Supplementary information

Geometrically Customizable Alginate Hydrogel Nanofibers for Cell Culture Platforms

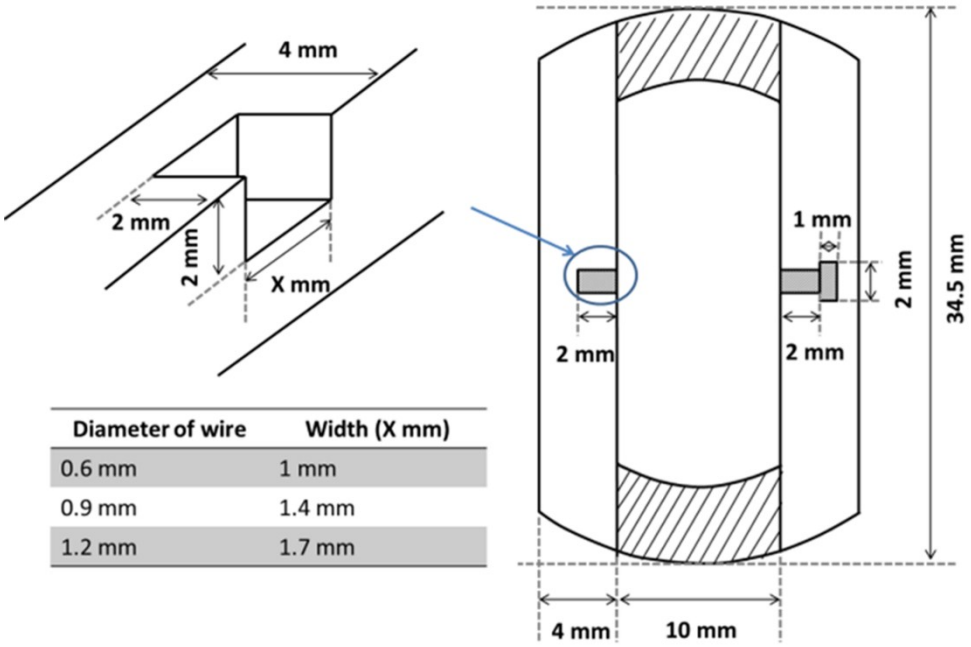
Satoshi Fujita[a,b] *, **Yuka Wakuda**[a], **Minori Matsumura**[a], **Shin-ichiro Suye** [a,b]

[a] Department of Frontier Fiber Technology and Science, Graduate School of Engineering, University of Fukui, Fukui, 910-8507, Japan

[b] Life Science Innovation Center, University of Fukui, Fukui, 910-8507, Japan

*Corresponding author at: Department of Frontier Fiber Technology and Science, Graduate School of Engineering, University of Fukui, 3-9-1 Bunkyo, Fukui 910-8507, Japan

Tel/Fax: +81-776-27-9969, E-mail: fujitas@u-fukui.ac.jp



Diameter of wire	Width (X mm)
0.6 mm	1 mm
0.9 mm	1.4 mm
1.2 mm	1.7 mm

Fig. S1 Schematic illustration of a wire holder for the suspended culture, which was fabricated from acrylic resin with a laser processing machine.

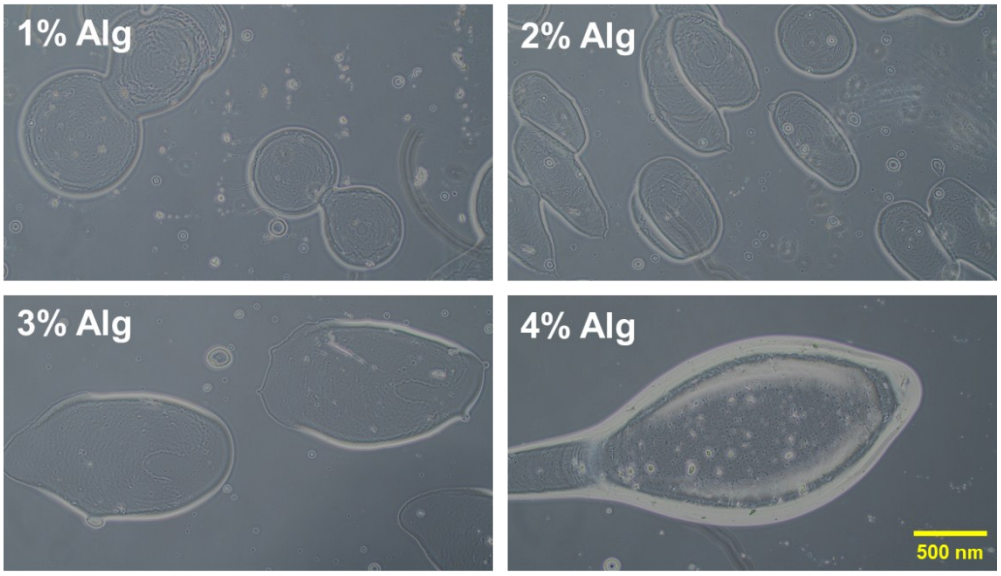


Fig. S2 Electrospinning of alginate (1,000 cps) aqueous solution alone with a single nozzle. Solutions were sprayed as beads, and no fiber was obtained in those conditions. The alginate solution of 6% and 8% concentration was unable to electrospin due to the high viscosity.

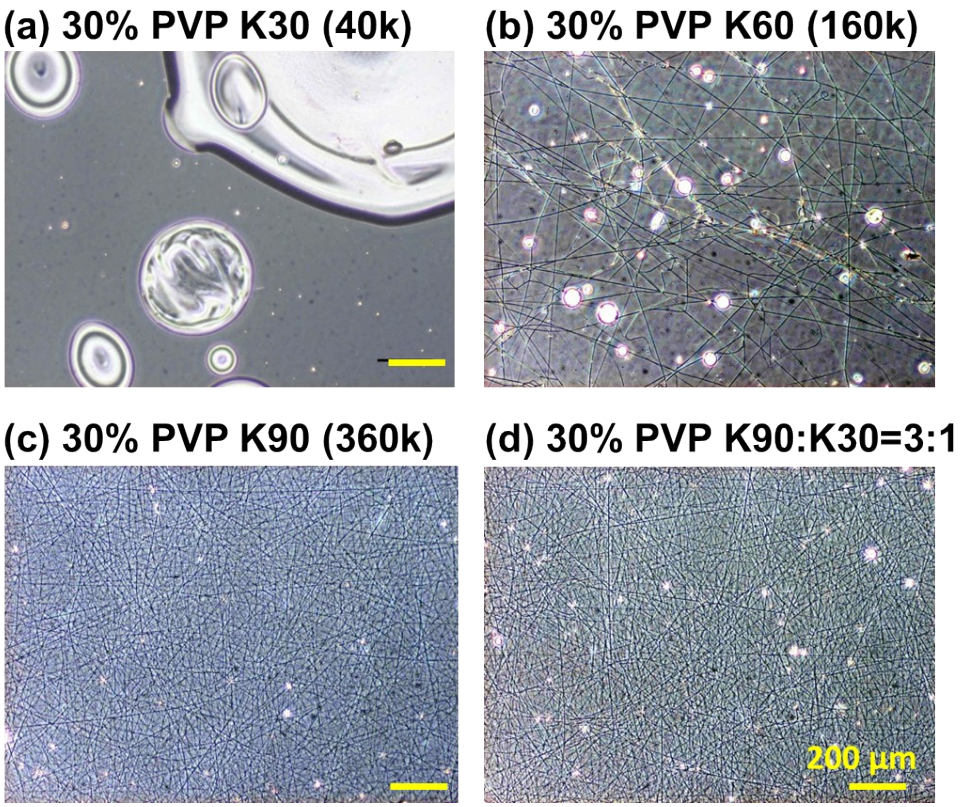


Fig. S3 Optimization of the molecular weight of PVP for electrospinning.

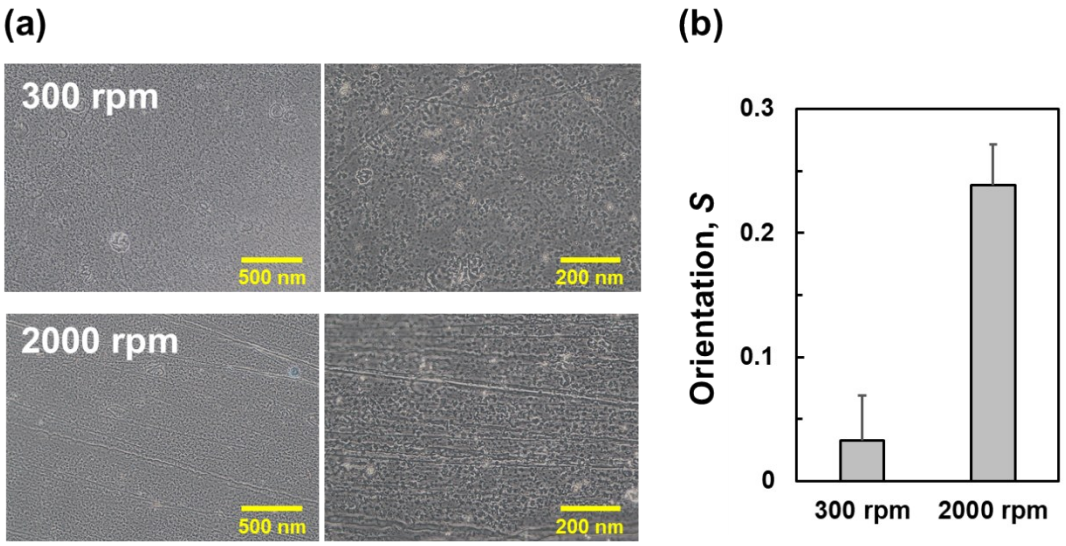


Fig. S4 (a) Phase contrast images of alginate hydrogel fiber which was electrospun at different rotation speed and following Ca^{2+} treatment. (b) Orientation of hydrogel fibers.

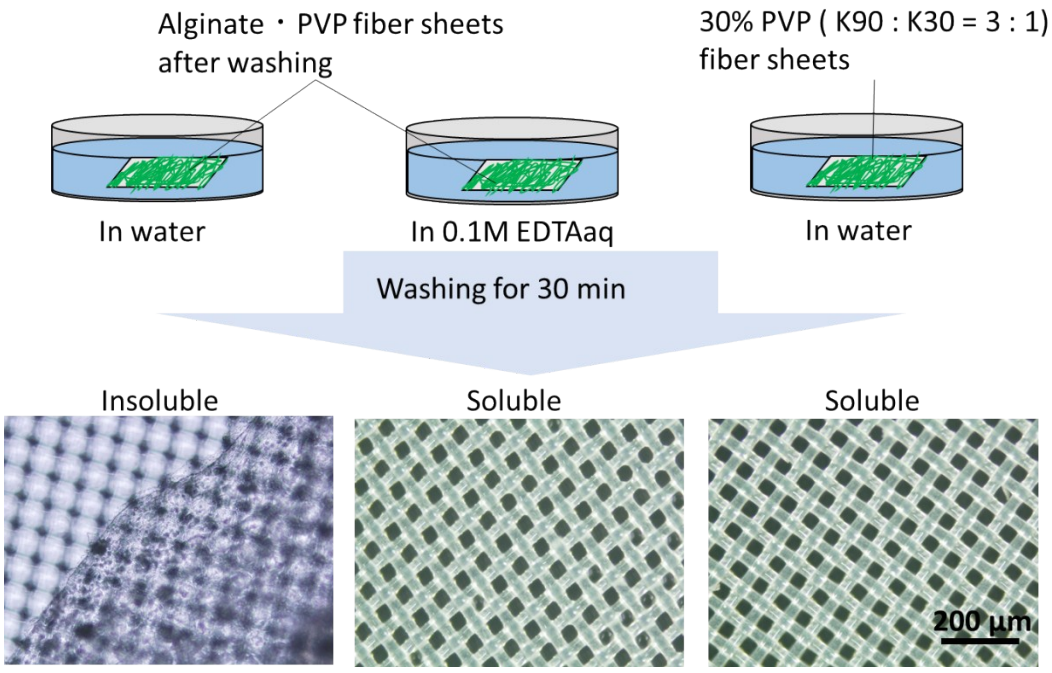


Fig. S5 Observation of fiber solubility. Alginate fiber sheets treated with Ca^{2+} were insoluble in water, but were soluble in a 0.1 M EDTA solution. PVP fibers which contain no alginate dissolve easily in water.

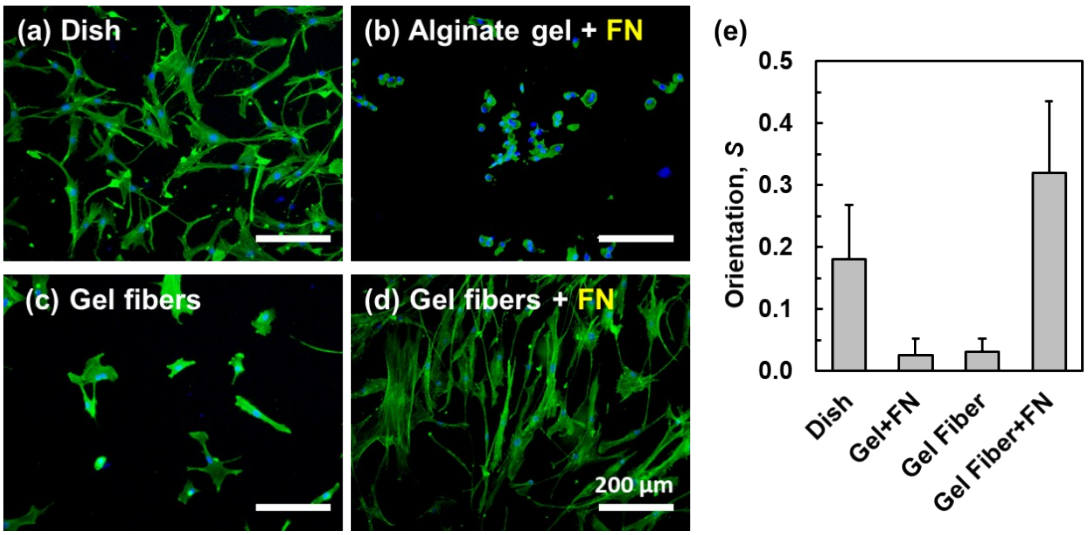


Fig. S6 Fluorescent images of human mesenchymal stem cells (hMSCs) on glass (a), isotropic normal alginate gel conjugated with fibronectin (b), alginate gel fibers fabricated from alginate/PVP fibers and Ca^{2+} treatment without fibronectin (c) and with fibronectin (d). Cells were stained with Hoechst 33342 (nuclei) and Alexa 488 phalloidin (F-actin). The direction of the arrow indicates the direction of fibers. Bar = 200 μm. (e) Orientation of cells cultured on each substrate.