

## Supplementary Materials

### Mitochondria-targeting amphiphilic polymers enable idebenone to promote neuronal regeneration following spinal cord injury

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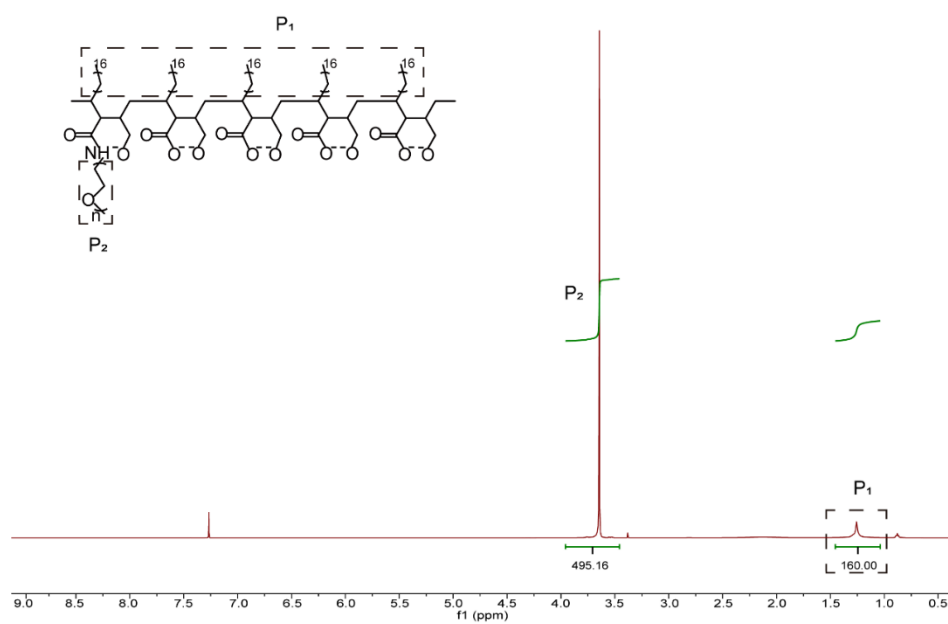
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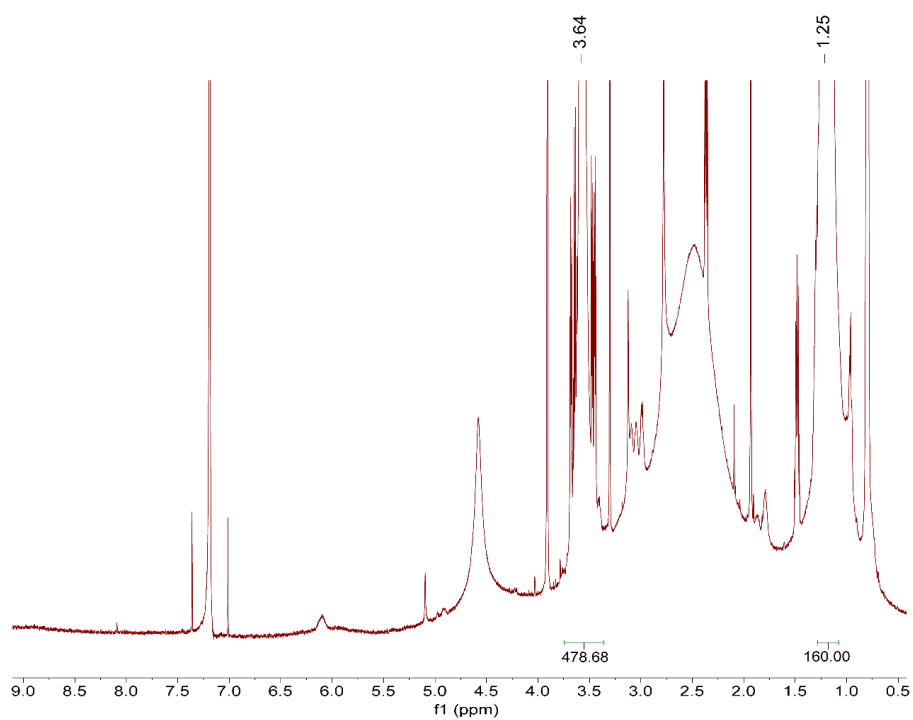
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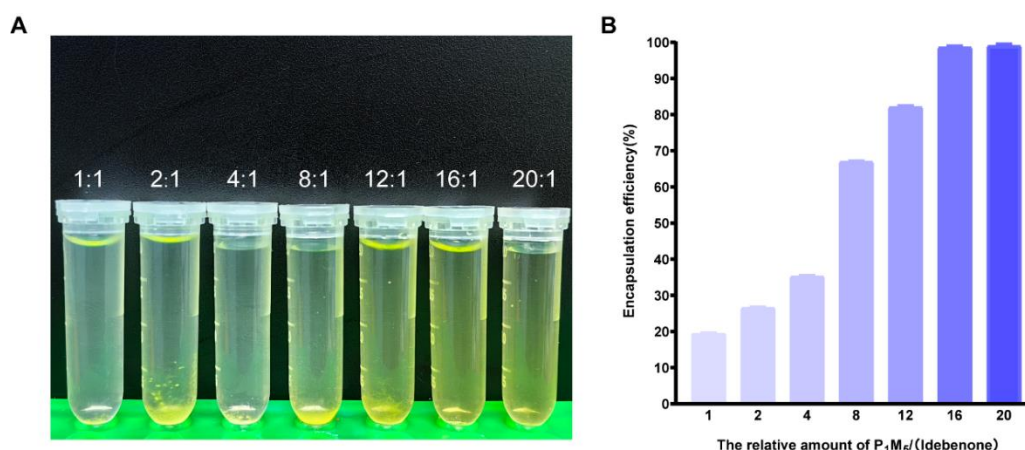
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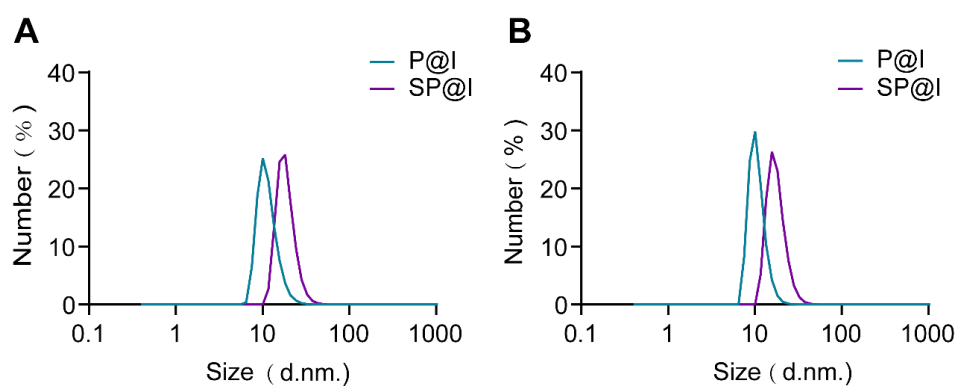
**Figure S1.**  $^1H$  NMR of  $P_1M_5$  in  $CDCl_3$ .  $^1H$  NMR (600 MHz, Chloroform-d)  $\delta$  3.64 (s, -O-CH<sub>2</sub>-), 1.26 (s, -CH<sub>2</sub>-).



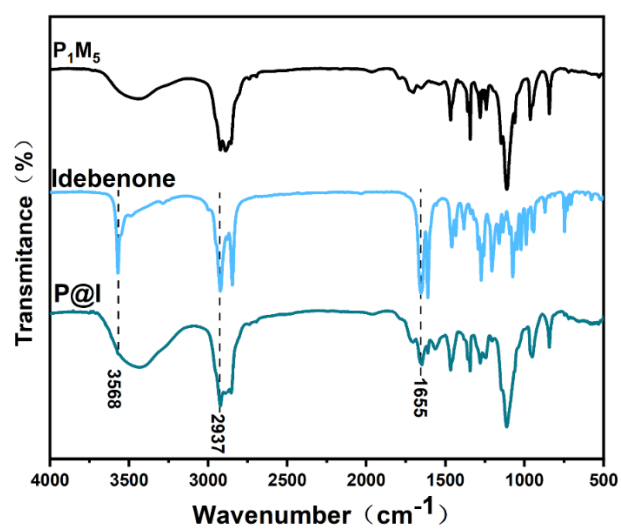
**Figure S2.**  $^1H$  NMR of  $P@I$  in  $DMSO-d_6$ .



**Figure S3.** Optimization of Idebenone encapsulation. (A) Optimization process for the encapsulation efficiency of Idebenone within the P<sub>1</sub>M<sub>5</sub> polymer. (B) The encapsulation efficiency of Idebenone achieved using different mass ratios of P<sub>1</sub>M<sub>5</sub>.



**Figure S4.** Physicochemical characterization of P@I and SP@I nanoparticles. (A) Hydrodynamic diameter distribution of the nanoparticles. (B) Stability assessment: hydrodynamic diameter distribution after storage at room temperature for 7 days.



**Figure S5.** FT-IR spectral analysis. FT-IR spectra of P<sub>1</sub>M<sub>5</sub>, Free Idebenone, and the P@I.