SUPPORTING MATERIAL

NMR spectroscopy

^{1}H-NMR resonances values of ODNs **AQ1**-**AQ5** (500 MHz, T = 25°C). N.D. = not determined.

AQ1 d($T_1S_2G_3G_4G_5G_6T_7$)								
	H8/H6	H1’	H2’/H2”	H3’	H4’	H5’/H5”	CH_3	NH
T_1	7.39	5.88	2.08/2.34	N.D.	N.D.	N.D.	1.60	N.D.
G_3	7.98 8.04	6.08 6.09	2.65/2.94 2.69/2.96	4.96 4.99	4.41 4.40	4.08 4.09	-	11.67 11.70
G_4	7.76	6.13	2.61/2.87	5.06	4.52	4.27	-	11.18
G_5	7.79	6.06	2.71/2.78	5.08	4.54	4.34	-	11.02
G_6	7.67	6.22	2.55/2.65	4.95	4.48	4.26/4.18	-	10.94
T_7	7.29	6.03	2.13	4.45	4.01	N.D.	1.62	N.D.

AQ2 d($T_1G_2S_3G_4G_5G_6T_7$)								
	H8/H6	H1’	H2’/H2”	H3’	H4’	H5’/H5”	CH_3	NH
T_1	7.24	5.81	1.86/2.17	4.52	3.88	3.49	1.35	N.D.
G_2	7.95	6.17	2.87/2.99	5.01	3.95	N.D.	-	11.46
G_4	7.45	6.14	2.56/2.86	4.85	4.23	3.93	-	11.29
G_5	7.87	6.11	2.61/2.82	5.03	4.31	N.D.	-	11.23
G_6	7.64	6.21	2.51/2.64	4.93	4.23	N.D.	-	11.13
T_7	7.32	6.03	2.14	4.45	4.01	N.D.	1.63	N.D.

AQ3 d($T_1G_2G_3S_4G_5G_6T_7$)								
	H8/H6	H1’	H2’/H2”	H3’	H4’	H5’/H5”	CH_3	NH
T_1	7.34	6.08	2.18/2.64	4.97	4.51	4.03/4.20	1.64	N.D.
G_2	8.02	5.95	2.88/2.64	5.13	4.95	4.02/4.20	-	11.44
G_3	7.53	6.15	2.47/2.63	4.98	4.45	N.D.	-	11.22
G_5	8.09	6.13	2.83/2.99	5.01	4.36	4.00	-	10.90
G_6	7.25	6.28	2.47/2.90	4.93	4.27	4.18	-	11.60
T_7	7.32	5.89	2.03/2.30	4.85	4.65	4.07/4.18	1.42	N.D.

AQ4 d($T_1G_2G_3G_4S_5G_6T_7$)

	H8/H6	H1’	H2’/H2”	H3’	H4’	H5’/H5”	CH_3	NH
T_1	7.46	5.94	2.18/2.46	N.D.	N.D.	N.D.	1.44	N.D.
G_2	8.11	6.10	2.73/3.06	5.04	4.08	N.D.	-	N.D.
G_3	7.77	6.04	2.53/2.78	5.06	N.D.	N.D.	-	N.D.
G_4	7.88	6.12	2.66	5.08	N.D.	N.D.	-	N.D.
G_6	7.64	5.88	2.20/2.49	N.D.	N.D.	N.D.	-	N.D.
T_7	7.36	5.98	2.15	N.D.	N.D.	N.D.	1.52	N.D.

AQ5 d($T_1G_2G_3G_4G_5S_6T_7$)

	H8/H6	H1’	H2’/H2”	H3’	H4’	H5’/H5”	CH_3	NH
T_1	7.37	5.86	2.12/2.38	4.61	3.66	3.19	1.38	N.D.
G_2	8.01	5.98	2.63/2.93	4.96	4.38	3.99	-	N.D.
G_3	7.70	6.00	2.52/2.78	4.99	4.46	4.30/4.22	-	N.D.
G_4	7.65	6.17	2.43/2.53	4.89	4.42	4.19/4.09	-	N.D.
G_5	7.60	5.92	2.63/2.72	5.01	4.46	3.74	-	N.D.
T_7	7.28	5.80	1.90/2.00	4.25	3.83	N.D.	1.52	N.D.

Polyacrylamide Gel Electrophoresis

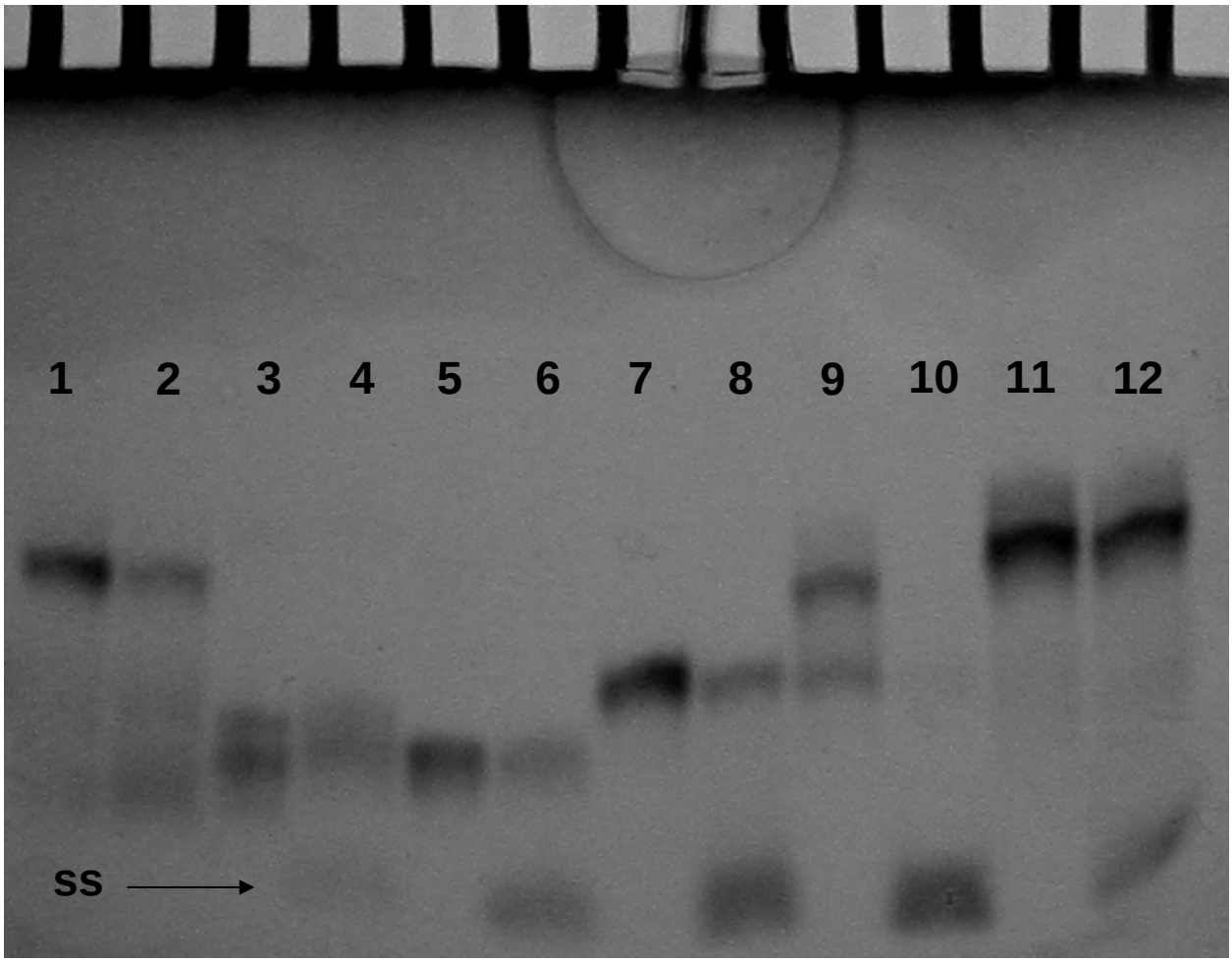

Fig. S1. Lane 1: native $[d(TGGGGT)]_4$; lane 2: denaturated $[d(TGGGGT)]_4$; lane 3: native **AQ1**; lane 4: denaturated **AQ1**; lane 5: native **AQ2**; lane 6: denaturated **AQ2**; lane 7: native **AQ3**; lane 8: denaturated **AQ3**; lane 9: native **AQ4**; lane 10: denaturated **AQ4**; lane 11: native **AQ5**; lane 12: denaturated **AQ5**. For all ODNs, except AQ4, only a partial denaturation occur. The black arrow indicates the slight band of AQ1 as single strand.

CD spectroscopy, kinetic and thermal analyses

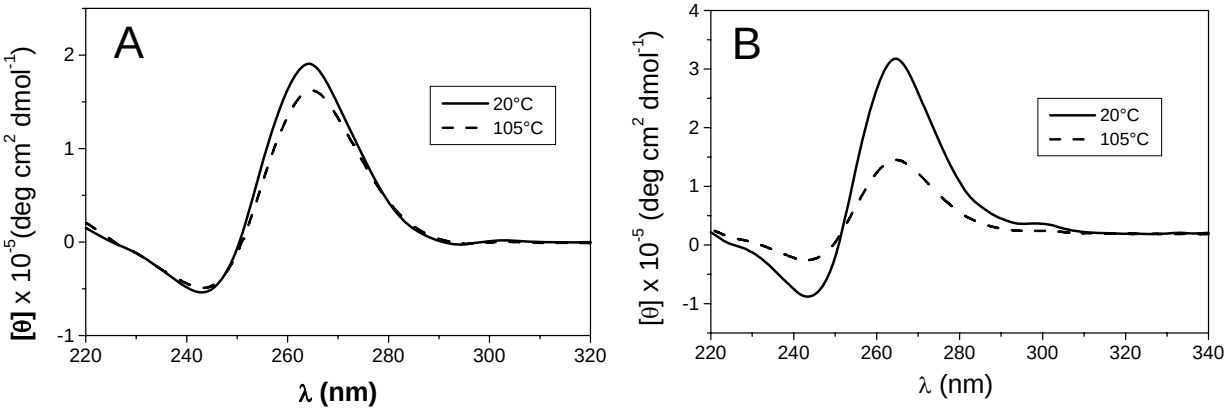

Figure S2. CD spectra of the quadruplex structures obtained from the sequences **AQ1** (A) and **AQ5** (B). The spectra have been reported at 20°C (solid line) and at higher temperatures (dashed line). The characteristic signals of the parallel quadruplex structures are still conserved at a high temperature suggesting the great thermal stability of the structures.

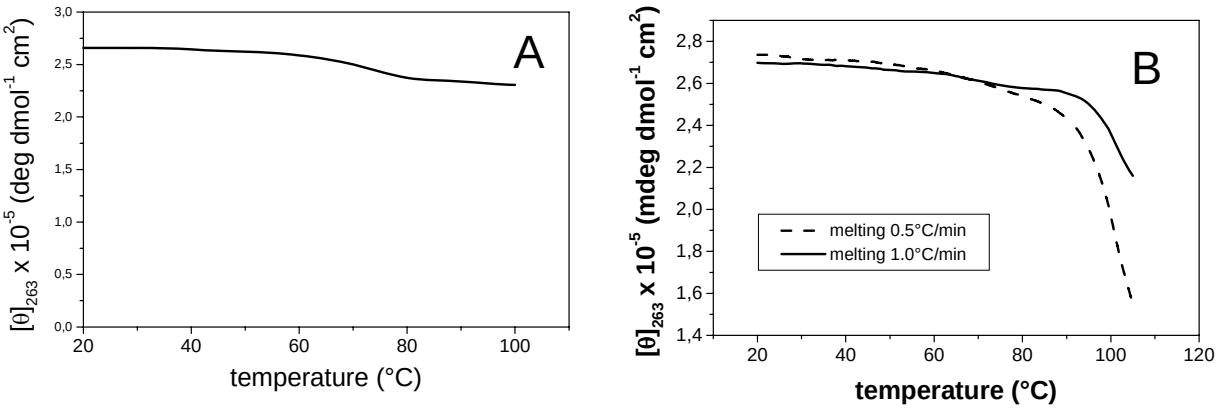

Figure S3: Thermal analysis of the quadruplex structure formed by **AQ1** (A) and **AQ5** (B). The panels report the melting curves obtained at a heating rate of 1°C/min (solid line) and 0.5°C/min (dashed line, recorded only for AQ5) following the CD signal at 263 nm. In both cases the melting process does not terminate suggesting the high thermal stability of the resulting quadruplex structures.

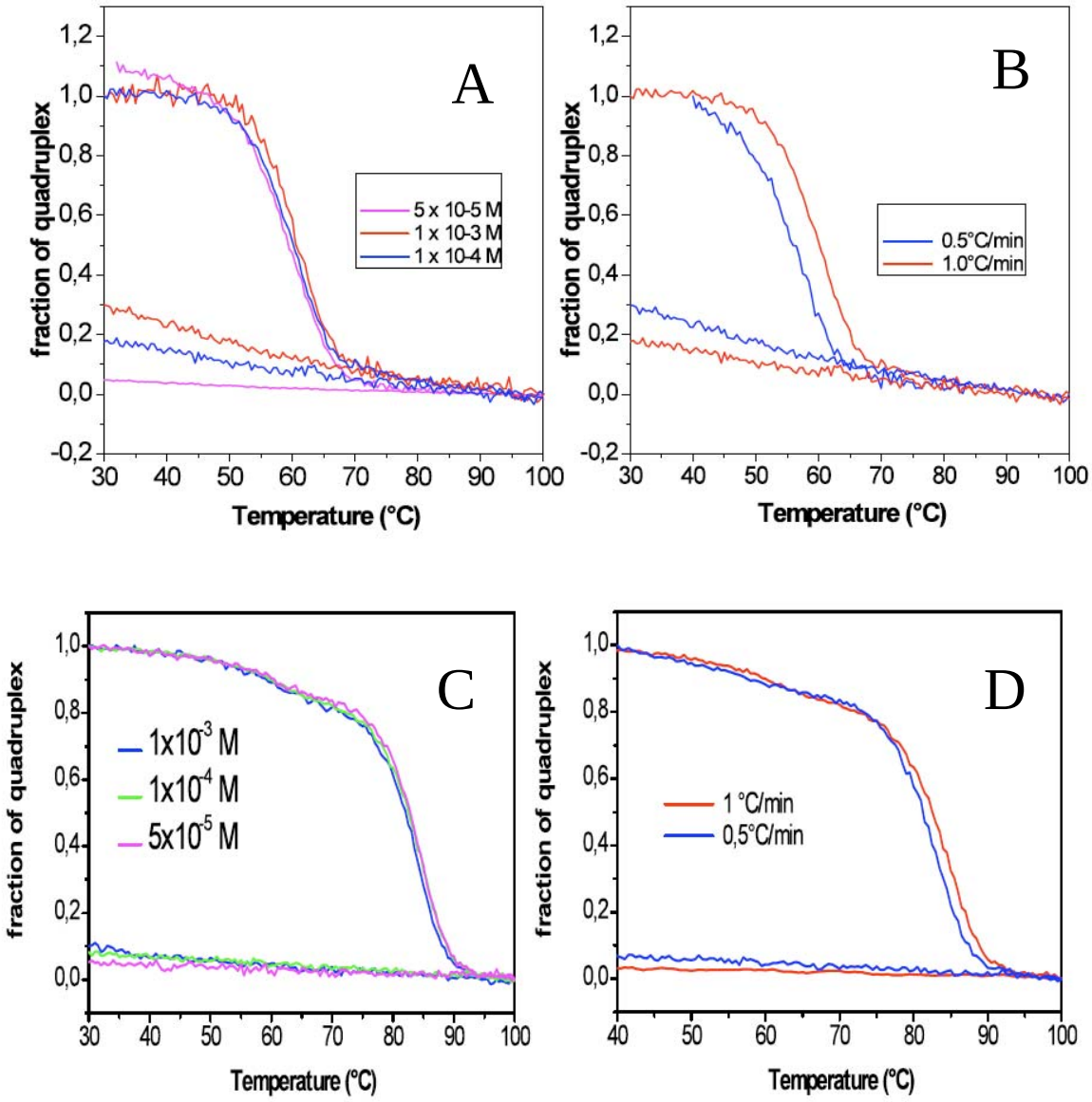

Figure S4: Thermal analysis carried out on the quadruplex structures obtained from the sequences **AQ2** (panel A and B) and **AQ4** (panel C and D). Melting/annealing curves were recorded at different quadruplex concentrations (panel A and C) and at different heating/cooling rates (panel B and D) for both systems. For panel B and D the quadruplex concentration is 5 x 10^{-5}.