

Supplementary Table 2. Single-read clustering statistics.

Sample	Modification state class	Numer of reads	% of total reads
Fig.3: Major cruciform clustering in mixed topoisomer populations			
Low_salt_s6	Extended local melting	13490	9.57
Low_salt_s6	Proto-cruciform folding	10174	7.22
Low_salt_s6	Cruciform with unstable 3-nt loop boundary	21854	15.5
Low_salt_s6	Cruciform with 3-nt loop	21029	14.91
Low_salt_s6	Partial melting	15307	10.86
Low_salt_s6	No Cruciform	59145	41.95
High_salt_s6	Extended local melting	6379	6.58
High_salt_s6	Proto-cruciform folding	4714	4.86
High_salt_s6	Pre-cruciform with 10-nt dyad melting	38098	39.3
High_salt_s6	Cruciform with 5-nt loop	1153	1.19
High_salt_s6	Cruciform with 3-nt loop	17913	18.48
High_salt_s6	Partial melting	4297	4.43
High_salt_s6	No Cruciform	24396	25.16
Fig.4: Joint DUE-IR-FUSE clustering in purified topoisomers			
DeltaLk_22	DUE+ IR+ FUSE-	886	1.89
DeltaLk_22	DUE- IR+ FUSE+(45 nt)	15355	32.81
DeltaLk_22	DUE+ IR- FUSE+(45 nt)	2897	6.19
DeltaLk_22	DUE- IR- FUSE+(45 nt)	3919	8.37
DeltaLk_22	DUE- IR+ FUSE+(68 nt) L	13993	29.9
DeltaLk_22	DUE- IR+ FUSE+(68 nt) R	1676	3.58
DeltaLk_22	DUE- IR- FUSE+(68 nt) L	6749	14.42
DeltaLk_22	DUE- IR- FUSE+(68 nt) R	134	0.29
DeltaLk_22	DUE- IR- FUSE+(88 nt)	1197	2.56
DeltaLk_23	DUE+ IR+ FUSE-	7093	8
DeltaLk_23	DUE- IR+ FUSE-	5442	6.14
DeltaLk_23	DUE+ IR+ FUSE+(45 nt)	3213	3.62
DeltaLk_23	DUE- IR+ FUSE+(45 nt)	47565	53.63
DeltaLk_23	DUE- IR- FUSE+(45 nt)	4611	5.2
DeltaLk_23	DUE- IR+ FUSE+(68 nt) L	15505	17.48
DeltaLk_23	DUE- IR+ FUSE+(68 nt) R	3413	3.85
DeltaLk_23	DUE- IR- FUSE+(68 nt)	1844	2.08
Fig.4: Major cruciform clustering in purified topoisomers			
DeltaLk_22	Extended local melting	4894	9.5
DeltaLk_22	Proto-cruciform folding	3694	7.2
DeltaLk_22	Cruciform with 3-nt loop	12539	24.4
DeltaLk_22	Cruciform with unstable 3-nt loop boundary	10396	20.2
DeltaLk_22	Partial melting	5294	10.3
DeltaLk_22	No Cruciform	14570	28.4
DeltaLk_23	Extended local melting	9432	11
DeltaLk_23	Proto-cruciform folding	7564	8.8
DeltaLk_23	Cruciform with 3-nt loop	27913	32.6

DeltaLk_23	Cruciform with unstable 3-nt loop boundary	23492	27.4
DeltaLk_23	Partial melting	6135	7.2
DeltaLk_23	No cruciform-related signal	11173	13