Sensing glucose in urine & serum and hydrogen peroxide in living cells using a novel boronate nanoprobe based on Surface-Enhanced Raman Spectroscopy

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Supporting Information

Summary:

This section contains the UV-vis and SEM characterization of the AuNPs, the internal standard ratio quantification and intensity quantification figures, dynamics study of the reaction. Data of the cell viability test are also included.

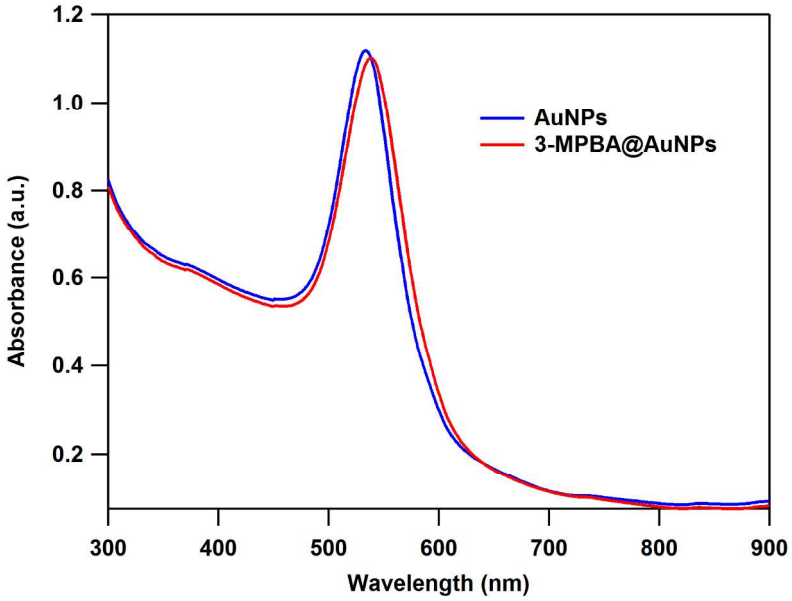

Figure. S1 UV-vis spectra of the purchased 60 nm AuNPs (blue trace) and the 3-MPBA modified SERS probe (red trace).

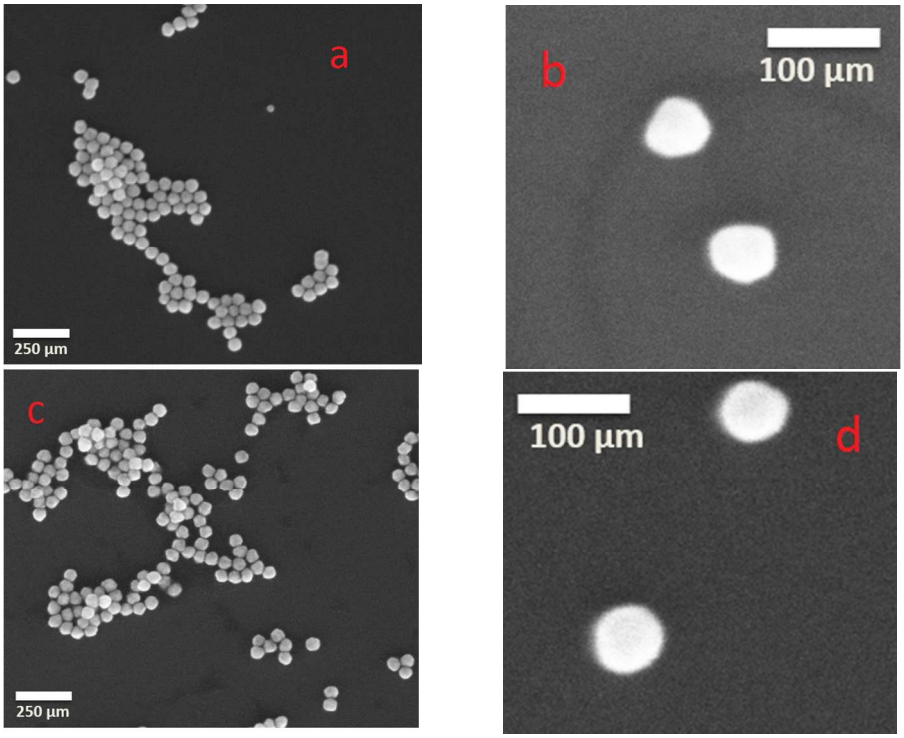

Figure. S2 SEM images of purchased 60 nm AuNPs (a&b) and the 3-MPBA modified SERS probe (c&d).

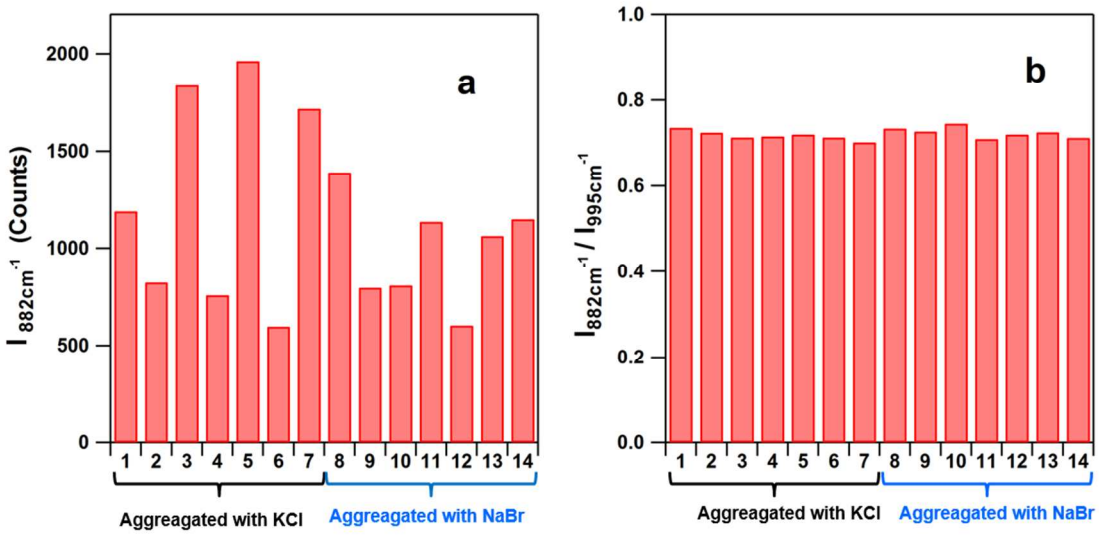

Figure. S3 (a) The SERS intensity of $I_{882\ cm^{-1}}$ after treatment of 100 μM H_2O_2. (b) The relative SERS intensity of $I_{882\ cm^{-1}}$ / $I_{995\ cm^{-1}}$ after treatment of 100 μM H_2O_2. 1-7 samples are aggregated 1 M KCl while 8-14 samples are aggregated NaBr before measurement. We observe a huge variance in $I_{882\ cm^{-1}}$ but very consistent value from $I_{882\ cm^{-1}}$ / $I_{995\ cm^{-1}}$. Also, $I_{882\ cm^{-1}}$ / $I_{995\ cm^{-1}}$ is not affected by the type of salt that aggregating the AuNPs.

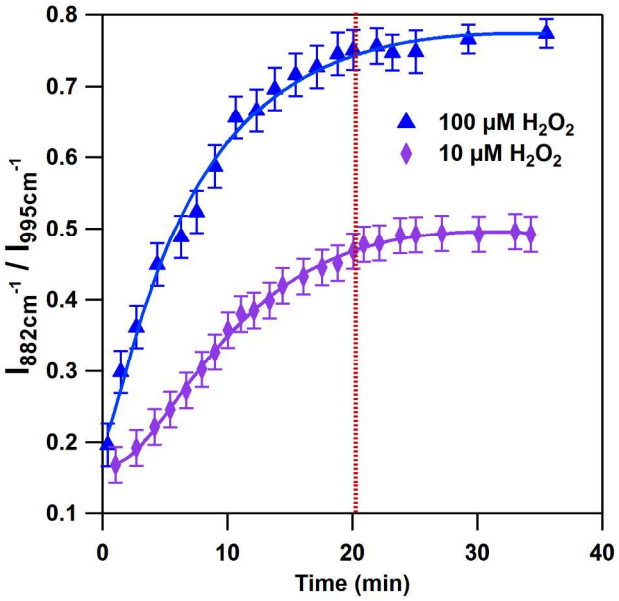

Figure. S4 The relative SERS intensity of $I_{882\ cm^{-1}}$ / $I_{995\ cm^{-1}}$ as a function of time (min) in the presence of 100 μM and 10 μM of H_2O_2. The signal remains unchanged after 20 min indicating complete reaction between boronate nanoprobe and H_2O_2. Therefore, 20 min is selected as the optimum time for the reaction.

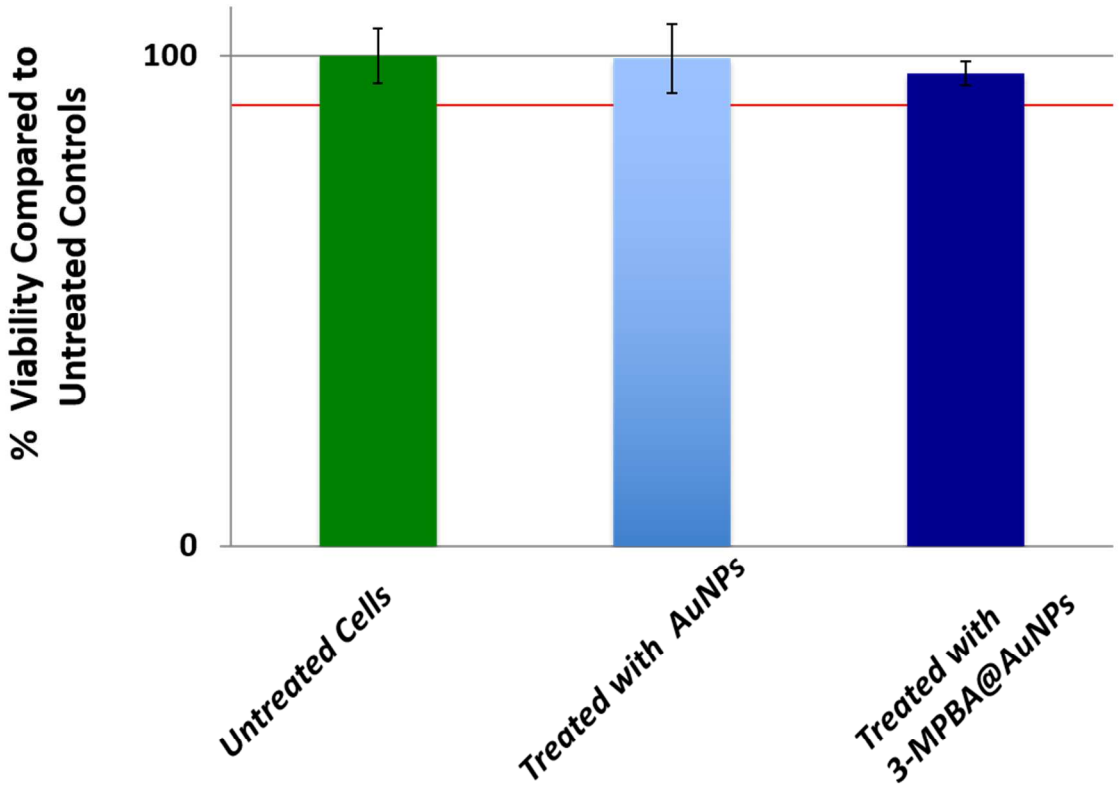

Figure. S5: Cell viability test of the cells. The cells treated with AuNPs (light blue bar) exhibit a viability of 99%. The cells treated with our SERS probe (dark blue bar) exhibit a viability of 96.3% indicating negligible toxicity to the cells. The red line denotes 90% viability.