

Supplementary Material

For

Highly sensitive determination of serotonin by using gold nanoparticles (Au NPs) with localized surface plasmon resonance (LSPR) absorption wavelength a visible region

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The concentration of 5-HT, dopamine, and ascorbic acid were 10^{-7} M. This sample was absorbed on our SERS substrate and measured by Raman spectroscopy. The result was shown in Fig. 1S. The spectrum of 5-HT (10^{-7} M) was inserted for the comparison. As shown in this figure, the peaks of 5-HT were slightly shifted to 754, 833, 946, 1202, 1308, 1350, 1440, and 1547 cm^{-1} . The additional peaks at 1370, 1479, 1622 cm^{-1} were belonged to dopamine.⁸⁰ There was no peak of ascorbic acid because it was nonaffinitiy for Au.⁸¹ In general, 5-HT can be detected by our SERS substrate in complex mixture.

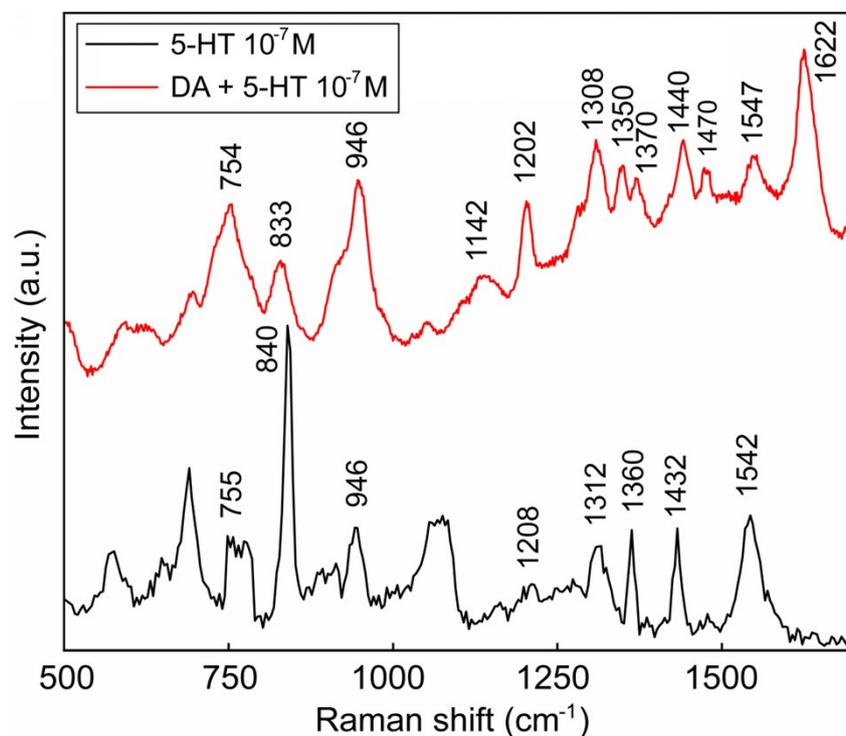


Figure 1S. Raman spectra of 5-HT (10^{-7} M) and the mixture of 5-HT and dopamine in the presence of ascorbic acid.

In comparison with other reports, 5-HT detected by our Au NPs has some advantages. First, the lowest 5-HT's concentration could be detected by our Au NPs was 1000 times lower than the polycrystalline silver electrode prepared by Song et al..⁷⁵ The peaks of 5-HT spectra was clearer and sharper than the substrate from graphene-Au nanopyramid heterostructure fabricated by Wang et al..⁸² Moreover, the spectra of 5-HT detected by our substrate was more reproducible than the Ag colloids synthesized by Qiu et al..⁸³ Our substrate was facilely fabricated and high efficient in 5-HT detection with the selective mechanism of Au NPs to amine group of 5-HT.

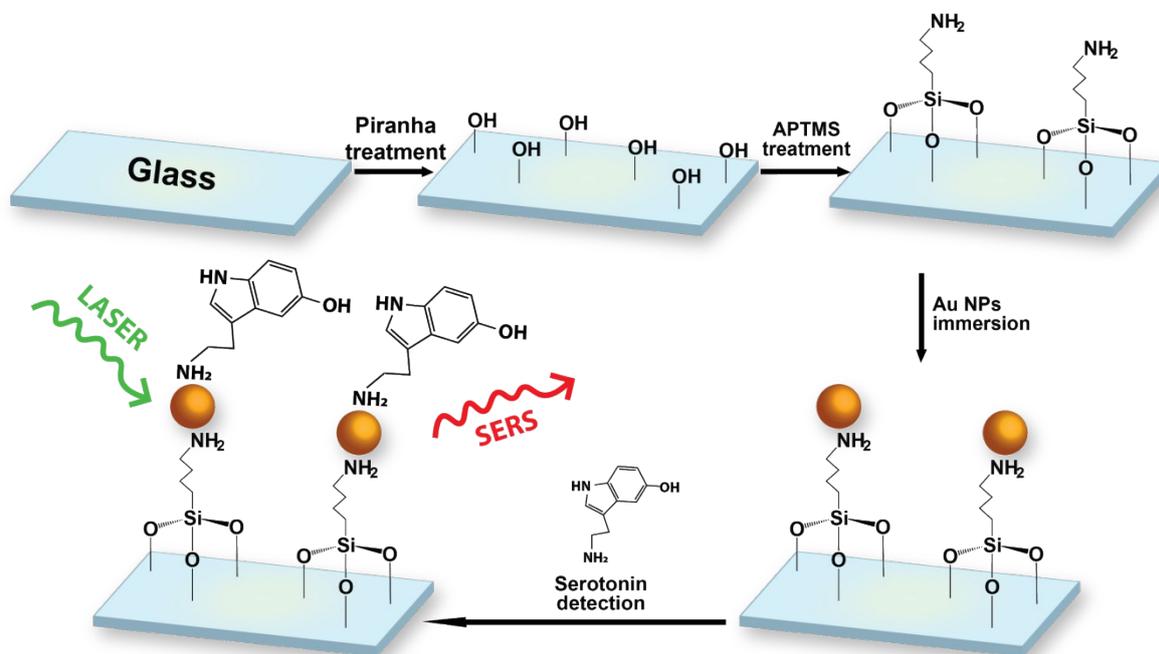


Fig. 2S. Schematic diagram of 5-HT molecules linking with the Au NPs modified on glass substrate.

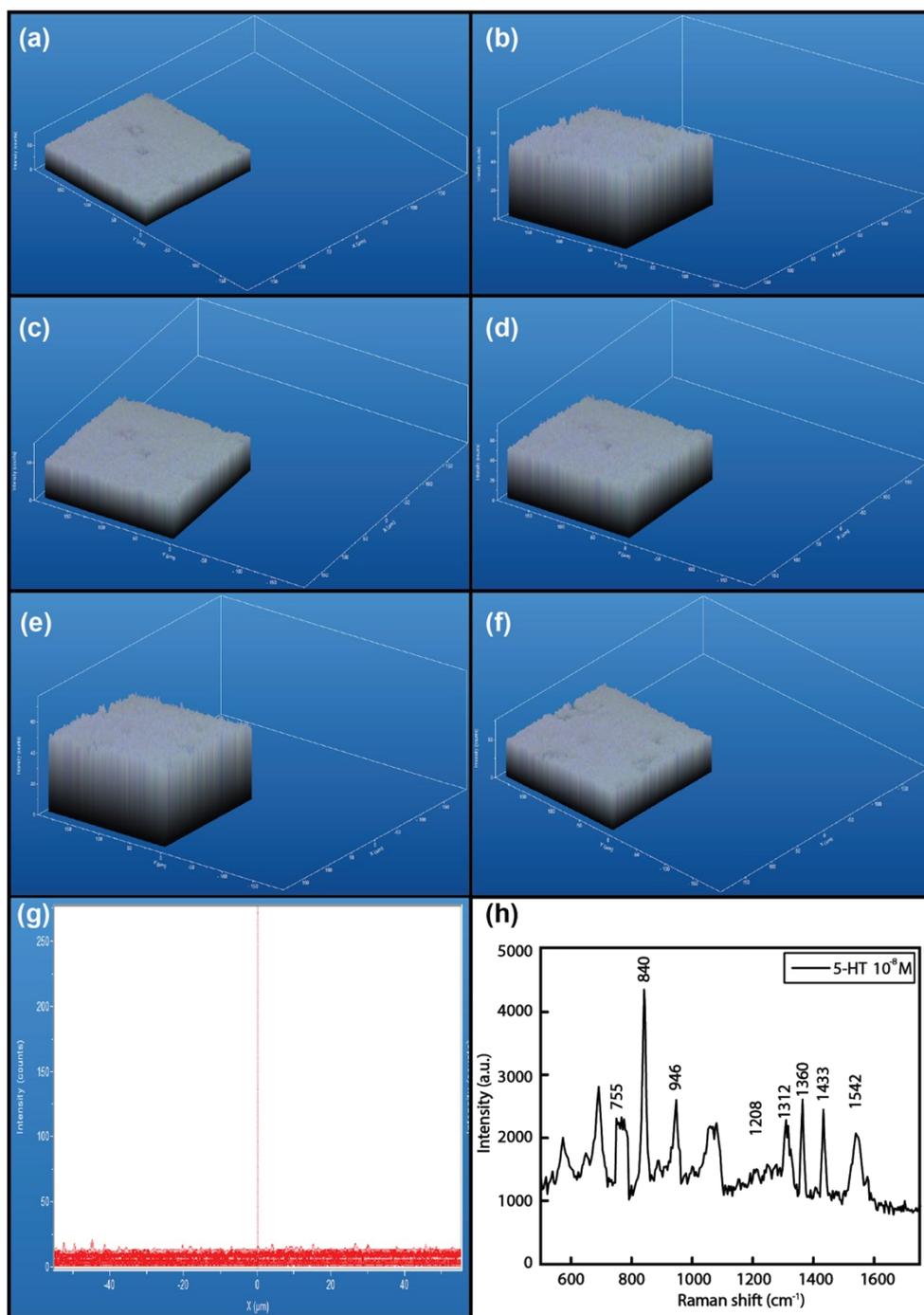


Fig. 3S. Raman mapping of 5-HT (10^{-8} M) adsorbed on our substrate.

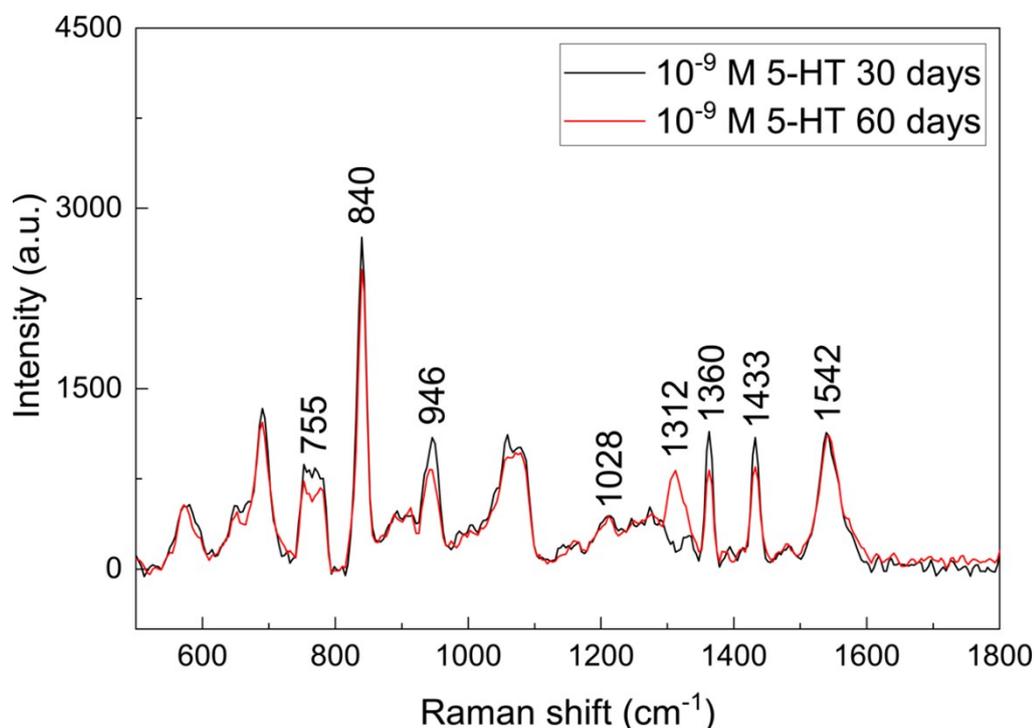


Fig. 4S. Raman spectra of 5-HT at the concentration of 10^{-9} M on Au NPs coated substrate in 30 and 60 days.

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