Supplementary Information

for

Bacterial Imprinted Polymer-based Detection of *Escherichia coli* Using Polydopamine on Gold Nanodendrite/Graphene Oxide Modified Electrodes

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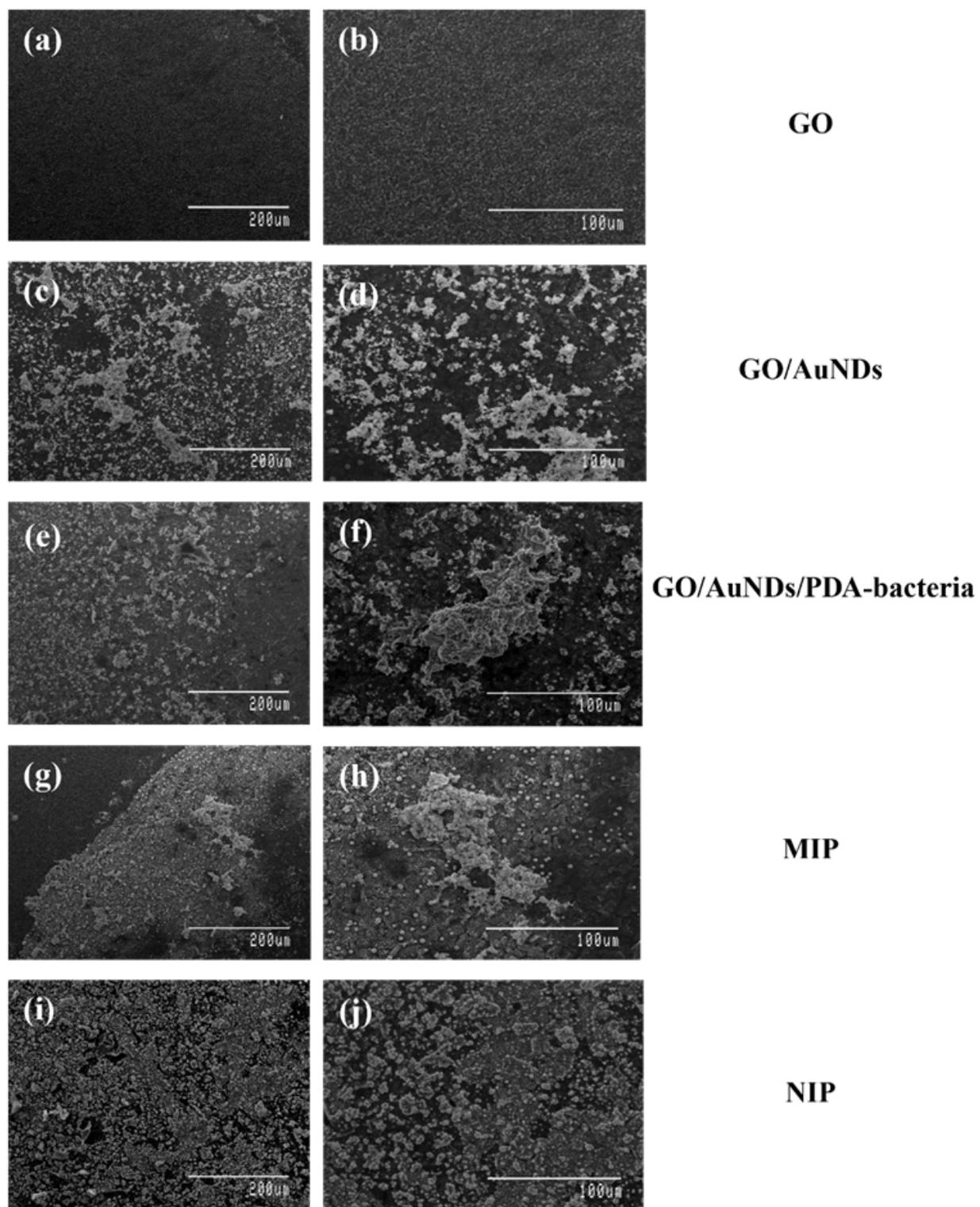[†]Corresponding author: kagan.kerman@utoronto.ca

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Figure S1. SEM images with different magnification for modified GCE with **(a-b)** GO, **(c-d)** GO/AuNDs, **(e-f)** GO/AuNDs/PDA-bacteria, **(g-h)** MIP, and **(i-j)** NIP.
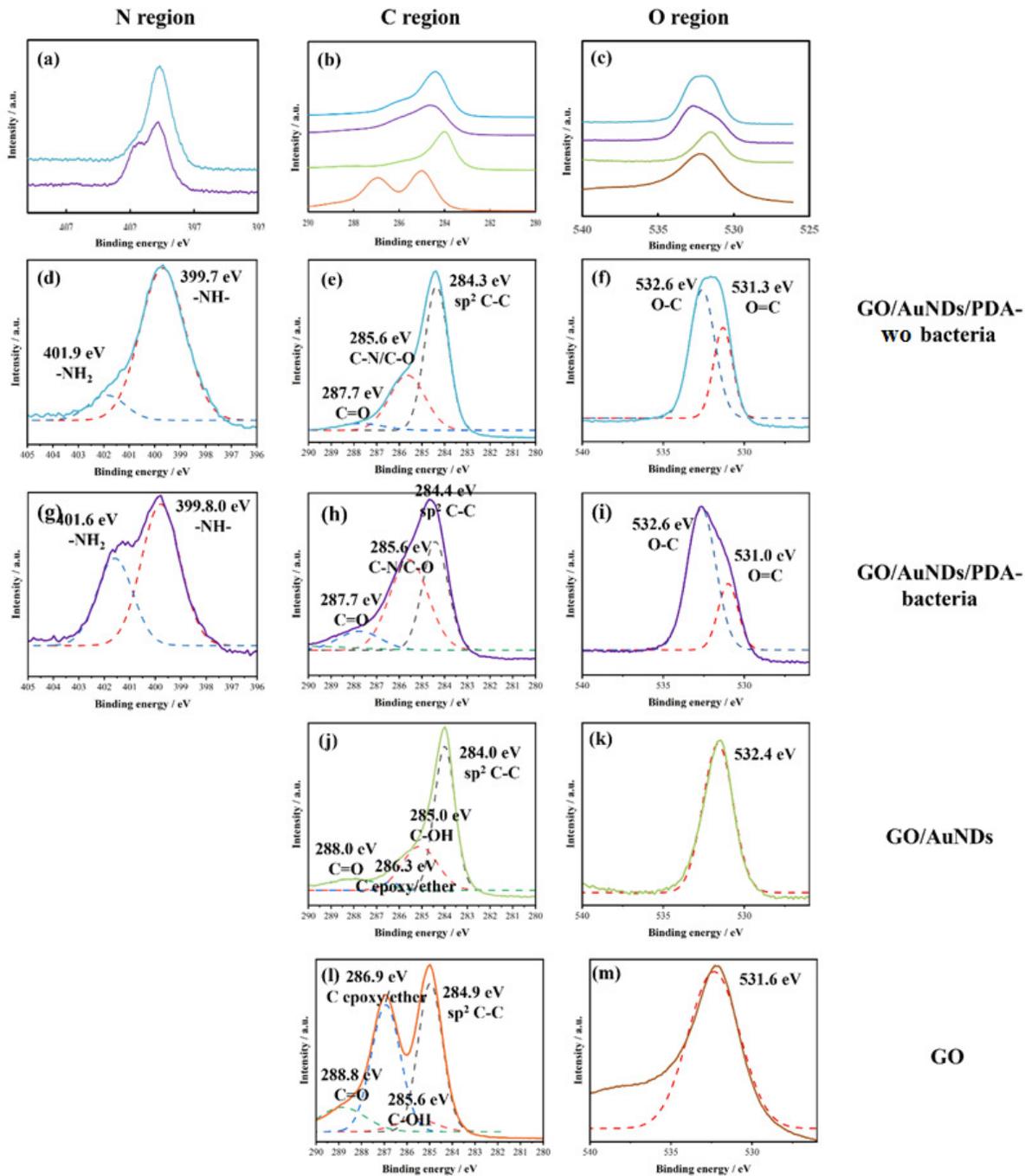
Figure S2. XPS stack plot of in the regions of the **(a)** N, **(b)** C, **(c)** O. XPS **(d)** N 1 s, **(e)** C 1s, and **(f)** O 1s spectra of GO/AuNDs/PDA-wo bacteria (without bacteria after the washing processes) with fitting. XPS **(g)** N 1 s, **(h)** C 1s, and **(i)** O 1s spectra of GO/AuNDs/PDA-bacteria with fitting. XPS **(j)** C 1s, and **(k)** O 1s spectra of GO/AuNDs. XPS **(l)** C 1s, and **(m)** O 1s spectra of GO.
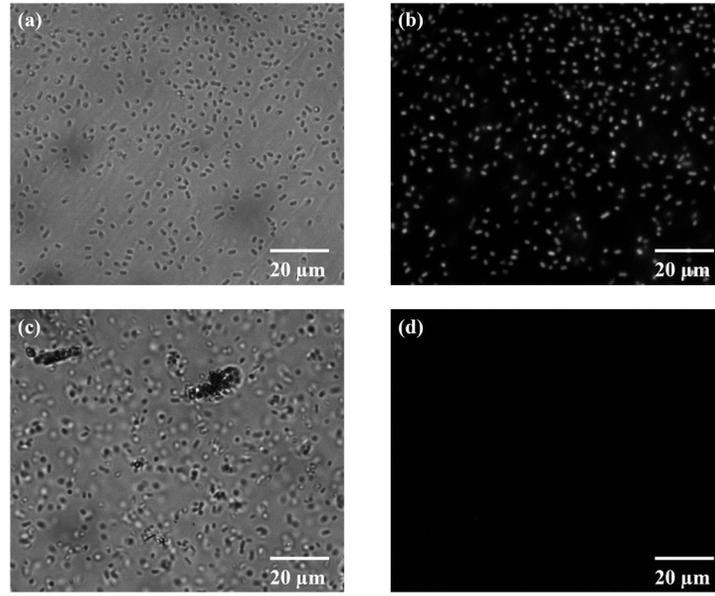
Figure S3. Images of the liquid culture of mCherry *E. coli* suspended in 1X PBS under **(a)** visible light and **(b)** fluorescence. Images of mCherry *E. coli* washed off from modified electrodes using HNO₃/SDS solution under **(c)** visible light and **(d)** fluorescence.
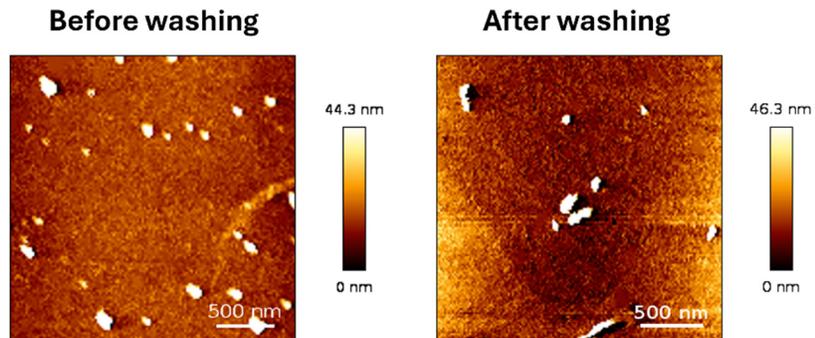

Figure S4. AFM images of GO/AuNDs/PDA/HOPG before and after washing with a 0.01 equiv. M HNO_3/SDS solution for 20 min sonication.
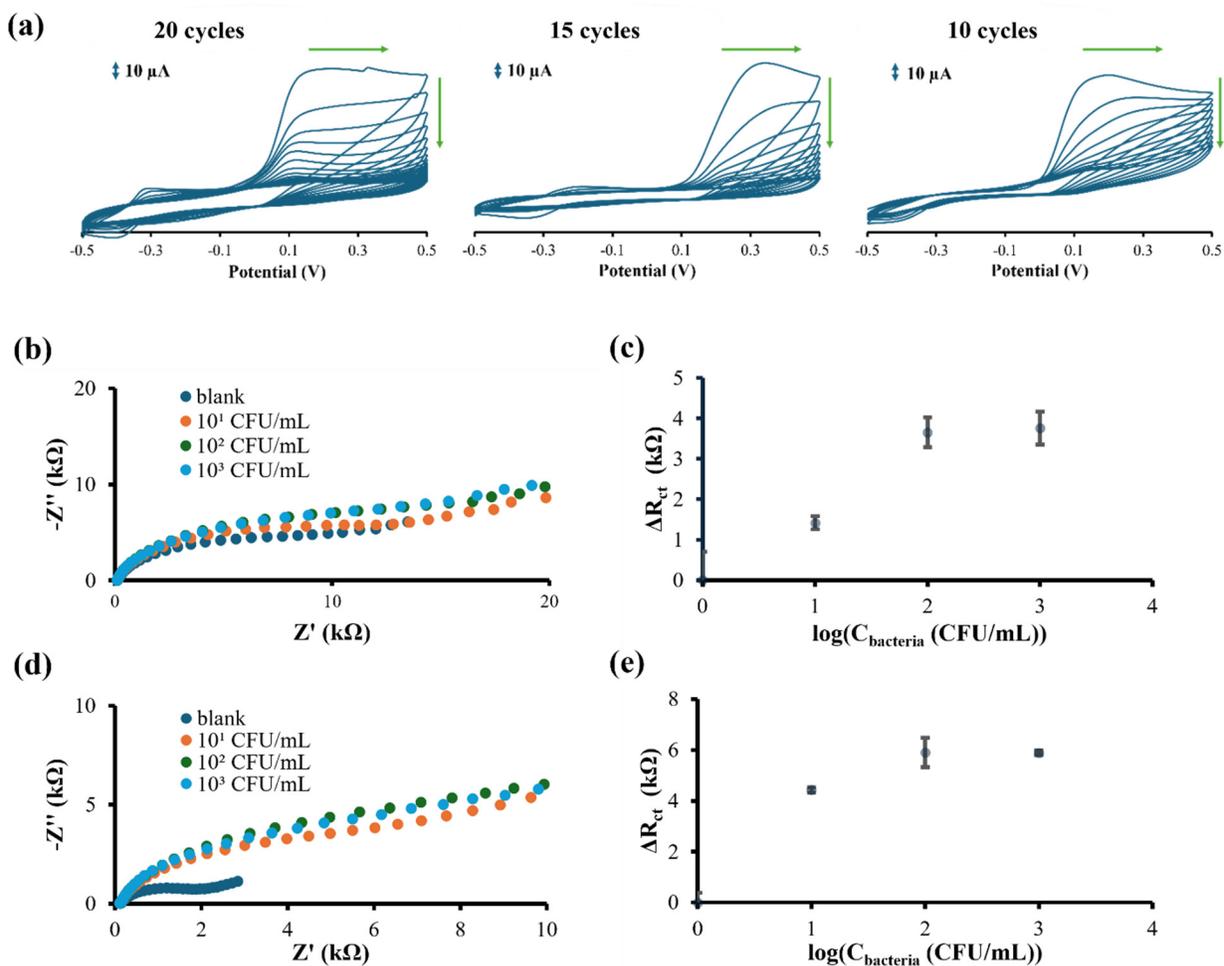
Figure S5. **(a)** Electropolymerization of DA with 20, 15, and 10 cycles of CV from -0.5 to +0.5 V in the presence of 5 mM DA and 1.0×10^8 CFU/mL bacteria solution. Nyquist plots of GO/AuNDs/PDA GCE prepared with **(b)** 20 cycles of CV and **(d)**15 cycles of CV measured in 5 mM $[Fe(CN)_6]^{3-/4-}$ containing 0.1 M KNO_3 from 100 kHz to 0.01 Hz. The plot of ΔR_{ct} *vs.* log concentration of *E. coli* for **(c)** 20 cycles and **(e)** 15 cycles of CV (n = 3). The ΔR_{ct} was calculated using the baseline subtraction.

Table S1. R_{ct} and χ^2 obtained from the EIS measurements fitting of the calibration study using GO/AuNDs/PDA/GCE for *E. coli* quantification.

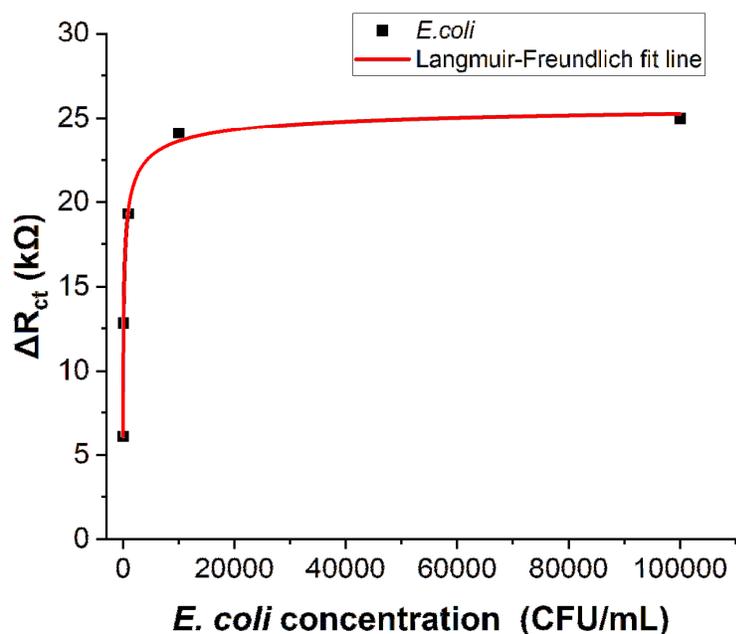|	blank	10^1 CFU/mL	10^2 CFU/mL	10^3 CFU/mL	10^4 CFU/mL	10^5 CFU/mL	10^6 CFU/mL	10^7 CFU/mL
R_{ct} (kΩ ± s.d.)	13.3±0.4	19.3±0.6	26.1± 0.1	32.6±1.1	37.4±0.3	38.3±0.2	37.5±0.4	37.7±0.7
χ^2 ± s.d.	0.13±0.03	0.07±0.01	0.05±0.02	0.06±0.01	0.08±0.02	0.07±0.02	0.05±0.01	0.04±0.01

Figure S6. Plot of *E.coli* concentration as a function of ΔR_{ct} using the GO/AuNDs/PDA/GCE with Langmuir-Freundlich isotherm fit line (red).
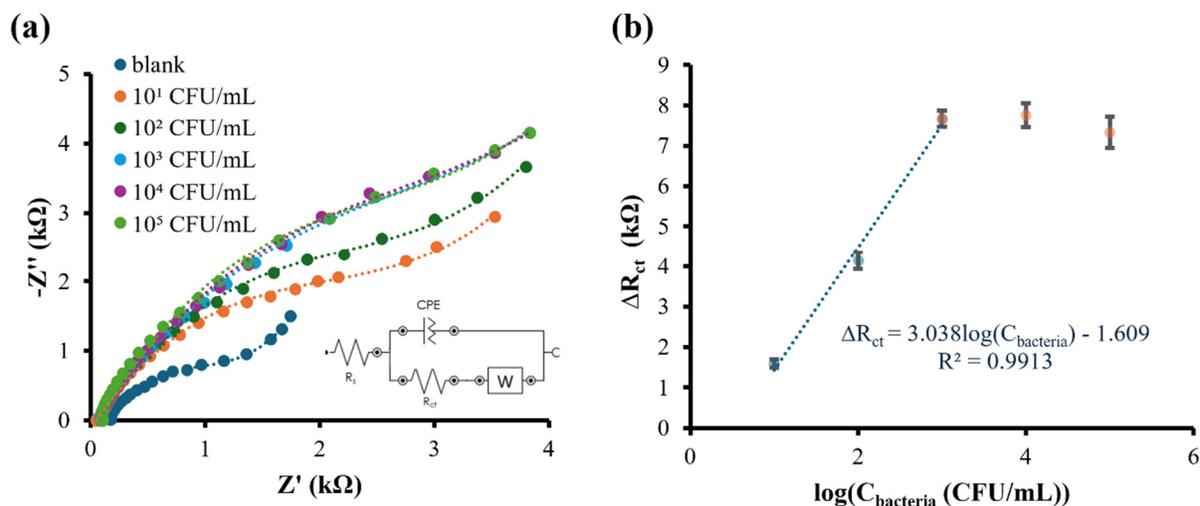

Figure S7. (a) Nyquist plots of GO/AuNDs/PDA SPE after incubation in different concentrations of *E. coli*, measured in 5 mM $[Fe(CN)_6]^{3-/4-}$ in 0.1 M KNO_3 from 100 kHz to 0.01 Hz (n = 3), and measurements were fitted with the modified Randles equivalent circuit (inset) and **(b)** the calibration plot of ΔR_{ct} *vs*. log concentration of *E. coli*. The ΔR_{ct} was calculated using the baseline subtraction.
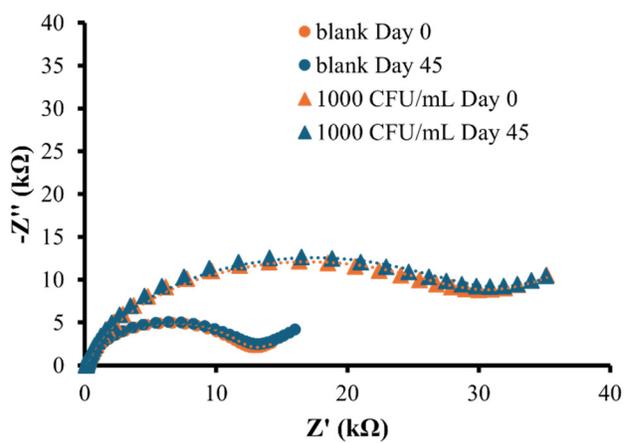
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Figure S8. Nyquist plots of GO/AuNDs/PDA GCE measurements in the presence and absence of 1000 CFU/mL of *E. coli* at Day 0 and Day 45 in 5 mM $[Fe(CN)_6]^{3-/4-}$ in 0.1 M KNO_3 from 100 kHz to 0.01 Hz (n = 3).