

Supporting information

Hybrid Bio-organic Interfaces with Matchable Nanoscale Topography for Durable High Extracellular Electron Transfer Activity

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1. The cartoon for the experimental setup used in this study.

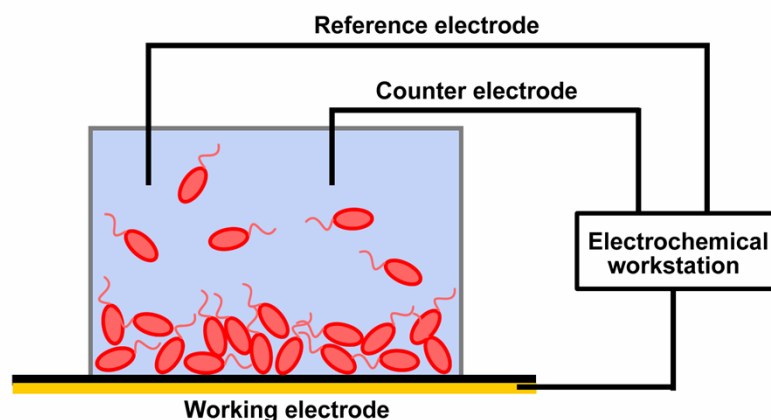


Fig. S1 The cartoon for the experimental setup used in this study. A single-chamber, three-electrode system was used to monitor the electrochemical behavior of microbes on various electrodes. Smooth PPy, ITO, Au, carbon plate, PPy-NA were used as working electrode in this study, which were mounted on the bottom of the setup. An Ag|AgCl (sat. KCl) and platinum wire were used as the reference and counter electrodes, respectively.

2. Comparison of generated currents on various electrodes with a cultivation of 100 h.

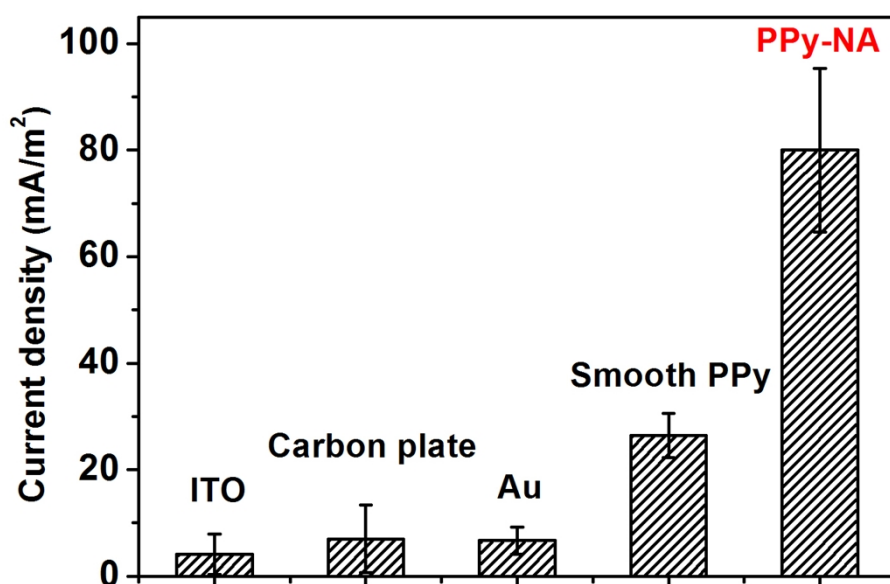


Fig. S2 Statistical currents generated on ITO, Carbon plate, Au, Smooth PPy and PPy-NA electrodes respectively after a cultivation of 100 h, four trials were averaged for each.

3. The schematic illustration of extracellular electron transfer from microbes to conductive PPy.

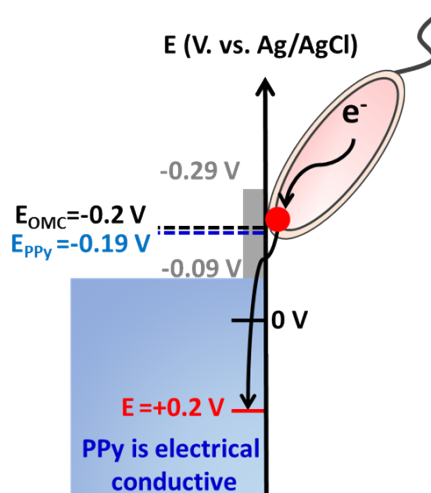


Fig. S3 Schematic illustrations depicting the electron transfer process from microbes to conductive PPy.

4. The schematic illustration of anodic equivalent circuit.

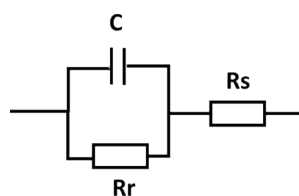


Fig. S4 Schematic illustration of anodic equivalent circuit in our system.

5. SEM image of bacterial cells on PPy-NA after 60 hours of electrochemical culture at an applied potential of 0.2 V

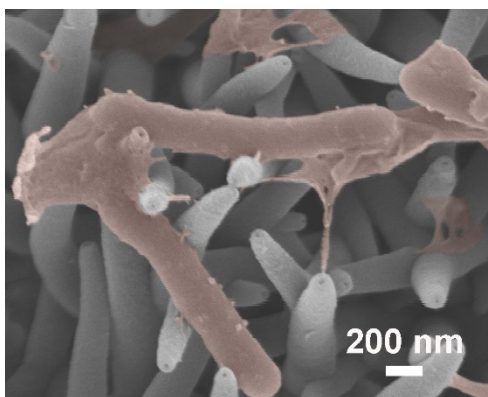


Fig. S5 High magnified SEM image of bacterial cells on PPy-NA electrode after 60 h of electrochemical culture at 0.2 V, where bacterial flagellum (appendages) were inclined to attach on nanowire arrays.

6. SEM images of bacterial cells on various electrodes after 60 hours of electrochemical culture at an applied potential of 0.2 V

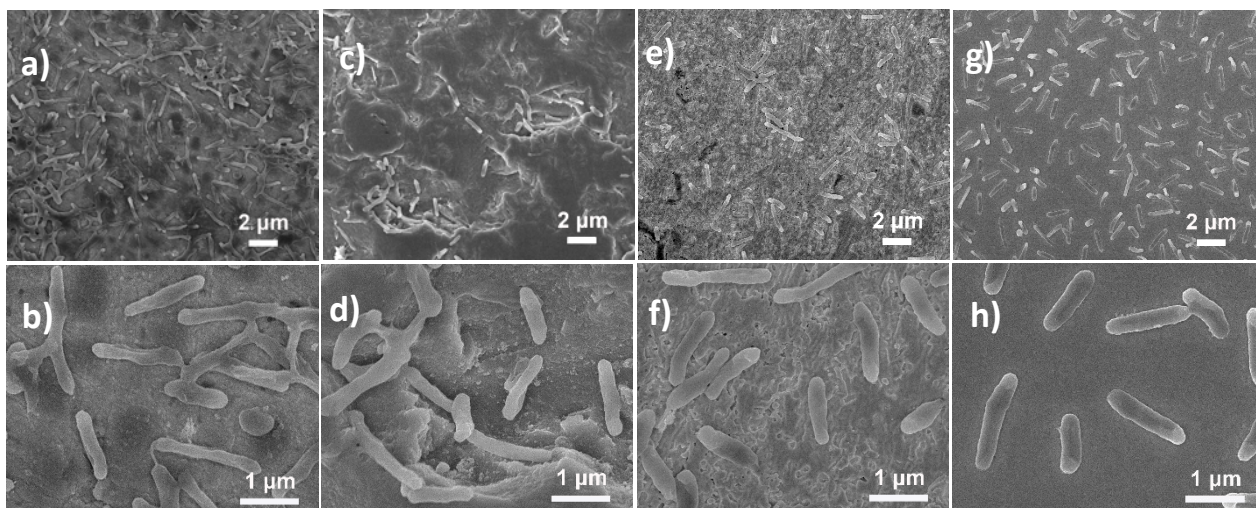


Fig. S6 SEM images of bacterial cells on various smooth electrodes after 60 h of electrochemical culture at 0.2 V in large scale (smooth PPy (a,b), carbon plate (c, d), Au (e, f), and ITO (g, h)), where microbes were randomly distributed on the whole electrode with difference in amount of microbes among various electrodes.