

Supplementary Information

pH-Responsive Biocompatible Luminescent Polymer Nanoparticles Based Phenylboronic Acid for Intracellular Imaging and Drug Delivery

Shengliang Li^{1,2,*}, Kelei Hu^{1,3,*}, Weipeng Cao¹, Yun Sun¹, Wang Sheng³, Feng Li²,

Yan Wu^{1,#}, Xing-Jie Liang^{1,#}

¹Chinese Academy of Sciences Key Lab for Biological Effects of Nanomaterials and Nanosafety, National Center for Nanoscience and Technology
No.11, First North Road, Zhongguancun, 100190 Beijing, P.R. China

²Department of Neurobiology and Anatomy, Zhongshan School of Medicine, Sun Yat-sen University, Guangzhou, China

³College of Life Science and Bioengineering Beijing University of Technology
No.100 Pingleyuan, Chaoyang District, Beijing 100124, P.R.China

*These authors contributed equally to this work.

#To whom correspondence should be addressed.

Correspondence and requests for materials should be addressed to Y. W. and X. J. L. (email:

liangxj@nanoctr.cn; wuy@nanoctr.cn)

Figures and Tables

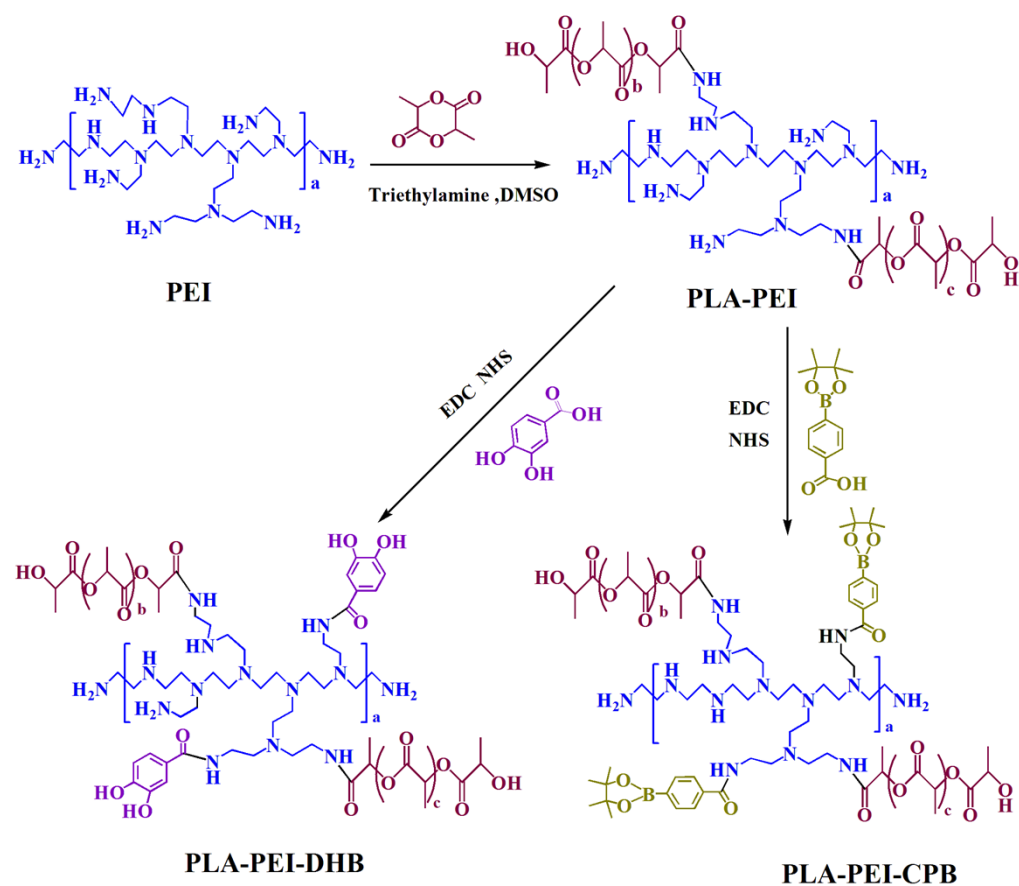


Figure S1 Scheme showing the synthesis of the PLA-PEI copolymer and its functionalization with DHB and CPB.

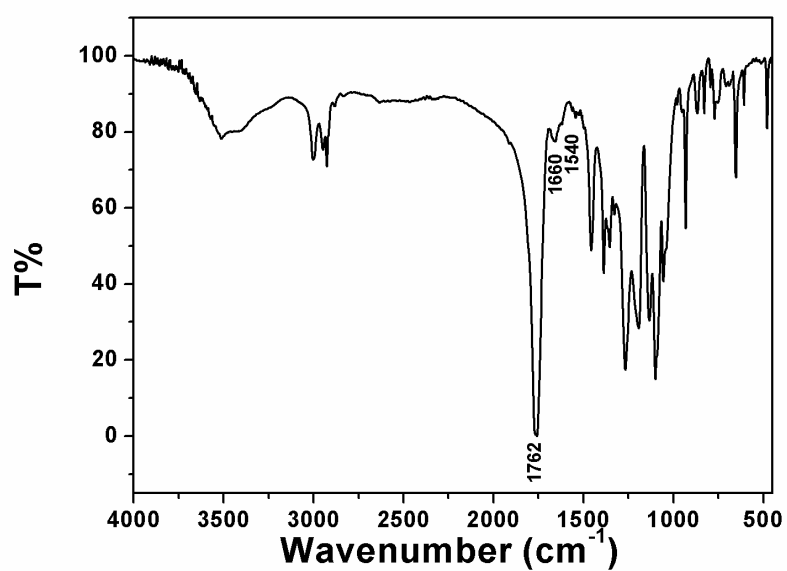


Figure S2 The FT-IR spectra of PLA-PEI copolymer

Notice that the strong absorption peak at $\sim 1762\text{ cm}^{-1}$ were attributed to the stretching vibration of the carbonyl group in PLA, and the absorption peaks at ~ 1660 and $\sim 1540\text{ cm}^{-1}$ were resulted from the amide I and II bands in PLA-PEI.

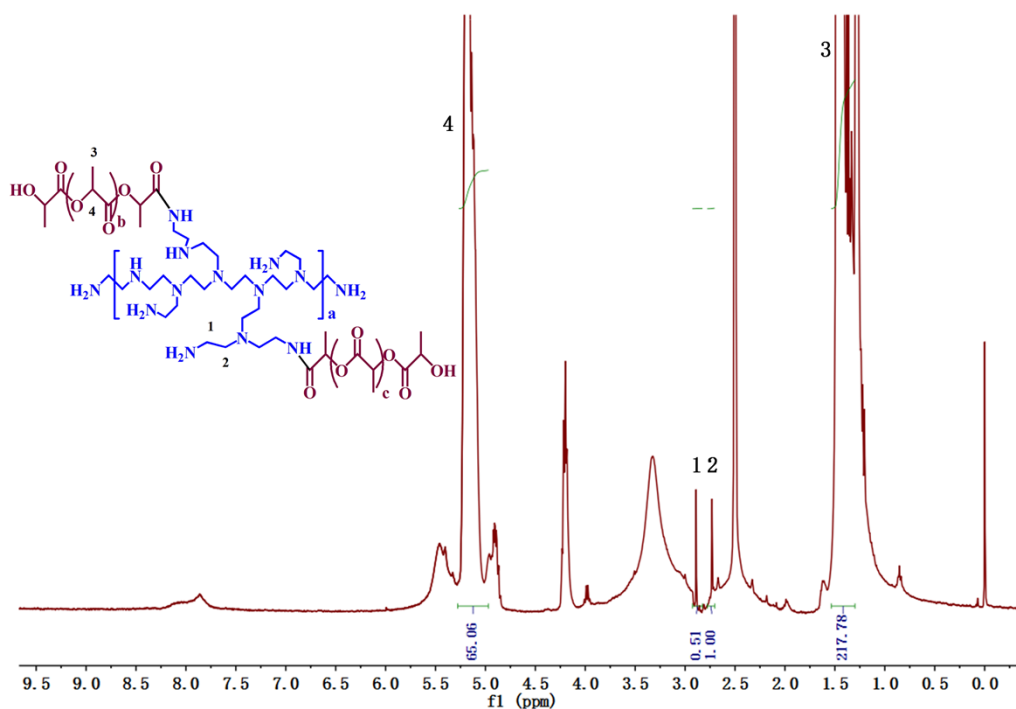


Figure S3 ^1H NMR spectra of PLA-PEI copolymer

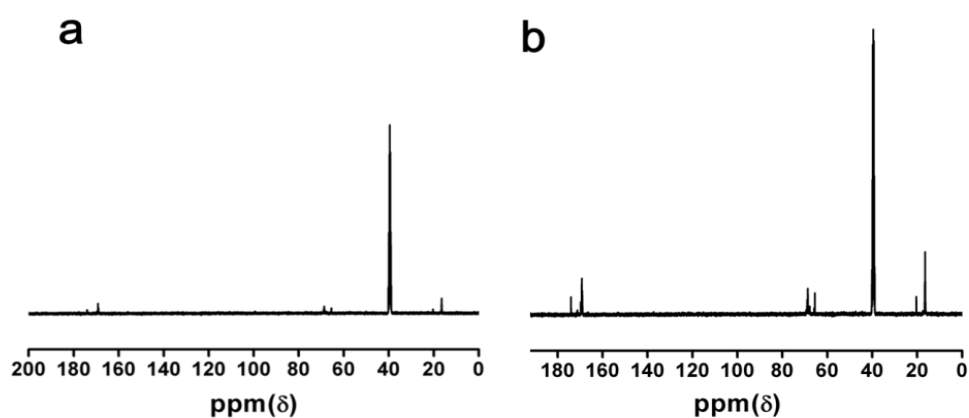


Figure S4 ^{13}C NMR spectra of PLA-PEI-CPB (a) and PLA-PEI-DHB (b).

Notice that the signals at 160-180 ppm of the ^{13}C NMR spectra also confirmed the existence of the aromatic ring moiety of PLA-PEI-DHB and PLA-PEI-CPB.

The molar ratios of the small molecules conjugated to PEI and repeating units in PEI and PLA was determined by the peak intergration ratios of the protons of the aromatic

ring in small molecules, -CH₂- protons in PEI blocks, and -CH- protons in PLA blocks.

Table S1. Quantum yield using quinoline sulfate as a reference

Sample	Abs at 360 nm	Integrated emission intensity	QY
Quinoline Sulfate	0.019	122315.2538	0.54(Known)
FBNPs	0.027	36563.2408	0.226

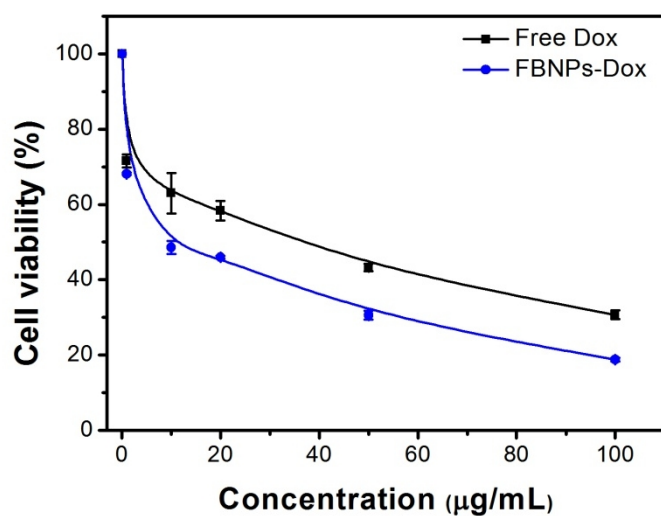


Figure S5. Cell viability of DOX resistant cell lines MCF-7R after treatment with pH-responsive Dox-loaded nanoparticles.

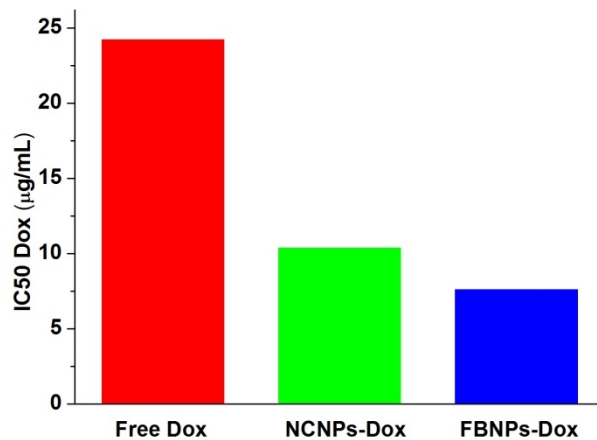


Figure S6. IC₅₀ of free DOX, NCNPs-Dox and FBNPs-Dox were calculated.

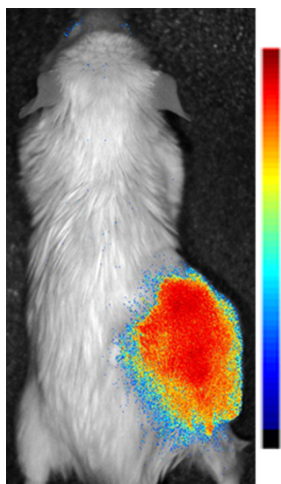


Figure S7. In vivo fluorescence image of FBNPs injected into mice tumor.