Electronic Supplementary Information for

Efficient photocleavage of DNA utilising water-soluble lipid membrane-incorporated [60]fullerenes prepared using a [60]fullerene exchange method

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Table S1 Average particle sizes (nm) determined using a light scattering method at 25°C in the absence and presence of C_{60}

	Average particle size / nm	
	Before addition of C_{60}	After addition of C_{60}
1	50 ± 10	80 ± 10
2	60 ± 10	70 ± 10
3	70 ± 10	100 ± 10

Table S2 Zeta potentials of LMI[60]fullerenes

	Zeta potential / mV
1-incorporated C_{60}[a]	68
2-incorporated C_{60}[a]	-6
3-incorporated C_{60}[a]	-65

[a] [lipids] = 0.50 mM, [C_{60}] = 0.05 mM, [NaCl] = 10 mM

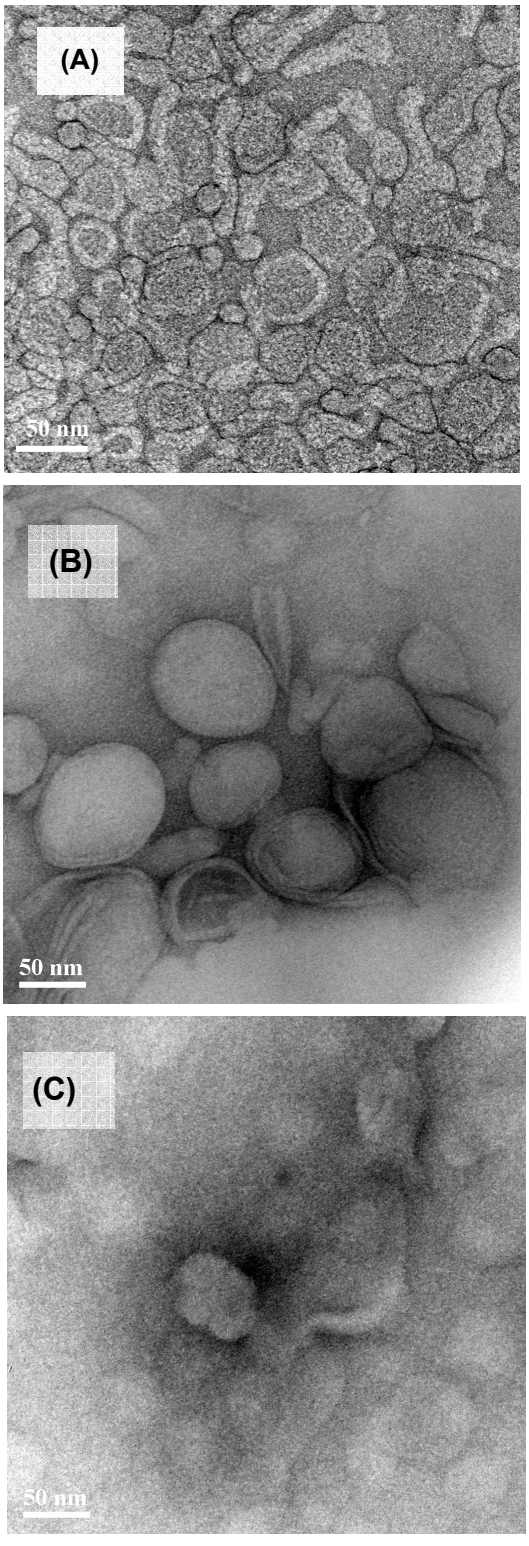


Fig. S1 TEM images of (A) the **1**-incorporated C_{60}, (B) the **2**-incorporated C_{60}, and (C) the **3**-incorporated C_{60}.

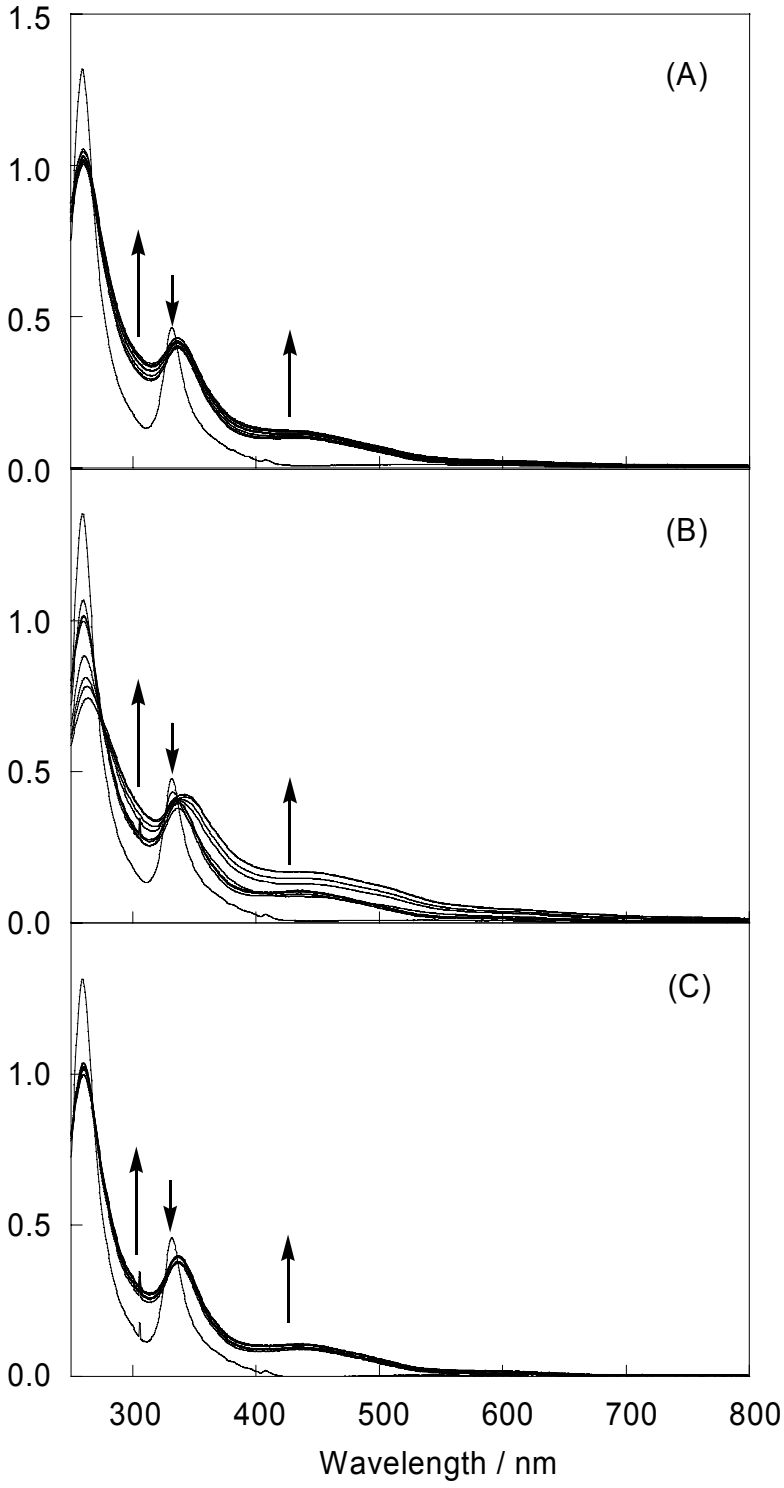


Fig. S2 UV-vis spectral changes of the C_{60}·γ-CDx complex ([γ-CDx] = 1.02 mM, [C_{60}] = 0.10 mM) upon addition of (A) **1** (0.10 mM), (B) **2** (0.10 mM), and (C) **3** (0.10 mM) heating at 80°C for 4 h (1 mm cell).

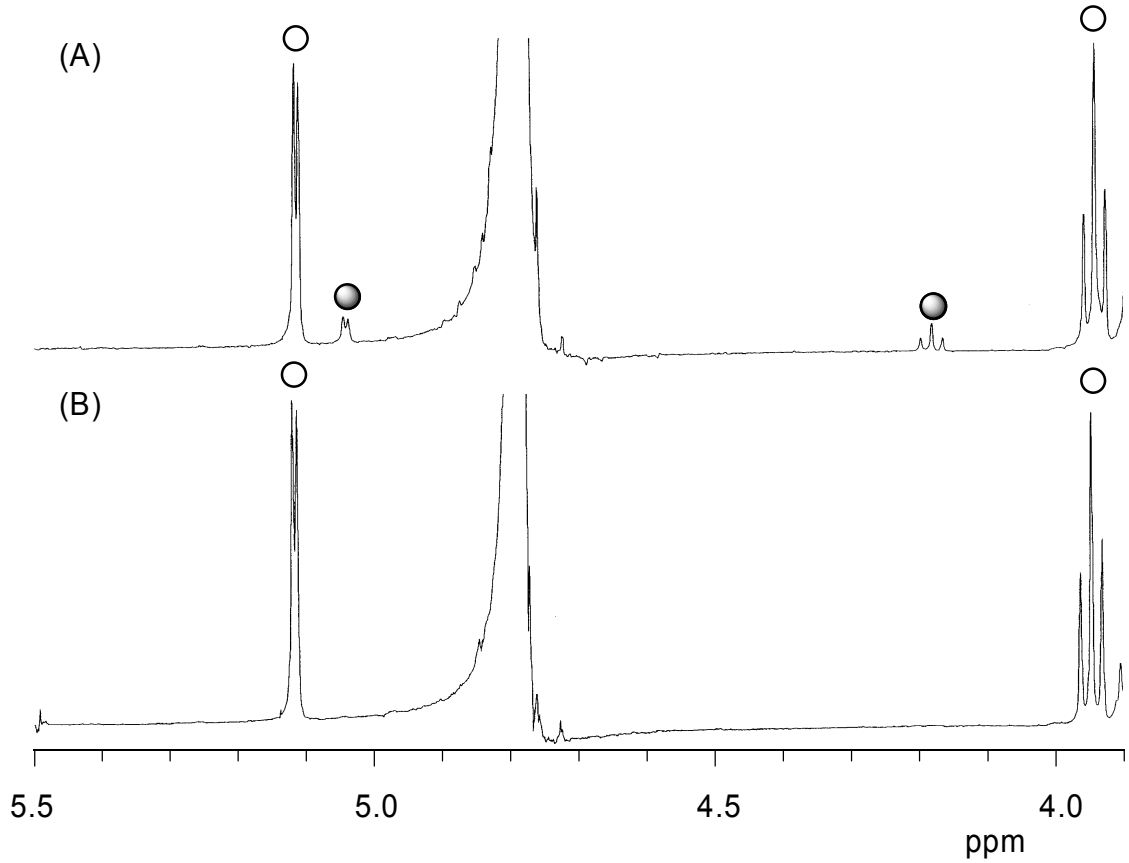


Fig. S3 ^{1}H NMR spectra at 600 MHz in D_2O at 25°C of γ-CDx and the C_{60}·γ-CDx complex ([γ-CDx] = 1.02 mM, [C_{60}] = 0.10 mM) (A) before heating and (B) after heating at 80°C for 4 h in the presence of **1** (1.00 mM) (○: free γ-CDx, ●: the C_{60}·γ-CDx complex).

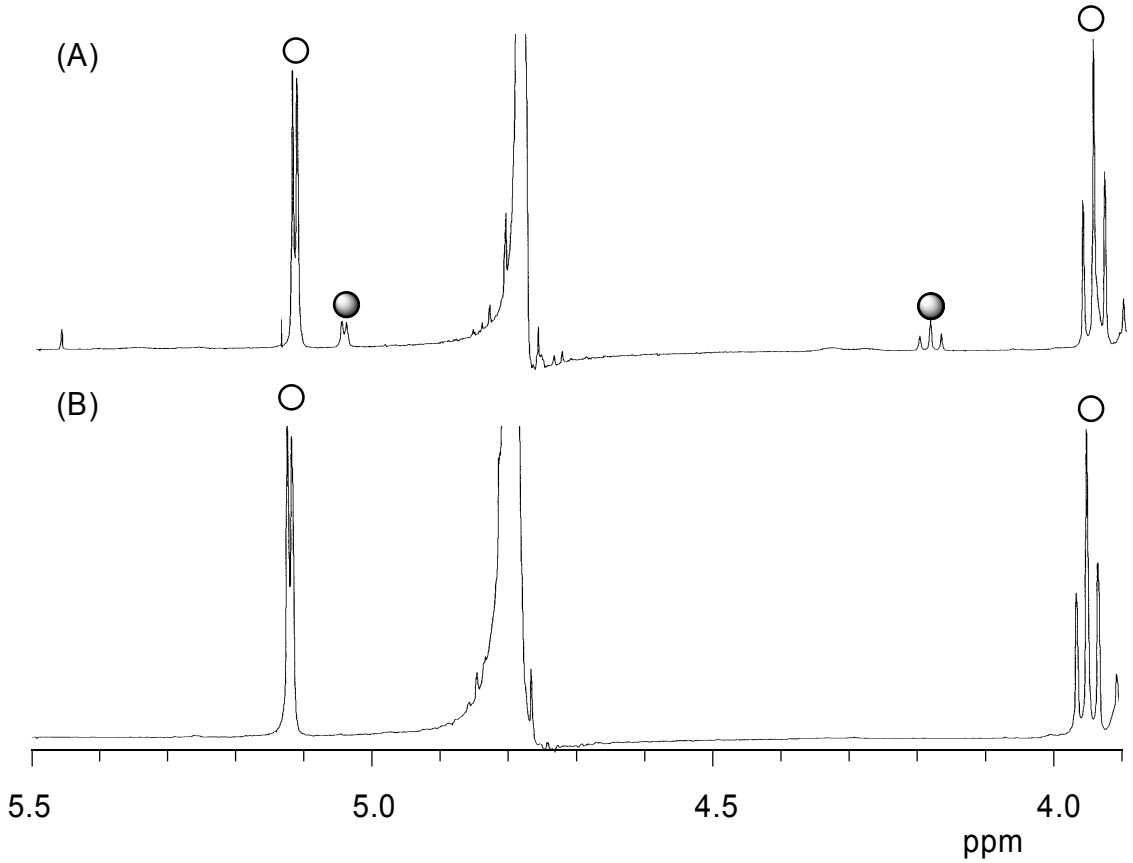


Fig. S4 ^{1}H NMR spectra at 600 MHz in D_2O at 25°C of γ-CDx and the C_{60}·γ-CDx complex ([γ-CDx] = 1.02 mM, [C_{60}] = 0.10 mM) (A) before heating and (B) after heating at 80°C for 4 h in the presence of **2** (1.00 mM) (○: free γ-CDx, ●: the C_{60}·γ-CDx complex).

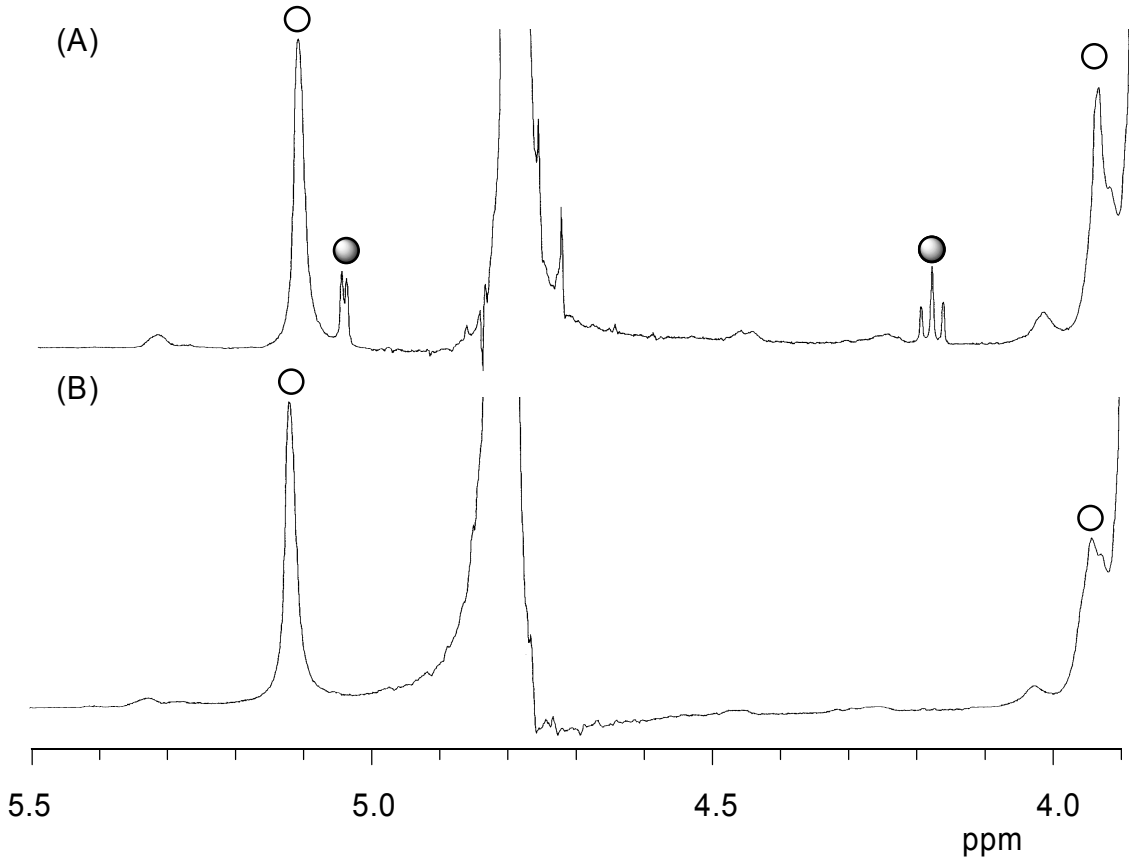
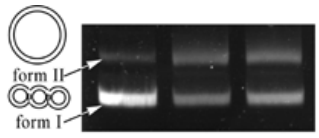


Fig. S5 ^{1}H NMR spectra at 600 MHz in D_2O at 25°C of γ-CDx and the C_{60}·γ-CDx complex ([γ-CDx] = 1.02 mM, [C_{60}] = 0.10 mM) (A) before heating and (B) after heating at 80°C for 4 h in the presence of **3** (1.00 mM) (○: free γ-CDx, ●: the C_{60}·γ-CDx complex).



lane	1	2	3
lipids	–	**1**	**1**
γ-CD	–	–	–
C_{60}	–	○	○
light	–	○	○
Ar	–	○	–

Fig. S6 Agarose gel electrophoretic patterns of DNA nicked by the LMI[60]fullerenes. Reaction samples contained 1.3 mg L^{-1} of ColE1 supercoiled plasmid. Lane 1: no chemicals were in the distilled water. Lanes 2 and 3: 200 μM of **1** and 20 μM of C_{60}. incubated under visible light irradiation at a distance of 10 cm using a 500 W Xe-arc lamp (UI-502Q; Ushio, Inc.) at 25°C for 3 h. Lane2: under the anaerobic (Ar) conditions. Lane 3: under the aerobic conditions. After the addition of 5 μL of 10% SDS solution and loading buffer (Wako Pure Chemical Industries, Ltd.) in this order, electrophoresis was performed using 0.9% agarose gel. The gel was stained with SYBR Gold (1:10000 dilution of stock supplied by Molecular Probes Inc., Eugene, Ore.) and viewed on a UV transilluminator.