Supporting Information

Short-wave near-infrared emissive $GdPO_4:Nd^{3+}$ theranostic probe for *in vivo* bioimaging beyond 1300 nm

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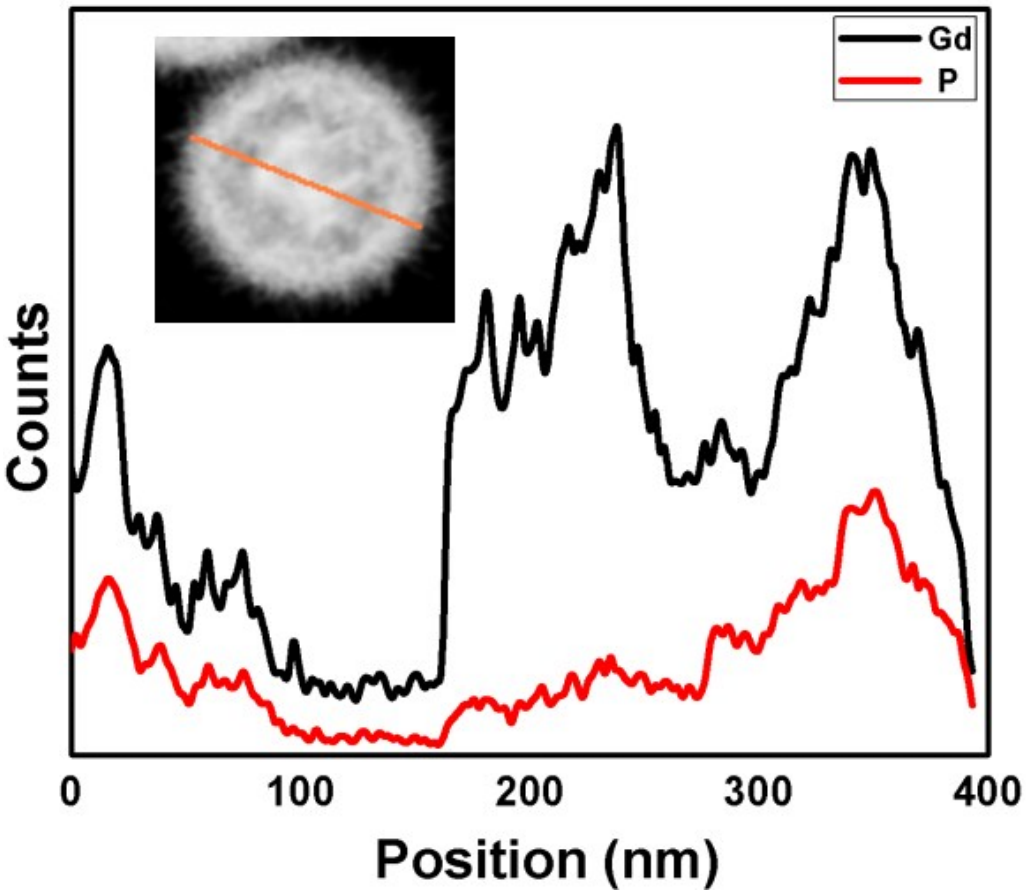

Fig S1 The EDS line scan along the line in the STEM image (inset) of $GdPO_4:Nd^{3+}$.

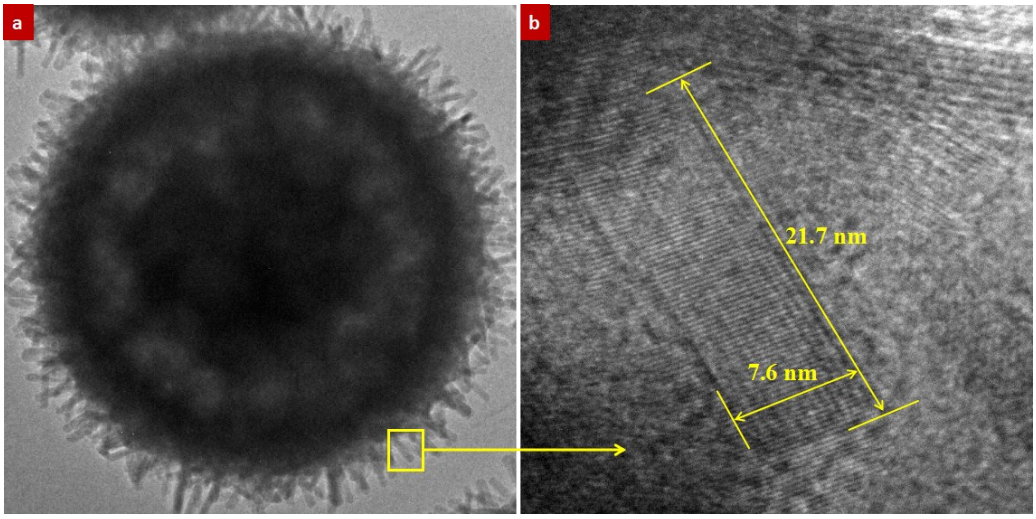

Fig. S2 TEM images of $GdPO_4:Nd^{3+}$: (a) the high-magnification TEM image; (b) the high-resolution TEM image taken from yellow rectangle of (a).

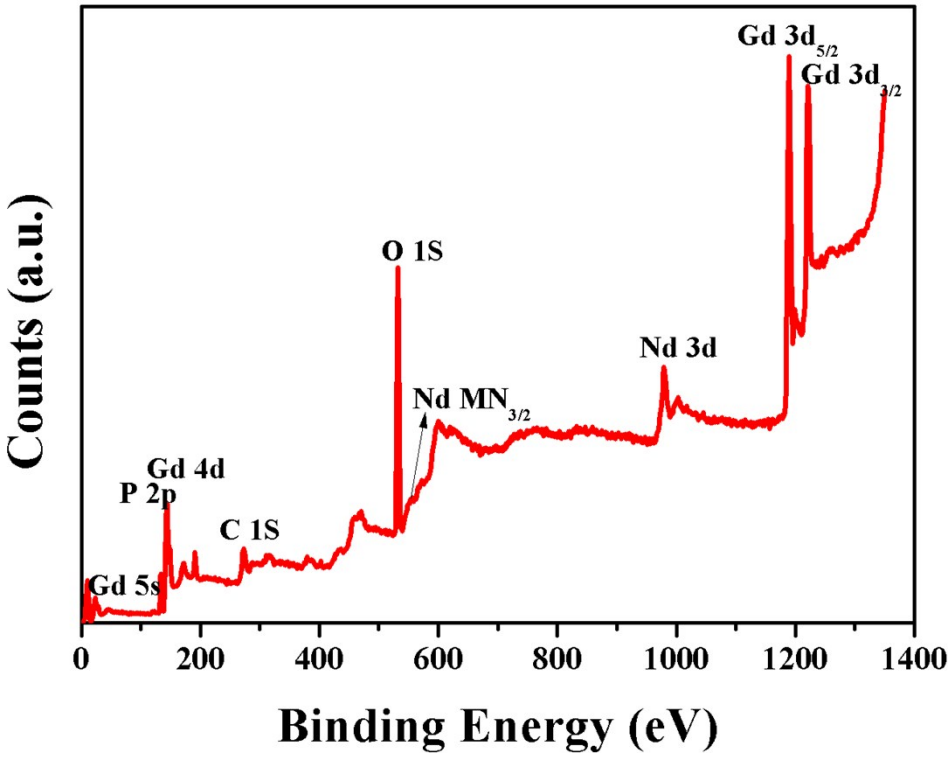

Fig. S3 The XPS spectra of the as-synthesized$GdPO_4$: 2% Nd^{3+}.The 5s level of Gd at 38 eV, 2p level of P at 142 eV, 4d level of Gd at 143 eV, 1S level of C at 286.6 eV, 1S level of O at 532 eV, $MN_{3/2}$ level of Nd at 556 eV, $3d_{5/2}$ and $3d_{3/2}$ levels of Nd at 979 and 1003 eV, $3d_{5/2}$ and $3d_{3/2}$ level of Gd at 1189 and 1221 eV.

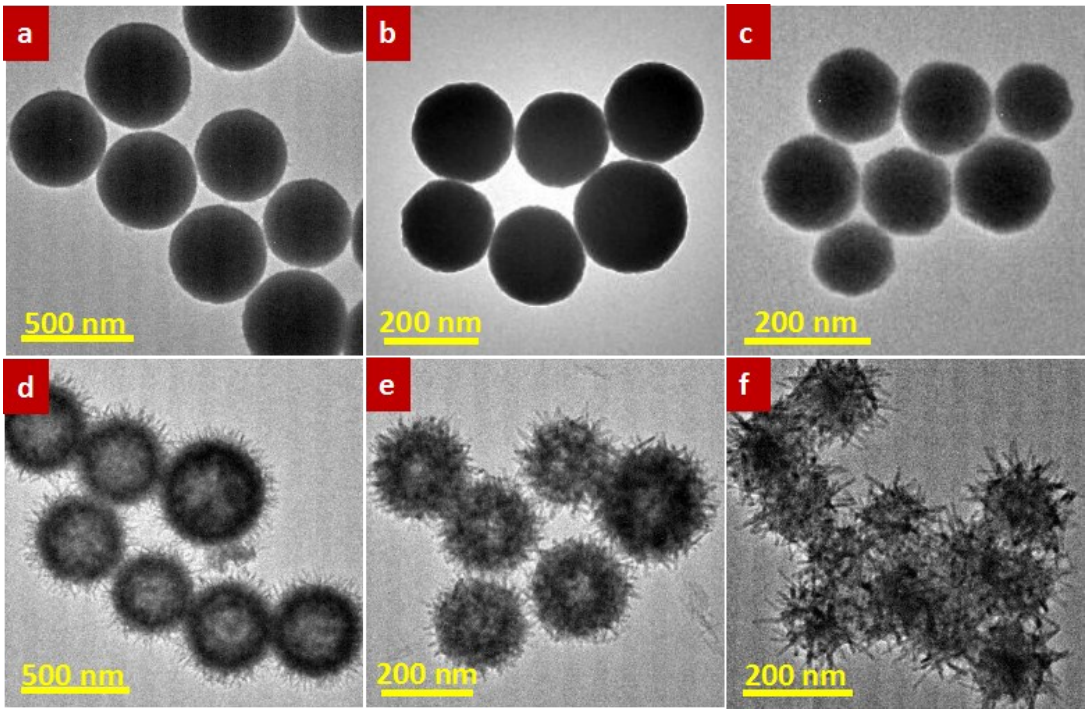

Fig. S4 The typical TEM images of the as-prepared samples: (a) and (d) are $Gd(OH)CO_3$: 2% Nd^{3+} precursor and $GdPO_4$: 2% Nd^{3+} samples with size of 380-410 nm, respectively; (b) and (e) are $Gd(OH)CO_3$: 2% Nd^{3+} precursor and $GdPO_4$: 2% Nd^{3+} samples with size of 200-220 nm, respectively; (c) and (f) are $Gd(OH)CO_3$: 2% Nd^{3+} precursor and $GdPO_4$: 2% Nd^{3+} samples with size of 110-150 nm, respectively.

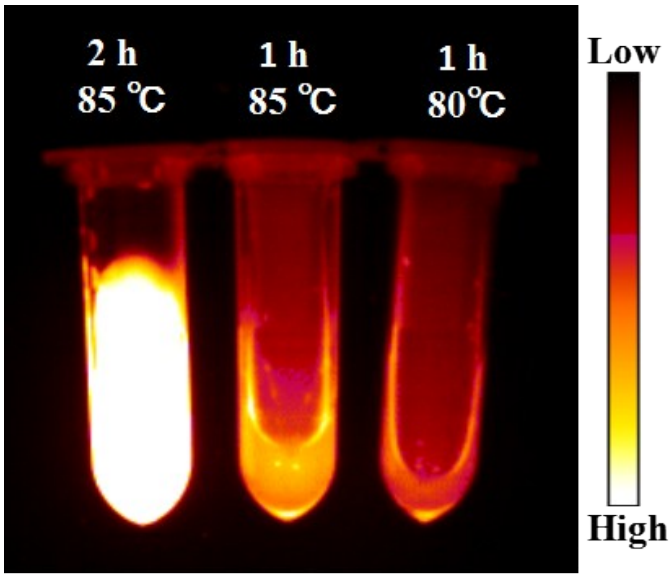

Fig. S5 *In vitro* phantom NIR-II imaging of the $GdPO_4$: 2% Nd^{3+} solution with different size under the excitation of 808 nm laser. left: 380-410 nm, middle: 200-220 nm, right: 110-150 nm.

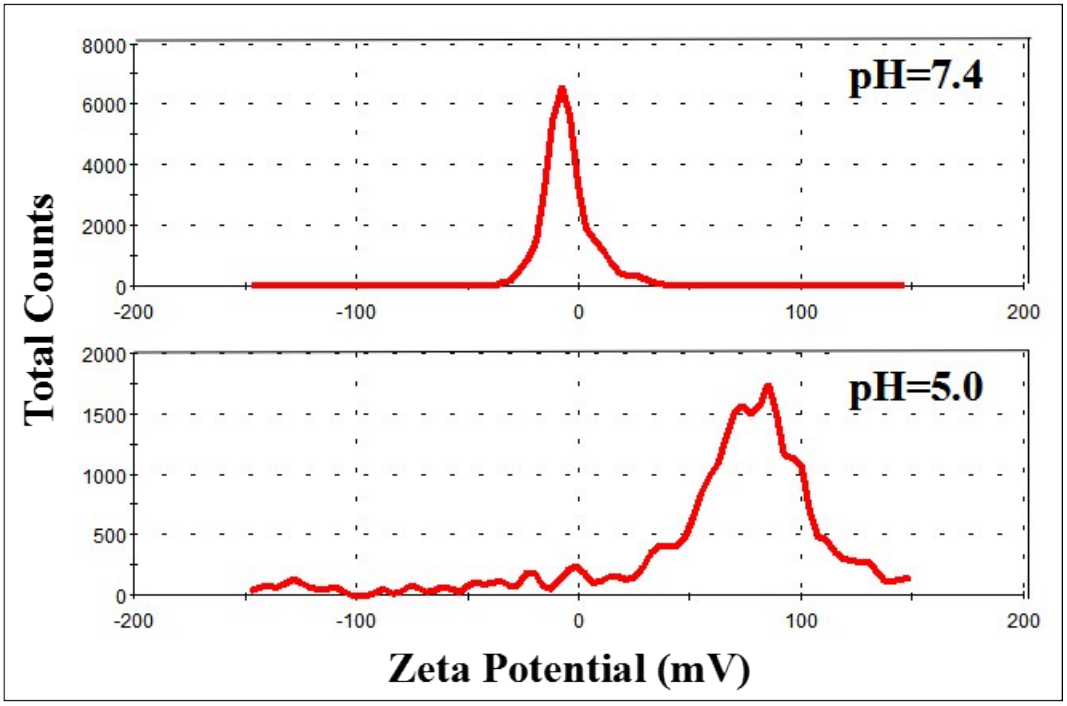

Fig. S6 Zeta potential of $GdPO_4$:Nd^{3+} under different pH values.