

Supporting Information for

Modular Design of Redox-Responsive Stabilizers for Nanocrystals

*Kathrin Fuhrmann, Anna Połomska, Carmen Aeberli, Bastien Castagner, Marc A. Gauthier, and
Jean-Christophe Leroux**

Institute of Pharmaceutical Sciences, Department of Chemistry and Applied Biosciences, Swiss
Federal Institute of Technology Zurich (ETH Zürich), Wolfgang-Pauli-Str. 10, 8093 Zurich,
Switzerland

To whom correspondence should be addressed: (J.-C.L.) jleroux@ethz.ch

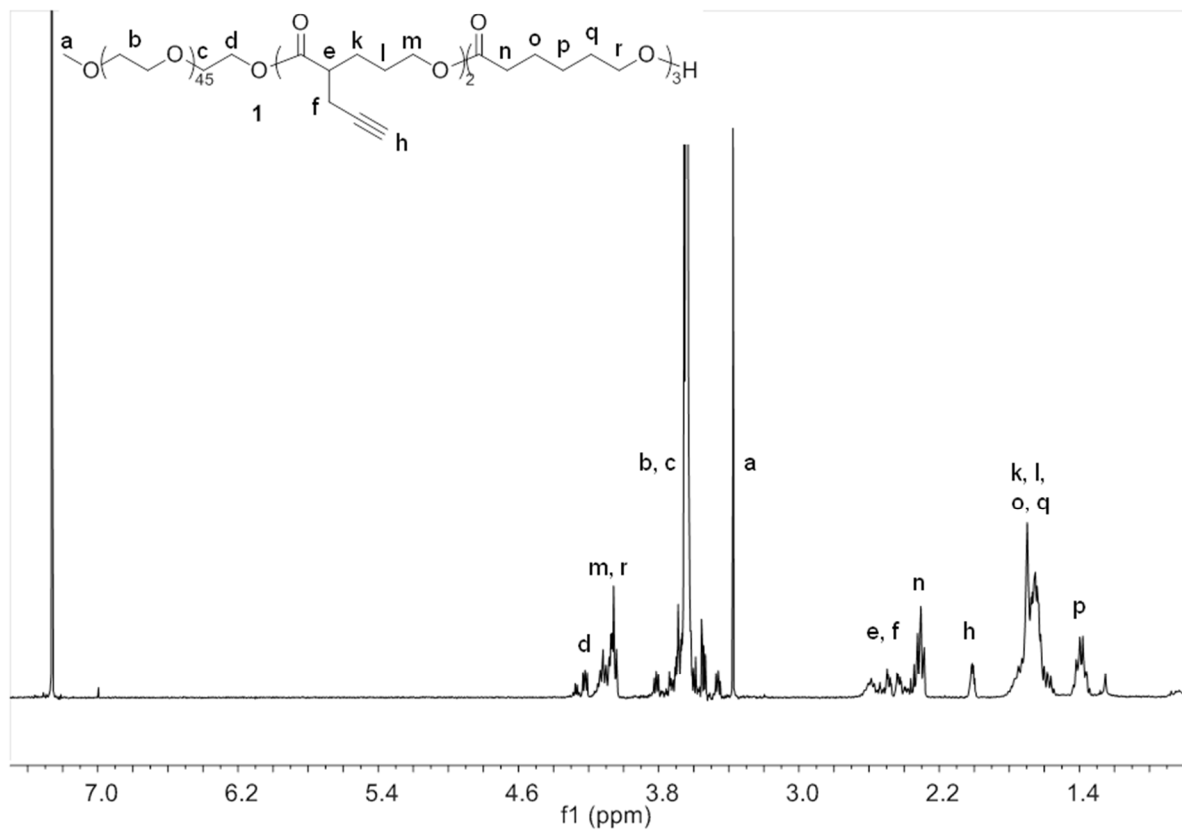


Fig. S1. ¹H NMR spectrum of polymer 1.

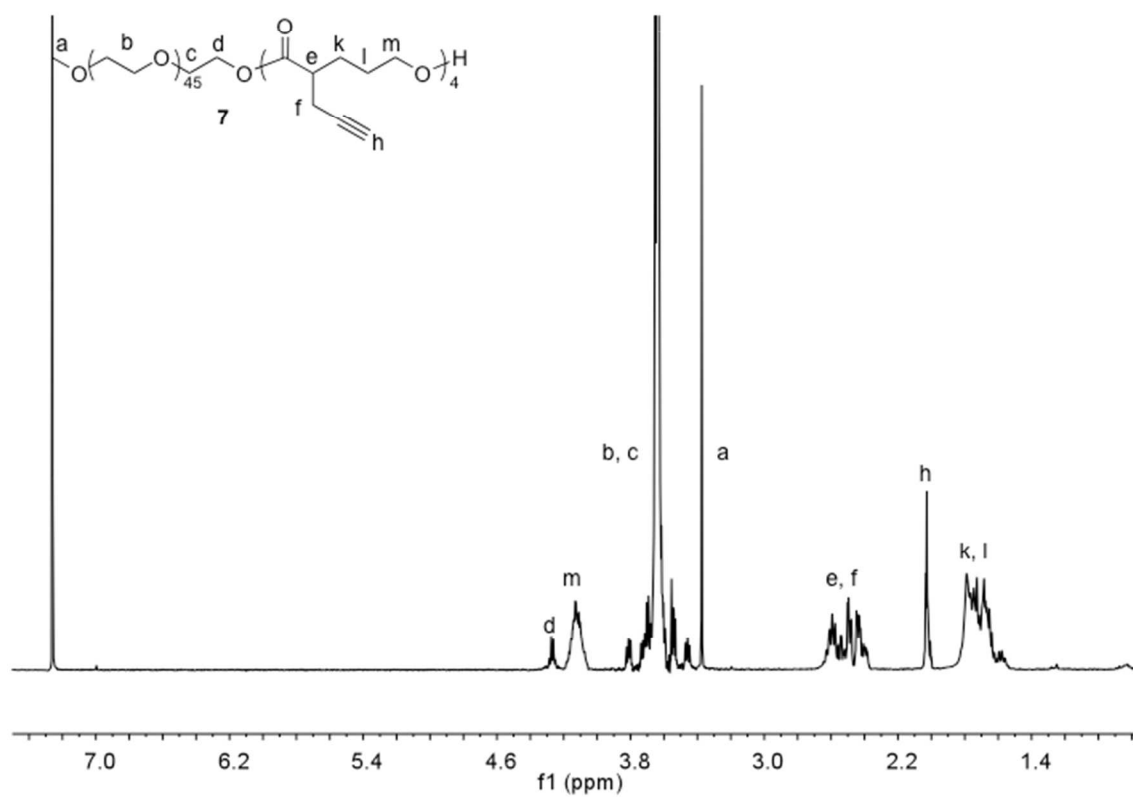


Fig. S2. ^1H NMR spectrum of polymer 7.

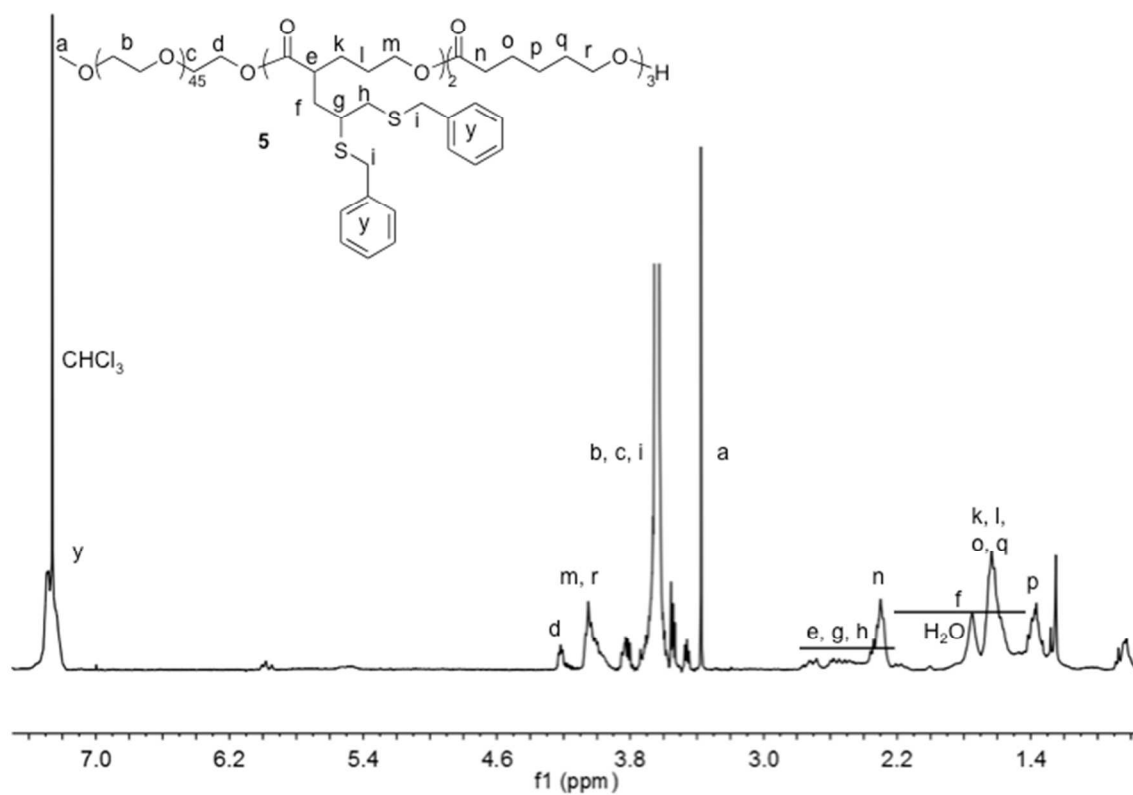


Fig. S3. ¹H NMR spectrum of polymer 5.

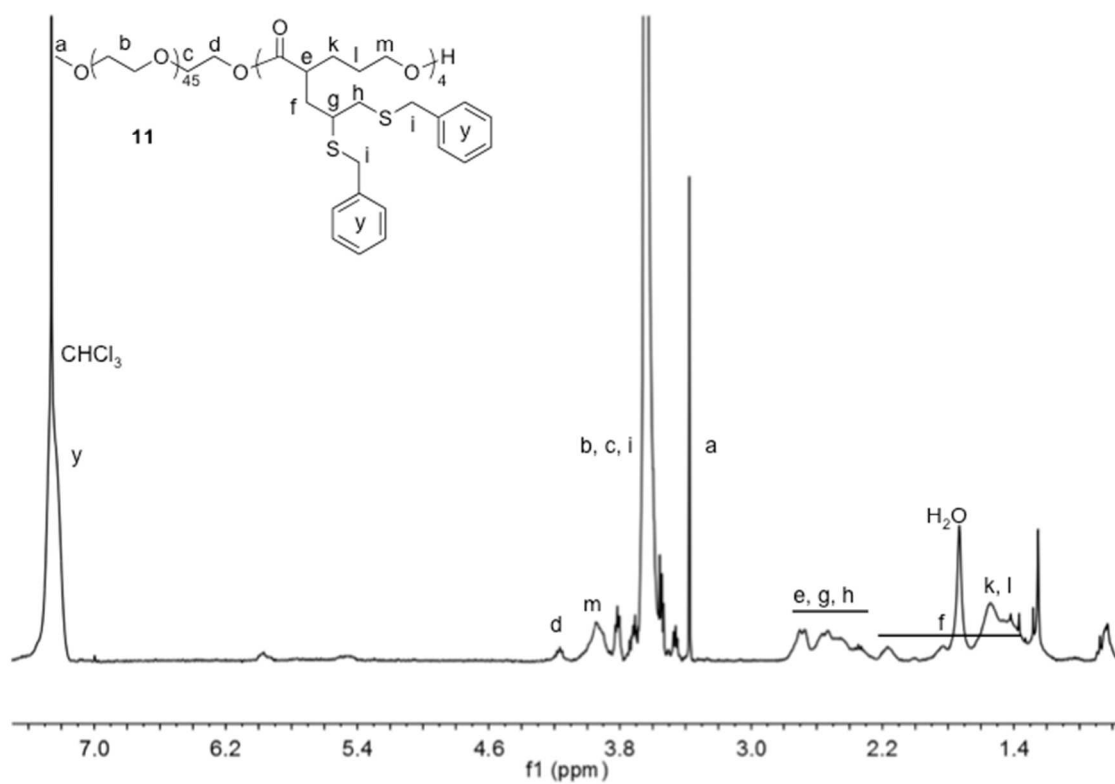


Fig. S4. ^1H NMR spectrum of polymer **11**.

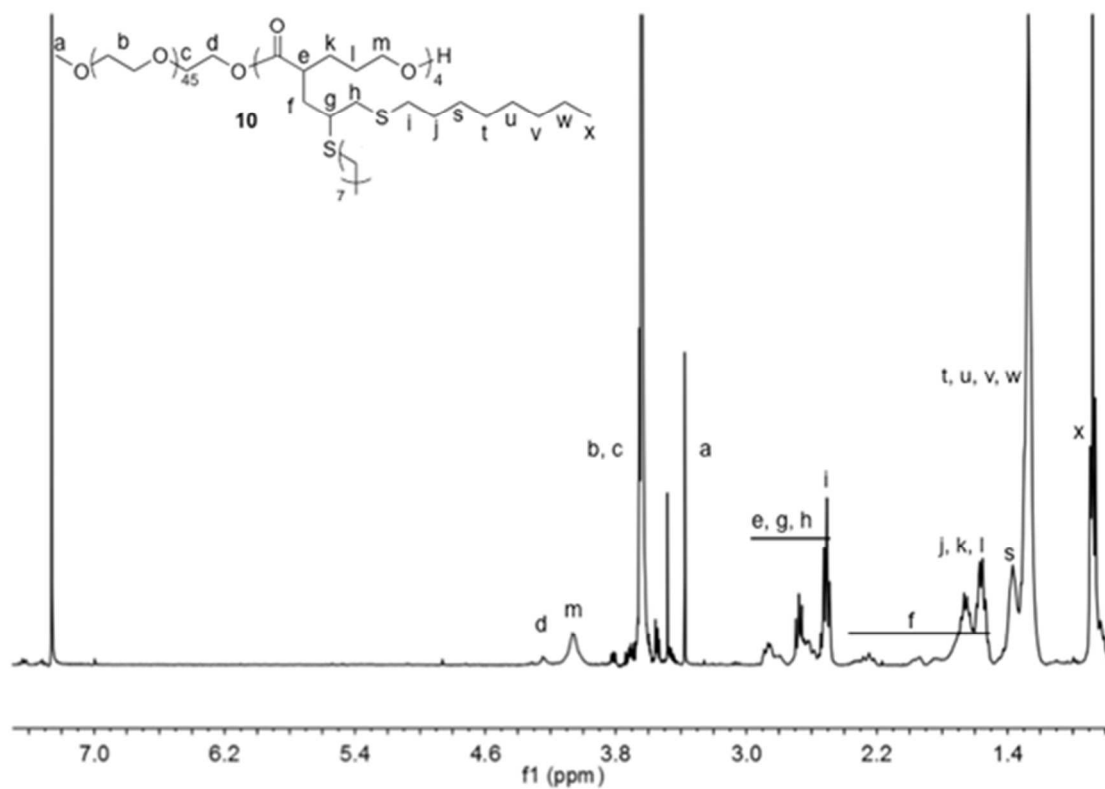


Fig. S5. ^1H NMR spectrum of polymer **10**. The polymer was purified by extensive dialysis against 63% THF.

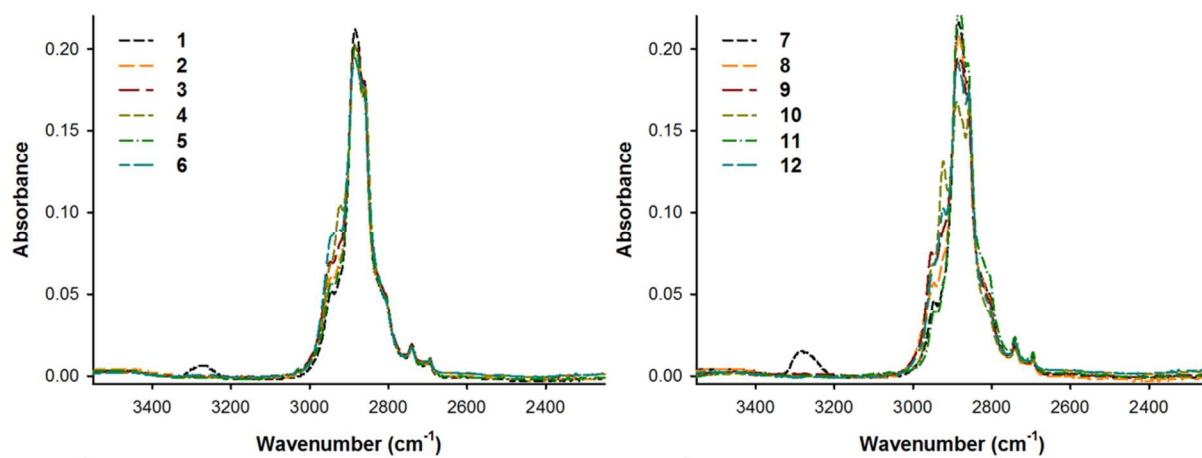


Fig. S6. FTIR spectra of parent polymers **1** and **7** and their respective thiol-ynes adducts showing the disappearance of the alkynyl peak at 3270 cm^{-1} .

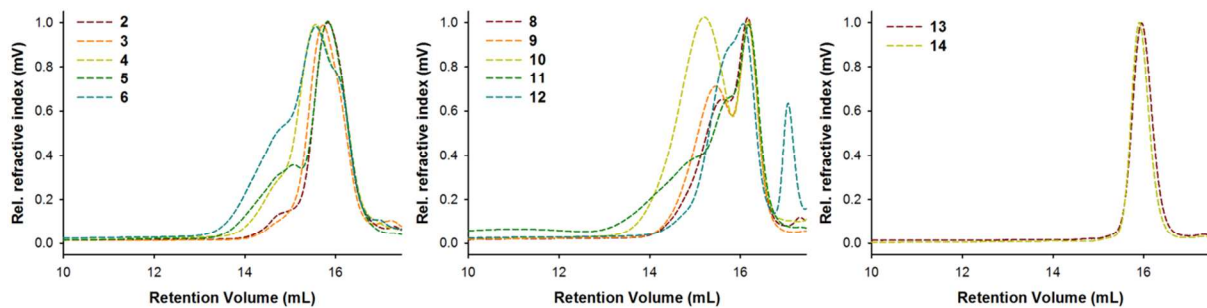


Fig. S7. SEC traces of polymers after thiol–yne coupling and control polymers

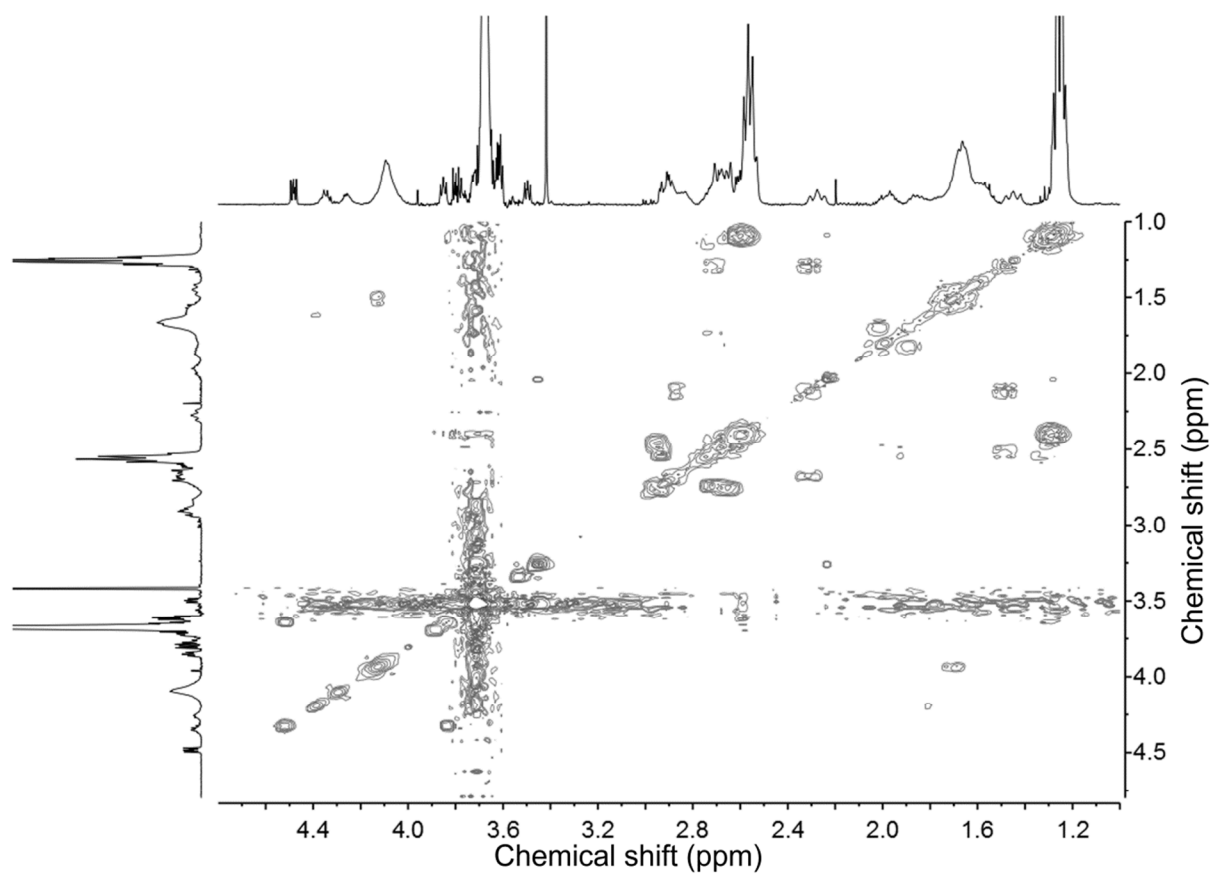


Fig. S8. ^1H - ^1H correlation spectrum of **8**.

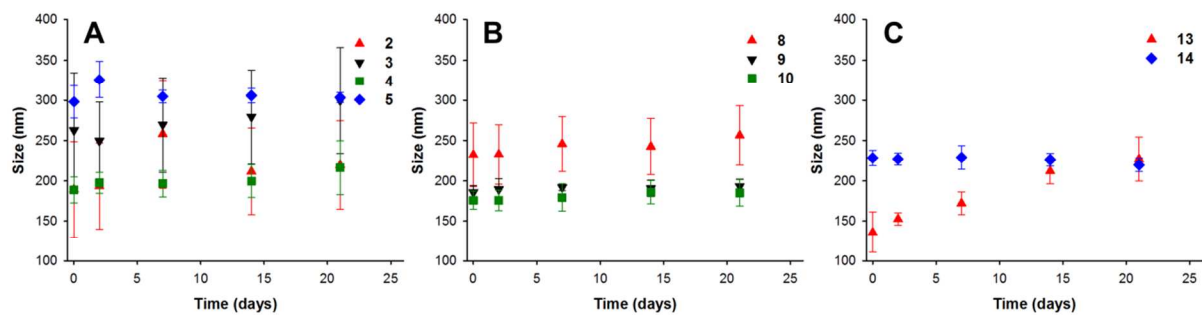


Fig. S9. Size stability of NCs milled with different polymers and stored at 6 °C. Values represent mean \pm SD, $n = 3-6$.

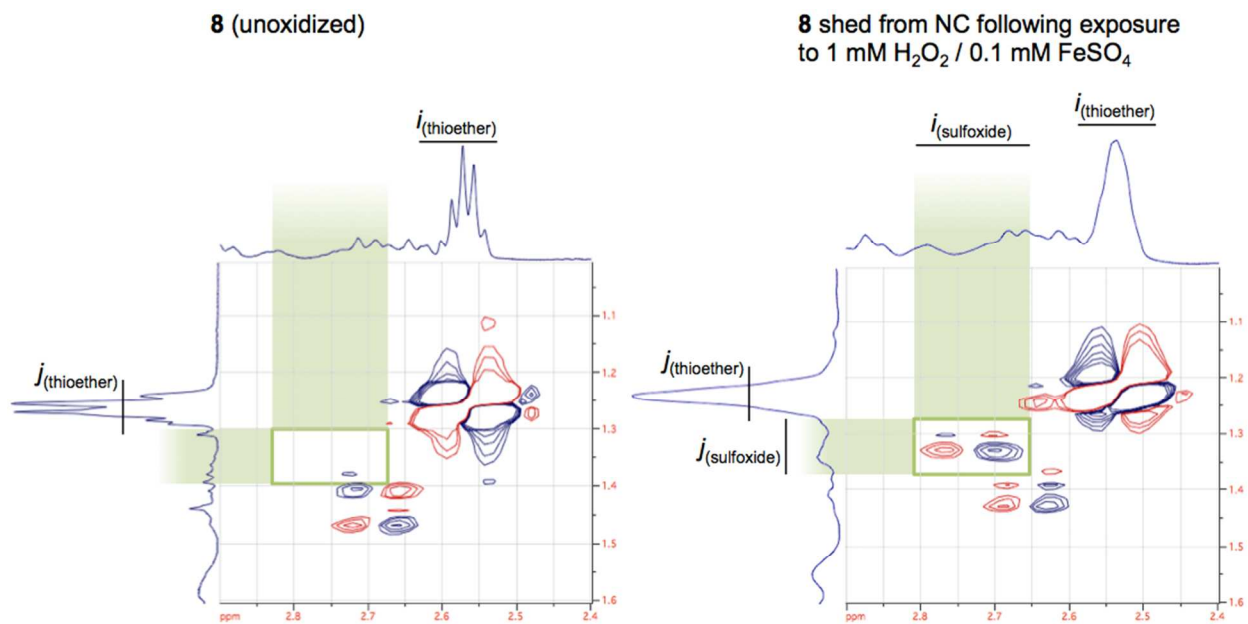


Fig. S10. Oxidation of **8**. 500 MHz ^1H - ^1H COSY NMR in CDCl_3 of the polymer shed from nanoparticles following exposure to 1mM H_2O_2 and 0.1 mM FeSO_4 for 4 h. The particles were centrifuged at 20,000 $\times g$ for 90 min and the supernatant containing shed polymer was collected and lyophilized. The spectrum exhibits a new peak at 1.31 ppm that correlates with a signal at 2.74 ppm, which is consistent with an ethylsulfoxide moiety. [Abraham *et al. Magn. Reson. Chem.* **2008**, *46*, 667.]

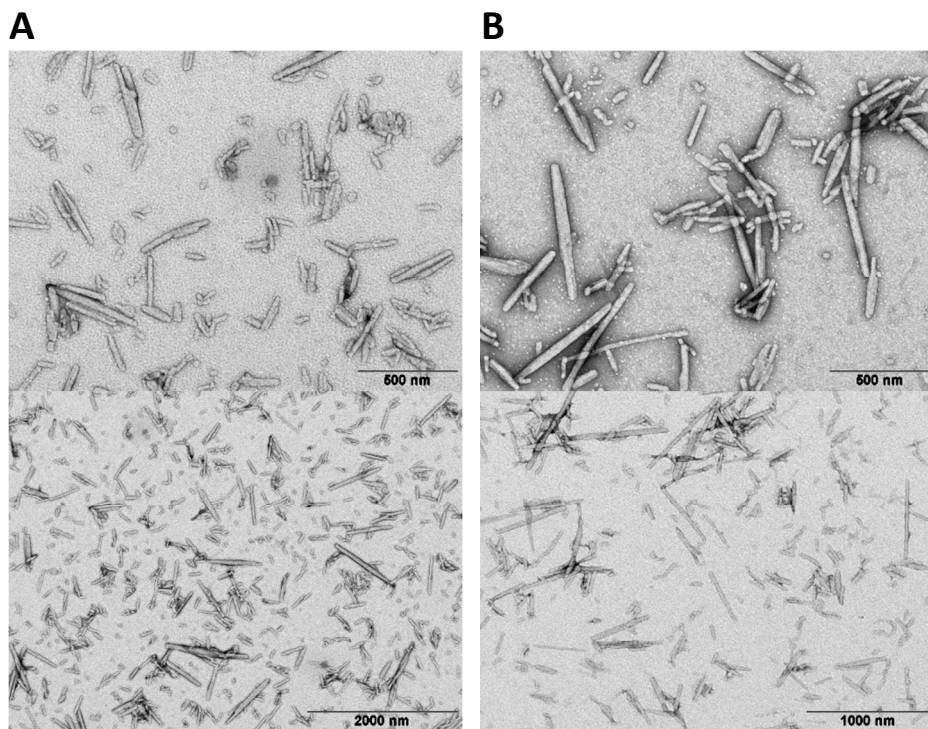


Fig. S11. Representative TEM overview and zoomed images of NCs stabilized with **8** before (A) and after (B) exposure to 1 mM H₂O₂/0.1 mM FeSO₄ for 4 hours, demonstrating signs of aggregation. The specimens were examined in a FEI Morgagni 268 (tungsten cathode) transmission electron microscope (FEI Company, Netherlands) at 100 kV and images were recorded with a Keen View camera (Soft Imaging System, Germany).

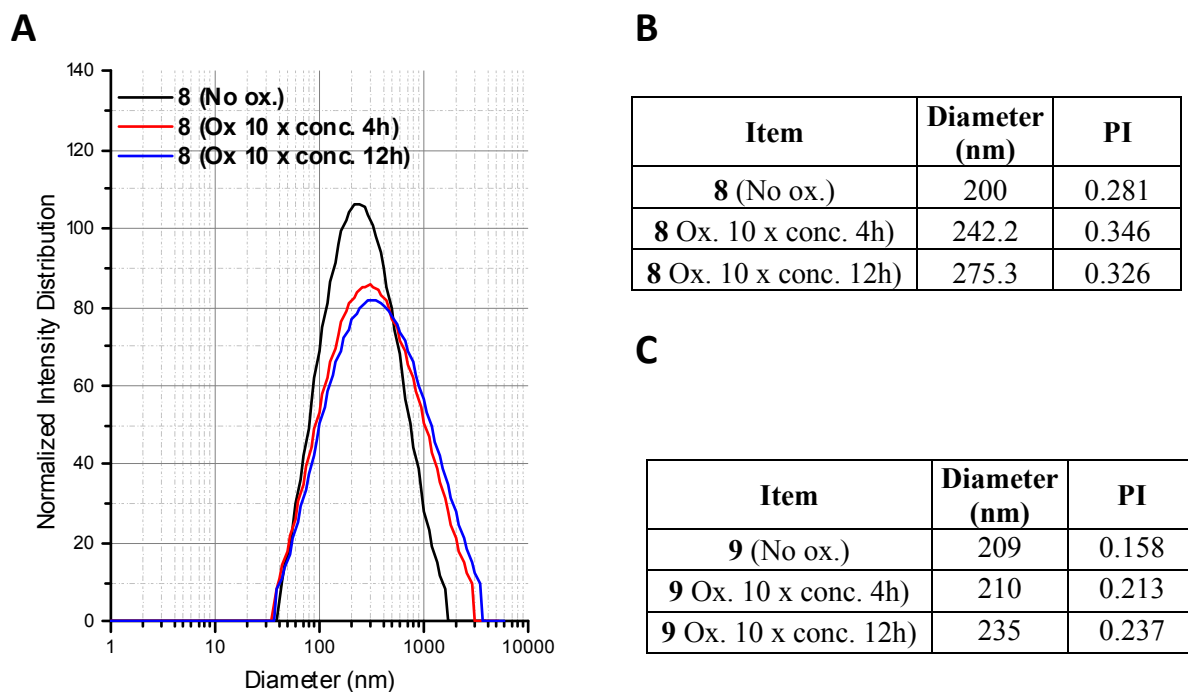


Fig. S12. Representative size distribution of NCs stabilized with **8** (A, B) and **9** (C) before and after exposure to 1 mM H₂O₂/0.1 mM FeSO₄ for 4 hours and 12 hours, demonstrating growth of the particles and increase in polydispersity index.

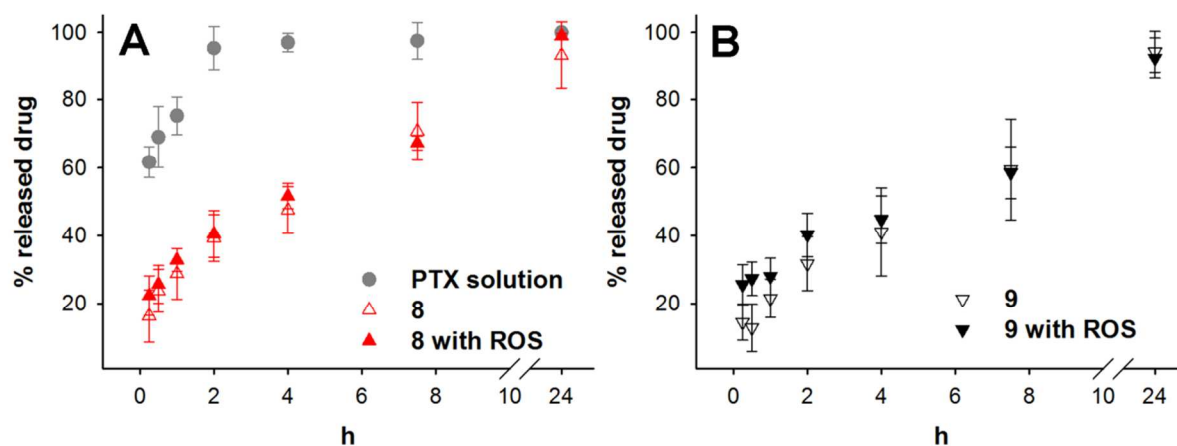


Fig. S13. Dissolution profiles of NCs stabilized with **8** (A) and **9** (B) before and after exposure to an oxidizing environment (1 mM H₂O₂/0.1 mM FeSO₄), a solution of PTX (A) served as control for the free diffusion of dissolved drug through the dialysis device.

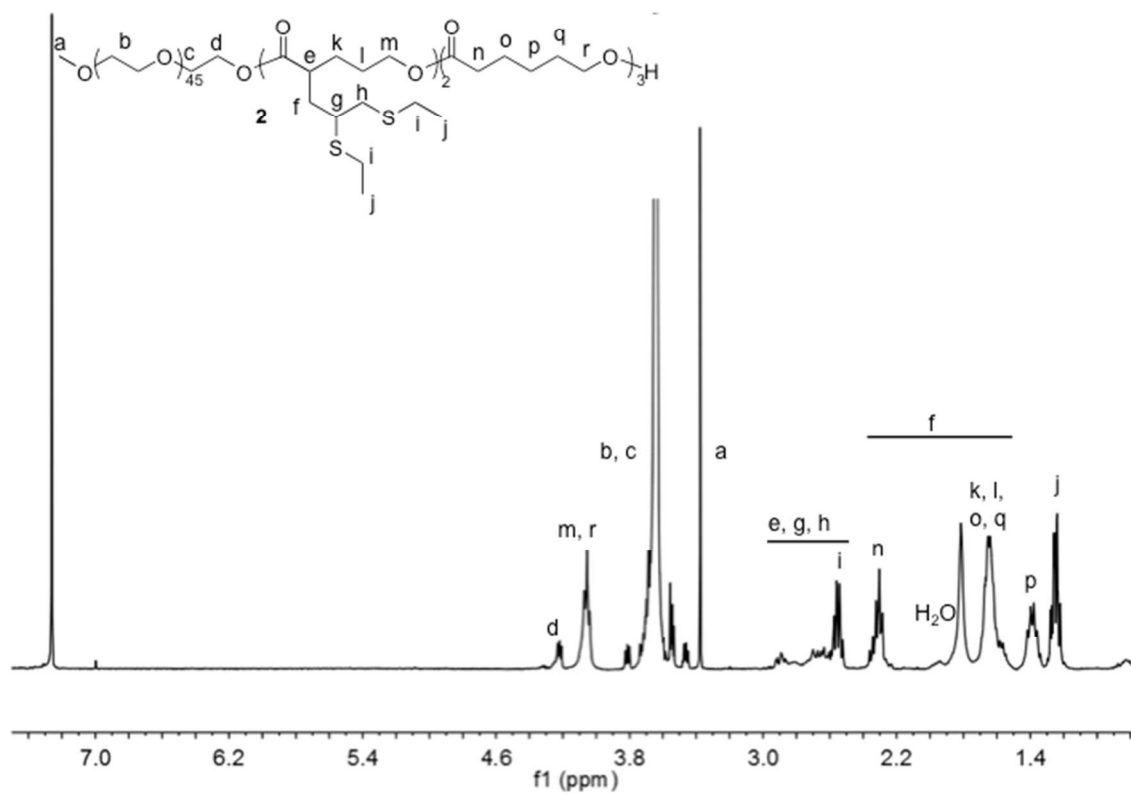


Fig. S14. ¹H NMR spectrum of polymer 2.

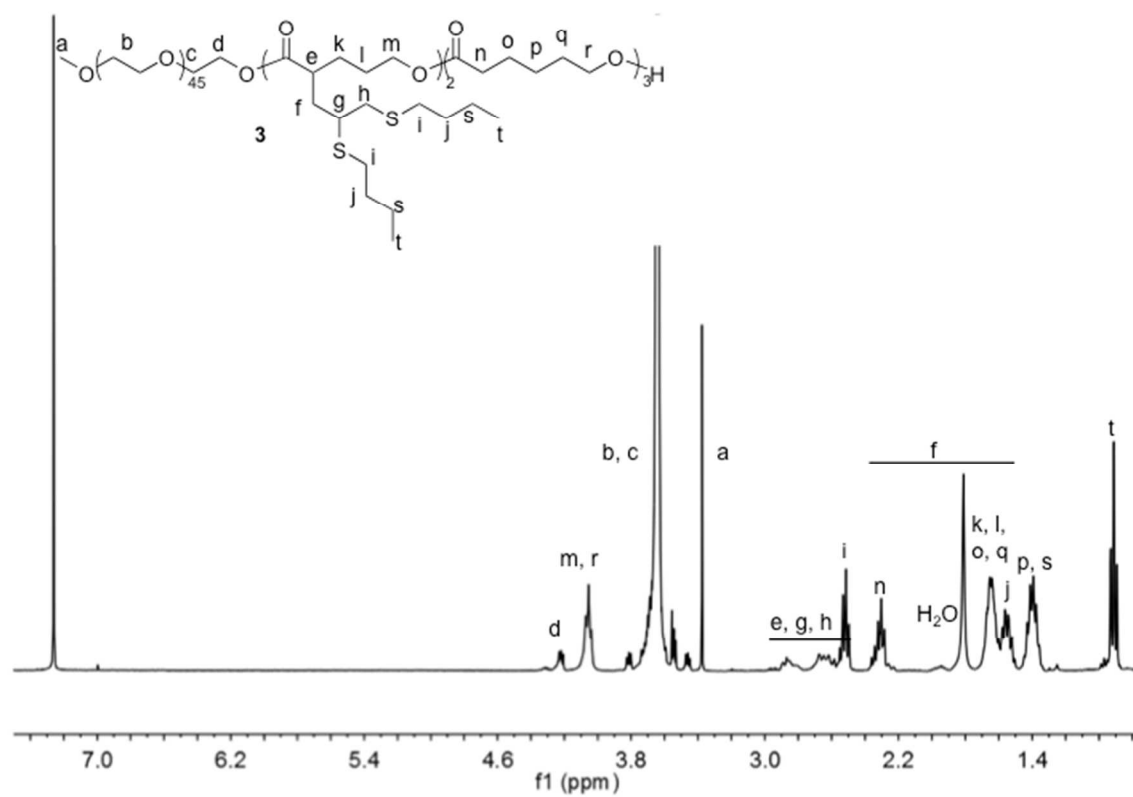


Fig. S15. ¹H NMR spectrum of polymer 3.

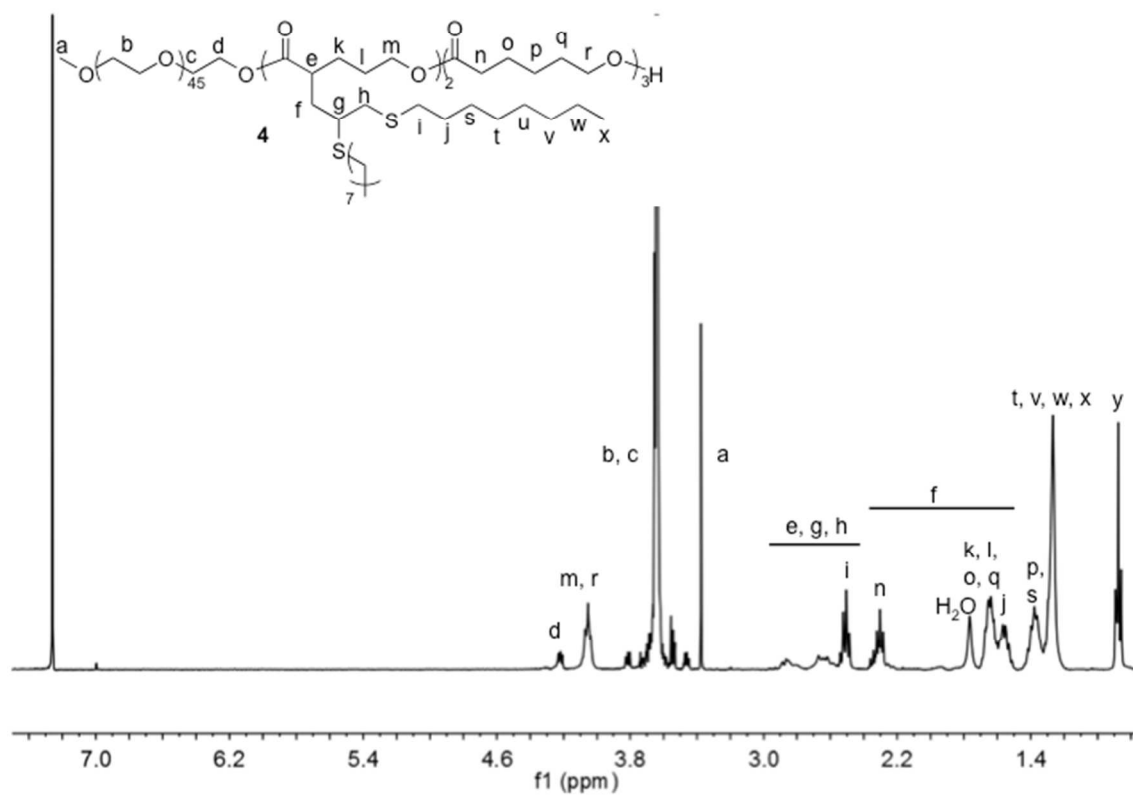


Fig. S16. ^1H NMR spectrum of polymer 4.

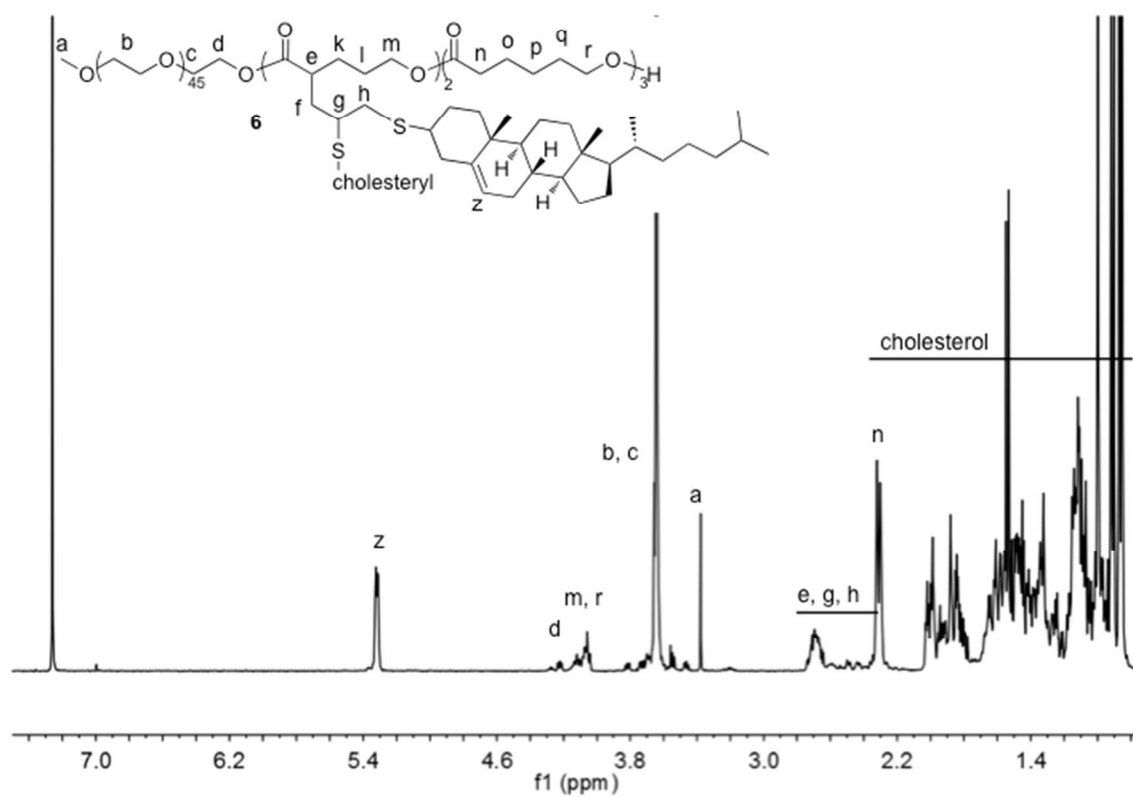


Fig. S17. ¹H NMR spectrum of polymer **6**. The polymer was purified by extensive dialysis against 63% THF.

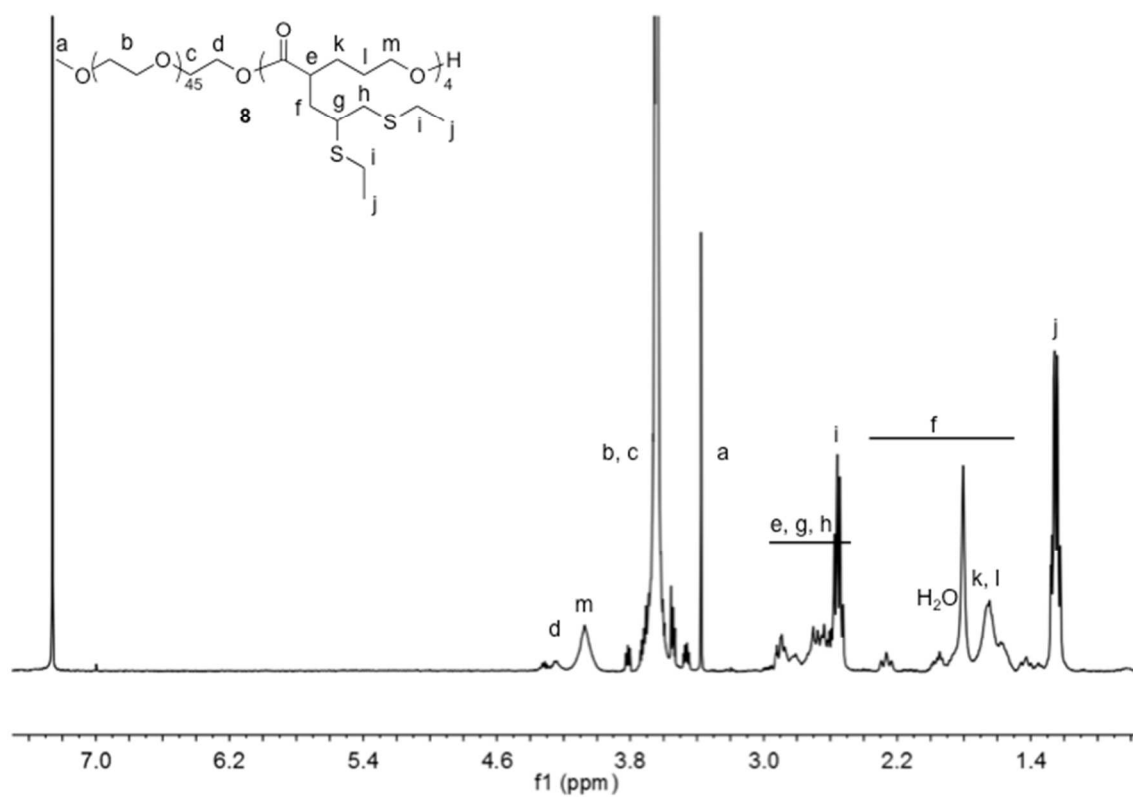


Fig. S18. ¹H NMR spectrum of polymer **8**.

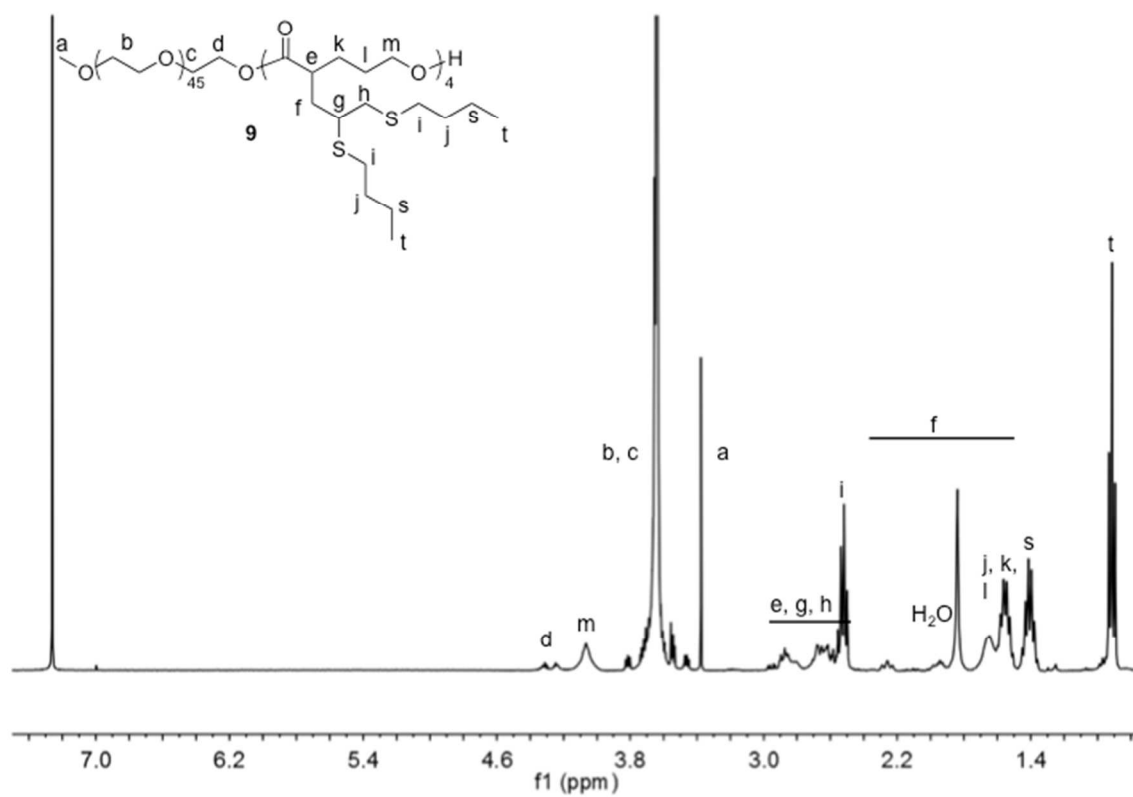


Fig. S19. ^1H NMR spectrum of polymer **9**.

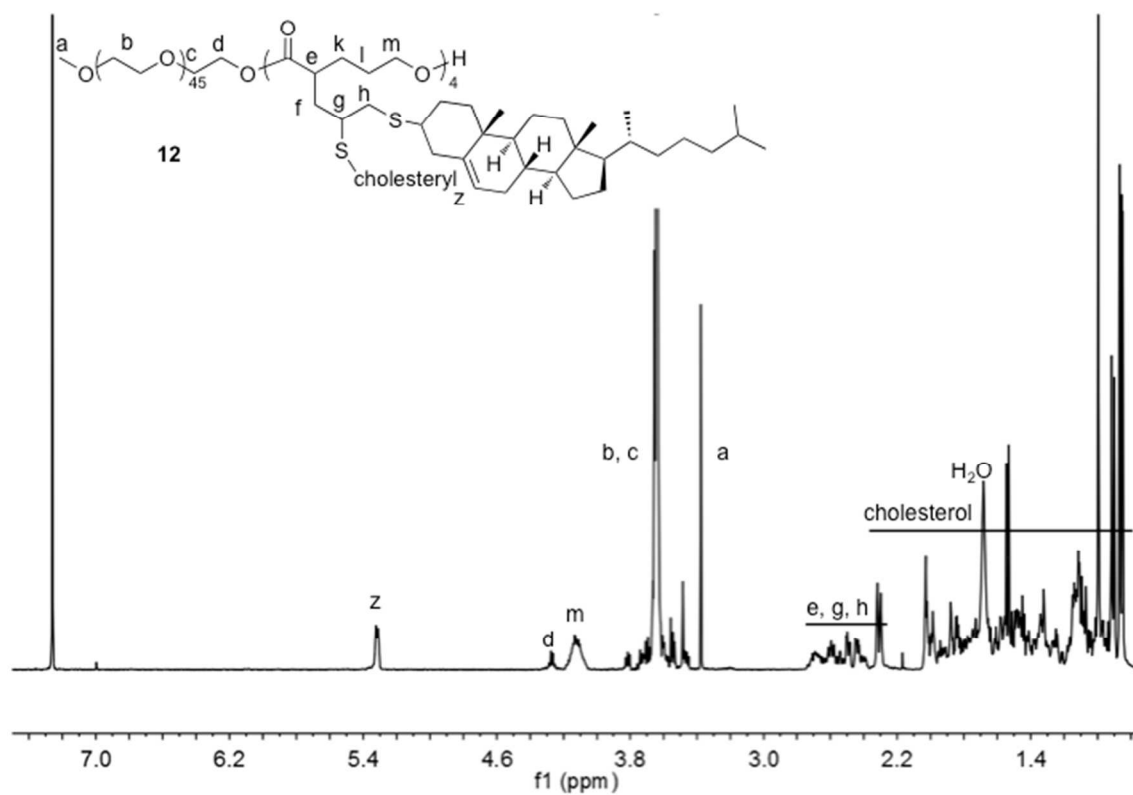


Fig. S20. ¹H NMR spectrum of polymer **12**. The polymer was purified by extensive dialysis against 63% THF.