Electronic Supplementary Material

Screen printed 3D Microfluidic Paper-based and Modifier-Free Electroanalytical Device for Clozapine Sensing

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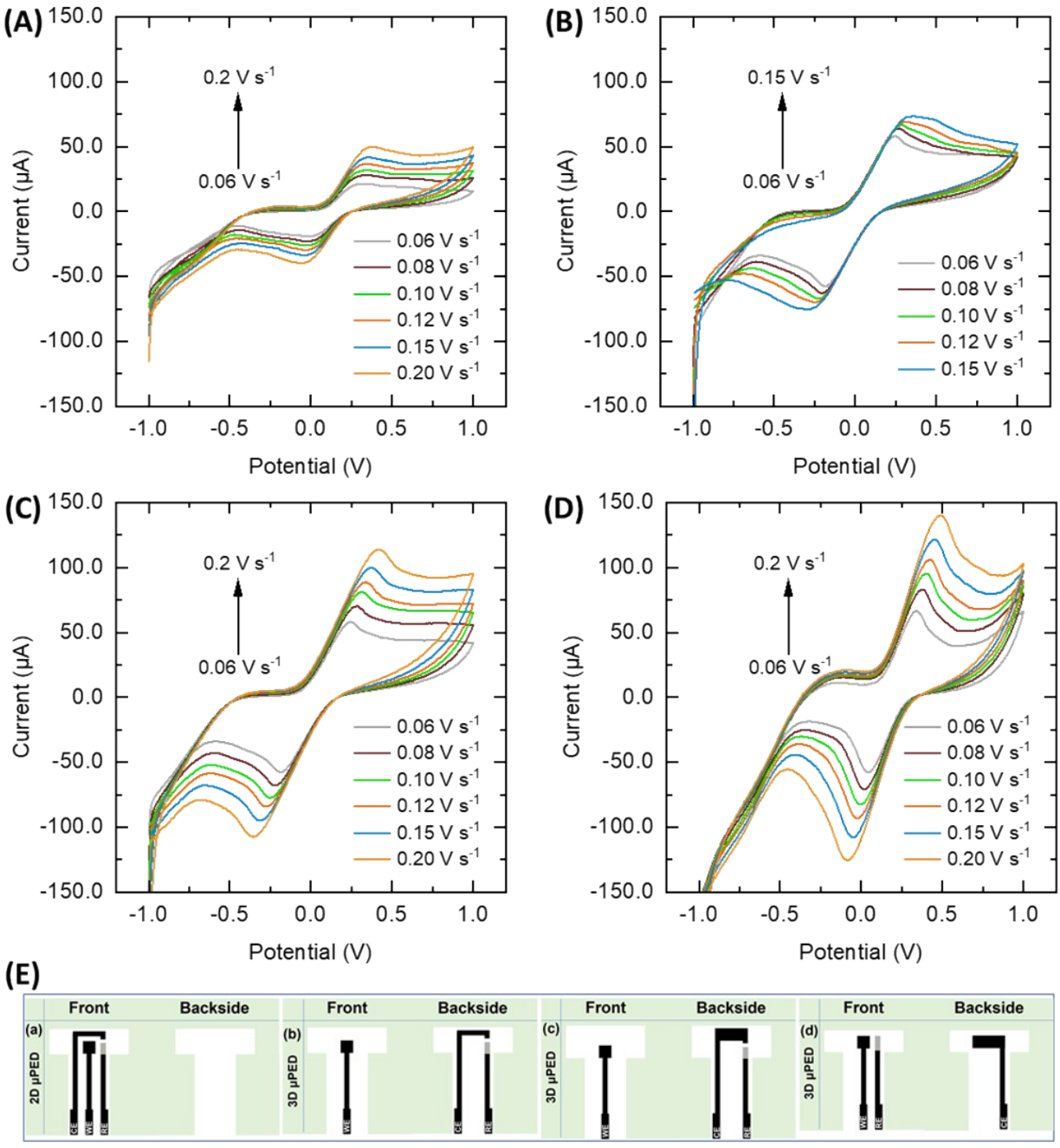
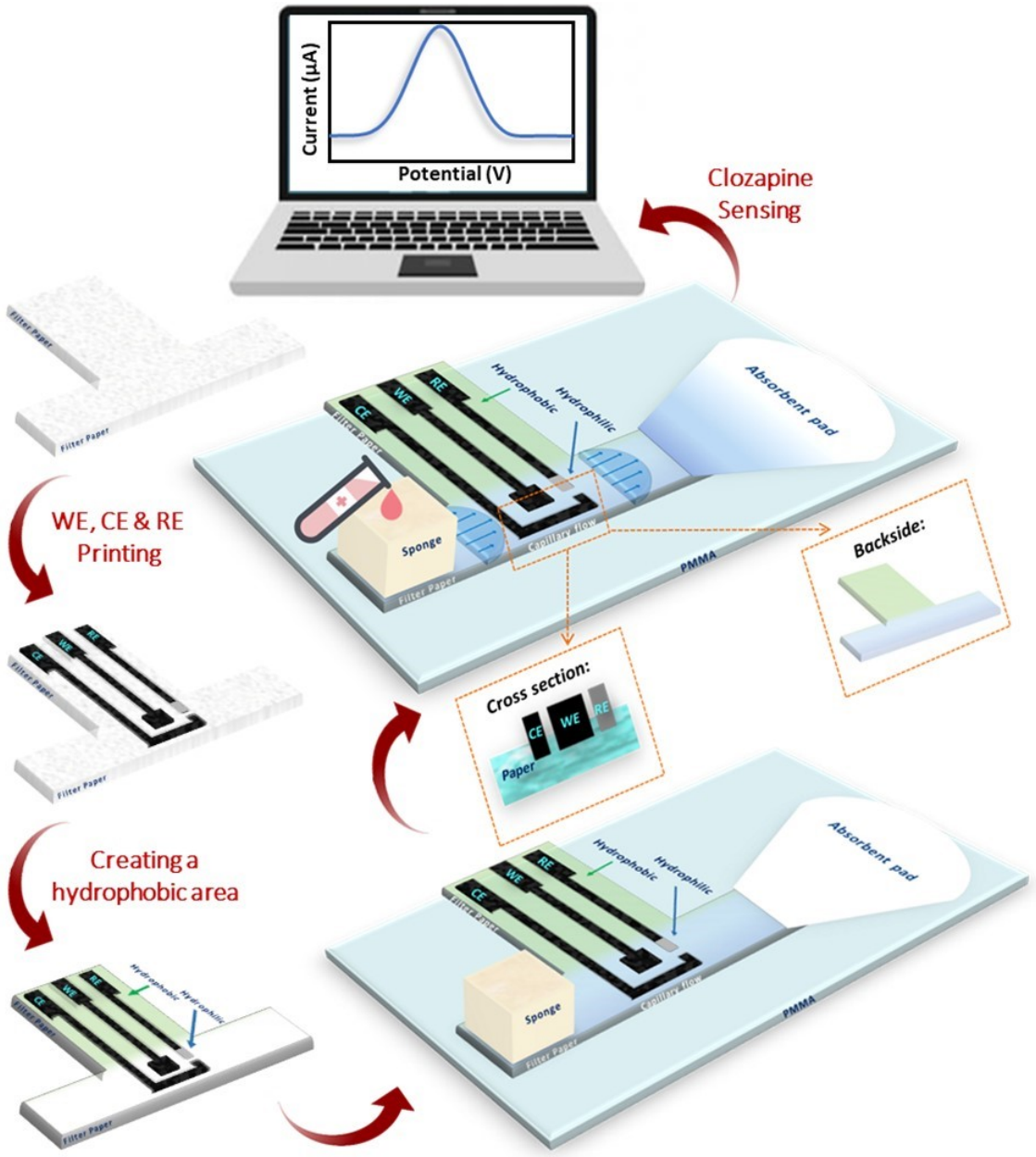
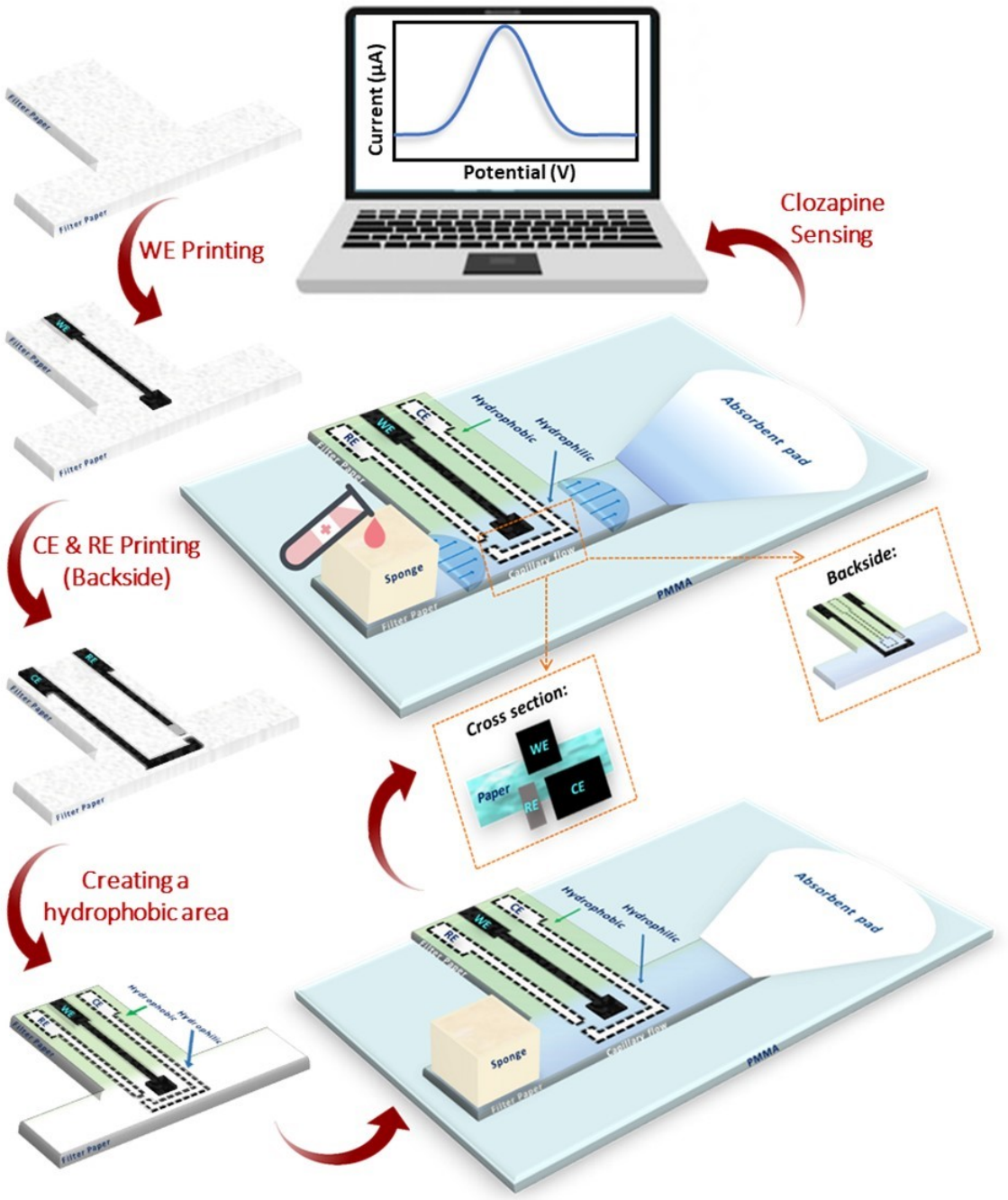


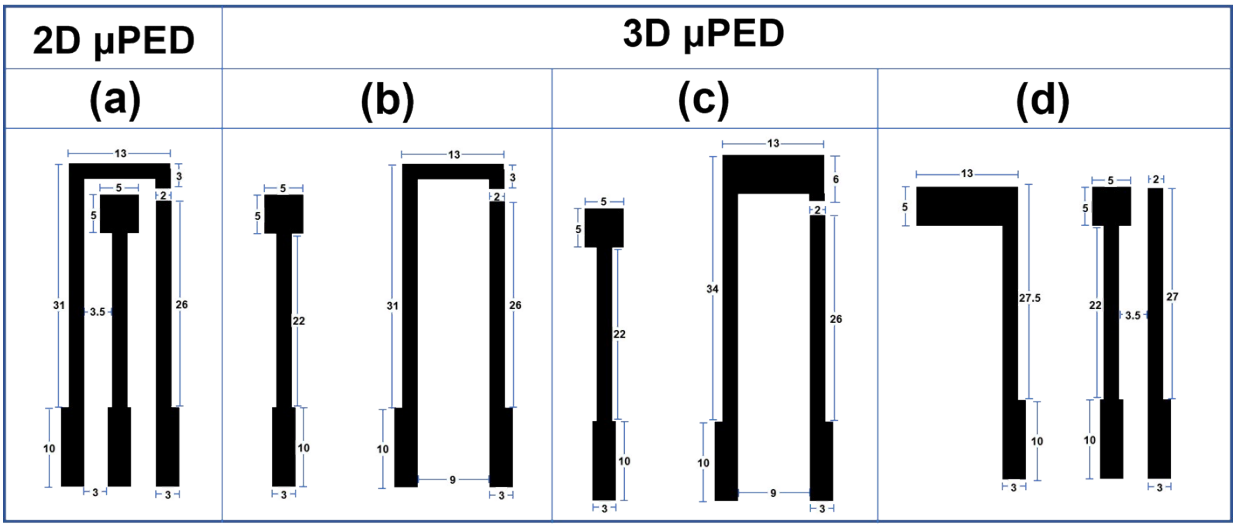
Figure S1. CVs of 5 mM of $[Fe(CN)_6]^{3-/4-}$ in 0.1 M KCl at various scan rates for different 2D and 3D μPEDs which are shown schematically in (E).



Scheme S1. Scheme illustration the 2D µPED (a) assembling process and subsequent use in CLZ sensing.



Scheme S2. Scheme illustration the 3D µPED (b) assembling process and subsequent use in CLZ sensing.



Scheme S3. Schematic geometry showing the dimensions (mm) of a 2D µPED (a) and 3D µPED (b-d).

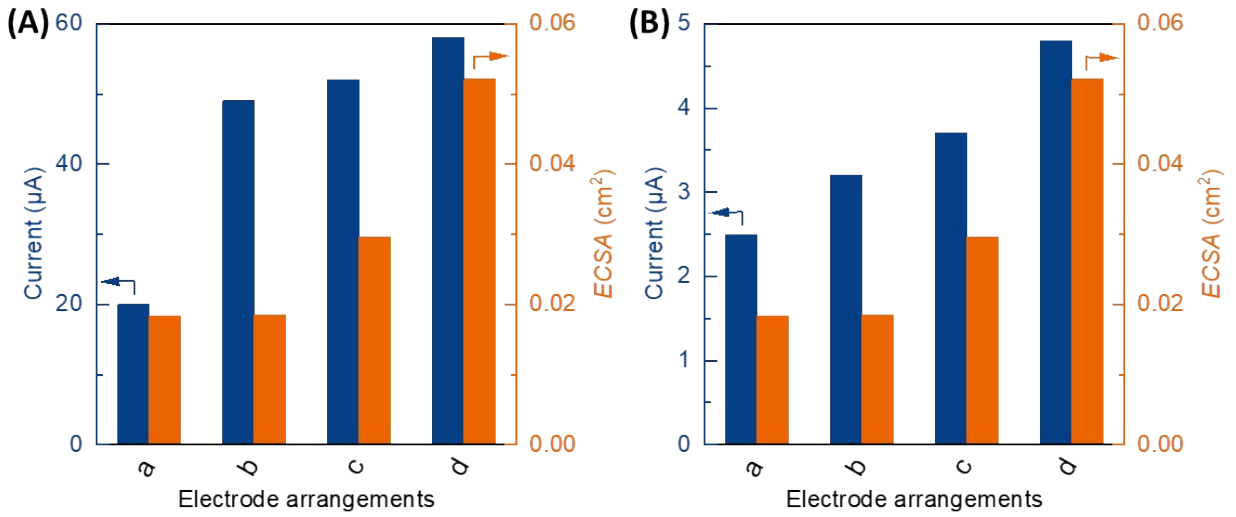
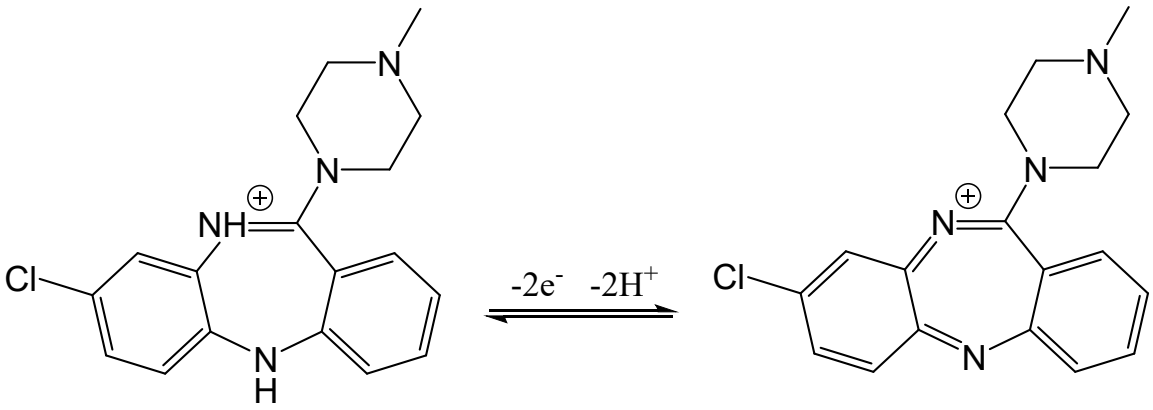


Figure S2. The peak current correlation (A) in a redox probe solution consisting of 5.0 mM of $[Fe(CN)6]^{3-/4-}$ and 0.1 M KCl under a scan rate of 100 mV s^{-1} and (B) in CLZ sensing via SWV for 50 µM CLZ at pH =8.0 (0.1 M PBS) and accumulation time =30 s with the ECSA determined with the redox probe for the prepared sensors.



Scheme S4. The electrooxidation mechanism of CLZ.

SWV parameter optimization

The influence of the SWV parameter in a solution of 30.0 μM CLZ at pH =8.0 (0.1 M PBS) was studied. To identify more suitable parameters for the determination, first, the influence of the frequency at fixed pulse height and step height was studied. Figure S3 shows the strong influence and improvement and that a maximum peak height results for frequency =25 Hz. Subsequently, the potential widths for pulse height and step height were varied. Lowering pulse height and step height increases the datapoint density within the peak strongly. Nevertheless, the intensity is reduced in parallel and the sensitivity is lowered. Increasing both potentials results in a maximum current for pulse height =25 and step height =10 mV, which reduces with higher potentials again. Consequently, the SWV parameters were stablished as follow: pulse height at 25 mV; step height at 10 mV; and frequency set to 25 Hz.

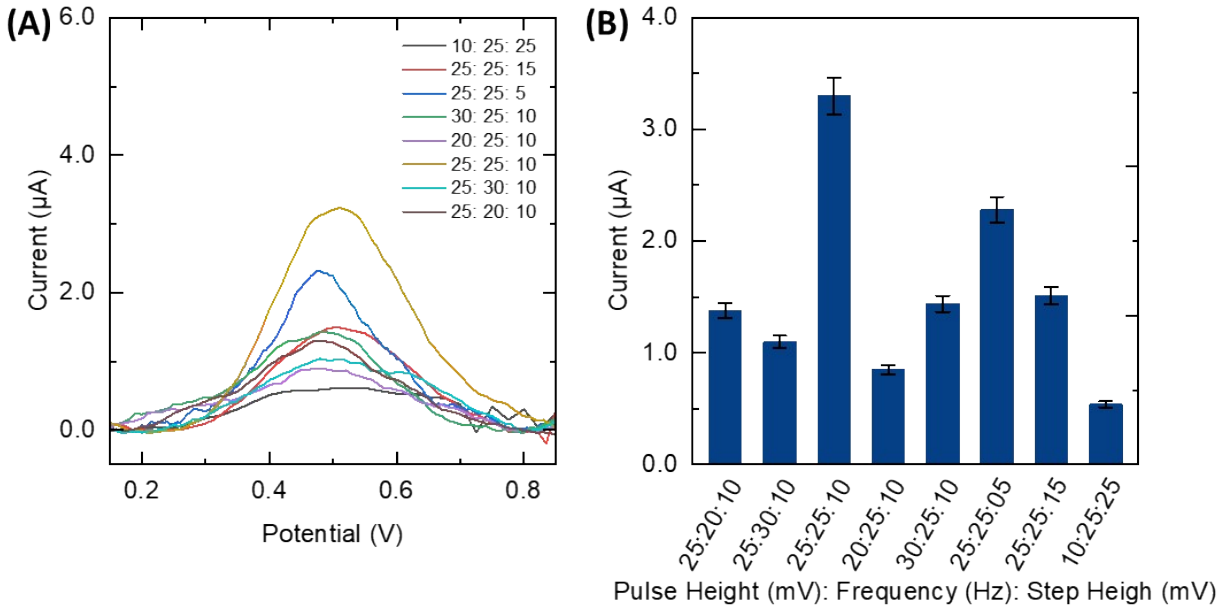


Figure S3. (A) SWV current response curves for a constant CLZ concentration of 30.0 μM in 0.1 M PBS at pH =8.0, and (B) Variation of frequency, pulse height and step heigh.

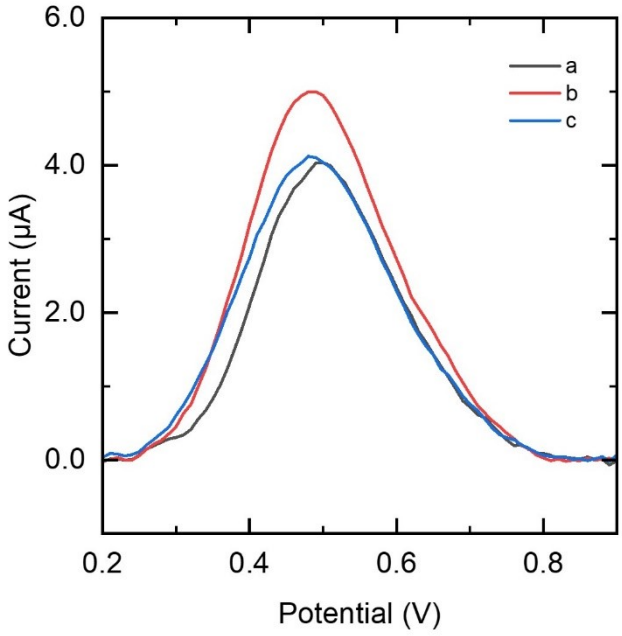


Figure S4. Recorded SWVs of the proposed sensor for the reproducibility study for the different devices (a, b, c) under 40.0 μM of CLZ in 0.1 M PBS at pH =8.0.

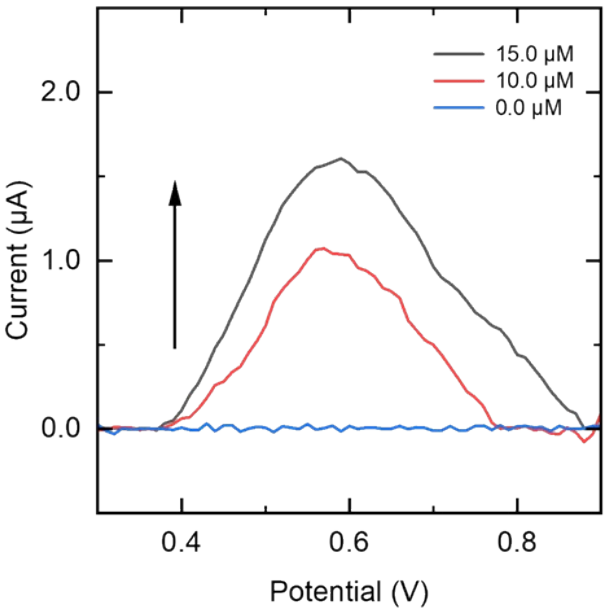


Figure S5. SWVs of the proposed sensor in human blood plasma sample for various concentrations of CLZ.