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# Supporting Information

## The Structure Effect of Antifouling Functionalities on the Electrochemical and Antifouling Performances of Conducting Polymers

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KEYWORDS：antifouling, poly(3,4-ethylenedioxythiophene), zwitterion, oligo(ethylene glycol), phosphorylcholine.

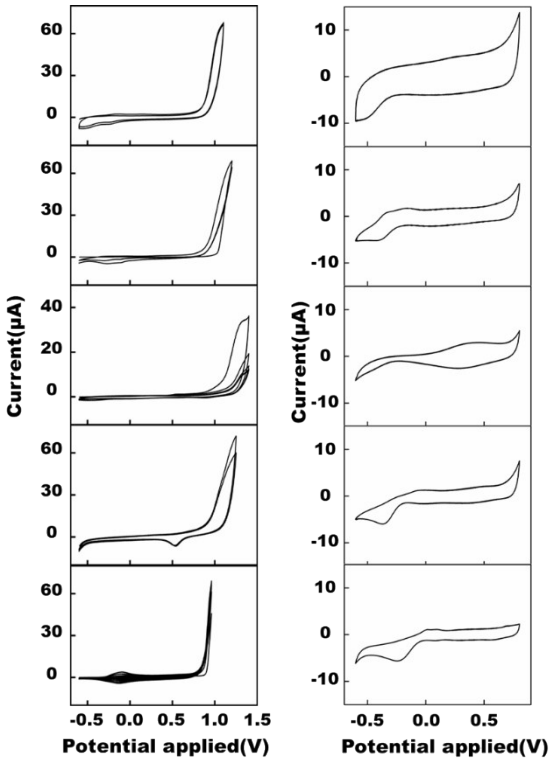


**Figure S1.** Cyclic voltammograms registered during the electropolymerization of (a) EDOT and antifouling EDOT polymers including (b) EDOT-EG3, (c) EDOT-EG4, (d) EDOT-SB, (e) EDOT-PC; CV profiles of PEDOT polymers in PBS buffer (pH=7.2): (a') PEDOT, (b') PEDOT-EG3, (c') PEDOT-EG4, (d') PEDOT-SB, (e') PEDOT-PC.

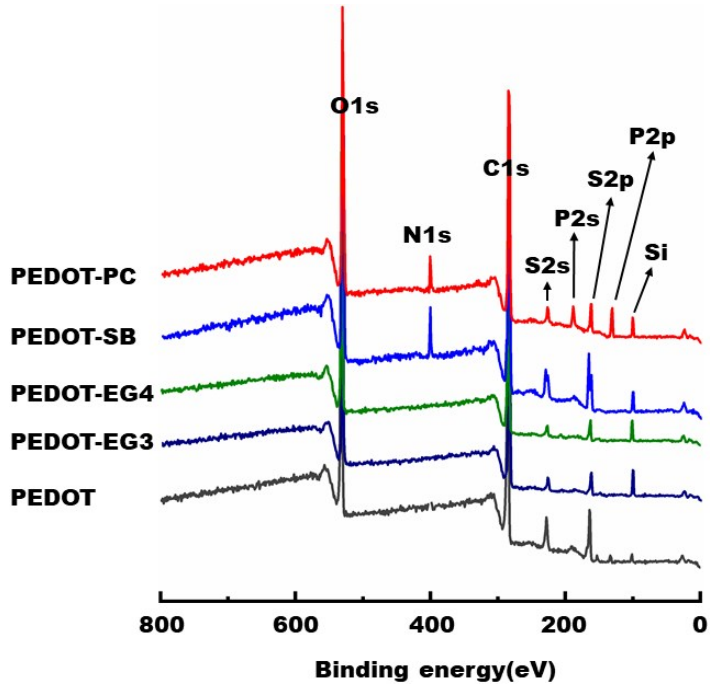


**Figure S2.** XPS profiles of PEDOT， PEDOT-EG3, PEDOT-EG4, PEDOT-SB, and PEDOT-PC thin films.

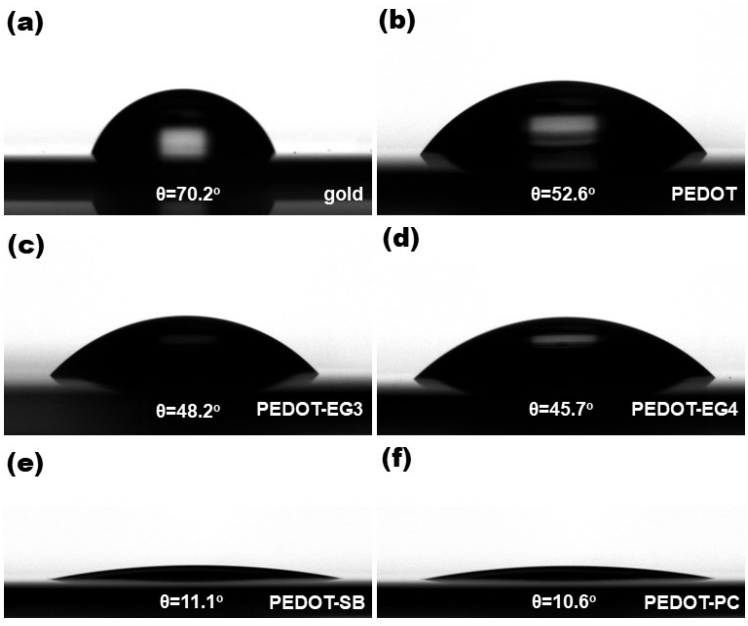


**Figure S3.** Water contact angles of (a) gold, (b) PEDOT, (c) PEDOT-EG3, (d) PEDOT-EG4, (e) PEDOT-SB, and (f) PEDOT-PC thin films on the microelectrode arrays.

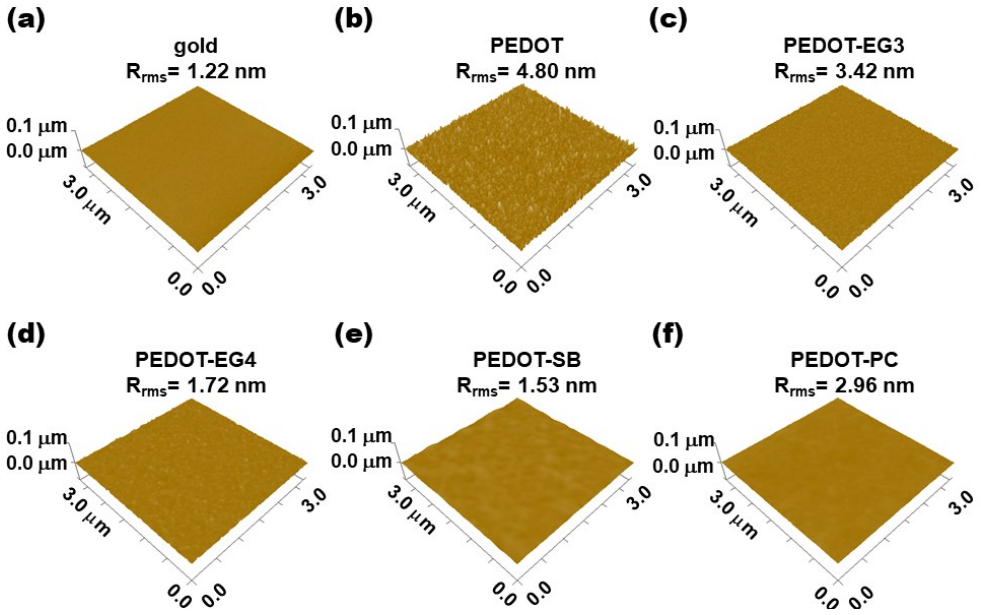


**Figure S4.** AFM images of PEDOT， PEDOT-EG3, PEDOT-EG4, PEDOT-SB, and PEDOT-PC thin films on the microelectrode arrays.

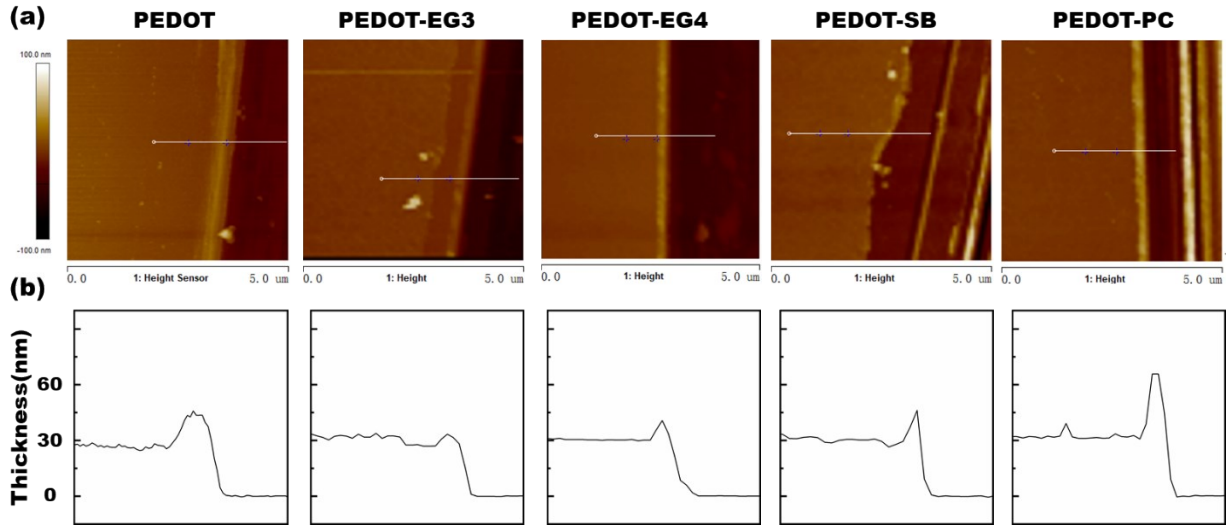


**Figure S5**. (a) Nanometrological AFM images of PEDOTs thin films (scan range: 5 μm × 5 μm). (b) Line profiles of step height calculation for PEDOTs thin films.

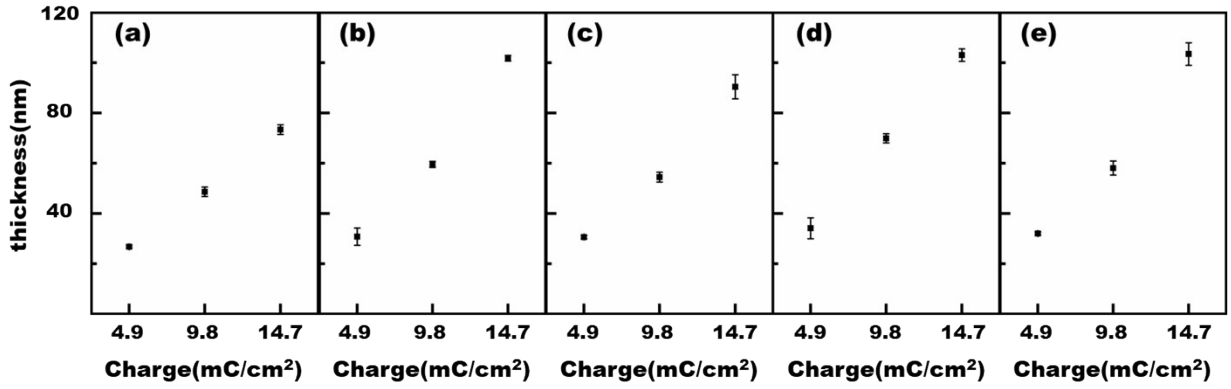


**Figure S6.** The thickness of (a) PEDOT, (b) PEDOT-EG3, (c) PEDOT-EG4, (d) PEDOT-SB, (e) PEDOT-PC films on the microelectrode arrays at different deposited charge, 4.9, 9.8, and 14.7 mC/cm$^2$.

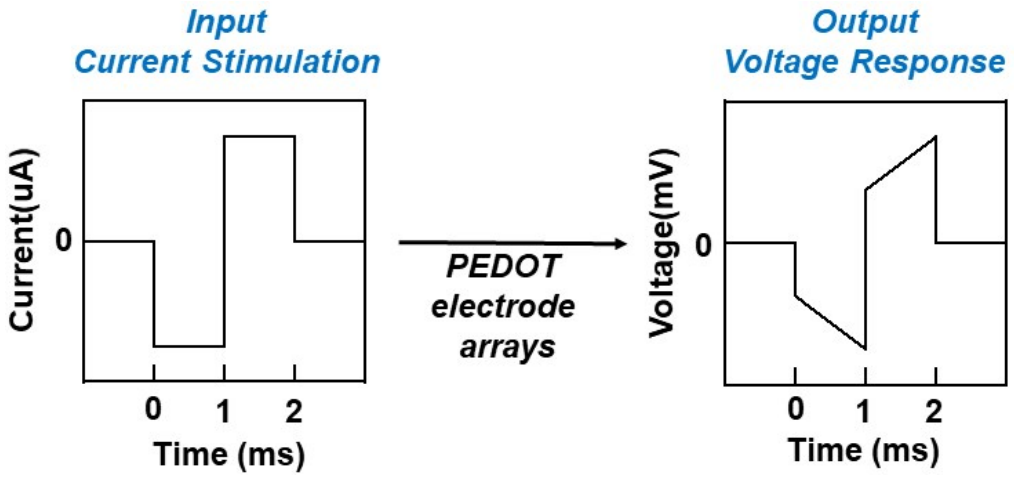


**Figure S7.** Waveform of biphasic current pulse stimulation.

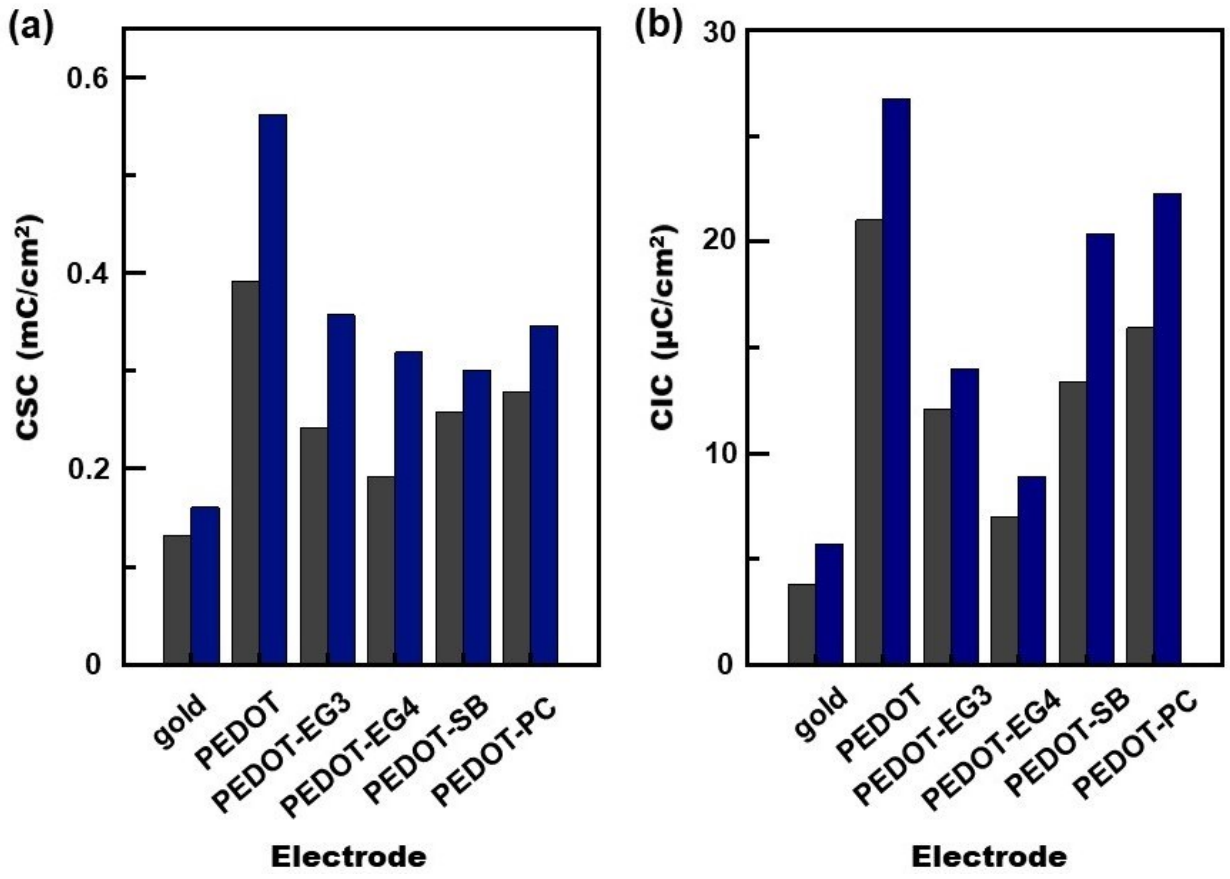


**Figure S8.** Assessment of (a) charge storage capacities (CSC) and (b) charge injection capacities (CIC) for different electrodes before (gray color) and after electrical stimulation (blue color).

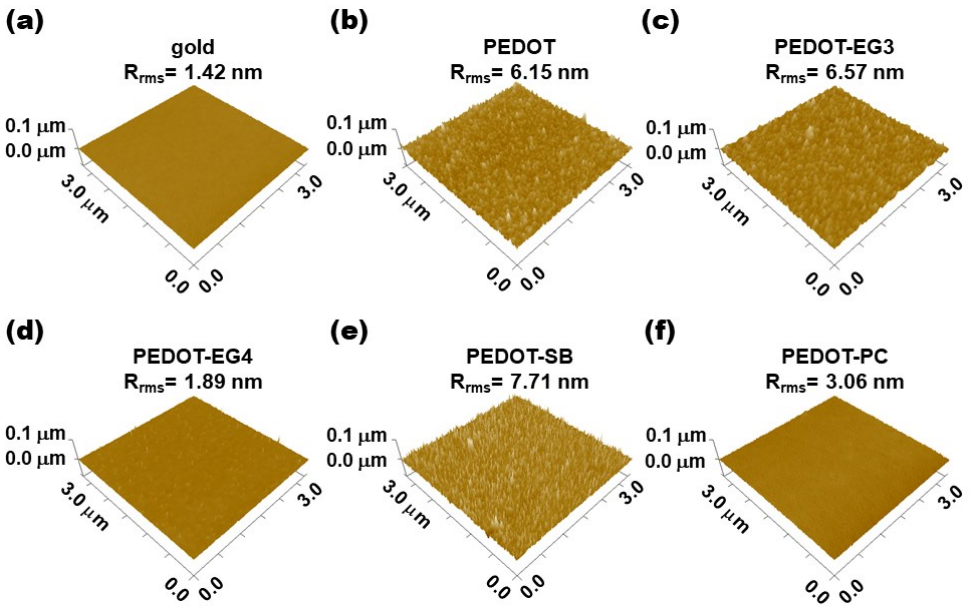


**Figure S9.** AFM images of PEDOT，PEDOT-EG3, PEDOT-EG4, PEDOT-SB and PEDOT-PC thin films on the microelectrode arrays after the biphasic stimulation.

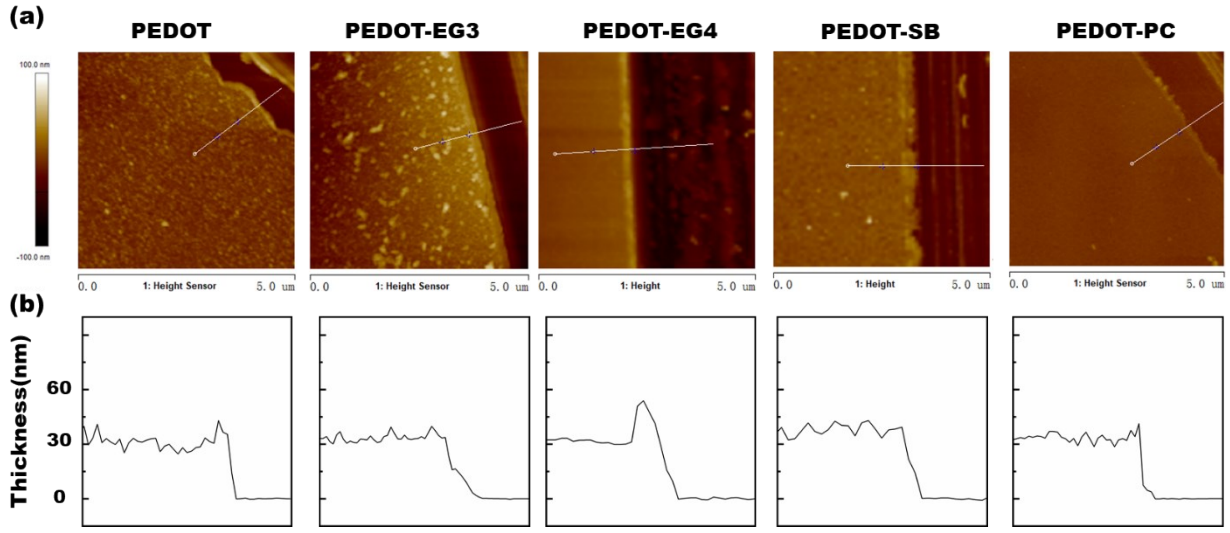


**Figure S10**. (a) Nanometrological AFM images of PEDOTs thin films after the biphasic stimulation (scan range: 5 μm × 5 μm). (b) Line profiles of step height calculation for PEDOTs thin films after the biphasic stimulation.

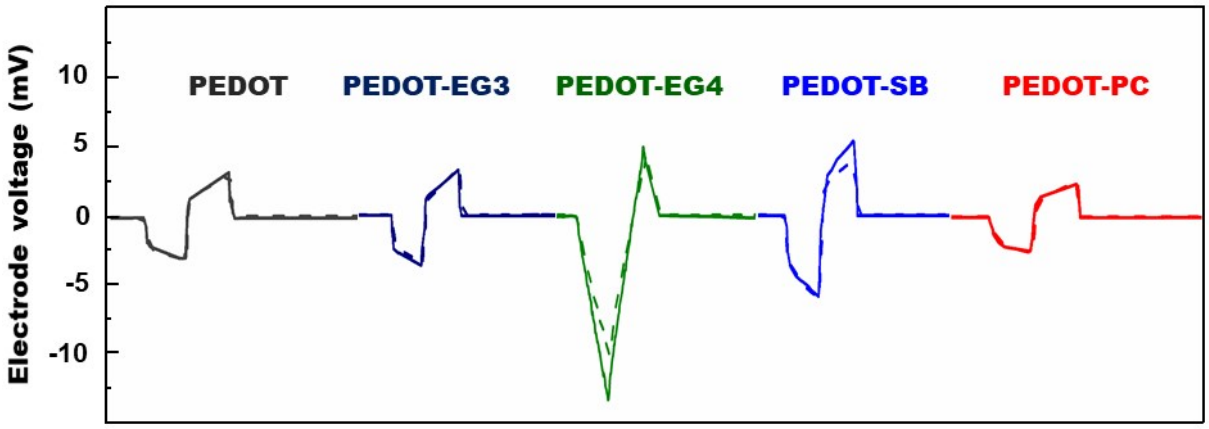


**Figure S11.** The voltage response of PEDOT, PEDOT-EG3, PEDOT-EG4, PEDOT-SB, and PEDOT-PC electrodes before (solid line) and after (dash line) the biphasic stimulation.

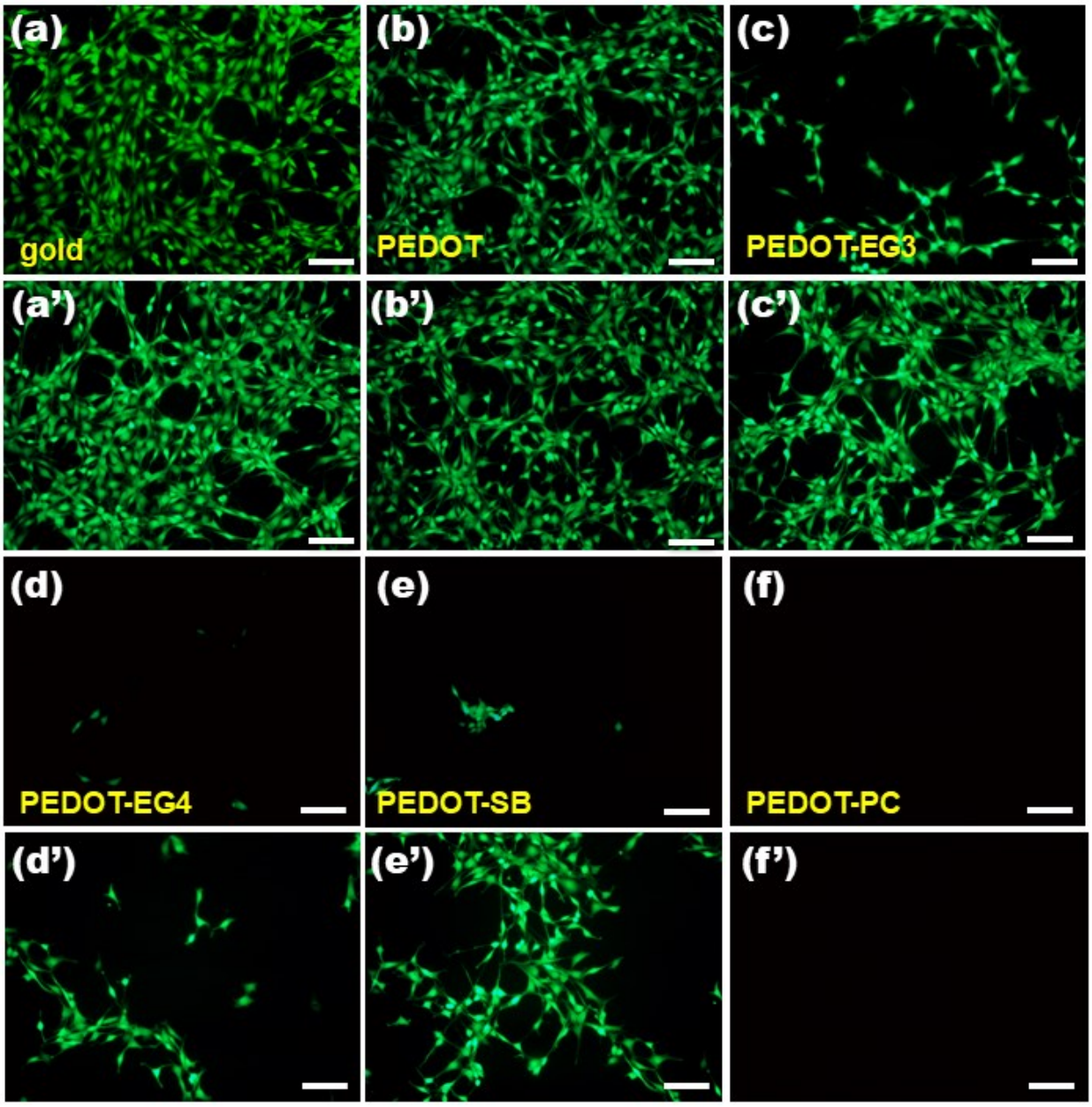


**Figure S12.** Fluorescence images of NIH 3T3 cells cultured on the gold, PEDOT and antifouling PEDOT electrodes before (a-f) and after (a'-f') the biphasic stimulation: (a, a') gold electrode, (b, b') PEDOT electrode, (c, c') PEDOT-EG3 electrode, (d, d') PEDOT-EG4 electrode, (e, e') PEDOT-SB electrode and (f, f') PEDOT-PC. Green color represents a live cell; red color represents a dead cell. The scale bar is 100 μm.