
Supplementary Materials

Physicochemical and Electrochemical Characterization of Electropolymerized Polydopamine Films: Influence of the Deposition Process

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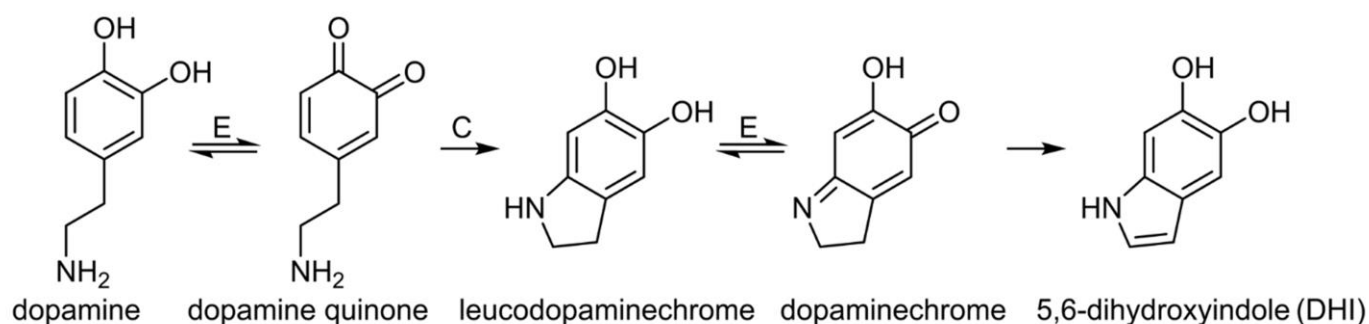


Figure S1. First steps of electrochemical oxidation of dopamine in slight basic solution. A ECE mechanism is described in the literature. In the first electrochemical step dopamine quinone is formed, which undergoes a cyclization reaction(chemical step), which furthers oxidizes dopaminechrome and 5,6-dihydroxyindole, respectively.

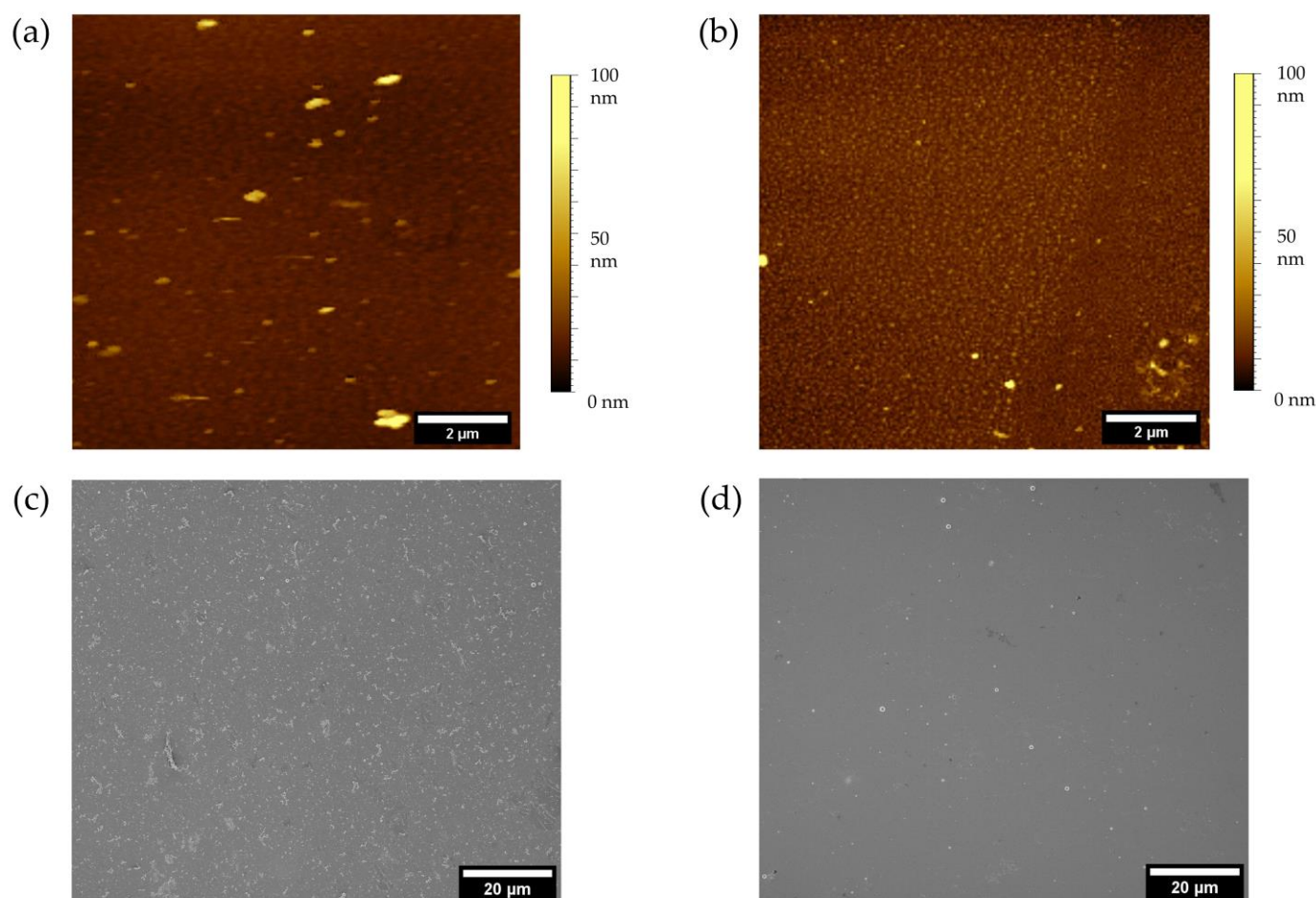


Figure S2. Comparison of AFM contact mode images (recorded in air) and SEM images using CV and pulsed deposition (topography). (a) AFM image: PDA deposited with 5 cycles (CV), (b) AFM image: PDA deposited with 75 pulse cycles (c) SEM image of PDA deposited with 10 cycles (CV), (d) PDA deposited with 100 pulse cycles.

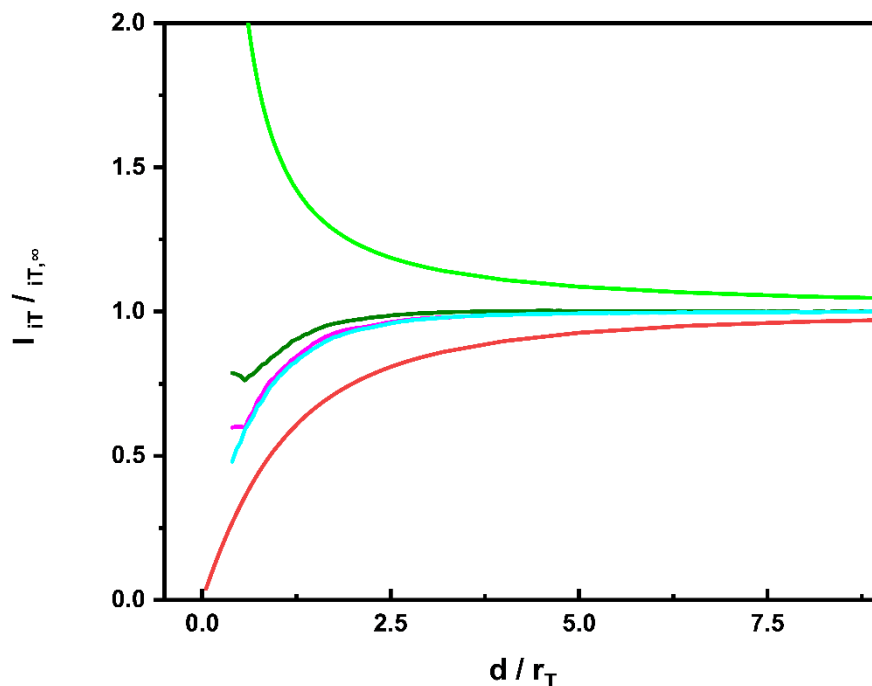


Figure S3. SECM approach curves recorded at three different spots on 25 pulse-deposited unbiased PDA substrate in 5 mM hexaammineruthenium (III) chloride and 0.1 M KCl. Determined κ values: 0.1018 (olive), 0.0615 (magenta) and 0.0507 (cyan).

Simulated approach curve for negative feedback (red) and positive feedback (green) in relation to RG 10.

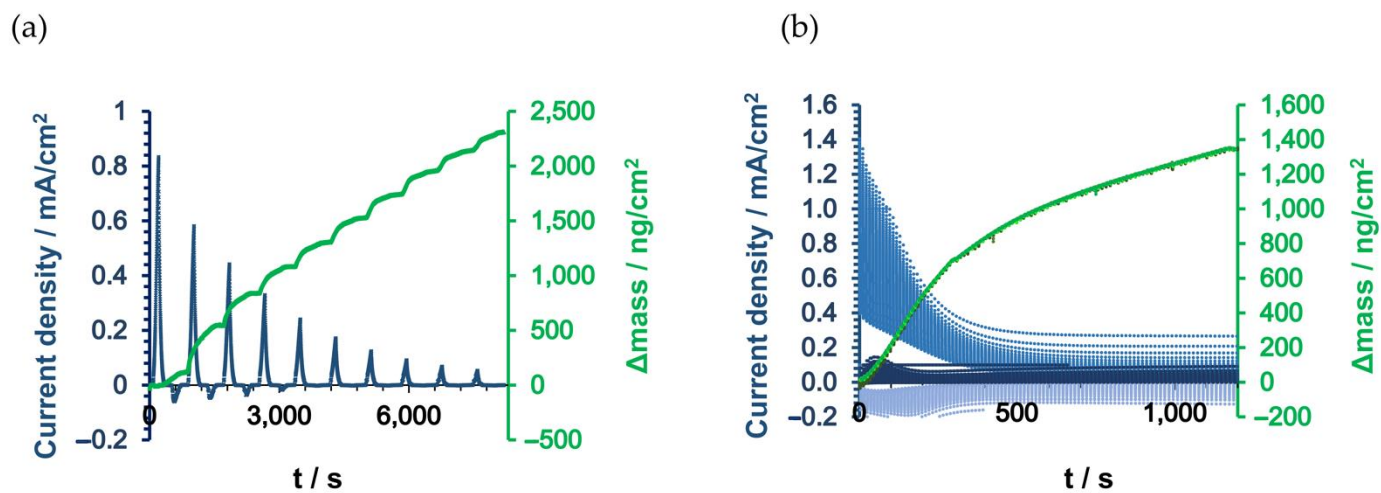


Figure S4. (a) Current density (blue) and areal mass density (green) for 10 cycle-deposited PDA film. (b) Current density (blue) and areal mass density (green) for 100 pulse-deposited PDA film.

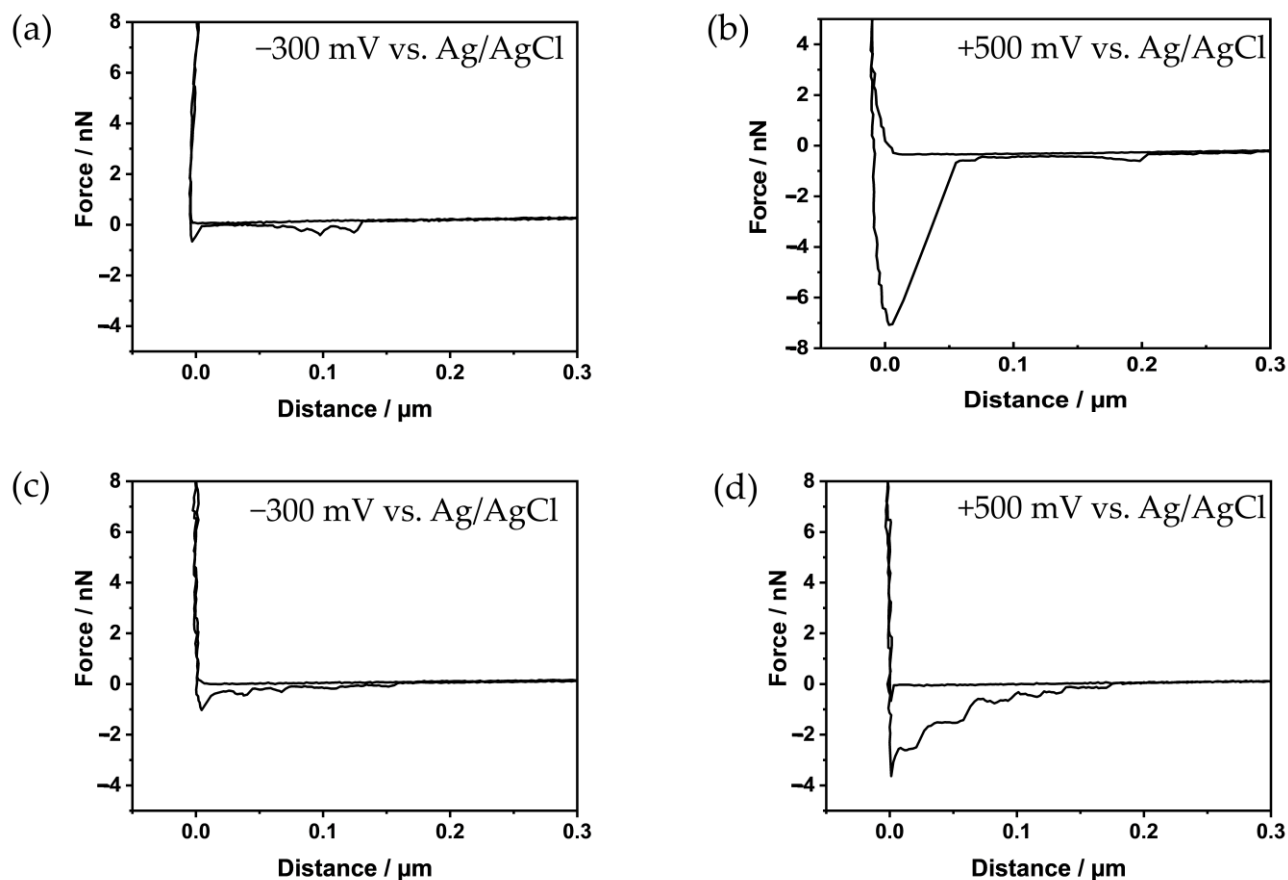


Figure S5. Exemplary force-distance curve recorded in 0.1 M KCl by applying a substrate potential of (a) -300 mV and (b) $+500 \text{ mV}$ vs. Ag/AgCl (QRE) at a 100 pulse-deposited PDA-modified Au substrate, (c) -300 mV and (d) $+500 \text{ mV}$ vs. Ag/AgCl (QRE) on 10 cycle-deposited PDA-modified Au substrate.

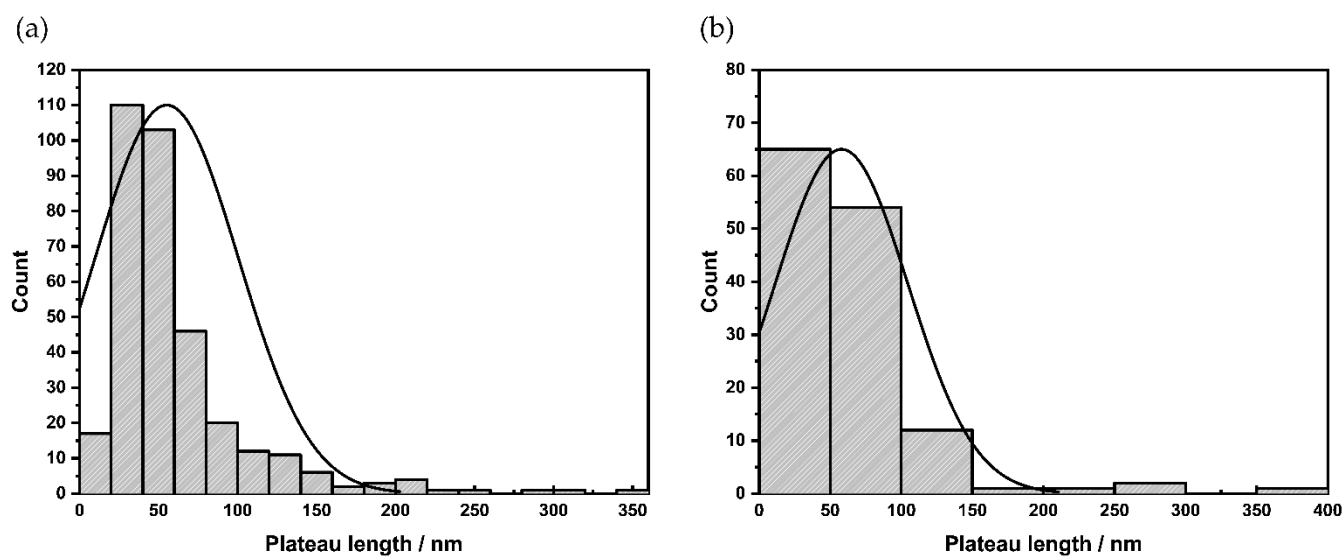


Figure S6. Distribution of plateau lengths of the force-distance curves at different PDA-modified Au substrate. (a) 10 cycle-deposited PDA (b) 100 pulse-deposited PDA.

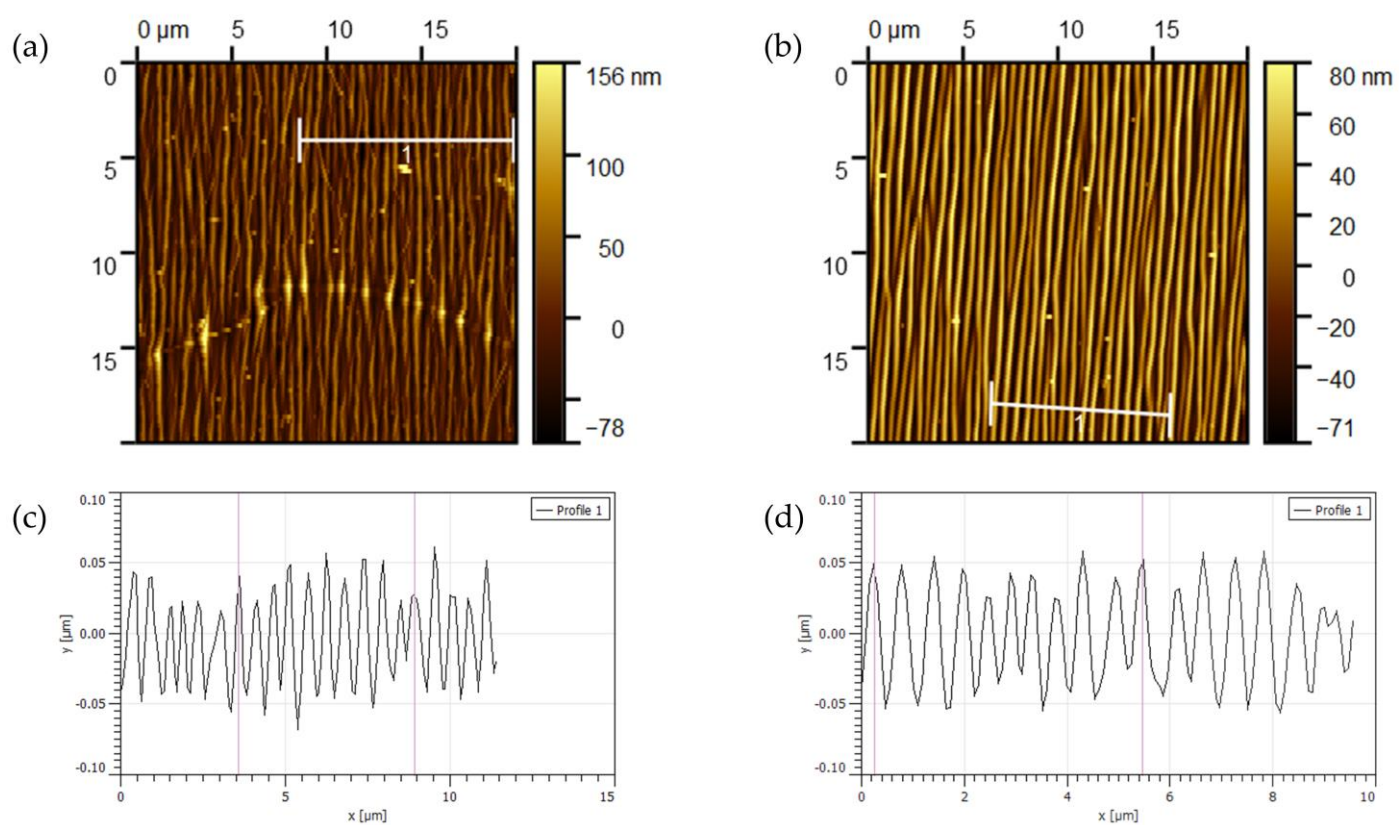


Figure S7. AFM topography images of wrinkled PDA films on PDMS. a) PDA film deposited with 10 CV cycles, (c) line profile retracted from a) as marked with line. (b) PDA film deposited via 100 pulse cycles, (d) line profile retracted from b) as marked with line.