

Electronic Supplementary Information

Electronically excited states of DNA oligonucleotides with disordered base sequences studied by fluorescence spectroscopy

Ingacio Vaya, Johanna Brazard, Thomas Gustavsson and Dimitra Markovitsi*

- Figure ESI-1: Melting curves of the duplexes ds-11 and ds-22
- Figure ESI-2: Absorption spectra of the duplexes ds-11 and ds-22
- Figure ESI-3: Fits of the steady-state fluorescence spectra
- Figure ESI-4: TCSPC decays of the single and double strands at three wavelengths
- Figure ESI-5: TSPC anisotropies of the duplex ds-22
- Table ESI-1: Fitted parameters determined for the TCSPC decays of all the studied systems

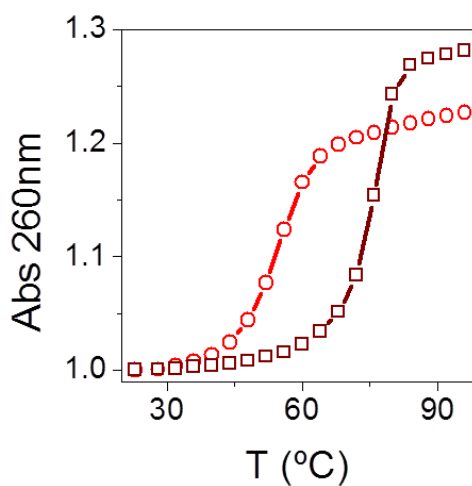


Figure ESI-1. Melting curves of ds-11 (red) and ds-22 (dark red) observed at 260 nm.

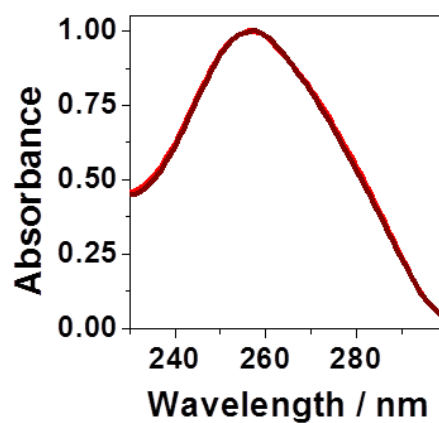


Figure ESI-2. Normalised UV absorption spectra of ds-11 (red) and ds-22 (dark red).

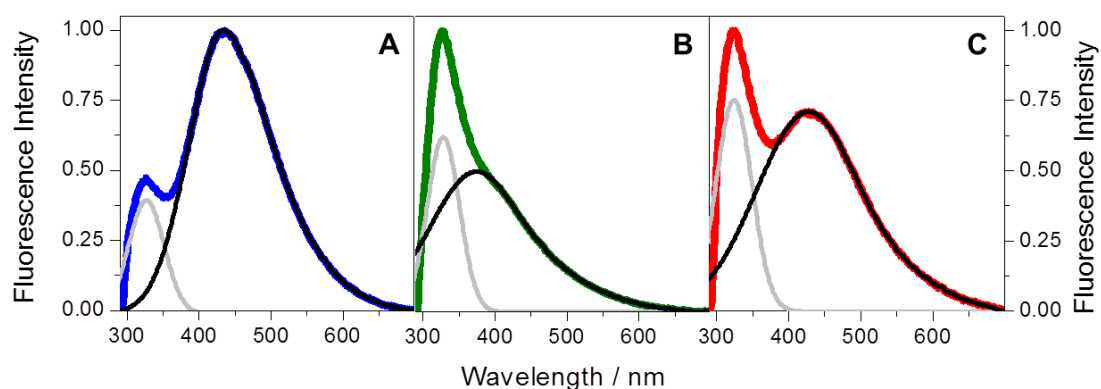


Figure ESI-3. Fits of the steady-state fluorescence spectra of ss-11a (blue, A), ss-11b (green, B) and ds-11 (red, C) with two Gaussian functions (grey and black).

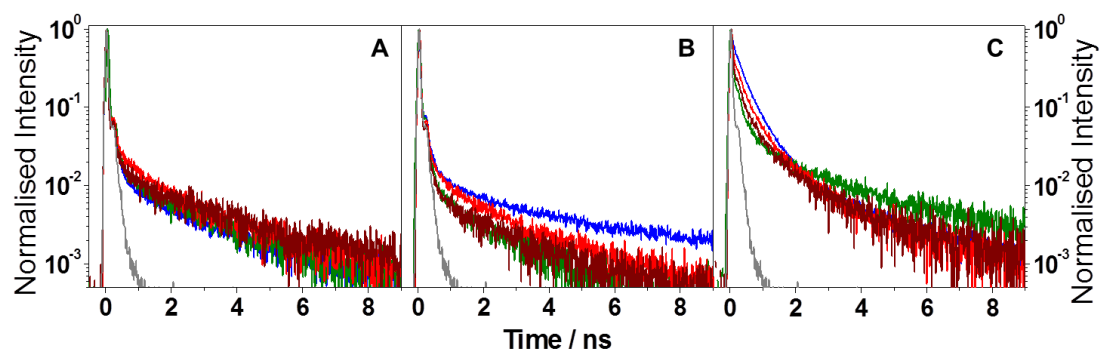


Figure ESI-4. Normalised TCSPC decays at A) 305nm, B) 330 nm and C) 420 nm for ss-11a (blue), ss-11b (green), ds-11 (red) and ds-22 (dark red). The instrumental response function is shown in grey.

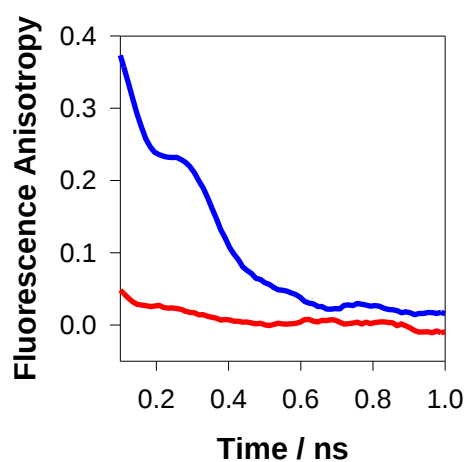


Figure ESI-5. Fluorescence anisotropy determined for ds-22 by TCSPC at 305 nm (blue) and 420 nm (red).

Table ESI-1. Parameters derived from the fits of the TCSPC decays at 305, 330 and 420 nm by tri-exponential functions: $a_1 \times \exp(-t/\tau_1) + a_2 \times \exp(-t/\tau_2) + a_3 \times \exp(-t/\tau_3)$. The average lifetime is defined as $\langle \tau \rangle = a_1 \times \tau_1 + a_2 \times \tau_2 + a_3 \times \tau_3$.

		τ_1 (ns)	a_1	τ_2 (ns)	a_2	τ_3 (ns)	a_3	$\langle \tau \rangle$ (ns)
ss-11a	305 nm	0.001	0.9987	1.7	0.0009	6.0	0.0005	0.005
	330 nm	0.001	0.9975	1.0	0.0018	8.7	0.0007	0.009
	420 nm	0.03	0.7227	0.29	0.2389	1.2	0.0384	0.13
ss-11b	305 nm	0.006	0.9983	2.6	0.0014	2.8	0.0004	0.01
	330 nm	0.02	0.9977	1.7	0.0014	3.6	0.0010	0.02
	420 nm	0.02	0.9521	0.30	0.0393	3.1	0.0086	0.06
ds-11	305 nm	0.001	0.9954	1.2	0.0039	5.0	0.0008	0.01
	330 nm	0.001	0.9964	1.1	0.0028	5.0	0.0008	0.008
	420 nm	0.01	0.8857	0.25	0.0948	1.3	0.0194	0.06
ds-22	305 nm	0.001	0.9963	1.5	0.0030	5.6	0.0007	0.009
	330 nm	0.001	0.9972	1.4	0.0022	5.3	0.0006	0.008
	420 nm	0.011	0.9252	0.24	0.0629	1.7	0.0119	0.046