Electronic Supplementary Material (ESI) for Biomaterials Science.

Supporting Information

In Vitro and In Vivo Analysis of Visible Light Crosslinkable Gelatin Methacryloyl (GelMA) Hydrogels

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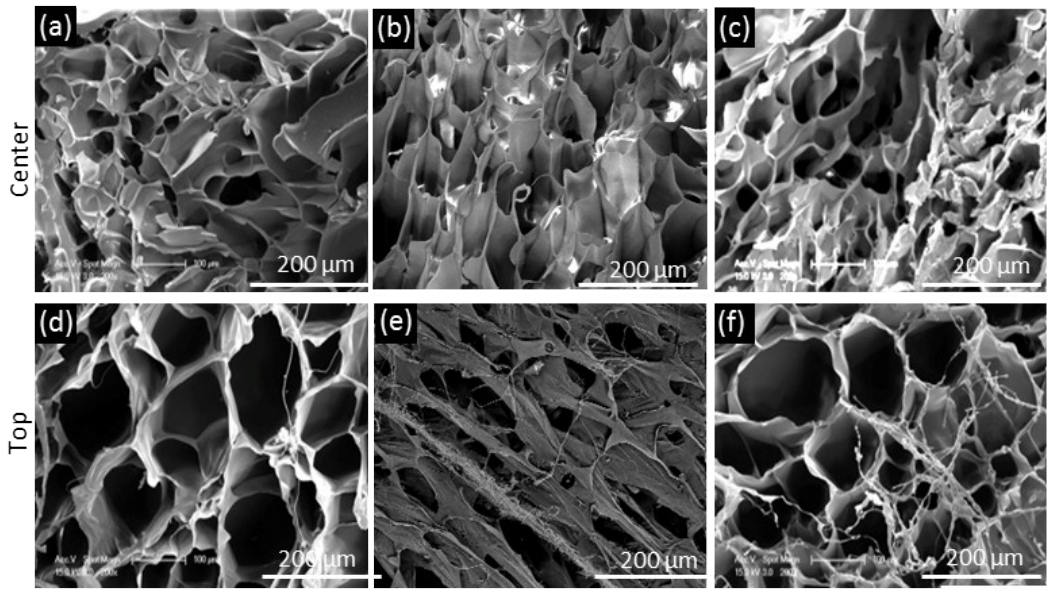

Figure S1. Representative SEM images of 10 %(w/v) GelMA hydrogels synthesized using 1 %(w/v) VC, 0.1 mM Eosin Y, and 180 sec light exposure time with **(a,d)** 1.5, **(b,e)** 1.0, and **(c,f)** 0.5 %(w/v) TEA. Paired images (center/top) were acquired from the same hydrogel. (scale bars: 200 µm).

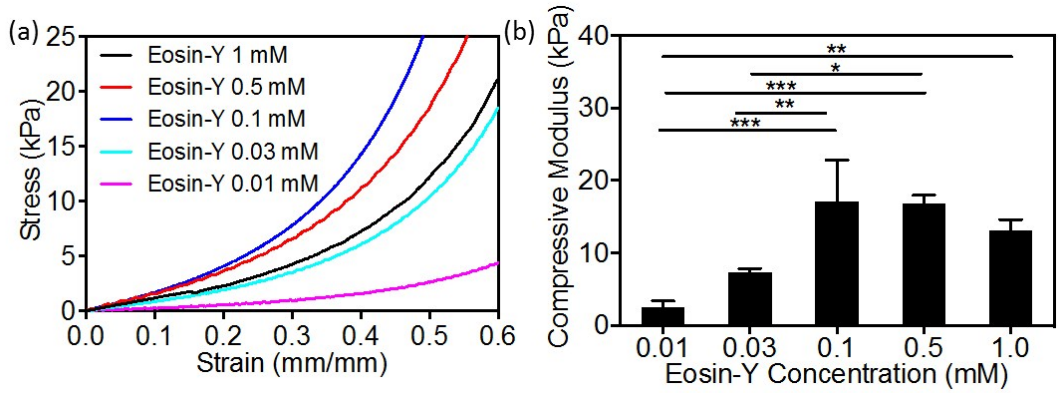

Figure S2. **Mechanical properties of visible light crosslinked GelMA hydrogels synthesized with different concentrations of Eosin Y. (a)** Representative compressive strain/stress curves and **(b)** compressive modulus of 10 %(w/v) GelMA hydrogel made by various concentrations of Eosin Y, 1 %(w/v) VC, 1 %(w/v) of TEA, and 180 sec light exposure time. Error bars represent the SD of measurements on 3 independent samples (*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ and ****$p < 0.0001$).

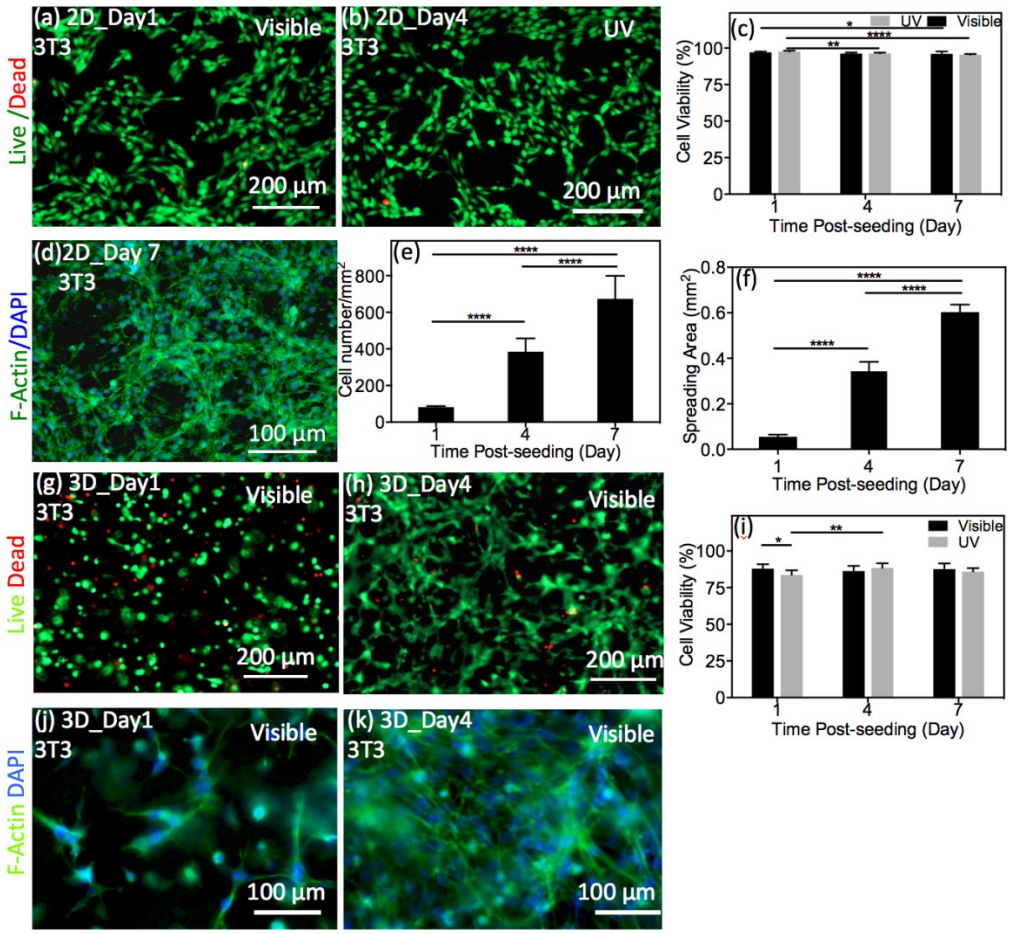

Figure S3. ***In vitro*** **2D and 3D cell culture of 3T3 seeded on the visible light crosslinked GelMA hydrogels. (a, b)** Fluorescent live/dead images of 3T3 cells seeded on the surface of visible and UV light crosslinked GelMA hydrogels (scale bar = 200 µm). **(c)** Quantitative analysis of cell viability of 3T3 cells seeded on visible and UV light crosslinked GelMA hydrogels. **(d)** Fluorescent F-actin/DAPI images of 3T3 cells seeded on the surface of visible light crosslinked GelMA hydrogels after 7 days of seeding (scale bar = 100 µm). **(e, f)** Quantitative analysis of cell density and cell spreading area from F-actin/DAPI staining at days 1, 4, and 7 post-seeding. **(g, h)** Representative live/dead images of 3T3 cells 3D encapsulated in visible light crosslinked GelMA hydrogels at days 1 and 4 post-encapsulation (scale bar = 200 µm). **(i)** Quantification of cell viability of 3D encapsulated 3T3 cells at days 1, 4, and 7 post-encapsulation in visible and UV light crosslinked 10 %(w/v) GelMA hydrogels. **(j,k)** Fluorescent F-actin/DAPI images of 3T3 cells 3D encapsulated at days 1 and 4 post-seeding (scale bar = 100 µm) (*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ and ****$p < 0.0001$). Visible light crosslinked hydrogels were synthesized using 10 %(w/v) GelMA, TEA: 1.5 %(w/v), VC: 1 %(w/v), and 0.1 mM Eosin Y, time: 20 sec. Ultraviolet light crosslinked hydrogels were synthesized using 10 %(w/v) GelMA, 0.5 %(w/v) Irgacure 2959, time: 20sec.