

Supplementary Materials

Rapid and easy detection of microcystin-LR using a bioactivated multi-walled carbon nanotube-based field-effect transistor sensor

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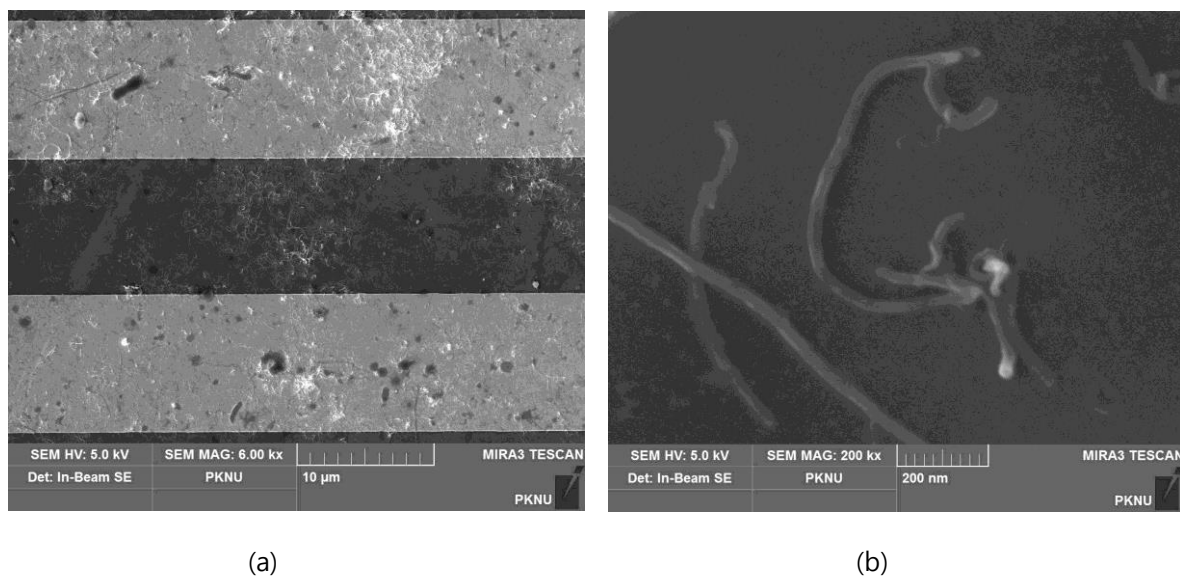


Figure S1. SEM images of the (a) MCTA-MWCNTs immobilized between the drain and source electrodes by solution dropping, and immobilized MCTA-MWCNTs after washing with PBS (scale bars: 10 μm) and (b) MCTA-MWCNTs entangled on the surface of the electrode.

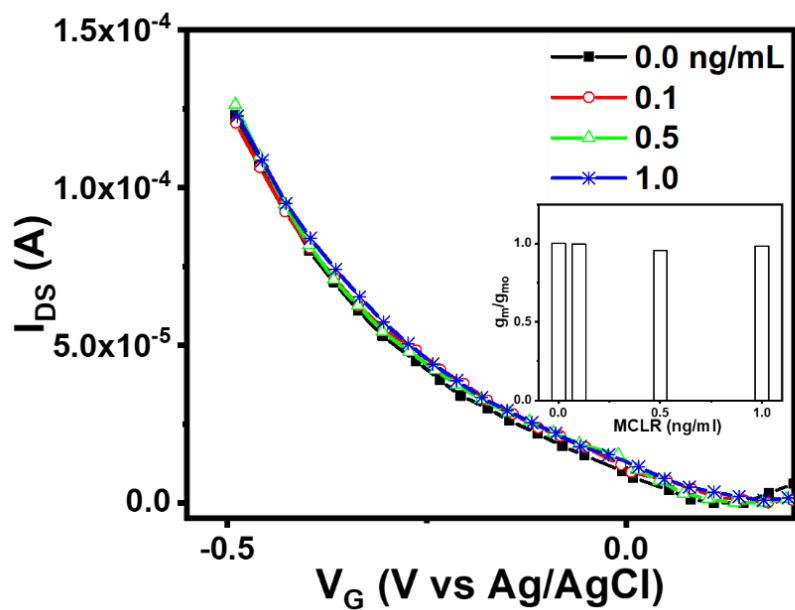


Figure S2. I_{DS} – V_G plots of the FET assembled using BSA-coated MWCNTs at a constant drain-source potential ($V_{DS} = -0.5$ V) with varying concentrations of MC-LR in PBS buffer, confirming the lack of bioactivity of the MWCNT-FET sensor without the MCTAs. The relative transconductance values (g_m/g_{m0}) corresponding to the various levels of MC-LR are identical.

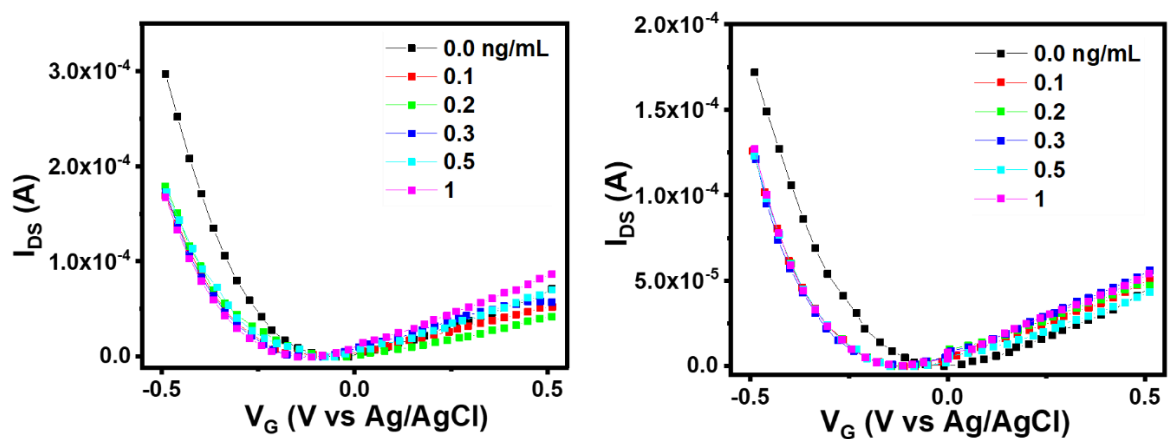


Figure S3. I_{DS} – V_G characteristic curves of the MCTA-MWCNT FET corresponding to various concentrations of (a) MC-YR and (b) MC-LY in PBS buffer, at a V_{DS} of -0.5 V.

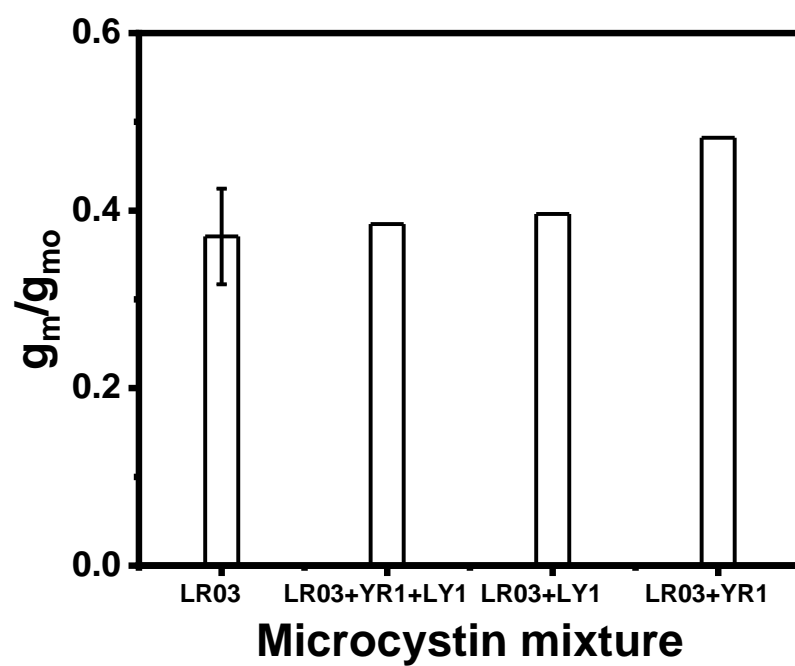


Figure S4. Relative conductance of MC-LR (0.3 ng/mL) with respect to various combinations of the MC-LY and MC-YR levels. In the x -axis, LR03, YR1, and LY1 correspond to MC-LR (0.3 ng/mL), MC-YR (1.0 ng/mL), and MC-LY (1.0 ng/mL) in PBS buffer, respectively.

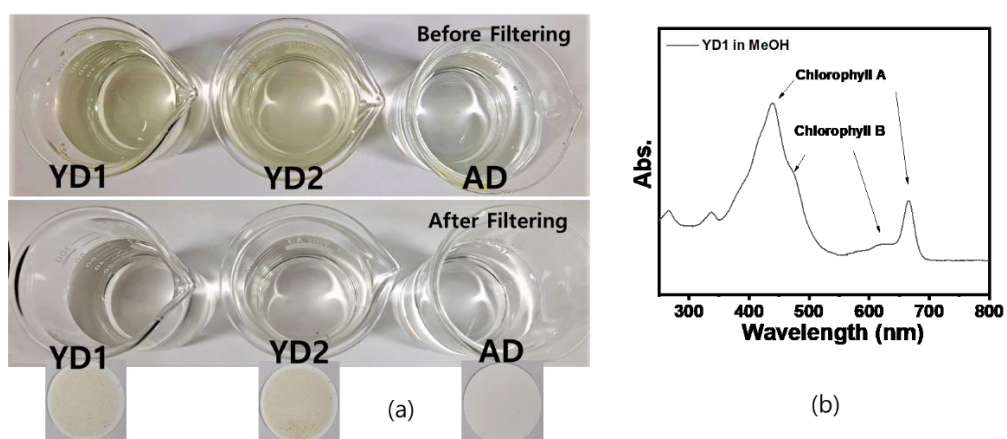


Figure S5. (a) Optical images of water sourced from the Yeongju dam (YD1 and YD2) and Andong dam (AD), before and after filtering; the used filter papers are also shown. (b) UV-vis spectrum of YD1.