Electronic Supplementary Material (ESI) for Photochemical & Photobiological Sciences.

Supporting Information

Effect of linker length on photo-cross-linking position mediated by click chemistry via [2+2]photocycloaddition

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Contents

1. Synthesized ODN

Table S1. MALDI-TOF-MS analysis of ODN

Entry	Sequence(5'-3')	Found	Calcd. for $[M+H]^+$
Ethynyl-ODN	CCAA^{E}SAACC	2551.55	2551.48
Ethynyl-ODN(-1)	TGCA^{E}SCCGT	2589.78	2589.46
Ethynyl-ODN(2)	TGAC^{E}SCCGT	2589.84	2589.46
^{CNV}K-ODN	CCAA^{CNV}KAACC	2743.78	2743.55
^{CNV}K-ODN(-1)	TGCA^{CNV}KCCGT	2781.56	2781.53
^{CNV}K-ODN(-2)	TGAC^{CNV}KCCGT	2781.93	2781.53
$^{2\text{-}CNV}$K-ODN	CCAA$^{2\text{-}CNV}$KAACC	2839.19	2840.61
$^{2\text{-}CNV}$K-ODN(-1)	TGCA$^{2\text{-}CNV}$KCCGT	2877.33	2878.59
$^{2\text{-}CNV}$K-ODN(-2)	TGAC$^{2\text{-}CNV}$KCCGT	2877.32	2878.59
$^{3\text{-}CNV}$K-ODN	CCAA$^{3\text{-}CNV}$KAACC	2853.06	2852.61
$^{3\text{-}CNV}$K-ODN(-1)	TGCA$^{3\text{-}CNV}$KCCGT	2891.49	2890.59
$^{3\text{-}CNV}$K-ODN(-2)	TGAC$^{3\text{-}CNV}$KCCGT	2891.49	2891.49
$^{4\text{-}CNV}$K-ODN	CCAA$^{4\text{-}CNV}$KAACC	2867.32	2868.65
$^{4\text{-}CNV}$K-ODN(-1)	TGCA$^{4\text{-}CNV}$KCCGT	2905.32	2906.62
$^{4\text{-}CNV}$K-ODN(-2)	TGAC$^{4\text{-}CNV}$KCCGT	2905.12	2906.62
$^{5\text{-}CNV}$K-ODN	CCAA$^{5\text{-}CNV}$KAACC	2881.75	2880.65
$^{5\text{-}CNV}$K-ODN(-1)	TGCA$^{5\text{-}CNV}$KCCGT	2919.54	2918.62
$^{5\text{-}CNV}$K-ODN(-2)	TGAC$^{5\text{-}CNV}$KCCGT	2919.67	2918.62

^{E}S : Ethynyl-dSpacer

2. 1H-NMR and 13C-NMR of synthesized compound

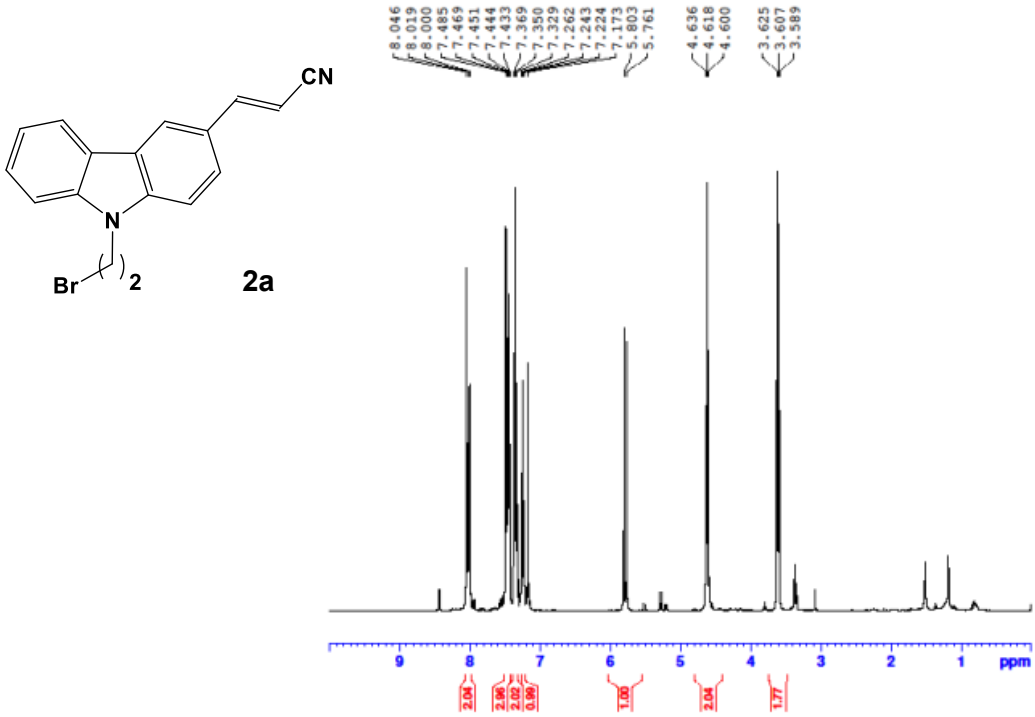

Fig. S1 1H NMR spectra of compound **2a**

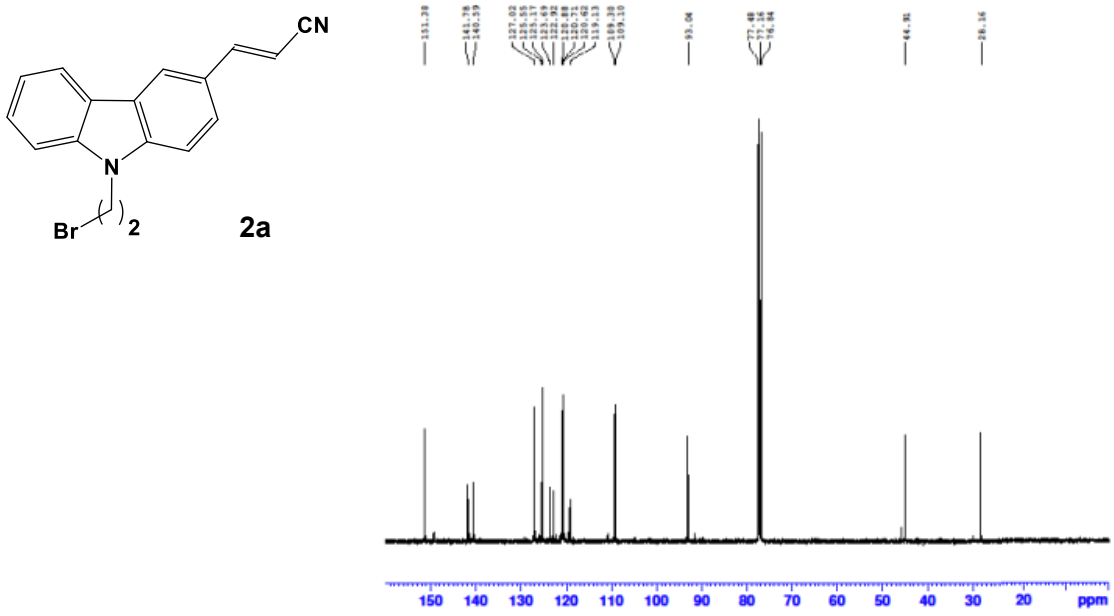

Fig. S2 13C NMR spectra of compound **2a**

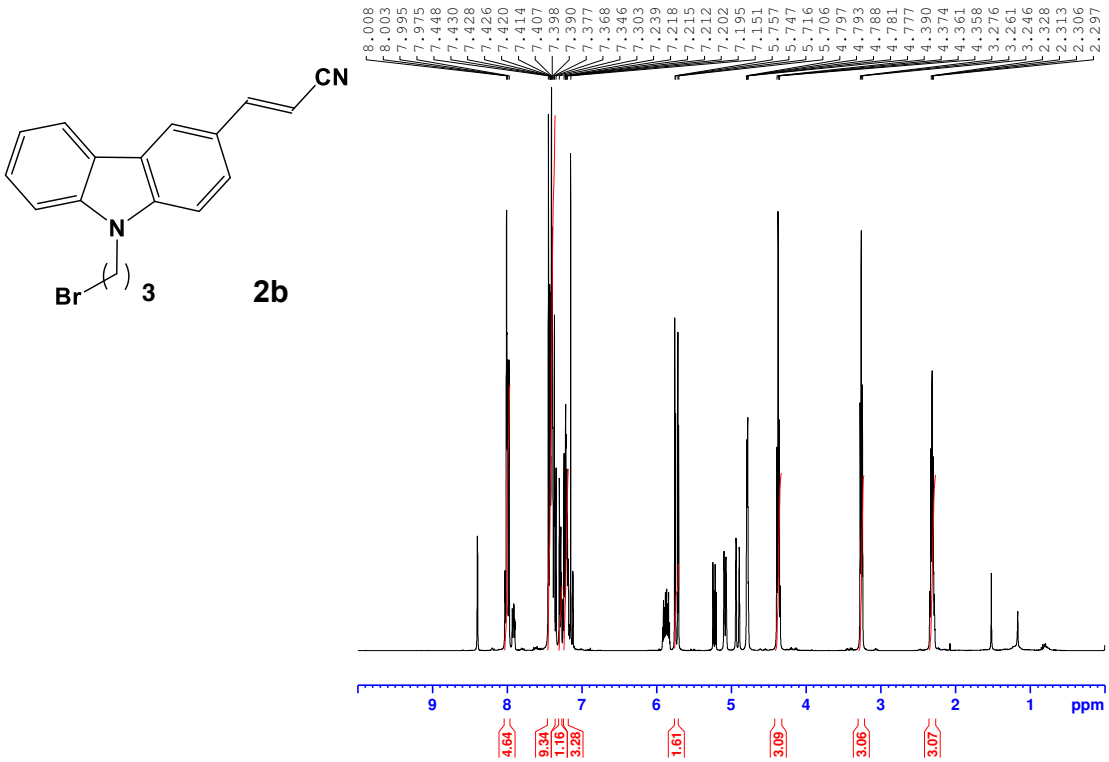

Fig. S3 1H NMR spectra of compound **2b**

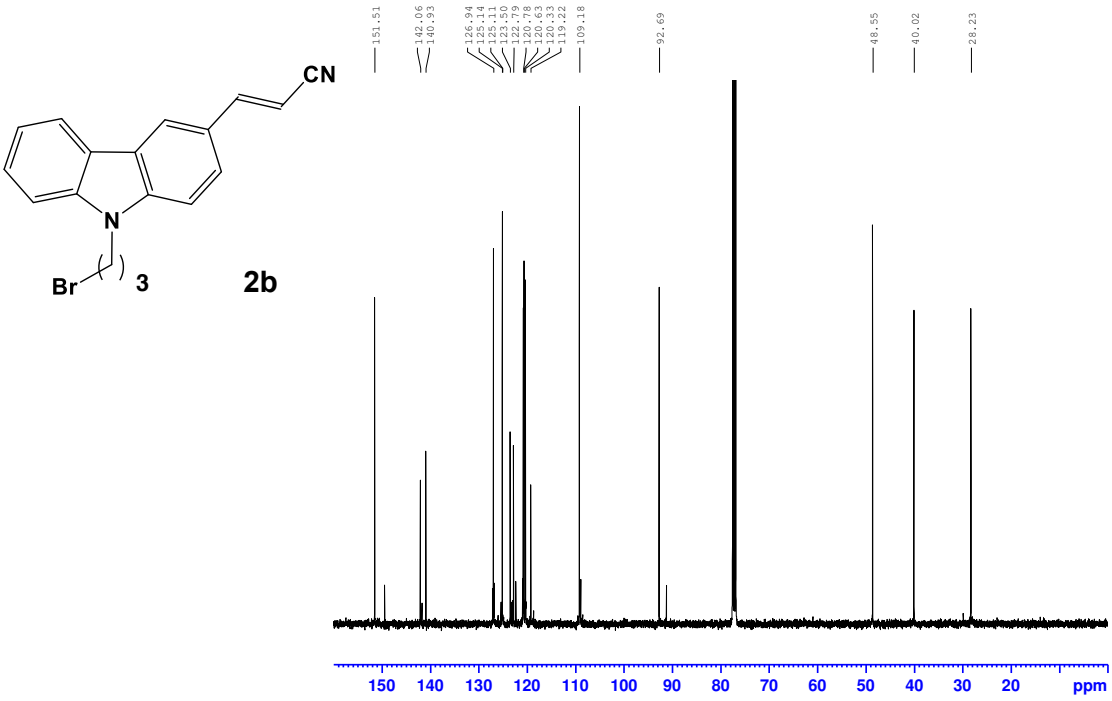

Fig. S4 13C NMR spectra of compound **2b**

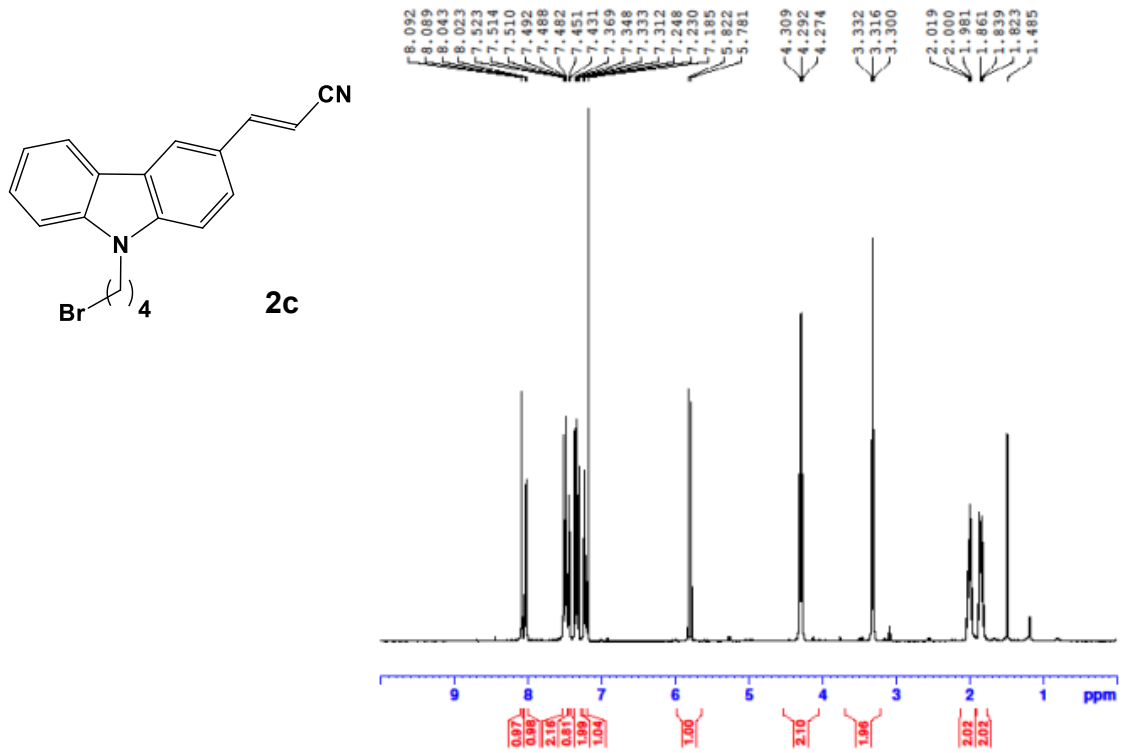

Fig. S5 1H NMR spectra of compound **2c**

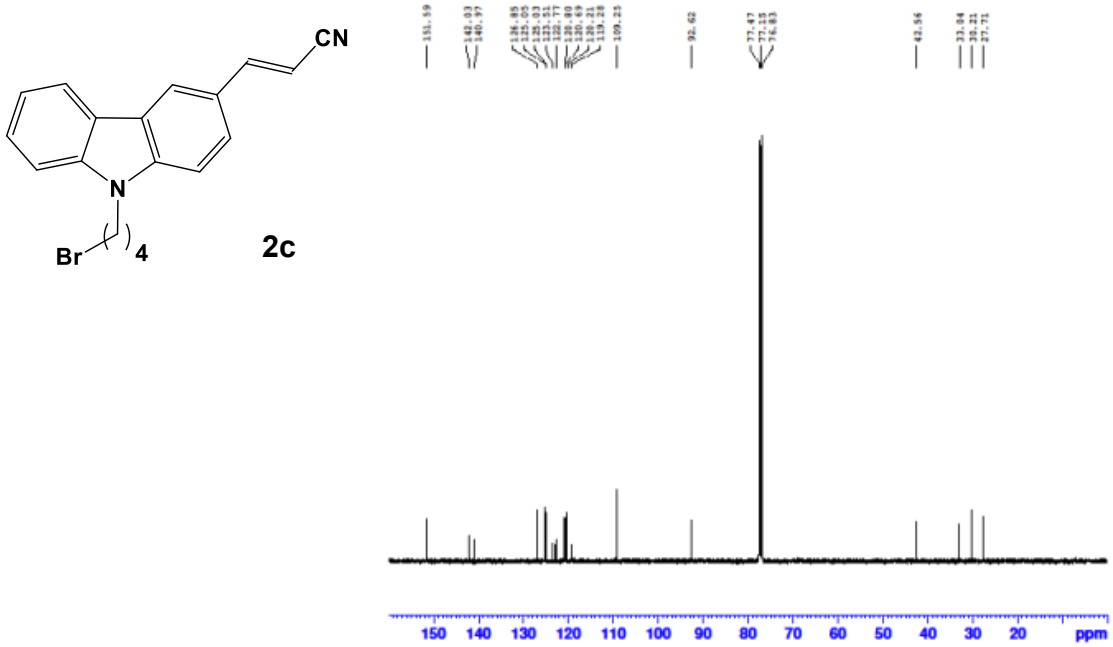

Fig. S6 13C NMR spectra of compound **2c**

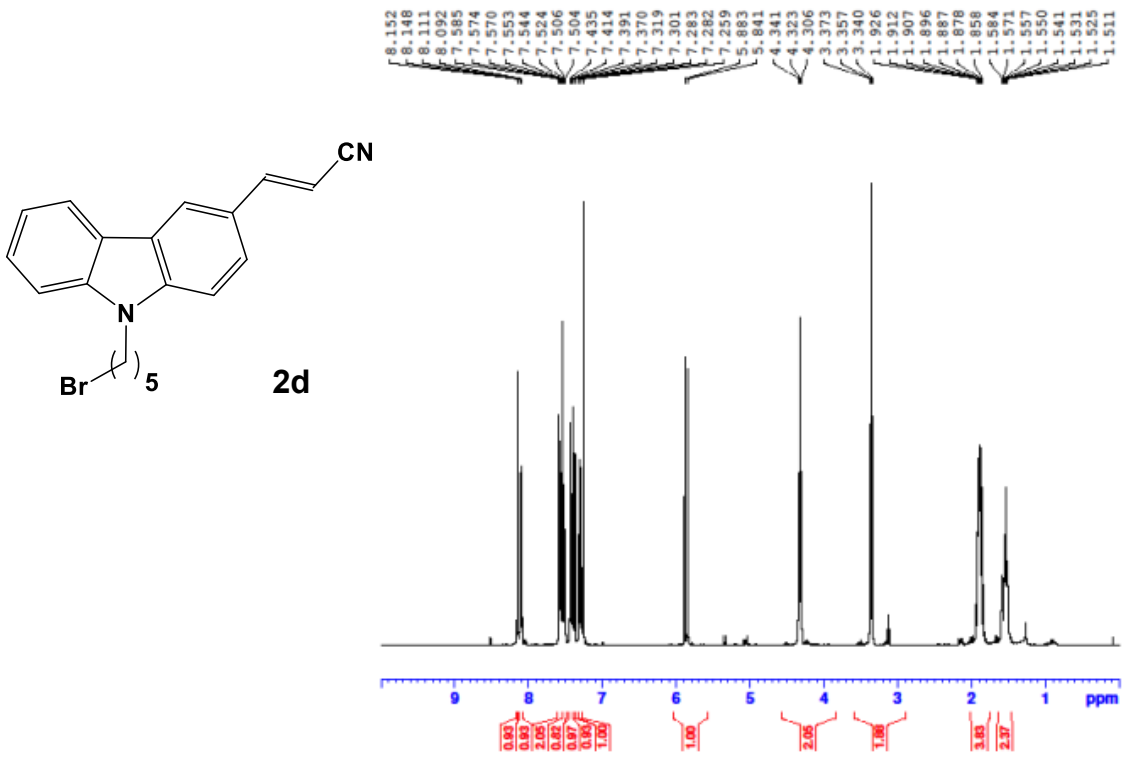

Fig. S7 1H NMR spectra of compound **2d**

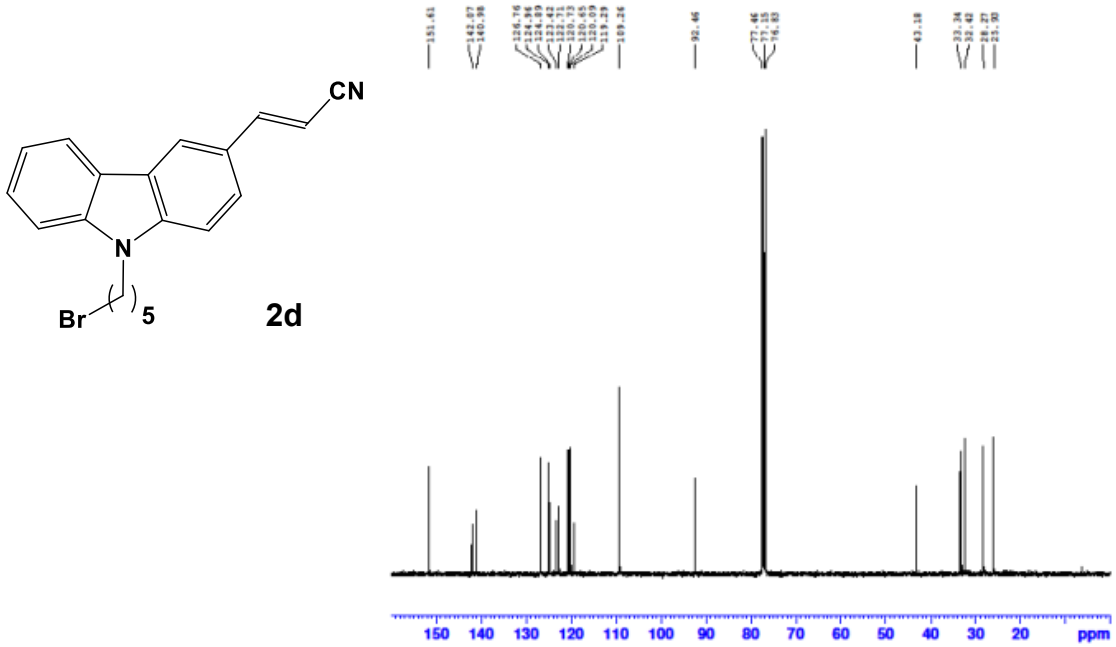

Fig. S8 13C NMR spectra of compound **2d**

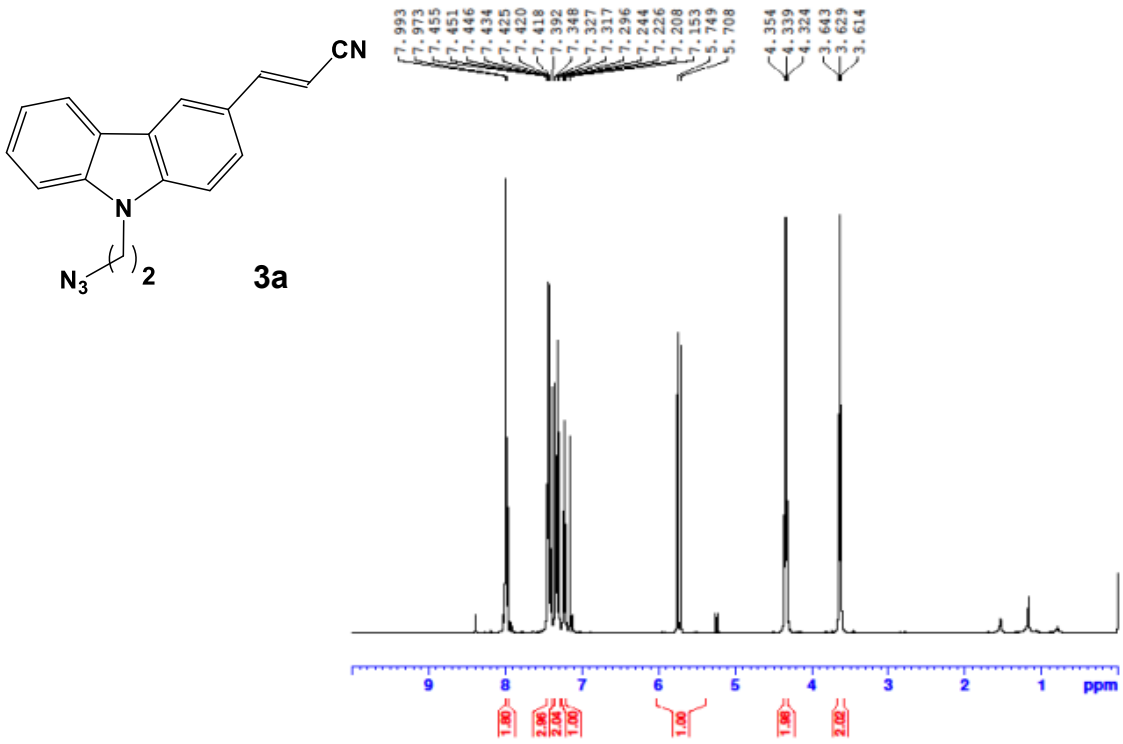

Fig. S9 1H NMR spectra of compound **3a**

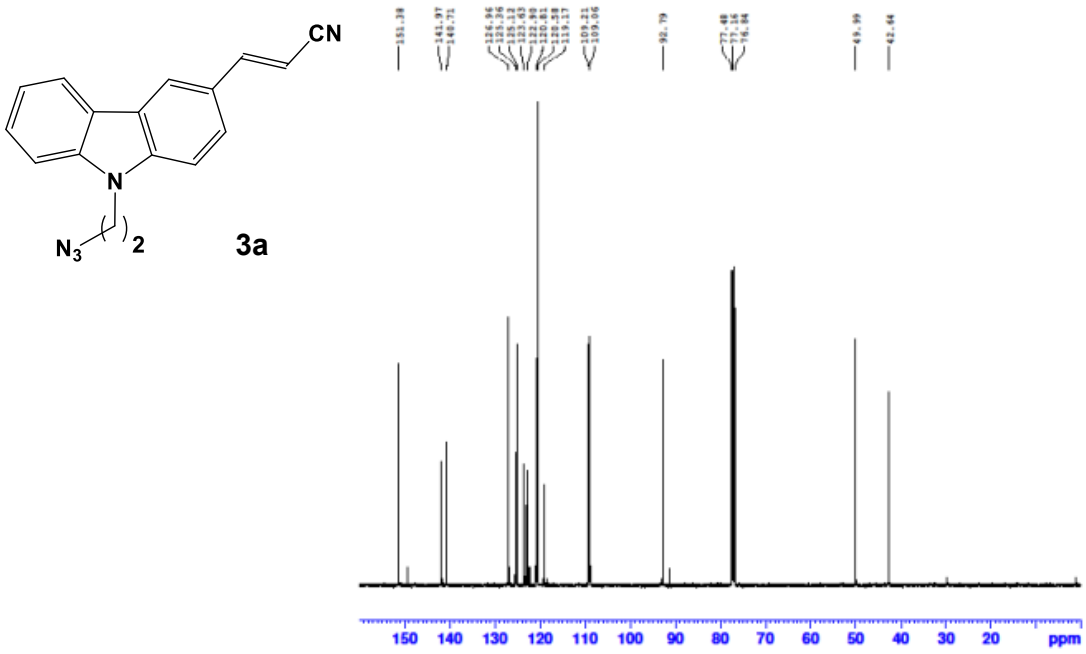

Fig. S10 13C NMR spectra of compound **3a**

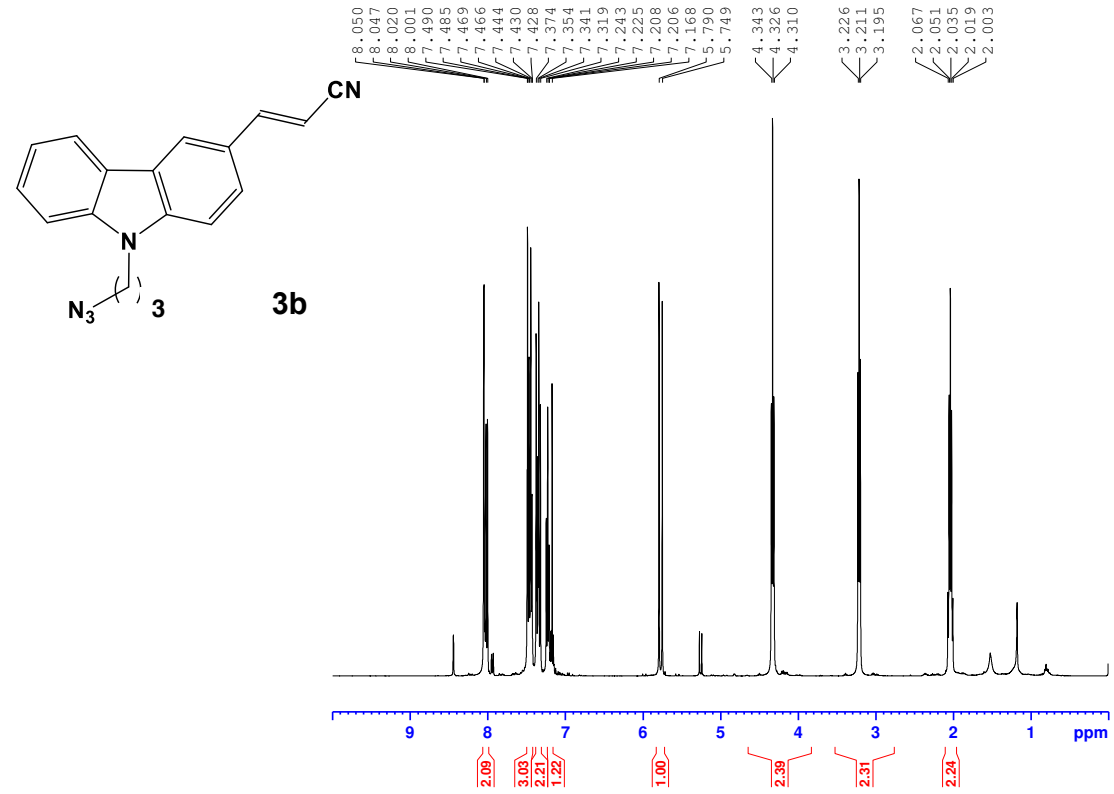

Fig. S11 1H NMR spectra of compound **3b**

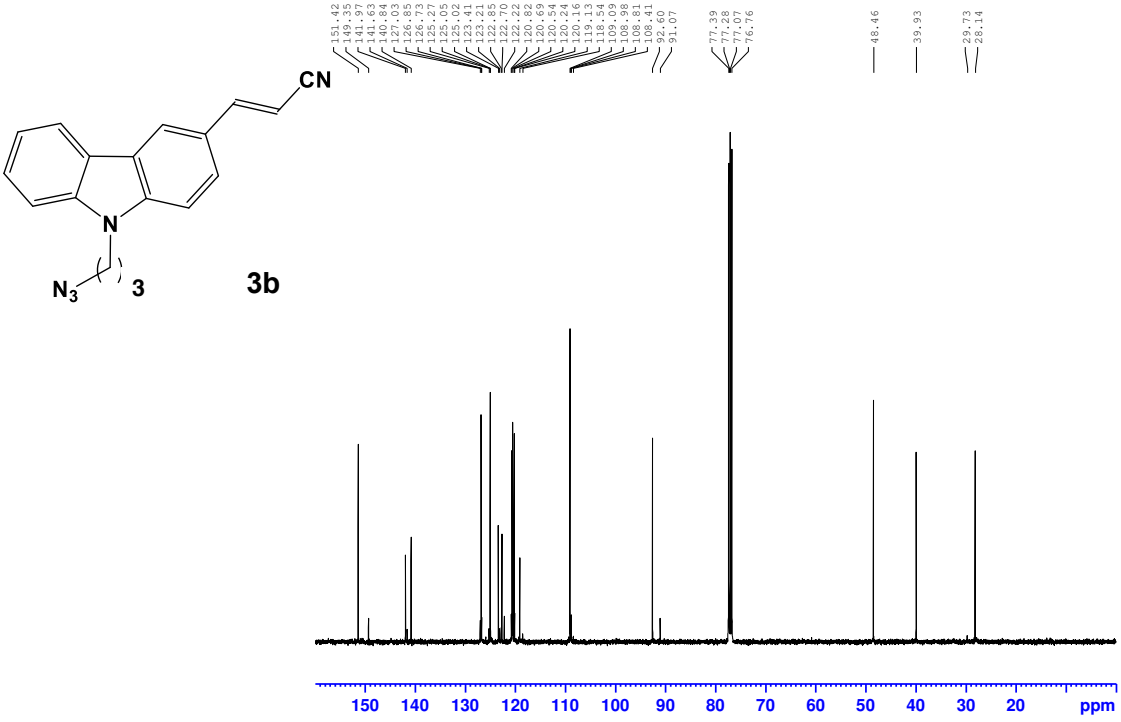

Fig. S12 13C NMR spectra of compound **3b**

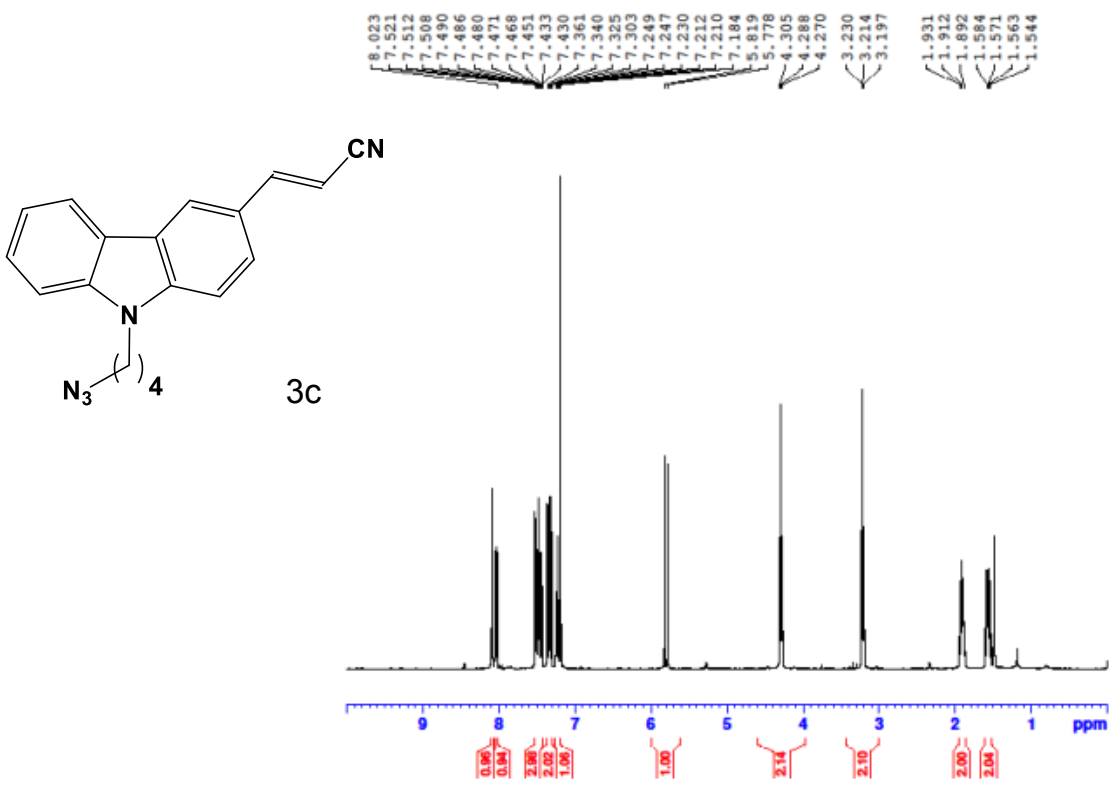

Fig. S13 1H NMR spectra of compound **3c**

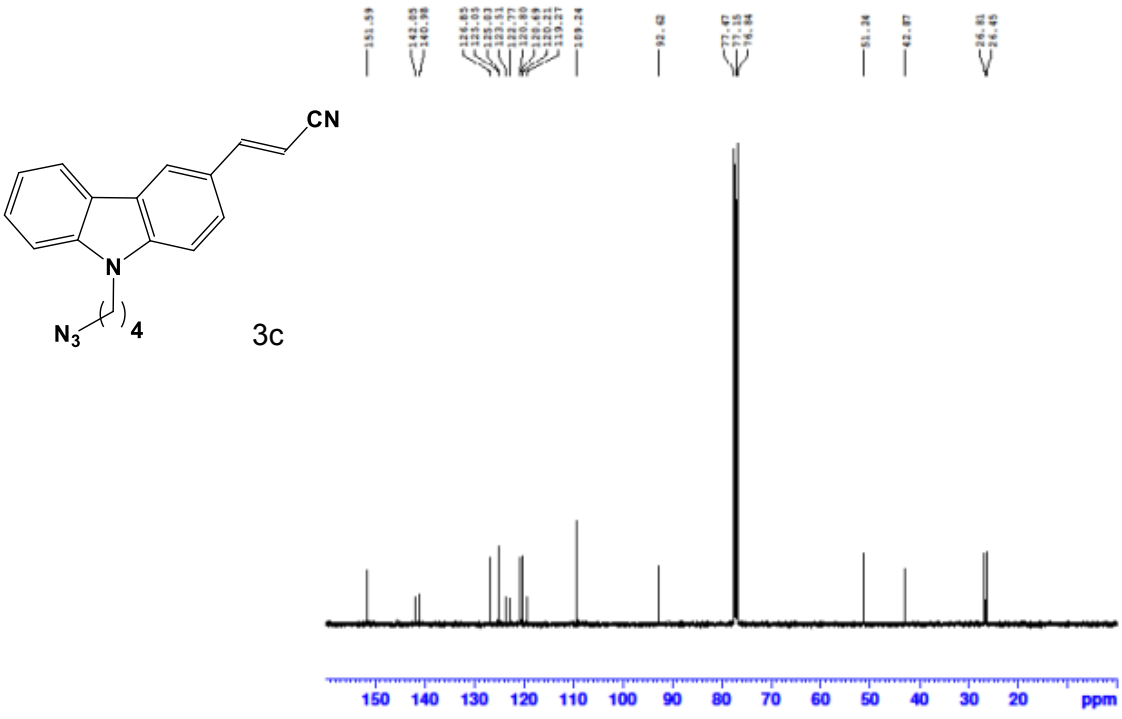

Fig. S14 13C NMR spectra of compound **3c**

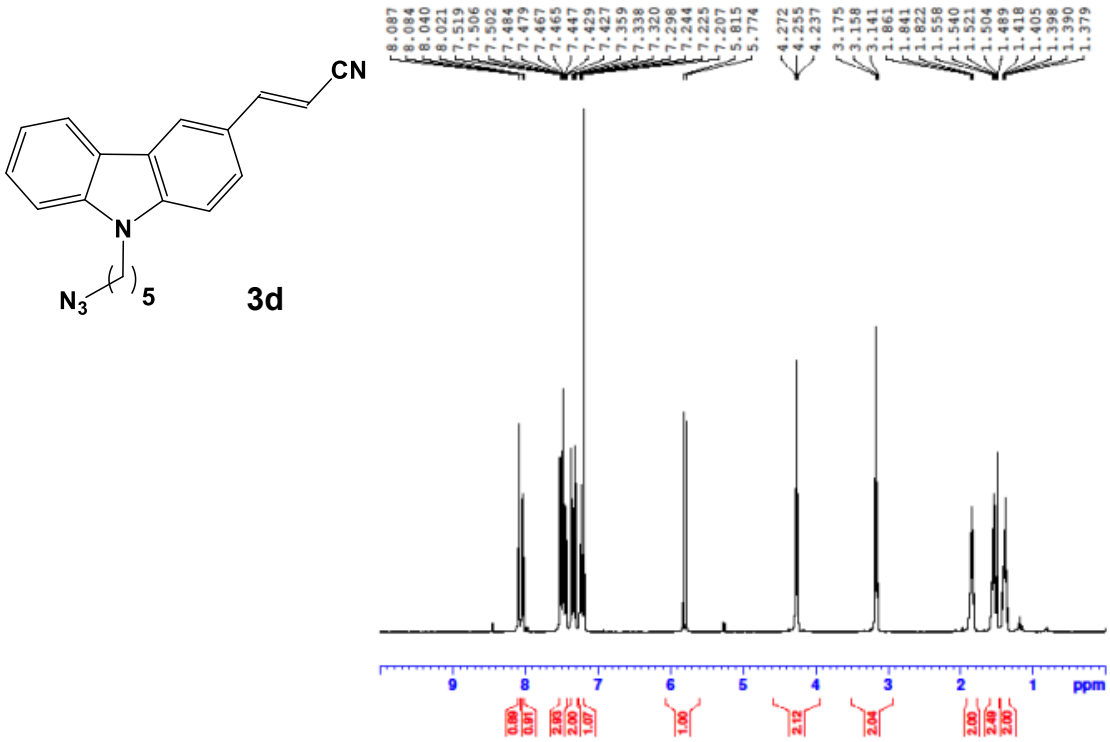

Fig. S15 1H NMR spectra of compound **3d**

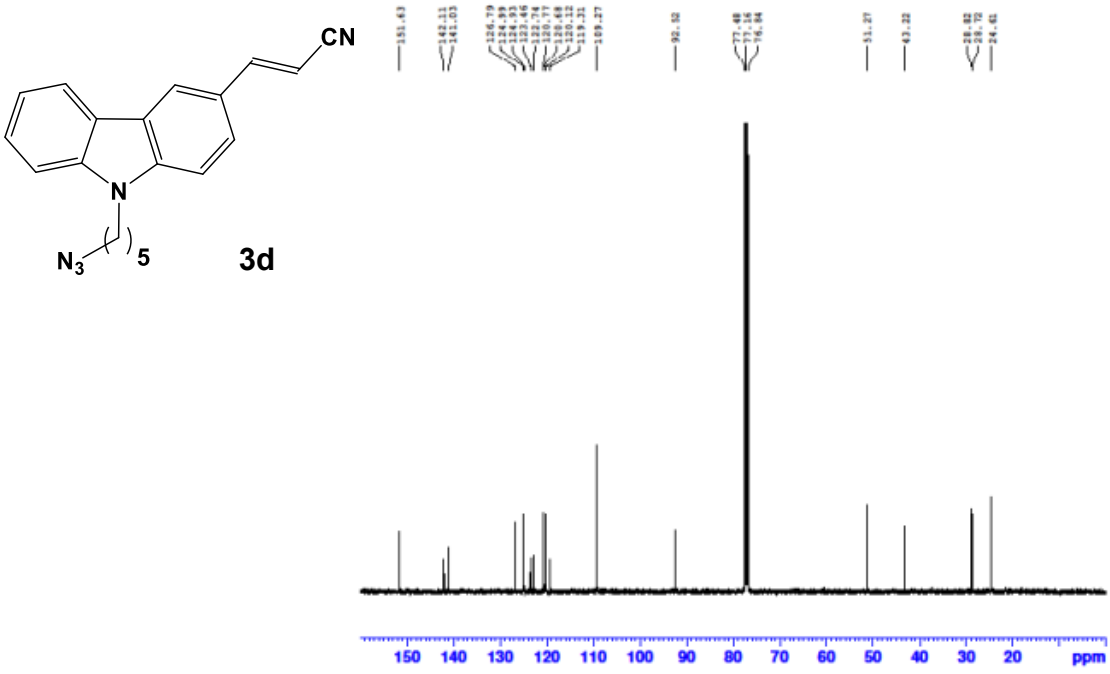

Fig. S16 13C NMR spectra of compound **3d**

3. Photo-splitting of dsDNA

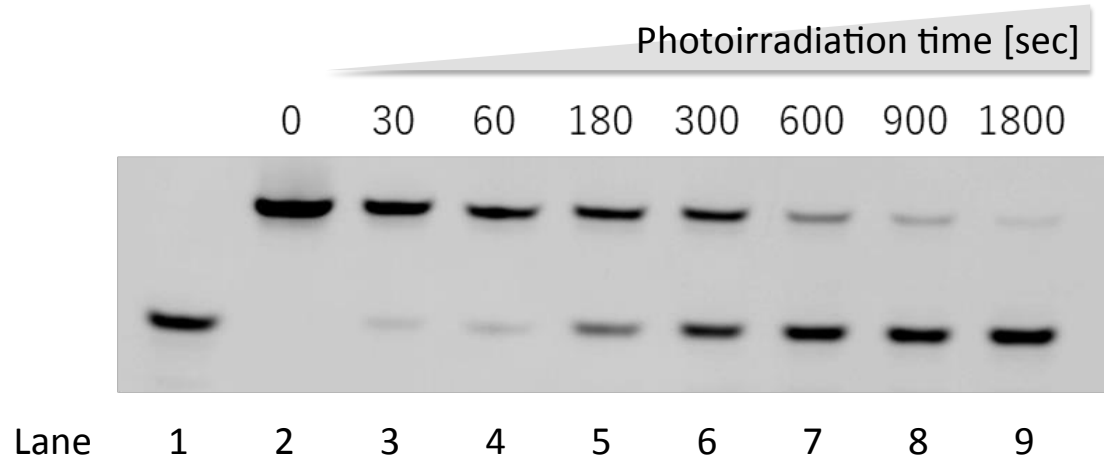

Fig S17. The photo-splitting of photo-cross-linked dsDNA. The photo-cross-linked dsDNA was photoirradiated at 312 nm using transilluminator.

4. Melting temperature of duplex DNA

cODN(-2) 5’-ACGGGGTCA-3’

X-ODN 3’-TGCCCCAGT-5’

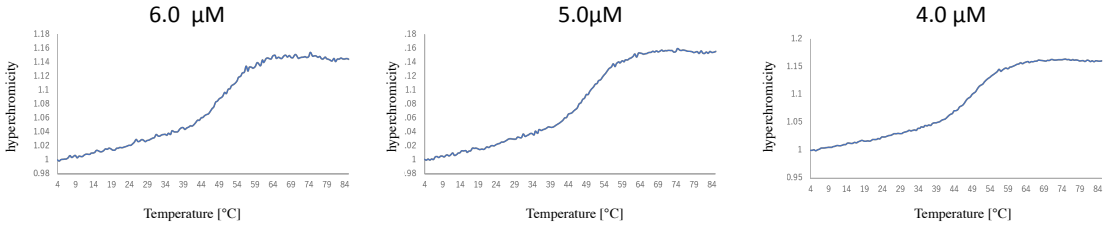

Fig. S18 Thermodynamic parameter of DNA duplex(X = C)

cODN(-2) 5’-ACGG----GGTCA-3’

^{CNV}K-ODN 3’-TGCC^{CNV}KCAGT-5’

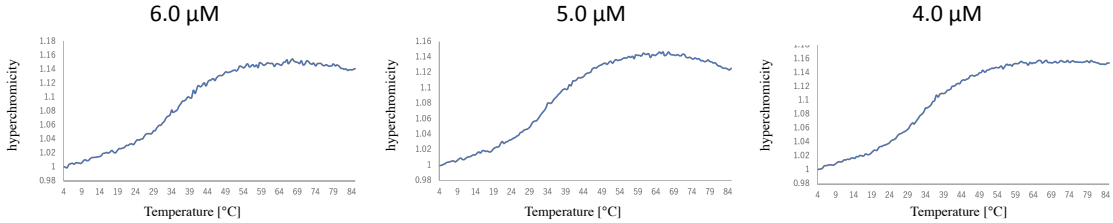

Fig. S19 Thermodynamic parameter of DNA duplex(X = ^{CNV}K)

cODN(-2) 5’-ACGG------GGTCA-3’

$^{2\text{-}CNV}$K-ODN 3’-TGCC$^{2\text{-}CNV}$KCAGT-5’

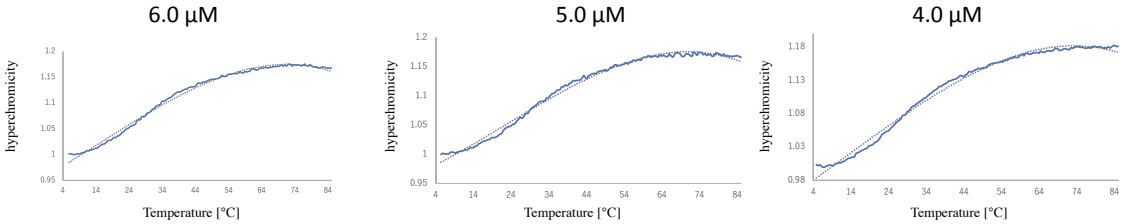

Fig. S20 Thermodynamic parameter of DNA duplex(X = $^{2\text{-}CNV}$K)

cODN(-2) 5’-ACGG----GGTCA-3’

$^{3\text{-CNV}}$K-ODN 3’-TGCC$^{3\text{-CNV}}$KCAGT-5’

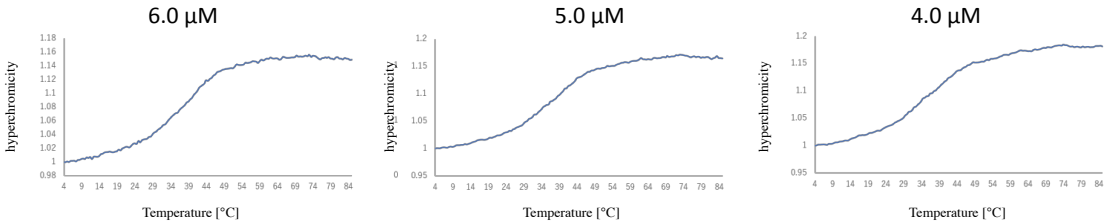

Fig. S21 Thermodynamic parameter of DNA duplex(X = $^{3\text{-CNV}}$K)

cODN(-2) 5’-ACGG------GGTCA-3’

$^{4\text{-CNV}}$K-ODN 3’-TGCC$^{4\text{-CNV}}$KCAGT-5’

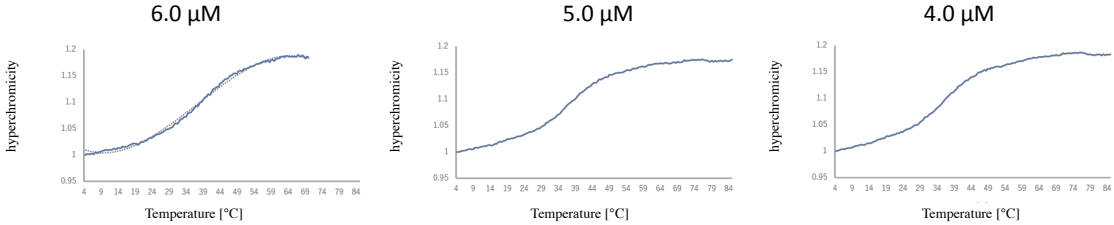

Fig. S22 Thermodynamic parameter of DNA duplex(X = $^{4\text{-CNV}}$K)

cODN(-2) 5’-ACGG----GGTCA-3’

$^{5\text{-CNV}}$K-ODN 3’-TGCC$^{5\text{-CNV}}$KCAGT-5’

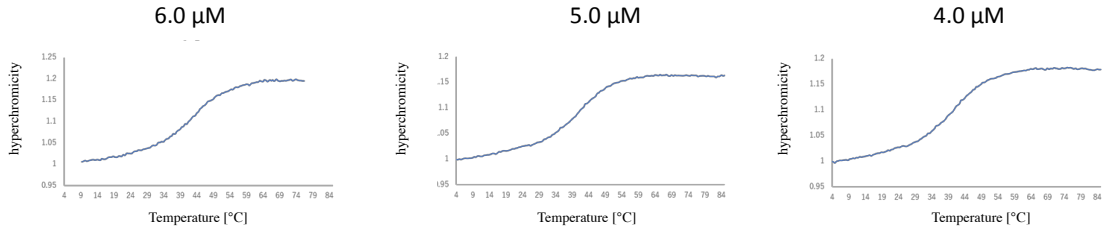

Fig. S23 Thermodynamic parameter of DNA duplex(X = $^{5\text{-CNV}}$K)