



Full wwPDB EM Validation Report ⓘ

Sep 24, 2025 – 04:03 pm BST

PDB ID : 6Q97 / pdb_00006q97
EMDB ID : EMD-4476
Title : Structure of tmRNA SmpB bound in A site of E. coli 70S ribosome
Authors : Rae, C.D.
Deposited on : 2018-12-17
Resolution : 3.90 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

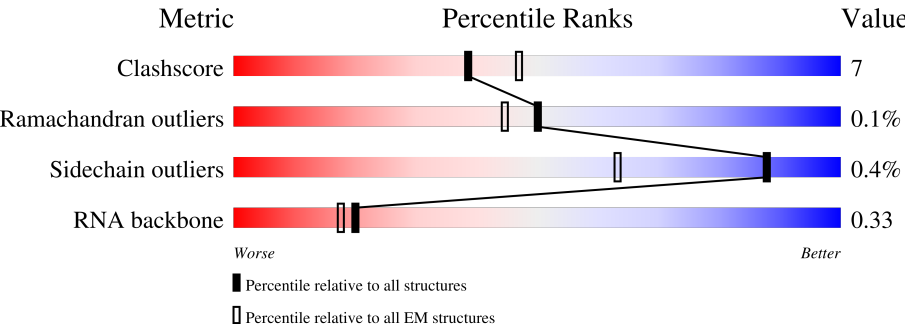
EMDB validation analysis : 0.0.1.dev129
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.46

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	1	2903	87% 46% 44% 9% .
2	2	1534	84% 57% 37% 6%
3	3	120	94% 43% 51% 6%
4	5	145	98% 76% 23% .
5	6	28	86% 100%
6	8	77	92% 27% 53% 18% .
7	9	6	83% 17% 83%

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Mol	Chain	Length	Quality of chain
8	B	270	81% 81% 19%
9	C	209	94% 73% 27%
10	D	201	86% 74% 26%
11	E	177	95% 84% 16%
12	F	175	100% 76% 24%
13	G	149	81% 84% 16%
14	H	130	100% 79% 20% .
15	I	135	100% 85% 14% .
16	J	141	96% 72% 28%
17	K	123	93% 85% 15%
18	L	144	69% 85% 15%
19	M	136	93% 82% 18%
20	N	119	89% 74% 26%
21	O	115	79% 78% 22%
22	P	114	85% 78% 22%
23	Q	117	87% 77% 22% .
24	R	103	88% 79% 21%
25	S	108	76% 78% 22%
26	T	94	80% 74% 26%
27	U	103	79% 79% 21%
28	V	94	98% 80% 20%
29	W	76	91% 79% 21%
30	X	77	78% 81% 19%
31	Y	58	88% 81% 19%
32	Z	56	88% 84% 16%

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Mol	Chain	Length	Quality of chain
33	a	66	97% 88% 12%
34	b	54	87% 72% 28%
35	c	52	88% 87% 13%
36	d	46	65% 78% 22%
37	e	64	72% 73% 23%
38	f	37	100% 78% 22%
39	g	225	100% 87% 12%
40	h	208	98% 84% 16%
41	i	205	99% 86% 14%
42	j	156	99% 87% 13%
43	k	104	76% 79% 21%
44	l	151	66% 83% 17%
45	m	129	99% 81% 19%
46	n	126	80% 81% 18%
47	o	99	97% 82% 18%
48	p	117	85% 79% 21%
49	q	123	77% 83% 17%
50	r	115	70% 85% 15%
51	s	100	90% 81% 19%
52	t	87	60% 84% 15%
53	u	81	98% 90% 10%
54	v	80	88% 85% 15%
55	w	65	85% 85% 15%
56	x	82	85% 90% 10%
57	y	85	76% 88% 12%

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Mol	Chain	Length	Quality of chain
58	z	70	81% 90% 10%
59	4	363	91% 22% 39% 28% 8%
60	7	77	94% 26% 49% 22%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
1	6MZ	1	1618	X	-	-	-
1	PSU	1	1911	X	-	-	-
1	3TD	1	1915	X	-	-	-
1	PSU	1	1917	X	-	-	-
1	5MU	1	1939	X	-	-	-
1	6MZ	1	2030	X	-	-	-
1	G7M	1	2069	X	-	-	-
1	OMG	1	2251	X	-	-	-
1	PSU	1	2457	X	-	-	-
1	OMC	1	2498	X	-	-	-
1	2MA	1	2503	X	-	-	-
1	PSU	1	2504	X	-	-	-
1	OMU	1	2552	X	-	-	-
1	PSU	1	2580	X	-	-	-
1	PSU	1	2605	X	-	-	-
1	1MG	1	745	X	-	-	-
1	PSU	1	746	X	-	-	-
1	5MU	1	747	X	-	-	-
1	PSU	1	955	X	-	-	-
2	4OC	2	1402	X	-	-	-
2	PSU	2	516	X	-	-	-
2	7MG	2	527	X	-	-	-

2 Entry composition [i](#)

There are 63 unique types of molecules in this entry. The entry contains 156609 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	1	2903	Total	C	N	O	P	0	0
			62336	27816	11470	20147	2903		

- Molecule 2 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	2	1534	Total	C	N	O	P	0	0
			32929	14693	6041	10661	1534		

- Molecule 3 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	3	120	Total	C	N	O	P	0	0
			2569	1144	468	837	120		

- Molecule 4 is a protein called SsrA-binding protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	5	145	Total	C	N	O	S	0	0
			1170	741	216	209	4		

- Molecule 5 is a protein called Nascent peptide.

Mol	Chain	Residues	Atoms				AltConf	Trace
5	6	28	Total	C	N	O	0	0
			140	84	28	28		

- Molecule 6 is a RNA chain called tRNA-Met.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	8	77	Total	C	N	O	P	0	0
			1638	732	291	538	77		

- Molecule 7 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	9	6	Total	C	N	O	P	0	0
			128	57	22	43	6		

- Molecule 8 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	B	270	Total	C	N	O	S	0	0
			2078	1285	422	364	7		

- Molecule 9 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	C	209	Total	C	N	O	S	0	0
			1565	979	288	294	4		

- Molecule 10 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	D	201	Total	C	N	O	S	0	0
			1552	974	283	290	5		

- Molecule 11 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	E	177	Total	C	N	O	S	0	0
			1411	899	249	257	6		

- Molecule 12 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	F	175	Total	C	N	O	S	0	0
			1313	826	241	244	2		

- Molecule 13 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	G	149	Total	C	N	O	S	0	0
			1111	699	197	214	1		

- Molecule 14 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	H	130	Total	C	N	O	S	0	0
			980	620	174	182	4		

- Molecule 15 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	I	135	Total	C	N	O	S	0	0
			984	622	171	185	6		

- Molecule 16 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	J	141	Total	C	N	O	S	0	0
			1121	709	211	198	3		

- Molecule 17 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	K	123	Total	C	N	O	S	0	0
			946	593	181	166	6		

- Molecule 18 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	L	144	Total	C	N	O	S	0	0
			1053	654	207	190	2		

- Molecule 19 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	M	136	Total	C	N	O	S	0	0
			1074	686	205	177	6		

- Molecule 20 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	N	119	Total	C	N	O	S	0	0
			951	588	195	163	5		

- Molecule 21 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	O	115	Total	C	N	O	0	0
			884	548	177	159		

- Molecule 22 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	P	114	Total	C	N	O	S	0	0
			917	574	179	163	1		

- Molecule 23 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	Q	117	Total	C	N	O	0	0
			947	604	192	151		

- Molecule 24 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	R	103	Total	C	N	O	S	0	0
			816	516	153	145	2		

- Molecule 25 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	S	108	Total	C	N	O	S	0	0
			840	522	164	152	2		

- Molecule 26 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	T	94	Total	C	N	O	S	0	0
			746	470	140	134	2		

- Molecule 27 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	U	103	Total	C	N	O	0	0
			788	498	148	142		

- Molecule 28 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	V	94	Total	C	N	O	S	0	0
			753	479	137	134	3		

- Molecule 29 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	W	76	Total	C	N	O	S	0	0
			582	360	117	104	1		

- Molecule 30 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	X	77	Total	C	N	O	S	0	0
			625	388	129	106	2		

- Molecule 31 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	Y	58	Total	C	N	O	S	0	0
			477	294	93	89	1		

- Molecule 32 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	Z	56	Total	C	N	O	S	0	0
			434	272	84	76	2		

- Molecule 33 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	a	66	Total	C	N	O	S	0	0
			522	323	99	94	6		

- Molecule 34 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	b	54	Total	C	N	O	S	0	0
			429	260	91	77	1		

- Molecule 35 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
35	c	52	Total	C	N	O	0	0
			426	275	78	73		

- Molecule 36 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	d	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 37 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	e	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 38 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	f	37	Total	C	N	O	S	0	0
			297	183	64	46	4		

- Molecule 39 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	g	225	Total	C	N	O	S	0	0
			1760	1113	316	323	8		

- Molecule 40 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	h	208	Total	C	N	O	S	0	0
			1636	1036	307	290	3		

- Molecule 41 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	i	205	Total	C	N	O	S	0	0
			1643	1026	315	298	4		

- Molecule 42 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	j	156	Total	C	N	O	S	0	0
			1152	717	217	212	6		

- Molecule 43 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	k	104	Total	C	N	O	S	0	0
			848	536	153	152	7		

- Molecule 44 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	l	151	Total	C	N	O	S	0	0
			1181	735	227	215	4		

- Molecule 45 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	m	129	Total	C	N	O	S	0	0
			979	616	173	184	6		

- Molecule 46 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	n	126	Total	C	N	O	S	0	0
			1010	628	202	177	3		

- Molecule 47 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	o	99	Total	C	N	O	S	0	0
			790	495	151	143	1		

- Molecule 48 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	p	117	Total	C	N	O	S	0	0
			877	540	174	160	3		

- Molecule 49 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	q	123	Total	C	N	O	S	0	0
			957	591	196	165	5		

- Molecule 50 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	r	115	Total	C	N	O	S	0	0
			891	552	179	157	3		

- Molecule 51 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	s	100	Total	C	N	O	S	0	0
			805	499	164	139	3		

- Molecule 52 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	t	87	Total	C	N	O	S	0	0
			708	436	143	128	1		

- Molecule 53 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	u	81	Total	C	N	O	S	0	0
			643	403	127	112	1		

- Molecule 54 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	v	80	Total	C	N	O	S	0	0
			649	411	121	114	3		

- Molecule 55 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	w	65	Total	C	N	O	S	0	0
			535	339	100	95	1		

- Molecule 56 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	x	82	Total	C	N	O	S	0	0
			658	421	125	110	2		

- Molecule 57 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	y	85	Total	C	N	O	S	0	0
			664	411	137	113	3		

- Molecule 58 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	z	70	Total	C	N	O	S	0	0
			589	366	125	97	1		

- Molecule 59 is a RNA chain called transfer-messenger RNA (tmRNA).

Mol	Chain	Residues	Atoms					AltConf	Trace
59	4	334	Total	C	N	O	P	0	0
			7134	3184	1286	2330	334		

- Molecule 60 is a RNA chain called tRNA-Val.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	7	77	Total	C	N	O	P	0	0
			1644	732	292	543	77		

- Molecule 61 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
61	1	291	Total	Mg	0
			291	291	
61	2	127	Total	Mg	0
			127	127	
61	3	8	Total	Mg	0
			8	8	
61	8	2	Total	Mg	0
			2	2	
61	C	1	Total	Mg	0
			1	1	
61	L	1	Total	Mg	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
61	M	1	Total 1	Mg 1	0
61	Q	1	Total 1	Mg 1	0
61	X	2	Total 2	Mg 2	0
61	r	1	Total 1	Mg 1	0
61	y	1	Total 1	Mg 1	0
61	7	3	Total 3	Mg 3	0

- Molecule 62 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
62	a	1	Total 1	Zn 1	0
62	f	1	Total 1	Zn 1	0

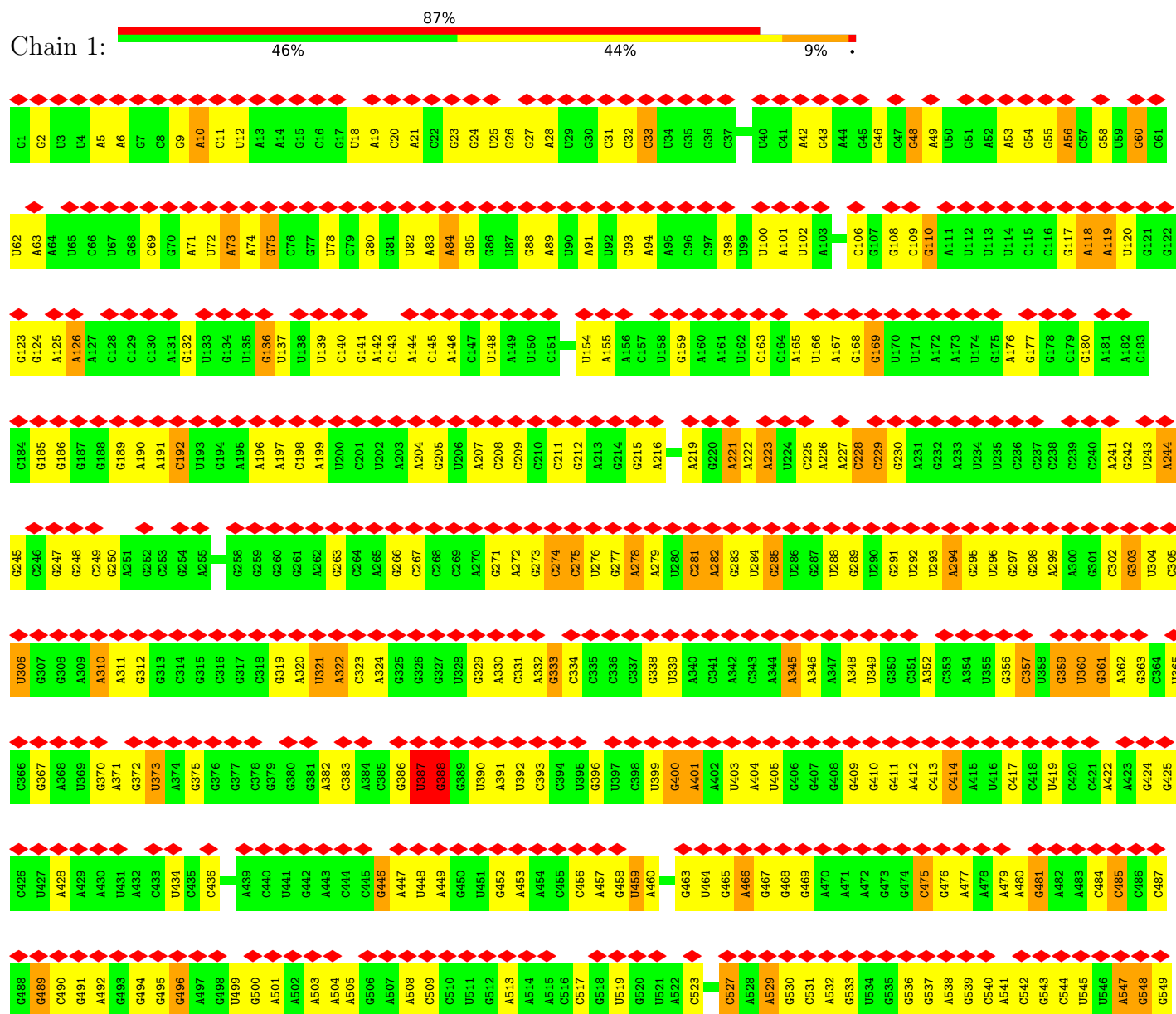
- Molecule 63 is water.

Mol	Chain	Residues	Atoms		AltConf
63	B	2	Total 2	O 2	0

3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: 23S ribosomal RNA



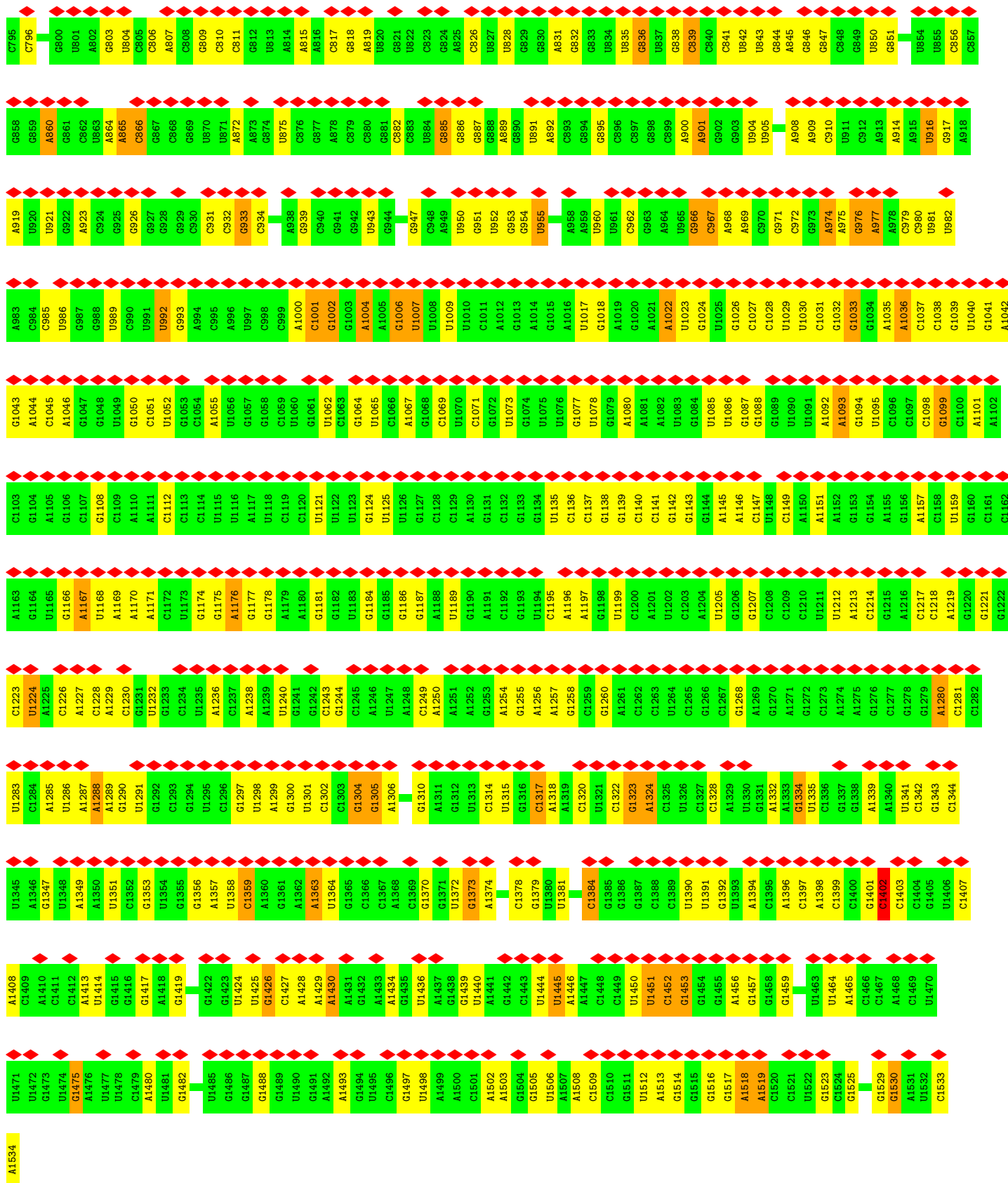
U1282	G1218	C1158	A1098	G1038	G978	A918	G858	G797	A735	C672	C611	C550
G1283	U1219	U1159	G1099	A1039	A979	U919	G859	G798	C736	C673	G612	G551
A1284	G1220	G1160	C1100	A1040	A980	A920	U860	G799	C737	G674	A613	G552
A1285	U1221	C1161	U1101	G1041	A981	C921	A861	A800	G738	A675	A614	G553
A1287	U1223	G1162	C1102	G1042	C982	C922	G862	G801	A739	A676	U615	U554
G1288	U1224	C1164	C1104	C1043	A983	C923	A863	A802	C740	C677	A616	G555
C1289	G1225	A1165	U1105	C1044	A984	C924	G864	A803	U741	C678	G617	A556
G1290	A1226	G1166	G1106	G1045	C985	A925	C665	A804	A742	C679	G618	C557
C1291	G1227	C1167	G1107	A1046	C986	C926	A866	G905	G745	G681	G619	U558
G1292	G1228	G1168	U1108	G1047	C987	A927	C667	C906	U746	G682	G620	G559
C1293	G1229	A1169	C1109	A1048	A988	A928	U868	U807	U747	G683	A621	C560
U1294	A1230	G1170	G1110	C1049	A989	C929	G869	G808	G748	G684	G622	G561
C1295	U1231	G1171	G1111	A1050	A990	C930	U870	G809	A749	A685	C623	U562
G1296		C1172	G1112	G1051	C991	U931	U871	U810	A750	C624	C624	A563
C1297		U1173	U1113	C1052	C992	U932	U872	U811	A751	G625	G625	C564
G1298		U1174	C1114	C1053	G993	A933	C673	U813	A752	A626	A626	C565
G1300		A1175	G1115	A1054	C994	U934	G874	C914	A753	U688	A627	U566
A1301		U1176	G1116	G1055	C995	C935	G875		U754	C691	G628	U567
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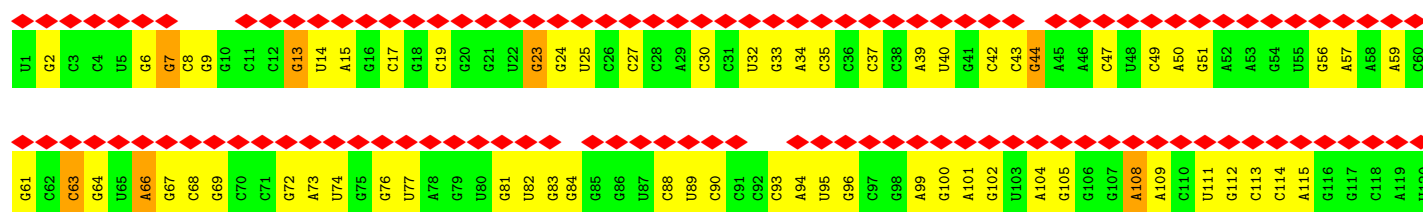
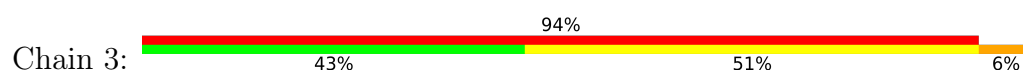
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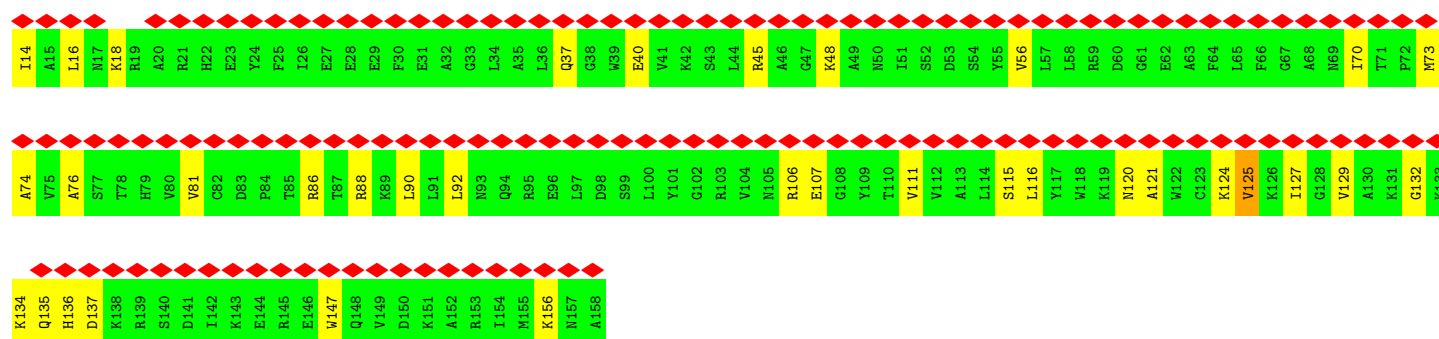
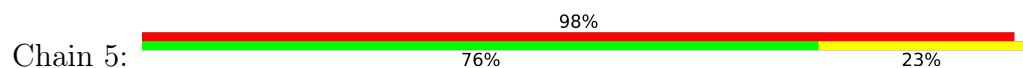
Chain 2: 84% 57% 37% 6%



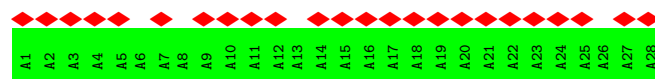
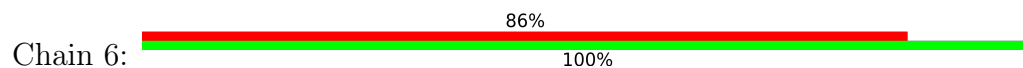




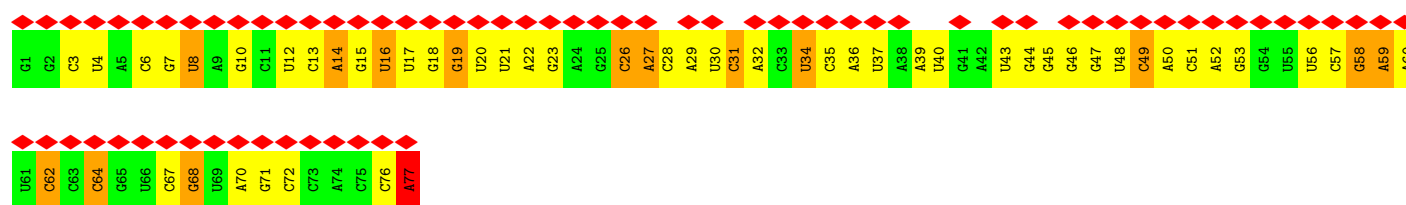
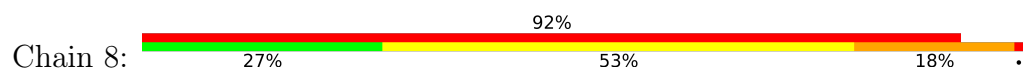
• Molecule 4: SsrA-binding protein



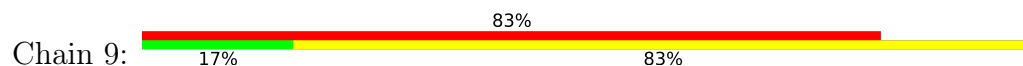
• Molecule 5: Nascent peptide



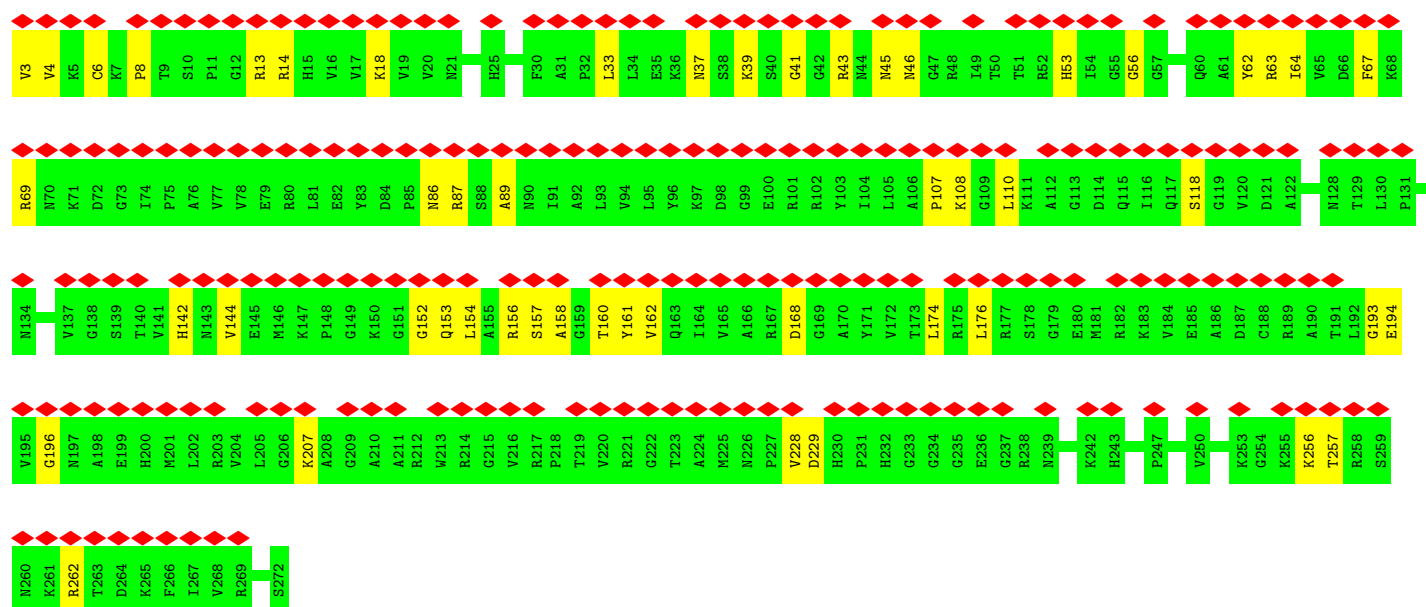
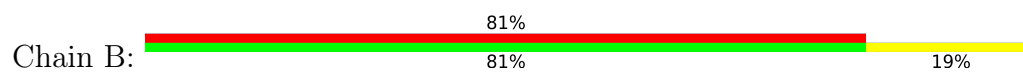
• Molecule 6: tRNA-Met



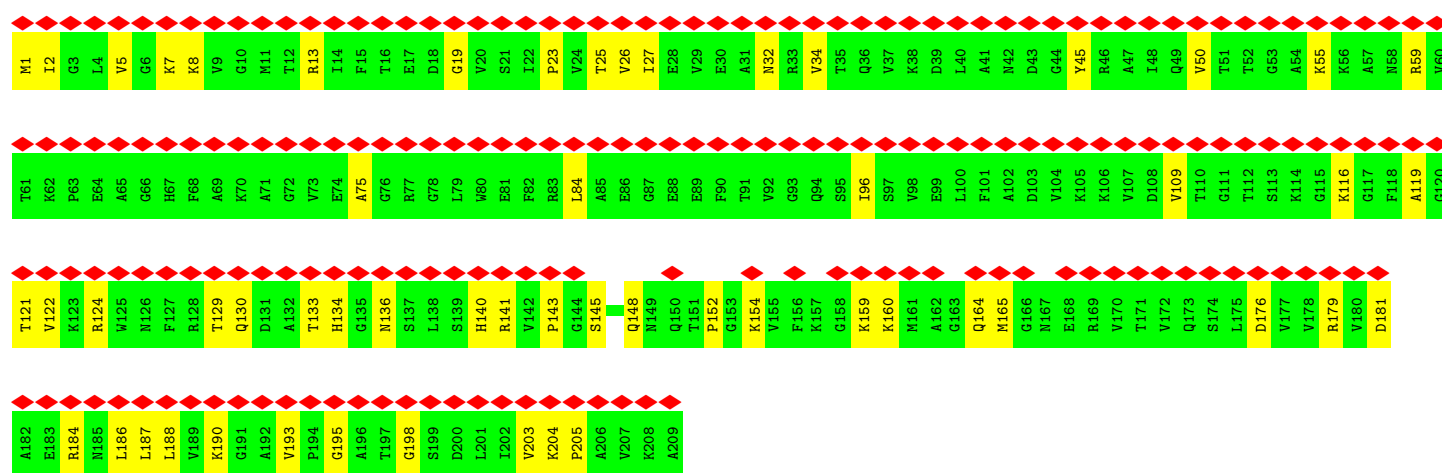
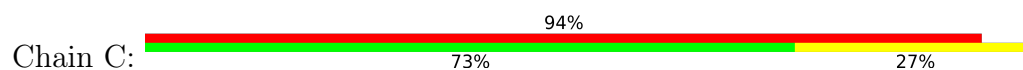
• Molecule 7: mRNA



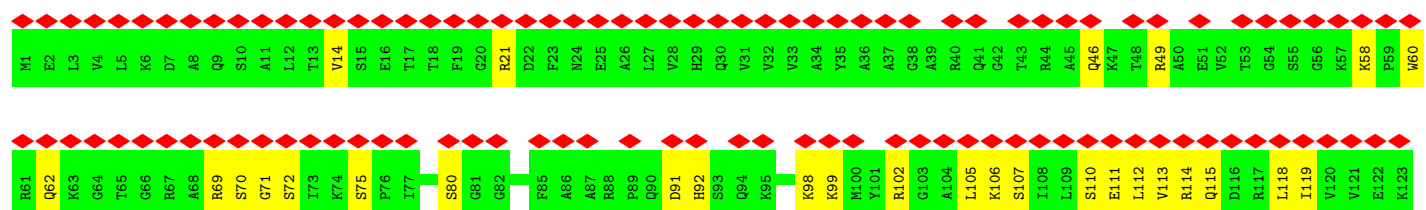
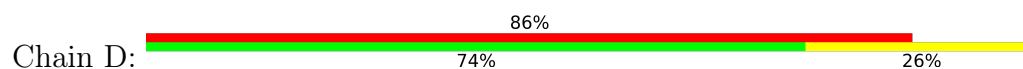
• Molecule 8: 50S ribosomal protein L2

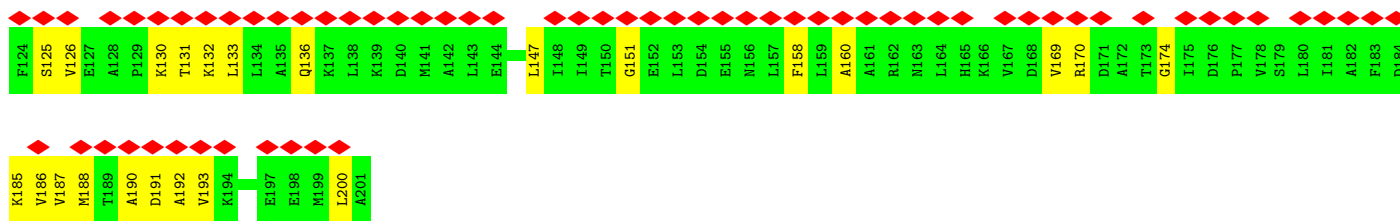


• Molecule 9: 50S ribosomal protein L3

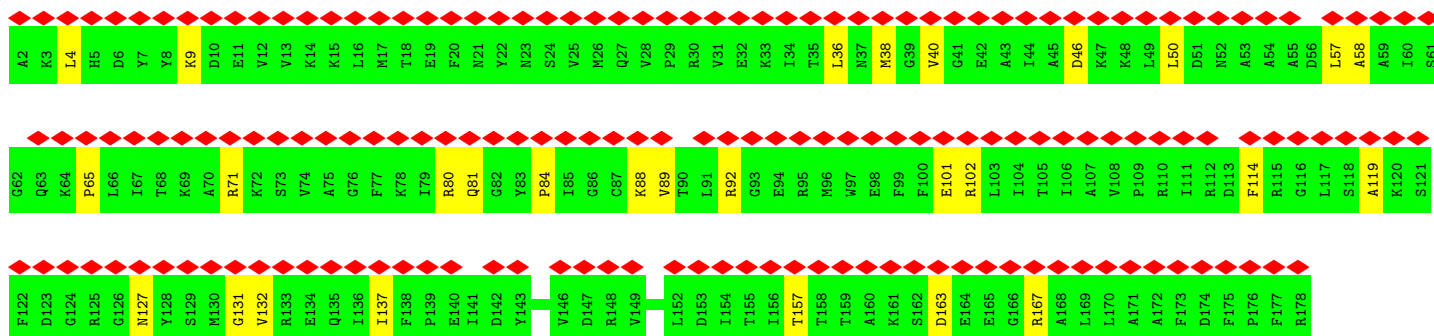
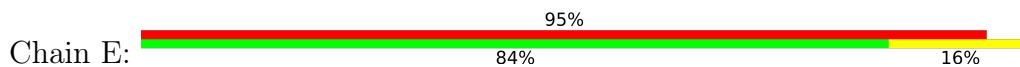


• Molecule 10: 50S ribosomal protein L4

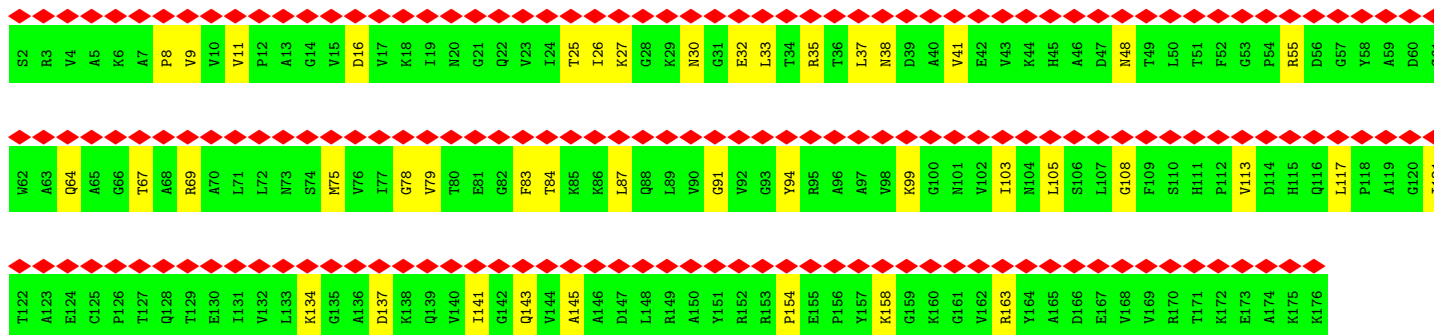
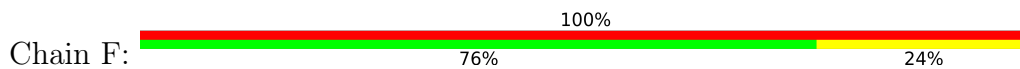




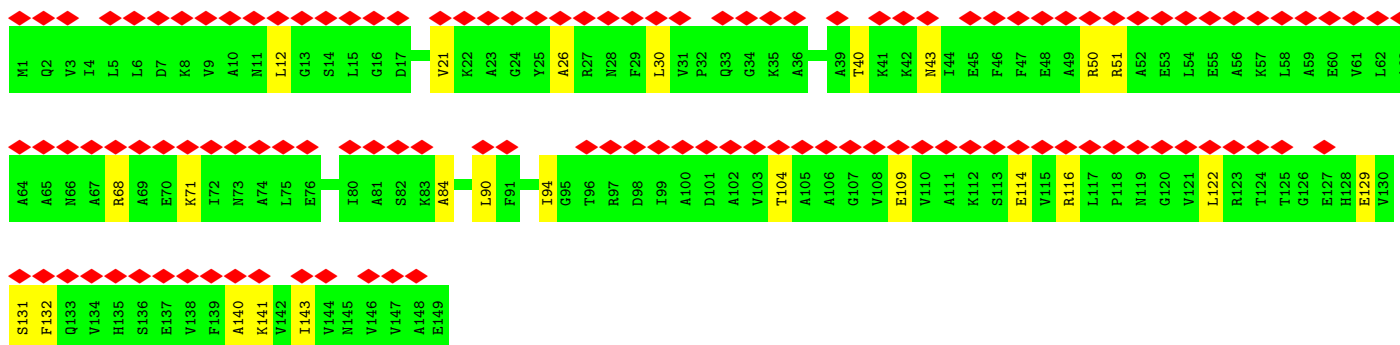
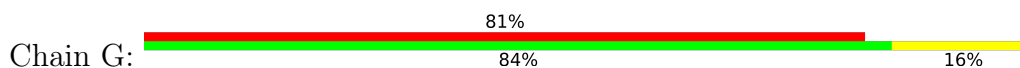
• Molecule 11: 50S ribosomal protein L5



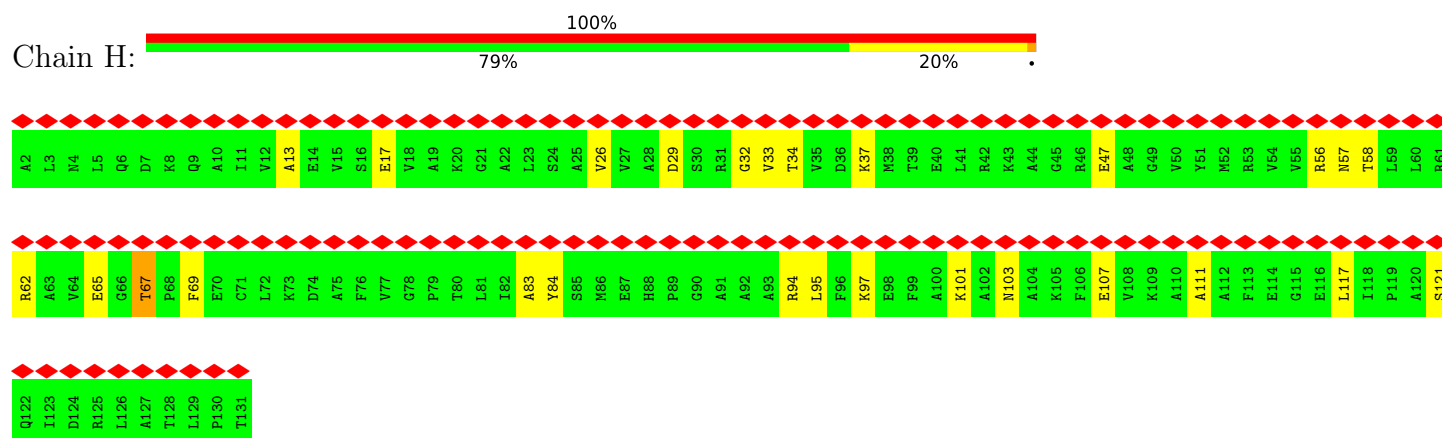
• Molecule 12: 50S ribosomal protein L6



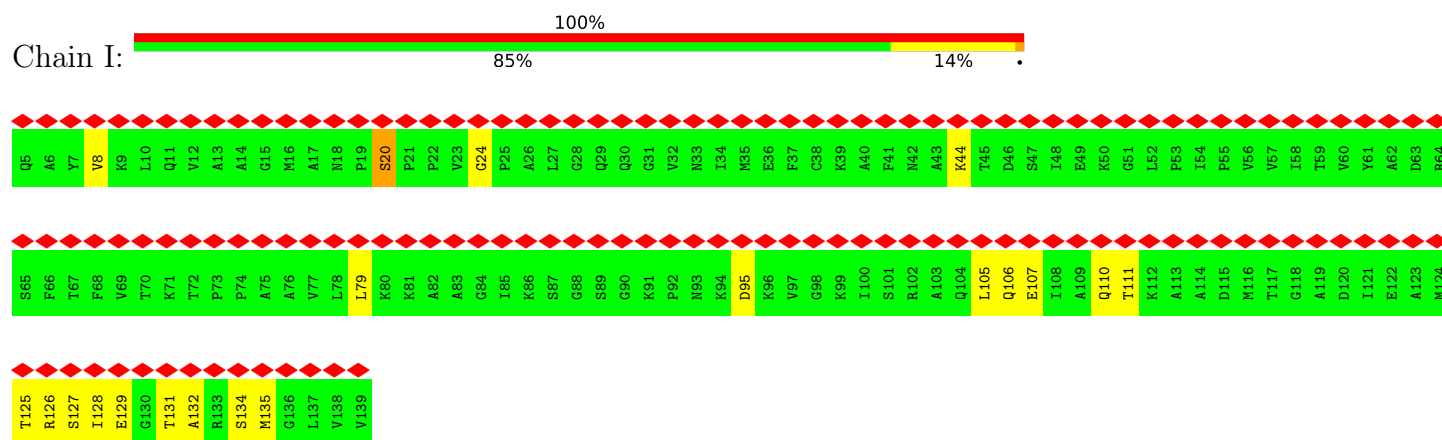
• Molecule 13: 50S ribosomal protein L9



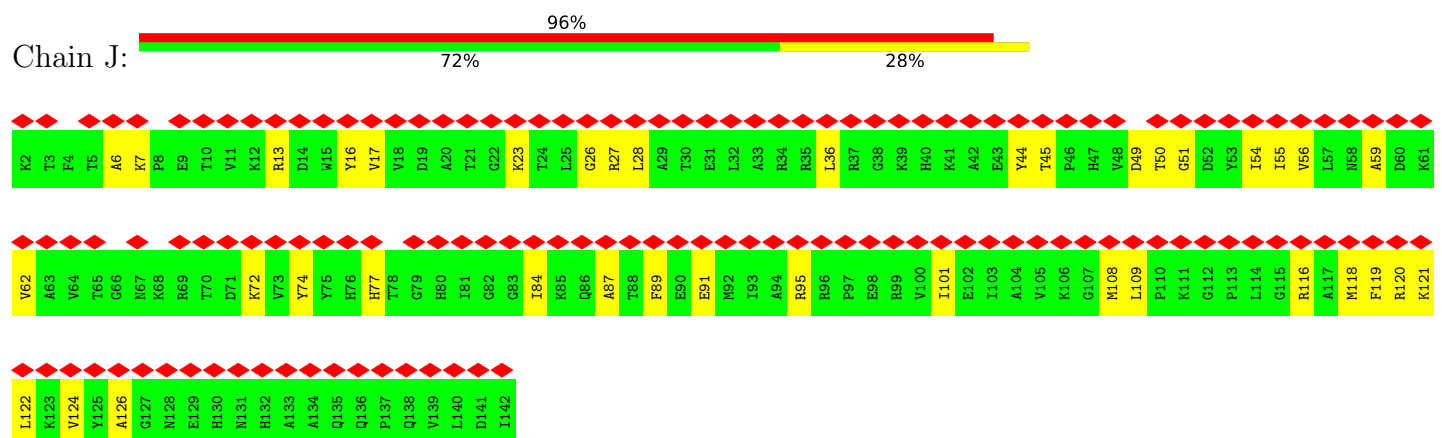
• Molecule 14: 50S ribosomal protein L10



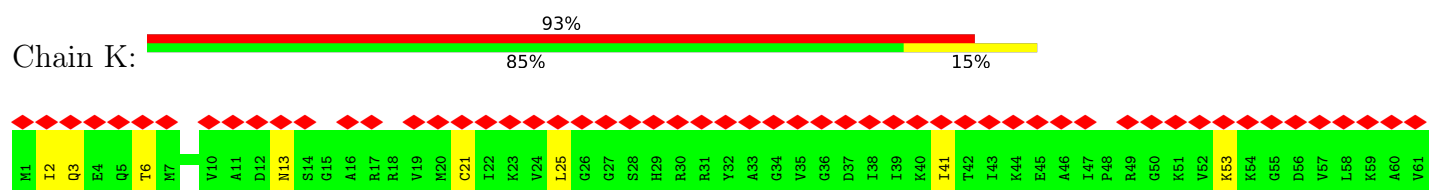
• Molecule 15: 50S ribosomal protein L11



• Molecule 16: 50S ribosomal protein L13

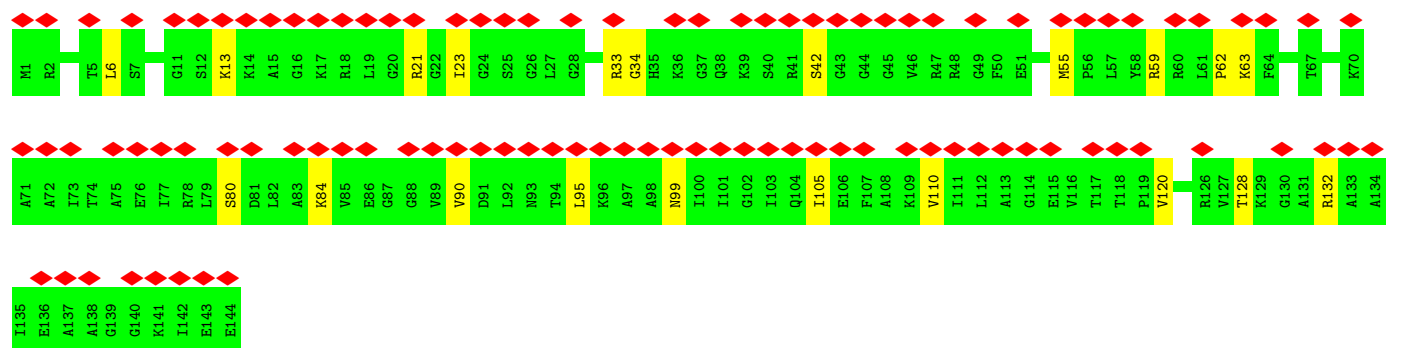
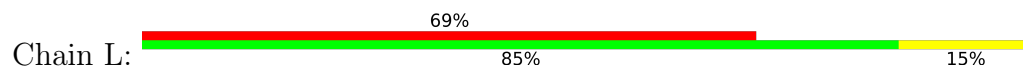


• Molecule 17: 50S ribosomal protein L14

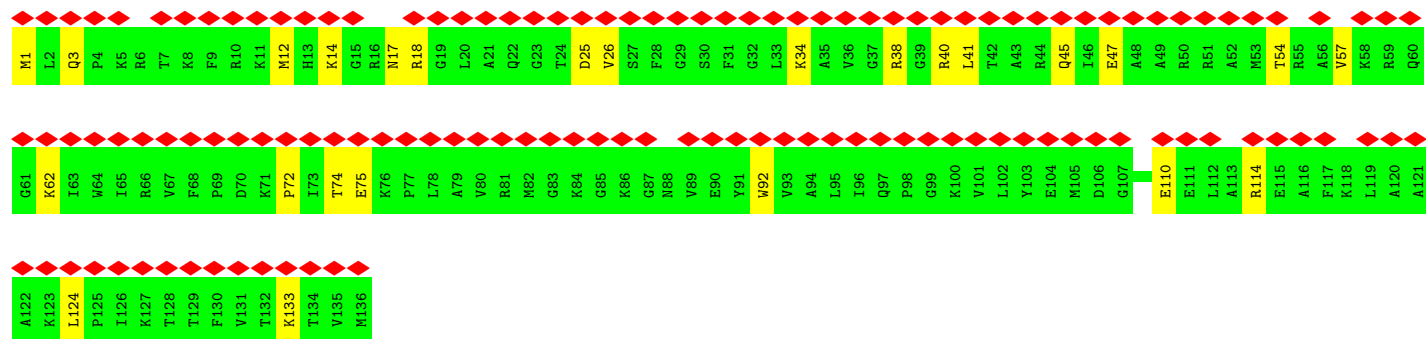
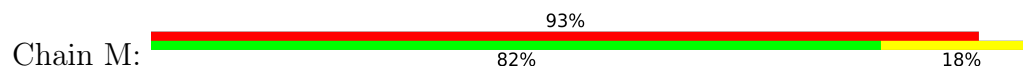




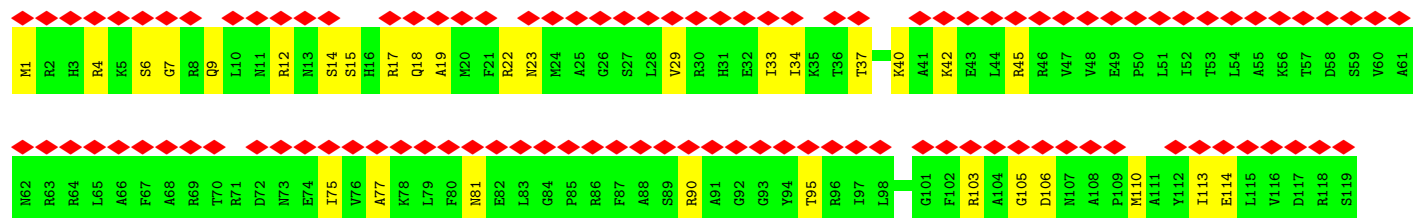
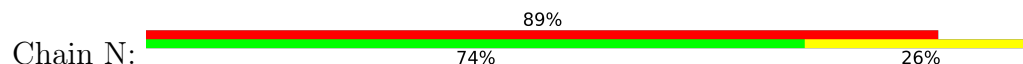
• Molecule 18: 50S ribosomal protein L15



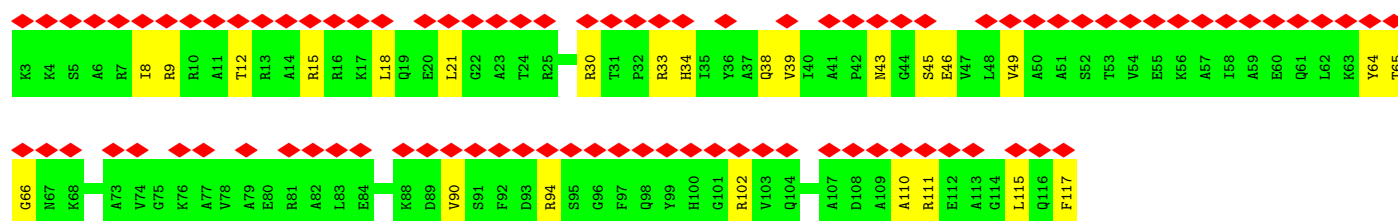
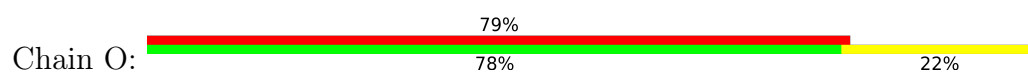
• Molecule 19: 50S ribosomal protein L16



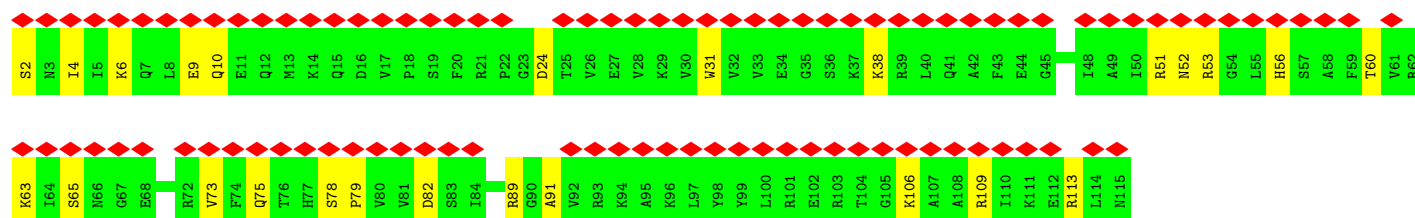
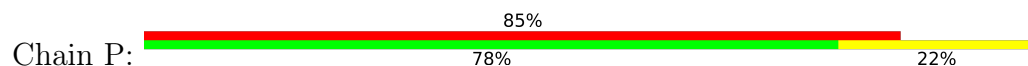
• Molecule 20: 50S ribosomal protein L17



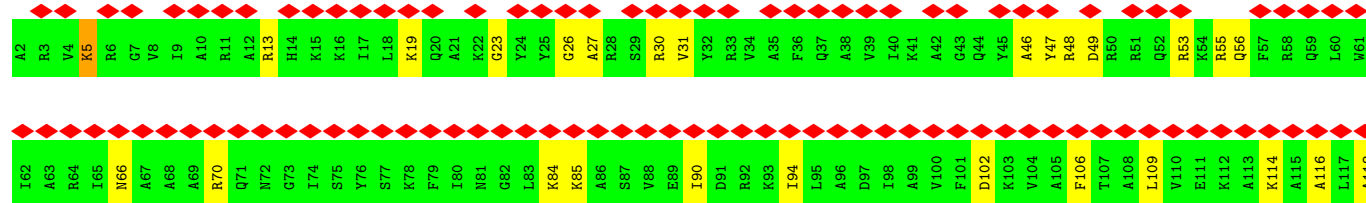
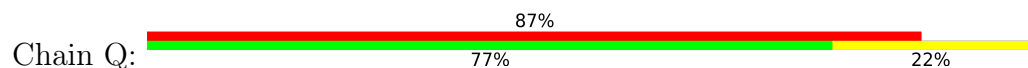
• Molecule 21: 50S ribosomal protein L18



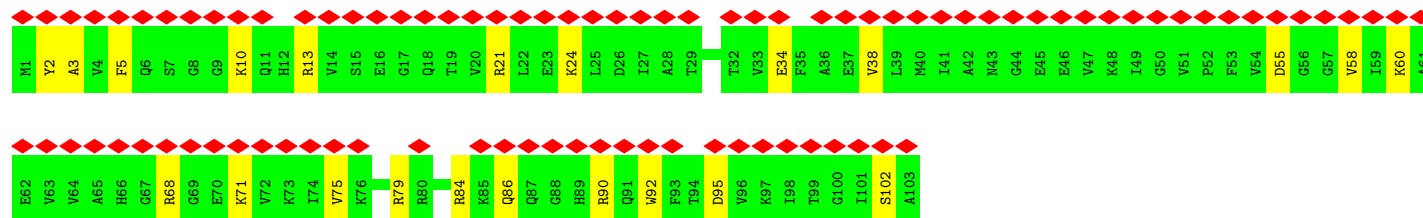
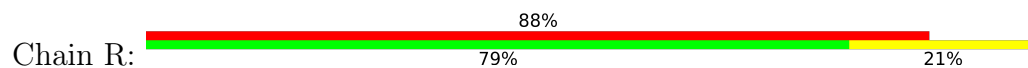
• Molecule 22: 50S ribosomal protein L19



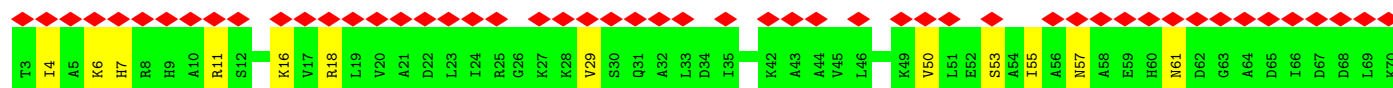
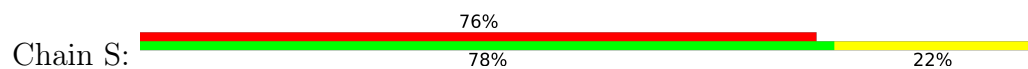
• Molecule 23: 50S ribosomal protein L20

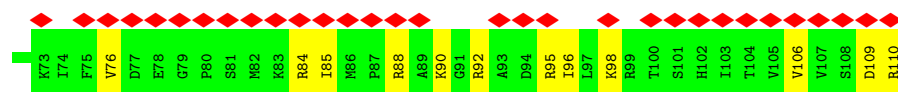


• Molecule 24: 50S ribosomal protein L21

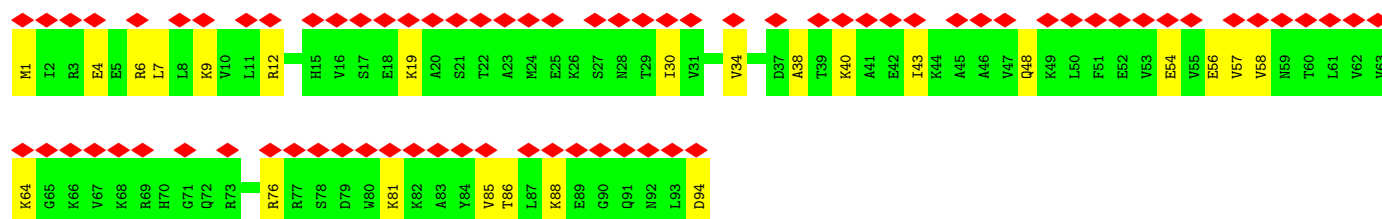
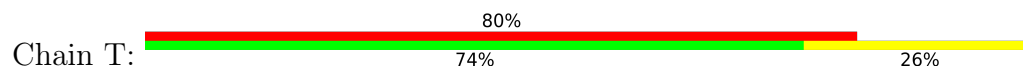


• Molecule 25: 50S ribosomal protein L22

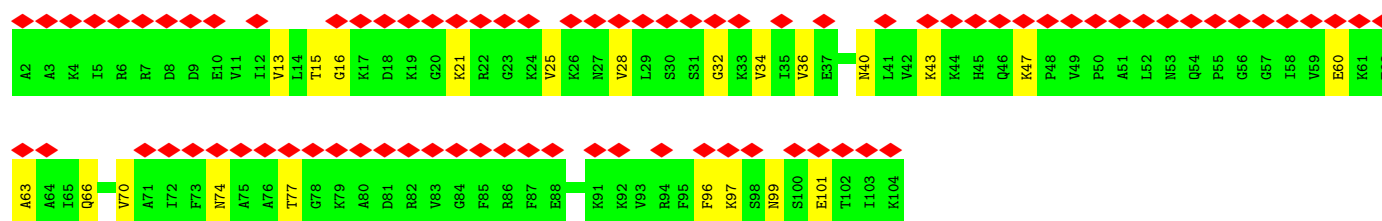
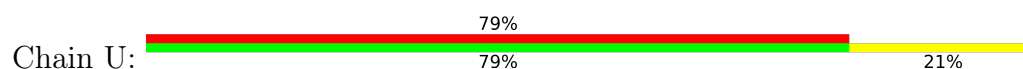




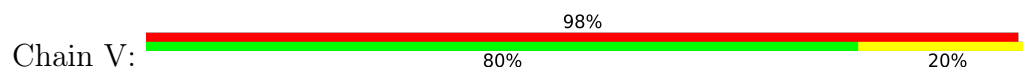
- Molecule 26: 50S ribosomal protein L23



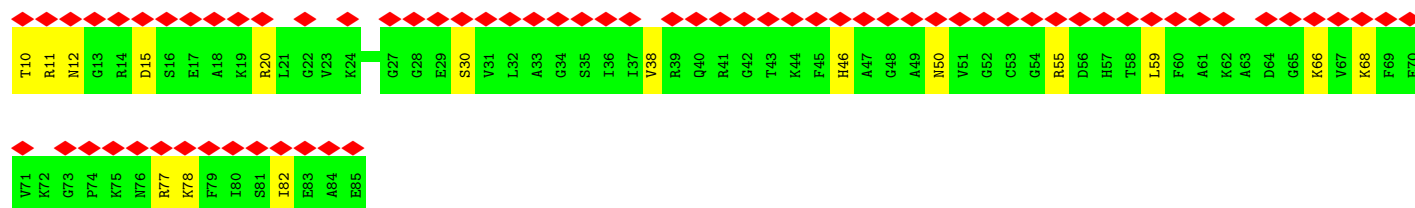
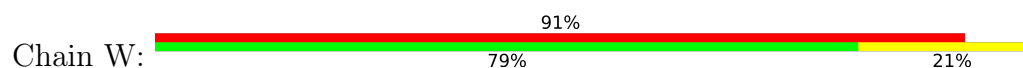
- Molecule 27: 50S ribosomal protein L24



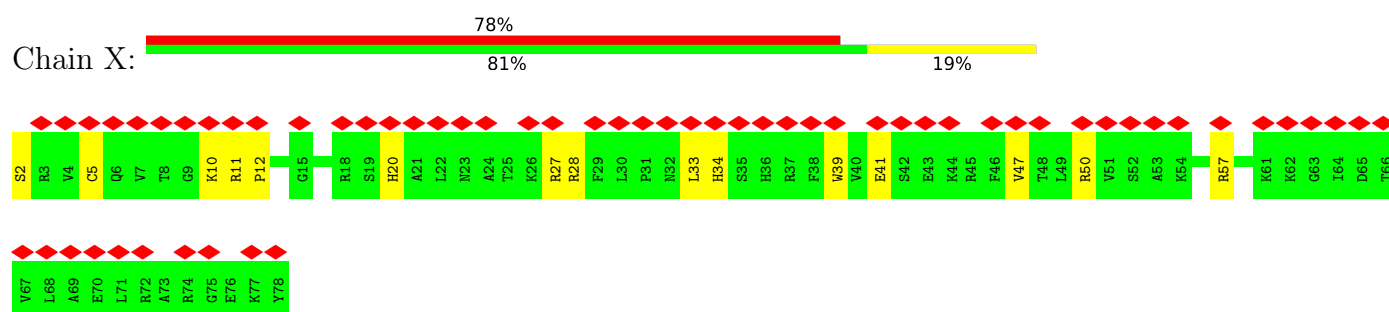
- Molecule 28: 50S ribosomal protein L25



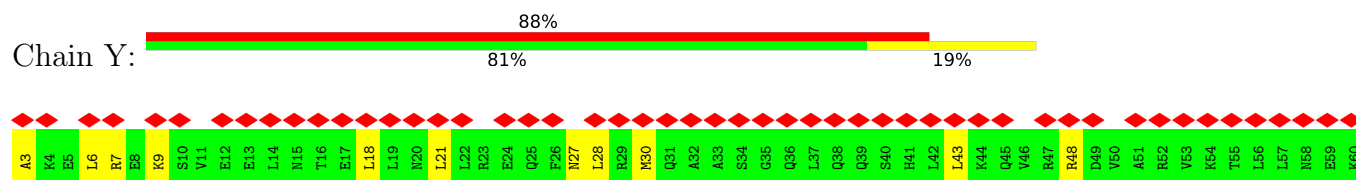
- Molecule 29: 50S ribosomal protein L27



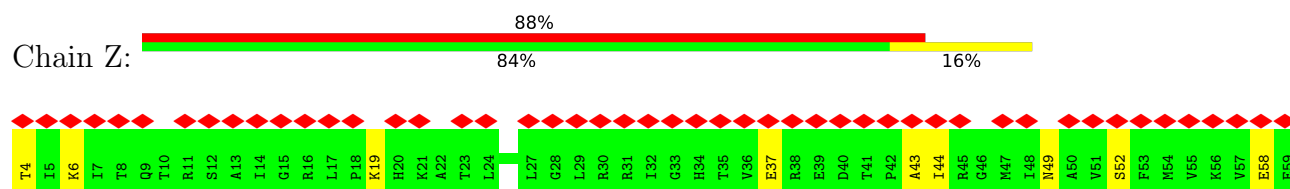
- Molecule 30: 50S ribosomal protein L28



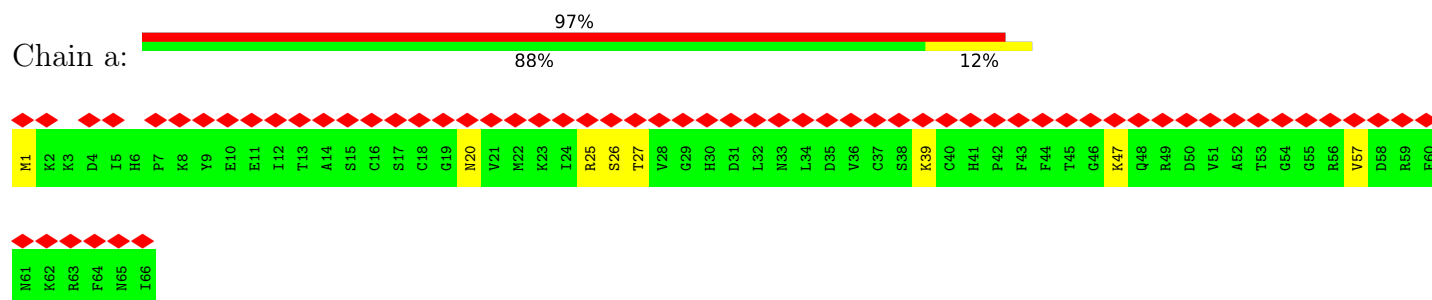
- Molecule 31: 50S ribosomal protein L29



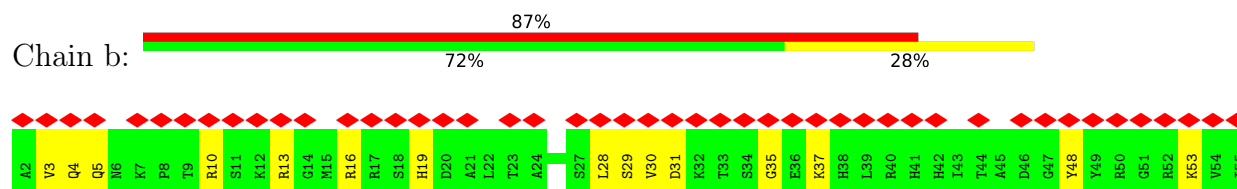
- Molecule 32: 50S ribosomal protein L30



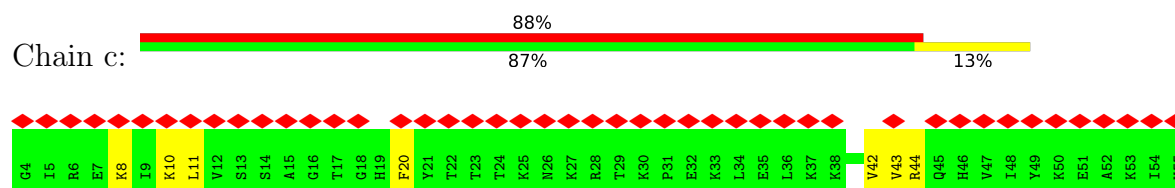
- Molecule 33: 50S ribosomal protein L31



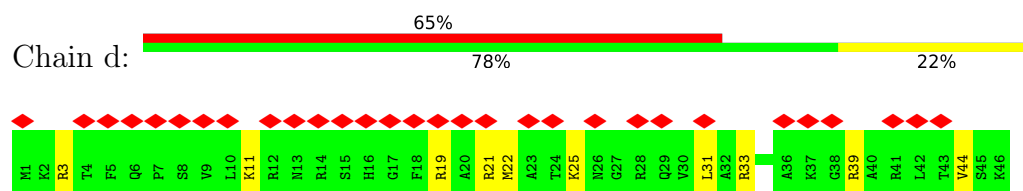
- Molecule 34: 50S ribosomal protein L32



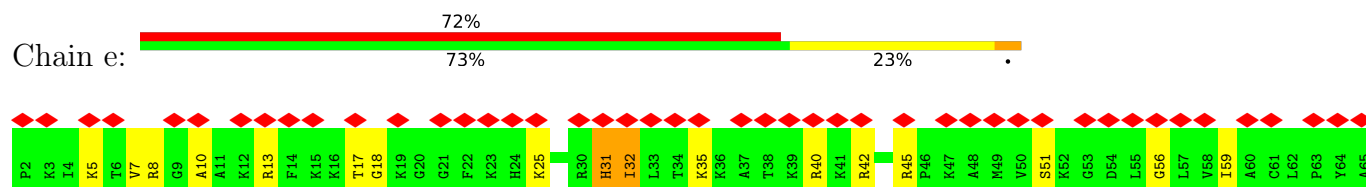
- Molecule 35: 50S ribosomal protein L33



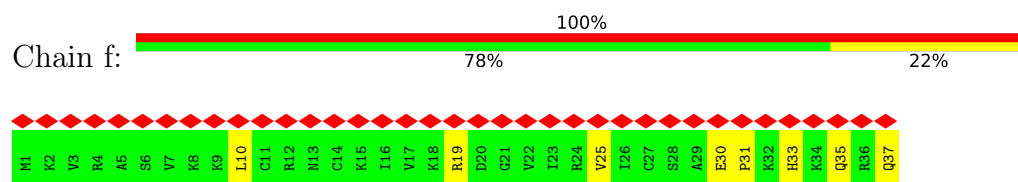
- Molecule 36: 50S ribosomal protein L34



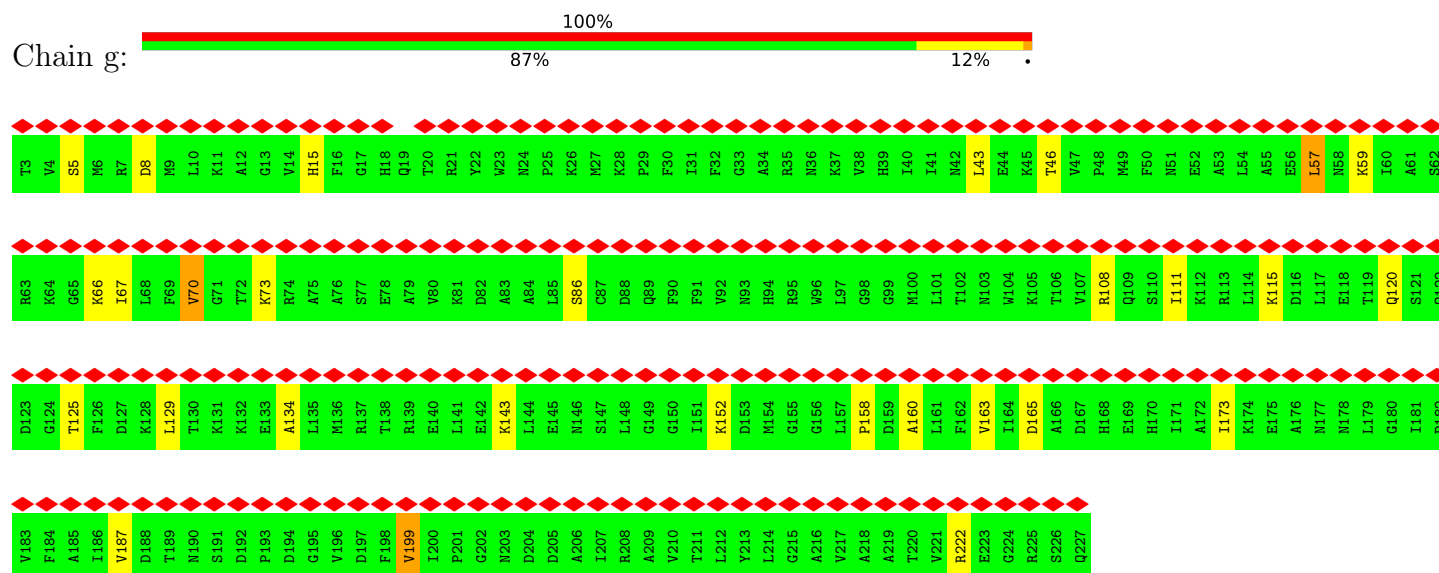
- Molecule 37: 50S ribosomal protein L35



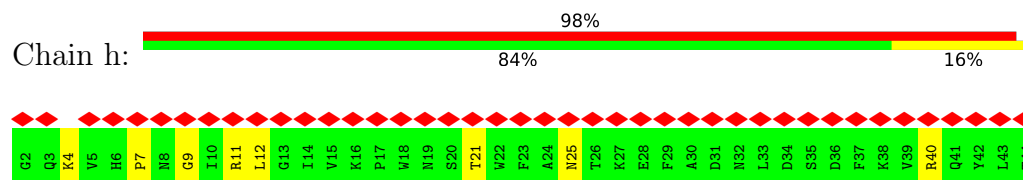
- Molecule 38: 50S ribosomal protein L36

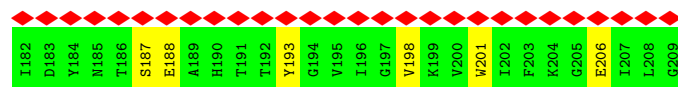
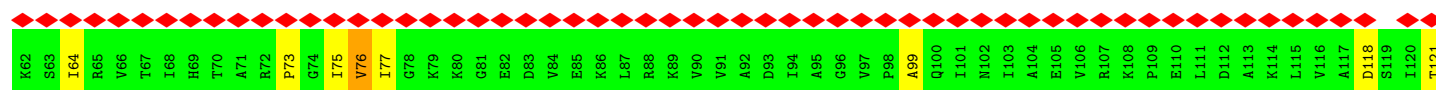


- Molecule 39: 30S ribosomal protein S2

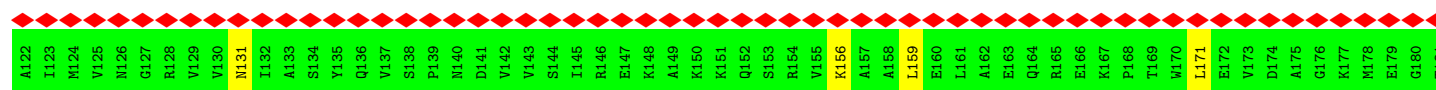
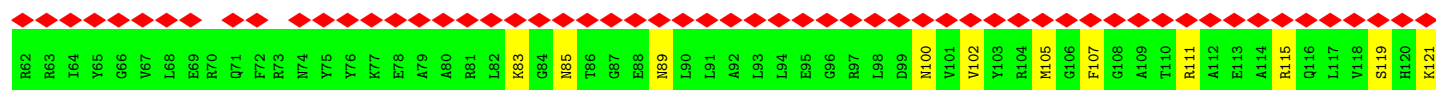
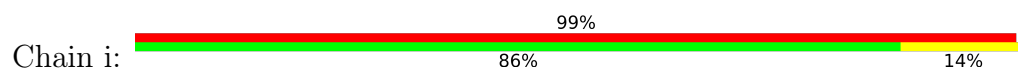


- Molecule 40: 30S ribosomal protein S3

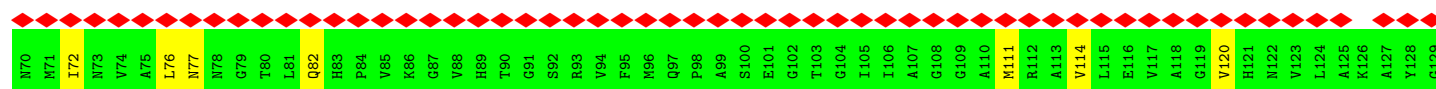
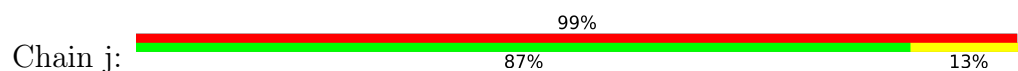




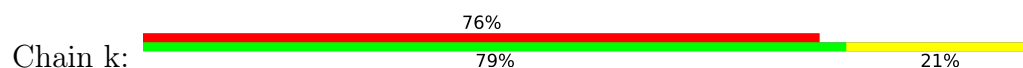
• Molecule 41: 30S ribosomal protein S4



• Molecule 42: 30S ribosomal protein S5

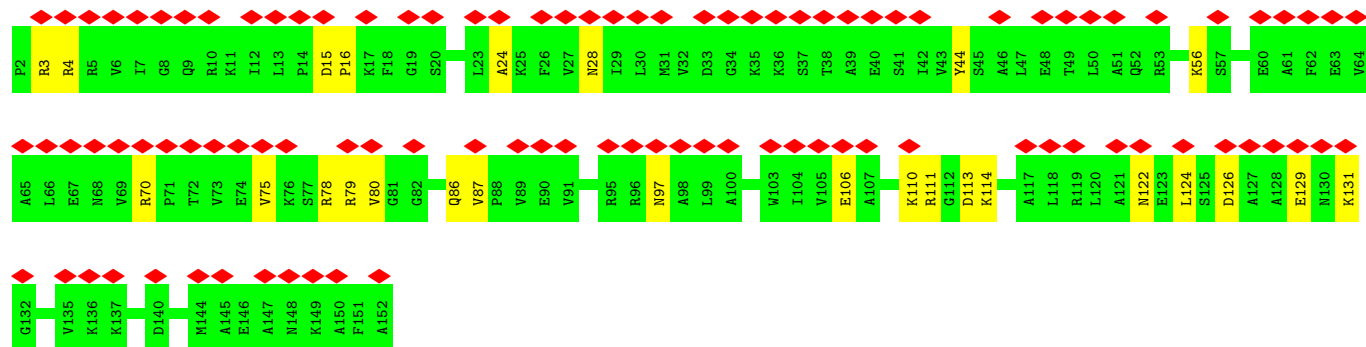
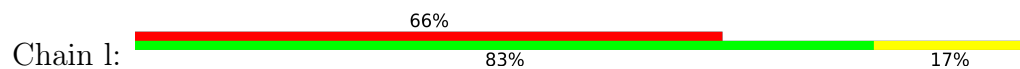


• Molecule 43: 30S ribosomal protein S6

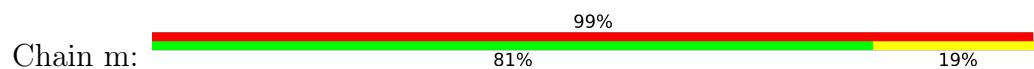




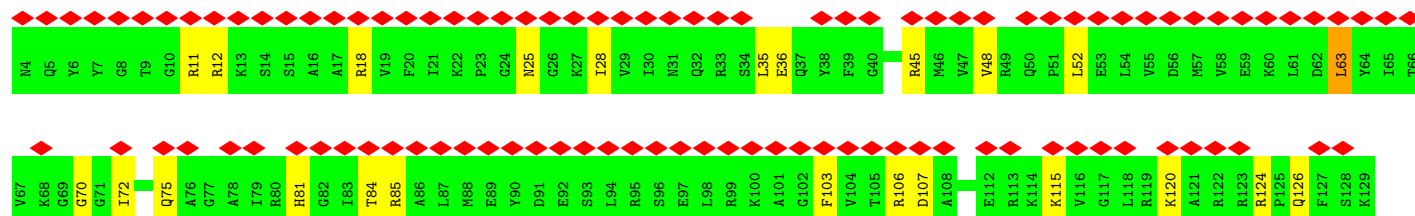
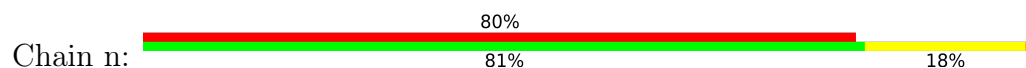
• Molecule 44: 30S ribosomal protein S7



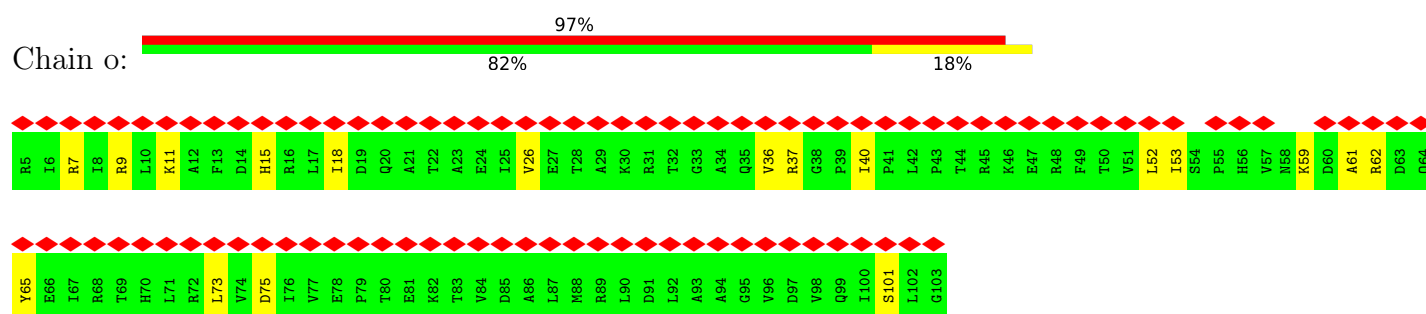
• Molecule 45: 30S ribosomal protein S8



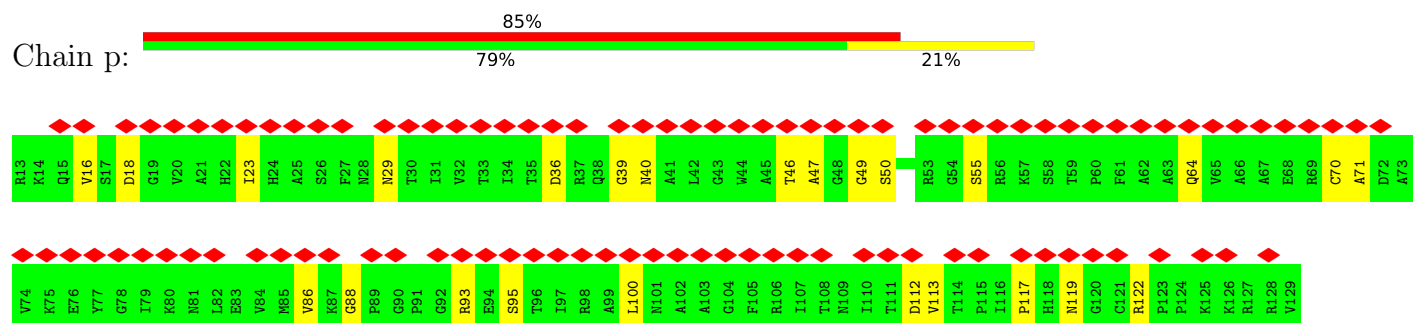
• Molecule 46: 30S ribosomal protein S9



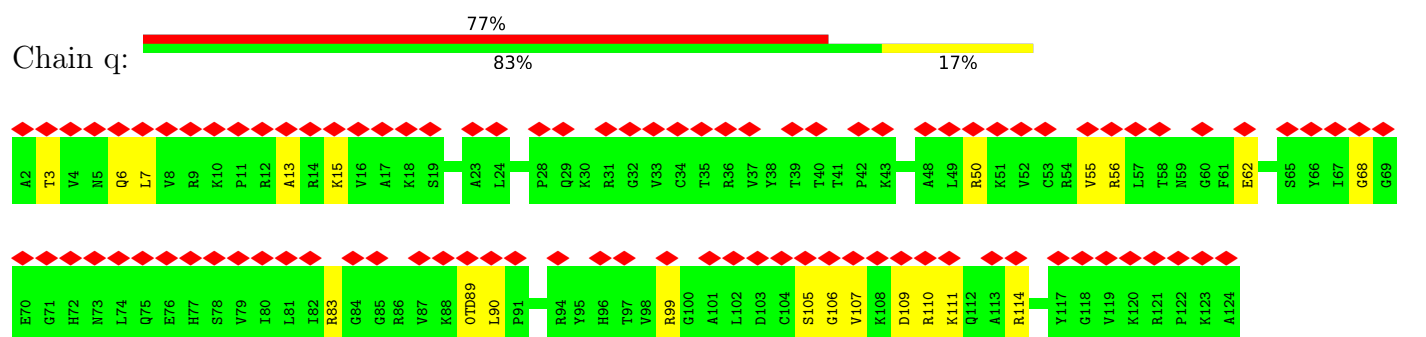
• Molecule 47: 30S ribosomal protein S10



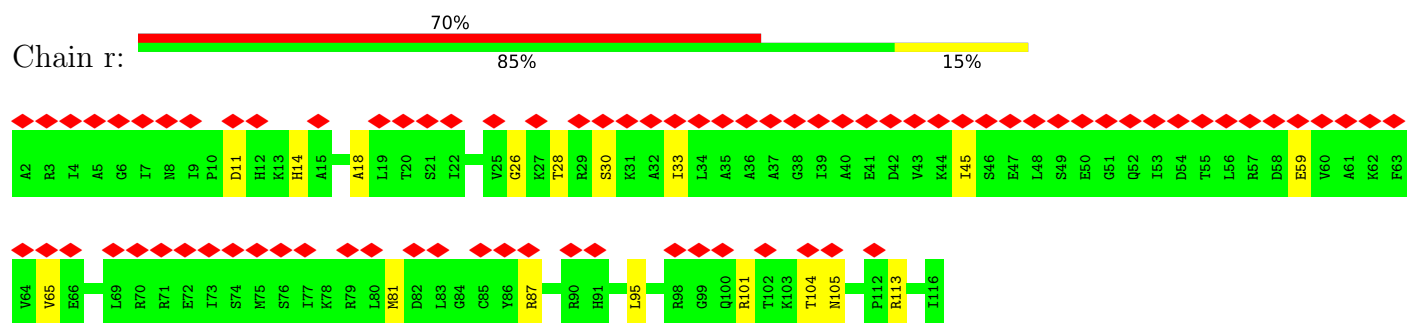
• Molecule 48: 30S ribosomal protein S11



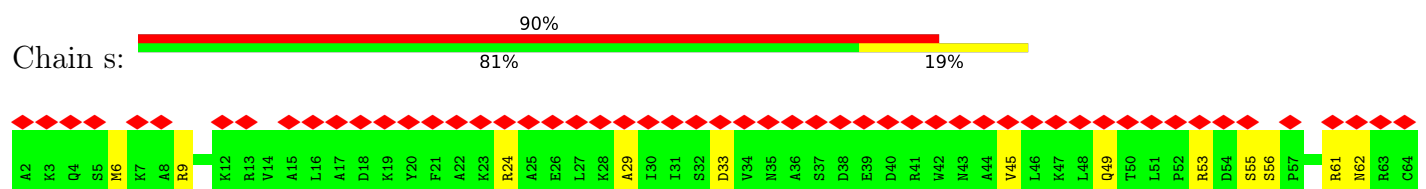
• Molecule 49: 30S ribosomal protein S12

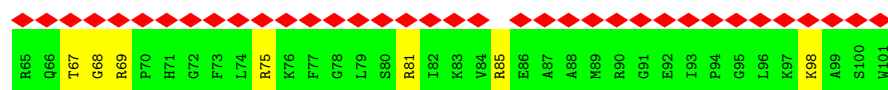


• Molecule 50: 30S ribosomal protein S13

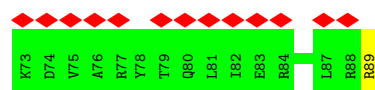
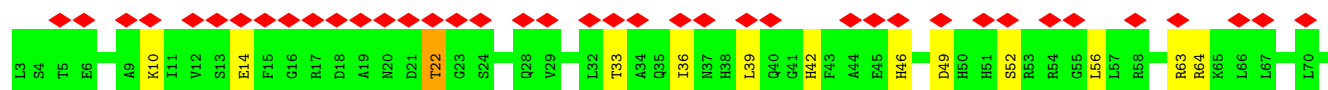
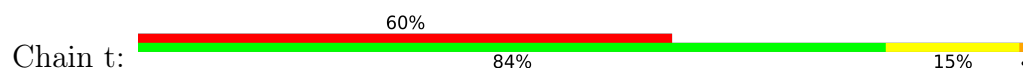


• Molecule 51: 30S ribosomal protein S14

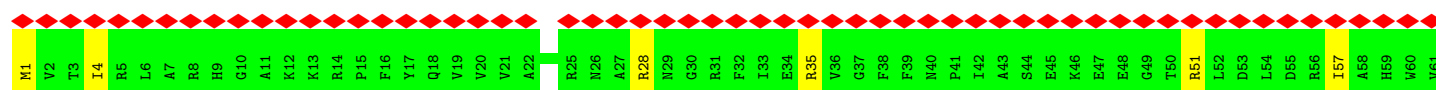
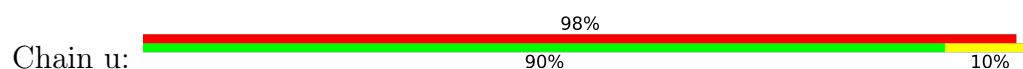




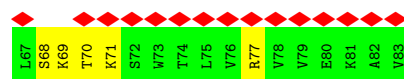
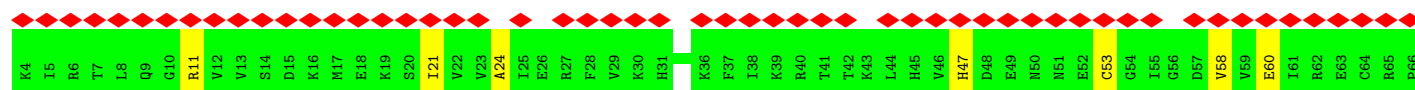
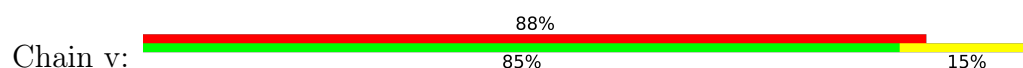
- Molecule 52: 30S ribosomal protein S15



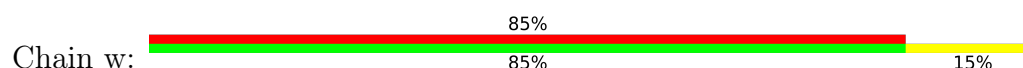
- Molecule 53: 30S ribosomal protein S16



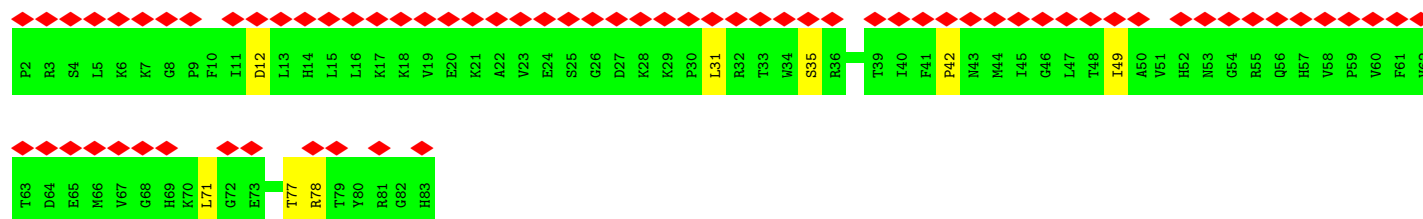
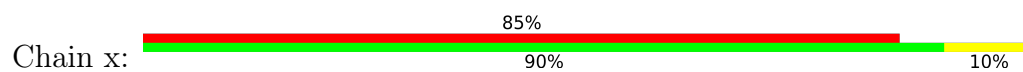
- Molecule 54: 30S ribosomal protein S17



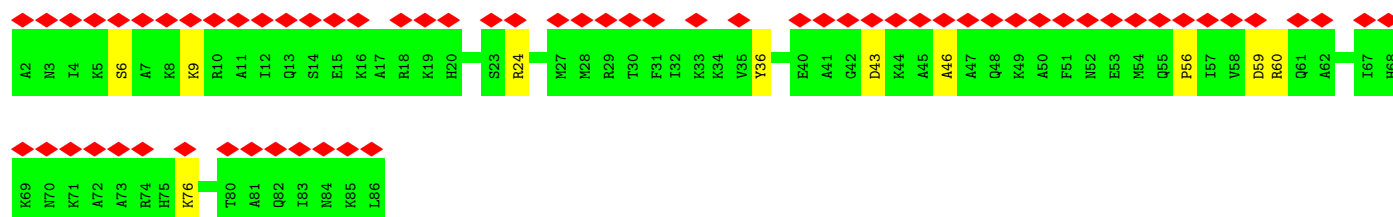
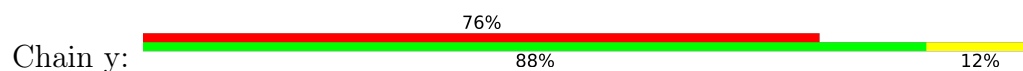
- Molecule 55: 30S ribosomal protein S18



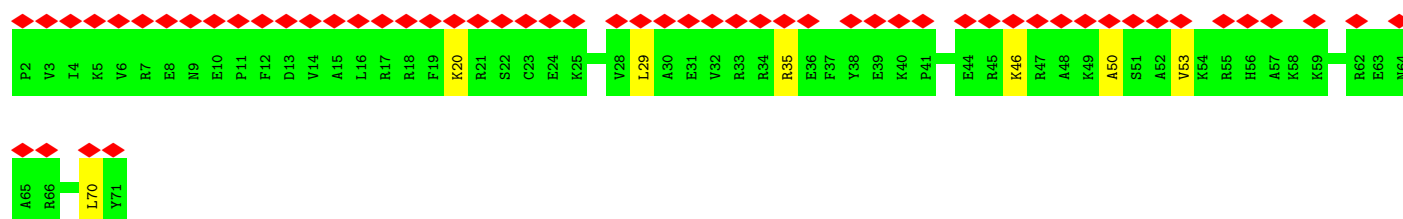
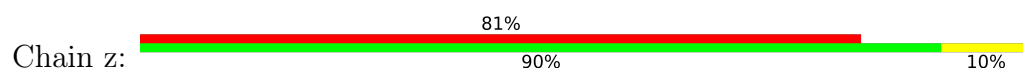
- Molecule 56: 30S ribosomal protein S19



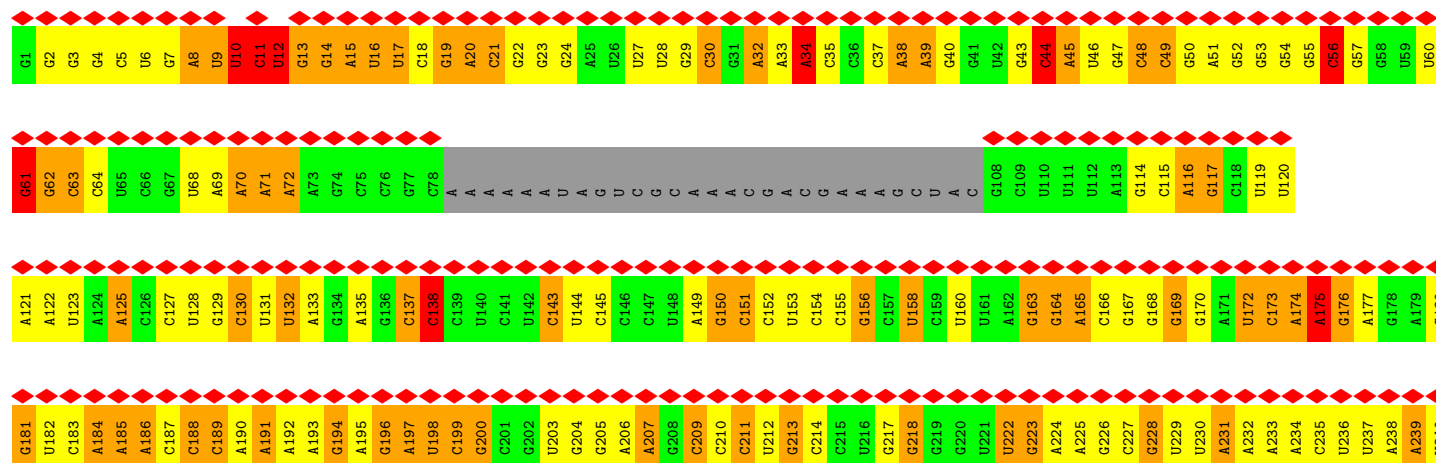
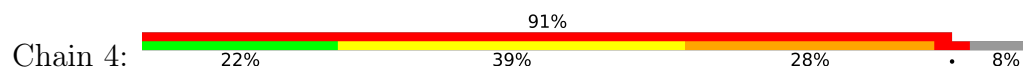
• Molecule 57: 30S ribosomal protein S20

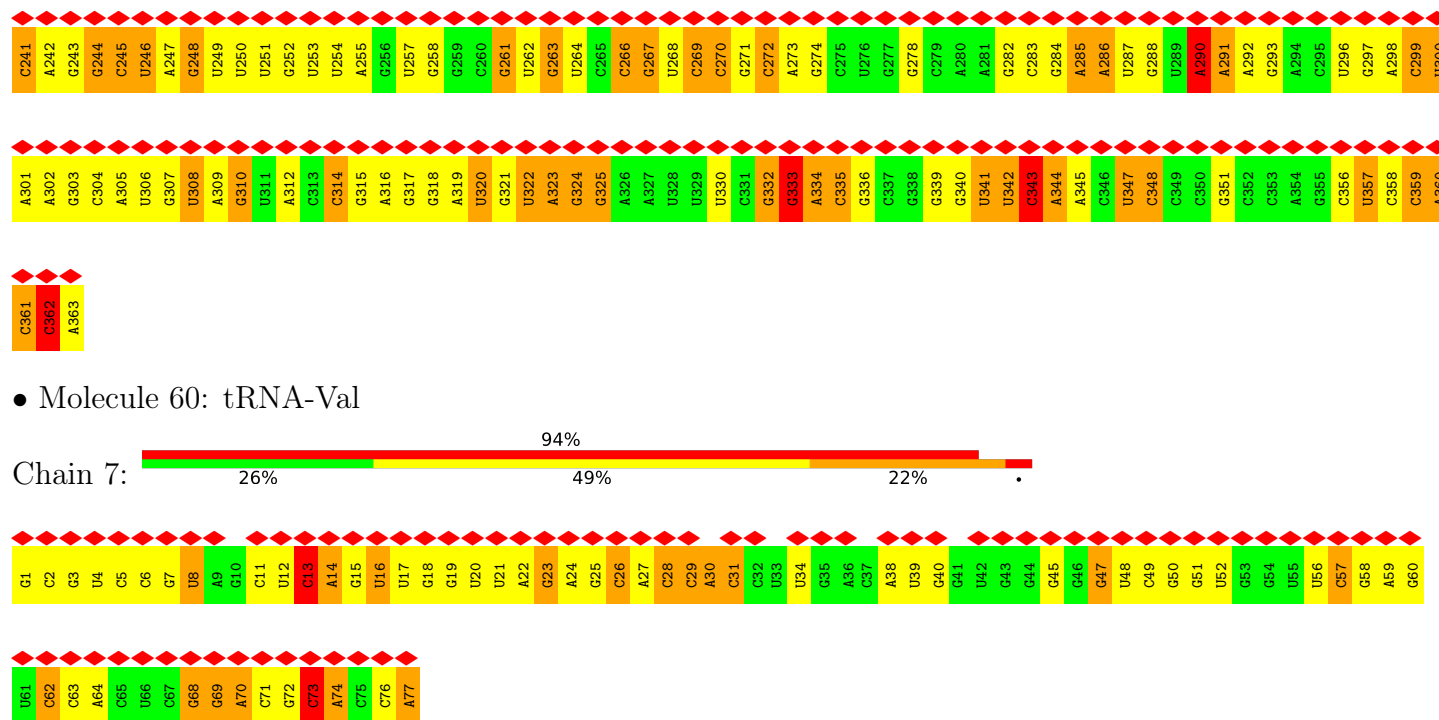


• Molecule 58: 30S ribosomal protein S21



• Molecule 59: transfer-messenger RNA (tmRNA)





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	47776	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	44	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.508	Depositor
Minimum map value	-0.282	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.013	Depositor
Recommended contour level	0.05	Depositor
Map size (Å)	406.6, 406.6, 406.6	wwPDB
Map dimensions	380, 380, 380	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: OMG, MA6, 6MZ, OMU, 7MG, PSU, 2MG, 5MU, G7M, 2MA, MG, 3TD, UR3, OMC, 4OC, 5MC, 1MG, 0TD, ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	1	0.51	2/69285 (0.0%)	0.49	6/108083 (0.0%)
2	2	0.60	0/36588	0.56	0/57066
3	3	0.24	0/2872	0.43	0/4478
4	5	0.36	0/1191	0.80	2/1601 (0.1%)
5	6	0.24	0/139	0.93	0/193
6	8	1.70	5/1830 (0.3%)	0.54	0/2849
7	9	0.49	0/142	1.03	0/219
8	B	0.40	0/2117	0.62	0/2845
9	C	0.27	0/1586	0.58	0/2134
10	D	0.24	0/1571	0.55	0/2113
11	E	0.29	0/1435	0.67	0/1926
12	F	0.21	0/1333	0.53	0/1805
13	G	0.25	0/1122	0.63	0/1515
14	H	0.29	0/993	0.75	0/1340
15	I	0.26	0/998	0.64	0/1348
16	J	0.22	0/1144	0.52	0/1541
17	K	0.36	0/955	0.60	0/1279
18	L	0.23	0/1062	0.54	0/1413
19	M	0.27	0/1093	0.57	0/1460
20	N	0.30	0/964	0.66	0/1289
21	O	0.21	0/894	0.54	0/1198
22	P	0.33	0/929	0.54	0/1242
23	Q	0.24	0/960	0.50	0/1278
24	R	0.22	0/829	0.53	0/1107
25	S	0.26	0/847	0.57	0/1134
26	T	0.24	0/752	0.52	0/1005
27	U	0.22	0/796	0.50	0/1062
28	V	0.21	0/766	0.46	0/1025
29	W	0.26	0/589	0.54	0/779
30	X	0.31	0/635	0.61	0/848
31	Y	0.22	0/478	0.55	0/637

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	Z	0.21	0/438	0.51	0/587
33	a	0.26	0/531	0.57	0/709
34	b	0.25	0/435	0.55	0/581
35	c	0.25	0/433	0.52	0/576
36	d	0.29	0/380	0.55	0/498
37	e	0.28	0/513	0.64	0/676
38	f	0.23	0/298	0.54	0/392
39	g	0.41	0/1791	0.69	0/2413
40	h	0.48	0/1663	0.69	0/2241
41	i	0.51	0/1665	0.66	0/2227
42	j	0.57	0/1165	0.77	0/1568
43	k	0.49	0/867	0.70	0/1171
44	l	0.42	0/1195	0.61	0/1602
45	m	0.57	0/989	0.68	0/1326
46	n	0.45	0/1022	0.69	0/1361
47	o	0.46	0/800	0.64	0/1082
48	p	0.49	0/893	0.61	0/1205
49	q	0.55	0/960	0.71	0/1286
50	r	0.39	0/900	0.67	0/1204
51	s	0.48	0/817	0.61	0/1088
52	t	0.55	0/716	0.69	0/956
53	u	0.57	0/653	0.71	0/877
54	v	0.51	0/658	0.71	0/881
55	w	0.54	0/544	0.66	0/731
56	x	0.43	0/675	0.62	0/908
57	y	0.48	0/670	0.67	0/888
58	z	0.37	0/597	0.58	0/792
59	4	0.48	0/7978	1.16	80/12434 (0.6%)
60	7	0.43	0/1836	0.99	8/2861 (0.3%)
All	All	0.52	7/168977 (0.0%)	0.60	96/252933 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	1	34	0
2	2	5	0
14	H	0	1
15	I	0	1
17	K	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
23	Q	0	1
30	X	0	1
37	e	0	2
39	g	0	1
40	h	0	2
53	u	0	1
All	All	39	11

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	388	G	P-O5'	102.58	3.65	1.59
6	8	77	A	N9-C4	34.22	2.06	1.37
6	8	77	A	N9-C8	34.06	2.05	1.37
6	8	77	A	C8-N7	32.52	1.96	1.31
6	8	77	A	N7-C5	31.84	2.02	1.39
6	8	77	A	C5-C4	28.41	1.95	1.38
1	1	2552	OMU	O3'-P	6.10	1.62	1.56

All (96) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	7	72	G	OP1-P-O3'	-15.28	62.15	108.00
1	1	388	G	P-O5'-C5'	11.97	156.80	120.90
59	4	48	C	O3'-P-O5'	10.15	119.23	104.00
60	7	73	C	OP1-P-OP2	9.58	148.35	119.60
59	4	39	A	N9-C1'-C2'	9.21	125.82	112.00
59	4	15	A	P-O3'-C3'	9.12	133.89	120.20
59	4	266	C	O3'-P-O5'	8.84	117.27	104.00
59	4	266	C	P-O3'-C3'	7.83	131.94	120.20
59	4	48	C	P-O3'-C3'	7.74	131.81	120.20
1	1	387	U	P-O3'-C3'	7.54	131.51	120.20
59	4	290	A	P-O3'-C3'	7.50	131.44	120.20
59	4	269	C	O3'-P-O5'	7.49	115.23	104.00
1	1	387	U	OP2-P-O3'	-7.47	85.58	108.00
60	7	71	C	P-O3'-C3'	-7.45	109.03	120.20
59	4	334	A	O4'-C1'-N9	7.41	119.62	108.50
59	4	137	C	O3'-P-O5'	7.41	115.11	104.00
59	4	9	U	P-O3'-C3'	7.25	131.07	120.20
59	4	191	A	O3'-P-O5'	7.06	114.60	104.00
59	4	245	C	C4'-C3'-O3'	6.99	123.48	113.00
59	4	39	A	O4'-C1'-N9	6.95	118.92	108.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
59	4	239	A	O3'-P-O5'	6.88	114.31	104.00
59	4	44	C	O3'-P-O5'	6.87	114.31	104.00
59	4	181	G	O5'-C5'-C4'	6.87	121.81	111.50
59	4	308	U	P-O3'-C3'	6.80	130.40	120.20
59	4	245	C	P-O3'-C3'	6.67	130.21	120.20
59	4	188	C	O3'-P-O5'	6.67	114.01	104.00
59	4	8	A	N9-C1'-C2'	6.61	121.92	112.00
59	4	63	C	O3'-P-O5'	6.61	113.91	104.00
59	4	39	A	C2'-C3'-O3'	-6.59	103.81	113.70
59	4	15	A	C4'-C3'-O3'	-6.49	99.67	109.40
59	4	290	A	O3'-P-O5'	6.41	113.62	104.00
59	4	314	C	P-O3'-C3'	6.26	129.59	120.20
60	7	13	C	C4'-C3'-O3'	6.23	122.35	113.00
59	4	198	U	P-O5'-C5'	-6.22	111.58	120.90
59	4	34	A	O3'-P-O5'	6.20	113.31	104.00
59	4	248	G	O3'-P-O5'	6.20	113.30	104.00
59	4	15	A	O5'-P-OP1	6.18	126.55	108.00
59	4	272	C	P-O3'-C3'	6.15	129.42	120.20
59	4	10	U	P-O3'-C3'	6.06	129.29	120.20
59	4	15	A	O3'-P-O5'	-6.05	94.93	104.00
59	4	197	A	O3'-P-O5'	6.01	113.02	104.00
59	4	12	U	O5'-C5'-C4'	5.97	120.66	111.70
59	4	38	A	P-O3'-C3'	5.95	129.12	120.20
59	4	198	U	O5'-C5'-C4'	5.94	120.40	111.50
59	4	198	U	N1-C1'-C2'	5.93	120.89	112.00
59	4	9	U	C5'-C4'-O4'	-5.79	100.42	109.10
59	4	138	C	P-O5'-C5'	5.70	129.45	120.90
59	4	61	G	O3'-P-O5'	5.69	112.53	104.00
59	4	334	A	C2'-C3'-O3'	-5.66	105.21	113.70
59	4	333	G	C5'-C4'-O4'	-5.63	101.36	109.80
59	4	158	U	C5'-C4'-O4'	-5.62	101.36	109.80
59	4	267	G	P-O5'-C5'	5.61	129.32	120.90
60	7	13	C	O5'-P-OP1	5.58	124.74	108.00
59	4	189	C	P-O3'-C3'	5.55	128.53	120.20
59	4	10	U	O3'-P-O5'	5.54	112.31	104.00
59	4	132	U	O3'-P-O5'	5.54	112.31	104.00
59	4	187	C	O3'-P-O5'	5.51	112.27	104.00
59	4	175	A	O3'-P-O5'	5.51	112.26	104.00
59	4	248	G	P-O3'-C3'	5.50	128.45	120.20
59	4	272	C	O3'-P-O5'	5.49	112.24	104.00
59	4	320	U	P-O3'-C3'	5.49	128.43	120.20
59	4	209	C	P-O5'-C5'	5.48	129.12	120.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	7	73	C	P-O5'-C5'	5.48	129.12	120.90
60	7	72	G	O3'-P-O5'	5.47	112.20	104.00
59	4	39	A	C4'-C3'-O3'	-5.45	104.83	113.00
4	5	136	HIS	CA-C-N	5.43	131.91	121.54
4	5	136	HIS	C-N-CA	5.43	131.91	121.54
59	4	12	U	P-O3'-C3'	5.41	128.32	120.20
59	4	196	G	O5'-C5'-C4'	-5.41	103.58	111.70
59	4	163	G	P-O3'-C3'	5.40	128.30	120.20
1	1	2552	OMU	P-O3'-C3'	5.39	126.17	119.70
59	4	284	G	P-O3'-C3'	5.39	128.28	120.20
59	4	343	C	N1-C1'-C2'	5.33	119.99	112.00
59	4	56	C	O3'-P-O5'	5.32	111.98	104.00
59	4	332	G	P-O3'-C3'	5.30	128.15	120.20
59	4	11	C	P-O3'-C3'	5.29	128.13	120.20
59	4	270	C	P-O5'-C5'	5.28	128.82	120.90
59	4	332	G	C4'-C3'-O3'	5.28	120.92	113.00
59	4	181	G	C5'-C4'-O4'	5.23	117.65	109.80
59	4	196	G	C4'-C3'-O3'	-5.22	101.57	109.40
59	4	116	A	O3'-P-O5'	5.19	111.78	104.00
59	4	12	U	C5'-C4'-C3'	5.11	122.86	115.20
59	4	261	G	P-O3'-C3'	5.11	127.87	120.20
59	4	362	C	O5'-P-OP1	5.10	123.29	108.00
1	1	1905	C	C2'-C3'-O3'	5.10	121.34	113.70
59	4	5	C	O3'-P-O5'	5.09	111.64	104.00
59	4	11	C	OP2-P-O3'	5.07	123.21	108.00
59	4	132	U	O5'-P-OP2	-5.05	92.86	108.00
1	1	894	U	P-O3'-C3'	5.05	127.77	120.20
59	4	16	U	P-O5'-C5'	5.05	128.47	120.90
59	4	165	A	P-O3'-C3'	5.04	127.77	120.20
59	4	223	G	P-O3'-C3'	5.04	127.77	120.20
59	4	130	C	C2'-C3'-O3'	5.03	117.04	109.50
59	4	16	U	P-O3'-C3'	5.02	127.73	120.20
59	4	29	G	O3'-P-O5'	5.01	111.51	104.00
60	7	28	C	N1-C1'-C2'	5.00	119.50	112.00

All (39) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	1	745	1MG	C2',C1'
1	1	746	PSU	C3',C4'
1	1	747	5MU	C2',C4'
1	1	955	PSU	C3',C4'

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Mol	Chain	Res	Type	Atom
1	1	1618	6MZ	C2',C3'
1	1	1911	PSU	C3',C4'
1	1	1915	3TD	C3'
1	1	1917	PSU	C3',C4'
1	1	1939	5MU	C2',C4'
1	1	2030	6MZ	C2',C3'
1	1	2069	G7M	C2'
1	1	2251	OMG	C2'
1	1	2457	PSU	C3',C4'
1	1	2498	OMC	C4'
1	1	2503	2MA	C2',C3'
1	1	2504	PSU	C3',C4'
1	1	2552	OMU	C2',C3'
1	1	2580	PSU	C3',C4'
1	1	2605	PSU	C3',C4'
2	2	516	PSU	C3',C4'
2	2	527	7MG	C3'
2	2	1402	4OC	C3',C1'

All (11) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
14	H	67	THR	Peptide
15	I	20	SER	Peptide
17	K	93	GLN	Peptide
23	Q	5	LYS	Peptide
30	X	20	HIS	Peptide
37	e	31	HIS	Peptide
37	e	51	SER	Peptide
39	g	57	LEU	Peptide
40	h	75	ILE	Peptide
40	h	76	VAL	Peptide
53	u	1	MET	Peptide

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	1	62336	0	31366	721	0
2	2	32929	0	16586	240	0
3	3	2569	0	1301	32	0
4	5	1170	0	1191	21	0
5	6	140	0	142	0	0
6	8	1638	0	830	38	0
7	9	128	0	65	1	0
8	B	2078	0	2149	34	0
9	C	1565	0	1616	39	0
10	D	1552	0	1619	36	0
11	E	1411	0	1444	20	0
12	F	1313	0	1358	27	0
13	G	1111	0	1148	12	0
14	H	980	0	1013	23	0
15	I	984	0	1035	15	0
16	J	1121	0	1150	24	0
17	K	946	0	1023	13	0
18	L	1053	0	1129	18	0
19	M	1074	0	1157	17	0
20	N	951	0	994	23	0
21	O	884	0	919	20	0
22	P	917	0	962	19	0
23	Q	947	0	1019	18	0
24	R	816	0	839	17	0
25	S	840	0	904	19	0
26	T	746	0	811	17	0
27	U	788	0	843	14	0
28	V	753	0	780	14	0
29	W	582	0	599	13	0
30	X	625	0	652	8	0
31	Y	477	0	505	7	0
32	Z	434	0	470	6	0
33	a	522	0	522	7	0
34	b	429	0	440	13	0
35	c	426	0	464	5	0
36	d	377	0	418	8	0
37	e	504	0	572	13	0
38	f	297	0	339	7	0
39	g	1760	0	1787	17	0
40	h	1636	0	1710	21	0
41	i	1643	0	1707	21	0
42	j	1152	0	1196	13	0
43	k	848	0	846	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
44	l	1181	0	1238	17	0
45	m	979	0	1031	18	0
46	n	1010	0	1057	21	0
47	o	790	0	831	13	0
48	p	877	0	887	18	0
49	q	957	0	1017	14	0
50	r	891	0	952	12	0
51	s	805	0	844	16	0
52	t	708	0	729	10	0
53	u	643	0	661	5	0
54	v	649	0	691	8	0
55	w	535	0	552	9	0
56	x	658	0	683	5	0
57	y	664	0	714	7	0
58	z	589	0	629	7	0
59	4	7134	0	3604	95	0
60	7	1644	0	831	24	0
61	1	291	0	0	0	0
61	2	127	0	0	0	0
61	3	8	0	0	0	0
61	7	3	0	0	0	0
61	8	2	0	0	0	0
61	C	1	0	0	0	0
61	L	1	0	0	0	0
61	M	1	0	0	0	0
61	Q	1	0	0	0	0
61	X	2	0	0	0	0
61	r	1	0	0	0	0
61	y	1	0	0	0	0
62	a	1	0	0	0	0
62	f	1	0	0	0	0
63	B	2	0	0	0	0
All	All	156609	0	104571	1683	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

All (1683) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:8:77:A:C4	6:8:77:A:C5	1.95	1.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:8:77:A:C8	6:8:77:A:N7	1.96	1.33
6:8:77:A:C5	6:8:77:A:N7	2.02	1.26
6:8:77:A:C8	6:8:77:A:N9	2.05	1.24
6:8:77:A:C4	6:8:77:A:N9	2.06	1.22
2:2:1006:G:N1	2:2:1022:A:C2	2.16	1.14
1:1:282:A:H2	1:1:359:G:N1	1.50	1.08
59:4:50:G:N2	59:4:70:A:H61	1.52	1.07
6:8:8:U:C2	6:8:14:A:N6	2.24	1.06
1:1:306:U:H3	1:1:310:A:H62	1.05	1.02
1:1:282:A:C2	1:1:359:G:N1	2.24	1.02
1:1:819:A:H62	1:1:1188:U:H3	1.13	0.97
1:1:1724:G:H1	1:1:1736:U:H3	0.99	0.97
59:4:50:G:H21	59:4:70:A:N6	1.62	0.97
1:1:1421:G:H21	1:1:1494:A:N6	1.64	0.96
1:1:2028:U:H3	1:1:2033:A:H62	1.13	0.95
1:1:1352:U:H3	1:1:1378:A:N6	1.65	0.95
2:2:1349:A:H62	2:2:1373:G:H21	1.13	0.95
1:1:1390:U:H3	1:1:1395:A:H62	0.99	0.94
1:1:1043:C:N4	1:1:1113:U:H3	1.65	0.94
1:1:1717:A:H62	1:1:1743:G:H21	0.94	0.93
1:1:1408:G:H1	1:1:1594:U:H3	1.12	0.93
1:1:2875:C:HO2'	22:P:2:SER:N	1.65	0.93
1:1:78:U:H3	1:1:108:G:H1	1.05	0.93
1:1:1421:G:H21	1:1:1494:A:H61	1.14	0.92
2:2:1349:A:H62	2:2:1373:G:N2	1.66	0.92
1:1:1837:C:C2	1:1:1904:G:N2	2.38	0.92
1:1:538:A:H62	1:1:555:G:H21	1.18	0.91
59:4:50:G:H21	59:4:70:A:H61	0.96	0.91
1:1:2141:G:O6	1:1:2151:U:C2	2.24	0.91
1:1:1483:G:H1	1:1:1506:U:H3	1.19	0.90
1:1:1717:A:H62	1:1:1743:G:N2	1.68	0.89
1:1:1717:A:N6	1:1:1743:G:H21	1.69	0.89
1:1:373:U:H3	1:1:401:A:H62	0.90	0.89
1:1:538:A:H62	1:1:555:G:N2	1.72	0.88
2:2:76:G:N2	2:2:95:C:C2	2.41	0.88
1:1:373:U:H3	1:1:401:A:N6	1.71	0.88
59:4:52:G:H21	59:4:71:A:N6	1.71	0.87
1:1:1858:A:H62	1:1:1884:G:N2	1.73	0.86
1:1:1421:G:N2	1:1:1494:A:H61	1.73	0.86
1:1:1039:A:H2	1:1:1116:G:H1	1.24	0.84
1:1:2136:G:O6	1:1:2155:U:C4	2.30	0.84

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:1043:C:H42	1:1:1113:U:H3	1.23	0.83
2:2:1349:A:N6	2:2:1373:G:H21	1.75	0.83
1:1:388:G:O5'	6:8:77:A:C8	2.31	0.83
1:1:1352:U:H3	1:1:1378:A:H62	0.86	0.83
2:2:1249:C:H42	2:2:1288:A:H62	1.22	0.83
1:1:281:C:H42	1:1:360:U:H3	1.24	0.82
1:1:2475:C:H42	1:1:2529:G:H22	1.24	0.82
1:1:388:G:P	6:8:77:A:C8	2.72	0.82
1:1:281:C:N4	1:1:360:U:H3	1.77	0.81
1:1:1858:A:H62	1:1:1884:G:H21	1.25	0.81
2:2:1166:G:H21	2:2:1170:A:N6	1.79	0.80
1:1:306:U:H3	1:1:310:A:N6	1.78	0.80
1:1:388:G:O5'	6:8:77:A:C4	2.35	0.79
1:1:1837:C:C2	1:1:1904:G:C2	2.71	0.79
59:4:52:G:N2	59:4:71:A:N6	2.30	0.79
1:1:388:G:O5'	6:8:77:A:C5	2.37	0.78
3:3:9:G:H1	3:3:111:U:H3	1.29	0.78
1:1:641:U:H3	1:1:647:G:H1	1.32	0.78
1:1:282:A:H2	1:1:359:G:H1	1.04	0.78
1:1:388:G:P	6:8:77:A:C4	2.77	0.78
1:1:1055:G:O6	1:1:1105:U:C2	2.38	0.77
1:1:388:G:P	6:8:77:A:C5	2.78	0.76
1:1:538:A:N6	1:1:555:G:H21	1.81	0.76
2:2:445:G:H1	2:2:489:C:H42	1.34	0.76
2:2:1088:G:N2	2:2:1167:A:H61	1.84	0.75
1:1:819:A:N6	1:1:1188:U:H3	1.85	0.74
1:1:1390:U:H3	1:1:1395:A:N6	1.81	0.73
1:1:189:G:H21	1:1:207:A:H62	1.37	0.72
1:1:388:G:O5'	6:8:77:A:N9	2.22	0.72
2:2:149:A:C8	2:2:149:A:H5''	2.24	0.72
2:2:149:A:H5''	2:2:149:A:H8	1.54	0.72
1:1:1837:C:O2	1:1:1904:G:C2	2.43	0.71
1:1:1858:A:N6	1:1:1884:G:H21	1.87	0.71
1:1:2839:G:H1	1:1:2878:U:H3	1.39	0.71
1:1:388:G:P	6:8:77:A:N9	2.64	0.71
1:1:2834:G:H21	1:1:2883:A:H62	1.39	0.70
32:Z:6:LYS:HB3	32:Z:58:GLU:HB3	1.73	0.70
1:1:282:A:N1	1:1:359:G:O6	2.25	0.70
1:1:2475:C:H42	1:1:2529:G:N2	1.87	0.70
1:1:539:G:H1	1:1:554:U:H3	1.40	0.69
2:2:1249:C:N4	2:2:1288:A:H62	1.90	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:947:A:N1	1:1:971:G:N2	2.40	0.69
1:1:388:G:P	6:8:77:A:N7	2.66	0.69
59:4:50:G:N2	59:4:70:A:N6	2.31	0.69
14:H:103:ASN:HD22	14:H:107:GLU:HB3	1.58	0.69
59:4:52:G:N2	59:4:71:A:H61	1.91	0.68
1:1:1093:G:N2	1:1:1098:A:N7	2.41	0.68
59:4:32:A:N6	59:4:37:C:OP2	2.27	0.68
60:7:26:C:H3'	60:7:27:A:H8	1.59	0.68
1:1:2305:U:H5''	11:E:131:GLY:HA3	1.76	0.67
2:2:1006:G:C6	2:2:1022:A:C2	2.82	0.67
1:1:2060:A:H62	10:D:69:ARG:HH12	1.42	0.67
6:8:8:U:N3	6:8:14:A:N6	2.42	0.67
1:1:1837:C:N3	1:1:1904:G:N1	2.42	0.67
2:2:1166:G:N2	2:2:1170:A:N6	2.43	0.67
1:1:1837:C:O2	1:1:1904:G:N2	2.27	0.67
4:5:40:GLU:HG3	4:5:70:ILE:HG23	1.76	0.67
13:G:84:ALA:HB2	13:G:90:LEU:HD12	1.76	0.67
2:2:1006:G:N2	2:2:1007:U:O4	2.29	0.66
1:1:1858:A:N6	1:1:1884:G:N2	2.44	0.66
2:2:1006:G:C6	2:2:1022:A:N1	2.64	0.66
2:2:1166:G:N2	2:2:1170:A:H62	1.94	0.66
42:j:38:VAL:HG21	42:j:114:VAL:HG23	1.76	0.66
2:2:587:G:N2	2:2:753:A:O2'	2.29	0.65
1:1:144:A:H5''	26:T:6:ARG:HH12	1.60	0.65
1:1:275:C:O2	1:1:362:A:N6	2.28	0.65
1:1:375:G:N7	1:1:400:G:N2	2.41	0.65
31:Y:3:ALA:O	31:Y:7:ARG:HB2	1.96	0.65
1:1:306:U:O4	1:1:310:A:N7	2.30	0.65
1:1:2834:G:N2	1:1:2883:A:H62	1.93	0.65
2:2:556:C:H2'	2:2:557:G:H8	1.62	0.65
1:1:2287:A:N6	1:1:2346:A:N7	2.45	0.64
2:2:458:U:H2'	2:2:459:A:H8	1.60	0.64
2:2:521:G:N7	49:q:50:ARG:NH2	2.44	0.64
1:1:1308:A:H61	1:1:1608:A:H61	1.43	0.64
1:1:2475:C:N4	1:1:2529:G:H22	1.91	0.64
1:1:494:G:H4'	25:S:6:LYS:HB2	1.79	0.64
39:g:43:LEU:HA	39:g:46:THR:HG22	1.79	0.64
1:1:273:G:H1	1:1:365:U:H3	1.45	0.64
2:2:501:C:OP1	49:q:114:ARG:NH2	2.31	0.64
1:1:864:G:N2	1:1:913:U:O2	2.31	0.64
2:2:570:G:O6	2:2:865:A:N6	2.31	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:8:8:U:C2	6:8:14:A:C6	2.85	0.64
15:I:105:LEU:HD22	15:I:125:THR:HA	1.80	0.64
46:n:84:THR:HG21	46:n:103:PHE:HB3	1.81	0.63
2:2:1349:A:OP2	46:n:120:LYS:NZ	2.31	0.63
24:R:24:LYS:HE2	24:R:92:TRP:HB2	1.81	0.63
43:k:90:MET:SD	55:w:61:ARG:NH2	2.71	0.63
1:1:282:A:N1	1:1:359:G:C6	2.64	0.63
16:J:6:ALA:H	16:J:45:THR:HG21	1.63	0.63
59:4:24:G:N2	59:4:330:U:O2'	2.31	0.63
59:4:56:C:H2'	59:4:57:G:H8	1.63	0.63
1:1:1204:A:H62	1:1:1241:A:H62	1.43	0.63
1:1:1536:C:O2	1:1:1537:G:N2	2.30	0.63
1:1:2144:G:N2	1:1:2148:G:OP2	2.32	0.62
2:2:860:A:H61	2:2:872:A:H62	1.46	0.62
10:D:131:THR:HG22	10:D:160:ALA:HA	1.79	0.62
2:2:1055:A:N3	40:h:156:ARG:NH1	2.47	0.62
6:8:26:C:H42	6:8:46:G:H22	1.45	0.62
46:n:106:ARG:NH1	46:n:107:ASP:O	2.33	0.62
59:4:61:G:H4'	59:4:62:G:H5'	1.81	0.62
2:2:339:C:OP2	17:K:98:ARG:NH1	2.33	0.62
2:2:952:U:H2'	2:2:953:G:H8	1.65	0.62
2:2:1317:C:N3	51:s:53:ARG:NH1	2.47	0.62
39:g:163:VAL:HG21	39:g:173:ILE:HD11	1.80	0.62
1:1:2087:G:N2	1:1:2233:U:O2	2.32	0.62
1:1:2392:A:OP2	37:e:31:HIS:NE2	2.30	0.62
1:1:299:A:OP1	27:U:97:LYS:NZ	2.33	0.62
1:1:698:C:O2'	1:1:734:A:N6	2.33	0.62
2:2:688:G:H5'	48:p:49:GLY:HA3	1.81	0.62
20:N:103:ARG:NH2	20:N:106:ASP:OD2	2.31	0.62
1:1:978:G:HO2'	1:1:1002:G:HO2'	1.45	0.62
1:1:1248:G:N7	10:D:46:GLN:NE2	2.47	0.62
54:v:47:HIS:HB2	54:v:71:LYS:HD3	1.81	0.62
11:E:71:ARG:O	11:E:81:GLN:NE2	2.33	0.62
1:1:132:G:N2	1:1:148:U:O2	2.33	0.61
1:1:388:G:O5'	6:8:77:A:N7	2.26	0.61
3:3:44:G:OP1	33:a:1:MET:N	2.33	0.61
2:2:933:G:H1	2:2:1384:C:H42	1.48	0.61
45:m:29:SER:OG	45:m:30:SER:N	2.33	0.61
59:4:263:G:OP1	59:4:310:G:N2	2.33	0.61
1:1:819:A:N7	1:1:1188:U:O4	2.33	0.61
1:1:1651:G:H1	1:1:2006:C:H42	1.47	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:1208:C:N3	1:1:1239:G:N2	2.48	0.61
1:1:527:C:O2'	16:J:120:ARG:NH1	2.34	0.61
59:4:156:G:N1	59:4:231:A:OP2	2.28	0.61
3:3:72:G:H21	3:3:104:A:H62	1.46	0.61
15:I:105:LEU:HD11	15:I:128:ILE:HB	1.83	0.61
1:1:538:A:N6	1:1:555:G:N2	2.46	0.61
37:e:42:ARG:HG3	37:e:45:ARG:HH12	1.66	0.61
49:q:56:ARG:HB3	49:q:62:GLU:HG2	1.82	0.61
1:1:189:G:N2	1:1:207:A:H62	1.99	0.60
1:1:1450:G:N2	1:1:1452:G:O6	2.34	0.60
1:1:1466:U:H5''	1:1:1467:U:H5'	1.82	0.60
12:F:35:ARG:NH2	12:F:75:MET:SD	2.75	0.60
1:1:1365:A:OP1	30:X:28:ARG:NH2	2.35	0.60
1:1:1954:G:H21	1:1:1956:U:H3	1.49	0.60
39:g:115:LYS:NZ	39:g:152:LYS:O	2.35	0.60
1:1:648:G:H2'	1:1:649:G:H8	1.65	0.60
2:2:537:G:OP1	49:q:110:ARG:NH2	2.34	0.60
2:2:1006:G:C2	2:2:1022:A:C2	2.89	0.60
22:P:63:LYS:HE2	22:P:65:SER:HB2	1.82	0.60
1:1:1352:U:O4	1:1:1378:A:N7	2.34	0.60
26:T:64:LYS:HZ1	26:T:76:ARG:HH11	1.48	0.60
41:i:100:ASN:OD1	41:i:111:ARG:NH1	2.34	0.60
1:1:275:C:C2	1:1:362:A:N6	2.69	0.60
4:5:45:ARG:NH1	4:5:121:ALA:O	2.34	0.60
31:Y:18:LEU:HD23	31:Y:21:LEU:HD23	1.83	0.60
59:4:213:G:H21	59:4:214:C:H41	1.49	0.60
40:h:131:ARG:HH12	40:h:166:GLU:HG3	1.65	0.60
1:1:2316:G:H2'	1:1:2317:A:H8	1.66	0.60
1:1:84:A:N1	1:1:98:G:O2'	2.35	0.60
3:3:8:C:OP1	21:O:15:ARG:NH1	2.35	0.60
21:O:30:ARG:HG2	21:O:102:ARG:HD2	1.82	0.60
29:W:10:THR:OG1	29:W:11:ARG:N	2.35	0.60
1:1:383:C:N3	1:1:392:U:O4	2.35	0.59
1:1:1245:G:OP1	18:L:13:LYS:NZ	2.35	0.59
2:2:1391:U:H2'	2:2:1392:G:H8	1.68	0.59
19:M:26:VAL:HG11	19:M:133:LYS:HA	1.83	0.59
22:P:60:THR:HG22	22:P:73:VAL:HG12	1.83	0.59
2:2:1223:C:H5''	2:2:1224:U:H5''	1.83	0.59
43:k:5:GLU:OE2	55:w:24:LYS:NZ	2.35	0.59
1:1:517:C:OP1	34:b:13:ARG:NH2	2.32	0.59
1:1:2282:G:N2	1:1:2390:U:O2	2.36	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:2:673:A:O3'	43:k:86:ARG:NH2	2.35	0.59
4:5:14:ILE:N	4:5:116:LEU:O	2.36	0.59
1:1:1352:U:N3	1:1:1378:A:N6	2.36	0.59
1:1:1658:C:H42	1:1:2002:G:H1	1.51	0.59
20:N:29:VAL:HB	20:N:75:ILE:HD11	1.85	0.59
54:v:68:SER:OG	54:v:69:LYS:N	2.35	0.59
1:1:1323:C:OP1	25:S:98:LYS:NZ	2.32	0.59
1:1:517:C:O2'	25:S:18:ARG:NH2	2.35	0.59
1:1:1018:U:O2'	1:1:1120:G:N2	2.35	0.59
1:1:1390:U:O4	1:1:1395:A:N7	2.36	0.59
27:U:25:VAL:HA	27:U:36:VAL:HA	1.85	0.59
1:1:1339:G:H5''	26:T:19:LYS:HD2	1.85	0.58
2:2:426:U:OP1	41:i:36:GLN:NE2	2.36	0.58
3:3:9:G:N2	3:3:111:U:O2	2.33	0.58
41:i:188:ARG:NH1	41:i:188:ARG:O	2.36	0.58
1:1:539:G:O6	1:1:554:U:O4	2.21	0.58
1:1:2006:C:O2'	1:1:2823:A:N3	2.36	0.58
2:2:683:G:N2	48:p:39:GLY:O	2.36	0.58
1:1:1358:G:N1	1:1:1372:U:OP2	2.35	0.58
1:1:2028:U:O4	1:1:2033:A:N7	2.36	0.58
2:2:932:C:H5''	44:l:4:ARG:HD2	1.84	0.58
59:4:52:G:N7	59:4:61:G:N2	2.51	0.58
59:4:53:G:N2	59:4:72:A:N1	2.46	0.58
59:4:174:A:H2'	59:4:175:A:H8	1.67	0.58
2:2:219:U:H2'	2:2:220:G:H8	1.68	0.58
3:3:77:U:OP1	28:V:21:ARG:NH1	2.37	0.58
8:B:39:LYS:NZ	8:B:56:GLY:O	2.36	0.58
15:I:79:LEU:HD21	15:I:132:ALA:HA	1.84	0.58
59:4:137:C:H3'	59:4:138:C:H5''	1.85	0.58
59:4:341:U:O2	59:4:345:A:N7	2.36	0.58
33:a:57:VAL:HG22	56:x:42:PRO:HB3	1.85	0.58
45:m:11:LEU:HD22	45:m:75:ILE:HD11	1.85	0.58
1:1:981:A:OP2	1:1:982:C:N4	2.37	0.58
2:2:976:G:OP2	2:2:1358:U:O2'	2.21	0.58
13:G:26:ALA:HA	13:G:30:LEU:HB2	1.86	0.58
37:e:56:GLY:HA2	37:e:59:ILE:HD12	1.85	0.58
1:1:247:G:OP2	1:1:249:C:N4	2.37	0.58
8:B:161:TYR:HB3	8:B:194:GLU:HG3	1.85	0.58
27:U:13:VAL:HA	27:U:70:VAL:HG12	1.86	0.58
1:1:282:A:H2	1:1:359:G:C2	2.19	0.58
2:2:674:G:H2'	2:2:675:A:H8	1.69	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:C:2:ILE:HG13	9:C:84:LEU:HD21	1.85	0.58
30:X:5:CYS:HB2	30:X:10:LYS:H	1.69	0.58
2:2:1280:A:OP1	47:o:9:ARG:NH2	2.37	0.58
2:2:1304:G:N2	2:2:1334:G:O6	2.37	0.58
10:D:158:PHE:HA	10:D:169:VAL:HG21	1.85	0.58
59:4:185:A:H3'	59:4:186:A:C8	2.39	0.58
60:7:15:G:N2	60:7:60:G:N3	2.51	0.58
1:1:9:G:N2	1:1:10:A:N7	2.51	0.57
2:2:17:U:H3	2:2:919:A:H2	1.50	0.57
2:2:891:U:H2'	2:2:892:A:H8	1.69	0.57
2:2:1229:A:OP2	50:r:113:ARG:NH1	2.37	0.57
2:2:195:A:N6	2:2:196:A:N1	2.51	0.57
2:2:405:U:O4	41:i:2:ALA:N	2.37	0.57
59:4:253:U:O4	59:4:278:G:O6	2.22	0.57
59:4:358:C:H2'	59:4:359:C:H4'	1.86	0.57
1:1:1352:U:C2	1:1:1378:A:N6	2.71	0.57
40:h:131:ARG:NH2	40:h:168:TYR:OH	2.36	0.57
59:4:362:C:O5'	60:7:74:A:N6	2.37	0.57
1:1:2141:G:O6	1:1:2151:U:O2	2.22	0.57
2:2:1289:A:H61	46:n:72:ILE:HD11	1.69	0.57
6:8:10:G:H1	6:8:27:A:H4'	1.68	0.57
50:r:101:ARG:NH2	50:r:104:THR:OG1	2.38	0.57
1:1:319:G:N2	1:1:333:G:N3	2.53	0.57
2:2:1305:G:H21	2:2:1332:A:H2	1.51	0.57
2:2:779:C:O2'	48:p:122:ARG:NH1	2.37	0.57
8:B:144:VAL:HB	8:B:154:LEU:HB2	1.86	0.57
10:D:21:ARG:O	10:D:114:ARG:NH2	2.37	0.57
40:h:153:VAL:HG12	40:h:198:VAL:HG22	1.85	0.57
43:k:2:ARG:NH1	43:k:68:GLN:OE1	2.37	0.57
1:1:124:G:N2	1:1:126:A:O2'	2.38	0.57
1:1:489:G:N2	1:1:1320:C:OP1	2.37	0.57
1:1:1476:U:N3	1:1:1516:G:N1	2.53	0.57
1:1:2141:G:C6	1:1:2151:U:O2	2.57	0.57
2:2:718:A:O2'	58:z:35:ARG:NH2	2.36	0.57
1:1:712:G:N2	1:1:720:U:O2	2.36	0.57
1:1:1031:G:H21	38:f:37:GLN:HE22	1.52	0.57
1:1:2306:C:H5''	1:1:2307:G:H2'	1.87	0.57
1:1:2362:C:OP1	37:e:40:ARG:NH1	2.38	0.57
2:2:1029:U:N3	2:2:1033:G:N1	2.52	0.57
2:2:1347:G:O6	46:n:12:ARG:NH2	2.38	0.57
49:q:105:SER:OG	49:q:106:GLY:N	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
54:v:60:GLU:OE1	54:v:77:ARG:NH2	2.38	0.57
1:1:560:C:O2'	23:Q:48:ARG:NH1	2.38	0.57
1:1:920:A:OP1	32:Z:19:LYS:NZ	2.38	0.57
1:1:953:G:OP2	19:M:18:ARG:NH1	2.38	0.57
2:2:447:G:N2	2:2:488:C:N3	2.53	0.57
2:2:1071:C:OP1	42:j:54:ARG:NH2	2.37	0.57
6:8:8:U:O2	6:8:14:A:C6	2.58	0.57
1:1:1715:G:N2	1:1:1744:A:OP2	2.36	0.57
2:2:252:U:O2	2:2:275:G:N2	2.38	0.57
6:8:34:U:OP1	44:l:86:GLN:NE2	2.38	0.57
1:1:954:G:H21	1:1:2274:A:H2	1.52	0.56
1:1:2015:A:H2	34:b:3:VAL:HA	1.70	0.56
1:1:2250:G:O2'	1:1:2496:C:OP1	2.23	0.56
1:1:2359:C:H2'	1:1:2360:G:H8	1.69	0.56
8:B:62:TYR:HA	8:B:86:ASN:HD21	1.70	0.56
8:B:67:PHE:HB3	8:B:152:GLY:H	1.70	0.56
40:h:9:GLY:HA2	40:h:12:LEU:HG	1.87	0.56
1:1:60:G:O6	1:1:89:A:N6	2.37	0.56
1:1:2304:G:H22	1:1:2312:U:H3	1.52	0.56
40:h:7:PRO:O	40:h:11:ARG:NH1	2.38	0.56
1:1:221:A:H61	1:1:428:A:H62	1.54	0.56
1:1:529:A:OP2	16:J:116:ARG:NH2	2.38	0.56
1:1:1447:C:O2'	1:1:1544:A:N3	2.39	0.56
2:2:484:G:H4'	2:2:485:U:H5'	1.88	0.56
2:2:1445:U:O2	2:2:1459:G:N1	2.33	0.56
42:j:22:SER:OG	42:j:23:LYS:N	2.38	0.56
48:p:93:ARG:NH1	48:p:112:ASP:OD2	2.38	0.56
60:7:8:U:N3	60:7:14:A:N6	2.53	0.56
1:1:537:G:O2'	1:1:556:A:N6	2.38	0.56
1:1:2898:U:H2'	1:1:2899:A:H8	1.70	0.56
2:2:375:U:O2	53:u:28:ARG:NH2	2.38	0.56
2:2:689:C:HO2'	2:2:705:G:HO2'	1.53	0.56
20:N:12:ARG:HH22	20:N:40:LYS:HE2	1.69	0.56
56:x:31:LEU:HB3	56:x:49:ILE:HG22	1.87	0.56
1:1:1106:G:H4'	14:H:56:ARG:HB2	1.86	0.56
1:1:2807:U:O2'	1:1:2892:G:N2	2.39	0.56
1:1:2885:G:O6	34:b:29:SER:OG	2.23	0.56
2:2:421:U:OP2	2:2:422:C:N4	2.38	0.56
10:D:132:LYS:O	10:D:136:GLN:NE2	2.39	0.56
1:1:242:G:H2'	37:e:5:LYS:HA	1.86	0.56
1:1:2289:G:H1	1:1:2343:U:H3	1.51	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:2362:C:H5''	37:e:40:ARG:HH11	1.71	0.56
2:2:427:U:H3'	2:2:428:G:H2'	1.87	0.56
2:2:1464:U:H2'	2:2:1465:A:H8	1.71	0.56
6:8:70:A:H2'	6:8:71:G:H8	1.70	0.56
1:1:1063:G:H4'	15:I:135:MET:HG3	1.86	0.56
1:1:466:A:H5'	36:d:21:ARG:HH22	1.70	0.56
2:2:736:C:OP1	55:w:61:ARG:NH1	2.38	0.56
1:1:176:A:H3'	1:1:177:G:H21	1.71	0.56
1:1:527:C:N4	1:1:2779:U:OP2	2.39	0.56
2:2:1149:C:OP2	46:n:11:ARG:NH1	2.38	0.56
49:q:68:GLY:O	49:q:99:ARG:NH1	2.36	0.56
59:4:172:U:H2'	59:4:173:C:H6	1.71	0.56
1:1:2428:G:H5''	1:1:2429:G:H5'	1.86	0.56
1:1:2688:G:N1	1:1:2720:U:OP2	2.39	0.56
1:1:2751:G:OP1	1:1:2751:G:N2	2.37	0.56
8:B:162:VAL:HG12	8:B:176:LEU:HA	1.88	0.56
13:G:132:PHE:HB2	13:G:140:ALA:HB3	1.87	0.56
44:l:15:ASP:N	44:l:15:ASP:OD1	2.35	0.56
59:4:23:G:H2'	59:4:24:G:H8	1.71	0.56
59:4:228:G:O2'	59:4:232:A:N1	2.38	0.56
1:1:467:G:H2'	1:1:468:G:H8	1.72	0.55
1:1:496:G:O2'	25:S:61:ASN:ND2	2.39	0.55
1:1:1223:G:N7	24:R:71:LYS:NZ	2.45	0.55
1:1:1275:A:N6	20:N:15:SER:O	2.38	0.55
2:2:1359:C:OP2	51:s:75:ARG:NH2	2.39	0.55
26:T:58:VAL:HG13	26:T:85:VAL:HG22	1.88	0.55
1:1:1023:U:OP2	1:1:1025:G:O2'	2.24	0.55
1:1:1922:G:O2'	60:7:26:C:O2'	2.18	0.55
12:F:154:PRO:HG3	12:F:163:ARG:HB3	1.88	0.55
1:1:249:C:O2	18:L:63:LYS:NZ	2.38	0.55
1:1:285:G:N7	1:1:357:C:N4	2.51	0.55
1:1:292:U:H3	1:1:349:U:H3	1.55	0.55
1:1:302:C:H2'	1:1:303:G:H8	1.71	0.55
1:1:476:G:N2	1:1:479:A:OP2	2.40	0.55
40:h:179:ARG:NE	40:h:206:GLU:OE2	2.33	0.55
1:1:281:C:N3	1:1:359:G:N2	2.55	0.55
1:1:771:G:HO2'	1:1:1355:G:HO2'	1.49	0.55
2:2:380:G:N2	2:2:383:A:OP2	2.38	0.55
10:D:118:LEU:HD11	10:D:188:MET:HB2	1.87	0.55
1:1:2589:A:N1	1:1:2606:C:N4	2.54	0.55
9:C:124:ARG:NH1	9:C:164:GLN:O	2.39	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
17:K:2:ILE:HD12	17:K:6:THR:HG21	1.88	0.55
24:R:5:PHE:HB3	24:R:38:VAL:HG23	1.88	0.55
26:T:54:GLU:HB3	26:T:88:LYS:HD3	1.88	0.55
59:4:306:U:H2'	59:4:307:G:H8	1.70	0.55
1:1:1055:G:H4'	14:H:33:VAL:HG22	1.88	0.55
1:1:2624:G:H1'	34:b:19:HIS:HE1	1.72	0.55
9:C:34:VAL:HA	9:C:50:VAL:HG12	1.89	0.55
59:4:272:C:H4'	59:4:291:A:H62	1.71	0.55
1:1:1731:G:N1	1:1:1733:G:N3	2.54	0.55
1:1:1870:C:OP1	1:1:1871:A:N6	2.40	0.55
1:1:2831:G:OP2	9:C:59:ARG:NH1	2.39	0.55
2:2:1088:G:N2	2:2:1167:A:N6	2.52	0.55
9:C:176:ASP:HB3	9:C:190:LYS:HB3	1.89	0.55
16:J:13:ARG:NH1	16:J:49:ASP:OD2	2.40	0.55
21:O:39:VAL:HG22	21:O:49:VAL:HG22	1.89	0.55
59:4:52:G:C2	59:4:71:A:N6	2.75	0.55
1:1:1666:G:O6	1:1:1667:G:N2	2.40	0.55
1:1:2388:A:N7	1:1:2389:G:N1	2.55	0.55
1:1:2515:C:H2'	1:1:2516:A:H8	1.71	0.55
2:2:148:G:H2'	2:2:149:A:C8	2.41	0.55
2:2:811:C:O2'	2:2:901:A:N1	2.40	0.55
3:3:113:C:H1'	21:O:46:GLU:HA	1.87	0.55
6:8:14:A:N1	6:8:49:C:N3	2.55	0.55
26:T:48:GLN:NE2	26:T:54:GLU:OE2	2.40	0.55
59:4:194:G:H2'	59:4:195:A:H8	1.71	0.55
1:1:345:A:N3	1:1:346:A:N6	2.55	0.55
8:B:69:ARG:NH2	8:B:118:SER:OG	2.39	0.55
9:C:119:ALA:HB2	9:C:165:MET:HB2	1.89	0.55
13:G:40:THR:OG1	13:G:43:ASN:ND2	2.40	0.55
18:L:55:MET:HE1	18:L:59:ARG:HE	1.71	0.55
48:p:23:ILE:HD12	48:p:86:VAL:HG22	1.89	0.55
1:1:969:G:N2	1:1:985:C:OP1	2.38	0.55
1:1:1072:C:N4	1:1:1093:G:O6	2.40	0.55
2:2:1451:U:O2'	2:2:1453:G:O6	2.25	0.55
21:O:111:ARG:NH2	21:O:117:PHE:OXT	2.40	0.55
59:4:51:A:H2'	59:4:52:G:C8	2.42	0.55
1:1:773:U:O2	1:1:778:G:O2'	2.25	0.54
35:c:11:LEU:O	35:c:20:PHE:HA	2.07	0.54
1:1:106:C:O2'	1:1:294:A:O2'	2.24	0.54
1:1:600:G:N2	1:1:605:G:O3'	2.39	0.54
1:1:1600:C:H2'	1:1:1601:G:H8	1.72	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:2314:A:OP1	11:E:88:LYS:NZ	2.40	0.54
2:2:662:U:O2'	2:2:836:G:OP1	2.24	0.54
8:B:107:PRO:HD2	8:B:110:LEU:HD22	1.89	0.54
10:D:21:ARG:NH2	10:D:107:SER:OG	2.40	0.54
10:D:190:ALA:HA	10:D:193:VAL:HG12	1.89	0.54
16:J:16:TYR:HB2	16:J:54:ILE:HD12	1.89	0.54
19:M:17:ASN:O	19:M:38:ARG:NH1	2.40	0.54
34:b:31:ASP:HB3	34:b:35:GLY:H	1.70	0.54
1:1:558:U:H2'	1:1:559:G:H8	1.72	0.54
1:1:2293:G:H5''	21:O:94:ARG:HH22	1.72	0.54
2:2:15:G:N2	2:2:921:U:O2	2.40	0.54
9:C:27:ILE:HG13	9:C:187:LEU:HB3	1.89	0.54
15:I:106:GLN:HG3	15:I:110:GLN:HE21	1.72	0.54
52:t:64:ARG:NH1	52:t:89:ARG:O	2.39	0.54
1:1:2325:G:N2	1:1:2326:C:N3	2.55	0.54
2:2:212:G:H2'	2:2:213:G:H8	1.72	0.54
2:2:626:G:OP1	53:u:35:ARG:NH2	2.41	0.54
1:1:1098:A:H5'	15:I:8:VAL:HG21	1.89	0.54
2:2:145:G:N2	2:2:178:C:N3	2.56	0.54
6:8:15:G:N2	6:8:60:A:N3	2.52	0.54
21:O:33:ARG:O	21:O:65:THR:OG1	2.26	0.54
27:U:25:VAL:HG12	27:U:36:VAL:HG22	1.90	0.54
28:V:15:GLY:O	28:V:19:ARG:NE	2.38	0.54
1:1:1589:U:HO2'	1:1:1590:A:H8	1.56	0.54
1:1:1800:C:O2'	8:B:153:GLN:NE2	2.40	0.54
2:2:103:U:OP2	57:y:9:LYS:NZ	2.39	0.54
2:2:562:U:O2'	49:q:13:ALA:O	2.23	0.54
12:F:33:LEU:HD22	12:F:75:MET:HG2	1.89	0.54
25:S:85:ILE:HA	25:S:95:ARG:HA	1.88	0.54
44:l:75:VAL:HA	44:l:87:VAL:O	2.07	0.54
59:4:207:A:H61	59:4:222:U:H3	1.56	0.54
1:1:729:G:OP2	8:B:207:LYS:NZ	2.38	0.54
1:1:1279:G:H5'	20:N:34:ILE:HG22	1.89	0.54
2:2:693:G:C5	7:9:1:A:H1'	2.43	0.54
4:5:156:LYS:HG2	41:i:49:SER:HB2	1.88	0.54
52:t:33:THR:OG1	52:t:63:ARG:NH1	2.41	0.54
59:4:347:U:OP2	59:4:348:C:N4	2.33	0.54
1:1:587:C:OP2	18:L:21:ARG:NH1	2.38	0.54
2:2:933:G:O6	44:l:3:ARG:NH2	2.41	0.54
41:i:26:ARG:NH2	41:i:30:THR:O	2.41	0.54
57:y:59:ASP:OD2	57:y:76:LYS:NZ	2.41	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:1949:G:N2	1:1:1958:C:O2	2.40	0.54
1:1:2043:C:N3	1:1:2044:C:N4	2.56	0.54
2:2:76:G:C2	2:2:95:C:C2	2.96	0.54
8:B:6:CYS:SG	8:B:13:ARG:NH2	2.81	0.54
22:P:52:ASN:O	22:P:53:ARG:NH1	2.37	0.54
59:4:17:U:O4	59:4:333:G:N1	2.38	0.54
1:1:712:G:N1	1:1:720:U:C2	2.66	0.53
1:1:1223:G:OP2	24:R:90:ARG:NH1	2.39	0.53
1:1:1476:U:O4	1:1:1516:G:O6	2.27	0.53
2:2:511:C:N3	2:2:541:G:N2	2.56	0.53
2:2:1166:G:N2	2:2:1170:A:C5	2.76	0.53
60:7:8:U:C2	60:7:14:A:N6	2.76	0.53
60:7:74:A:H5''	60:7:74:A:H8	1.72	0.53
1:1:1039:A:N1	1:1:1116:G:O6	2.40	0.53
2:2:674:G:H1	2:2:716:A:H61	1.55	0.53
16:J:59:ALA:H	16:J:126:ALA:HA	1.74	0.53
39:g:86:SER:OG	39:g:222:ARG:NH2	2.41	0.53
1:1:1681:G:N2	1:1:1763:G:OP2	2.37	0.53
1:1:2880:C:O2'	20:N:90:ARG:NH1	2.40	0.53
3:3:93:C:OP2	28:V:18:ARG:NH1	2.41	0.53
15:I:20:SER:O	15:I:24:GLY:N	2.40	0.53
59:4:120:U:H5	59:4:125:A:H61	1.56	0.53
1:1:185:G:H22	1:1:211:C:H42	1.56	0.53
1:1:1779:U:OP2	1:1:1784:A:N6	2.41	0.53
33:a:20:ASN:HD21	33:a:39:LYS:HB2	1.73	0.53
59:4:243:G:N2	59:4:244:G:O6	2.41	0.53
1:1:166:U:H2'	1:1:167:A:H8	1.74	0.53
1:1:642:U:N3	1:1:644:A:N7	2.56	0.53
1:1:1308:A:N6	1:1:1606:C:O2'	2.42	0.53
20:N:9:GLN:NE2	20:N:12:ARG:O	2.41	0.53
41:i:188:ARG:NE	41:i:197:GLU:OE1	2.41	0.53
42:j:77:ASN:HB2	42:j:82:GLN:HG2	1.90	0.53
1:1:500:G:N2	1:1:503:A:O5'	2.38	0.53
1:1:677:A:O2'	1:1:2070:A:O2'	2.27	0.53
2:2:701:U:O2	2:2:703:G:N2	2.42	0.53
2:2:1006:G:O6	2:2:1022:A:N1	2.42	0.53
9:C:27:ILE:HD11	9:C:187:LEU:HD23	1.90	0.53
20:N:14:SER:OG	20:N:17:ARG:NH1	2.42	0.53
21:O:110:ALA:HB1	21:O:115:LEU:HD12	1.90	0.53
1:1:274:C:N4	1:1:363:G:O6	2.41	0.53
1:1:2816:G:N3	1:1:2883:A:O2'	2.37	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:H:26:VAL:HG13	14:H:83:ALA:H	1.73	0.53
17:K:102:PRO:HB3	17:K:121:GLU:HB3	1.90	0.53
1:1:2050:C:N4	1:1:2051:A:N1	2.57	0.53
2:2:1230:C:H5'	60:7:31:C:H4'	1.89	0.53
14:H:26:VAL:HG11	14:H:111:ALA:HB3	1.90	0.53
41:i:83:LYS:O	41:i:89:ASN:ND2	2.42	0.53
59:4:253:U:H3	59:4:278:G:H1	1.56	0.53
1:1:1924:C:O2'	60:7:13:C:OP1	2.25	0.53
1:1:2747:G:H21	1:1:2748:A:H62	1.56	0.53
1:1:2839:G:O6	1:1:2878:U:O4	2.26	0.53
35:c:42:VAL:O	35:c:44:ARG:NH2	2.42	0.53
40:h:40:ARG:NH1	40:h:55:ILE:O	2.42	0.53
40:h:187:SER:OG	40:h:188:GLU:N	2.40	0.53
43:k:18:VAL:HG23	43:k:19:PRO:HD3	1.91	0.53
60:7:8:U:O4	60:7:14:A:N7	2.42	0.53
1:1:2364:C:OP1	29:W:55:ARG:NH2	2.41	0.53
2:2:321:A:N7	2:2:328:C:O2'	2.39	0.53
2:2:1249:C:H42	2:2:1288:A:N6	2.01	0.53
23:Q:66:ASN:OD1	23:Q:70:ARG:NH2	2.41	0.53
28:V:2:PHE:HE2	28:V:55:GLU:HB2	1.74	0.53
59:4:285:A:H2'	59:4:286:A:H5''	1.91	0.53
1:1:2658:C:OP1	12:F:158:LYS:NZ	2.43	0.52
3:3:33:G:H2'	3:3:34:A:H8	1.74	0.52
8:B:45:ASN:OD1	8:B:46:ASN:ND2	2.41	0.52
1:1:1258:U:H2'	1:1:1259:G:H8	1.74	0.52
1:1:2849:U:N3	1:1:2867:G:N3	2.54	0.52
59:4:48:C:H2'	59:4:49:C:H5''	1.91	0.52
1:1:2087:G:H1	1:1:2233:U:H3	1.57	0.52
1:1:2277:G:H3'	29:W:12:ASN:HD21	1.74	0.52
1:1:539:G:OP1	16:J:7:LYS:NZ	2.41	0.52
1:1:2166:U:O4	1:1:2170:A:N6	2.42	0.52
16:J:119:PHE:HA	16:J:122:LEU:HD23	1.91	0.52
59:4:21:C:H2'	59:4:22:G:H8	1.75	0.52
1:1:243:U:H2'	1:1:244:A:H8	1.74	0.52
1:1:1827:U:H5'	1:1:1971:U:H4'	1.90	0.52
1:1:2522:U:O2'	1:1:2647:U:OP1	2.26	0.52
2:2:1001:C:O2'	2:2:1002:G:O4'	2.26	0.52
2:2:1187:G:H5'	46:n:115:LYS:HE3	1.91	0.52
2:2:1349:A:N6	2:2:1373:G:N2	2.42	0.52
19:M:12:MET:H	19:M:72:PRO:HG2	1.75	0.52
40:h:155:GLY:HA2	40:h:163:ALA:HB1	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
48:p:18:ASP:N	48:p:18:ASP:OD1	2.40	0.52
57:y:43:ASP:HB3	57:y:46:ALA:HB3	1.90	0.52
1:1:33:C:N4	1:1:446:G:O2'	2.39	0.52
1:1:2372:U:H2'	1:1:2373:G:H8	1.73	0.52
2:2:981:U:O2'	51:s:61:ARG:NH1	2.42	0.52
2:2:1530:G:O6	58:z:46:LYS:NZ	2.42	0.52
11:E:114:PHE:O	33:a:47:LYS:NZ	2.43	0.52
28:V:16:ALA:HA	28:V:19:ARG:HH11	1.74	0.52
1:1:617:G:H5''	10:D:102:ARG:HH11	1.75	0.52
1:1:1286:A:O2'	1:1:1288:G:OP2	2.27	0.52
1:1:1322:A:O2'	25:S:84:ARG:NH1	2.42	0.52
1:1:1408:G:O6	1:1:1594:U:O4	2.27	0.52
6:8:31:C:H2'	6:8:32:A:H8	1.74	0.52
20:N:95:THR:HB	20:N:113:ILE:HD11	1.92	0.52
44:l:111:ARG:NH2	44:l:126:ASP:OD2	2.41	0.52
51:s:24:ARG:NH1	51:s:56:SER:OG	2.43	0.52
1:1:621:A:OP2	18:L:99:ASN:ND2	2.43	0.52
1:1:467:G:OP1	36:d:33:ARG:NH2	2.43	0.52
1:1:1808:A:H3'	1:1:1809:A:H8	1.75	0.52
1:1:1844:C:O3'	8:B:256:LYS:NZ	2.43	0.52
1:1:1998:A:OP2	9:C:141:ARG:NH2	2.41	0.52
1:1:2014:A:H2'	1:1:2015:A:C8	2.44	0.52
4:5:76:ALA:HB3	4:5:81:VAL:HG13	1.90	0.52
9:C:152:PRO:HB2	9:C:154:LYS:HG2	1.91	0.52
11:E:119:ALA:O	11:E:167:ARG:NH2	2.38	0.52
18:L:23:ILE:HD13	24:R:84:ARG:HG2	1.91	0.52
33:a:26:SER:OG	33:a:27:THR:N	2.43	0.52
44:l:129:GLU:OE1	44:l:131:LYS:NZ	2.43	0.52
1:1:538:A:N6	1:1:555:G:C2	2.71	0.52
1:1:563:A:OP2	24:R:79:ARG:NH2	2.37	0.52
8:B:142:HIS:ND1	8:B:193:GLY:O	2.43	0.52
13:G:104:THR:HG22	13:G:109:GLU:HA	1.91	0.52
51:s:24:ARG:NH1	51:s:55:SER:O	2.43	0.52
1:1:247:G:OP1	1:1:388:G:N2	2.41	0.51
2:2:885:G:OP2	49:q:15:LYS:NZ	2.43	0.51
1:1:390:U:H4'	1:1:391:A:H5'	1.93	0.51
1:1:487:C:O2	25:S:53:SER:OG	2.28	0.51
1:1:948:C:H2'	1:1:949:G:H8	1.75	0.51
1:1:1243:C:O2'	18:L:6:LEU:O	2.26	0.51
1:1:1853:A:OP2	1:1:1888:G:N1	2.43	0.51
14:H:117:LEU:HA	14:H:121:SER:H	1.75	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
39:g:15:HIS:HB3	39:g:43:LEU:HD11	1.92	0.51
59:4:254:U:H2'	59:4:255:A:H8	1.75	0.51
1:1:117:G:OP2	1:1:119:A:O2'	2.26	0.51
1:1:2683:C:OP1	22:P:51:ARG:NH2	2.41	0.51
2:2:568:G:N2	2:2:569:C:O2	2.43	0.51
2:2:1098:C:OP2	39:g:143:LYS:NZ	2.38	0.51
60:7:16:U:O2'	60:7:62:C:OP1	2.26	0.51
1:1:245:G:N7	37:e:8:ARG:NH2	2.56	0.51
1:1:282:A:C2	1:1:359:G:C6	2.98	0.51
1:1:2134:A:O2'	1:1:2159:G:N3	2.42	0.51
1:1:2271:G:H5'	29:W:20:ARG:HG2	1.93	0.51
2:2:1217:C:OP1	51:s:9:ARG:NH2	2.43	0.51
6:8:8:U:N3	6:8:14:A:C6	2.78	0.51
1:1:53:A:H62	1:1:117:G:H21	1.59	0.51
1:1:225:C:N4	1:1:419:U:O2'	2.44	0.51
1:1:434:U:O2'	1:1:436:C:N4	2.43	0.51
1:1:919:U:H2'	1:1:920:A:H8	1.75	0.51
1:1:1056:G:O2'	1:1:1087:G:O6	2.27	0.51
1:1:1124:G:H1'	38:f:37:GLN:HE21	1.75	0.51
1:1:1529:G:O6	1:1:1542:U:C2	2.64	0.51
2:2:771:G:N2	2:2:809:G:N3	2.58	0.51
2:2:1249:C:O2'	46:n:75:GLN:NE2	2.44	0.51
43:k:49:TYR:HB3	55:w:74:HIS:CD2	2.46	0.51
50:r:14:HIS:O	50:r:18:ALA:CB	2.59	0.51
1:1:5:A:H2'	1:1:6:A:H8	1.75	0.51
1:1:879:G:H2'	1:1:880:G:C8	2.46	0.51
1:1:2115:G:HO2'	1:1:2165:C:H42	1.56	0.51
1:1:2857:G:H21	1:1:2859:G:H8	1.58	0.51
2:2:1218:C:H2'	2:2:1219:A:C8	2.45	0.51
9:C:5:VAL:H	9:C:32:ASN:HD21	1.58	0.51
1:1:776:G:N2	1:1:2241:A:OP1	2.34	0.51
1:1:1428:C:N4	1:1:1570:A:OP2	2.37	0.51
2:2:222:C:H2'	2:2:223:A:H8	1.76	0.51
2:2:904:U:H2'	2:2:905:U:H6	1.76	0.51
2:2:977:A:N6	2:2:1224:U:OP1	2.44	0.51
2:2:1452:C:O2	2:2:1453:G:N2	2.43	0.51
14:H:26:VAL:HA	14:H:83:ALA:HB3	1.93	0.51
59:4:30:C:H3'	59:4:34:A:H62	1.76	0.51
1:1:373:U:O4	1:1:401:A:N7	2.44	0.51
1:1:447:A:OP1	23:Q:5:LYS:NZ	2.44	0.51
1:1:2353:G:H22	1:1:2365:G:H1'	1.75	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:8:37:U:O4	44:l:79:ARG:NH1	2.43	0.51
9:C:159:LYS:NZ	9:C:160:LYS:O	2.44	0.51
45:m:96:MET:HE3	45:m:130:ALA:HB1	1.93	0.51
47:o:52:LEU:HB2	51:s:81:ARG:HD2	1.93	0.51
1:1:1534:U:O2'	1:1:1537:G:N1	2.44	0.51
2:2:563:A:O2'	2:2:566:G:O2'	2.26	0.51
4:5:116:LEU:HD21	4:5:125:VAL:HG22	1.92	0.51
10:D:151:GLY:HA3	10:D:191:ASP:HB2	1.92	0.51
1:1:2641:G:N2	1:1:2774:C:N3	2.59	0.51
2:2:517:G:N2	2:2:530:G:OP1	2.35	0.51
1:1:674:G:H5''	10:D:71:GLY:HA3	1.92	0.50
1:1:692:C:H2'	1:1:693:A:H8	1.76	0.50
1:1:874:G:OP1	19:M:62:LYS:NZ	2.43	0.50
1:1:1046:A:H5''	14:H:65:GLU:HG3	1.93	0.50
1:1:2798:U:H4'	1:1:2799:A:H5'	1.92	0.50
2:2:690:G:OP2	48:p:29:ASN:ND2	2.29	0.50
2:2:1513:A:H2'	2:2:1514:G:H8	1.76	0.50
3:3:43:C:O2	11:E:92:ARG:NH2	2.44	0.50
9:C:133:THR:OG1	9:C:134:HIS:N	2.43	0.50
21:O:90:VAL:HG13	21:O:117:PHE:HB3	1.93	0.50
42:j:152:MET:O	42:j:156:LYS:HB2	2.11	0.50
52:t:39:LEU:HD23	52:t:56:LEU:HD13	1.93	0.50
1:1:1036:G:H1	1:1:1119:U:H3	1.59	0.50
2:2:111:G:HO2'	2:2:389:A:HO2'	1.59	0.50
3:3:49:C:H2'	3:3:50:A:H8	1.76	0.50
3:3:81:G:O6	3:3:95:U:O2	2.28	0.50
12:F:105:LEU:HB2	12:F:113:VAL:HB	1.93	0.50
26:T:9:LYS:O	26:T:12:ARG:NH2	2.39	0.50
39:g:129:LEU:HD11	39:g:134:ALA:HB2	1.93	0.50
39:g:187:VAL:HG21	39:g:199:VAL:HG23	1.94	0.50
1:1:667:U:O4	1:1:668:A:N6	2.44	0.50
1:1:1055:G:O6	1:1:1105:U:O2	2.29	0.50
1:1:1568:G:OP2	8:B:63:ARG:NH1	2.41	0.50
1:1:2150:C:H2'	1:1:2151:U:C2	2.46	0.50
1:1:2436:G:H2'	1:1:2437:G:H8	1.76	0.50
1:1:2845:U:O3'	22:P:53:ARG:NH1	2.43	0.50
2:2:126:G:OP1	2:2:605:U:O2'	2.24	0.50
4:5:92:LEU:O	59:4:19:G:O2'	2.23	0.50
9:C:7:LYS:HE3	9:C:198:GLY:HA2	1.94	0.50
14:H:97:LYS:HE2	14:H:101:LYS:HZ2	1.76	0.50
45:m:2:SER:OG	45:m:3:MET:N	2.38	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
59:4:143:C:N4	59:4:176:G:O6	2.45	0.50
1:1:1340:U:OP1	26:T:19:LYS:NZ	2.44	0.50
1:1:2055:C:OP1	34:b:5:GLN:NE2	2.45	0.50
3:3:30:C:H1'	3:3:57:A:H61	1.77	0.50
1:1:302:C:H2'	1:1:303:G:C8	2.47	0.50
1:1:382:A:H61	1:1:393:C:H42	1.60	0.50
1:1:1391:U:O2'	1:1:1393:A:N6	2.42	0.50
1:1:2013:A:H4'	25:S:96:ILE:HG22	1.94	0.50
1:1:2128:G:H21	1:1:2129:C:H41	1.59	0.50
2:2:1413:A:N1	2:2:1488:G:C2	2.80	0.50
1:1:926:G:H2'	1:1:927:A:H8	1.77	0.50
1:1:1266:G:OP1	34:b:16:ARG:NE	2.44	0.50
1:1:2295:C:OP2	21:O:9:ARG:NH2	2.44	0.50
2:2:108:G:H5'	2:2:109:A:H5''	1.94	0.50
2:2:231:U:H2'	2:2:232:G:H8	1.76	0.50
2:2:398:U:H2'	2:2:399:G:H8	1.76	0.50
2:2:835:U:OP1	55:w:53:ARG:NH2	2.44	0.50
17:K:76:VAL:H	22:P:73:VAL:HG22	1.76	0.50
1:1:523:C:O2	1:1:554:U:O2'	2.29	0.50
1:1:937:C:H2'	1:1:938:G:H8	1.76	0.50
1:1:1096:A:N6	1:1:1097:U:O2	2.45	0.50
1:1:1837:C:H2'	1:1:1899:A:H61	1.77	0.50
1:1:1939:5MU:OP1	1:1:2604:U:O2'	2.29	0.50
1:1:2438:U:O2'	1:1:2440:C:OP1	2.27	0.50
2:2:614:C:N4	2:2:626:G:O6	2.39	0.50
23:Q:26:GLY:O	23:Q:30:ARG:NH1	2.43	0.50
1:1:673:C:OP1	10:D:49:ARG:NH2	2.39	0.50
1:1:2756:U:OP2	38:f:19:ARG:NE	2.41	0.50
4:5:70:ILE:HG21	4:5:81:VAL:HG11	1.93	0.50
23:Q:85:LYS:HE2	23:Q:116:ALA:HB1	1.94	0.50
23:Q:90:ILE:HD11	23:Q:94:ILE:HB	1.93	0.50
1:1:69:C:O2	1:1:73:A:O2'	2.30	0.50
1:1:1016:G:N2	1:1:1017:G:O6	2.45	0.50
1:1:2016:U:O2	34:b:4:GLN:NE2	2.35	0.50
2:2:247:G:N2	2:2:248:C:N3	2.59	0.50
8:B:108:LYS:HA	8:B:196:GLY:HA2	1.94	0.50
51:s:6:MET:SD	51:s:9:ARG:NH1	2.76	0.50
1:1:1043:C:N3	1:1:1113:U:O2	2.45	0.49
1:1:1476:U:C4	1:1:1516:G:O6	2.65	0.49
1:1:1716:U:H2'	1:1:1717:A:H8	1.77	0.49
2:2:923:A:O2'	2:2:1399:C:OP2	2.25	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:2:1166:G:N2	2:2:1170:A:C6	2.80	0.49
11:E:80:ARG:NH1	60:7:57:C:OP1	2.44	0.49
14:H:13:ALA:O	14:H:17:GLU:HB2	2.11	0.49
50:r:11:ASP:HA	50:r:45:ILE:HB	1.94	0.49
1:1:812:C:H4'	23:Q:13:ARG:HH22	1.77	0.49
1:1:824:U:O2'	1:1:2358:A:N6	2.42	0.49
1:1:933:A:H5''	1:1:934:U:H5	1.76	0.49
1:1:1299:G:H5''	1:1:1300:G:H5'	1.94	0.49
2:2:776:G:O2'	2:2:777:A:N7	2.46	0.49
2:2:1298:U:H5	44:l:114:LYS:HG2	1.77	0.49
9:C:129:THR:OG1	9:C:140:HIS:O	2.29	0.49
26:T:40:LYS:HG2	26:T:58:VAL:HB	1.94	0.49
46:n:35:LEU:HD11	46:n:48:VAL:HG11	1.94	0.49
1:1:953:G:N2	1:1:965:C:O2	2.45	0.49
1:1:1138:G:H21	16:J:108:MET:HE2	1.77	0.49
2:2:1323:G:H2'	2:2:1324:A:C8	2.47	0.49
9:C:109:VAL:HG22	9:C:203:VAL:HG12	1.94	0.49
15:I:105:LEU:HD21	15:I:128:ILE:HD13	1.95	0.49
16:J:62:VAL:HG11	16:J:101:ILE:HD11	1.93	0.49
18:L:59:ARG:HG3	37:e:13:ARG:HH22	1.78	0.49
59:4:116:A:H2'	59:4:117:G:H5''	1.94	0.49
59:4:135:A:O2'	59:4:177:A:OP1	2.29	0.49
6:8:52:A:H61	6:8:64:C:H42	1.59	0.49
9:C:181:ASP:OD2	9:C:184:ARG:NH2	2.45	0.49
16:J:91:GLU:OE1	16:J:95:ARG:NH2	2.45	0.49
49:q:50:ARG:HG3	49:q:90:LEU:HD11	1.93	0.49
52:t:10:LYS:O	52:t:10:LYS:NZ	2.45	0.49
2:2:319:G:H1	2:2:334:C:H42	1.60	0.49
2:2:1426:G:N3	2:2:1475:G:N2	2.61	0.49
25:S:18:ARG:HG2	25:S:76:VAL:HG11	1.94	0.49
1:1:606:U:H4'	1:1:658:U:H4'	1.94	0.49
1:1:2578:G:C6	9:C:145:SER:HB3	2.48	0.49
15:I:95:ASP:OD1	15:I:95:ASP:N	2.41	0.49
26:T:56:GLU:OE1	26:T:86:THR:OG1	2.31	0.49
1:1:1516:G:H2'	1:1:1517:G:C8	2.47	0.49
2:2:803:G:H2'	2:2:804:U:H6	1.77	0.49
2:2:943:U:H1'	46:n:126:GLN:HE22	1.78	0.49
6:8:19:G:H21	6:8:59:A:H5'	1.76	0.49
8:B:37:ASN:HB2	8:B:62:TYR:HB2	1.95	0.49
20:N:37:THR:HA	20:N:110:MET:HA	1.94	0.49
1:1:83:A:O2'	1:1:84:A:O4'	2.29	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:452:G:H2'	1:1:453:A:H8	1.78	0.49
1:1:527:C:OP2	1:1:2779:U:N3	2.37	0.49
1:1:863:A:O3'	3:3:100:G:N2	2.46	0.49
1:1:1999:C:O2	1:1:2687:U:O2'	2.31	0.49
1:1:2039:U:H2'	1:1:2040:G:C8	2.47	0.49
1:1:2210:U:H4'	1:1:2211:A:H5'	1.95	0.49
1:1:2469:A:H62	1:1:2481:G:H21	1.59	0.49
1:1:2692:G:N3	1:1:2847:U:O2'	2.46	0.49
39:g:73:LYS:NZ	39:g:165:ASP:OD2	2.40	0.49
47:o:15:HIS:HA	47:o:18:ILE:HG22	1.93	0.49
1:1:1785:A:H2	1:1:2588:G:H21	1.61	0.49
1:1:1865:U:OP1	1:1:2409:G:N2	2.45	0.49
1:1:2582:G:H2'	1:1:2583:G:H8	1.78	0.49
2:2:404:G:OP2	41:i:115:ARG:NH2	2.46	0.49
3:3:112:G:N2	21:O:45:SER:OG	2.43	0.49
18:L:62:PRO:HG2	37:e:25:LYS:HB3	1.95	0.49
46:n:81:HIS:CE1	46:n:85:ARG:HH21	2.31	0.49
46:n:81:HIS:HE1	46:n:85:ARG:HH21	1.61	0.49
1:1:414:C:O2	1:1:1864:U:O2'	2.27	0.49
1:1:1039:A:H2	1:1:1116:G:N1	2.02	0.49
1:1:1085:A:H2'	1:1:1086:A:C4	2.48	0.49
1:1:2089:C:H2'	1:1:2090:A:H8	1.77	0.49
1:1:2414:G:H2'	1:1:2415:G:H8	1.78	0.49
1:1:2834:G:H21	1:1:2883:A:N6	2.06	0.49
2:2:76:G:C2	2:2:95:C:O2	2.65	0.49
2:2:676:A:H1'	48:p:117:PRO:HB3	1.93	0.49
10:D:110:SER:OG	10:D:114:ARG:NH2	2.46	0.49
25:S:109:ASP:O	25:S:110:ARG:NH2	2.46	0.49
27:U:74:ASN:HD22	27:U:99:ASN:HD21	1.59	0.49
50:r:14:HIS:O	50:r:18:ALA:HB2	2.13	0.49
52:t:36:ILE:HG23	52:t:56:LEU:HD11	1.94	0.49
1:1:674:G:H1'	10:D:69:ARG:HD3	1.94	0.48
1:1:1483:G:O6	1:1:1506:U:O4	2.31	0.48
1:1:20:C:H2'	1:1:21:A:C8	2.49	0.48
1:1:449:A:O2'	1:1:1248:G:N2	2.46	0.48
1:1:694:U:H5''	1:1:1569:A:N1	2.28	0.48
1:1:2579:C:O2'	9:C:136:ASN:OD1	2.25	0.48
2:2:1086:U:H3	2:2:1099:G:H22	1.60	0.48
2:2:1310:G:OP2	50:r:87:ARG:NH1	2.46	0.48
2:2:1347:G:O2'	2:2:1373:G:O6	2.31	0.48
27:U:15:THR:OG1	27:U:16:GLY:N	2.46	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
40:h:118:ASP:HA	40:h:121:THR:HG22	1.95	0.48
1:1:796:C:H2'	1:1:797:G:C8	2.48	0.48
2:2:552:U:H2'	2:2:553:A:H8	1.77	0.48
16:J:72:LYS:HB3	16:J:89:PHE:HB2	1.95	0.48
42:j:111:MET:HG2	42:j:140:THR:HG21	1.95	0.48
1:1:145:C:H2'	1:1:146:A:H8	1.78	0.48
1:1:903:C:H2'	1:1:904:G:C8	2.48	0.48
1:1:1000:A:OP2	1:1:1154:G:N1	2.39	0.48
1:1:1174:U:O2'	1:1:1176:U:O2'	2.26	0.48
2:2:1391:U:H2'	2:2:1392:G:C8	2.47	0.48
8:B:87:ARG:HG3	8:B:89:ALA:H	1.78	0.48
12:F:84:THR:HB	12:F:134:LYS:HD2	1.95	0.48
30:X:39:TRP:NE1	30:X:41:GLU:OE2	2.46	0.48
37:e:32:ILE:HD12	37:e:35:LYS:HD3	1.95	0.48
59:4:50:G:H2'	59:4:51:A:C8	2.49	0.48
1:1:660:C:H2'	1:1:661:A:C8	2.48	0.48
1:1:2028:U:H3	1:1:2033:A:N6	1.96	0.48
2:2:57:G:N2	2:2:388:G:O6	2.47	0.48
2:2:1052:U:O2'	2:2:1055:A:OP2	2.30	0.48
2:2:1343:G:H4'	46:n:124:ARG:HB2	1.95	0.48
11:E:65:PRO:HB3	11:E:89:VAL:HG22	1.95	0.48
18:L:90:VAL:HG13	18:L:95:LEU:HD21	1.95	0.48
24:R:55:ASP:OD1	24:R:55:ASP:N	2.46	0.48
40:h:73:PRO:O	40:h:76:VAL:O	2.30	0.48
1:1:745:1MG:O2'	1:1:746:PSU:O4'	2.30	0.48
19:M:25:ASP:OD1	19:M:25:ASP:N	2.44	0.48
48:p:64:GLN:NE2	48:p:95:SER:OG	2.42	0.48
59:4:151:C:H2'	59:4:152:C:H6	1.78	0.48
59:4:324:G:N1	59:4:325:G:O6	2.46	0.48
59:4:357:U:H2'	59:4:358:C:C6	2.48	0.48
1:1:55:G:H2'	1:1:56:A:H8	1.78	0.48
1:1:729:G:C8	8:B:207:LYS:HD2	2.49	0.48
1:1:796:C:H2'	1:1:797:G:H8	1.79	0.48
1:1:1858:A:N6	1:1:1884:G:C2	2.81	0.48
1:1:2514:U:H2'	1:1:2515:C:C6	2.49	0.48
2:2:626:G:O3'	53:u:51:ARG:NH1	2.47	0.48
14:H:94:ARG:HH12	14:H:101:LYS:HZ1	1.61	0.48
59:4:44:C:H2'	59:4:45:A:C8	2.48	0.48
60:7:73:C:C6	60:7:73:C:H5''	2.48	0.48
1:1:484:C:N3	1:1:485:C:N4	2.62	0.48
1:1:547:A:H62	1:1:548:G:H21	1.62	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:1190:G:OP1	18:L:33:ARG:N	2.46	0.48
1:1:2136:G:O6	1:1:2155:U:O4	2.32	0.48
1:1:2632:A:O2'	1:1:2811:G:O2'	2.31	0.48
1:1:2708:G:H2'	1:1:2709:G:H8	1.78	0.48
2:2:634:C:H2'	2:2:635:A:C8	2.48	0.48
44:l:113:ASP:OD2	44:l:122:ASN:ND2	2.47	0.48
1:1:1529:G:O6	1:1:1542:U:O2	2.32	0.48
1:1:1753:G:N2	1:1:1756:G:OP2	2.33	0.48
1:1:1801:A:N7	8:B:262:ARG:NH2	2.62	0.48
1:1:2594:C:H2'	1:1:2595:G:C8	2.49	0.48
2:2:114:U:H2'	2:2:115:G:H8	1.77	0.48
2:2:222:C:H2'	2:2:223:A:C8	2.48	0.48
2:2:974:A:OP1	51:s:69:ARG:NH1	2.46	0.48
2:2:1359:C:OP2	51:s:62:ASN:ND2	2.47	0.48
28:V:20:LEU:HD11	28:V:41:GLU:HB3	1.95	0.48
1:1:747:5MU:OP2	25:S:90:LYS:NZ	2.34	0.48
2:2:674:G:H2'	2:2:675:A:C8	2.47	0.48
4:5:115:SER:OG	4:5:116:LEU:N	2.44	0.48
11:E:38:MET:HE3	11:E:57:LEU:HB3	1.95	0.48
12:F:41:VAL:O	12:F:55:ARG:NE	2.45	0.48
48:p:50:SER:O	48:p:50:SER:OG	2.31	0.48
59:4:14:G:N2	59:4:343:C:N3	2.62	0.48
60:7:23:G:O6	60:7:47:G:C2	2.67	0.48
1:1:594:U:O2	1:1:664:G:N2	2.47	0.47
1:1:598:U:H2'	1:1:599:A:H8	1.78	0.47
1:1:818:G:N1	1:1:1188:U:OP2	2.37	0.47
1:1:1259:G:H2'	1:1:1260:A:C8	2.49	0.47
12:F:16:ASP:HB3	12:F:27:LYS:HB3	1.96	0.47
14:H:47:GLU:HG2	14:H:95:LEU:HD21	1.95	0.47
27:U:40:ASN:HB3	27:U:63:ALA:HB3	1.97	0.47
52:t:42:HIS:CE1	52:t:46:HIS:HD2	2.32	0.47
56:x:77:THR:OG1	56:x:78:ARG:N	2.47	0.47
1:1:2147:A:H2'	1:1:2148:G:H8	1.79	0.47
1:1:2577:A:H2'	1:1:2614:A:H62	1.78	0.47
1:1:2874:C:OP1	20:N:4:ARG:NH2	2.48	0.47
3:3:74:U:H1'	28:V:37:PRO:HG2	1.96	0.47
16:J:51:GLY:HA3	16:J:121:LYS:HE3	1.94	0.47
30:X:33:LEU:O	30:X:34:HIS:ND1	2.47	0.47
38:f:25:VAL:HB	38:f:35:GLN:HB2	1.96	0.47
1:1:978:G:O2'	1:1:1002:G:O2'	2.23	0.47
1:1:1055:G:C6	1:1:1105:U:O2	2.67	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:1969:A:O2'	1:1:1972:G:N3	2.35	0.47
1:1:221:A:O2'	1:1:267:C:N4	2.47	0.47
1:1:1043:C:N4	1:1:1113:U:N3	2.41	0.47
1:1:1050:A:O2'	1:1:2752:C:O2	2.33	0.47
1:1:2302:U:H2'	1:1:2303:G:H8	1.80	0.47
41:i:49:SER:OG	41:i:50:ASP:N	2.44	0.47
43:k:73:GLU:O	43:k:76:THR:OG1	2.30	0.47
52:t:49:ASP:OD2	52:t:52:SER:OG	2.29	0.47
1:1:1219:U:H2'	1:1:1220:G:C8	2.49	0.47
1:1:2264:C:N4	29:W:15:ASP:OD1	2.47	0.47
1:1:2559:C:H2'	1:1:2560:A:H8	1.78	0.47
1:1:2646:C:OP2	1:1:2732:G:O2'	2.31	0.47
11:E:102:ARG:NH1	33:a:25:ARG:O	2.47	0.47
15:I:126:ARG:HA	15:I:129:GLU:HB2	1.96	0.47
19:M:3:GLN:HE21	19:M:92:TRP:CD1	2.31	0.47
1:1:1432:G:H2'	1:1:1433:A:C8	2.50	0.47
2:2:114:U:H2'	2:2:115:G:C8	2.50	0.47
2:2:673:A:H2'	2:2:674:G:C8	2.50	0.47
2:2:1513:A:H2'	2:2:1514:G:C8	2.49	0.47
3:3:63:C:N4	3:3:64:G:O6	2.48	0.47
8:B:4:VAL:HG12	8:B:18:LYS:HE2	1.95	0.47
9:C:13:ARG:HH11	22:P:56:HIS:HA	1.78	0.47
14:H:13:ALA:O	14:H:17:GLU:CB	2.62	0.47
24:R:68:ARG:HE	24:R:90:ARG:HB2	1.80	0.47
30:X:11:ARG:HD3	30:X:12:PRO:HD2	1.97	0.47
45:m:105:SER:HB3	45:m:126:ILE:HD11	1.96	0.47
1:1:226:A:O2'	1:1:229:C:N4	2.43	0.47
1:1:332:A:O2'	1:1:334:C:OP2	2.30	0.47
1:1:566:U:O2'	1:1:809:G:OP2	2.32	0.47
1:1:888:C:N4	50:r:81:MET:SD	2.70	0.47
1:1:968:C:H2'	1:1:969:G:C8	2.50	0.47
1:1:1089:A:H2	1:1:1090:A:H62	1.62	0.47
1:1:1174:U:OP1	1:1:1175:A:N6	2.48	0.47
1:1:2016:U:O2'	34:b:4:GLN:O	2.32	0.47
1:1:2626:C:H2'	1:1:2627:G:C8	2.50	0.47
1:1:2875:C:O2'	22:P:2:SER:N	2.37	0.47
2:2:574:A:HO2'	2:2:882:C:HO2'	1.62	0.47
2:2:1328:C:H5''	50:r:28:THR:HG21	1.95	0.47
3:3:27:C:H5''	21:O:34:HIS:CD2	2.50	0.47
3:3:66:A:OP2	3:3:108:A:N6	2.48	0.47
3:3:72:G:N2	3:3:104:A:H62	2.11	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:E:163:ASP:O	11:E:167:ARG:NH1	2.48	0.47
26:T:94:ASP:OD1	26:T:94:ASP:N	2.44	0.47
28:V:30:ILE:HG12	28:V:91:PHE:HB2	1.97	0.47
29:W:30:SER:HA	29:W:66:LYS:HA	1.97	0.47
31:Y:7:ARG:O	31:Y:7:ARG:NH1	2.39	0.47
31:Y:28:LEU:HG	31:Y:43:LEU:HD23	1.97	0.47
42:j:72:ILE:HD11	42:j:145:GLU:HG3	1.97	0.47
49:q:109:ASP:OD1	49:q:111:LYS:NZ	2.48	0.47
53:u:68:SER:OG	53:u:69:ASP:N	2.48	0.47
1:1:1259:G:H2'	1:1:1260:A:H8	1.79	0.47
1:1:2594:C:O2'	60:7:73:C:OP1	2.26	0.47
1:1:2848:G:O2'	1:1:2867:G:N2	2.40	0.47
2:2:552:U:O2'	49:q:83:ARG:O	2.33	0.47
22:P:31:TRP:HE3	22:P:38:LYS:HG2	1.79	0.47
39:g:70:VAL:HG23	39:g:163:VAL:HG12	1.95	0.47
1:1:399:U:H5	30:X:57:ARG:HH22	1.62	0.47
1:1:948:C:H2'	1:1:949:G:C8	2.50	0.47
1:1:2443:C:H2'	1:1:2444:G:H8	1.80	0.47
2:2:176:C:H4'	57:y:24:ARG:HH21	1.80	0.47
2:2:875:U:O2	45:m:16:ASN:ND2	2.37	0.47
2:2:1147:C:O2	46:n:18:ARG:NH1	2.48	0.47
2:2:1250:A:H4'	46:n:70:GLY:H	1.79	0.47
6:8:10:G:O6	6:8:27:A:O2'	2.31	0.47
9:C:1:MET:HG2	9:C:2:ILE:HD12	1.97	0.47
14:H:32:GLY:HA2	14:H:37:LYS:HD3	1.95	0.47
17:K:13:ASN:OD1	17:K:97:THR:N	2.47	0.47
28:V:9:ARG:HE	28:V:20:LEU:HD13	1.80	0.47
29:W:50:ASN:HB3	29:W:82:ILE:HB	1.96	0.47
1:1:707:G:O6	1:1:725:G:N2	2.48	0.47
1:1:806:C:O3'	1:1:830:G:N2	2.47	0.47
1:1:965:C:H2'	1:1:966:G:C8	2.50	0.47
1:1:1681:G:N3	1:1:1762:A:H2'	2.30	0.47
1:1:2682:A:C2	9:C:23:PRO:HB3	2.50	0.47
1:1:2830:C:H3'	9:C:59:ARG:HH11	1.80	0.47
2:2:1249:C:H4'	46:n:75:GLN:HE22	1.80	0.47
10:D:125:SER:OG	10:D:126:VAL:N	2.48	0.47
12:F:137:ASP:OD1	12:F:137:ASP:N	2.44	0.47
19:M:54:THR:HA	19:M:57:VAL:HG12	1.95	0.47
20:N:42:LYS:HG2	20:N:45:ARG:HH21	1.80	0.47
41:i:57:GLU:HG2	41:i:199:LEU:HD12	1.96	0.47
45:m:74:SER:HB3	45:m:130:ALA:HB3	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
59:4:34:A:O2'	59:4:323:A:N3	2.35	0.47
59:4:53:G:O2'	59:4:72:A:OP2	2.27	0.47
59:4:167:G:N2	59:4:168:G:O6	2.48	0.47
60:7:29:C:H2'	60:7:30:A:C8	2.50	0.47
1:1:608:A:H2'	1:1:609:A:C8	2.50	0.46
1:1:670:A:OP1	18:L:42:SER:OG	2.30	0.46
1:1:968:C:H2'	1:1:969:G:H8	1.80	0.46
1:1:2243:U:H2'	1:1:2244:U:H6	1.80	0.46
2:2:662:U:H2'	2:2:663:A:C8	2.50	0.46
3:3:76:G:O3'	28:V:21:ARG:NH2	2.42	0.46
41:i:121:LYS:HZ3	41:i:131:ASN:HB2	1.80	0.46
43:k:36:ILE:HA	43:k:64:VAL:HG23	1.97	0.46
57:y:56:PRO:O	57:y:60:ARG:HB2	2.14	0.46
59:4:23:G:H2'	59:4:24:G:C8	2.50	0.46
1:1:961:C:O2'	1:1:2031:A:N6	2.48	0.46
1:1:1077:A:N6	15:I:134:SER:OG	2.49	0.46
10:D:72:SER:O	10:D:75:SER:OG	2.32	0.46
11:E:132:VAL:HB	11:E:137:ILE:HD11	1.95	0.46
12:F:30:ASN:ND2	12:F:78:GLY:O	2.44	0.46
14:H:57:ASN:HB2	14:H:62:ARG:HE	1.80	0.46
18:L:80:SER:O	18:L:84:LYS:NZ	2.43	0.46
20:N:19:ALA:O	20:N:23:ASN:ND2	2.47	0.46
23:Q:84:LYS:HA	23:Q:84:LYS:HD3	1.78	0.46
24:R:68:ARG:HG3	24:R:92:TRP:CD1	2.50	0.46
47:o:37:ARG:HB2	47:o:75:ASP:HB2	1.97	0.46
1:1:1098:A:N6	1:1:1099:G:N3	2.63	0.46
1:1:2233:U:H2'	1:1:2234:G:H8	1.79	0.46
1:1:2356:U:O2	1:1:2361:G:O6	2.33	0.46
1:1:2822:G:O2'	1:1:2824:C:OP2	2.26	0.46
2:2:1035:A:N1	2:2:1036:A:N6	2.63	0.46
27:U:32:GLY:O	27:U:66:GLN:NE2	2.49	0.46
45:m:29:SER:HB3	45:m:57:PRO:HG2	1.98	0.46
55:w:11:CYS:SG	55:w:12:ARG:N	2.87	0.46
59:4:246:U:H3	59:4:283:C:P	2.39	0.46
1:1:674:G:H1	1:1:807:U:H3	1.63	0.46
1:1:1710:G:H2'	1:1:1711:A:H8	1.80	0.46
2:2:287:U:H2'	2:2:288:A:H8	1.81	0.46
21:O:8:ILE:O	21:O:12:THR:OG1	2.26	0.46
32:Z:4:THR:OG1	32:Z:37:GLU:OE2	2.33	0.46
39:g:120:GLN:O	39:g:125:THR:N	2.47	0.46
1:1:2046:G:N1	1:1:2623:G:N3	2.63	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:2349:G:OP2	37:e:42:ARG:NH2	2.43	0.46
1:1:2576:G:O2'	1:1:2579:C:OP2	2.26	0.46
2:2:62:U:O2'	2:2:379:C:O2	2.33	0.46
2:2:719:C:H1'	55:w:38:LYS:HB3	1.97	0.46
4:5:106:ARG:NH1	4:5:107:GLU:OE1	2.49	0.46
6:8:16:U:O2'	6:8:62:C:OP1	2.25	0.46
10:D:111:GLU:OE2	10:D:115:GLN:NE2	2.45	0.46
59:4:322:U:H2'	59:4:323:A:C8	2.50	0.46
1:1:1019:U:OP1	1:1:1035:U:O2'	2.33	0.46
1:1:1517:G:H22	1:1:1732:C:H1'	1.80	0.46
1:1:1528:A:N6	1:1:1543:G:O2'	2.48	0.46
1:1:1809:A:H2'	1:1:1810:A:C8	2.51	0.46
2:2:301:G:H2'	2:2:302:G:H8	1.81	0.46
2:2:1429:A:H2'	2:2:1430:A:H8	1.81	0.46
3:3:33:G:H2'	3:3:34:A:C8	2.51	0.46
3:3:39:A:H1'	3:3:44:G:H22	1.80	0.46
12:F:8:PRO:O	12:F:69:ARG:NH2	2.49	0.46
25:S:7:HIS:HB2	25:S:50:VAL:HG11	1.97	0.46
59:4:251:U:H2'	59:4:252:G:H8	1.81	0.46
1:1:185:G:H1'	1:1:212:G:H22	1.80	0.46
1:1:2064:C:H5''	60:7:76:C:H5''	1.98	0.46
1:1:2578:G:H21	9:C:130:GLN:HE22	1.62	0.46
1:1:2746:U:N3	1:1:2756:U:O4	2.39	0.46
1:1:2861:U:H2'	1:1:2862:G:C8	2.50	0.46
2:2:1029:U:O2	2:2:1033:G:C2	2.69	0.46
2:2:1178:G:N2	2:2:1181:G:OP2	2.39	0.46
10:D:130:LYS:HB3	10:D:133:LEU:HG	1.98	0.46
11:E:58:ALA:HB2	11:E:65:PRO:HD3	1.98	0.46
16:J:77:HIS:HD2	16:J:84:ILE:HB	1.81	0.46
54:v:21:ILE:HG21	54:v:53:CYS:HB2	1.98	0.46
59:4:184:A:H1'	59:4:185:A:H8	1.80	0.46
59:4:211:C:N4	59:4:241:C:OP2	2.31	0.46
1:1:694:U:H2'	1:1:695:G:H8	1.79	0.46
1:1:887:A:O2'	1:1:889:C:OP2	2.33	0.46
1:1:1583:A:H4'	1:1:1585:C:H41	1.80	0.46
1:1:2781:A:H5''	1:1:2782:G:H5'	1.98	0.46
2:2:137:U:H2'	2:2:138:G:H8	1.80	0.46
6:8:67:C:N4	6:8:68:G:O6	2.49	0.46
11:E:46:ASP:OD1	11:E:46:ASP:N	2.48	0.46
16:J:45:THR:H	16:J:50:THR:HG21	1.80	0.46
23:Q:102:ASP:OD2	24:R:2:TYR:OH	2.33	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
30:X:27:ARG:NE	30:X:28:ARG:O	2.46	0.46
35:c:10:LYS:HG2	35:c:20:PHE:HB2	1.97	0.46
41:i:119:SER:O	41:i:119:SER:OG	2.24	0.46
43:k:43:GLY:O	43:k:58:HIS:ND1	2.40	0.46
60:7:23:G:O6	60:7:47:G:N1	2.48	0.46
1:1:1057:A:H1'	14:H:34:THR:HG21	1.97	0.46
1:1:1096:A:H2'	1:1:1097:U:H4'	1.97	0.46
1:1:1322:A:OP1	25:S:11:ARG:NH1	2.42	0.46
1:1:1837:C:N3	1:1:1904:G:C2	2.83	0.46
1:1:1851:U:O2'	6:8:72:C:OP1	2.33	0.46
10:D:170:ARG:NH2	10:D:174:GLY:O	2.42	0.46
13:G:68:ARG:O	13:G:71:LYS:NZ	2.47	0.46
48:p:88:GLY:O	48:p:93:ARG:NH2	2.49	0.46
1:1:729:G:C5	8:B:207:LYS:HB2	2.50	0.46
1:1:863:A:H2'	1:1:864:G:C8	2.51	0.46
1:1:2046:G:H22	1:1:2623:G:H1'	1.80	0.46
3:3:13:G:N1	3:3:69:G:O2'	2.48	0.46
4:5:73:MET:HG3	4:5:74:ALA:H	1.81	0.46
9:C:19:GLY:HA2	22:P:79:PRO:HG2	1.98	0.46
11:E:4:LEU:HD13	11:E:101:GLU:HB2	1.97	0.46
59:4:304:C:H2'	59:4:305:A:H8	1.81	0.46
1:1:469:G:O6	36:d:39:ARG:NH1	2.50	0.45
1:1:717:C:H3'	1:1:718:A:H8	1.81	0.45
1:1:770:G:OP2	36:d:11:LYS:NZ	2.49	0.45
1:1:2029:G:N1	1:1:2033:A:OP2	2.42	0.45
1:1:2564:A:OP1	1:1:2648:G:O2'	2.29	0.45
1:1:2666:C:N4	12:F:108:GLY:O	2.43	0.45
21:O:33:ARG:NH1	21:O:64:TYR:OH	2.49	0.45
32:Z:49:ASN:HA	32:Z:52:SER:HB3	1.98	0.45
43:k:36:ILE:HD11	43:k:39:LEU:HD22	1.97	0.45
47:o:52:LEU:HB2	51:s:81:ARG:HH11	1.80	0.45
1:1:82:U:H2'	1:1:83:A:C8	2.52	0.45
1:1:523:C:O2'	1:1:554:U:O2	2.32	0.45
1:1:1309:G:HO2'	1:1:1611:C:HO2'	1.64	0.45
10:D:151:GLY:HA2	10:D:192:ALA:HB2	1.97	0.45
50:r:26:GLY:O	50:r:30:SER:HB3	2.16	0.45
59:4:11:C:H4'	59:4:12:U:H3'	1.99	0.45
59:4:56:C:H2'	59:4:57:G:C8	2.47	0.45
59:4:163:G:O2'	59:4:164:G:H5'	2.16	0.45
59:4:174:A:H2'	59:4:175:A:C8	2.50	0.45
1:1:647:G:H2'	1:1:648:G:C8	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:700:G:O2'	1:1:1632:A:N3	2.38	0.45
1:1:1394:U:H4'	1:1:1603:A:H4'	1.98	0.45
1:1:2250:G:OP2	1:1:2250:G:N2	2.42	0.45
1:1:2298:A:OP1	11:E:71:ARG:NH2	2.43	0.45
1:1:2436:G:H2'	1:1:2437:G:C8	2.52	0.45
9:C:8:LYS:NZ	9:C:195:GLY:O	2.41	0.45
21:O:43:ASN:ND2	21:O:46:GLU:OE2	2.49	0.45
45:m:27:MET:HB3	45:m:27:MET:HE2	1.72	0.45
47:o:40:ILE:HD11	47:o:73:LEU:HD23	1.99	0.45
48:p:46:THR:OG1	48:p:47:ALA:N	2.50	0.45
1:1:629:G:O2'	1:1:639:U:O2	2.34	0.45
1:1:886:A:H3'	1:1:887:A:C8	2.52	0.45
1:1:1386:C:H2'	1:1:1387:A:H8	1.80	0.45
2:2:8:A:N6	41:i:202:GLU:O	2.45	0.45
2:2:976:G:N2	2:2:1363:A:N3	2.63	0.45
9:C:122:VAL:HG21	9:C:141:ARG:HE	1.81	0.45
10:D:106:LYS:NZ	10:D:200:LEU:O	2.42	0.45
23:Q:19:LYS:HA	23:Q:19:LYS:HD3	1.77	0.45
34:b:48:TYR:CZ	34:b:53:LYS:HD3	2.52	0.45
47:o:53:ILE:HG22	51:s:85:ARG:HD2	1.97	0.45
1:1:675:A:O2'	10:D:62:GLN:OE1	2.29	0.45
1:1:1724:G:O6	1:1:1736:U:O4	2.34	0.45
1:1:2037:A:H2'	1:1:2038:G:H8	1.81	0.45
1:1:2066:C:C2	1:1:2445:2MG:HM22	2.51	0.45
1:1:2266:A:N6	1:1:2273:A:OP2	2.41	0.45
1:1:2586:U:H2'	1:1:2587:A:C8	2.52	0.45
2:2:401:C:O2'	2:2:621:A:N3	2.48	0.45
8:B:168:ASP:OD1	8:B:168:ASP:N	2.49	0.45
21:O:66:GLY:O	21:O:102:ARG:NH1	2.50	0.45
46:n:25:ASN:OD1	46:n:25:ASN:N	2.49	0.45
1:1:19:A:OP1	23:Q:23:GLY:N	2.47	0.45
1:1:720:U:H2'	1:1:721:A:C8	2.52	0.45
1:1:1155:A:O3'	23:Q:55:ARG:NH2	2.46	0.45
2:2:1112:C:H42	40:h:178:LEU:HD23	1.80	0.45
11:E:127:ASN:HD22	11:E:157:THR:HG23	1.81	0.45
12:F:103:ILE:HG12	12:F:117:LEU:HD21	1.97	0.45
18:L:23:ILE:HG21	24:R:84:ARG:HE	1.82	0.45
22:P:9:GLU:O	22:P:10:GLN:NE2	2.49	0.45
25:S:4:ILE:HG22	25:S:106:VAL:HA	1.98	0.45
54:v:11:ARG:O	54:v:24:ALA:N	2.43	0.45
59:4:333:G:OP2	59:4:335:C:N4	2.47	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:370:G:O2'	1:1:424:G:OP1	2.34	0.45
1:1:581:C:H2'	1:1:582:A:C8	2.52	0.45
1:1:2037:A:H2'	1:1:2038:G:C8	2.52	0.45
1:1:2562:U:H4'	17:K:25:LEU:HD22	1.98	0.45
2:2:768:A:H2	2:2:1512:U:H4'	1.82	0.45
2:2:806:C:H2'	2:2:807:A:C8	2.52	0.45
2:2:947:G:O2'	2:2:1306:A:O2'	2.28	0.45
12:F:9:VAL:HA	12:F:69:ARG:HH21	1.81	0.45
22:P:106:LYS:HG3	22:P:109:ARG:HH22	1.81	0.45
23:Q:53:ARG:HA	23:Q:56:GLN:HE21	1.81	0.45
59:4:306:U:H2'	59:4:307:G:C8	2.50	0.45
1:1:118:A:N6	1:1:119:A:N1	2.65	0.45
1:1:770:G:O2'	1:1:1379:U:O4	2.32	0.45
1:1:1050:A:H2	1:1:2751:G:H2'	1.82	0.45
1:1:1324:G:O2'	1:1:1326:U:OP2	2.30	0.45
1:1:1656:C:H2'	1:1:1657:U:C6	2.52	0.45
1:1:2368:C:H2'	1:1:2369:A:H8	1.81	0.45
2:2:28:A:N7	2:2:29:U:N3	2.65	0.45
2:2:672:U:H2'	2:2:673:A:H8	1.82	0.45
9:C:55:LYS:N	9:C:75:ALA:O	2.48	0.45
39:g:59:LYS:HE3	39:g:59:LYS:HB2	1.81	0.45
1:1:1035:U:O2	1:1:1120:G:O6	2.35	0.45
1:1:2828:G:H2'	1:1:2829:A:H8	1.81	0.45
2:2:1347:G:N2	2:2:1374:A:OP2	2.47	0.45
8:B:144:VAL:HG11	8:B:174:LEU:HD11	1.99	0.45
10:D:112:LEU:HD12	10:D:113:VAL:HG23	1.98	0.45
10:D:119:ILE:O	10:D:187:VAL:HA	2.17	0.45
20:N:1:MET:HB3	20:N:1:MET:HE2	1.79	0.45
27:U:28:VAL:HG23	27:U:34:VAL:HG12	1.98	0.45
42:j:41:ASP:OD1	42:j:41:ASP:N	2.50	0.45
59:4:44:C:O2'	59:4:45:A:H5'	2.17	0.45
1:1:1463:C:H2'	1:1:1464:G:C8	2.52	0.45
1:1:2508:G:H2'	1:1:2509:G:H8	1.81	0.45
2:2:532:A:H62	40:h:193:TYR:HE1	1.64	0.45
2:2:1004:A:OP1	2:2:1024:G:N1	2.50	0.45
4:5:111:VAL:HG12	4:5:129:VAL:HG22	1.99	0.45
12:F:25:THR:HG23	12:F:32:GLU:HB2	1.99	0.45
14:H:58:THR:HG22	14:H:84:TYR:HB2	1.99	0.45
16:J:17:VAL:HG12	16:J:55:ILE:HB	1.99	0.45
18:L:110:VAL:HG23	18:L:128:THR:HG22	1.98	0.45
38:f:10:LEU:HB2	38:f:33:HIS:CE1	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:672:C:N3	1:1:809:G:N2	2.64	0.44
1:1:680:C:H2'	1:1:681:G:C8	2.52	0.44
1:1:2246:G:H2'	1:1:2247:A:C8	2.52	0.44
41:i:105:MET:HE3	41:i:171:LEU:HD22	1.98	0.44
46:n:36:GLU:OE1	46:n:45:ARG:NE	2.46	0.44
1:1:243:U:H2'	1:1:244:A:C8	2.53	0.44
1:1:1091:G:O6	1:1:1101:U:C4	2.70	0.44
1:1:1822:C:H2'	1:1:1823:G:C8	2.52	0.44
1:1:2298:A:H62	1:1:2318:G:H21	1.64	0.44
2:2:410:G:OP2	41:i:31:LYS:NZ	2.40	0.44
38:f:30:GLU:HG3	38:f:33:HIS:H	1.81	0.44
51:s:45:VAL:O	51:s:49:GLN:NE2	2.50	0.44
1:1:467:G:H2'	1:1:468:G:C8	2.52	0.44
1:1:1190:G:OP1	18:L:34:GLY:N	2.47	0.44
1:1:2845:U:H2'	1:1:2846:G:C8	2.52	0.44
8:B:8:PRO:HB3	8:B:14:ARG:HD3	1.98	0.44
13:G:129:GLU:HA	13:G:143:ILE:HA	1.98	0.44
20:N:33:ILE:HD12	20:N:114:GLU:HB3	1.98	0.44
1:1:780:G:N1	8:B:229:ASP:OD2	2.48	0.44
1:1:1387:A:H2'	1:1:1388:G:H8	1.82	0.44
2:2:977:A:O2'	2:2:979:C:OP2	2.33	0.44
42:j:43:ASN:HB3	42:j:44:GLY:H	1.67	0.44
45:m:13:ARG:HD2	45:m:27:MET:HE2	1.98	0.44
48:p:55:SER:O	48:p:55:SER:OG	2.35	0.44
1:1:1987:A:H2'	1:1:1988:G:H8	1.82	0.44
1:1:2014:A:H2'	1:1:2015:A:H8	1.80	0.44
1:1:2485:G:H5''	19:M:45:GLN:HE21	1.83	0.44
2:2:21:G:H2'	2:2:22:G:C8	2.52	0.44
2:2:253:A:H2'	2:2:254:G:H8	1.82	0.44
6:8:8:U:N3	6:8:14:A:C5	2.85	0.44
13:G:12:LEU:HD11	13:G:21:VAL:HG12	1.99	0.44
36:d:19:ARG:HA	36:d:22:MET:HB2	2.00	0.44
41:i:203:LEU:HD12	41:i:203:LEU:HA	1.83	0.44
1:1:166:U:H2'	1:1:167:A:C8	2.51	0.44
1:1:1022:G:N2	1:1:1141:U:O2	2.49	0.44
1:1:1330:C:H2'	1:1:1331:G:C8	2.53	0.44
1:1:1822:C:H2'	1:1:1823:G:H8	1.82	0.44
1:1:2139:U:H2'	1:1:2140:G:C8	2.53	0.44
1:1:2281:A:H4'	1:1:2389:G:H21	1.83	0.44
14:H:94:ARG:O	14:H:94:ARG:NH1	2.41	0.44
29:W:38:VAL:HB	29:W:59:LEU:HD12	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
59:4:20:A:O2'	59:4:21:C:H5'	2.17	0.44
1:1:540:C:H2'	1:1:541:A:C8	2.52	0.44
1:1:1091:G:O6	1:1:1101:U:O4	2.36	0.44
1:1:1666:G:H4'	17:K:6:THR:HG23	1.98	0.44
1:1:1724:G:N2	1:1:1736:U:O2	2.35	0.44
2:2:992:U:C4	2:2:1045:C:N4	2.86	0.44
3:3:49:C:H2'	3:3:50:A:C8	2.53	0.44
8:B:41:GLY:O	8:B:43:ARG:NH1	2.51	0.44
24:R:34:GLU:HB3	24:R:60:LYS:HG2	1.99	0.44
34:b:28:LEU:HD12	34:b:37:LYS:HB3	2.00	0.44
43:k:90:MET:HE3	43:k:90:MET:HB2	1.76	0.44
57:y:36:TYR:HD1	57:y:36:TYR:HA	1.70	0.44
1:1:19:A:H2'	1:1:20:C:C6	2.53	0.44
1:1:523:C:O3'	1:1:539:G:N2	2.51	0.44
1:1:695:G:OP1	1:1:1569:A:N6	2.50	0.44
1:1:958:U:OP1	19:M:40:ARG:NH2	2.51	0.44
1:1:994:C:H1'	24:R:10:LYS:HD3	1.99	0.44
1:1:2377:A:O2'	21:O:117:PHE:O	2.36	0.44
1:1:2645:G:H4'	1:1:2732:G:H1'	1.98	0.44
2:2:171:A:H2'	2:2:172:A:C8	2.53	0.44
2:2:1087:G:N2	58:z:70:LEU:O	2.51	0.44
27:U:43:LYS:NZ	27:U:60:GLU:OE2	2.44	0.44
54:v:11:ARG:HG2	54:v:58:VAL:HG22	2.00	0.44
58:z:50:ALA:HA	58:z:53:VAL:HG12	1.99	0.44
59:4:194:G:H2'	59:4:195:A:C8	2.51	0.44
1:1:24:G:H2'	1:1:25:U:C6	2.53	0.44
1:1:55:G:H2'	1:1:56:A:C8	2.53	0.44
1:1:382:A:N6	1:1:393:C:H42	2.15	0.44
1:1:448:U:N3	1:1:583:G:N3	2.66	0.44
1:1:684:G:N2	1:1:788:A:OP2	2.42	0.44
1:1:819:A:OP2	1:1:1187:G:N2	2.48	0.44
1:1:864:G:H5'	3:3:100:G:H21	1.83	0.44
1:1:1501:G:H2'	1:1:1502:A:H8	1.83	0.44
1:1:1689:A:H4'	2:2:1475:G:H4'	2.00	0.44
1:1:1710:G:H2'	1:1:1711:A:C8	2.53	0.44
2:2:297:G:N2	2:2:300:A:OP2	2.49	0.44
2:2:413:G:H1'	2:2:428:G:H22	1.82	0.44
6:8:19:G:O6	6:8:58:G:N1	2.51	0.44
21:O:115:LEU:HD23	21:O:115:LEU:HA	1.87	0.44
47:o:7:ARG:O	47:o:101:SER:OG	2.33	0.44
1:1:191:A:O2'	1:1:192:C:O4'	2.36	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:1694:C:O2	1:1:1695:G:N2	2.50	0.43
1:1:1818:U:OP2	8:B:156:ARG:NH2	2.50	0.43
1:1:2360:G:N3	1:1:2428:G:N2	2.65	0.43
1:1:2396:G:H2'	1:1:2397:G:H8	1.83	0.43
1:1:2708:G:H2'	1:1:2709:G:C8	2.53	0.43
2:2:147:G:H2'	2:2:148:G:C8	2.53	0.43
2:2:1040:U:H2'	2:2:1041:G:C8	2.53	0.43
11:E:36:LEU:HB2	11:E:89:VAL:HB	1.99	0.43
23:Q:114:LYS:O	23:Q:118:ALA:HB3	2.17	0.43
35:c:42:VAL:HG23	35:c:43:VAL:HG23	2.00	0.43
45:m:34:VAL:O	45:m:38:ASN:HB2	2.18	0.43
47:o:53:ILE:HD11	47:o:61:ALA:HB1	1.99	0.43
1:1:2527:C:H5''	38:f:31:PRO:HB3	2.00	0.43
2:2:102:G:H2'	2:2:103:U:H6	1.83	0.43
2:2:1356:G:H2'	2:2:1357:A:C8	2.52	0.43
8:B:257:THR:O	8:B:257:THR:OG1	2.33	0.43
13:G:50:ARG:HD2	13:G:51:ARG:HH21	1.83	0.43
13:G:114:GLU:O	13:G:116:ARG:NH1	2.51	0.43
16:J:56:VAL:HB	16:J:124:VAL:HG13	1.99	0.43
19:M:14:LYS:HB2	19:M:14:LYS:HE3	1.86	0.43
42:j:111:MET:HA	42:j:114:VAL:HG12	2.00	0.43
44:l:56:LYS:HA	44:l:56:LYS:HD2	1.80	0.43
44:l:70:ARG:HH21	44:l:97:ASN:HD21	1.66	0.43
1:1:851:C:O2'	32:Z:43:ALA:O	2.36	0.43
1:1:1039:A:N1	1:1:1116:G:C6	2.87	0.43
1:1:1175:A:H4'	1:1:1176:U:H4'	2.01	0.43
1:1:1466:U:HO2'	1:1:1546:G:HO2'	1.62	0.43
1:1:1983:G:H4'	1:1:2606:C:H4'	2.00	0.43
2:2:717:U:H4'	48:p:119:ASN:HD22	1.83	0.43
9:C:116:LYS:HB2	9:C:165:MET:HB3	2.00	0.43
9:C:121:THR:HG21	9:C:143:PRO:HD3	2.01	0.43
31:Y:27:ASN:HA	31:Y:30:MET:HG2	2.00	0.43
1:1:48:G:N2	1:1:177:G:OP2	2.51	0.43
1:1:660:C:H2'	1:1:661:A:H8	1.83	0.43
1:1:680:C:H2'	1:1:681:G:H8	1.83	0.43
1:1:783:A:H4'	1:1:2588:G:H4'	2.00	0.43
1:1:1088:A:N6	15:I:131:THR:OG1	2.50	0.43
1:1:1663:G:N2	1:1:1992:G:O6	2.51	0.43
1:1:2220:U:H2'	1:1:2221:G:H8	1.84	0.43
1:1:2241:A:H2'	1:1:2242:G:C8	2.53	0.43
1:1:2403:C:N3	1:1:2415:G:N1	2.67	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:2:1077:G:N2	2:2:1080:A:OP2	2.36	0.43
4:5:48:LYS:HB2	4:5:73:MET:HE2	2.00	0.43
8:B:33:LEU:HB3	8:B:64:ILE:HG22	2.00	0.43
9:C:84:LEU:HD23	9:C:84:LEU:HA	1.90	0.43
17:K:21:CYS:HA	17:K:41:ILE:HG22	2.01	0.43
18:L:132:ARG:HA	18:L:132:ARG:HD3	1.89	0.43
1:1:584:C:N4	1:1:585:G:O6	2.52	0.43
1:1:675:A:OP1	10:D:58:LYS:NZ	2.47	0.43
1:1:835:C:H2'	1:1:836:G:H8	1.83	0.43
1:1:1271:G:O2'	1:1:1618:6MZ:O2P	2.28	0.43
1:1:2591:C:H2'	1:1:2592:G:C8	2.53	0.43
2:2:458:U:H2'	2:2:459:A:C8	2.48	0.43
22:P:24:ASP:HB2	22:P:89:ARG:HA	2.01	0.43
40:h:73:PRO:O	40:h:76:VAL:C	2.61	0.43
41:i:102:VAL:HG13	41:i:107:PHE:HB2	1.99	0.43
59:4:184:A:H1'	59:4:185:A:C8	2.54	0.43
1:1:571:U:H1'	1:1:573:U:H6	1.84	0.43
1:1:937:C:H2'	1:1:938:G:C8	2.53	0.43
1:1:1463:C:H2'	1:1:1464:G:H8	1.84	0.43
1:1:1707:G:O6	1:1:1752:C:N4	2.51	0.43
1:1:1819:A:H5''	8:B:160:THR:HG21	2.00	0.43
1:1:2073:C:H5''	8:B:228:VAL:HG12	2.00	0.43
2:2:257:G:H1	2:2:269:C:H42	1.66	0.43
12:F:26:ILE:HG23	12:F:79:VAL:HG21	2.01	0.43
22:P:31:TRP:CD1	22:P:82:ASP:HB2	2.54	0.43
26:T:30:ILE:HD12	26:T:30:ILE:HA	1.93	0.43
39:g:57:LEU:HD23	39:g:57:LEU:HA	1.90	0.43
1:1:168:G:H2'	1:1:169:G:C8	2.54	0.43
1:1:228:C:H42	1:1:417:C:H1'	1.83	0.43
1:1:463:G:H21	1:1:465:G:H8	1.66	0.43
1:1:475:C:N4	1:1:481:G:O6	2.51	0.43
1:1:1012:U:H3	16:J:27:ARG:HD3	1.84	0.43
1:1:1656:C:H2'	1:1:1657:U:H6	1.84	0.43
1:1:2136:G:C6	1:1:2155:U:N3	2.86	0.43
1:1:2693:G:H2'	1:1:2694:G:H8	1.84	0.43
2:2:61:G:N7	57:y:6:SER:OG	2.41	0.43
2:2:1417:G:H2'	2:2:1482:G:N2	2.33	0.43
3:3:82:U:H2'	3:3:83:G:H8	1.83	0.43
4:5:16:LEU:HD22	4:5:18:LYS:HG3	2.00	0.43
26:T:56:GLU:HG2	26:T:57:VAL:HG13	2.01	0.43
28:V:8:VAL:HG22	28:V:40:ILE:HG22	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
34:b:10:ARG:H	34:b:10:ARG:HG2	1.60	0.43
39:g:108:ARG:HA	39:g:111:ILE:HG22	2.00	0.43
59:4:341:U:C2	59:4:345:A:N7	2.86	0.43
1:1:1523:U:H5''	1:1:1524:G:C8	2.54	0.43
1:1:2011:U:OP2	25:S:16:LYS:NZ	2.36	0.43
1:1:2088:A:N6	1:1:2232:C:H42	2.17	0.43
1:1:2090:A:N6	1:1:2230:G:O6	2.51	0.43
1:1:2898:U:H2'	1:1:2899:A:C8	2.53	0.43
4:5:92:LEU:HD11	4:5:127:ILE:HD11	1.99	0.43
10:D:91:ASP:O	10:D:92:HIS:ND1	2.52	0.43
24:R:58:VAL:H	24:R:102:SER:HG	1.62	0.43
36:d:25:LYS:HE3	36:d:25:LYS:HB3	1.85	0.43
40:h:64:ILE:HG22	40:h:99:ALA:HA	2.00	0.43
43:k:22:ILE:HG23	43:k:39:LEU:HD21	2.00	0.43
44:l:16:PRO:HG2	44:l:44:TYR:HE2	1.84	0.43
59:4:299:C:H4'	59:4:300:U:H5''	2.00	0.43
1:1:992:C:OP1	23:Q:47:TYR:OH	2.29	0.43
1:1:1072:C:H42	1:1:1092:C:H5	1.67	0.43
1:1:2372:U:H2'	1:1:2373:G:C8	2.52	0.43
2:2:150:U:H2'	2:2:151:A:H8	1.83	0.43
17:K:85:VAL:HG11	17:K:115:ILE:HD13	2.00	0.43
20:N:6:SER:OG	20:N:7:GLY:N	2.52	0.43
21:O:18:LEU:HD23	21:O:21:LEU:HD12	1.99	0.43
22:P:6:LYS:HE2	22:P:6:LYS:HB3	1.85	0.43
42:j:76:LEU:HD21	42:j:120:VAL:HG12	2.01	0.43
52:t:22:THR:O	52:t:22:THR:OG1	2.30	0.43
59:4:168:G:H2'	59:4:169:G:H8	1.84	0.43
60:7:1:G:P	60:7:1:G:H8	2.42	0.43
1:1:75:G:H4'	31:Y:48:ARG:HH21	1.84	0.43
1:1:373:U:N3	1:1:401:A:N6	2.45	0.43
1:1:373:U:C2	1:1:401:A:N6	2.84	0.43
1:1:573:U:O4	1:1:2029:G:O2'	2.35	0.43
1:1:601:C:O2'	10:D:99:LYS:NZ	2.41	0.43
1:1:1614:A:N6	25:S:92:ARG:O	2.52	0.43
1:1:2013:A:N3	25:S:88:ARG:NH1	2.67	0.43
1:1:2812:G:H2'	1:1:2813:A:C8	2.54	0.43
49:q:7:LEU:HD23	49:q:7:LEU:HA	1.84	0.43
3:3:7:G:N2	21:O:38:GLN:OE1	2.52	0.42
9:C:204:LYS:NZ	9:C:205:PRO:O	2.41	0.42
12:F:35:ARG:HH11	12:F:37:LEU:HD21	1.82	0.42
12:F:91:GLY:HA3	12:F:94:TYR:HD2	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:N:18:GLN:HE22	20:N:22:ARG:HH11	1.67	0.42
23:Q:106:PHE:HA	23:Q:109:LEU:HD12	2.01	0.42
44:l:24:ALA:O	44:l:28:ASN:ND2	2.52	0.42
44:l:106:GLU:O	44:l:110:LYS:NZ	2.39	0.42
1:1:1631:G:O2'	1:1:1633:G:O6	2.34	0.42
1:1:2628:C:O2'	1:1:2782:G:OP1	2.28	0.42
1:1:2812:G:H2'	1:1:2813:A:H8	1.85	0.42
1:1:2899:A:H2'	1:1:2900:A:H8	1.84	0.42
2:2:52:C:H2'	2:2:53:A:C8	2.54	0.42
19:M:110:GLU:OE2	19:M:114:ARG:NH2	2.49	0.42
22:P:75:GLN:HB2	22:P:78:SER:HB2	2.01	0.42
36:d:3:ARG:HD3	36:d:3:ARG:HA	1.90	0.42
37:e:17:THR:OG1	37:e:18:GLY:N	2.47	0.42
45:m:5:ASP:OD1	45:m:8:ALA:N	2.39	0.42
1:1:1049:C:H2'	1:1:1050:A:C8	2.53	0.42
1:1:1469:A:H2'	1:1:1470:A:C8	2.54	0.42
1:1:2636:C:O2'	9:C:45:TYR:OH	2.35	0.42
1:1:2707:U:H2'	1:1:2708:G:H8	1.84	0.42
40:h:21:THR:O	40:h:21:THR:OG1	2.29	0.42
50:r:33:ILE:HD12	50:r:59:GLU:HB3	2.01	0.42
59:4:217:G:H2'	59:4:218:G:H8	1.84	0.42
1:1:620:G:O6	10:D:98:LYS:NZ	2.46	0.42
1:1:1286:A:N7	1:1:1289:C:N4	2.66	0.42
1:1:1353:A:H2'	1:1:1354:A:C8	2.55	0.42
1:1:2262:U:H2'	1:1:2263:C:C6	2.54	0.42
1:1:2707:U:H2'	1:1:2708:G:C8	2.54	0.42
2:2:19:A:OP1	42:j:130:SER:OG	2.37	0.42
6:8:29:A:H2'	6:8:30:U:C5	2.54	0.42
9:C:32:ASN:O	9:C:96:ILE:N	2.51	0.42
12:F:83:PHE:HB3	12:F:141:ILE:HD11	2.02	0.42
16:J:23:LYS:HG3	16:J:28:LEU:HB2	2.00	0.42
16:J:44:TYR:HA	16:J:50:THR:HG21	2.00	0.42
30:X:2:SER:O	30:X:50:ARG:NH2	2.52	0.42
53:u:4:ILE:HD13	53:u:57:ILE:HG23	2.01	0.42
59:4:150:G:N1	59:4:168:G:O4'	2.53	0.42
1:1:31:C:H2'	1:1:32:C:C6	2.55	0.42
1:1:208:C:H2'	1:1:209:C:H6	1.84	0.42
1:1:298:G:N1	1:1:339:U:OP2	2.41	0.42
1:1:299:A:N6	1:1:322:A:O2'	2.41	0.42
1:1:1062:G:O4'	1:1:1088:A:O2'	2.36	0.42
1:1:1070:A:H62	1:1:1096:A:H2	1.66	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:1361:G:H2'	1:1:1362:C:H6	1.85	0.42
1:1:2311:A:O2'	1:1:2312:U:O4'	2.37	0.42
1:1:2333:A:P	29:W:77:ARG:HH22	2.42	0.42
1:1:2885:G:N1	34:b:30:VAL:O	2.46	0.42
2:2:628:G:H2'	2:2:629:A:C8	2.55	0.42
2:2:1342:C:H2'	2:2:1343:G:C8	2.54	0.42
10:D:105:LEU:HB3	10:D:200:LEU:HD21	2.00	0.42
10:D:170:ARG:HA	10:D:170:ARG:HD3	1.80	0.42
12:F:11:VAL:O	12:F:48:ASN:ND2	2.53	0.42
23:Q:46:ALA:HA	23:Q:49:ASP:HB2	2.01	0.42
24:R:21:ARG:HA	24:R:95:ASP:HA	2.01	0.42
45:m:22:LYS:O	45:m:65:TYR:OH	2.31	0.42
59:4:174:A:O2'	59:4:175:A:H5'	2.20	0.42
1:1:1666:G:H21	17:K:3:GLN:HE22	1.68	0.42
1:1:1679:A:H2'	1:1:1680:U:H6	1.85	0.42
2:2:316:C:OP2	2:2:351:G:O2'	2.38	0.42
2:2:1088:G:H21	2:2:1167:A:N6	2.17	0.42
2:2:1243:C:H2'	2:2:1244:G:C8	2.55	0.42
20:N:9:GLN:O	20:N:17:ARG:NH2	2.52	0.42
20:N:77:ALA:O	20:N:81:ASN:ND2	2.53	0.42
43:k:7:VAL:HB	43:k:61:LEU:HD12	2.00	0.42
45:m:88:ARG:H	45:m:88:ARG:HG2	1.59	0.42
59:4:17:U:H3	59:4:333:G:H22	1.68	0.42
59:4:21:C:H2'	59:4:22:G:C8	2.54	0.42
1:1:1131:G:N2	1:1:1132:U:O4	2.46	0.42
1:1:1391:U:N3	1:1:1394:U:OP2	2.42	0.42
2:2:985:C:H2'	2:2:986:U:C6	2.54	0.42
4:5:56:VAL:HB	4:5:111:VAL:HG23	2.02	0.42
9:C:179:ARG:HB3	9:C:188:LEU:HD12	2.02	0.42
13:G:131:SER:HA	13:G:141:LYS:HA	2.01	0.42
24:R:75:VAL:HG22	24:R:86:GLN:HE22	1.84	0.42
25:S:29:VAL:HB	25:S:55:ILE:HD11	2.02	0.42
45:m:36:ILE:HD11	45:m:126:ILE:HG21	2.01	0.42
59:4:199:C:H2'	59:4:200:G:C8	2.54	0.42
1:1:1997:C:H2'	1:1:1998:A:C8	2.55	0.42
1:1:2684:U:O4'	17:K:70:ARG:NH1	2.50	0.42
2:2:254:G:OP1	54:v:68:SER:OG	2.31	0.42
19:M:74:THR:OG1	19:M:75:GLU:N	2.53	0.42
28:V:31:TYR:O	28:V:92:VAL:HA	2.19	0.42
39:g:5:SER:OG	39:g:8:ASP:OD2	2.33	0.42
40:h:25:ASN:HD21	47:o:11:LYS:NZ	2.17	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
41:i:156:LYS:HA	41:i:159:LEU:HB2	2.01	0.42
45:m:30:SER:OG	45:m:31:LYS:N	2.52	0.42
48:p:70:CYS:SG	48:p:71:ALA:N	2.93	0.42
1:1:223:A:C6	1:1:422:A:H2	2.37	0.42
1:1:860:U:H2'	1:1:861:A:H8	1.84	0.42
1:1:2052:A:O2'	9:C:148:GLN:O	2.31	0.42
1:1:2594:C:N4	1:1:2595:G:O6	2.53	0.42
8:B:157:SER:OG	8:B:158:ALA:N	2.41	0.42
11:E:50:LEU:HD21	11:E:84:PRO:HB2	2.01	0.42
14:H:67:THR:O	14:H:69:PHE:N	2.52	0.42
50:r:95:LEU:HD23	50:r:95:LEU:HA	1.79	0.42
51:s:29:ALA:O	51:s:33:ASP:HB2	2.19	0.42
59:4:297:G:H2'	59:4:298:A:C8	2.55	0.42
1:1:136:G:O6	1:1:143:C:N4	2.52	0.42
1:1:832:U:H2'	1:1:833:A:H8	1.85	0.42
1:1:1094:U:H2'	1:1:1095:A:H3'	2.02	0.42
1:1:1106:G:C2	14:H:29:ASP:HB2	2.55	0.42
1:1:1660:G:H2'	1:1:1661:G:H8	1.85	0.42
1:1:1923:U:H5''	60:7:25:G:H21	1.84	0.42
1:1:2127:G:N2	1:1:2173:A:O2'	2.50	0.42
1:1:2220:U:H2'	1:1:2221:G:C8	2.54	0.42
1:1:2649:C:H2'	1:1:2650:U:C6	2.55	0.42
4:5:90:LEU:HD23	4:5:90:LEU:HA	1.87	0.42
12:F:38:ASN:O	12:F:64:GLN:NE2	2.51	0.42
60:7:68:G:H2'	60:7:69:G:C8	2.55	0.42
1:1:60:G:O2'	1:1:62:U:O2	2.32	0.41
1:1:1059:G:H21	15:I:127:SER:HA	1.85	0.41
10:D:147:LEU:HB3	10:D:186:VAL:HG23	2.02	0.41
36:d:31:LEU:HD23	36:d:31:LEU:HA	1.85	0.41
41:i:194:ASP:OD1	41:i:194:ASP:N	2.53	0.41
43:k:71:ILE:HD13	43:k:71:ILE:HA	1.87	0.41
56:x:71:LEU:HA	56:x:71:LEU:HD23	1.86	0.41
59:4:11:C:H1'	59:4:13:G:H5'	2.01	0.41
59:4:290:A:H4'	59:4:291:A:H5'	2.01	0.41
1:1:321:U:H5''	10:D:131:THR:HG23	2.01	0.41
1:1:775:G:H21	1:1:793:A:H1'	1.85	0.41
1:1:1056:G:O2'	1:1:1103:A:N6	2.53	0.41
1:1:1287:A:N6	20:N:105:GLY:O	2.48	0.41
1:1:1752:C:H2'	1:1:1753:G:C8	2.54	0.41
1:1:1910:G:N2	1:1:1921:G:N3	2.67	0.41
1:1:2283:C:H42	1:1:2325:G:H22	1.68	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:2439:A:OP1	60:7:77:A:N6	2.52	0.41
2:2:1254:A:H2'	2:2:1255:G:H8	1.85	0.41
4:5:124:LYS:NZ	59:4:19:G:O6	2.52	0.41
11:E:9:LYS:HD3	11:E:9:LYS:HA	1.86	0.41
27:U:21:LYS:HE2	27:U:21:LYS:HB3	1.87	0.41
55:w:30:LYS:HD2	55:w:30:LYS:HA	1.85	0.41
1:1:409:G:H2'	1:1:410:G:C8	2.54	0.41
1:1:459:U:H2'	1:1:460:A:C8	2.55	0.41
1:1:951:C:H2'	1:1:952:G:C8	2.55	0.41
1:1:976:G:H2'	1:1:977:G:C8	2.55	0.41
1:1:1028:A:N3	1:1:2486:C:O2'	2.45	0.41
1:1:1051:G:H3'	1:1:1052:C:H5	1.85	0.41
2:2:191:G:H2'	2:2:192:A:C8	2.55	0.41
26:T:4:GLU:HA	26:T:7:LEU:HD12	2.02	0.41
44:l:124:LEU:HD23	44:l:124:LEU:HA	1.87	0.41
59:4:168:G:H2'	59:4:169:G:C8	2.55	0.41
1:1:288:U:H2'	1:1:289:G:H8	1.84	0.41
1:1:697:G:N2	1:1:766:U:O2	2.54	0.41
1:1:1283:G:N1	1:1:1286:A:OP2	2.53	0.41
1:1:1370:C:H1'	1:1:1810:A:H2	1.84	0.41
1:1:1723:G:O6	1:1:1737:G:O2'	2.36	0.41
2:2:302:G:H2'	2:2:303:A:C8	2.55	0.41
2:2:591:U:OP2	45:m:31:LYS:NZ	2.38	0.41
2:2:1157:A:H1'	2:2:1181:G:H22	1.85	0.41
2:2:1314:C:H2'	2:2:1315:U:C6	2.55	0.41
13:G:94:ILE:HG21	13:G:122:LEU:HD12	2.01	0.41
15:I:107:GLU:O	15:I:111:THR:OG1	2.31	0.41
29:W:82:ILE:HD13	29:W:82:ILE:HA	1.93	0.41
46:n:52:LEU:HD11	46:n:63:LEU:HD21	2.02	0.41
58:z:20:LYS:HA	58:z:20:LYS:HD2	1.61	0.41
59:4:323:A:H2'	59:4:324:G:C8	2.55	0.41
1:1:143:C:O2	26:T:1:MET:N	2.53	0.41
1:1:1086:A:N7	14:H:34:THR:OG1	2.48	0.41
1:1:1440:U:H2'	1:1:1441:G:C8	2.56	0.41
1:1:1548:A:H2'	1:1:1549:A:C8	2.56	0.41
1:1:2104:C:C4	1:1:2105:U:H1'	2.56	0.41
12:F:99:LYS:HD2	12:F:99:LYS:HA	1.85	0.41
20:N:12:ARG:O	20:N:17:ARG:NH2	2.54	0.41
26:T:38:ALA:O	26:T:81:LYS:NZ	2.51	0.41
33:a:1:MET:HE2	33:a:1:MET:HB3	1.89	0.41
39:g:66:LYS:HB2	39:g:158:PRO:HA	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
40:h:4:LYS:HE3	40:h:4:LYS:HB3	1.80	0.41
40:h:175:LEU:HD21	40:h:201:TRP:HE1	1.84	0.41
47:o:26:VAL:HG13	47:o:36:VAL:HG11	2.02	0.41
48:p:86:VAL:HG11	48:p:93:ARG:HG3	2.02	0.41
59:4:271:G:O2'	59:4:272:C:H5'	2.20	0.41
1:1:291:G:O6	1:1:349:U:C2	2.73	0.41
1:1:463:G:N1	1:1:467:G:O6	2.54	0.41
1:1:543:G:H1	1:1:550:C:H42	1.68	0.41
1:1:1336:A:H2'	1:1:1337:G:H8	1.86	0.41
1:1:1405:U:H2'	1:1:1406:U:H6	1.86	0.41
1:1:1469:A:H2'	1:1:1470:A:H8	1.86	0.41
2:2:672:U:H2'	2:2:673:A:C8	2.55	0.41
23:Q:27:ALA:HB1	23:Q:31:VAL:HG12	2.03	0.41
50:r:105:ASN:HD22	50:r:105:ASN:HA	1.64	0.41
1:1:1028:A:OP2	1:1:1126:A:N6	2.54	0.41
1:1:1164:C:H2'	1:1:1165:A:C8	2.56	0.41
1:1:1709:U:H2'	1:1:1710:G:H8	1.86	0.41
1:1:2396:G:H2'	1:1:2397:G:C8	2.56	0.41
2:2:398:U:H2'	2:2:399:G:C8	2.55	0.41
2:2:593:U:H2'	2:2:594:U:C6	2.56	0.41
12:F:87:LEU:HD21	12:F:145:ALA:HB1	2.02	0.41
16:J:74:TYR:HB2	16:J:87:ALA:O	2.20	0.41
39:g:67:ILE:HD13	39:g:160:ALA:HB3	2.03	0.41
44:l:78:ARG:HG2	44:l:80:VAL:HG13	2.01	0.41
1:1:145:C:H2'	1:1:146:A:C8	2.55	0.41
1:1:387:U:OP1	6:8:77:A:O2'	2.25	0.41
1:1:495:G:N2	25:S:57:ASN:OD1	2.54	0.41
1:1:539:G:O6	1:1:554:U:C4	2.74	0.41
1:1:593:U:H2'	1:1:594:U:C6	2.56	0.41
1:1:658:U:H2'	1:1:659:G:H8	1.86	0.41
1:1:1276:A:N7	1:1:1645:G:C2	2.88	0.41
1:1:2358:A:H2'	1:1:2359:C:C6	2.55	0.41
2:2:950:U:H2'	2:2:951:G:H8	1.85	0.41
2:2:1067:A:O2'	2:2:1093:A:O2'	2.32	0.41
2:2:1176:A:H2'	2:2:1177:G:C8	2.55	0.41
3:3:14:U:H2'	3:3:15:A:H2	1.85	0.41
17:K:53:LYS:HA	17:K:53:LYS:HD2	1.84	0.41
26:T:34:VAL:HG11	26:T:43:ILE:HD11	2.01	0.41
27:U:74:ASN:HB3	27:U:77:THR:HG22	2.02	0.41
29:W:68:LYS:HB3	29:W:68:LYS:HE3	1.85	0.41
41:i:85:ASN:O	41:i:89:ASN:ND2	2.42	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
49:q:3:THR:HB	49:q:6:GLN:HG3	2.03	0.41
59:4:360:A:H2'	59:4:361:C:H4'	2.02	0.41
1:1:26:G:N7	1:1:27:G:N1	2.69	0.41
1:1:296:U:H2'	1:1:297:G:C8	2.56	0.41
1:1:571:U:O2	1:1:2030:6MZ:O2'	2.38	0.41
1:1:839:U:O2'	1:1:1191:G:N3	2.54	0.41
1:1:1084:A:N1	14:H:56:ARG:NH2	2.68	0.41
1:1:1425:G:H2'	1:1:1426:G:C8	2.56	0.41
1:1:1476:U:N3	1:1:1516:G:C6	2.87	0.41
1:1:2131:U:H4'	1:1:2133:G:H5''	2.02	0.41
1:1:2284:A:N6	1:1:2285:C:H42	2.18	0.41
1:1:2420:C:H5''	35:c:8:LYS:HD3	2.01	0.41
1:1:2595:G:H5'	60:7:73:C:OP1	2.20	0.41
2:2:674:G:H1	2:2:716:A:N6	2.18	0.41
2:2:739:C:HO2'	52:t:42:HIS:HD1	1.61	0.41
2:2:954:G:H2'	2:2:955:U:C6	2.56	0.41
3:3:82:U:H2'	3:3:83:G:C8	2.56	0.41
9:C:186:LEU:HD11	22:P:4:ILE:HG22	2.03	0.41
14:H:97:LYS:HB2	14:H:97:LYS:HE3	1.91	0.41
15:I:44:LYS:HA	15:I:44:LYS:HD2	1.97	0.41
18:L:105:ILE:H	18:L:105:ILE:HG12	1.74	0.41
19:M:41:LEU:HD23	19:M:41:LEU:HA	1.89	0.41
20:N:33:ILE:HA	20:N:113:ILE:O	2.21	0.41
28:V:85:LYS:HB3	28:V:85:LYS:HE2	1.89	0.41
32:Z:44:ILE:HD13	32:Z:44:ILE:HA	1.93	0.41
51:s:67:THR:OG1	51:s:68:GLY:N	2.54	0.41
54:v:70:THR:O	54:v:70:THR:OG1	2.32	0.41
55:w:40:VAL:HA	55:w:41:PRO:HD3	1.93	0.41
1:1:123:G:H2'	1:1:124:G:H8	1.86	0.41
1:1:1057:A:H8	1:1:1086:A:H2'	1.86	0.41
1:1:2233:U:H2'	1:1:2234:G:C8	2.56	0.41
2:2:108:G:N2	2:2:109:A:N1	2.69	0.41
2:2:404:G:H4'	2:2:439:U:H5	1.85	0.41
2:2:1444:U:N3	2:2:1459:G:O6	2.54	0.41
4:5:37:GLN:OE1	4:5:86:ARG:NH2	2.54	0.41
12:F:117:LEU:HD12	12:F:121:ILE:HG21	2.03	0.41
17:K:65:THR:HG22	17:K:67:LYS:H	1.86	0.41
27:U:96:PHE:HD2	27:U:101:GLU:HB3	1.86	0.41
45:m:15:ARG:HE	45:m:15:ARG:HB3	1.61	0.41
59:4:115:C:H2'	59:4:116:A:H8	1.85	0.41
1:1:185:G:H22	1:1:211:C:N4	2.17	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:1096:A:C5	1:1:1097:U:H1'	2.56	0.40
1:1:2745:C:H1'	12:F:143:GLN:HB2	2.02	0.40
1:1:2757:A:N1	12:F:67:THR:HG21	2.36	0.40
2:2:180:U:H2'	2:2:181:A:H8	1.86	0.40
2:2:520:A:H62	2:2:529:G:H21	1.69	0.40
2:2:916:U:H2'	2:2:917:G:C8	2.56	0.40
4:5:40:GLU:OE1	4:5:88:ARG:NH2	2.46	0.40
4:5:147:TRP:CG	42:j:20:ARG:HD2	2.55	0.40
16:J:109:LEU:HD21	16:J:118:MET:HB2	2.02	0.40
49:q:107:VAL:HG21	49:q:110:ARG:HD2	2.04	0.40
59:4:172:U:H2'	59:4:173:C:C6	2.54	0.40
1:1:362:A:H3'	1:1:363:G:H8	1.85	0.40
1:1:1047:G:H21	1:1:1048:A:H62	1.69	0.40
1:1:1140:C:H5'	16:J:26:GLY:HA3	2.03	0.40
1:1:1681:G:O2'	1:1:1762:A:N3	2.48	0.40
1:1:1844:C:H2'	1:1:1845:G:H8	1.85	0.40
1:1:1993:U:H4'	9:C:133:THR:HG21	2.02	0.40
1:1:2018:G:H2'	1:1:2019:A:C8	2.57	0.40
1:1:2271:G:H4'	29:W:20:ARG:HH21	1.87	0.40
1:1:2286:G:H21	1:1:2287:A:H61	1.70	0.40
1:1:2706:A:H5''	1:1:2851:A:H5''	2.03	0.40
1:1:2832:U:O2	1:1:2834:G:N1	2.54	0.40
2:2:24:U:HO2'	2:2:524:G:HO2'	1.66	0.40
2:2:421:U:H5'	2:2:422:C:C5	2.56	0.40
2:2:838:G:H2'	2:2:839:C:O4'	2.21	0.40
2:2:1343:G:H2'	2:2:1344:C:C6	2.55	0.40
3:3:23:G:H2'	3:3:24:G:C8	2.55	0.40
3:3:111:U:H2'	3:3:112:G:H8	1.86	0.40
16:J:36:LEU:HD23	16:J:121:LYS:HB2	2.03	0.40
19:M:1:MET:N	19:M:47:GLU:HG3	2.36	0.40
27:U:47:LYS:HA	27:U:47:LYS:HD2	1.91	0.40
31:Y:6:LEU:HA	31:Y:9:LYS:HD3	2.02	0.40
48:p:36:ASP:OD2	48:p:40:ASN:ND2	2.55	0.40
56:x:12:ASP:OD1	56:x:35:SER:OG	2.32	0.40
60:7:69:G:H2'	60:7:70:A:C8	2.57	0.40
1:1:278:A:OP2	1:1:361:G:N1	2.42	0.40
1:1:571:U:O2'	1:1:573:U:O5'	2.39	0.40
1:1:612:G:H21	1:1:616:A:H62	1.68	0.40
1:1:1702:G:N2	2:2:1428:A:O2'	2.54	0.40
1:1:2089:C:H2'	1:1:2090:A:C8	2.55	0.40
1:1:2455:G:H2'	1:1:2456:C:C6	2.57	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:2:113:G:H1'	2:2:354:G:H5'	2.03	0.40
2:2:204:G:H2'	2:2:205:A:C4	2.56	0.40
22:P:91:ALA:HB2	22:P:113:ARG:HG3	2.03	0.40
29:W:46:HIS:N	29:W:78:LYS:O	2.34	0.40
46:n:28:ILE:HG21	46:n:35:LEU:HD22	2.04	0.40
47:o:65:TYR:HD1	51:s:98:LYS:HA	1.84	0.40
59:4:163:G:H2'	59:4:164:G:C8	2.57	0.40
59:4:195:A:H2'	59:4:196:G:H8	1.85	0.40
59:4:342:U:H2'	59:4:344:A:H62	1.86	0.40
1:1:185:G:N1	1:1:186:G:O6	2.54	0.40
1:1:771:G:O2'	1:1:1355:G:O2'	2.25	0.40
1:1:894:U:H1'	1:1:895:U:H5'	2.03	0.40
1:1:1399:C:H2'	1:1:1400:U:C6	2.57	0.40
1:1:1800:C:O2	1:1:1818:U:N3	2.54	0.40
1:1:2291:U:H2'	1:1:2292:U:C6	2.57	0.40
9:C:25:THR:HG21	9:C:193:VAL:HG22	2.04	0.40
10:D:185:LYS:HA	10:D:185:LYS:HD3	1.99	0.40
37:e:7:VAL:HG23	37:e:10:ALA:HB3	2.02	0.40
47:o:59:LYS:HD2	47:o:62:ARG:HH22	1.86	0.40
52:t:10:LYS:HZ2	52:t:14:GLU:HB2	1.85	0.40
1:1:109:C:N4	1:1:110:G:O6	2.55	0.40
1:1:594:U:H2'	1:1:595:C:C6	2.57	0.40
1:1:813:U:H2'	1:1:814:C:C6	2.56	0.40
1:1:949:G:H2'	1:1:950:G:H8	1.87	0.40
1:1:1276:A:O3'	20:N:12:ARG:NH1	2.55	0.40
1:1:1636:U:H2'	1:1:1637:A:C8	2.57	0.40
1:1:1796:U:H2'	1:1:1797:G:H8	1.86	0.40
1:1:1824:G:OP2	8:B:53:HIS:NE2	2.53	0.40
2:2:866:C:O2'	2:2:919:A:OP1	2.38	0.40
2:2:1232:U:H5''	46:n:126:GLN:HB3	2.03	0.40
10:D:60:TRP:NE1	10:D:70:SER:OG	2.54	0.40
10:D:80:SER:O	10:D:80:SER:OG	2.29	0.40
12:F:30:ASN:HB2	12:F:79:VAL:HA	2.04	0.40
19:M:34:LYS:HB2	19:M:34:LYS:HE3	1.85	0.40
19:M:124:LEU:HD23	19:M:124:LEU:HA	1.92	0.40
24:R:3:ALA:O	24:R:13:ARG:HA	2.22	0.40
28:V:29:ILE:HD11	28:V:37:PRO:HB3	2.02	0.40
40:h:157:LEU:HD13	40:h:157:LEU:HA	1.88	0.40
43:k:77:THR:O	43:k:81:ASN:CB	2.70	0.40
48:p:117:PRO:HD2	58:z:35:ARG:HD2	2.04	0.40
58:z:29:LEU:HD23	58:z:29:LEU:HA	1.81	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
59:4:10:U:H3'	59:4:11:C:H5'	2.02	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	5	143/145 (99%)	112 (78%)	27 (19%)	4 (3%)	4	28
5	6	26/28 (93%)	17 (65%)	9 (35%)	0	100	100
8	B	268/270 (99%)	243 (91%)	25 (9%)	0	100	100
9	C	207/209 (99%)	194 (94%)	13 (6%)	0	100	100
10	D	199/201 (99%)	176 (88%)	23 (12%)	0	100	100
11	E	175/177 (99%)	157 (90%)	18 (10%)	0	100	100
12	F	173/175 (99%)	151 (87%)	22 (13%)	0	100	100
13	G	147/149 (99%)	133 (90%)	14 (10%)	0	100	100
14	H	128/130 (98%)	103 (80%)	25 (20%)	0	100	100
15	I	133/135 (98%)	108 (81%)	25 (19%)	0	100	100
16	J	139/141 (99%)	129 (93%)	10 (7%)	0	100	100
17	K	121/123 (98%)	105 (87%)	16 (13%)	0	100	100
18	L	142/144 (99%)	124 (87%)	18 (13%)	0	100	100
19	M	134/136 (98%)	128 (96%)	6 (4%)	0	100	100
20	N	117/119 (98%)	102 (87%)	15 (13%)	0	100	100
21	O	113/115 (98%)	103 (91%)	10 (9%)	0	100	100
22	P	112/114 (98%)	102 (91%)	10 (9%)	0	100	100
23	Q	115/117 (98%)	109 (95%)	6 (5%)	0	100	100
24	R	101/103 (98%)	90 (89%)	11 (11%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
25	S	106/108 (98%)	97 (92%)	9 (8%)	0	100	100
26	T	92/94 (98%)	85 (92%)	7 (8%)	0	100	100
27	U	101/103 (98%)	91 (90%)	10 (10%)	0	100	100
28	V	92/94 (98%)	86 (94%)	6 (6%)	0	100	100
29	W	74/76 (97%)	65 (88%)	9 (12%)	0	100	100
30	X	75/77 (97%)	66 (88%)	9 (12%)	0	100	100
31	Y	56/58 (97%)	55 (98%)	1 (2%)	0	100	100
32	Z	54/56 (96%)	51 (94%)	3 (6%)	0	100	100
33	a	64/66 (97%)	57 (89%)	7 (11%)	0	100	100
34	b	52/54 (96%)	44 (85%)	8 (15%)	0	100	100
35	c	50/52 (96%)	45 (90%)	5 (10%)	0	100	100
36	d	44/46 (96%)	40 (91%)	4 (9%)	0	100	100
37	e	62/64 (97%)	53 (86%)	8 (13%)	1 (2%)	8	37
38	f	35/37 (95%)	35 (100%)	0	0	100	100
39	g	223/225 (99%)	198 (89%)	25 (11%)	0	100	100
40	h	206/208 (99%)	188 (91%)	17 (8%)	1 (0%)	25	60
41	i	203/205 (99%)	190 (94%)	13 (6%)	0	100	100
42	j	154/156 (99%)	135 (88%)	19 (12%)	0	100	100
43	k	102/104 (98%)	96 (94%)	6 (6%)	0	100	100
44	l	149/151 (99%)	140 (94%)	9 (6%)	0	100	100
45	m	127/129 (98%)	113 (89%)	14 (11%)	0	100	100
46	n	124/126 (98%)	113 (91%)	11 (9%)	0	100	100
47	o	97/99 (98%)	87 (90%)	10 (10%)	0	100	100
48	p	115/117 (98%)	103 (90%)	12 (10%)	0	100	100
49	q	120/123 (98%)	105 (88%)	15 (12%)	0	100	100
50	r	113/115 (98%)	100 (88%)	13 (12%)	0	100	100
51	s	98/100 (98%)	86 (88%)	12 (12%)	0	100	100
52	t	85/87 (98%)	79 (93%)	5 (6%)	1 (1%)	11	43
53	u	79/81 (98%)	71 (90%)	8 (10%)	0	100	100
54	v	78/80 (98%)	69 (88%)	9 (12%)	0	100	100
55	w	63/65 (97%)	57 (90%)	6 (10%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
56	x	80/82 (98%)	75 (94%)	5 (6%)	0	100	100
57	y	83/85 (98%)	76 (92%)	7 (8%)	0	100	100
58	z	68/70 (97%)	66 (97%)	2 (3%)	0	100	100
All	All	6017/6124 (98%)	5403 (90%)	607 (10%)	7 (0%)	50	80

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	5	137	ASP
52	t	22	THR
4	5	135	GLN
4	5	132	GLY
4	5	120	ASN
40	h	77	ILE
37	e	32	ILE

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	5	121/121 (100%)	119 (98%)	2 (2%)	56	72
8	B	216/216 (100%)	215 (100%)	1 (0%)	86	90
9	C	164/164 (100%)	163 (99%)	1 (1%)	84	88
10	D	165/165 (100%)	164 (99%)	1 (1%)	84	88
11	E	148/148 (100%)	147 (99%)	1 (1%)	81	86
12	F	136/136 (100%)	136 (100%)	0	100	100
13	G	114/114 (100%)	114 (100%)	0	100	100
14	H	99/99 (100%)	99 (100%)	0	100	100
15	I	104/104 (100%)	104 (100%)	0	100	100
16	J	115/115 (100%)	115 (100%)	0	100	100
17	K	104/104 (100%)	104 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
18	L	103/103 (100%)	102 (99%)	1 (1%)	73	81
19	M	109/109 (100%)	109 (100%)	0	100	100
20	N	99/99 (100%)	99 (100%)	0	100	100
21	O	85/85 (100%)	85 (100%)	0	100	100
22	P	99/99 (100%)	99 (100%)	0	100	100
23	Q	89/89 (100%)	89 (100%)	0	100	100
24	R	84/84 (100%)	84 (100%)	0	100	100
25	S	91/91 (100%)	91 (100%)	0	100	100
26	T	81/81 (100%)	81 (100%)	0	100	100
27	U	84/84 (100%)	84 (100%)	0	100	100
28	V	78/78 (100%)	78 (100%)	0	100	100
29	W	58/58 (100%)	58 (100%)	0	100	100
30	X	67/67 (100%)	66 (98%)	1 (2%)	60	74
31	Y	53/53 (100%)	53 (100%)	0	100	100
32	Z	47/47 (100%)	47 (100%)	0	100	100
33	a	59/59 (100%)	59 (100%)	0	100	100
34	b	46/46 (100%)	46 (100%)	0	100	100
35	c	47/47 (100%)	47 (100%)	0	100	100
36	d	38/38 (100%)	37 (97%)	1 (3%)	41	61
37	e	51/51 (100%)	51 (100%)	0	100	100
38	f	34/34 (100%)	34 (100%)	0	100	100
39	g	187/187 (100%)	185 (99%)	2 (1%)	70	79
40	h	171/171 (100%)	171 (100%)	0	100	100
41	i	172/172 (100%)	172 (100%)	0	100	100
42	j	119/119 (100%)	118 (99%)	1 (1%)	79	84
43	k	91/91 (100%)	90 (99%)	1 (1%)	70	79
44	l	124/124 (100%)	124 (100%)	0	100	100
45	m	104/104 (100%)	104 (100%)	0	100	100
46	n	104/104 (100%)	103 (99%)	1 (1%)	73	81
47	o	86/86 (100%)	86 (100%)	0	100	100
48	p	90/90 (100%)	87 (97%)	3 (3%)	33	56

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
49	q	102/102 (100%)	101 (99%)	1 (1%)	73	81
50	r	93/93 (100%)	92 (99%)	1 (1%)	70	79
51	s	83/83 (100%)	83 (100%)	0	100	100
52	t	75/75 (100%)	75 (100%)	0	100	100
53	u	65/65 (100%)	65 (100%)	0	100	100
54	v	74/74 (100%)	74 (100%)	0	100	100
55	w	56/56 (100%)	56 (100%)	0	100	100
56	x	72/72 (100%)	72 (100%)	0	100	100
57	y	65/65 (100%)	65 (100%)	0	100	100
58	z	60/60 (100%)	60 (100%)	0	100	100
All	All	4981/4981 (100%)	4962 (100%)	19 (0%)	88	91

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	5	125	VAL
4	5	134	LYS
8	B	3	VAL
9	C	26	VAL
10	D	14	VAL
11	E	40	VAL
18	L	120	VAL
30	X	47	VAL
36	d	44	VAL
39	g	70	VAL
39	g	199	VAL
42	j	39	VAL
43	k	89	VAL
46	n	63	LEU
48	p	16	VAL
48	p	100	LEU
48	p	113	VAL
49	q	55	VAL
50	r	65	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (86) such sidechains are listed below:

Mol	Chain	Res	Type
4	5	94	GLN
8	B	58	HIS
8	B	86	ASN
8	B	128	ASN
8	B	143	ASN
8	B	153	GLN
8	B	260	ASN
9	C	32	ASN
9	C	36	GLN
9	C	49	GLN
9	C	130	GLN
9	C	150	GLN
9	C	164	GLN
10	D	90	GLN
10	D	163	ASN
11	E	37	ASN
11	E	52	ASN
11	E	63	GLN
11	E	127	ASN
12	F	88	GLN
13	G	43	ASN
13	G	73	ASN
13	G	128	HIS
14	H	103	ASN
15	I	30	GLN
15	I	93	ASN
15	I	104	GLN
15	I	110	GLN
16	J	135	GLN
17	K	3	GLN
17	K	29	HIS
20	N	11	ASN
20	N	23	ASN
20	N	81	ASN
21	O	104	GLN
22	P	10	GLN
22	P	12	GLN
23	Q	56	GLN
23	Q	59	GLN
25	S	60	HIS
25	S	61	ASN
26	T	28	ASN
26	T	91	GLN

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Mol	Chain	Res	Type
27	U	45	HIS
27	U	66	GLN
27	U	74	ASN
28	V	5	ASN
28	V	75	GLN
30	X	16	ASN
31	Y	20	ASN
31	Y	36	GLN
33	a	20	ASN
33	a	33	ASN
34	b	6	ASN
35	c	26	ASN
38	f	37	GLN
39	g	109	GLN
40	h	25	ASN
40	h	69	HIS
41	i	198	HIS
44	l	28	ASN
44	l	97	ASN
45	m	18	GLN
45	m	21	ASN
46	n	31	ASN
46	n	75	GLN
46	n	81	HIS
46	n	110	GLN
46	n	126	GLN
48	p	15	GLN
48	p	22	HIS
48	p	38	GLN
48	p	64	GLN
48	p	119	ASN
49	q	5	ASN
49	q	46	ASN
49	q	73	ASN
50	r	105	ASN
52	t	38	HIS
52	t	46	HIS
52	t	50	HIS
56	x	14	HIS
56	x	52	HIS
57	y	3	ASN
57	y	13	GLN

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Mol	Chain	Res	Type
57	y	70	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	2902/2903 (99%)	958 (33%)	24 (0%)
2	2	1531/1534 (99%)	434 (28%)	7 (0%)
3	3	119/120 (99%)	38 (31%)	0
59	4	332/363 (91%)	198 (59%)	33 (9%)
6	8	76/77 (98%)	43 (56%)	1 (1%)
60	7	76/77 (98%)	49 (64%)	2 (2%)
7	9	5/6 (83%)	4 (80%)	0
All	All	5041/5080 (99%)	1724 (34%)	67 (1%)

All (1724) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	2	G
1	1	10	A
1	1	11	C
1	1	12	U
1	1	18	U
1	1	23	G
1	1	28	A
1	1	33	C
1	1	42	A
1	1	43	G
1	1	46	G
1	1	48	G
1	1	49	A
1	1	54	G
1	1	56	A
1	1	58	G
1	1	60	G
1	1	63	A
1	1	71	A
1	1	72	U
1	1	73	A
1	1	74	A
1	1	75	G
1	1	80	G

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Mol	Chain	Res	Type
1	1	84	A
1	1	85	G
1	1	88	G
1	1	91	A
1	1	93	G
1	1	94	A
1	1	100	U
1	1	101	A
1	1	102	U
1	1	110	G
1	1	118	A
1	1	119	A
1	1	120	U
1	1	125	A
1	1	126	A
1	1	136	G
1	1	137	U
1	1	139	U
1	1	140	C
1	1	141	G
1	1	142	A
1	1	154	U
1	1	155	A
1	1	159	G
1	1	163	C
1	1	165	A
1	1	169	G
1	1	180	G
1	1	190	A
1	1	192	C
1	1	196	A
1	1	197	A
1	1	198	C
1	1	199	A
1	1	204	A
1	1	205	G
1	1	215	G
1	1	216	A
1	1	219	A
1	1	221	A
1	1	222	A
1	1	223	A

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Mol	Chain	Res	Type
1	1	227	A
1	1	228	C
1	1	229	C
1	1	230	G
1	1	241	A
1	1	244	A
1	1	248	G
1	1	250	G
1	1	263	G
1	1	266	G
1	1	271	G
1	1	272	A
1	1	274	C
1	1	275	C
1	1	276	U
1	1	277	G
1	1	278	A
1	1	279	A
1	1	281	C
1	1	282	A
1	1	283	G
1	1	284	U
1	1	285	G
1	1	293	U
1	1	294	A
1	1	295	G
1	1	303	G
1	1	304	U
1	1	305	C
1	1	306	U
1	1	310	A
1	1	311	A
1	1	312	G
1	1	320	A
1	1	321	U
1	1	322	A
1	1	323	C
1	1	324	A
1	1	329	G
1	1	330	A
1	1	331	C
1	1	333	G

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Mol	Chain	Res	Type
1	1	338	G
1	1	345	A
1	1	348	A
1	1	352	A
1	1	356	G
1	1	357	C
1	1	359	G
1	1	360	U
1	1	361	G
1	1	367	G
1	1	371	A
1	1	372	G
1	1	373	U
1	1	386	G
1	1	387	U
1	1	388	G
1	1	396	G
1	1	400	G
1	1	401	A
1	1	403	U
1	1	404	A
1	1	405	U
1	1	411	G
1	1	412	A
1	1	413	C
1	1	414	C
1	1	425	G
1	1	446	G
1	1	456	C
1	1	457	A
1	1	458	G
1	1	459	U
1	1	464	U
1	1	466	A
1	1	475	C
1	1	477	A
1	1	480	A
1	1	481	G
1	1	485	C
1	1	489	G
1	1	490	C
1	1	491	G

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Mol	Chain	Res	Type
1	1	492	A
1	1	496	G
1	1	499	U
1	1	501	A
1	1	504	A
1	1	505	A
1	1	508	A
1	1	509	C
1	1	513	A
1	1	519	U
1	1	527	C
1	1	529	A
1	1	530	G
1	1	531	C
1	1	532	A
1	1	533	G
1	1	536	G
1	1	542	C
1	1	544	C
1	1	545	U
1	1	547	A
1	1	548	G
1	1	549	G
1	1	554	U
1	1	557	C
1	1	562	U
1	1	563	A
1	1	571	U
1	1	572	A
1	1	573	U
1	1	575	A
1	1	583	G
1	1	586	A
1	1	587	C
1	1	592	A
1	1	603	A
1	1	613	A
1	1	614	A
1	1	615	U
1	1	616	A
1	1	618	G
1	1	620	G

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Mol	Chain	Res	Type
1	1	623	C
1	1	627	A
1	1	628	G
1	1	632	A
1	1	634	C
1	1	635	C
1	1	637	A
1	1	642	U
1	1	643	A
1	1	644	A
1	1	646	U
1	1	647	G
1	1	651	G
1	1	654	A
1	1	655	A
1	1	662	G
1	1	672	C
1	1	685	A
1	1	686	U
1	1	702	U
1	1	703	U
1	1	709	U
1	1	710	U
1	1	715	A
1	1	717	C
1	1	719	C
1	1	720	U
1	1	726	G
1	1	728	G
1	1	729	G
1	1	730	A
1	1	734	A
1	1	745	1MG
1	1	746	PSU
1	1	747	5MU
1	1	748	G
1	1	749	A
1	1	762	U
1	1	764	A
1	1	765	C
1	1	769	U
1	1	770	G

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Mol	Chain	Res	Type
1	1	775	G
1	1	782	A
1	1	784	G
1	1	785	G
1	1	792	A
1	1	800	A
1	1	801	G
1	1	805	G
1	1	807	U
1	1	812	C
1	1	813	U
1	1	819	A
1	1	827	U
1	1	828	U
1	1	830	G
1	1	831	G
1	1	835	C
1	1	840	C
1	1	842	U
1	1	845	A
1	1	846	U
1	1	847	U
1	1	856	G
1	1	858	G
1	1	859	G
1	1	860	U
1	1	865	C
1	1	868	U
1	1	875	G
1	1	878	A
1	1	882	G
1	1	883	G
1	1	884	U
1	1	885	C
1	1	886	A
1	1	887	A
1	1	888	C
1	1	890	C
1	1	892	A
1	1	893	C
1	1	894	U
1	1	895	U

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Mol	Chain	Res	Type
1	1	896	A
1	1	897	C
1	1	898	C
1	1	899	A
1	1	910	A
1	1	911	A
1	1	912	C
1	1	913	U
1	1	928	A
1	1	931	U
1	1	934	U
1	1	941	A
1	1	953	G
1	1	955	PSU
1	1	956	G
1	1	958	U
1	1	959	A
1	1	961	C
1	1	962	G
1	1	965	C
1	1	970	U
1	1	971	G
1	1	974	G
1	1	977	G
1	1	983	A
1	1	988	A
1	1	990	A
1	1	995	C
1	1	996	A
1	1	997	G
1	1	999	U
1	1	1006	C
1	1	1007	C
1	1	1012	U
1	1	1013	C
1	1	1017	G
1	1	1023	U
1	1	1025	G
1	1	1026	G
1	1	1033	U
1	1	1041	G
1	1	1043	C

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Mol	Chain	Res	Type
1	1	1046	A
1	1	1047	G
1	1	1051	G
1	1	1052	C
1	1	1053	C
1	1	1054	A
1	1	1056	G
1	1	1057	A
1	1	1058	U
1	1	1059	G
1	1	1061	U
1	1	1062	G
1	1	1065	U
1	1	1066	U
1	1	1067	A
1	1	1068	G
1	1	1069	A
1	1	1070	A
1	1	1071	G
1	1	1072	C
1	1	1073	A
1	1	1075	C
1	1	1077	A
1	1	1078	U
1	1	1082	U
1	1	1083	U
1	1	1084	A
1	1	1085	A
1	1	1087	G
1	1	1088	A
1	1	1089	A
1	1	1090	A
1	1	1093	G
1	1	1095	A
1	1	1096	A
1	1	1097	U
1	1	1098	A
1	1	1101	U
1	1	1103	A
1	1	1104	C
1	1	1106	G
1	1	1108	U

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Mol	Chain	Res	Type
1	1	1110	G
1	1	1111	A
1	1	1112	G
1	1	1113	U
1	1	1114	C
1	1	1121	C
1	1	1122	G
1	1	1129	A
1	1	1130	U
1	1	1131	G
1	1	1132	U
1	1	1133	A
1	1	1134	A
1	1	1135	C
1	1	1139	G
1	1	1141	U
1	1	1142	A
1	1	1144	A
1	1	1147	A
1	1	1148	U
1	1	1155	A
1	1	1157	G
1	1	1158	C
1	1	1163	G
1	1	1171	G
1	1	1173	U
1	1	1174	U
1	1	1175	A
1	1	1176	U
1	1	1177	G
1	1	1178	C
1	1	1179	G
1	1	1180	U
1	1	1182	G
1	1	1186	G
1	1	1191	G
1	1	1192	G
1	1	1199	U
1	1	1200	C
1	1	1206	G
1	1	1211	C
1	1	1212	G

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Mol	Chain	Res	Type
1	1	1218	G
1	1	1220	G
1	1	1225	G
1	1	1227	G
1	1	1236	G
1	1	1237	A
1	1	1238	G
1	1	1240	U
1	1	1244	A
1	1	1245	G
1	1	1247	A
1	1	1250	G
1	1	1251	C
1	1	1253	A
1	1	1256	G
1	1	1265	A
1	1	1266	G
1	1	1267	U
1	1	1268	A
1	1	1271	G
1	1	1272	A
1	1	1273	U
1	1	1286	A
1	1	1287	A
1	1	1300	G
1	1	1301	A
1	1	1302	A
1	1	1310	G
1	1	1312	U
1	1	1321	A
1	1	1325	U
1	1	1330	C
1	1	1332	G
1	1	1333	G
1	1	1338	G
1	1	1341	G
1	1	1345	C
1	1	1358	G
1	1	1359	A
1	1	1367	A
1	1	1368	G
1	1	1370	C

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Mol	Chain	Res	Type
1	1	1372	U
1	1	1378	A
1	1	1379	U
1	1	1380	G
1	1	1381	G
1	1	1383	A
1	1	1390	U
1	1	1393	A
1	1	1394	U
1	1	1395	A
1	1	1401	G
1	1	1403	A
1	1	1408	G
1	1	1409	U
1	1	1414	C
1	1	1416	G
1	1	1417	C
1	1	1419	A
1	1	1427	A
1	1	1428	C
1	1	1429	G
1	1	1433	A
1	1	1434	A
1	1	1440	U
1	1	1443	U
1	1	1444	G
1	1	1451	C
1	1	1452	G
1	1	1453	A
1	1	1454	C
1	1	1455	G
1	1	1458	U
1	1	1460	U
1	1	1461	C
1	1	1464	G
1	1	1474	U
1	1	1475	G
1	1	1482	G
1	1	1490	A
1	1	1493	C
1	1	1495	A
1	1	1497	U

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Mol	Chain	Res	Type
1	1	1498	C
1	1	1499	C
1	1	1502	A
1	1	1508	A
1	1	1509	A
1	1	1510	G
1	1	1515	A
1	1	1517	G
1	1	1522	A
1	1	1524	G
1	1	1529	G
1	1	1530	G
1	1	1531	C
1	1	1532	A
1	1	1534	U
1	1	1535	A
1	1	1536	C
1	1	1537	G
1	1	1538	G
1	1	1541	C
1	1	1546	G
1	1	1554	U
1	1	1557	C
1	1	1558	C
1	1	1566	A
1	1	1567	G
1	1	1569	A
1	1	1575	C
1	1	1578	U
1	1	1580	A
1	1	1581	G
1	1	1583	A
1	1	1584	U
1	1	1587	G
1	1	1588	G
1	1	1590	A
1	1	1596	A
1	1	1597	A
1	1	1602	U
1	1	1603	A
1	1	1606	C
1	1	1607	C

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Mol	Chain	Res	Type
1	1	1608	A
1	1	1610	A
1	1	1611	C
1	1	1614	A
1	1	1615	C
1	1	1616	A
1	1	1617	C
1	1	1618	6MZ
1	1	1619	G
1	1	1628	G
1	1	1630	A
1	1	1633	G
1	1	1634	A
1	1	1639	C
1	1	1642	G
1	1	1643	G
1	1	1644	C
1	1	1646	C
1	1	1647	U
1	1	1648	U
1	1	1649	G
1	1	1650	A
1	1	1651	G
1	1	1654	A
1	1	1671	U
1	1	1672	A
1	1	1673	G
1	1	1674	G
1	1	1676	A
1	1	1690	A
1	1	1694	C
1	1	1695	G
1	1	1698	A
1	1	1699	G
1	1	1702	G
1	1	1703	G
1	1	1705	A
1	1	1715	G
1	1	1726	C
1	1	1729	U
1	1	1730	C
1	1	1732	C

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Mol	Chain	Res	Type
1	1	1733	G
1	1	1738	G
1	1	1749	A
1	1	1756	G
1	1	1757	A
1	1	1758	U
1	1	1761	C
1	1	1762	A
1	1	1764	C
1	1	1768	C
1	1	1769	U
1	1	1770	G
1	1	1773	A
1	1	1780	A
1	1	1781	U
1	1	1782	U
1	1	1785	A
1	1	1791	A
1	1	1799	G
1	1	1800	C
1	1	1801	A
1	1	1802	A
1	1	1805	A
1	1	1808	A
1	1	1810	A
1	1	1815	A
1	1	1816	C
1	1	1829	A
1	1	1830	C
1	1	1833	C
1	1	1835	2MG
1	1	1842	G
1	1	1859	U
1	1	1862	G
1	1	1866	A
1	1	1868	C
1	1	1869	G
1	1	1870	C
1	1	1871	A
1	1	1872	A
1	1	1873	G
1	1	1880	U

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Mol	Chain	Res	Type
1	1	1886	U
1	1	1890	A
1	1	1905	C
1	1	1906	G
1	1	1910	G
1	1	1911	PSU
1	1	1912	A
1	1	1913	A
1	1	1914	C
1	1	1915	3TD
1	1	1916	A
1	1	1917	PSU
1	1	1918	A
1	1	1923	U
1	1	1924	C
1	1	1929	G
1	1	1930	G
1	1	1933	G
1	1	1936	A
1	1	1937	A
1	1	1938	A
1	1	1939	5MU
1	1	1940	U
1	1	1942	C
1	1	1943	U
1	1	1945	G
1	1	1955	U
1	1	1961	C
1	1	1964	G
1	1	1965	C
1	1	1967	C
1	1	1968	G
1	1	1970	A
1	1	1971	U
1	1	1972	G
1	1	1981	A
1	1	1982	U
1	1	1991	U
1	1	1992	G
1	1	1993	U
1	1	1996	C
1	1	1997	C

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Mol	Chain	Res	Type
1	1	2015	A
1	1	2022	U
1	1	2023	C
1	1	2030	6MZ
1	1	2031	A
1	1	2032	G
1	1	2033	A
1	1	2034	U
1	1	2035	G
1	1	2036	C
1	1	2041	U
1	1	2043	C
1	1	2044	C
1	1	2049	G
1	1	2052	A
1	1	2055	C
1	1	2056	G
1	1	2058	A
1	1	2059	A
1	1	2060	A
1	1	2061	G
1	1	2062	A
1	1	2068	U
1	1	2069	G7M
1	1	2070	A
1	1	2072	C
1	1	2077	A
1	1	2081	U
1	1	2085	U
1	1	2092	U
1	1	2093	G
1	1	2094	A
1	1	2095	A
1	1	2096	C
1	1	2097	A
1	1	2099	U
1	1	2101	A
1	1	2102	G
1	1	2103	C
1	1	2104	C
1	1	2105	U
1	1	2106	U

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Mol	Chain	Res	Type
1	1	2107	G
1	1	2108	A
1	1	2111	U
1	1	2112	G
1	1	2114	A
1	1	2115	G
1	1	2116	G
1	1	2117	A
1	1	2118	U
1	1	2120	G
1	1	2121	G
1	1	2122	U
1	1	2124	G
1	1	2125	G
1	1	2126	A
1	1	2127	G
1	1	2128	G
1	1	2131	U
1	1	2132	U
1	1	2136	G
1	1	2138	G
1	1	2139	U
1	1	2145	C
1	1	2146	C
1	1	2147	A
1	1	2150	C
1	1	2151	U
1	1	2155	U
1	1	2156	G
1	1	2157	G
1	1	2158	A
1	1	2159	G
1	1	2161	C
1	1	2163	A
1	1	2164	C
1	1	2165	C
1	1	2166	U
1	1	2168	G
1	1	2169	A
1	1	2170	A
1	1	2171	A
1	1	2172	U

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Mol	Chain	Res	Type
1	1	2174	C
1	1	2177	C
1	1	2178	C
1	1	2180	U
1	1	2181	U
1	1	2182	U
1	1	2183	A
1	1	2184	A
1	1	2186	G
1	1	2187	U
1	1	2189	U
1	1	2190	G
1	1	2191	A
1	1	2193	G
1	1	2194	U
1	1	2198	A
1	1	2204	G
1	1	2211	A
1	1	2212	A
1	1	2213	U
1	1	2214	C
1	1	2218	G
1	1	2219	U
1	1	2226	C
1	1	2232	C
1	1	2238	G
1	1	2250	G
1	1	2252	G
1	1	2255	G
1	1	2256	G
1	1	2266	A
1	1	2268	A
1	1	2278	A
1	1	2279	G
1	1	2280	G
1	1	2283	C
1	1	2286	G
1	1	2287	A
1	1	2288	A
1	1	2305	U
1	1	2306	C
1	1	2308	G

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Mol	Chain	Res	Type
1	1	2315	G
1	1	2320	U
1	1	2322	A
1	1	2325	G
1	1	2327	A
1	1	2328	A
1	1	2333	A
1	1	2334	U
1	1	2335	A
1	1	2336	A
1	1	2344	U
1	1	2347	C
1	1	2350	C
1	1	2351	G
1	1	2352	A
1	1	2354	C
1	1	2359	C
1	1	2361	G
1	1	2367	G
1	1	2371	G
1	1	2376	A
1	1	2378	A
1	1	2383	G
1	1	2385	C
1	1	2391	G
1	1	2401	U
1	1	2402	U
1	1	2403	C
1	1	2406	A
1	1	2410	G
1	1	2420	C
1	1	2423	U
1	1	2424	C
1	1	2425	A
1	1	2426	A
1	1	2428	G
1	1	2429	G
1	1	2430	A
1	1	2432	A
1	1	2441	U
1	1	2445	2MG
1	1	2448	A

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Mol	Chain	Res	Type
1	1	2449	U
1	1	2457	PSU
1	1	2458	G
1	1	2462	C
1	1	2465	C
1	1	2470	G
1	1	2476	A
1	1	2478	A
1	1	2481	G
1	1	2491	U
1	1	2498	OMC
1	1	2499	C
1	1	2501	C
1	1	2502	G
1	1	2503	2MA
1	1	2504	PSU
1	1	2505	G
1	1	2506	U
1	1	2507	C
1	1	2509	G
1	1	2513	A
1	1	2518	A
1	1	2520	C
1	1	2529	G
1	1	2533	U
1	1	2534	A
1	1	2535	G
1	1	2537	U
1	1	2538	C
1	1	2543	G
1	1	2547	A
1	1	2552	OMU
1	1	2553	G
1	1	2556	C
1	1	2564	A
1	1	2566	A
1	1	2567	G
1	1	2573	C
1	1	2574	G
1	1	2580	PSU
1	1	2581	G
1	1	2582	G

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Mol	Chain	Res	Type
1	1	2585	U
1	1	2586	U
1	1	2600	A
1	1	2602	A
1	1	2604	U
1	1	2605	PSU
1	1	2606	C
1	1	2608	G
1	1	2609	U
1	1	2613	U
1	1	2614	A
1	1	2615	U
1	1	2629	U
1	1	2630	G
1	1	2631	G
1	1	2634	A
1	1	2646	C
1	1	2648	G
1	1	2654	A
1	1	2663	G
1	1	2668	G
1	1	2670	A
1	1	2679	A
1	1	2682	A
1	1	2689	U
1	1	2690	U
1	1	2697	G
1	1	2700	A
1	1	2713	U
1	1	2714	G
1	1	2716	C
1	1	2718	G
1	1	2721	A
1	1	2726	A
1	1	2729	G
1	1	2732	G
1	1	2733	A
1	1	2739	U
1	1	2741	A
1	1	2744	G
1	1	2748	A
1	1	2750	A

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Mol	Chain	Res	Type
1	1	2751	G
1	1	2752	C
1	1	2753	A
1	1	2755	C
1	1	2756	U
1	1	2766	A
1	1	2773	C
1	1	2775	G
1	1	2776	A
1	1	2777	G
1	1	2778	A
1	1	2780	G
1	1	2781	A
1	1	2786	U
1	1	2790	U
1	1	2791	G
1	1	2792	A
1	1	2794	C
1	1	2795	C
1	1	2797	U
1	1	2798	U
1	1	2800	A
1	1	2802	G
1	1	2804	U
1	1	2806	C
1	1	2808	G
1	1	2818	U
1	1	2820	A
1	1	2825	G
1	1	2832	U
1	1	2833	U
1	1	2834	G
1	1	2835	A
1	1	2836	U
1	1	2837	A
1	1	2847	U
1	1	2849	U
1	1	2853	C
1	1	2859	G
1	1	2867	G
1	1	2872	A
1	1	2874	C

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Mol	Chain	Res	Type
1	1	2879	A
1	1	2880	C
1	1	2883	A
1	1	2884	U
1	1	2885	G
1	1	2891	U
1	1	2895	G
1	1	2898	U
1	1	2901	C
1	1	2903	U
2	2	4	U
2	2	7	A
2	2	9	G
2	2	14	U
2	2	22	G
2	2	32	A
2	2	38	G
2	2	39	G
2	2	47	C
2	2	48	C
2	2	51	A
2	2	52	C
2	2	58	C
2	2	66	A
2	2	70	U
2	2	72	A
2	2	74	A
2	2	75	G
2	2	76	G
2	2	78	A
2	2	79	G
2	2	80	A
2	2	81	A
2	2	83	C
2	2	84	U
2	2	85	U
2	2	86	G
2	2	87	C
2	2	88	U
2	2	89	U
2	2	91	U
2	2	94	G

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Mol	Chain	Res	Type
2	2	95	C
2	2	98	A
2	2	101	A
2	2	110	C
2	2	119	A
2	2	120	A
2	2	121	U
2	2	122	G
2	2	130	A
2	2	131	A
2	2	144	G
2	2	149	A
2	2	150	U
2	2	151	A
2	2	160	A
2	2	163	C
2	2	164	G
2	2	174	A
2	2	181	A
2	2	190	A
2	2	191	G
2	2	195	A
2	2	199	A
2	2	203	G
2	2	204	G
2	2	207	C
2	2	208	U
2	2	209	U
2	2	211	G
2	2	212	G
2	2	213	G
2	2	214	C
2	2	228	A
2	2	237	G
2	2	245	U
2	2	247	G
2	2	251	G
2	2	257	G
2	2	262	A
2	2	266	G
2	2	267	C
2	2	271	C

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Mol	Chain	Res	Type
2	2	273	U
2	2	279	A
2	2	281	G
2	2	289	G
2	2	298	A
2	2	299	G
2	2	306	A
2	2	317	U
2	2	325	A
2	2	328	C
2	2	329	A
2	2	330	C
2	2	332	G
2	2	334	C
2	2	336	A
2	2	340	U
2	2	344	A
2	2	347	G
2	2	352	C
2	2	354	G
2	2	364	A
2	2	366	A
2	2	367	U
2	2	372	C
2	2	373	A
2	2	381	C
2	2	382	A
2	2	384	G
2	2	386	C
2	2	388	G
2	2	392	C
2	2	397	A
2	2	406	G
2	2	411	A
2	2	412	A
2	2	413	G
2	2	414	A
2	2	416	G
2	2	421	U
2	2	422	C
2	2	423	G
2	2	424	G

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Mol	Chain	Res	Type
2	2	428	G
2	2	429	U
2	2	435	A
2	2	443	C
2	2	451	A
2	2	457	G
2	2	458	U
2	2	460	A
2	2	464	U
2	2	465	A
2	2	466	A
2	2	467	U
2	2	468	A
2	2	469	C
2	2	475	C
2	2	476	U
2	2	479	U
2	2	482	A
2	2	484	G
2	2	485	U
2	2	486	U
2	2	492	C
2	2	495	A
2	2	496	A
2	2	505	G
2	2	511	C
2	2	514	C
2	2	516	PSU
2	2	517	G
2	2	518	C
2	2	527	7MG
2	2	528	C
2	2	531	U
2	2	532	A
2	2	533	A
2	2	541	G
2	2	545	C
2	2	546	A
2	2	547	A
2	2	564	C
2	2	565	U
2	2	566	G

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Mol	Chain	Res	Type
2	2	571	U
2	2	572	A
2	2	573	A
2	2	576	C
2	2	577	G
2	2	579	A
2	2	587	G
2	2	607	A
2	2	629	A
2	2	632	U
2	2	633	G
2	2	638	U
2	2	639	G
2	2	653	U
2	2	654	G
2	2	665	A
2	2	702	A
2	2	703	G
2	2	706	A
2	2	721	G
2	2	723	U
2	2	724	G
2	2	731	G
2	2	734	G
2	2	738	C
2	2	747	A
2	2	748	G
2	2	753	A
2	2	755	G
2	2	758	C
2	2	763	G
2	2	764	C
2	2	767	A
2	2	768	A
2	2	769	G
2	2	777	A
2	2	779	C
2	2	790	A
2	2	792	A
2	2	793	U
2	2	794	A
2	2	796	C

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Mol	Chain	Res	Type
2	2	810	C
2	2	815	A
2	2	817	C
2	2	818	G
2	2	819	A
2	2	826	C
2	2	828	U
2	2	831	A
2	2	832	G
2	2	836	G
2	2	839	C
2	2	841	C
2	2	842	U
2	2	843	U
2	2	844	G
2	2	845	A
2	2	846	G
2	2	847	G
2	2	850	U
2	2	851	G
2	2	856	C
2	2	860	A
2	2	864	A
2	2	865	A
2	2	866	C
2	2	885	G
2	2	886	G
2	2	887	G
2	2	889	A
2	2	895	G
2	2	900	A
2	2	901	A
2	2	908	A
2	2	909	A
2	2	910	C
2	2	914	A
2	2	916	U
2	2	926	G
2	2	931	C
2	2	933	G
2	2	934	C
2	2	939	G

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Mol	Chain	Res	Type
2	2	955	U
2	2	960	U
2	2	962	C
2	2	966	2MG
2	2	967	5MC
2	2	968	A
2	2	969	A
2	2	971	G
2	2	972	C
2	2	974	A
2	2	975	A
2	2	976	G
2	2	977	A
2	2	980	C
2	2	982	U
2	2	989	U
2	2	992	U
2	2	993	G
2	2	1000	A
2	2	1001	C
2	2	1002	G
2	2	1004	A
2	2	1006	G
2	2	1007	U
2	2	1009	U
2	2	1017	U
2	2	1018	G
2	2	1022	A
2	2	1023	U
2	2	1026	G
2	2	1027	C
2	2	1028	C
2	2	1030	U
2	2	1031	C
2	2	1032	G
2	2	1033	G
2	2	1036	A
2	2	1037	C
2	2	1038	C
2	2	1039	G
2	2	1042	A
2	2	1043	G

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Mol	Chain	Res	Type
2	2	1044	A
2	2	1046	A
2	2	1050	G
2	2	1051	C
2	2	1062	U
2	2	1064	G
2	2	1065	U
2	2	1069	C
2	2	1073	U
2	2	1078	U
2	2	1085	U
2	2	1092	A
2	2	1093	A
2	2	1094	G
2	2	1095	U
2	2	1099	G
2	2	1101	A
2	2	1108	G
2	2	1121	U
2	2	1124	G
2	2	1125	U
2	2	1135	U
2	2	1136	C
2	2	1137	C
2	2	1138	G
2	2	1139	G
2	2	1140	C
2	2	1141	C
2	2	1142	G
2	2	1143	G
2	2	1145	A
2	2	1146	A
2	2	1151	A
2	2	1159	U
2	2	1167	A
2	2	1168	U
2	2	1169	A
2	2	1171	A
2	2	1174	G
2	2	1175	G
2	2	1176	A
2	2	1184	G

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Mol	Chain	Res	Type
2	2	1186	G
2	2	1189	U
2	2	1195	C
2	2	1196	A
2	2	1197	A
2	2	1199	U
2	2	1205	U
2	2	1212	U
2	2	1213	A
2	2	1214	C
2	2	1221	G
2	2	1224	U
2	2	1226	C
2	2	1227	A
2	2	1228	C
2	2	1236	A
2	2	1238	A
2	2	1240	U
2	2	1256	A
2	2	1257	A
2	2	1258	G
2	2	1260	G
2	2	1268	G
2	2	1280	A
2	2	1281	C
2	2	1283	U
2	2	1285	A
2	2	1286	U
2	2	1287	A
2	2	1288	A
2	2	1290	G
2	2	1291	U
2	2	1297	G
2	2	1299	A
2	2	1300	G
2	2	1301	U
2	2	1302	C
2	2	1304	G
2	2	1305	G
2	2	1317	C
2	2	1318	A
2	2	1320	C

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Mol	Chain	Res	Type
2	2	1322	C
2	2	1323	G
2	2	1324	A
2	2	1334	G
2	2	1335	U
2	2	1339	A
2	2	1341	U
2	2	1351	U
2	2	1353	G
2	2	1359	C
2	2	1363	A
2	2	1364	U
2	2	1370	G
2	2	1372	U
2	2	1373	G
2	2	1378	C
2	2	1379	G
2	2	1381	U
2	2	1384	C
2	2	1390	U
2	2	1394	A
2	2	1396	A
2	2	1397	C
2	2	1398	A
2	2	1401	G
2	2	1402	4OC
2	2	1403	C
2	2	1408	A
2	2	1414	U
2	2	1419	G
2	2	1424	U
2	2	1425	U
2	2	1426	G
2	2	1427	C
2	2	1430	A
2	2	1434	A
2	2	1436	U
2	2	1439	G
2	2	1440	U
2	2	1445	U
2	2	1446	A
2	2	1450	U

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Mol	Chain	Res	Type
2	2	1451	U
2	2	1452	C
2	2	1453	G
2	2	1456	A
2	2	1457	G
2	2	1475	G
2	2	1480	A
2	2	1493	A
2	2	1497	G
2	2	1502	A
2	2	1503	A
2	2	1505	G
2	2	1506	U
2	2	1508	A
2	2	1509	C
2	2	1517	G
2	2	1518	MA6
2	2	1519	MA6
2	2	1523	G
2	2	1525	G
2	2	1529	G
2	2	1530	G
2	2	1533	C
2	2	1534	A
3	3	2	G
3	3	6	G
3	3	7	G
3	3	13	G
3	3	17	C
3	3	19	C
3	3	23	G
3	3	25	U
3	3	32	U
3	3	35	C
3	3	37	C
3	3	40	U
3	3	42	C
3	3	44	G
3	3	47	C
3	3	51	G
3	3	56	G
3	3	59	A

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Mol	Chain	Res	Type
3	3	61	G
3	3	63	C
3	3	66	A
3	3	67	G
3	3	68	C
3	3	73	A
3	3	84	G
3	3	88	C
3	3	89	U
3	3	90	C
3	3	94	A
3	3	96	G
3	3	99	A
3	3	101	A
3	3	102	G
3	3	105	G
3	3	108	A
3	3	109	A
3	3	114	C
3	3	115	A
6	8	3	C
6	8	4	U
6	8	6	C
6	8	7	G
6	8	8	U
6	8	12	U
6	8	13	C
6	8	14	A
6	8	16	U
6	8	17	U
6	8	18	G
6	8	19	G
6	8	20	U
6	8	21	U
6	8	22	A
6	8	23	G
6	8	26	C
6	8	27	A
6	8	28	C
6	8	31	C
6	8	34	U
6	8	35	C

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Mol	Chain	Res	Type
6	8	36	A
6	8	39	A
6	8	40	U
6	8	43	U
6	8	44	G
6	8	45	G
6	8	47	G
6	8	48	U
6	8	49	C
6	8	50	A
6	8	51	C
6	8	53	G
6	8	56	U
6	8	57	C
6	8	58	G
6	8	59	A
6	8	62	C
6	8	64	C
6	8	68	G
6	8	76	C
6	8	77	A
7	9	2	U
7	9	3	G
7	9	7	G
7	9	9	C
59	4	2	G
59	4	3	G
59	4	4	G
59	4	6	U
59	4	7	G
59	4	8	A
59	4	9	U
59	4	10	U
59	4	11	C
59	4	12	U
59	4	13	G
59	4	14	G
59	4	15	A
59	4	16	U
59	4	17	U
59	4	18	C
59	4	20	A

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Mol	Chain	Res	Type
59	4	21	C
59	4	27	U
59	4	28	U
59	4	30	C
59	4	32	A
59	4	33	A
59	4	34	A
59	4	35	C
59	4	38	A
59	4	39	A
59	4	40	G
59	4	43	G
59	4	44	C
59	4	45	A
59	4	46	U
59	4	47	G
59	4	49	C
59	4	54	G
59	4	55	G
59	4	56	C
59	4	60	U
59	4	61	G
59	4	62	G
59	4	63	C
59	4	64	C
59	4	68	U
59	4	69	A
59	4	70	A
59	4	71	A
59	4	72	A
59	4	114	G
59	4	117	G
59	4	119	U
59	4	121	A
59	4	122	A
59	4	123	U
59	4	125	A
59	4	127	C
59	4	128	U
59	4	129	G
59	4	130	C
59	4	131	U

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Mol	Chain	Res	Type
59	4	132	U
59	4	133	A
59	4	138	C
59	4	143	C
59	4	144	U
59	4	145	C
59	4	149	A
59	4	150	G
59	4	151	C
59	4	154	C
59	4	155	C
59	4	156	G
59	4	158	U
59	4	160	U
59	4	164	G
59	4	165	A
59	4	166	C
59	4	169	G
59	4	170	G
59	4	172	U
59	4	173	C
59	4	174	A
59	4	175	A
59	4	176	G
59	4	180	G
59	4	181	G
59	4	182	U
59	4	183	C
59	4	184	A
59	4	185	A
59	4	186	A
59	4	188	C
59	4	189	C
59	4	190	A
59	4	191	A
59	4	192	A
59	4	193	A
59	4	194	G
59	4	197	A
59	4	198	U
59	4	199	C
59	4	200	G

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Mol	Chain	Res	Type
59	4	203	U
59	4	204	G
59	4	205	G
59	4	206	A
59	4	207	A
59	4	209	C
59	4	210	C
59	4	211	C
59	4	213	G
59	4	218	G
59	4	222	U
59	4	223	G
59	4	224	A
59	4	225	A
59	4	226	G
59	4	227	C
59	4	228	G
59	4	230	U
59	4	231	A
59	4	233	A
59	4	234	A
59	4	235	C
59	4	236	U
59	4	237	U
59	4	238	A
59	4	239	A
59	4	240	U
59	4	241	C
59	4	242	A
59	4	244	G
59	4	245	C
59	4	246	U
59	4	248	G
59	4	249	U
59	4	250	U
59	4	257	U
59	4	258	G
59	4	261	G
59	4	262	U
59	4	263	G
59	4	264	U
59	4	266	C

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Mol	Chain	Res	Type
59	4	267	G
59	4	268	U
59	4	269	C
59	4	270	C
59	4	273	A
59	4	274	G
59	4	282	G
59	4	285	A
59	4	286	A
59	4	287	U
59	4	288	G
59	4	291	A
59	4	292	A
59	4	293	G
59	4	296	U
59	4	299	C
59	4	300	U
59	4	301	A
59	4	302	A
59	4	303	G
59	4	308	U
59	4	309	A
59	4	310	G
59	4	312	A
59	4	315	G
59	4	316	A
59	4	317	G
59	4	318	G
59	4	319	A
59	4	321	G
59	4	322	U
59	4	323	A
59	4	324	G
59	4	325	G
59	4	332	G
59	4	333	G
59	4	334	A
59	4	335	C
59	4	336	G
59	4	339	G
59	4	340	G
59	4	341	U

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Mol	Chain	Res	Type
59	4	342	U
59	4	343	C
59	4	344	A
59	4	347	U
59	4	348	C
59	4	351	G
59	4	356	C
59	4	357	U
59	4	359	C
59	4	360	A
59	4	361	C
59	4	362	C
59	4	363	A
60	7	2	C
60	7	3	G
60	7	4	U
60	7	5	C
60	7	6	C
60	7	7	G
60	7	8	U
60	7	11	C
60	7	12	U
60	7	13	C
60	7	14	A
60	7	16	U
60	7	17	U
60	7	18	G
60	7	19	G
60	7	20	U
60	7	21	U
60	7	22	A
60	7	23	G
60	7	24	A
60	7	26	C
60	7	28	C
60	7	29	C
60	7	30	A
60	7	31	C
60	7	34	U
60	7	38	A
60	7	39	U
60	7	40	G

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Mol	Chain	Res	Type
60	7	45	G
60	7	47	G
60	7	48	U
60	7	49	C
60	7	50	G
60	7	51	G
60	7	52	U
60	7	56	U
60	7	57	C
60	7	58	G
60	7	59	A
60	7	62	C
60	7	63	C
60	7	64	A
60	7	68	G
60	7	69	G
60	7	70	A
60	7	73	C
60	7	74	A
60	7	77	A

All (67) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	1	278	A
1	1	387	U
1	1	404	A
1	1	747	5MU
1	1	784	G
1	1	894	U
1	1	955	PSU
1	1	1332	G
1	1	1379	U
1	1	1614	A
1	1	1905	C
1	1	1911	PSU
1	1	1917	PSU
1	1	1939	5MU
1	1	2193	G
1	1	2225	A
1	1	2255	G
1	1	2425	A

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Mol	Chain	Res	Type
1	1	2457	PSU
1	1	2498	OMC
1	1	2504	PSU
1	1	2506	U
1	1	2580	PSU
1	1	2605	PSU
2	2	120	A
2	2	149	A
2	2	516	PSU
2	2	527	7MG
2	2	1145	A
2	2	1151	A
2	2	1281	C
6	8	18	G
59	4	9	U
59	4	11	C
59	4	13	G
59	4	14	G
59	4	15	A
59	4	16	U
59	4	17	U
59	4	19	G
59	4	20	A
59	4	32	A
59	4	33	A
59	4	38	A
59	4	68	U
59	4	130	C
59	4	131	U
59	4	153	U
59	4	183	C
59	4	185	A
59	4	212	U
59	4	223	G
59	4	229	U
59	4	233	A
59	4	245	C
59	4	247	A
59	4	257	U
59	4	261	G
59	4	290	A
59	4	299	C

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Mol	Chain	Res	Type
59	4	308	U
59	4	314	C
59	4	320	U
59	4	332	G
59	4	333	G
60	7	13	C
60	7	18	G

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

34 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
1	PSU	1	2504	1	18,21,22	2.02	5 (27%)	22,30,33	2.24	6 (27%)
2	MA6	2	1519	2	18,26,27	1.11	1 (5%)	19,38,41	1.39	2 (10%)
1	5MC	1	1962	1	18,22,23	2.15	3 (16%)	26,32,35	1.47	5 (19%)
1	PSU	1	2457	1	18,21,22	1.99	5 (27%)	22,30,33	2.10	7 (31%)
2	PSU	2	516	2	18,21,22	2.29	6 (33%)	22,30,33	2.50	6 (27%)
1	6MZ	1	1618	1	18,25,26	1.90	1 (5%)	16,36,39	2.53	5 (31%)
49	0TD	q	89	49	7,9,10	1.39	0	6,11,13	1.90	2 (33%)
2	2MG	2	1207	2	18,26,27	3.02	6 (33%)	16,38,41	1.35	4 (25%)
2	2MG	2	966	2	18,26,27	2.95	6 (33%)	16,38,41	1.41	3 (18%)
1	OMC	1	2498	61,1	19,22,23	1.70	4 (21%)	26,31,34	2.22	6 (23%)
1	PSU	1	955	1	18,21,22	1.98	4 (22%)	22,30,33	2.17	5 (22%)
2	UR3	2	1498	2	19,22,23	2.99	7 (36%)	26,32,35	1.55	5 (19%)
2	5MC	2	1407	2	18,22,23	2.05	3 (16%)	26,32,35	1.49	4 (15%)
1	2MG	1	2445	1	18,26,27	2.90	5 (27%)	16,38,41	1.32	3 (18%)
1	6MZ	1	2030	1	18,25,26	1.91	1 (5%)	16,36,39	3.25	5 (31%)
1	PSU	1	2605	1	18,21,22	2.07	6 (33%)	22,30,33	1.92	4 (18%)
1	PSU	1	746	1	18,21,22	1.85	5 (27%)	22,30,33	2.00	4 (18%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	PSU	1	1911	1	18,21,22	1.95	4 (22%)	22,30,33	2.22	4 (18%)
1	2MG	1	1835	1	18,26,27	2.96	6 (33%)	16,38,41	1.78	4 (25%)
1	3TD	1	1915	61,1	18,22,23	2.77	7 (38%)	22,32,35	1.87	4 (18%)
1	OMG	1	2251	1	18,26,27	2.98	7 (38%)	19,38,41	1.55	4 (21%)
1	1MG	1	745	1	18,26,27	2.97	7 (38%)	19,39,42	2.29	9 (47%)
1	5MU	1	1939	61,1	19,22,23	2.49	7 (36%)	28,32,35	3.58	10 (35%)
2	5MC	2	967	2	18,22,23	2.11	3 (16%)	26,32,35	1.52	4 (15%)
1	5MU	1	747	1	19,22,23	2.10	7 (36%)	28,32,35	4.58	10 (35%)
1	PSU	1	1917	1	18,21,22	2.09	5 (27%)	22,30,33	2.15	5 (22%)
1	PSU	1	2580	1	18,21,22	1.94	5 (27%)	22,30,33	2.16	6 (27%)
2	7MG	2	527	2	22,26,27	6.62	6 (27%)	29,39,42	2.60	9 (31%)
1	OMU	1	2552	61,1	19,22,23	2.76	7 (36%)	26,31,34	2.07	8 (30%)
1	G7M	1	2069	1	20,26,27	2.82	5 (25%)	17,39,42	0.83	0
2	MA6	2	1518	2	18,26,27	1.00	1 (5%)	19,38,41	1.48	2 (10%)
2	2MG	2	1516	2	18,26,27	2.94	6 (33%)	16,38,41	1.43	3 (18%)
2	4OC	2	1402	2	20,23,24	2.57	5 (25%)	26,32,35	2.03	8 (30%)
1	2MA	1	2503	61,1	19,25,26	1.12	1 (5%)	21,37,40	1.95	3 (14%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	PSU	1	2504	1	2/2/5/5	4/7/25/26	0/2/2/2
2	MA6	2	1519	2	-	6/7/29/30	0/3/3/3
1	5MC	1	1962	1	-	4/7/25/26	0/2/2/2
1	PSU	1	2457	1	2/2/5/5	2/7/25/26	0/2/2/2
2	PSU	2	516	2	2/2/5/5	7/7/25/26	0/2/2/2
1	6MZ	1	1618	1	2/2/5/6	3/5/27/28	0/3/3/3
49	0TD	q	89	49	-	2/7/12/14	-
2	2MG	2	1207	2	-	0/5/27/28	0/3/3/3
2	2MG	2	966	2	-	2/5/27/28	0/3/3/3
1	OMC	1	2498	61,1	1/1/5/5	5/9/27/28	0/2/2/2
1	PSU	1	955	1	2/2/5/5	4/7/25/26	0/2/2/2
2	UR3	2	1498	2	-	0/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	5MC	2	1407	2	-	0/7/25/26	0/2/2/2
1	2MG	1	2445	1	-	4/5/27/28	0/3/3/3
1	6MZ	1	2030	1	2/2/5/6	3/5/27/28	0/3/3/3
1	PSU	1	2605	1	2/2/5/5	3/7/25/26	0/2/2/2
1	PSU	1	746	1	2/2/5/5	5/7/25/26	0/2/2/2
1	PSU	1	1911	1	2/2/5/5	1/7/25/26	0/2/2/2
1	2MG	1	1835	1	-	2/5/27/28	0/3/3/3
1	3TD	1	1915	61,1	1/1/5/5	4/7/25/26	0/2/2/2
1	OMG	1	2251	1	1/1/5/5	1/5/27/28	0/3/3/3
1	1MG	1	745	1	2/2/5/5	1/3/25/26	0/3/3/3
1	5MU	1	1939	61,1	2/2/5/5	1/7/25/26	0/2/2/2
2	5MC	2	967	2	-	2/7/25/26	0/2/2/2
1	5MU	1	747	1	2/2/5/5	5/7/25/26	0/2/2/2
1	PSU	1	1917	1	2/2/5/5	2/7/25/26	0/2/2/2
1	PSU	1	2580	1	2/2/5/5	4/7/25/26	0/2/2/2
2	7MG	2	527	2	1/1/7/7	3/7/37/38	0/3/3/3
1	OMU	1	2552	61,1	2/2/5/5	3/9/27/28	0/2/2/2
1	G7M	1	2069	1	1/1/5/5	1/3/25/26	0/3/3/3
2	MA6	2	1518	2	-	4/7/29/30	0/3/3/3
2	2MG	2	1516	2	-	2/5/27/28	0/3/3/3
2	4OC	2	1402	2	2/2/5/6	5/9/29/30	0/2/2/2
1	2MA	1	2503	61,1	2/2/5/5	2/3/25/26	0/3/3/3

All (157) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	2	527	7MG	C8-N9	-28.63	1.30	1.46
1	1	2069	G7M	O6-C6	10.17	1.44	1.23
1	1	2251	OMG	O6-C6	9.17	1.41	1.23
2	2	1516	2MG	O6-C6	8.90	1.41	1.23
1	1	2445	2MG	O6-C6	8.76	1.41	1.23
2	2	966	2MG	O6-C6	8.67	1.40	1.23
2	2	1207	2MG	O6-C6	8.65	1.40	1.23
2	2	1402	4OC	O2-C2	8.48	1.39	1.23
1	1	745	1MG	O6-C6	8.46	1.39	1.22
2	2	1498	UR3	O4-C4	8.16	1.41	1.23
1	1	2552	OMU	O4-C4	8.04	1.40	1.24
1	1	1915	3TD	O4-C4	7.70	1.39	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	1835	2MG	O6-C6	7.58	1.38	1.23
1	1	1618	6MZ	C6-N6	7.26	1.46	1.35
2	2	527	7MG	O6-C6	7.23	1.37	1.23
1	1	2030	6MZ	C6-N6	6.76	1.46	1.35
2	2	967	5MC	C4-N4	6.40	1.50	1.34
1	1	1962	5MC	C4-N4	6.27	1.50	1.34
2	2	527	7MG	C2-N2	6.18	1.48	1.34
2	2	1407	5MC	C4-N4	5.98	1.49	1.34
2	2	966	2MG	C2-N2	5.96	1.46	1.33
1	1	745	1MG	C2-N2	5.77	1.44	1.34
2	2	1498	UR3	C2-N1	-5.70	1.30	1.38
2	2	516	PSU	C4-N3	-5.65	1.28	1.38
2	2	1207	2MG	C2-N2	5.60	1.45	1.33
1	1	2445	2MG	C2-N2	5.52	1.45	1.33
1	1	1939	5MU	C2-N1	-5.45	1.29	1.38
1	1	1962	5MC	C2-N1	-5.26	1.28	1.40
2	2	1516	2MG	C2-N2	5.24	1.45	1.33
1	1	1835	2MG	C2-N2	5.07	1.44	1.33
2	2	527	7MG	C4-N9	-5.06	1.31	1.37
1	1	2251	OMG	C2-N2	4.95	1.46	1.34
1	1	2552	OMU	C2-N1	-4.89	1.30	1.38
1	1	745	1MG	C6-N1	-4.89	1.30	1.39
1	1	1835	2MG	C6-N1	-4.86	1.30	1.37
2	2	967	5MC	C2-N1	-4.82	1.29	1.40
1	1	2580	PSU	C4-N3	-4.79	1.29	1.38
2	2	1407	5MC	C2-N1	-4.76	1.29	1.40
1	1	2498	OMC	C4-N4	4.74	1.45	1.33
1	1	1917	PSU	C4-N3	-4.68	1.30	1.38
1	1	2457	PSU	C4-N3	-4.65	1.30	1.38
1	1	1915	3TD	C2-N1	-4.62	1.31	1.37
1	1	2069	G7M	C2-N2	4.58	1.45	1.34
1	1	2605	PSU	C4-N3	-4.52	1.30	1.38
1	1	1911	PSU	C4-N3	-4.50	1.30	1.38
2	2	1402	4OC	C2-N1	-4.39	1.30	1.40
2	2	1402	4OC	C4-N4	4.37	1.44	1.35
1	1	1915	3TD	C4-N3	-4.36	1.31	1.40
1	1	1835	2MG	C5-C6	-4.36	1.38	1.47
1	1	2605	PSU	C6-C5	4.35	1.40	1.35
1	1	2504	PSU	C6-C5	4.35	1.40	1.35
1	1	2504	PSU	C4-N3	-4.34	1.30	1.38
1	1	1939	5MU	C2-N3	-4.30	1.30	1.38
2	2	1498	UR3	C4-N3	-4.28	1.30	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	746	PSU	C4-N3	-4.28	1.30	1.38
2	2	1207	2MG	C6-N1	-4.25	1.31	1.37
1	1	955	PSU	C4-N3	-4.21	1.31	1.38
1	1	955	PSU	C6-C5	4.06	1.40	1.35
1	1	1917	PSU	C2-N1	-4.06	1.31	1.36
1	1	1939	5MU	C6-C5	4.01	1.41	1.34
1	1	2251	OMG	C6-N1	-4.01	1.31	1.37
1	1	1911	PSU	C6-C5	4.00	1.40	1.35
1	1	1917	PSU	C6-C5	3.99	1.40	1.35
2	2	1516	2MG	C6-N1	-3.96	1.32	1.37
1	1	955	PSU	C2-N1	-3.95	1.31	1.36
1	1	2069	G7M	C6-N1	-3.93	1.32	1.37
2	2	516	PSU	C2-N3	-3.92	1.30	1.37
1	1	2457	PSU	C6-C5	3.86	1.39	1.35
1	1	1835	2MG	C2-N1	-3.82	1.30	1.36
1	1	747	5MU	C6-N1	-3.81	1.31	1.38
1	1	747	5MU	C2-N3	-3.80	1.31	1.38
1	1	2445	2MG	C6-N1	-3.79	1.32	1.37
2	2	966	2MG	C6-N1	-3.78	1.32	1.37
1	1	746	PSU	C6-C5	3.76	1.39	1.35
2	2	1207	2MG	C5-C6	-3.75	1.39	1.47
1	1	1939	5MU	C6-N1	-3.75	1.31	1.38
1	1	1939	5MU	C4-N3	-3.75	1.31	1.38
2	2	1498	UR3	C6-N1	-3.64	1.29	1.38
1	1	2580	PSU	C2-N1	-3.63	1.31	1.36
1	1	2552	OMU	C2-N3	-3.60	1.31	1.38
2	2	516	PSU	C2-N1	-3.59	1.31	1.36
1	1	747	5MU	C6-C5	3.56	1.40	1.34
1	1	1917	PSU	C6-N1	-3.55	1.30	1.36
2	2	1498	UR3	C2-N3	-3.54	1.32	1.39
1	1	2552	OMU	C4-N3	-3.52	1.32	1.38
1	1	2457	PSU	C6-N1	-3.49	1.30	1.36
1	1	746	PSU	C2-N1	-3.48	1.32	1.36
2	2	1498	UR3	O2-C2	-3.45	1.16	1.22
1	1	2605	PSU	C2-N1	-3.45	1.32	1.36
2	2	527	7MG	C6-N1	-3.44	1.32	1.38
1	1	2457	PSU	C2-N1	-3.44	1.32	1.36
2	2	516	PSU	C6-C5	3.43	1.39	1.35
2	2	1516	2MG	C5-C6	-3.43	1.40	1.47
1	1	2504	PSU	C2-N1	-3.42	1.32	1.36
1	1	955	PSU	C6-N1	-3.41	1.30	1.36
1	1	2504	PSU	C6-N1	-3.38	1.30	1.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	2445	2MG	C5-C6	-3.36	1.40	1.47
1	1	1911	PSU	C6-N1	-3.35	1.30	1.36
1	1	747	5MU	C4-N3	-3.32	1.32	1.38
2	2	1207	2MG	C2-N1	-3.31	1.31	1.36
1	1	1939	5MU	O4-C4	-3.26	1.17	1.23
2	2	966	2MG	C5-C6	-3.22	1.40	1.47
1	1	1911	PSU	C2-N1	-3.21	1.32	1.36
1	1	1915	3TD	C2-N3	-3.21	1.31	1.38
1	1	747	5MU	C2-N1	-3.15	1.33	1.38
1	1	2503	2MA	C6-N6	3.14	1.45	1.34
1	1	2580	PSU	C6-N1	-3.12	1.31	1.36
2	2	516	PSU	C6-N1	-3.12	1.31	1.36
1	1	1939	5MU	O2-C2	-3.09	1.17	1.23
2	2	527	7MG	C2-N1	-3.07	1.30	1.37
2	2	1516	2MG	C2-N1	-3.02	1.31	1.36
2	2	1402	4OC	C2-N3	-2.98	1.30	1.36
1	1	2552	OMU	O2-C2	-2.96	1.17	1.23
1	1	2605	PSU	C6-N1	-2.92	1.31	1.36
1	1	2445	2MG	C2-N1	-2.91	1.32	1.36
1	1	2251	OMG	C5-C6	-2.90	1.41	1.47
1	1	747	5MU	O4-C4	-2.89	1.18	1.23
2	2	516	PSU	O4'-C1'	-2.87	1.39	1.43
1	1	1915	3TD	C6-N1	-2.86	1.31	1.36
1	1	746	PSU	C6-N1	-2.82	1.31	1.36
1	1	745	1MG	C5-C6	-2.80	1.39	1.47
2	2	966	2MG	C2-N1	-2.78	1.32	1.36
1	1	1915	3TD	O2-C2	-2.72	1.18	1.23
1	1	2251	OMG	C2-N1	-2.69	1.31	1.37
1	1	2580	PSU	C6-C5	2.68	1.38	1.35
1	1	2580	PSU	C2-N3	-2.68	1.32	1.37
1	1	1962	5MC	C2-N3	-2.65	1.31	1.36
1	1	747	5MU	O2-C2	-2.61	1.18	1.23
1	1	2498	OMC	O2-C2	-2.59	1.18	1.23
1	1	1835	2MG	C5-C4	-2.53	1.36	1.43
1	1	2552	OMU	C6-N1	-2.53	1.31	1.38
1	1	1917	PSU	C2-N3	-2.50	1.33	1.37
1	1	2498	OMC	C5-C4	-2.45	1.37	1.42
1	1	2251	OMG	O2'-CM2	-2.44	1.33	1.42
2	2	1498	UR3	C5-C4	-2.42	1.37	1.43
1	1	1915	3TD	C6-C5	2.39	1.38	1.35
1	1	2251	OMG	C5-C4	-2.38	1.37	1.43
2	2	1402	4OC	C6-N1	-2.37	1.32	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	2552	OMU	C5-C4	-2.35	1.38	1.43
2	2	1207	2MG	C5-C4	-2.33	1.37	1.43
1	1	2504	PSU	O4'-C1'	-2.32	1.40	1.43
1	1	2605	PSU	O4'-C1'	-2.32	1.40	1.43
2	2	967	5MC	C2-N3	-2.30	1.31	1.36
1	1	2069	G7M	C2-N1	-2.30	1.32	1.37
1	1	2457	PSU	C2-N3	-2.28	1.33	1.37
1	1	2498	OMC	C2-N3	-2.23	1.31	1.36
1	1	2605	PSU	C2-N3	-2.21	1.33	1.37
1	1	745	1MG	C2'-C1'	-2.17	1.50	1.53
2	2	1407	5MC	C2-N3	-2.15	1.32	1.36
1	1	746	PSU	C2-N3	-2.13	1.33	1.37
1	1	745	1MG	C8-N7	-2.12	1.31	1.35
2	2	966	2MG	C5-C4	-2.06	1.37	1.43
2	2	1516	2MG	C5-C4	-2.06	1.37	1.43
2	2	1519	MA6	C4-N3	-2.06	1.32	1.35
1	1	745	1MG	C5-C4	-2.04	1.37	1.43
1	1	2069	G7M	C4-N3	-2.04	1.32	1.37
2	2	1518	MA6	C4-N3	-2.01	1.32	1.35

All (169) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1	747	5MU	C1'-N1-C2	10.73	136.99	117.57
1	1	747	5MU	C1'-N1-C6	-10.52	103.61	121.12
1	1	2030	6MZ	C9-N6-C6	-9.43	114.75	122.87
1	1	747	5MU	C5M-C5-C4	9.35	129.06	118.77
1	1	1939	5MU	N3-C2-N1	8.73	126.48	114.89
1	1	1939	5MU	C4-N3-C2	-8.03	116.96	127.35
1	1	747	5MU	N3-C2-N1	7.98	125.49	114.89
1	1	1939	5MU	C5M-C5-C4	7.40	126.91	118.77
1	1	2503	2MA	C2-N3-C4	7.40	121.53	115.52
1	1	747	5MU	C5M-C5-C6	-7.29	113.12	122.85
1	1	2498	OMC	O2-C2-N3	-7.05	110.87	122.33
1	1	747	5MU	C4-N3-C2	-6.85	118.48	127.35
2	2	516	PSU	N1-C2-N3	6.83	122.87	115.13
1	1	1911	PSU	N1-C2-N3	6.72	122.74	115.13
2	2	527	7MG	N9-C4-N3	6.46	135.13	125.47
1	1	747	5MU	O2-C2-N3	-6.41	109.56	121.50
2	2	527	7MG	C5-C6-N1	6.27	122.04	110.99
1	1	1939	5MU	C5-C6-N1	-6.22	116.94	123.34
1	1	2504	PSU	N1-C2-N3	6.16	122.11	115.13

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1	2457	PSU	N1-C2-N3	6.12	122.06	115.13
1	1	1939	5MU	C5-C4-N3	6.11	120.52	115.31
1	1	1915	3TD	N1-C2-N3	5.97	120.85	116.14
1	1	1618	6MZ	C9-N6-C6	-5.80	117.88	122.87
1	1	2605	PSU	N1-C2-N3	5.78	121.68	115.13
1	1	1917	PSU	N1-C2-N3	5.78	121.68	115.13
2	2	967	5MC	C5-C6-N1	-5.77	117.40	123.34
1	1	1939	5MU	C5M-C5-C6	-5.75	115.17	122.85
1	1	2580	PSU	N1-C2-N3	5.66	121.54	115.13
1	1	2030	6MZ	C2-N1-C6	5.64	121.43	116.59
2	2	1402	4OC	O3'-C3'-C2'	5.55	126.93	111.17
1	1	955	PSU	N1-C2-N3	5.52	121.38	115.13
1	1	746	PSU	N1-C2-N3	5.43	121.28	115.13
1	1	1618	6MZ	C2-N1-C6	5.41	121.23	116.59
1	1	2030	6MZ	N3-C2-N1	-5.31	120.38	128.68
2	2	527	7MG	C2-N3-C4	5.17	121.52	112.30
2	2	516	PSU	C4-N3-C2	-5.12	118.97	126.34
1	1	747	5MU	C5-C4-N3	4.91	119.50	115.31
1	1	2580	PSU	C4-N3-C2	-4.73	119.53	126.34
1	1	1962	5MC	C5-C6-N1	-4.70	118.51	123.34
2	2	527	7MG	C5-C4-N3	-4.69	119.18	128.13
2	2	516	PSU	C6-C5-C4	-4.69	114.92	118.20
1	1	1939	5MU	O2-C2-N3	-4.68	112.79	121.50
2	2	1498	UR3	C4-N3-C2	-4.67	120.17	124.56
1	1	1618	6MZ	N3-C2-N1	-4.64	121.43	128.68
2	2	1518	MA6	N3-C2-N1	-4.56	121.55	128.68
1	1	2552	OMU	C4-N3-C2	-4.55	120.57	126.58
2	2	1519	MA6	N3-C2-N1	-4.54	121.59	128.68
1	1	955	PSU	C6-C5-C4	-4.41	115.12	118.20
1	1	745	1MG	O3'-C3'-C4'	4.40	123.78	111.05
1	1	955	PSU	O2-C2-N1	-4.40	117.95	122.79
1	1	2504	PSU	O2-C2-N1	-4.38	117.97	122.79
1	1	1835	2MG	C5-C6-N1	4.38	121.68	113.95
1	1	2552	OMU	N3-C2-N1	4.34	120.65	114.89
1	1	2498	OMC	O2-C2-N1	4.34	127.85	118.89
1	1	1911	PSU	O2-C2-N1	-4.26	118.10	122.79
1	1	2498	OMC	C1'-N1-C2	4.25	127.91	118.42
2	2	1402	4OC	O3'-C3'-C4'	4.23	123.29	111.05
1	1	2504	PSU	C4-N3-C2	-4.23	120.24	126.34
1	1	1911	PSU	C4-N3-C2	-4.11	120.42	126.34
1	1	1917	PSU	O2-C2-N1	-4.02	118.36	122.79
1	1	746	PSU	C4-N3-C2	-3.97	120.62	126.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	2	1407	5MC	O2-C2-N3	-3.96	115.90	122.33
1	1	2457	PSU	C4-N3-C2	-3.95	120.65	126.34
1	1	746	PSU	O2-C2-N1	-3.94	118.45	122.79
2	2	1407	5MC	C5-C6-N1	-3.94	119.29	123.34
1	1	1939	5MU	O4-C4-N3	-3.86	112.72	120.12
1	1	747	5MU	C5-C6-N1	-3.84	119.38	123.34
1	1	1917	PSU	C6-C5-C4	-3.80	115.54	118.20
1	1	745	1MG	O4'-C4'-C5'	3.78	121.82	109.37
2	2	1516	2MG	CM2-N2-C2	-3.78	115.51	123.86
1	1	2552	OMU	C5-C4-N3	3.67	120.33	114.84
2	2	1402	4OC	CM2-O2'-C2'	3.63	124.04	114.52
2	2	527	7MG	N9-C8-N7	3.57	108.48	103.38
1	1	2030	6MZ	C4-C5-N7	-3.54	105.71	109.40
1	1	2457	PSU	O2-C2-N1	-3.51	118.92	122.79
2	2	966	2MG	C5-C6-N1	3.44	120.03	113.95
1	1	2445	2MG	C5-C6-N1	3.44	120.03	113.95
1	1	2498	OMC	C6-N1-C2	-3.44	114.53	120.49
1	1	747	5MU	O4-C4-N3	-3.43	113.54	120.12
1	1	2251	OMG	C5-C6-N1	3.42	119.99	113.95
1	1	1835	2MG	O6-C6-C5	-3.42	117.70	124.37
1	1	2552	OMU	O3'-C3'-C4'	3.35	120.74	111.05
1	1	2580	PSU	O2-C2-N1	-3.33	119.12	122.79
1	1	955	PSU	C4-N3-C2	-3.32	121.55	126.34
1	1	2605	PSU	O2-C2-N1	-3.32	119.14	122.79
1	1	745	1MG	O2'-C2'-C3'	3.32	122.55	111.82
1	1	1917	PSU	C4-N3-C2	-3.29	121.61	126.34
2	2	527	7MG	C2-N1-C6	-3.27	119.14	125.10
1	1	1911	PSU	C6-N1-C2	-3.27	119.34	122.68
2	2	1518	MA6	C4-C5-N7	-3.25	106.01	109.40
49	q	89	0TD	OD2-CG-CB	3.22	120.10	113.15
1	1	746	PSU	C6-C5-C4	-3.18	115.98	118.20
2	2	1207	2MG	C5-C6-N1	3.17	119.55	113.95
1	1	2605	PSU	C4-N3-C2	-3.15	121.80	126.34
2	2	527	7MG	C6-C5-N7	3.12	136.83	131.91
1	1	2504	PSU	C6-C5-C4	-3.11	116.03	118.20
2	2	516	PSU	O2-C2-N3	-3.10	115.97	121.82
1	1	745	1MG	O3'-C3'-C2'	3.10	121.85	111.82
1	1	745	1MG	C5'-C4'-C3'	3.06	126.66	115.18
1	1	2552	OMU	O4-C4-C5	-3.05	119.79	125.16
2	2	527	7MG	C6-C5-C4	-3.05	116.33	122.62
1	1	1915	3TD	O3'-C3'-C4'	3.05	119.86	111.05
2	2	527	7MG	O6-C6-C5	-3.03	120.11	127.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	2	516	PSU	O4-C4-N3	-3.03	114.31	120.12
1	1	1835	2MG	CM2-N2-C2	-3.01	117.22	123.86
1	1	2251	OMG	C2-N1-C6	-3.00	119.57	125.10
1	1	2605	PSU	C6-N1-C2	-2.99	119.63	122.68
1	1	745	1MG	C5-C6-N1	2.90	118.26	113.90
1	1	1917	PSU	C6-N1-C2	-2.86	119.76	122.68
1	1	745	1MG	C8-N7-C5	2.82	108.37	102.99
2	2	1516	2MG	C5-C6-N1	2.79	118.88	113.95
1	1	1915	3TD	O3'-C3'-C2'	2.76	120.75	111.82
2	2	967	5MC	O2-C2-N3	-2.76	117.84	122.33
2	2	1402	4OC	C1'-N1-C6	-2.75	114.84	120.84
2	2	966	2MG	C8-N7-C5	2.73	108.19	102.99
1	1	1962	5MC	O2-C2-N3	-2.71	117.92	122.33
1	1	2504	PSU	C6-N1-C2	-2.68	119.94	122.68
2	2	1407	5MC	C5-C4-N3	-2.65	118.81	121.67
2	2	516	PSU	C5-C4-N3	2.63	122.54	116.58
1	1	745	1MG	O2'-C2'-C1'	2.63	120.55	110.85
1	1	1618	6MZ	C4-C5-N7	-2.62	106.67	109.40
2	2	1402	4OC	C1'-N1-C2	2.61	124.25	118.42
1	1	2503	2MA	C4-C5-N7	-2.61	106.68	109.40
1	1	1915	3TD	C4-N3-C2	-2.60	121.79	124.61
1	1	2445	2MG	O6-C6-C5	-2.56	119.37	124.37
1	1	955	PSU	C6-N1-C2	-2.56	120.06	122.68
2	2	1207	2MG	C8-N7-C5	2.53	107.81	102.99
1	1	2552	OMU	O3'-C3'-C2'	2.49	118.25	111.17
2	2	1519	MA6	C4-C5-N7	-2.46	106.83	109.40
2	2	1498	UR3	C5-C6-N1	-2.41	117.77	121.81
2	2	1498	UR3	C1'-N1-C2	2.39	121.02	116.99
1	1	2498	OMC	C5-C6-N1	2.37	125.78	121.81
1	1	1962	5MC	N4-C4-N3	2.36	122.79	118.48
1	1	1618	6MZ	C1'-N9-C4	2.36	130.79	126.64
1	1	2503	2MA	N3-C2-N1	-2.34	121.45	125.73
1	1	2498	OMC	C4-N3-C2	2.34	124.03	120.25
1	1	1962	5MC	C5-C4-N4	-2.33	117.99	121.48
1	1	2580	PSU	O3'-C3'-C4'	2.33	117.78	111.05
2	2	1498	UR3	C1'-N1-C6	-2.33	115.77	120.84
2	2	967	5MC	C5-C4-N3	-2.33	119.17	121.67
1	1	2457	PSU	C6-N1-C2	-2.29	120.34	122.68
1	1	1962	5MC	C5-C4-N3	-2.27	119.22	121.67
2	2	1407	5MC	N1-C2-N3	2.26	122.93	118.81
1	1	2251	OMG	O6-C6-C5	-2.26	119.95	124.37
1	1	1939	5MU	C1'-N1-C6	-2.25	117.38	121.12

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	2	1402	4OC	C2'-C3'-C4'	2.25	106.88	101.99
1	1	2580	PSU	C5-C6-N1	-2.24	118.75	122.11
1	1	2251	OMG	C8-N7-C5	2.24	107.25	102.99
2	2	966	2MG	O6-C6-C5	-2.19	120.10	124.37
2	2	1207	2MG	O6-C6-C5	-2.18	120.11	124.37
1	1	1835	2MG	C8-N7-C5	2.18	107.14	102.99
1	1	2445	2MG	C8-N7-C5	2.15	107.08	102.99
1	1	2580	PSU	O3'-C3'-C2'	2.13	118.72	111.82
49	q	89	0TD	OD1-CG-CB	-2.13	117.97	122.44
1	1	2552	OMU	O2-C2-N1	-2.13	119.95	122.79
2	2	1402	4OC	O4'-C1'-N1	2.13	113.22	108.36
1	1	1939	5MU	C1'-N1-C2	2.12	121.42	117.57
2	2	1207	2MG	CM2-N2-C2	-2.12	119.17	123.86
1	1	2457	PSU	O3'-C3'-C4'	2.11	117.15	111.05
2	2	1402	4OC	C3'-C2'-C1'	-2.09	98.95	102.89
2	2	1516	2MG	C8-N7-C5	2.08	106.95	102.99
1	1	2504	PSU	O4'-C1'-C2'	2.07	108.06	105.14
2	2	1498	UR3	O3'-C3'-C2'	-2.07	105.14	111.82
1	1	2552	OMU	CM2-O2'-C2'	-2.05	109.14	114.52
2	2	967	5MC	N1-C2-N3	2.05	122.54	118.81
1	1	2030	6MZ	C1'-N9-C4	-2.04	123.05	126.64
1	1	745	1MG	O4'-C1'-C2'	2.04	109.91	106.93
1	1	2457	PSU	C6-C5-C4	-2.02	116.79	118.20
1	1	2457	PSU	C3'-C2'-C1'	-2.01	99.30	101.64

All (39) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	1	745	1MG	C2'
1	1	745	1MG	C1'
1	1	746	PSU	C3'
1	1	746	PSU	C4'
1	1	747	5MU	C2'
1	1	747	5MU	C4'
1	1	955	PSU	C3'
1	1	955	PSU	C4'
1	1	1618	6MZ	C2'
1	1	1618	6MZ	C3'
1	1	1911	PSU	C3'
1	1	1911	PSU	C4'
1	1	1915	3TD	C3'
1	1	1917	PSU	C3'

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Mol	Chain	Res	Type	Atom
1	1	1917	PSU	C4'
1	1	1939	5MU	C2'
1	1	1939	5MU	C4'
1	1	2030	6MZ	C2'
1	1	2030	6MZ	C3'
1	1	2069	G7M	C2'
1	1	2251	OMG	C2'
1	1	2457	PSU	C3'
1	1	2457	PSU	C4'
1	1	2498	OMC	C4'
1	1	2503	2MA	C2'
1	1	2503	2MA	C3'
1	1	2504	PSU	C3'
1	1	2504	PSU	C4'
1	1	2552	OMU	C2'
1	1	2552	OMU	C3'
1	1	2580	PSU	C3'
1	1	2580	PSU	C4'
1	1	2605	PSU	C3'
1	1	2605	PSU	C4'
2	2	516	PSU	C3'
2	2	516	PSU	C4'
2	2	527	7MG	C3'
2	2	1402	4OC	C3'
2	2	1402	4OC	C1'

All (97) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	1	746	PSU	C2'-C1'-C5-C6
1	1	746	PSU	O4'-C1'-C5-C6
1	1	746	PSU	C3'-C4'-C5'-O5'
1	1	746	PSU	O4'-C4'-C5'-O5'
1	1	747	5MU	C3'-C4'-C5'-O5'
1	1	955	PSU	C2'-C1'-C5-C4
1	1	1618	6MZ	O4'-C4'-C5'-O5'
1	1	1618	6MZ	C3'-C4'-C5'-O5'
1	1	1915	3TD	O4'-C1'-C5-C6
1	1	1962	5MC	C2'-C1'-N1-C2
1	1	1962	5MC	C2'-C1'-N1-C6
1	1	2030	6MZ	N1-C6-N6-C9
1	1	2445	2MG	C3'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
1	1	2445	2MG	N1-C2-N2-CM2
1	1	2445	2MG	N3-C2-N2-CM2
1	1	2498	OMC	C3'-C4'-C5'-O5'
1	1	2498	OMC	C4'-C5'-O5'-P
1	1	2504	PSU	C3'-C4'-C5'-O5'
1	1	2504	PSU	O4'-C4'-C5'-O5'
1	1	2552	OMU	O4'-C4'-C5'-O5'
1	1	2580	PSU	C2'-C1'-C5-C6
1	1	2580	PSU	C3'-C4'-C5'-O5'
1	1	2605	PSU	C4'-C5'-O5'-P
2	2	516	PSU	C2'-C1'-C5-C4
2	2	516	PSU	O4'-C1'-C5-C4
2	2	516	PSU	C2'-C1'-C5-C6
2	2	516	PSU	O4'-C1'-C5-C6
2	2	516	PSU	C3'-C4'-C5'-O5'
2	2	516	PSU	O4'-C4'-C5'-O5'
2	2	527	7MG	C3'-C4'-C5'-O5'
2	2	966	2MG	O4'-C4'-C5'-O5'
2	2	966	2MG	C3'-C4'-C5'-O5'
2	2	967	5MC	O4'-C4'-C5'-O5'
2	2	1402	4OC	C3'-C2'-O2'-CM2
2	2	1402	4OC	O4'-C1'-N1-C2
2	2	1402	4OC	O4'-C1'-N1-C6
2	2	1516	2MG	N1-C2-N2-CM2
2	2	1516	2MG	N3-C2-N2-CM2
2	2	1518	MA6	O4'-C4'-C5'-O5'
2	2	1518	MA6	C3'-C4'-C5'-O5'
2	2	1519	MA6	O4'-C4'-C5'-O5'
2	2	1519	MA6	C3'-C4'-C5'-O5'
2	2	1519	MA6	C5-C6-N6-C10
2	2	1519	MA6	N1-C6-N6-C10
1	1	747	5MU	C2'-C1'-N1-C6
1	1	747	5MU	C2'-C1'-N1-C2
1	1	745	1MG	C4'-C5'-O5'-P
1	1	2457	PSU	C4'-C5'-O5'-P
1	1	2030	6MZ	O4'-C4'-C5'-O5'
1	1	2030	6MZ	C3'-C4'-C5'-O5'
1	1	2503	2MA	O4'-C4'-C5'-O5'
1	1	2503	2MA	C3'-C4'-C5'-O5'
1	1	2552	OMU	C3'-C4'-C5'-O5'
1	1	2605	PSU	C3'-C4'-C5'-O5'
2	2	967	5MC	C3'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
1	1	747	5MU	O4'-C4'-C5'-O5'
1	1	1835	2MG	O4'-C4'-C5'-O5'
1	1	1835	2MG	C3'-C4'-C5'-O5'
1	1	2445	2MG	O4'-C4'-C5'-O5'
1	1	2580	PSU	O4'-C4'-C5'-O5'
2	2	527	7MG	O4'-C4'-C5'-O5'
2	2	1402	4OC	O4'-C4'-C5'-O5'
1	1	955	PSU	C4'-C5'-O5'-P
1	1	2504	PSU	C4'-C5'-O5'-P
1	1	955	PSU	C3'-C4'-C5'-O5'
1	1	2498	OMC	O4'-C4'-C5'-O5'
1	1	2605	PSU	O4'-C4'-C5'-O5'
2	2	1518	MA6	C5-C6-N6-C9
2	2	1518	MA6	C5-C6-N6-C10
1	1	955	PSU	O4'-C4'-C5'-O5'
1	1	1915	3TD	C3'-C4'-C5'-O5'
1	1	2580	PSU	C4'-C5'-O5'-P
1	1	2552	OMU	C4'-C5'-O5'-P
49	q	89	0TD	SB-CB-CG-OD1
1	1	2498	OMC	C2'-C1'-N1-C6
1	1	1917	PSU	C4'-C5'-O5'-P
1	1	1939	5MU	C4'-C5'-O5'-P
1	1	1917	PSU	O4'-C4'-C5'-O5'
1	1	2457	PSU	C3'-C4'-C5'-O5'
1	1	1962	5MC	O4'-C1'-N1-C6
1	1	746	PSU	C4'-C5'-O5'-P
2	2	516	PSU	C4'-C5'-O5'-P
2	2	527	7MG	C4'-C5'-O5'-P
2	2	1519	MA6	C5-C6-N6-C9
1	1	2498	OMC	C2'-C1'-N1-C2
1	1	1915	3TD	C4'-C5'-O5'-P
1	1	1911	PSU	C4'-C5'-O5'-P
1	1	1962	5MC	O4'-C1'-N1-C2
1	1	2504	PSU	O4'-C1'-C5-C4
1	1	2251	OMG	C4'-C5'-O5'-P
1	1	747	5MU	C4'-C5'-O5'-P
2	2	1402	4OC	C3'-C4'-C5'-O5'
1	1	1915	3TD	O4'-C4'-C5'-O5'
1	1	2069	G7M	O4'-C4'-C5'-O5'
49	q	89	0TD	CG-CB-SB-CSB
2	2	1519	MA6	C4'-C5'-O5'-P
1	1	1618	6MZ	C4'-C5'-O5'-P

There are no ring outliers.

7 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	1	1618	6MZ	1	0
1	1	2445	2MG	1	0
1	1	2030	6MZ	1	0
1	1	746	PSU	1	0
1	1	745	1MG	1	0
1	1	1939	5MU	1	0
1	1	747	5MU	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 441 ligands modelled in this entry, 441 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	2	2
1	1	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	1	2314:A	O3'	2315:G	P	3.20
1	2	1276:G	O3'	1277:C	P	3.19
1	2	1383:C	O3'	1384:C	P	3.17

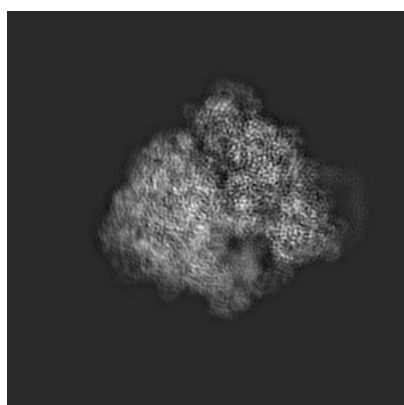
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-4476. These allow visual inspection of the internal detail of the map and identification of artifacts.

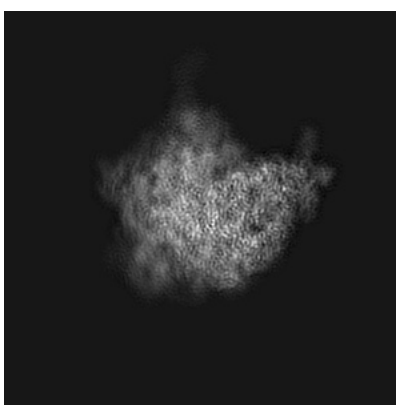
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

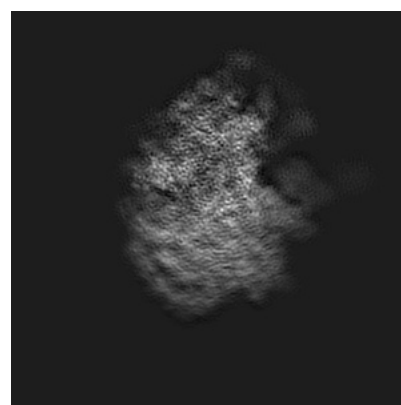
6.1.1 Primary map



X



Y

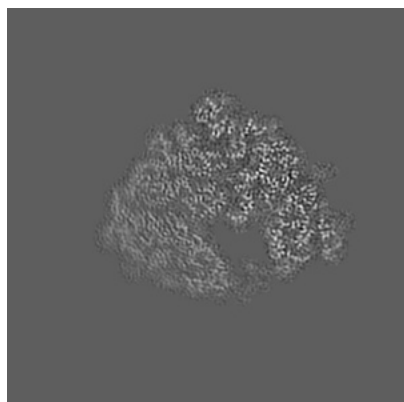


Z

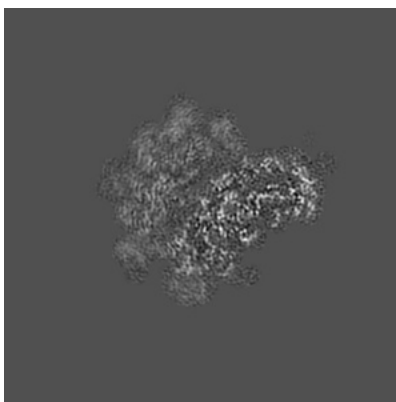
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

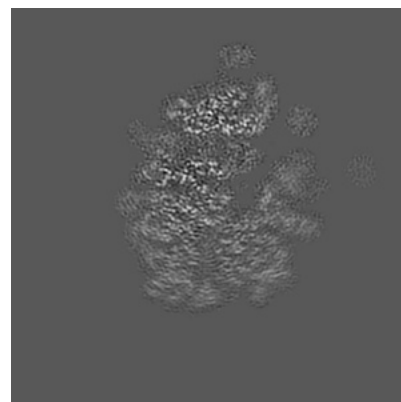
6.2.1 Primary map



X Index: 190



Y Index: 190

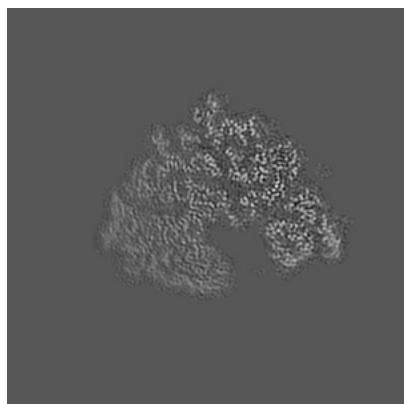


Z Index: 190

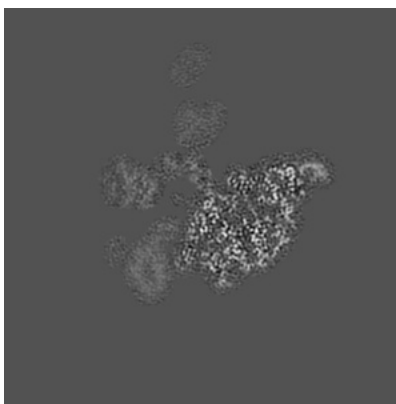
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

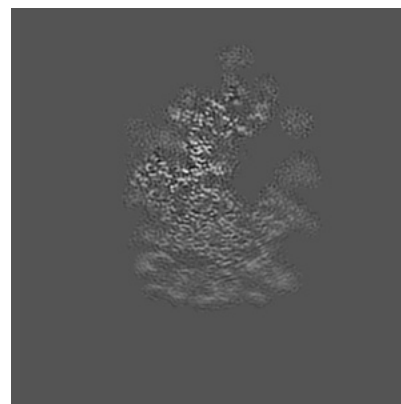
6.3.1 Primary map



X Index: 186



Y Index: 231

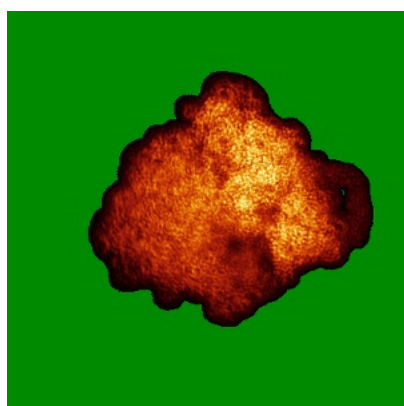


Z Index: 199

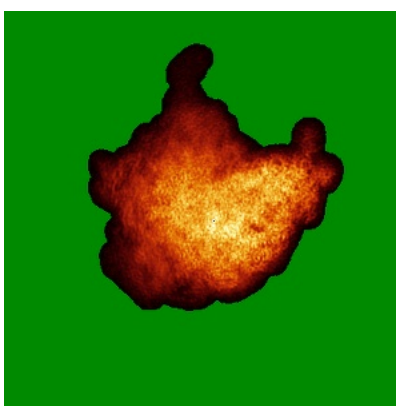
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

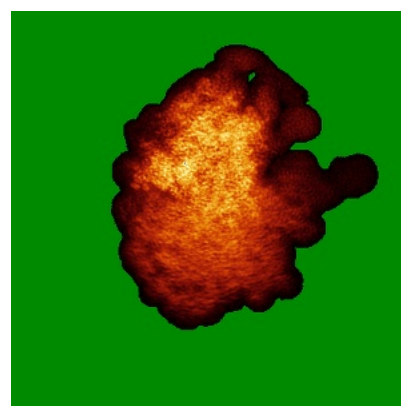
6.4.1 Primary map



X



Y



Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.05. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

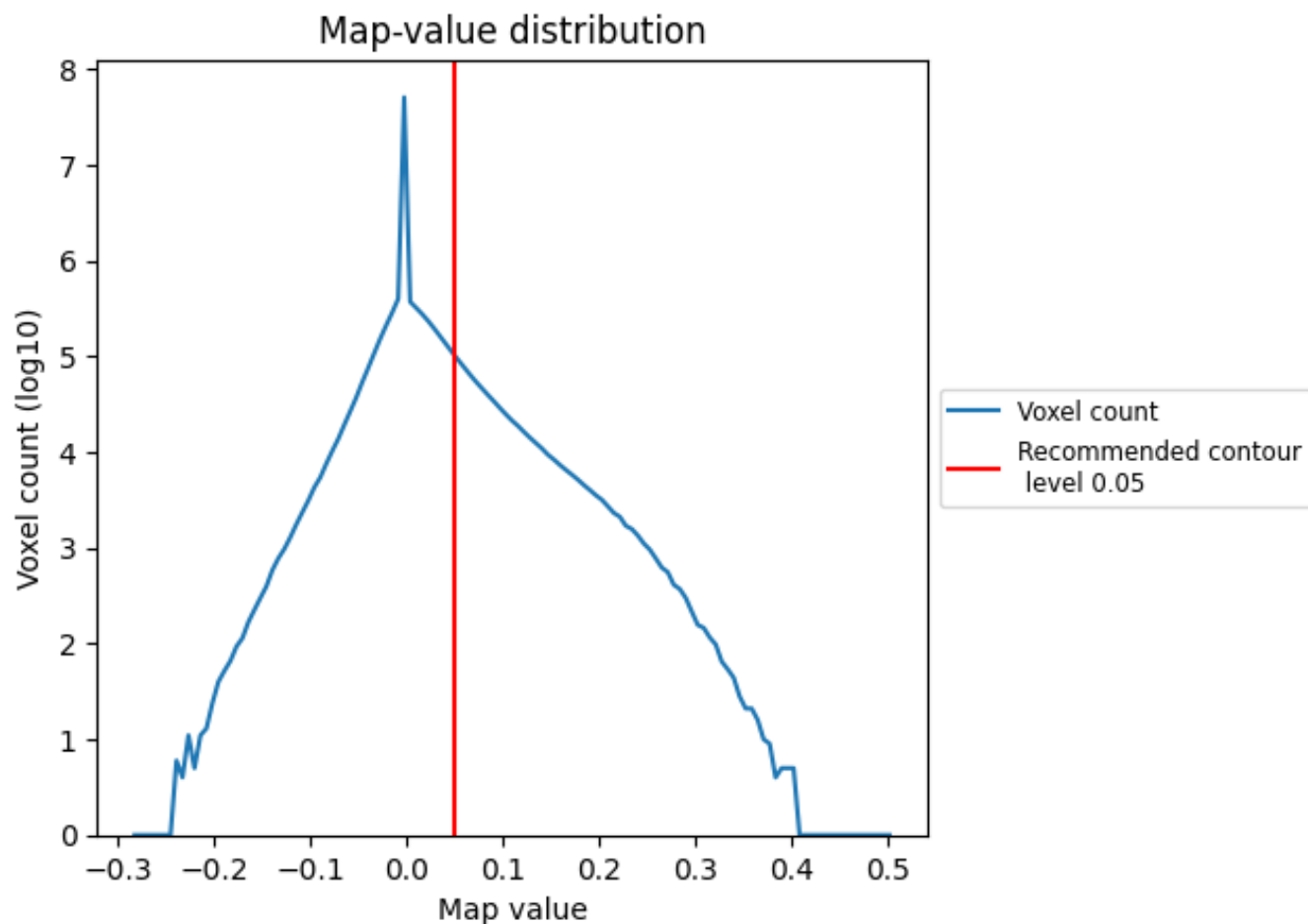
6.6 Mask visualisation [i](#)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis [i](#)

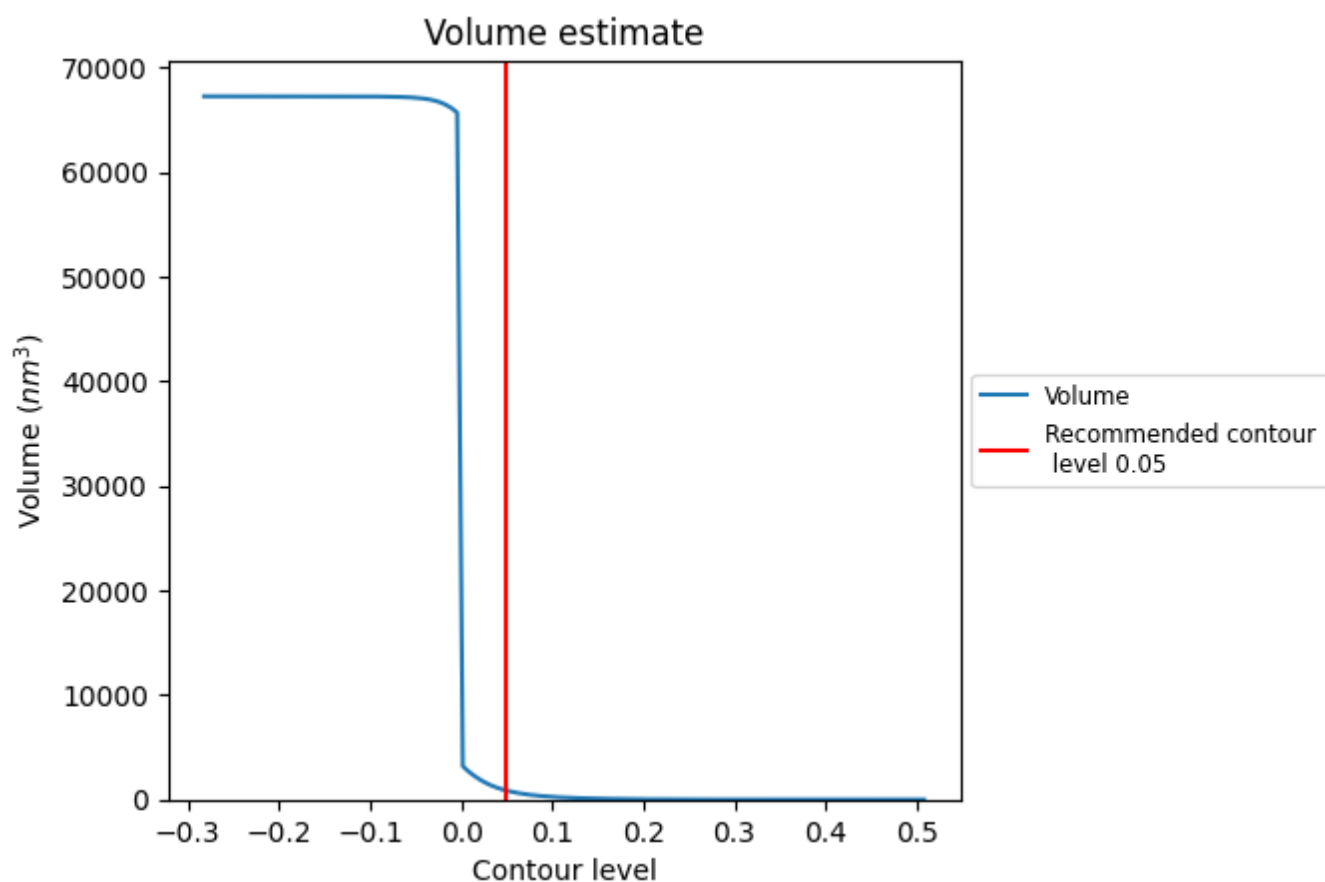
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

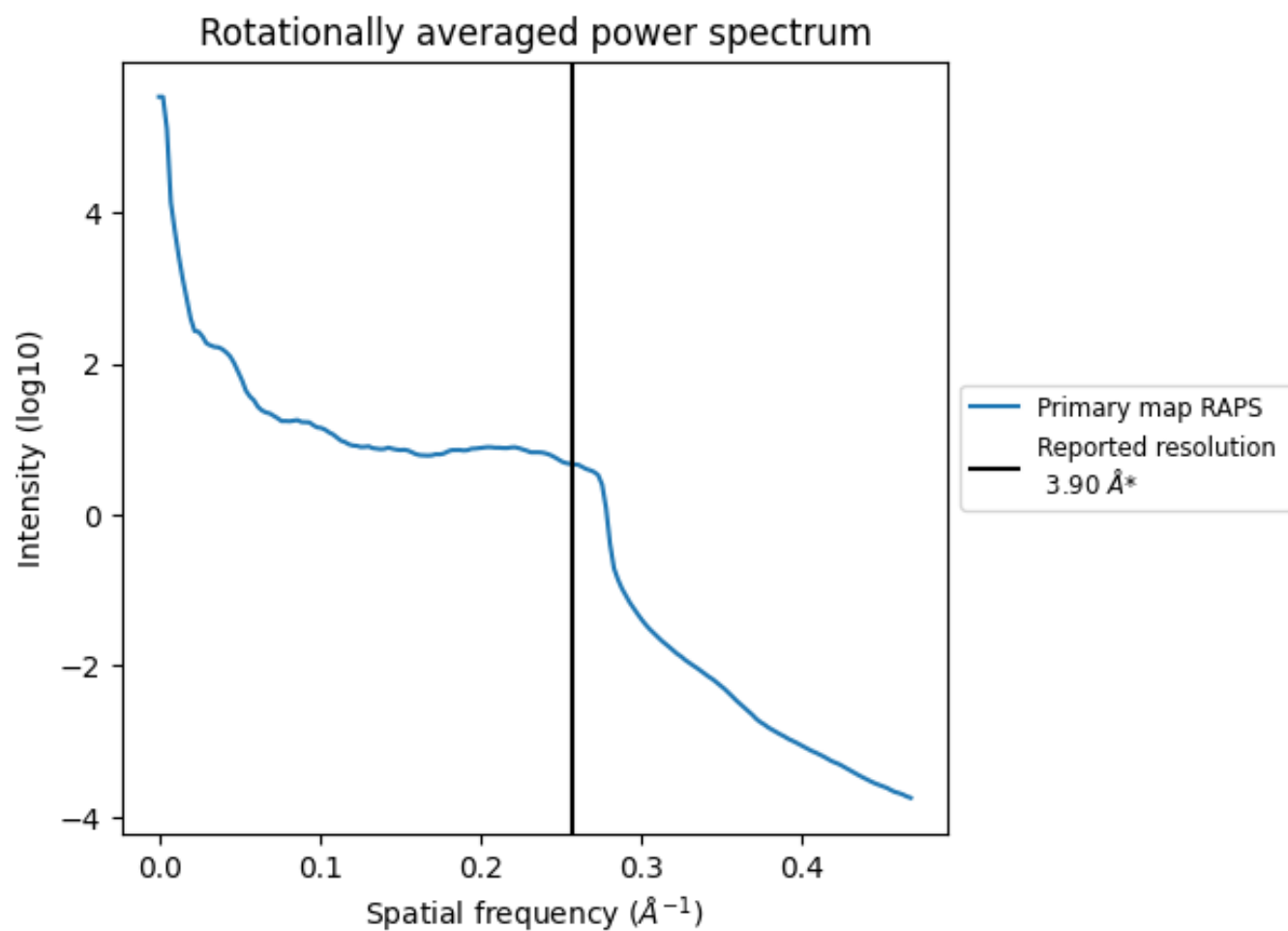
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 855 nm³; this corresponds to an approximate mass of 773 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ



*Reported resolution corresponds to spatial frequency of 0.256 Å⁻¹

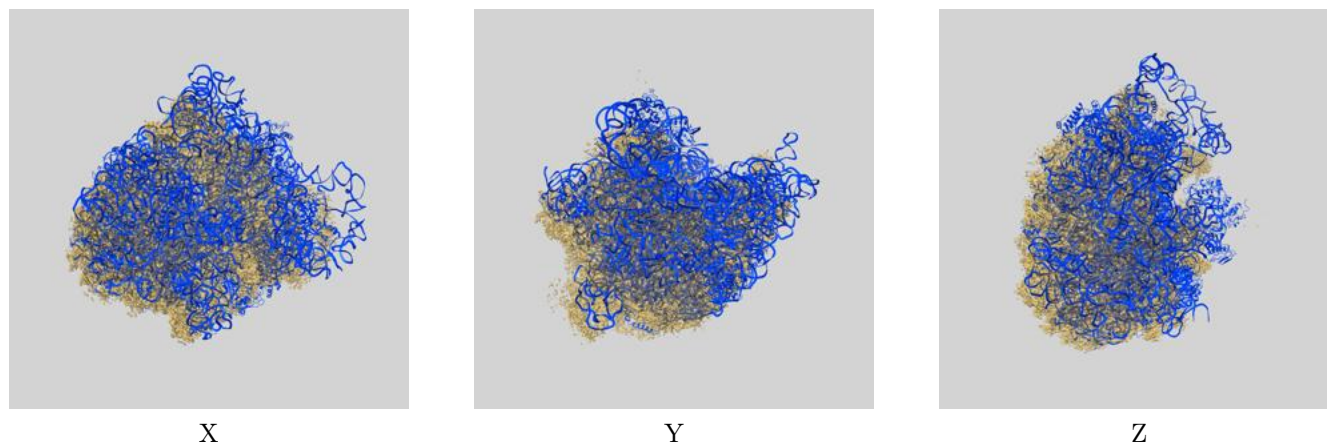
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit [i](#)

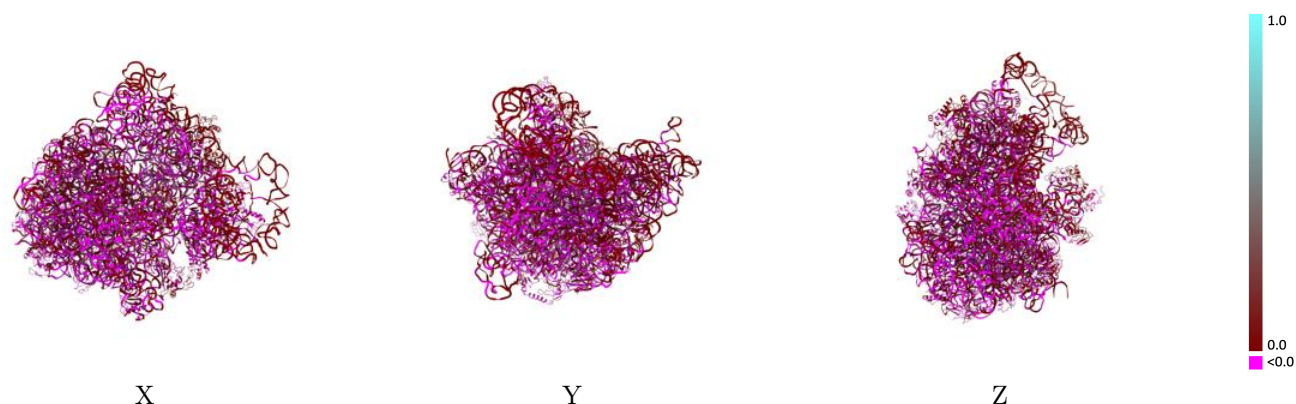
This section contains information regarding the fit between EMDB map EMD-4476 and PDB model 6Q97. Per-residue inclusion information can be found in [section 3](#) on [page 16](#).

9.1 Map-model overlay [i](#)



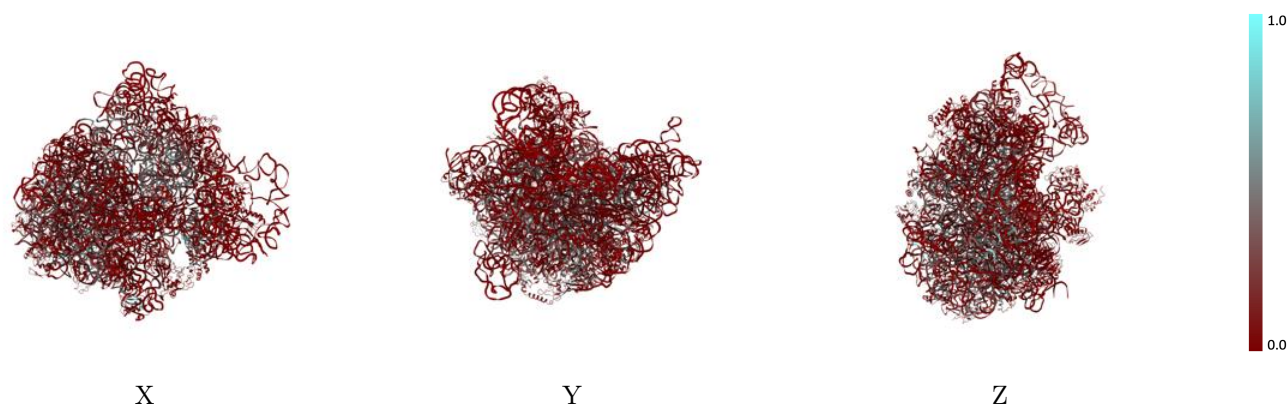
The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



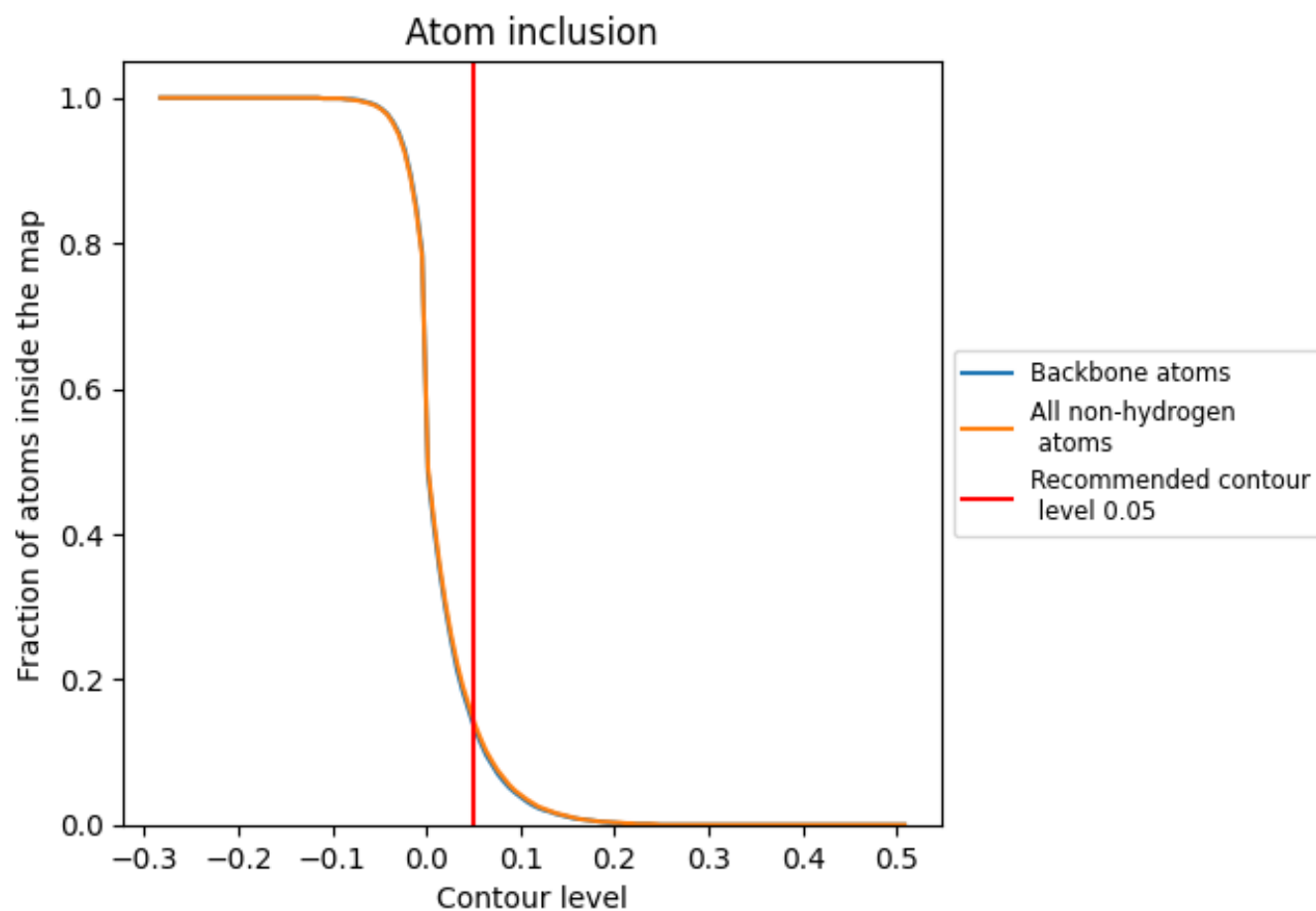
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.05).

9.4 Atom inclusion [i](#)



At the recommended contour level, 14% of all backbone atoms, 14% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.05) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.1440	 -0.0010
1	 0.1690	 -0.0020
2	 0.1670	 -0.0030
3	 0.0810	 0.0030
4	 0.0140	 -0.0030
5	 0.0260	 0.0150
6	 0.1860	 -0.0290
7	 0.1050	 -0.0190
8	 0.1050	 0.0030
9	 0.2340	 -0.0170
B	 0.1980	 -0.0130
C	 0.0560	 0.0000
D	 0.1420	 -0.0190
E	 0.0460	 0.0070
F	 0.0000	 0.0060
G	 0.1630	 -0.0130
H	 0.0000	 0.0110
I	 0.0000	 0.0110
J	 0.0650	 -0.0030
K	 0.0710	 0.0030
L	 0.2720	 -0.0120
M	 0.1040	 0.0150
N	 0.1370	 0.0140
O	 0.1820	 0.0280
P	 0.1140	 -0.0400
Q	 0.1330	 0.0020
R	 0.1360	 0.0130
S	 0.2230	 -0.0050
T	 0.1900	 0.0030
U	 0.1970	 0.0040
V	 0.0240	 -0.0050
W	 0.1240	 -0.0310
X	 0.2190	 -0.0150
Y	 0.1330	 -0.0100
Z	 0.0900	 0.0510



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Chain	Atom inclusion	Q-score
a	 0.0350	 0.0220
b	 0.1310	 0.0080
c	 0.0860	 0.0350
d	 0.2650	 -0.0190
e	 0.2750	 -0.0030
f	 0.0210	 -0.0030
g	 0.0090	 0.0020
h	 0.0380	 0.0150
i	 0.0230	 0.0100
j	 0.0260	 0.0040
k	 0.2410	 -0.0250
l	 0.3350	 -0.0050
m	 0.0070	 -0.0010
n	 0.1730	 -0.0000
o	 0.0580	 -0.0180
p	 0.1480	 -0.0090
q	 0.2100	 0.0100
r	 0.2560	 0.0250
s	 0.1080	 0.0230
t	 0.3320	 -0.0030
u	 0.0180	 0.0080
v	 0.0920	 0.0220
w	 0.1950	 0.0020
x	 0.1480	 0.0230
y	 0.2090	 -0.0010
z	 0.1430	 -0.0070