Supporting Information

Gold Nanoparticle-Enhanced Secondary Ion Mass Spectrometry Imaging of Peptides on Self-Assembled Monolayers

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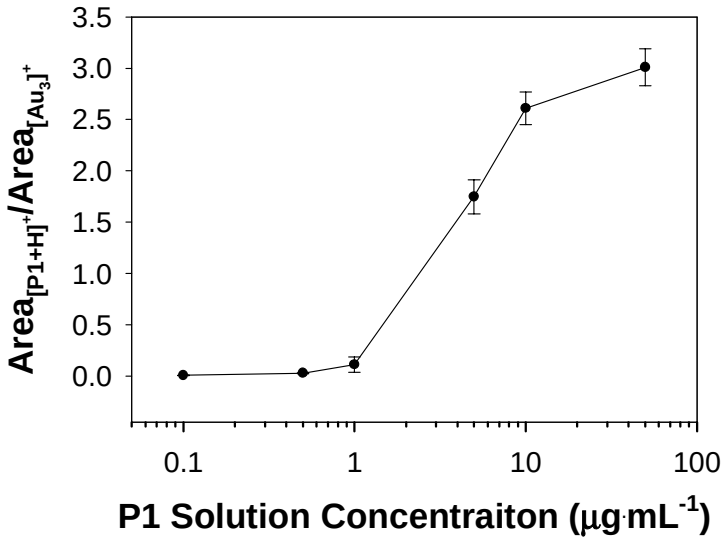

Figure S1. Change in the SIMS intensity ratio of $[P1+H]^+$ to $[Au_3]^+$ as a function of P1 peptide solution concentration on Si/APTES/AuNPs. Secondary ion intensity at *m/z* $[Au_3]^+$ decreased with increasing P1 concentration, whereas secondary ion intensity at *m/z* $[P1+H]^+$ increased with increasing P1 concentration. Peptides with different concentrations were adsorbed on the same surface for 1 h at room temperature.

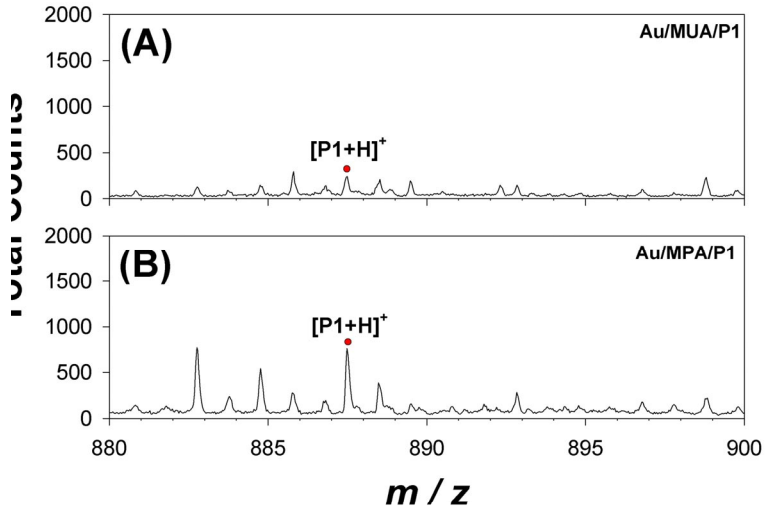

Figure S2. P1 peptide ions generation between two carboxy SAMs with different lengths in their alkane chains.

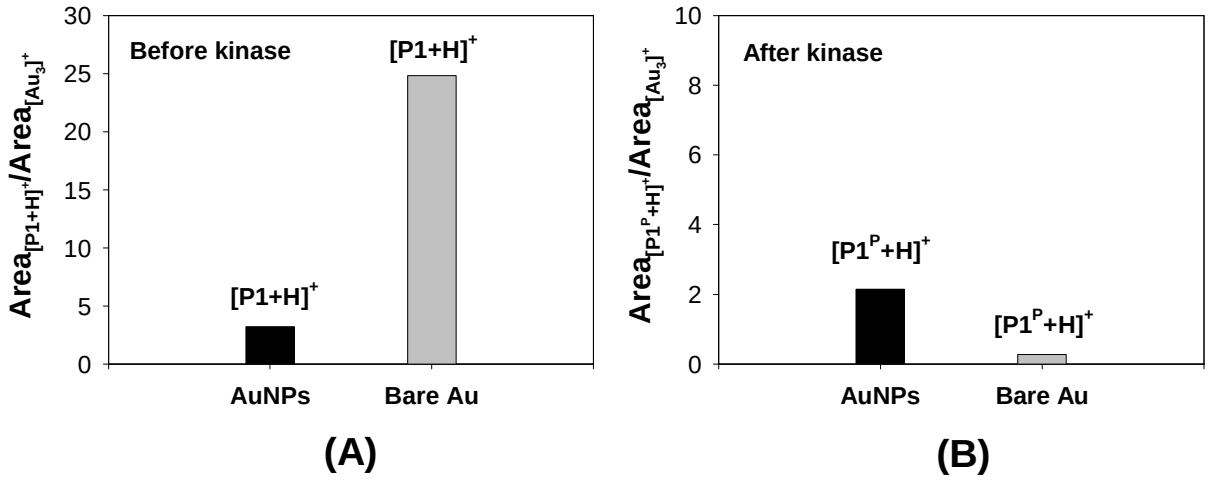

Figure S3. Secondary ion emission of peptides on SAMs/AuNPs and on bare gold (A) before and (B) after kinase reaction. In contrast to non-phosphorylated ion $[P1+H]^+$, phosphorylated ion signal $[P1^P+H]^+$ by kinase reaction was higher on the SAMs/AuNPs assembly than on bare gold. To compare the normalized intensity, the peak area of peptide ion was divided by the peak area of gold ion $[Au_3]^+$ on the same surface. For the kinase reaction, the peptide-adsorbed AuNPs/SAM and bare gold surface were incubated for 2 h at 30 ˚C with a mixture of Abl kinase (Calbiochem Inc., 2 $U \cdot \mu L^{-1}$), ATP (150 μM), and $MgCl_2$ (30 mM) in a reaction buffer (50 mM Tris pH 7.5, containing 0.05 mM EDTA, 1mM DTT, 0.015 % Tween-20, 0.1 $mg \cdot mL^{-1}$ BSA).