

Supporting Information for

Integrated Scanning Electrochemical Cell Microscopy Platform with Local
Electrochemical Impedance Spectroscopy using Preamplifier

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Table of Content

Figure S1. Labview program for output and acquisition of AC signals.

Figure S2. SEM image of the nano-capillary tip.

Figure S3. Data from EIS tests on two analogue electrochemical cells using Parstat 4000+ and CHI 760.

Figure S4. SEM image of footprints at Au surface remained by the droplet during SECCM scanning.

Figure S5. AFM image of Au/ITO interface.

Figure S6. EIS characterization of Au surface before and after the immersion in dodecanethiol.

Table S1. The current amplitudes at different voltage frequencies.

Table S2. Comparison of the calibration and measured values at analogue electrochemical cells using Parstat 4000+ and our system.

Fig. S1. LabVIEW program for output and acquisition of AC signals. a. Front panel of the program; b. Generating the output voltage waveform section; c. Voltage output & current and voltage acquisition section.

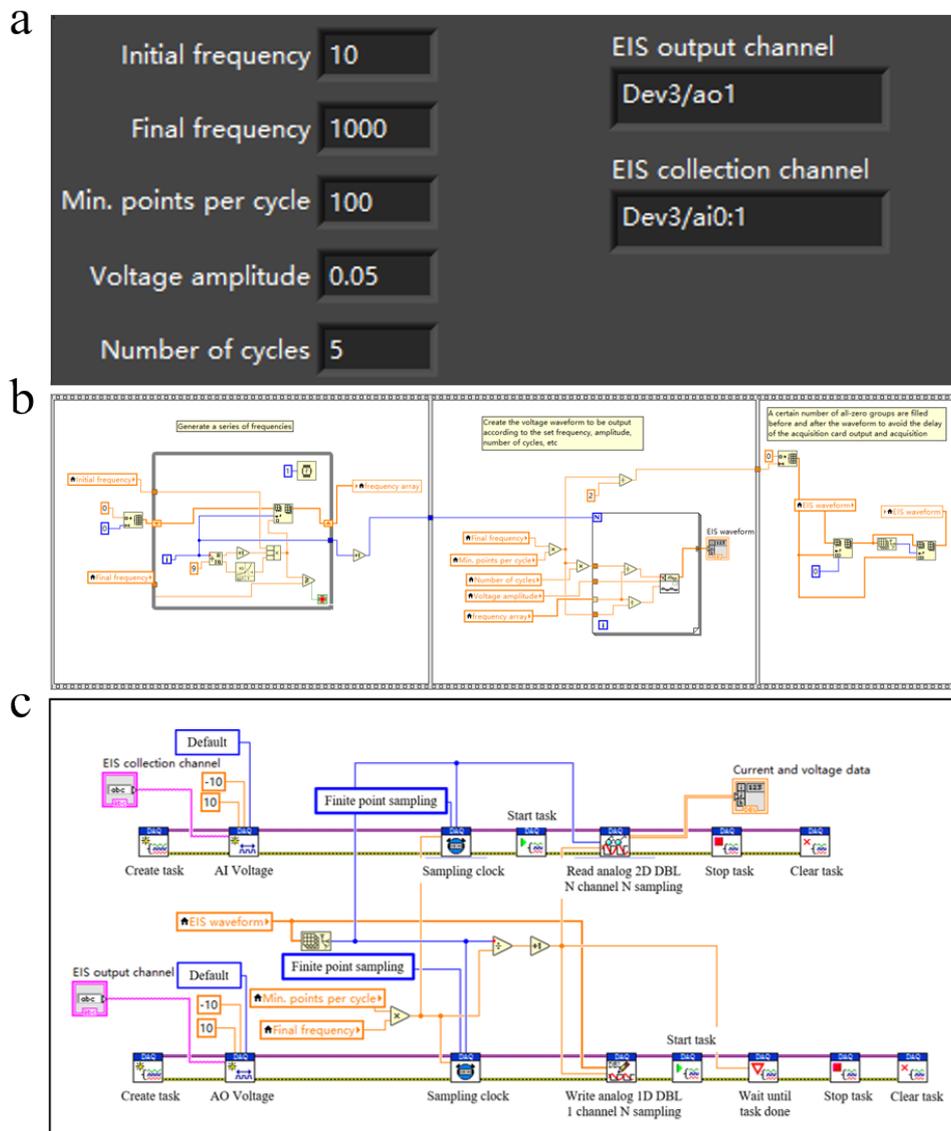


Fig. S2. SEM image of the nano-capillary tip.

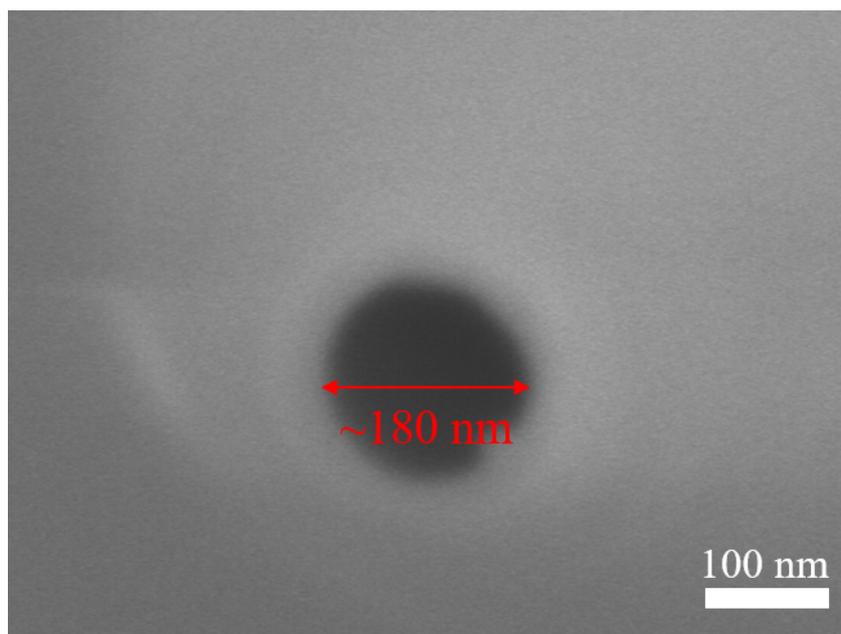


Fig. S3. Data from EIS tests on two analogue electrochemical cells using Parstat 4000+ and CHI 760. Measured experimental values of the Nyquist diagram (black dots) versus fitted values (red curves) at two analogue electrochemical cells with (a,c) high and (b,d) low impedances.

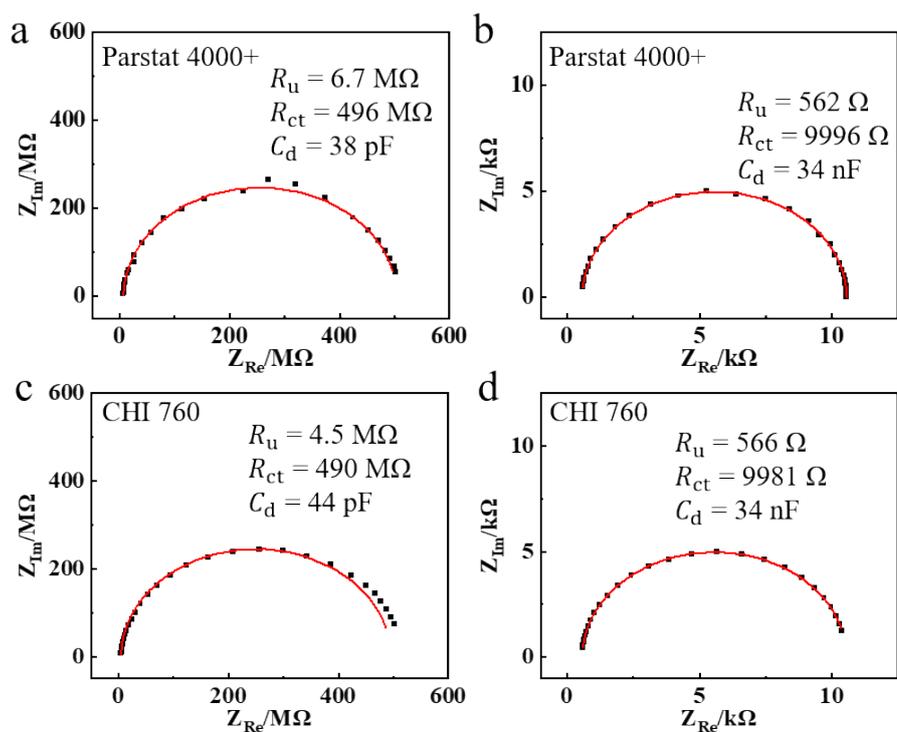


Fig. S4. SEM image of footprints at Au surface remained by the droplet during SECCM scanning.

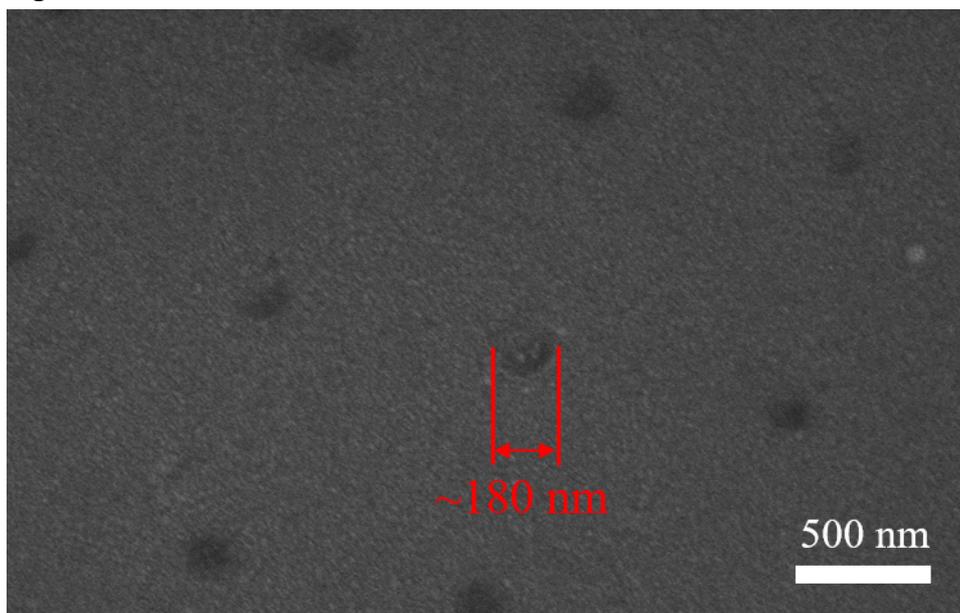


Fig. S5. AFM image of Au/ITO interface. a. three-dimensional Au/ITO surface morphology; B. the height difference between Au and ITO.

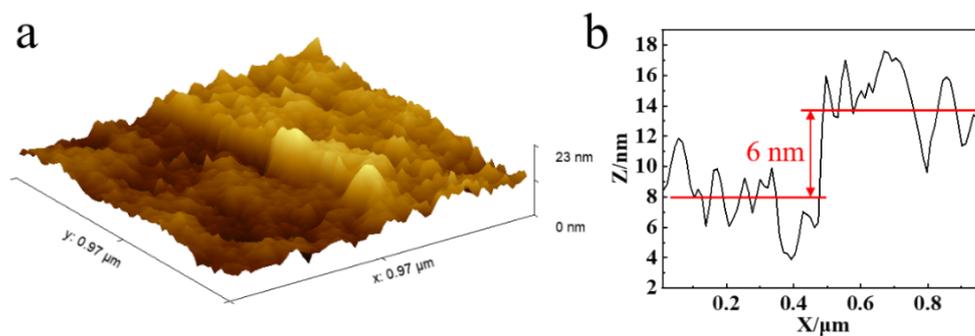


Fig. S6. EIS characterization of Au surface before and after reaction with dodecanethiol for 24 h. a. Before the immobilization; b. After the immobilization.

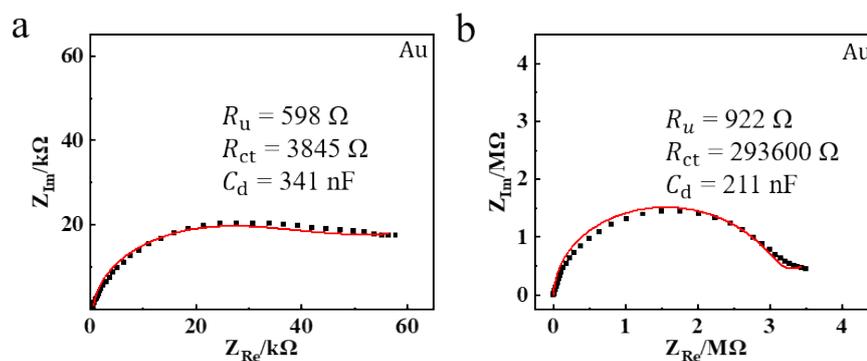


Table S1. The current amplitude at different voltage frequencies.

Frequencies/Hz	Current Amplitude/nA
50000	2.54
10000	2.58
5000	2.58
1000	2.38
500	2.24
100	2.16
50	2.16
10	2.28
5	2.24
1	2.28

Table S2. Comparison of the calibration and measured values at analogue electrochemical cells using Parstat 4000+ and our system.

	Simulated electrochemical cell 1 with high impedance			Simulated electrochemical cell 2 with low impedance		
	$R_u / M\Omega$	$R_{ct} / M\Omega$	C_d / pF	R_u / Ω	R_{ct} / Ω	C_d / nF
Calibration Value	10	500	33	560	10000	33
Home-made Instrument	13	485	35	554	10072	38
Relative Error	33%	3%	6%	1%	0.7%	15%
Parstat 4000+	6.7	496	38	562	9996	34
Relative Error	33%	0.8%	15%	0.4%	0.04%	3%