Constructing pH-responsive poly(trimethylene carbonate) (PTMC)-based polymersomes functionalized with cell-penetrating guanidines

Lili Zhao,† Suzhen Wang,† Zhezhe Li, Jian Gu,* and Hailong Che*

School of Environmental and Chemical Engineering, Shanghai University, Shanghai 200444, China. Email: gujian@shu.edu.cn; hche@shu.edu.c

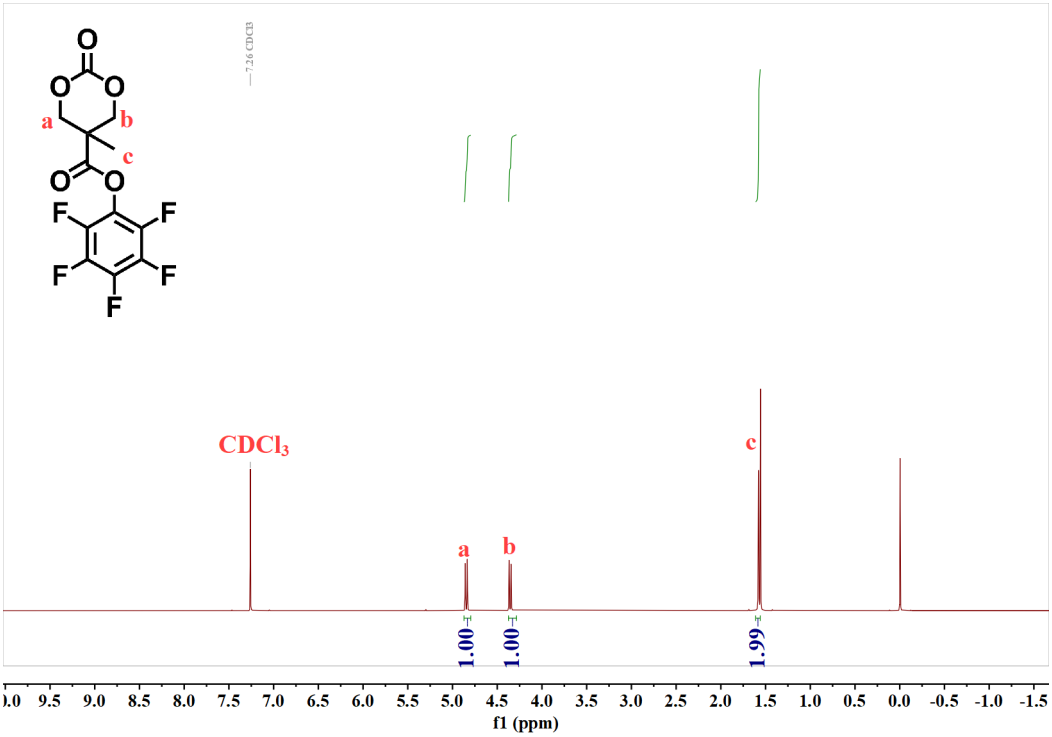

Fig. S1 ^{1}H NMR spectrum of TMC-OC_6F_5 in $CDCl_3$.

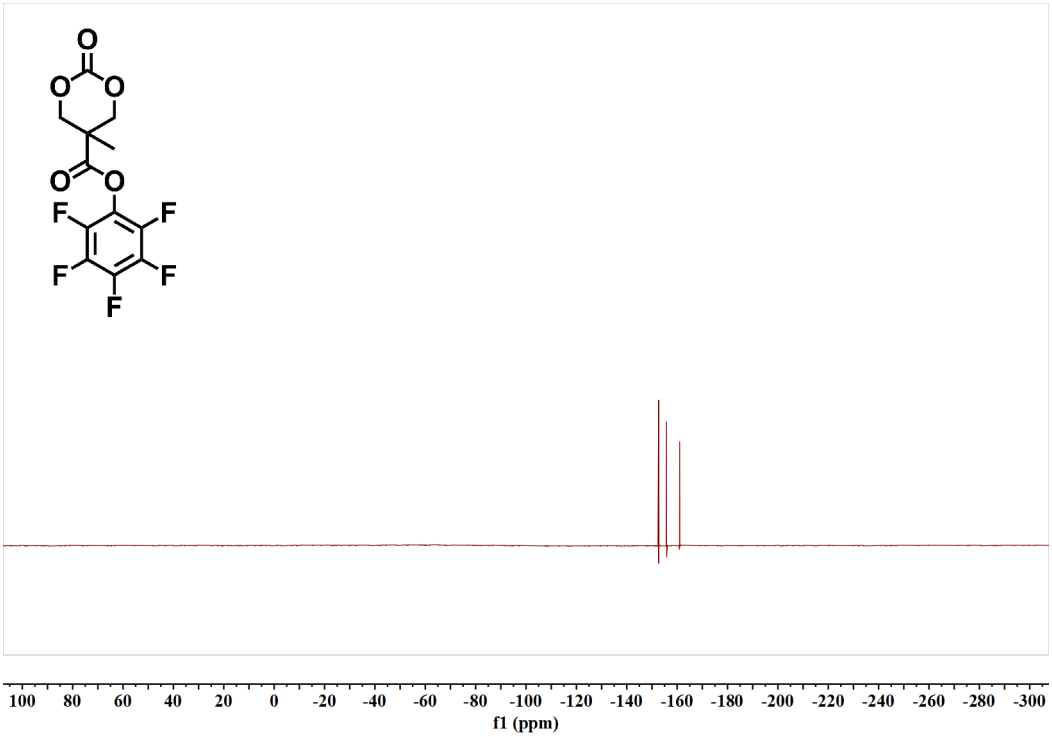

Fig. S2 ^{19}F NMR spectrum of TMC-OC_6F_5 in $CDCl_3$.

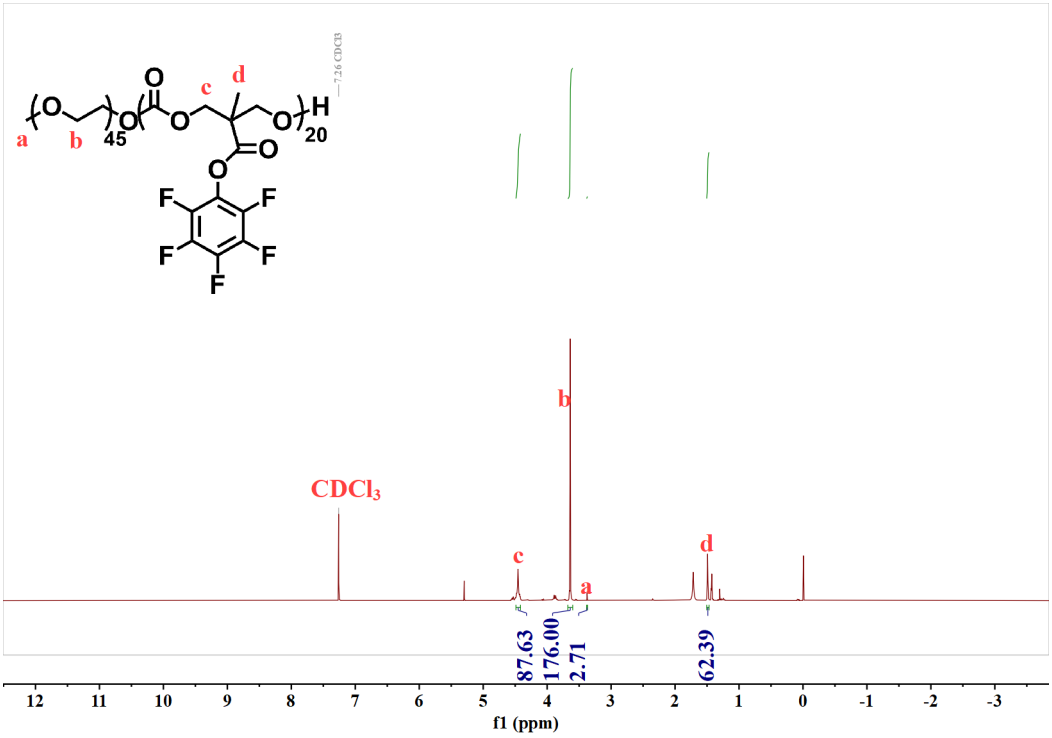

Fig. S3 ^{1}H NMR spectrum of PEG_{45}-*b*-$P(TMC\text{-}OC_6F_5)_{20}$ in $CDCl_3$.

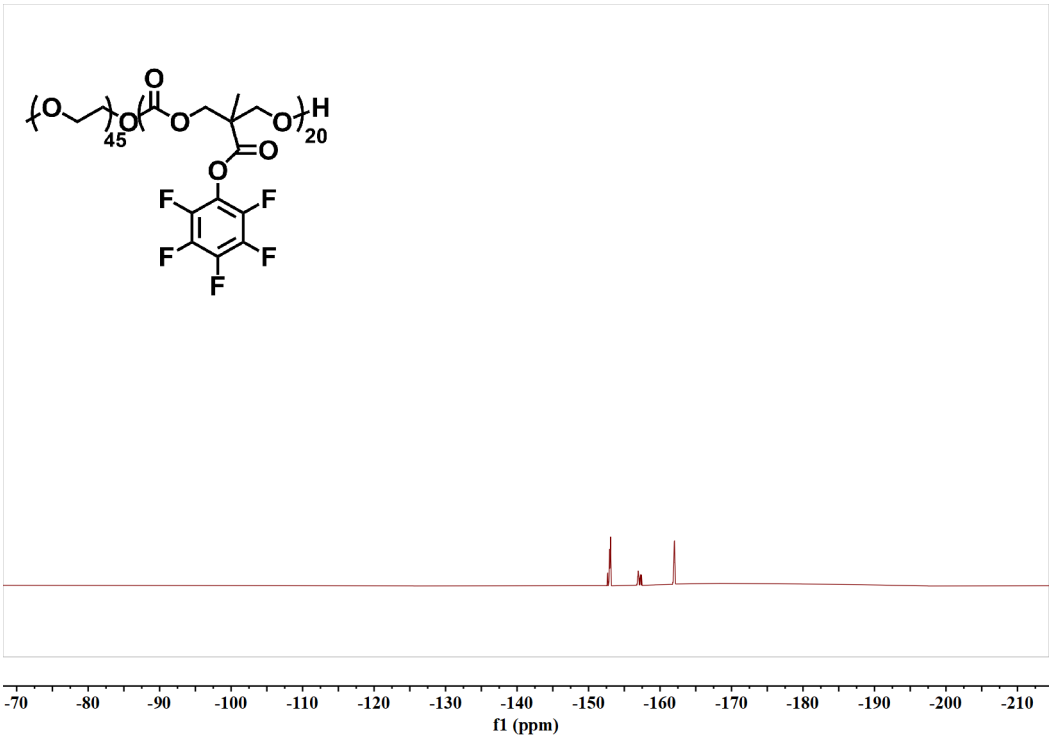

Fig. S4 ^{19}F NMR spectrum of PEG_{45}-*b*-$P(TMC\text{-}OC_6F_5)_{20}$ in $CDCl_3$.

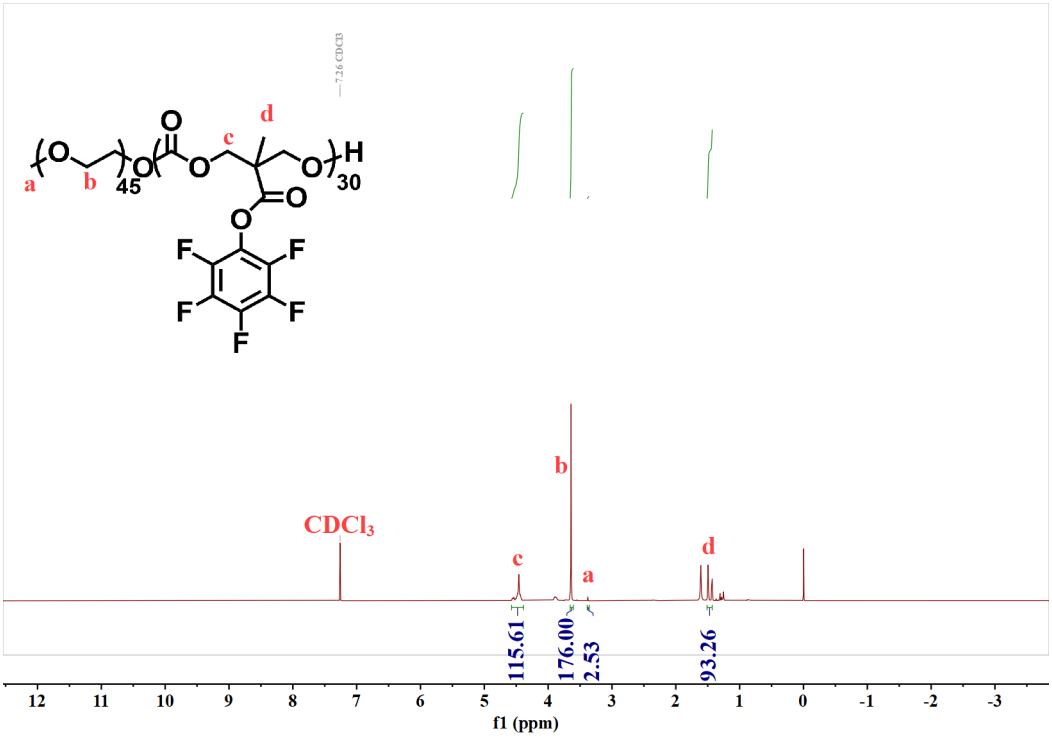

Fig. S5 ^{1}H NMR spectrum of PEG_{45}-*b*-$P(TMC\text{-}OC_6F_5)_{30}$ in $CDCl_3$.

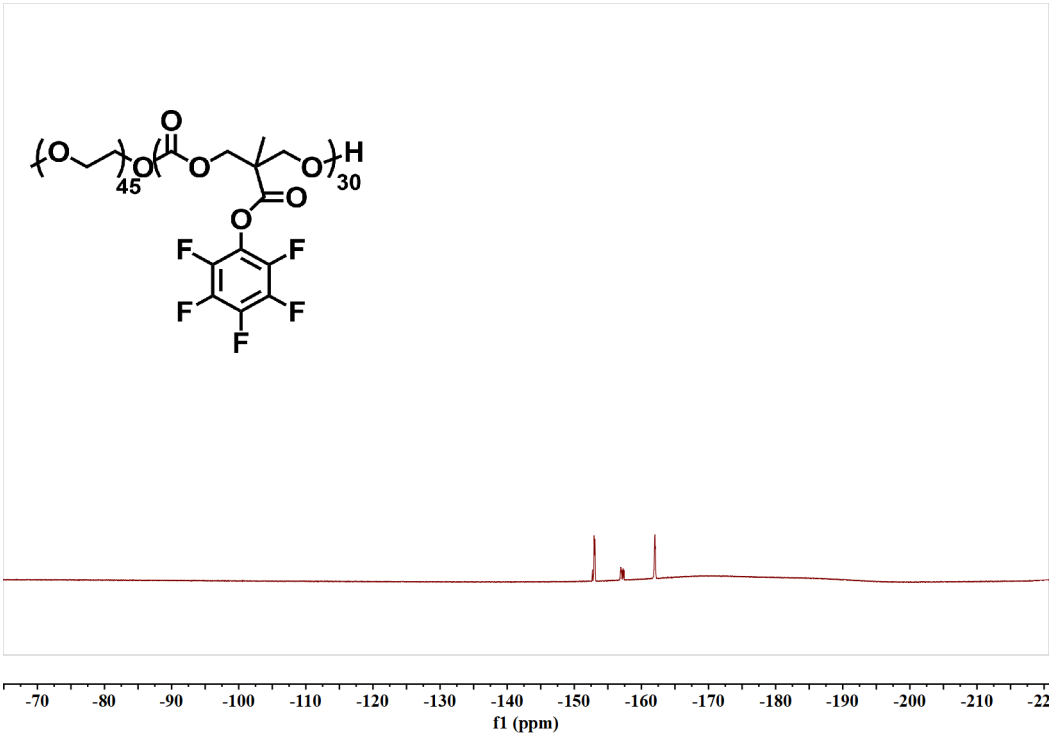

Fig. S6 ^{19}F NMR spectrum of PEG_{45}-*b*-$P(TMC\text{-}OC_6F_5)_{30}$ in $CDCl_3$.

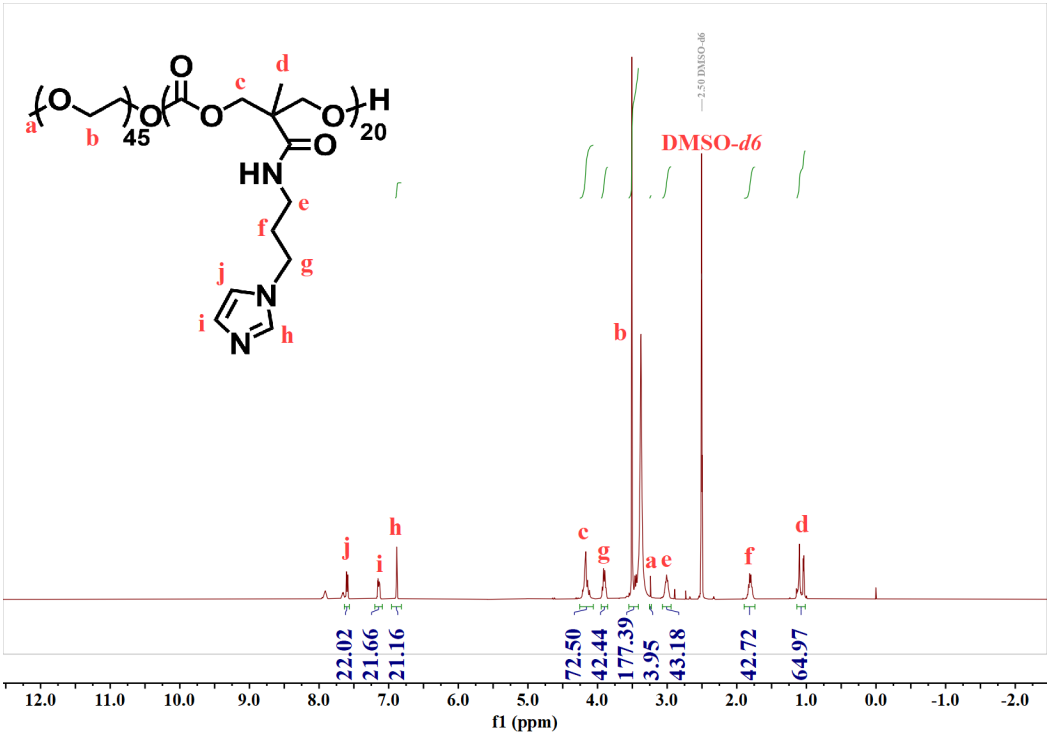

Fig. S7 ^{1}H NMR spectrum of PTMCIM-1in DMSO-*d6*.

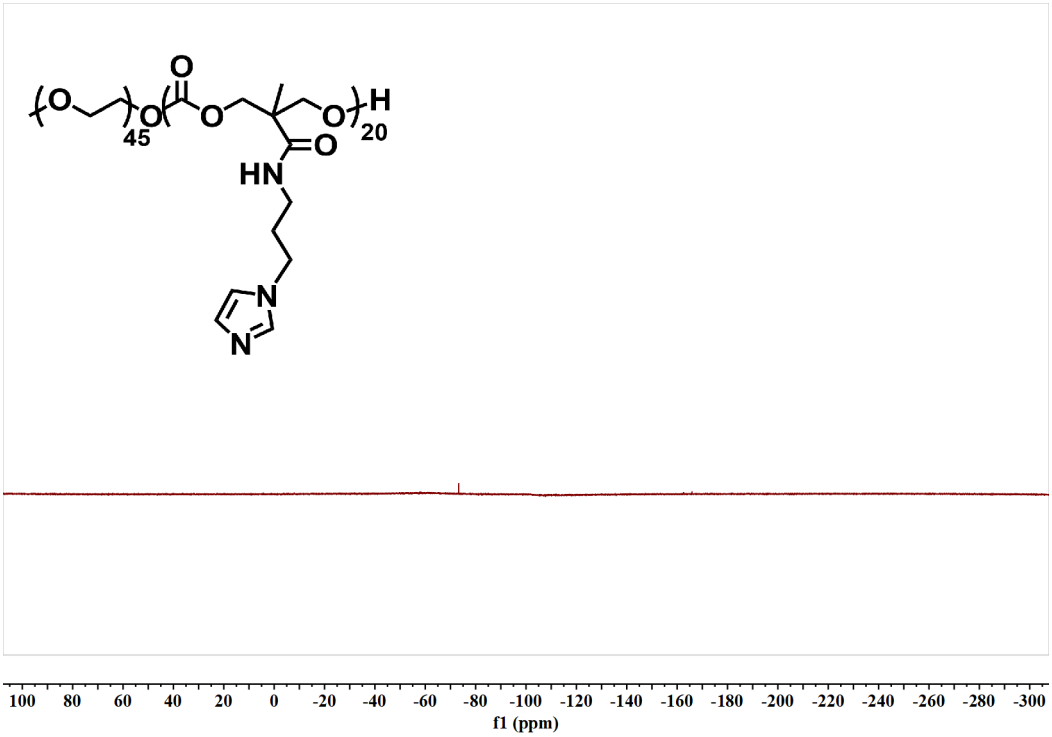

Fig. S8 ^{19}F NMR spectrum of PTMCIM-1 in DMSO-*d6*.

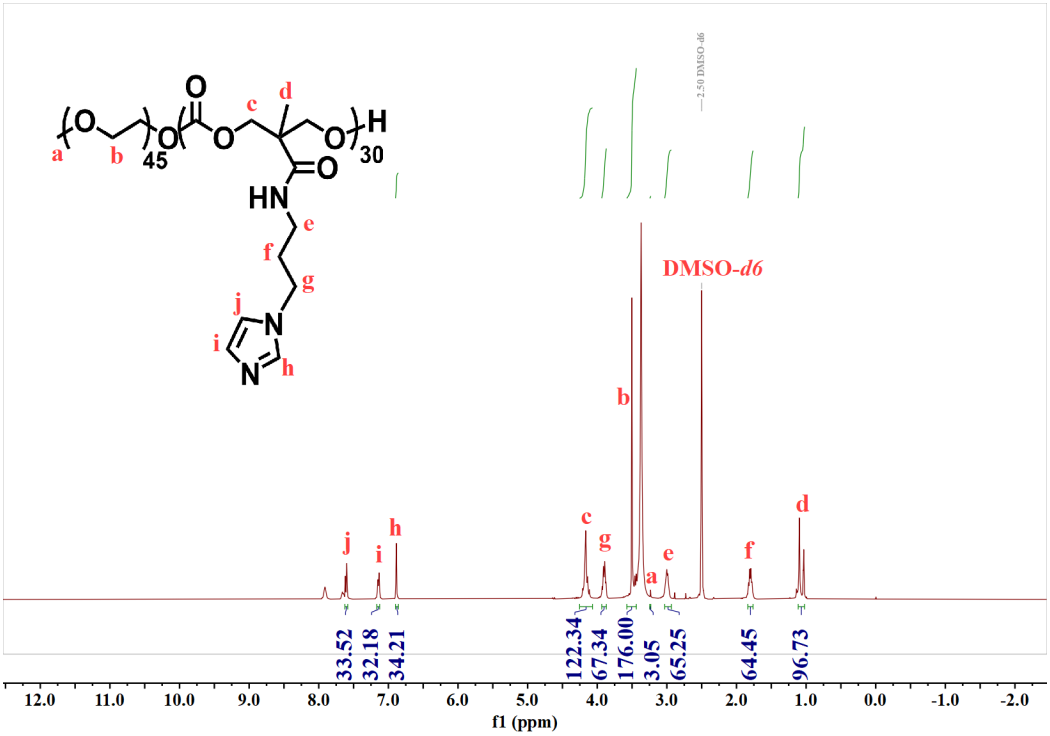

Fig. S9 ^{1}H NMR spectrum of PTMCIM-2 in DMSO-*d6*.

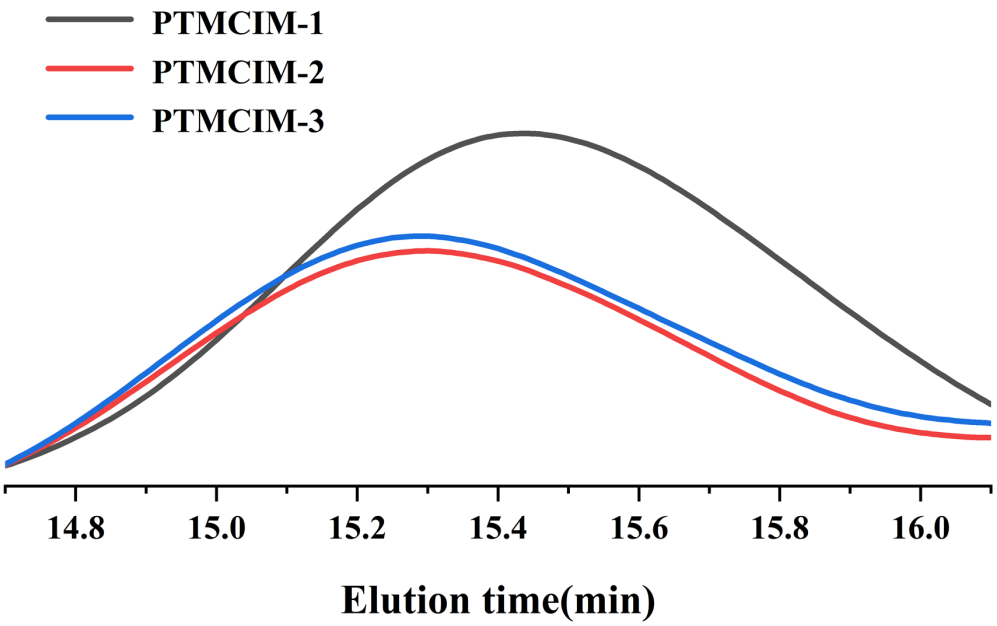

Fig. S10 SEC traces of PEG_{45}-*b*-$P(TMCIM)_n$ with different hydrophobic length.

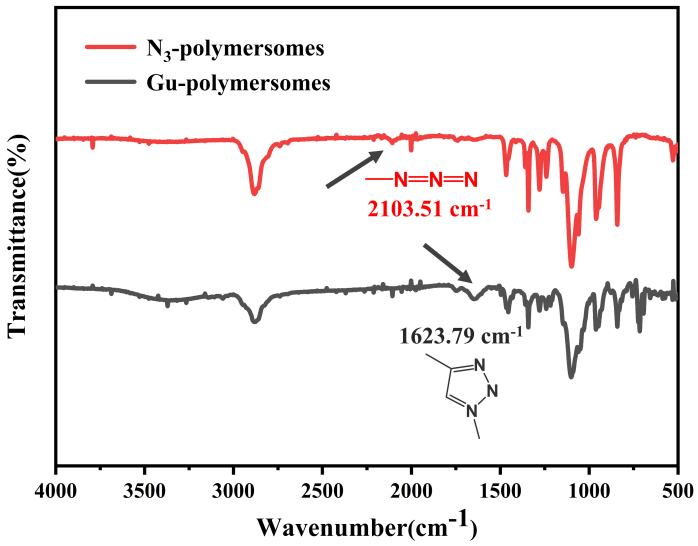

Fig. S11 The Fourier transform infrared (FTIR) characterization of N_3-polymersomes and Gu-polymersomes.

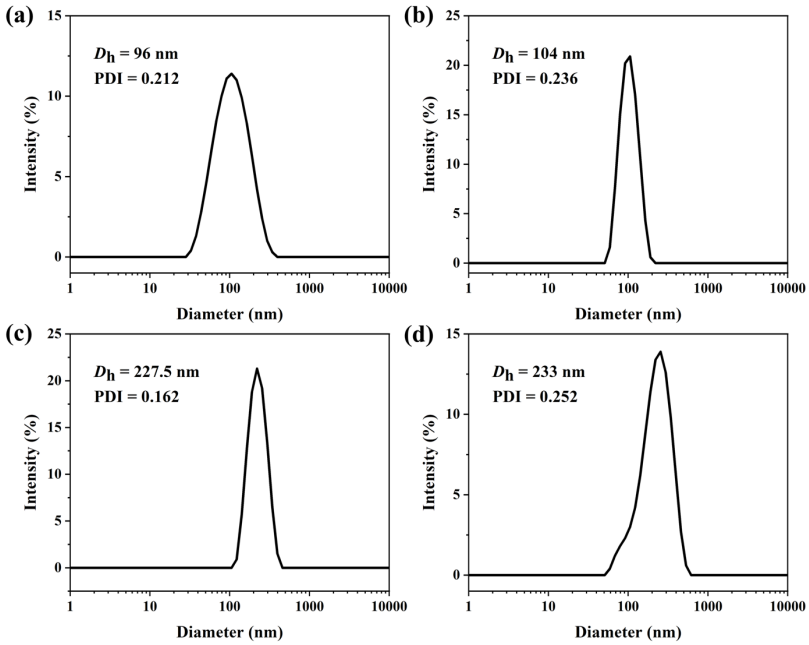

Fig. S12 DLS results of different polymer self-assemblies: (a) PTMCIM-1, (b) PTMCIM-2, (c) PTMCIM-3, and (d) Gu1-PTMCIM-3.

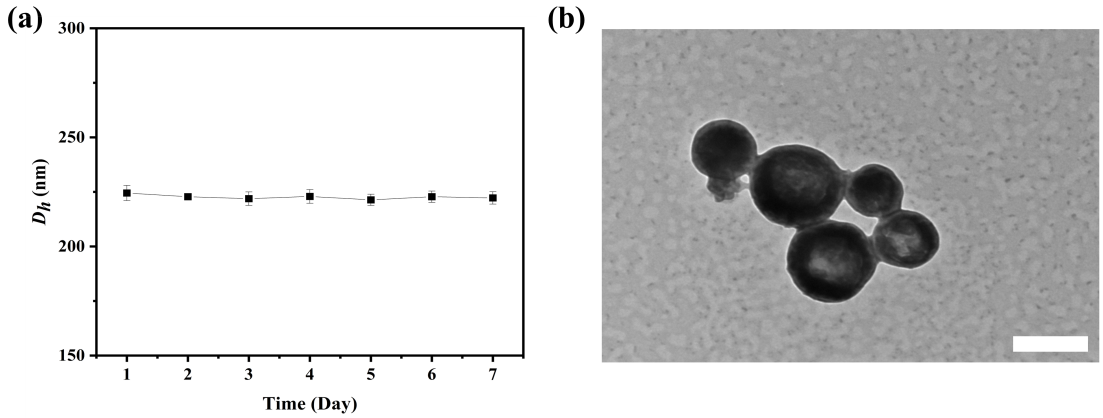

Fig. S13 (a) The size change of PTMCIM-3 at different times under physiological conditions and (b) the TEM image of PTMCIM-3 after 7 days under physiological conditions.

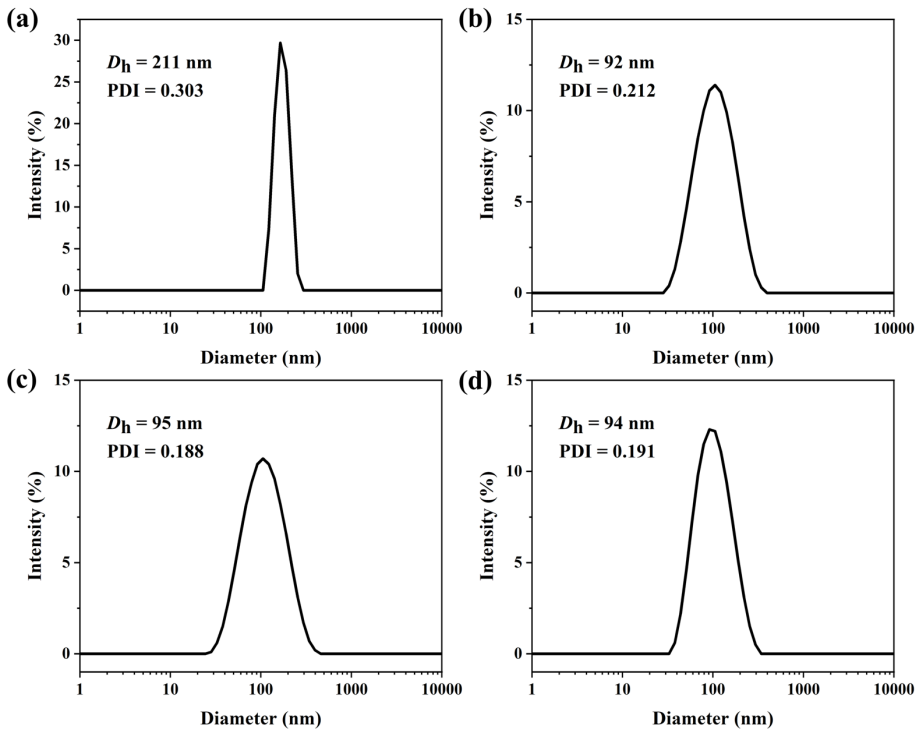

Fig. S14 The effect of pH on the size of PTMCIM-3 polymersomes: (a) pH 7.5, (b) pH 6.5, (c) pH 5.5, and (d) pH 4.5.

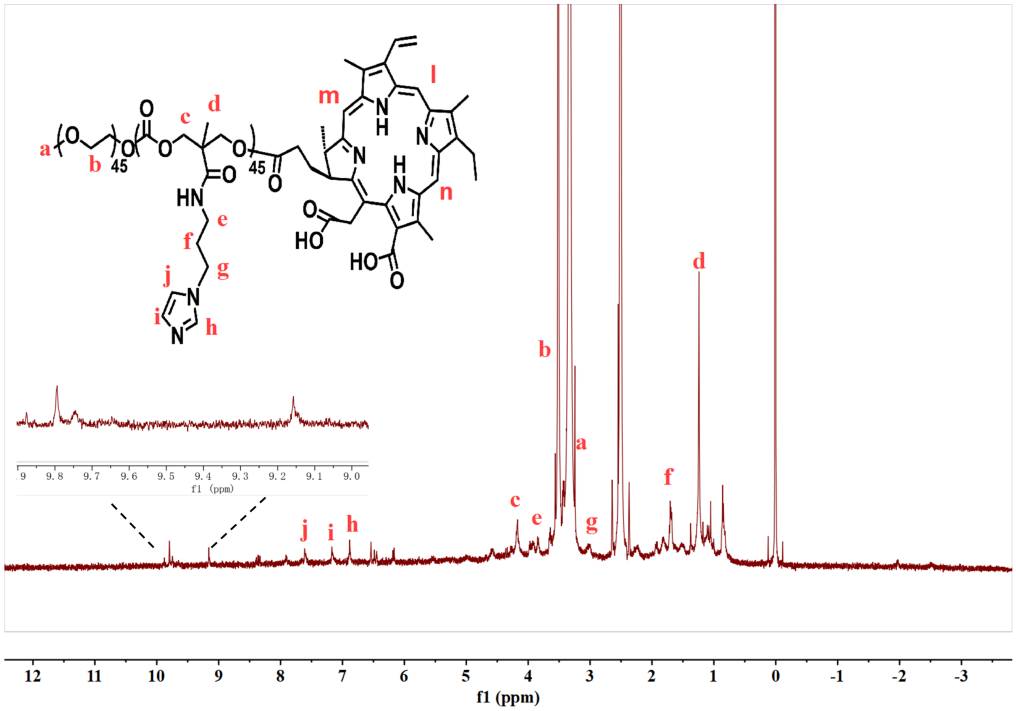

Fig. S15 ^{1}H NMR spectrum of Ce6 labeled PTMCIM-3 in DMSO-*d6*.

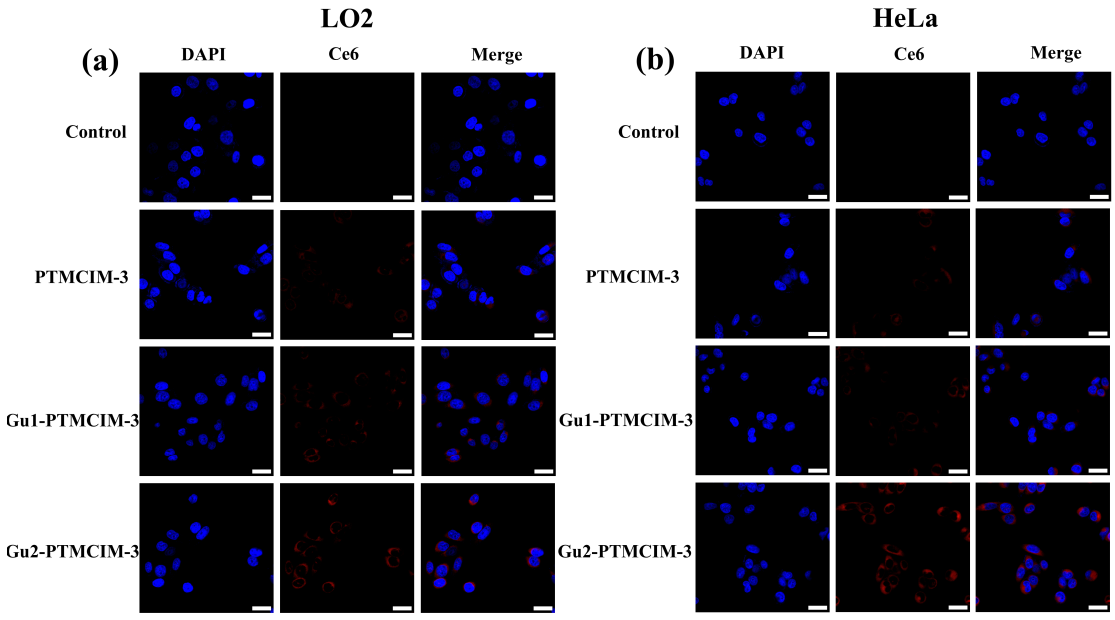

Fig. S16 Polymersome internalization study. CLSM images demonstrated the internalization of Ce6-labeled PTMCIM-3, Gu1-PTMCIM-3 and Gu2-PTMCIM-3 by LO2 cells by (a) LO2 and (b) HeLa cells. Before imaging, the cells were incubated with polymersomes for 6 h. Scale bars are 30 μm.