



Full wwPDB EM Validation Report ⓘ

Dec 12, 2023 – 06:01 pm GMT

PDB ID : 8PVK
EMDB ID : EMD-17969
Title : Chaetomium thermophilum pre-60S State 5 - pre-5S rotation - L1 inward - composite structure
Authors : Thoms, M.; Cheng, J.; Denk, T.; Berninghausen, O.; Beckmann, R.
Deposited on : 2023-07-17
Resolution : 2.55 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:

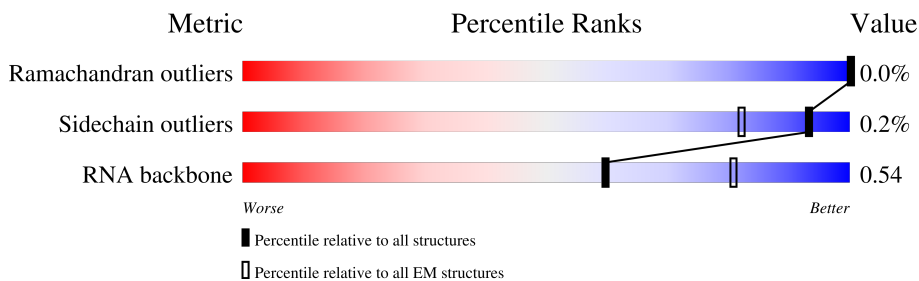
EMDB validation analysis : 0.0.1.dev70
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

1 Overall quality at a glance i

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

The reported resolution of this entry is 2.55 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.







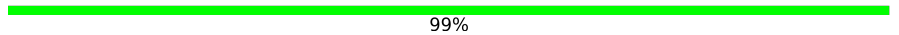
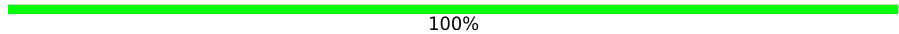


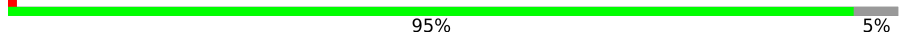




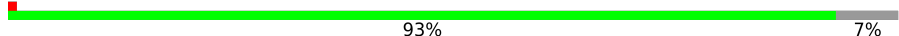
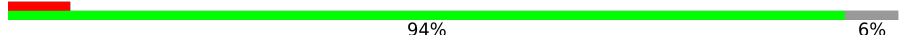


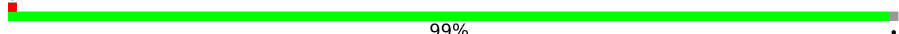
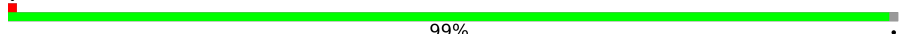
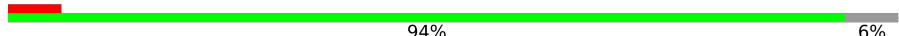
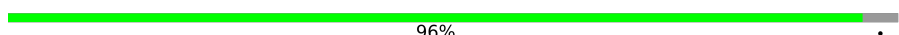


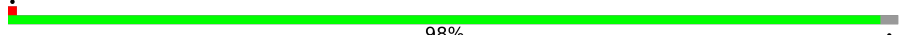
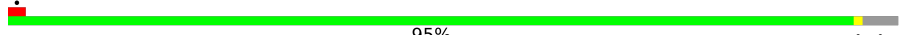
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	C1	3342	
2	C2	156	
3	C3	162	
4	C4	119	
5	CB	391	
6	CF	270	
7	CH	661	
8	CI	414	

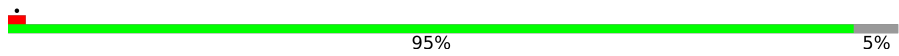
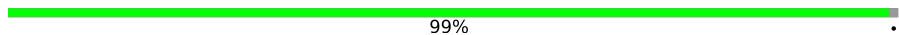
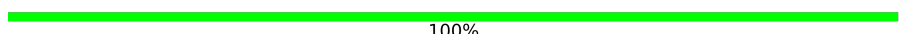
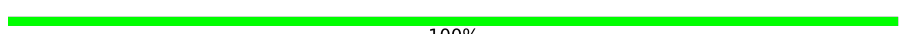


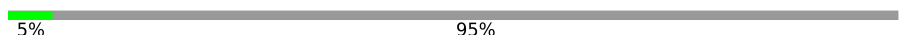
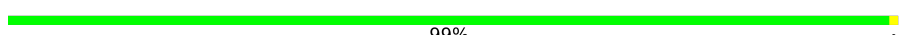


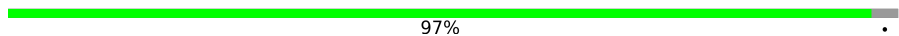
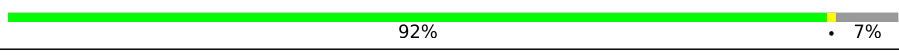
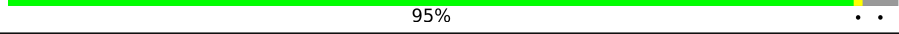
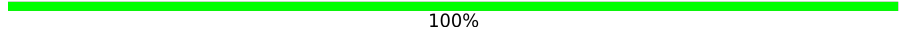


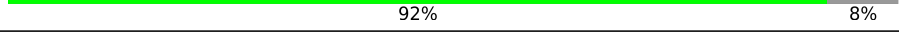
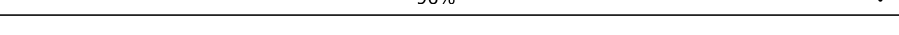
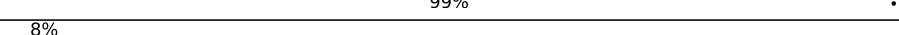
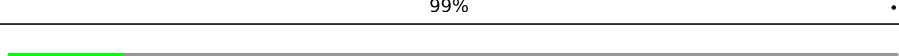
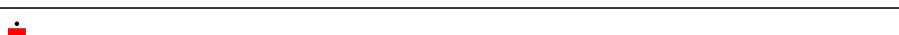
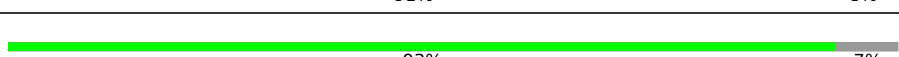

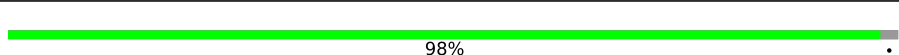

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Mol	Chain	Length	Quality of chain
9	CJ	679	 56% 44%
10	CK	261	 90% 9%
11	CL	558	 14% 86%
12	CM	249	 86% 13%
12	LF	249	 99%
13	CN	246	 100%
14	CO	120	 52% 48%
15	CQ	225	 9% 81% 19%
16	Lq	147	 95% 5%
17	Cb	117	 86% 14%
18	Cd	627	 74% 26%
19	Ce	443	 70% 29%
20	Cf	350	 81% 19%
21	Cg	202	 93% 7%
22	Ch	517	 7% 94% 6%
23	Cz	123	 81% 18%
24	LA	254	 75% 25%
25	LB	392	 99%
26	LC	365	 99%
27	LD	304	 6% 94% 6%
28	LE	200	 96%
29	LG	262	 90% 10%
30	LH	229	 83% 17%
31	LJ	173	 98%
32	LK	165	 95%

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Mol	Chain	Length	Quality of chain
33	LL	213	 95% 5%
34	LM	142	 99%
35	LN	203	 100%
36	LO	204	 100%
37	LP	187	 91% 9%
38	LQ	213	 70% 30%
39	LR	2898	 5% 95%
40	LS	174	 99%
41	LT	160	 6% 81% 19%
42	LU	127	 83% 17%
43	LV	139	 97%
44	LX	156	 92% 7%
45	LY	138	 95%
46	LZ	135	 100%
47	La	149	 72% 28%
48	Lc	108	 88% 12%
49	Ld	120	 92% 8%
50	Le	131	 96%
51	Lf	109	 99%
52	Lg	119	 8% 99%
53	Lh	935	 13% 87%
54	Li	110	 91% 8%
55	Lj	95	 93% 7%
56	Lk	94	 80% 19%
57	Ll	51	 98%

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Mol	Chain	Length	Quality of chain
58	Lp	92	 99%
59	Lr	217	 98%

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	OMC	C1	1420	X	-	-	-
1	OMG	C1	1433	X	-	-	-
1	OMC	C1	1491	X	-	-	-
1	OMC	C1	1812	X	-	-	-
1	OMC	C1	1836	X	-	-	-
1	OMC	C1	2300	X	-	-	-
1	OMG	C1	2358	X	-	-	-
1	OMG	C1	2578	X	-	-	-
1	OMG	C1	2774	X	-	-	-
1	OMC	C1	2838	X	-	-	-
1	OMG	C1	2876	X	-	-	-
1	OMG	C1	2881	X	-	-	-
1	OMC	C1	2918	X	-	-	-
1	OMG	C1	385	X	-	-	-
1	OMG	C1	627	X	-	-	-
1	OMG	C1	646	X	-	-	-
1	OMC	C1	778	X	-	-	-
1	OMG	C1	787	X	-	-	-

2 Entry composition [i](#)

There are 63 unique types of molecules in this entry. The entry contains 160598 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 26S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	C1	3138	67174	30003	12160	21873	3138	0	0

- Molecule 2 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	C2	156	3319	1484	589	1090	156	0	0

- Molecule 3 is a RNA chain called ITS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	C3	82	1754	780	316	576	82	0	0

- Molecule 4 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	C4	119	2536	1131	453	833	119	0	0

- Molecule 5 is a protein called Utp30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	CB	265	2107	1351	371	382	3	0	0

- Molecule 6 is a protein called Large ribosomal subunit protein uL10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	CF	245	1934	1215	350	360	9	0	0

- Molecule 7 is a protein called Nucleolar GTP-binding protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	CH	627	5063	3181	924	939	19	0	0

- Molecule 8 is a protein called Putative RNA-binding protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	CI	152	1234	791	230	208	5	0	0

- Molecule 9 is a protein called Pescadillo homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	CJ	382	3116	2008	548	550	10	0	0

- Molecule 10 is a protein called Ribosome biogenesis protein NSA2 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	CK	237	1903	1198	368	333	4	0	0

- Molecule 11 is a protein called Putative GTP binding protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
11	CL	79	622	389	125	108	0	0

- Molecule 12 is a protein called 60S ribosomal protein l7-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	CM	217	1773	1144	329	297	3	0	0
12	LF	248	2023	1297	377	346	3	0	0

- Molecule 13 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	CN	246	1853	1156	322	368	7	0	0

- Molecule 14 is a protein called DUF2423 domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	CO	62	468	290	94	82	2	0	0

- Molecule 15 is a protein called Ribosome biogenesis protein RLP24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	CQ	183	1480	925	304	241	10	0	0

- Molecule 16 is a protein called Putative 60S ribosomal protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
16	Lq	139	1073	672	213	188	0	0

- Molecule 17 is a protein called Zinc finger domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	Cb	101	830	517	161	148	4	0	0

- Molecule 18 is a protein called Nucleolar GTP-binding protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	Cd	462	3691	2350	671	659	11	0	0

- Molecule 19 is a protein called Ribosome biogenesis protein NOP53.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	Ce	313	2549	1585	487	473	4	0	0

- Molecule 20 is a protein called Ribosome production factor 2 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	Cf	285	2282	1443	417	401	21	0	0

- Molecule 21 is a protein called Ribosome biogenesis regulatory protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	Cg	188	Total	C	N	O	S	0	0
			1478	924	283	270	1		

- Molecule 22 is a protein called Ribosome assembly protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Ch	485	Total	C	N	O	S	1	0
			3813	2396	697	710	10		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Ch	117	ASP	GLU	engineered mutation	UNP G0SC29

- Molecule 23 is a protein called rRNA-processing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	Cz	101	Total	C	N	O	S	0	0
			869	541	180	144	4		

- Molecule 24 is a protein called 60S ribosomal protein L2-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	LA	191	Total	C	N	O	S	0	0
			1454	917	278	256	3		

- Molecule 25 is a protein called 60S ribosomal protein L3-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	LB	389	Total	C	N	O	S	0	0
			3104	1973	579	539	13		

- Molecule 26 is a protein called 60S ribosomal protein L4-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	LC	363	Total	C	N	O	S	0	0
			2751	1737	527	478	9		

- Molecule 27 is a protein called 60S ribosomal protein l5-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	LD	286	Total	C	N	O	S	0	0
			2266	1434	407	422	3		

- Molecule 28 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	LE	191	Total	C	N	O	S	0	0
			1477	944	267	263	3		

- Molecule 29 is a protein called 60S ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	LG	235	Total	C	N	O	S	0	0
			1889	1210	350	324	5		

- Molecule 30 is a protein called 60S ribosomal protein l9-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	LH	190	Total	C	N	O	S	0	0
			1495	949	268	272	6		

- Molecule 31 is a protein called Putative ribosomal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	LJ	169	Total	C	N	O	S	0	0
			1357	850	266	235	6		

- Molecule 32 is a protein called 60S ribosomal protein L12-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	LK	158	Total	C	N	O	S	0	0
			1184	743	215	224	2		

- Molecule 33 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	LL	203	Total	C	N	O	S	0	0
			1587	989	325	271	2		

- Molecule 34 is a protein called 60S ribosomal protein L14-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	LM	141	Total	C	N	O	S	0	0
			1126	714	216	195	1		

- Molecule 35 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	LN	202	Total	C	N	O	S	0	0
			1704	1062	360	278	4		

- Molecule 36 is a protein called 60S ribosomal protein L16-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	LO	203	Total	C	N	O	S	0	0
			1611	1034	305	267	5		

- Molecule 37 is a protein called 60S ribosomal protein l17-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	LP	171	Total	C	N	O	S	0	0
			1343	834	274	232	3		

- Molecule 38 is a protein called Ribosomal protein L18-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	LQ	150	Total	C	N	O	S	0	0
			1200	759	239	200	2		

- Molecule 39 is a protein called Ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	LR	155	Total	C	N	O	S	0	0
			1241	772	262	203	4		

- Molecule 40 is a protein called 60S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	LS	174	Total	C	N	O	S	0	0
			1426	917	266	238	5		

- Molecule 41 is a protein called 60S ribosomal protein l21-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	LT	129	Total	C	N	O	S	0	0
			1027	651	195	179	2		

- Molecule 42 is a protein called 60S ribosomal protein L22-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	LU	105	Total	C	N	O	S	0	0
			846	548	146	151	1		

- Molecule 43 is a protein called 60S ribosomal protein l23-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	LV	135	Total	C	N	O	S	0	0
			991	630	184	170	7		

- Molecule 44 is a protein called 60S ribosomal protein L25-like protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
44	LX	145	Total	C	N	O	0	0
			1133	723	211	199		

- Molecule 45 is a protein called 60S ribosomal protein L26-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	LY	133	Total	C	N	O	S	0	0
			1056	658	213	183	2		

- Molecule 46 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	LZ	135	Total	C	N	O	S	0	0
			1112	713	207	188	4		

- Molecule 47 is a protein called 60S ribosomal protein L28-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	La	108	Total	C	N	O	S	0	0
			872	556	168	147	1		

- Molecule 48 is a protein called 60S ribosomal protein l30-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	Lc	95	705	449	122	129	5	0	0

- Molecule 49 is a protein called Putative 60S ribosomal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	Ld	110	875	555	171	148	1	0	0

- Molecule 50 is a protein called 60S ribosomal protein L32-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	Le	126	1017	640	208	163	6	0	0

- Molecule 51 is a protein called 60S ribosomal protein l33-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	Lf	108	862	546	171	144	1	0	0

- Molecule 52 is a protein called Ribosomal protein l34-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	Lg	118	914	567	186	157	4	0	0

- Molecule 53 is a protein called dolichyl-diphosphooligosaccharide--protein glycotransferase.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
53	Lh	122	1003	637	198	168	0	0

- Molecule 54 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	Li	101	827	509	181	136	1	0	0

- Molecule 55 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	Lj	88	Total	C	N	O	S	0	0
			698	427	154	112	5		

- Molecule 56 is a protein called 60S ribosomal protein L38-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	Lk	76	Total	C	N	O	S	0	0
			632	400	121	109	2		

- Molecule 57 is a protein called Ribosomal protein eL39.

Mol	Chain	Residues	Atoms				AltConf	Trace
57	Ll	50	Total	C	N	O	0	0
			436	275	97	64		

- Molecule 58 is a protein called 60S ribosomal protein L43-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	Lp	91	Total	C	N	O	S	0	0
			698	430	138	124	6		

- Molecule 59 is a protein called Ribosomal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	Lr	214	Total	C	N	O	S	0	0
			1660	1056	296	300	8		

- Molecule 60 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
60	CH	1	32	10	5	14	3	0
60	Cd	1	32	10	5	14	3	0

- Molecule 61 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
61	CH	1	1	1	0
61	Cd	2	2	2	0

- Molecule 62 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
62	CQ	1	1	1	0
62	Cb	1	1	1	0
62	Lg	1	1	1	0
62	Lj	1	1	1	0
62	Lp	1	1	1	0

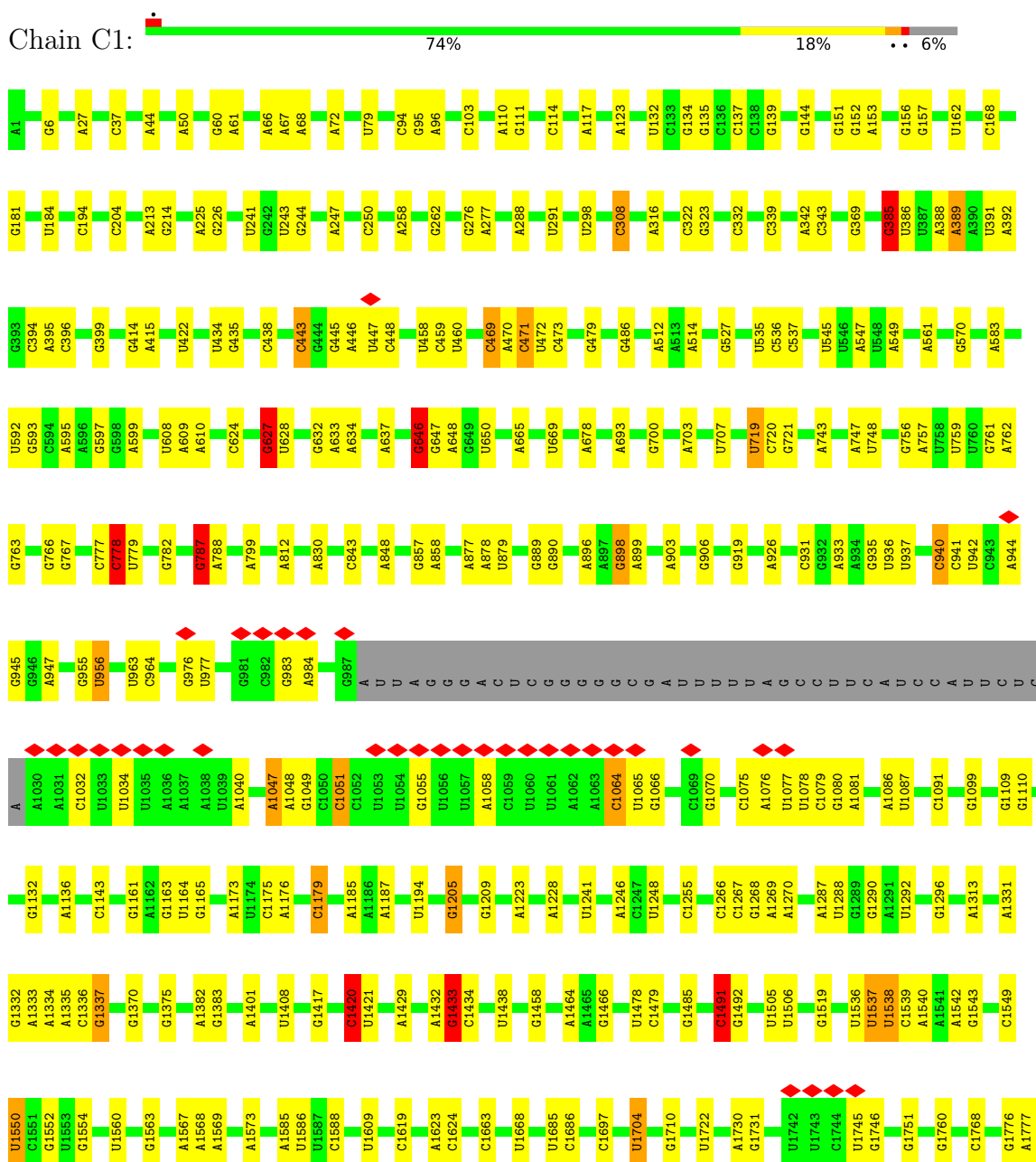
- Molecule 63 is water.

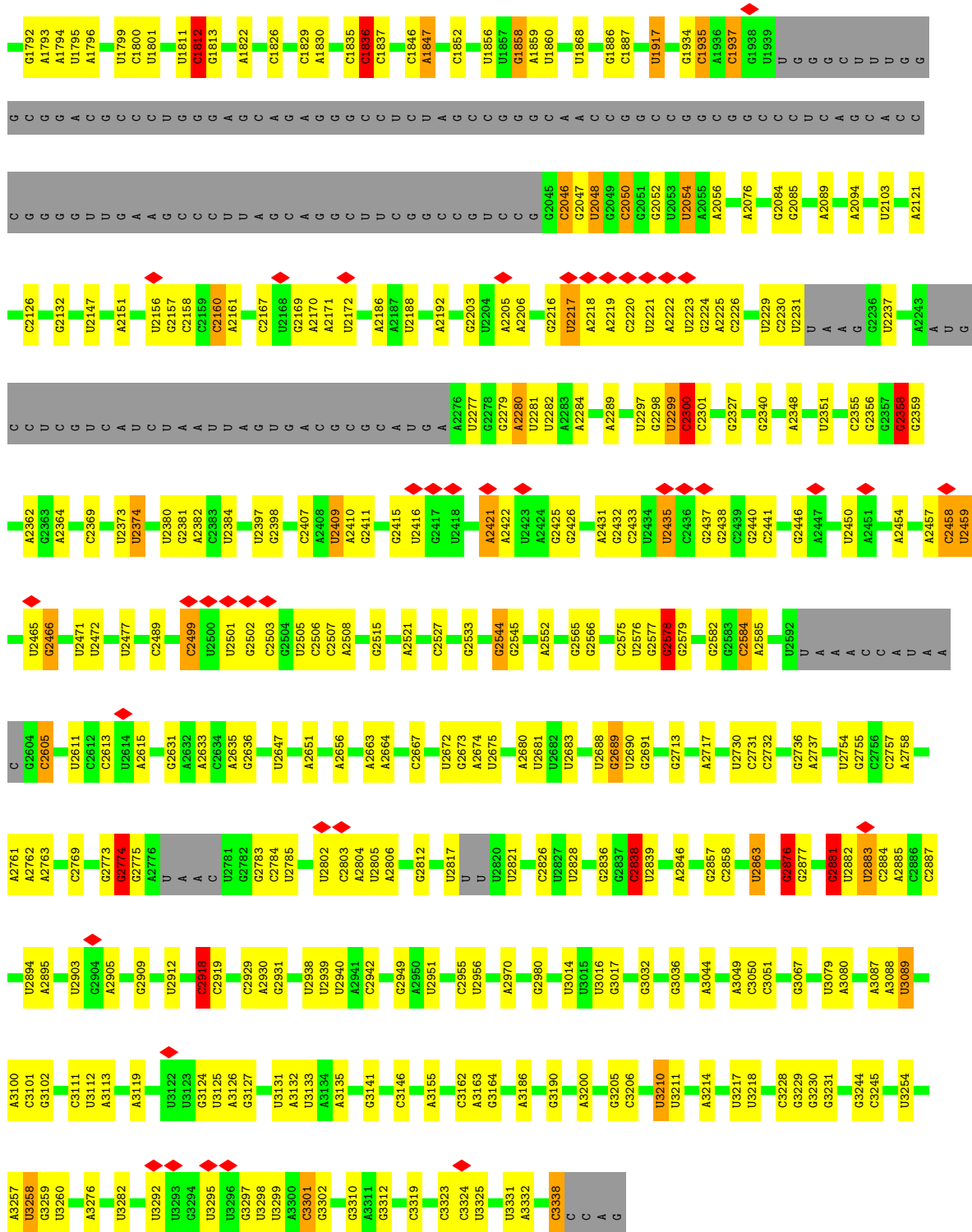
Mol	Chain	Residues	Atoms		AltConf
63	CH	1	Total 1	O 1	0
63	Cd	2	Total 2	O 2	0

3 Residue-property plots [i](#)

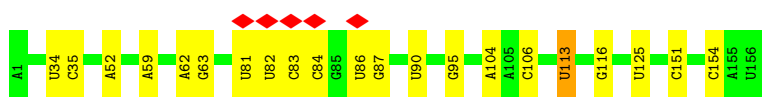
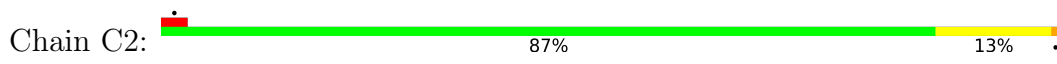
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: 26S rRNA

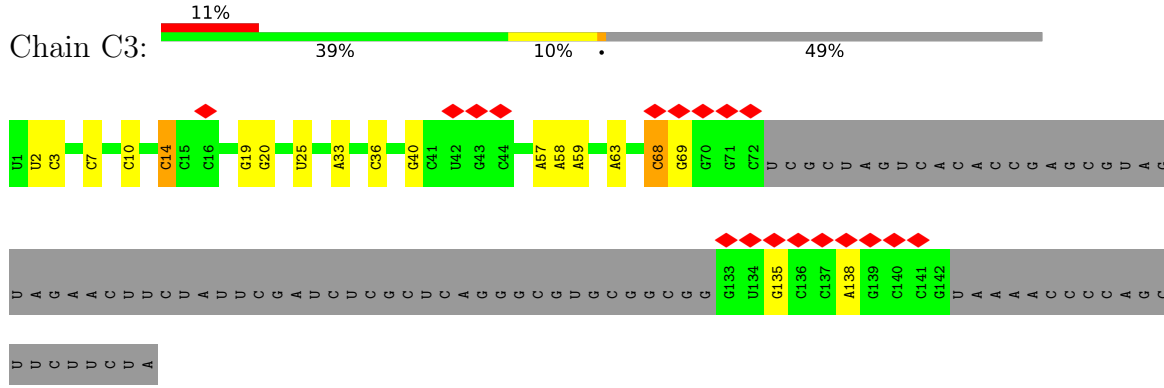




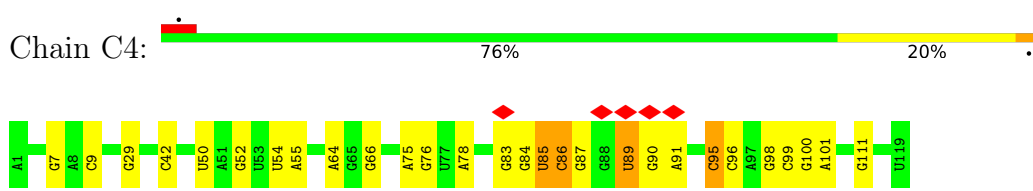
• Molecule 2: 5.8S rRNA



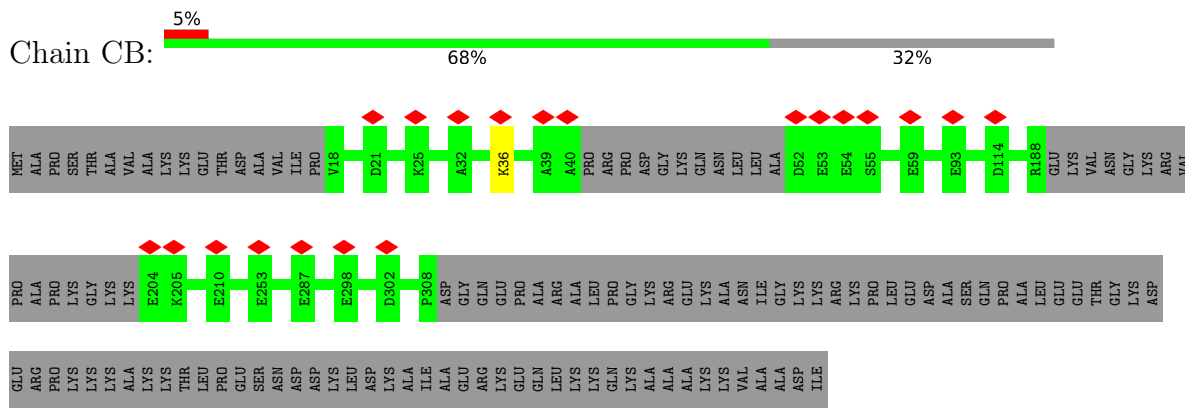
• Molecule 3: ITS2



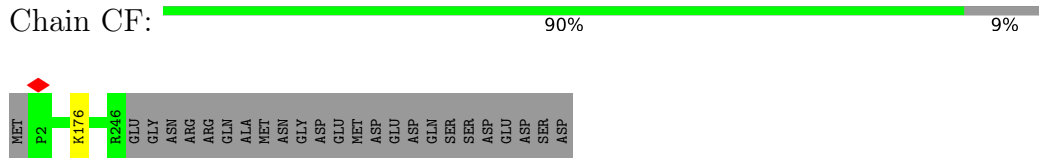
• Molecule 4: 5S rRNA



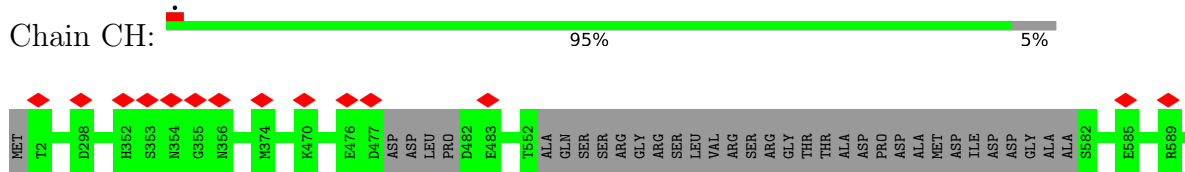
• Molecule 5: Utp30



• Molecule 6: Large ribosomal subunit protein uL10

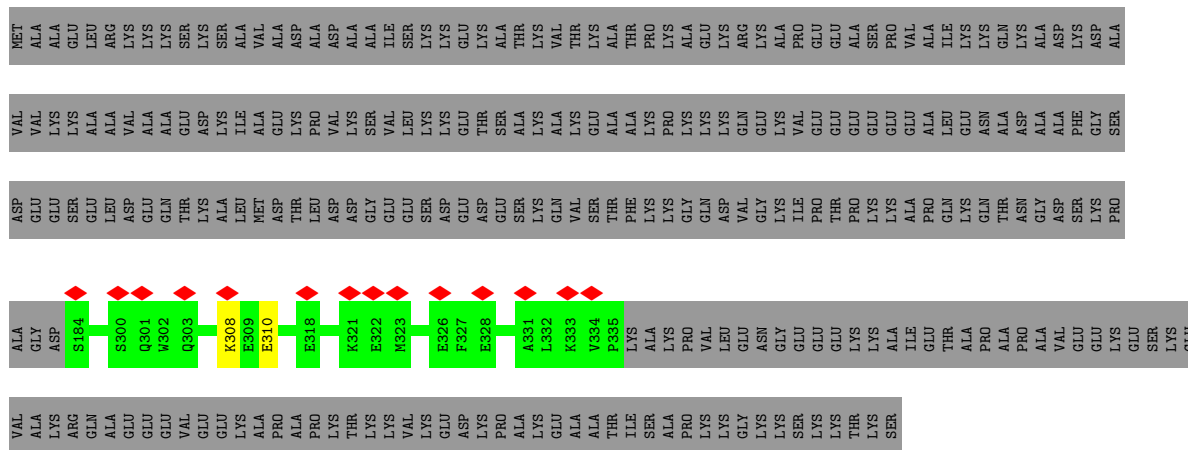


• Molecule 7: Nucleolar GTP-binding protein 1

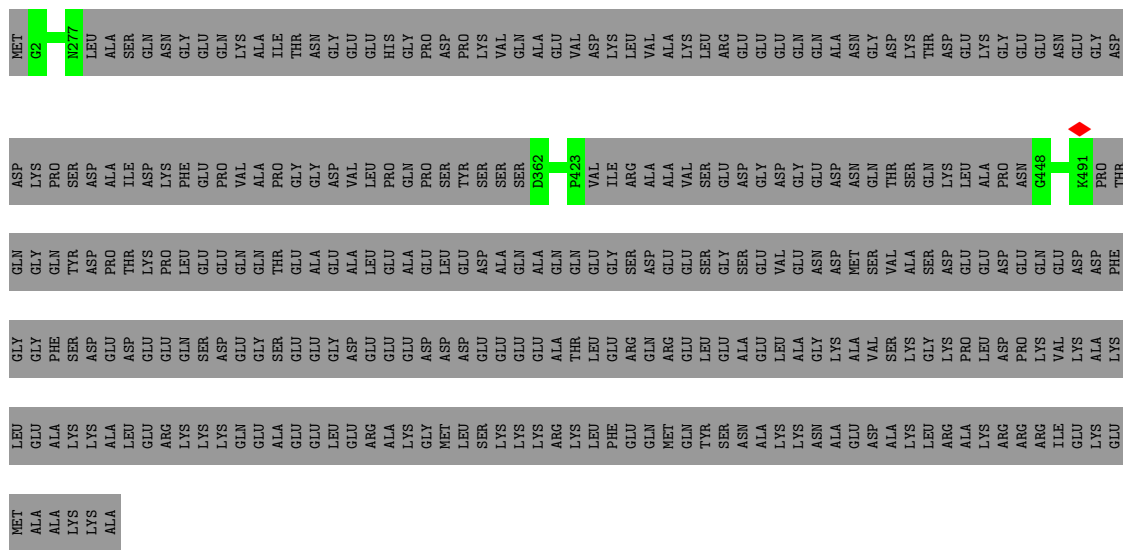




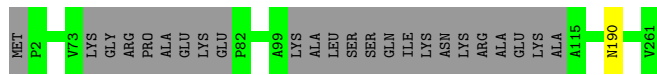
• Molecule 8: Putative RNA-binding protein



• Molecule 9: Pescadillo homolog

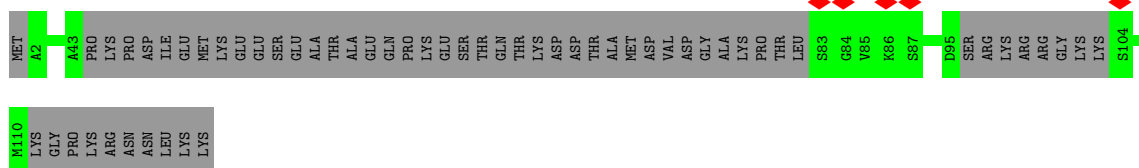


• Molecule 10: Ribosome biogenesis protein NSA2 homolog




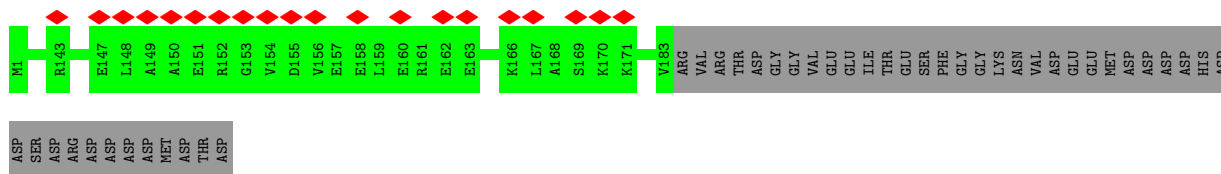
• Molecule 11: Putative GTP binding protein

Chain CO:  52% 48%



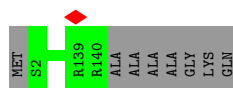
- Molecule 15: Ribosome biogenesis protein RLP24

Chain CQ:  9% 81% 19%



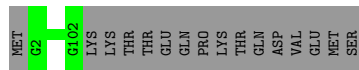
- Molecule 16: Putative 60S ribosomal protein

Chain Lq:  95% 5%



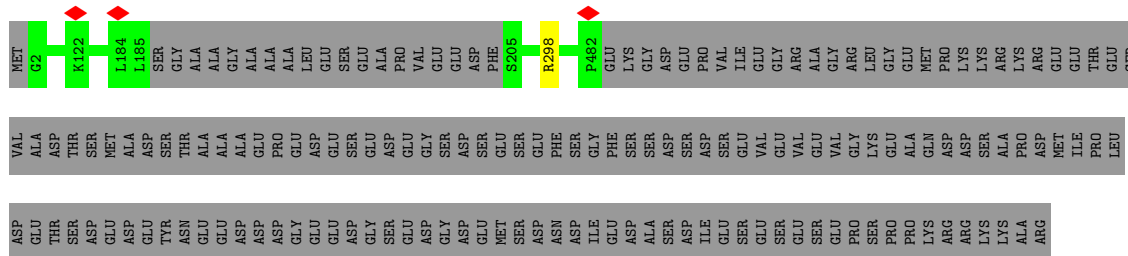
- Molecule 17: Zinc finger domain-containing protein

Chain Cb:  86% 14%



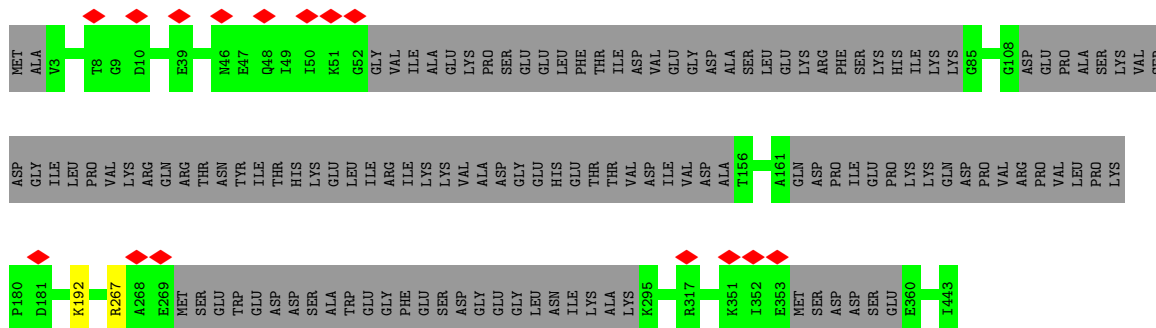
- Molecule 18: Nucleolar GTP-binding protein 2

Chain Cd:  74% 26%

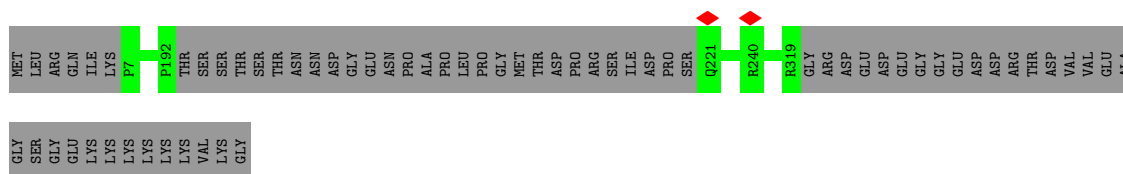
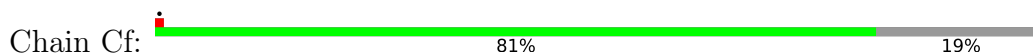


- Molecule 19: Ribosome biogenesis protein NOP53

Chain Ce:  70% 29%



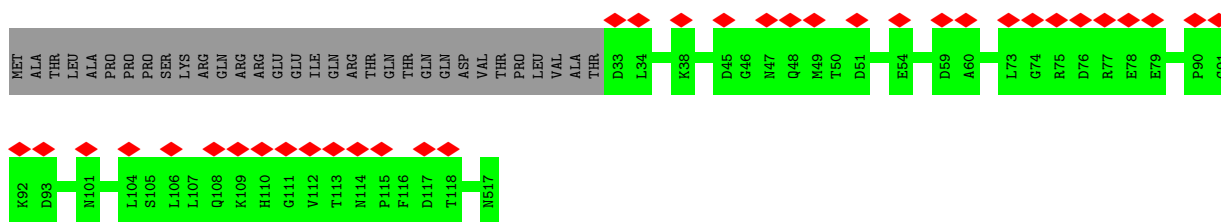
• Molecule 20: Ribosome production factor 2 homolog



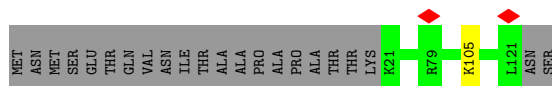
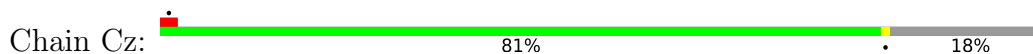
• Molecule 21: Ribosome biogenesis regulatory protein



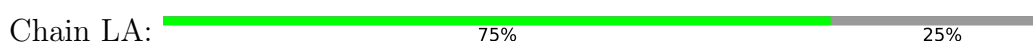
• Molecule 22: Ribosome assembly protein 4

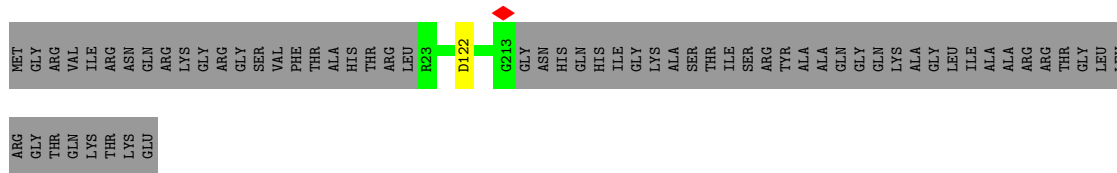


• Molecule 23: rRNA-processing protein

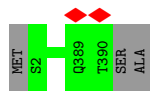


• Molecule 24: 60S ribosomal protein L2-like protein

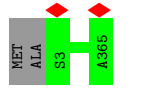




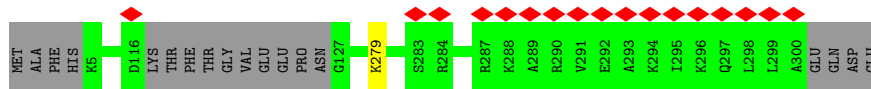
● Molecule 25: 60S ribosomal protein L3-like protein



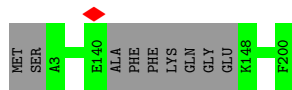
● Molecule 26: 60S ribosomal protein L4-like protein



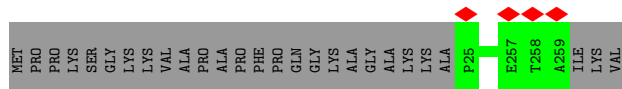
● Molecule 27: 60S ribosomal protein l5-like protein



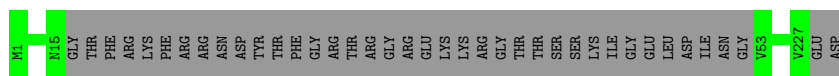
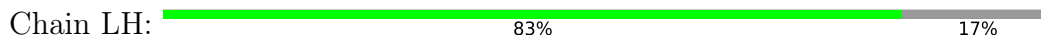
● Molecule 28: 60S ribosomal protein L6



● Molecule 29: 60S ribosomal protein L8

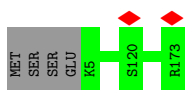


● Molecule 30: 60S ribosomal protein l9-like protein



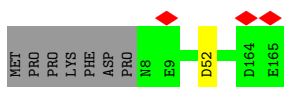
- Molecule 31: Putative ribosomal protein

Chain LJ:  98%



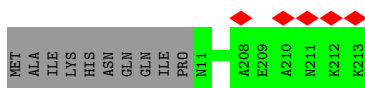
- Molecule 32: 60S ribosomal protein L12-like protein

Chain LK:  95%



- Molecule 33: 60S ribosomal protein L13

Chain LL:  95% 5%



- Molecule 34: 60S ribosomal protein L14-like protein

Chain LM:  99%



- Molecule 35: Ribosomal protein L15

Chain LN:  100%



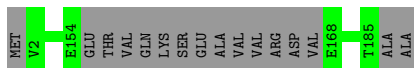
- Molecule 36: 60S ribosomal protein L16-like protein

Chain LO:  100%



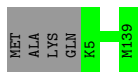
- Molecule 37: 60S ribosomal protein l17-like protein

Chain LP:  91% 9%



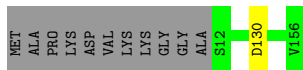
- Molecule 43: 60S ribosomal protein l23-like protein

Chain LV:  97%



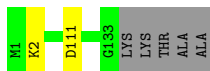
- Molecule 44: 60S ribosomal protein L25-like protein

Chain LX:  92%



- Molecule 45: 60S ribosomal protein L26-like protein

Chain LY:  95%



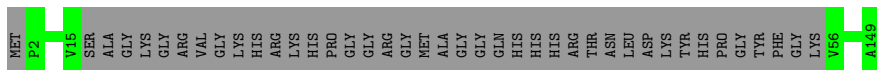
- Molecule 46: 60S ribosomal protein L27

Chain LZ:  100%

There are no outlier residues recorded for this chain.

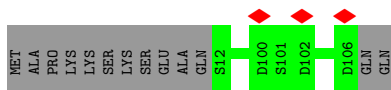
- Molecule 47: 60S ribosomal protein L28-like protein

Chain La:  72%



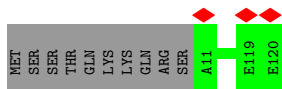
- Molecule 48: 60S ribosomal protein l30-like protein

Chain Lc:  88%



- Molecule 49: Putative 60S ribosomal protein

Chain Ld:  92%



- Molecule 50: 60S ribosomal protein L32-like protein

Chain Le:  96%



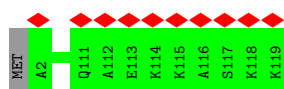
- Molecule 51: 60S ribosomal protein l33-like protein

Chain Lf:  99%



- Molecule 52: Ribosomal protein l34-like protein

Chain Lg:  8% 99%



- Molecule 53: dolichyl-diphosphooligosaccharide--protein glycotransferase

Chain Lh:  13% 87%



MET	SER	LYS
T4		
T5		
W6		
A7		
G8		
W9		
R10		
Q11		
M12		
V13		
A14		
E15		
L16		
L17		
D18		
Y19		
S20		
N21		
N22		
V23		
K24		
K25		
R26		
N27		
F28		
L29		
E30		
T31		
V32		
E33		
L34		
Q35		
I36		
G37		
L38		
K39		
N40		
Y41		
D42		
P43		
D44		
R45		
D46		
K47		
R48		
F49		
S50		
G51		
T52		
V53		
K54		
L55		
P56		
T57		
W58		
P59		
R60		
F61		
N62		
N63		
S64		
I65		
C66		
I67		
L68		
G69		
D70		
Q71		
H72		
D73		
I74		
D75		
R76		
A77		
K78		
H79		
G80		
G81		
I82		
D83		
A84		
H85		
S86		
A87		
D88		
D89		
L90		
K91		
K92		
L93		
N94		
K95		
N96		
K97		
K98		
L99		
I100		
K101		
K102		
L103		
A104		
R105		
K106		
Y107		
D108		
A109		
F110		
I111		
A112		
S113		
E114		
S115		
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I117		
K118		
Q119		
I120		
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R122		
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L124		
G125		
P126		
G127		
L128		
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G132		
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D143		
L144		
S145		
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K147		
V148		
M149		
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K152		
S153		
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V155		
K156		
F157		
Q158		
L159		
K160		
K161		
V162		
L163		
C164		
M165		
G166		
V167		
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M171		
V172		
G173		
M174		
T175		
Q176		
E177		
Q178		
L179		
V180		
A181		
M182		
I183		
M184		
L185		
A186		
I187		
M188		
Y189		
L190		
V191		
S192		
L193		
L194		
K195		
K196		
G197		
W198		
Q199		
N200		
V201		
G202		
S203		
L204		
T205		
T206		
K207		
A208		
T209		
M210		
S211		
P212		
P213		
K214		
R215		
L216		
Y217		

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	74129	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 ($e^-/\text{\AA}^2$)	45.6	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	8.766	Depositor
Minimum map value	0.000	Depositor
Average map value	0.018	Depositor
Map value standard deviation	0.167	Depositor
Recommended contour level	0.6	Depositor
Map size (Å)	522.5, 522.5, 522.5	wwPDB
Map dimensions	500, 500, 500	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.045, 1.045, 1.045	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: OMU, OMG, MG, GTP, A2M, ZN, OMC

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	C1	0.28	0/74323	0.93	168/115881 (0.1%)
2	C2	0.27	0/3710	0.88	3/5778 (0.1%)
3	C3	0.25	0/1958	0.93	2/3050 (0.1%)
4	C4	0.29	0/2833	1.07	20/4414 (0.5%)
5	CB	0.25	0/2153	0.50	0/2926
6	CF	0.26	0/1972	0.54	0/2660
7	CH	0.27	0/5147	0.54	0/6926
8	CI	0.29	0/1265	0.65	1/1702 (0.1%)
9	CJ	0.26	0/3196	0.50	0/4319
10	CK	0.25	0/1939	0.54	0/2608
11	CL	0.24	0/631	0.50	0/843
12	CM	0.26	0/1805	0.52	0/2417
12	LF	0.27	0/2061	0.53	0/2765
13	CN	0.25	0/1878	0.55	0/2555
14	CO	0.25	0/470	0.49	0/619
15	CQ	0.27	0/1504	0.59	0/2000
16	Lq	0.29	0/1091	0.56	0/1468
17	Cb	0.26	0/845	0.60	0/1128
18	Cd	0.26	0/3770	0.52	0/5082
19	Ce	0.26	0/2579	0.56	0/3434
20	Cf	0.26	0/2326	0.54	0/3113
21	Cg	0.27	0/1508	0.57	1/2051 (0.0%)
22	Ch	0.25	0/3914	0.54	0/5319
23	Cz	0.27	0/877	0.56	0/1148
24	LA	0.27	0/1488	0.58	1/2009 (0.0%)
25	LB	0.26	0/3172	0.54	0/4260
26	LC	0.26	0/2808	0.52	0/3785
27	LD	0.27	0/2308	0.51	0/3105
28	LE	0.25	0/1504	0.49	0/2027
29	LG	0.26	0/1918	0.50	0/2565
30	LH	0.26	0/1515	0.54	0/2037
31	LJ	0.26	0/1379	0.60	0/1844

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	LK	0.27	0/1198	0.56	1/1611 (0.1%)
33	LL	0.26	0/1614	0.60	0/2168
34	LM	0.28	0/1145	0.56	0/1539
35	LN	0.26	0/1741	0.61	0/2332
36	LO	0.28	0/1645	0.55	0/2205
37	LP	0.26	0/1364	0.57	0/1835
38	LQ	0.26	0/1218	0.57	0/1639
39	LR	0.25	0/1260	0.53	0/1683
40	LS	0.26	0/1461	0.55	0/1966
41	LT	0.26	0/1046	0.55	0/1409
42	LU	0.26	0/859	0.49	0/1151
43	LV	0.27	0/1009	0.54	0/1357
44	LX	0.26	0/1151	0.55	1/1547 (0.1%)
45	LY	0.27	0/1070	0.63	1/1432 (0.1%)
46	LZ	0.26	0/1135	0.54	0/1519
47	La	0.28	0/892	0.54	0/1200
48	Lc	0.26	0/714	0.50	0/960
49	Ld	0.25	0/889	0.53	0/1192
50	Le	0.25	0/1035	0.54	0/1379
51	Lf	0.26	0/883	0.55	0/1187
52	Lg	0.26	0/927	0.59	0/1244
53	Lh	0.27	0/1014	0.57	0/1349
54	Li	0.26	0/834	0.60	0/1099
55	Lj	0.27	0/712	0.63	0/944
56	Lk	0.26	0/640	0.53	0/850
57	Ll	0.23	0/446	0.55	0/593
58	Lp	0.25	0/706	0.57	0/940
59	Lr	0.24	0/1684	0.51	0/2266
All	All	0.27	0/170139	0.78	199/246434 (0.1%)

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	C1	36	0
53	Lh	0	1
56	Lk	0	1
All	All	36	2

There are no bond length outliers.

All (199) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	1179	C	N1-C2-O2	11.19	125.61	118.90
1	C1	1179	C	C2-N1-C1'	11.03	130.93	118.80
1	C1	1538	U	N1-C2-O2	9.05	129.13	122.80
1	C1	1538	U	C2-N1-C1'	9.00	128.50	117.70
1	C1	2584	C	C2-N1-C1'	8.78	128.46	118.80
1	C1	2730	U	C2-N1-C1'	8.76	128.21	117.70
1	C1	1478	U	C2-N1-C1'	8.65	128.08	117.70
1	C1	2584	C	N1-C2-O2	8.57	124.04	118.90
1	C1	1538	U	N3-C2-O2	-8.57	116.20	122.20
4	C4	85	U	N3-C2-O2	-8.49	116.25	122.20
1	C1	1179	C	N3-C2-O2	-8.48	115.96	121.90
1	C1	2730	U	N1-C2-O2	8.45	128.72	122.80
4	C4	89	U	C2-N1-C1'	8.45	127.84	117.70
4	C4	89	U	N1-C2-O2	8.43	128.70	122.80
4	C4	95	C	C2-N1-C1'	8.35	127.98	118.80
1	C1	250	C	N3-C2-O2	-7.97	116.32	121.90
4	C4	85	U	N1-C2-O2	7.97	128.38	122.80
1	C1	1179	C	C6-N1-C1'	-7.89	111.33	120.80
1	C1	1478	U	N1-C2-O2	7.82	128.28	122.80
1	C1	2730	U	N3-C2-O2	-7.76	116.77	122.20
4	C4	89	U	N3-C2-O2	-7.71	116.81	122.20
1	C1	1835	C	C2-N1-C1'	7.66	127.23	118.80
1	C1	1835	C	N1-C2-O2	7.34	123.30	118.90
1	C1	2299	U	N3-C2-O2	-7.33	117.07	122.20
1	C1	1478	U	N3-C2-O2	-7.29	117.10	122.20
1	C1	2681	U	N3-C2-O2	-7.28	117.11	122.20
1	C1	250	C	N1-C2-O2	7.22	123.23	118.90
1	C1	2046	C	C2-N1-C1'	7.22	126.74	118.80
1	C1	103	C	N1-C2-O2	7.21	123.22	118.90
1	C1	1087	U	N1-C2-O2	7.07	127.75	122.80
1	C1	3016	U	C2-N1-C1'	7.07	126.18	117.70
1	C1	1087	U	C2-N1-C1'	7.04	126.14	117.70
1	C1	3089	U	C2-N1-C1'	6.89	125.97	117.70
1	C1	2351	U	N3-C2-O2	-6.83	117.42	122.20
1	C1	2471	U	C2-N1-C1'	6.78	125.83	117.70
1	C1	2435	U	N1-C2-O2	6.77	127.54	122.80
1	C1	2912	U	C2-N1-C1'	6.69	125.73	117.70
1	C1	1087	U	N3-C2-O2	-6.66	117.54	122.20
4	C4	50	U	N1-C2-O2	6.64	127.45	122.80
1	C1	2435	U	C2-N1-C1'	6.64	125.66	117.70
1	C1	936	U	C2-N1-C1'	6.63	125.66	117.70
1	C1	2441	C	N1-C2-O2	6.63	122.88	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	3016	U	N1-C2-O2	6.60	127.42	122.80
1	C1	2584	C	N3-C2-O2	-6.46	117.38	121.90
4	C4	42	C	N1-C2-O2	6.45	122.77	118.90
1	C1	469	C	N1-C2-O2	6.45	122.77	118.90
1	C1	1179	C	C6-N1-C2	-6.44	117.72	120.30
1	C1	2544	G	N3-C4-C5	-6.44	125.38	128.60
1	C1	2544	G	C4-N9-C1'	6.40	134.82	126.50
1	C1	2544	G	N3-C4-N9	6.37	129.82	126.00
1	C1	1811	U	C2-N1-C1'	6.33	125.30	117.70
1	C1	1266	C	N1-C2-O2	6.32	122.69	118.90
4	C4	95	C	N1-C2-O2	6.32	122.69	118.90
1	C1	2584	C	C6-N1-C1'	-6.32	113.22	120.80
24	LA	122	ASP	CB-CG-OD2	6.31	123.98	118.30
1	C1	2681	U	N1-C2-O2	6.31	127.22	122.80
4	C4	85	U	C2-N1-C1'	6.31	125.27	117.70
1	C1	2435	U	N3-C2-O2	-6.30	117.79	122.20
1	C1	2374	U	N3-C2-O2	-6.30	117.79	122.20
1	C1	2912	U	N1-C2-O2	6.30	127.21	122.80
1	C1	3111	C	C2-N1-C1'	6.30	125.73	118.80
4	C4	50	U	N3-C2-O2	-6.30	117.79	122.20
1	C1	1064	C	P-O3'-C3'	6.28	127.23	119.70
1	C1	79	U	N3-C2-O2	-6.26	117.82	122.20
1	C1	1937	C	N1-C2-O2	6.25	122.65	118.90
1	C1	2046	C	N1-C2-O2	6.22	122.63	118.90
1	C1	94	C	N1-C2-O2	6.20	122.62	118.90
1	C1	2689	G	C4-N9-C1'	6.17	134.53	126.50
1	C1	443	C	C2-N1-C1'	6.12	125.54	118.80
1	C1	1937	C	C2-N1-C1'	6.12	125.53	118.80
2	C2	113	U	C2-N1-C1'	6.12	125.04	117.70
1	C1	1479	C	C2-N1-C1'	6.11	125.52	118.80
1	C1	308	C	C2-N1-C1'	6.10	125.51	118.80
1	C1	2459	U	C2-N1-C1'	6.08	125.00	117.70
1	C1	2054	U	C2-N1-C1'	6.07	124.99	117.70
3	C3	14	C	C2-N1-C1'	6.06	125.47	118.80
1	C1	2048	U	C2-N1-C1'	6.05	124.96	117.70
1	C1	1266	C	N3-C2-O2	-6.04	117.67	121.90
1	C1	2160	C	P-O3'-C3'	6.04	126.94	119.70
1	C1	1537	U	P-O3'-C3'	6.00	126.90	119.70
1	C1	3016	U	N3-C2-O2	-5.97	118.02	122.20
1	C1	1179	C	C5-C6-N1	5.96	123.98	121.00
1	C1	94	C	C2-N1-C1'	5.96	125.36	118.80
1	C1	103	C	N3-C2-O2	-5.96	117.73	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	114	C	C2-N1-C1'	5.95	125.34	118.80
1	C1	3258	U	P-O3'-C3'	5.95	126.84	119.70
1	C1	2217	U	C2-N1-C1'	5.94	124.83	117.70
1	C1	438	C	C2-N1-C1'	5.93	125.32	118.80
3	C3	68	C	C2-N1-C1'	5.90	125.29	118.80
1	C1	399	G	O4'-C1'-N9	5.88	112.91	108.20
1	C1	1811	U	N1-C2-O2	5.86	126.90	122.80
1	C1	940	C	N1-C2-O2	5.86	122.41	118.90
1	C1	936	U	N1-C2-O2	5.85	126.90	122.80
1	C1	1478	U	C6-N1-C1'	-5.85	113.01	121.20
1	C1	2912	U	N3-C2-O2	-5.85	118.11	122.20
1	C1	1686	C	N1-C2-O2	5.84	122.41	118.90
1	C1	1337	G	C4-N9-C1'	5.83	134.07	126.50
1	C1	471	C	N1-C2-O2	5.82	122.39	118.90
1	C1	162	U	N3-C2-O2	-5.82	118.13	122.20
1	C1	1935	C	C2-N1-C1'	5.81	125.19	118.80
1	C1	3111	C	N1-C2-O2	5.81	122.39	118.90
1	C1	1835	C	N3-C2-O2	-5.77	117.86	121.90
1	C1	2887	C	C2-N1-C1'	5.77	125.15	118.80
1	C1	1538	U	C6-N1-C1'	-5.77	113.12	121.20
1	C1	1205	G	O4'-C1'-N9	5.76	112.81	108.20
1	C1	2299	U	N1-C2-O2	5.76	126.83	122.80
1	C1	2441	C	C2-N1-C1'	5.74	125.11	118.80
1	C1	2433	C	C2-N1-C1'	5.73	125.11	118.80
1	C1	2397	U	N1-C2-O2	5.73	126.81	122.80
1	C1	2351	U	N1-C2-O2	5.72	126.81	122.80
1	C1	469	C	C2-N1-C1'	5.72	125.09	118.80
4	C4	95	C	C6-N1-C1'	-5.71	113.95	120.80
1	C1	2730	U	C6-N1-C1'	-5.69	113.24	121.20
1	C1	471	C	C2-N1-C1'	5.68	125.05	118.80
1	C1	2217	U	N1-C2-O2	5.68	126.78	122.80
1	C1	940	C	C2-N1-C1'	5.67	125.04	118.80
1	C1	1663	C	N1-C2-O2	5.66	122.30	118.90
1	C1	2505	U	C2-N1-C1'	5.66	124.50	117.70
4	C4	95	C	C6-N1-C2	-5.61	118.06	120.30
2	C2	113	U	N1-C2-O2	5.60	126.72	122.80
4	C4	86	C	C2-N1-C1'	5.60	124.96	118.80
1	C1	719	U	N1-C2-O2	5.59	126.72	122.80
1	C1	936	U	N3-C2-O2	-5.59	118.29	122.20
1	C1	2048	U	N1-C2-O2	5.58	126.71	122.80
1	C1	956	U	C2-N1-C1'	5.57	124.39	117.70
1	C1	3338	C	C2-N1-C1'	5.55	124.90	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	2883	U	P-O3'-C3'	5.53	126.33	119.70
1	C1	2217	U	N3-C2-O2	-5.52	118.33	122.20
1	C1	1588	C	C2-N1-C1'	5.52	124.87	118.80
1	C1	2397	U	C2-N1-C1'	5.50	124.31	117.70
1	C1	2421	A	O4'-C1'-N9	5.50	112.60	108.20
1	C1	1811	U	N3-C2-O2	-5.49	118.36	122.20
1	C1	2397	U	N3-C2-O2	-5.48	118.36	122.20
1	C1	2499	C	C2-N1-C1'	5.47	124.82	118.80
1	C1	162	U	N1-C2-O2	5.47	126.63	122.80
1	C1	103	C	C2-N1-C1'	5.46	124.80	118.80
1	C1	777	C	N1-C2-O2	5.45	122.17	118.90
1	C1	1858	G	C4-N9-C1'	5.44	133.57	126.50
1	C1	1852	C	N1-C2-O2	5.42	122.15	118.90
1	C1	1051	C	C2-N1-C1'	5.42	124.76	118.80
4	C4	50	U	C2-N1-C1'	5.41	124.19	117.70
1	C1	2689	G	N3-C4-N9	5.40	129.24	126.00
4	C4	89	U	C6-N1-C1'	-5.40	113.64	121.20
1	C1	2280	A	P-O3'-C3'	5.39	126.17	119.70
1	C1	1937	C	C6-N1-C2	-5.37	118.15	120.30
1	C1	2374	U	N1-C2-O2	5.36	126.55	122.80
1	C1	2050	C	C2-N1-C1'	5.35	124.69	118.80
1	C1	1835	C	C6-N1-C1'	-5.35	114.38	120.80
1	C1	2466	G	C4-N9-C1'	5.35	133.46	126.50
1	C1	3301	C	P-O3'-C3'	5.34	126.11	119.70
1	C1	2544	G	C8-N9-C1'	-5.34	120.06	127.00
1	C1	1704	U	O4'-C1'-N1	5.32	112.45	108.20
1	C1	2689	G	N3-C4-C5	-5.31	125.94	128.60
1	C1	1047	A	P-O3'-C3'	5.31	126.07	119.70
1	C1	37	C	N1-C2-O2	5.30	122.08	118.90
1	C1	719	U	N3-C2-O2	-5.29	118.49	122.20
1	C1	1550	U	N1-C2-O2	5.27	126.49	122.80
1	C1	2054	U	N1-C2-O2	5.25	126.48	122.80
1	C1	1091	C	C2-N1-C1'	5.24	124.57	118.80
1	C1	719	U	C2-N1-C1'	5.24	123.99	117.70
1	C1	2605	C	C2-N1-C1'	5.24	124.56	118.80
1	C1	2689	G	C8-N9-C1'	-5.24	120.19	127.00
44	LX	130	ASP	CB-CG-OD1	5.24	123.01	118.30
1	C1	1768	C	C2-N1-C1'	5.20	124.53	118.80
1	C1	473	C	C2-N1-C1'	5.20	124.52	118.80
1	C1	103	C	C6-N1-C2	-5.19	118.22	120.30
1	C1	2046	C	C6-N1-C2	-5.19	118.22	120.30
1	C1	2863	U	C2-N1-C1'	5.19	123.93	117.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
21	Cg	24	ASP	CB-CG-OD2	5.19	122.97	118.30
1	C1	1668	U	N1-C2-O2	5.19	126.43	122.80
4	C4	95	C	C5-C6-N1	5.18	123.59	121.00
4	C4	99	C	C2-N1-C1'	5.18	124.50	118.80
1	C1	2471	U	N1-C2-O2	5.17	126.42	122.80
2	C2	113	U	N3-C2-O2	-5.16	118.59	122.20
1	C1	2054	U	N3-C2-O2	-5.16	118.59	122.20
4	C4	42	C	N3-C2-O2	-5.13	118.31	121.90
1	C1	3210	U	P-O3'-C3'	5.13	125.85	119.70
1	C1	3338	C	N1-C2-O2	5.12	121.97	118.90
1	C1	2441	C	N3-C2-O2	-5.10	118.33	121.90
45	LY	111	ASP	CB-CG-OD1	5.09	122.89	118.30
1	C1	2369	C	C5-C6-N1	5.09	123.55	121.00
1	C1	1408	U	N3-C2-O2	-5.09	118.64	122.20
1	C1	2170	A	P-O3'-C3'	5.09	125.81	119.70
1	C1	898	G	P-O3'-C3'	5.08	125.80	119.70
1	C1	1337	G	C8-N9-C1'	-5.07	120.41	127.00
1	C1	2611	U	N1-C2-O2	5.07	126.35	122.80
32	LK	52	ASP	CB-CG-OD2	5.07	122.86	118.30
1	C1	469	C	N3-C2-O2	-5.06	118.36	121.90
1	C1	2458	C	C2-N1-C1'	5.05	124.36	118.80
1	C1	2584	C	C6-N1-C2	-5.05	118.28	120.30
1	C1	137	C	C2-N1-C1'	5.05	124.35	118.80
1	C1	1835	C	C6-N1-C2	-5.04	118.28	120.30
1	C1	168	C	C2-N1-C1'	5.03	124.33	118.80
8	CI	310	GLU	N-CA-CB	5.03	119.65	110.60
1	C1	94	C	N3-C2-O2	-5.02	118.38	121.90
1	C1	3089	U	C5-C6-N1	5.02	125.21	122.70
4	C4	89	U	C5-C6-N1	5.02	125.21	122.70
1	C1	1550	U	C2-N1-C1'	5.02	123.72	117.70
1	C1	2409	U	N1-C2-O2	5.00	126.30	122.80

All (36) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	C1	385	OMG	C3',C4'
1	C1	627	OMG	C3',C4'
1	C1	646	OMG	C3',C4'
1	C1	778	OMC	C3',C4'
1	C1	787	OMG	C3',C4'
1	C1	1420	OMC	C3',C4'
1	C1	1433	OMG	C3',C4'

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Mol	Chain	Res	Type	Atom
1	C1	1491	OMC	C3',C4'
1	C1	1812	OMC	C3',C4'
1	C1	1836	OMC	C3',C4'
1	C1	2300	OMC	C3',C4'
1	C1	2358	OMG	C3',C4'
1	C1	2578	OMG	C3',C4'
1	C1	2774	OMG	C3',C4'
1	C1	2838	OMC	C3',C4'
1	C1	2876	OMG	C3',C4'
1	C1	2881	OMG	C3',C4'
1	C1	2918	OMC	C3',C4'

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
53	Lh	16	ASN	Peptide
56	Lk	16	ARG	Sidechain

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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	
5	CB	259/391 (66%)	255 (98%)	4 (2%)	0	100	100
6	CF	243/270 (90%)	241 (99%)	2 (1%)	0	100	100
7	CH	621/661 (94%)	617 (99%)	4 (1%)	0	100	100
8	CI	150/414 (36%)	147 (98%)	3 (2%)	0	100	100
9	CJ	376/679 (55%)	373 (99%)	3 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
10	CK	231/261 (88%)	225 (97%)	6 (3%)	0	100	100
11	CL	77/558 (14%)	76 (99%)	1 (1%)	0	100	100
12	CM	211/249 (85%)	207 (98%)	3 (1%)	1 (0%)	29	40
12	LF	246/249 (99%)	240 (98%)	6 (2%)	0	100	100
13	CN	244/246 (99%)	238 (98%)	6 (2%)	0	100	100
14	CO	56/120 (47%)	56 (100%)	0	0	100	100
15	CQ	181/225 (80%)	180 (99%)	1 (1%)	0	100	100
16	Lq	137/147 (93%)	134 (98%)	3 (2%)	0	100	100
17	Cb	99/117 (85%)	98 (99%)	1 (1%)	0	100	100
18	Cd	458/627 (73%)	450 (98%)	8 (2%)	0	100	100
19	Ce	301/443 (68%)	299 (99%)	2 (1%)	0	100	100
20	Cf	281/350 (80%)	276 (98%)	5 (2%)	0	100	100
21	Cg	186/202 (92%)	185 (100%)	1 (0%)	0	100	100
22	Ch	484/517 (94%)	468 (97%)	16 (3%)	0	100	100
23	Cz	99/123 (80%)	98 (99%)	1 (1%)	0	100	100
24	LA	189/254 (74%)	185 (98%)	4 (2%)	0	100	100
25	LB	387/392 (99%)	380 (98%)	7 (2%)	0	100	100
26	LC	361/365 (99%)	355 (98%)	6 (2%)	0	100	100
27	LD	282/304 (93%)	280 (99%)	2 (1%)	0	100	100
28	LE	187/200 (94%)	182 (97%)	5 (3%)	0	100	100
29	LG	233/262 (89%)	230 (99%)	3 (1%)	0	100	100
30	LH	188/229 (82%)	184 (98%)	4 (2%)	0	100	100
31	LJ	167/173 (96%)	166 (99%)	1 (1%)	0	100	100
32	LK	156/165 (94%)	155 (99%)	1 (1%)	0	100	100
33	LL	201/213 (94%)	199 (99%)	2 (1%)	0	100	100
34	LM	139/142 (98%)	136 (98%)	3 (2%)	0	100	100
35	LN	200/203 (98%)	193 (96%)	7 (4%)	0	100	100
36	LO	201/204 (98%)	199 (99%)	2 (1%)	0	100	100
37	LP	167/187 (89%)	166 (99%)	1 (1%)	0	100	100
38	LQ	148/213 (70%)	145 (98%)	3 (2%)	0	100	100
39	LR	153/2898 (5%)	152 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
40	LS	172/174 (99%)	169 (98%)	3 (2%)	0	100	100
41	LT	127/160 (79%)	125 (98%)	2 (2%)	0	100	100
42	LU	103/127 (81%)	100 (97%)	3 (3%)	0	100	100
43	LV	133/139 (96%)	132 (99%)	1 (1%)	0	100	100
44	LX	143/156 (92%)	140 (98%)	3 (2%)	0	100	100
45	LY	131/138 (95%)	125 (95%)	6 (5%)	0	100	100
46	LZ	133/135 (98%)	132 (99%)	1 (1%)	0	100	100
47	La	104/149 (70%)	102 (98%)	2 (2%)	0	100	100
48	Lc	93/108 (86%)	92 (99%)	1 (1%)	0	100	100
49	Ld	108/120 (90%)	107 (99%)	1 (1%)	0	100	100
50	Le	124/131 (95%)	123 (99%)	1 (1%)	0	100	100
51	Lf	106/109 (97%)	105 (99%)	1 (1%)	0	100	100
52	Lg	116/119 (98%)	114 (98%)	2 (2%)	0	100	100
53	Lh	120/935 (13%)	116 (97%)	4 (3%)	0	100	100
54	Li	99/110 (90%)	99 (100%)	0	0	100	100
55	Lj	86/95 (90%)	84 (98%)	2 (2%)	0	100	100
56	Lk	74/94 (79%)	73 (99%)	1 (1%)	0	100	100
57	Ll	48/51 (94%)	46 (96%)	2 (4%)	0	100	100
58	Lp	89/92 (97%)	85 (96%)	4 (4%)	0	100	100
59	Lr	212/217 (98%)	201 (95%)	11 (5%)	0	100	100
All	All	10620/16612 (64%)	10440 (98%)	179 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
12	CM	197	VAL

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	
5	CB	227/329 (69%)	226 (100%)	1 (0%)	91	95
6	CF	212/236 (90%)	211 (100%)	1 (0%)	88	93
7	CH	549/575 (96%)	549 (100%)	0	100	100
8	CI	124/336 (37%)	123 (99%)	1 (1%)	81	88
9	CJ	331/579 (57%)	331 (100%)	0	100	100
10	CK	206/225 (92%)	205 (100%)	1 (0%)	88	93
11	CL	61/458 (13%)	61 (100%)	0	100	100
12	CM	185/215 (86%)	184 (100%)	1 (0%)	88	93
12	LF	213/215 (99%)	212 (100%)	1 (0%)	88	93
13	CN	205/206 (100%)	205 (100%)	0	100	100
14	CO	48/99 (48%)	48 (100%)	0	100	100
15	CQ	144/192 (75%)	144 (100%)	0	100	100
16	Lq	109/112 (97%)	109 (100%)	0	100	100
17	Cb	85/101 (84%)	85 (100%)	0	100	100
18	Cd	403/541 (74%)	402 (100%)	1 (0%)	93	97
19	Ce	267/383 (70%)	265 (99%)	2 (1%)	84	90
20	Cf	250/310 (81%)	250 (100%)	0	100	100
21	Cg	158/176 (90%)	158 (100%)	0	100	100
22	Ch	408/436 (94%)	408 (100%)	0	100	100
23	Cz	89/107 (83%)	88 (99%)	1 (1%)	73	83
24	LA	150/198 (76%)	150 (100%)	0	100	100
25	LB	329/331 (99%)	329 (100%)	0	100	100
26	LC	282/285 (99%)	282 (100%)	0	100	100
27	LD	221/253 (87%)	220 (100%)	1 (0%)	88	93
28	LE	157/166 (95%)	157 (100%)	0	100	100
29	LG	200/222 (90%)	200 (100%)	0	100	100
30	LH	167/200 (84%)	167 (100%)	0	100	100
31	LJ	140/150 (93%)	140 (100%)	0	100	100
32	LK	127/136 (93%)	127 (100%)	0	100	100
33	LL	158/176 (90%)	158 (100%)	0	100	100
34	LM	116/117 (99%)	116 (100%)	0	100	100
35	LN	179/180 (99%)	179 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
36	LO	162/163 (99%)	162 (100%)	0	100	100
37	LP	133/152 (88%)	133 (100%)	0	100	100
38	LQ	128/178 (72%)	127 (99%)	1 (1%)	81	88
39	LR	125/2396 (5%)	125 (100%)	0	100	100
40	LS	152/154 (99%)	151 (99%)	1 (1%)	84	90
41	LT	110/135 (82%)	110 (100%)	0	100	100
42	LU	92/108 (85%)	92 (100%)	0	100	100
43	LV	98/102 (96%)	98 (100%)	0	100	100
44	LX	122/129 (95%)	122 (100%)	0	100	100
45	LY	116/119 (98%)	115 (99%)	1 (1%)	78	86
46	LZ	121/121 (100%)	121 (100%)	0	100	100
47	La	93/122 (76%)	93 (100%)	0	100	100
48	Lc	76/88 (86%)	76 (100%)	0	100	100
49	Ld	90/105 (86%)	90 (100%)	0	100	100
50	Le	109/114 (96%)	109 (100%)	0	100	100
51	Lf	89/90 (99%)	89 (100%)	0	100	100
52	Lg	95/102 (93%)	95 (100%)	0	100	100
53	Lh	109/781 (14%)	109 (100%)	0	100	100
54	Li	85/93 (91%)	84 (99%)	1 (1%)	71	81
55	Lj	72/78 (92%)	72 (100%)	0	100	100
56	Lk	73/88 (83%)	73 (100%)	0	100	100
57	Ll	45/46 (98%)	45 (100%)	0	100	100
58	Lp	73/74 (99%)	73 (100%)	0	100	100
59	Lr	186/189 (98%)	184 (99%)	2 (1%)	73	83
All	All	9054/13972 (65%)	9037 (100%)	17 (0%)	93	97

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
5	CB	36	LYS
6	CF	176	LYS
8	CI	308	LYS
10	CK	190	ASN
12	CM	221	ARG

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Mol	Chain	Res	Type
18	Cd	298	ARG
19	Ce	192	LYS
19	Ce	267	ARG
23	Cz	105	LYS
27	LD	279	LYS
12	LF	23	LYS
38	LQ	35	ARG
40	LS	84	ARG
45	LY	2	LYS
54	Li	32	LYS
59	Lr	45	ARG
59	Lr	78	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
10	CK	53	GLN
17	Cb	68	HIS
19	Ce	350	GLN
21	Cg	185	GLN
22	Ch	56	ASN
40	LS	89	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	C1	3130/3342 (93%)	590 (18%)	41 (1%)
2	C2	155/156 (99%)	21 (13%)	0
3	C3	80/162 (49%)	19 (23%)	0
4	C4	118/119 (99%)	25 (21%)	2 (1%)
All	All	3483/3779 (92%)	655 (18%)	43 (1%)

All (655) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	C1	6	G
1	C1	27	A
1	C1	44	A
1	C1	50	A
1	C1	60	G

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Mol	Chain	Res	Type
1	C1	61	A
1	C1	66	A
1	C1	67	A
1	C1	68	A
1	C1	72	A
1	C1	95	G
1	C1	96	A
1	C1	110	A
1	C1	111	G
1	C1	117	A
1	C1	123	A
1	C1	132	U
1	C1	134	G
1	C1	135	G
1	C1	139	G
1	C1	144	G
1	C1	152	G
1	C1	153	A
1	C1	156	G
1	C1	157	G
1	C1	181	G
1	C1	184	U
1	C1	194	C
1	C1	204	C
1	C1	213	A
1	C1	214	G
1	C1	225	A
1	C1	226	G
1	C1	241	U
1	C1	244	G
1	C1	247	A
1	C1	258	A
1	C1	262	G
1	C1	276	G
1	C1	277	A
1	C1	288	A
1	C1	291	U
1	C1	298	U
1	C1	308	C
1	C1	316	A
1	C1	322	C
1	C1	323	G

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Mol	Chain	Res	Type
1	C1	332	C
1	C1	339	C
1	C1	342	A
1	C1	343	C
1	C1	369	G
1	C1	385	OMG
1	C1	386	U
1	C1	388	A
1	C1	389	A2M
1	C1	391	U
1	C1	392	A
1	C1	394	C
1	C1	395	A
1	C1	396	C
1	C1	414	G
1	C1	415	A
1	C1	422	U
1	C1	434	U
1	C1	435	G
1	C1	443	C
1	C1	445	G
1	C1	446	A
1	C1	447	U
1	C1	448	C
1	C1	458	U
1	C1	459	C
1	C1	460	U
1	C1	469	C
1	C1	470	A
1	C1	471	C
1	C1	472	U
1	C1	479	G
1	C1	486	G
1	C1	512	A
1	C1	514	A
1	C1	527	G
1	C1	535	U
1	C1	536	C
1	C1	537	C
1	C1	545	U
1	C1	547	A
1	C1	549	A

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Mol	Chain	Res	Type
1	C1	561	A
1	C1	570	G
1	C1	583	A
1	C1	592	U
1	C1	593	G
1	C1	595	A
1	C1	597	G
1	C1	599	A
1	C1	608	U
1	C1	609	A
1	C1	610	A
1	C1	624	C
1	C1	627	OMG
1	C1	628	U
1	C1	632	G
1	C1	633	A
1	C1	634	A
1	C1	646	OMG
1	C1	647	G
1	C1	648	A
1	C1	650	U
1	C1	665	A
1	C1	669	U
1	C1	678	A
1	C1	693	A
1	C1	700	G
1	C1	703	A
1	C1	707	U
1	C1	719	U
1	C1	720	C
1	C1	721	G
1	C1	743	A
1	C1	747	A
1	C1	748	U
1	C1	756	G
1	C1	757	A
1	C1	759	U
1	C1	761	G
1	C1	762	A
1	C1	763	G
1	C1	766	G
1	C1	767	G

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Mol	Chain	Res	Type
1	C1	778	OMC
1	C1	779	U
1	C1	782	G
1	C1	787	OMG
1	C1	788	A
1	C1	799	A
1	C1	812	A
1	C1	830	A
1	C1	843	C
1	C1	857	G
1	C1	877	A
1	C1	878	A
1	C1	879	U
1	C1	889	G
1	C1	890	G
1	C1	896	A
1	C1	898	G
1	C1	899	A
1	C1	903	A
1	C1	906	G
1	C1	919	G
1	C1	926	A
1	C1	931	C
1	C1	933	A
1	C1	935	G
1	C1	937	U
1	C1	940	C
1	C1	941	C
1	C1	942	U
1	C1	944	A
1	C1	945	G
1	C1	947	A
1	C1	955	G
1	C1	956	U
1	C1	963	U
1	C1	964	C
1	C1	976	G
1	C1	977	U
1	C1	983	G
1	C1	984	A
1	C1	1032	C
1	C1	1034	U

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Mol	Chain	Res	Type
1	C1	1040	A
1	C1	1047	A
1	C1	1048	A
1	C1	1049	G
1	C1	1051	C
1	C1	1055	G
1	C1	1058	A
1	C1	1064	C
1	C1	1065	U
1	C1	1066	G
1	C1	1070	G
1	C1	1075	C
1	C1	1076	A
1	C1	1077	U
1	C1	1078	U
1	C1	1079	C
1	C1	1080	G
1	C1	1081	A
1	C1	1086	A
1	C1	1099	G
1	C1	1109	G
1	C1	1110	G
1	C1	1115	C
1	C1	1118	A
1	C1	1127	U
1	C1	1132	G
1	C1	1136	A
1	C1	1143	C
1	C1	1161	G
1	C1	1163	G
1	C1	1164	U
1	C1	1165	G
1	C1	1173	A
1	C1	1175	C
1	C1	1176	A
1	C1	1179	C
1	C1	1185	A
1	C1	1187	A
1	C1	1194	U
1	C1	1205	G
1	C1	1209	G
1	C1	1228	A

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Mol	Chain	Res	Type
1	C1	1241	U
1	C1	1246	A
1	C1	1248	U
1	C1	1255	C
1	C1	1268	G
1	C1	1269	A
1	C1	1270	A
1	C1	1287	A
1	C1	1288	U
1	C1	1290	G
1	C1	1292	U
1	C1	1296	G
1	C1	1313	A
1	C1	1331	A
1	C1	1332	G
1	C1	1333	A
1	C1	1334	A
1	C1	1335	A
1	C1	1336	C
1	C1	1337	G
1	C1	1370	G
1	C1	1375	G
1	C1	1382	A
1	C1	1383	G
1	C1	1401	A
1	C1	1417	G
1	C1	1420	OMC
1	C1	1421	U
1	C1	1429	A
1	C1	1433	OMG
1	C1	1434	C
1	C1	1438	U
1	C1	1458	G
1	C1	1464	A
1	C1	1466	G
1	C1	1485	G
1	C1	1491	OMC
1	C1	1492	G
1	C1	1505	U
1	C1	1506	U
1	C1	1519	G
1	C1	1536	U

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Mol	Chain	Res	Type
1	C1	1538	U
1	C1	1539	C
1	C1	1540	A
1	C1	1542	A
1	C1	1543	G
1	C1	1549	C
1	C1	1550	U
1	C1	1552	G
1	C1	1554	G
1	C1	1560	U
1	C1	1563	G
1	C1	1567	A
1	C1	1568	A
1	C1	1569	A
1	C1	1573	A
1	C1	1585	A
1	C1	1586	U
1	C1	1609	U
1	C1	1619	C
1	C1	1623	A
1	C1	1624	C
1	C1	1685	U
1	C1	1697	C
1	C1	1704	U
1	C1	1710	G
1	C1	1722	U
1	C1	1730	A
1	C1	1731	G
1	C1	1745	U
1	C1	1746	G
1	C1	1751	G
1	C1	1760	G
1	C1	1776	G
1	C1	1777	A
1	C1	1792	G
1	C1	1793	A
1	C1	1794	A
1	C1	1795	U
1	C1	1796	A
1	C1	1799	U
1	C1	1800	C
1	C1	1801	U

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Mol	Chain	Res	Type
1	C1	1812	OMC
1	C1	1813	G
1	C1	1822	A
1	C1	1826	C
1	C1	1829	C
1	C1	1830	A
1	C1	1836	OMC
1	C1	1837	C
1	C1	1846	C
1	C1	1847	A2M
1	C1	1856	U
1	C1	1858	G
1	C1	1859	A
1	C1	1860	U
1	C1	1886	G
1	C1	1887	C
1	C1	1917	OMU
1	C1	1934	G
1	C1	1935	C
1	C1	1937	C
1	C1	2046	C
1	C1	2047	G
1	C1	2048	U
1	C1	2050	C
1	C1	2052	G
1	C1	2054	U
1	C1	2056	A
1	C1	2076	A
1	C1	2084	G
1	C1	2085	G
1	C1	2089	A
1	C1	2094	A
1	C1	2103	U
1	C1	2121	A
1	C1	2126	C
1	C1	2132	G
1	C1	2147	U
1	C1	2151	A
1	C1	2156	U
1	C1	2157	G
1	C1	2158	C
1	C1	2161	A

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Mol	Chain	Res	Type
1	C1	2167	C
1	C1	2169	G
1	C1	2171	A
1	C1	2172	U
1	C1	2186	A
1	C1	2188	U
1	C1	2192	A
1	C1	2203	G
1	C1	2205	A
1	C1	2206	A
1	C1	2216	G
1	C1	2217	U
1	C1	2218	A
1	C1	2219	A
1	C1	2220	C
1	C1	2221	U
1	C1	2222	A
1	C1	2223	U
1	C1	2224	G
1	C1	2225	A
1	C1	2226	C
1	C1	2229	U
1	C1	2230	C
1	C1	2231	U
1	C1	2237	U
1	C1	2279	G
1	C1	2281	U
1	C1	2282	U
1	C1	2284	A
1	C1	2297	U
1	C1	2298	G
1	C1	2299	U
1	C1	2300	OMC
1	C1	2301	C
1	C1	2327	G
1	C1	2340	G
1	C1	2348	A
1	C1	2355	C
1	C1	2356	G
1	C1	2358	OMG
1	C1	2359	G
1	C1	2362	A

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Mol	Chain	Res	Type
1	C1	2364	A
1	C1	2373	U
1	C1	2374	U
1	C1	2381	G
1	C1	2382	A
1	C1	2398	G
1	C1	2407	C
1	C1	2409	U
1	C1	2410	A
1	C1	2411	G
1	C1	2415	G
1	C1	2416	U
1	C1	2421	A
1	C1	2422	A
1	C1	2425	G
1	C1	2426	G
1	C1	2431	A
1	C1	2432	G
1	C1	2435	U
1	C1	2437	G
1	C1	2438	G
1	C1	2440	G
1	C1	2446	G
1	C1	2450	U
1	C1	2454	A
1	C1	2457	A
1	C1	2458	C
1	C1	2459	U
1	C1	2465	U
1	C1	2466	G
1	C1	2472	U
1	C1	2477	U
1	C1	2489	C
1	C1	2499	C
1	C1	2501	U
1	C1	2502	G
1	C1	2503	C
1	C1	2506	C
1	C1	2507	C
1	C1	2508	A
1	C1	2515	G
1	C1	2521	A

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Mol	Chain	Res	Type
1	C1	2527	C
1	C1	2533	G
1	C1	2544	G
1	C1	2545	G
1	C1	2552	A
1	C1	2565	G
1	C1	2566	G
1	C1	2576	U
1	C1	2577	G
1	C1	2578	OMG
1	C1	2579	G
1	C1	2582	G
1	C1	2584	C
1	C1	2585	A
1	C1	2605	C
1	C1	2613	C
1	C1	2615	A
1	C1	2631	G
1	C1	2633	A
1	C1	2635	A
1	C1	2636	G
1	C1	2647	U
1	C1	2651	A
1	C1	2656	A
1	C1	2663	A
1	C1	2664	A
1	C1	2667	C
1	C1	2672	U
1	C1	2673	G
1	C1	2674	A
1	C1	2675	U
1	C1	2680	A
1	C1	2689	G
1	C1	2691	G
1	C1	2713	G
1	C1	2717	A
1	C1	2731	C
1	C1	2732	C
1	C1	2736	G
1	C1	2737	A
1	C1	2754	U
1	C1	2755	G

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Mol	Chain	Res	Type
1	C1	2757	C
1	C1	2758	A
1	C1	2761	A
1	C1	2762	A
1	C1	2763	A
1	C1	2769	C
1	C1	2773	G
1	C1	2774	OMG
1	C1	2775	G
1	C1	2783	G
1	C1	2784	C
1	C1	2785	U
1	C1	2802	U
1	C1	2803	C
1	C1	2804	A
1	C1	2805	U
1	C1	2806	A
1	C1	2812	G
1	C1	2817	U
1	C1	2821	U
1	C1	2826	C
1	C1	2828	U
1	C1	2836	G
1	C1	2838	OMC
1	C1	2839	U
1	C1	2846	A
1	C1	2857	G
1	C1	2858	C
1	C1	2863	U
1	C1	2876	OMG
1	C1	2877	G
1	C1	2881	OMG
1	C1	2882	U
1	C1	2883	U
1	C1	2884	C
1	C1	2885	A
1	C1	2894	U
1	C1	2895	A
1	C1	2903	U
1	C1	2905	A
1	C1	2909	G
1	C1	2918	OMC

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Mol	Chain	Res	Type
1	C1	2919	C
1	C1	2929	C
1	C1	2930	A
1	C1	2931	G
1	C1	2938	U
1	C1	2939	U
1	C1	2940	U
1	C1	2942	C
1	C1	2949	G
1	C1	2951	U
1	C1	2955	C
1	C1	2956	U
1	C1	2970	A
1	C1	2980	G
1	C1	3014	U
1	C1	3017	G
1	C1	3032	G
1	C1	3036	G
1	C1	3044	A
1	C1	3049	A
1	C1	3050	C
1	C1	3051	C
1	C1	3067	G
1	C1	3080	A
1	C1	3087	A
1	C1	3088	A
1	C1	3089	U
1	C1	3100	A
1	C1	3101	C
1	C1	3102	G
1	C1	3112	U
1	C1	3113	A
1	C1	3119	A
1	C1	3124	G
1	C1	3125	U
1	C1	3126	A
1	C1	3127	G
1	C1	3131	U
1	C1	3133	U
1	C1	3135	A
1	C1	3141	G
1	C1	3146	C

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Mol	Chain	Res	Type
1	C1	3155	A
1	C1	3162	C
1	C1	3163	A
1	C1	3164	G
1	C1	3186	A
1	C1	3190	G
1	C1	3200	A
1	C1	3206	C
1	C1	3210	U
1	C1	3211	U
1	C1	3214	A
1	C1	3217	U
1	C1	3218	U
1	C1	3228	C
1	C1	3229	G
1	C1	3231	G
1	C1	3244	G
1	C1	3245	C
1	C1	3254	U
1	C1	3257	A
1	C1	3258	U
1	C1	3259	G
1	C1	3260	U
1	C1	3276	A
1	C1	3282	U
1	C1	3292	U
1	C1	3295	U
1	C1	3297	G
1	C1	3299	U
1	C1	3302	G
1	C1	3310	G
1	C1	3312	G
1	C1	3319	C
1	C1	3323	C
1	C1	3324	C
1	C1	3325	U
1	C1	3331	U
1	C1	3332	A
1	C1	3338	C
2	C2	34	U
2	C2	35	C
2	C2	52	A

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Mol	Chain	Res	Type
2	C2	59	A
2	C2	62	A
2	C2	63	G
2	C2	81	U
2	C2	82	U
2	C2	83	C
2	C2	84	C
2	C2	86	U
2	C2	87	G
2	C2	90	U
2	C2	95	G
2	C2	104	A
2	C2	106	C
2	C2	113	U
2	C2	116	G
2	C2	125	U
2	C2	151	C
2	C2	154	C
3	C3	2	U
3	C3	3	C
3	C3	7	C
3	C3	10	C
3	C3	14	C
3	C3	19	G
3	C3	20	G
3	C3	25	U
3	C3	33	A
3	C3	36	C
3	C3	40	G
3	C3	57	A
3	C3	58	A
3	C3	59	A
3	C3	63	A
3	C3	68	C
3	C3	69	G
3	C3	135	G
3	C3	138	A
4	C4	7	G
4	C4	9	C
4	C4	29	G
4	C4	52	G
4	C4	54	U

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Mol	Chain	Res	Type
4	C4	55	A
4	C4	64	A
4	C4	66	G
4	C4	75	A
4	C4	76	G
4	C4	78	A
4	C4	83	G
4	C4	84	G
4	C4	85	U
4	C4	86	C
4	C4	87	G
4	C4	89	U
4	C4	90	G
4	C4	91	A
4	C4	95	C
4	C4	96	C
4	C4	98	G
4	C4	100	G
4	C4	101	A
4	C4	111	G

All (43) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	C1	151	G
1	C1	243	U
1	C1	385	OMG
1	C1	627	OMG
1	C1	646	OMG
1	C1	778	OMC
1	C1	787	OMG
1	C1	898	G
1	C1	1047	A
1	C1	1064	C
1	C1	1077	U
1	C1	1267	C
1	C1	1420	OMC
1	C1	1433	OMG
1	C1	1491	OMC
1	C1	1537	U
1	C1	1812	OMC
1	C1	1836	OMC

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Mol	Chain	Res	Type
1	C1	2157	G
1	C1	2160	C
1	C1	2225	A
1	C1	2280	A
1	C1	2300	OMC
1	C1	2358	OMG
1	C1	2409	U
1	C1	2575	C
1	C1	2578	OMG
1	C1	2774	OMG
1	C1	2838	OMC
1	C1	2876	OMG
1	C1	2881	OMG
1	C1	2883	U
1	C1	2918	OMC
1	C1	3079	U
1	C1	3132	A
1	C1	3205	G
1	C1	3210	U
1	C1	3230	G
1	C1	3258	U
1	C1	3298	U
1	C1	3301	C
4	C4	85	U
4	C4	90	G

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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	OMU	C1	2277	1	19,22,23	3.08	6 (31%)	26,31,34	1.66	5 (19%)
1	OMC	C1	1420	1	19,22,23	3.02	8 (42%)	26,31,34	2.52	9 (34%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	OMG	C1	646	1	18,26,27	2.59	8 (44%)	19,38,41	2.52	9 (47%)
1	A2M	C1	858	1	18,25,26	4.38	9 (50%)	18,36,39	3.85	4 (22%)
1	OMC	C1	2300	1	19,22,23	3.04	8 (42%)	26,31,34	2.69	10 (38%)
1	OMG	C1	2358	1	18,26,27	2.60	8 (44%)	19,38,41	2.54	9 (47%)
1	A2M	C1	1847	1	18,25,26	4.33	9 (50%)	18,36,39	3.95	4 (22%)
1	OMC	C1	2838	1	19,22,23	3.15	8 (42%)	26,31,34	2.53	8 (30%)
1	OMU	C1	2384	1	19,22,23	3.11	6 (31%)	26,31,34	1.65	5 (19%)
1	OMU	C1	2690	1	19,22,23	3.06	6 (31%)	26,31,34	1.67	4 (15%)
1	OMC	C1	1812	1	19,22,23	3.13	8 (42%)	26,31,34	2.51	10 (38%)
1	OMU	C1	2683	1	19,22,23	3.05	6 (31%)	26,31,34	1.65	5 (19%)
1	OMU	C1	2688	1	19,22,23	3.07	6 (31%)	26,31,34	1.68	5 (19%)
1	A2M	C1	1432	1	18,25,26	4.33	9 (50%)	18,36,39	3.92	4 (22%)
1	A2M	C1	389	1	18,25,26	4.37	9 (50%)	18,36,39	3.87	4 (22%)
1	A2M	C1	1223	1	18,25,26	4.31	9 (50%)	18,36,39	3.81	4 (22%)
1	OMG	C1	787	1	18,26,27	2.57	8 (44%)	19,38,41	2.51	9 (47%)
1	OMC	C1	1491	1	19,22,23	3.07	8 (42%)	26,31,34	2.61	10 (38%)
1	OMU	C1	1917	1	19,22,23	3.12	6 (31%)	26,31,34	1.70	5 (19%)
1	OMG	C1	627	1	18,26,27	2.59	8 (44%)	19,38,41	2.55	10 (52%)
1	OMG	C1	1433	1	18,26,27	2.62	8 (44%)	19,38,41	2.58	9 (47%)
1	OMU	C1	2380	1	19,22,23	3.05	6 (31%)	26,31,34	1.67	5 (19%)
1	OMG	C1	2774	1	18,26,27	2.63	8 (44%)	19,38,41	2.55	10 (52%)
1	OMG	C1	2578	1	18,26,27	2.65	8 (44%)	19,38,41	2.59	10 (52%)
1	A2M	C1	637	1	18,25,26	4.35	9 (50%)	18,36,39	3.85	4 (22%)
1	OMG	C1	385	1	18,26,27	2.65	8 (44%)	19,38,41	2.64	10 (52%)
1	A2M	C1	848	1	18,25,26	4.36	9 (50%)	18,36,39	3.83	4 (22%)
1	A2M	C1	2289	1	18,25,26	4.38	9 (50%)	18,36,39	3.78	4 (22%)
1	OMC	C1	778	1	19,22,23	3.11	8 (42%)	26,31,34	2.54	9 (34%)
1	OMC	C1	2918	1	19,22,23	3.12	8 (42%)	26,31,34	2.57	9 (34%)
1	OMC	C1	1836	1	19,22,23	3.10	8 (42%)	26,31,34	2.65	10 (38%)
1	OMG	C1	2881	1	18,26,27	2.54	8 (44%)	19,38,41	2.54	8 (42%)
1	OMU	C1	1868	1	19,22,23	3.09	6 (31%)	26,31,34	1.75	4 (15%)
1	OMG	C1	2876	1	18,26,27	2.63	8 (44%)	19,38,41	2.67	8 (42%)

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	OMU	C1	2277	1	-	0/9/27/28	0/2/2/2
1	OMC	C1	1420	1	2/2/5/5	5/9/27/28	0/2/2/2
1	OMG	C1	646	1	2/2/5/5	3/5/27/28	0/3/3/3
1	A2M	C1	858	1	-	1/5/27/28	0/3/3/3
1	OMC	C1	2300	1	2/2/5/5	5/9/27/28	0/2/2/2
1	OMG	C1	2358	1	2/2/5/5	3/5/27/28	0/3/3/3
1	A2M	C1	1847	1	-	3/5/27/28	0/3/3/3
1	OMC	C1	2838	1	2/2/5/5	5/9/27/28	0/2/2/2
1	OMU	C1	2384	1	-	1/9/27/28	0/2/2/2
1	OMU	C1	2690	1	-	0/9/27/28	0/2/2/2
1	OMC	C1	1812	1	2/2/5/5	4/9/27/28	0/2/2/2
1	OMU	C1	2683	1	-	1/9/27/28	0/2/2/2
1	OMU	C1	2688	1	-	0/9/27/28	0/2/2/2
1	A2M	C1	1432	1	-	0/5/27/28	0/3/3/3
1	A2M	C1	389	1	-	3/5/27/28	0/3/3/3
1	A2M	C1	1223	1	-	2/5/27/28	0/3/3/3
1	OMG	C1	787	1	2/2/5/5	1/5/27/28	0/3/3/3
1	OMC	C1	1491	1	2/2/5/5	6/9/27/28	0/2/2/2
1	OMU	C1	1917	1	-	3/9/27/28	0/2/2/2
1	OMG	C1	627	1	2/2/5/5	2/5/27/28	0/3/3/3
1	OMG	C1	1433	1	2/2/5/5	2/5/27/28	0/3/3/3
1	OMU	C1	2380	1	-	0/9/27/28	0/2/2/2
1	OMG	C1	2774	1	2/2/5/5	3/5/27/28	0/3/3/3
1	OMG	C1	2578	1	2/2/5/5	3/5/27/28	0/3/3/3
1	A2M	C1	637	1	-	1/5/27/28	0/3/3/3
1	OMG	C1	385	1	2/2/5/5	4/5/27/28	0/3/3/3
1	A2M	C1	848	1	-	0/5/27/28	0/3/3/3
1	A2M	C1	2289	1	-	0/5/27/28	0/3/3/3
1	OMC	C1	778	1	2/2/5/5	5/9/27/28	0/2/2/2
1	OMC	C1	2918	1	2/2/5/5	5/9/27/28	0/2/2/2
1	OMC	C1	1836	1	2/2/5/5	5/9/27/28	0/2/2/2
1	OMG	C1	2881	1	2/2/5/5	3/5/27/28	0/3/3/3
1	OMU	C1	1868	1	-	0/9/27/28	0/2/2/2
1	OMG	C1	2876	1	2/2/5/5	3/5/27/28	0/3/3/3

All (264) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	2289	A2M	C3'-C2'	-12.81	1.24	1.52
1	C1	858	A2M	C3'-C2'	-12.77	1.24	1.52
1	C1	637	A2M	C3'-C2'	-12.72	1.24	1.52
1	C1	848	A2M	C3'-C2'	-12.72	1.24	1.52
1	C1	389	A2M	C3'-C2'	-12.62	1.24	1.52
1	C1	1223	A2M	C3'-C2'	-12.57	1.24	1.52
1	C1	1432	A2M	C3'-C2'	-12.55	1.25	1.52
1	C1	1847	A2M	C3'-C2'	-12.54	1.25	1.52
1	C1	2289	A2M	O4'-C1'	8.20	1.52	1.41
1	C1	848	A2M	O4'-C1'	8.18	1.52	1.41
1	C1	1847	A2M	O4'-C1'	8.16	1.52	1.41
1	C1	389	A2M	O4'-C1'	8.15	1.52	1.41
1	C1	858	A2M	O4'-C1'	8.10	1.52	1.41
1	C1	637	A2M	O4'-C1'	7.94	1.52	1.41
1	C1	1432	A2M	O4'-C1'	7.77	1.51	1.41
1	C1	1223	A2M	O4'-C1'	7.74	1.51	1.41
1	C1	1917	OMU	C2-N1	7.63	1.50	1.38
1	C1	2384	OMU	C2-N1	7.49	1.50	1.38
1	C1	1868	OMU	C2-N1	7.43	1.50	1.38
1	C1	2277	OMU	C2-N1	7.33	1.50	1.38
1	C1	2688	OMU	C2-N1	7.27	1.50	1.38
1	C1	2690	OMU	C2-N1	7.27	1.50	1.38
1	C1	2384	OMU	C2-N3	7.24	1.50	1.38
1	C1	2683	OMU	C2-N1	7.23	1.50	1.38
1	C1	2688	OMU	C2-N3	7.19	1.50	1.38
1	C1	2380	OMU	C2-N3	7.17	1.50	1.38
1	C1	2277	OMU	C2-N3	7.14	1.50	1.38
1	C1	2380	OMU	C2-N1	7.13	1.49	1.38
1	C1	2683	OMU	C2-N3	7.12	1.50	1.38
1	C1	1868	OMU	C2-N3	7.11	1.50	1.38
1	C1	2690	OMU	C2-N3	7.10	1.50	1.38
1	C1	1917	OMU	C2-N3	7.08	1.50	1.38
1	C1	637	A2M	O4'-C4'	-6.58	1.30	1.45
1	C1	389	A2M	O4'-C4'	-6.54	1.30	1.45
1	C1	1223	A2M	O4'-C4'	-6.51	1.30	1.45
1	C1	858	A2M	O4'-C4'	-6.44	1.30	1.45
1	C1	1847	A2M	O4'-C4'	-6.43	1.30	1.45
1	C1	1432	A2M	O4'-C4'	-6.42	1.30	1.45
1	C1	2289	A2M	O4'-C4'	-6.31	1.30	1.45
1	C1	848	A2M	O4'-C4'	-6.27	1.31	1.45
1	C1	2838	OMC	C4-N4	6.27	1.48	1.33
1	C1	1917	OMU	C6-C5	6.24	1.49	1.35
1	C1	1868	OMU	C6-C5	6.20	1.49	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	2380	OMU	C6-C5	6.20	1.49	1.35
1	C1	1836	OMC	C4-N4	6.18	1.48	1.33
1	C1	2277	OMU	C6-C5	6.18	1.49	1.35
1	C1	2688	OMU	C6-C5	6.17	1.49	1.35
1	C1	1812	OMC	C4-N4	6.17	1.48	1.33
1	C1	2918	OMC	C4-N4	6.16	1.48	1.33
1	C1	2690	OMU	C6-C5	6.15	1.49	1.35
1	C1	2384	OMU	C6-C5	6.15	1.49	1.35
1	C1	778	OMC	C4-N4	6.11	1.48	1.33
1	C1	2683	OMU	C6-C5	6.11	1.49	1.35
1	C1	2300	OMC	C4-N4	6.04	1.48	1.33
1	C1	1491	OMC	C4-N4	5.96	1.48	1.33
1	C1	1812	OMC	C2-N3	5.96	1.48	1.36
1	C1	1836	OMC	C2-N3	5.87	1.48	1.36
1	C1	1420	OMC	C4-N4	5.84	1.47	1.33
1	C1	778	OMC	C2-N3	5.83	1.48	1.36
1	C1	2918	OMC	C2-N3	5.79	1.48	1.36
1	C1	1491	OMC	C2-N3	5.70	1.47	1.36
1	C1	2300	OMC	C2-N3	5.61	1.47	1.36
1	C1	1420	OMC	C2-N3	5.60	1.47	1.36
1	C1	1432	A2M	C3'-C4'	5.59	1.67	1.53
1	C1	2838	OMC	C2-N3	5.57	1.47	1.36
1	C1	2876	OMG	C2-N3	5.53	1.46	1.33
1	C1	2838	OMC	C6-C5	5.43	1.47	1.35
1	C1	2838	OMC	C2-N1	5.42	1.51	1.40
1	C1	646	OMG	C2-N3	5.38	1.46	1.33
1	C1	787	OMG	C2-N3	5.37	1.46	1.33
1	C1	848	A2M	C3'-C4'	5.33	1.66	1.53
1	C1	2289	A2M	C3'-C4'	5.32	1.66	1.53
1	C1	858	A2M	C3'-C4'	5.31	1.66	1.53
1	C1	627	OMG	C2-N3	5.28	1.46	1.33
1	C1	1223	A2M	C3'-C4'	5.27	1.66	1.53
1	C1	2578	OMG	C2-N3	5.24	1.45	1.33
1	C1	2881	OMG	C2-N3	5.21	1.45	1.33
1	C1	2774	OMG	C2-N3	5.19	1.45	1.33
1	C1	2918	OMC	C6-C5	5.18	1.47	1.35
1	C1	1433	OMG	C2-N3	5.18	1.45	1.33
1	C1	1847	A2M	C3'-C4'	5.17	1.66	1.53
1	C1	637	A2M	C3'-C4'	5.16	1.66	1.53
1	C1	2918	OMC	C2-N1	5.16	1.51	1.40
1	C1	646	OMG	C4-N3	5.15	1.49	1.37
1	C1	2876	OMG	C2-N2	5.14	1.46	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	389	A2M	C3'-C4'	5.14	1.66	1.53
1	C1	2578	OMG	C2-N2	5.14	1.46	1.34
1	C1	627	OMG	C2-N2	5.13	1.46	1.34
1	C1	1812	OMC	C6-C5	5.12	1.47	1.35
1	C1	2774	OMG	C2-N2	5.12	1.46	1.34
1	C1	2300	OMC	C2-N1	5.11	1.51	1.40
1	C1	385	OMG	C2-N2	5.11	1.46	1.34
1	C1	1433	OMG	C2-N2	5.10	1.46	1.34
1	C1	385	OMG	C2-N3	5.10	1.45	1.33
1	C1	2358	OMG	C2-N2	5.10	1.46	1.34
1	C1	2578	OMG	C4-N3	5.08	1.49	1.37
1	C1	2358	OMG	C2-N3	5.07	1.45	1.33
1	C1	778	OMC	C6-C5	5.06	1.46	1.35
1	C1	1491	OMC	C2-N1	5.05	1.51	1.40
1	C1	778	OMC	C2-N1	5.04	1.50	1.40
1	C1	2876	OMG	C4-N3	5.04	1.49	1.37
1	C1	1491	OMC	C6-C5	5.03	1.46	1.35
1	C1	2774	OMG	C4-N3	5.02	1.49	1.37
1	C1	787	OMG	C4-N3	5.02	1.49	1.37
1	C1	1836	OMC	C6-C5	5.00	1.46	1.35
1	C1	1433	OMG	C4-N3	4.99	1.49	1.37
1	C1	646	OMG	C2-N2	4.99	1.46	1.34
1	C1	2881	OMG	C2-N2	4.98	1.46	1.34
1	C1	2881	OMG	C4-N3	4.97	1.49	1.37
1	C1	2358	OMG	C4-N3	4.97	1.49	1.37
1	C1	627	OMG	C4-N3	4.97	1.49	1.37
1	C1	1836	OMC	C2-N1	4.95	1.50	1.40
1	C1	1420	OMC	C6-C5	4.95	1.46	1.35
1	C1	1812	OMC	C2-N1	4.95	1.50	1.40
1	C1	385	OMG	C4-N3	4.90	1.49	1.37
1	C1	787	OMG	C2-N2	4.87	1.45	1.34
1	C1	2300	OMC	C6-C5	4.83	1.46	1.35
1	C1	1812	OMC	C4-N3	4.80	1.44	1.34
1	C1	1836	OMC	C4-N3	4.80	1.44	1.34
1	C1	1420	OMC	C2-N1	4.79	1.50	1.40
1	C1	778	OMC	C4-N3	4.74	1.44	1.34
1	C1	2918	OMC	C4-N3	4.67	1.43	1.34
1	C1	1420	OMC	C4-N3	4.67	1.43	1.34
1	C1	2300	OMC	C4-N3	4.58	1.43	1.34
1	C1	1491	OMC	C4-N3	4.56	1.43	1.34
1	C1	2384	OMU	C4-N3	4.29	1.46	1.38
1	C1	2277	OMU	C4-N3	4.29	1.46	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	2683	OMU	C4-N3	4.28	1.46	1.38
1	C1	2688	OMU	C4-N3	4.28	1.46	1.38
1	C1	2838	OMC	C4-N3	4.26	1.43	1.34
1	C1	1491	OMC	O2-C2	-4.23	1.15	1.23
1	C1	1868	OMU	C4-N3	4.22	1.46	1.38
1	C1	2300	OMC	O2-C2	-4.21	1.15	1.23
1	C1	2380	OMU	C4-N3	4.19	1.46	1.38
1	C1	1836	OMC	O2-C2	-4.19	1.16	1.23
1	C1	1917	OMU	C4-N3	4.18	1.46	1.38
1	C1	2690	OMU	C4-N3	4.18	1.46	1.38
1	C1	1420	OMC	O2-C2	-4.15	1.16	1.23
1	C1	2838	OMC	O2-C2	-4.14	1.16	1.23
1	C1	778	OMC	O2-C2	-4.11	1.16	1.23
1	C1	2918	OMC	O2-C2	-4.09	1.16	1.23
1	C1	1812	OMC	O2-C2	-4.06	1.16	1.23
1	C1	385	OMG	C6-N1	3.98	1.43	1.37
1	C1	2774	OMG	C6-N1	3.94	1.43	1.37
1	C1	2578	OMG	C6-N1	3.88	1.43	1.37
1	C1	1433	OMG	C6-N1	3.84	1.43	1.37
1	C1	389	A2M	O2'-C2'	3.78	1.52	1.42
1	C1	2876	OMG	C6-N1	3.68	1.43	1.37
1	C1	627	OMG	C6-N1	3.67	1.43	1.37
1	C1	2358	OMG	C6-N1	3.64	1.43	1.37
1	C1	787	OMG	C6-N1	3.63	1.43	1.37
1	C1	1432	A2M	O2'-C2'	3.57	1.51	1.42
1	C1	858	A2M	O2'-C2'	3.55	1.51	1.42
1	C1	637	A2M	O2'-C2'	3.54	1.51	1.42
1	C1	1223	A2M	O2'-C2'	3.50	1.51	1.42
1	C1	2289	A2M	O2'-C2'	3.50	1.51	1.42
1	C1	848	A2M	O2'-C2'	3.46	1.51	1.42
1	C1	1847	A2M	O2'-C2'	3.45	1.51	1.42
1	C1	646	OMG	C6-N1	3.30	1.42	1.37
1	C1	2881	OMG	C6-N1	3.25	1.42	1.37
1	C1	2838	OMC	C5-C4	3.21	1.50	1.42
1	C1	385	OMG	C5-C6	3.19	1.53	1.47
1	C1	637	A2M	C6-N6	3.16	1.45	1.34
1	C1	389	A2M	C6-N6	3.14	1.45	1.34
1	C1	2289	A2M	C6-N6	3.12	1.45	1.34
1	C1	848	A2M	C6-N6	3.12	1.45	1.34
1	C1	1223	A2M	C6-N6	3.12	1.45	1.34
1	C1	858	A2M	C6-N6	3.12	1.45	1.34
1	C1	1847	A2M	C6-N6	3.12	1.45	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	1432	A2M	C6-N6	3.11	1.45	1.34
1	C1	2918	OMC	C5-C4	2.94	1.49	1.42
1	C1	2838	OMC	C6-N1	2.91	1.45	1.38
1	C1	2358	OMG	C5-C6	2.88	1.53	1.47
1	C1	778	OMC	C5-C4	2.87	1.49	1.42
1	C1	2578	OMG	C5-C6	2.87	1.53	1.47
1	C1	1812	OMC	C5-C4	2.85	1.49	1.42
1	C1	2774	OMG	C5-C6	2.85	1.53	1.47
1	C1	1491	OMC	C5-C4	2.83	1.49	1.42
1	C1	1433	OMG	C5-C6	2.79	1.53	1.47
1	C1	646	OMG	C5-C4	-2.79	1.36	1.43
1	C1	1917	OMU	C6-N1	2.79	1.44	1.38
1	C1	2918	OMC	C6-N1	2.78	1.44	1.38
1	C1	1836	OMC	C5-C4	2.77	1.49	1.42
1	C1	2688	OMU	C6-N1	2.76	1.44	1.38
1	C1	778	OMC	C6-N1	2.76	1.44	1.38
1	C1	1420	OMC	C6-N1	2.75	1.44	1.38
1	C1	1491	OMC	C6-N1	2.75	1.44	1.38
1	C1	2358	OMG	C5-C4	-2.74	1.36	1.43
1	C1	2690	OMU	C6-N1	2.74	1.44	1.38
1	C1	2876	OMG	C2-N1	2.74	1.44	1.37
1	C1	1868	OMU	C6-N1	2.74	1.44	1.38
1	C1	1812	OMC	C6-N1	2.73	1.44	1.38
1	C1	2384	OMU	C6-N1	2.73	1.44	1.38
1	C1	385	OMG	C2-N1	2.72	1.44	1.37
1	C1	2380	OMU	C6-N1	2.71	1.44	1.38
1	C1	2277	OMU	C6-N1	2.71	1.44	1.38
1	C1	1836	OMC	C6-N1	2.70	1.44	1.38
1	C1	627	OMG	C5-C4	-2.70	1.36	1.43
1	C1	2289	A2M	C5-C4	-2.70	1.33	1.40
1	C1	1433	OMG	C5-C4	-2.68	1.36	1.43
1	C1	858	A2M	C5-C4	-2.68	1.33	1.40
1	C1	2683	OMU	C6-N1	2.66	1.44	1.38
1	C1	848	A2M	C5-C4	-2.66	1.33	1.40
1	C1	1223	A2M	C5-C4	-2.66	1.33	1.40
1	C1	1420	OMC	C5-C4	2.66	1.49	1.42
1	C1	1433	OMG	C2-N1	2.65	1.44	1.37
1	C1	1432	A2M	C5-C4	-2.65	1.33	1.40
1	C1	385	OMG	C5-C4	-2.65	1.36	1.43
1	C1	389	A2M	C5-C4	-2.65	1.33	1.40
1	C1	2774	OMG	C5-C4	-2.65	1.36	1.43
1	C1	2881	OMG	C5-C6	2.64	1.52	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	1847	A2M	C5-C4	-2.64	1.33	1.40
1	C1	787	OMG	C5-C6	2.64	1.52	1.47
1	C1	2578	OMG	C5-C4	-2.63	1.36	1.43
1	C1	2881	OMG	O6-C6	-2.63	1.18	1.23
1	C1	637	A2M	C5-C4	-2.63	1.34	1.40
1	C1	2578	OMG	C2-N1	2.62	1.44	1.37
1	C1	2300	OMC	C5-C4	2.61	1.48	1.42
1	C1	2876	OMG	O6-C6	-2.61	1.18	1.23
1	C1	2881	OMG	C5-C4	-2.59	1.36	1.43
1	C1	2876	OMG	C5-C4	-2.54	1.36	1.43
1	C1	646	OMG	C2-N1	2.54	1.44	1.37
1	C1	646	OMG	O6-C6	-2.54	1.18	1.23
1	C1	627	OMG	C2-N1	2.52	1.43	1.37
1	C1	2300	OMC	C6-N1	2.52	1.44	1.38
1	C1	787	OMG	C2-N1	2.51	1.43	1.37
1	C1	2358	OMG	O6-C6	-2.50	1.18	1.23
1	C1	2881	OMG	C2-N1	2.49	1.43	1.37
1	C1	2774	OMG	C2-N1	2.47	1.43	1.37
1	C1	627	OMG	O6-C6	-2.47	1.18	1.23
1	C1	2578	OMG	O6-C6	-2.44	1.18	1.23
1	C1	2358	OMG	C2-N1	2.43	1.43	1.37
1	C1	787	OMG	C5-C4	-2.43	1.36	1.43
1	C1	1433	OMG	O6-C6	-2.43	1.18	1.23
1	C1	2774	OMG	O6-C6	-2.43	1.18	1.23
1	C1	627	OMG	C5-C6	2.41	1.52	1.47
1	C1	787	OMG	O6-C6	-2.41	1.18	1.23
1	C1	385	OMG	O6-C6	-2.39	1.18	1.23
1	C1	1432	A2M	O3'-C3'	2.39	1.48	1.43
1	C1	646	OMG	C5-C6	2.33	1.52	1.47
1	C1	2690	OMU	C5-C4	2.31	1.48	1.43
1	C1	1847	A2M	O3'-C3'	2.31	1.48	1.43
1	C1	1868	OMU	C5-C4	2.31	1.48	1.43
1	C1	2688	OMU	C5-C4	2.30	1.48	1.43
1	C1	848	A2M	C2-N3	2.28	1.35	1.32
1	C1	1917	OMU	C5-C4	2.27	1.48	1.43
1	C1	2277	OMU	C5-C4	2.25	1.48	1.43
1	C1	2380	OMU	C5-C4	2.23	1.48	1.43
1	C1	389	A2M	C2-N3	2.23	1.35	1.32
1	C1	2683	OMU	C5-C4	2.23	1.48	1.43
1	C1	637	A2M	C2-N3	2.21	1.35	1.32
1	C1	2384	OMU	C5-C4	2.20	1.48	1.43
1	C1	848	A2M	O3'-C3'	2.20	1.48	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	1847	A2M	C2-N3	2.20	1.35	1.32
1	C1	858	A2M	C2-N3	2.20	1.35	1.32
1	C1	1223	A2M	C2-N3	2.16	1.35	1.32
1	C1	2289	A2M	C2-N3	2.16	1.35	1.32
1	C1	1432	A2M	C2-N3	2.16	1.35	1.32
1	C1	389	A2M	O3'-C3'	2.16	1.48	1.43
1	C1	858	A2M	O3'-C3'	2.13	1.48	1.43
1	C1	2289	A2M	O3'-C3'	2.12	1.48	1.43
1	C1	1223	A2M	O3'-C3'	2.07	1.47	1.43
1	C1	2876	OMG	C5-C6	2.07	1.51	1.47
1	C1	637	A2M	O3'-C3'	2.02	1.47	1.43

All (237) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	1847	A2M	C1'-N9-C4	10.95	145.89	126.64
1	C1	389	A2M	C1'-N9-C4	10.72	145.47	126.64
1	C1	1432	A2M	C1'-N9-C4	10.70	145.44	126.64
1	C1	637	A2M	C1'-N9-C4	10.62	145.29	126.64
1	C1	858	A2M	C1'-N9-C4	10.45	144.99	126.64
1	C1	848	A2M	C1'-N9-C4	10.37	144.86	126.64
1	C1	1223	A2M	C1'-N9-C4	10.13	144.44	126.64
1	C1	2289	A2M	C1'-N9-C4	10.04	144.28	126.64
1	C1	1847	A2M	C5-C6-N6	9.05	134.10	120.35
1	C1	1432	A2M	C5-C6-N6	9.00	134.03	120.35
1	C1	858	A2M	C5-C6-N6	8.97	133.98	120.35
1	C1	1223	A2M	C5-C6-N6	8.94	133.94	120.35
1	C1	637	A2M	C5-C6-N6	8.92	133.91	120.35
1	C1	2289	A2M	C5-C6-N6	8.91	133.89	120.35
1	C1	848	A2M	C5-C6-N6	8.89	133.87	120.35
1	C1	389	A2M	C5-C6-N6	8.80	133.73	120.35
1	C1	1847	A2M	N6-C6-N1	-6.13	105.85	118.57
1	C1	848	A2M	N6-C6-N1	-6.08	105.95	118.57
1	C1	1432	A2M	N6-C6-N1	-6.07	105.98	118.57
1	C1	2300	OMC	O2'-C2'-C1'	6.05	120.88	109.08
1	C1	2918	OMC	C2'-C1'-N1	6.04	125.97	114.22
1	C1	2918	OMC	O2'-C2'-C1'	6.03	120.85	109.08
1	C1	637	A2M	N6-C6-N1	-5.99	106.13	118.57
1	C1	858	A2M	N6-C6-N1	-5.99	106.14	118.57
1	C1	1223	A2M	N6-C6-N1	-5.99	106.15	118.57
1	C1	389	A2M	N6-C6-N1	-5.96	106.21	118.57
1	C1	1836	OMC	O2'-C2'-C1'	5.92	120.63	109.08

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	2289	A2M	N6-C6-N1	-5.91	106.30	118.57
1	C1	2838	OMC	O2'-C2'-C1'	5.91	120.60	109.08
1	C1	1836	OMC	C2'-C1'-N1	5.89	125.67	114.22
1	C1	778	OMC	O2'-C2'-C1'	5.88	120.54	109.08
1	C1	1812	OMC	O2'-C2'-C1'	5.86	120.52	109.08
1	C1	1420	OMC	O2'-C2'-C1'	5.86	120.51	109.08
1	C1	1491	OMC	O2'-C2'-C1'	5.86	120.50	109.08
1	C1	2289	A2M	N3-C2-N1	-5.70	119.76	128.68
1	C1	858	A2M	N3-C2-N1	-5.70	119.77	128.68
1	C1	1223	A2M	N3-C2-N1	-5.67	119.81	128.68
1	C1	2300	OMC	C2'-C1'-N1	5.65	125.20	114.22
1	C1	1432	A2M	N3-C2-N1	-5.65	119.85	128.68
1	C1	848	A2M	N3-C2-N1	-5.64	119.86	128.68
1	C1	389	A2M	N3-C2-N1	-5.64	119.86	128.68
1	C1	1847	A2M	N3-C2-N1	-5.61	119.91	128.68
1	C1	385	OMG	O2'-C2'-C1'	5.58	120.15	109.09
1	C1	2881	OMG	O2'-C2'-C1'	5.54	120.07	109.09
1	C1	627	OMG	O2'-C2'-C1'	5.50	120.00	109.09
1	C1	2876	OMG	O2'-C2'-C1'	5.50	119.99	109.09
1	C1	637	A2M	N3-C2-N1	-5.49	120.09	128.68
1	C1	2774	OMG	O2'-C2'-C1'	5.45	119.89	109.09
1	C1	1433	OMG	O2'-C2'-C1'	5.41	119.81	109.09
1	C1	2358	OMG	O2'-C2'-C1'	5.41	119.81	109.09
1	C1	2578	OMG	O2'-C2'-C1'	5.38	119.76	109.09
1	C1	787	OMG	O2'-C2'-C1'	5.38	119.75	109.09
1	C1	1868	OMU	C4-N3-C2	-5.34	119.54	126.58
1	C1	646	OMG	O2'-C2'-C1'	5.28	119.55	109.09
1	C1	778	OMC	C2'-C1'-N1	5.23	124.38	114.22
1	C1	2838	OMC	C2'-C1'-N1	5.21	124.34	114.22
1	C1	2690	OMU	C4-N3-C2	-5.18	119.75	126.58
1	C1	2688	OMU	C4-N3-C2	-5.13	119.81	126.58
1	C1	2380	OMU	C4-N3-C2	-5.12	119.82	126.58
1	C1	1491	OMC	C2'-C1'-N1	5.11	124.15	114.22
1	C1	1420	OMC	C2'-C1'-N1	5.07	124.07	114.22
1	C1	1812	OMC	C2'-C1'-N1	5.04	124.01	114.22
1	C1	2277	OMU	C4-N3-C2	-5.03	119.95	126.58
1	C1	2838	OMC	O4'-C1'-N1	5.00	119.79	108.36
1	C1	2683	OMU	C4-N3-C2	-5.00	119.99	126.58
1	C1	1917	OMU	C4-N3-C2	-4.98	120.01	126.58
1	C1	2384	OMU	C4-N3-C2	-4.84	120.20	126.58
1	C1	646	OMG	O3'-C3'-C4'	4.40	123.78	111.05
1	C1	2358	OMG	O3'-C3'-C4'	4.31	123.50	111.05

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	2578	OMG	O3'-C3'-C4'	4.27	123.40	111.05
1	C1	2881	OMG	O3'-C3'-C2'	4.24	123.21	111.17
1	C1	1433	OMG	O3'-C3'-C4'	4.24	123.30	111.05
1	C1	787	OMG	O3'-C3'-C2'	4.21	123.12	111.17
1	C1	2918	OMC	O4'-C1'-N1	4.20	117.97	108.36
1	C1	627	OMG	O3'-C3'-C4'	4.18	123.14	111.05
1	C1	2876	OMG	O3'-C3'-C2'	4.16	122.97	111.17
1	C1	1491	OMC	O3'-C3'-C4'	4.15	123.06	111.05
1	C1	2918	OMC	O3'-C3'-C2'	4.12	122.85	111.17
1	C1	1491	OMC	O3'-C3'-C2'	4.11	122.85	111.17
1	C1	2774	OMG	O3'-C3'-C4'	4.09	122.87	111.05
1	C1	2300	OMC	C1'-N1-C2	4.06	127.48	118.42
1	C1	1836	OMC	O3'-C3'-C2'	4.05	122.67	111.17
1	C1	2881	OMG	O3'-C3'-C4'	4.05	122.75	111.05
1	C1	1420	OMC	O3'-C3'-C2'	4.04	122.64	111.17
1	C1	385	OMG	O3'-C3'-C2'	4.01	122.55	111.17
1	C1	2838	OMC	O3'-C3'-C2'	4.00	122.53	111.17
1	C1	2876	OMG	C5'-C4'-C3'	3.98	130.09	115.18
1	C1	385	OMG	O3'-C3'-C4'	3.98	122.55	111.05
1	C1	1433	OMG	O3'-C3'-C2'	3.97	122.45	111.17
1	C1	2300	OMC	C1'-N1-C6	-3.97	112.18	120.84
1	C1	1812	OMC	O3'-C3'-C4'	3.94	122.46	111.05
1	C1	778	OMC	O3'-C3'-C4'	3.94	122.45	111.05
1	C1	778	OMC	O3'-C3'-C2'	3.93	122.34	111.17
1	C1	1917	OMU	N3-C2-N1	3.90	120.07	114.89
1	C1	1420	OMC	O3'-C3'-C4'	3.90	122.32	111.05
1	C1	627	OMG	O3'-C3'-C2'	3.90	122.24	111.17
1	C1	1812	OMC	O4'-C1'-N1	3.89	117.25	108.36
1	C1	778	OMC	O4'-C1'-N1	3.88	117.23	108.36
1	C1	2774	OMG	O3'-C3'-C2'	3.88	122.17	111.17
1	C1	2300	OMC	O3'-C3'-C4'	3.87	122.25	111.05
1	C1	1868	OMU	N3-C2-N1	3.87	120.03	114.89
1	C1	1836	OMC	C1'-N1-C2	3.85	127.02	118.42
1	C1	2838	OMC	O3'-C3'-C4'	3.85	122.18	111.05
1	C1	1491	OMC	C1'-N1-C2	3.85	127.00	118.42
1	C1	2876	OMG	O3'-C3'-C4'	3.84	122.14	111.05
1	C1	787	OMG	O3'-C3'-C4'	3.83	122.13	111.05
1	C1	1420	OMC	O4'-C1'-N1	3.83	117.11	108.36
1	C1	2300	OMC	O3'-C3'-C2'	3.83	122.03	111.17
1	C1	1836	OMC	O3'-C3'-C4'	3.82	122.09	111.05
1	C1	2578	OMG	O3'-C3'-C2'	3.80	121.95	111.17
1	C1	1433	OMG	C5'-C4'-C3'	3.79	129.40	115.18

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	2918	OMC	O3'-C3'-C4'	3.78	121.97	111.05
1	C1	2300	OMC	O4'-C1'-N1	3.77	116.98	108.36
1	C1	1491	OMC	O4'-C1'-N1	3.75	116.94	108.36
1	C1	627	OMG	C5'-C4'-C3'	3.75	129.22	115.18
1	C1	1812	OMC	O3'-C3'-C2'	3.73	121.75	111.17
1	C1	1836	OMC	O4'-C1'-N1	3.71	116.83	108.36
1	C1	2688	OMU	N3-C2-N1	3.70	119.81	114.89
1	C1	2380	OMU	N3-C2-N1	3.69	119.79	114.89
1	C1	646	OMG	O3'-C3'-C2'	3.69	121.65	111.17
1	C1	2384	OMU	N3-C2-N1	3.68	119.78	114.89
1	C1	2690	OMU	N3-C2-N1	3.68	119.78	114.89
1	C1	646	OMG	C5'-C4'-C3'	3.67	128.93	115.18
1	C1	2358	OMG	O3'-C3'-C2'	3.66	121.57	111.17
1	C1	1491	OMC	C5'-C4'-C3'	3.65	128.87	115.18
1	C1	1836	OMC	C5'-C4'-C3'	3.64	128.82	115.18
1	C1	2277	OMU	N3-C2-N1	3.63	119.71	114.89
1	C1	2683	OMU	N3-C2-N1	3.62	119.69	114.89
1	C1	1836	OMC	C1'-N1-C6	-3.61	112.97	120.84
1	C1	2881	OMG	C5'-C4'-C3'	3.59	128.65	115.18
1	C1	385	OMG	O4'-C4'-C5'	3.59	121.19	109.37
1	C1	2876	OMG	O6-C6-C5	-3.59	117.36	124.37
1	C1	2300	OMC	C5'-C4'-C3'	3.53	128.41	115.18
1	C1	2918	OMC	C5'-C4'-C3'	3.53	128.41	115.18
1	C1	1491	OMC	C1'-N1-C6	-3.53	113.14	120.84
1	C1	2578	OMG	C5'-C4'-C3'	3.52	128.38	115.18
1	C1	778	OMC	C5'-C4'-C3'	3.51	128.33	115.18
1	C1	787	OMG	C5'-C4'-C3'	3.50	128.29	115.18
1	C1	787	OMG	O4'-C4'-C5'	3.49	120.86	109.37
1	C1	2578	OMG	O4'-C4'-C5'	3.49	120.85	109.37
1	C1	1812	OMC	C5'-C4'-C3'	3.49	128.25	115.18
1	C1	2358	OMG	C5'-C4'-C3'	3.48	128.22	115.18
1	C1	778	OMC	C1'-N1-C2	3.47	126.16	118.42
1	C1	2774	OMG	C5'-C4'-C3'	3.46	128.15	115.18
1	C1	2838	OMC	C5'-C4'-C3'	3.46	128.14	115.18
1	C1	1491	OMC	O4'-C4'-C5'	3.45	120.72	109.37
1	C1	1420	OMC	C5'-C4'-C3'	3.44	128.07	115.18
1	C1	2774	OMG	O4'-C4'-C5'	3.43	120.67	109.37
1	C1	2358	OMG	O4'-C4'-C5'	3.42	120.61	109.37
1	C1	1812	OMC	C1'-N1-C2	3.41	126.02	118.42
1	C1	385	OMG	C5-C6-N1	3.40	119.95	113.95
1	C1	2578	OMG	C5-C6-N1	3.39	119.93	113.95
1	C1	2380	OMU	C5-C4-N3	3.38	119.90	114.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	2838	OMC	O4'-C4'-C5'	3.36	120.43	109.37
1	C1	2881	OMG	O4'-C4'-C5'	3.35	120.39	109.37
1	C1	2690	OMU	C5-C4-N3	3.34	119.84	114.84
1	C1	1868	OMU	C5-C4-N3	3.34	119.83	114.84
1	C1	2876	OMG	C5-C6-N1	3.33	119.83	113.95
1	C1	385	OMG	C5'-C4'-C3'	3.32	127.63	115.18
1	C1	2688	OMU	C5-C4-N3	3.31	119.79	114.84
1	C1	2918	OMC	O4'-C4'-C5'	3.31	120.26	109.37
1	C1	1812	OMC	O4'-C4'-C5'	3.29	120.19	109.37
1	C1	2683	OMU	C5-C4-N3	3.27	119.73	114.84
1	C1	1420	OMC	C1'-N1-C6	-3.26	113.74	120.84
1	C1	778	OMC	O4'-C4'-C5'	3.26	120.09	109.37
1	C1	2277	OMU	C5-C4-N3	3.26	119.71	114.84
1	C1	1836	OMC	O4'-C4'-C5'	3.25	120.06	109.37
1	C1	1420	OMC	O4'-C4'-C5'	3.24	120.05	109.37
1	C1	627	OMG	O4'-C4'-C5'	3.23	120.02	109.37
1	C1	2300	OMC	O4'-C4'-C5'	3.22	119.97	109.37
1	C1	1433	OMG	O4'-C4'-C5'	3.21	119.93	109.37
1	C1	1433	OMG	C5-C6-N1	3.21	119.62	113.95
1	C1	646	OMG	O4'-C4'-C5'	3.19	119.87	109.37
1	C1	778	OMC	C1'-N1-C6	-3.18	113.90	120.84
1	C1	1420	OMC	C1'-N1-C2	3.18	125.52	118.42
1	C1	1917	OMU	C5-C4-N3	3.15	119.55	114.84
1	C1	2384	OMU	C5-C4-N3	3.14	119.54	114.84
1	C1	2358	OMG	C5-C6-N1	3.11	119.44	113.95
1	C1	2774	OMG	C5-C6-N1	3.11	119.44	113.95
1	C1	2876	OMG	O4'-C4'-C5'	3.11	119.59	109.37
1	C1	1812	OMC	C1'-N1-C6	-3.07	114.14	120.84
1	C1	627	OMG	C5-C6-N1	3.04	119.33	113.95
1	C1	646	OMG	C5-C6-N1	3.04	119.33	113.95
1	C1	2881	OMG	C5-C6-N1	3.02	119.28	113.95
1	C1	787	OMG	C5-C6-N1	3.01	119.27	113.95
1	C1	2838	OMC	O2-C2-N3	-3.00	117.45	122.33
1	C1	2683	OMU	O4-C4-C5	-2.93	120.02	125.16
1	C1	2688	OMU	O4-C4-C5	-2.88	120.10	125.16
1	C1	2876	OMG	C2-N1-C6	-2.87	119.81	125.10
1	C1	385	OMG	C2-N1-C6	-2.85	119.84	125.10
1	C1	1868	OMU	O4-C4-C5	-2.85	120.14	125.16
1	C1	2277	OMU	O4-C4-C5	-2.85	120.15	125.16
1	C1	2380	OMU	O4-C4-C5	-2.83	120.18	125.16
1	C1	2384	OMU	O4-C4-C5	-2.82	120.20	125.16
1	C1	2690	OMU	O4-C4-C5	-2.77	120.29	125.16

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	385	OMG	C8-N7-C5	2.75	108.22	102.99
1	C1	646	OMG	O6-C6-C5	-2.69	119.12	124.37
1	C1	2774	OMG	C8-N7-C5	2.63	107.99	102.99
1	C1	2578	OMG	C2-N1-C6	-2.62	120.27	125.10
1	C1	1917	OMU	O4-C4-C5	-2.62	120.55	125.16
1	C1	2578	OMG	C8-N7-C5	2.61	107.97	102.99
1	C1	2358	OMG	C8-N7-C5	2.60	107.94	102.99
1	C1	1433	OMG	C8-N7-C5	2.60	107.94	102.99
1	C1	2918	OMC	C1'-N1-C2	2.57	124.16	118.42
1	C1	787	OMG	C2-N1-C6	-2.54	120.42	125.10
1	C1	1433	OMG	C2-N1-C6	-2.53	120.44	125.10
1	C1	627	OMG	C8-N7-C5	2.50	107.74	102.99
1	C1	1917	OMU	C1'-N1-C2	2.49	122.08	117.57
1	C1	627	OMG	O6-C6-C5	-2.46	119.57	124.37
1	C1	2358	OMG	N1-C2-N3	-2.43	118.78	123.32
1	C1	646	OMG	C8-N7-C5	2.40	107.57	102.99
1	C1	787	OMG	C8-N7-C5	2.40	107.56	102.99
1	C1	2881	OMG	C8-N7-C5	2.36	107.49	102.99
1	C1	627	OMG	C2-N1-C6	-2.35	120.78	125.10
1	C1	2384	OMU	C1'-N1-C2	2.34	121.80	117.57
1	C1	787	OMG	O6-C6-C5	-2.33	119.81	124.37
1	C1	385	OMG	N2-C2-N1	2.32	121.65	116.71
1	C1	646	OMG	C2-N1-C6	-2.32	120.83	125.10
1	C1	1433	OMG	O6-C6-C5	-2.29	119.89	124.37
1	C1	2918	OMC	C1'-N1-C6	-2.28	115.87	120.84
1	C1	2774	OMG	C2-N1-C6	-2.28	120.90	125.10
1	C1	2578	OMG	O6-C6-C5	-2.27	119.93	124.37
1	C1	2380	OMU	O2-C2-N1	-2.25	119.80	122.79
1	C1	2774	OMG	O6-C6-C5	-2.25	119.98	124.37
1	C1	2881	OMG	C2-N1-C6	-2.17	121.10	125.10
1	C1	2774	OMG	N1-C2-N3	-2.17	119.27	123.32
1	C1	385	OMG	O6-C6-C5	-2.17	120.14	124.37
1	C1	2358	OMG	C2-N1-C6	-2.15	121.14	125.10
1	C1	1836	OMC	N4-C4-N3	2.15	121.74	117.97
1	C1	2683	OMU	O2-C2-N1	-2.15	119.93	122.79
1	C1	2578	OMG	N1-C2-N3	-2.15	119.31	123.32
1	C1	2688	OMU	O2-C2-N1	-2.06	120.05	122.79
1	C1	2277	OMU	O2-C2-N1	-2.04	120.08	122.79
1	C1	1812	OMC	N4-C4-N3	2.03	121.52	117.97
1	C1	1491	OMC	O2-C2-N3	-2.02	119.04	122.33
1	C1	2300	OMC	O2-C2-N3	-2.02	119.04	122.33
1	C1	627	OMG	N1-C2-N3	-2.01	119.57	123.32

All (36) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	C1	385	OMG	C3'
1	C1	385	OMG	C4'
1	C1	627	OMG	C3'
1	C1	627	OMG	C4'
1	C1	646	OMG	C3'
1	C1	646	OMG	C4'
1	C1	778	OMC	C3'
1	C1	778	OMC	C4'
1	C1	787	OMG	C3'
1	C1	787	OMG	C4'
1	C1	1420	OMC	C3'
1	C1	1420	OMC	C4'
1	C1	1433	OMG	C3'
1	C1	1433	OMG	C4'
1	C1	1491	OMC	C3'
1	C1	1491	OMC	C4'
1	C1	1812	OMC	C3'
1	C1	1812	OMC	C4'
1	C1	1836	OMC	C3'
1	C1	1836	OMC	C4'
1	C1	2300	OMC	C3'
1	C1	2300	OMC	C4'
1	C1	2358	OMG	C3'
1	C1	2358	OMG	C4'
1	C1	2578	OMG	C3'
1	C1	2578	OMG	C4'
1	C1	2774	OMG	C3'
1	C1	2774	OMG	C4'
1	C1	2838	OMC	C3'
1	C1	2838	OMC	C4'
1	C1	2876	OMG	C3'
1	C1	2876	OMG	C4'
1	C1	2881	OMG	C3'
1	C1	2881	OMG	C4'
1	C1	2918	OMC	C3'
1	C1	2918	OMC	C4'

All (82) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	C1	385	OMG	O4'-C4'-C5'-O5'
1	C1	385	OMG	C3'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
1	C1	389	A2M	O4'-C4'-C5'-O5'
1	C1	389	A2M	C1'-C2'-O2'-CM2
1	C1	627	OMG	C3'-C2'-O2'-CM2
1	C1	637	A2M	C1'-C2'-O2'-CM2
1	C1	646	OMG	C4'-C5'-O5'-P
1	C1	646	OMG	C3'-C4'-C5'-O5'
1	C1	646	OMG	C3'-C2'-O2'-CM2
1	C1	778	OMC	C3'-C2'-O2'-CM2
1	C1	778	OMC	C3'-C4'-C5'-O5'
1	C1	787	OMG	C3'-C4'-C5'-O5'
1	C1	1223	A2M	C1'-C2'-O2'-CM2
1	C1	1420	OMC	C3'-C2'-O2'-CM2
1	C1	1420	OMC	O4'-C4'-C5'-O5'
1	C1	1433	OMG	C3'-C2'-O2'-CM2
1	C1	1491	OMC	C3'-C2'-O2'-CM2
1	C1	1491	OMC	O4'-C4'-C5'-O5'
1	C1	1812	OMC	C3'-C2'-O2'-CM2
1	C1	1812	OMC	C3'-C4'-C5'-O5'
1	C1	1812	OMC	C4'-C5'-O5'-P
1	C1	1836	OMC	C3'-C2'-O2'-CM2
1	C1	1836	OMC	C3'-C4'-C5'-O5'
1	C1	1836	OMC	C4'-C5'-O5'-P
1	C1	1917	OMU	C1'-C2'-O2'-CM2
1	C1	2300	OMC	C3'-C2'-O2'-CM2
1	C1	2358	OMG	C4'-C5'-O5'-P
1	C1	2358	OMG	C3'-C4'-C5'-O5'
1	C1	2358	OMG	C3'-C2'-O2'-CM2
1	C1	2578	OMG	C3'-C2'-O2'-CM2
1	C1	2683	OMU	C1'-C2'-O2'-CM2
1	C1	2774	OMG	C3'-C4'-C5'-O5'
1	C1	2774	OMG	C3'-C2'-O2'-CM2
1	C1	2838	OMC	O4'-C1'-N1-C2
1	C1	2838	OMC	O4'-C1'-N1-C6
1	C1	2838	OMC	C3'-C2'-O2'-CM2
1	C1	2838	OMC	C3'-C4'-C5'-O5'
1	C1	2876	OMG	C3'-C2'-O2'-CM2
1	C1	2881	OMG	C3'-C4'-C5'-O5'
1	C1	2881	OMG	C3'-C2'-O2'-CM2
1	C1	2918	OMC	C3'-C2'-O2'-CM2
1	C1	2918	OMC	C3'-C4'-C5'-O5'
1	C1	2881	OMG	C4'-C5'-O5'-P
1	C1	1917	OMU	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
1	C1	2300	OMC	C3'-C4'-C5'-O5'
1	C1	2578	OMG	O4'-C4'-C5'-O5'
1	C1	2774	OMG	C4'-C5'-O5'-P
1	C1	389	A2M	C3'-C4'-C5'-O5'
1	C1	1917	OMU	C3'-C4'-C5'-O5'
1	C1	385	OMG	C3'-C2'-O2'-CM2
1	C1	1491	OMC	C4'-C5'-O5'-P
1	C1	2838	OMC	C4'-C5'-O5'-P
1	C1	778	OMC	C4'-C5'-O5'-P
1	C1	2918	OMC	C4'-C5'-O5'-P
1	C1	627	OMG	C3'-C4'-C5'-O5'
1	C1	1420	OMC	C3'-C4'-C5'-O5'
1	C1	1847	A2M	C3'-C4'-C5'-O5'
1	C1	2300	OMC	C4'-C5'-O5'-P
1	C1	1491	OMC	C3'-C4'-C5'-O5'
1	C1	2578	OMG	C4'-C5'-O5'-P
1	C1	1433	OMG	O4'-C4'-C5'-O5'
1	C1	2300	OMC	C2'-C1'-N1-C2
1	C1	385	OMG	C4'-C5'-O5'-P
1	C1	1847	A2M	O4'-C4'-C5'-O5'
1	C1	1491	OMC	C2'-C1'-N1-C2
1	C1	2300	OMC	C2'-C1'-N1-C6
1	C1	1420	OMC	C4'-C5'-O5'-P
1	C1	1847	A2M	C4'-C5'-O5'-P
1	C1	2876	OMG	C3'-C4'-C5'-O5'
1	C1	2918	OMC	C2'-C1'-N1-C6
1	C1	1491	OMC	C2'-C1'-N1-C6
1	C1	1836	OMC	C2'-C1'-N1-C6
1	C1	1836	OMC	C2'-C1'-N1-C2
1	C1	858	A2M	O4'-C4'-C5'-O5'
1	C1	1223	A2M	O4'-C4'-C5'-O5'
1	C1	2384	OMU	C1'-C2'-O2'-CM2
1	C1	778	OMC	C2'-C1'-N1-C2
1	C1	1420	OMC	C2'-C1'-N1-C2
1	C1	2918	OMC	C2'-C1'-N1-C2
1	C1	2876	OMG	O4'-C4'-C5'-O5'
1	C1	778	OMC	C2'-C1'-N1-C6
1	C1	1812	OMC	C2'-C1'-N1-C2

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 8 are monoatomic - leaving 2 for Mogul analysis.

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$
60	GTP	CH	701	61	26,34,34	1.14	2 (7%)	32,54,54	1.63	7 (21%)
60	GTP	Cd	1000	61	26,34,34	1.16	2 (7%)	32,54,54	1.61	7 (21%)

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
60	GTP	CH	701	61	-	7/18/38/38	0/3/3/3
60	GTP	Cd	1000	61	-	2/18/38/38	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
60	Cd	1000	GTP	C5-C6	-4.09	1.39	1.47
60	CH	701	GTP	C5-C6	-4.03	1.39	1.47
60	CH	701	GTP	C2-N3	2.19	1.38	1.33
60	Cd	1000	GTP	C2-N3	2.05	1.38	1.33

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	CH	701	GTP	PA-O3A-PB	-3.83	119.69	132.83
60	Cd	1000	GTP	PB-O3B-PG	-3.75	119.95	132.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	CH	701	GTP	PB-O3B-PG	-3.66	120.28	132.83
60	Cd	1000	GTP	C3'-C2'-C1'	3.24	105.86	100.98
60	CH	701	GTP	C5-C6-N1	3.20	119.59	113.95
60	Cd	1000	GTP	C5-C6-N1	3.17	119.55	113.95
60	CH	701	GTP	C3'-C2'-C1'	3.14	105.70	100.98
60	Cd	1000	GTP	C8-N7-C5	3.00	108.70	102.99
60	CH	701	GTP	C8-N7-C5	2.95	108.61	102.99
60	Cd	1000	GTP	C2-N1-C6	-2.85	119.85	125.10
60	CH	701	GTP	C2-N1-C6	-2.83	119.89	125.10
60	Cd	1000	GTP	PA-O3A-PB	-2.30	124.92	132.83
60	Cd	1000	GTP	O6-C6-C5	-2.22	120.04	124.37
60	CH	701	GTP	O6-C6-C5	-2.13	120.21	124.37

There are no chirality outliers.

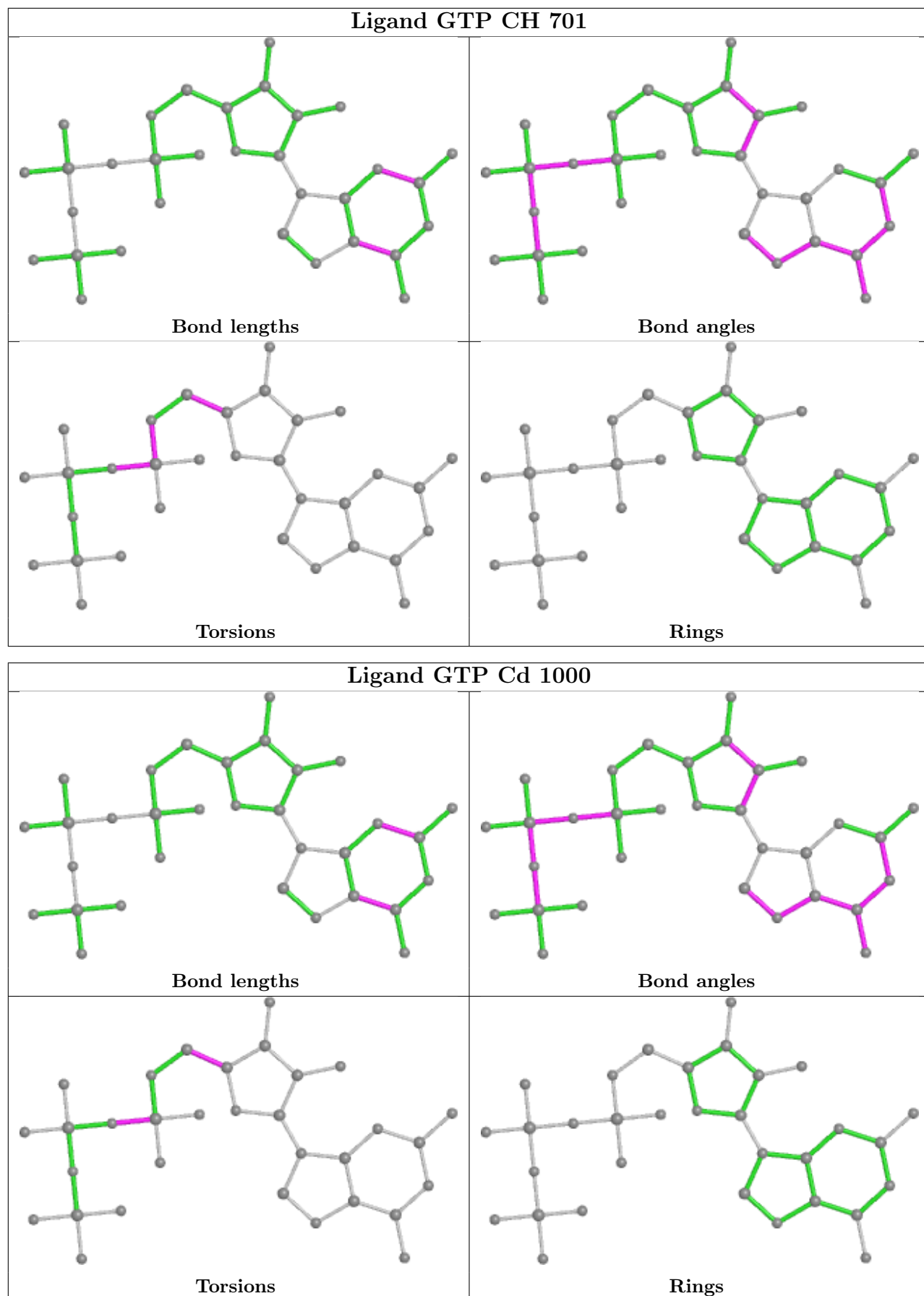
All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
60	CH	701	GTP	C5'-O5'-PA-O3A
60	CH	701	GTP	C5'-O5'-PA-O1A
60	CH	701	GTP	C5'-O5'-PA-O2A
60	CH	701	GTP	C3'-C4'-C5'-O5'
60	CH	701	GTP	O4'-C4'-C5'-O5'
60	CH	701	GTP	PB-O3A-PA-O2A
60	Cd	1000	GTP	O4'-C4'-C5'-O5'
60	CH	701	GTP	PB-O3A-PA-O1A
60	Cd	1000	GTP	PB-O3A-PA-O2A

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

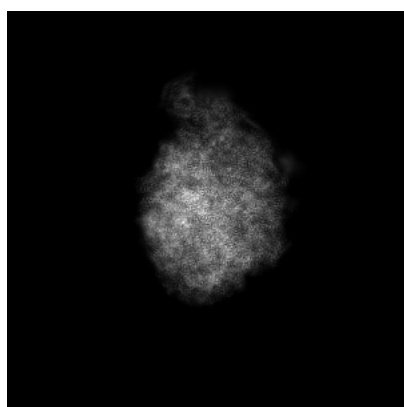
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-17969. These allow visual inspection of the internal detail of the map and identification of artifacts.

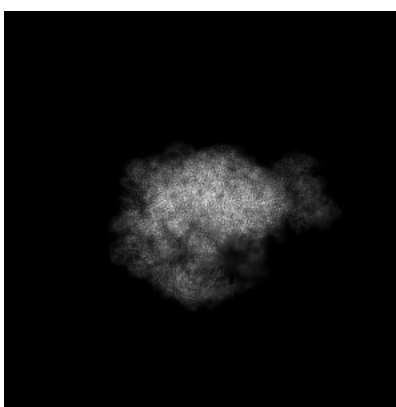
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

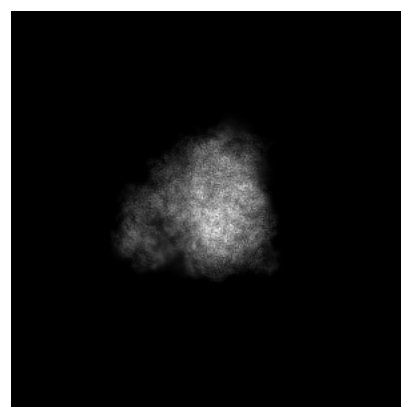
6.1.1 Primary map



X



Y

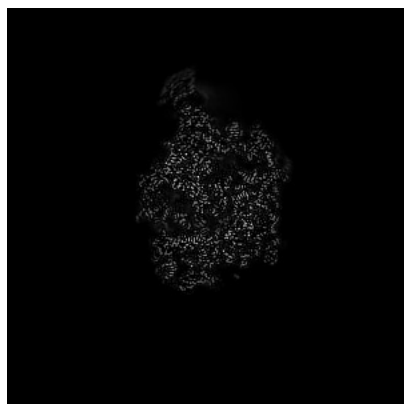


Z

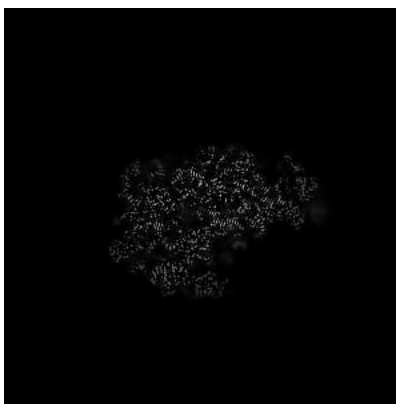
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

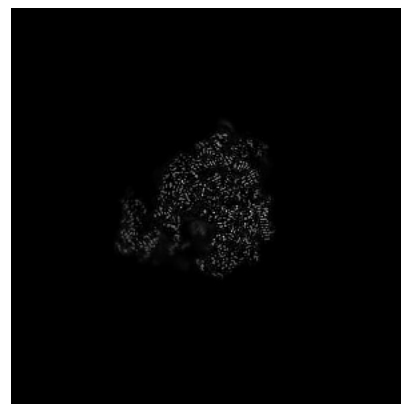
6.2.1 Primary map



X Index: 250



Y Index: 250

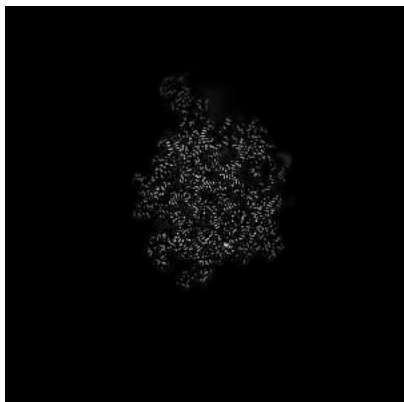


Z Index: 250

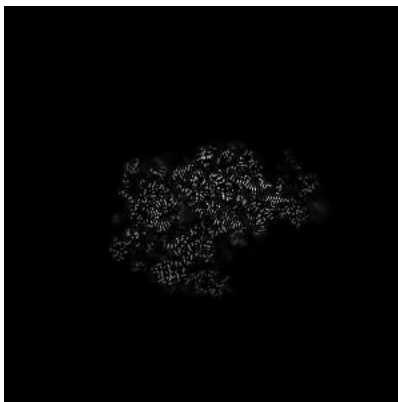
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

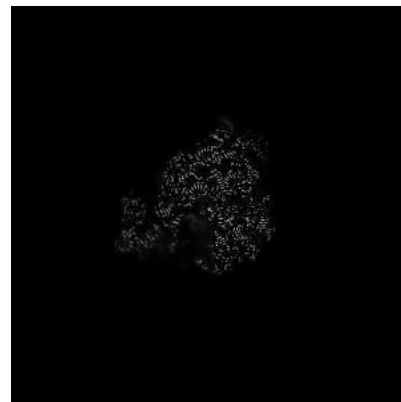
6.3.1 Primary map



X Index: 259



Y Index: 248

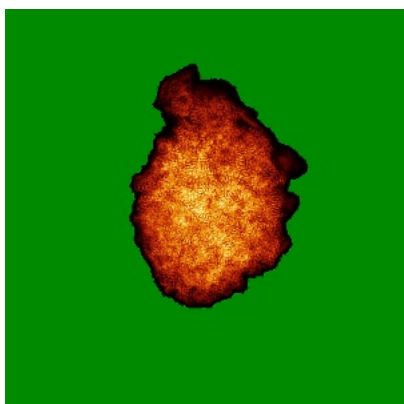


Z Index: 252

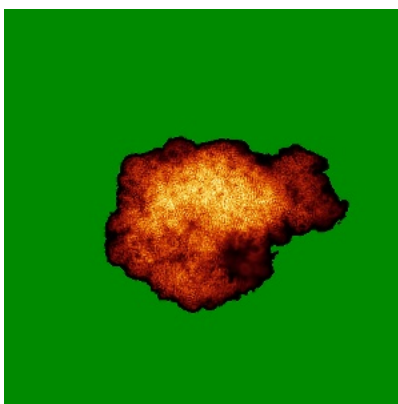
The images above show the largest variance slices of the map in three orthogonal directions.

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

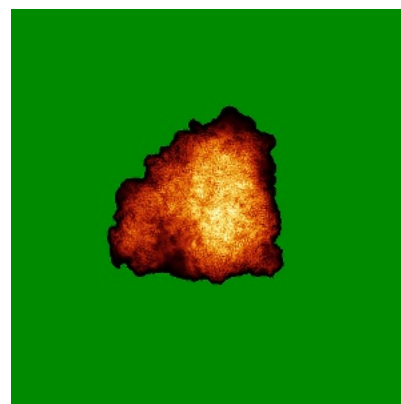
6.4.1 Primary map



X



Y

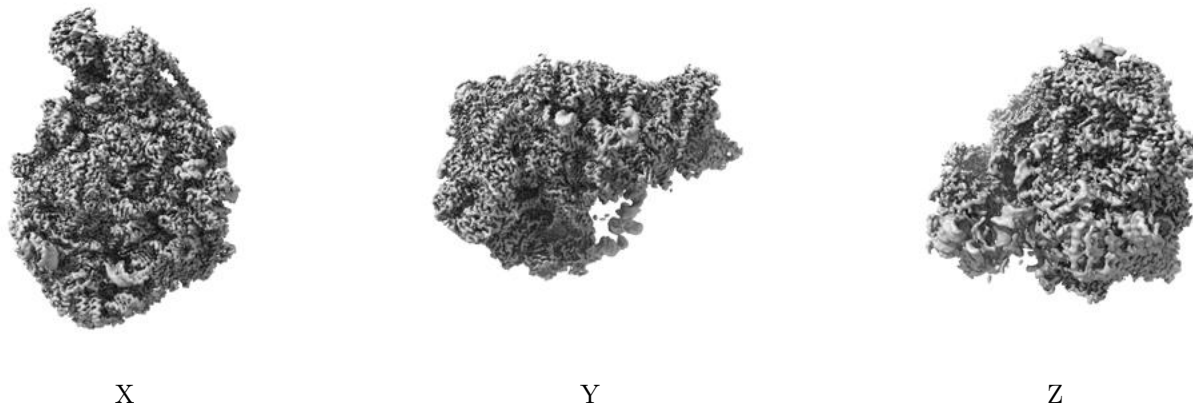


Z

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 0.6. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

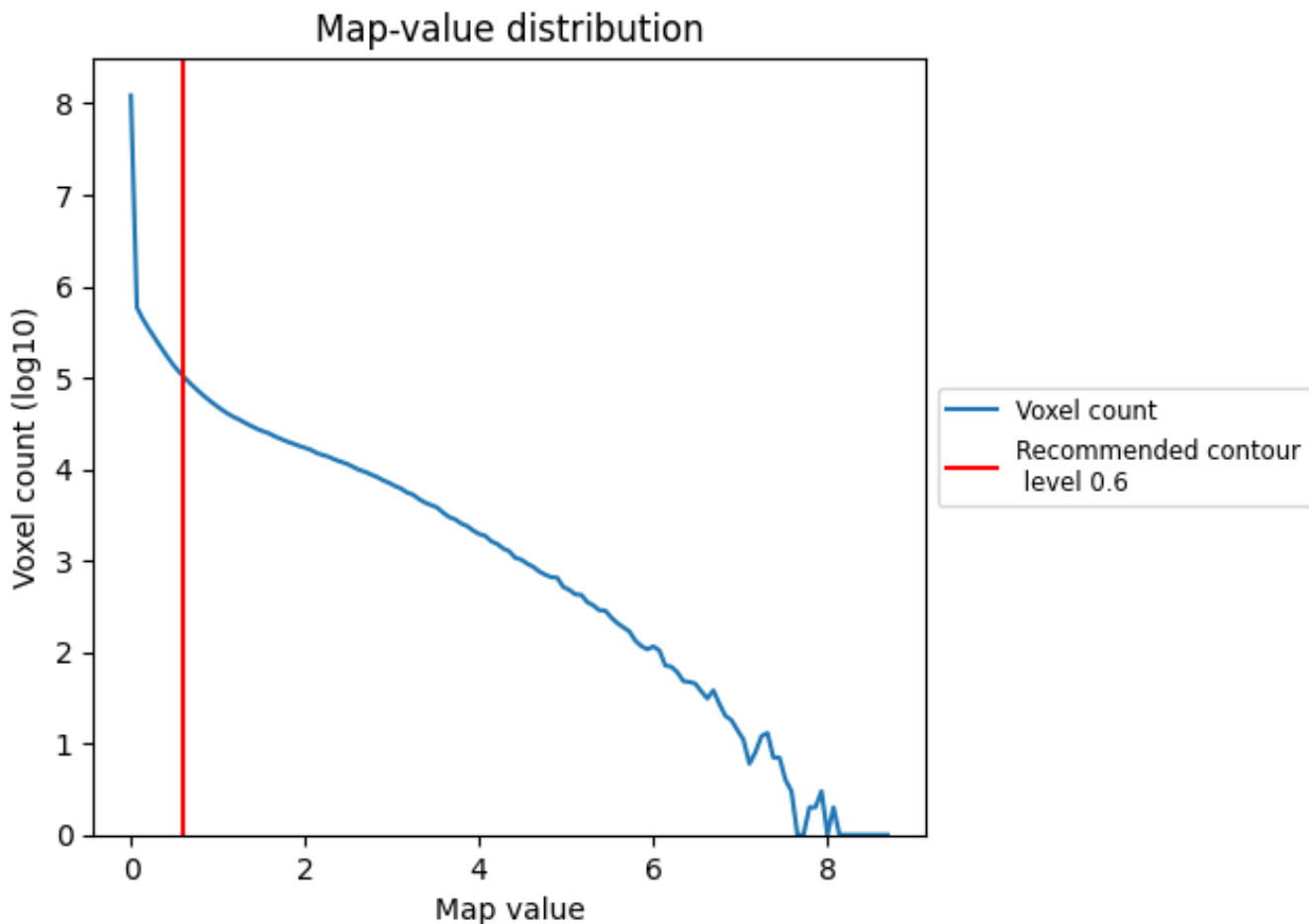
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

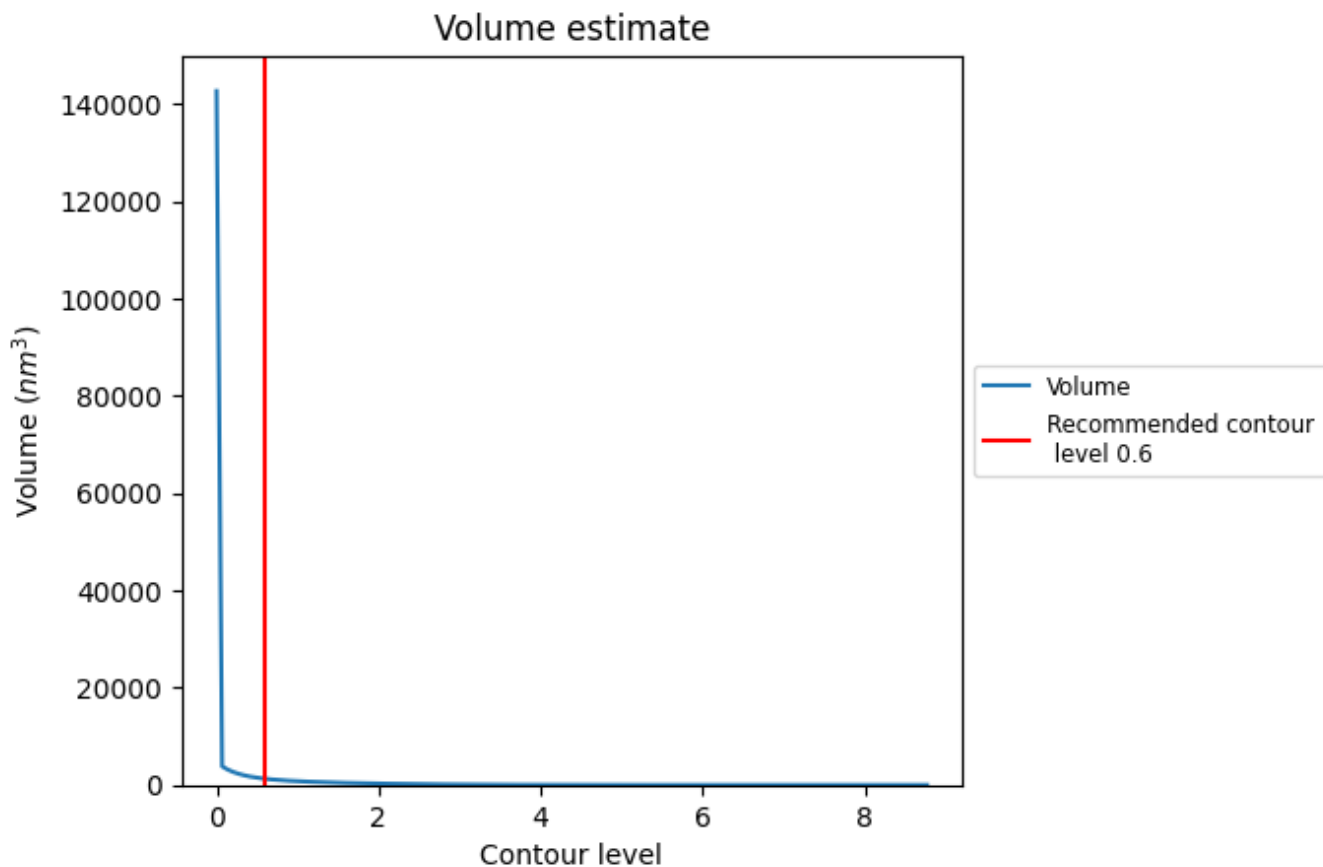
This section contains the results of statistical analysis of the map.

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.

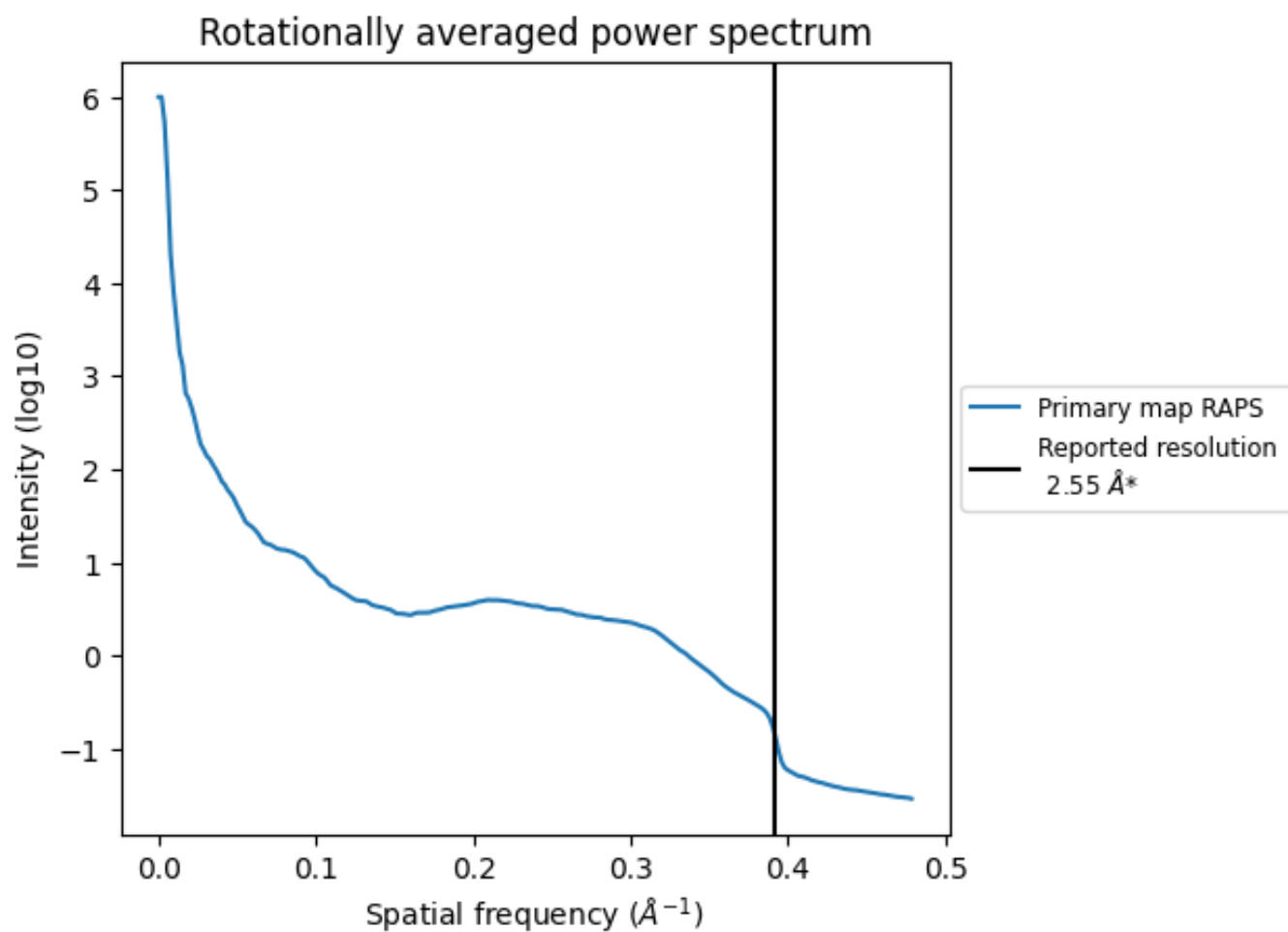
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1273 nm³; this corresponds to an approximate mass of 1150 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 [i](#)



*Reported resolution corresponds to spatial frequency of 0.392 Å⁻¹

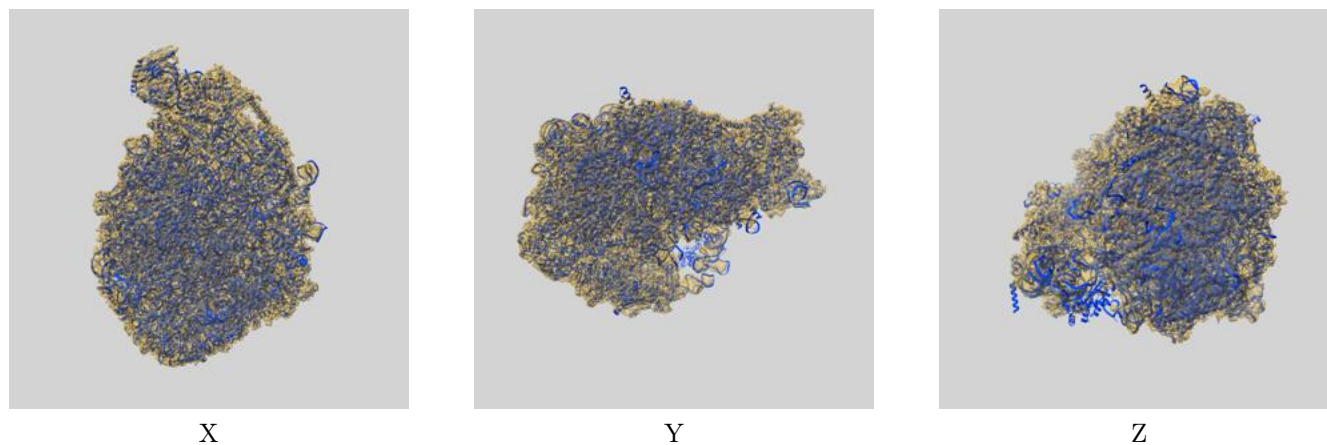
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

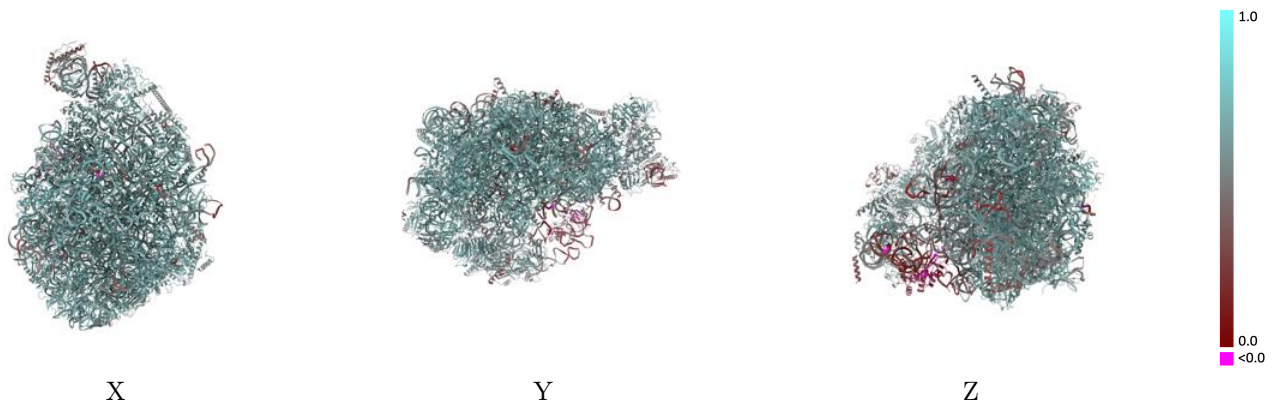
This section contains information regarding the fit between EMDB map EMD-17969 and PDB model 8PVK. Per-residue inclusion information can be found in section 3 on page 17.

9.1 Map-model overlay [i](#)



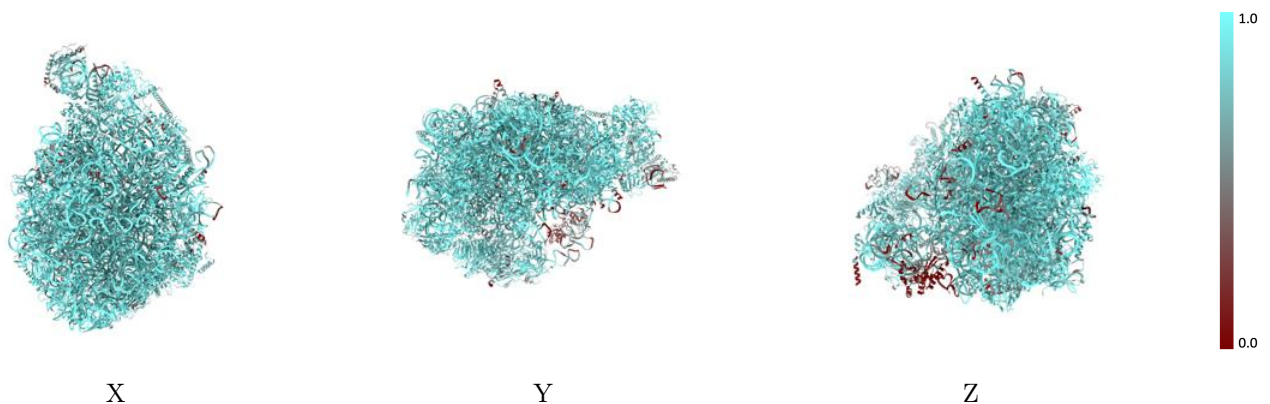
The images above show the 3D surface view of the map at the recommended contour level 0.6 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



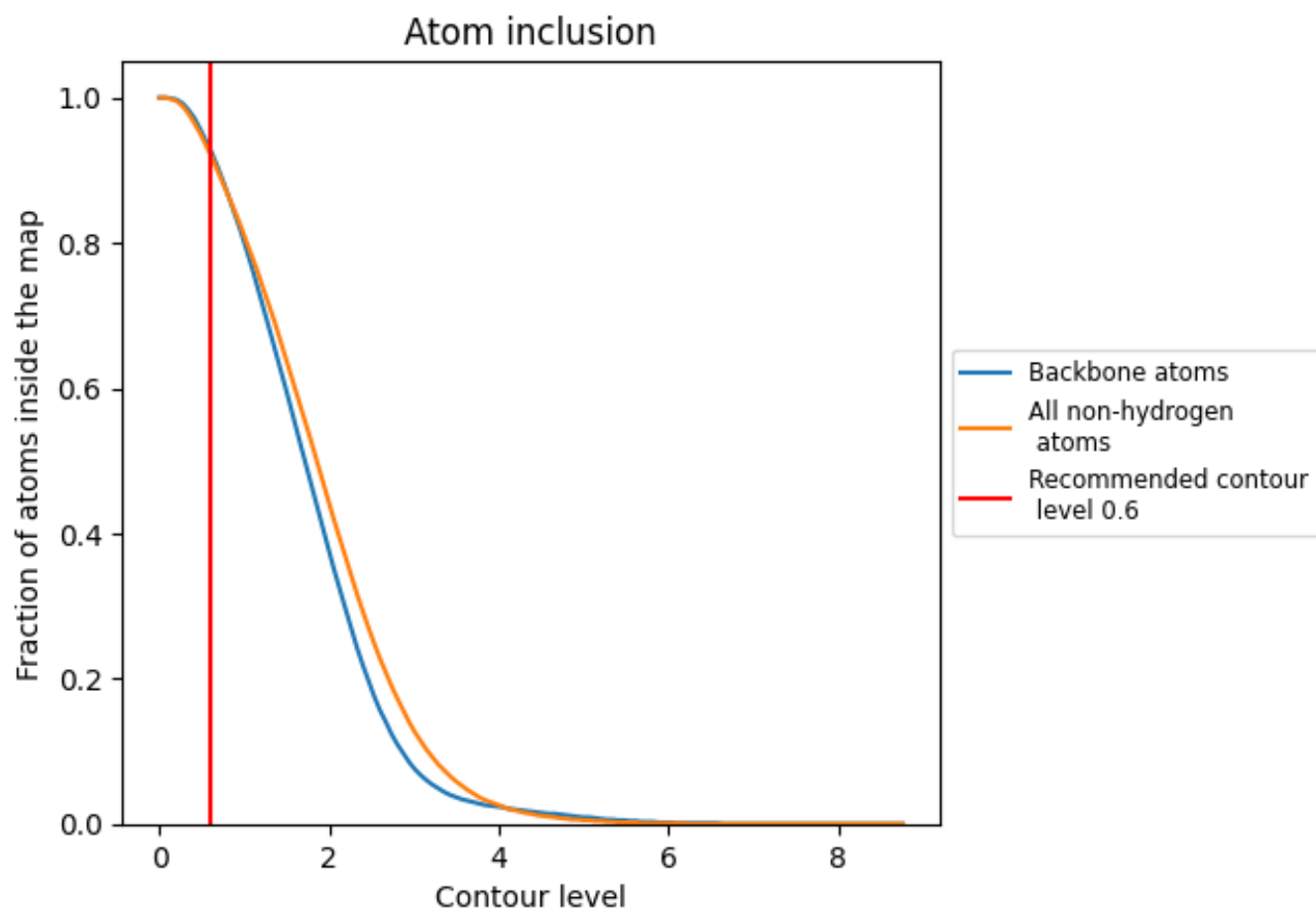
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.6).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 93% of all backbone atoms, 92% 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 (0.6) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9220	 0.6060
C1	 0.9550	 0.6080
C2	 0.9690	 0.6450
C3	 0.7300	 0.4480
C4	 0.9180	 0.5110
CB	 0.7580	 0.5000
CF	 0.8970	 0.5920
CH	 0.8990	 0.6180
CI	 0.8100	 0.5130
CJ	 0.9510	 0.6240
CK	 0.9640	 0.6650
CL	 0.8570	 0.5710
CM	 0.8750	 0.5730
CN	 0.9440	 0.6480
CO	 0.8860	 0.6390
CQ	 0.8610	 0.6100
Cb	 0.9430	 0.6410
Cd	 0.9490	 0.6360
Ce	 0.8150	 0.5550
Cf	 0.9210	 0.5690
Cg	 0.9030	 0.5700
Ch	 0.8730	 0.5910
Cz	 0.7990	 0.5320
LA	 0.9700	 0.6550
LB	 0.9680	 0.6780
LC	 0.9690	 0.6690
LD	 0.8850	 0.5800
LE	 0.9110	 0.6200
LF	 0.9510	 0.6470
LG	 0.9420	 0.6310
LH	 0.9420	 0.6490
LJ	 0.8340	 0.5000
LK	 0.8410	 0.5490
LL	 0.9350	 0.6400
LM	 0.9520	 0.6370



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Chain	Atom inclusion	Q-score
LN	 0.9910	 0.6760
LO	 0.9760	 0.6770
LP	 0.9750	 0.6720
LQ	 0.9310	 0.6420
LR	 0.9450	 0.6560
LS	 0.9610	 0.6490
LT	 0.8200	 0.5330
LU	 0.8900	 0.5980
LV	 0.9750	 0.6750
LX	 0.9340	 0.6300
LY	 0.9390	 0.6390
LZ	 0.9450	 0.6390
La	 0.9500	 0.6430
Lc	 0.9020	 0.6170
Ld	 0.9300	 0.6560
Le	 0.9810	 0.6760
Lf	 0.9830	 0.6880
Lg	 0.9160	 0.6430
Lh	 0.9070	 0.5950
Li	 0.9500	 0.6030
Lj	 0.9900	 0.6940
Lk	 0.8830	 0.6050
Ll	 1.0000	 0.7020
Lp	 0.9150	 0.6290
Lq	 0.9490	 0.6390
Lr	 0.0380	 0.1190