

Supporting information

Development of phenylboronic acid-functionalized nanoparticles for emodin delivery

Bo Wang,^{a,b} Limin Chen,^b Yingjuan Sun,^b Youliang Zhu,^b Zhaoyan Sun,^b Tiezhu An,^a Yuhua Li,^{*a}

Yuan Lin,^{*b} Daping Fan,^c and Qian Wang^d

*^a College of Life Science, Northeast Forestry University, Harbin 150040, PR China. **

*^b State Key Laboratory of Polymer Physics and Chemistry, Changchun Institute of Applied Chemistry,
Chinese Academy of Sciences, Changchun 130022, PR China.*

^c School of Medicine, University of South Carolina, Columbia, South Carolina 29208, USA

*^d Department of Chemistry and Biochemistry, University of South Carolina, Columbia, South Carolina
29208, USA*

Preparation of PBA-ARS nanoparticles

Briefly, 0.1 mg PBAH and 0.1 mg ARS both dissolved in DMSO were mixed together. Then the mixture solution was added dropwise to deionized water under stirring for 30 min. Final volume of the PBA-ARS solution was 1 mL (DMSO/H₂O = 3:7, v/v). Then, the mixture was dialyzed (MWCO 3500 Da) against 2000 mL of deionized water for 24 h. After dialysis, the polymer suspension was collected. The UV absorbance at 421 nm was measured to calculate the drug concentration with UV-vis spectrophotometer. The fluorescence intensity was measured at room temperature by a fluorescence spectrometer (Hitachi F-2500) using an emission wavelength of 468 nm. The excitation and emission bandwidths were both 2.5 nm.

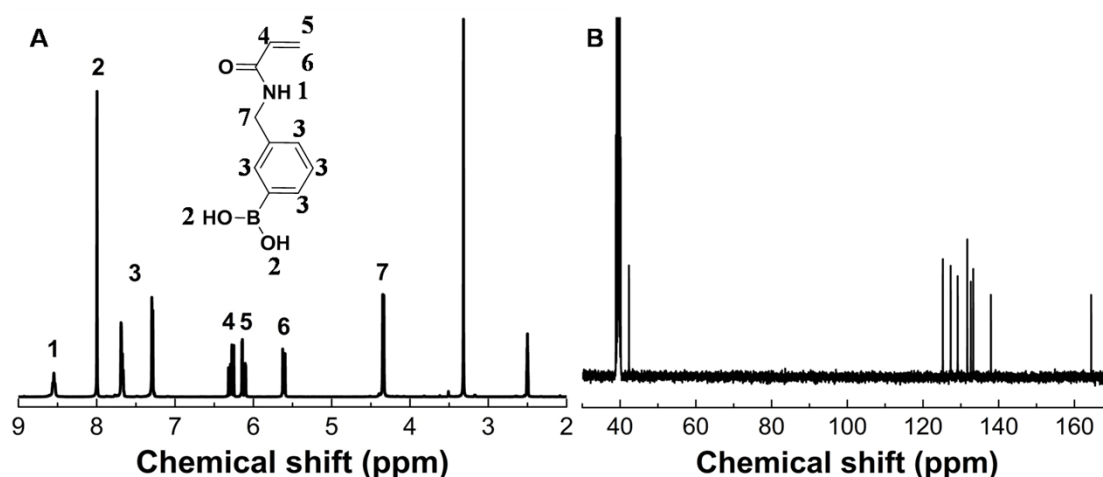


Fig. S1 ¹H NMR (A, 400 MHz, DMSO-*d*₆) and ¹³C NMR spectra (B, 75 MHz, DMSO-*d*₆) of monomer.

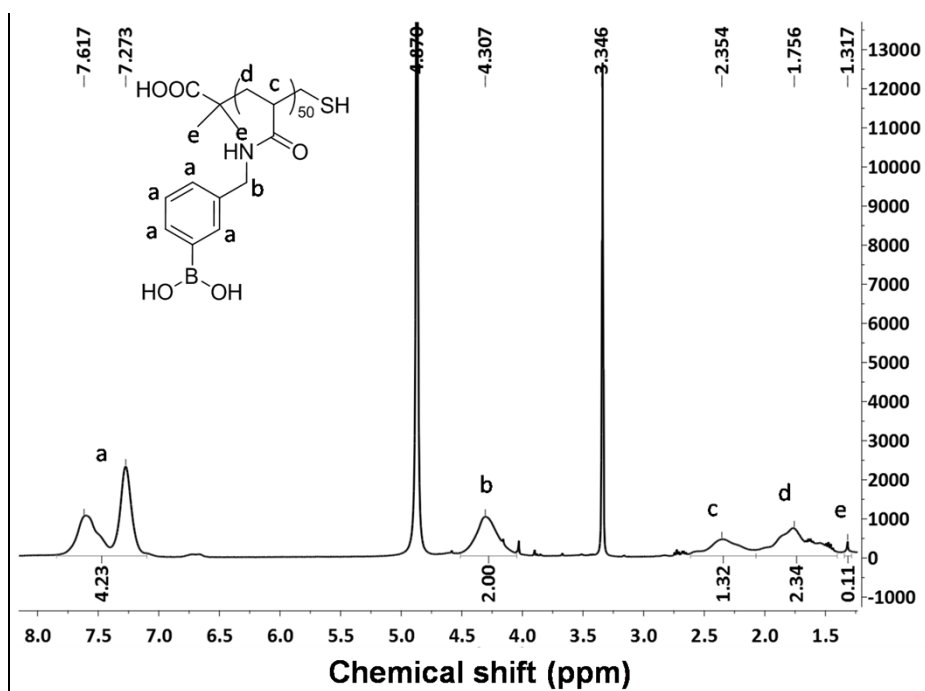


Fig. S2 ^1H NMR spectrum (400 MHz, CD_3OD) of PBAH.

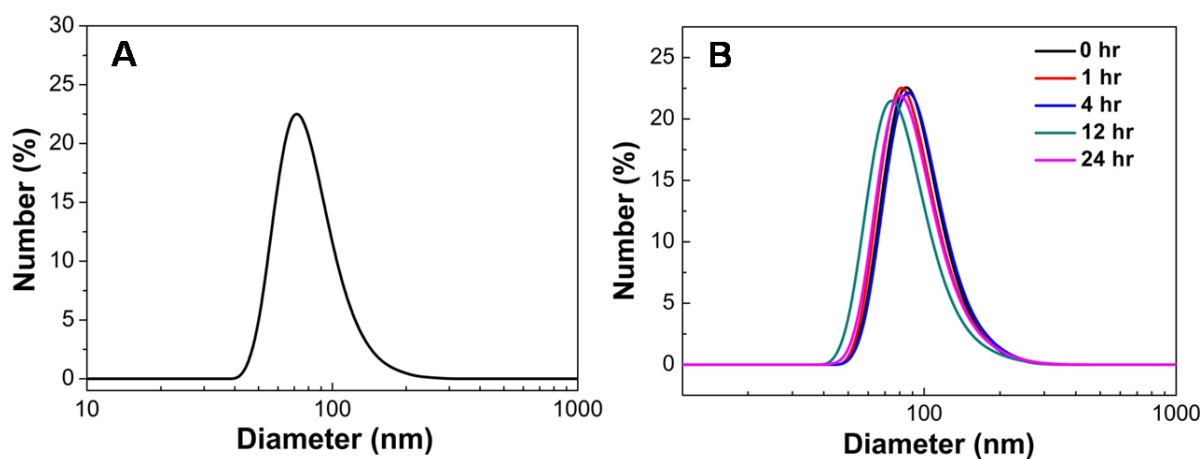


Fig. S3 (A) Size distribution profile of PBA-NPs determined by DLS. The initial PBAH concentration was 2 mg mL^{-1} . (B) The time course DLS analysis of the diameter distributions of PBA-NPs in 20 mM DTT solution.

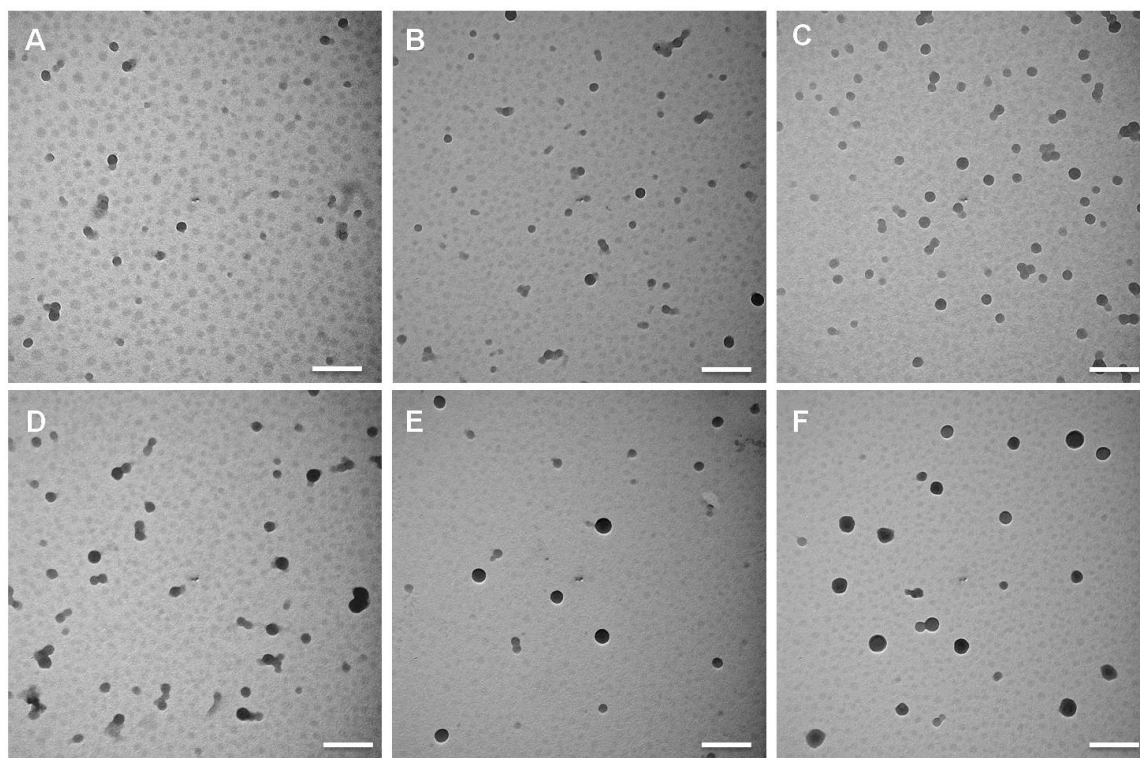


Fig. S4 TEM images of PBA-NPs assembled at various stirring time: (A) 30 sec, (B) 1 min, (C) 5 min, (D) 10 min, (E) 30 min, and (F) 60 min. The initial PBAH concentration was 0.5 mg/mL, and the volume ratio of methanol and water was 1:9. The scale bars are 200 nm.

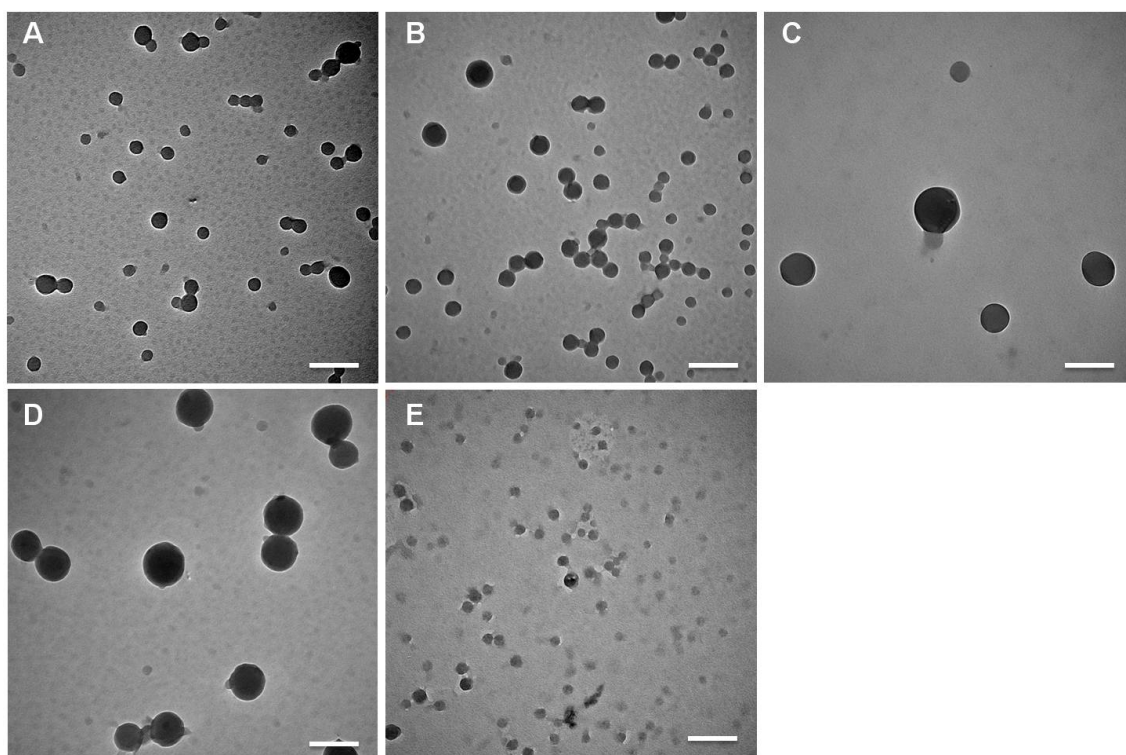


Fig. S5 TEM images of PBA-NPs assembled at various volume ratios of methanol and water: (A) 1:9, (B) 2:8, (C) 3:7, (D) 4:6, and (E) 5:5. The scale bars are 200 nm.

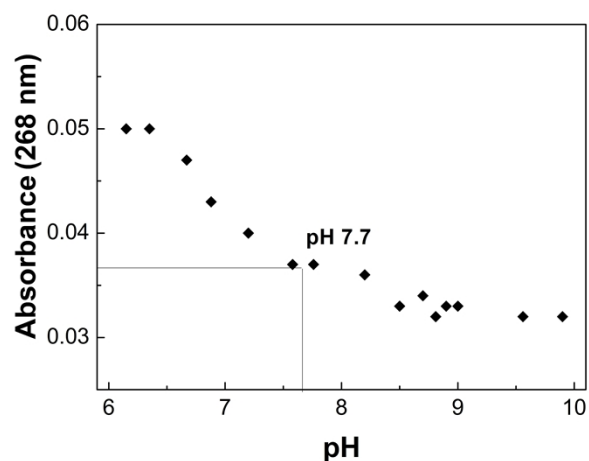


Fig. S6 The absorbance at 268 nm for PBAH at various pH solution.

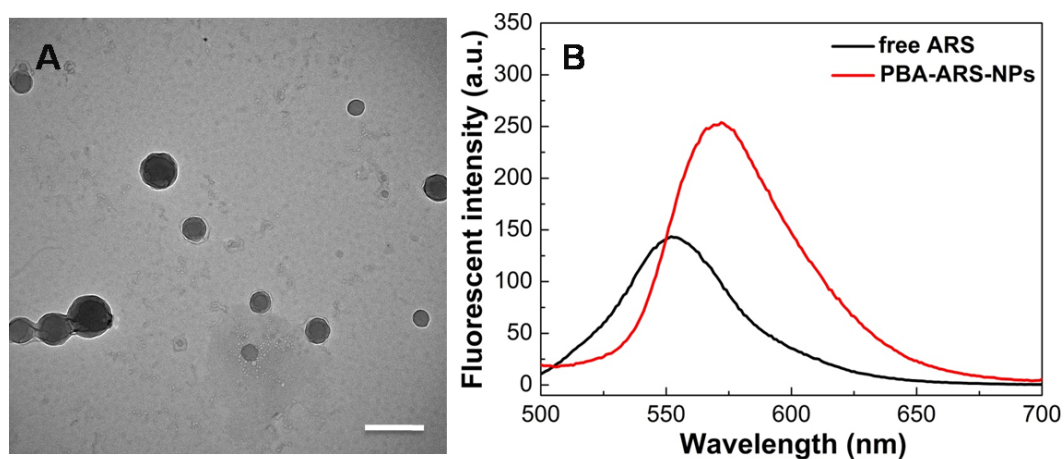


Fig. S7 (A) TEM image of PBA-ARS-NPs. The scale bar is 200 nm. (B) The fluorescent spectrum of PBA-ARS-NPs solution and ARS solution. The concentrations of ARS were kept the same in both solutions.

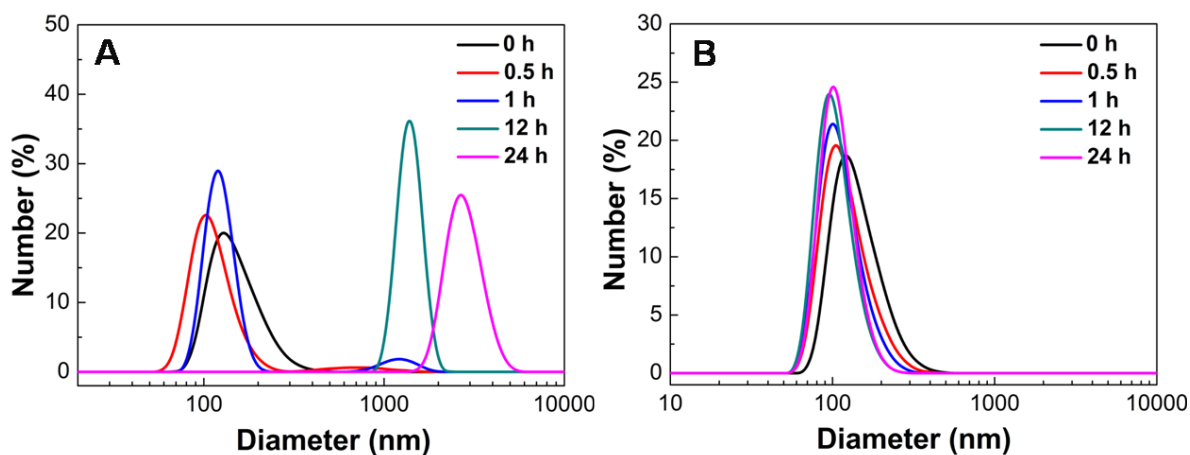


Fig. S8 The time course DLS analysis of the diameter distributions of PBA-Emodin-NPs at (A) pH 5.0, and (B) pH 7.4.