

**Table\_par6\_motifs.** The top-100 most frequent motifs forming 21 groups based on their interaction networks.

N	group representative					group	number of motifs
	motif	residue(s)	atom-atom interactions				
			bp layer 1	bp layer 2	bp layer 3		
1	719_8_1.00_7o7y_48_772	AT.C.11	O2'-O2'(3.35)			ribose-ribose	26
2	641_8_0.52_6th6_65_738	BA.A.1663	O2'-O2'(2.95) N1-O2'(3.74)			Type I A-minor (A1-staple)	22
3	463_8_0.55_6th6_49_196	BA.A.727	N3-O2'(3.05)			base-ribose	9
4	450_8_0.40_3p49_0_706	A.A.135	O2'-O2'(2.78)	N1-O2'(3.59)		Type II A-minor (A2-staple)	6
5	644_8_1.00_6zu5_29_1106	S60.G.1311	O2'-O2'(3.05)	N2-O4'(3.62)		G2-staple	5
6	443_7_0.25_6me0_2_295	A.A.105	N3-O2'(2.5)			Type II A-minor	4
7	409_9_0.60_7o7y_15_1258	B5.U.4403	O4-N2G(2.8)			base-base	4
8	482_9_1.00_7o7y_48_1140	AT.C.11,AT.U.12	O2'-O2'(3.35)		O2'-O2'(2.52)	NN3-staple	3
9	350_9_1.00_6th6_36_1244	BA.A.628	O2'-O2'(2.86)	N1-O2'(4.39)		A2-staple	3
10	539_7_0.26_2z75_1_259	B.A.104	O2'-O2'(2.65)	N1-N2G(2.94)	N6-O4'(3.02)	A3-staple	2
11	500_6_1.00_7o7y_3_734	A2.C.1181	N4-O2'(3.03) N4-O2C(3.07)	O2-O2'(2.94)		C2-staple	2
12	296_6_0.67_7m4y_16_173	a.U.1433	OP1-O2'(4.1)			phosphate-ribose	2
13	284_9_1.00_6zu5_29_2060	S60.G.1311,S60.G.1312	O2'-O2'(3.05)	O2'-O2'(3.3)		NN2-staple	2
14	283_9_0.35_6th6_65_1407	BA.A.1663,BA.A.1664	O2'-O2'(2.95) N1-O2'(3.74)	O2'-O2'(2.83)		AN2-staple	2
15	278_8_1.00_6th6_36_580	BA.A.600,BA.A.601	O2'-O2'(2.8) N3-O2'(2.81)	O2'-O2'(3.07) N1-O2'(3.5)		Type I/II A-minor (AA2-staple)	2
16	555_8_0.36_7m4y_128_455	a.A.1415	O2'-O4'(3.67) O4'-O2'(3.89)	N1-O2'(3.95)		Inclined Type I A-minor (A2-staple)	1
17	421_7_0.52_6frk_4_109	1.G.27	O2'-O2'(4.02)		N2-O2'(3.85)	G3-staple	1
18	409_9_1.00_6frk_1_1347	1.A.289	O2'-O2'(3.48)	O2'-N2G(3.11)		N2-staple	1
19	320_7_1.00_6th6_38_380	BA.A.217,BA.A.218	N1-O2'(2.87) N6-O2U(2.99)	N1-N2G(3.13) N6-O2'(3.45) N6-N3G(3.2)		AA2-staple	1
20	283_9_0.94_7m4y_39_367	a.A.1011,a.A.1013	N3-O2'(3.35)		O2'-O2'(2.54) N1-O2'(3.54)	base-ribose, Type I A-minor (A1-staple)	1
21	265_9_0.75_7m4y_128_828	a.A.1415,A.A.1480	N1-O2'(3.95)	O2'-O4'(3.67) O4'-O2'(3.89) O2'-O2'(3.89)	N3-O2'(3.6)	Type I/I A-minor (AA3-staple)	1