Supporting Information for

3D Bioprinting of carbohydrazide-modified gelatin into microparticle-suspended oxidized alginate for fabrication of complex-shaped tissue constructs

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Video Captions:

Video S1: Mixing and casting of OAlg and Gel-CDH hydrogels into 3D printed PDMS molds for fabrication of samples for the compression test. A5G5, A4G6, A3G7 and A2G8 solutions were loaded into mixer nozzles (McMaster-Carr, GA) and extruded into PDMS molds with an inner diameter of 7.5 mm and a height of 15 mm which were 3D printed using an INKREDIBLE bioprinter (Cellink, Sweden).

Video S2: Compression testing of samples made of different OAlg and Gel-CDH combinations. Video shows the mechanical properties of composite hydrogels which were determined at room temperature using a compression tester (Instron 5966, Instron, MA) equipped with a 1-kN load-cell at a compression speed of 50 mm/min. The specimens were compressed to 30% strain. Young's modulus was calculated form the stress-strain curve. Five samples (n=5) were used for each group.

Video S3: Crosslinking of OAlg and Gel-CDH via Schiff's base reaction. OAlg and Gel-CDH were crosslinked via Schiff base reaction to form the imine bond between aldehyde groups of OAlg and amino groups of Gel-CDH.

Video S4: 3D Bioprinting of a meshed tube construct with preheated Gel-CDH Ink and slurry bath consisting of OAlg and crosslinked gelation microparticles. Gel-CDH was preheated to 37 °C and extruded into the slurry bath composed of gelatin microparticles and OAlg solution. Gel-CDH and OAlg were then rapidly crosslinked to form filaments.

Video S5: A 3D bioprinted meshed tube construct removed from the slurry bath. Meshed tube construct maintained its structural integrity without any collapse or filament decomposition after pipetting of PBS indicating the remarkable mechanical stability of the printed constructs.

Video S6: A 3D bioprinted "ball-in-a-cage" construct removed from the slurry bath. "ball-in-a-cage" construct was 3D printed, and the ball (red color) was trapped and able to freely rotate within the enclosing mesh cage (green color).