Supporting Information

Water-Soluble BODIPY-Conjugated Glycopolymer as Fluorescent Probe for Live Cell Imaging

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1. Synthesis of BODIPYMA (Scheme S1, Figures S1, S2 and S3).

2. Synthesis of AcGEMA (Scheme S2, Figures S4 and S5).

3. The time-dependence of polymerization time and Ln (M₀/M) (Figure S6).

4. The content of BODIPYMA in copolymer (Figure S7).

5. GPC profile of p(AcGEMA-co-BODIPYMA) (Figure S8).

6. ¹³C NMR spectrum of p(AcGEMA-co-BODIPYMA) (Figure S9).

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8. Synthesis of p(HEMA-co-BODIPYMA) (Scheme S3, Figures S12 and S13).

9. Cytotoxicity of p(HEMA-co-BODIPYMA) and BODIPYMA (Figures S14 and S15).
1. **Synthesis of BODIPYMA**

\[ \text{Scheme S1. Synthesis of BODIPYMA. Conditions: a) DCM, N}_2\text{, Et}_3\text{N, BF}_3\text{-Et}_3\text{O, room temperature; b) DMF, N}_2\text{, tetrabutylammonium bromide, 60 °C, 16 h.} \]

**Figure S1.** \(^1\)H NMR spectrum of BODIPYMA (CDCl\(_3\) as solvent).

**Figure S2.** \(^1\)C NMR spectrum of BODIPYMA (CDCl\(_3\) as solvent).
Figure S3. FT-IR spectrum of BODIPYMA.

The peaks at 2853 and 2924 cm$^{-1}$ were assigned to C-H stretching vibrations of $=\text{CH}_2$. The peak at 1738 cm$^{-1}$ represented C=O stretching vibrations. The result proved the introduction of methylacrylate unit.

2. Synthesis of AcGEMA

![Scheme S2. Synthesis of AcGEMA.](image1)

Figure S4. $^1$H NMR spectrum of AcGEMA (CDCl$_3$ as a solvent).
Figure S5. $^{13}$C NMR spectrum of AcGEMA (CDCl$_3$ as a solvent).

3. The time-dependence of polymerization time and Ln ($M_0/M$)

![Graph showing Ln($M_0/M$) vs. time (h)](image)

Figure S6. The time-dependence of polymerization time and Ln ($M_0/M$).

The polymers showed a typical linear variation of Ln ($M_0/M$) with polymerization time, which was inherent in living free radical polymerizations. The intersection of the fitting straight line and the X axis was not at the origin, showing that the polymerization needed an induction period.
4. The content of BODIPYMA in copolymer

![Graph showing the content of BODIPYMA as a function of molecular weight.](image)

**Figure S7.** The BODIPYMA content as a function of the molecular weight of copolymer.

The results in Figure S7 show that there was a positive correlation nonlinearly between the BODIPYMA content and the molecular weight of copolymer, and the content of BODIPYMA increased from 0.74% to 1% as the molecular weight enhanced from 8.8 to 31.2 kDa.

5. GPC profiles of p(AcGEMA-co-BODIPYMA)

![GPC profiles showing molecular weight distributions.](image)

**Figure S8.** GPC profiles of p(AcGEMA-co-BODIPYMA): (A) $M_n = 10.7$ kDa, PDI = 1.32; (B) $M_n = 20.8$ kDa, PDI = 1.18; and (C) $M_n = 31.2$ kDa, PDI = 1.13. THF as an
eluent and polystyrene as a calibration standard.

6. $^{13}$C NMR spectrum of p(AcGEMA-co-BODIPYMA)

![NMR spectrum](image)

**Figure S9.** $^{13}$C NMR spectrum of p(AcGEMA-co-BODIPYMA) (CD$_3$Cl as solvent).

7. $^{13}$C NMR spectra of p(GEMA-co-BODIPYMA)
Figure S10. $^{13}$C NMR spectrum of p(GEMA-co-BODIPYMA) (DMSO as solvent).

Figure S11. $^{13}$C NMR spectrum of p(GEMA-co-BODIPYMA) in solid.

8. Synthesis of p(HEMA-co-BODIPYMA)
Scheme S3. Scheme for the synthesis of p(HEMA-co-BODIPYMA).

Figure S12. $^1$H NMR of p(HEMA-co-BODIPYMA) (DMSO as solvent).
Figure S13. FT-IR spectrum of p(HEMA-co-BODIPYMA).

9. Cytotoxicity of p(HEMA-co-BODIPYMA) and BODIPYMA (Figures S14 and S14).
Figures S14. Cell viability of HepG2 and NIH3T3 cells after the treatment with the p(HEMA-co-BODIPYMA) and BODIPYMA. p(HEMA-co-BODIPYMA) (A and B); and BODIPYMA (C and D). Each value represents the mean ± SD (n = 5).
Figure S15. Histograms of ethidium bromide as an indicator of apoptosis in NIH3T3 cells treated with 40 nmol/ml of p(GEMA-co-BODIPYMA), p(HEMA-co-BODIPYMA) and BODIPYMA for 24 h, respectively. (A) viable cell population and (B) apoptotic cell population.