Electronic Supplementary Material (ESI) for Lab on a Chip.

Support information

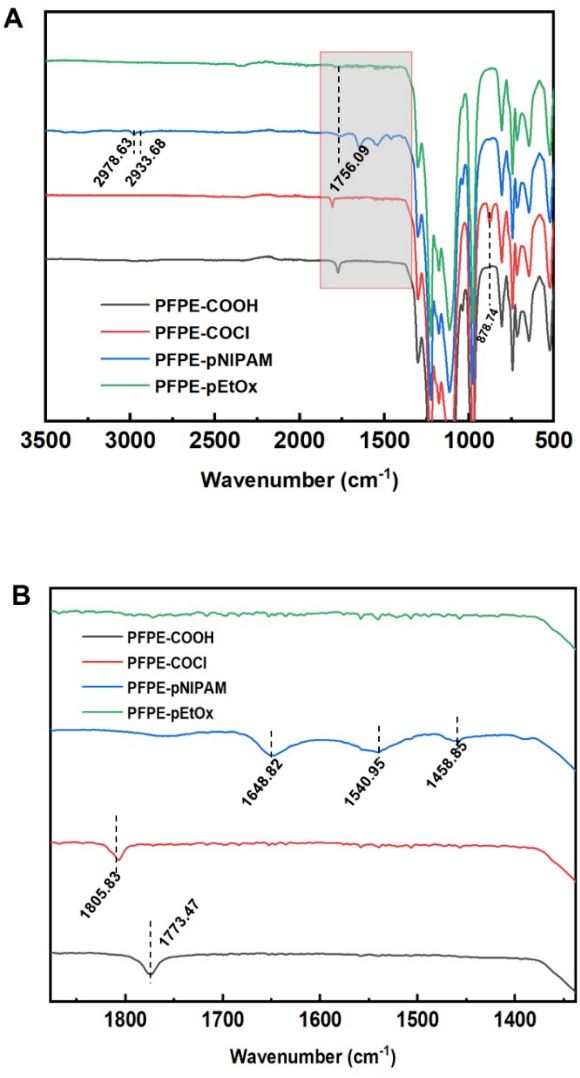

Fig. S1 (A) FTIR spectra of the diblock surfactant PFPE-pNIPAM, PFPE-pEtOx as compared to PFPE-COOH and PFPE-COCl. (B) The fingerprint region (2000-1400 cm^{-1}) of FTIR spectra showing the change in characteristic peaks of different compounds.

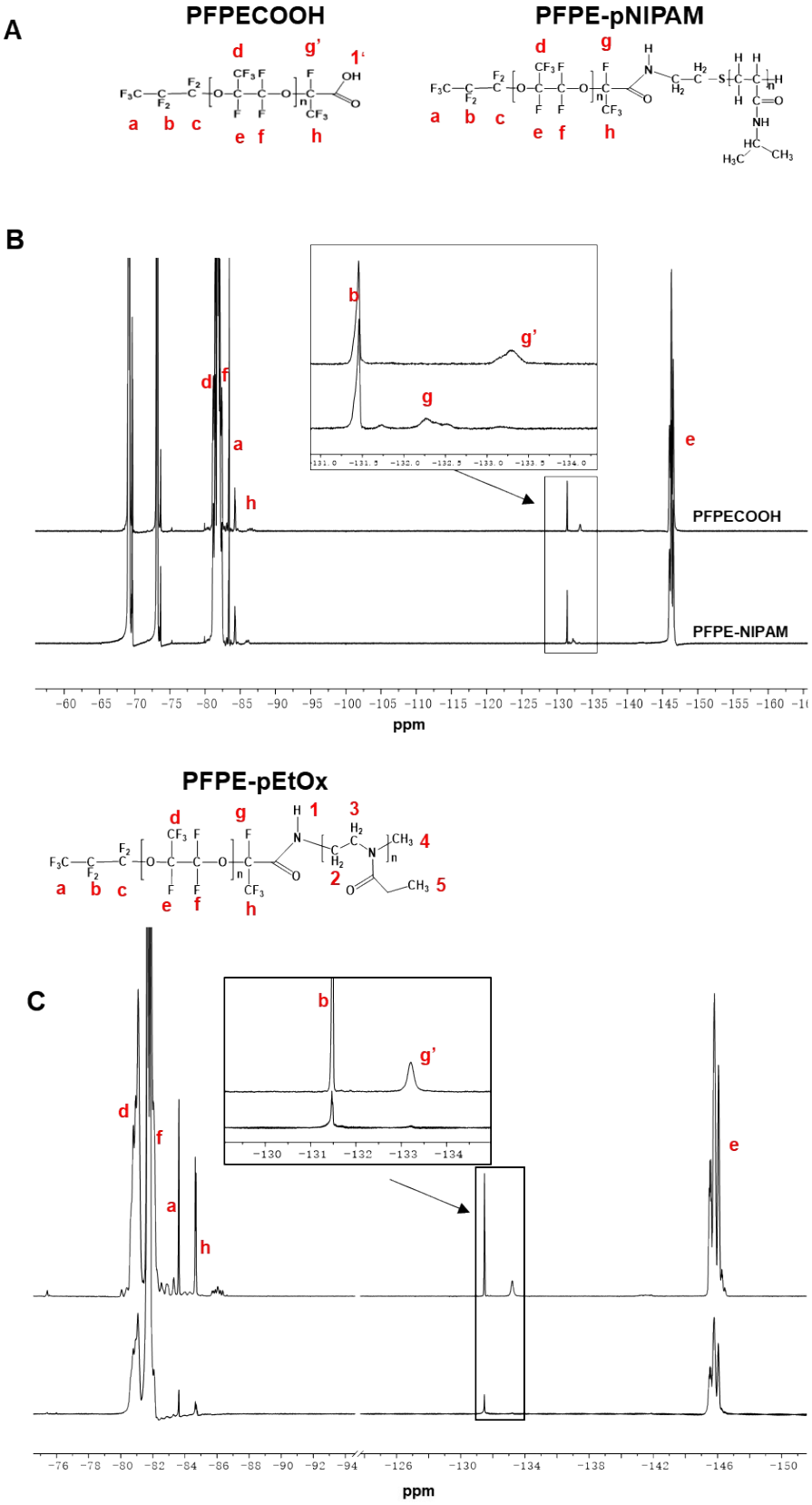

Fig. S2 ^{19}F NMR spectra of the resulting diblock surfactant PFPE-Pnipam (B) and PFPE-pEtOx (C) in comparison with the starting compound PFPECOOH.

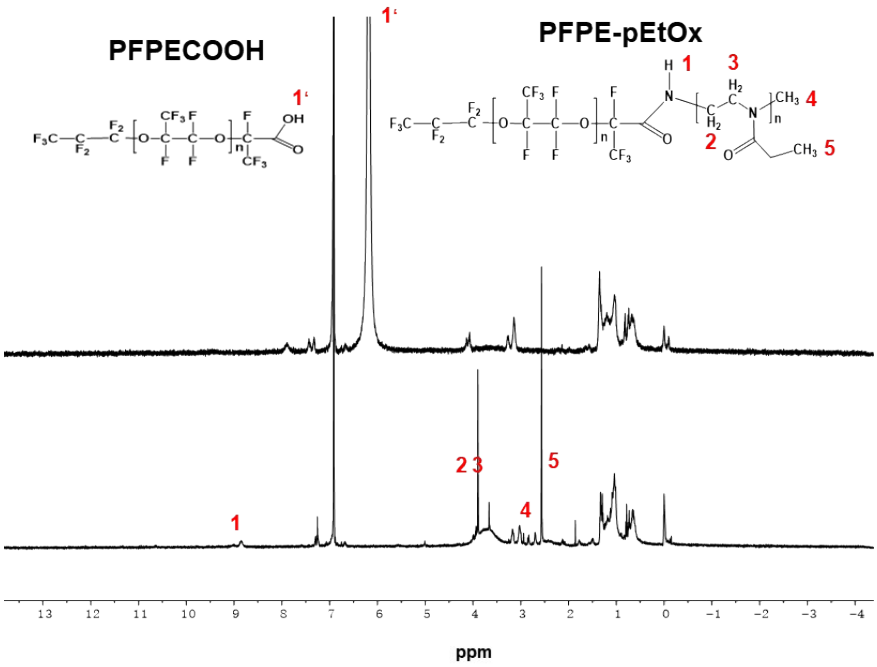

Fig. S3 ^{1}H NMR spectra of the resulting diblock surfactant PFPE-pEtOx in comparison with the starting compound PFPECOOH.

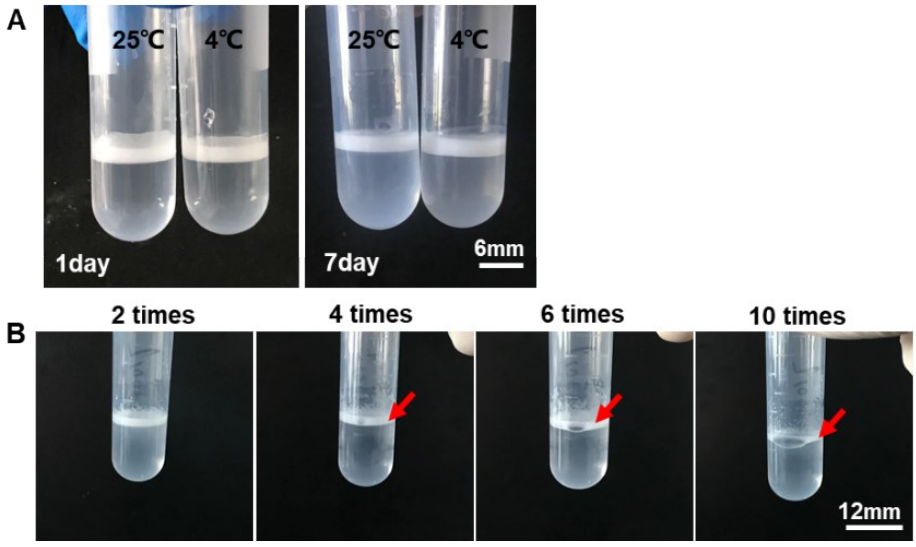

Fig. S4 (A) The emulsion droplets generated by using 0.5 w/v% commercial surfactant Krytox-PEG-Krytox and HFE 7100 as the oil phase. (B) To break the emulsion, the droplets were washed by adding excessive amount of HFE 7100 oil to 10 cycles of washing. A majority of the droplets remained stable after 6 times of washing, and some droplets still maintained even after 10 times of washing. This demonstrated the conventional Krytox-PEG-Krytox surfactant is indeed very stable and difficult to allow demulsification simply by washing with oil.

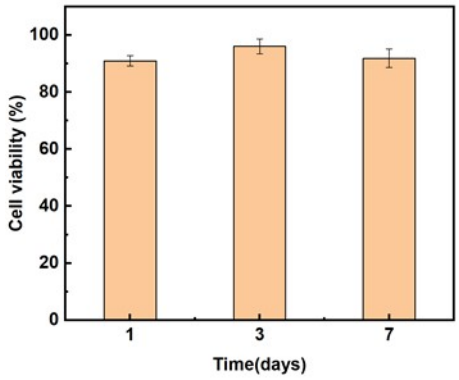

Fig. S5 The cell viability based on live/dead staining of hMSCs in alginate microgels over time.

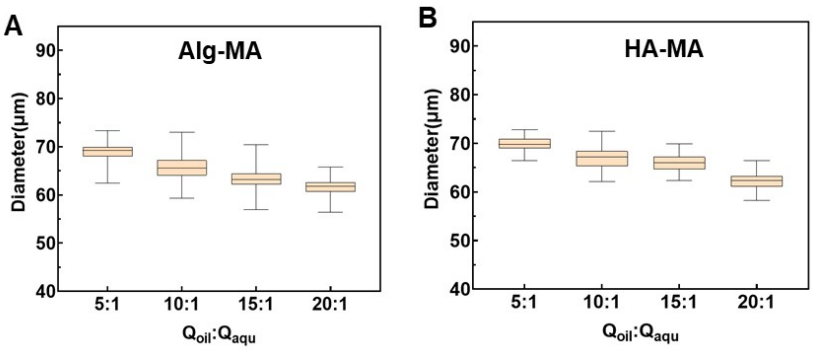

Fig. S6 The size distribution of the resulting droplets of different materials 1 wt% Alg-MA (A) and 3wt% HA-MA (B) aqueous solution. The flow rates of oil phase were set at 1 mL/hr while changing the flow rates of aqueous phase from 0.05 to 0.2 mL/hr. We further investigated the feasibility of the synthesized diblock surfactant to produce microgels using methacrylated alginate (Alg-MA) and methacrylated hyalurate (HA-MA) which can be triggered to form microgels by UV-polymerization. The results showed that all samples exhibited monodisperse droplets and the droplet size increased gradually with the increase of aqueous phase flow rate in the Fig. S6 (A, B). These results demonstrated that the PFPE-pNIPAM fluorosurfactant can be used to generate microgels with different types of polymers.

Movie 1. The demulsification process over time via visible light observation.

Movie 2. The demulsification process over time via fluorescent observation.