Supplementary figures:

Mussel-inspired conductive nanofibrous membranes repair myocardial infarction by enhancing cardiac function and revascularization

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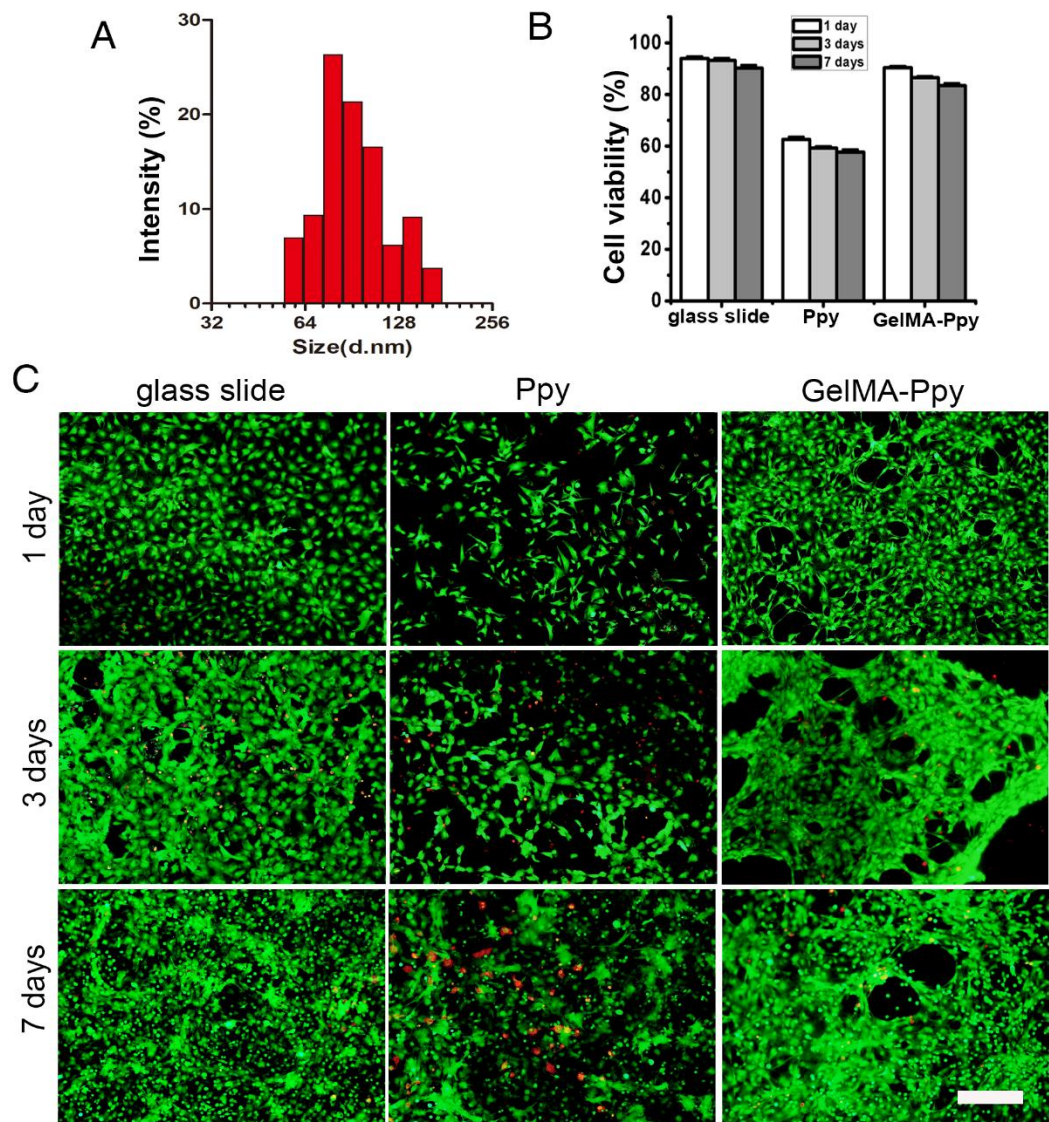Prof. Xiaozhong Qiu

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Figure S1. The biocompatibility of GelMA-Ppy nanoparticles. (A) Size distribution of GelMA-Ppy nanoparticles assessed by DLS. **(B)** Quantitative cell viability of untreated CMs, 25 mg/mL Ppy-treated CMs, and 50 mg/mL GelMA-Ppy nanoparticles-treated CMs for 1, 3 and 7 days. **(C)** Live/dead staining of untreated cardiac fibroblasts, 25 mg/mL Ppy-treated cardiac fibroblasts, and 50 mg/mL GelMA-Ppy nanoparticles-treated cardiac fibroblasts for 1, 3 and 7 days. The live cells are green and the dead cells are red. Scale bar, 100 μm.
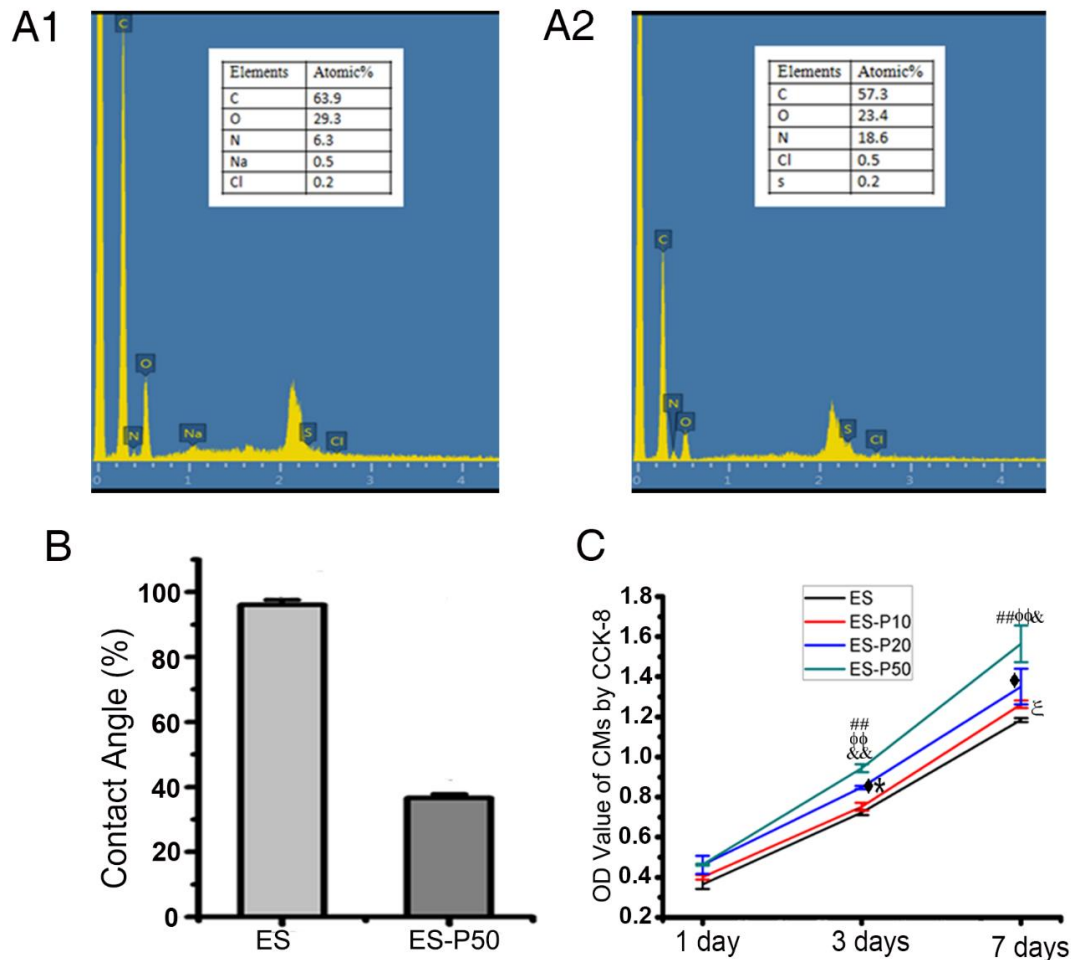
Elements	Atomic%
C	63.9
O	29.3
N	6.3
Na	0.5
Cl	0.2

Elements	Atomic%
C	57.3
O	23.4
N	18.6
Cl	0.5
s	0.2

Figure S2. Characterization of dopa-based conductive membranes. (A) The energy dispersive analysis of ES (A1) and ES-P50 (A2). **(B)** Contact angle measurements of ES and ES-P50. Data are presented as means ± SD. n=10. **(C)** The viability of CMs cultured on various membranes was investigated on 1, 3 and 7 days with CCK-8 assay. ES: pristine ES-GelMA/PCL membrane; ES-P10: dopa-based ES-P10 membrane; ES-P20: dopa-based ES-P20 membrane; ES-P50: dopa-based ES-P50 membrane. All data are presented as mean ± SD. ##, $p<0.01$ between ES and ES-P50; φφ, $p<0.01$ between ES-P10 and ES-P50; &, $p<0.05$ between ES-P20 and ES-P50; &&, $p<0.01$ between ES-P20 and ES-P50; ♦, $p<0.05$ between ES and ES-P20; *, $p<0.05$ between ES-P10 and ES-P20; ξ,
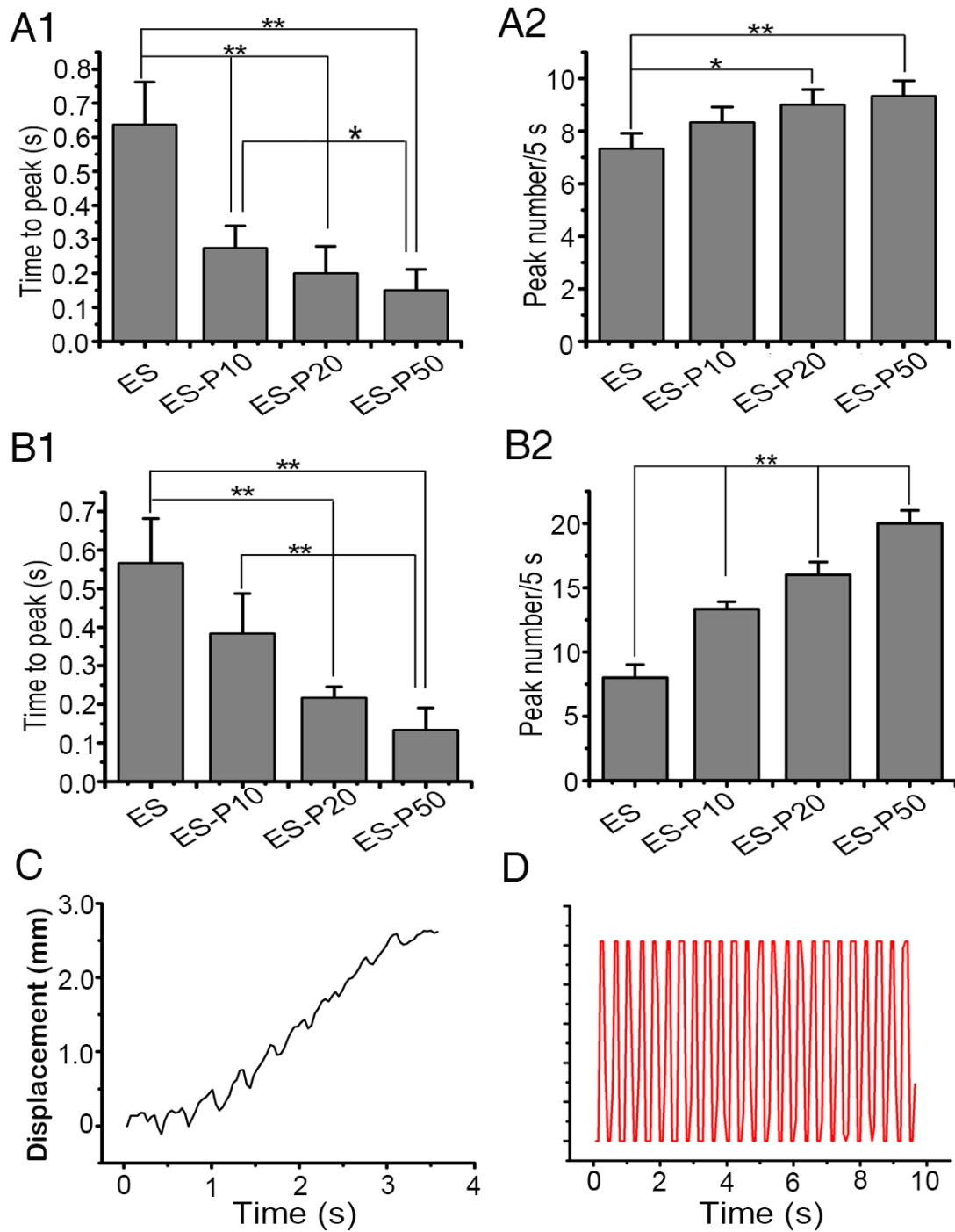
p<0.05 between ES and ES-P10.

Figure S3. **Calcium transient parameters of CMs cultured on different membranes. (A-B)** The calcium transient parameters at day 3 (A) and day 7 (B) calculated by ImageJ software according to the data from Figure 4A-B, including the

times to calcium peak and peak numbers within 5 s. ES: pristine ES-GelMA/PCL membrane; ES-P10: dopa-based ES-P10 membrane; ES-P20: dopa-based ES-P20 membrane; ES-P50: dopa-based ES-P50 membrane. All data are presented as mean ± SD. *, $p<0.05$; **, $p<0.01$. **(C)** The displacement vs. time plot for the spontaneous linear travelling of the dopa-based ES-P50 ECP based on figure 4C1-2 and supplemental movie 2. **(D)** The beating signal analysis of the dopa-based ES-P50 ECP in Figure 4C3-4 and supplemental movie 2 with METLAB.