Supporting Information

Rational Designed Hyperbranched Azopolymer with Temperature, Photo and pH Responsive Behavior

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Synthesis of N,N'-(diazenediylbis(4,1-phenylene)) diacrylamide (AzoBA)

Figure S1 shows the $^1$H NMR (400 MHz) spectrum of AzoBA with peak assignments in DMSO-$d_6$. δ (ppm): 10.52 (-CONHPh-, 1H); 7.90 (azobenzene, 8H); 6.47, 6.37 and 5.80 (CH$_2$=CH-CO, 3H).

Figure S1. $^1$H NMR spectrum and chemical structure of AzoBA.

Figure S2. GPC curve of HPAzoAMAM capped with palmityl chloride.
Figure S3. TEM and liquid AFM images of HPAzoAMAM-star-EG3 LCMs at (a), (c) 30 °C and (b), (d) 20 °C. The inset in (c) and (d) are the AFM height profile along the red line.

Figure S4. UV-Vis absorption spectra of (a) HPAzoAMAM-star-EG3 in DMF, (b) HPAzoAMAM-star-EG3 LCMs and (c) LCMs with SNPs upon irradiation of 450 nm light.
Figure S5. SEM images of HPAzoAMAM-star-EG₃ LCMs irradiated by polarized light for (a) 0, (b) 10, (c) 20, (d) 30, (e) 60, (f) 90, (g) 120, and (h) 180 min and LCMs with SNPs irradiated for (a₁) 0, (b₁) 10, (c₁) 20, (d₁) 30, (e₁) 60, (f₁) 90, (g₁) 120, and (h₁) 180 min, respectively.