and 5% (w/v)). Colony forming units assay for MeTro/GelMA-ZnO hydrogels with different ZnO concentrations (0% as a control, 1%, 3% and 5% (w/v)) seeded with **(b)** *E. coli* and **(c)** MRSA. 70/30 MeTro/GelMA hydrogels with 15% (w/v) total polymer concentration were used for these studies. Data is represented as mean ± SD (*p<0.05, **p<0.01, ***p<0.001, ****p<0.0001, n ≥ 3).

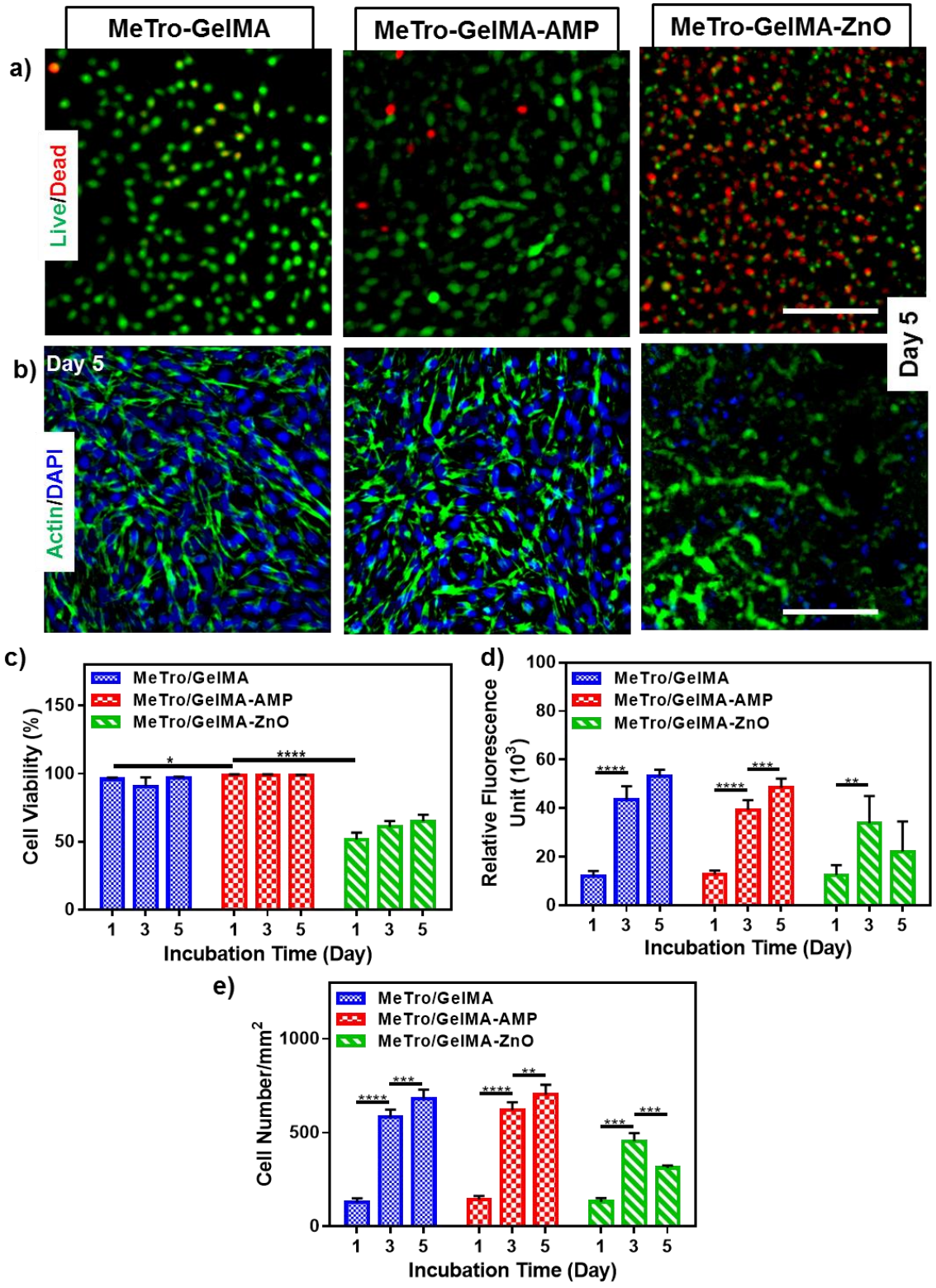

Figure S7. ***In vitro*** **2D cell seeding on MeTro/GelMA and MeTro/GelMA-AMP (0.1% (w/v) AMP) and MeTro/GelMA-ZnO (3% (w/v) ZnO) using 3T3 cells.** Representative **(a)** live/dead and **(b)** Actin/DAPI stained images for 3T3 cells seeded on the surface of

MeTro/GelMA, MeTro/GelMA-AMP and MeTro/GelMA-ZnO hydrogels on day 5 post seeding (scale bar = 200 μm). **(c)** Quantification of cell viability seeded on MeTro/GelMA, MeTro/GelMA-AMP and MeTro/GelMA-ZnO scaffolds after 1, 3, and 5 days of seeding. **(d)** Quantification of metabolic activity of 3T3 cells seeded on the surface of MeTro/GelMA, MeTro/GelMA-AMP and MeTro/GelMA-ZnO hydrogels after 1, 3, and 5 days. **(e)** Quantification of 3T3 cell number per area, seeded on the surface of MeTro/GelMA, MeTro/GelMA-AMP and MeTro/GelMA-ZnO hydrogels after 1, 3, and 5 days seeding. 30/70 MeTro/GelMA hydrogels with 15% (w/v) total polymer concentration were use for 2D cell seeding. Data is represented as mean ± SD (*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ and ****$p < 0.0001$, $n \geq 3$).