

Supplementary Material

for

Injectable conductive hydrogel can reduce pacing threshold and enhance efficacy of cardiac pacemaker

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Supplementary Figure

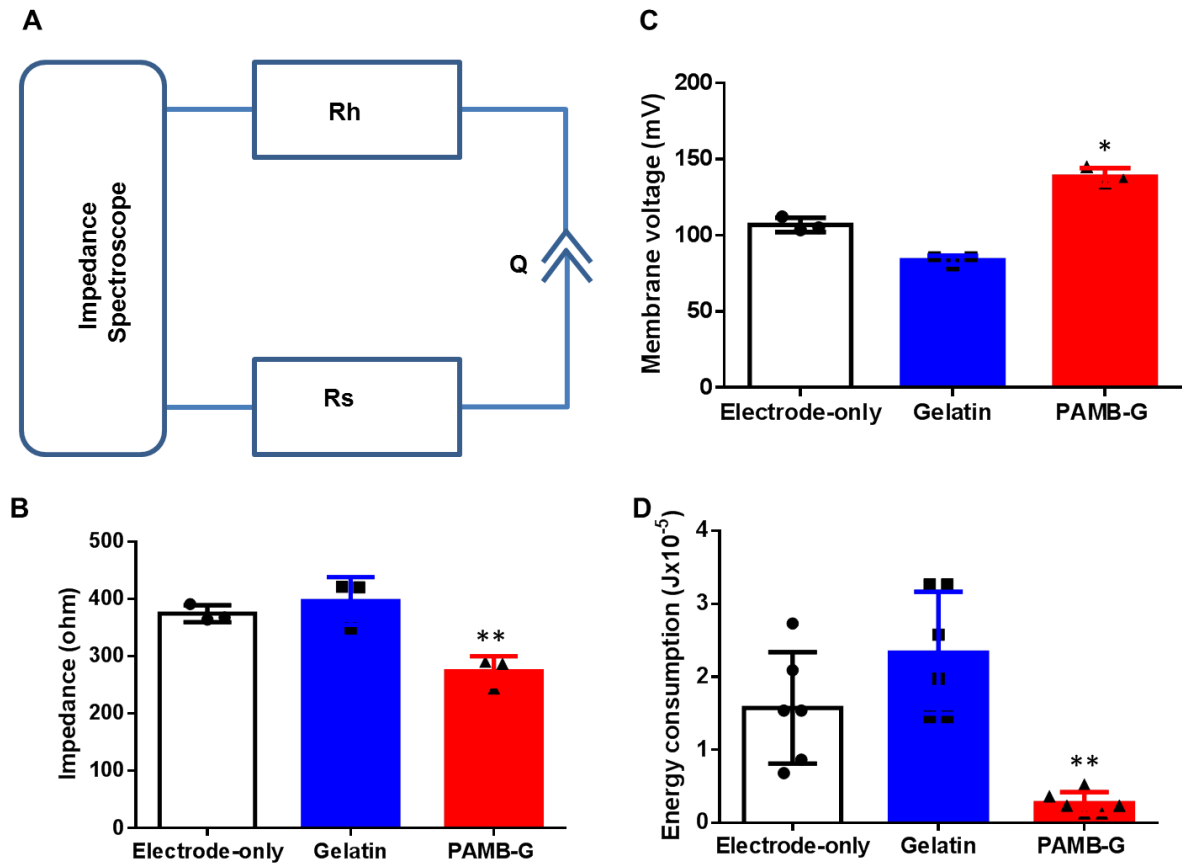


Figure S1: Equivalent circuit model of biomaterials. (A) Schematic drawing of equivalent circuit model. (B) Injection of PAMB-G hydrogel into the electrode-tissue interface significantly decreased myocardial tissue impedance at frequency of 7 kHz compared to the control groups ($n = 3/\text{group}$, $**P < 0.01$ compared with electrode-only and gelatin). (C) Injecting PAMB-G hydrogel into the electrode-tissue interface significantly increased myocardial cell membrane voltage compared to the control groups ($n = 3/\text{group}$, $*P < 0.05$ compared with electrode-only and gelatin). (D) Pacing energy consumption was significantly decreased in the PAMB-G group ($n = 6/\text{group}$, $**P < 0.01$ compared with electrode-only and gelatin). Data analysis used one-way analysis of variance (ANOVA) followed by Tukey's *post-hoc* tests. Data shown as mean \pm SD.

Supplementary movies

Movie S1. Under 0.5 V stimulation, the optical mapping movie showed that the stimulation in electrode-only group did not change the autonomous heart rhythm, and a local depolarization in the electrode insert area was detected (small black arrow). Activation orientation was indicated by a large black arrow.

Movie S2. Under 0.5 V stimulation, the optical mapping movie showed a local depolarization in the gelatin injection area (black circle), reflecting the low conductivity of gelatin. The stimulation did not change autonomous heart rhythm. Activation orientation was indicated by a black arrow.

Movie S3. Optical mapping movie showed that 0.5 V stimulation is enough to change the rhythm from autonomous cardiac rhythm to the pacing rhythm, and an ectopic pacemaker at the PAMB-G injected area was detected (small black arrow). Activation orientation was indicated by a large black arrow.