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Supplementary Materials for

Injectable hydrogel microspheres with self-renewable hydration layers alleviate osteoarthritis

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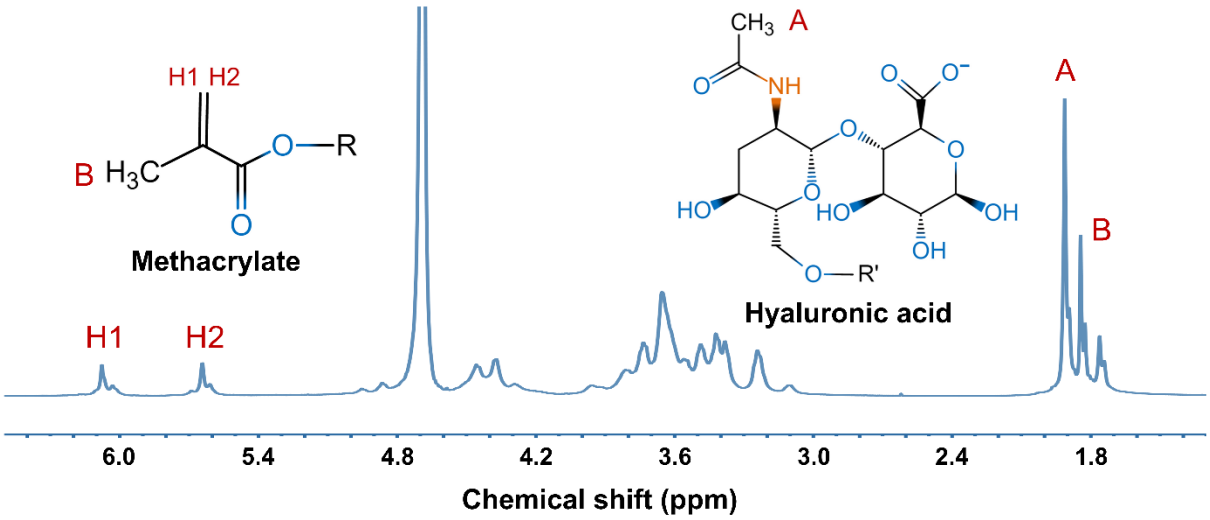

fig. S1. The ^{1}H NMR spectra of HAMA.

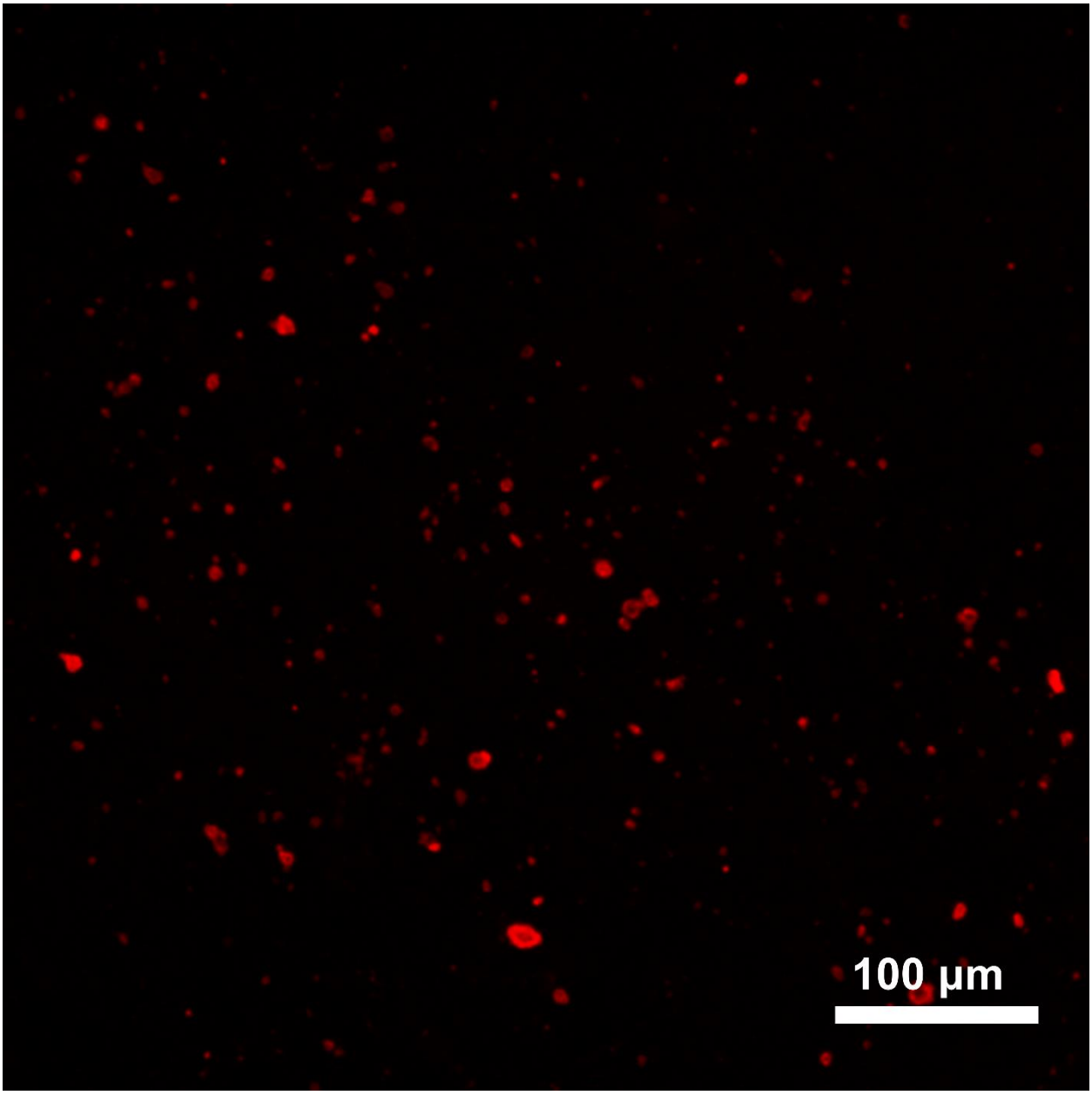

fig. S2. LSCM image of the cartilage section incubated with Dil-labelled cationic liposomes.

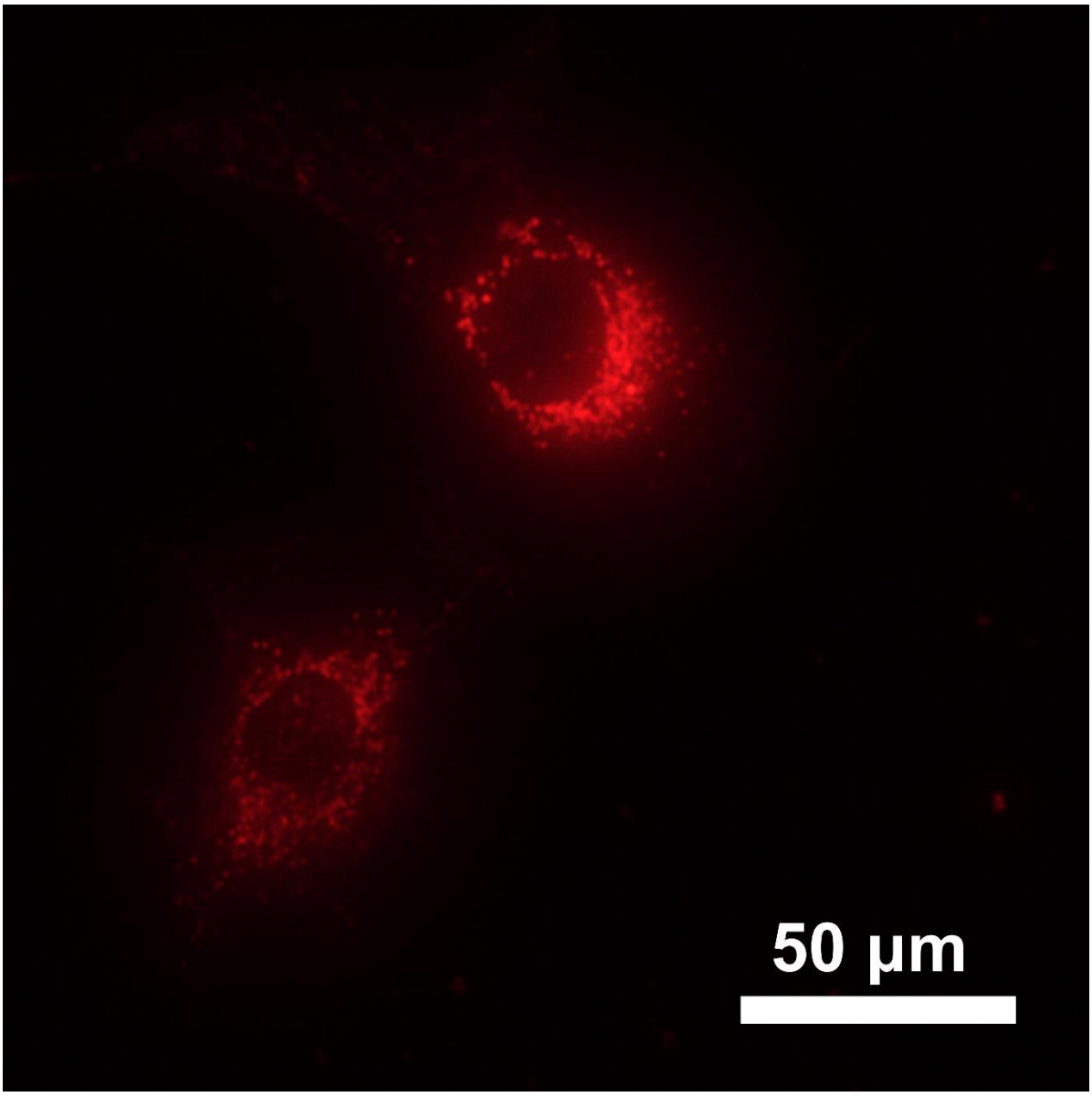

fig. S3. LSCM image of the chondrocytes incubated with Dil-labelled cationic liposomes.

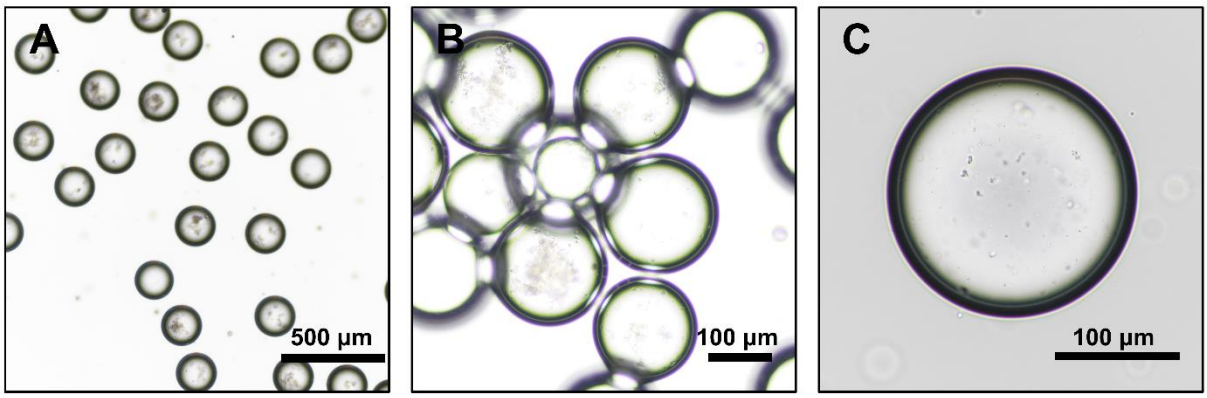

fig. S4. Characterization of pre-gel droplets: (A-B) dispersed pre-gel droplets, and **(C)** mono-pre-gel droplet.

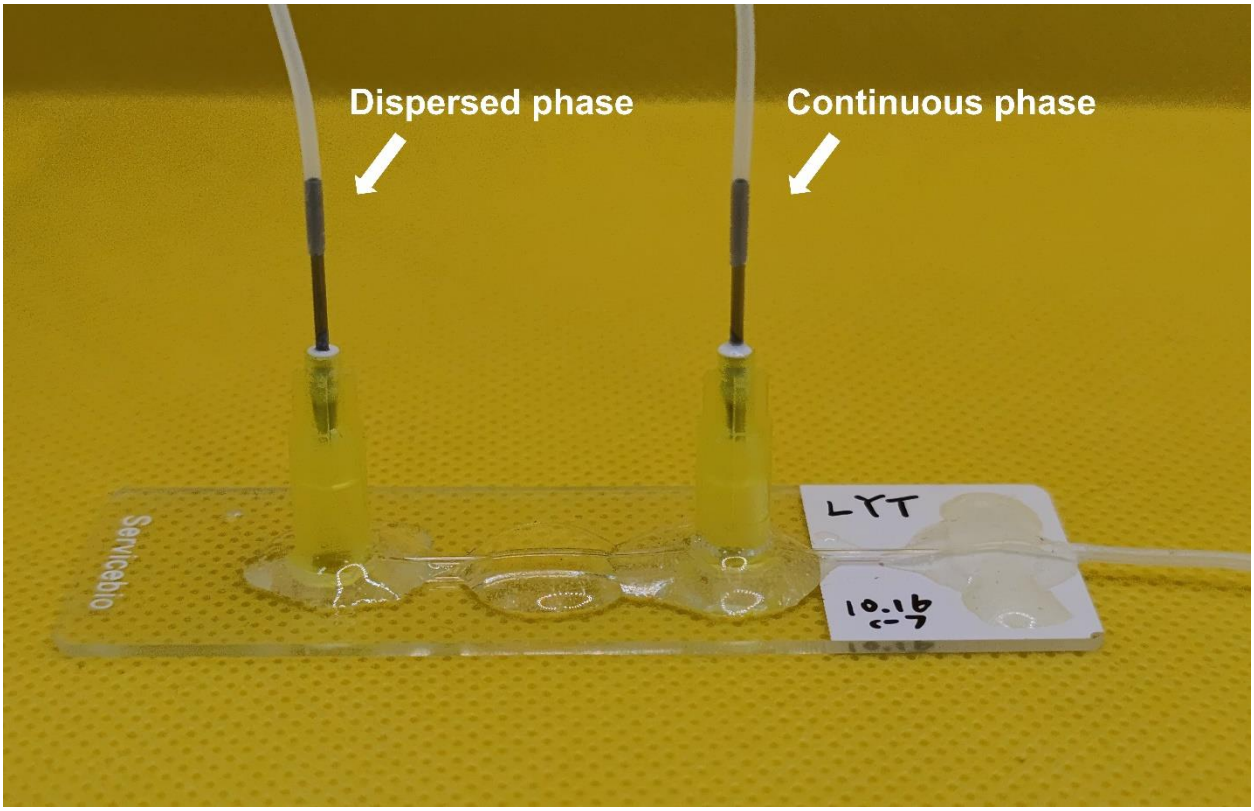

fig. S5. Photograph of the microfluidic device. Photo Credit: Yiting Lei, The First Affiliated Hospital of Chongqing Medical University.

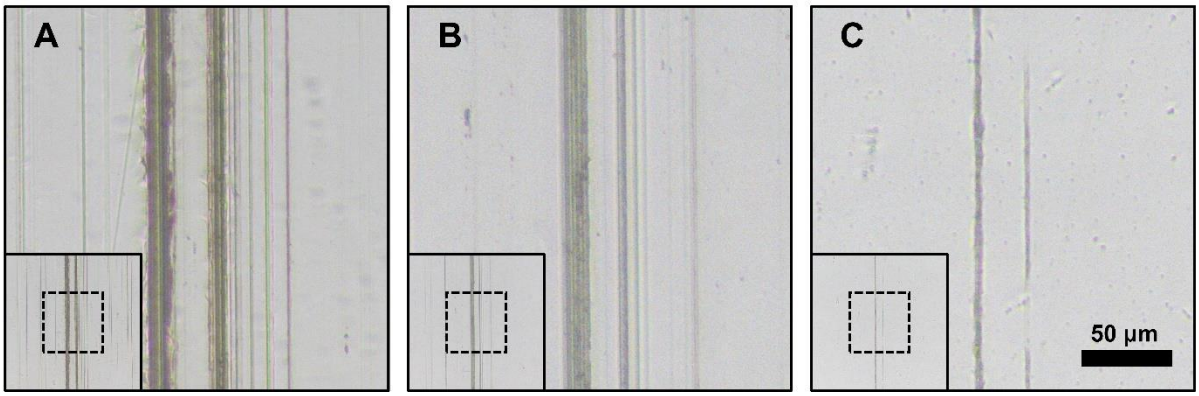

fig. S6. Bright-field images of the wear track on the disk tested by (A) PBS, **(B)** HMs, and **(C)** the worn Lipo@HMs.

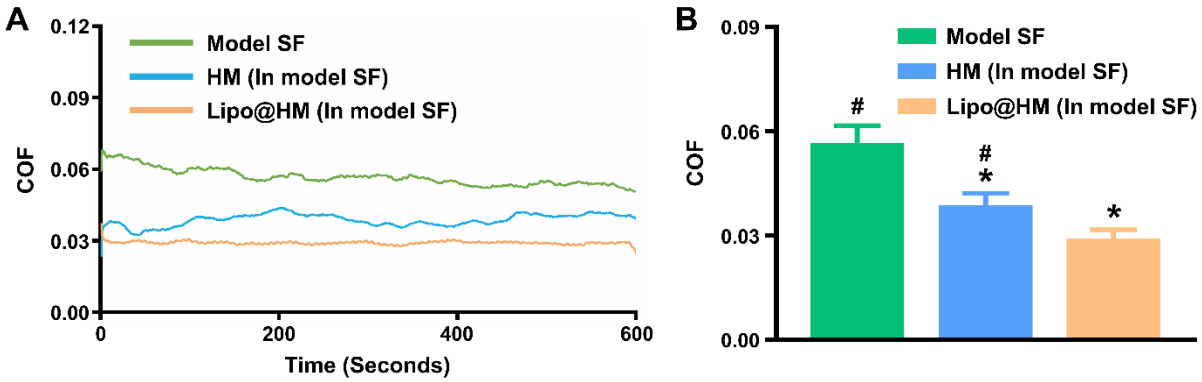

fig. S7. The lubricating performance in the presence of SF: (A) COF-time curves and **(B)** COF histograms for model SF, HMs (in model SF), and the worn Lipo@HMs (in model SF). (# and * indicated $P < 0.05$ in comparison with the Lipo@HM and SF groups, respectively).

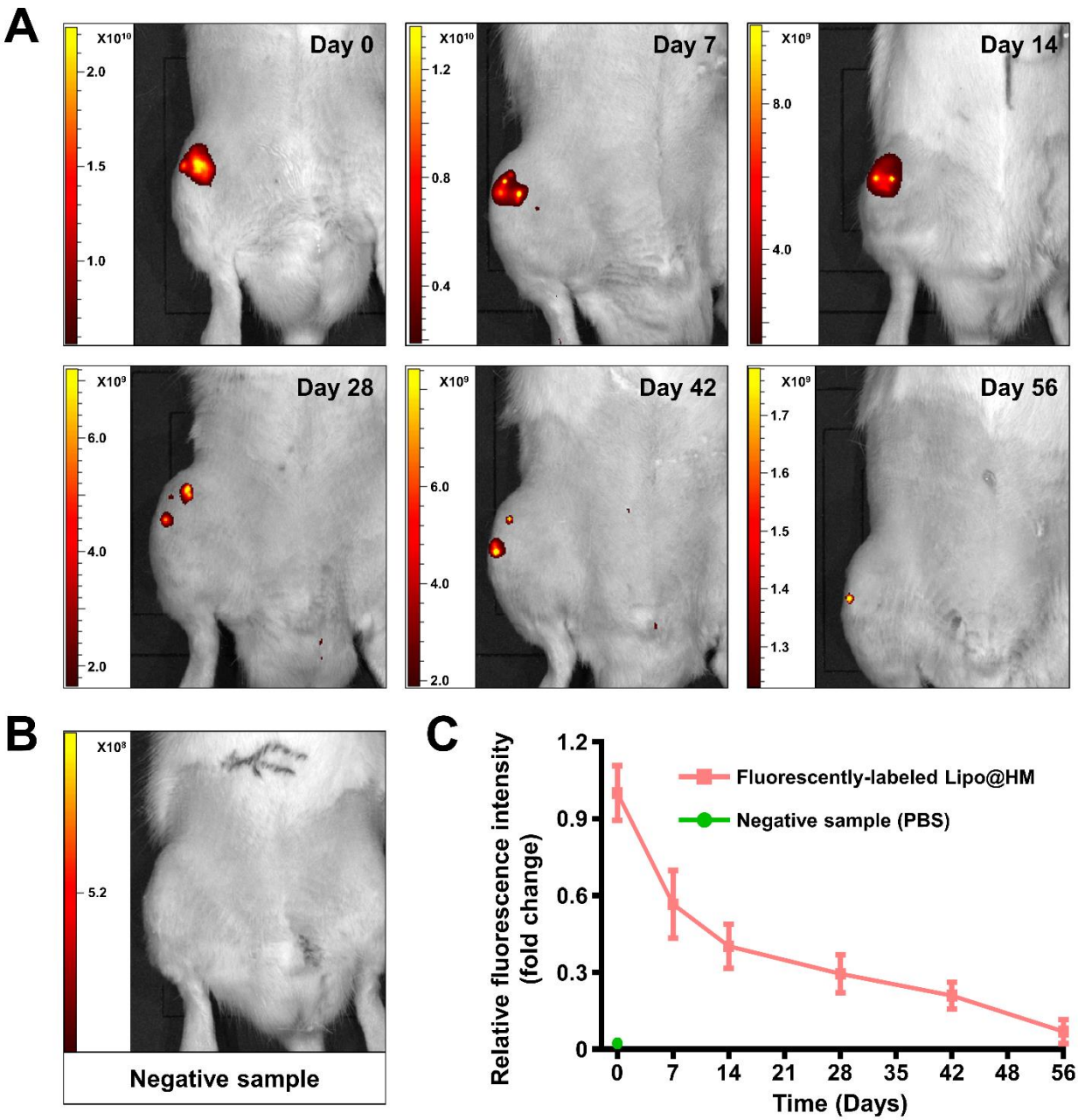

fig. S8. In vivo retention time: (A) The IVIS images of fluorescently labeled Lipo@HMs at different time points. **(B)** The IVIS image of the negative sample. **(C)** The relative fluorescence intensity at each time points (relative to fluorescently labeled Lipo@HMs on day 0).

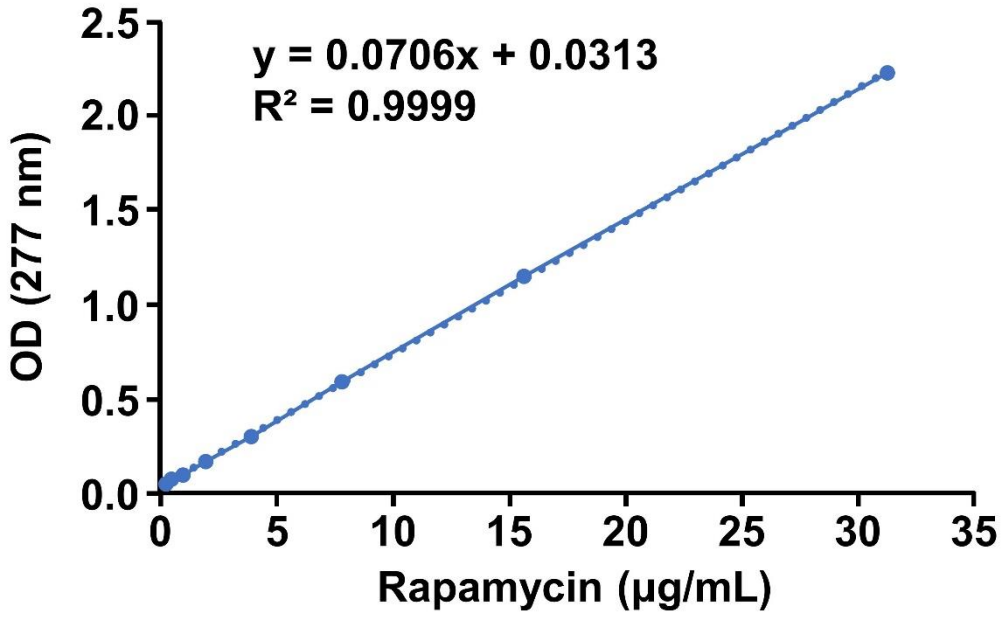

fig. S9. The calibration curve of RAPA with different concentrations.

Table S1. Primers used in real-time PCR.

Gene	Primer	Sequence
GAPDH	Forward	GGAAGCTTGTCATCAATGGAAATC
	Reverse	TGATGACCCTTTTGGCTCCC
Col2	Forward	CACTCAAGTCCCTCAACAACCAG
	Reverse	GGGGTCAATCCAGTAGTCTCCAC
LC3B	Forward	CGAACAAAGAGTAGAAGATGTCCGA
	Reverse	GCTGCTTCTCACCCTTGTATCG
ATG5	Forward	GGATGAGATAACTGAAAGGGAAGC
	Reverse	CCATTTCAGTGGTGTGCCTTC
MMP13	Forward	GGTGATGAAGATGATTTGTCTGAGG
	Reverse	CGTCAAGTTTGCCAGTCACCT