Electronic Supplementary Information (ESI)

for

A Label-Free and Sensitive Photoluminescence Sensing Platform based on Long Persistent Luminescence Nanoparticles for Determination of Antibiotic and 2,4,6-Trinitrophenol

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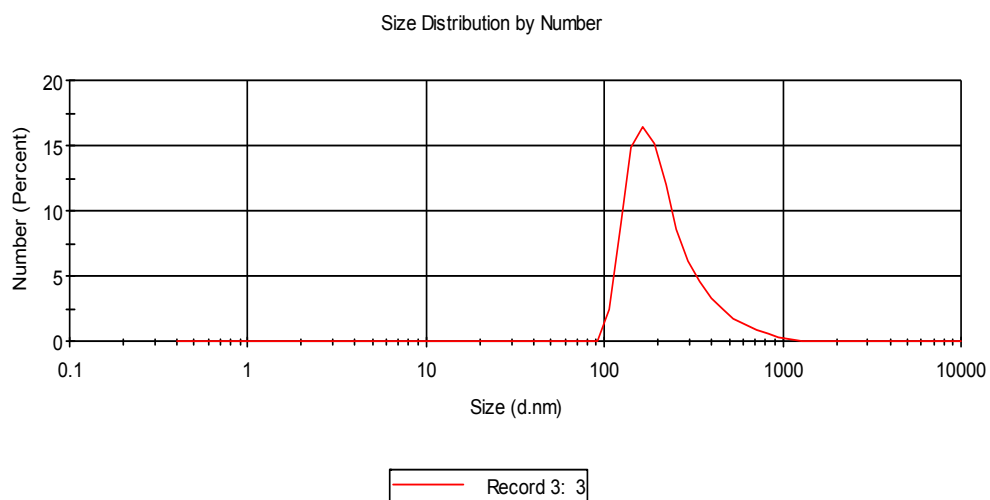
Phone: 86-871-65941087

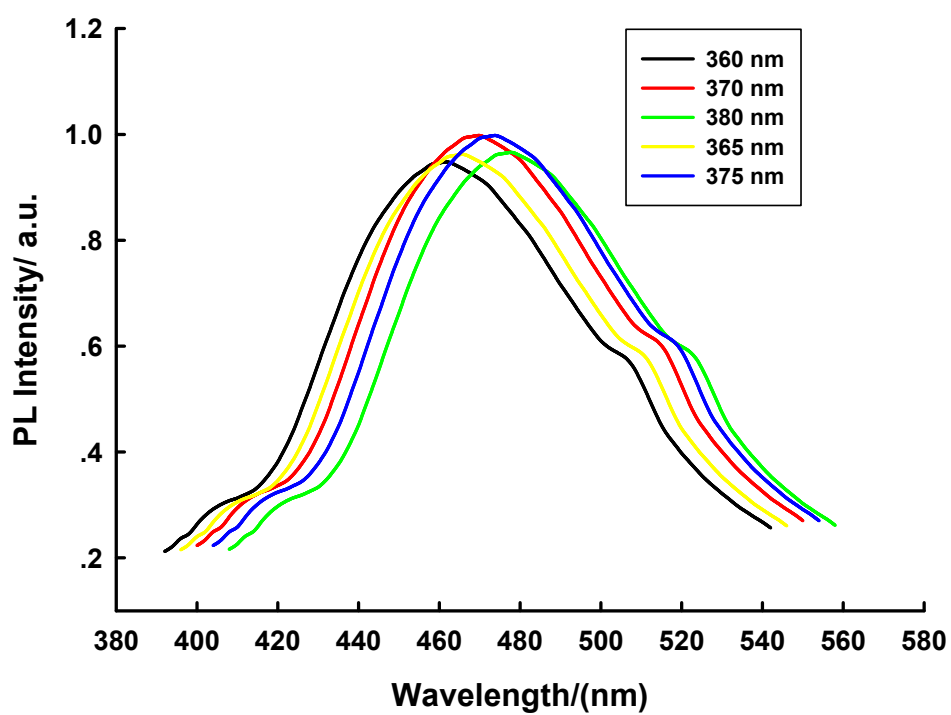Size Distribution by Number

Figure S1 DLS of the PLNPs

Figure S2 The emission spectra of the PLNPs under different excitation wavelengths ranging
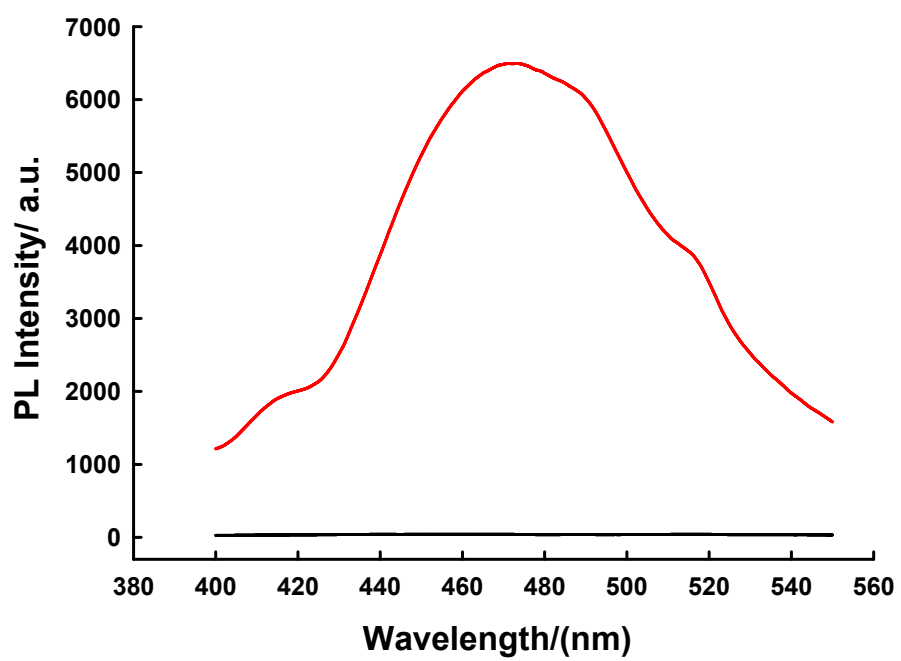
from 300 nm to 370 nm.

Figure S3 PL spectra of the biosensor in the presences and absence of antibiotic.
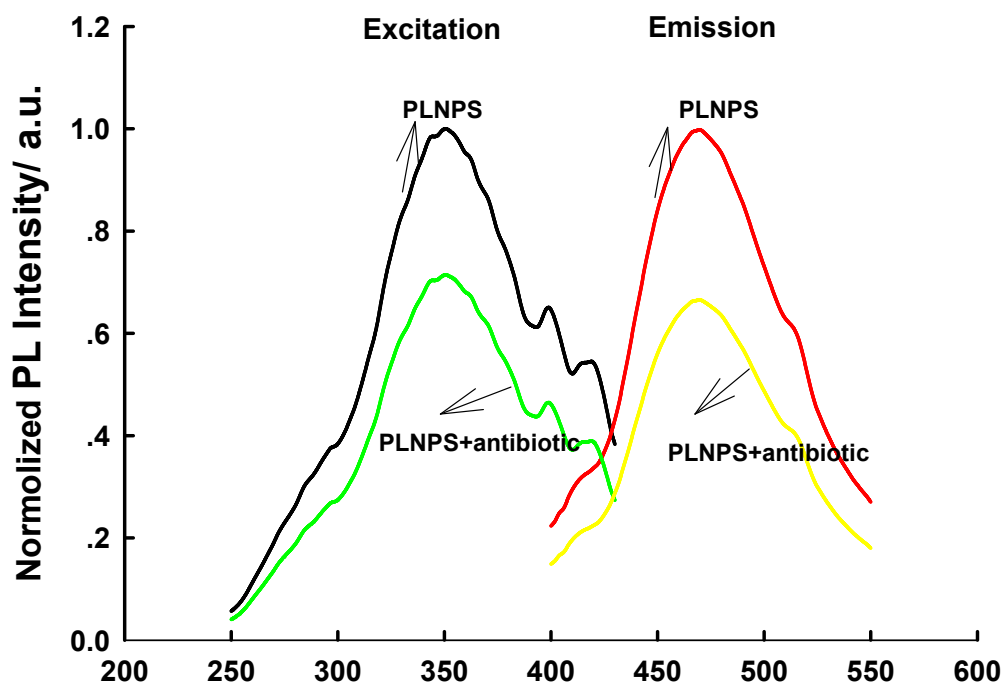
Figure S4 Photoluminescence excitation and emission spectra of the PLNPs in the presence and absence of 10 μM antibiotic.
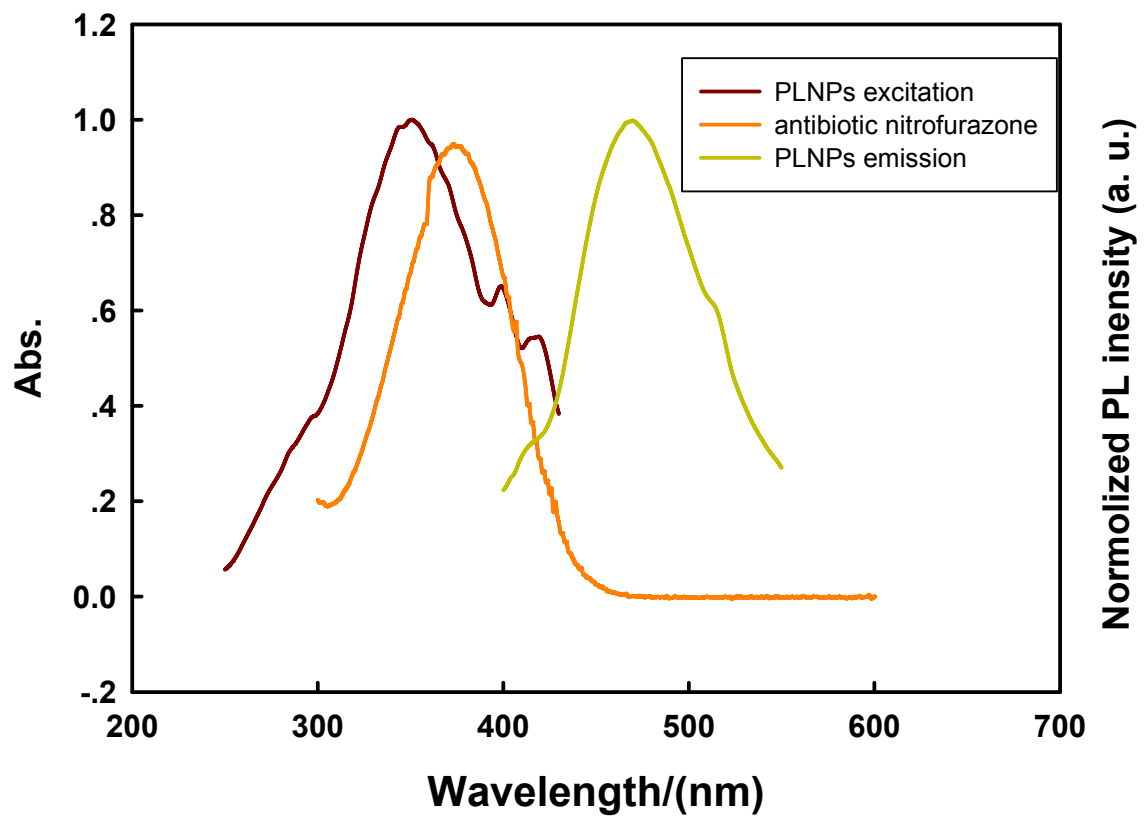
Figure S5 UV−vis absorption spectrum of antibiotic nitrofurazone and the PL excitation and
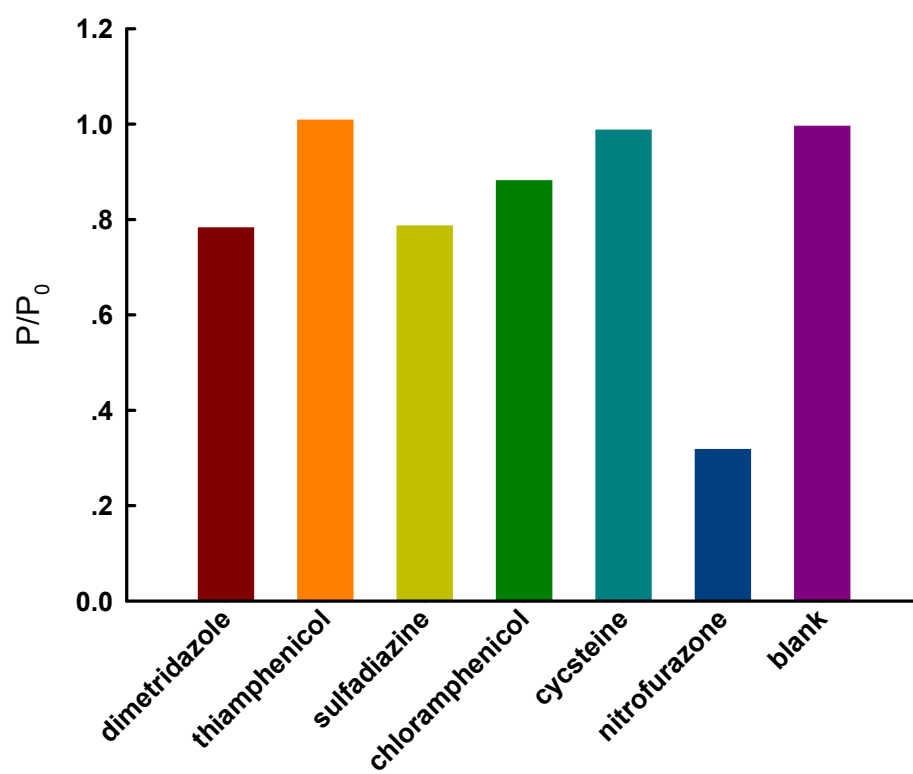
emission spectra of the PLNPs.

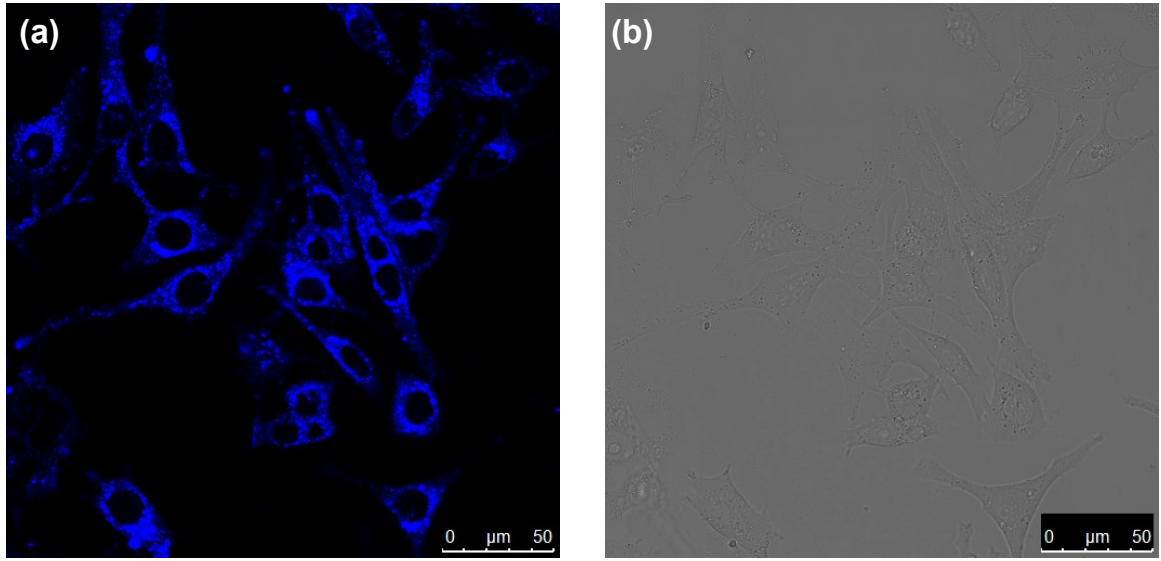**Figure S6** Selectivity of the PLNPs-based PL sensorfor antibiotic.

Figure S7 PL imaging of antibiotic in living cells. PL image of the PLNPs (a) and the bright-field image of the samples in (b).
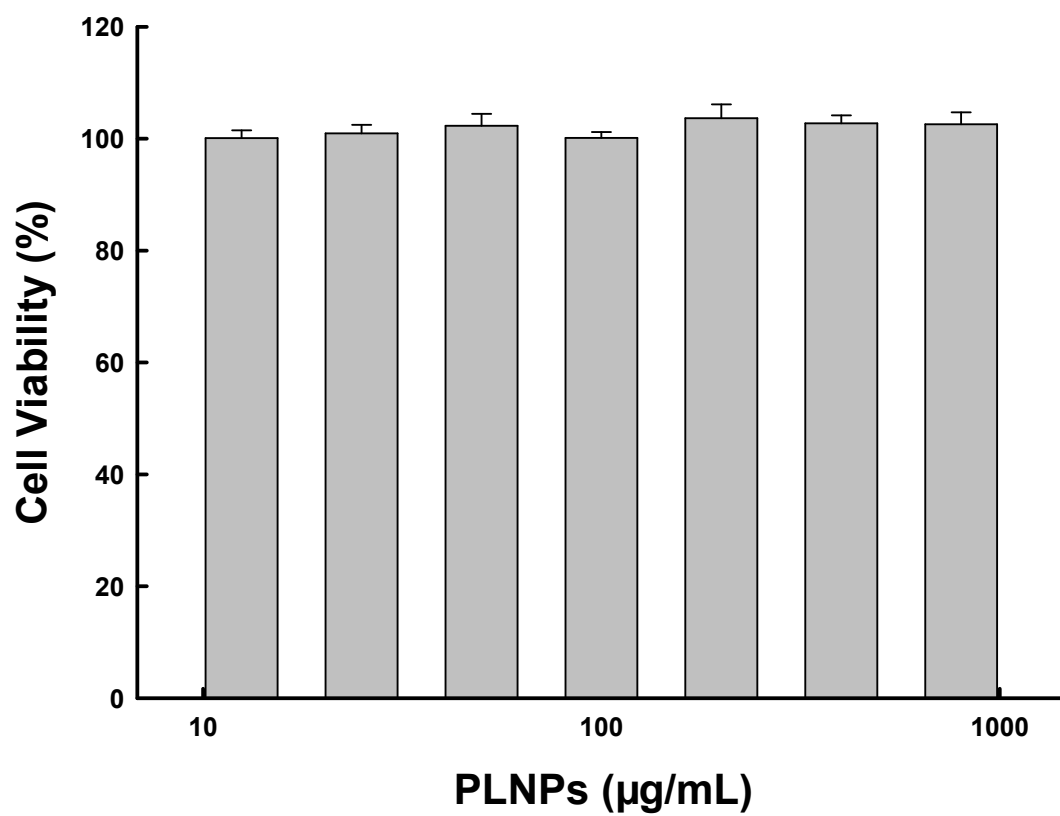
Figure S8 PL imaging of antibiotic in living cells. PL image of the PLNPs (a) and the bright-

field image of the samples in (b).

Figure S9 Photographs of the PLNPs in the absence (left) or presence (right), of the milk

solution upon removal of the excitation source after excitation using a UV lamp for 10 min.
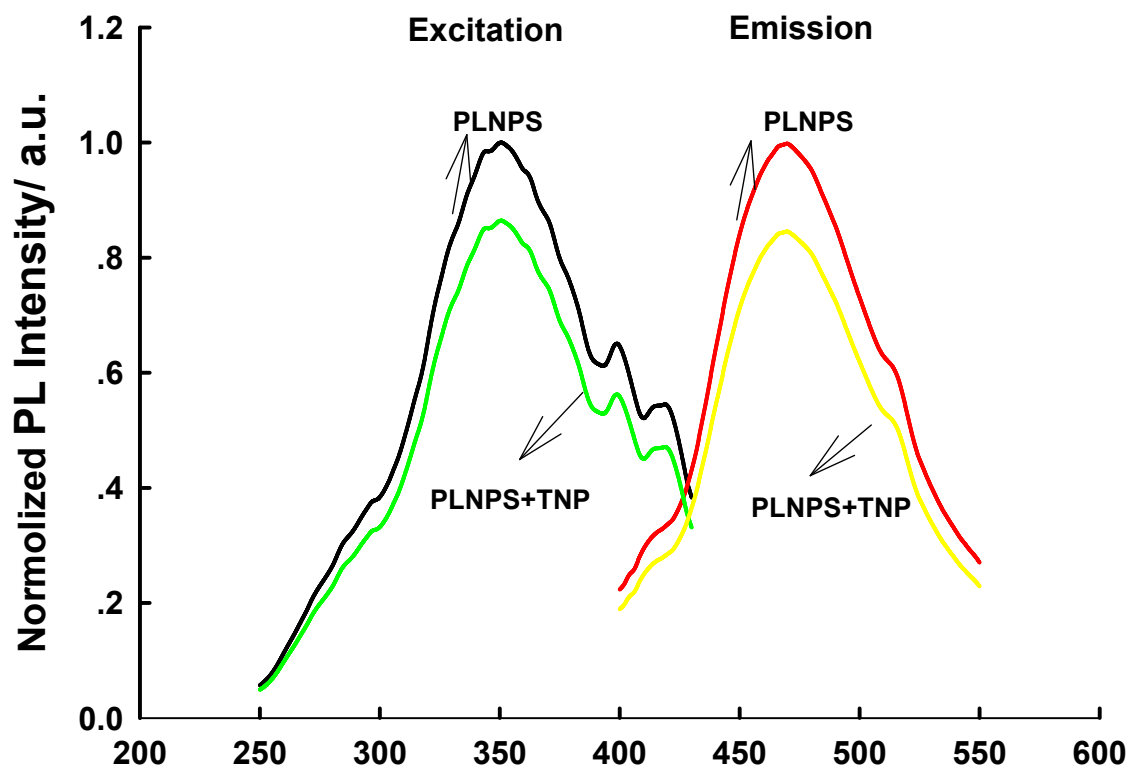
Figure S10 Photoluminescence excitation and emission spectra of the PLNPs in the presence
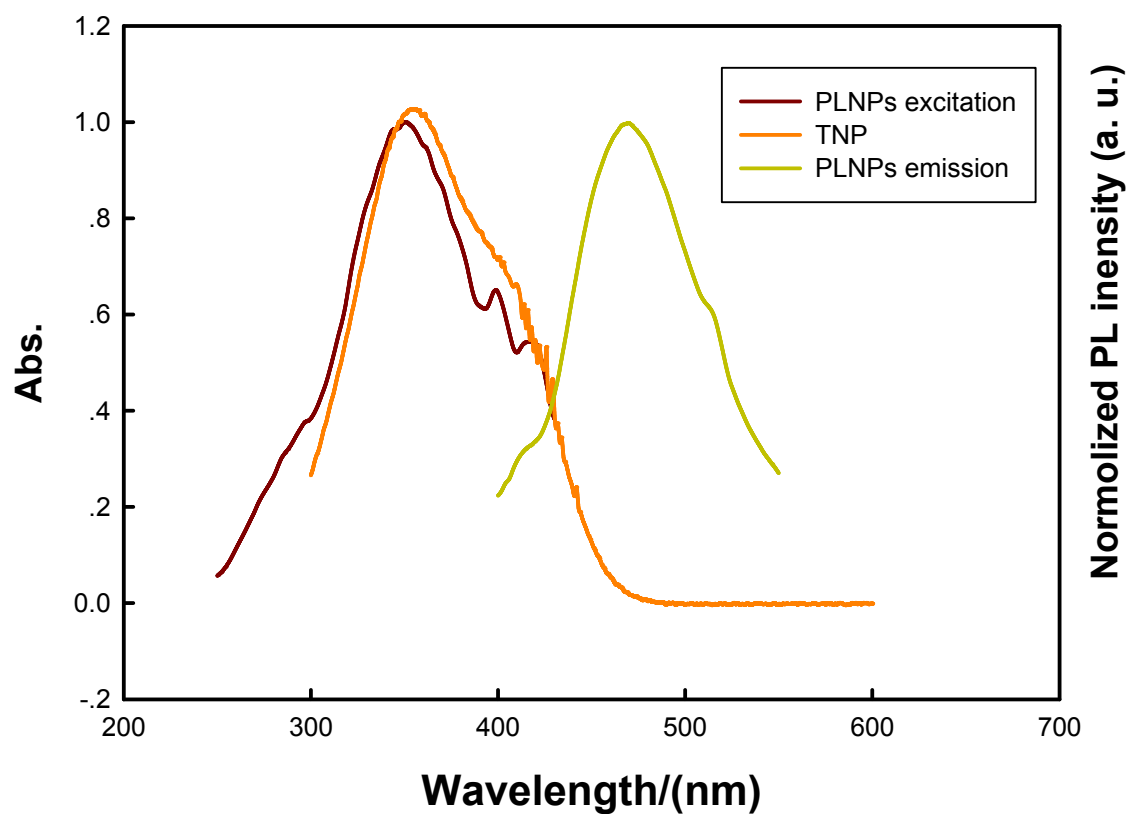
and absence of 5 μM TNP.

Figure S11 UV−vis absorption spectrum of TNP and the PL excitation and emission spectra

of the PLNPs.

Table S1. Analytical Performance of Homogeneous Detection Methods

Nanomaterial	Linear Range	Detection Limit	Reference
Highly sensitive photoluminescence energy transfer detection for 2,4,6-trinitrophenol using photoluminescent carbon nanodots	0.08 to 100 mM	22 nM TNP	*RSC Adv.*, 2014, 4, 42066- 42070
Highly Fluorescent Polyimide Covalent Organic Nanosheets as Sensing Probes for the Detection of 2,4,6-Trinitrophenol	0.5 to 10 μM	0.25 μM TNP	*ACS Appl. Mater. Interfaces*, 2017, 9, 13415–13421
Molybdenum Disulfide Quantum Dots as a Photoluminescence Sensing Platform for 2,4,6-Trinitrophenol Detection	0.099 to 36.5 μM	95 nM TNP	*Anal. Chem.* 2014, 86, 7463−7470
A heterometallic sodium–europium-cluster-based metal–organic framework as a versatile and water-stable chemosensor for antibiotics and explosives	1μM to 50μM 10 ppm to 60 ppm	0.8 μM antibiotic 0.4 ppm TNP	*J. Mater. Chem. C*, 2017, 5, 8469--8474
One-Pot Synthesis of Fluorescent Silicon Nanoparticles for Sensitive and Selective Determination of 2,4,6-Trinitrophenol in Aqueous Solution	0.02 to 120 μg/mL	6.7 ng/mL TNP	*Anal. Chem.*, 2017, 89, 3001–3008
A Label-Free and Sensitive Photoluminescence Sensing Platform based on Long Persistent Luminescence Nanoparticles for Determination of Antibiotic and 2,4,6-Trinitrophenol	50 nM-5 μM 0.025 to 2.5 μM	10 nM TNP 5 nM antibiotic	This work

Table S2: Recovery experiments of TNP in water samples.

Sample	Added concentration of TNP (nmol)	Found (nmol)	Recovery (%)	Average (%)
1	100	100.7[a]±2.58[b]	107	
2	250	250.4[a]±4.66[b]	100.4	102.5
3	2500	2500.2[a]±2.04[b]	100.2	

[a] Mean value of four determinations. [b] Standard deviation.