

Electronic Supplementary Information

Direct detection of nucleotide radical cations produced by electron-transfer oxidation of DNA bases with electron-transfer state of 9-mesityl-10-methylacridinium ion and resulting efficient DNA cleavage without oxygen

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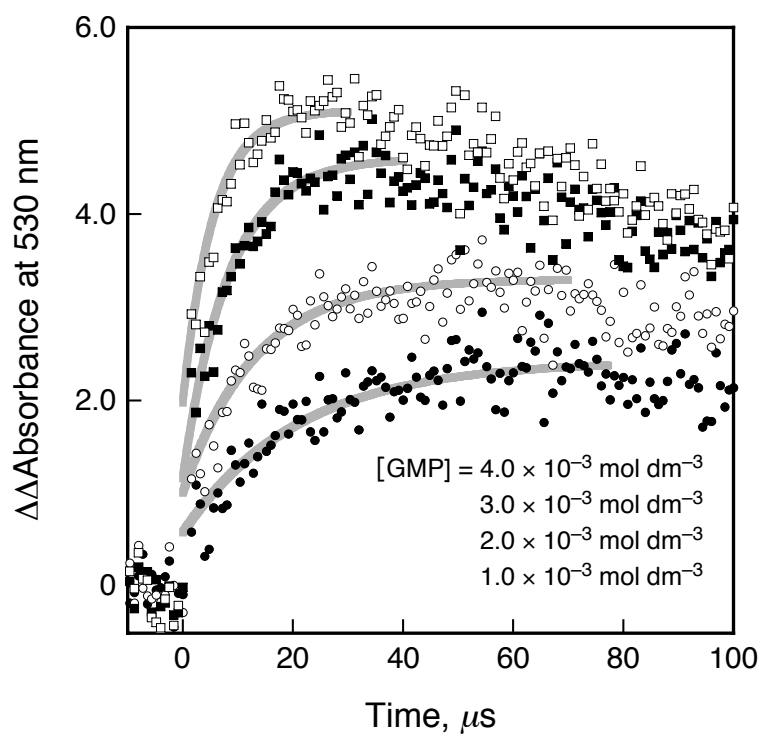


Fig. S1 Absorbance time profiles at 530 nm due to GMP^{*+} in the photoinduced ET oxidation of GMP with $\text{Acr}^{+}\text{-Mes}$ in deaerated 5 mmol dm^{-3} KCl/HCl buffer (pH 2.0).

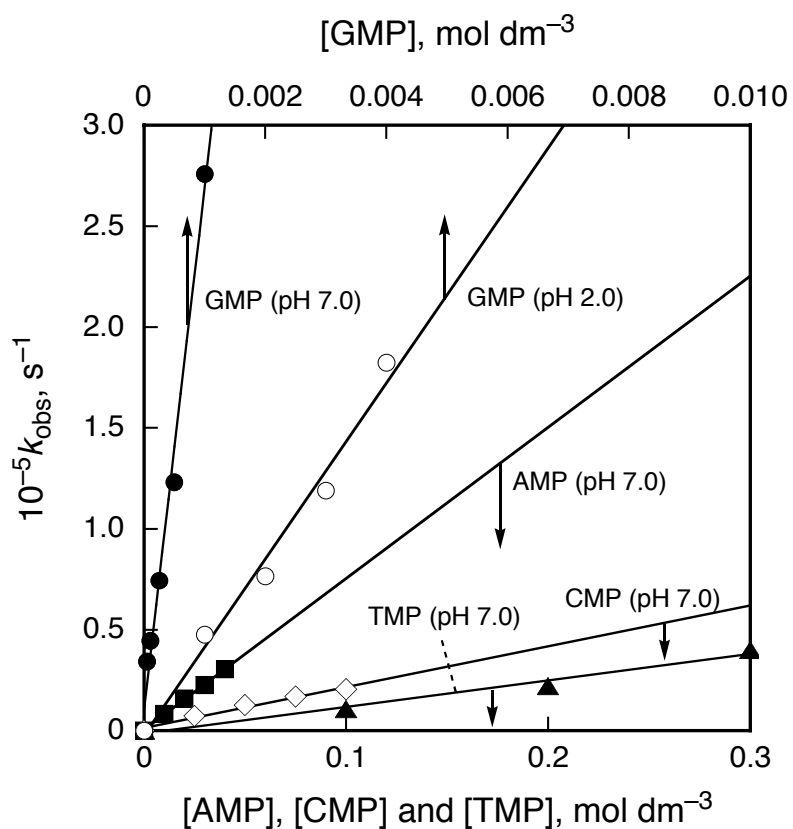


Fig. S2 Plots of pseudo-first-order rate constants (k_{obs}) vs [GMP] (○: pH 2.0, ●: pH 7.0), [AMP] (■), [CMP] (◇) and [TMP] (▲) for formation of nucleotide radical cations in the photoinduced ET oxidation of nucleotides with Acr^+-Mes in 5 mmol dm^{-3} KCl/HCl (pH 2.0) or Tris/HCl (pH 7.0) buffer at 298 K.

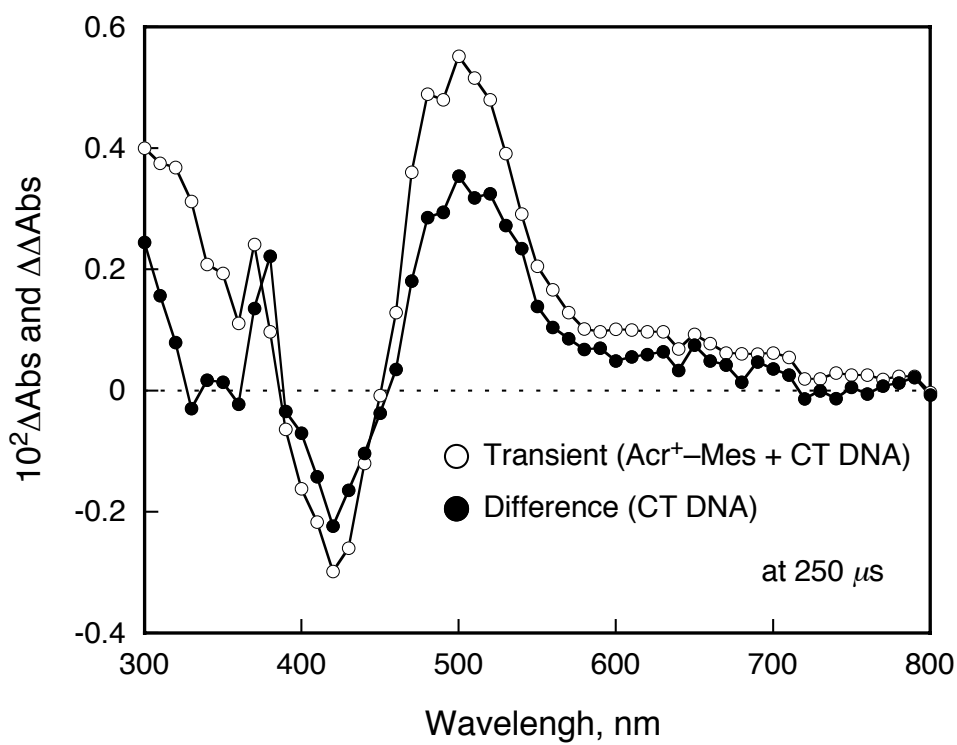


Fig. S3 Transient absorption spectrum of Acr⁺–Mes (6.0 × 10⁻⁵ mol dm⁻³) in the presence of calf thymus DNA (CT DNA) (1.0 × 10⁻³ mol dm⁻³) and the difference spectrum of DNA radical cation at pH 7.0. measured at 250 μs after laser excitation at λ = 355 nm at 298 K.

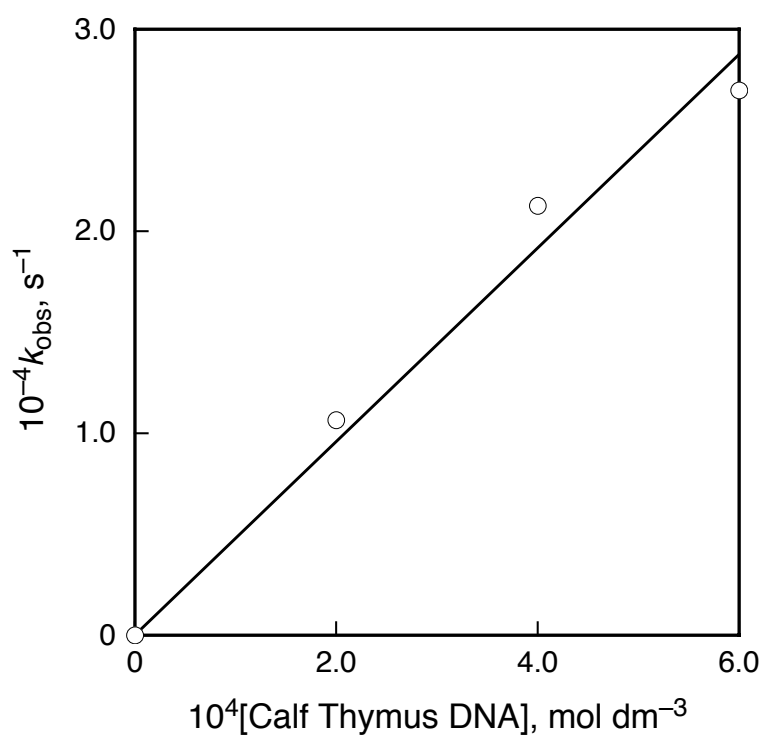


Fig. S4 Plot of the pseudo-first-order rate constant (k_{obs}) vs [Calf Thymus DNA] for formation of DNA radical cation in the photoinduced ET oxidation of Calf thymus DNA with Acr^+ -Mes in 5 mmol dm^{-3} Tris/HCl buffer (pH 7.0) at 298 K.