

Supporting Information

Table S1. DNA with their corresponding name and sequence

No.	Name	Sequence (5'-3')
1	D-Tel G4	A GGG TTA GGG TTA GGG TTA GGG
2	L-Tel G4	A GGG TTA GGG TTA GGG TTA GGG
3	D-Oxy1.5	GGG GTT TTG GGG
4	L-Oxy1.5	GGG GTT TTG GGG
5	c-kit	A GGG AGG GCG CTG GGA GGA GGG
6	c-myc	TGG GGA GGG TGG GGA GGG TGG GGA AGG
7	21CTA	GGG CTA GGG CTA GGG CTAGGG
8	27Kras	GGG CGG TGT GGG AAG AGG GAA GAG GGG
9	32Kras	A GGG CGG TGT GGG AAG AGG GAA GAG GGG GAG G
10	35Kras	A GGG CGG TGT GGG AAG AGG GAA GAG GGG GAG GCA G
11	VAV1	GGG CAG GGA GGG AAC TGG G
12	Oxy3.5	GGG GTT TTG GGG TTT TGG GGT TTT GGG G
13	Insulin a2	ACA GGG GTG TGG GGA CAG GGG TGT GGG G
14	TBA	GGT TGG TGT GGT TGG
15	Asc20	GGC TTA GGC TTA GGC TTA GG
16	ss DNA	ATC GTC GAT GCT AAT CCT GA
17	ds AT	ATA TAT ATA TAT ATA T
18	ds GC	GCG CGC GCG CGC GCG C
19	Tri-DNA	S1: GAG AGG AGA GAG AAG AGG AAG S2: CTT CCT CTT CTC TCT CCT CTC S3: CTC TCC TCT CTC TTC TCC TTC
20	i-motif	CCC TAA CCC TAA CCC TAA CCC T

DNA concentration was determined by measuring the absorbance of 260 nm. The molar extinction coefficients were calculated by oligo analyzer from IDT.

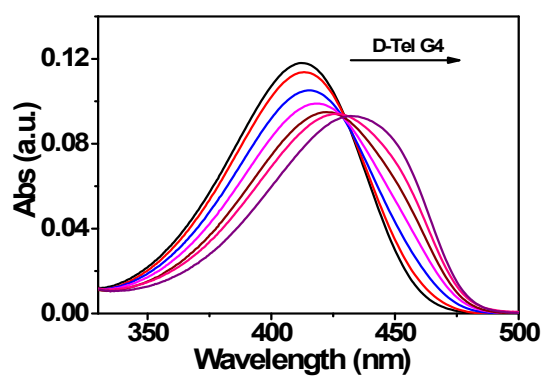


Figure S1 Absorption and of ThT after gradually incubated with D-Tel G4 in 50 mM Tris buffer.

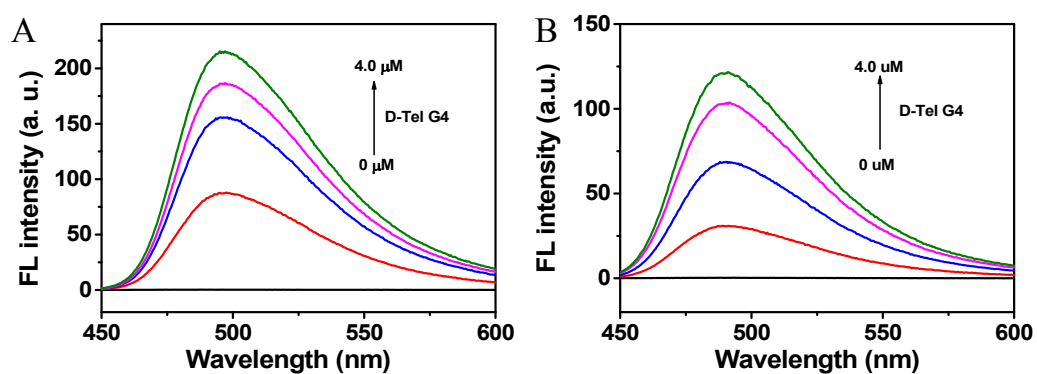


Figure S2 FL spectra of D-Tel G4-ThT with different mixing ratios in the absence (A) or presence (B) of 5 mM KCl in 50 mM Tris buffer (pH 7.2).

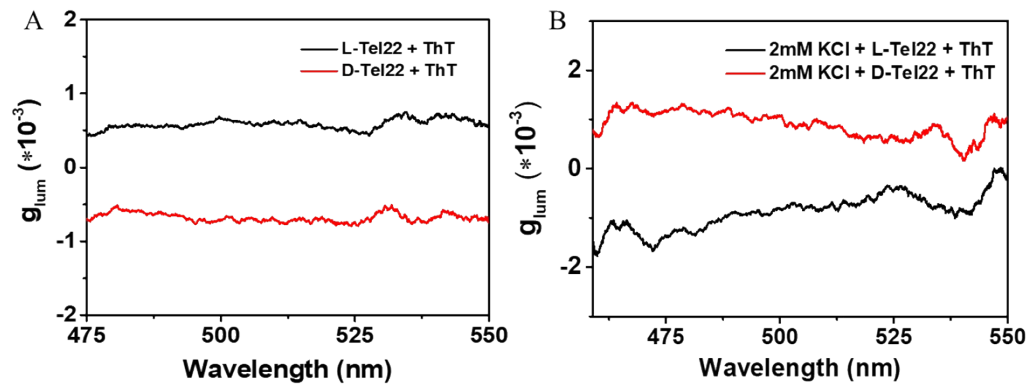


Figure S3 Mirror g_{lum} of the assembled L-/D-Tel G4-ThT in the absence (A) or presence (B) of 2 mM KCl in 50 mM Tris buffer.

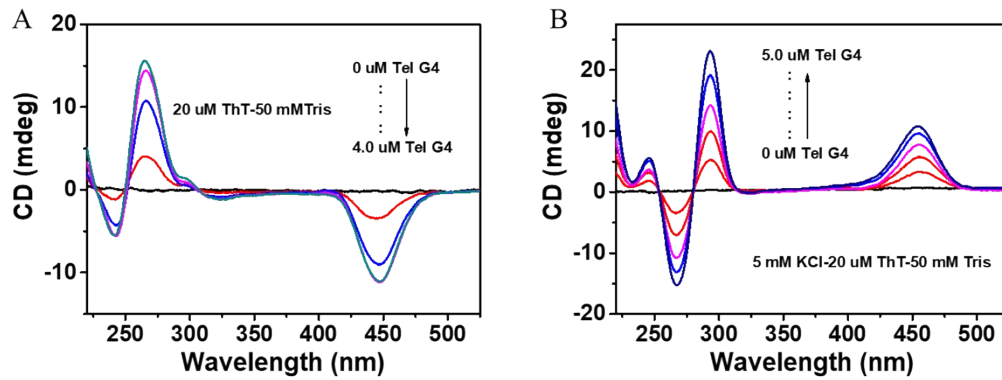


Figure S4 CD spectra of D-Tel G4 -ThT with different mixing ratios in the absence (A) or presence (B) of 5 mM KCl in 50 mM Tris buffer (pH 7.2).

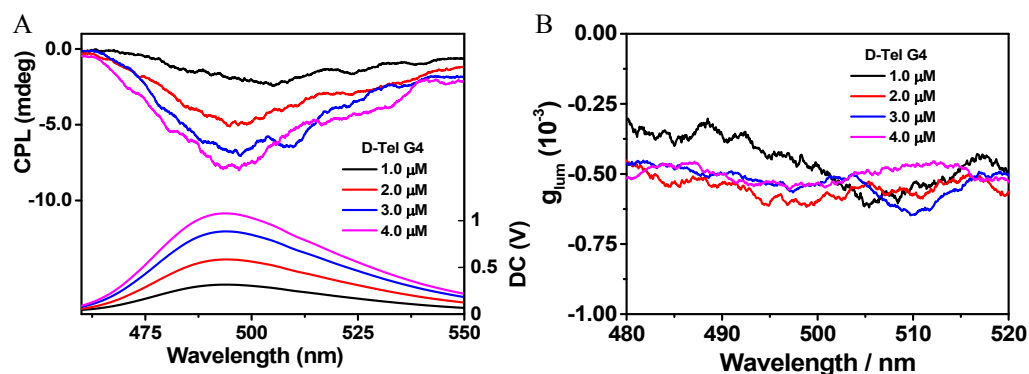


Figure S5 CPL spectra (A) and g_{lum} (B) of D-Tel G4 -ThT system with different mixing ratios in the absence of KCl in 50 mM Tris buffer (pH 7.2).

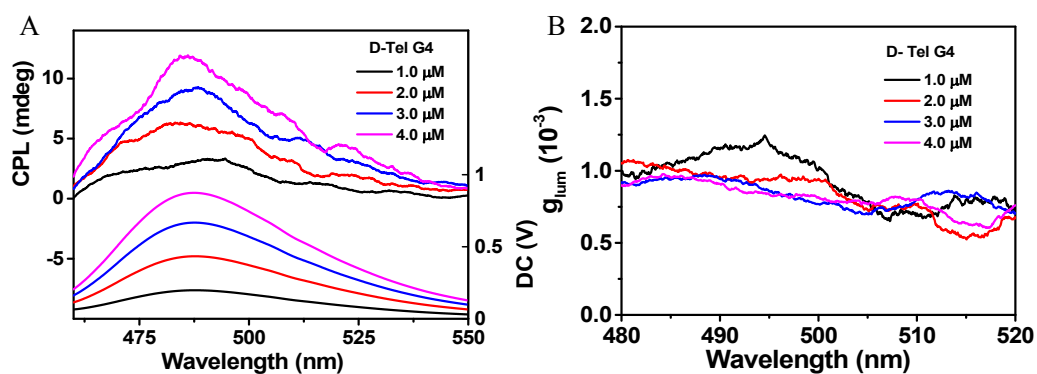


Figure S6 CPL spectra (A) and g_{lum} (B) of D-Tel G4 -ThT system with different mixing ratios in the presence of 5 mM KCl in 50 mM Tris buffer (pH 7.2).

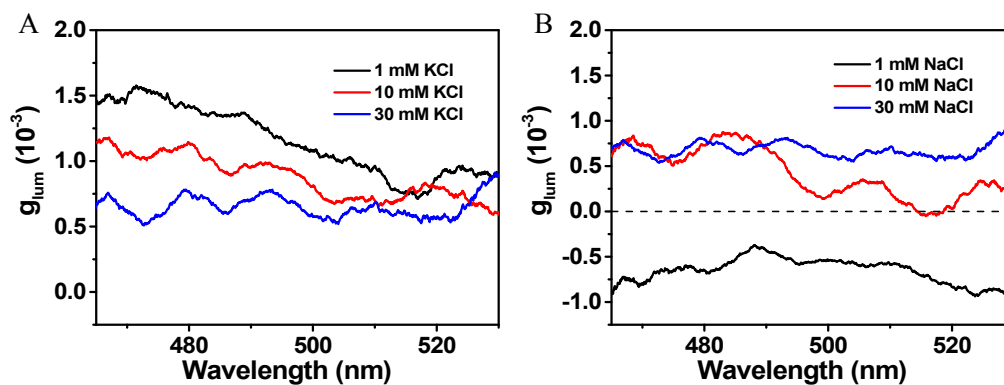


Figure S7 (A) g_{lum} values of 2 μM D-Tel G4 with 20 μM ThT in different K^+ concentrations from 1 to 30 mM. and (B) different Na^+ concentrations from 1 to 30 mM.

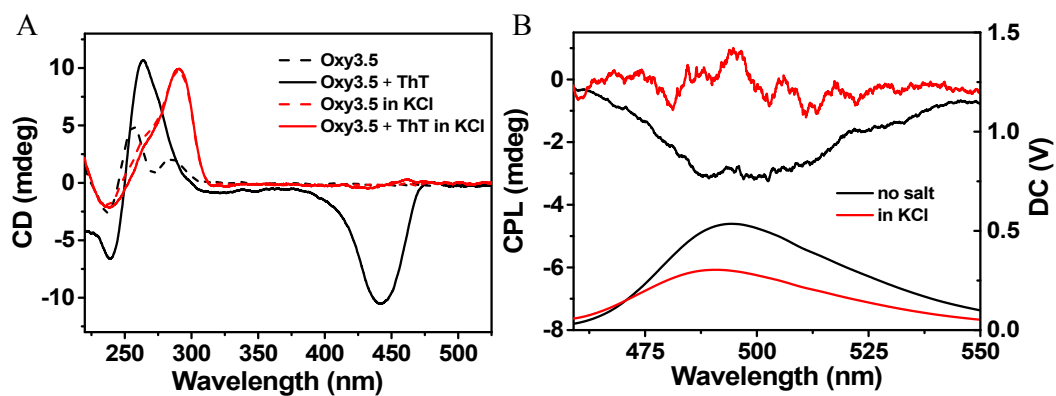


Figure S8 (A) CD and (B) CPL spectra of Oxy 3.5 G4 in the absence or presence of K^+ .

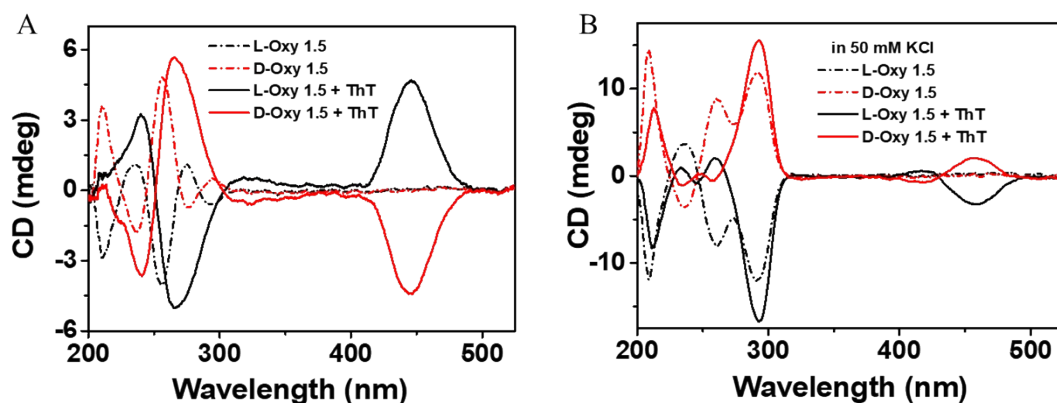


Figure S9 (A) Mirror CD spectra of enantiomeric pairs of L-/D- Oxy1.5 G4 DNA with or without ThT in salt-free 50 mM Tris buffer (pH 7.2). (B) CD spectra of L-/D- Oxy1.5 G4 DNA with or without ThT in the absence or presence of 50 mM KCl in 50 mM Tris buffer (pH 7.2). ($C_{\text{Tel G4}}=2.0/4.0$ uM, $C_{\text{ThT}}=20$ uM).

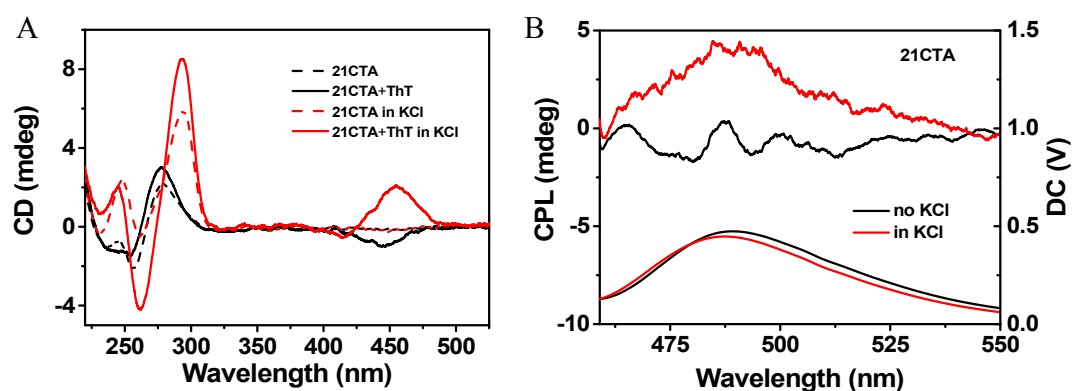


Figure S10 (A) CD and (B) CPL spectra of 21CTA G4 with or without ThT in the absence or presence of 2 mM KCl in 50 mM Tris buffer (pH 7.2). ($C_{21\text{CTA G4}}=2.0$ uM, $C_{\text{ThT}}=20$ uM).

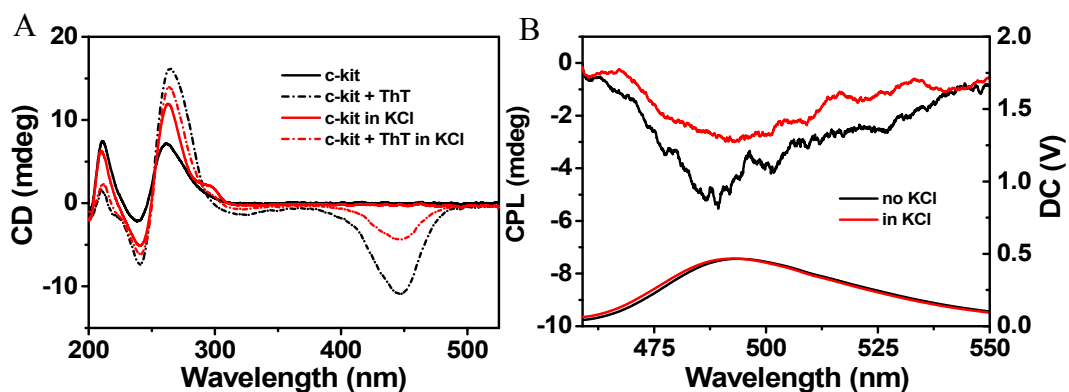


Figure S11 (A) CD and (B) CPL spectra of c-kit DNA with or without ThT in 50 mM Tris buffer (pH 7.2). ($C_{\text{c-kit}}=2.0$ μM , $C_{\text{ThT}}=20$ μM).

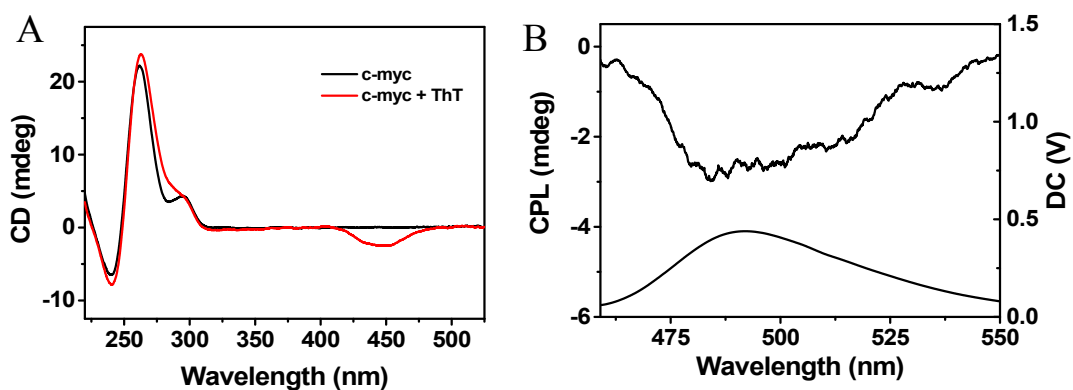


Figure S12 (A) CD and (B) CPL spectra of c-myc G4 with or without ThT in the presence of 20 mM KCl in 50 mM Tris buffer (pH 7.2). ($C_{\text{c-myc}}=2.0$ μM , $C_{\text{ThT}}=20$ μM).

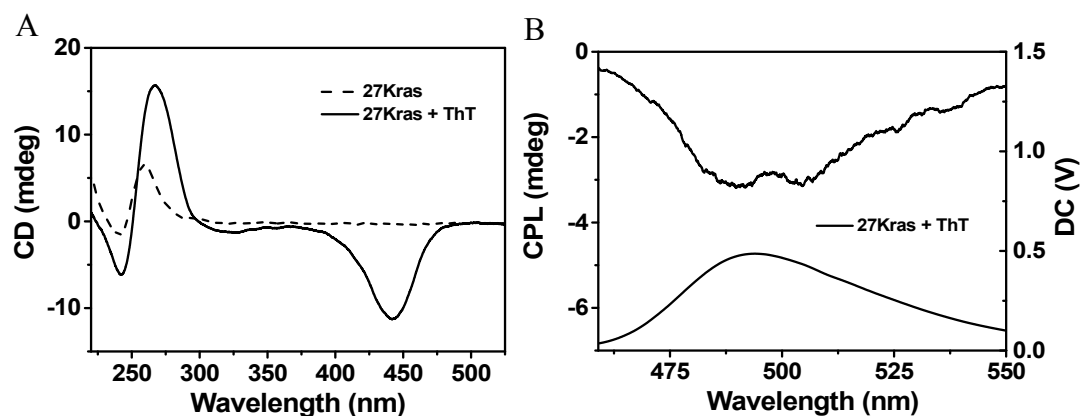


Figure S13 (A) CD and (B) CPL spectra of 27Kras G4 with or without ThT in 50 mM Tris buffer (pH 7.2). ($C_{27Kras}=2.0$ μ M, $C_{ThT}=20$ μ M).

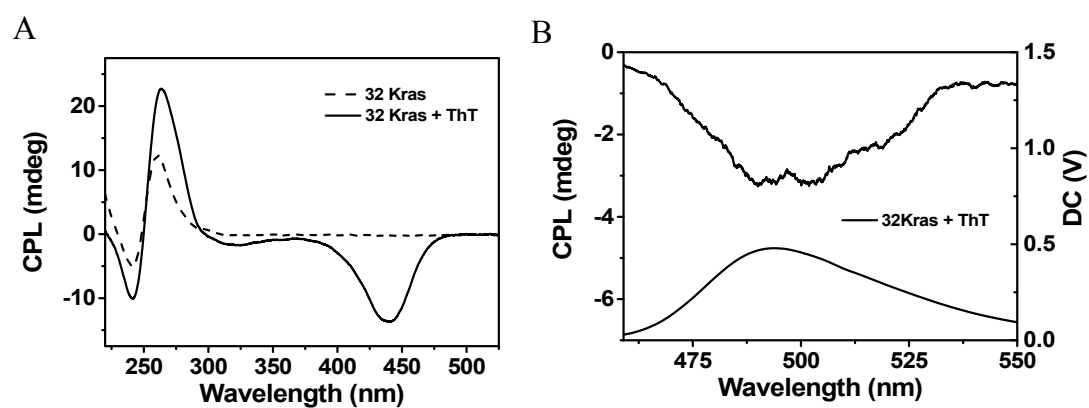


Figure S14 (A) CD and (B) CPL spectra of 32Kras G4 with or without ThT in 50 mM Tris buffer (pH 7.2). ($C_{32Kras}=2.0$ μ M, $C_{ThT}=20$ μ M).

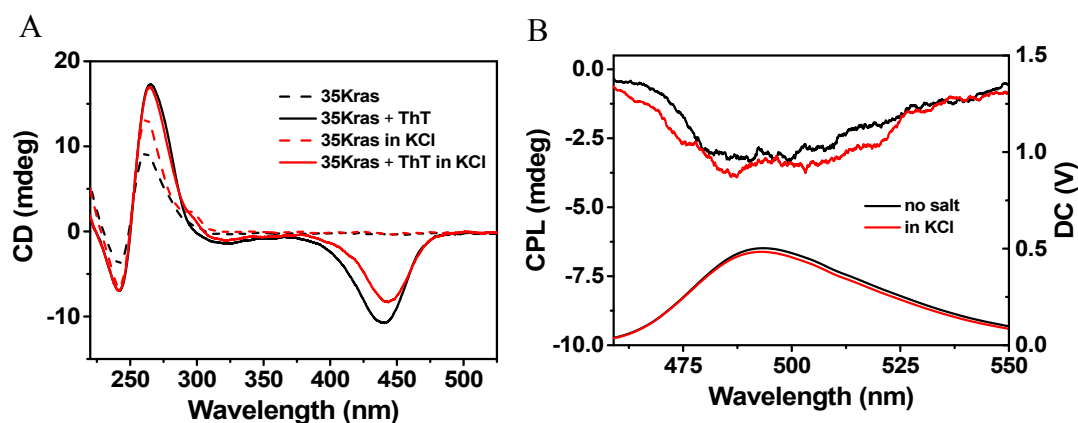


Figure S15 (A) CD and (B) CPL spectra of 35Kras G4 with or without ThT in the absence or presence of 2 mM KCl in 50 mM Tris buffer (pH 7.2). ($C_{35Kras\ G4}=2.0\ \mu\text{M}$, $C_{ThT}=20\ \mu\text{M}$).

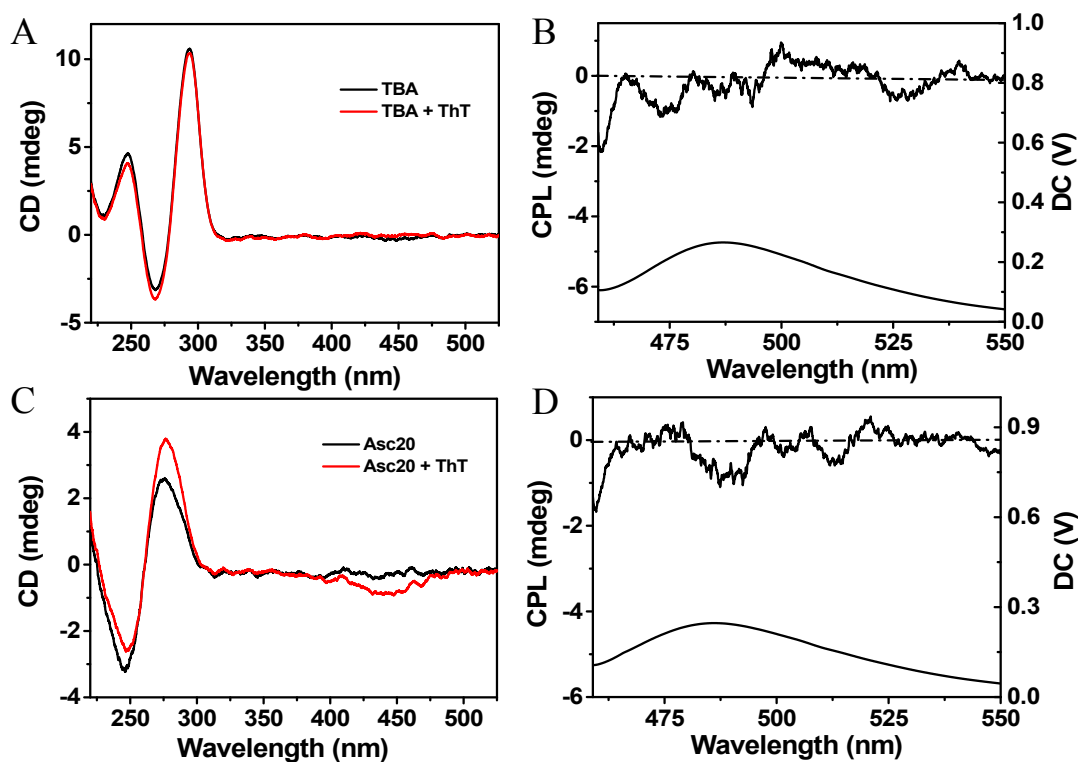


Figure S16 (A) CD and (B) CPL spectra of TBA G4 with or without ThT in the presence of 2 mM KCl in 50 mM Tris buffer (pH 7.2). ($C_{TBA}=2.0\ \mu\text{M}$, $C_{ThT}=20\ \mu\text{M}$). (C) CD and (D) CPL spectra of Asc20 G4 with or without ThT in 50 mM Tris buffer (pH 7.2). ($C_{Asc20}=2.0\ \mu\text{M}$, $C_{ThT}=20\ \mu\text{M}$).

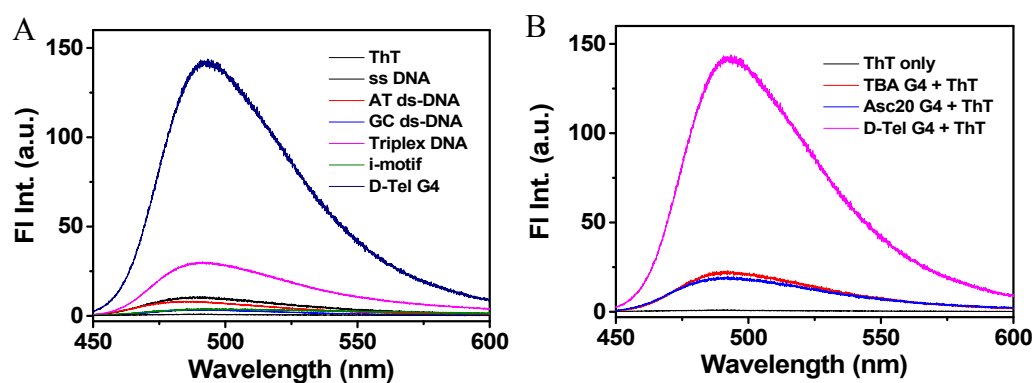


Figure S17 (A) Fluorescence spectra of ThT after incubated with Tel G4, i-motif, ss-DNA, ds-DNA and tri-DNA, separately. (B) Fluorescence spectra of ThT after incubated with Tel G4, TBA G4 and Asc20 G4, separately. ($C_{\text{DNA strand}}=2.0 \text{ uM}$, $C_{\text{ThT}}=20 \text{ uM}$).

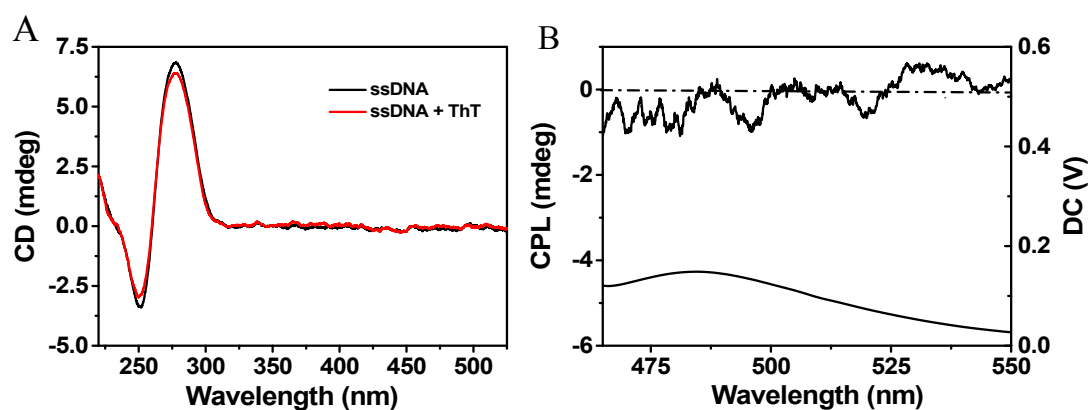


Figure S18 (A) CD and (B) CPL spectra of ss-DNA with or without ThT in 50 mM Tris buffer (pH 7.2) ($C_{\text{ss-DNA}}=2.0 \text{ uM}$, $C_{\text{ThT}}=20 \text{ uM}$).

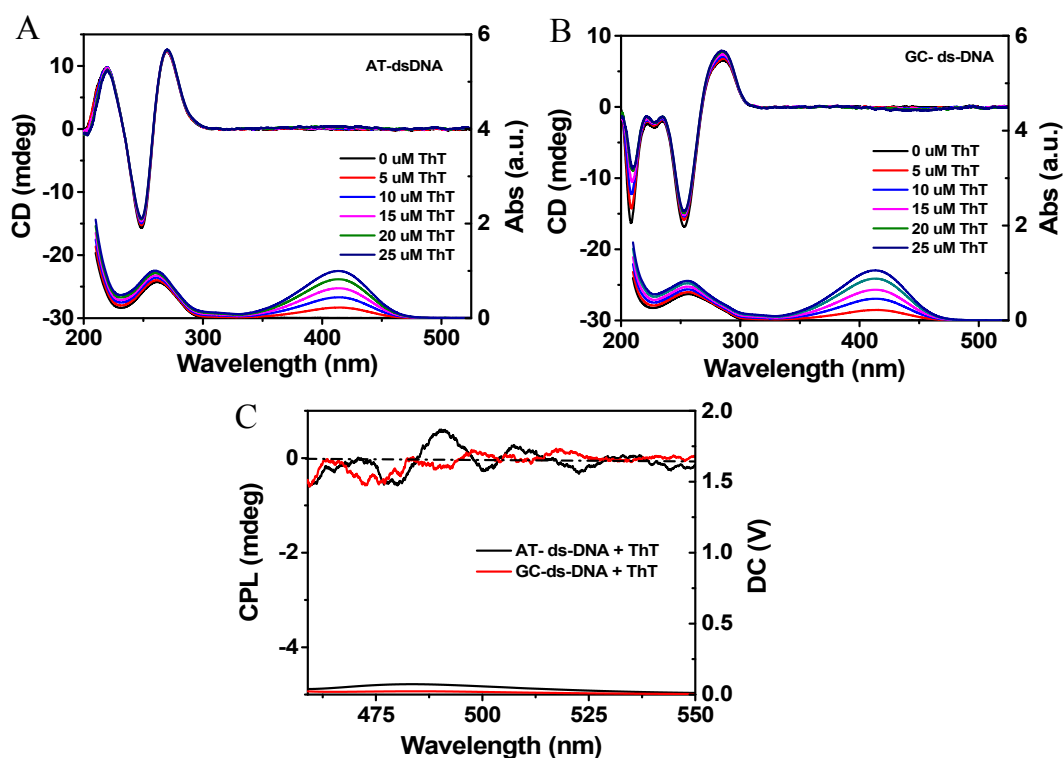


Figure S19 CD spectra of A) ds-AT-DNA and (B) ds-GC-DNA and CPL spectra of 2 μM ds-DNA in 50 mM Tris buffer (pH 7.2), ($C_{\text{ds-DNA}}=2.0$ μM, $C_{\text{ThT}}=20$ μM).

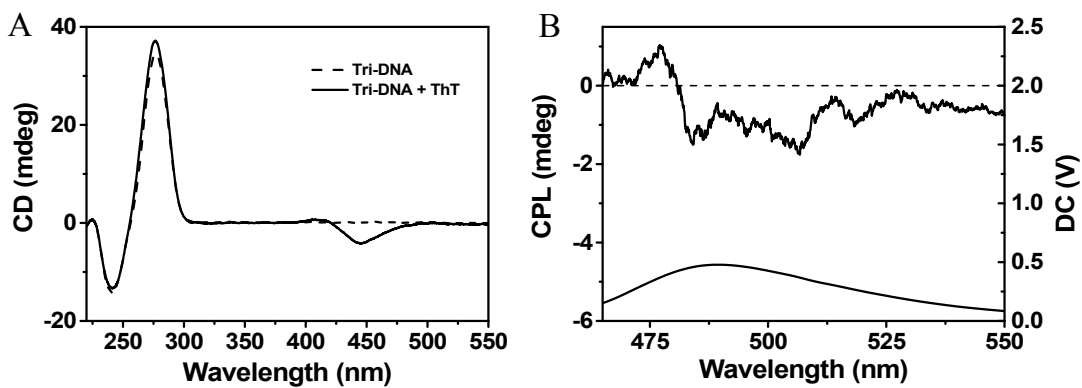


Figure S20 (A) CD and (B) CPL spectra of tri-DNA with or without ThT in 50 mM Tris buffer (pH 7.2) ($C_{\text{tri-DNA}}=2.0$ μM, $C_{\text{ThT}}=20$ μM).

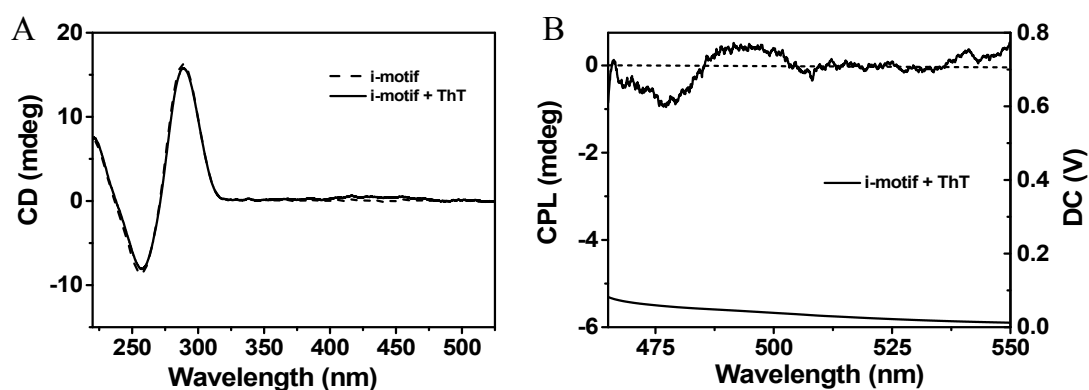


Figure S21 (A) CD and (B) CPL spectra of i-motif DNA with or without ThT in 50 mM Tris buffer (pH 7.2) ($C_{\text{i-motif}}=2.0$ uM, $C_{\text{ThT}}=20$ uM).

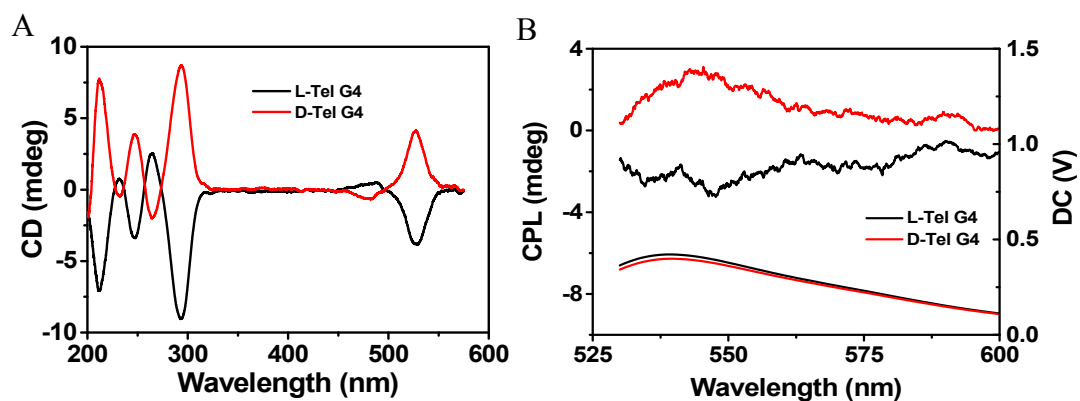


Figure S22 (A) and (B) Mirror CD and CPL spectra of enantiomeric pairs of L-/D-Tel G4 DNA with TO in the presence of 2 mM KCl in 50 mM Tris buffer (pH 7.2). ($C_{\text{L-/D-Tel G4}}=2.0$ uM, $C_{\text{TO}}=20$ uM).

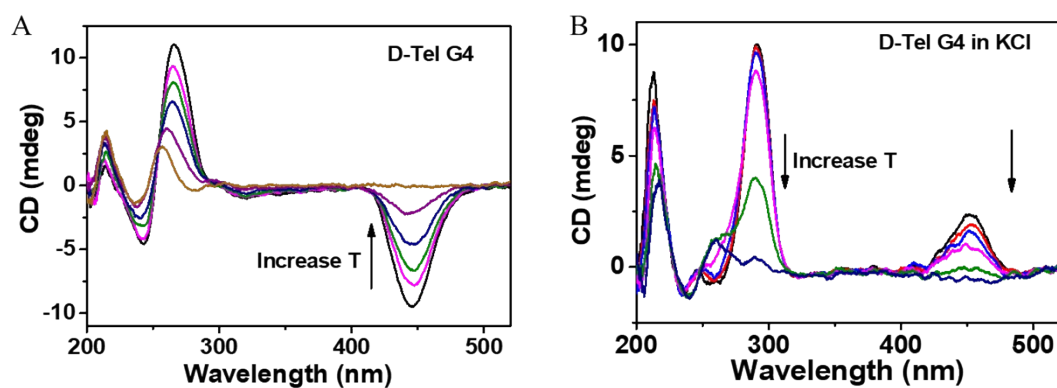


Figure S23 CD spectra of the assembled Tel G4-ThT under different temperatures in the absence (A) or presence (B) of KCl in 50 mM Tris buffer (pH 7.2).

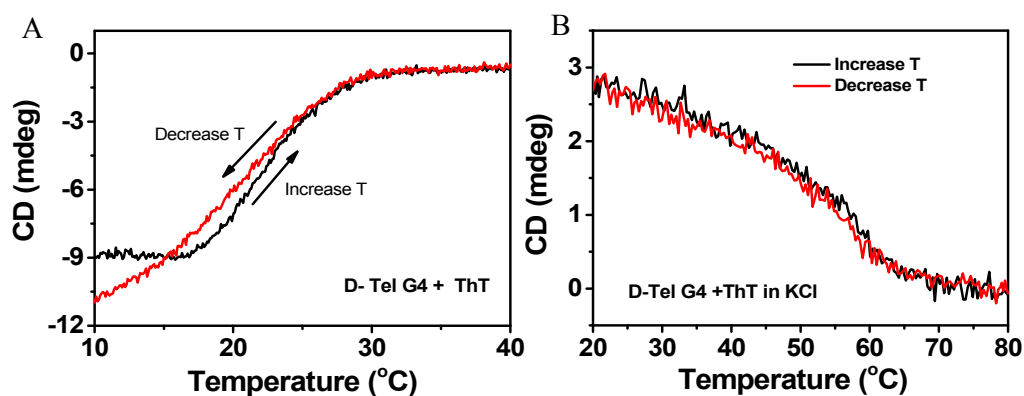


Figure S24 Melting curves for the assembled D-Tel G4-ThT in the absence (A) or presence (B) of KCl.