Electronic Supplementary Material (ESI) for Biomaterials Science.

Supplementary materials for:

An injectable fluorescent and iodinated hydrogel for preoperative localization and dual image-guided surgery of pulmonary nodules

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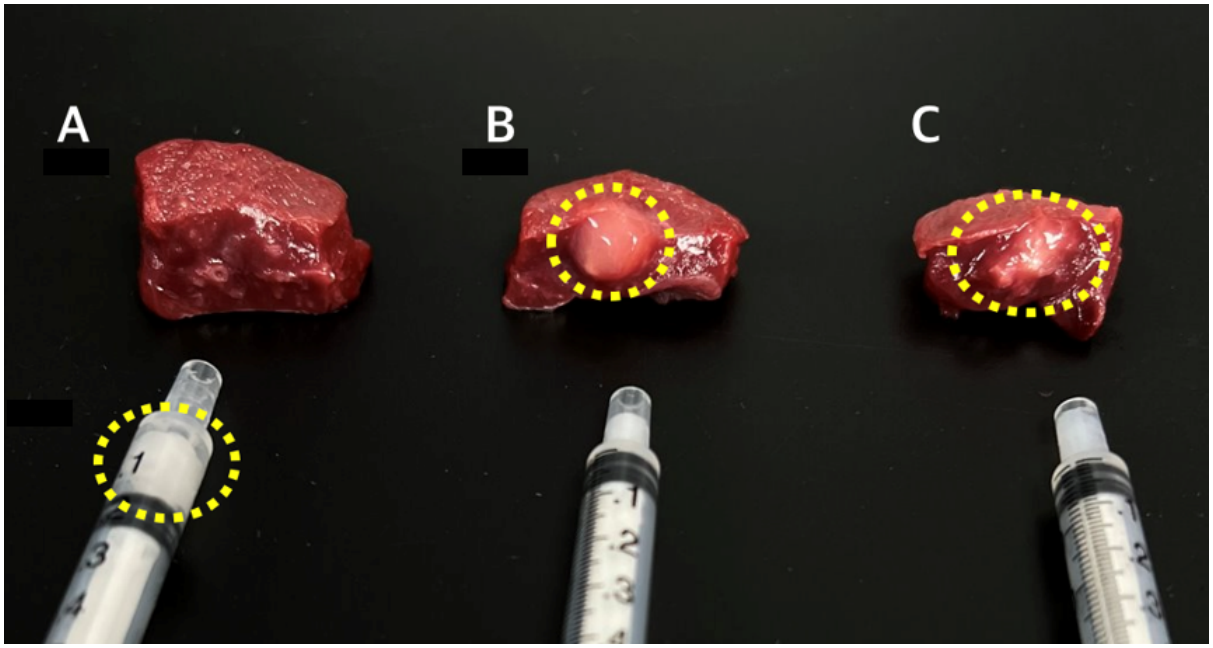
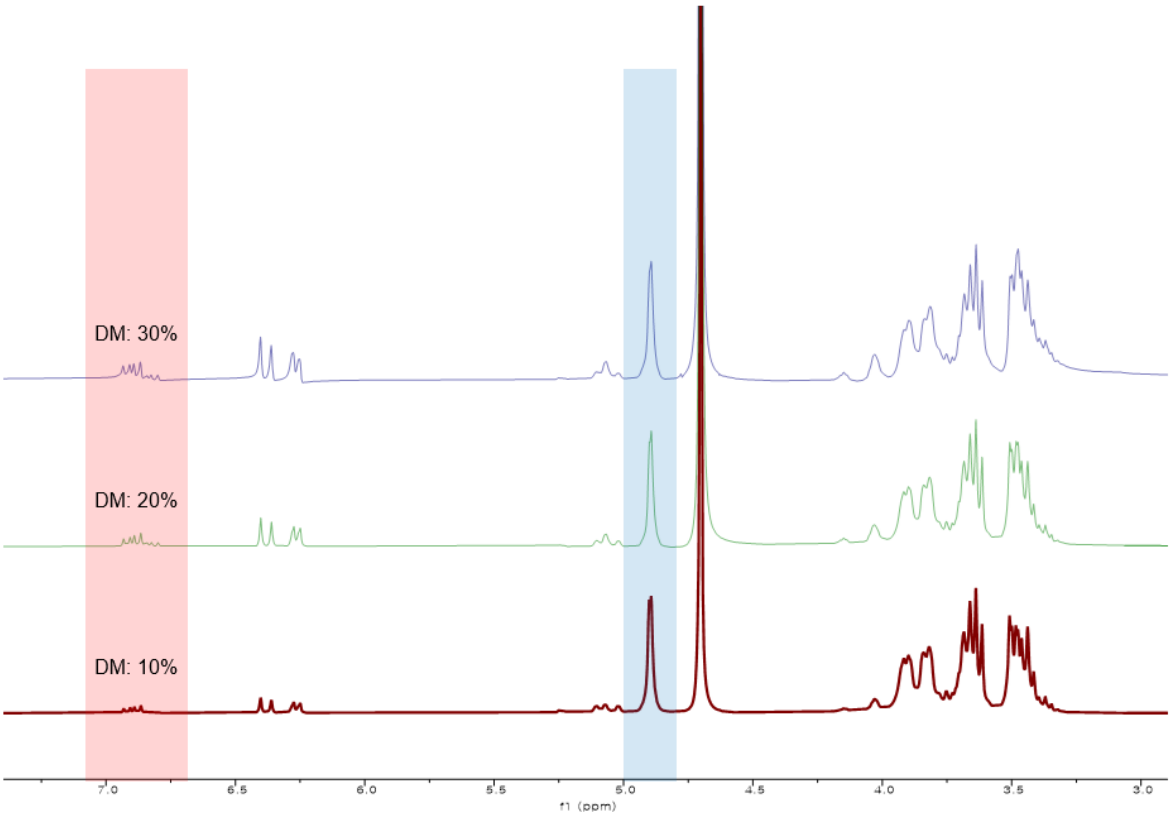
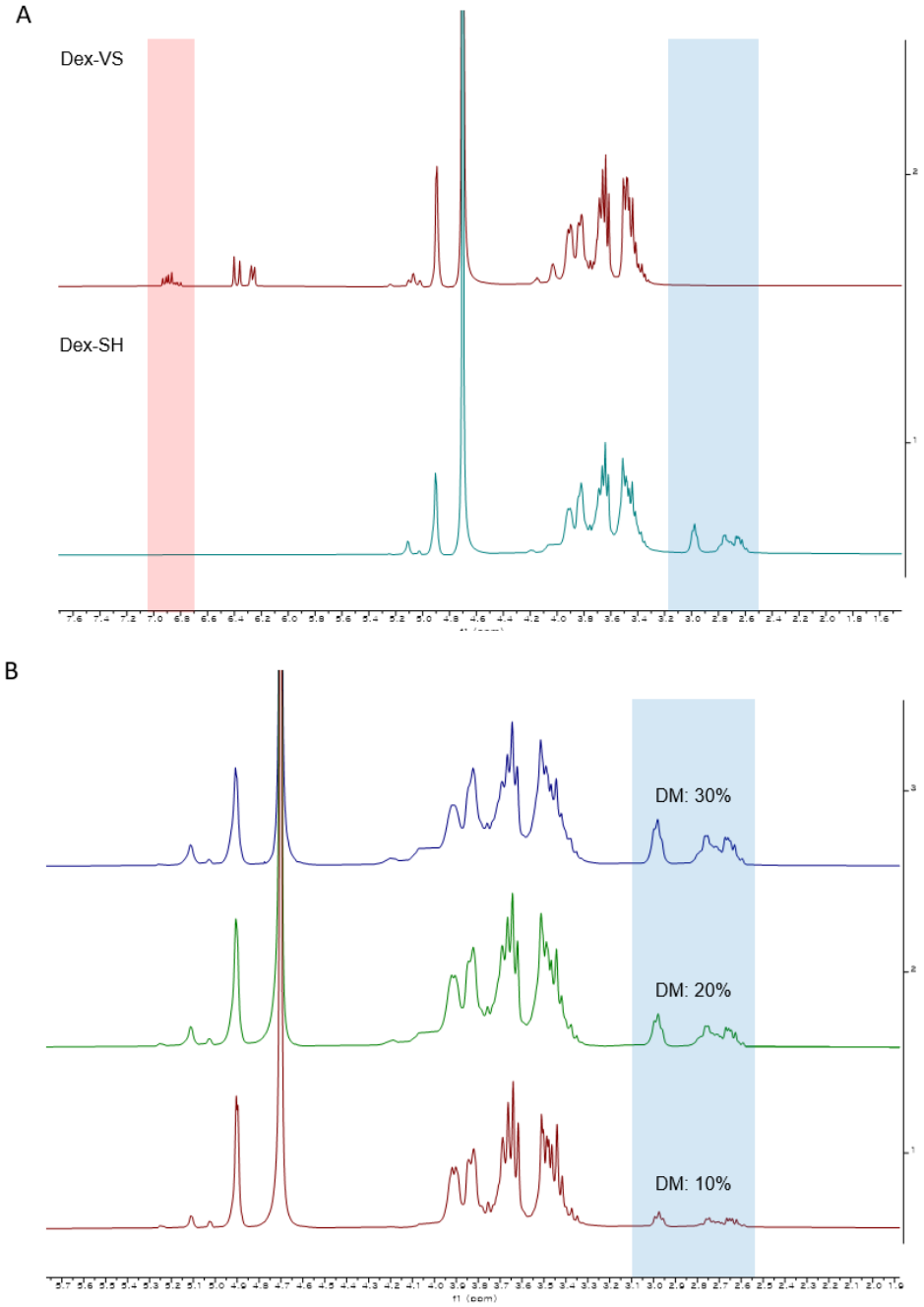


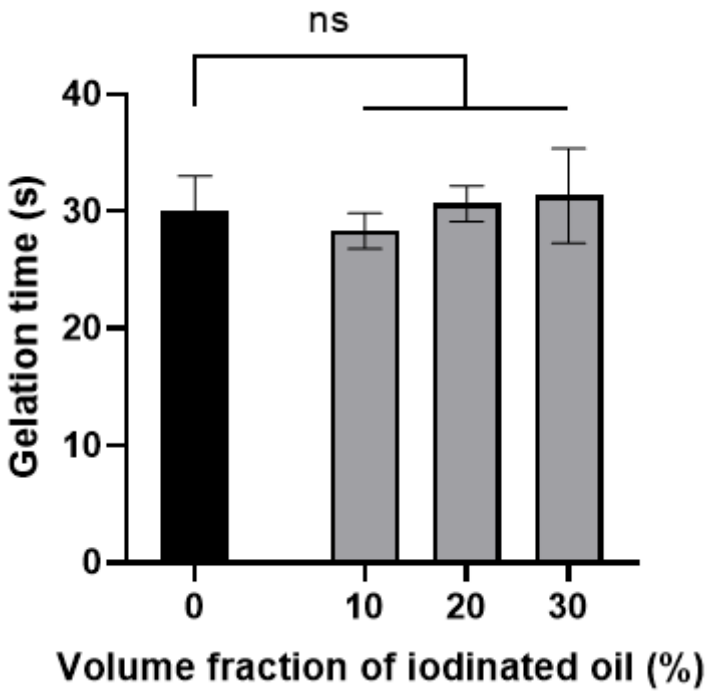
Supplementary Figure 1. Further screening of a clinically appropriate gelation time by utilizing pig lungs. Emulsified hydrogels each having a gelation time of A) 10 seconds (syringe clogging), B) 30 seconds (well-formed), and C) 50 seconds (leakage), respectively.



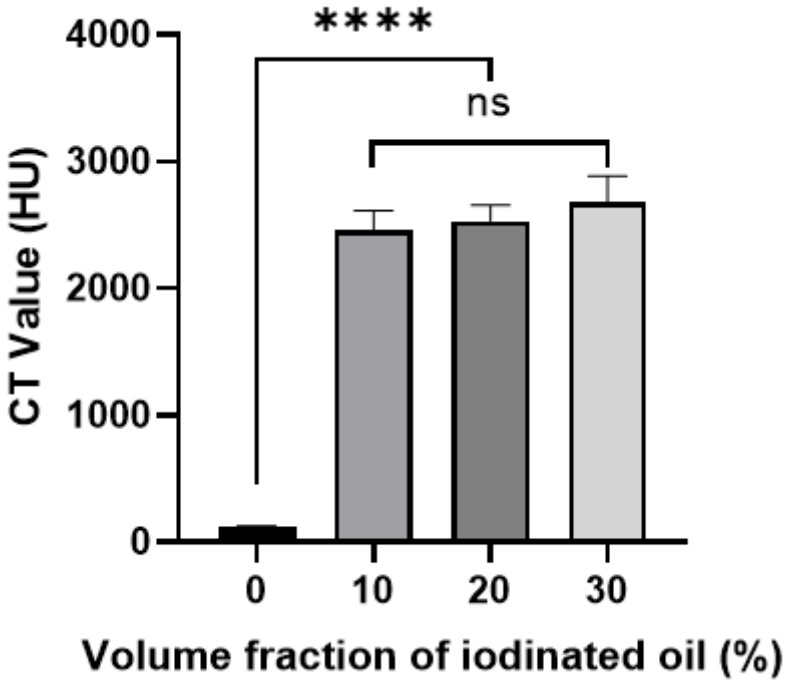
Supplementary Figure 2. ^{1}H NMR spectra for the synthesis of vinyl sulfone-modified dextran (Dex-VS). Different degrees of modifications (DM) of dextran hydroxyl (-OH) groups by vinyl sulfone (-VS) groups were achieved by varying the reaction time. DM was determined by comparing the relative amounts of vinyl protons at δ = 6.82 – 6.9 (1H, red box) to pyranose δ = 4.87 – 5.29 (1H, blue box).



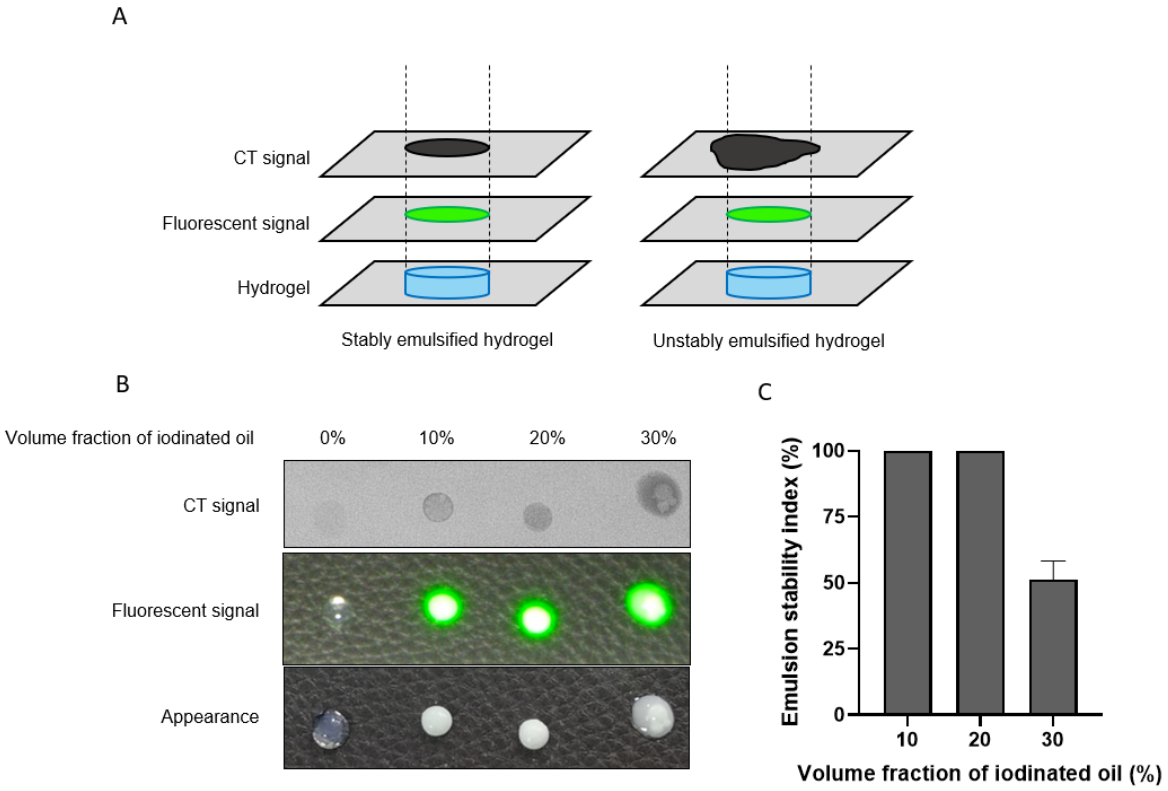
Supplementary Figure 3. ^{1}H NMR spectra for the synthesis of thiol-modified dextran (Dex-SH). A) Successful synthesis of thiol-modified dextran (Dex-SH) was confirmed by the disappearance of vinyl protons at δ = 6.82 – 6.9 (1H, red box) and the formation of proton peaks at δ = 2.5 – 3.1 (blue box). B) ^{1}H NMR spectra for different DMs of Dex-SH synthesized.



Supplementary Figure 4. Gelation time of hydrogels containing different volume fractions of iodinated oil (n=3, one-way ANOVA).



Supplementary Figure 5. CT values of hydrogels containing different volume fractions of iodinated oil (n=3, one-way ANOVA).



Supplementary Figure 6. A) Schematic illustration of hydrogels with strong (left) and weak emulsion stability (right). B) Representative images of fluorescent hydrogels formed at different volume fractions of iodinated oil. Unstable emulsion begins to form when the volume fraction of iodinated oil becomes 30% (v/v). C) Emulsion stability index (%) of hydrogels containing different volume fractions of iodinated oil (n=3).

Supplementary Table 1. Quantification of free thiol (-SH) groups by Ellman's assay

Degree of modification by vinyl sulfone(-VS) (%)	10	20	30
Degree of modification by thiol (-SH) (%)	10.36	22.18	28.66