

# Supplementary Material:

## An impedance sensor in detection of Immunoglobulin G with interdigitated electrodes on flexible substrate

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Appendix.

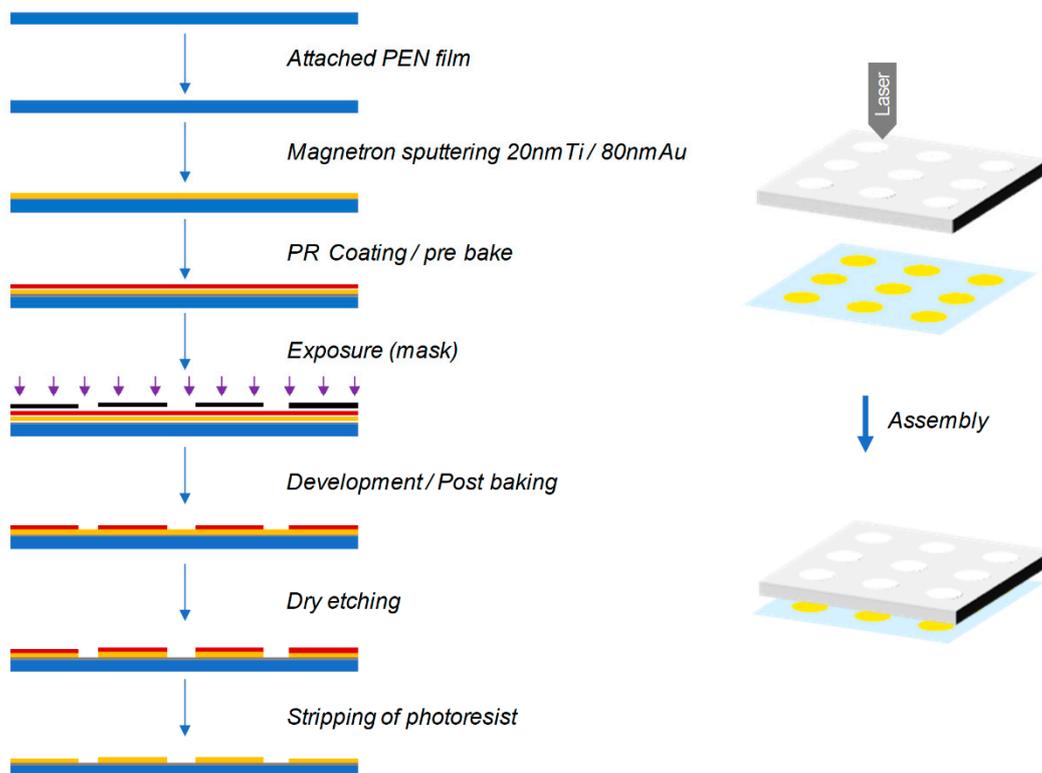
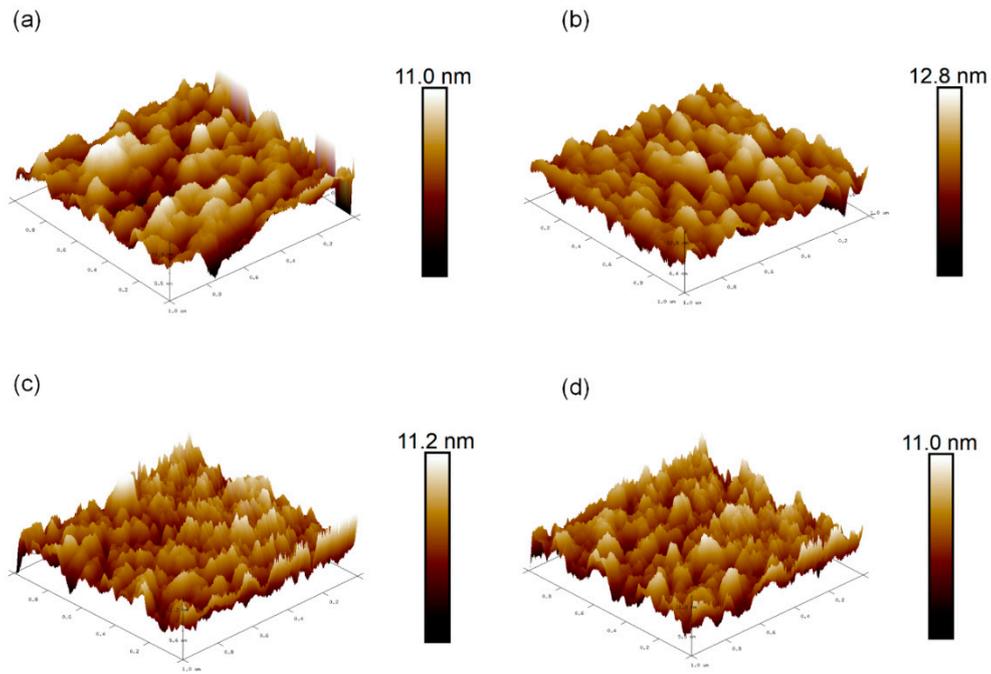
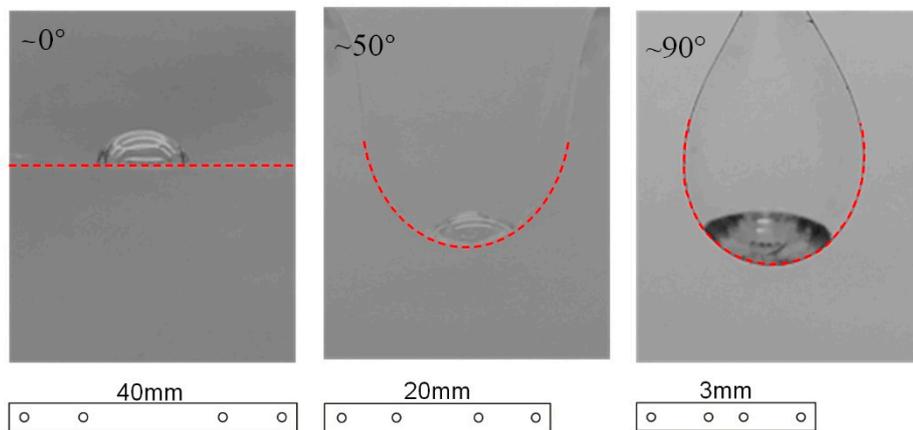


Figure 1. System process flow and assembly diagram.

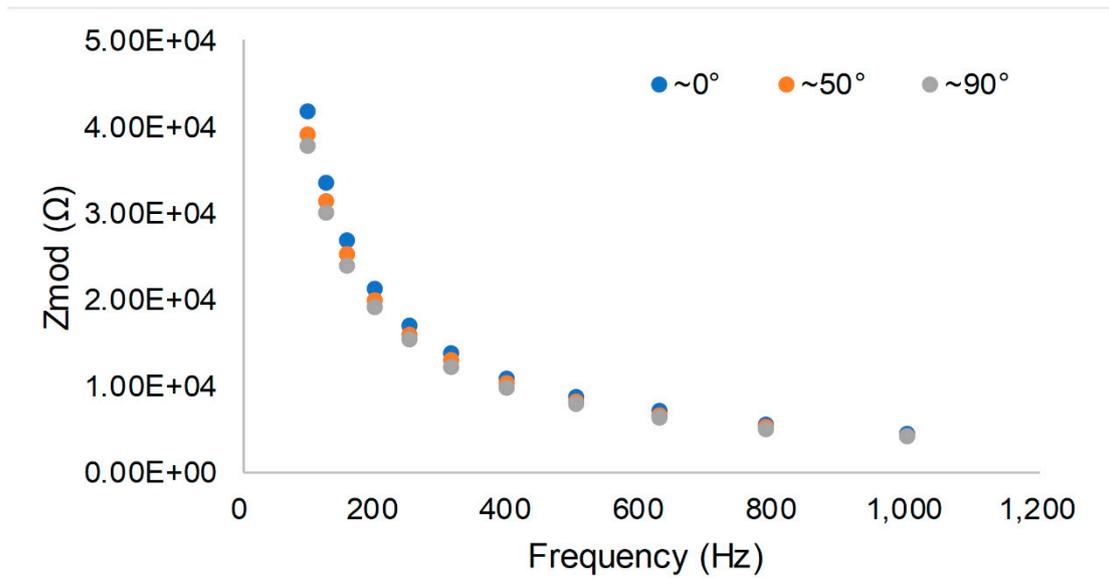
AFM test results before and after interdigital gold electrode biofunctionalization



**Figure 2.** (a) and (b) are AFM measurements on two different positions of the gold electrode before the sensor is biologically functionalized. (c) and (d) are AFM measurements of two different positions of the gold electrode after the biofunctionalization of the sensor.



**Figure 3.** Physical picture of flexible electrode in three different bending forms.



**Figure 4.** Under three electrode shapes with different degrees of bending, test the impedance and frequency change curve of 0.1XPbs solution.

Figures S3. and S4. are explained as follows:

By controlling the distance between the two pads of the flexible PEN electrode to control the bending degree of the channel, three curved surfaces of  $\sim 0^\circ$  and  $\sim 50^\circ$  and  $\sim 90^\circ$  were obtained, then the impedance test of the 0.1XPBS solution was performed. Experiments show that as the bending degree increased, the impedance had a significant decrease. The reason for this phenomenon is that electrodes with different degrees of curvature generate different electric fields under the same excitation signal, which directly affects the change in impedance. This phenomenon shows that the flexible electrode can influence the measurement result of the impedance by bending its own shape without changing the electrode design, as the latter of which may change the system sensitivity.