Supporting Information

# A novel platform of cardiomyocytes culture and coculture via fibroblast-derived matrix-coupled aligned electrospun nanofiber

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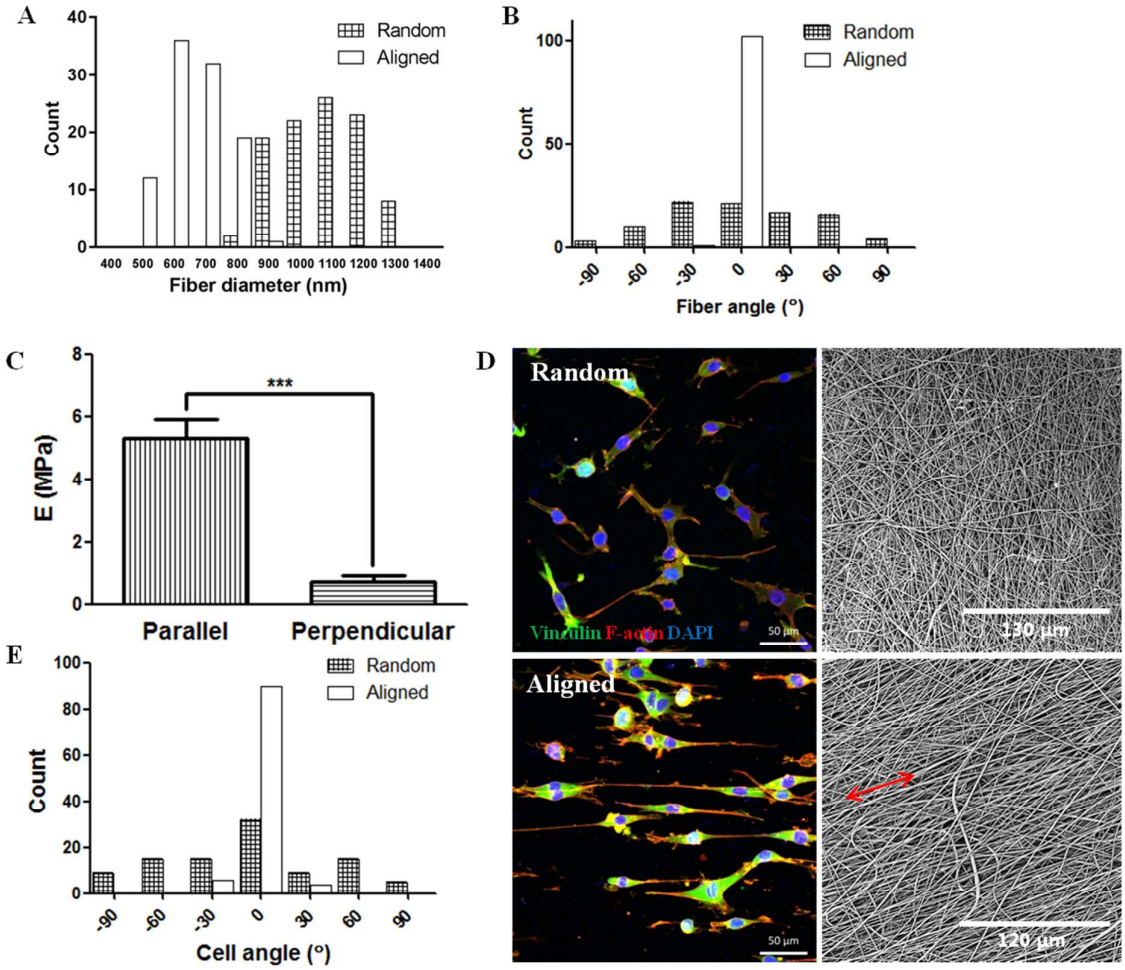


**Figure S1.** Characterization of electrospun PLCL fibers. (A) Analysis of fiber diameters and (B) direction of fiber angle based on the SEM images of random and aligned PLCL fibers. (C) Mechanical property (Young's modulus) measurement in which the PLCL fibers were stretched into the direction of parallel or perpendicular to the fiber axis. (D) Assessment of cell morphology along with corresponding SEM images of electrospun PLCL fibers in lower magnifications (red arrow indicates direction of fiber alignment) and staining against vinculin, f-actin, along with DAPI staining. (E) Distribution of cell angles as evaluated by fibroblasts cultured on random and aligned fibers, respectively. Scale bar is 50 μm. Statistical significance (***$p < 0.001$).

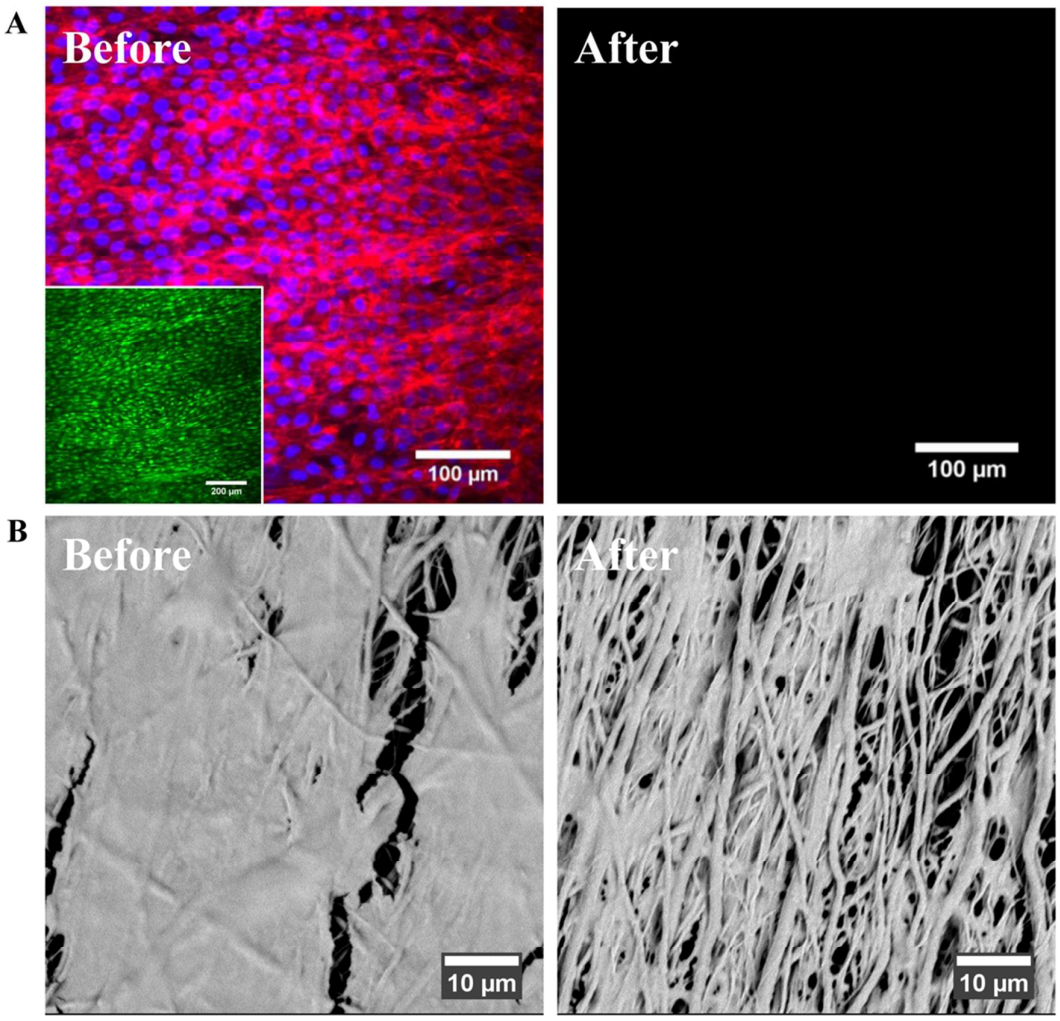


**Figure S2.** Fabrication and characterization of PLCL/FDM. (A) Decellularization via detergents and enzyme treatment was confirmed by using f-actin (red) and DAPI staining (blue) before and after decellularization. Scale bar is 100 μm. Inset shows viable cells (green) and dead cells (red) (scale bar is 200 μm). (B) SEM images before and after decellularization; FDM is coated homogenously on top of PLCL fibers. Scale bar is 10 μm.

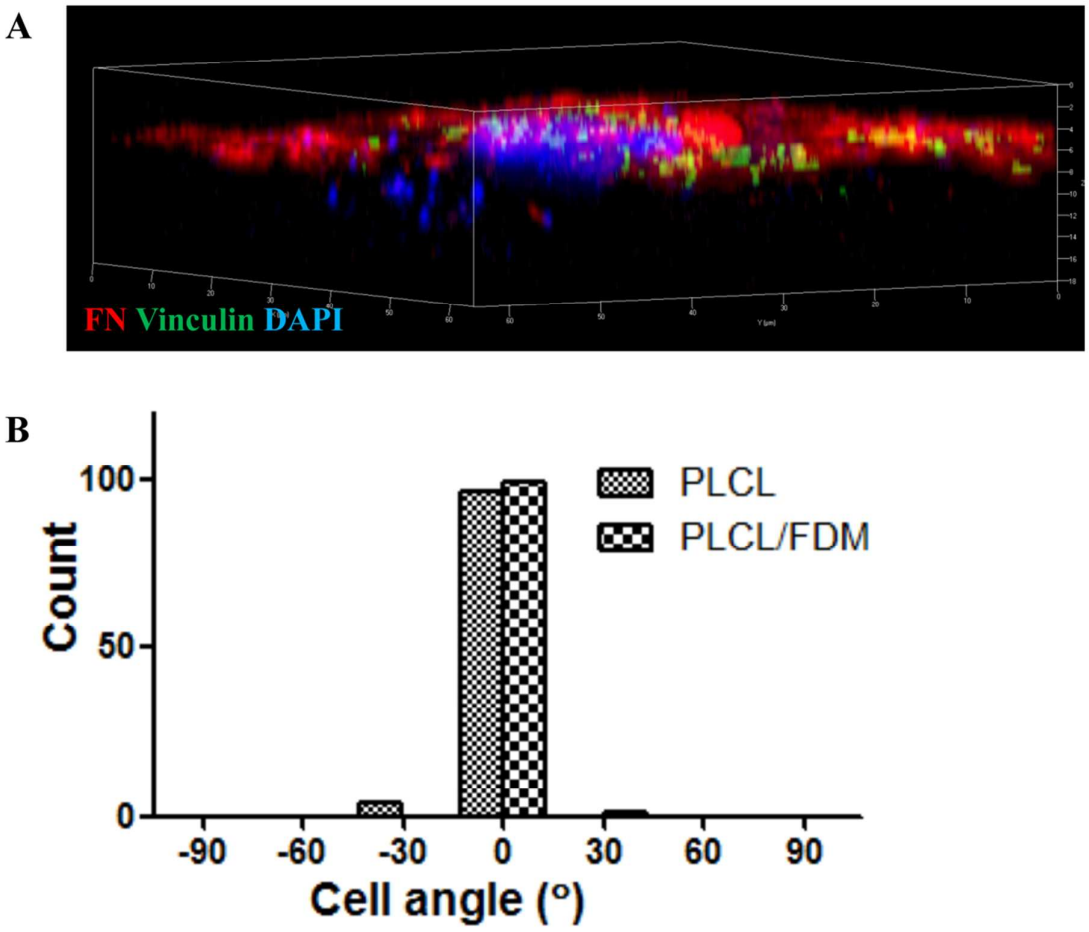


**Figure S3.** (A) Cells-FDM interactions as visualized by 3D reconstruction image of cell-seeded PLCL/FDM as stained against fibronectin and focal adhesion molecule (vinculin), along with DAPI staining. (B) Cell angle distribution of H9c2 cardiomyoblasts cultured for 24 hr on PLCL and PLCL/FDM, respectively.

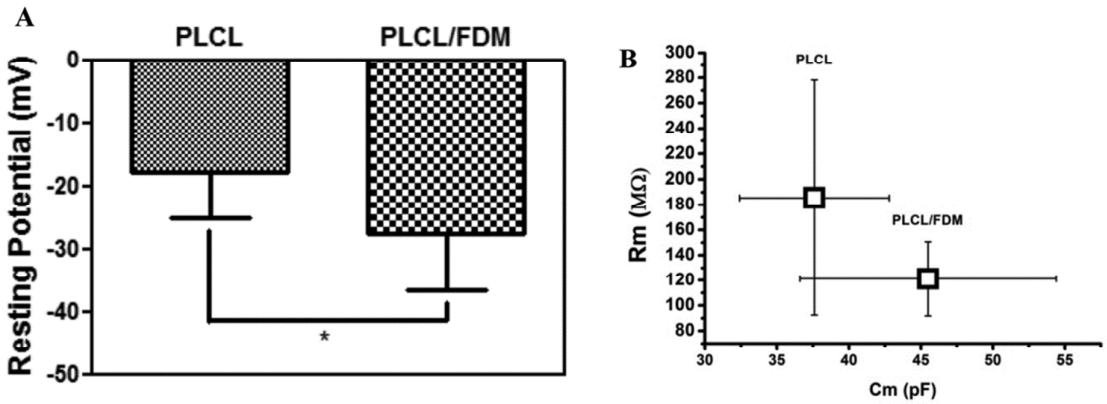


**Figure S4.** Electrophysiological properties of CMs as measured by passive membrane properties, such as (A) resting potential, (B) membrane capacitance (Cm), and membrane resistance (Rm).

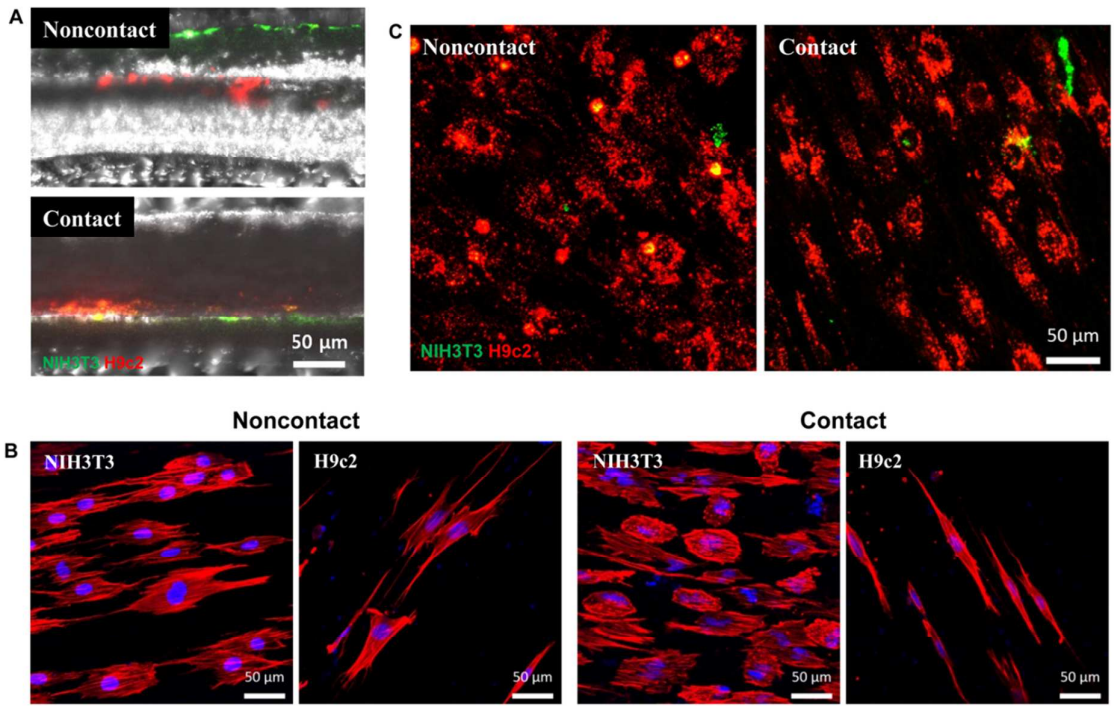


**Figure S5.** (A) Fluorescence images of cryo-sectioned samples where cells are pre-labeled with fluorescence dyes (H9c2-red, NIH3T3-green) and cocultured for 5 days in two different modes prior to imaging. (B) Cell morphology was taken by staining against f-actin after each cell was cocultured for 24 hr. (C) Fluorescence images of H9c2 cardiomyoblast layer separated after coculture of H9c2 (red) and NIH3T3 (green) for 24 hr. All the scale bars are 50 μm.