

Au@ZIF-8 SERS Paper for Food Spoilage Detection

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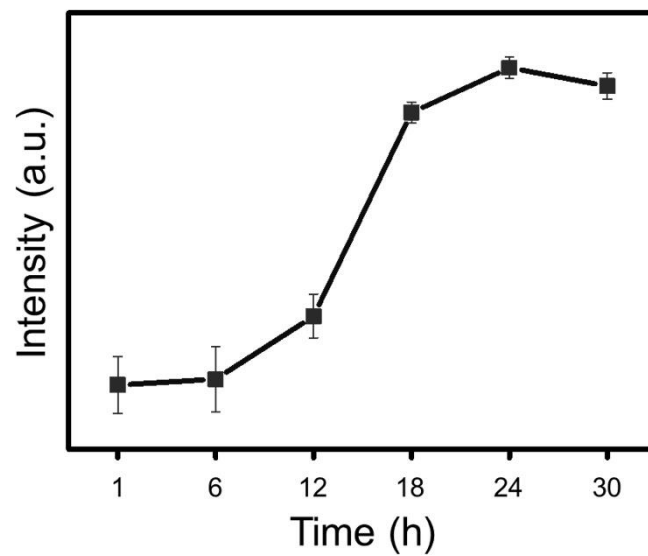


Figure S1. Plot of SERS intensity as a function of 4-MBA incubation time.

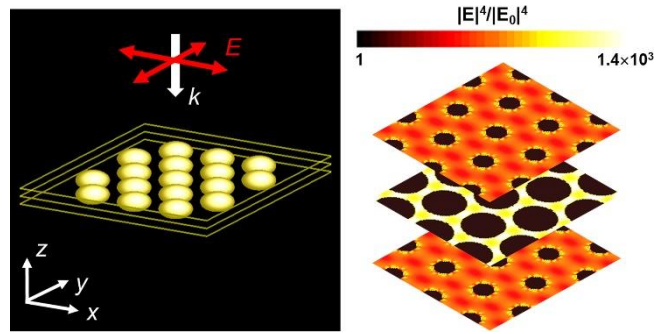


Figure S2. Scheme of FDTD simulation for Au NPs with 1.5 nm interparticle gaps (left). k -vector indicates incident direction of excitation laser. E -vectors indicate polarization direction. Corresponding lateral distributions of $|E|^4/|E_0|^4$ for Au NPs (right).

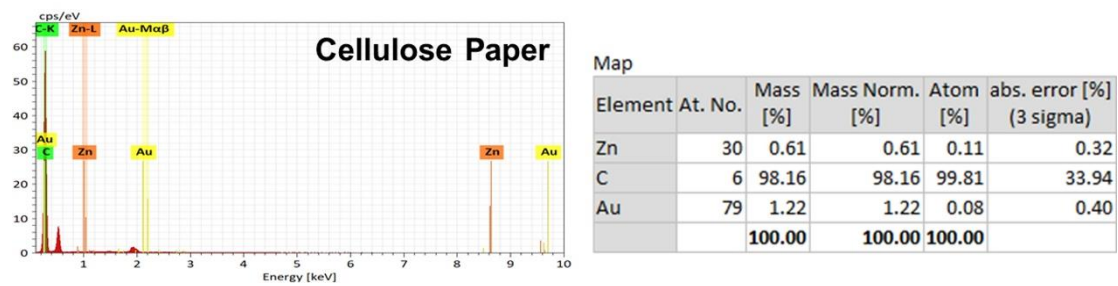


Figure S3. EDX spectra of cellulose paper

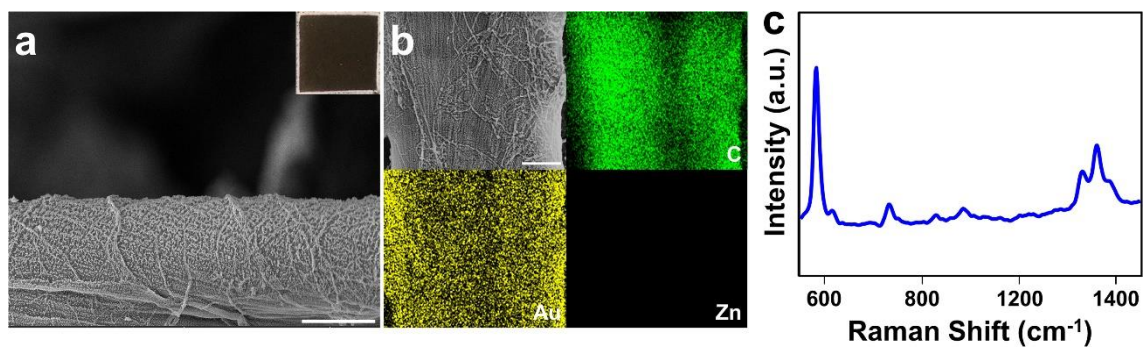


Figure S4. a) Side-view SEM image of Au impregnated paper. Scale bar denotes 5 μm . Inset is photograph of Au impregnated paper. b) EDX elemental mapping images of Au impregnated paper. Scale bar denotes 5 μm . c) SERS spectra of BCB measured from Au impregnated paper.

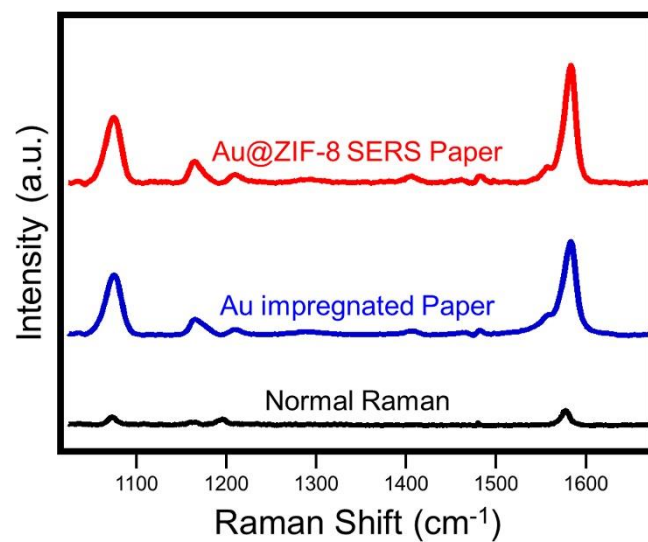


Figure S5. SERS spectra of 4-MBA measured from Au@ZIF-8 SERS paper (red) and Au impregnated paper (blue), and normal Raman spectrum of 4-MBA (black).

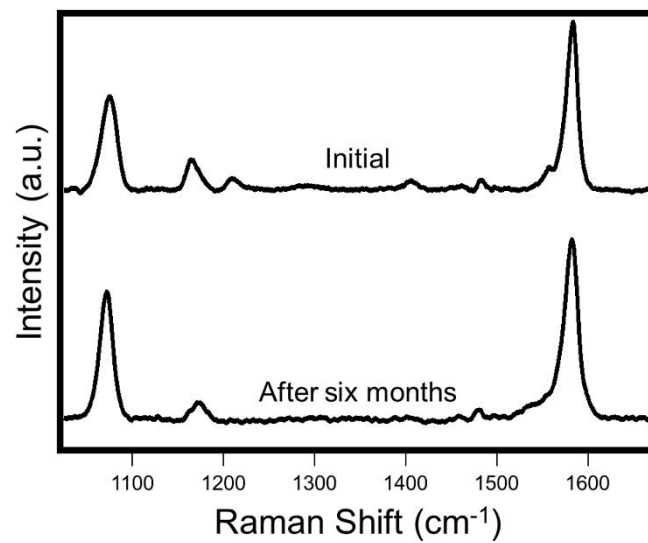


Figure S6. SERS spectra of 4-MBA measured from Au@ZIF-8 SERS paper after storing under ambient conditions for 0 and 6 months.

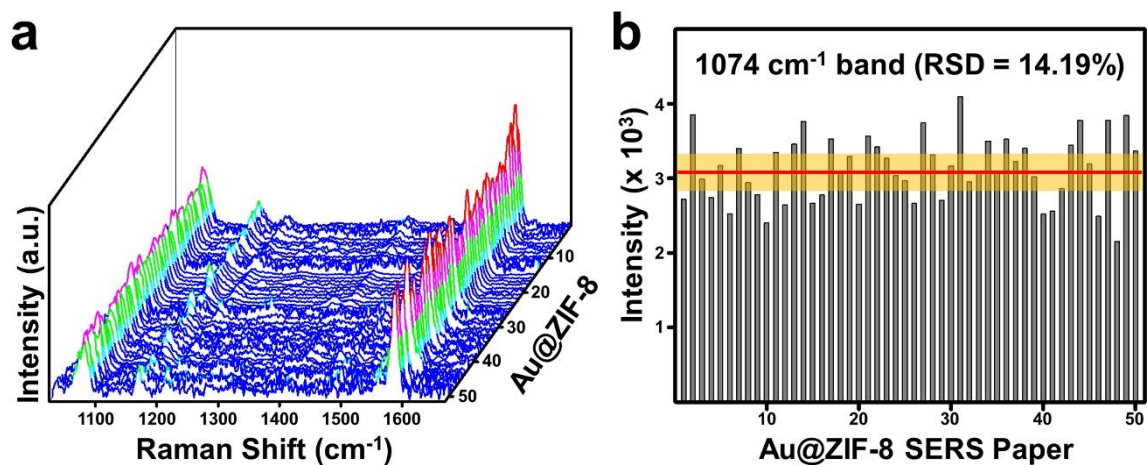


Figure S7. a) 50 SERS spectra of 4-MBA-functionalized Au@ZIF-8 SERS papers. b) Intensity distribution of 4-MBA at 1074 cm^{-1} band obtained from a). Average intensity is indicated with red line. RSD is calculated to be 14.19% of the average intensity. The orange zone represents the average intensity $\pm 14.19\%$ variation.

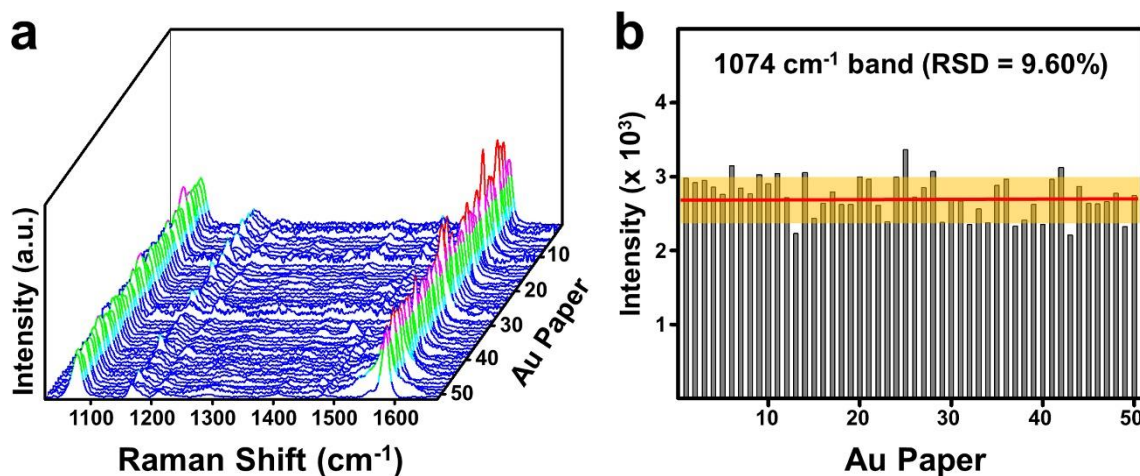


Figure S8. a) 50 SERS spectra of 4-MBA-modified Au impregnated papers. b) Intensity distribution of 4-MBA at 1074 cm^{-1} band obtained from a). Average intensity is indicated with red line. RSD is calculated to be 9.60% of the average intensity. The orange zone represents the average intensity $\pm 9.60\%$ variation.

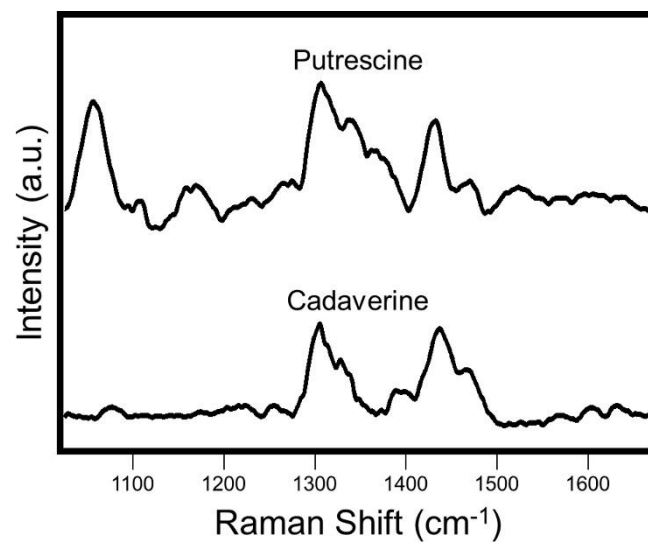


Figure S9. Normal Raman spectra of putrescine and cadaverine.

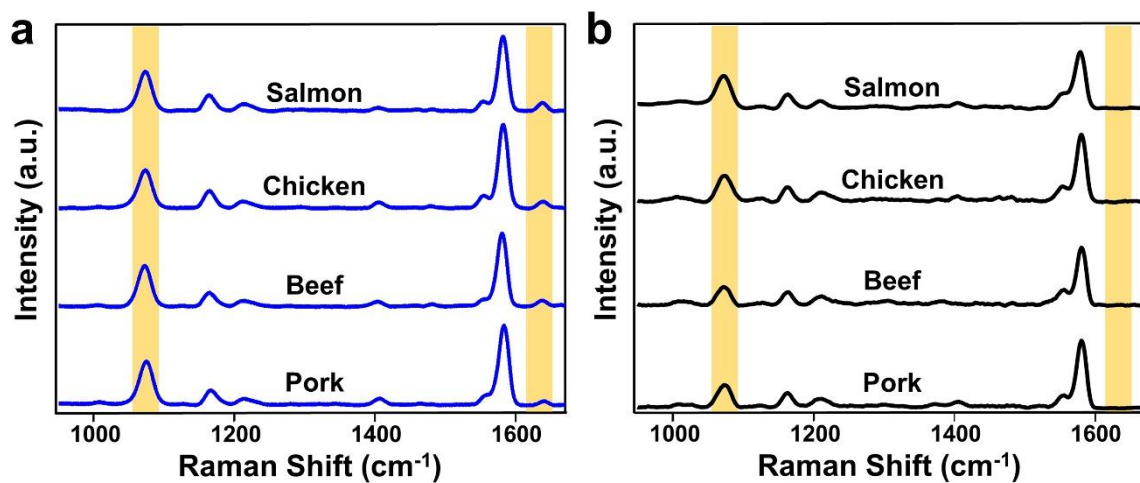


Figure S10. Full SERS spectra of Figure 5b corresponding to a) spoiled food samples and b) fresh food samples.