Supporting Information

Short-wave near-infrared emissive GdPO$_4$:Nd$^{3+}$ theranostic probe for in vivo bioimaging beyond 1300 nm

Qiuhua Yang,$^a$ Xiaolong Li,$^a$ Zhenluan Xue,$^a$ Mingyang Jiang,$^a$ Youbin Li,$^a$ Songjun Zeng,$^a$

$^a$ College of Physics and Information Science, Key Laboratory of Low-dimensional Quantum Structures and Quantum Control of the Ministry of Education, Synergetic Innovation Center for Quantum Effects and Applications, Hunan Normal University, Changsha, 410081, Hunan, China.

Email: songjunz@hunnu.edu.cn
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 GdPO₄: 2% Nd³⁺. 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, MN₃/₂ level of Nd at 556 eV, 3d₅/₂ and 3d₃/₂ levels of Nd at 979 and 1003 eV, 3d₅/₂ and 3d₃/₂ 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)CO₃: 2% Nd³⁺ precursor and GdPO₄: 2% Nd³⁺ samples with size of 380-410 nm, respectively; (b) and (e) are Gd(OH)CO₃: 2% Nd³⁺ precursor and GdPO₄: 2% Nd³⁺ samples with size of 200-220 nm, respectively; (c) and (f) are Gd(OH)CO₃: 2% Nd³⁺ precursor and GdPO₄: 2% Nd³⁺ 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.