Supplemental Information

Bioprinting Schwann cell-laden scaffolds from low-viscosity hydrogel compositions

Liqun Ning[1*], Ning Zhu[2], Fatemeh Mohabatpour[3], M.D. Sarker[3], David J. Schreyer[4], and Xiongbiao Chen[1,3]

[1]Department of Mechanical Engineering, College of Engineering, University of Saskatchewan, S7N 5A9, SK, Canada

[2]Canadian Light Source, Saskatoon, S7N 2V3, SK, Canada

[3]Division of Biomedical Engineering, College of Engineering, University of Saskatchewan, S7N 5A9, SK, Canada

[4]Department of Anatomy and Cell Biology, College of Medicine, University of Saskatchewan, S7N 5E5, SK, Canada

Corresponding author: Liqun Ning, Department of Mechanical Engineering, College of Engineering, University of Saskatchewan, S7N 5A9, SK, Canada

Email: lin255@mail.usask.ca;

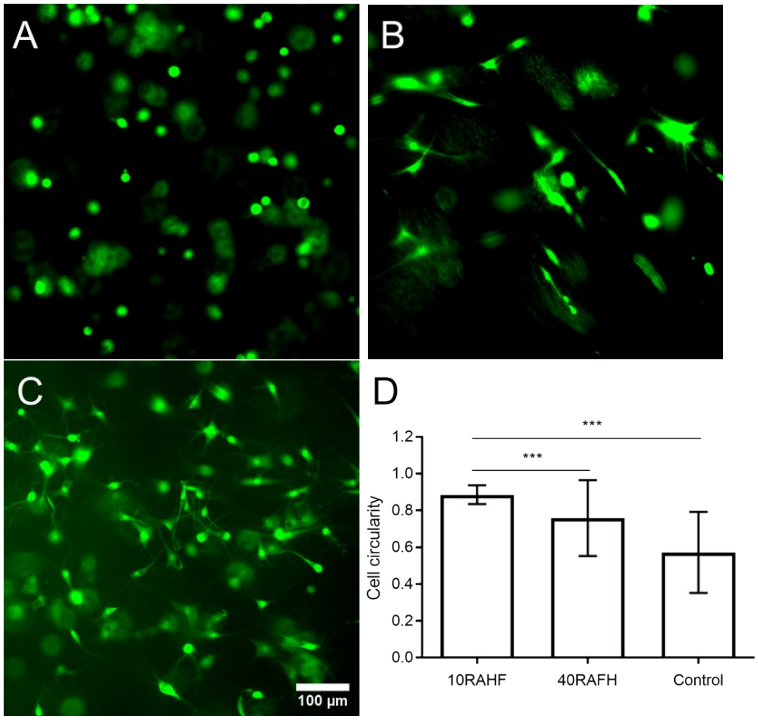

Figure S1 Schwann cell circularity encapsulated in different hydrogels; A,10RAHF; B, 40RAHF; C, control group of pure fibrin (10 mg/ml); and D, statistical results. *** represents $p < 0.001$.

Both 10RAHF/Schwann cell and 40RAHF/Schwann cell with a cell density of 1×10^6 cells/ml were prepared. A 40 uL aliquot of each cell suspension was carefully pipetted onto a round glass slide for 10 min crosslinking in medium containing 25 U/ml thrombin and 100 mM calcium ions. Solidified hydrogels were rinsed twice with Tris buffered saline (TBS), and subsequently cultured in a 24-well plate using culture medium. Calcein–AM solution with a final concentration of 1 μg/ml was added to each well for 30 min after 4 d's culture, and the stained cells was observed under a fluorescence microscope (Carl Zeiss Axiovert 100). Three hydrogels were prepared for each group and three random images were taken for each hydrogel sample. Cell circularity was analyzed using ImageJ.

Results show that Schwann cell circularity in 10RAHF was 0.886 ± 0.051, which was significantly higher than cell circularity in 40RAHF and control, indicating low cell attachment. When fibrin reached 40 mg/ml, the value of circularity was reduced to 0.758 ± 0.206, showing that more Schwann cells were stretched and elongated. As such, hydrogel compensation of 40RAHF was selected for bioprinting Schwann cell-laden scaffolds.