

Supplementary Data for

**Location-Dependent Sensing of Nitric Oxide and Calcium Ion at
Living Rat Kidney Using an Amperometric/Potentiometric Dual
Microsensor**

Yee Seul Kim,^a Yejin Ha,^a Jungeun Sim,^b Minah Suh,^{b,c,d,*} Youngmi Lee^{a,*}

^a *Department of Chemistry and Nano Science, Ewha Womans University, Seoul, 120-750, Korea*

^b *Center for Neuroscience Research Imaging (CNIR), Institute for Basic Science (IBS), Suwon
440-746, Republic of Korea*

^c *Department of Biomedical Engineering, Sungkyunkwan University, Suwon, 440-746, Republic
of Korea*

^d *Samsung Advanced Institute of Health Science and Technology (SAIHST), Sungkyunkwan
University, Suwon, 440-746, Republic of Korea*

*Co-corresponding authors: (Fax) +82-2-3277-2384, (E-mail) youngmilee@ewha.ac.kr (Y. Lee)
and minahsuh@skku.edu (M. Suh).

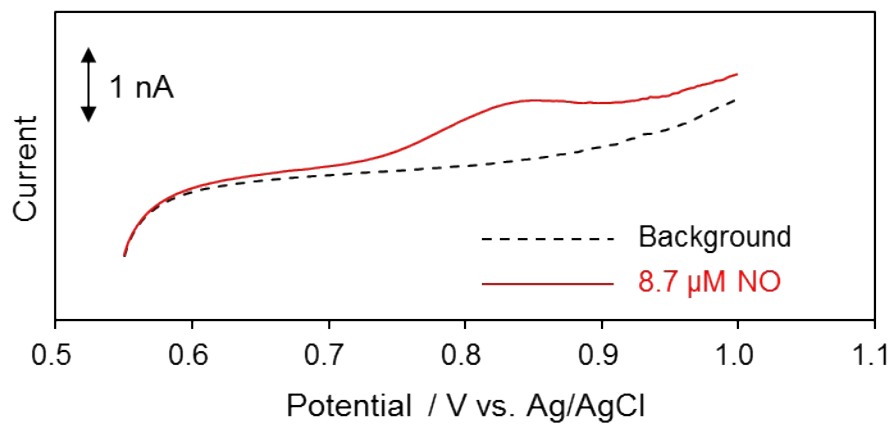


Fig. S1. Linear sweep voltammetry curves for NO oxidation obtained with WE1 (25 μm in diameter) of a NO/ Ca^{2+} dual microsensor in a deaerated PBS solution (pH = 7.4). Scan rate; 20 mV s^{-1} .

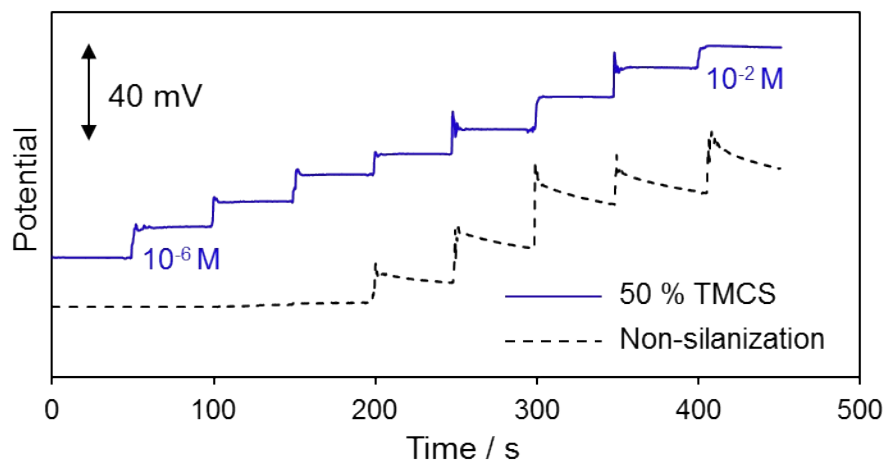


Fig. S2. Dynamic potentiometric response curves to Ca^{2+} from 10^{-6} M to 10^{-2} M obtained with two different WE2 electrodes of a dual sensor. Blue solid line: pretreated with a solution of TMCS in toluene (1:1, v/v). Black dashed line: without the pretreatment.

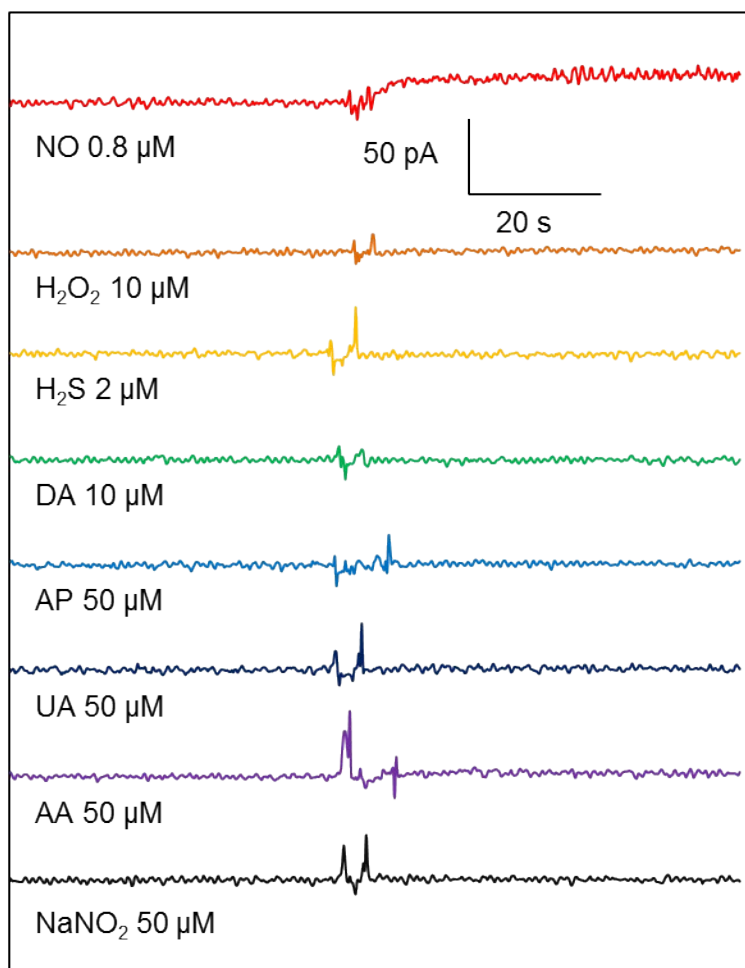


Fig. S3. Amperometric responses of WE1 to typical interfering agents: 50 μM nitrite, 50 μM AA, 50 μM UA, 50 μM AP, 10 μM DA, 2 μM H₂S, and 10 μM H₂O₂. The current response to 0.8 μM NO was also showed.

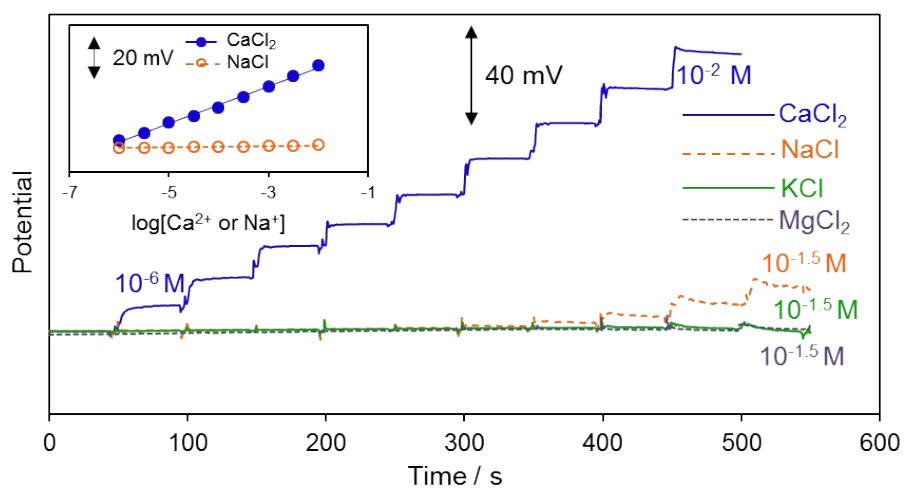


Fig. S4. Potentiometric response curves of WE2 to various cations to determine the selectivity coefficient ($\log K_{Ca^{2+},X}^{Pot}$, X = Na⁺, K⁺, and Mg²⁺) at calcium detection limit.

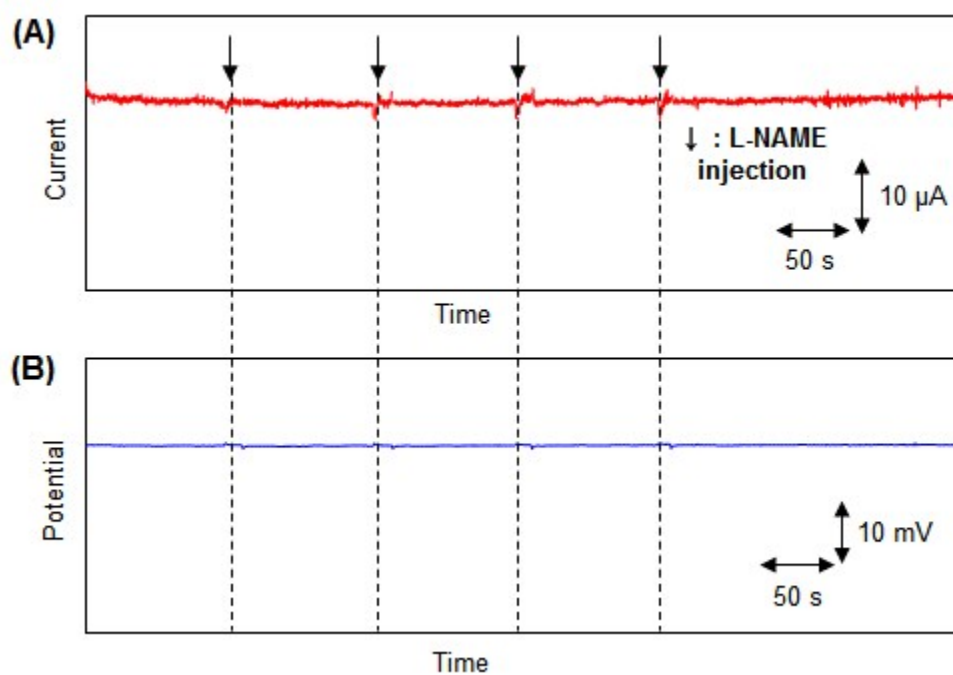


Fig. S5. Amperometric and potentiometric response curves of (A) WE1 and (B) WE2 to the L-NAME additions. Four successive injections of L-NAME standard solution (marked with arrows) made the final 10 mM of L-NAME in a tested solution. A NO/Ca²⁺ dual microsensor did not respond to L-NAME.

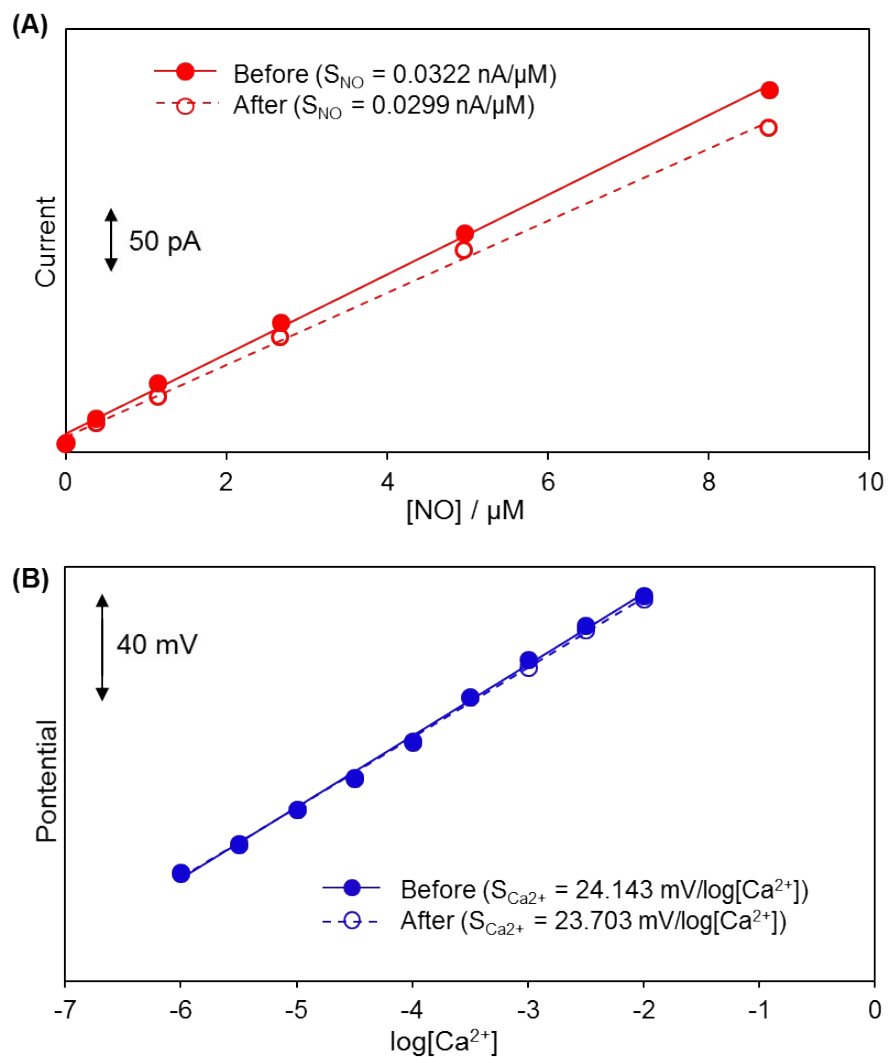


Fig. S6. Calibration curves of a NO/Ca²⁺ dual microsensor before (full circle symbols) and after (empty circle symbols) kidney tissue experiments. (A) Amperometric responses of WE1. (B) Potentiometric responses of WE2. The obtained sensitivities are also provided. S_{NO} and $S_{\text{Ca}^{2+}}$ mean the sensor sensitivities to NO and Ca²⁺, respectively.