Supporting Information

Controlling Droplet Cell Environment in Scanning Electrochemical Cell Microscopy (SECCM) via Migration and Electroosmotic Flow

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S1. SEM Image of Dual-Channel Pipette

The opening diameter of the pipette was measured by scanning electron microscope (Scios2 Dual Beam SEM, Thermo Fisher Scientific) under 10 kV with a 7 mm working distance. The pipette has 380 nm radius openings, as shown in **Figure S1**. The dimensions from the pipette were used for simulation in SI section S2.

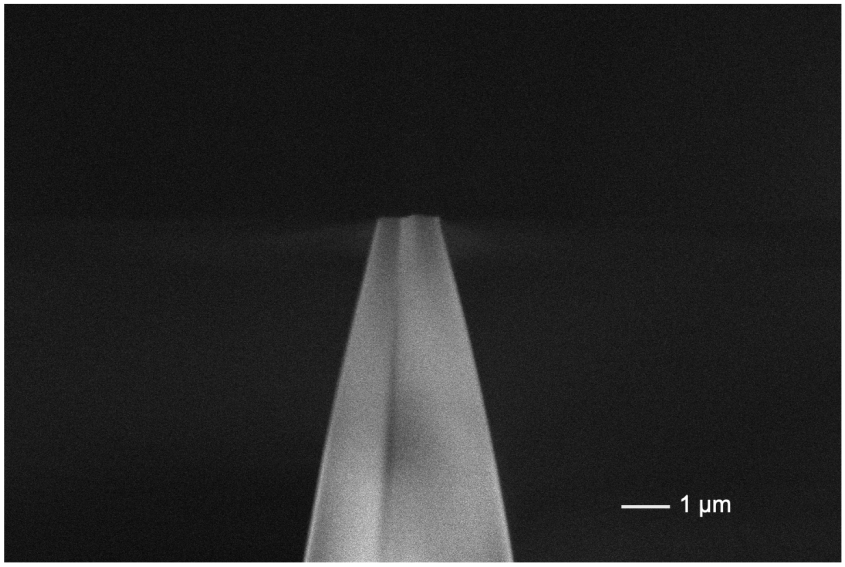

Figure S1. SEM image of a dual-channel pipette.

S2. Additional Information on Finite Element Simulation

Table S1 shows the parameters for the Finite Element Simulation. **Figure S2** show the pipette geometry utilized for the 3-D model and the boundary conditions employed for different areas of the pipette.

Table S1. Parameters used in the numerical simulation of dual-barrel SECCM.

T (temperature)	293.15 K
D_{K+} (K^+ diffusion coefficient)	1.96×10^{-9} m^2/s [1]
D_{FcTMA} $FcTMA^+$ diffusion coefficient)	7.5×10^{-10} m^2/s [2]
D_{RuHex} ($Ru(NH_3)_6^{3+}$ diffusion coefficient)	7.4×10^{-10} m^2/s [2]
D_{Cl} (Cl^- diffusion coefficient)	2.03×10^{-9} m^2/s [1]
ρ (water density)	998 kg/m^3
μ (dynamic viscosity)	1.005×10^{-3} P·s
c_K (K^+ concentration)	2.0 mM
c_{Fc} ($FcTMA^+$ concentration)	2.0 mM
c_{Ru} ($Ru(NH_3)_6^{3+}$ concentration)	2.0 mM
c_{Cl} (Cl concentration)	2.0 mM
ζ (zeta potential)	-0.030 V [3]

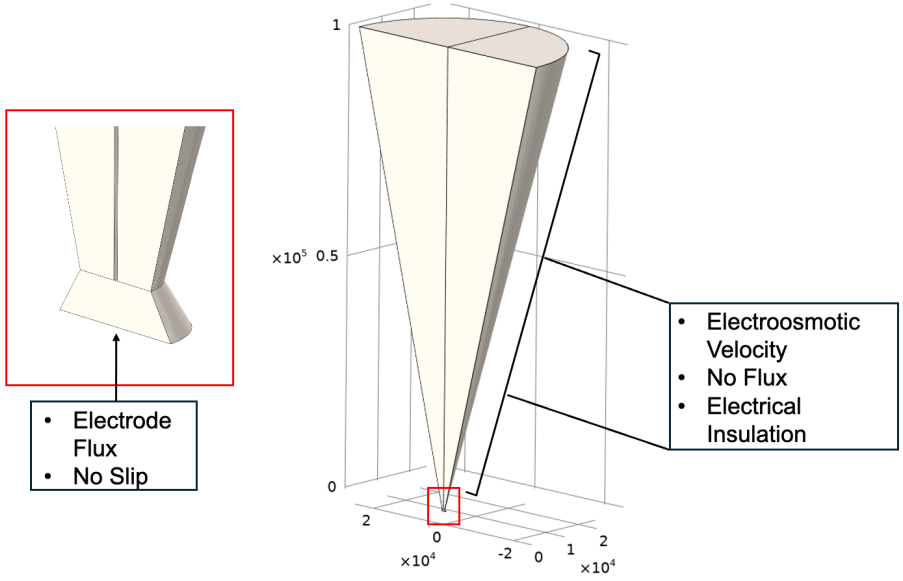

Figure S2. 3D geometry of the model used in the simulation. The model consists of two channels, each containing a redox mediator. The meniscus cell is at the bottom enclosed in the red box.

S3. References

1. P. Atkins, J. de Paula and J. Keeler, Physical Chemistry 11th Edition, Oxford, 2018.

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3. H. C. Li and P. L. De Bruyn, Surface Science, 1966, 5, 203-220.