Supporting Information for

A Facile Strategy to Prepare Redox-Responsive Amphiphilic PEGylated Prodrug with High Drug Loading Content and Low Critical Micelle Concentration

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Determination of the loading content of POEGSSMIBu and POEGMIBu

The preparation of IBu-loaded polymeric prodrug micelles were conducted in dialysis method. The initial weight ratio of ibuprofen to copolymer was kept equal to 3:10 for POEGSSMIBu micelles and for POEGMIBu micelles. The representative ^{1}H NMR spectra of IBu loaded POEGSSMIBu and POEGMIBu were shown in Fig. S1 and Fig. S2. The total drug loading contents were calculated according to the integrals of MA units (black) and the integrals of Ibuprofen units (red). Both the weight of POEGSSMIBu and POEGMIBu copolymer (W_P) and the weight of conjugated IBu (W_{DC}) was calculated from the integrals of corresponding signals at δ 5.46 ppm ($H^{d'}$), the weight of whole IBu (W_{DM}), including conjugated IBu and encapsulated IBu, was determined based on the integrals of corresponding signals at δ 2.45 ppm (H^k), W_{Dt} is the total weight of IBu used in drug-encapsulated experiment.

$$DLC\,(wt\%) = W_{DM}/W_P \times 100\% = (I_{k/2} \times M_{IBu})/(I_{d'} \times M_P) \times 100\%$$

$$DLE\,(wt\%) = (W_{DM} - W_{DC})/W_{Dt} \times 100\% = [(I_{k/2} - I_{d'}) \times M_{IBu} \times W_P]/(I_{d'} \times M_P \times W_{Dt}) \times 100\%$$

$I_{k/2}$ is the integrals of signals which ascribed to whole IBu moieties, $I_{d'}$ is the integrals of signals which assigned to conjugated IBu molecules, M_{IBu} is the molecular weight of IBu, M_P is the molecular weight of one repeating unit of the copolymer, W_{Dt} is the weight of free IBu used in drug-encapsulated experiment.

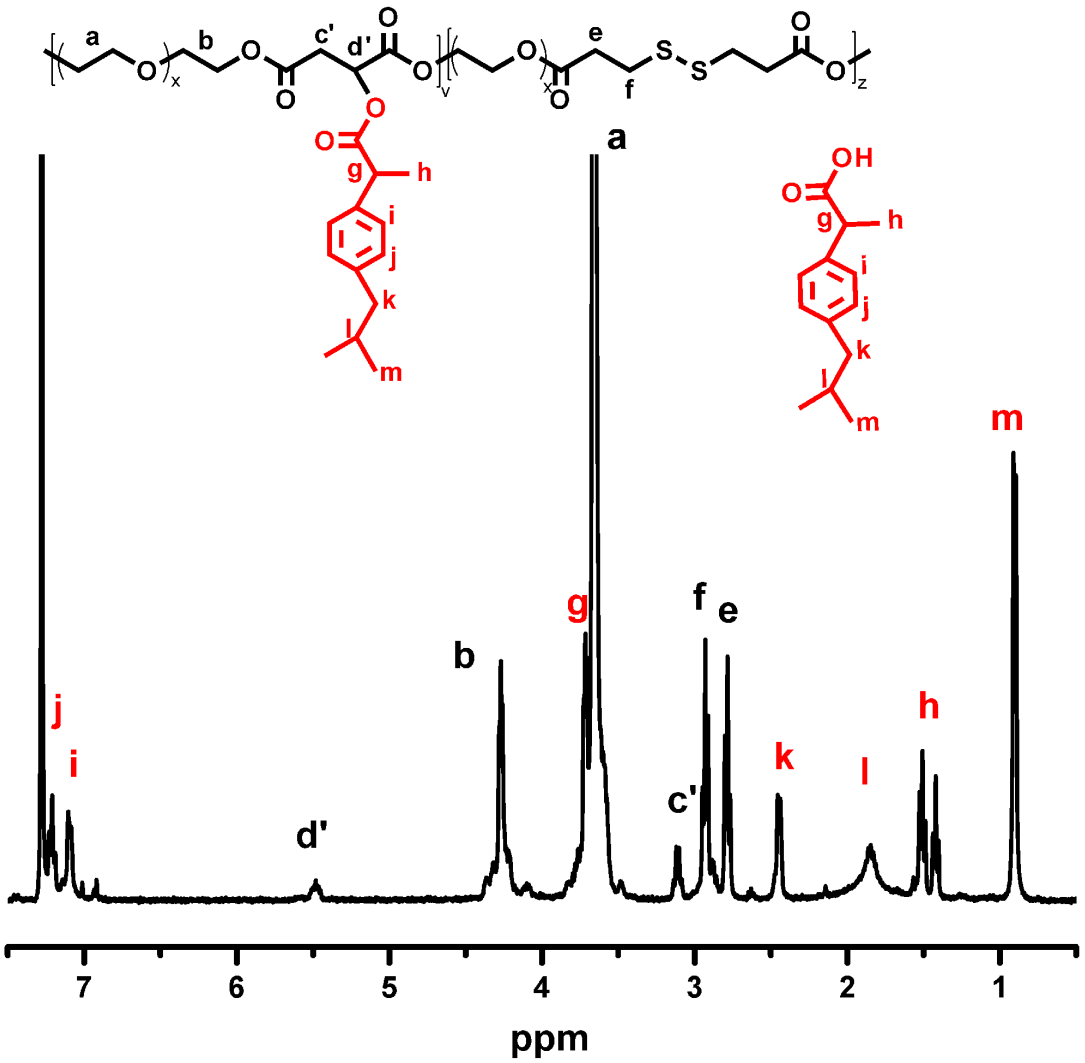

Fig. S1 ^{1}H NMR spectrum of IBu-loaded POEGSSMIBu.

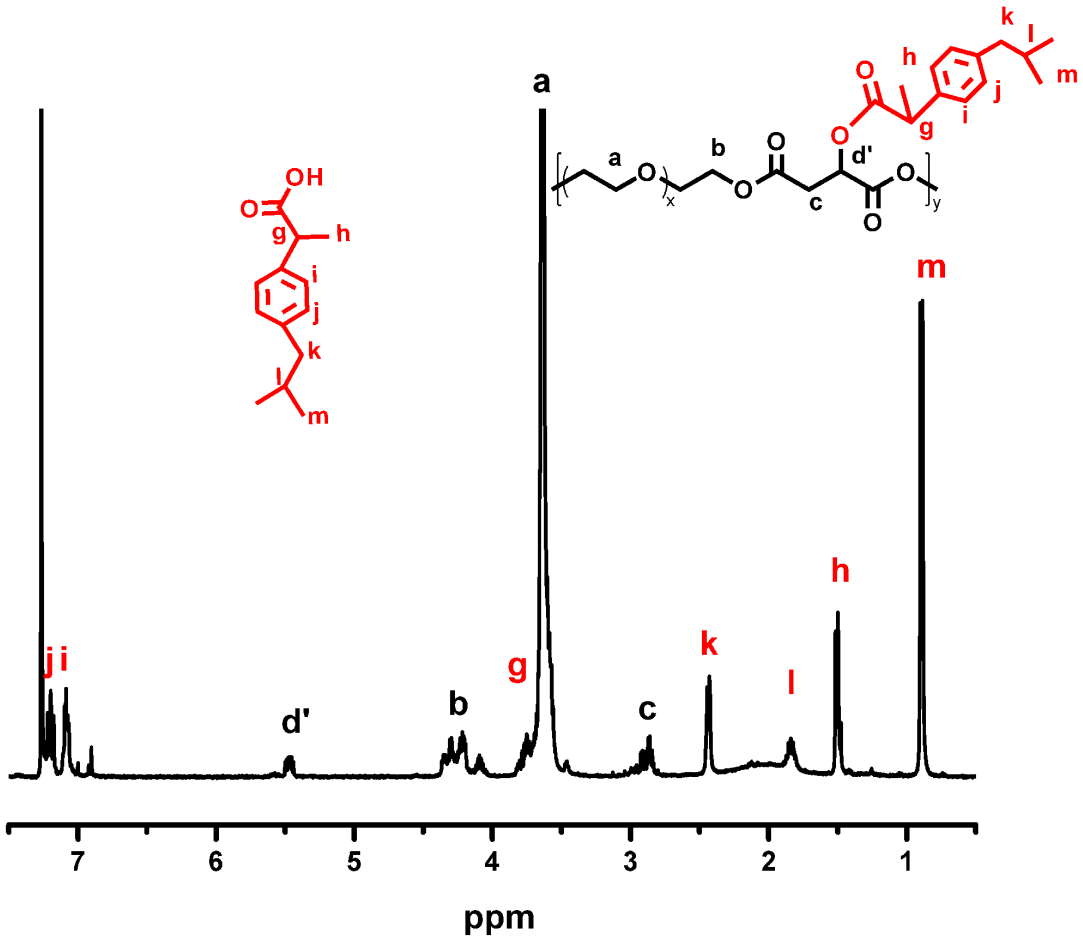

Fig. S2 ^{1}H NMR spectrum of IBu-loaded POEGMIBu.

Determination of the Calibration curves of IBu in PBS with and without DTT

Calibration curves of IBu in pure phosphate buffer (PBS) (0.01M, pH = 7.4) and phosphate buffer (PBS) (0.01M, 10 mM DTT, pH = 7.4) were determined by measuring the absorption of IBu with known concentrations via Shimadzu UV2550 UV-vis spectrophotometer at a wavelength of 222 nm, which is the typical absorption for IBu. The absorption as a function of IBu concentration was recorded to generate the calibration curve, which is shown in Fig. S3.

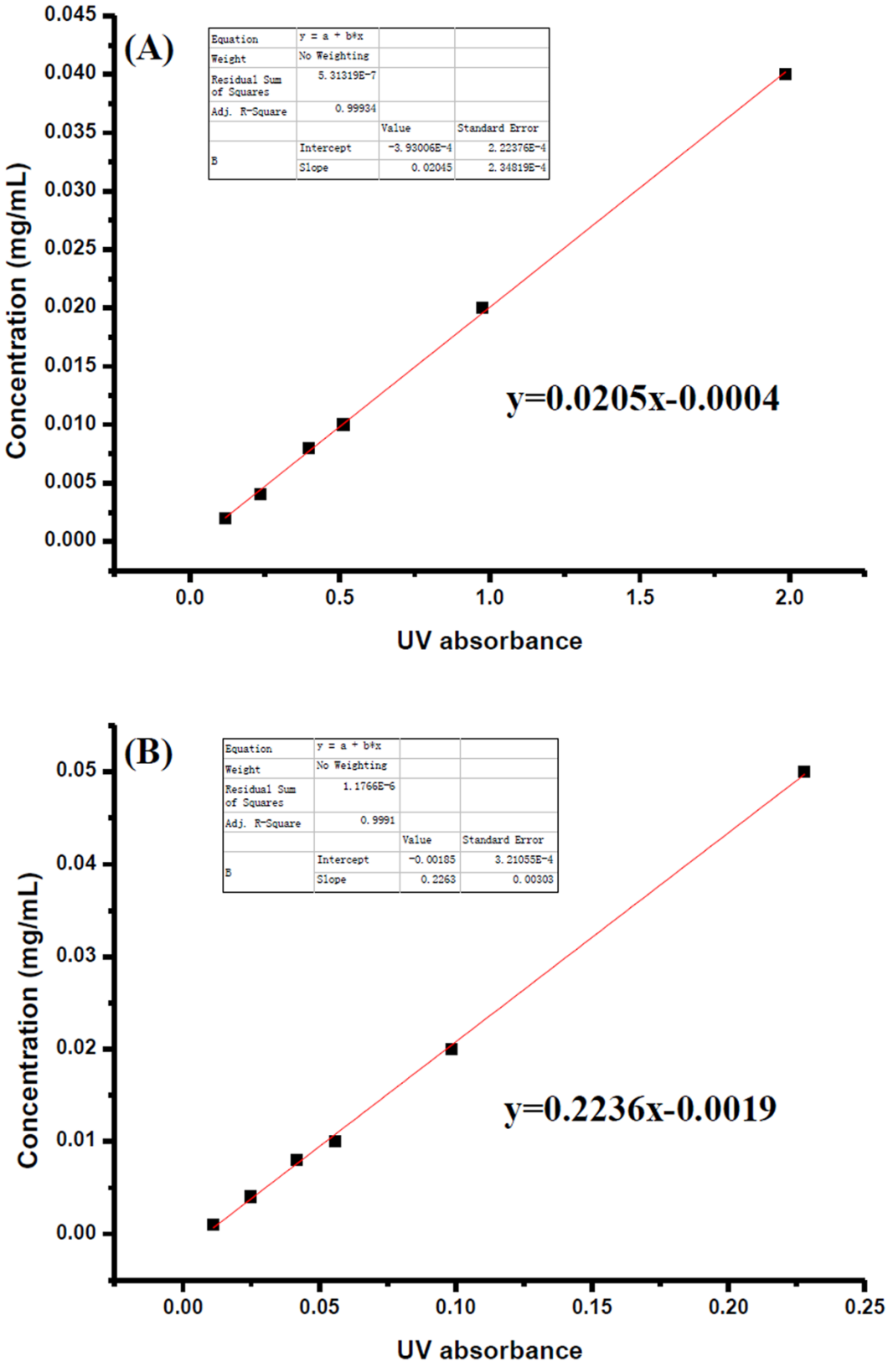

Fig. S3 Calibration curves of IBu in pure PBS (0.01 M, pH = 7.4) (A) and PBS with

DTT (10 mM DTT, 0.01 M, pH = 7.4) (B).