

Supplementary Materials

Three-Dimensional Bioprinting with Alginate by Freeform Reversible Embedding of Suspended Hydrogels with Tunable Physical Properties and Cell Proliferation

Yuanjia Zhu ^{1,2}, Charles J. Stark ¹, Sarah Madira ¹, Sidarth Ethiraj ¹, Akshay Venkatesh ¹, Shreya Anilkumar ¹, Jinsuh Jung ¹, Seunghyun Lee ¹, Catherine A. Wu ¹, Sabrina K. Walsh ¹, Gabriel A. Stankovich ¹ and Yi-Ping Joseph Woo ^{1,2,*}

¹ Department of Cardiothoracic Surgery, Stanford University, Stanford, CA 94305, USA

² Department of Bioengineering, Stanford University, Stanford, CA 94305, USA

* Correspondence: joswoo@stanford.edu

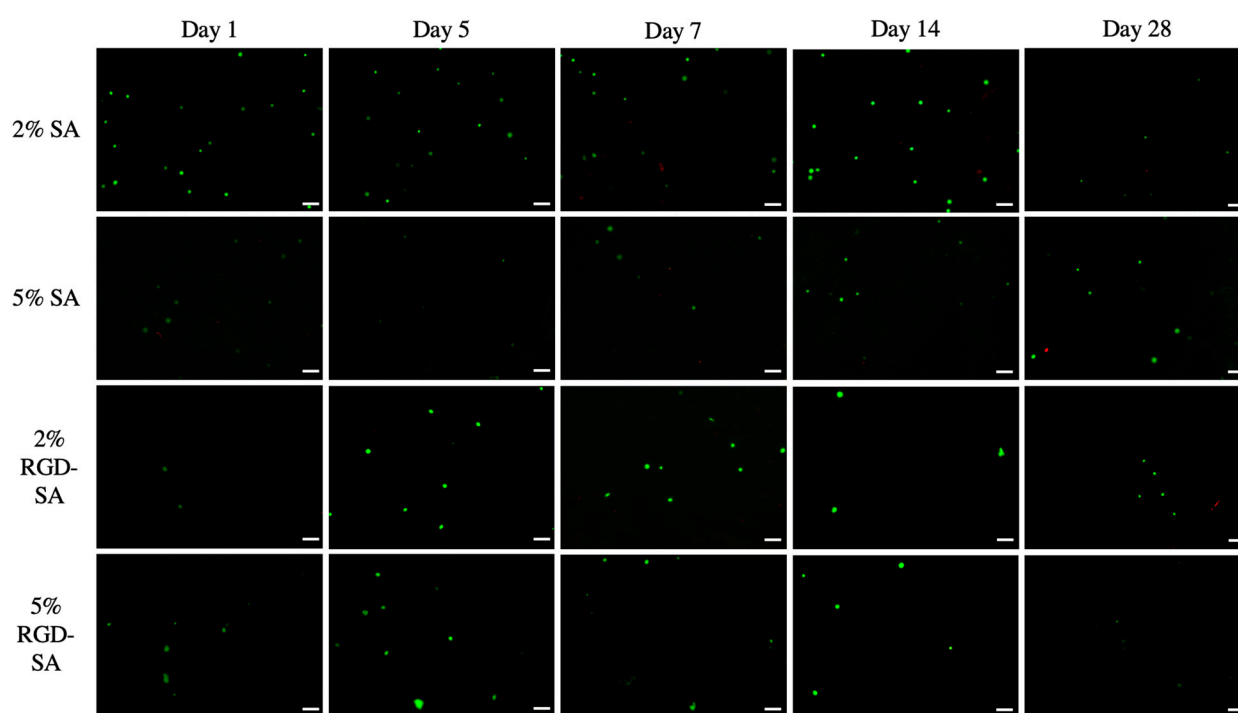


Figure S1. Exemplary live dead images of adult human dermal fibroblasts in different alginate bio-inks after 3D printing over 28 days. Scale bar = 100 μ m. SA: sodium alginate; RGD-SA: RGD-modified sodium alginate.

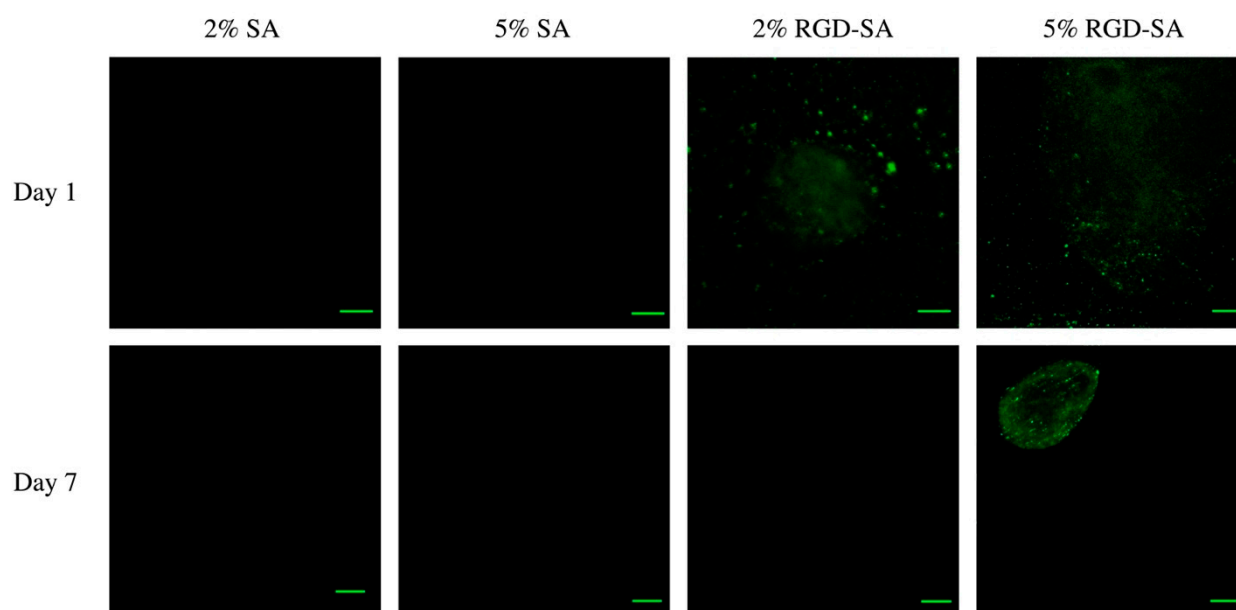


Figure S2. Integrin signals of cells printed in alginates 1 and 7 days after bioprinting. Integrin was present in both RGD-modified alginates 1 day after bioprinting, but after 7 days of culturing, only 5% RGD-SA demonstrated enhanced integrin signals with clustering. SA: sodium alginate. Scale bar = 5 μ m.

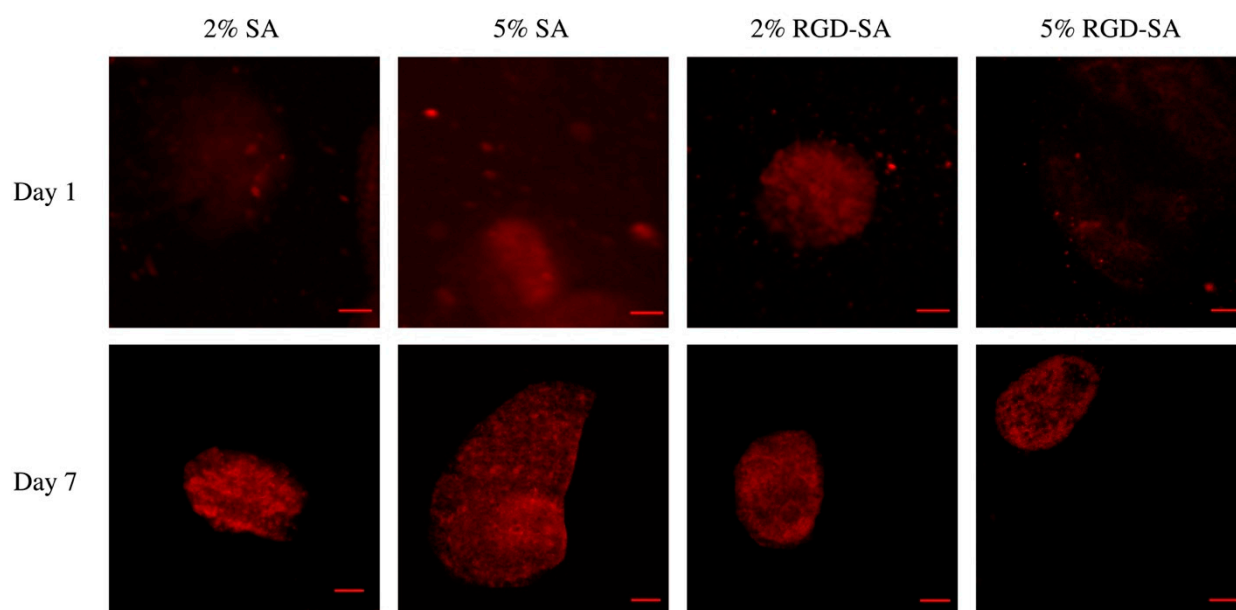


Figure S3. Actin signals of cells printed in alginates 1 and 7 days after bioprinting. Actin signals were well visualized in different alginates at both 1 and 7 days after bioprinting. More pronounced actin formalization was observed after 7 days compared to 1 day after bioprinting. SA: sodium alginate. RGD-SA: RGD-modified sodium alginate. Scale bar = 5 μ m.

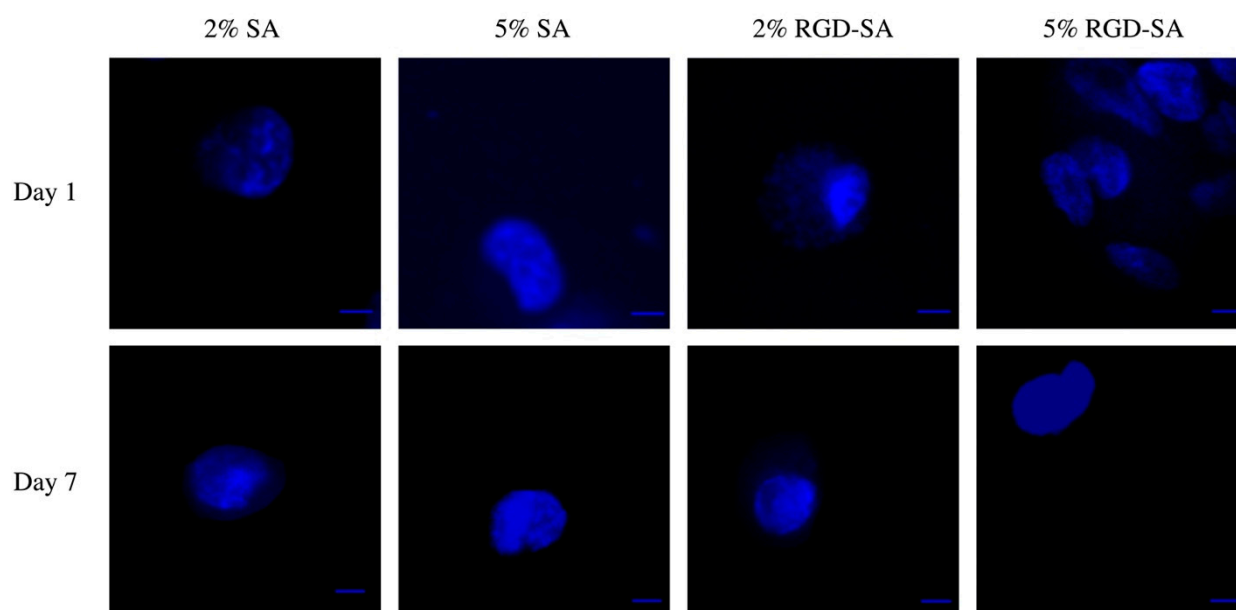


Figure S4. DAPI signals of cells printed in alginates 1 and 7 days after bioprinting. No changes in DAPI signals were observed in different alginates at 1 and 7 days after bioprinting. SA: sodium alginate. RGD-SA: RGD-modified sodium alginate. Scale bar = 5 μ m.