Electronic Supplementary Information

A photo-triggerable drug carrier based on cleavage of PEG lipids by photosensitiser-generated reactive singlet oxygen

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Experimental Section

Materials: γ-CDx and **1** were purchased from Wako Pure Chemical Industries Ltd. (Tokyo, Japan) and NOF Corp. (Tokyo, Japan), respectively. Compound **5** was purchased from Avanti Polar Lipids Inc (Alabama, USA).

Compounds **2**,[S1] **3**[24] and C_{60}-derivative **4**[S2] were prepared according to the method described previously.

^{1}H NMR spectroscopy: ^{1}H NMR spectra were recorded on a JEOL JNM-ECP 400 M spectrometer in $CDCl_3$, and the chemical shifts were expressed with reference to tetramethylsilane (TMS) as the internal standard.

Mass spectroscopy: The MALDI-TOF mass spectrum was recorded on an Autoflex II spectrometer from Bruker Daltonics using 1,8-dihydroxy-9(10H)-anthracenone (dithranol) as a matrix. The EI mass spectra were recorded on a JEOL JMS-700 mass spectrometer.

References

S1 Y. Murakami, A. Nakano and H. Ikeda, *J. Org. Chem.*, 1982, **47**, 2137–2144.

S2 A. M. Cassell, W. A. Scrivens and J. M. Tour, *Angew. Chem. Int. Ed.*, 1998, **31**, 1528–1531.

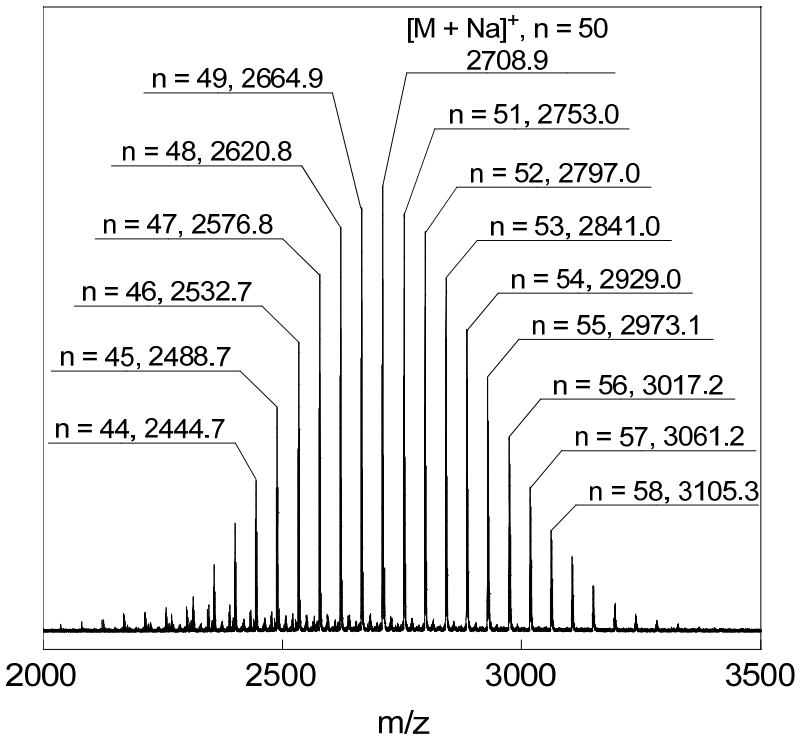

Fig. S1 Positive ion MALDI-TOF mass spectrum of **3**

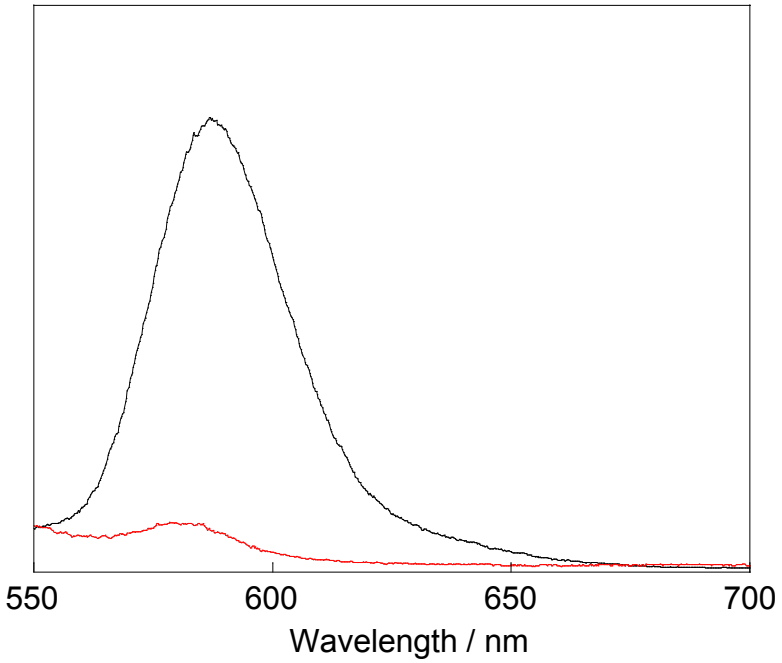

Fig. S2 Fluorescence spectral change (λ_{ex} = 488 nm) of the liposome **1**, **2** and **3** {**1**:**2**:**3** = 5:95:15 (mol/mol/mol)} containing **5** (0.25 mol%) before (black line) and after the exchange reaction with the C_{60}-**4**•γ-CDx complex (red line).

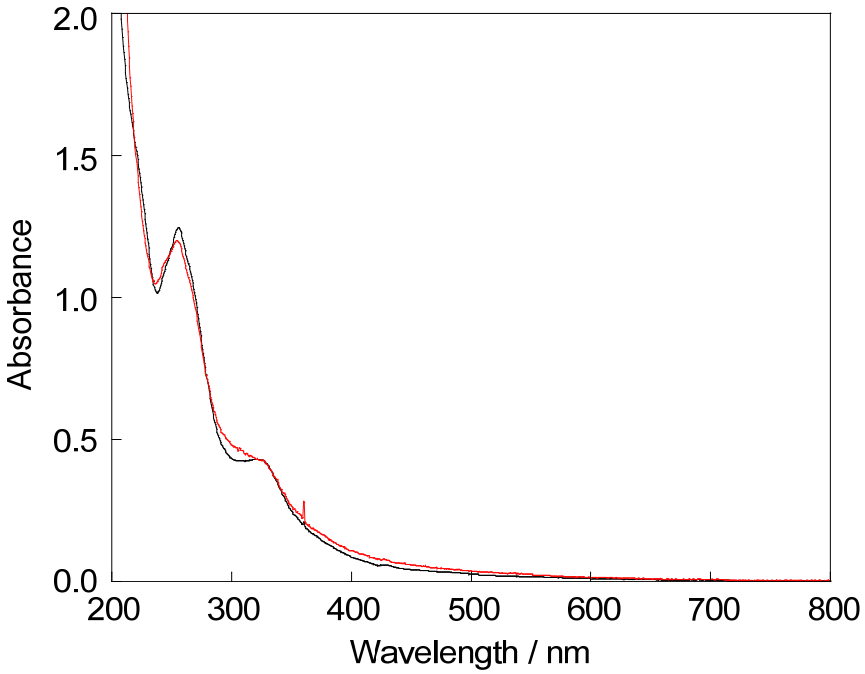

Fig. S3 UV-vis absorption spectra of the C_{60}-**4**•γ-CDx complex (black line) and LMIC_{60}-**4** (red line) ([C_{60}-**4**] = 0.01 mM, 1 mm cell).

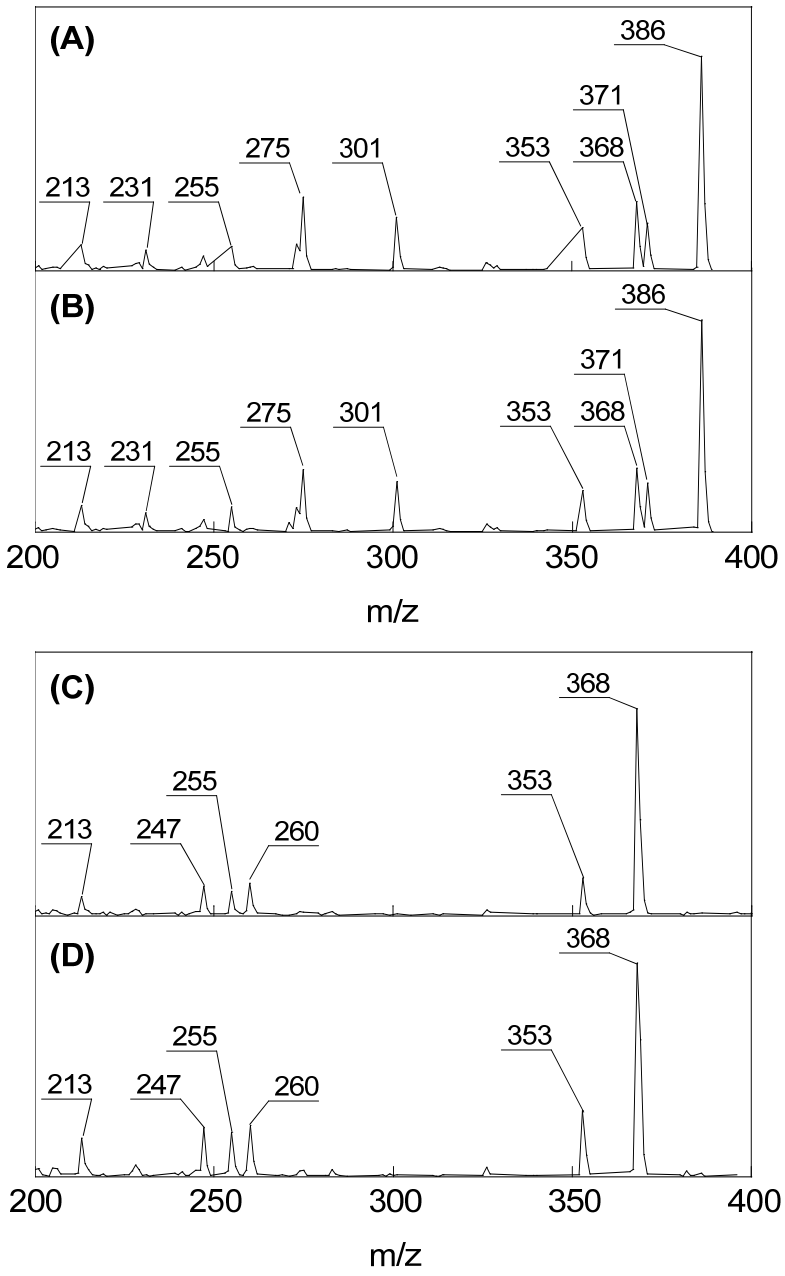

Fig. S4 EI mass spectra of (A and C) two cholesterol-related compounds separated from the photolysates of **3** in $LMIC_{60}$-**4** by column chromatography on silica; commercial (B) cholesterol and (D) cholesterol formate as reference standards.

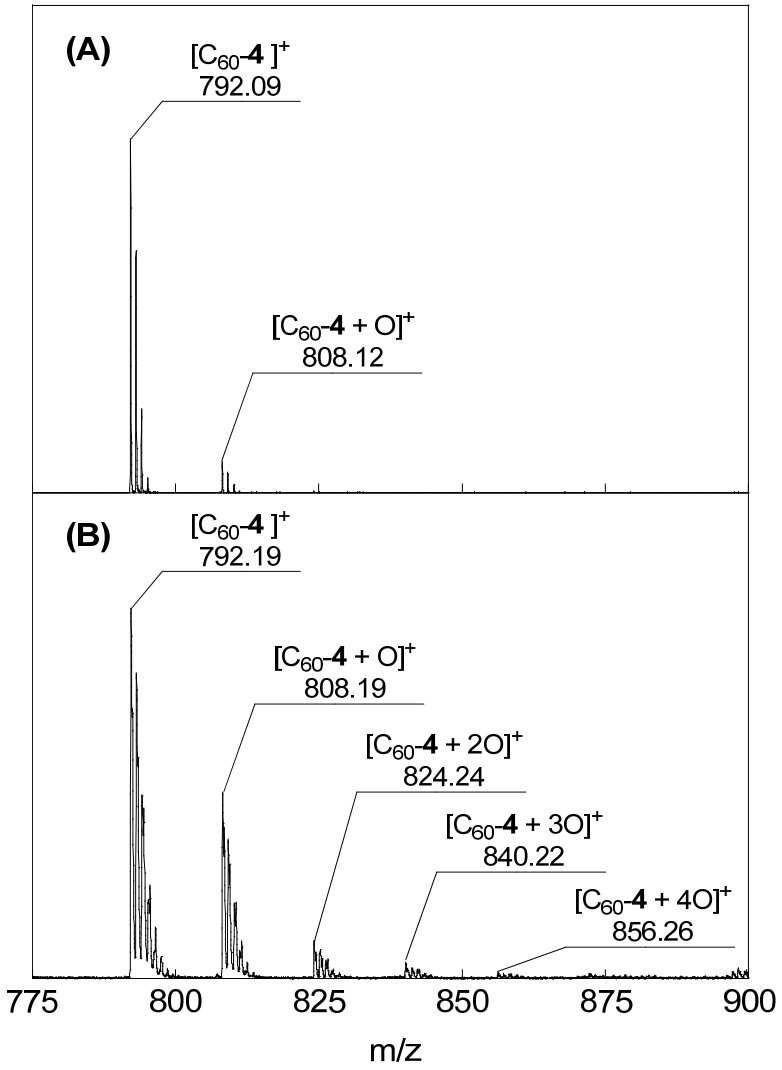

Fig. S5 Positive ion MALDI-TOF mass spectrum of C_{60}-**4** in $LMIC_{60}$-**4** (A) before the photoirradiation and (B) after the photoirradiation for 5 min.

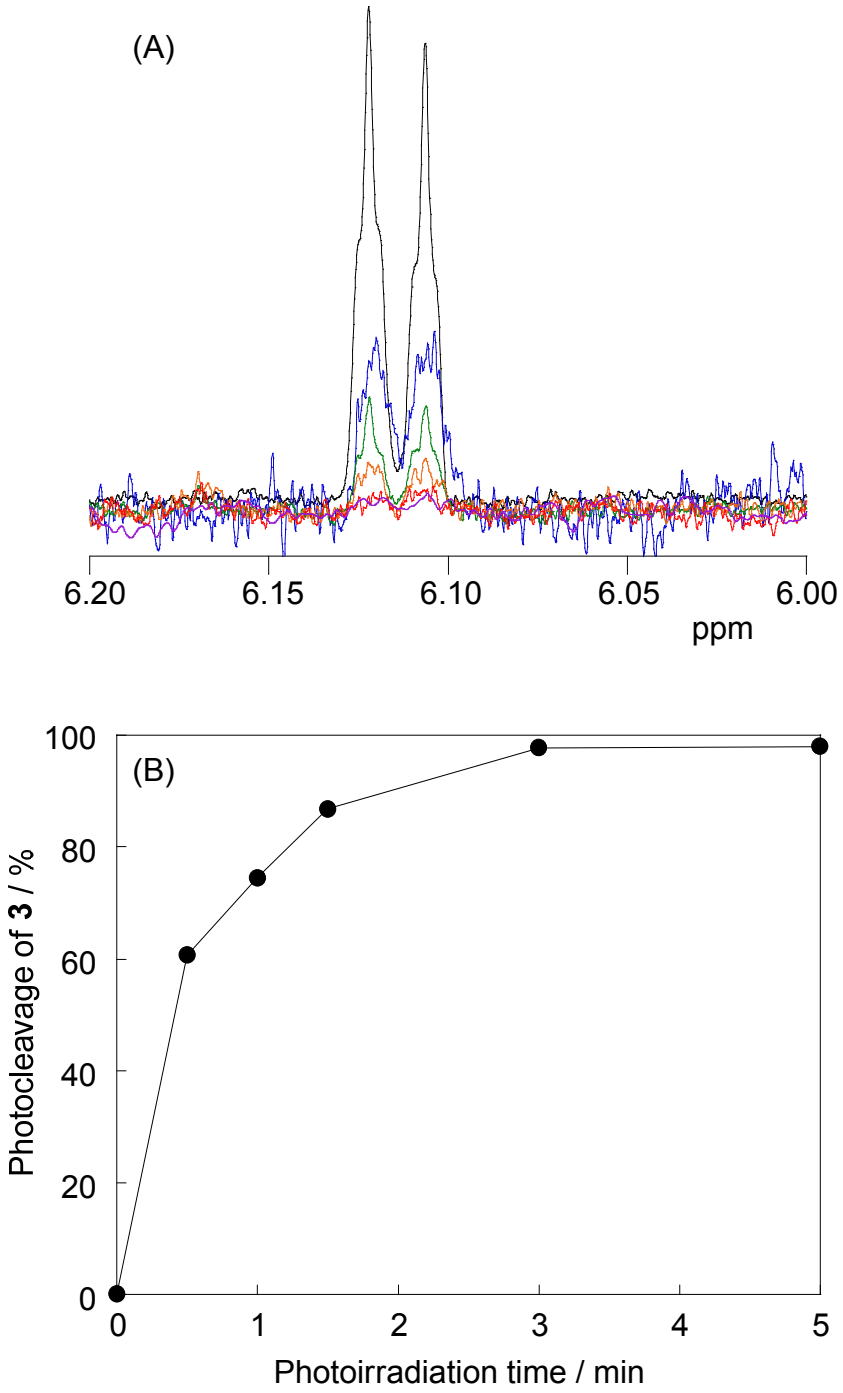

Fig. S6 (A) Partial ^{1}H NMR spectra of **3** in LMIC$_{60}$-**4** before (black line) and after photoirradiation for 0.5 (blue line), 1 (green line), 1.5 (orange line), 3 (red line) and 5 (purple line) min. (B) Time-dependent photocleavage of **3** in LMIC$_{60}$-**4**.