

Optimization of Paper-based Alveolar-Mimicking SERS Sensor for High-Sensitivity Detection of Antifungal Agent

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Author contributions

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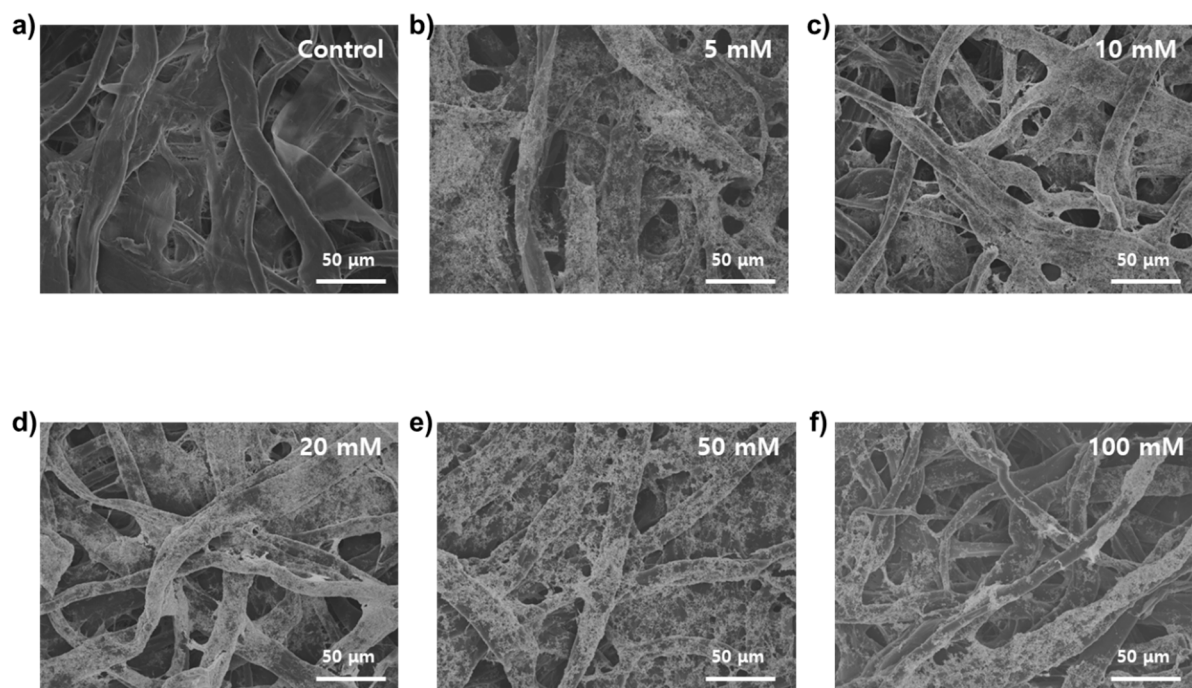


Figure S1. Low-magnification SEM images of paper-based substrates fabricated with different concentrations of OMH: (a) control, (b) 5 mM, (c) 10 mM, (d) 20 mM, (e) 50 mM, and (f) 100 mM.

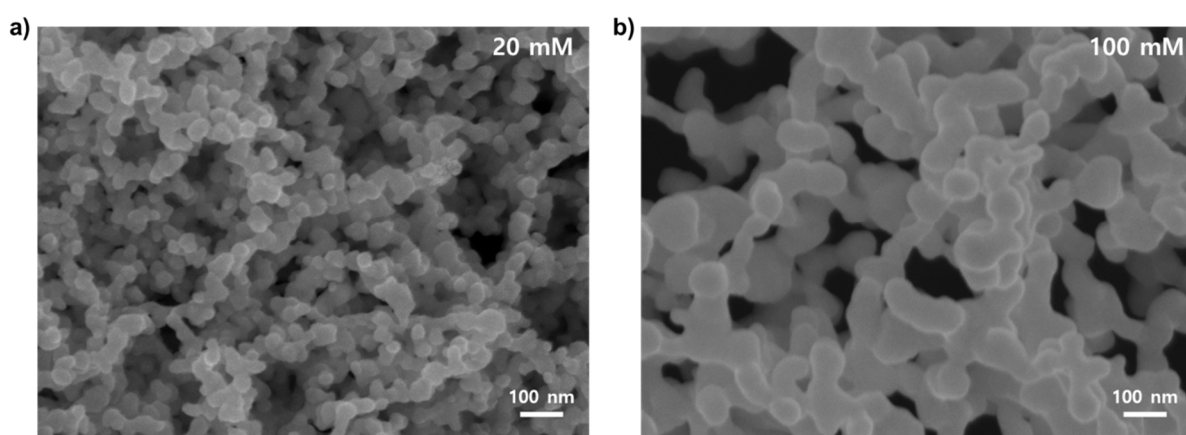


Figure S2. High-magnification SEM images of paper-based substrates fabricated with different concentrations of OMH: (a) 20 mM and (b) 100 mM.

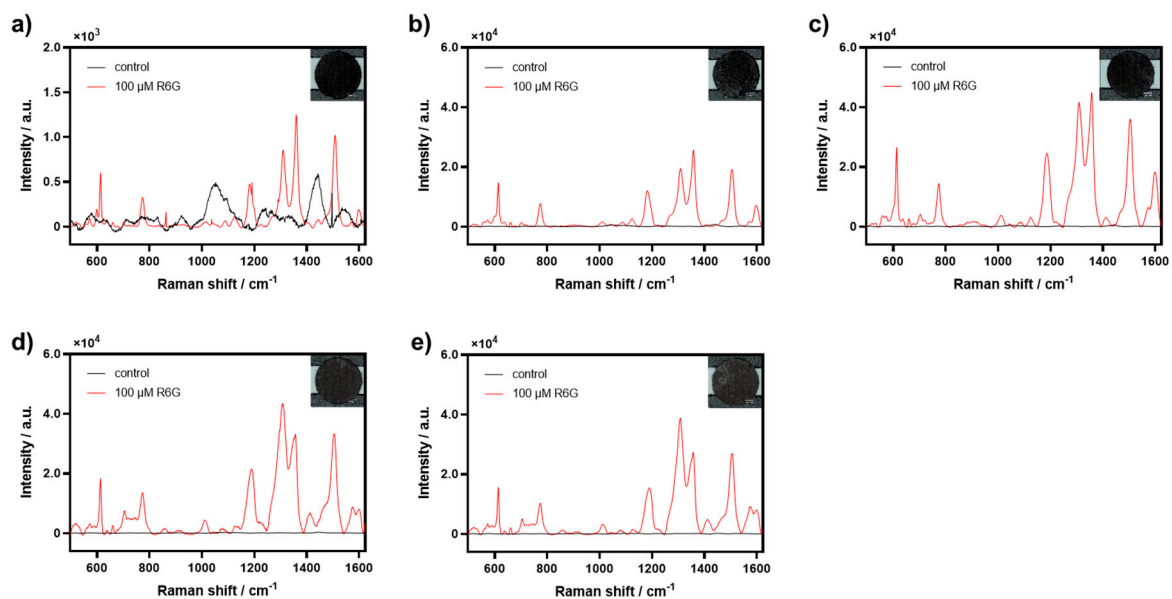


Figure S3. SERS spectra of 100 μM R6G in paper-based substrates fabricated with different concentrations of OMH. Each inset shows an optical image of a paper-based substrate. (a) 5 mM, (b) 10 mM, (c) 20 mM, (d) 50 mM, and (e) 100 mM.

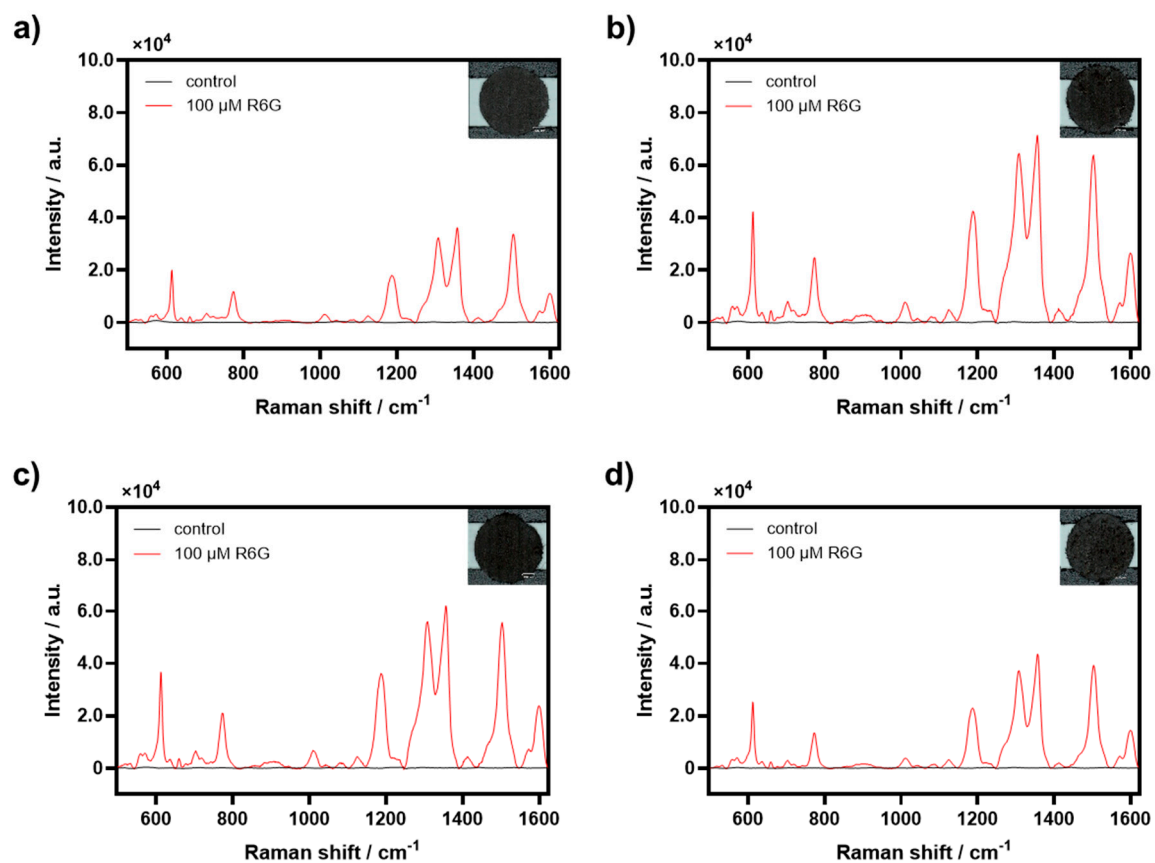


Figure S4. SERS spectra of 100 μM R6G in paper-based substrates fabricated with different reaction times. Each inset shows an optical image of a paper-based substrate. (a) 30 min, (b) 60 min, (c) 90 min, and (d) 120 min.

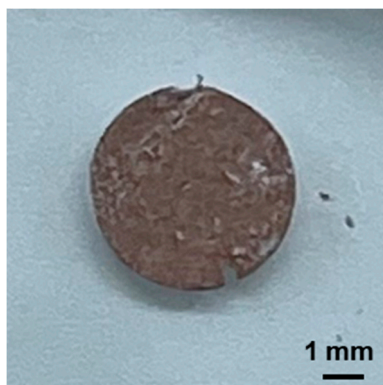


Figure S5. Actual image of the AMSP.

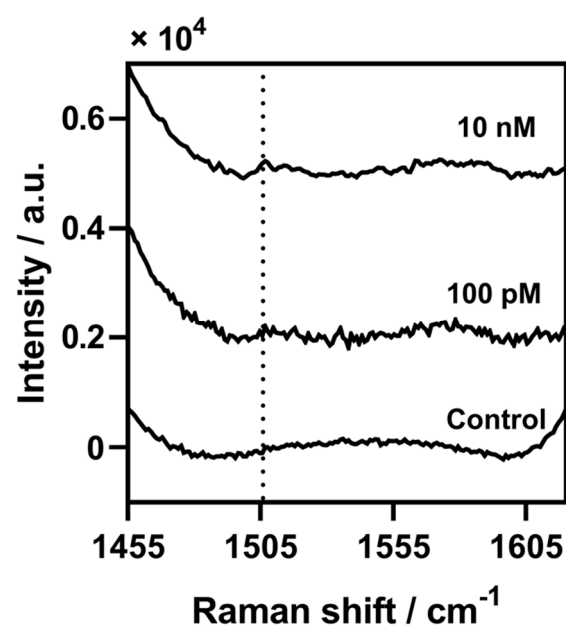


Figure S6. Raman spectra data with y-axis scale adjusted for control, 100 pM, and 10 nM concentrations of the R6G indicator.

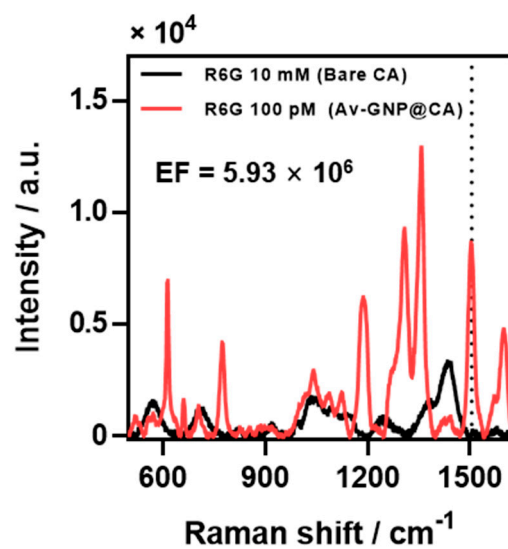


Figure S7. Raman spectra data with y-axis scale adjusted for control, 100 pM, and 10 nM concentrations of the R6G indicator.

Year	Substrate	Enhancement factor (EF)	References
2021	Silver nanowire	2.63×10^6	[65]
2021	Ag nanostructure	1.2×10^5	[61]
2022	Ag@Au nanoparticles	9.28×10^4	[63]
2023	Paper-tip	1.15×10^5	[66]
2023	AgNP	3.058×10^5	[67]
2024	AMSP	5.93×10^6	This work

Table S1. Comparison of enhancement factors (EF) of various fabricated paper-based SERS substrates.

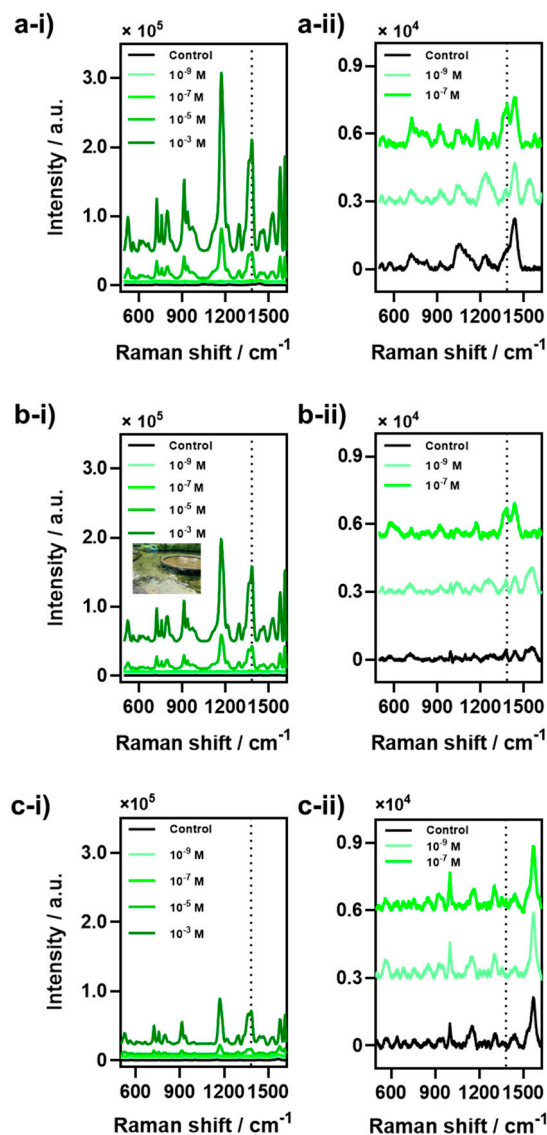


Figure S8. Raman spectra of CV at various concentrations. (a-i) Raman spectra of CV in DI water at concentrations ranging from 10^{-3} to 10^{-9} M. (a-ii) Detailed Raman spectra for low concentrations of CV (10^{-7} , 10^{-9} M) and control in DI water. (b-i) Raman spectra of CV in fish farm water at concentrations ranging from 10^{-3} to 10^{-9} M, inset image shows water from aquaculture farm used in the experiment. (b-ii) Detailed Raman spectra for low concentrations of CV (10^{-7} , 10^{-9} M) and control in fish farm water. (c-i) Raman spectra of CV in 1% human serum at concentrations ranging from 10^{-3} to 10^{-9} M. (c-ii) Detailed Raman spectra for low concentrations of CV (10^{-7} , 10^{-9} M) and control in **10%** human serum.