Supporting Information

A Simple Hydrogen Peroxide-Activatable Bodipy for Tumor Imaging and Type I/II Photodynamic Therapy

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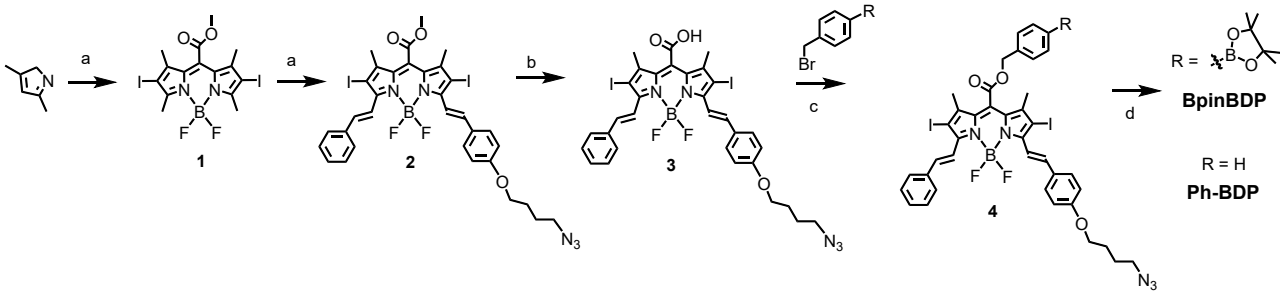
Contents

1. Synthesis.

Synthesis of BpinBDP: 18.8 mg compound **4** and 24 mg Alk-PEG2k were dissolved in $CHCl_3$: EtOH : H_2O (8 mL: 0.6 mL: 0.6 mL), the mixture was deoxygenate via three freeze-thaw cycles. Subsequently, 10 mg CuBr were added and the solution was stirred in 30 °C for 12 h. The solvent was evaporated under reduced pressure and then re-dissolved in water. The unreacted Bodipy dyes and residual catalysts were removed via filtration and Sephadex G50 column. Finally, the solution was dialysis in DI water for 12 h. ^{1}H NMR (400 MHz, d_6-DMSO) δ = 8.13 (s, 2H), 7.64-7.44 (m, 13H), 7.05 (t, J = 8.0 Hz, 2H), 5.57 (d, J = 12.0 Hz, 2H), 4.07 (d, J = 4.0 Hz, 2H), 3.50 (s, 174H), 2.11 (s, 6H), 1.98 (t, J = 8.0 Hz, 4H), 1.23 (s, 12H). TOF MALDI-HRMS: calculated m/z ≈ 3200 Da, found m/z ≈ 3200 Da.



Scheme S1. The synthesis route of **BpinBDP**.

2. UV–visible Absorption and Fluorescence Emission Spectra.

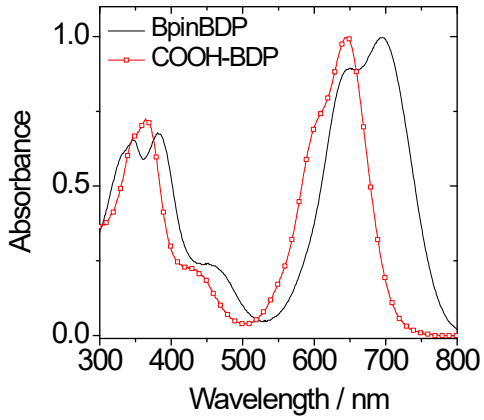


Figure S1. Normalized UV–vis absorption of **BpinBDP** and **COOH-BDP-PEG** in PBS (pH = 7.4).

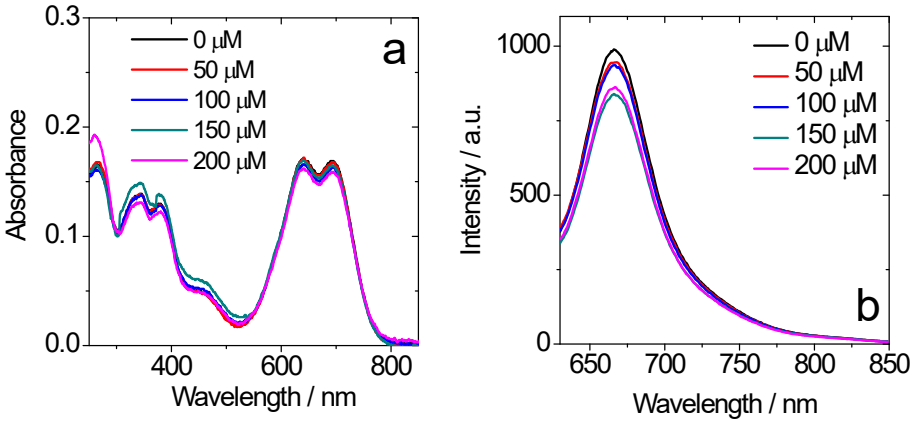


Figure S2. (a) UV–visible absorption and (b) fluorescence emission of **PhBDP** upon addition of different concentration of H_2O_2 in PBS (pH = 7.4) and incubating with 2 h at 37 °C.

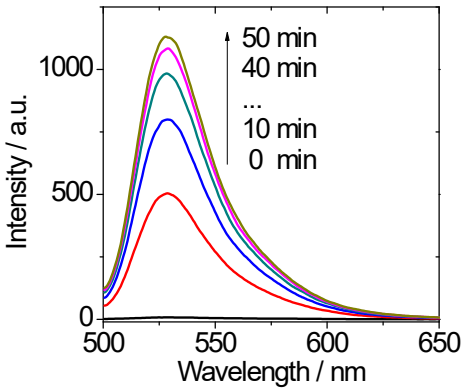


Figure S3. Fluorescence emission of dihydrorhodamine 123 (DHR123) at different irradiation time in the presence of **BpinBDP**, indicating the production of superoxide anion.

3. EPR Signals.

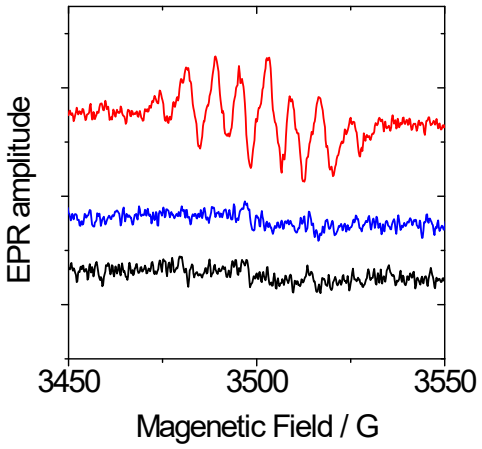


Figure S4. EPR signals of dimethyl-1-pyrroline-*N*-oxide (DMPO) for superoxide anion characterization in MeOH.

4. Flow cytometry analysis.

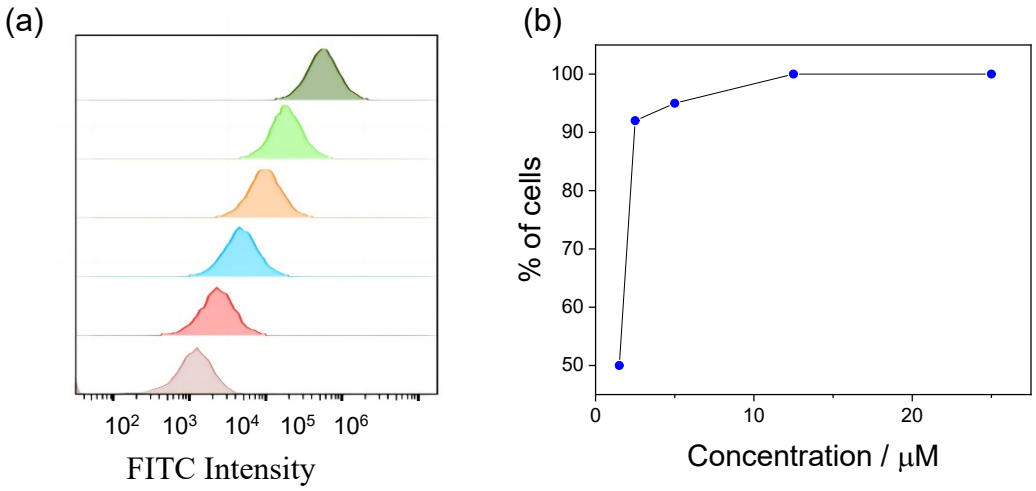


Figure S5. (a) Flow cytometry analysis of 4T1 cancer cells treated with different concentration of **BpinBDP** for 2 hours to study the relationship between uptake efficiency and concentration. (a) The number of cells containing **BpinBDP** is assigned by cells of higher FITC intensity than the threshold intensity (of untreated cells). (b) Percentage of cells containing **BpinBDP** in different incubation concentration..

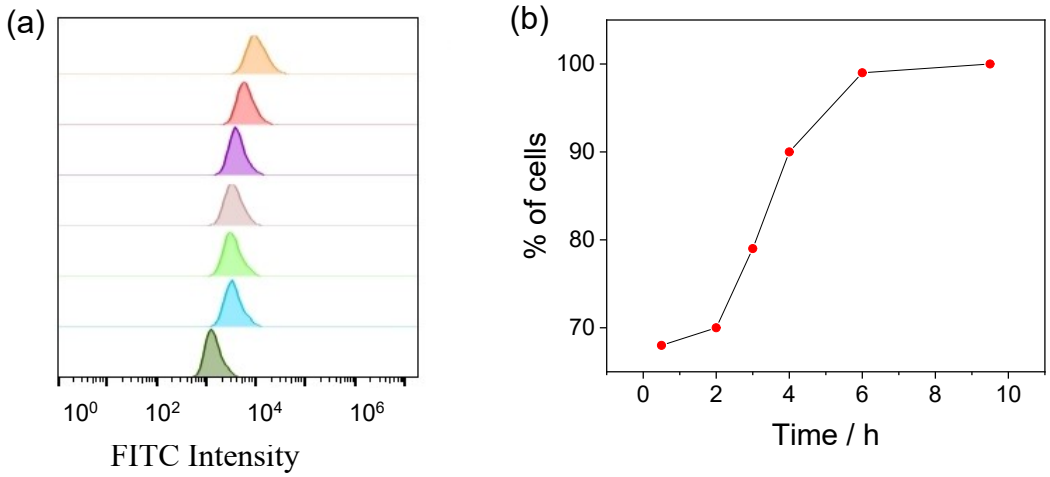


Figure S6. Flow cytometry analysis of 4T1 cancer cells after 0 h, 0.5 h, 2.0 h, 3.0 h, 4.0 h, 6.0 h and 9.5 h post incubation of **BpinBDP** (c = 10 μM) to study the relationship between uptake efficiency and time points. (a) The number of cells containing **BpinBDP** is assigned by cells of

higher FITC intensity than the threshold intensity (of untreated cells). (b) Percentage of cells containing **BpinBDP** at different incubation time points

5. H&E Stainings.

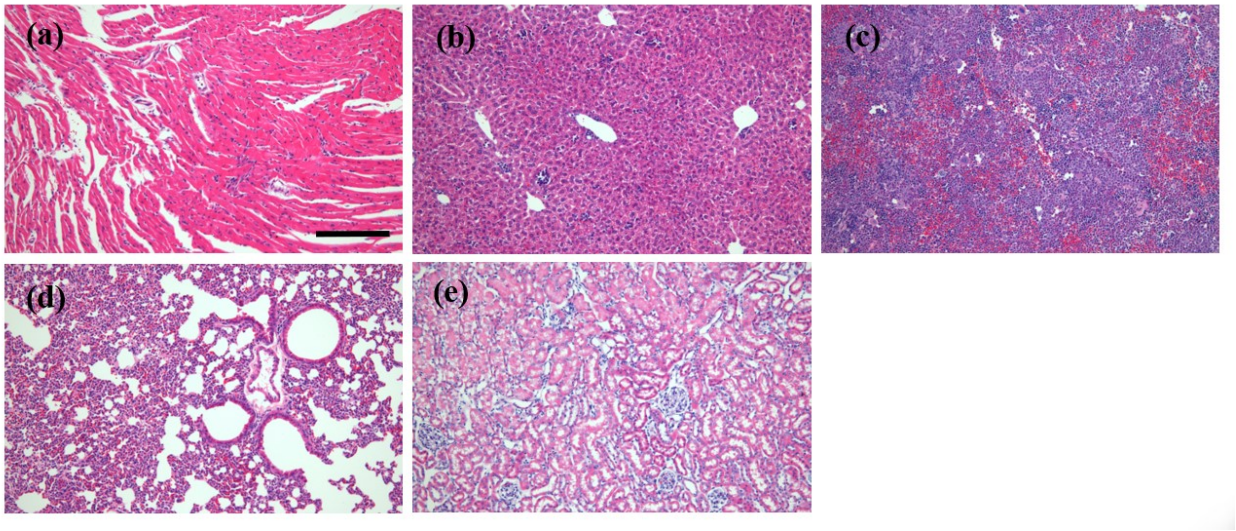


Figure S7. H&E stainings of heart, liver, spleen, lung and kidney of Group 1. Scale bar = 200 μm.

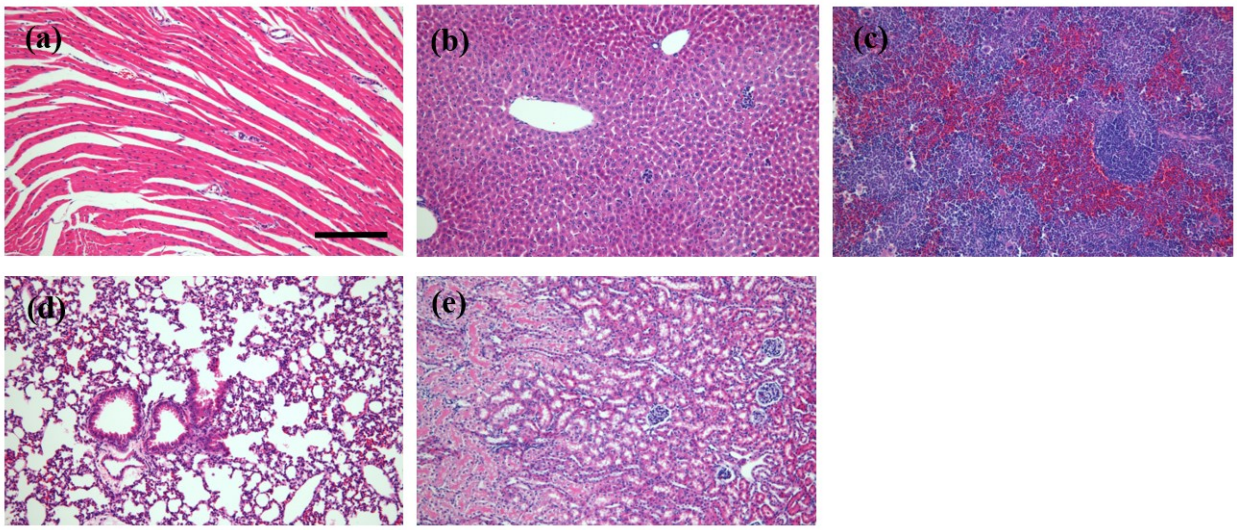


Figure S8. H&E stainings of heart, liver, spleen, lung and kidney of Group 2. Scale bar = 200 μm.

6. NMR and HRMS Spectra.

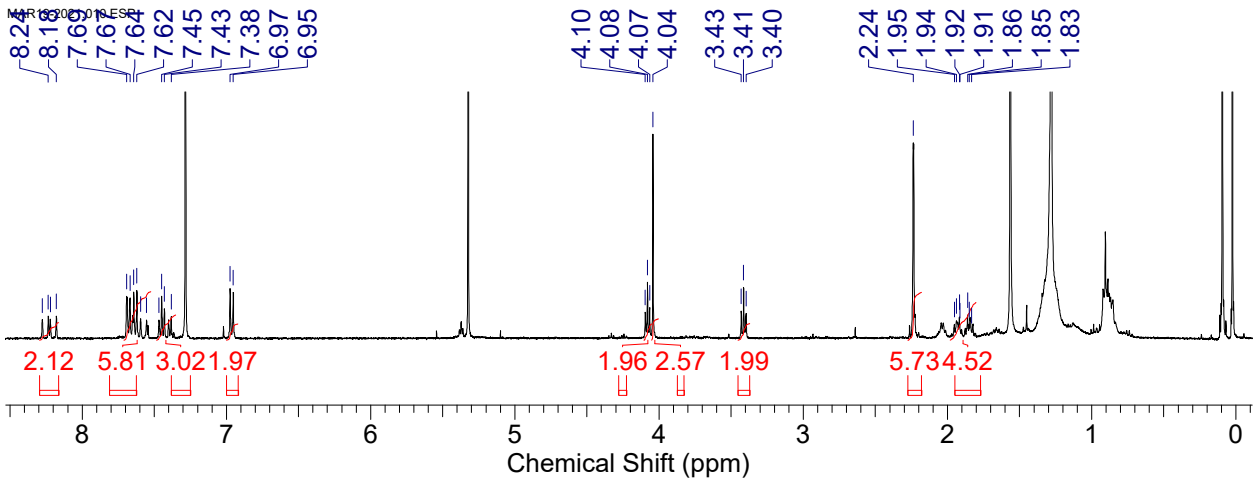


Figure S9. ^{1}H-NMR of compound **2** in $CDCl_3$.

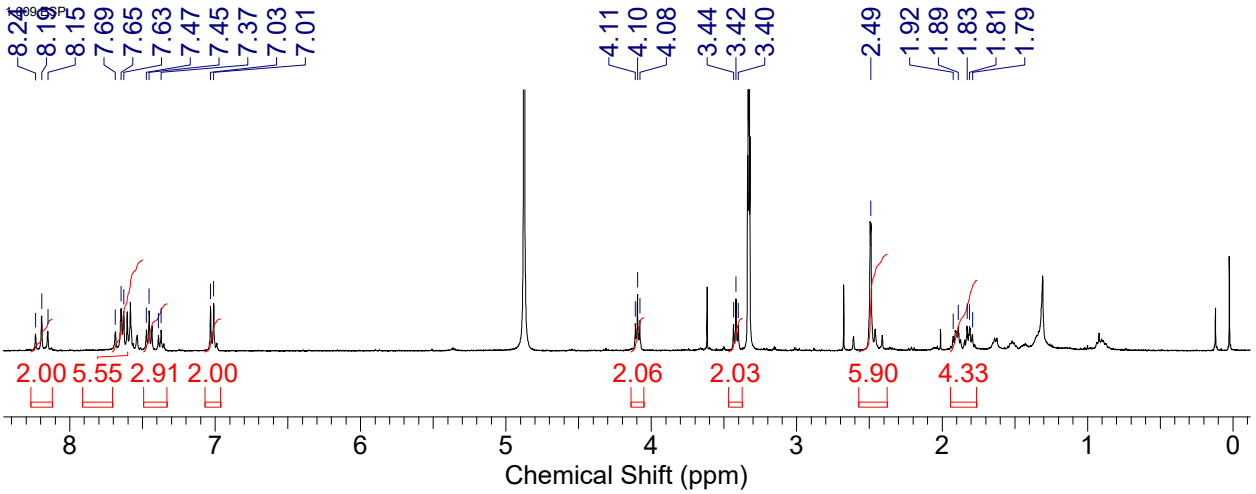


Figure S10. ^{1}H-NMR of compound **3** in MeOD.

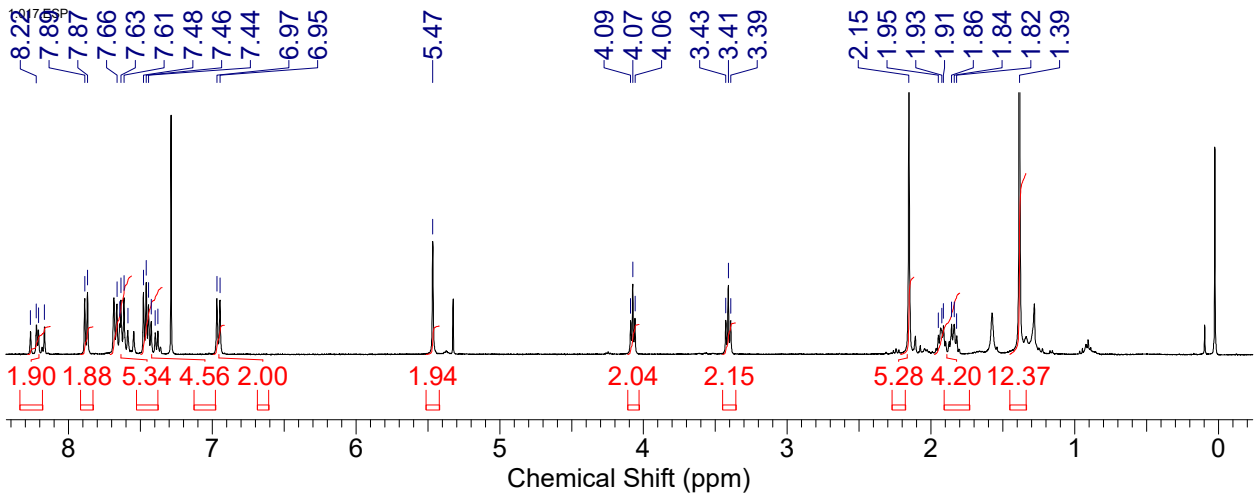


Figure S11. ^{1}H-NMR of compound **4** in $CDCl_3$.

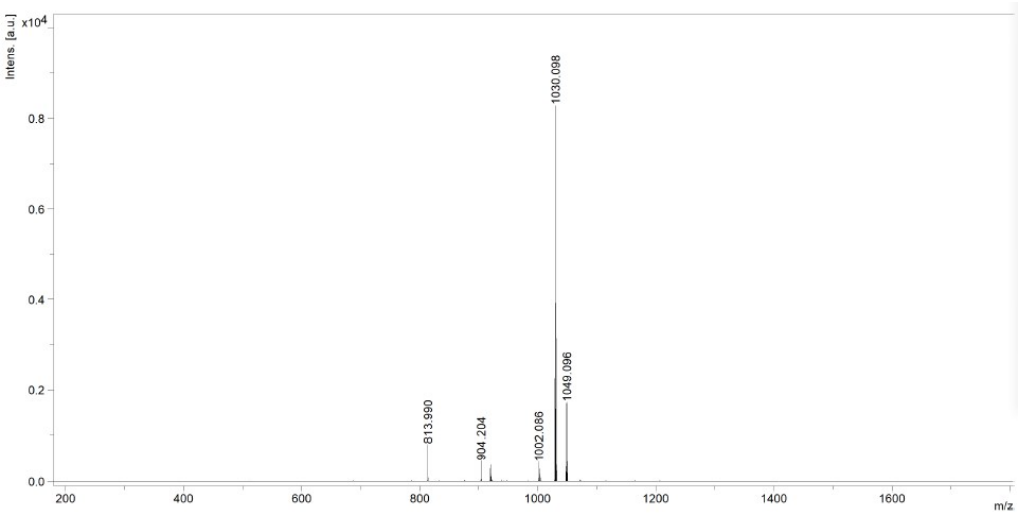


Figure S12. MALDI-Tof-MS of compound **4**.

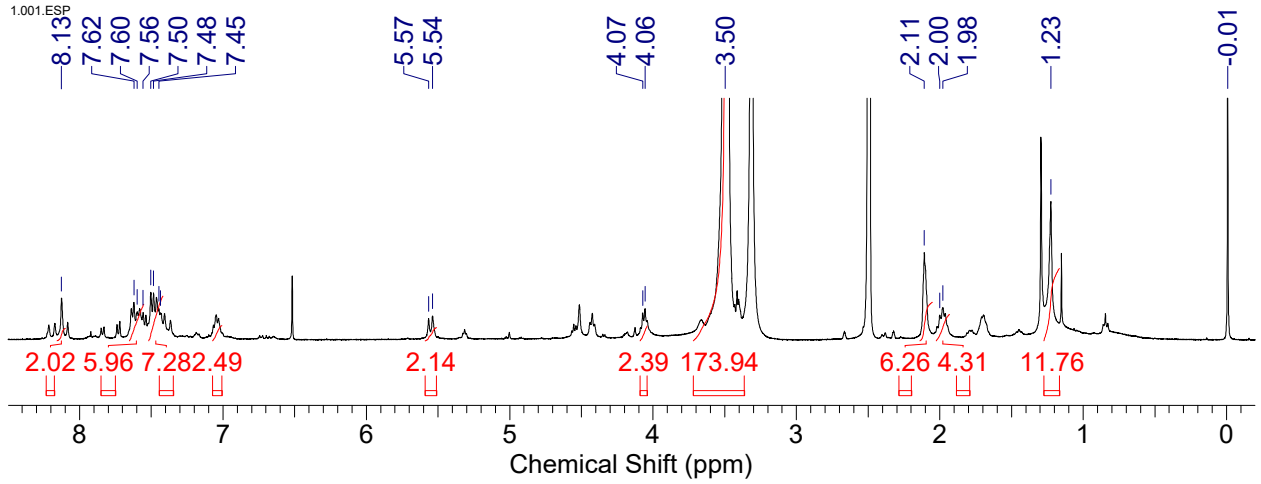


Figure S13. ^{1}H-NMR of compound **BpinBDP** in d_6-DMSO.

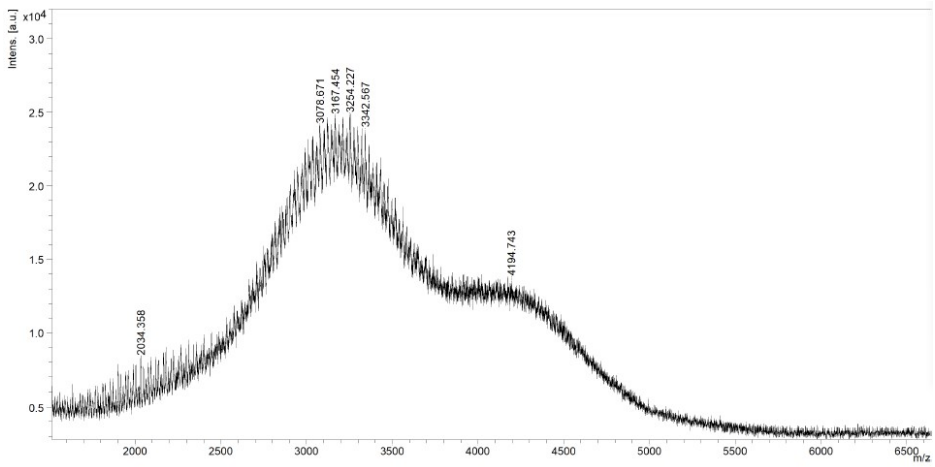


Figure S14. MALDI-Tof-MS of **BpinBDP**.

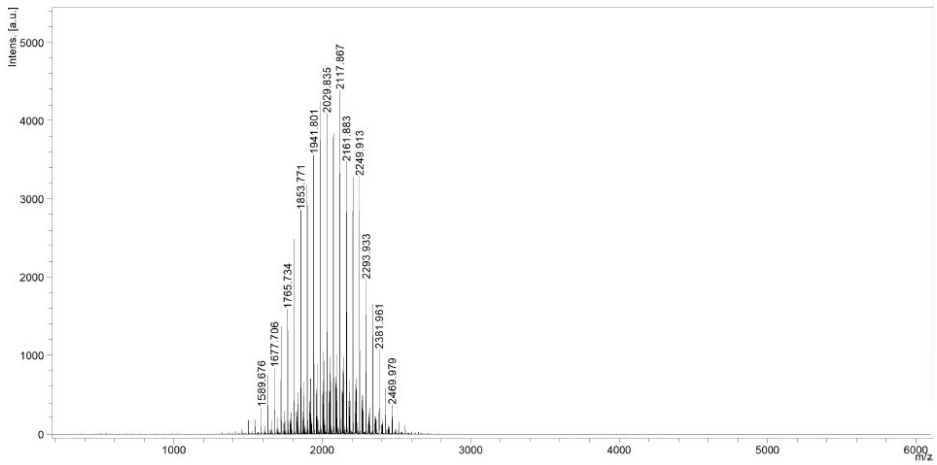


Figure S15. MALDI-Tof-MS of **Alk-PEG2k**.