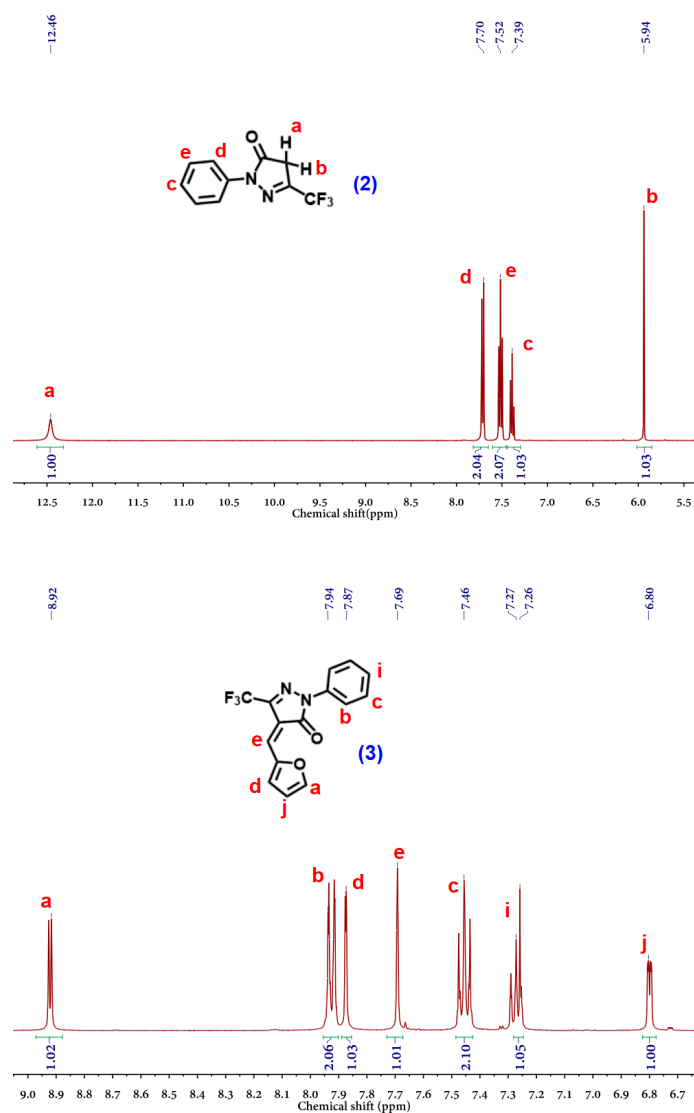
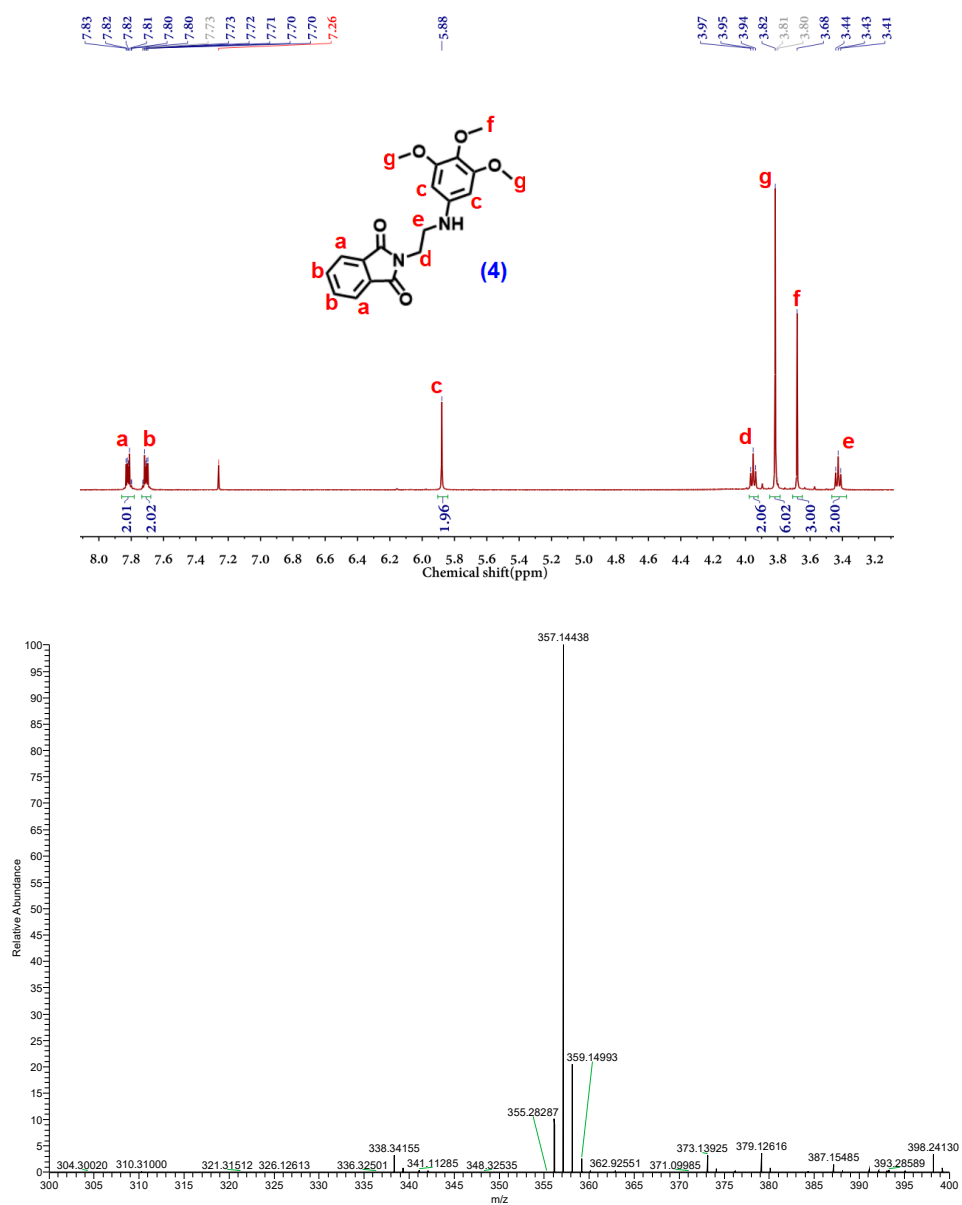


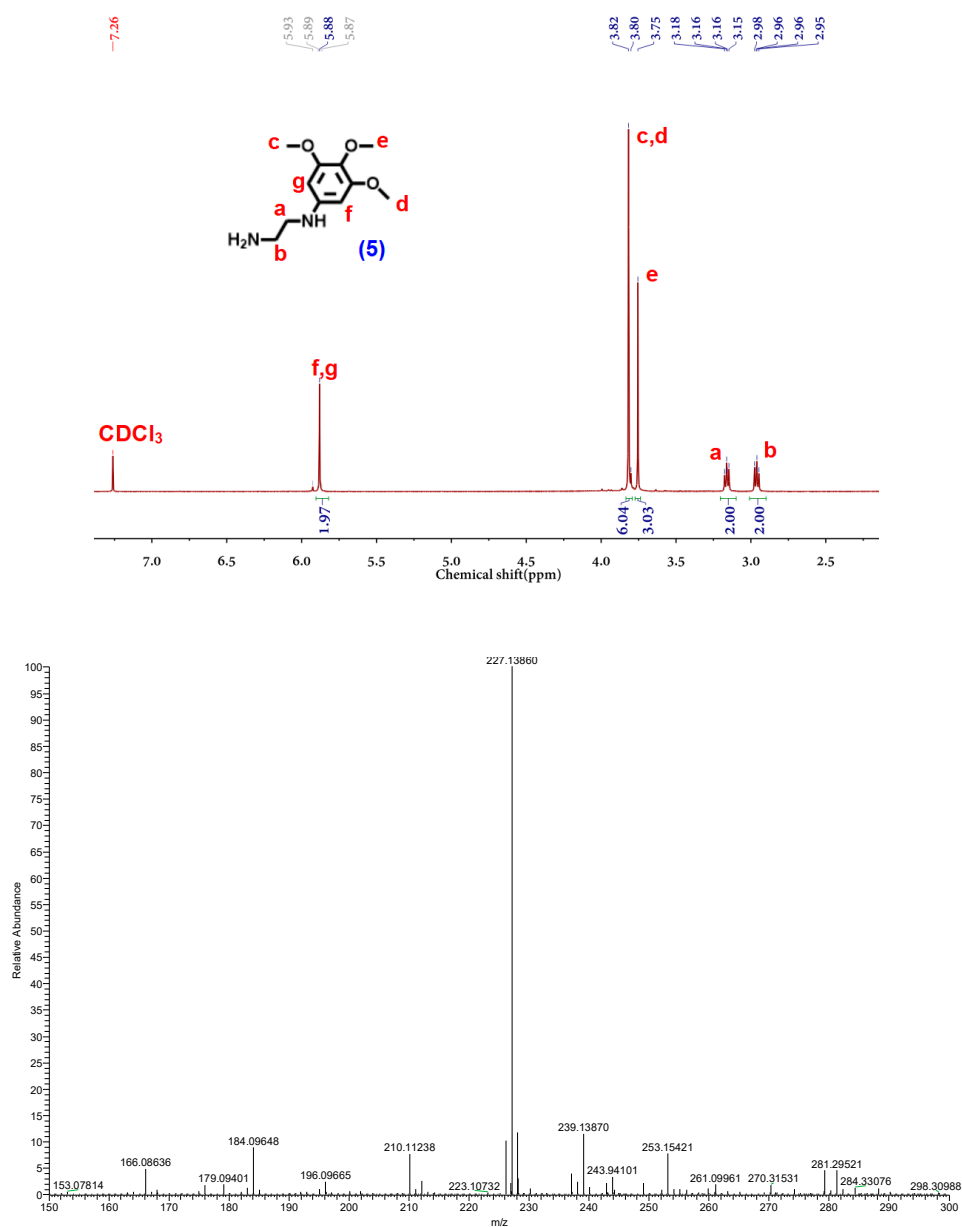
**Figure S1.** <sup>1</sup>H (top), <sup>13</sup>C (middle), and <sup>19</sup>F NMR (bottom) spectra of the compound (1) (pentafluorophenyl methacrylate) in CDCl<sub>3</sub> (25 °C, 400 MHz).



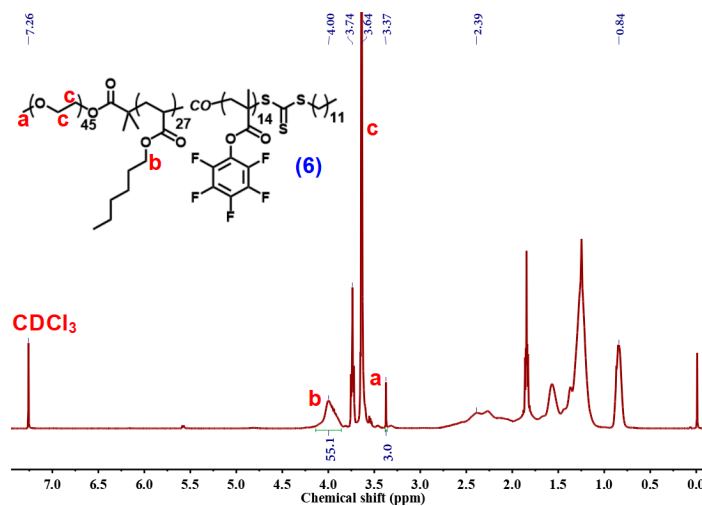
**Figure S2.** <sup>1</sup>H NMR (25 °C, 400 MHz) spectra of the compound (2) in DMSO (top) and compound (3) in CDCl<sub>3</sub> (bottom), respectively.



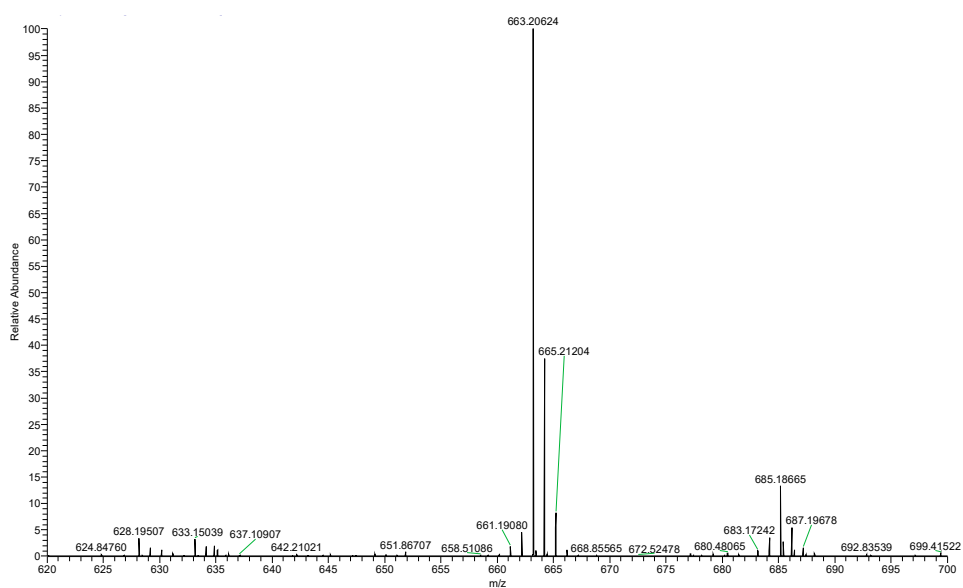
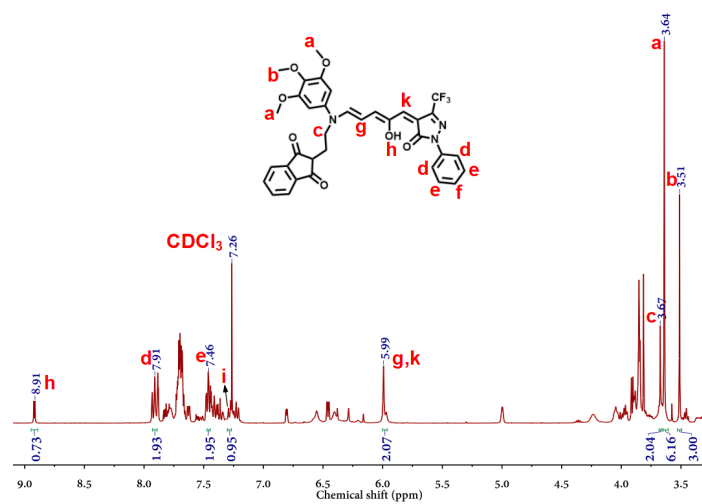
**Figure S3.** <sup>1</sup>H NMR (top, CDCl<sub>3</sub>, 25 °C, 400 MHz) and mass (bottom) spectra of the compound (4).



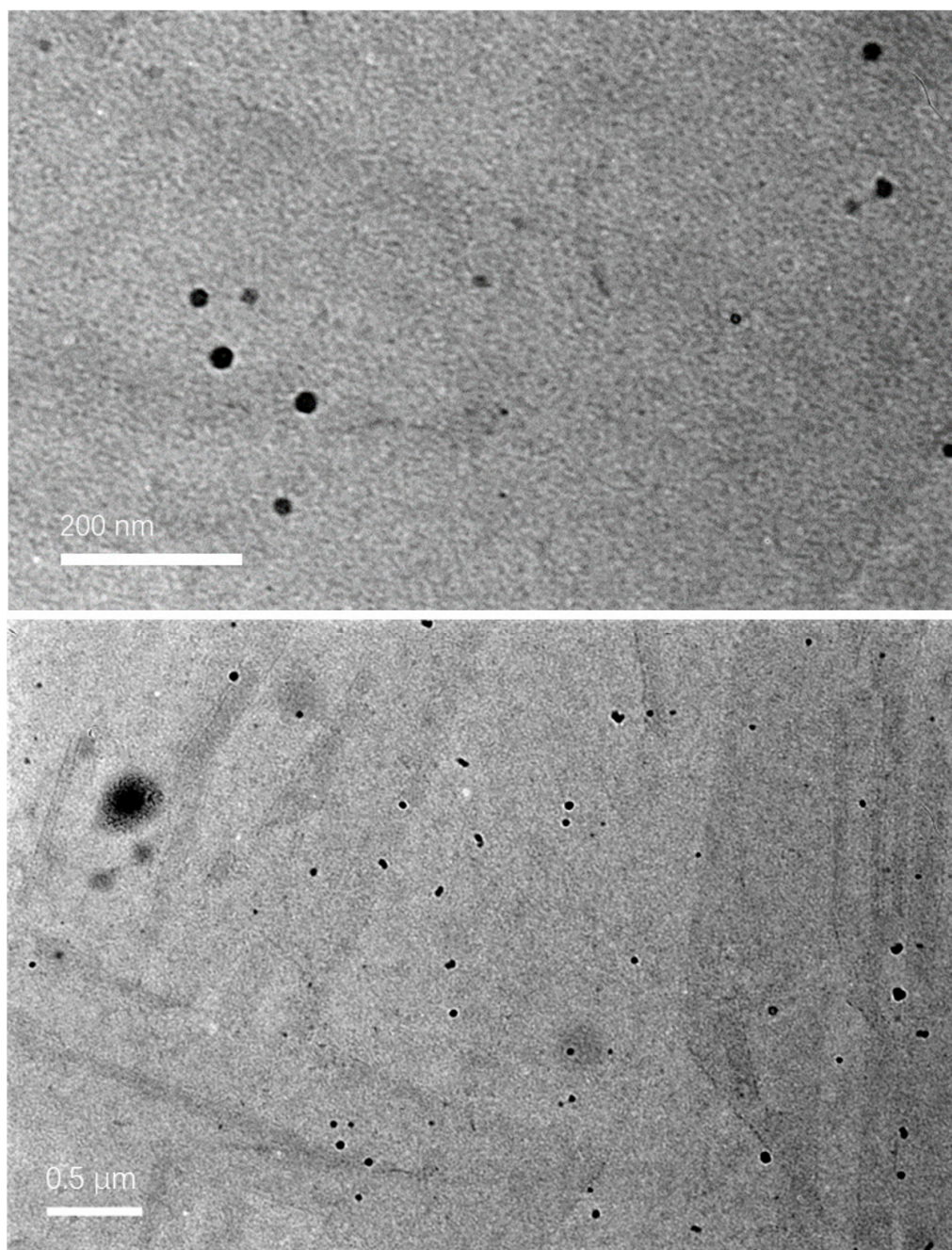
**Figure S4.** <sup>1</sup>H NMR (top, CDCl<sub>3</sub>, 25 °C, 400 MHz) and mass (bottom) spectra of the compound (5).



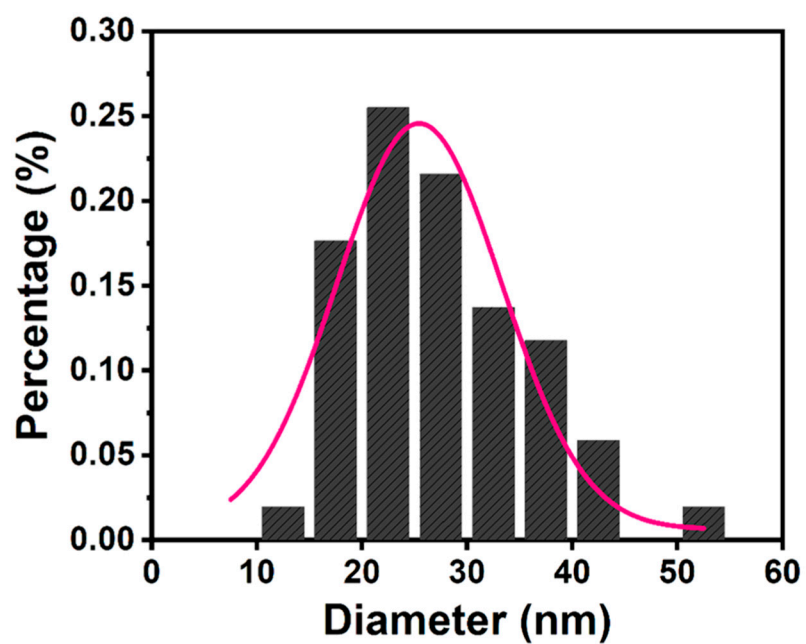
**Figure S5.**  $^1\text{H}$  NMR (25 °C, 400 MHz) spectrum of polymer (6) in  $\text{CDCl}_3$ .



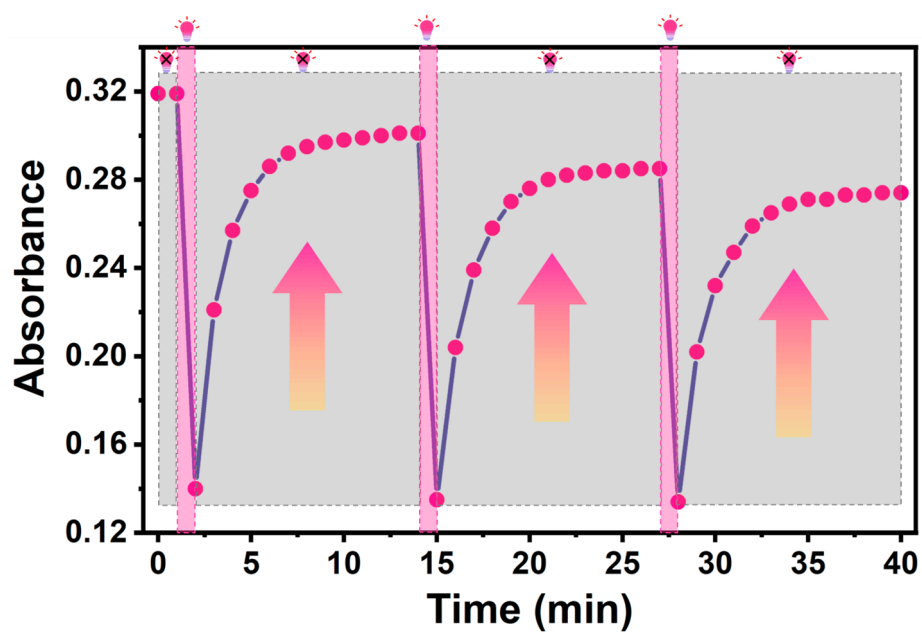
**Figure S6.**  $^1\text{H}$  NMR (top,  $\text{CDCl}_3$ , 25 °C, 400 MHz) and mass (bottom) spectra of the compound (9).



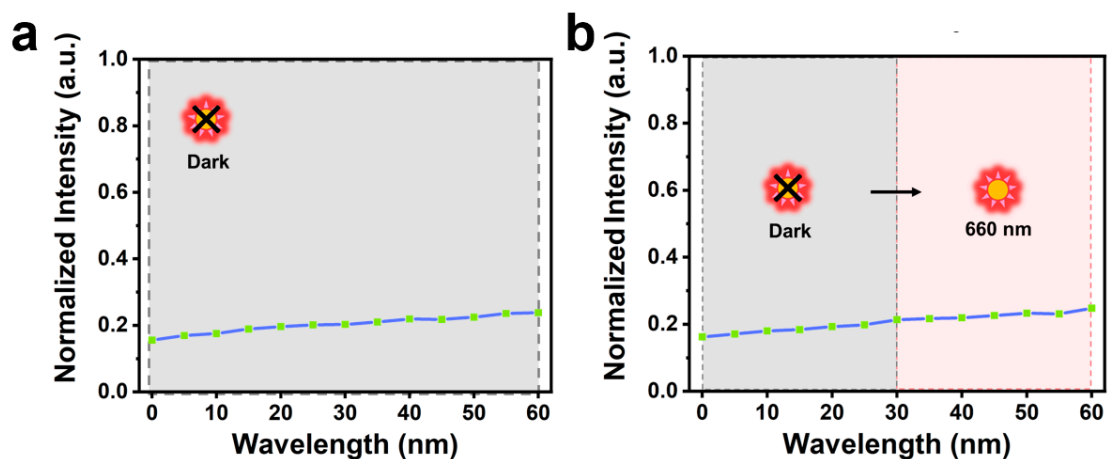
**Figure S7.** TEM observations of the DASA-polymer aggregates at various magnifications.



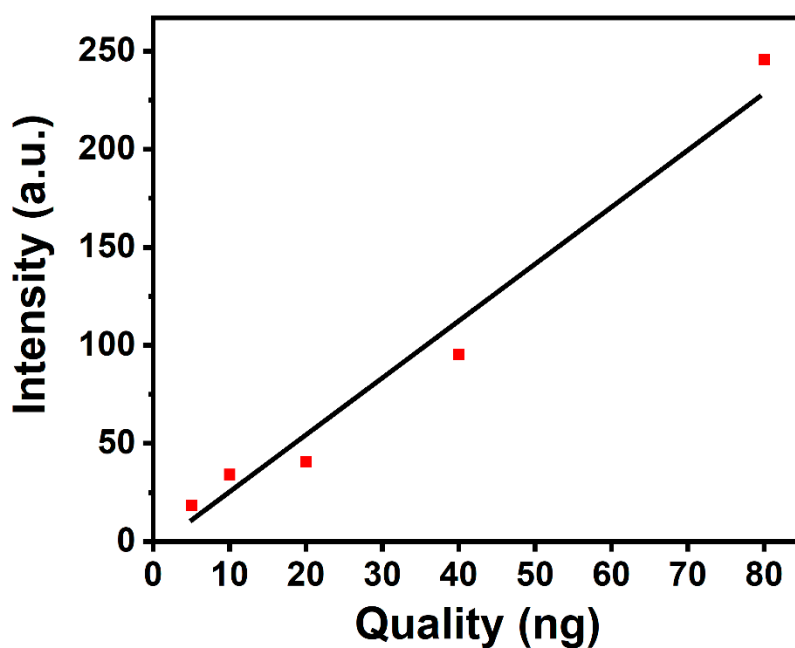
**Figure S8.** The size distribution histogram of DASA–polymer micelles unveils an average diameter of 25 nm.



**Figure S9.** Fatigue resistance study of DASA–polymer in water ( $150 \text{ mW cm}^{-2}$ ).

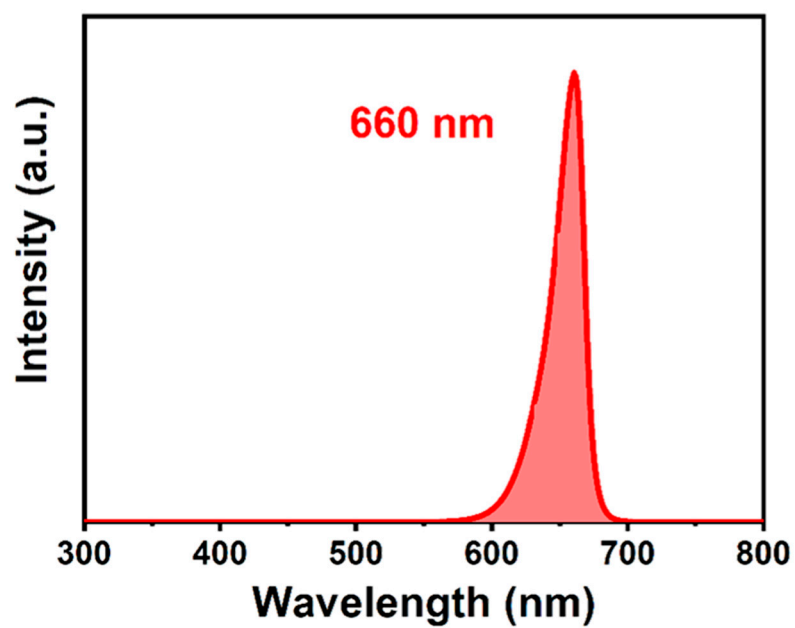


**Figure S10.** Plots of emission at 650 nm vs time. The time periods at which the 660 nm is turned off (gray area) or turned on (pink area) are indicated. (a) NR-loaded DASA-polymer nanovectors. (b) NR-free DASA-polymer nanovectors.



**Figure S11.** The standard linear calibration curve of NR in the solution of F-127 polymer micelles ( $1 \text{ mg mL}^{-1}$  in  $\text{H}_2\text{O}$ ). ( $\lambda_{\text{ex}}$ , 550 nm;  $\lambda_{\text{em}}$ , 650 nm).



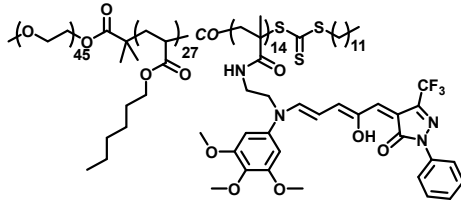
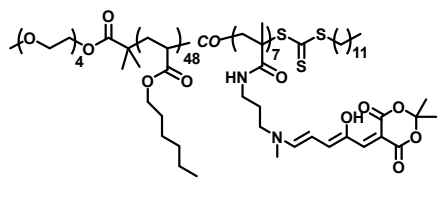
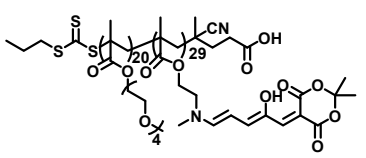
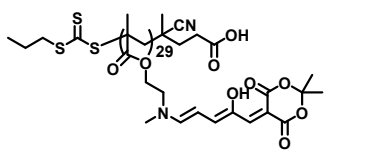


**Figure S12.** The emission spectrum of the red light-LED.

**Table S1.** GPC results.

	Mn	Mw	PDI
Polymer (6)	10,100	12,500	1.24
PEO <sub>45</sub> -DDMAT	3,100	3,200	1.03

**Table S2.** Apparent half lifetimes to reach equilibrium in the dark at 25 °C in water.

 <p>DASA-polymer</p>		 <p>DASA ADC (PEO<sub>45</sub>-<i>b</i>-P(DASA<sub>7</sub>-<i>co</i>-HA<sub>48</sub>))</p>	
 <p>pPEGMEMA<sub>20</sub>-<i>b</i>-pMAEMA<sub>29</sub> DASA</p>		 <p>PMAEMA<sub>29</sub> DASA</p>	
Sample	<i>t</i> <sub>1/2</sub> (min)	Reference	
<b>DASA-polymer</b>	<b>1</b>	<b>this work</b>	
DASA ADC (PEO <sub>45</sub> - <i>b</i> -P(DASA <sub>7</sub> - <i>co</i> -HA <sub>48</sub> ))	∞	Macromol. Rapid Commun. <b>2021</b> , 42, 2100318	
PMAEMA <sub>29</sub> DASA	37	Polym. Chem. <b>2019</b> , 10, 6515	
pPEGMEMA <sub>20</sub> - <i>b</i> -pMAEMA <sub>29</sub> DASA	67	Macromol. Rapid Commun. <b>2020</b> , 41, 2000236	