Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry.

Supporting Information

Attenuation of guanine oxidation via DNA-mediated electron transfer in crowded environment using small cosolutes

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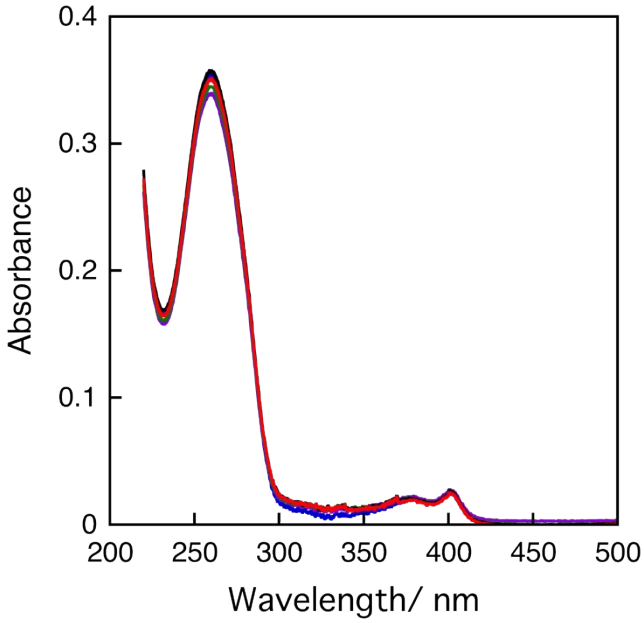

Fig. S1 Absorption spectra of DNA I in aqueous buffer solution (blue line), 10 wt % (purple line), 20 wt % (green line), 30 wt % (black line), 40 wt % glycerol (red line). Aliquots were prepared under the conditions: [DNA duplex] = 4.0 μM, and [NaCl] = 100 mM in pH 7.4 Tris-HCl buffer (50 mM).

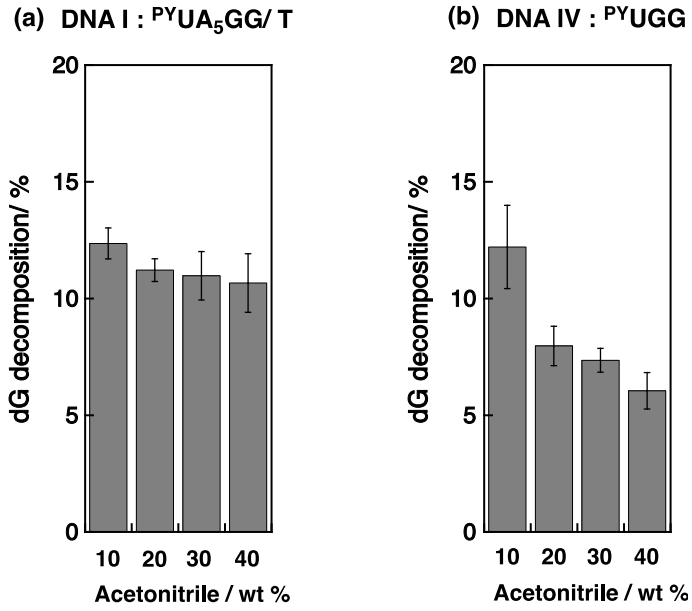

Fig. S2 dG decomposition percentages of pyrene-modified oligonucleotides (a) DNA I from photoirradiation (λ_{ex} > 350 nm, 10 min), and (b) DNA IV obtained from photoirradiation (λ_{ex} > 350 nm, 1 min) in 10 – 40 wt % acetonitrile. The conditions were as follows: [DNA] = 4.0 μM in pH 7.4 Tris-HCl buffer (50 mM), and [NaCl] = 100 mM.

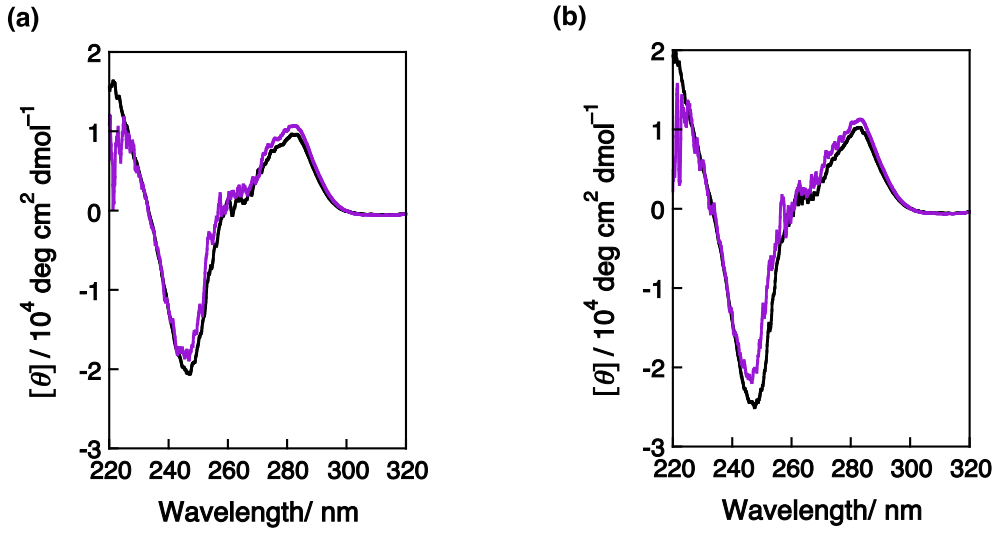

Fig. S3 (a) CD spectra of DNA I in aqueous buffer solution (black line) and in 40 wt % acetonitrile solution (purple line). (b) CD spectra of DNA IV in aqueous buffer solution (black line) and in 40 wt % acetonitrile solution (purple line). These spectra were obtained using a micro cell holder with a micro cylindrical cel. Experimental conditions: [DNA duplex] = 4.0 μM, and [NaCl] = 100 mM in pH 7.4 Tris-HCl buffer (50 mM).

Table S1. Viscosities (η) of aqueous glycerol and ethylene glycol solutions.

Cosolute	η / mPa·s[a]	Cosolute	η / mPa·s[a]
none	0.98	none	0.98
10 wt % glycerol	1.28	10 wt % ethylene glycol	1.28
20 wt % glycerol	1.72	20 wt % ethylene glycol	1.67
30 wt % glycerol	2.47	30 wt % ethylene glycol	2.14
40 wt % glycerol	3.60	40 wt % ethylene glycol	2.80

[a]Measured in aqueous glycerol or ethylene glycol solutions containing 50 mM Tris-HCl (pH7.4) and 100 mM NaCl at 23.6 ºC.

Table S2. Melting temperatures (T_m) for dsDNA I and IV in the absence and presence of acetonitrile.

Cosolute	T_m, °C	T_m, °C
	DNA I	DNA IV
none	53.7	54.8
10 wt % acetonitrile	49.4	50.5
20 wt % acetonitrile	44.2	45.6
30 wt % acetonitrile	40.3	41.6
40 wt % acetonitrile	38.0	39.3

Experimental conditions: [DNA duplex] = 4.0 μM in 50 mM Tris-HCl, pH7.4, 100 mM NaCl. T_m is determined by monitoring the UV absorption at 260 nm. The error of T_m was less than 0.5 °C.