Electronic Supplementary Material (ESI) for Biomaterials Science.

Supplementary Information

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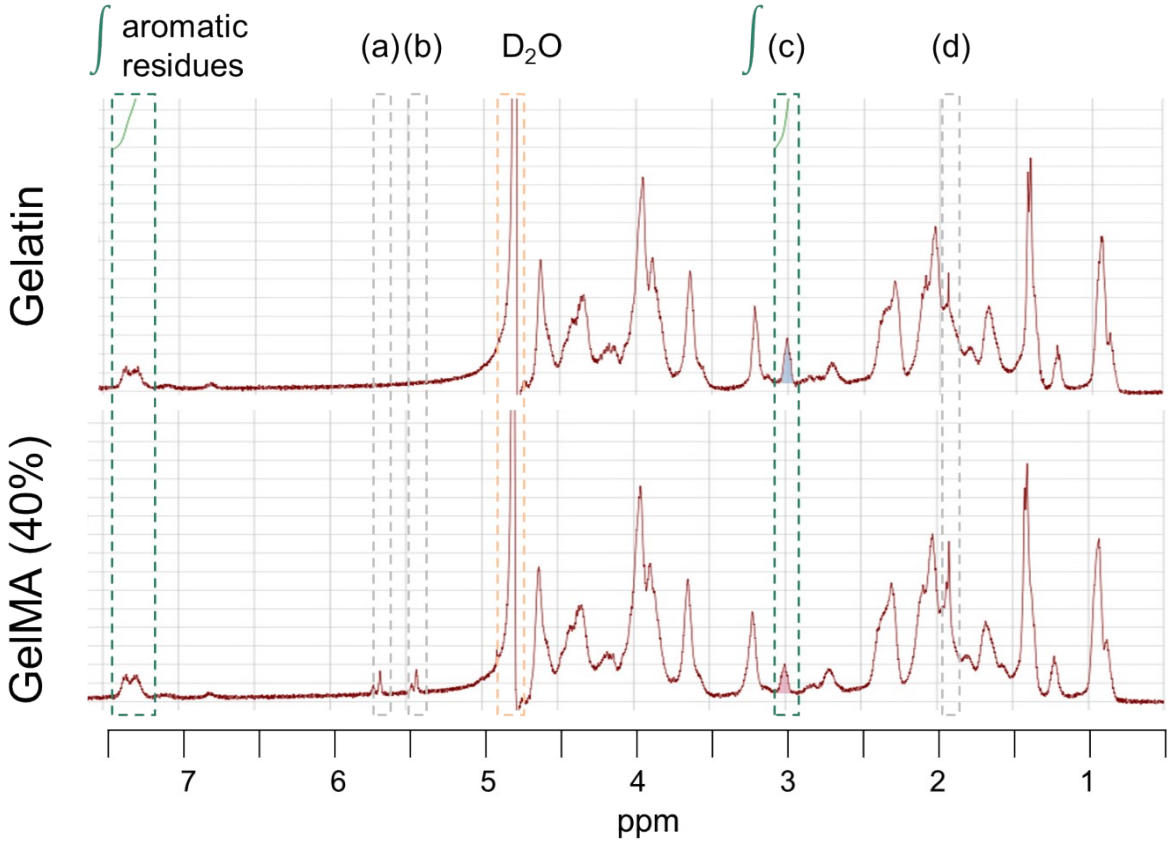
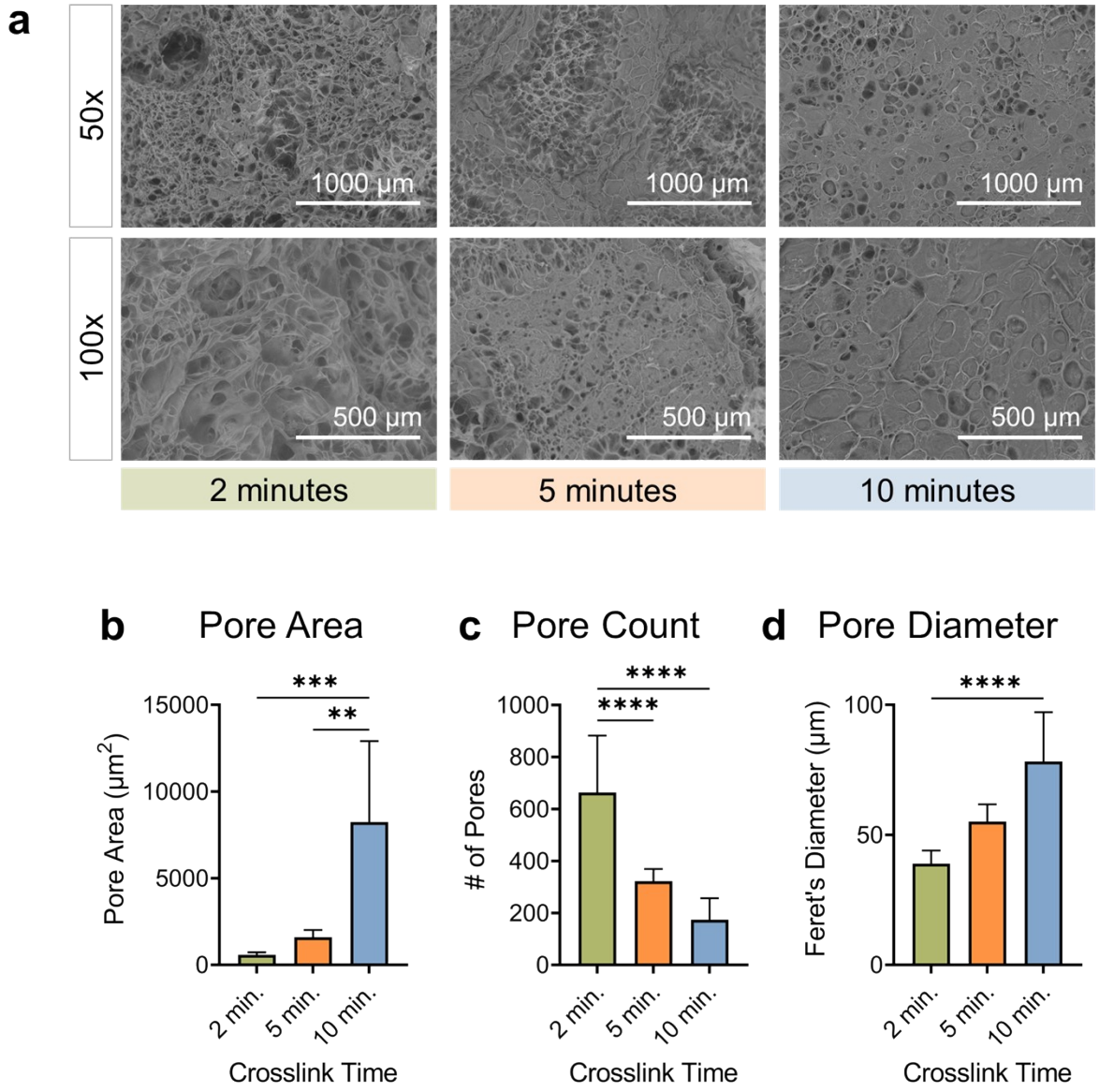
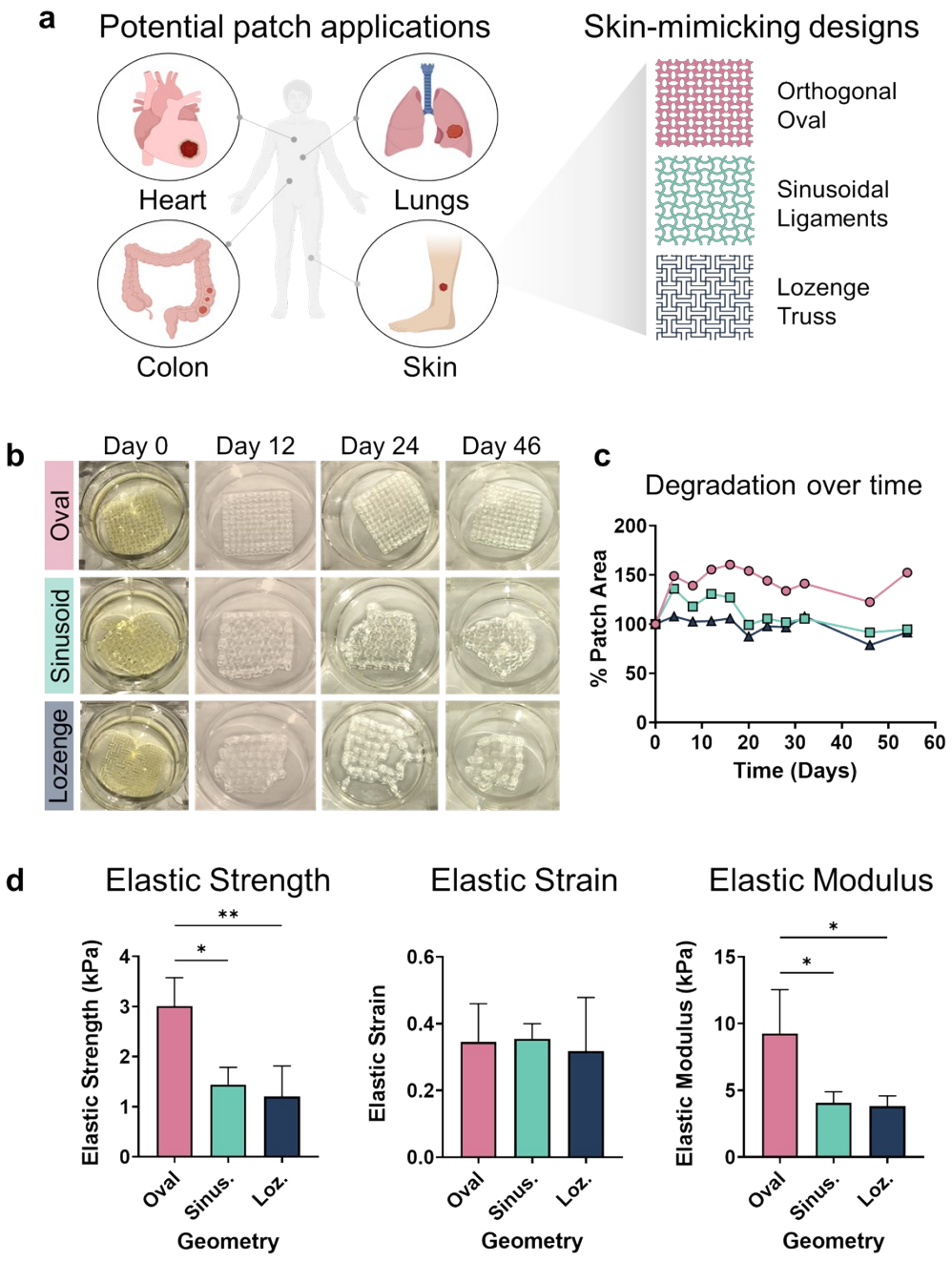


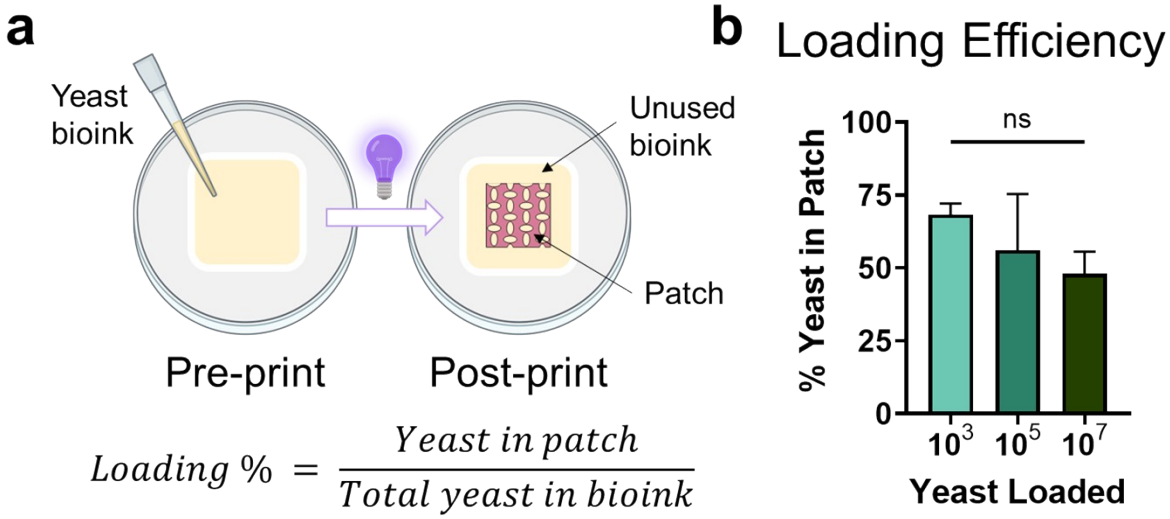
Supplementary Figure 1. NMR spectra of gelatin versus 40% GelMA. Aromatic protons on the gelatin backbone are highlighted in green and were integrated before analysis. The reference D_2O signal is highlighted in orange; (a) and (b) show methacrylamide group acrylic protons in lysines and hydroxylysines; (c) show protons in lysine groups on the gelatin backbone which were integrated to calculate degree of methacrylation (DOM); (d) show methyl protons of methacryloyl groups.



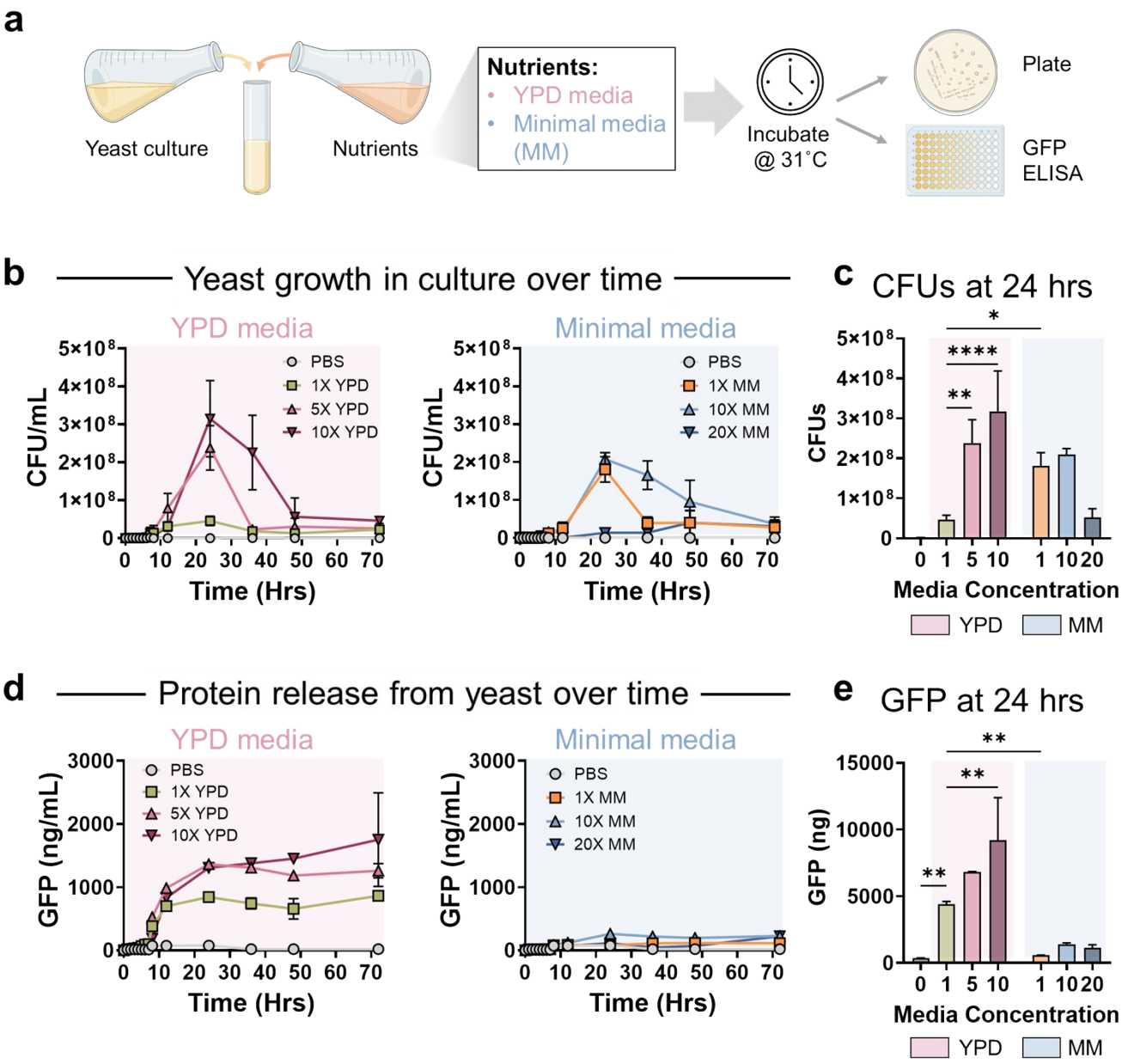
Supplementary Figure 2. **Patch pore size versus crosslink time. (A)** SEM images of patches with increasing crosslink time at two magnifications. **(B)** Average pore area calculated from these images. **(C)** The number of pores present in a consistent square of patches. **(D)** The average diameter of pores in these patches. Data are presented as mean ± SD, n=3, with *p<0.05, **p<0.01, ***p<0.001, and ****p<0.0001 by one-way ANOVA followed by Dunnett's multiple comparisons test using GraphPad Prism.



Supplementary Figure 3. The degradation and tensile mechanical properties of skin-mimicking patch geometries as a function of pore size. (A) Patch geometries used are the same as in Figure 1 (oval, sinusoidal ligament, and lozenge truss). These were chosen as examples of skin-mimicking geometries for potential wound healing applications. **(B)** Images of the patches at time points up to 46 days to show how patch geometry/integrity differs between these geometries over time. **(C)** Plot of patch area over time. **(D)** Elastic strength, strain, and modulus of these three geometries determined using tensile testing. Data are presented as mean ± SD, n=3, with *p<0.05, **p<0.01, by one-way ANOVA followed by Dunnett's multiple comparisons test using GraphPad Prism.



Supplementary Figure 4. (A) Schematic of yeast loading into patches and equation used for calculating loading efficiency. Increasing amounts of yeast cells were loaded into the bioinks. A sample was taken and plated before printing. After patch printing, a sample of the uncrosslinked bioink was taken to calculate the number of cells that were not encapsulated. **(B)** Loading efficiency as a function of yeast concentration. Data are presented as mean ± SD, n=3, with *p<0.05 by one-way ANOVA followed by Dunnett's multiple comparisons test using GraphPad Prism.



Supplementary Figure 5. Yeast growth and GFP release in culture with different concentrations of growth media. (A) Experimental workflow of how nutrients were added into yeast cultures and how their effects were tested. **(B)** Yeast growth over time (CFU/mL) with increasing concentrations of YPD and MM. **(C)** Yeast CFU/mL at 24 h to compare all groups. **(D)** GFP release with increasing concentrations of YPD and minimal medium. **(E)** GFP concentration in all media at 24-hour timepoint, representative of the maximum amount of GFP present during the measured timeframe. Data are presented as mean ± SD, n=3, with *p<0.05, **p<0.01, ***p<0.001, and ****p<0.0001 by one-way ANOVA followed by Dunnett's multiple comparisons test using GraphPad Prism.