

## Supplementary Materials

### Phosphorylation-Dependent SERS Readout for Activity Assay of Protein Kinase A in Cell Extracts

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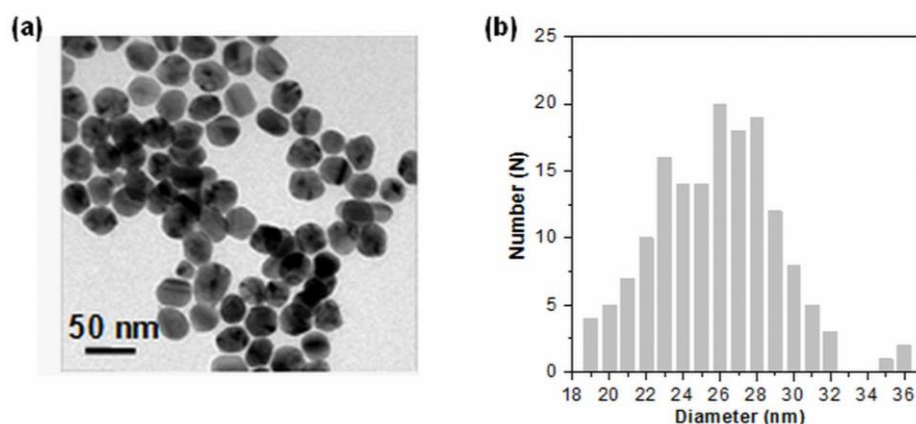
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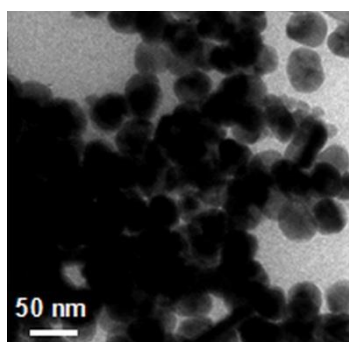
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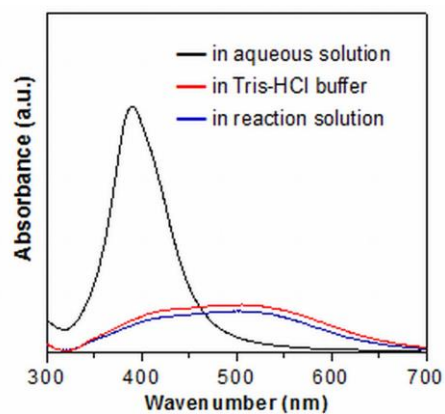
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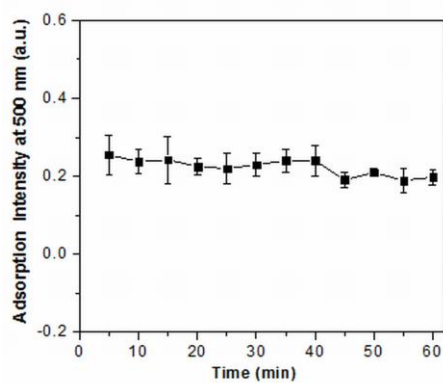
**Figure S1.** (a) TEM image of spermine-functionalized AgNPs in aqueous solution. (b) The size distribution of spermine-functionalized AgNPs determined by TEM examination (N = 158).



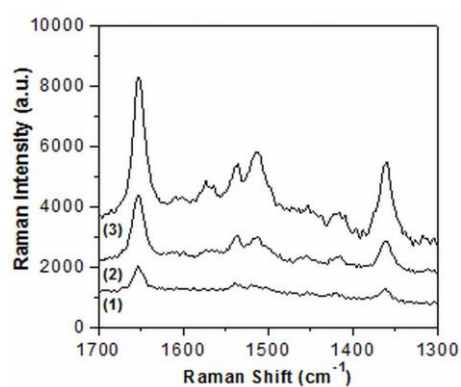
**Figure S2.** TEM image of the aggregated AgNPs in Tris-HCl buffer (50 mM, pH 7.5).



**Figure S3.** UV-vis spectra of AgNPs in aqueous solution, Tris-HCl buffer and PKA reaction solution, respectively.



**Figure S4.** The absorption intensity of aggregated AgNPs (~500 nm) as a function of the incubation time.



**Figure S5.** SERS spectra obtained from HeLa cell extracts (1) without or with the stimulation of (2) 10  $\mu$ M forskolin/20  $\mu$ M IBMX and (3) 25  $\mu$ M forskolin/50  $\mu$ M IBMX, respectively.