Colorimetric detection of Ba$^{2+}$, Cd$^{2+}$ and Pb$^{2+}$ Based on a Multifunctionalized Au NPs Sensor

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Fig. S1 The FT-IR spectra of Au NPs, 3-MPA-abc modified Au NPs and 3-MPA-abc.
Fig. S2 The size dispersion of Au NPs under different conditions. (a) Au NPs (control); (b) Au NPs with 10 µM 3-MPA-abc; (c) Au NPs with Ba$^{2+}$/Cd$^{2+}$/Pb$^{2+}$; (d) Au NPs with 3-MPA-abc in the presence of Ba$^{2+}$; (e) Au NPs with 3-MPA-abc in the presence of Cd$^{2+}$; (f) Au NPs with 3-MPA-abc in the presence of Pb$^{2+}$. 
Fig. S3 Effect of 3-MPA-abc concentration (2, 4, 5, 7.5, 10, 15, and 20 µM) on the detection of Ba$^{2+}$ by the functionalized Au NPs. (a) Photograph of the colorimetric detection effect (up: control samples, down: samples with Ba$^{2+}$); (b) UV-vis absorption intensity ratio $A/A_0$ of Au NPs solutions ($A$ represents the absorption intensity ratio of functionalized Au NPs containing Ba$^{2+}$ at 685 nm and 525 nm, $A_0$ represents the absorption intensity ratio of the blank one).
Fig. S4 The influence of pH values (5, 6, 7, 8, 10, 12, 12.5) on the detection effect of Ba$^{2+}$ by modified Au NPs. (a) Photograph of the detection effect (up: control samples, down: samples with Ba$^{2+}$); (b) UV-vis absorption intensity ratio A/A$_0$ of Au NPs (A represents the absorption intensity ratio of functionalized Au NPs containing Ba$^{2+}$ at 685 nm and 525 nm, A$_0$ represents the absorption intensity ratio of the blank one).
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Fig. S6 UV-vis absorption spectra of blank groups and functionalized Au NPs solutions containing Ba$^{2+}$ (5 μM).