Electronic Supplementary Material (ESI) for Materials Advances.


# Functionalization Study of Aerosol Jet Printed Organic Electrochemical Transistor (OECT) for Glucose Detection

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## Supporting information

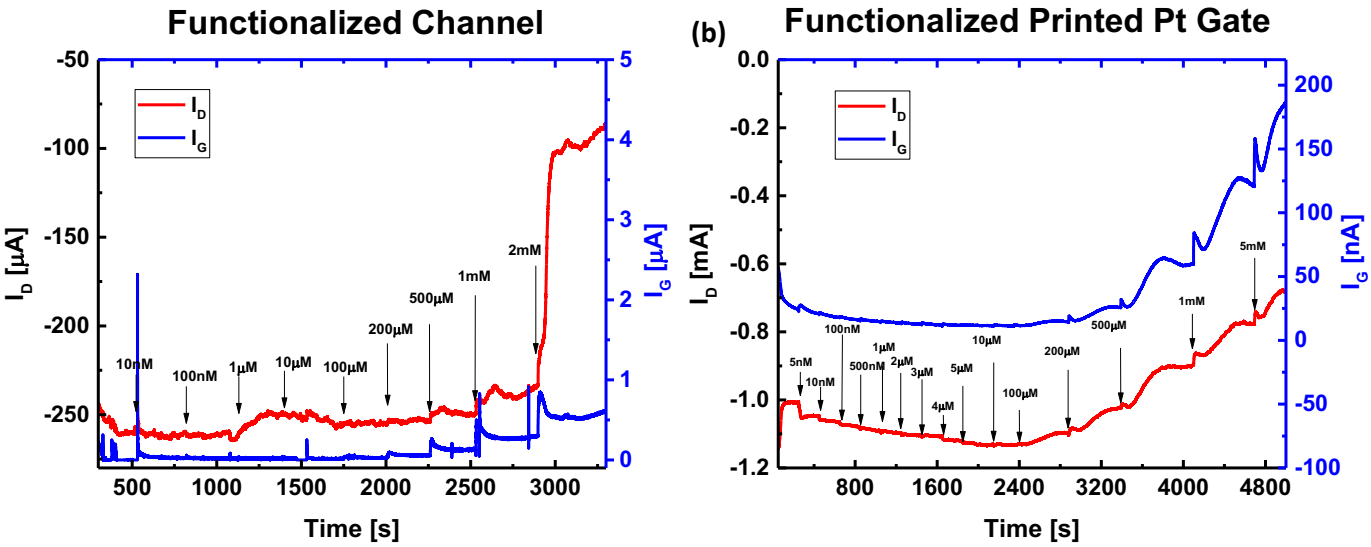


*Figure S1. Real time $I_D$ measured for OECTs with functionalized (a) channel and (b) functionalized printed Pt gate. 3 µL of 8 mg/mL GOx stock solution was added to the designated functionalization site. PBS was used as the background electrolyte. The functionalized devices were biased with constant voltages ($V_D$ = -0.2 V and $V_G$ = 0.6 V). The change in $I_D$ was monitored after the addition of glucose solutions with different concentrations. Lower current responses were observed for both cases.*

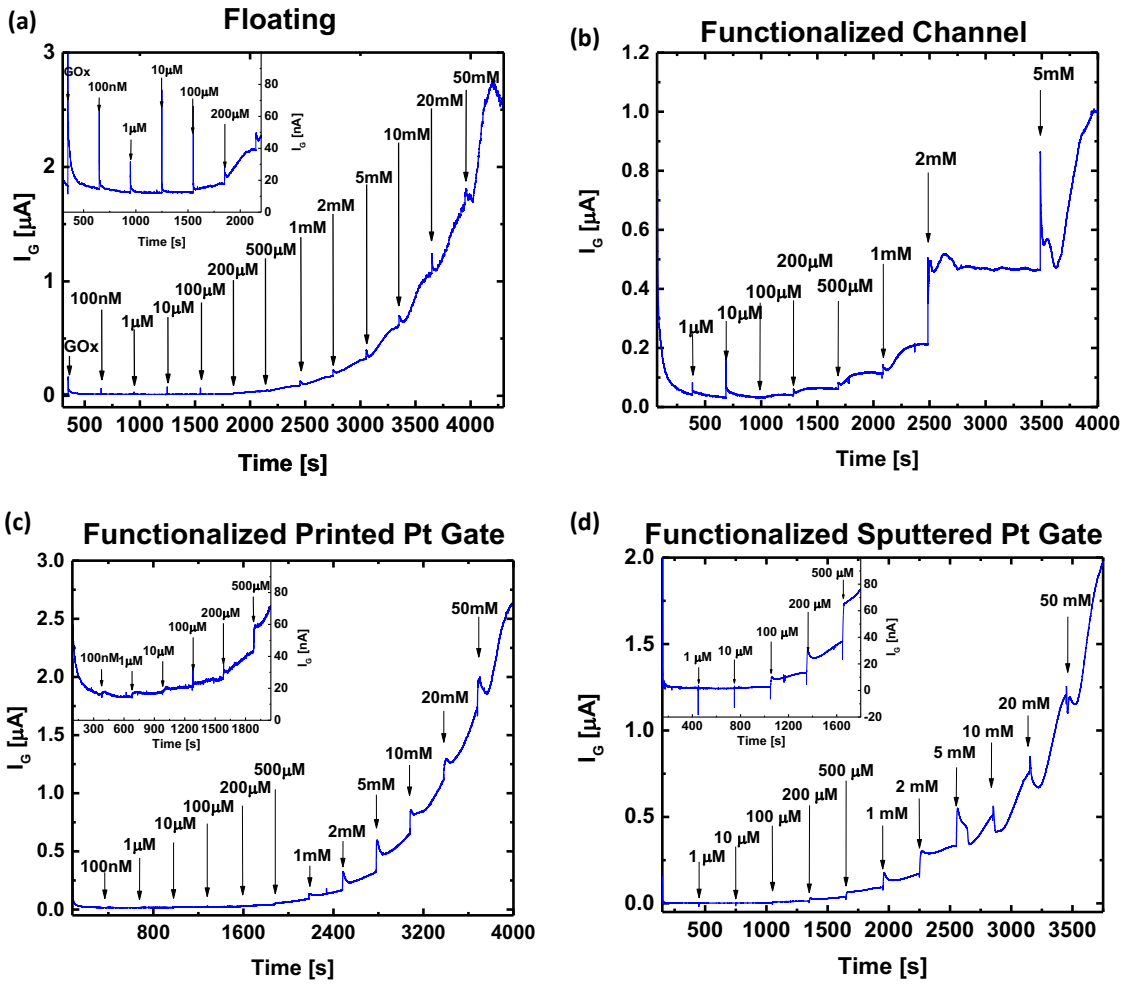


*Figure S2. The corresponding $I_G$ response of the four OECT functionalization configurations as shown in Figure 3. (a) Unfunctionalized OECT with floating GOx. (b) OECT with functionalized channel. (c) OECT with functionalized printed Pt gate. (d) OECT with functionalized sputtered Pt gate. At higher glucose concentrations, $I_G$ keeps increasing due to the limited GOx amount for glucose molecule oxidation and limited Pt surface area for $H_2O_2$ decomposition.*

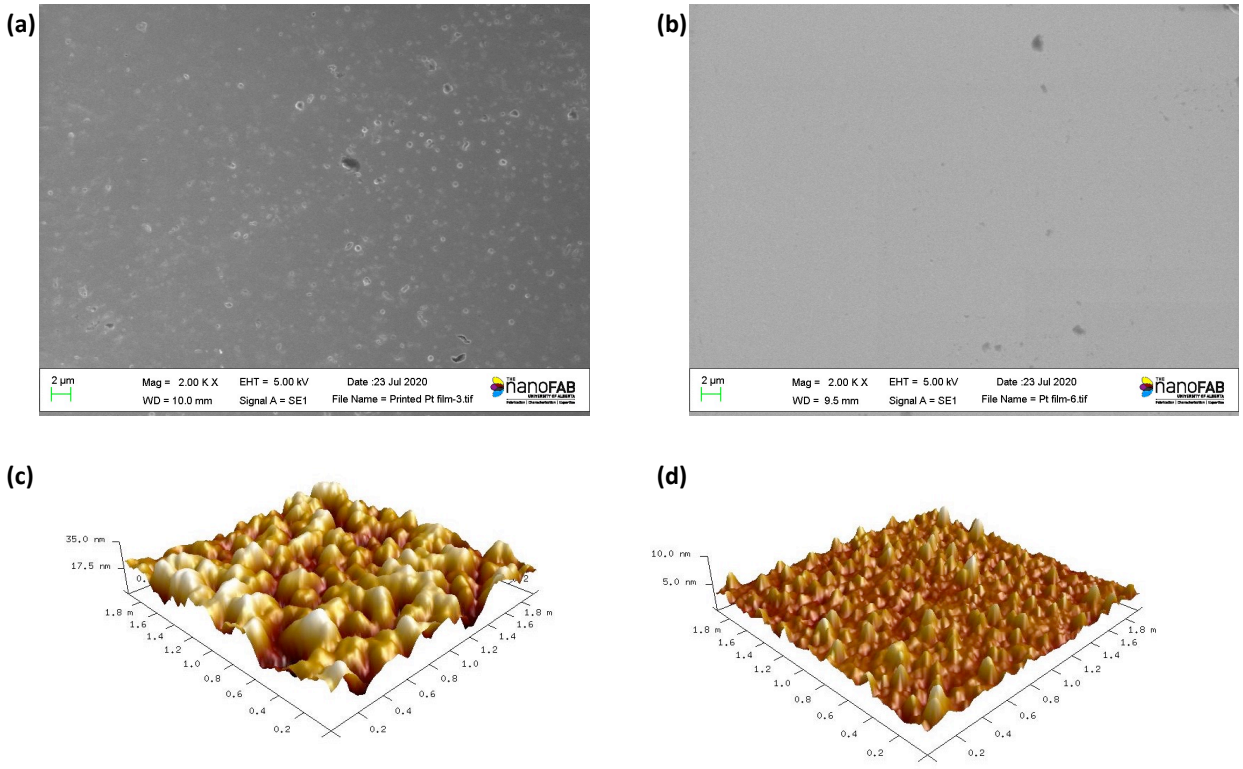


*Figure S3. Surface roughness comparison of printed and sputtered Pt films. (a) Scanning electron microscopic (SEM) image of printed Pt film. (b) SEM image of Pt thin film deposited by magnetron sputter system. (c) Atomic force microscopic (AFM) image of printed Pt film. (d) AFM image of sputtered Pt film. The printed nanoparticle-based Pt film has higher surface RMS roughness (Rq) of 13.8 nm as compared to Rq = 0.852 nm for the sputtered Pt film.*