

## Supporting Information

### Colorimetric assay for simultaneous detection of $\text{Cd}^{2+}$ , $\text{Ni}^{2+}$ and $\text{Co}^{2+}$ using peptide-modified gold nanoparticles

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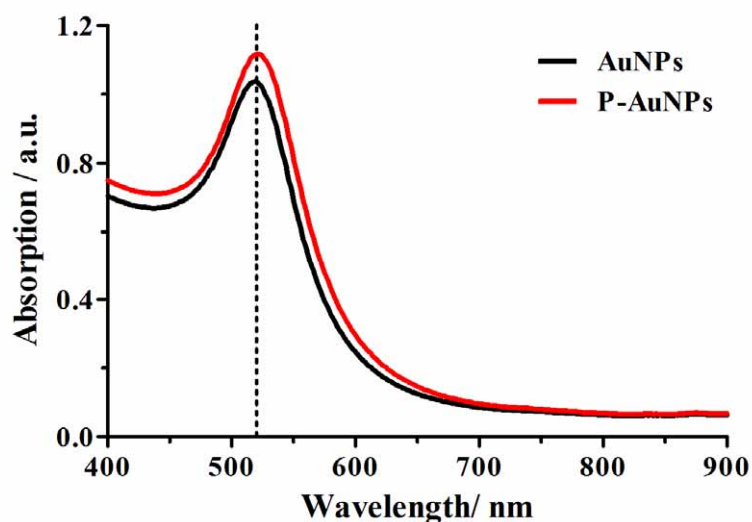
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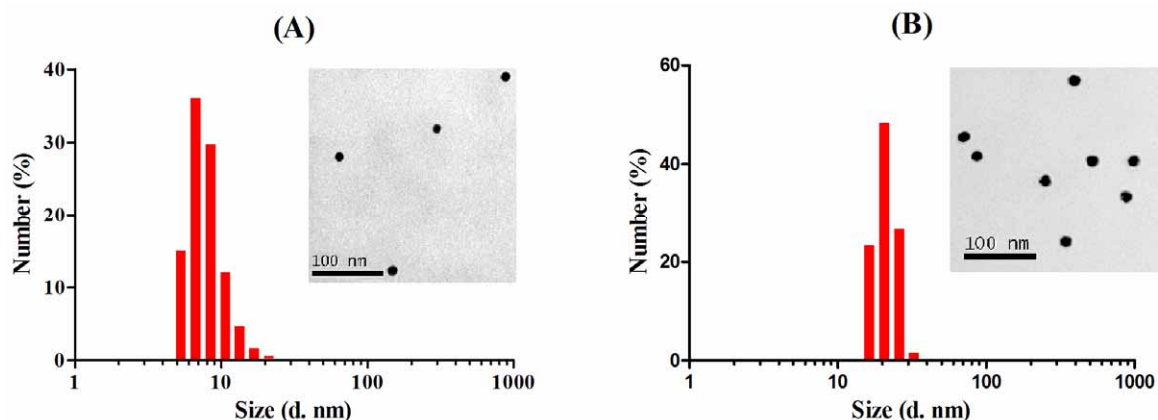
*Table S1* The information of peptides indicated in this work

Sequence	*Information
CALNN	Number of amino acids: 5; Molecular weight: 533.6; Theoretical pI: 5.52
CALNNDHHHHH	Number of amino acids: 12; Molecular weight: 1471.5; Theoretical pI: 6.62

10 \*Tools via the website: <http://web.expasy.org/protparam/>

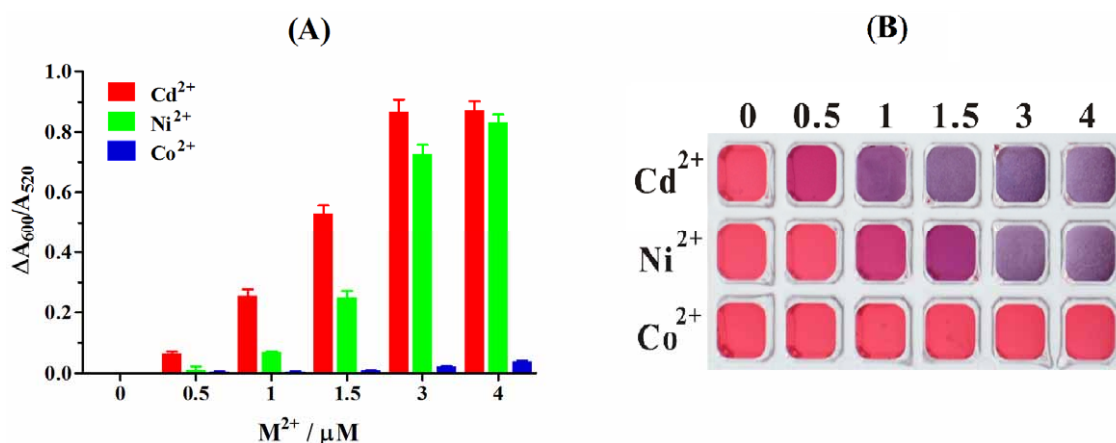


*Figure S1* UV-vis absorption spectra of the unmodified citrate-AuNPs (AuNPs) and peptide-modified AuNPs (P-AuNPs).



**Figure S2** Histograms of size distribution of (A) the unmodified citrate-AuNPs (AuNPs) and (B) peptide-modified AuNPs (P-AuNPs) characterized by dynamic light scattering (DLS) measurement. Insets: the corresponding transmission electron microscope (TEM) images.

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**Figure S3** (A) Bars represent the changes in absorption ratios of P-AuNPs ( $\Delta A_{600}/A_{520}$ ) corresponding to the  $Cd^{2+}$ ,  $Ni^{2+}$  and  $Co^{2+}$  concentration in the range 0–4.0  $\mu M$ , respectively. (B) Direct observation of the color change of P-AuNPs corresponding to the  $Cd^{2+}$ ,  $Ni^{2+}$  and  $Co^{2+}$  concentration in the range 10 0–4.0  $\mu M$ .

**Table S2.** Determination of  $Cd^{2+}$  in real samples

Sample	Added ( $\mu M$ )	Found ( $\mu M$ )	Recovery (%)
Tap water	0.60	0.58	96.67
	1.30	1.39	106.92
River water	0.60	0.64	106.67
	1.30	1.38	106.15

**Table S3.** Determination of Ni<sup>2+</sup> in real samples

Sample	Added (μM)	Found (μM)	Recovery (%)
Tap water	1.20	1.27	105.83
	2.00	2.12	106.00
River water	1.20	1.15	95.83
	2.00	1.94	97.00

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**Table S4.** Determination of Co<sup>2+</sup> in real samples

Sample	Added (μM)	Found (μM)	Recovery (%)
Tap water	6.00	6.53	108.83
	9.00	9.57	106.33
River water	6.00	6.41	106.83
	9.00	9.71	107.89