ACCSCIENCE PUBLISHING

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RESEARCH ARTICLE

Optimization of alginate/gelatin/dextran-aldehyde bioink for 3D bioprinting and cell engraftment

Supplementary File

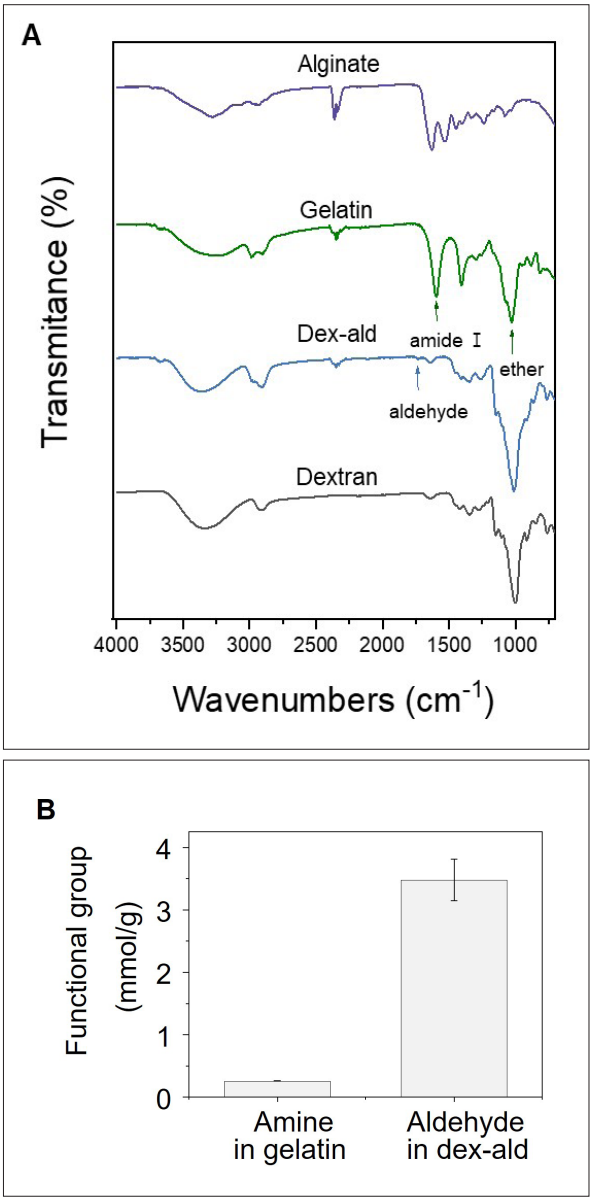

Figure S1. FTIR spectra of (A) dextran, dex-ald, gelatin, alginate, and (B) amount of functional group in gelatin (amine group) and dex-ald (aldehyde group). Abbreviations: Dex-ald, Dextran-aldehyde; FTIR, Fourier-transform infrared spectroscopy.

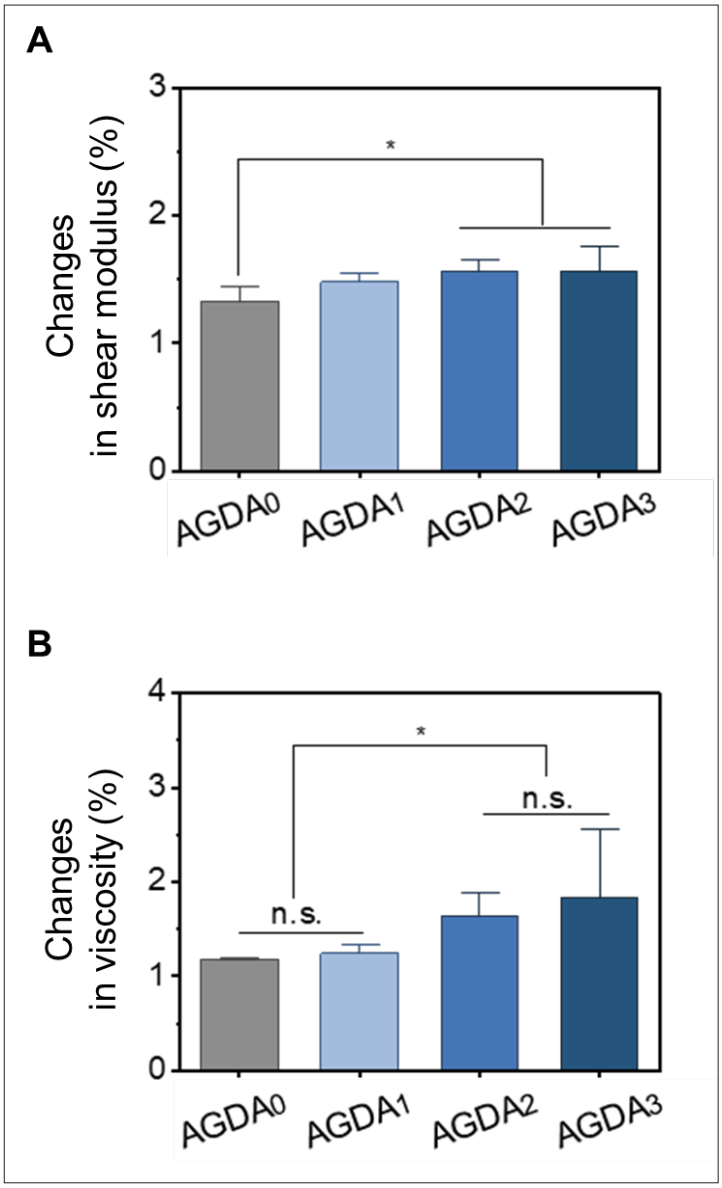

Figure S2. (A) Shear modulus and (B) viscosity changes at 1 s^{-1} during incubation. *$p < 0.05$. Abbreviation: AGDA, alginate/gelatin/dextran-aldehyde.

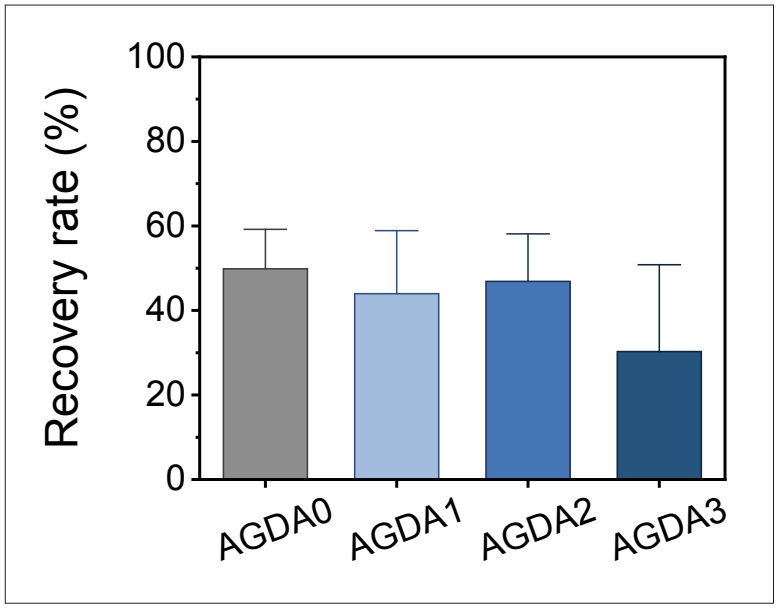

Figure S3. Recovery rate of bioinks during the thixotropic test. Recovery was quantified as the viscosity ratio at 0.1 s^{-1} measured at 180 s and 540 s of thixotropic test. Abbreviation: AGDA, alginate/gelatin/dextran-aldehyde.

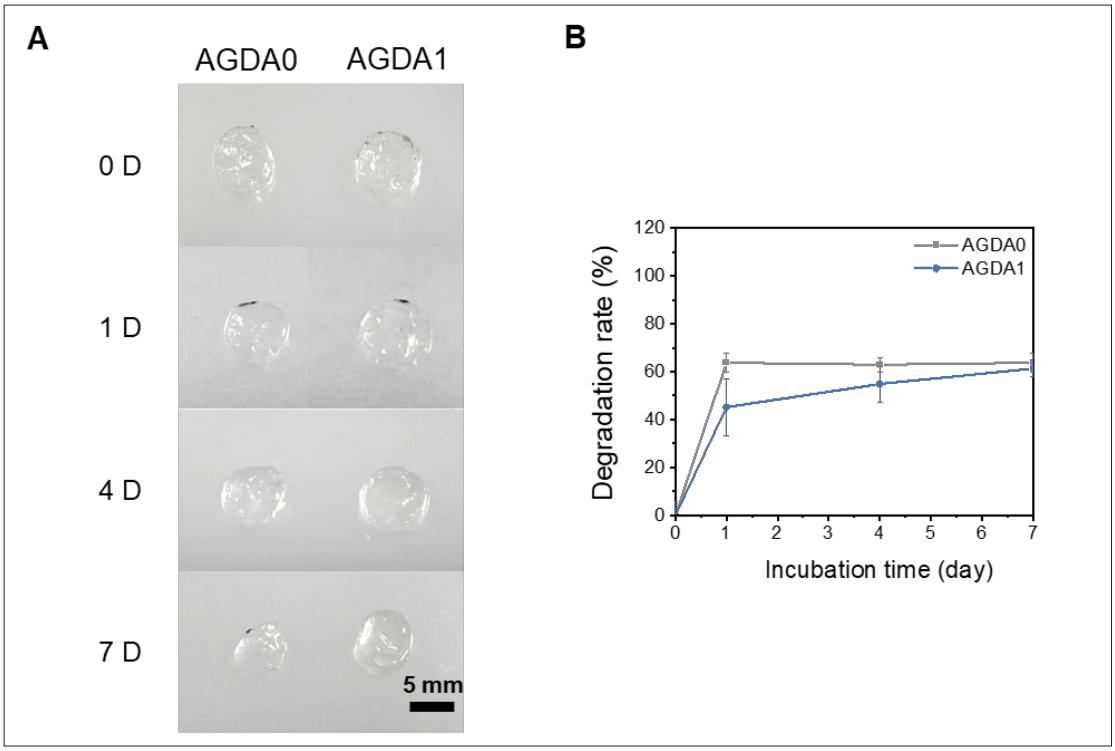

Figure S4. Degradation test of AGDA0 and AGDA1 in 0.15 M NaCl containing 0.1% $CaCl_2$. (A) Representative photographs of the hydrogels incubated at 37 °C with stirring (50 rpm) for up to 7 days. (B) Degradation rate (%) of the hydrogels during the incubation. The degradation rate was calculated as the ratio of the mass of the freeze-dried hydrogel at each time point to its initial mass at day 0. Abbreviation: AGDA, alginate/gelatin/dextran-aldehyde.

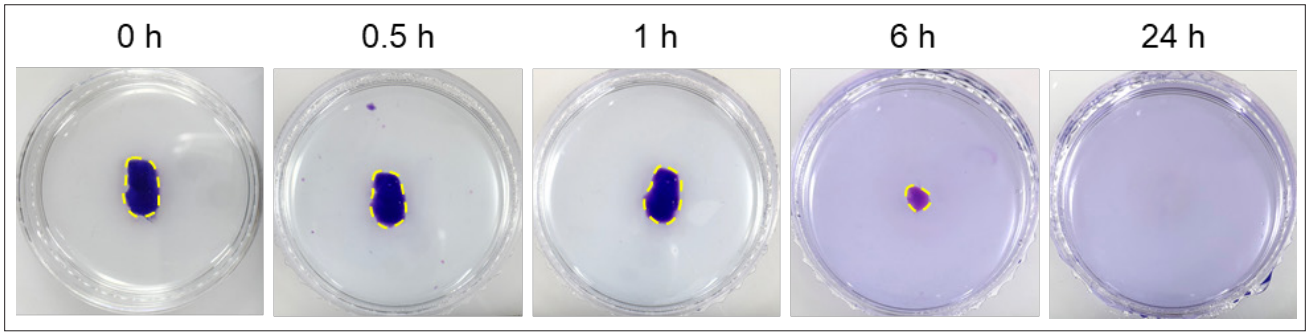

Figure S5. Photographs of AGDA1 during incubation in 0.15 M NaCl at 37 °C for up to 24 h. Abbreviation: AGDA, alginate/gelatin/dextran-aldehyde.

Table S1. Weight-average molecular weight (M_w), number-average molecular weight (M_n), and polydispersity (PDI) of dextran, dextran-aldehyde (dex-ald), and gelatin

	M_w (g/mol)	M_n (g/mol)	PDI (M_w/M_n)
Alginate	$2.53 (\pm 0.11) \times 10^5$	$1.83 (\pm 0.11) \times 10^4$	1.39 (± 0.10)
Gelatin	$2.06 (\pm 0.05) \times 10^5$	$1.32 (\pm 0.0) \times 10^5$	1.57 (± 0.08)
Dextran	$3.69 (\pm 0.03) \times 10^5$	$3.63 (\pm 0.03) \times 10^5$	1.02 (± 0.01)
Dex-ald	$4.65 (\pm 0.26) \times 10^4$	$4.98 (\pm 0.23) \times 10^4$	1.07 (± 0.08)