Table S1: Oligonucleotide sequences.

Name	Sequence (5' - 3')
Tetra1_LongSE	[PHO]**CCGTAGCTGTTGATCGTCAAA**TTTCAACTGCCTGGTGATAAAACGACACTACGTGGGAATCTACTATGGCGGCTCTTC
Tetra2_LongSE	[PHO]**CCGTAGCTGTTGATCGTCAAA**TTTTCAGACTTAGGAATGTGCTTCCCACGTAGTGTCGTTTGTATTGGACCCTCGCAT
Tetra3_ShortSE	GAATTGGAGACATTACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAGAGCCGCCATAGTA
Tetra4_ShortSE	GAATTGGAGACATTTATCACCAGGCAGTTGACAGTGTAGCAAGCTGTAATAGATGCGAGGGTCCAATAC
Tetra3_ShortSE_3FAM	GAATTGGAGACATTACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAGAGCCGCCATAGTA[FAM]
Tetra1_noLongSE	TCAACTGCCTGGTGATAAAACGACACTACGTGGGAATCTACTATGGCGGCTCTTC
Tetra2_noLongSE	TTCAGACTTAGGAATGTGCTTCCCACGTAGTGTCGTTTGTATTGGACCCTCGCAT
Tetra3_noShortSE	ACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAGAGCCGCCATAGTA
Tetra4_noShortSE	TATCACCAGGCAGTTGACAGTGTAGCAAGCTGTAATAGATGCGAGGGTCCAATAC
Tetra3_noShortSE_3FAM	ACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAGAGCCGCCATAGTA[FAM]
LL1	**TTTGACGATCAACAGCTACGG**ACGGAGACGGTCTGTTATTGA
LL2	**TTTGACGATCAACAGCTACGG**TCAATAACAGACCGTCTCCGT
SL1	TGTCTCCAATTCTCACACACCTATTTACTCCCT
SL2	TGTCTCCAATTCAGGGAGTAAATAGGTGTGTGA
X1_ShortSE	GAATTGGAGACACTGGACTAACGGAACGGTTAGTCAGGTATGCCAGCA
X2_LongSE	[PHO]**CCGTAGCTGTTGATCGTCAAA**TGCTGGCATACCTGACTTTCGCAAATTTACAGCGCC
X3_ShortSE	GAATTGGAGACAGGCGCTGTAAATTTGCGTTCATCACTTGGGACCATG
X4_LongSE	[PHO]**CCGTAGCTGTTGATCGTCAAA**CATGGTCCCAAGTGATGTTCCGTTCCGTTAGTCCAG
X1_ShortSE_3FAM	GAATTGGAGACACTGGACTAACGGAACGGTTAGTCAGGTATGCCAGCA[FAM]
LL1_PCS	**TTTGACGATCAACAGCTACGG**ACGGAGACGG[PC spacer]TCTGTTATTGA
LL2_PCS	**TTTGACGATCAACAGCTACGG**TCAATAACAGA[PC spacer]CCGTCTCCGT

Table S2: Melting temperature, T_m of sequence pairs determined using NUPACK with 350 mM Na^+ and DNA strands at 1µM each with 'dna04' parameter and ensemble set as 'All stacking'.

Sequence pair	T_m [°C]
ACATTCCTAAGTCTGAA vs TTCAGACTTAGGAATGT	58.5°C
ATTACAGCTTGCTACAC vs GTGTAGCAAGCTGTAAT	61.0°C
GAAGAGCCGCCATAGTA vs TACTATGGCGGCTCTTC	71.0°C
TATCACCAGGCAGTTGA vs TCAACTGCCTGGTGATA	68.0°C
ATGCGAGGGTCCAATAC vs GTATTGGACCCTCGCAT	68.5°C
ACGACACTACGTGGGAA vs TTCCCACGTAGTGTCGT	65.5°C
CCGTAGCTGTTGATCGTCAAA vs **TTTGACGATCAACAGCTACGG**	69.5°C
GAATTGGAGACA vs TGTCTCCAATTC	42.0°C
ACGGAGACGGTCTGTTATTGA vs TCAATAACAGACCGTCTCCGT	69.5°C
TCACACACCTATTTACTCCCT vs AGGGAGTAAATAGGTGTGTGA	69.0°C
CTGGACTAACGGAACGG vs CCGTTCCGTTAGTCCAG	64.5°C
AGTCAGGTATGCCAGCA vs TGCTGGCATACCTGACT	67.5°C
CGCAAATTTACAGCGCC vs GGCGCTGTAAATTTGCG	65.5°C
CATCACTTGGGACCATG vs CATGGTCCCAAGTGATG	65.5°C

Table S3: DNA strand concentration for different monomer assemblies.

Monomer	Name of DNA stand	Final concentration
Tetra-motif	Tetra1_LongSE	1.18
	Tetra2_LongSE	1.18
	Tetra3_ShortSE	1.062
	Tetra3_ShortSE_3FAM	0.118
	Tetra4_ShortSE	1.18
Tetra-motif_noShortSE	Tetra1_LongSE	1.18
	Tetra2_LongSE	1.18
	Tetra3_**no**ShortSE	1.062
	Tetra3_**no**ShortSE_3FAM	0.118
	Tetra4_**no**ShortSE	1.18
Tetra-motif_noSE	Tetra1_**no**LongSE	1.18
	Tetra2_**no**LongSE	1.18
	Tetra3_**no**ShortSE	1.062
	Tetra3_**no**ShortSE_3FAM	0.118
	Tetra4_**no**ShortSE	1.18
X-motif	X1_ShortSE	1.062
	X2_LongSE	1.18
	X3_ShortSE	1.18
	X4_LongSE	1.18
	X1_ShortSE_3FAM	0.118

Table S4: DNA strand concentration for S-linker, L-linker and S-linker + L-linker.

Linker	Components	Final concentration
S-linker	SL1	1.18
	SL2	1.18
L-linker	LL1	1.18
	LL2	1.18
S-linker + L-linker	SL1	1.18
	SL2	1.18
	LL1	1.18
	LL2	1.18
PC spacer-inserted L-linker	LL1_PCS	1.18
	LL2_PCS	1.18