

Electronic Supplementary information

One-pot and gram-scale synthesis of biodegradable polyglycerol at ambient conditions; nanocarriers for intradermal drug delivery

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Experimental

Methods

Nuclear magnetic resonance (NMR). NMR spectra were performed on a Bruker AMX 500 spectrometer. Inverse-gated ^{13}C NMR was performed on Bruker Avance 400 or Bruker Avance 500 spectrometers. For internal calibration tetramethylsilane was used at 12 MHz with complete proton decoupling. The degree of branching was calculated according to the inverse-gated ^{13}C NMR data using an equation from Frey et al.¹

$$DB = \frac{2D}{2D + L_{1,3} + L_{1,4}}$$

Where D, L13, and L14 represent the parts corresponding to dendritic, linear 1,3- (repeating unit with one primary hydroxyl group) and 1,4-(repeating unit with one secondary hydroxyl group) units, respectively.

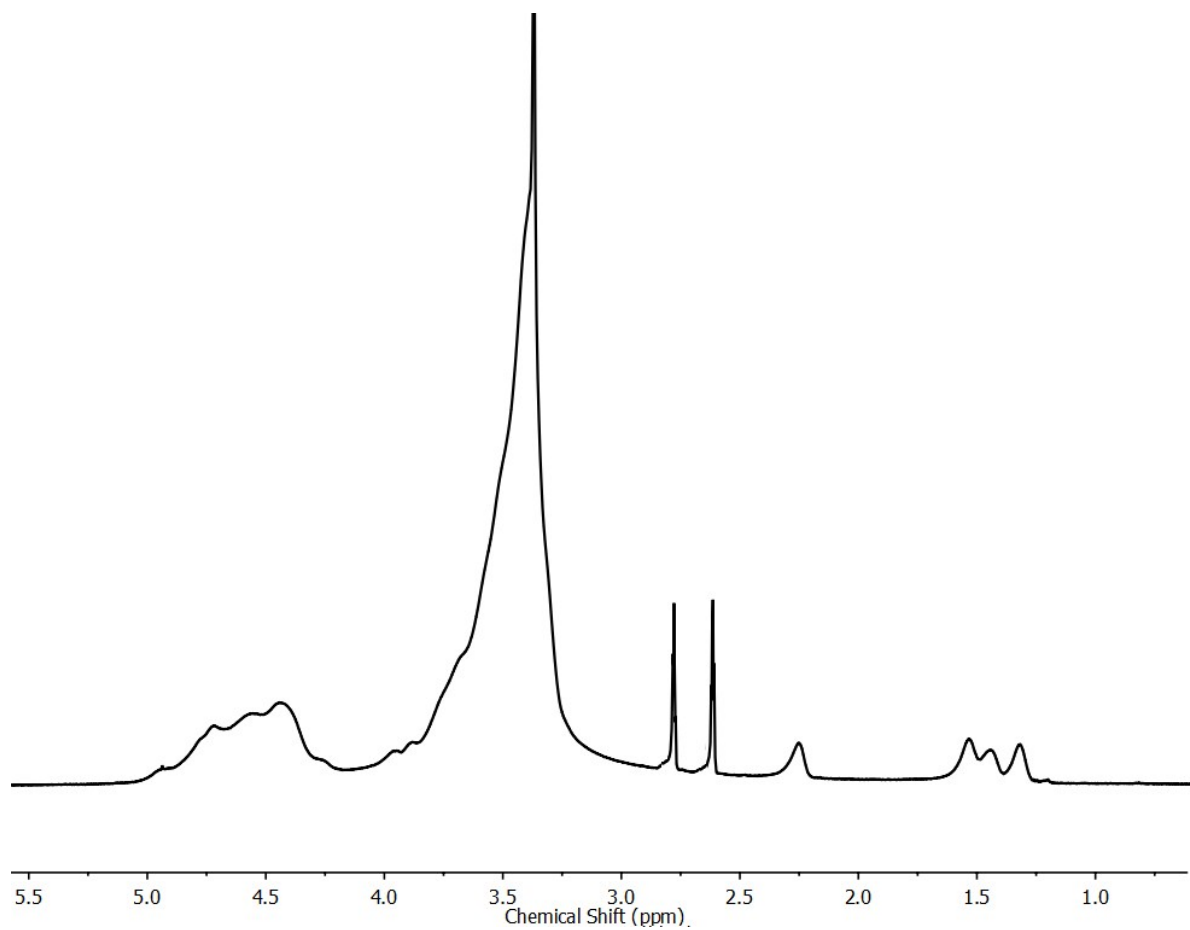


Figure S1. ¹H NMR spectrum of hPGOC41-50 recorded in DMF-d7 solvent.

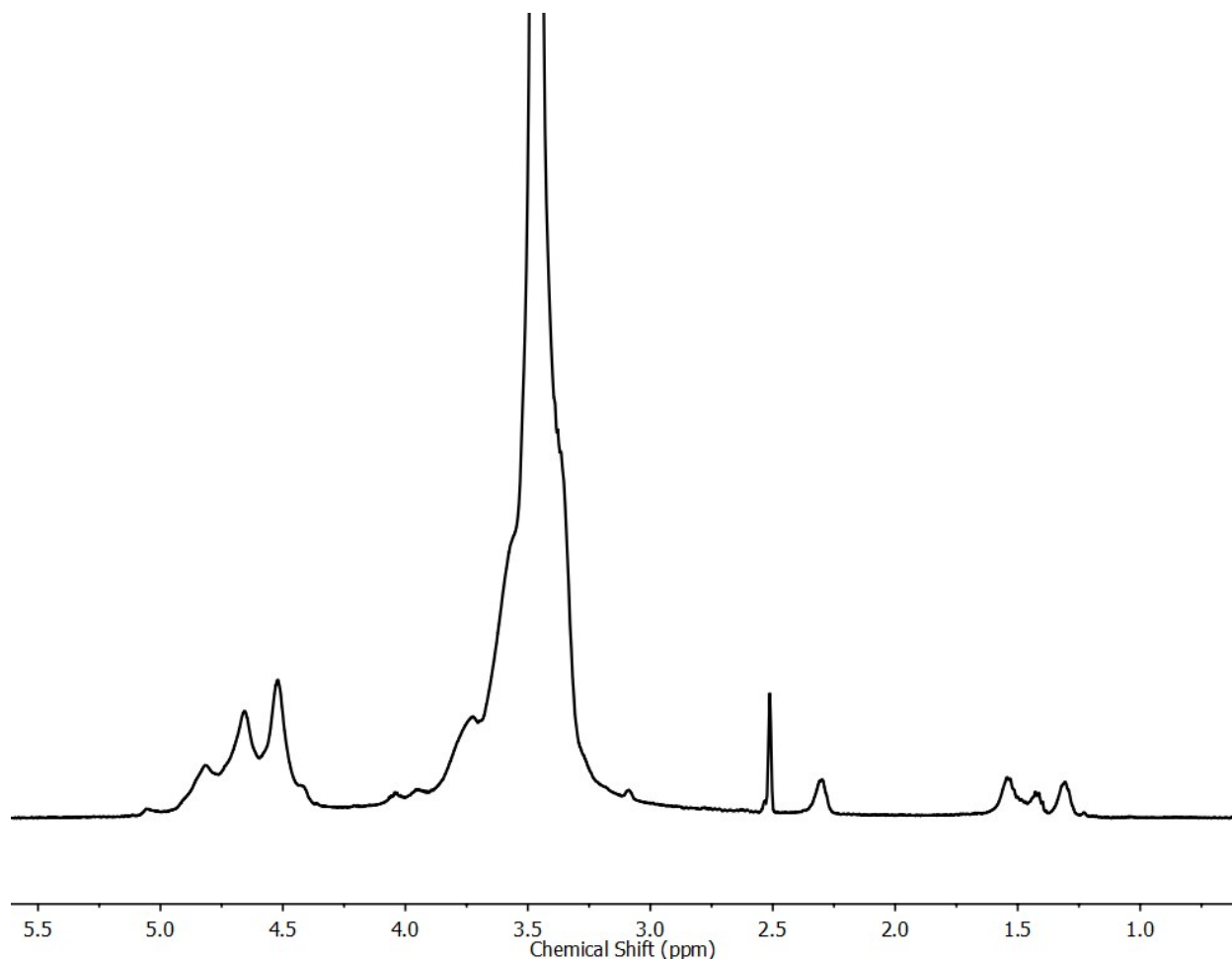


Figure S2. ¹H NMR spectrum of hPGOC41-50 recorded in DMSO-d₆ solvent.

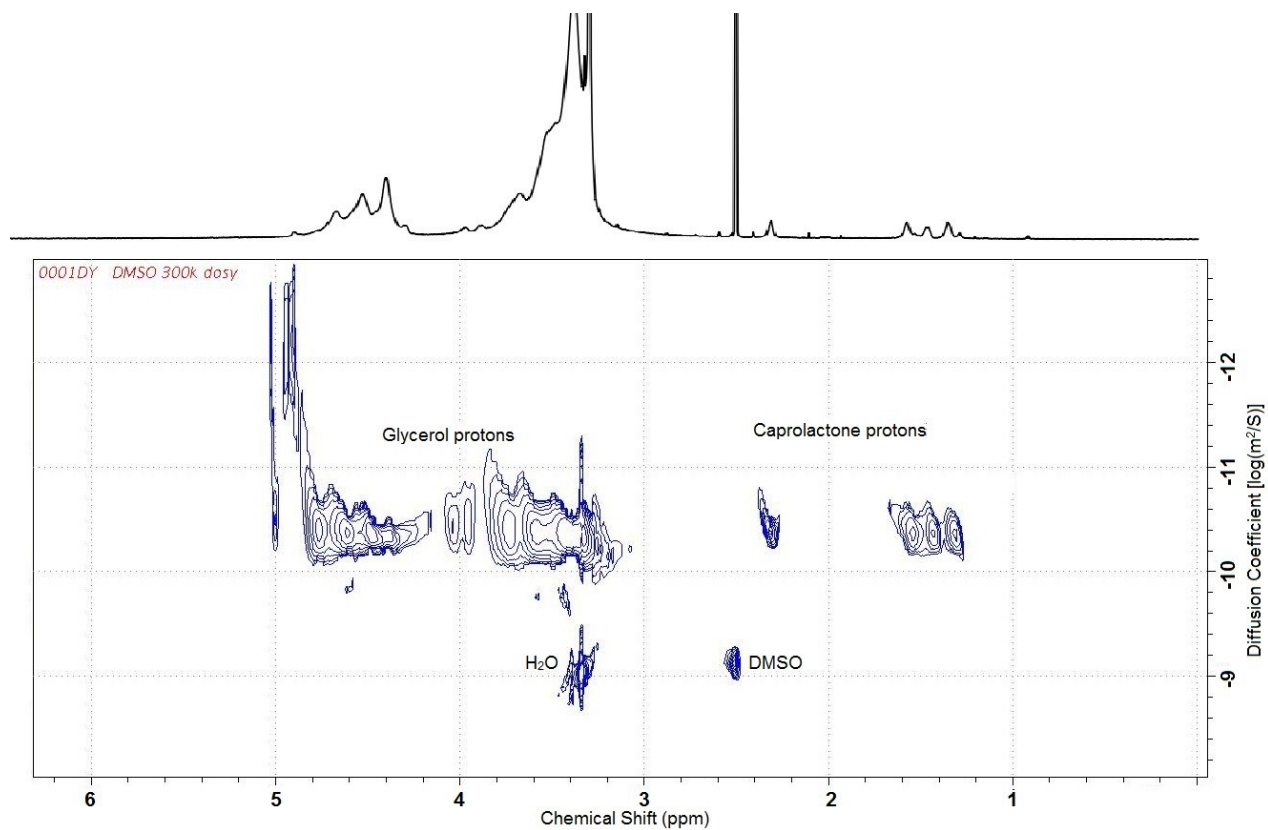


Figure S3. Diffusion coefficient of caprolactone and glycerol blocks of hPGOC41-50 in DMSO solvent measured by DOSY NMR.

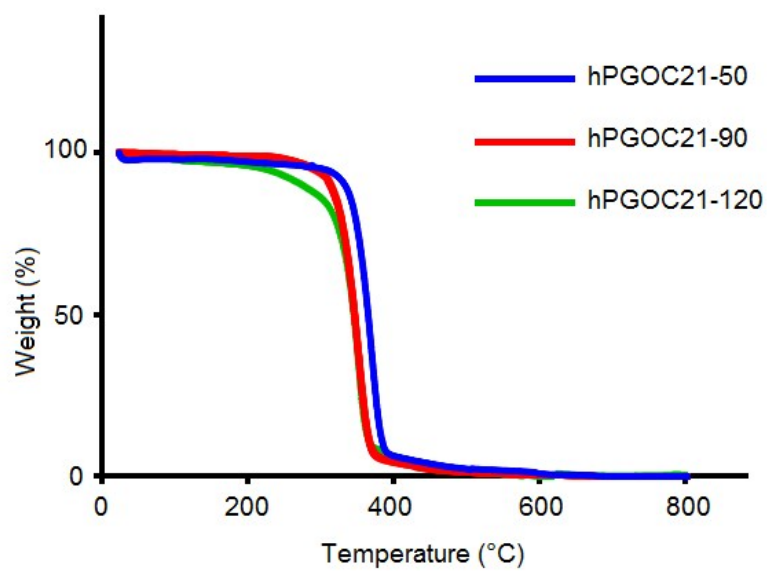


Figure S4. TGA diagrams of hPGOCs.

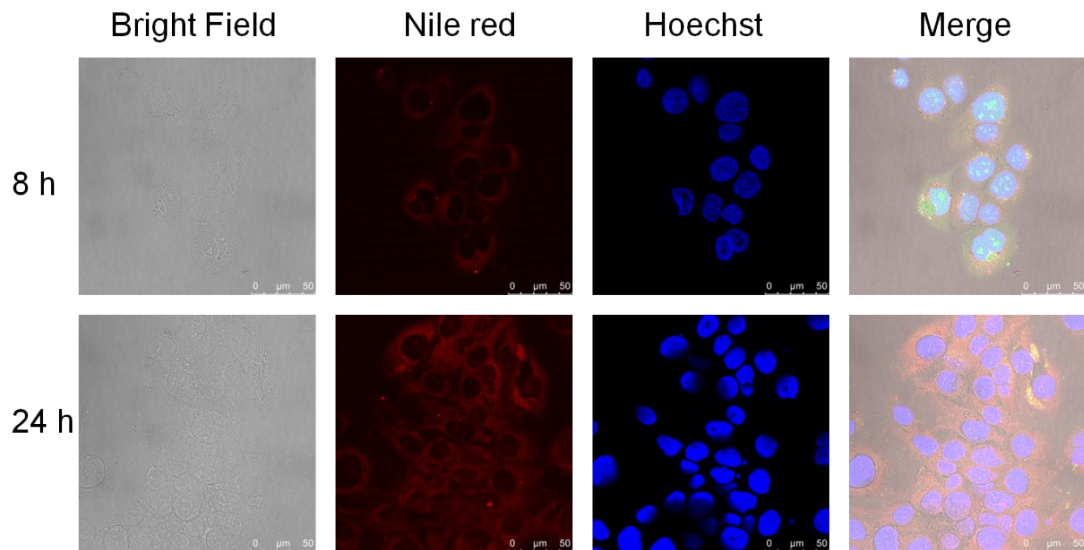


Figure S6. The CLSM images of hPGOC41-50 loaded with Nile red after incubation with living HaCaT cells for 8 h and 24 h.

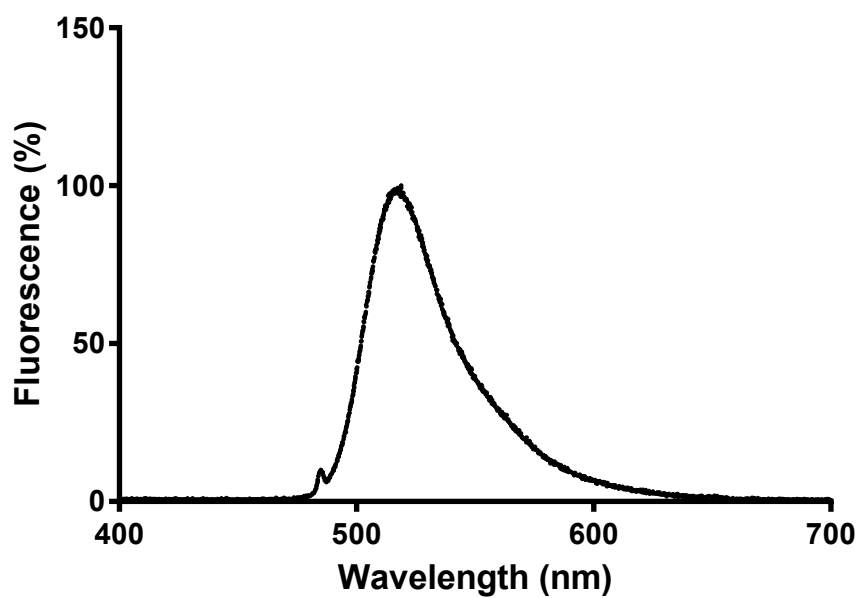
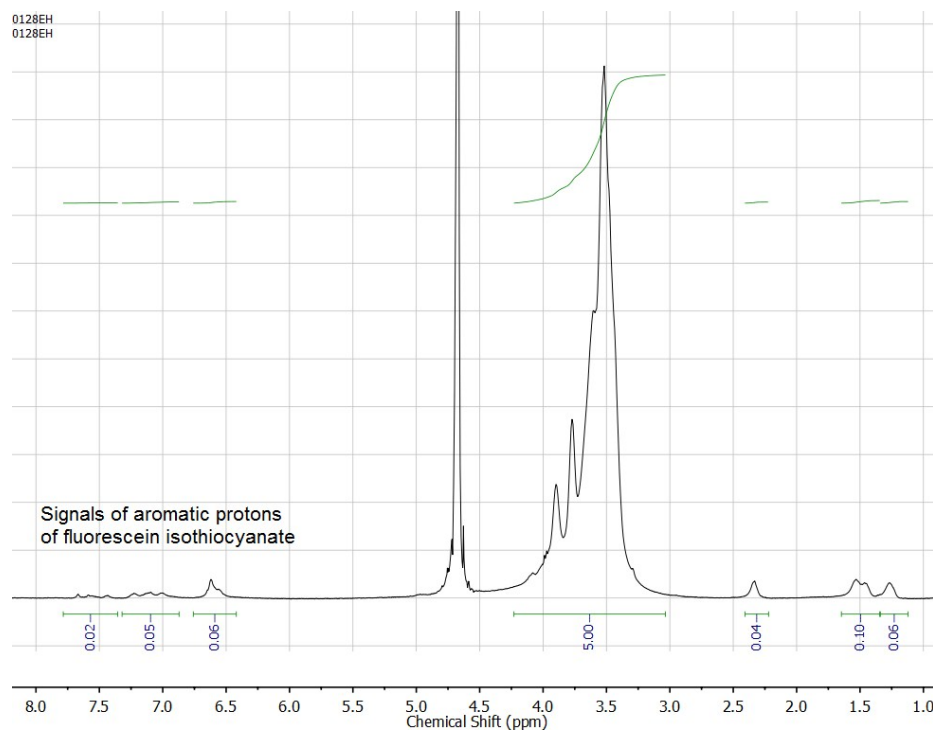


Figure S7. ^1H NMR (top) and fluorescent emission (down) spectra of FITC conjugated hPGOC41-50.

References

1. Sunder, A.; Hanselmann, R.; Frey, H.; Mülhaupt, R., *Controlled Synthesis of Hyperbranched Polyglycerols by Ring-Opening Multibranching Polymerization. Macromolecules* **1999**, *32* (13), 4240-4246.