



Full wwPDB EM Validation Report ⓘ

Sep 9, 2025 – 04:58 AM JST

PDB ID : 8IR1 / pdb_00008ir1
EMDB ID : EMD-35672
Title : human nuclear pre-60S ribosomal particle - State A
Authors : Zhang, Y.; Gao, N.
Deposited on : 2023-03-17
Resolution : 3.30 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.dev126
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0rc1
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.45.1

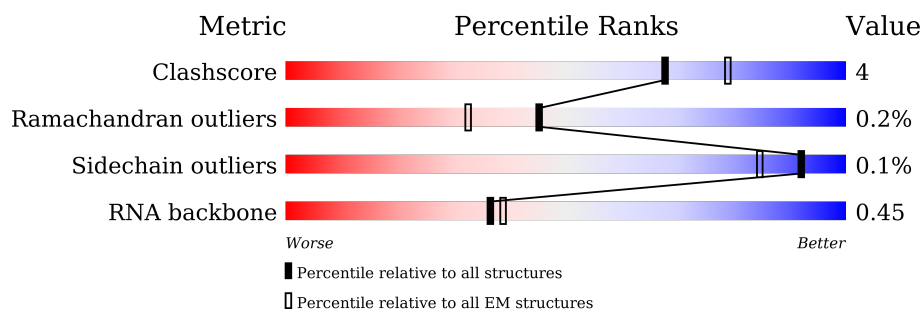
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.30 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	y	165	44% 92% 8%
2	4	634	22% 87% 11% .
3	6	245	7% 88% 11%
4	7	163	6% 71% 12% 17%
5	B	403	5% 91% 9%
6	D	427	. 80% . 16%
7	E	115	83% 79% 6% 15%

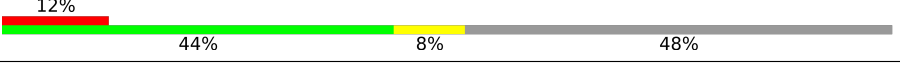
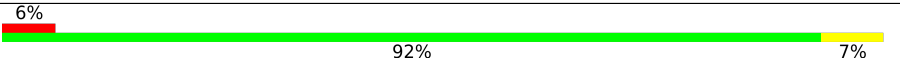
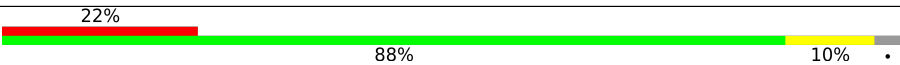
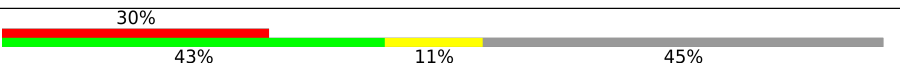
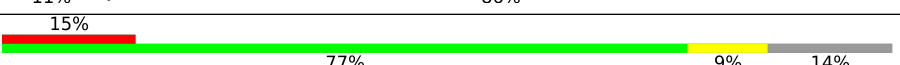
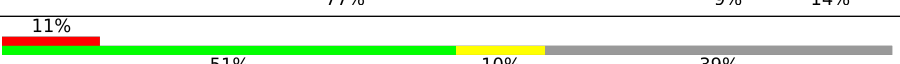
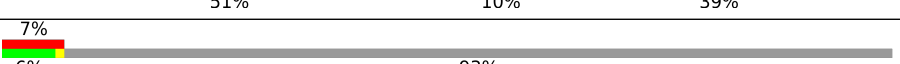
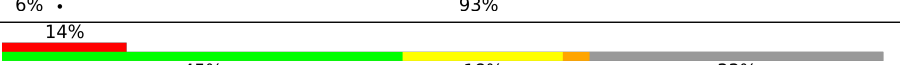
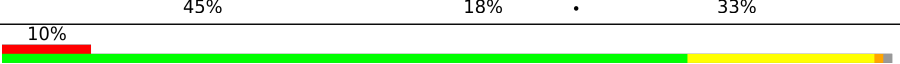
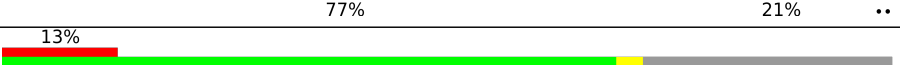
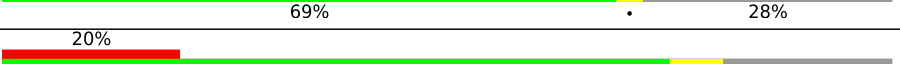
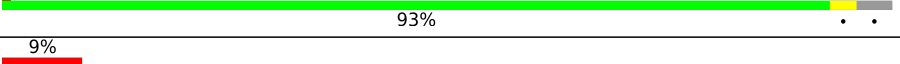
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Mol	Chain	Length	Quality of chain
8	F	117	
9	G	266	
10	H	123	
11	I	192	
12	K	105	
13	L	148	
14	M	97	
15	P	51	
16	Q	211	
17	S	215	
18	U	204	
19	V	203	
20	X	92	
21	Z	188	
22	a	196	
23	b	176	
24	c	160	
25	e	140	
26	h	145	
27	i	136	
28	l	137	
29	m	257	
30	n	110	
31	o	288	
32	p	248	

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Mol	Chain	Length	Quality of chain
33	z	129	
34	A	178	
35	C	297	
36	J	260	
37	N	485	
38	R	365	
39	u	549	
40	v	239	
41	w	731	
42	r	360	
43	2	5054	
44	8	156	
45	g	156	
46	d	128	
47	j	125	
48	k	135	
49	Y	184	
50	O	70	
51	W	120	
52	T	306	
53	9	847	

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
54	GTP	w	801	-	-	X	-
55	MG	w	802	-	-	X	-

2 Entry composition

There are 55 unique types of molecules in this entry. The entry contains 150033 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 protein called 60S ribosomal protein L12.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	y	165	Total	C	N	O	S	0	0
			1250	779	232	234	5		

- Molecule 2 is a protein called GTP-binding protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	4	620	Total	C	N	O	S	0	0
			5093	3198	935	933	27		

- Molecule 3 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	6	244	Total	C	N	O	S	0	0
			1852	1149	318	372	13		

- Molecule 4 is a protein called Probable ribosome biogenesis protein RLP24.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	7	135	Total	C	N	O	S	0	0
			1159	737	225	187	10		

- Molecule 5 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	B	402	Total	C	N	O	S	1	0
			3244	2065	609	556	14		

- Molecule 6 is a protein called 60S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	D	358	Total	C	N	O	S	0	0
			2853	1797	570	473	13		

- Molecule 7 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	E	98	Total	C	N	O	S	0	0
			764	485	135	138	6		

- Molecule 8 is a protein called 60S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	F	109	Total	C	N	O	S	0	0
			868	544	179	139	6		

- Molecule 9 is a protein called 60S ribosomal protein L7a.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	G	216	Total	C	N	O	S	1	0
			1729	1101	335	289	4		

- Molecule 10 is a protein called 60S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	H	122	Total	C	N	O	S	0	0
			1015	641	205	168	1		

- Molecule 11 is a protein called 60S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	I	190	Total	C	N	O	S	0	0
			1518	956	284	272	6		

- Molecule 12 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	K	102	Total	C	N	O	S	0	0
			832	521	177	129	5		

- Molecule 13 is a protein called 60S ribosomal protein L27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	L	113	Total	C	N	O	S	0	0
			888	563	176	146	3		

- Molecule 14 is a protein called 60S ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	M	86	Total	C	N	O	S	0	0
			705	434	155	111	5		

- Molecule 15 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	50	Total	C	N	O	S	0	0
			444	281	98	64	1		

- Molecule 16 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	Q	203	Total	C	N	O	S	0	0
			1652	1036	341	272	3		

- Molecule 17 is a protein called 60S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	S	135	Total	C	N	O	S	0	0
			1111	713	213	178	7		

- Molecule 18 is a protein called 60S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	U	182	Total	C	N	O	S	0	0
			1542	972	324	242	4		

- Molecule 19 is a protein called 60S ribosomal protein L13a.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	V	201	Total	C	N	O	S	0	0
			1650	1063	321	261	5		

- Molecule 20 is a protein called 60S ribosomal protein L37a.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	X	91	Total	C	N	O	S	0	0
			708	445	136	120	7		

- Molecule 21 is a protein called 60S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	Z	151	Total	C	N	O	S	0	0
			1223	768	247	203	5		

- Molecule 22 is a protein called 60S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	a	148	Total	C	N	O	S	0	0
			1239	772	266	192	9		

- Molecule 23 is a protein called 60S ribosomal protein L18a.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	b	176	Total	C	N	O	S	0	0
			1461	930	284	236	11		

- Molecule 24 is a protein called 60S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	c	119	Total	C	N	O	S	0	0
			975	619	189	164	3		

- Molecule 25 is a protein called 60S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	e	131	Total	C	N	O	S	0	0
			979	618	184	172	5		

- Molecule 26 is a protein called 60S ribosomal protein L26.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	h	134	Total	C	N	O	S	0	0
			1115	700	226	186	3		

- Molecule 27 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	i	135	Total	C	N	O	S	0	0
			1107	714	208	182	3		

- Molecule 28 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	l	125	Total	C	N	O	S	0	0
			1002	622	207	168	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
29	m	181	Total	C	N	O	S	0	0
			1397	885	273	234	5		

- Molecule 30 is a protein called 60S ribosomal protein L35a.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	n	109	Total	C	N	O	S	0	0
			876	555	174	144	3		

- Molecule 31 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	o	235	Total	C	N	O	S	0	0
			1897	1217	360	316	4		

- Molecule 32 is a protein called 60S ribosomal protein L7.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	p	225	Total	C	N	O	S	1	0
			1878	1207	361	301	9		

- Molecule 33 is a protein called Protein LLP homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	z	67	Total	C	N	O	S	0	0
			581	363	128	88	2		

- Molecule 34 is a protein called 60S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	A	165	Total	C	N	O	S	0	0
			1319	836	245	233	5		

- Molecule 35 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	C	248	Total	C	N	O	S	0	0
			2027	1289	370	354	14		

- Molecule 36 is a protein called Ribosome biogenesis protein NSA2 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	J	259	Total	C	N	O	S	0	0
			2106	1339	399	359	9		

- Molecule 37 is a protein called Notchless protein homolog 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	N	472	Total	C	N	O	S	0	0
			3669	2307	660	690	12		

- Molecule 38 is a protein called Ribosome biogenesis regulatory protein homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	R	199	Total	C	N	O	S	0	0
			1636	1022	315	296	3		

- Molecule 39 is a protein called Guanine nucleotide-binding protein-like 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	u	75	Total	C	N	O	S	0	0
			639	400	138	98	3		

- Molecule 40 is a protein called mRNA turnover protein 4 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	v	205	Total	C	N	O	S	0	0
			1675	1069	292	303	11		

- Molecule 41 is a protein called G Protein Nucleolar 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	w	449	Total	C	N	O	S	0	0
			3623	2301	643	665	14		

- Molecule 42 is a protein called Coiled-coil domain-containing protein 86.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	r	24	Total	C	N	O	S	0	0
			217	134	45	37	1		

- Molecule 43 is a RNA chain called 28S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	2	3369	Total	C	N	O	P	0	0
			72334	32257	13244	23465	3368		

- Molecule 44 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	8	155	Total	C	N	O	P	0	0
			3295	1472	583	1086	154		

- Molecule 45 is a protein called 60S ribosomal protein L23a.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	g	112	Total	C	N	O	S	0	0
			919	588	171	159	1		

- Molecule 46 is a protein called 60S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	d	104	Total	C	N	O	S	0	0
			850	542	149	157	2		

- Molecule 47 is a protein called 60S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	j	111	Total	C	N	O	S	0	0
			918	578	178	160	2		

- Molecule 48 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	k	129	Total	C	N	O	S	0	0
			1064	673	220	166	5		

- Molecule 49 is a protein called 60S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	Y	167	Total	C	N	O	S	0	0
			1355	848	260	238	9		

- Molecule 50 is a protein called 60S ribosomal protein L38.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	O	69	Total	C	N	O	S	0	0
			569	366	103	99	1		

- Molecule 51 is a RNA chain called 5S RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	W	120	Total	C	N	O	P	0	0
			2558	1141	456	842	119		

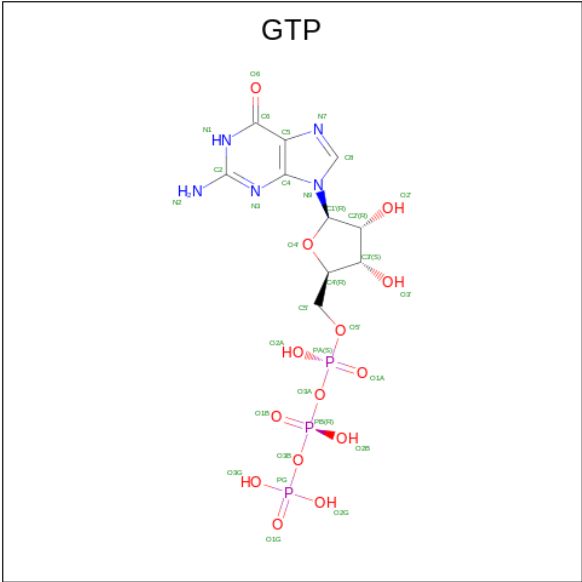
- Molecule 52 is a protein called Ribosome production factor 2 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	T	255	Total	C	N	O	S	0	0
			2082	1336	364	371	11		

- Molecule 53 is a protein called pre-rRNA 2'-O-ribose RNA methyltransferase FTSJ3.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	9	65	Total	C	N	O	S	0	0
			538	334	103	98	3		

- Molecule 54 is GUANOSINE-5'-TRIPHOSPHATE (CCD ID: GTP) (formula: C₁₀H₁₆N₅O₁₄P₃).



Mol	Chain	Residues	Atoms					AltConf
54	w	1	Total	C	N	O	P	0
			32	10	5	14	3	

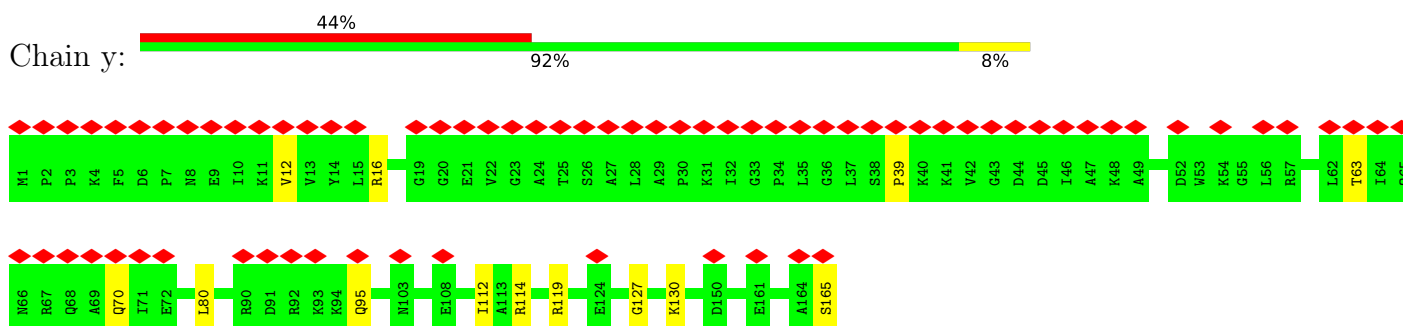
- Molecule 55 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
55	w	1	Total	Mg	0
			1	1	

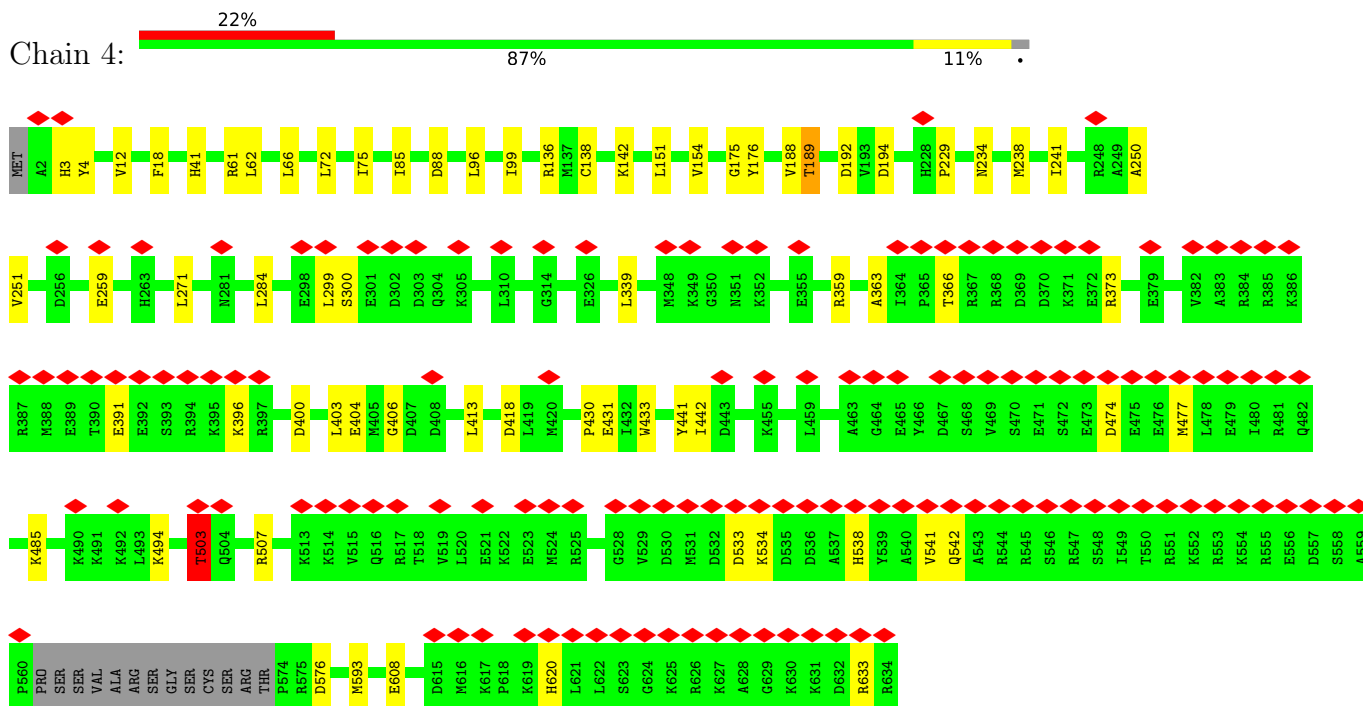
3 Residue-property plots [i](#)

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.

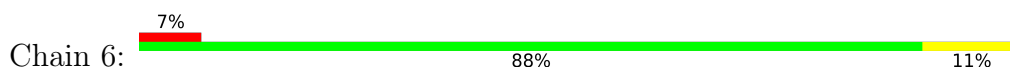
- Molecule 1: 60S ribosomal protein L12



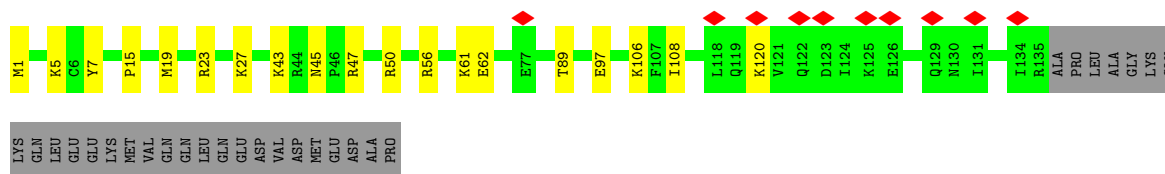
- Molecule 2: GTP-binding protein 4



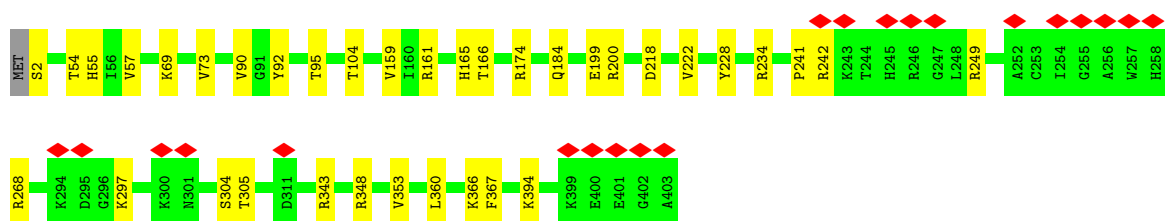
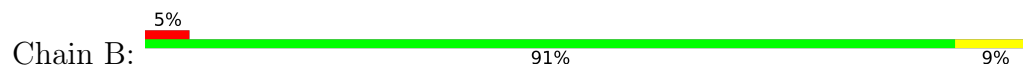
- Molecule 3: Eukaryotic translation initiation factor 6



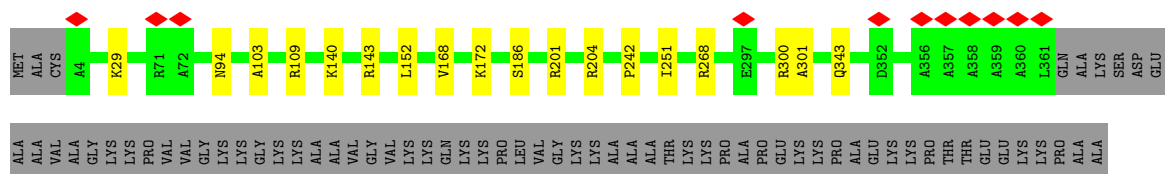
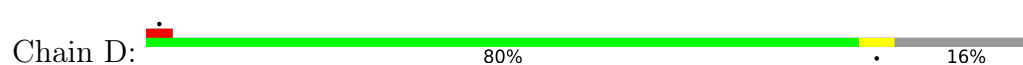
- Molecule 4: Probable ribosome biogenesis protein RLP24



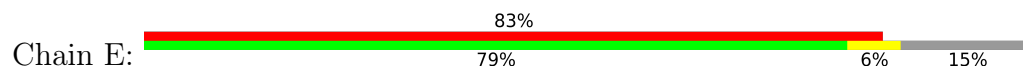
- Molecule 5: 60S ribosomal protein L3



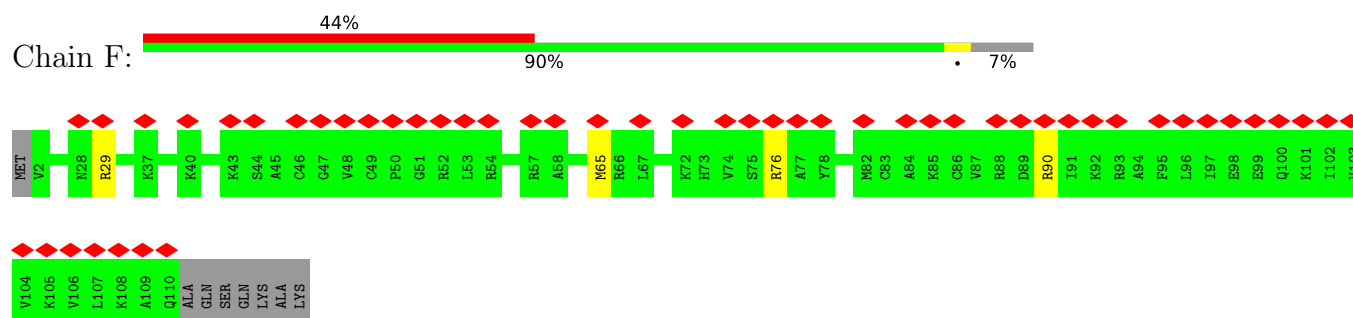
- Molecule 6: 60S ribosomal protein L4



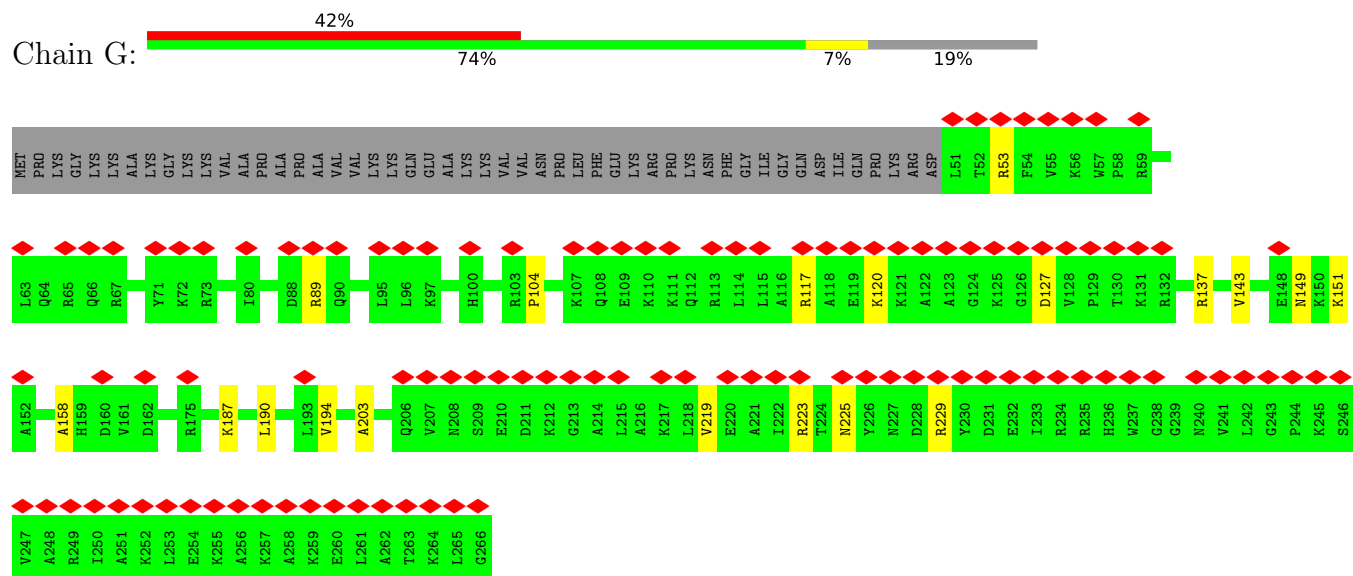
- Molecule 7: 60S ribosomal protein L30



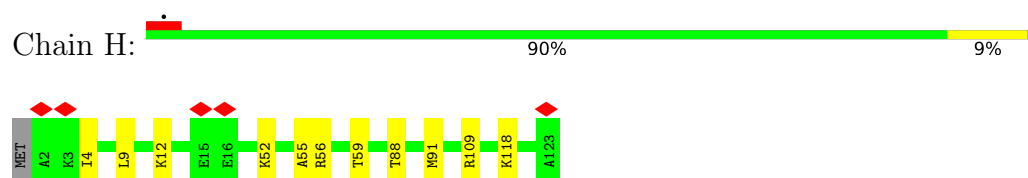
- Molecule 8: 60S ribosomal protein L34



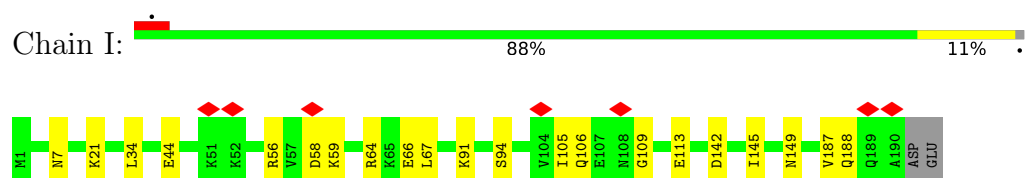
- Molecule 9: 60S ribosomal protein L7a



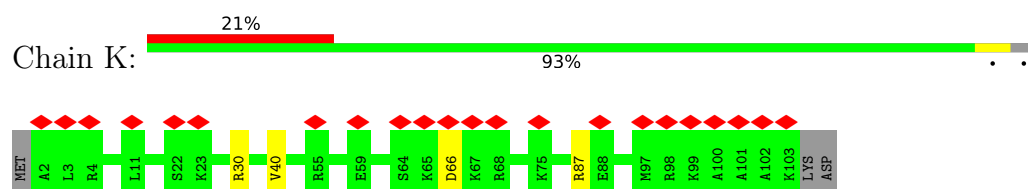
- Molecule 10: 60S ribosomal protein L35

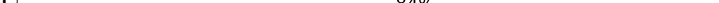


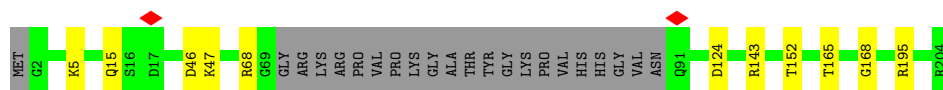
- Molecule 11: 60S ribosomal protein L9



- Molecule 12: 60S ribosomal protein L36

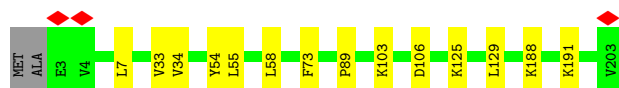


- Chain U:  84% 5% 11%



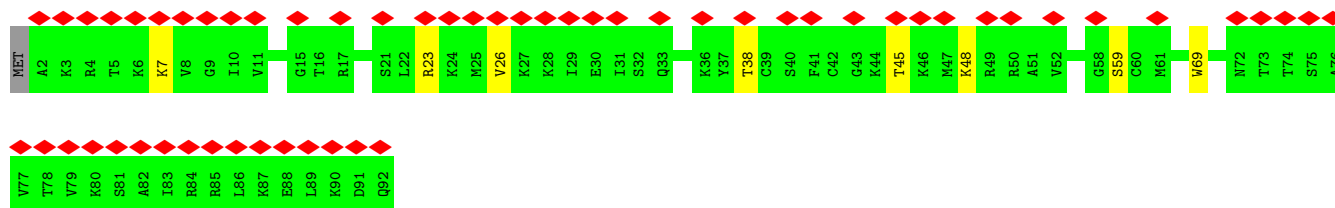
- Molecule 19: 60S ribosomal protein L13a

Chain V: 92% 7%



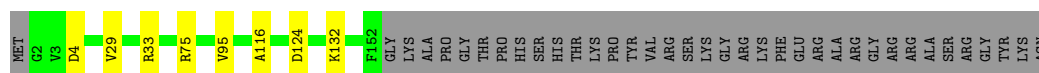
- Molecule 20: 60S ribosomal protein L37a

Chain X: 62% 90% 9%



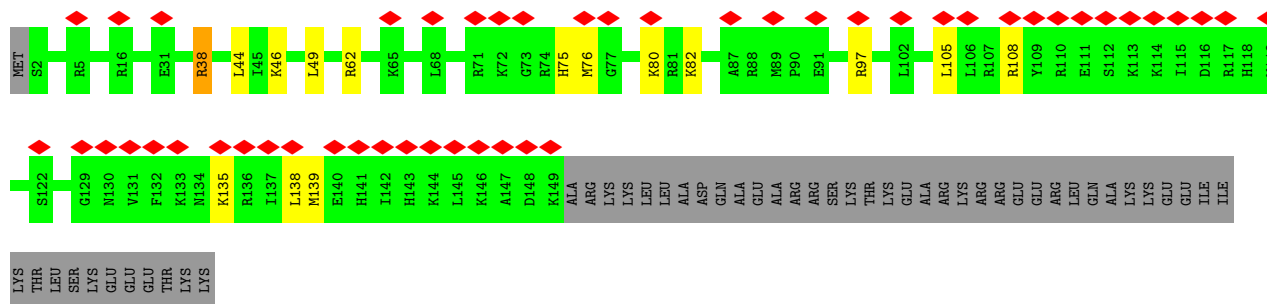
- Molecule 21: 60S ribosomal protein L18

Chain Z: 76% 20%



- Molecule 22: 60S ribosomal protein L19

Chain a: 25% 68% 7% 24%

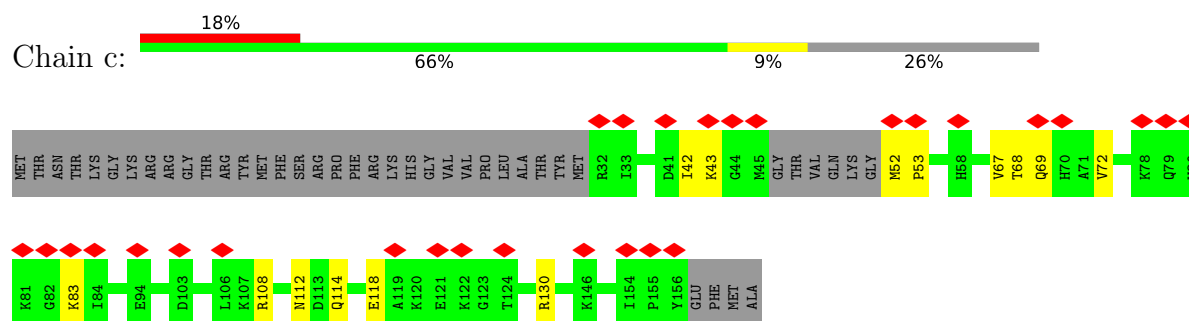


- Molecule 23: 60S ribosomal protein L18a

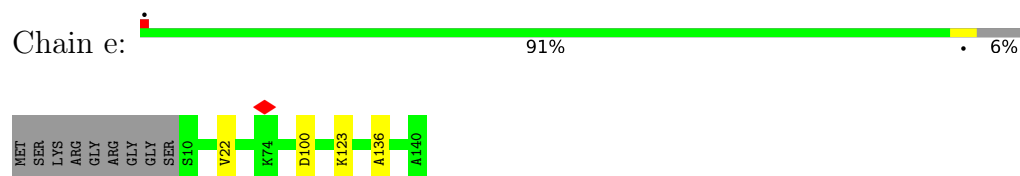
Chain b: 92% 8%



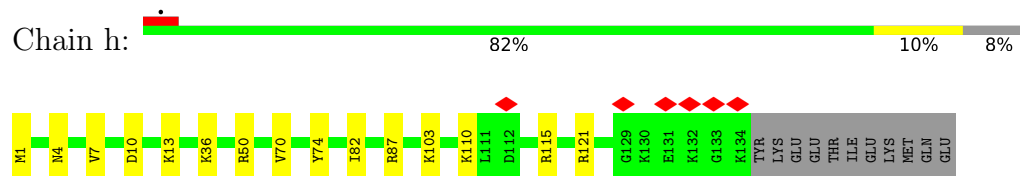
- Molecule 24: 60S ribosomal protein L21



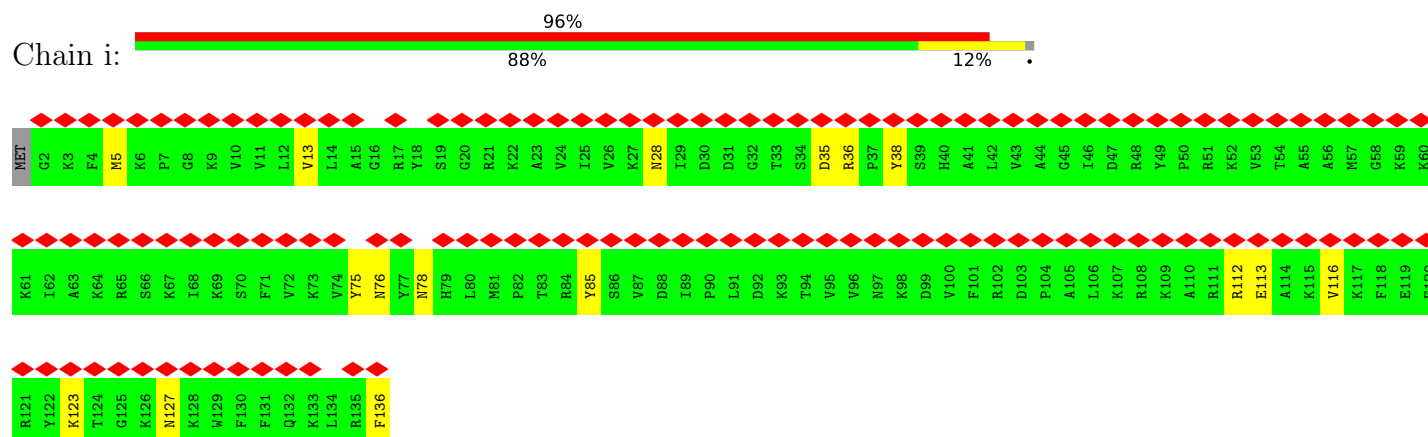
- Molecule 25: 60S ribosomal protein L23



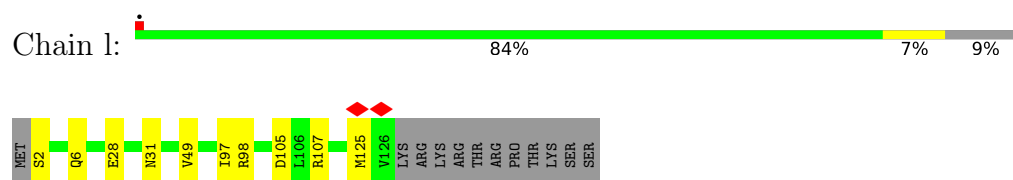
- Molecule 26: 60S ribosomal protein L26



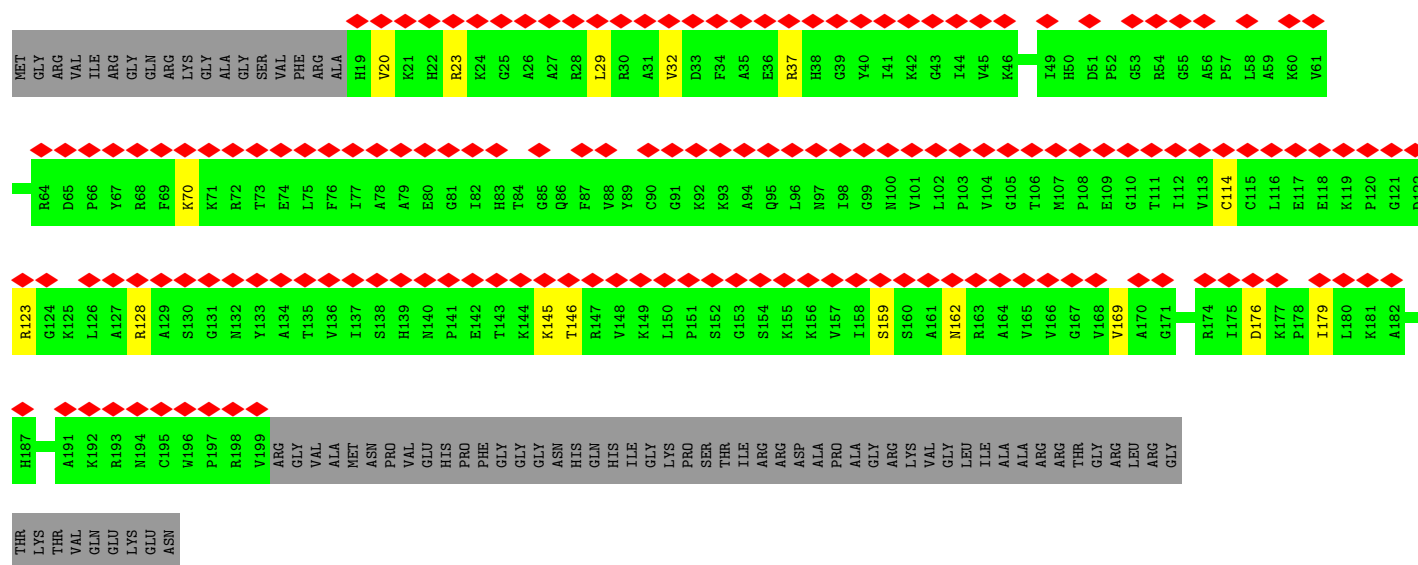
- Molecule 27: 60S ribosomal protein L27



- Molecule 28: 60S ribosomal protein L28



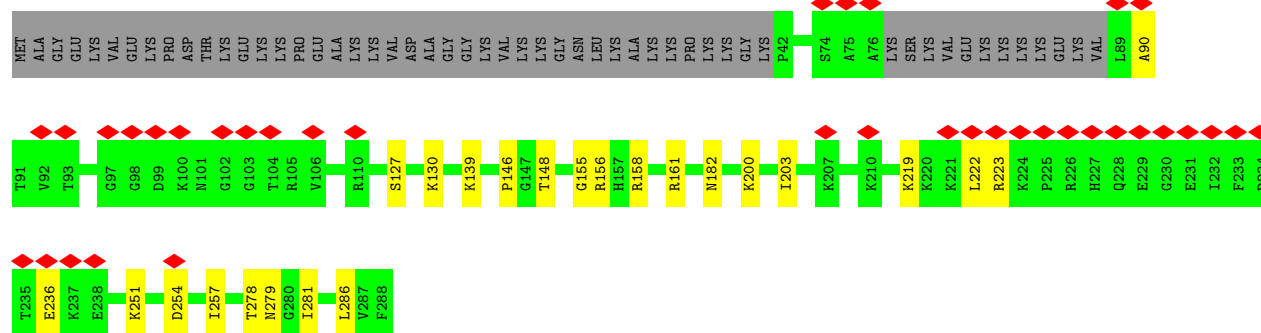
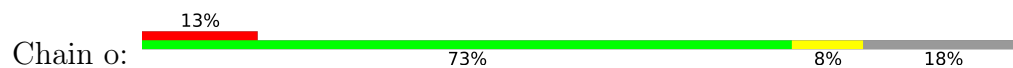
- Molecule 29: 60S ribosomal protein L8



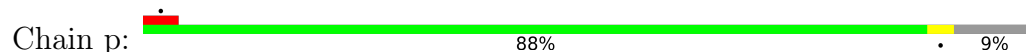
- Molecule 30: 60S ribosomal protein L35a



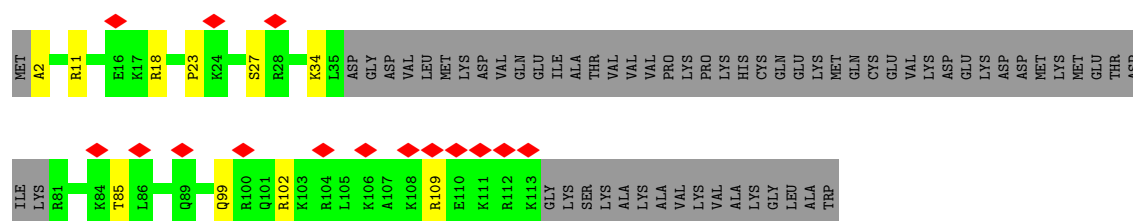
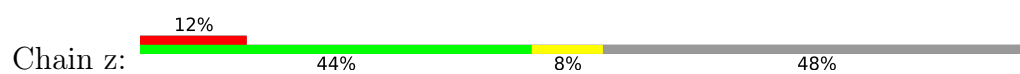
- Molecule 31: 60S ribosomal protein L6



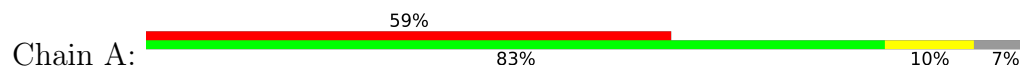
- Molecule 32: 60S ribosomal protein L7



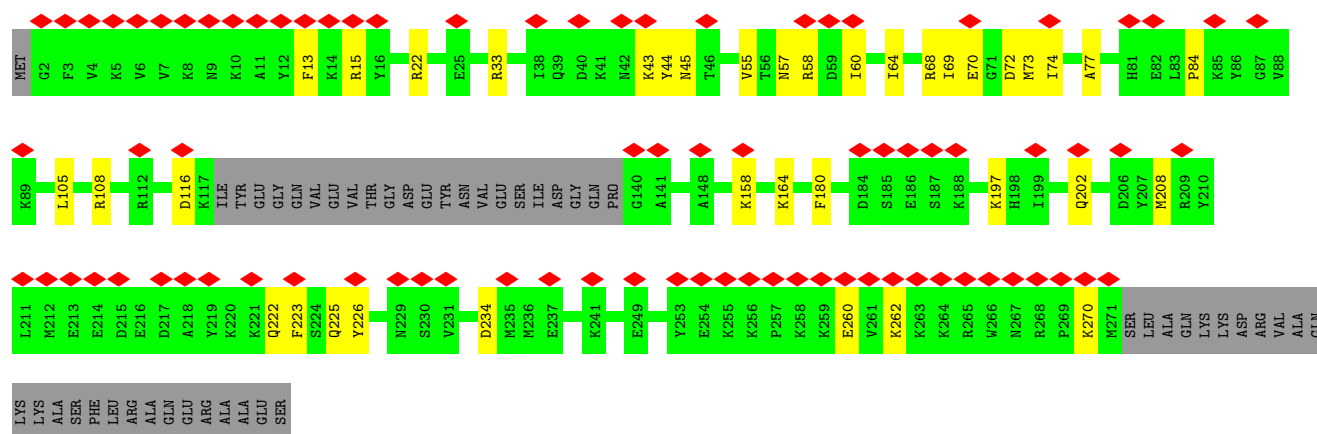
- Molecule 33: Protein LLP homolog



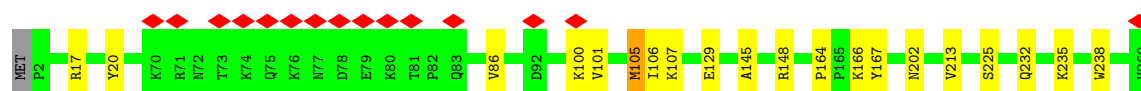
• Molecule 34: 60S ribosomal protein L11



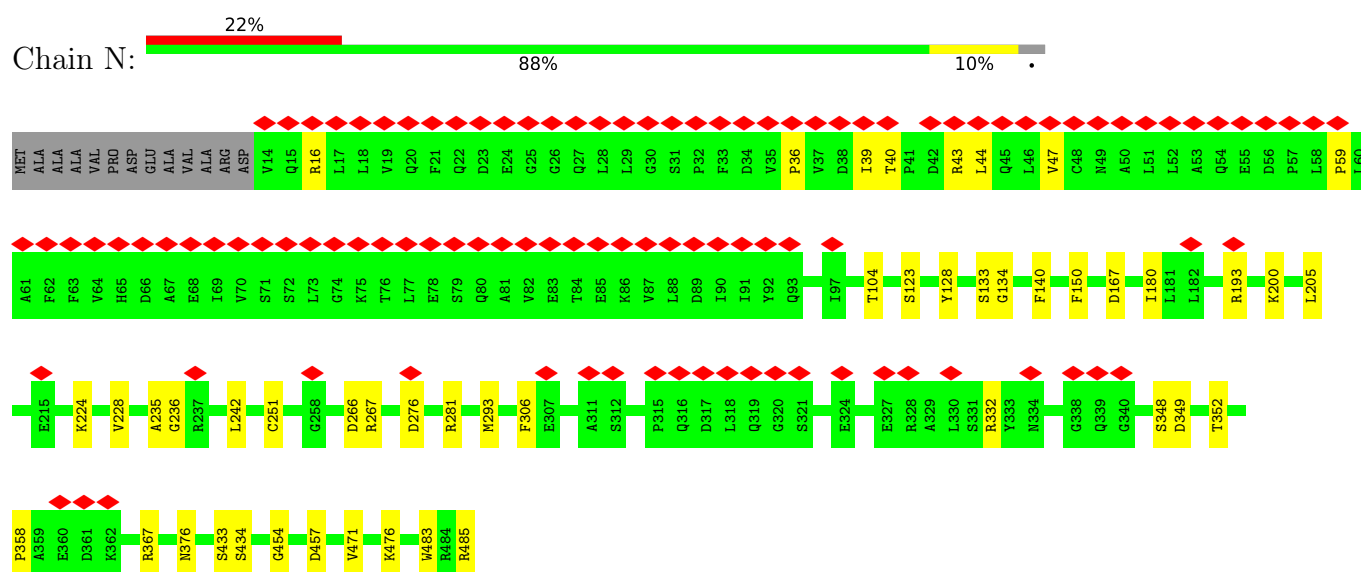
• Molecule 35: 60S ribosomal protein L5



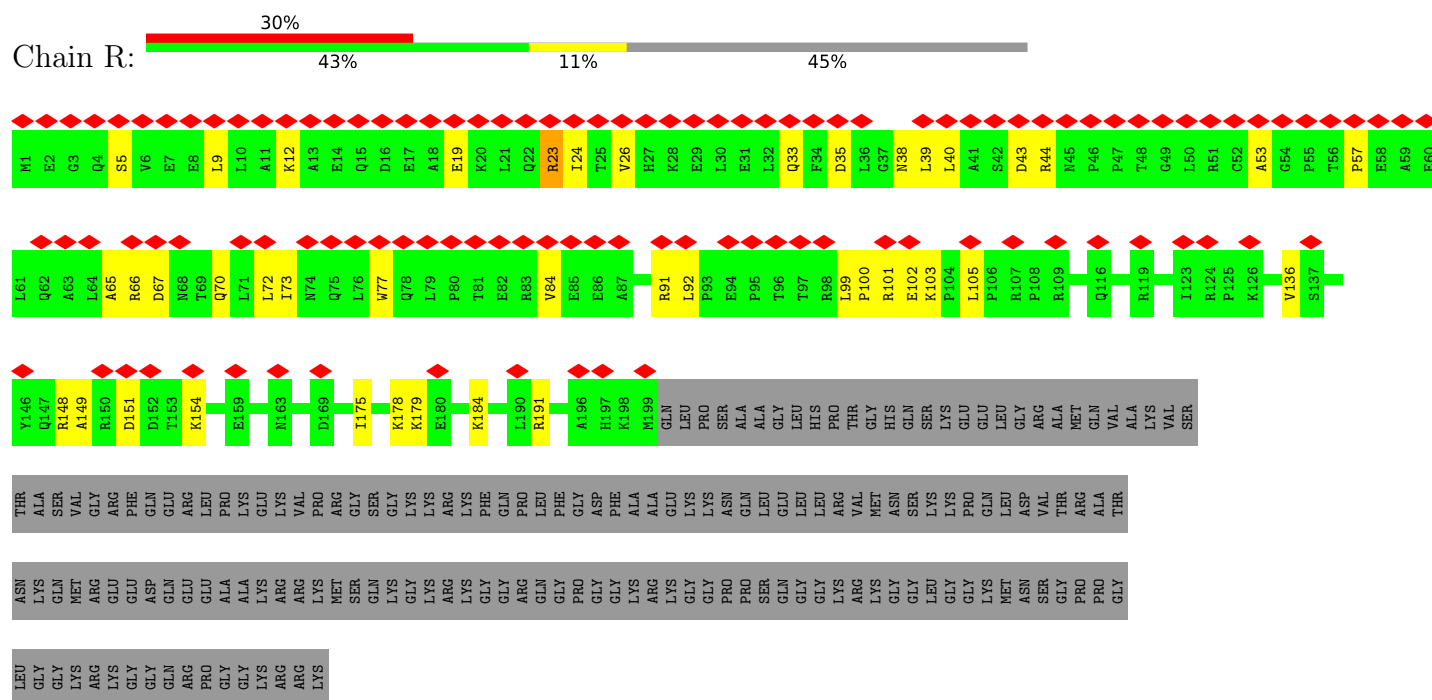
• Molecule 36: Ribosome biogenesis protein NSA2 homolog



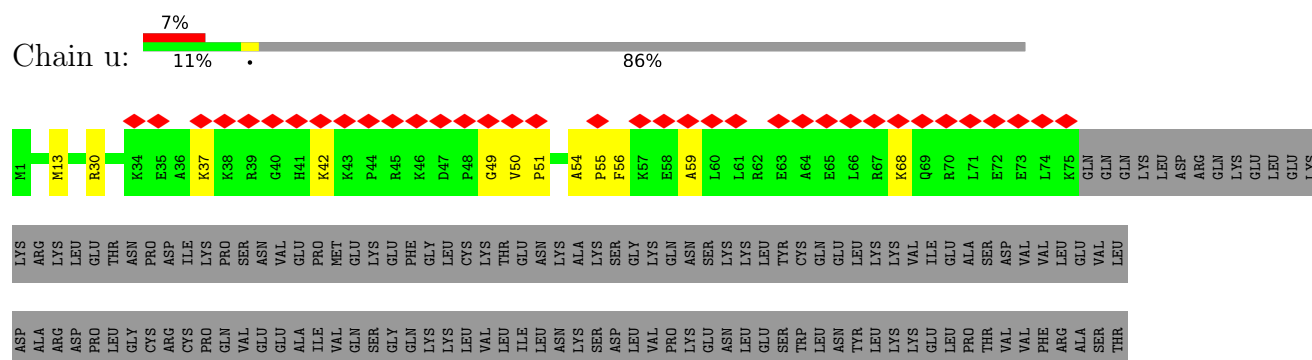
• Molecule 37: Notchless protein homolog 1

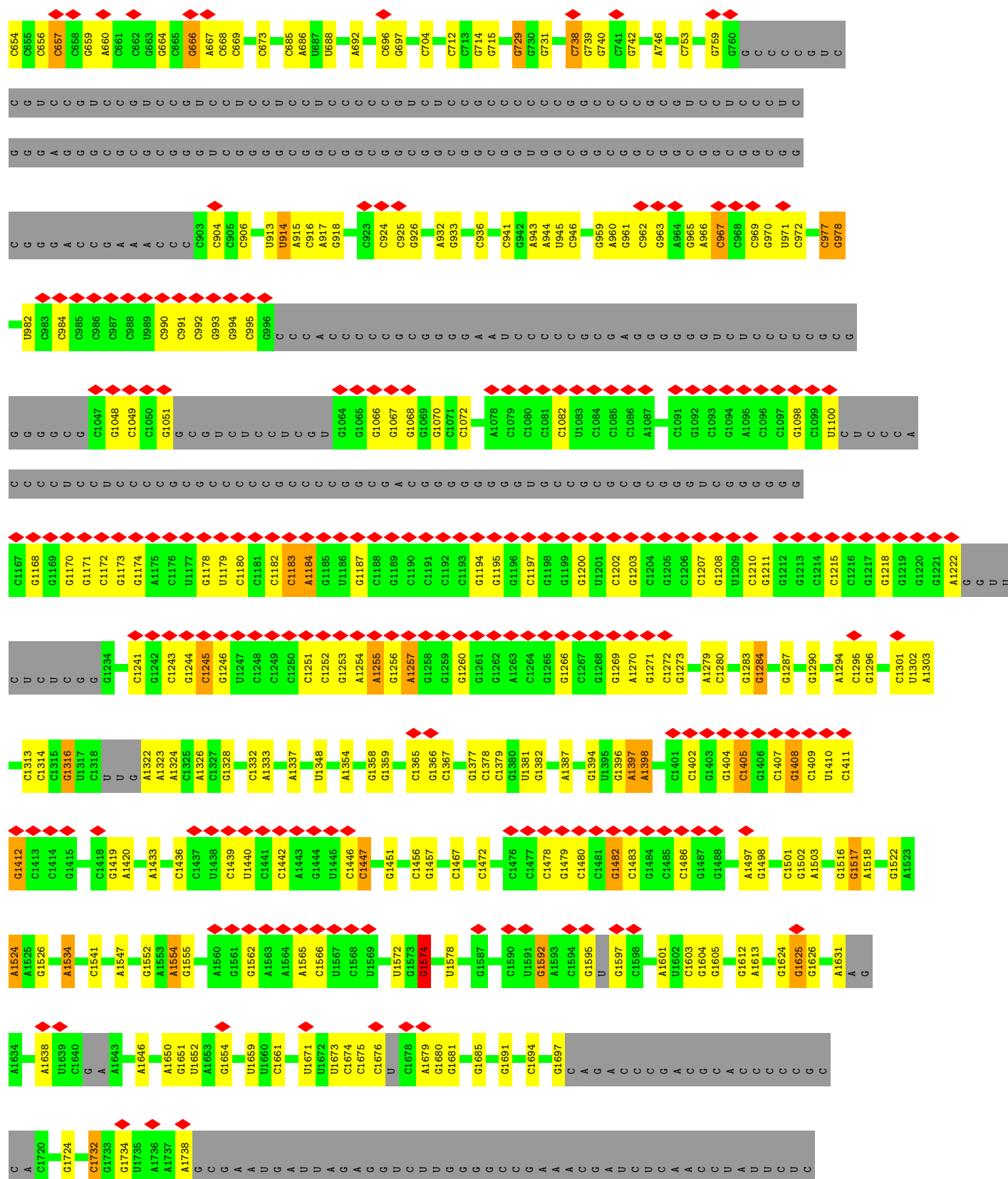


- Molecule 38: Ribosome biogenesis regulatory protein homolog



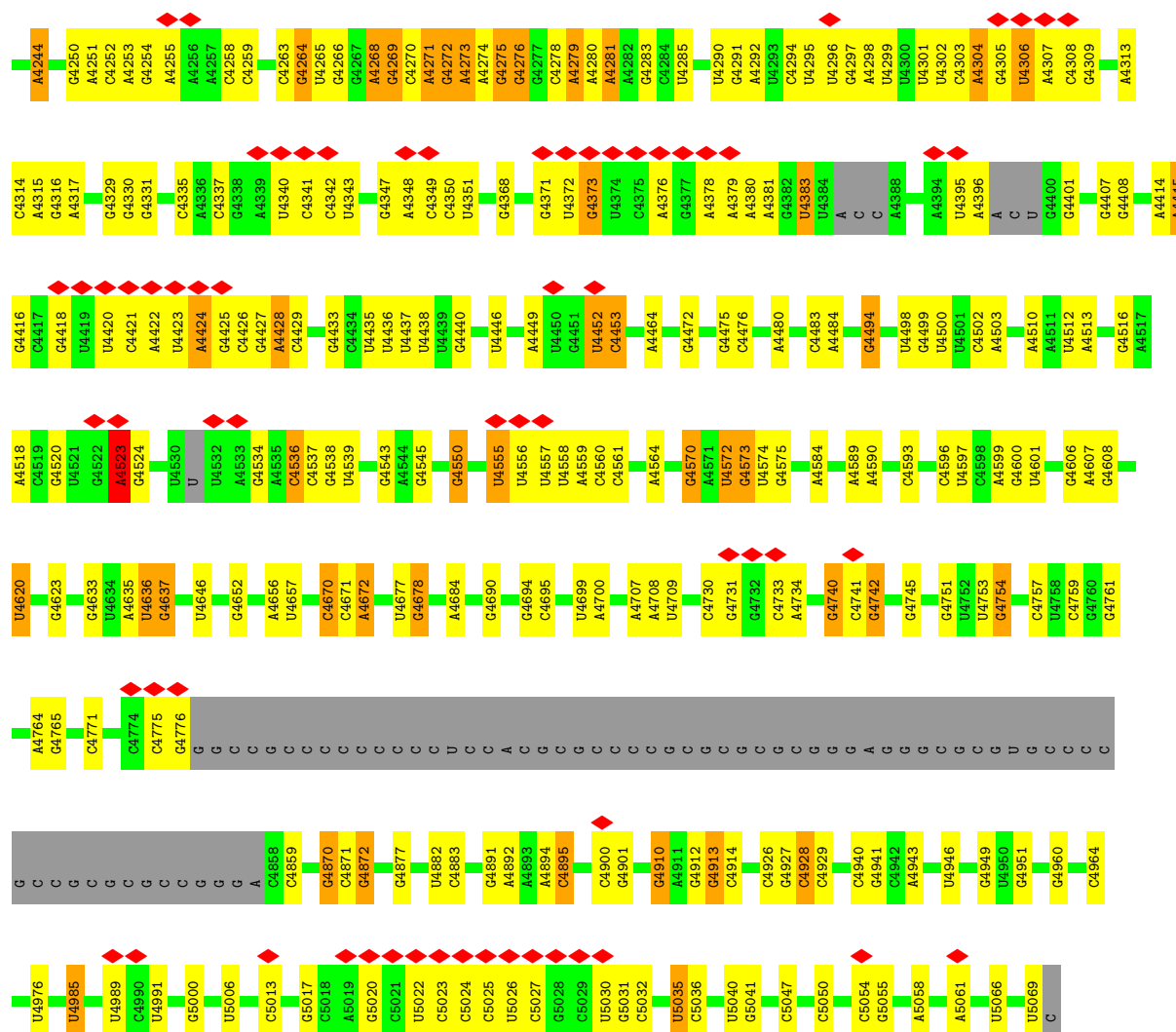
- Molecule 39: Guanine nucleotide-binding protein-like 3



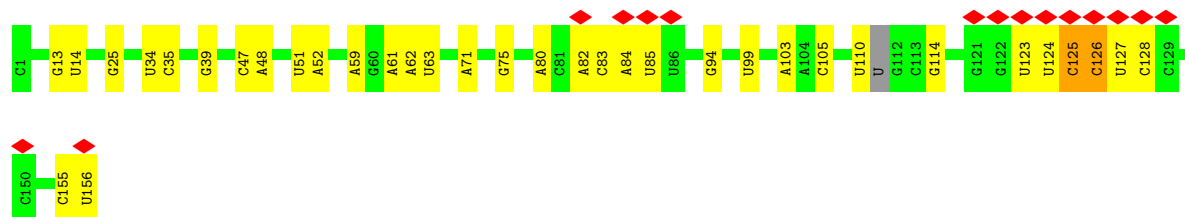




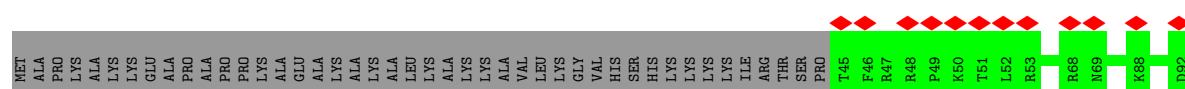


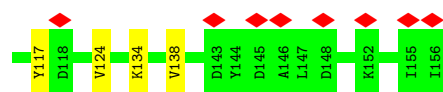


• Molecule 44: 5.8S rRNA

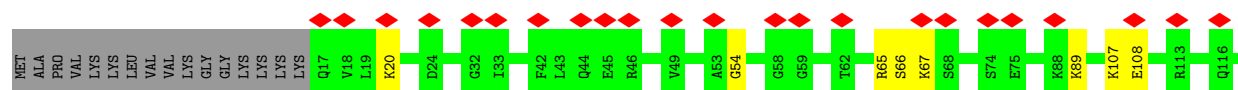
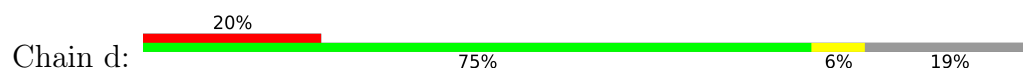


• Molecule 45: 60S ribosomal protein L23a

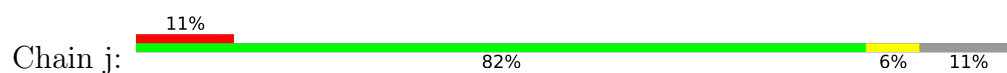




- Molecule 46: 60S ribosomal protein L22



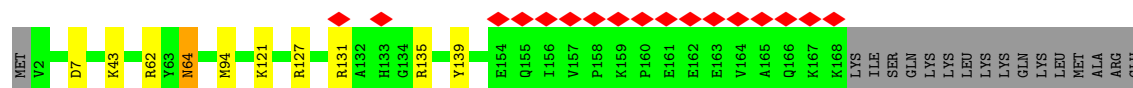
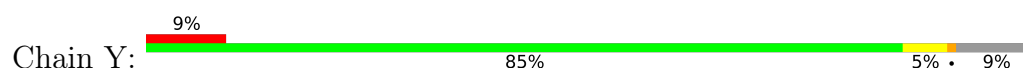
- Molecule 47: 60S ribosomal protein L31



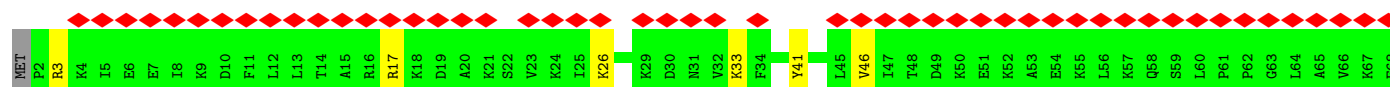
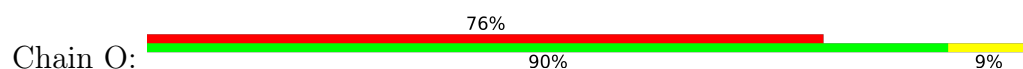
- Molecule 48: 60S ribosomal protein L32



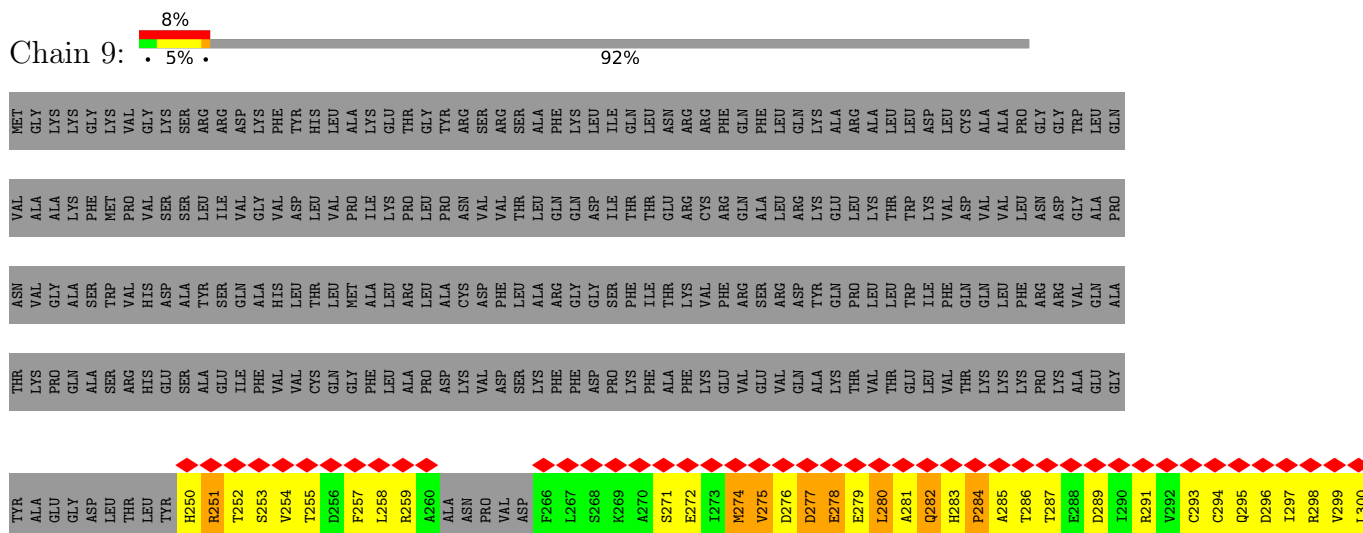
- Molecule 49: 60S ribosomal protein L17



- Molecule 50: 60S ribosomal protein L38



- Molecule 51: 5S RNA



[illegible]

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	30311	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 ($e^-/\text{\AA}^2$)	1.8	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.173	Depositor
Minimum map value	-0.049	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.038	Depositor
Map size (Å)	548.0, 548.0, 548.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.37, 1.37, 1.37	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: P4U, E7G, P7G, B8K, A2M, M7A, OMU, I4U, MG, B8Q, 1MA, B9H, UR3, 7MG, B8T, 5MU, BGH, B8W, OMG, GTP, B9B, 2MG, 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	y	0.33	0/1269	0.75	1/1712 (0.1%)
2	4	0.35	0/5177	0.85	28/6942 (0.4%)
3	6	0.29	0/1877	0.70	1/2554 (0.0%)
4	7	0.29	0/1181	0.64	2/1563 (0.1%)
5	B	0.27	0/3315	0.66	2/4435 (0.0%)
6	D	0.27	0/2907	0.64	1/3905 (0.0%)
7	E	0.31	0/774	0.67	0/1038
8	F	0.27	0/878	0.61	0/1170
9	G	0.35	0/1760	0.76	0/2368
10	H	0.29	0/1023	0.59	0/1351
11	I	0.29	0/1537	0.68	0/2066
12	K	0.30	0/843	0.72	0/1115
13	L	0.24	0/904	0.60	0/1207
14	M	0.24	0/720	0.58	0/952
15	P	0.24	0/454	0.54	0/599
16	Q	0.30	0/1682	0.60	1/2248 (0.0%)
17	S	0.30	0/1133	0.67	2/1516 (0.1%)
18	U	0.22	0/1580	0.51	0/2112
19	V	0.28	0/1682	0.58	0/2250
20	X	0.26	0/718	0.62	0/953
21	Z	0.24	0/1239	0.56	0/1658
22	a	0.29	0/1255	0.73	4/1662 (0.2%)
23	b	0.22	0/1501	0.50	0/2013
24	c	0.32	0/994	0.73	2/1327 (0.2%)
25	e	0.27	0/993	0.66	0/1332
26	h	0.29	0/1132	0.64	0/1504
27	i	0.33	0/1130	0.72	2/1507 (0.1%)
28	l	0.27	0/1017	0.57	0/1364
29	m	0.28	0/1426	0.67	2/1915 (0.1%)
30	n	0.24	0/895	0.69	3/1198 (0.3%)
31	o	0.28	0/1935	0.71	4/2596 (0.2%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	p	0.37	1/1916 (0.1%)	0.72	2/2553 (0.1%)
33	z	0.35	0/587	0.81	1/767 (0.1%)
34	A	0.33	0/1341	0.82	0/1793
35	C	0.28	0/2068	0.72	3/2767 (0.1%)
36	J	0.24	0/2146	0.63	7/2865 (0.2%)
37	N	0.25	0/3756	0.62	2/5103 (0.0%)
38	R	0.32	0/1668	0.78	7/2255 (0.3%)
39	u	0.40	0/649	0.93	3/851 (0.4%)
40	v	0.26	0/1709	0.60	2/2293 (0.1%)
41	w	0.31	0/3699	0.80	6/4992 (0.1%)
42	r	0.21	0/220	0.57	0/288
43	2	0.23	2/79277 (0.0%)	0.45	21/123568 (0.0%)
44	8	0.23	0/3656	0.42	1/5694 (0.0%)
45	g	0.31	0/935	0.67	2/1257 (0.2%)
46	d	0.35	0/864	0.92	7/1160 (0.6%)
47	j	0.27	0/933	0.60	0/1256
48	k	0.26	0/1082	0.63	0/1443
49	Y	0.25	0/1383	0.57	0/1856
50	O	0.34	0/575	0.78	0/761
51	W	0.23	0/2858	0.41	0/4455
52	T	0.33	0/2120	0.83	4/2837 (0.1%)
53	9	0.34	0/544	0.84	1/730 (0.1%)
All	All	0.26	3/158917 (0.0%)	0.57	124/231676 (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
2	4	0	4
5	B	0	2
16	Q	0	1
24	c	0	1
30	n	0	1
38	R	0	1
39	u	0	4
41	w	0	2
43	2	0	1
52	T	0	1
All	All	0	18

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
32	p	137	GLU	C-N	7.42	1.40	1.33
43	2	3876	A	N9-C4	6.53	1.50	1.37
43	2	3876	A	C1'-N9	5.42	1.55	1.47

All (124) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
53	9	284	PRO	CA-N-CD	-9.76	98.34	112.00
36	J	105	MET	CA-C-N	8.84	137.89	121.97
36	J	105	MET	C-N-CA	8.84	137.89	121.97
52	T	147	GLY	CA-C-N	8.48	136.97	121.70
52	T	147	GLY	C-N-CA	8.48	136.97	121.70
43	2	3876	A	N9-C1'-C2'	8.14	126.21	114.00
2	4	503	THR	CA-C-N	7.92	135.95	121.70
2	4	503	THR	C-N-CA	7.92	135.95	121.70
2	4	75	ILE	N-CA-C	7.66	117.71	110.74
37	N	266	ASP	CA-C-N	7.27	135.43	121.54
37	N	266	ASP	C-N-CA	7.27	135.43	121.54
43	2	1931	C	C2'-C3'-O3'	7.00	120.00	109.50
43	2	3876	A	C8-N9-C4	-6.88	85.17	105.80
43	2	3876	A	C8-N9-C1'	6.86	148.29	127.70
36	J	86	VAL	CB-CA-C	6.82	116.01	109.33
38	R	151	ASP	CA-C-N	6.62	134.19	121.54
38	R	151	ASP	C-N-CA	6.62	134.19	121.54
41	w	458	PHE	N-CA-C	6.62	120.58	111.71
2	4	406	GLY	CA-C-N	6.56	134.07	121.54
2	4	406	GLY	C-N-CA	6.56	134.07	121.54
35	C	84	PRO	CA-N-CD	-6.55	102.84	112.00
46	d	54	GLY	CA-C-N	6.39	133.75	121.54
46	d	54	GLY	C-N-CA	6.39	133.75	121.54
30	n	106	TYR	N-CA-C	6.31	123.75	109.81
40	v	49	ARG	CG-CD-NE	6.30	125.85	112.00
41	w	264	ALA	CA-C-N	6.28	129.01	120.54
41	w	264	ALA	C-N-CA	6.28	129.01	120.54
22	a	76	MET	CA-C-N	6.21	132.37	120.07
22	a	76	MET	C-N-CA	6.21	132.37	120.07
22	a	38	ARG	CA-C-N	6.21	133.40	121.54
22	a	38	ARG	C-N-CA	6.21	133.40	121.54
36	J	86	VAL	N-CA-C	-6.20	104.11	109.19
43	2	2760	G	P-O3'-C3'	6.19	129.49	120.20
52	T	147	GLY	CA-C-O	-6.13	115.55	121.06
45	g	117	TYR	CA-C-N	6.12	131.09	122.46
45	g	117	TYR	C-N-CA	6.12	131.09	122.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	4	188	VAL	N-CA-C	-6.12	101.02	109.46
30	n	105	LEU	CA-C-N	6.08	136.63	121.80
30	n	105	LEU	C-N-CA	6.08	136.63	121.80
2	4	175	GLY	CA-C-N	6.03	143.07	122.15
2	4	175	GLY	C-N-CA	6.03	143.07	122.15
2	4	188	VAL	CA-C-N	5.98	129.61	120.82
2	4	188	VAL	C-N-CA	5.98	129.61	120.82
43	2	914	U	P-O3'-C3'	5.96	129.14	120.20
2	4	430	PRO	CA-C-N	5.95	132.91	121.54
2	4	430	PRO	C-N-CA	5.95	132.91	121.54
43	2	2470	C	P-O3'-C3'	5.95	129.12	120.20
43	2	4235	G	P-O3'-C3'	5.93	129.10	120.20
4	7	7	TYR	CA-C-N	5.92	132.84	121.54
4	7	7	TYR	C-N-CA	5.92	132.84	121.54
38	R	23	ARG	CA-C-N	5.91	132.60	121.97
38	R	23	ARG	C-N-CA	5.91	132.60	121.97
32	p	220	MET	CA-C-N	5.87	132.75	121.54
32	p	220	MET	C-N-CA	5.87	132.75	121.54
40	v	49	ARG	CA-CB-CG	5.86	125.82	114.10
31	o	236	GLU	CA-C-N	5.85	131.74	122.61
31	o	236	GLU	C-N-CA	5.85	131.74	122.61
35	C	234	ASP	CA-C-N	5.81	130.62	122.08
35	C	234	ASP	C-N-CA	5.81	130.62	122.08
41	w	263	TRP	CA-C-N	5.81	132.63	121.54
41	w	263	TRP	C-N-CA	5.81	132.63	121.54
33	z	34	LYS	CB-CG-CD	5.79	124.63	111.30
43	2	1808	C	P-O3'-C3'	5.77	128.86	120.20
43	2	3876	A	N7-C8-N9	5.77	131.12	113.80
43	2	4229	U	P-O3'-C3'	5.71	128.76	120.20
38	R	136	VAL	N-CA-C	-5.63	108.37	113.71
2	4	41	HIS	CA-C-N	5.60	133.66	124.31
2	4	41	HIS	C-N-CA	5.60	133.66	124.31
43	2	2033	A	P-O3'-C3'	5.59	128.58	120.20
2	4	433	TRP	CA-C-N	5.54	130.69	122.82
2	4	433	TRP	C-N-CA	5.54	130.69	122.82
44	8	125	C	P-O3'-C3'	5.54	128.51	120.20
5	B	360	LEU	CA-CB-CG	5.52	135.62	116.30
2	4	88	ASP	CA-C-N	5.49	132.03	121.54
2	4	88	ASP	C-N-CA	5.49	132.03	121.54
2	4	189	THR	N-CA-C	5.48	117.36	110.24
1	y	95	GLN	CA-CB-CG	5.47	125.05	114.10
43	2	4555	U	P-O3'-C3'	5.47	128.40	120.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
29	m	179	ILE	CA-C-N	5.45	131.95	121.54
29	m	179	ILE	C-N-CA	5.45	131.95	121.54
43	2	914	U	C2'-C3'-O3'	5.44	117.66	109.50
2	4	391	GLU	CA-C-N	5.41	131.87	121.54
2	4	391	GLU	C-N-CA	5.41	131.87	121.54
17	S	31	ILE	CA-C-N	5.39	131.84	121.54
17	S	31	ILE	C-N-CA	5.39	131.84	121.54
43	2	4269	G	P-O3'-C3'	5.37	128.25	120.20
46	d	107	LYS	CA-C-N	5.36	129.96	122.08
46	d	107	LYS	C-N-CA	5.36	129.96	122.08
43	2	3905	A	P-O3'-C3'	5.35	128.23	120.20
43	2	1980	U	P-O3'-C3'	5.35	128.22	120.20
2	4	396	LYS	N-CA-C	5.34	119.09	112.47
16	Q	47	ALA	N-CA-C	5.34	121.61	109.81
38	R	84	VAL	CA-C-N	5.32	131.71	121.54
38	R	84	VAL	C-N-CA	5.32	131.71	121.54
46	d	66	SER	CA-C-N	5.29	131.65	121.54
46	d	66	SER	C-N-CA	5.29	131.65	121.54
39	u	68	LYS	CB-CG-CD	5.29	123.46	111.30
6	D	343	GLN	CA-CB-CG	5.29	124.67	114.10
5	B	305	THR	OG1-CB-CG2	-5.27	98.76	109.30
43	2	3875	G	P-O3'-C3'	5.27	128.10	120.20
27	i	123	LYS	CA-C-N	5.25	131.30	123.05
27	i	123	LYS	C-N-CA	5.25	131.30	123.05
2	4	72	LEU	N-CA-C	5.23	119.14	112.34
39	u	13	MET	CA-C-N	5.22	131.50	121.54
39	u	13	MET	C-N-CA	5.22	131.50	121.54
41	w	261	PRO	N-CA-C	5.21	118.79	111.33
2	4	12	VAL	CA-CB-CG1	5.21	119.25	110.40
43	2	4913	G	P-O3'-C3'	5.19	127.99	120.20
24	c	42	ILE	CA-C-N	5.15	131.38	121.54
24	c	42	ILE	C-N-CA	5.15	131.38	121.54
36	J	100	LYS	CA-C-N	5.14	131.22	121.97
36	J	100	LYS	C-N-CA	5.14	131.22	121.97
2	4	229	PRO	CA-C-N	5.14	131.35	121.54
2	4	229	PRO	C-N-CA	5.14	131.35	121.54
43	2	4636	U	C2-N1-C1'	5.13	133.10	117.70
3	6	123	ARG	CA-CB-CG	5.13	124.36	114.10
43	2	5035	U	P-O3'-C3'	5.11	127.87	120.20
2	4	3	HIS	CA-C-N	5.10	131.28	121.54
2	4	3	HIS	C-N-CA	5.10	131.28	121.54
52	T	148	ASP	N-CA-C	5.08	125.23	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
36	J	238	TRP	CA-CB-CG	5.08	123.25	113.60
46	d	108	GLU	CA-CB-CG	5.05	124.19	114.10
31	o	127	SER	CA-C-N	5.02	130.44	122.61
31	o	127	SER	C-N-CA	5.02	130.44	122.61

There are no chirality outliers.

All (18) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
43	2	3876	A	Sidechain
2	4	189	THR	Peptide
2	4	299	LEU	Peptide
2	4	300	SER	Peptide
2	4	503	THR	Peptide
5	B	241	PRO	Peptide
5	B	304	SER	Peptide
16	Q	154	VAL	Peptide
38	R	5	SER	Peptide
52	T	190	ASN	Peptide
24	c	52	MET	Peptide
30	n	106	TYR	Peptide
39	u	42	LYS	Peptide
39	u	49	GLY	Peptide
39	u	50	VAL	Peptide
39	u	54	ALA	Peptide
41	w	126	ARG	Peptide
41	w	456	ILE	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	y	1250	0	1305	8	0
2	4	5093	0	5239	39	0
3	6	1852	0	1828	20	0
4	7	1159	0	1222	34	0
5	B	3244	0	3389	22	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	D	2853	0	3028	14	0
7	E	764	0	804	4	0
8	F	868	0	963	4	0
9	G	1729	0	1871	11	0
10	H	1015	0	1148	7	0
11	I	1518	0	1601	11	0
12	K	832	0	917	4	0
13	L	888	0	951	3	0
14	M	705	0	741	3	0
15	P	444	0	483	3	0
16	Q	1652	0	1770	12	0
17	S	1111	0	1174	13	0
18	U	1542	0	1582	8	0
19	V	1650	0	1794	9	0
20	X	708	0	760	7	0
21	Z	1223	0	1330	6	0
22	a	1239	0	1363	11	0
23	b	1461	0	1502	9	0
24	c	975	0	1032	6	0
25	e	979	0	1039	4	0
26	h	1115	0	1205	11	0
27	i	1107	0	1182	9	0
28	l	1002	0	1068	7	0
29	m	1397	0	1468	12	0
30	n	876	0	912	4	0
31	o	1897	0	2046	16	0
32	p	1878	0	2009	4	0
33	z	581	0	656	6	0
34	A	1319	0	1358	13	0
35	C	2027	0	2056	62	0
36	J	2106	0	2250	10	0
37	N	3669	0	3614	24	0
38	R	1636	0	1672	68	0
39	u	639	0	718	4	0
40	v	1675	0	1696	13	0
41	w	3623	0	3697	84	0
42	r	217	0	219	2	0
43	2	72334	0	36388	307	0
44	8	3295	0	1676	8	0
45	g	919	0	984	2	0
46	d	850	0	868	3	0
47	j	918	0	964	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
48	k	1064	0	1160	3	0
49	Y	1355	0	1389	10	0
50	O	569	0	637	4	0
51	W	2558	0	1296	39	0
52	T	2082	0	2158	137	0
53	9	538	0	545	140	0
54	w	32	0	12	14	0
55	w	1	0	0	2	0
All	All	150033	0	114739	926	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (926) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
38:R:77:TRP:CE3	52:T:177:LEU:HD12	1.23	1.64
43:2:4083:5MU:C5	43:2:4083:5MU:C4	1.79	1.64
38:R:77:TRP:CZ3	52:T:177:LEU:HD12	1.36	1.57
43:2:3616:U:C2	53:9:302:ARG:CD	1.90	1.53
43:2:3616:U:C5	53:9:302:ARG:HB3	1.44	1.47
53:9:258:LEU:CD2	53:9:315:LEU:CD1	1.89	1.47
53:9:258:LEU:HD21	53:9:315:LEU:CD1	0.98	1.45
43:2:3616:U:C4	53:9:302:ARG:HB3	1.52	1.44
43:2:3616:U:C5	53:9:302:ARG:CB	2.01	1.43
43:2:3616:U:N3	53:9:302:ARG:HD3	1.13	1.43
38:R:77:TRP:CZ3	52:T:177:LEU:CD1	2.07	1.36
43:2:3616:U:C2	53:9:302:ARG:HD2	1.52	1.35
35:C:68:ARG:NH1	52:T:133:SER:OG	1.60	1.30
4:7:47:ARG:HB2	53:9:289:ASP:OD2	1.30	1.26
53:9:314:LYS:O	53:9:318:TYR:CD2	1.86	1.26
41:w:339:ALA:O	54:w:801:GTP:H5'	1.14	1.26
53:9:258:LEU:HD22	53:9:315:LEU:CB	1.63	1.26
53:9:253:SER:O	53:9:257:PHE:CE2	1.89	1.26
38:R:77:TRP:CE3	52:T:177:LEU:CD1	2.18	1.24
43:2:3616:U:C2	53:9:302:ARG:HD3	1.57	1.23
38:R:77:TRP:CH2	52:T:177:LEU:O	1.93	1.22
53:9:258:LEU:CD2	53:9:315:LEU:HD12	1.55	1.22
41:w:300:GLN:NE2	52:T:267:HIS:CB	2.03	1.21
41:w:300:GLN:NE2	52:T:267:HIS:HB2	1.58	1.19
43:2:3616:U:N3	53:9:302:ARG:CD	1.99	1.19

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
41:w:297:LEU:HD11	52:T:266:ILE:CD1	1.73	1.16
53:9:284:PRO:HG2	53:9:311:TRP:CH2	1.80	1.15
53:9:258:LEU:HD22	53:9:315:LEU:HB2	1.21	1.14
38:R:77:TRP:CZ3	52:T:177:LEU:CG	2.30	1.13
43:2:3616:U:C6	53:9:302:ARG:HB2	1.86	1.10
35:C:262:LYS:HG3	51:W:120:U:C5'	1.80	1.10
41:w:300:GLN:CD	52:T:267:HIS:HB2	1.74	1.10
41:w:300:GLN:HE22	52:T:267:HIS:HB3	1.09	1.10
35:C:262:LYS:HG3	51:W:120:U:H5''	1.25	1.09
41:w:297:LEU:CD1	52:T:266:ILE:HD11	1.81	1.08
53:9:283:HIS:HB3	53:9:284:PRO:HD3	1.27	1.08
53:9:314:LYS:O	53:9:318:TYR:HD2	1.23	1.07
35:C:260:GLU:OE2	51:W:120:U:O4'	1.74	1.05
41:w:339:ALA:O	54:w:801:GTP:C5'	2.05	1.05
43:2:3781:C:H42	52:T:277:GLN:C	1.62	1.05
43:2:3616:U:N1	53:9:302:ARG:HD2	1.71	1.04
38:R:77:TRP:CH2	52:T:177:LEU:HB2	1.94	1.03
41:w:289:PHE:CE1	52:T:272:ASP:O	2.13	1.02
38:R:77:TRP:HH2	52:T:177:LEU:O	1.30	1.02
43:2:3780:G:H1	52:T:276:LEU:HD23	1.24	1.01
43:2:3616:U:C4	53:9:302:ARG:CB	2.35	1.01
41:w:289:PHE:HE1	52:T:272:ASP:O	1.43	1.01
35:C:69:ILE:HD11	52:T:137:GLU:HA	1.43	1.00
43:2:3616:U:OP1	53:9:303:LYS:CG	2.08	1.00
43:2:3616:U:C5	53:9:302:ARG:HB2	1.84	1.00
53:9:258:LEU:CD2	53:9:315:LEU:HD13	1.67	1.00
43:2:3616:U:OP1	53:9:303:LYS:HG3	1.60	0.99
35:C:69:ILE:HD13	52:T:137:GLU:HB2	1.45	0.99
53:9:286:THR:O	53:9:291:ARG:NE	1.96	0.99
38:R:77:TRP:HE3	52:T:177:LEU:HD12	1.24	0.98
53:9:258:LEU:HD21	53:9:315:LEU:HD13	1.00	0.98
53:9:253:SER:O	53:9:257:PHE:CD2	2.16	0.98
4:7:45:ASN:ND2	53:9:304:GLU:OE2	1.96	0.98
43:2:3918:G:H1	43:2:4383:U:H3	1.11	0.97
43:2:4272:G:OP1	52:T:15:ALA:HB1	1.65	0.96
53:9:253:SER:O	53:9:257:PHE:HE2	1.32	0.96
41:w:340:PRO:HA	54:w:801:GTP:H4'	1.49	0.95
41:w:300:GLN:NE2	52:T:267:HIS:HB3	1.75	0.94
38:R:77:TRP:CZ3	52:T:177:LEU:HB2	2.03	0.94
43:2:1804:A:H62	43:2:1836:G:H1	1.09	0.93
53:9:258:LEU:CD2	53:9:315:LEU:CB	2.44	0.93

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:9:283:HIS:CB	53:9:284:PRO:HD3	1.97	0.93
43:2:3616:U:H3	53:9:302:ARG:HD3	1.34	0.93
38:R:39:LEU:O	52:T:142:MET:HB2	1.69	0.92
41:w:300:GLN:HE22	52:T:267:HIS:CB	1.69	0.92
38:R:102:GLU:HG3	52:T:31:LYS:HG2	1.50	0.92
38:R:77:TRP:CH2	52:T:177:LEU:CB	2.54	0.91
43:2:3781:C:H42	52:T:277:GLN:CA	1.82	0.91
35:C:68:ARG:CZ	52:T:133:SER:OG	2.20	0.90
38:R:100:PRO:HG2	52:T:165:ASP:OD2	1.72	0.90
43:2:3616:U:C4	53:9:302:ARG:HD3	2.06	0.89
35:C:33:ARG:NE	51:W:7:G:OP1	2.04	0.89
35:C:22:ARG:HH22	51:W:6:C:P	1.97	0.89
4:7:47:ARG:CZ	53:9:289:ASP:N	2.31	0.88
4:7:45:ASN:HB2	53:9:304:GLU:OE2	1.73	0.87
43:2:3781:C:N4	52:T:277:GLN:HA	1.88	0.87
43:2:3616:U:C6	53:9:302:ARG:CB	2.51	0.86
41:w:297:LEU:HD11	52:T:266:ILE:HD11	0.88	0.86
38:R:77:TRP:CH2	52:T:177:LEU:C	2.53	0.86
38:R:77:TRP:HZ3	52:T:177:LEU:CD1	1.81	0.86
38:R:77:TRP:CZ2	52:T:177:LEU:O	2.29	0.86
38:R:77:TRP:CZ3	52:T:177:LEU:CB	2.57	0.86
35:C:69:ILE:CD1	52:T:137:GLU:HB2	2.05	0.85
53:9:254:VAL:HA	53:9:257:PHE:HD2	1.41	0.85
43:2:1804:A:N6	43:2:1836:G:H1	1.75	0.85
43:2:3781:C:N4	52:T:277:GLN:C	2.34	0.84
35:C:74:ILE:CG2	51:W:115:A:O4'	2.26	0.84
53:9:258:LEU:CD2	53:9:315:LEU:HB2	2.07	0.83
4:7:47:ARG:CB	53:9:289:ASP:OD2	2.23	0.83
53:9:258:LEU:HD22	53:9:315:LEU:HB3	1.57	0.82
38:R:38:ASN:ND2	52:T:168:ARG:HD2	1.94	0.82
43:2:2845:A:H61	43:2:3843:C:H42	1.25	0.82
35:C:69:ILE:HD11	52:T:137:GLU:CA	2.09	0.81
4:7:45:ASN:CG	53:9:304:GLU:OE2	2.23	0.81
4:7:45:ASN:CB	53:9:304:GLU:OE2	2.29	0.81
53:9:284:PRO:HG2	53:9:311:TRP:HH2	1.38	0.81
38:R:77:TRP:CZ3	52:T:177:LEU:HG	2.14	0.81
53:9:258:LEU:CG	53:9:315:LEU:HD13	2.11	0.81
35:C:270:LYS:HB3	51:W:60:G:H5''	1.61	0.80
53:9:258:LEU:CD1	53:9:315:LEU:HD13	2.11	0.80
53:9:283:HIS:HB3	53:9:284:PRO:CD	2.11	0.80
4:7:45:ASN:ND2	53:9:289:ASP:OD2	2.16	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:9:258:LEU:HD21	53:9:315:LEU:HD12	0.81	0.79
43:2:3781:C:H42	52:T:277:GLN:HA	1.42	0.79
53:9:299:VAL:HG12	53:9:299:VAL:O	1.83	0.79
53:9:314:LYS:HB3	53:9:318:TYR:HE2	1.49	0.78
38:R:77:TRP:HH2	52:T:177:LEU:C	1.91	0.78
30:n:2:SER:N	43:2:4946:U:HO2'	1.82	0.78
53:9:258:LEU:HD11	53:9:315:LEU:HD13	1.63	0.77
41:w:110:VAL:HG22	52:T:263:TYR:CE2	2.18	0.77
43:2:3930:U:H3	43:2:4180:G:H1	1.32	0.77
43:2:3781:C:N4	52:T:277:GLN:CA	2.46	0.77
41:w:297:LEU:CD1	52:T:266:ILE:CD1	2.51	0.76
43:2:4276:G:N2	52:T:65:LYS:HB3	2.01	0.76
53:9:258:LEU:CD2	53:9:315:LEU:CG	2.63	0.76
41:w:289:PHE:CZ	52:T:273:LEU:HD23	2.21	0.76
53:9:284:PRO:CG	53:9:311:TRP:CH2	2.65	0.76
41:w:111:MET:O	52:T:262:THR:O	2.05	0.75
53:9:280:LEU:HB2	53:9:282:GLN:HE22	1.50	0.75
4:7:47:ARG:CZ	53:9:289:ASP:H	2.00	0.74
35:C:262:LYS:CG	51:W:120:U:C5'	2.62	0.74
43:2:3616:U:C4	53:9:302:ARG:CD	2.69	0.74
41:w:108:LYS:NZ	52:T:265:ARG:NH1	2.35	0.74
53:9:314:LYS:C	53:9:318:TYR:CD2	2.66	0.73
53:9:284:PRO:CG	53:9:311:TRP:HH2	2.00	0.73
41:w:345:THR:HG1	55:w:802:MG:MG	0.97	0.73
41:w:293:ALA:HB2	52:T:269:GLN:OE1	1.88	0.73
53:9:307:SER:O	53:9:311:TRP:HD1	1.71	0.72
53:9:314:LYS:C	53:9:318:TYR:HD2	1.96	0.72
35:C:158:LYS:NZ	51:W:47:G:OP2	2.20	0.71
4:7:47:ARG:HB2	53:9:289:ASP:CG	2.15	0.71
38:R:101:ARG:HE	52:T:28:GLU:CD	1.98	0.71
43:2:2452:G:H21	43:2:2507:A:H62	1.39	0.70
38:R:38:ASN:HD21	52:T:168:ARG:HD2	1.55	0.70
43:2:3780:G:H1	52:T:276:LEU:CD2	2.04	0.70
53:9:283:HIS:CB	53:9:284:PRO:CD	2.67	0.70
35:C:45:ASN:O	52:T:176:ARG:NH1	2.25	0.69
53:9:285:ALA:O	53:9:286:THR:OG1	2.08	0.69
16:Q:140:SER:O	16:Q:144:LEU:HB2	1.92	0.69
35:C:270:LYS:NZ	51:W:60:G:OP1	2.26	0.69
53:9:254:VAL:HG23	53:9:276:ASP:HB3	1.73	0.69
53:9:284:PRO:HD2	53:9:285:ALA:H	1.57	0.69
35:C:262:LYS:HB2	51:W:119:U:H2'	1.74	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
41:w:256:LYS:HG2	54:w:801:GTP:C6	2.28	0.68
35:C:13:PHE:HE1	51:W:15:C:H1'	1.58	0.68
53:9:286:THR:O	53:9:287:THR:CG2	2.41	0.68
53:9:307:SER:O	53:9:311:TRP:CD1	2.46	0.68
38:R:77:TRP:HZ3	52:T:177:LEU:CG	1.97	0.68
43:2:3615:G:C5'	53:9:303:LYS:NZ	2.57	0.68
34:A:143:ASP:O	51:W:43:U:H4'	1.92	0.68
53:9:284:PRO:HG2	53:9:311:TRP:CZ3	2.27	0.68
38:R:40:LEU:HD13	52:T:143:LEU:HB2	1.75	0.67
43:2:1322:A:H2'	43:2:1323:A:C8	2.29	0.67
41:w:256:LYS:HE2	54:w:801:GTP:C4	2.30	0.67
41:w:256:LYS:HG2	54:w:801:GTP:N1	2.09	0.67
35:C:13:PHE:CE1	51:W:15:C:H1'	2.30	0.66
35:C:33:ARG:CD	51:W:7:G:OP1	2.43	0.66
53:9:284:PRO:HD2	53:9:285:ALA:N	2.10	0.66
35:C:74:ILE:HG21	51:W:115:A:O4'	1.94	0.66
53:9:251:ARG:HG3	53:9:272:GLU:HG2	1.78	0.66
35:C:262:LYS:HG3	51:W:120:U:H5'	1.75	0.66
41:w:109:VAL:O	52:T:263:TYR:HD2	1.78	0.66
43:2:4276:G:C2	52:T:65:LYS:HB3	2.31	0.65
43:2:2845:A:N6	43:2:3843:C:H42	1.95	0.65
43:2:4537:C:H2'	43:2:4538:G:H8	1.62	0.65
43:2:2845:A:H61	43:2:3843:C:N4	1.94	0.64
41:w:345:THR:OG1	55:w:802:MG:MG	1.40	0.64
2:4:138:CYS:O	2:4:142:LYS:HB2	1.97	0.64
4:7:43:LYS:HB3	53:9:301:GLY:CA	2.28	0.64
35:C:72:ASP:O	51:W:113:G:N2	2.31	0.64
53:9:293:CYS:SG	53:9:300:LEU:HD21	2.37	0.64
35:C:43:LYS:O	52:T:176:ARG:HG3	1.98	0.64
38:R:77:TRP:CZ2	52:T:177:LEU:HB2	2.32	0.63
41:w:300:GLN:OE1	52:T:267:HIS:O	2.15	0.63
53:9:251:ARG:HG2	53:9:274:MET:HA	1.80	0.63
43:2:4272:G:OP1	52:T:15:ALA:CB	2.43	0.63
53:9:254:VAL:HA	53:9:257:PHE:CD2	2.29	0.63
43:2:2362:U:H2'	43:2:2363:A2M:H8	1.81	0.62
53:9:312:ARG:O	53:9:316:ARG:HG3	1.99	0.62
35:C:57:ASN:HB2	51:W:49:A:H61	1.63	0.62
38:R:65:ALA:CB	52:T:214:LEU:HD11	2.30	0.62
41:w:256:LYS:CG	54:w:801:GTP:C6	2.82	0.62
41:w:340:PRO:HA	54:w:801:GTP:C4'	2.28	0.62
52:T:88:SER:HB2	52:T:108:MET:H	1.64	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:9:252:THR:OG1	53:9:257:PHE:HZ	1.82	0.61
35:C:260:GLU:CD	51:W:120:U:O4'	2.42	0.61
43:2:3616:U:C4	53:9:302:ARG:CG	2.84	0.61
35:C:33:ARG:HD2	51:W:7:G:OP1	2.00	0.61
43:2:3925:U:N3	43:2:4187:G:N1	2.47	0.61
41:w:340:PRO:HB3	54:w:801:GTP:O3'	2.01	0.61
41:w:112:LYS:O	52:T:261:THR:HA	2.01	0.60
35:C:45:ASN:HB2	52:T:176:ARG:HB2	1.81	0.60
38:R:178:LYS:HE3	43:2:4201:G:H5''	1.83	0.60
43:2:4297:G:H1	43:2:4314:C:H42	1.50	0.60
53:9:286:THR:O	53:9:287:THR:HG23	2.00	0.60
12:K:40:VAL:HG11	18:U:5:LYS:HG2	1.83	0.60
53:9:304:GLU:HA	53:9:307:SER:OG	2.01	0.60
43:2:3757:G:H1	43:2:3768:U:H3	1.50	0.60
4:7:47:ARG:NE	53:9:289:ASP:N	2.49	0.59
11:I:44:GLU:HB3	11:I:58:ASP:HB2	1.84	0.59
35:C:262:LYS:CG	51:W:120:U:H5'	2.29	0.59
35:C:260:GLU:OE2	51:W:120:U:C4'	2.50	0.59
41:w:108:LYS:HZ3	52:T:265:ARG:NH1	1.99	0.59
41:w:282:HIS:CG	52:T:276:LEU:HD11	2.37	0.59
38:R:92:LEU:HD11	52:T:175:ILE:CG2	2.33	0.59
41:w:110:VAL:HG22	52:T:263:TYR:HE2	1.64	0.59
37:N:457:ASP:HB3	37:N:476:LYS:HB3	1.84	0.59
43:2:3717:A:C8	43:2:3736:A:C8	2.91	0.59
35:C:69:ILE:CD1	52:T:137:GLU:CB	2.80	0.58
51:W:28:C:H1'	51:W:54:A:H61	1.67	0.58
43:2:3781:C:C4	52:T:277:GLN:HA	2.37	0.58
43:2:4536:C:H2'	43:2:4537:C:C6	2.38	0.58
43:2:3617:G:O6	53:9:306:ARG:NH2	2.36	0.58
53:9:301:GLY:O	53:9:305:LEU:HG	2.04	0.58
41:w:301:PHE:CE2	52:T:266:ILE:CD1	2.86	0.58
38:R:70:GLN:NE2	52:T:209:THR:OG1	2.37	0.58
16:Q:188:ASN:O	16:Q:192:PHE:HB2	2.03	0.57
35:C:260:GLU:CD	51:W:120:U:C1'	2.77	0.57
53:9:271:SER:O	53:9:297:ILE:HB	2.04	0.57
35:C:69:ILE:HG12	52:T:135:CYS:O	2.04	0.57
41:w:323:LYS:N	54:w:801:GTP:O2B	2.34	0.57
26:h:110:LYS:O	26:h:115:ARG:NH1	2.37	0.57
35:C:74:ILE:HG21	51:W:115:A:C1'	2.34	0.57
53:9:282:GLN:HG2	53:9:283:HIS:CD2	2.39	0.57
27:i:36:ARG:NH1	27:i:38:TYR:OH	2.38	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
38:R:99:LEU:HD12	52:T:168:ARG:NH1	2.18	0.57
53:9:252:THR:OG1	53:9:257:PHE:CZ	2.57	0.57
19:V:188:LYS:HD3	43:2:4892:A:H5''	1.87	0.56
41:w:88:LYS:HG3	41:w:89:GLN:HG2	1.87	0.56
38:R:72:LEU:HD22	52:T:144:ILE:HD11	1.88	0.56
43:2:3754:G:O6	52:T:252:LYS:NZ	2.37	0.56
53:9:286:THR:C	53:9:287:THR:HG23	2.30	0.56
43:2:1270:A:H8	43:2:2106:G:H21	1.54	0.56
38:R:35:ASP:HB3	38:R:40:LEU:HB3	1.88	0.55
43:2:1804:A:N6	43:2:1836:G:N1	2.43	0.55
19:V:89:PRO:HD3	43:2:1914:C:H4'	1.88	0.55
43:2:3717:A:C2	43:2:3933:G:H1'	2.41	0.55
41:w:126:ARG:HB3	41:w:128:HIS:H	1.72	0.55
4:7:23:ARG:CZ	53:9:298:ARG:HD2	2.37	0.55
49:Y:64:ASN:HD22	49:Y:64:ASN:H	1.54	0.55
9:G:117:ARG:HD2	9:G:120:LYS:HD3	1.87	0.55
38:R:43:ASP:OD1	52:T:146:ALA:HA	2.07	0.55
34:A:120:ASP:HB3	34:A:123:ILE:HG12	1.88	0.55
43:2:1804:A:N6	43:2:1836:G:C6	2.74	0.55
38:R:102:GLU:CG	52:T:31:LYS:HG2	2.30	0.55
40:v:124:TYR:HB2	40:v:126:ARG:HH21	1.71	0.55
53:9:299:VAL:O	53:9:299:VAL:CG1	2.52	0.54
5:B:57:VAL:HG12	5:B:73:VAL:HG12	1.89	0.54
26:h:50:ARG:NH2	44:8:83:C:N3	2.55	0.54
38:R:65:ALA:HB3	52:T:214:LEU:HD11	1.89	0.54
41:w:300:GLN:OE1	52:T:267:HIS:HB2	2.07	0.54
24:c:114:GLN:NE2	24:c:118:GLU:OE2	2.41	0.54
35:C:45:ASN:C	52:T:176:ARG:HD3	2.32	0.54
39:u:56:PHE:HB3	39:u:59:ALA:HB2	1.90	0.54
53:9:295:GLN:O	53:9:296:ASP:OD1	2.26	0.54
2:4:400:ASP:HA	2:4:403:LEU:HG	1.90	0.54
35:C:260:GLU:OE2	51:W:120:U:C1'	2.54	0.54
10:H:118:LYS:HE3	16:Q:48:PRO:HG3	1.88	0.54
35:C:69:ILE:CD1	52:T:137:GLU:CA	2.84	0.54
41:w:57:ILE:HG13	41:w:58:LYS:HG3	1.90	0.54
3:6:24:CYS:HB3	3:6:48:VAL:HG12	1.89	0.54
43:2:4414:A:H1'	43:2:4428:A:N6	2.23	0.54
1:y:80:LEU:HD23	1:y:112:ILE:HG12	1.90	0.54
6:D:152:LEU:HD23	6:D:251:ILE:HG12	1.90	0.54
29:m:29:LEU:O	29:m:123:ARG:NH1	2.41	0.54
35:C:15:ARG:NH1	43:2:4266:G:OP1	2.41	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
38:R:66:ARG:HG3	52:T:213:GLU:OE1	2.07	0.53
43:2:1595:G:H1'	43:2:1597:G:H21	1.72	0.53
43:2:35:U:O2'	43:2:1651:G:N3	2.41	0.53
43:2:3723:A:H2'	43:2:3724:A:C8	2.44	0.53
4:7:43:LYS:HB3	53:9:301:GLY:HA3	1.90	0.53
4:7:45:ASN:CG	53:9:289:ASP:OD2	2.51	0.53
43:2:3938:G:N2	43:2:4171:C:OP2	2.42	0.53
31:o:254:ASP:HA	31:o:257:ILE:HG22	1.91	0.53
9:G:225:ASN:O	9:G:229:ARG:NH1	2.42	0.53
19:V:34:VAL:HG12	19:V:103:LYS:HB2	1.91	0.53
38:R:77:TRP:HZ3	52:T:177:LEU:HG	1.63	0.53
50:O:26:LYS:HB3	50:O:33:LYS:HB2	1.91	0.53
13:L:110:LYS:NZ	43:2:1396:G:N7	2.56	0.53
53:9:314:LYS:O	53:9:318:TYR:CE2	2.53	0.53
43:2:493:G:O6	43:2:660:A:N1	2.42	0.53
2:4:400:ASP:O	2:4:404:GLU:HB2	2.09	0.52
10:H:88:THR:HB	10:H:91:MET:HB2	1.90	0.52
38:R:33:GLN:HG3	38:R:44:ARG:HH12	1.74	0.52
5:B:199:GLU:OE2	5:B:200:ARG:NH1	2.43	0.52
31:o:219:LYS:HD2	43:2:1290:G:H5''	1.91	0.52
43:2:2772:C:O2'	50:O:17:ARG:NH1	2.43	0.52
5:B:92:TYR:HB2	5:B:159:VAL:HB	1.92	0.52
41:w:109:VAL:O	52:T:263:TYR:CD2	2.60	0.52
41:w:16:LYS:HB3	41:w:24:VAL:HB	1.92	0.52
34:A:158:SER:OG	34:A:159:LYS:N	2.40	0.52
38:R:100:PRO:HG3	52:T:107:ARG:NH1	2.25	0.52
5:B:353:VAL:O	33:z:18:ARG:NH1	2.43	0.52
38:R:26:VAL:HG21	38:R:67:ASP:HB2	1.91	0.52
38:R:39:LEU:HB3	52:T:142:MET:CB	2.39	0.52
40:v:20:LEU:O	40:v:24:GLN:NE2	2.43	0.52
52:T:99:ARG:HD3	52:T:226:ARG:HD3	1.92	0.52
6:D:140:LYS:O	6:D:204:ARG:NH2	2.43	0.52
7:E:14:ILE:HD13	7:E:17:ARG:HD3	1.92	0.52
38:R:40:LEU:CD1	52:T:143:LEU:HB2	2.40	0.52
43:2:2452:G:N2	43:2:2507:A:H62	2.07	0.52
51:W:76:U:O2	51:W:100:A:N7	2.43	0.52
37:N:140:PHE:HB2	37:N:150:PHE:HB2	1.91	0.52
38:R:53:ALA:HB1	38:R:57:PRO:HA	1.90	0.52
53:9:281:ALA:O	53:9:283:HIS:N	2.43	0.51
36:J:105:MET:HG2	36:J:107:LYS:HE2	1.93	0.51
43:2:4276:G:O6	52:T:63:TYR:HA	2.09	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:y:12:VAL:HG22	1:y:63:THR:HG22	1.92	0.51
11:I:59:LYS:HZ1	11:I:66:GLU:HG2	1.75	0.51
37:N:281:ARG:NH2	37:N:358:PRO:O	2.43	0.51
43:2:2562:G:N2	43:2:2565:A:OP2	2.44	0.51
52:T:134:LYS:NZ	52:T:217:MET:O	2.43	0.51
52:T:117:ILE:HA	52:T:228:THR:HG22	1.93	0.51
9:G:89:ARG:NH1	44:8:155:C:OP2	2.43	0.51
19:V:7:LEU:HB3	19:V:33:VAL:HG12	1.92	0.51
38:R:148:ARG:NH2	43:2:4201:G:OP2	2.44	0.51
43:2:518:G:H2'	43:2:519:C:H4'	1.92	0.51
43:2:3717:A:H2	43:2:3933:G:H1'	1.75	0.51
2:4:363:ALA:HB3	3:6:181:LEU:H	1.76	0.51
31:o:281:ILE:HD12	31:o:286:LEU:HD11	1.93	0.51
43:2:1562:G:N2	43:2:1565:A:OP2	2.43	0.51
43:2:4212:A:N6	43:2:4219:A:OP2	2.42	0.51
22:a:108:ARG:NH2	43:2:2899:C:OP1	2.42	0.51
43:2:4304:A:H2'	43:2:4306:U:H3	1.76	0.51
53:9:300:LEU:HD22	53:9:304:GLU:OE1	2.10	0.51
35:C:70:GLU:OE1	52:T:134:LYS:HB2	2.11	0.51
43:2:423:G:OP1	49:Y:62:ARG:NH1	2.44	0.51
43:2:664:G:N2	43:2:666:G:O6	2.44	0.51
5:B:174:ARG:NH1	43:2:4985:U:O2	2.44	0.51
12:K:66:ASP:OD2	12:K:87:ARG:NH1	2.43	0.51
27:i:13:VAL:HG13	27:i:75:TYR:HE1	1.76	0.51
28:l:28:GLU:OE1	28:l:31:ASN:ND2	2.43	0.51
43:2:1555:G:N2	43:2:1572:U:O2	2.42	0.51
43:2:2601:A:N6	43:2:2744:A:OP2	2.43	0.51
18:U:165:THR:HG23	18:U:168:GLY:H	1.76	0.51
31:o:156:ARG:NH1	43:2:4940:C:OP1	2.44	0.51
34:A:20:LEU:HG	34:A:132:VAL:HG22	1.93	0.51
43:2:67:C:OP2	43:2:312:G:N2	2.44	0.51
17:S:106:ASP:OD1	31:o:161:ARG:NH2	2.44	0.50
43:2:1245:C:H2'	43:2:1246:G:H8	1.76	0.50
29:m:123:ARG:NH2	43:2:4083:5MU:OP2	2.44	0.50
7:E:38:ILE:HD11	7:E:46:VAL:HG21	1.94	0.50
35:C:223:PHE:HB3	35:C:226:TYR:HB2	1.93	0.50
37:N:433:SER:OG	37:N:434:SER:N	2.44	0.50
38:R:77:TRP:CH2	52:T:177:LEU:CG	2.87	0.50
43:2:1804:A:N7	43:2:1836:G:N2	2.56	0.50
43:2:2112:G:O2'	43:2:2249:C:N4	2.45	0.50
38:R:175:ILE:HG22	38:R:179:LYS:HE2	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:6:228:GLN:HG2	3:6:232:ILE:HG13	1.93	0.50
43:2:3721:U:C2	43:2:3722:G:C8	3.00	0.50
43:2:3722:G:H2'	43:2:3723:A:H8	1.76	0.50
45:g:124:VAL:HG12	45:g:138:VAL:HA	1.94	0.50
53:9:310:ASN:O	53:9:313:THR:OG1	2.22	0.50
34:A:159:LYS:HE3	34:A:163:MET:HE3	1.94	0.50
43:2:1433:A:N6	43:2:1451:G:O2'	2.45	0.50
2:4:373:ARG:NH2	3:6:136:GLU:OE2	2.45	0.50
2:4:477:MET:HE2	4:7:120:LYS:HG2	1.93	0.50
16:Q:46:ILE:HB	16:Q:49:ARG:HD2	1.93	0.50
23:b:15:ARG:HB3	23:b:27:LEU:HD23	1.92	0.50
27:i:112:ARG:NH2	43:2:2572:C:O2'	2.45	0.50
35:C:22:ARG:NH2	51:W:6:C:OP2	2.37	0.50
35:C:45:ASN:C	52:T:176:ARG:HH11	2.19	0.50
38:R:39:LEU:HB3	52:T:142:MET:HB3	1.94	0.50
38:R:65:ALA:HB1	52:T:214:LEU:HD11	1.94	0.50
43:2:498:C:H42	43:2:657:C:H42	1.60	0.50
43:2:4080:C:H2'	43:2:4081:G:H8	1.77	0.50
53:9:284:PRO:CB	53:9:311:TRP:HH2	2.24	0.50
9:G:117:ARG:NH1	9:G:127:ASP:O	2.44	0.49
21:Z:75:ARG:NH2	43:2:1457:G:O2'	2.45	0.49
36:J:17:ARG:HB3	36:J:20:TYR:HB2	1.93	0.49
38:R:38:ASN:ND2	52:T:168:ARG:CD	2.72	0.49
43:2:3724:A:H2'	43:2:3725:G:C8	2.47	0.49
52:T:119:LEU:HB3	52:T:223:LEU:HD12	1.94	0.49
34:A:90:ARG:NH2	34:A:108:GLY:O	2.45	0.49
35:C:57:ASN:O	51:W:49:A:N6	2.46	0.49
5:B:2:SER:N	43:2:4516:G:OP2	2.46	0.49
6:D:201:ARG:NH2	43:2:235:A:OP1	2.45	0.49
35:C:68:ARG:NH2	35:C:73:MET:SD	2.85	0.49
36:J:145:ALA:O	36:J:148:ARG:NH2	2.46	0.49
43:2:4740:G:H1'	43:2:4742:G:H5''	1.94	0.49
2:4:192:ASP:OD2	40:v:164:ARG:NH2	2.45	0.49
9:G:53:ARG:NH1	43:2:4163:U:OP2	2.45	0.49
23:b:95:ARG:NH2	43:2:1951:G:O2'	2.46	0.49
30:n:100:ARG:NH1	43:2:4753:U:OP1	2.45	0.49
35:C:260:GLU:CD	51:W:120:U:H1'	2.37	0.49
2:4:85:ILE:O	41:w:150:ARG:NH2	2.45	0.49
10:H:109:ARG:NH2	43:2:267:G:OP1	2.45	0.49
18:U:47:LYS:NZ	43:2:280:G:OP1	2.45	0.49
24:c:68:THR:OG1	24:c:69:GLN:N	2.45	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
38:R:154:LYS:NZ	43:2:4202:U:O4	2.44	0.49
52:T:203:LYS:HZ1	52:T:213:GLU:H	1.61	0.49
16:Q:18:TRP:NE1	43:2:1516:G:O2'	2.45	0.49
23:b:138:ARG:HH11	39:u:56:PHE:HD1	1.59	0.49
41:w:256:LYS:HG3	54:w:801:GTP:C6	2.48	0.49
43:2:1972:G:H1	43:2:1994:C:H5	1.59	0.49
43:2:2020:U:H2'	43:2:2021:G:H8	1.77	0.49
2:4:66:LEU:HD23	2:4:96:LEU:HD12	1.93	0.49
3:6:79:GLN:OE1	4:7:1:MET:N	2.46	0.49
6:D:103:ALA:HA	43:2:1517:2MG:HN2	1.77	0.49
37:N:348:SER:OG	37:N:349:ASP:N	2.45	0.49
41:w:17:ALA:HB3	41:w:20:ASN:HB2	1.93	0.49
43:2:2420:A:OP2	49:Y:127:ARG:NH1	2.45	0.49
43:2:4420:U:O4	43:2:4424:A:N6	2.45	0.49
5:B:218:ASP:OD2	5:B:348:ARG:NH1	2.46	0.49
53:9:300:LEU:CD1	53:9:308:LEU:HD11	2.43	0.49
2:4:608:GLU:OE2	15:P:41:ARG:NH1	2.44	0.49
38:R:92:LEU:HD11	52:T:175:ILE:HG22	1.95	0.49
41:w:267:ARG:HD2	43:2:3776:G:H5''	1.95	0.49
43:2:1332:C:H2'	43:2:1333:A:H8	1.78	0.49
43:2:1732:C:H41	43:2:1796:U:H3	1.60	0.49
43:2:3944:G:H22	43:2:4069:U:H3	1.61	0.49
5:B:222:VAL:O	5:B:343:ARG:NH1	2.45	0.49
21:Z:29:VAL:O	21:Z:33:ARG:HB2	2.13	0.49
35:C:270:LYS:CE	51:W:60:G:OP1	2.61	0.49
43:2:2418:A:N1	43:2:2429:A:O2'	2.45	0.49
43:2:3641:U:OP2	43:2:3646:A:N6	2.46	0.49
14:M:55:ARG:NH2	43:2:364:G:O6	2.46	0.48
24:c:67:VAL:HG22	24:c:72:VAL:HG22	1.95	0.48
35:C:33:ARG:NH2	35:C:72:ASP:OD2	2.45	0.48
38:R:77:TRP:CH2	52:T:177:LEU:CA	2.95	0.48
41:w:34:ASP:OD1	41:w:34:ASP:N	2.44	0.48
43:2:2630:U:O4	46:d:89:LYS:NZ	2.46	0.48
53:9:281:ALA:C	53:9:283:HIS:N	2.71	0.48
2:4:194:ASP:OD1	2:4:194:ASP:N	2.46	0.48
34:A:154:LYS:HE2	51:W:55:A:OP1	2.12	0.48
38:R:73:ILE:CG2	52:T:209:THR:HB	2.42	0.48
41:w:352:THR:HG23	43:2:4539:U:H5''	1.95	0.48
41:w:423:GLU:HG3	41:w:438:PRO:HG3	1.95	0.48
43:2:3890:A:H61	43:2:4570:G:H2'	1.78	0.48
47:j:18:ASN:O	47:j:90:ARG:NH2	2.46	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:4:18:PHE:HE1	2:4:61:ARG:HG2	1.78	0.48
26:h:70:VAL:HG12	26:h:82:ILE:HG12	1.95	0.48
40:v:50:ASN:HA	40:v:53:LEU:HB2	1.96	0.48
43:2:3925:U:O4	43:2:4187:G:O6	2.32	0.48
2:4:413:LEU:HD23	5:B:69:LYS:HG3	1.95	0.48
2:4:533:ASP:OD1	2:4:533:ASP:N	2.46	0.48
4:7:19:MET:SD	4:7:19:MET:N	2.86	0.48
5:B:90:VAL:HG12	5:B:104:THR:HG22	1.94	0.48
19:V:125:LYS:HG2	19:V:129:LEU:HD12	1.95	0.48
26:h:4:ASN:HB3	26:h:7:VAL:HG22	1.96	0.48
34:A:20:LEU:HD13	34:A:79:ALA:HB1	1.96	0.48
43:2:1552:G:O2'	43:2:1574:B9B:N2	2.46	0.48
43:2:1858:A:H2'	43:2:1859:C:C6	2.48	0.48
43:2:3620:G:OP1	43:2:3622:C:N4	2.47	0.48
53:9:275:VAL:HG22	53:9:295:GLN:HA	1.96	0.48
17:S:71:LYS:NZ	43:2:738:C:O3'	2.47	0.48
38:R:105:LEU:HD11	52:T:243:PRO:HG3	1.95	0.48
41:w:251:ILE:HG22	41:w:277:PRO:HB2	1.95	0.48
53:9:250:HIS:O	53:9:272:GLU:HB3	2.13	0.48
2:4:234:ASN:ND2	43:2:1981:G:OP2	2.47	0.48
17:S:35:ARG:HA	17:S:51:PRO:HA	1.94	0.48
22:a:135:LYS:HG2	22:a:139:MET:HE2	1.95	0.48
43:2:1098:G:H1	43:2:1197:C:H42	1.61	0.48
43:2:3719:A:H2'	43:2:3720:G:O4'	2.14	0.48
3:6:129:LEU:O	3:6:133:LEU:HB2	2.14	0.48
26:h:87:ARG:NH2	43:2:404:U:O3'	2.46	0.48
38:R:38:ASN:HD22	52:T:168:ARG:HG3	1.77	0.48
41:w:282:HIS:HB3	41:w:289:PHE:HB3	1.96	0.48
43:2:1322:A:H2'	43:2:1323:A:H8	1.78	0.48
2:4:576:ASP:OD1	2:4:576:ASP:N	2.47	0.48
53:9:300:LEU:CD1	53:9:308:LEU:CD1	2.92	0.48
53:9:302:ARG:HA	53:9:305:LEU:HD12	1.94	0.48
1:y:39:PRO:HD2	2:4:259:GLU:HB3	1.95	0.48
13:L:85:GLN:HA	13:L:88:VAL:HG12	1.96	0.48
17:S:15:VAL:HG12	17:S:55:MET:HG2	1.96	0.48
43:2:2579:G:N2	43:2:2582:A:OP2	2.42	0.48
43:2:4620:OMU:OP2	43:2:4670:C:N4	2.46	0.48
2:4:359:ARG:HD3	3:6:163:PRO:HB3	1.96	0.47
2:4:418:ASP:OD1	2:4:418:ASP:N	2.46	0.47
43:2:34:A:H1'	43:2:1526:G:H21	1.79	0.47
43:2:1328:G:OP1	43:2:3906:A:N6	2.46	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:9:300:LEU:HD13	53:9:308:LEU:CD1	2.44	0.47
43:2:4891:G:H1	43:2:4928:C:H5	1.60	0.47
51:W:75:G:N2	51:W:100:A:OP2	2.46	0.47
53:9:286:THR:O	53:9:287:THR:HG22	2.14	0.47
22:a:97:ARG:NH2	43:2:2725:A:OP2	2.48	0.47
28:l:98:ARG:NH2	43:2:2262:G:OP2	2.46	0.47
31:o:278:THR:OG1	43:2:4754:G:N7	2.46	0.47
43:2:32:G:H21	43:2:50:C:H5	1.60	0.47
43:2:382:G:N1	43:2:385:A:OP2	2.45	0.47
53:9:274:MET:O	53:9:275:VAL:C	2.57	0.47
12:K:30:ARG:NH1	43:2:327:U:O2'	2.47	0.47
28:l:2:SER:O	28:l:6:GLN:NE2	2.47	0.47
43:2:2447:U:H2'	43:2:2448:G:H8	1.80	0.47
43:2:4272:G:N3	52:T:18:PHE:CE2	2.82	0.47
51:W:98:G:H4'	52:T:98:LYS:HD3	1.97	0.47
4:7:45:ASN:HB2	53:9:304:GLU:CD	2.37	0.47
8:F:90:ARG:NH2	27:i:136:PHE:OXT	2.45	0.47
37:N:306:PHE:O	37:N:332:ARG:NH1	2.48	0.47
41:w:159:ASP:N	41:w:159:ASP:OD1	2.47	0.47
43:2:2249:C:N4	43:2:2251:G:O6	2.47	0.47
2:4:136:ARG:NH2	43:2:4435:U:O2'	2.48	0.47
16:Q:16:LYS:NZ	43:2:97:G:OP1	2.47	0.47
18:U:68:ARG:NH1	18:U:124:ASP:O	2.46	0.47
20:X:38:THR:HG22	20:X:45:THR:HG22	1.96	0.47
21:Z:95:VAL:HG13	21:Z:116:ALA:HB2	1.96	0.47
21:Z:124:ASP:OD1	21:Z:124:ASP:N	2.47	0.47
27:i:5:MET:O	27:i:28:ASN:ND2	2.46	0.47
29:m:114:CYS:HB2	29:m:169:VAL:HG13	1.96	0.47
37:N:251:CYS:HB3	37:N:293:MET:HE3	1.95	0.47
40:v:120:THR:HG22	40:v:201:LYS:HD3	1.97	0.47
41:w:108:LYS:HZ1	52:T:265:ARG:NH1	2.13	0.47
41:w:304:LEU:HD13	52:T:264:GLY:HA3	1.96	0.47
41:w:319:PRO:HA	54:w:801:GTP:O3G	2.14	0.47
34:A:68:ILE:HD12	43:2:4258:C:H5'	1.96	0.47
38:R:148:ARG:NH1	38:R:149:ALA:O	2.47	0.47
15:P:2:SER:N	43:2:2406:G:N7	2.62	0.47
26:h:121:ARG:NH1	43:2:194:C:O2	2.48	0.47
38:R:191:ARG:NH1	43:2:4373:G:OP1	2.48	0.47
41:w:21:PRO:O	41:w:35:ARG:NH1	2.47	0.47
5:B:165:HIS:ND1	5:B:166:THR:O	2.48	0.47
33:z:85:THR:HG22	33:z:109:ARG:HH12	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
35:C:74:ILE:HG21	51:W:115:A:H1'	1.97	0.47
38:R:9:LEU:HA	38:R:12:LYS:HD2	1.98	0.47
38:R:184:LYS:NZ	43:2:4337:C:OP2	2.48	0.47
1:y:16:ARG:NH1	43:2:1975:G:O2'	2.48	0.46
30:n:2:SER:N	43:2:4946:U:O2'	2.47	0.46
43:2:2045:G:N2	43:2:2046:G:N7	2.63	0.46
20:X:23:ARG:NH1	43:2:2875:C:OP1	2.45	0.46
30:n:37:ASP:N	30:n:37:ASP:OD1	2.47	0.46
38:R:73:ILE:HG21	52:T:209:THR:HB	1.96	0.46
52:T:45:VAL:HA	52:T:48:VAL:HG22	1.98	0.46
4:7:50:ARG:NH1	43:2:5006:U:OP2	2.48	0.46
35:C:45:ASN:ND2	52:T:179:GLY:O	2.48	0.46
43:2:2704:C:H2'	43:2:2705:G:H8	1.79	0.46
22:a:38:ARG:NH1	43:2:2527:A:OP2	2.49	0.46
26:h:10:ASP:HB3	26:h:13:LYS:HB2	1.97	0.46
28:l:49:VAL:HG21	28:l:97:ILE:HD11	1.96	0.46
31:o:161:ARG:O	31:o:182:ASN:ND2	2.48	0.46
37:N:39:ILE:HA	37:N:43:ARG:HH21	1.80	0.46
38:R:77:TRP:CE3	52:T:177:LEU:HB2	2.47	0.46
53:9:275:VAL:CG2	53:9:295:GLN:HG2	2.44	0.46
2:4:503:THR:H	2:4:507:ARG:HH21	1.64	0.46
6:D:300:ARG:HH21	43:2:1447:C:H1'	1.79	0.46
37:N:471:VAL:HB	37:N:483:TRP:HB2	1.96	0.46
38:R:91:ARG:NH1	38:R:92:LEU:O	2.45	0.46
17:S:98:ARG:NH1	43:2:4872:2MG:O6	2.49	0.46
31:o:278:THR:OG1	31:o:279:ASN:N	2.48	0.46
49:Y:7:ASP:OD1	49:Y:7:ASP:N	2.48	0.46
6:D:109:ARG:NH2	43:2:2343:G:OP2	2.44	0.46
31:o:155:GLY:O	31:o:158:ARG:NH1	2.48	0.46
38:R:19:GLU:OE1	38:R:23:ARG:NH1	2.48	0.46
9:G:219:VAL:HG22	9:G:223:ARG:HD2	1.98	0.46
16:Q:35:ARG:NH2	43:2:337:U:OP1	2.45	0.46
38:R:100:PRO:CG	52:T:165:ASP:OD2	2.55	0.46
44:8:47:C:H1'	44:8:61:A:H2'	1.97	0.46
53:9:293:CYS:SG	53:9:300:LEU:CD2	3.04	0.46
6:D:268:ARG:HB3	43:2:654:C:H5'	1.96	0.46
31:o:146:PRO:HB2	31:o:203:ILE:HG21	1.97	0.46
33:z:99:GLN:HA	33:z:102:ARG:HD2	1.98	0.46
43:2:2780:C:OP1	45:g:134:LYS:NZ	2.49	0.46
53:9:300:LEU:CD2	53:9:304:GLU:OE1	2.64	0.46
31:o:148:THR:HG22	31:o:200:LYS:HG2	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
41:w:289:PHE:HB3	52:T:276:LEU:HD12	1.97	0.46
53:9:284:PRO:CD	53:9:285:ALA:N	2.77	0.46
3:6:238:ASP:OD1	3:6:238:ASP:N	2.48	0.45
9:G:104:PRO:HG2	9:G:194:VAL:HG12	1.98	0.45
23:b:1:MET:HE3	23:b:35:PRO:HD3	1.99	0.45
26:h:74:TYR:OH	44:8:75:G:OP2	2.34	0.45
34:A:118:LYS:NZ	43:2:1174:G:O3'	2.48	0.45
37:N:193:ARG:HE	37:N:236:GLY:HA3	1.79	0.45
43:2:3718:A:O2'	43:2:3933:G:N2	2.47	0.45
52:T:235:LEU:O	52:T:239:SER:HB2	2.17	0.45
6:D:168:VAL:O	6:D:172:LYS:HB2	2.16	0.45
20:X:59:SER:O	43:2:2652:G:N2	2.49	0.45
28:l:125:MET:SD	28:l:125:MET:N	2.90	0.45
36:J:232:GLN:NE2	37:N:454:GLY:O	2.49	0.45
40:v:93:SER:HA	40:v:96:LEU:HD12	1.98	0.45
43:2:1408:G:O2'	43:2:1412:G:O6	2.34	0.45
22:a:46:LYS:NZ	43:2:2706:G:O6	2.42	0.45
23:b:147:ASP:HB3	23:b:150:ILE:HB	1.99	0.45
41:w:22:ASP:OD1	41:w:22:ASP:N	2.47	0.45
44:8:126:C:O2'	44:8:128:C:N4	2.48	0.45
2:4:250:ALA:HB2	2:4:339:LEU:HB2	1.98	0.45
18:U:195:ARG:NH2	43:2:98:A:O3'	2.49	0.45
33:z:11:ARG:NH2	43:2:4678:G:N7	2.64	0.45
43:2:359:A:N3	43:2:363:A:O2'	2.49	0.45
53:9:286:THR:C	53:9:287:THR:CG2	2.88	0.45
6:D:143:ARG:HA	6:D:143:ARG:HD2	1.78	0.45
43:2:1555:G:H1	43:2:1572:U:H3	1.63	0.45
43:2:3936:A:H2	43:2:4174:U:H3	1.65	0.45
52:T:98:LYS:HG3	52:T:99:ARG:HG3	1.98	0.45
3:6:214:GLU:HA	3:6:217:VAL:HG22	1.99	0.45
18:U:15:GLN:NE2	43:2:305:A:OP2	2.50	0.45
35:C:116:ASP:OD1	35:C:116:ASP:N	2.47	0.45
41:w:108:LYS:NZ	52:T:265:ARG:HH12	2.14	0.45
19:V:106:ASP:O	43:2:4910:G:N2	2.49	0.45
20:X:69:TRP:HZ3	29:m:176:ASP:HB2	1.80	0.45
37:N:16:ARG:HA	37:N:36:PRO:HA	1.99	0.45
37:N:40:THR:H	37:N:43:ARG:HE	1.64	0.45
40:v:63:SER:OG	40:v:104:PHE:O	2.35	0.45
43:2:1892:A:OP2	43:2:3875:G:N1	2.50	0.45
43:2:2039:G:H5''	43:2:2040:A:H5''	1.99	0.45
43:2:3722:G:H2'	43:2:3723:A:C8	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
43:2:4452:U:O2'	43:2:4453:C:O2	2.33	0.45
3:6:49:VAL:HG11	3:6:87:SER:HB3	1.98	0.45
10:H:9:LEU:HA	10:H:12:LYS:HD2	1.97	0.45
39:u:30:ARG:NH2	43:2:1859:C:OP1	2.49	0.45
2:4:62:LEU:HD22	2:4:99:ILE:HG23	1.98	0.45
4:7:56:ARG:HH21	4:7:61:LYS:HD3	1.81	0.45
24:c:83:LYS:NZ	43:2:1685:G:O2'	2.50	0.45
43:2:1524:A2M:H2	43:2:1652:U:H3	1.82	0.45
5:B:57:VAL:HG22	5:B:367:PHE:HB3	1.99	0.45
5:B:249:ARG:NH1	43:2:2837:U:OP1	2.45	0.45
22:a:105:LEU:HD23	22:a:138:LEU:HD23	1.98	0.45
23:b:66:GLN:O	43:2:729:2MG:N2	2.43	0.45
4:7:43:LYS:CB	53:9:301:GLY:HA3	2.47	0.44
6:D:301:ALA:HB1	21:Z:132:LYS:HD3	1.99	0.44
41:w:289:PHE:CZ	52:T:272:ASP:O	2.67	0.44
43:2:3615:G:C4'	53:9:303:LYS:HZ1	2.30	0.44
37:N:180:ILE:HD12	37:N:205:LEU:HD21	1.99	0.44
40:v:53:LEU:HD22	40:v:65:MET:HE1	1.99	0.44
41:w:406:ILE:HD11	41:w:457:PRO:HB3	1.99	0.44
43:2:1405:C:N4	43:2:1408:G:O2'	2.50	0.44
2:4:538:HIS:HA	2:4:541:VAL:HG12	1.99	0.44
2:4:620:HIS:O	2:4:633:ARG:NH2	2.50	0.44
3:6:111:ASN:ND2	3:6:155:SER:O	2.51	0.44
17:S:11:ARG:NH1	17:S:58:THR:O	2.49	0.44
36:J:129:GLU:HB2	41:w:64:SER:H	1.82	0.44
43:2:3855:C:H2'	43:2:3856:A:H8	1.81	0.44
50:O:3:ARG:NH2	50:O:41:TYR:OH	2.50	0.44
2:4:366:THR:HG23	3:6:175:SER:HA	1.99	0.44
10:H:4:ILE:O	10:H:56:ARG:NH1	2.45	0.44
17:S:27:ILE:HA	17:S:38:VAL:HG12	1.99	0.44
47:j:111:VAL:HG21	47:j:117:LEU:HD11	1.99	0.44
16:Q:190:ARG:NH2	43:2:4351:U:OP1	2.51	0.44
43:2:1478:C:H2'	43:2:1479:G:H8	1.83	0.44
43:2:1802:A:O2'	43:2:1837:A:OP1	2.35	0.44
24:c:108:ARG:O	24:c:112:ASN:ND2	2.38	0.44
35:C:222:GLN:O	35:C:225:GLN:NE2	2.44	0.44
35:C:262:LYS:HE2	51:W:120:U:H4'	2.00	0.44
37:N:104:THR:OG1	37:N:485:ARG:O	2.35	0.44
41:w:339:ALA:O	54:w:801:GTP:C4'	2.63	0.44
43:2:4572:U:O2'	43:2:4573:G:OP1	2.34	0.44
49:Y:127:ARG:HB2	49:Y:139:TYR:HB3	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:6:85:ARG:HD2	3:6:94:ILE:HD13	2.00	0.44
4:7:45:ASN:OD1	53:9:289:ASP:OD2	2.34	0.44
5:B:57:VAL:HG23	5:B:366:LYS:HB3	1.99	0.44
12:K:87:ARG:HE	12:K:87:ARG:HB3	1.66	0.44
29:m:20:VAL:HA	29:m:23:ARG:HG3	2.00	0.44
32:p:214:SER:OG	32:p:215:SER:N	2.50	0.44
33:z:2:ALA:N	43:2:4593:C:OP2	2.50	0.44
35:C:55:VAL:HG23	35:C:60:ILE:HG12	1.99	0.44
39:u:37:LYS:NZ	43:2:1862:U:OP1	2.50	0.44
43:2:1883:OMG:OP1	48:k:47:ARG:NH1	2.50	0.44
43:2:4272:G:C2	52:T:18:PHE:CE2	3.06	0.44
43:2:4426:C:N4	43:2:4427:G:O6	2.51	0.44
53:9:277:ASP:O	53:9:278:GLU:C	2.60	0.44
43:2:1183:C:H2'	43:2:1184:A:H8	1.83	0.44
43:2:2557:G:H1	43:2:2570:U:H3	1.65	0.44
52:T:129:ASP:O	52:T:131:LYS:NZ	2.47	0.44
32:p:213:LEU:HD13	32:p:247:MET:HG3	1.99	0.44
43:2:62:A:N3	43:2:77:U:O2'	2.48	0.44
43:2:1855:G:O6	43:2:1880:G:N2	2.51	0.44
48:k:4:LEU:HB2	48:k:121:ARG:HG3	2.00	0.44
50:O:33:LYS:HG2	50:O:46:VAL:HG22	1.99	0.44
53:9:300:LEU:HD11	53:9:308:LEU:HD11	2.00	0.44
2:4:176:TYR:HD1	2:4:271:LEU:HD22	1.82	0.43
4:7:1:MET:HE3	4:7:15:PRO:HG2	2.00	0.43
6:D:242:PRO:O	43:2:2296:G:O2'	2.35	0.43
24:c:130:ARG:NH1	43:2:1837:A:OP2	2.51	0.43
25:e:22:VAL:HG21	43:2:4494:OMG:HM21	2.00	0.43
28:l:105:ASP:N	28:l:105:ASP:OD1	2.47	0.43
34:A:67:LYS:HB2	34:A:67:LYS:HE3	1.82	0.43
35:C:64:ILE:HG22	35:C:105:LEU:HD11	1.99	0.43
40:v:126:ARG:HA	40:v:126:ARG:HD3	1.85	0.43
44:8:13:G:O2'	49:Y:121:LYS:O	2.36	0.43
6:D:186:SER:O	6:D:186:SER:OG	2.36	0.43
11:I:91:LYS:HG2	11:I:145:ILE:HG22	2.00	0.43
13:L:63:LEU:HD13	43:2:87:A:H4'	2.00	0.43
18:U:143:ARG:NH2	18:U:152:THR:OG1	2.51	0.43
43:2:1480:C:O3'	43:2:1482:G:N2	2.51	0.43
53:9:314:LYS:C	53:9:318:TYR:CE2	2.95	0.43
1:y:63:THR:OG1	1:y:70:GLN:NE2	2.45	0.43
10:H:52:LYS:NZ	44:8:61:A:OP1	2.44	0.43
11:I:106:GLN:NE2	11:I:113:GLU:OE2	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
27:i:85:TYR:OH	27:i:127:ASN:ND2	2.50	0.43
43:2:4244:A:H62	43:2:4264:G:H21	1.65	0.43
49:Y:131:ARG:HB2	49:Y:135:ARG:HB2	2.00	0.43
2:4:442:ILE:HD13	4:7:89:THR:HG21	2.00	0.43
11:I:94:SER:HB2	11:I:142:ASP:HB3	1.99	0.43
31:o:130:LYS:HG3	43:2:1284:G:H21	1.83	0.43
41:w:296:GLN:OE1	52:T:269:GLN:HB2	2.18	0.43
43:2:120:A:N1	43:2:148:C:O2'	2.46	0.43
43:2:1810:G:H2'	43:2:1811:G:H8	1.83	0.43
43:2:3890:A:N6	43:2:4570:G:H2'	2.33	0.43
46:d:65:ARG:HD2	46:d:67:LYS:H	1.83	0.43
53:9:280:LEU:HB2	53:9:282:GLN:NE2	2.26	0.43
5:B:297:LYS:HE2	5:B:297:LYS:HB3	1.86	0.43
14:M:49:TRP:O	43:2:1646:A:O2'	2.35	0.43
38:R:102:GLU:OE1	38:R:103:LYS:NZ	2.47	0.43
40:v:153:LEU:HD12	40:v:158:LEU:HD22	1.99	0.43
53:9:275:VAL:HA	53:9:294:CYS:HB3	2.01	0.43
53:9:304:GLU:C	53:9:307:SER:HG	2.25	0.43
11:I:34:LEU:HD11	11:I:149:ASN:HB3	2.01	0.43
43:2:1100:U:O2	43:2:1195:G:C6	2.71	0.43
53:9:275:VAL:HG21	53:9:295:GLN:HG2	1.99	0.43
3:6:31:SER:OG	3:6:32:GLU:N	2.51	0.43
3:6:88:LEU:HD12	3:6:94:ILE:HD11	2.00	0.43
11:I:64:ARG:HA	11:I:67:LEU:HB2	2.00	0.43
19:V:54:TYR:OH	19:V:73:PHE:O	2.36	0.43
41:w:301:PHE:CE2	52:T:266:ILE:HD13	2.53	0.43
53:9:251:ARG:HG2	53:9:274:MET:CA	2.48	0.43
4:7:23:ARG:NH1	53:9:298:ARG:HB2	2.33	0.43
5:B:228:TYR:O	43:2:2835:A:O2'	2.34	0.43
43:2:1603:C:H2'	43:2:1604:G:H8	1.83	0.43
2:4:593:MET:HE2	2:4:593:MET:HB3	1.96	0.43
17:S:86:TRP:O	17:S:89:THR:OG1	2.36	0.43
43:2:500:G:OP1	43:2:504:G:N2	2.47	0.43
43:2:977:C:H2'	43:2:978:2MG:H8	1.82	0.43
43:2:1397:A:HO2'	43:2:1467:C:HO2'	1.62	0.43
43:2:1870:C:H2'	43:2:1871:A2M:H8	2.01	0.43
43:2:2466:G:O2'	43:2:2469:C:O2	2.37	0.43
43:2:4272:G:C2	52:T:18:PHE:CZ	3.07	0.43
43:2:4560:C:O2	43:2:4561:C:N4	2.52	0.43
53:9:255:THR:O	53:9:259:ARG:HG3	2.18	0.43
3:6:44:ASP:OD1	3:6:44:ASP:N	2.47	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
31:o:251:LYS:HB3	31:o:251:LYS:HE3	1.87	0.43
41:w:418:ALA:O	41:w:422:LEU:HB2	2.19	0.43
43:2:4620:OMU:HM23	43:2:4620:OMU:H1'	1.85	0.43
47:j:32:ARG:HB3	47:j:48:GLU:HG3	2.01	0.43
53:9:284:PRO:HB2	53:9:311:TRP:HH2	1.84	0.43
53:9:297:ILE:HG23	53:9:300:LEU:HD12	2.01	0.43
5:B:161:ARG:HG2	5:B:184:GLN:HG3	2.01	0.42
15:P:16:LYS:HA	15:P:16:LYS:HD2	1.85	0.42
53:9:300:LEU:HD13	53:9:308:LEU:HD12	2.01	0.42
2:4:431:GLU:OE1	3:6:79:GLN:NE2	2.52	0.42
2:4:474:ASP:OD1	2:4:474:ASP:N	2.48	0.42
29:m:128:ARG:NE	43:2:3681:G:OP2	2.52	0.42
36:J:202:ASN:ND2	36:J:213:VAL:O	2.52	0.42
36:J:235:LYS:HB3	41:w:86:VAL:HG13	2.02	0.42
37:N:133:SER:OG	37:N:134:GLY:N	2.52	0.42
43:2:4633:G:O2'	43:2:4635:A:OP2	2.31	0.42
9:G:149:ASN:O	9:G:151:LYS:NZ	2.51	0.42
16:Q:106:SER:OG	43:2:73:A:OP1	2.37	0.42
23:b:77:ASN:HB3	23:b:98:ARG:HG2	2.01	0.42
27:i:35:ASP:OD1	27:i:35:ASP:N	2.53	0.42
35:C:58:ARG:NH2	51:W:49:A:C8	2.87	0.42
35:C:69:ILE:HD11	52:T:137:GLU:CB	2.45	0.42
43:2:1194:G:N2	43:2:1195:G:O6	2.52	0.42
43:2:1592:G:O2'	43:2:2840:A:OP1	2.37	0.42
43:2:1853:G:OP2	43:2:1853:G:N2	2.45	0.42
29:m:159:SER:OG	29:m:162:ASN:OD1	2.37	0.42
37:N:193:ARG:NH2	37:N:235:ALA:O	2.52	0.42
43:2:2361:G:O2'	43:2:3859:G:O6	2.37	0.42
43:2:2890:C:H42	43:2:3611:A:H61	1.68	0.42
9:G:158:ALA:HB2	9:G:190:LEU:HD12	2.00	0.42
14:M:80:GLU:HA	44:8:94:G:H4'	2.02	0.42
41:w:99:MET:HE2	41:w:99:MET:HB3	1.91	0.42
41:w:108:LYS:HZ1	52:T:265:ARG:HH12	1.67	0.42
2:4:251:VAL:HG13	2:4:284:LEU:HD12	2.00	0.42
3:6:56:CYS:SG	25:e:123:LYS:NZ	2.84	0.42
4:7:23:ARG:NH1	53:9:298:ARG:HD2	2.34	0.42
5:B:242:ARG:NH2	43:2:2856:C:O2	2.48	0.42
9:G:143:VAL:HG22	9:G:203:ALA:HB2	2.02	0.42
22:a:44:LEU:HD22	22:a:49:LEU:HD22	2.01	0.42
37:N:123:SER:HB3	37:N:128:TYR:HB2	2.01	0.42
38:R:19:GLU:HG3	38:R:23:ARG:HD3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
40:v:18:LYS:NZ	43:2:2000:G:OP1	2.49	0.42
43:2:2295:C:H2'	43:2:2296:G:H8	1.85	0.42
43:2:2780:C:H2'	43:2:2781:G:H8	1.84	0.42
49:Y:94:MET:HE3	49:Y:94:MET:HB2	1.82	0.42
4:7:43:LYS:HB3	53:9:301:GLY:N	2.34	0.42
29:m:70:LYS:HG3	43:2:2594:C:H5''	2.02	0.42
43:2:1436:C:O2'	43:2:2098:G:OP2	2.35	0.42
43:2:3686:G:H2'	43:2:3687:A:H8	1.85	0.42
17:S:3:PHE:H	23:b:175:PHE:HZ	1.67	0.42
38:R:39:LEU:HB3	52:T:142:MET:HB2	2.01	0.42
43:2:153:G:H2'	43:2:154:G:H8	1.83	0.42
43:2:2557:G:H22	43:2:2570:U:H3	1.67	0.42
43:2:4407:G:H2'	43:2:4408:G:C8	2.55	0.42
49:Y:64:ASN:HD22	49:Y:64:ASN:N	2.17	0.42
8:F:29:ARG:NH1	43:2:2522:7MG:OP1	2.53	0.42
17:S:97:ALA:HA	17:S:100:ARG:HG2	2.02	0.42
35:C:164:LYS:HB2	35:C:180:PHE:HE2	1.85	0.42
36:J:166:LYS:O	41:w:44:TYR:OH	2.37	0.42
37:N:44:LEU:HA	37:N:47:VAL:HG22	2.00	0.42
41:w:390:PRO:HA	41:w:393:HIS:HD2	1.84	0.42
20:X:23:ARG:HA	20:X:26:VAL:HG22	2.02	0.42
35:C:208:MET:HE3	35:C:208:MET:HB2	1.82	0.42
37:N:228:VAL:HB	37:N:242:LEU:HB2	2.02	0.42
42:r:275:GLN:HA	42:r:278:LYS:HG2	2.02	0.42
43:2:714:G:H2'	43:2:715:G:H8	1.84	0.42
43:2:4268:A:H61	43:2:4281:A:H61	1.66	0.42
53:9:271:SER:O	53:9:297:ILE:HD12	2.20	0.42
53:9:281:ALA:C	53:9:283:HIS:H	2.28	0.42
3:6:8:GLU:HB3	43:2:4596:C:H4'	2.01	0.41
5:B:234:ARG:NH1	5:B:268:ARG:O	2.53	0.41
11:I:105:ILE:HD11	11:I:109:GLY:HA2	2.03	0.41
18:U:46:ASP:OD1	18:U:46:ASP:N	2.50	0.41
43:2:1207:C:H2'	43:2:1208:G:H8	1.85	0.41
43:2:1554:A:H3'	43:2:1555:G:H8	1.85	0.41
43:2:2521:G:H2'	43:2:2522:7MG:H82	2.02	0.41
43:2:4894:A:H5''	43:2:4895:C:H2'	2.02	0.41
8:F:76:ARG:NH1	43:2:2583:C:OP2	2.46	0.41
17:S:63:LYS:HB2	17:S:63:LYS:HE2	1.83	0.41
17:S:114:LYS:HD2	43:2:4929:C:H5''	2.03	0.41
17:S:124:LYS:HB2	17:S:124:LYS:HE3	1.82	0.41
43:2:1171:G:O6	43:2:1172:C:N4	2.53	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:4:441:TYR:OH	4:7:97:GLU:OE2	2.38	0.41
4:7:27:LYS:HE2	53:9:296:ASP:OD2	2.19	0.41
4:7:62:GLU:HG3	4:7:108:ILE:HD11	2.02	0.41
7:E:48:LEU:HD21	7:E:60:ILE:HG21	2.01	0.41
26:h:1:MET:N	43:2:226:G:OP2	2.46	0.41
41:w:322:GLY:HA3	54:w:801:GTP:N7	2.36	0.41
43:2:493:G:N1	43:2:660:A:C2	2.87	0.41
43:2:2773:OMG:HM22	43:2:2774:C:H5'	2.02	0.41
43:2:3870:C:H2'	43:2:3871:A:H8	1.85	0.41
2:4:485:LYS:HB2	2:4:485:LYS:HE3	1.83	0.41
4:7:5:LYS:HA	4:7:5:LYS:HD3	1.83	0.41
19:V:55:LEU:HD23	19:V:58:LEU:HD12	2.02	0.41
27:i:113:GLU:HA	27:i:116:VAL:HG12	2.02	0.41
41:w:453:ARG:NH2	43:2:3630:A:O2'	2.54	0.41
43:2:500:G:OP2	43:2:503:C:O2'	2.37	0.41
43:2:1411:C:O2'	43:2:1412:G:N7	2.49	0.41
11:I:7:ASN:HD22	11:I:56:ARG:HH21	1.68	0.41
16:Q:177:LYS:HB3	16:Q:180:ALA:HB3	2.02	0.41
22:a:82:LYS:O	43:2:2863:G:O2'	2.37	0.41
27:i:76:ASN:HB3	27:i:78:ASN:H	1.84	0.41
37:N:167:ASP:OD1	37:N:167:ASP:N	2.45	0.41
51:W:23:A:N3	51:W:118:C:O2'	2.46	0.41
20:X:7:LYS:HE2	20:X:7:LYS:HB3	1.86	0.41
37:N:200:LYS:HB3	37:N:224:LYS:HB3	2.03	0.41
41:w:289:PHE:CE2	52:T:273:LEU:HD23	2.55	0.41
41:w:301:PHE:CZ	52:T:266:ILE:HD13	2.55	0.41
43:2:1255:A:H5'	43:2:1257:A:H2	1.84	0.41
43:2:1541:C:H1'	43:2:2448:G:H21	1.85	0.41
43:2:2364:OMG:H1'	43:2:2364:OMG:HM23	1.85	0.41
43:2:4275:G:C6	52:T:80:PHE:CD2	3.08	0.41
1:y:114:ARG:NH1	1:y:165:SER:O	2.54	0.41
2:4:494:LYS:HD3	2:4:494:LYS:HA	1.92	0.41
8:F:65:MET:HE1	43:2:2748:C:H4'	2.02	0.41
20:X:48:LYS:HE2	20:X:48:LYS:HB3	1.82	0.41
34:A:35:ARG:HD2	34:A:123:ILE:HA	2.01	0.41
35:C:197:LYS:HG3	35:C:202:GLN:HB2	2.03	0.41
37:N:352:THR:HG21	37:N:367:ARG:HH11	1.84	0.41
43:2:2281:U:H2'	43:2:2282:A:H8	1.86	0.41
43:2:4268:A:N7	43:2:4279:A:N6	2.68	0.41
43:2:4314:C:H4'	52:T:27:ASN:HD21	1.86	0.41
9:G:187:LYS:HE2	9:G:187:LYS:HB3	1.90	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:H:55:ALA:O	10:H:59:THR:OG1	2.38	0.41
23:b:97:TYR:HB3	23:b:108:GLN:HE21	1.86	0.41
29:m:32:VAL:HG12	29:m:37:ARG:HH21	1.85	0.41
29:m:145:LYS:HD3	29:m:145:LYS:HA	1.88	0.41
31:o:222:LEU:HD12	31:o:223:ARG:HG2	2.02	0.41
36:J:225:SER:HB2	41:w:120:LEU:HD21	2.01	0.41
41:w:334:LYS:NZ	43:2:3821:A:OP1	2.51	0.41
43:2:967:C:N4	43:2:2259:G:O2'	2.53	0.41
43:2:2045:G:O6	43:2:3870:C:O2'	2.39	0.41
43:2:3616:U:C6	53:9:302:ARG:HD2	2.48	0.41
1:y:119:ARG:NH2	43:2:1974:U:OP2	2.54	0.41
1:y:127:GLY:HA2	1:y:130:LYS:HD2	2.03	0.41
5:B:54:THR:OG1	5:B:55:HIS:N	2.54	0.41
6:D:29:LYS:HD3	6:D:29:LYS:HA	1.91	0.41
22:a:75:HIS:ND1	43:2:2889:G:OP1	2.48	0.41
26:h:36:LYS:HE3	26:h:36:LYS:HB3	1.88	0.41
28:l:107:ARG:NH2	43:2:2263:A:OP1	2.54	0.41
31:o:90:ALA:HB2	43:2:2259:G:H21	1.85	0.41
35:C:262:LYS:HD3	35:C:262:LYS:HA	1.89	0.41
37:N:276:ASP:OD1	37:N:276:ASP:N	2.49	0.41
40:v:64:ARG:NH1	40:v:65:MET:O	2.54	0.41
43:2:53:C:O2'	43:2:2461:G:O2'	2.38	0.41
43:2:1992:U:H5'	43:2:1993:C:H5'	2.02	0.41
43:2:3664:G:H2'	43:2:3665:G:H8	1.86	0.41
43:2:4271:A:OP1	52:T:12:THR:HG23	2.21	0.41
43:2:4271:A:N6	43:2:4273:A:N3	2.68	0.41
47:j:105:LEU:HG	47:j:107:THR:HG23	2.03	0.41
3:6:106:ASN:ND2	25:e:136:ALA:O	2.54	0.41
4:7:43:LYS:CB	53:9:301:GLY:CA	2.98	0.41
4:7:106:LYS:HD2	4:7:106:LYS:HA	1.89	0.41
5:B:394:LYS:NZ	43:2:5000:G:OP1	2.54	0.41
22:a:62:ARG:NH2	43:2:4646:U:OP2	2.52	0.41
25:e:100:ASP:N	25:e:100:ASP:OD1	2.54	0.41
43:2:456:C:H2'	43:2:457:G:H8	1.86	0.41
43:2:4537:C:H2'	43:2:4538:G:C8	2.50	0.41
46:d:20:LYS:HB2	46:d:20:LYS:HE2	1.93	0.41
11:I:21:LYS:HE3	11:I:21:LYS:HB2	1.88	0.40
19:V:191:LYS:H	19:V:191:LYS:HG2	1.67	0.40
26:h:103:LYS:NZ	43:2:231:U:O2	2.48	0.40
35:C:77:ALA:O	35:C:108:ARG:NH1	2.54	0.40
43:2:1480:C:O2'	43:2:1482:G:OP2	2.37	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
43:2:4670:C:O2'	43:2:4672:A:OP2	2.36	0.40
43:2:5066:U:OP1	49:Y:43:LYS:NZ	2.45	0.40
53:9:258:LEU:HD13	53:9:315:LEU:HB3	2.03	0.40
2:4:151:LEU:HA	2:4:154:VAL:HG12	2.03	0.40
16:Q:170:THR:OG1	16:Q:173:GLU:OE1	2.33	0.40
36:J:164:PRO:HB2	36:J:167:TYR:HD1	1.87	0.40
40:v:21:GLU:O	40:v:25:ASN:ND2	2.44	0.40
41:w:331:ARG:HD3	41:w:335:VAL:HG21	2.02	0.40
43:2:1323:A:H2'	43:2:1324:A:O4'	2.22	0.40
43:2:3616:U:N1	53:9:302:ARG:CD	2.50	0.40
43:2:3658:C:H2'	43:2:3659:G:H8	1.86	0.40
43:2:4523:A2M:H5'	43:2:4523:A2M:H8	2.03	0.40
2:4:238:MET:HA	2:4:241:ILE:HB	2.04	0.40
2:4:534:LYS:HD3	2:4:534:LYS:HA	1.93	0.40
2:4:538:HIS:O	2:4:542:GLN:HB2	2.21	0.40
7:E:20:LEU:HD23	7:E:20:LEU:HA	1.97	0.40
11:I:187:VAL:HG12	11:I:188:GLN:HG3	2.03	0.40
16:Q:190:ARG:HH22	43:2:4351:U:H5''	1.86	0.40
33:z:23:PRO:O	33:z:27:SER:OG	2.38	0.40
41:w:105:ASP:N	41:w:105:ASP:OD1	2.53	0.40
41:w:410:TYR:OH	41:w:450:ASP:OD2	2.38	0.40
42:r:270:LYS:NZ	43:2:2025:A:O2'	2.54	0.40
43:2:2306:G:OP1	48:k:128:ARG:NH1	2.54	0.40
43:2:2411:C:H2'	43:2:2412:A:H8	1.86	0.40
5:B:95:THR:HG22	43:2:4910:G:H4'	2.03	0.40
6:D:94:ASN:OD1	6:D:94:ASN:N	2.55	0.40
29:m:37:ARG:NH1	43:2:4088:C:OP1	2.49	0.40
29:m:146:THR:OG1	29:m:159:SER:O	2.39	0.40
41:w:214:ILE:HD12	41:w:241:LEU:HD11	2.02	0.40
43:2:1398:A:N6	43:2:1419:G:O2'	2.54	0.40
21:Z:4:ASP:O	32:p:115:ARG:NH1	2.55	0.40
22:a:80:LYS:HA	22:a:80:LYS:HD2	1.94	0.40
31:o:139:LYS:NZ	43:2:712:C:OP1	2.45	0.40
32:p:31:LYS:HE3	43:2:2099:G:H5'	2.02	0.40
34:A:144:LYS:O	34:A:148:THR:OG1	2.40	0.40
41:w:96:GLN:HG2	41:w:121:LEU:HD22	2.04	0.40
41:w:230:MET:HE1	41:w:272:LEU:HD21	2.04	0.40
41:w:314:GLY:HA2	41:w:360:ILE:HB	2.02	0.40
43:2:1891:A:H3'	43:2:3875:G:H1	1.86	0.40
53:9:252:THR:O	53:9:274:MET:N	2.49	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	
1	y	163/165 (99%)	159 (98%)	4 (2%)	0	100	100
2	4	616/634 (97%)	555 (90%)	60 (10%)	1 (0%)	44	71
3	6	242/245 (99%)	226 (93%)	16 (7%)	0	100	100
4	7	133/163 (82%)	129 (97%)	4 (3%)	0	100	100
5	B	401/403 (100%)	380 (95%)	21 (5%)	0	100	100
6	D	356/427 (83%)	333 (94%)	23 (6%)	0	100	100
7	E	96/115 (84%)	92 (96%)	4 (4%)	0	100	100
8	F	107/117 (92%)	105 (98%)	2 (2%)	0	100	100
9	G	215/266 (81%)	204 (95%)	11 (5%)	0	100	100
10	H	120/123 (98%)	118 (98%)	2 (2%)	0	100	100
11	I	188/192 (98%)	178 (95%)	10 (5%)	0	100	100
12	K	100/105 (95%)	96 (96%)	4 (4%)	0	100	100
13	L	109/148 (74%)	102 (94%)	7 (6%)	0	100	100
14	M	84/97 (87%)	79 (94%)	5 (6%)	0	100	100
15	P	48/51 (94%)	46 (96%)	2 (4%)	0	100	100
16	Q	201/211 (95%)	189 (94%)	12 (6%)	0	100	100
17	S	133/215 (62%)	127 (96%)	6 (4%)	0	100	100
18	U	178/204 (87%)	172 (97%)	6 (3%)	0	100	100
19	V	199/203 (98%)	193 (97%)	6 (3%)	0	100	100
20	X	89/92 (97%)	85 (96%)	4 (4%)	0	100	100
21	Z	149/188 (79%)	148 (99%)	1 (1%)	0	100	100
22	a	146/196 (74%)	141 (97%)	5 (3%)	0	100	100
23	b	174/176 (99%)	166 (95%)	8 (5%)	0	100	100
24	c	115/160 (72%)	104 (90%)	9 (8%)	2 (2%)	7	31
25	e	129/140 (92%)	117 (91%)	12 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
26	h	132/145 (91%)	129 (98%)	3 (2%)	0	100	100
27	i	133/136 (98%)	125 (94%)	8 (6%)	0	100	100
28	l	123/137 (90%)	115 (94%)	8 (6%)	0	100	100
29	m	179/257 (70%)	163 (91%)	16 (9%)	0	100	100
30	n	107/110 (97%)	100 (94%)	5 (5%)	2 (2%)	6	29
31	o	231/288 (80%)	212 (92%)	19 (8%)	0	100	100
32	p	224/248 (90%)	209 (93%)	15 (7%)	0	100	100
33	z	63/129 (49%)	61 (97%)	2 (3%)	0	100	100
34	A	163/178 (92%)	152 (93%)	11 (7%)	0	100	100
35	C	244/297 (82%)	234 (96%)	9 (4%)	1 (0%)	30	61
36	J	257/260 (99%)	247 (96%)	8 (3%)	2 (1%)	16	46
37	N	470/485 (97%)	450 (96%)	18 (4%)	2 (0%)	30	61
38	R	197/365 (54%)	186 (94%)	10 (5%)	1 (0%)	25	56
39	u	73/549 (13%)	63 (86%)	8 (11%)	2 (3%)	4	22
40	v	203/239 (85%)	199 (98%)	4 (2%)	0	100	100
41	w	445/731 (61%)	414 (93%)	28 (6%)	3 (1%)	19	50
42	r	22/360 (6%)	21 (96%)	1 (4%)	0	100	100
45	g	110/156 (70%)	104 (94%)	6 (6%)	0	100	100
46	d	102/128 (80%)	96 (94%)	6 (6%)	0	100	100
47	j	109/125 (87%)	104 (95%)	5 (5%)	0	100	100
48	k	127/135 (94%)	120 (94%)	7 (6%)	0	100	100
49	Y	165/184 (90%)	158 (96%)	7 (4%)	0	100	100
50	O	67/70 (96%)	63 (94%)	4 (6%)	0	100	100
52	T	249/306 (81%)	224 (90%)	22 (9%)	3 (1%)	11	38
53	9	61/847 (7%)	52 (85%)	8 (13%)	1 (2%)	8	32
All	All	8747/11901 (74%)	8245 (94%)	482 (6%)	20 (0%)	45	71

All (20) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
24	c	53	PRO
36	J	106	ILE
37	N	59	PRO

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Mol	Chain	Res	Type
37	N	267	ARG
39	u	51	PRO
39	u	55	PRO
41	w	126	ARG
41	w	264	ALA
52	T	148	ASP
52	T	152	VAL
53	9	282	GLN
35	C	44	TYR
36	J	101	VAL
52	T	191	GLY
24	c	43	LYS
41	w	456	ILE
2	4	4	TYR
30	n	107	PRO
30	n	106	TYR
38	R	24	ILE

5.3.2 Protein sidechains ⓘ

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	
1	y	137/137 (100%)	137 (100%)	0	100	100
2	4	562/574 (98%)	562 (100%)	0	100	100
3	6	212/213 (100%)	212 (100%)	0	100	100
4	7	126/149 (85%)	126 (100%)	0	100	100
5	B	349/349 (100%)	349 (100%)	0	100	100
6	D	298/348 (86%)	298 (100%)	0	100	100
7	E	83/97 (86%)	83 (100%)	0	100	100
8	F	94/100 (94%)	94 (100%)	0	100	100
9	G	181/223 (81%)	179 (99%)	2 (1%)	70	82
10	H	109/110 (99%)	109 (100%)	0	100	100
11	I	169/171 (99%)	169 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
12	K	86/89 (97%)	86 (100%)	0	100	100
13	L	95/121 (78%)	95 (100%)	0	100	100
14	M	73/80 (91%)	73 (100%)	0	100	100
15	P	47/48 (98%)	47 (100%)	0	100	100
16	Q	171/177 (97%)	171 (100%)	0	100	100
17	S	115/161 (71%)	115 (100%)	0	100	100
18	U	155/172 (90%)	155 (100%)	0	100	100
19	V	173/174 (99%)	173 (100%)	0	100	100
20	X	74/75 (99%)	74 (100%)	0	100	100
21	Z	136/165 (82%)	136 (100%)	0	100	100
22	a	133/175 (76%)	133 (100%)	0	100	100
23	b	157/157 (100%)	157 (100%)	0	100	100
24	c	106/140 (76%)	106 (100%)	0	100	100
25	e	101/107 (94%)	101 (100%)	0	100	100
26	h	124/135 (92%)	124 (100%)	0	100	100
27	i	117/118 (99%)	117 (100%)	0	100	100
28	l	109/121 (90%)	109 (100%)	0	100	100
29	m	143/199 (72%)	143 (100%)	0	100	100
30	n	88/89 (99%)	88 (100%)	0	100	100
31	o	208/252 (82%)	208 (100%)	0	100	100
32	p	195/215 (91%)	195 (100%)	0	100	100
33	z	61/115 (53%)	61 (100%)	0	100	100
34	A	138/149 (93%)	138 (100%)	0	100	100
35	C	209/250 (84%)	209 (100%)	0	100	100
36	J	227/228 (100%)	227 (100%)	0	100	100
37	N	396/404 (98%)	395 (100%)	1 (0%)	91	94
38	R	173/300 (58%)	173 (100%)	0	100	100
39	u	68/485 (14%)	68 (100%)	0	100	100
40	v	182/214 (85%)	182 (100%)	0	100	100
41	w	405/654 (62%)	405 (100%)	0	100	100
42	r	22/312 (7%)	22 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
45	g	100/133 (75%)	100 (100%)	0	100	100
46	d	94/115 (82%)	94 (100%)	0	100	100
47	j	101/110 (92%)	101 (100%)	0	100	100
48	k	115/121 (95%)	115 (100%)	0	100	100
49	Y	147/163 (90%)	146 (99%)	1 (1%)	81	88
50	O	64/65 (98%)	64 (100%)	0	100	100
52	T	232/279 (83%)	232 (100%)	0	100	100
53	9	60/733 (8%)	53 (88%)	7 (12%)	4	17
All	All	7720/10271 (75%)	7709 (100%)	11 (0%)	92	96

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
9	G	137[A]	ARG
9	G	137[B]	ARG
37	N	376	ASN
49	Y	64	ASN
53	9	251	ARG
53	9	274	MET
53	9	275	VAL
53	9	277	ASP
53	9	278	GLU
53	9	279	GLU
53	9	280	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (103) such sidechains are listed below:

Mol	Chain	Res	Type
1	y	65	GLN
2	4	45	HIS
2	4	84	ASN
2	4	98	GLN
2	4	228	HIS
2	4	414	GLN
2	4	421	ASN
2	4	504	GLN
3	6	21	ASN
3	6	75	ASN

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Mol	Chain	Res	Type
3	6	82	GLN
3	6	140	GLN
3	6	145	GLN
3	6	170	GLN
4	7	129	GLN
5	B	121	ASN
5	B	145	GLN
5	B	184	GLN
6	D	43	ASN
6	D	212	ASN
6	D	329	ASN
7	E	73	HIS
9	G	100	HIS
9	G	108	GLN
9	G	206	GLN
9	G	225	ASN
10	H	30	GLN
10	H	62	ASN
10	H	101	ASN
11	I	149	ASN
12	K	20	ASN
14	M	48	ASN
15	P	33	ASN
16	Q	104	ASN
16	Q	115	GLN
16	Q	205	GLN
17	S	34	ASN
17	S	69	HIS
17	S	70	GLN
18	U	109	HIS
18	U	149	GLN
18	U	156	HIS
19	V	180	GLN
20	X	33	GLN
22	a	7	GLN
23	b	117	HIS
24	c	79	GLN
24	c	127	GLN
24	c	131	GLN
24	c	144	ASN
25	e	50	ASN
25	e	108	ASN

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Mol	Chain	Res	Type
26	h	14	ASN
27	i	132	GLN
28	l	6	GLN
28	l	85	ASN
29	m	86	GLN
29	m	139	HIS
29	m	140	ASN
30	n	21	GLN
31	o	47	ASN
31	o	191	GLN
32	p	39	GLN
32	p	58	HIS
32	p	80	ASN
32	p	99	ASN
32	p	248	ASN
33	z	21	ASN
33	z	101	GLN
34	A	98	ASN
35	C	39	GLN
35	C	111	ASN
35	C	222	GLN
36	J	96	GLN
36	J	108	GLN
36	J	202	ASN
36	J	232	GLN
37	N	314	ASN
37	N	316	GLN
37	N	376	ASN
37	N	455	HIS
38	R	38	ASN
38	R	70	GLN
41	w	61	GLN
41	w	282	HIS
41	w	300	GLN
42	r	275	GLN
46	d	38	ASN
46	d	44	GLN
47	j	34	HIS
47	j	118	GLN
48	k	23	HIS
48	k	24	GLN
48	k	63	ASN

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Mol	Chain	Res	Type
49	Y	10	ASN
49	Y	64	ASN
49	Y	80	GLN
49	Y	97	ASN
49	Y	116	HIS
52	T	27	ASN
52	T	32	ASN
52	T	101	ASN
53	9	282	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
43	2	3340/5054 (66%)	803 (24%)	26 (0%)
44	8	153/156 (98%)	26 (16%)	1 (0%)
51	W	119/120 (99%)	19 (15%)	0
All	All	3612/5330 (67%)	848 (23%)	27 (0%)

All (848) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
43	2	25	A
43	2	39	A
43	2	42	A
43	2	48	G
43	2	56	A
43	2	59	A
43	2	64	A
43	2	65	A
43	2	66	A
43	2	69	A
43	2	71	C
43	2	72	C
43	2	73	A
43	2	91	G
43	2	98	A
43	2	108	A
43	2	109	G
43	2	110	C
43	2	112	C
43	2	119	G

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Mol	Chain	Res	Type
43	2	120	A
43	2	122	U
43	2	131	C
43	2	132	G
43	2	135	G
43	2	136	C
43	2	141	C
43	2	144	G
43	2	152	U
43	2	159	C
43	2	172	C
43	2	175	C
43	2	181	C
43	2	183	C
43	2	185	C
43	2	188	G
43	2	197	A
43	2	200	U
43	2	209	U
43	2	217	C
43	2	218	A
43	2	220	C
43	2	233	U
43	2	234	G
43	2	237	B9B
43	2	254	G
43	2	256	G
43	2	262	G
43	2	265	C
43	2	266	C
43	2	267	G
43	2	279	A
43	2	280	G
43	2	297	U
43	2	306	A
43	2	309	C
43	2	315	G
43	2	316	U
43	2	340	C
43	2	363	A
43	2	385	A
43	2	387	G

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Mol	Chain	Res	Type
43	2	398	A2M
43	2	401	G
43	2	406	C
43	2	407	A
43	2	409	G
43	2	410	A
43	2	412	G
43	2	432	U
43	2	449	C
43	2	450	G
43	2	452	A
43	2	453	G
43	2	454	U
43	2	464	G
43	2	467	U
43	2	483	G
43	2	485	C
43	2	486	C
43	2	489	C
43	2	491	G
43	2	493	G
43	2	496	G
43	2	497	G
43	2	498	C
43	2	499	G
43	2	500	G
43	2	501	C
43	2	502	C
43	2	503	C
43	2	504	G
43	2	505	G
43	2	509	A
43	2	510	U
43	2	514	U
43	2	515	C
43	2	516	C
43	2	518	G
43	2	519	C
43	2	653	U
43	2	656	C
43	2	657	C
43	2	659	G

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Mol	Chain	Res	Type
43	2	666	G
43	2	667	A
43	2	668	C
43	2	669	C
43	2	673	C
43	2	685	C
43	2	686	A
43	2	688	U
43	2	692	A
43	2	696	C
43	2	697	G
43	2	704	C
43	2	731	G
43	2	738	C
43	2	739	G
43	2	740	G
43	2	742	G
43	2	746	A
43	2	753	C
43	2	759	G
43	2	904	C
43	2	906	C
43	2	913	U
43	2	914	U
43	2	915	A
43	2	916	C
43	2	917	A
43	2	918	G
43	2	924	C
43	2	925	C
43	2	926	G
43	2	932	A
43	2	933	G
43	2	936	C
43	2	941	C
43	2	943	A
43	2	944	A
43	2	945	U
43	2	946	C
43	2	959	G
43	2	960	A
43	2	961	G

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Mol	Chain	Res	Type
43	2	962	C
43	2	963	G
43	2	965	G
43	2	966	A
43	2	967	C
43	2	969	C
43	2	970	G
43	2	971	U
43	2	972	C
43	2	977	C
43	2	982	U
43	2	984	C
43	2	990	C
43	2	991	C
43	2	992	C
43	2	993	G
43	2	994	G
43	2	995	C
43	2	1048	G
43	2	1049	C
43	2	1051	G
43	2	1066	G
43	2	1067	G
43	2	1068	G
43	2	1070	G
43	2	1072	C
43	2	1082	C
43	2	1168	G
43	2	1170	G
43	2	1173	G
43	2	1178	G
43	2	1179	U
43	2	1180	C
43	2	1182	C
43	2	1183	C
43	2	1184	A
43	2	1187	G
43	2	1200	G
43	2	1202	C
43	2	1203	G
43	2	1210	C
43	2	1211	G

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Mol	Chain	Res	Type
43	2	1215	C
43	2	1218	G
43	2	1222	A
43	2	1241	C
43	2	1243	C
43	2	1244	G
43	2	1245	C
43	2	1251	C
43	2	1252	C
43	2	1253	G
43	2	1254	A
43	2	1255	A
43	2	1256	G
43	2	1257	A
43	2	1260	G
43	2	1266	G
43	2	1269	G
43	2	1271	G
43	2	1272	C
43	2	1273	G
43	2	1279	A
43	2	1280	C
43	2	1283	G
43	2	1284	G
43	2	1287	G
43	2	1294	A
43	2	1295	C
43	2	1296	G
43	2	1301	C
43	2	1302	U
43	2	1303	A
43	2	1313	C
43	2	1314	C
43	2	1316	OMG
43	2	1337	A
43	2	1354	A
43	2	1358	G
43	2	1359	G
43	2	1365	C
43	2	1366	G
43	2	1367	C
43	2	1377	G

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Mol	Chain	Res	Type
43	2	1378	C
43	2	1379	C
43	2	1381	U
43	2	1382	G
43	2	1387	A
43	2	1394	G
43	2	1397	A
43	2	1398	A
43	2	1402	C
43	2	1404	G
43	2	1405	C
43	2	1407	C
43	2	1408	G
43	2	1409	C
43	2	1410	U
43	2	1412	G
43	2	1420	A
43	2	1439	C
43	2	1440	U
43	2	1442	C
43	2	1446	C
43	2	1447	C
43	2	1472	C
43	2	1482	G
43	2	1483	C
43	2	1486	C
43	2	1497	A
43	2	1498	G
43	2	1501	C
43	2	1502	G
43	2	1503	A
43	2	1518	A
43	2	1534	A2M
43	2	1547	A
43	2	1554	A
43	2	1566	C
43	2	1574	B9B
43	2	1578	U
43	2	1592	G
43	2	1601	A
43	2	1612	G
43	2	1613	A

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Mol	Chain	Res	Type
43	2	1624	G
43	2	1625	OMG
43	2	1626	G
43	2	1631	A
43	2	1638	A
43	2	1650	A
43	2	1654	G
43	2	1661	C
43	2	1671	U
43	2	1673	U
43	2	1674	C
43	2	1675	C
43	2	1676	C
43	2	1679	A
43	2	1680	G
43	2	1681	G
43	2	1691	G
43	2	1694	C
43	2	1697	G
43	2	1724	G
43	2	1732	C
43	2	1734	G
43	2	1738	A
43	2	1789	C
43	2	1791	U
43	2	1792	U
43	2	1793	A
43	2	1802	A
43	2	1803	G
43	2	1804	A
43	2	1806	G
43	2	1809	C
43	2	1810	G
43	2	1816	C
43	2	1818	G
43	2	1821	G
43	2	1822	U
43	2	1829	G
43	2	1832	C
43	2	1833	G
43	2	1836	G
43	2	1837	A

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Mol	Chain	Res	Type
43	2	1842	G
43	2	1854	G
43	2	1855	G
43	2	1856	C
43	2	1859	C
43	2	1860	U
43	2	1863	U
43	2	1865	G
43	2	1867	A
43	2	1870	C
43	2	1871	A2M
43	2	1883	OMG
43	2	1891	A
43	2	1897	A
43	2	1916	G
43	2	1918	U
43	2	1919	G
43	2	1920	C
43	2	1922	G
43	2	1925	G
43	2	1929	A
43	2	1931	C
43	2	1932	A
43	2	1935	C
43	2	1938	C
43	2	1939	A
43	2	1940	G
43	2	1942	A
43	2	1943	A
43	2	1944	A
43	2	1948	G
43	2	1956	A
43	2	1959	U
43	2	1966	C
43	2	1972	G
43	2	1979	A
43	2	1980	U
43	2	1981	G
43	2	1983	A
43	2	1984	A
43	2	1985	G
43	2	1991	A

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Mol	Chain	Res	Type
43	2	1997	U
43	2	2001	G
43	2	2002	A
43	2	2003	G
43	2	2010	A
43	2	2011	C
43	2	2017	A
43	2	2018	C
43	2	2025	A
43	2	2026	A
43	2	2033	A
43	2	2034	G
43	2	2040	A
43	2	2043	A
43	2	2044	U
43	2	2046	G
43	2	2048	U
43	2	2055	G
43	2	2056	G
43	2	2069	A
43	2	2071	A
43	2	2084	C
43	2	2085	G
43	2	2092	G
43	2	2093	A
43	2	2095	A
43	2	2096	G
43	2	2098	G
43	2	2100	A
43	2	2101	C
43	2	2104	G
43	2	2105	A
43	2	2110	C
43	2	2111	G
43	2	2112	G
43	2	2113	C
43	2	2250	C
43	2	2253	A
43	2	2255	C
43	2	2256	C
43	2	2258	C
43	2	2259	G

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Mol	Chain	Res	Type
43	2	2260	C
43	2	2262	G
43	2	2268	A
43	2	2289	C
43	2	2300	A
43	2	2301	G
43	2	2306	G
43	2	2313	A
43	2	2331	G
43	2	2333	G
43	2	2348	G
43	2	2351	C
43	2	2360	A
43	2	2364	OMG
43	2	2395	A
43	2	2416	G
43	2	2417	A
43	2	2422	OMC
43	2	2424	OMG
43	2	2425	U
43	2	2439	G
43	2	2450	G
43	2	2453	A
43	2	2463	G
43	2	2465	C
43	2	2469	C
43	2	2470	C
43	2	2471	G
43	2	2506	G
43	2	2507	A
43	2	2512	A
43	2	2513	A
43	2	2519	U
43	2	2529	A
43	2	2543	A
43	2	2544	G
43	2	2545	U
43	2	2546	G
43	2	2547	G
43	2	2548	C
43	2	2549	G
43	2	2554	U

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Mol	Chain	Res	Type
43	2	2555	G
43	2	2559	G
43	2	2560	C
43	2	2563	C
43	2	2566	G
43	2	2573	A
43	2	2576	G
43	2	2583	C
43	2	2586	G
43	2	2587	A
43	2	2589	C
43	2	2600	A
43	2	2601	A
43	2	2618	G
43	2	2627	C
43	2	2652	G
43	2	2653	C
43	2	2659	A
43	2	2661	U
43	2	2662	G
43	2	2669	C
43	2	2670	C
43	2	2675	G
43	2	2687	U
43	2	2694	G
43	2	2695	A
43	2	2696	A
43	2	2708	U
43	2	2711	G
43	2	2723	U
43	2	2724	G
43	2	2725	A
43	2	2726	G
43	2	2739	C
43	2	2742	G
43	2	2743	A
43	2	2753	G
43	2	2754	B9B
43	2	2759	G
43	2	2761	U
43	2	2763	U
43	2	2769	U

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Mol	Chain	Res	Type
43	2	2770	C
43	2	2787	A
43	2	2788	U
43	2	2790	U
43	2	2799	G
43	2	2826	U
43	2	2827	G
43	2	2855	G
43	2	2857	A
43	2	2875	C
43	2	2897	G
43	2	3596	A
43	2	3597	G
43	2	3599	A
43	2	3614	G
43	2	3615	G
43	2	3616	U
43	2	3626	G
43	2	3630	A
43	2	3635	A
43	2	3638	G
43	2	3648	A
43	2	3662	A
43	2	3663	A
43	2	3673	C
43	2	3678	G
43	2	3691	G
43	2	3692	A
43	2	3718	A
43	2	3721	U
43	2	3735	G
43	2	3736	A
43	2	3758	U
43	2	3759	A
43	2	3760	A
43	2	3761	C
43	2	3765	G
43	2	3766	A
43	2	3767	C
43	2	3768	U
43	2	3769	C
43	2	3777	G

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Mol	Chain	Res	Type
43	2	3778	U
43	2	3779	A
43	2	3780	G
43	2	3781	C
43	2	3782	C
43	2	3783	A
43	2	3823	G
43	2	3833	C
43	2	3838	U
43	2	3839	G
43	2	3840	U
43	2	3867	A2M
43	2	3875	G
43	2	3876	A
43	2	3877	A
43	2	3878	C
43	2	3879	G
43	2	3880	P7G
43	2	3897	B8K
43	2	3901	A
43	2	3904	G
43	2	3905	A
43	2	3906	A
43	2	3915	U
43	2	3922	G
43	2	3923	A
43	2	3924	C
43	2	3925	U
43	2	3926	C
43	2	3931	C
43	2	3938	G
43	2	3941	G
43	2	3944	G
43	2	4068	U
43	2	4076	G
43	2	4077	A
43	2	4083	5MU
43	2	4084	G
43	2	4162	C
43	2	4163	U
43	2	4164	C
43	2	4166	G

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Mol	Chain	Res	Type
43	2	4170	A
43	2	4171	C
43	2	4183	G
43	2	4184	G
43	2	4191	G
43	2	4197	G
43	2	4198	G
43	2	4200	G
43	2	4202	U
43	2	4207	C
43	2	4209	G
43	2	4212	A
43	2	4213	A
43	2	4214	A
43	2	4225	G
43	2	4227	U
43	2	4228	G
43	2	4229	U
43	2	4230	C
43	2	4231	C
43	2	4232	U
43	2	4233	A
43	2	4234	A
43	2	4235	G
43	2	4236	G
43	2	4244	A
43	2	4250	G
43	2	4251	A
43	2	4252	C
43	2	4253	A
43	2	4254	G
43	2	4255	A
43	2	4259	C
43	2	4263	C
43	2	4264	G
43	2	4265	U
43	2	4268	A
43	2	4269	G
43	2	4270	C
43	2	4271	A
43	2	4272	G
43	2	4273	A

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Mol	Chain	Res	Type
43	2	4274	A
43	2	4275	G
43	2	4276	G
43	2	4278	C
43	2	4279	A
43	2	4280	A
43	2	4281	A
43	2	4283	G
43	2	4285	U
43	2	4290	U
43	2	4291	G
43	2	4292	A
43	2	4294	C
43	2	4295	U
43	2	4296	U
43	2	4298	A
43	2	4299	U
43	2	4301	U
43	2	4302	U
43	2	4303	C
43	2	4304	A
43	2	4305	G
43	2	4306	U
43	2	4307	A
43	2	4308	C
43	2	4309	G
43	2	4313	A
43	2	4315	A
43	2	4316	G
43	2	4317	A
43	2	4329	G
43	2	4331	G
43	2	4335	C
43	2	4340	U
43	2	4341	C
43	2	4342	C
43	2	4343	U
43	2	4347	G
43	2	4348	A
43	2	4349	C
43	2	4350	C
43	2	4368	G

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Mol	Chain	Res	Type
43	2	4371	G
43	2	4372	U
43	2	4373	G
43	2	4376	A
43	2	4378	A
43	2	4379	A
43	2	4380	A
43	2	4381	A
43	2	4383	U
43	2	4395	U
43	2	4396	A
43	2	4401	G
43	2	4415	1MA
43	2	4416	G
43	2	4418	G
43	2	4421	C
43	2	4422	A
43	2	4423	U
43	2	4424	A
43	2	4425	G
43	2	4428	A
43	2	4429	C
43	2	4433	G
43	2	4436	U
43	2	4437	U
43	2	4438	U
43	2	4440	G
43	2	4446	U
43	2	4449	A
43	2	4452	U
43	2	4453	C
43	2	4464	A
43	2	4475	G
43	2	4476	C
43	2	4480	A
43	2	4484	A
43	2	4498	U
43	2	4499	G
43	2	4500	U
43	2	4502	C
43	2	4503	A
43	2	4510	A

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Mol	Chain	Res	Type
43	2	4512	U
43	2	4513	A
43	2	4518	A
43	2	4520	G
43	2	4523	A2M
43	2	4524	G
43	2	4534	G
43	2	4536	C
43	2	4543	G
43	2	4545	G
43	2	4550	7MG
43	2	4555	U
43	2	4556	U
43	2	4557	U
43	2	4558	U
43	2	4559	A
43	2	4570	G
43	2	4573	G
43	2	4574	U
43	2	4575	G
43	2	4584	A
43	2	4589	A
43	2	4590	A
43	2	4599	A
43	2	4600	G
43	2	4601	U
43	2	4606	G
43	2	4607	A
43	2	4608	G
43	2	4636	U
43	2	4637	OMG
43	2	4652	G
43	2	4656	A
43	2	4657	U
43	2	4670	C
43	2	4672	A
43	2	4677	U
43	2	4678	G
43	2	4684	A
43	2	4694	G
43	2	4695	C
43	2	4700	A

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Mol	Chain	Res	Type
43	2	4707	A
43	2	4708	A
43	2	4709	U
43	2	4730	C
43	2	4731	G
43	2	4733	C
43	2	4734	A
43	2	4740	G
43	2	4741	C
43	2	4742	G
43	2	4745	G
43	2	4751	G
43	2	4754	G
43	2	4757	C
43	2	4759	C
43	2	4761	G
43	2	4764	A
43	2	4765	G
43	2	4771	C
43	2	4775	C
43	2	4776	G
43	2	4859	C
43	2	4870	OMG
43	2	4871	C
43	2	4877	G
43	2	4882	U
43	2	4883	C
43	2	4895	C
43	2	4900	C
43	2	4901	G
43	2	4910	G
43	2	4912	G
43	2	4914	C
43	2	4926	C
43	2	4927	G
43	2	4928	C
43	2	4941	G
43	2	4943	A
43	2	4949	G
43	2	4951	G
43	2	4960	G
43	2	4964	C

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Mol	Chain	Res	Type
43	2	4976	U
43	2	4985	U
43	2	4989	U
43	2	4991	U
43	2	5013	C
43	2	5017	G
43	2	5020	G
43	2	5022	U
43	2	5023	C
43	2	5024	C
43	2	5025	C
43	2	5026	U
43	2	5027	C
43	2	5030	U
43	2	5031	G
43	2	5032	C
43	2	5035	U
43	2	5036	C
43	2	5040	U
43	2	5041	G
43	2	5047	C
43	2	5050	C
43	2	5054	C
43	2	5055	G
43	2	5058	A
43	2	5061	A
43	2	5069	U
44	8	25	G
44	8	34	U
44	8	35	C
44	8	39	G
44	8	48	A
44	8	51	U
44	8	52	A
44	8	59	A
44	8	62	A
44	8	63	U
44	8	71	A
44	8	80	A
44	8	82	A
44	8	84	A
44	8	85	U

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Mol	Chain	Res	Type
44	8	99	U
44	8	103	A
44	8	105	C
44	8	110	U
44	8	114	G
44	8	123	U
44	8	124	U
44	8	125	C
44	8	126	C
44	8	127	U
44	8	156	U
51	W	7	G
51	W	11	A
51	W	13	A
51	W	40	U
51	W	41	G
51	W	49	A
51	W	53	U
51	W	54	A
51	W	63	C
51	W	64	G
51	W	74	A
51	W	75	G
51	W	76	U
51	W	97	G
51	W	100	A
51	W	103	A
51	W	106	G
51	W	109	U
51	W	110	G

All (27) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
43	2	406	C
43	2	914	U
43	2	1808	C
43	2	1931	C
43	2	1980	U
43	2	2033	A
43	2	2470	C
43	2	2546	G

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Mol	Chain	Res	Type
43	2	2760	G
43	2	3596	A
43	2	3767	C
43	2	3776	G
43	2	3875	G
43	2	3905	A
43	2	4228	G
43	2	4229	U
43	2	4235	G
43	2	4269	G
43	2	4330	G
43	2	4555	U
43	2	4572	U
43	2	4636	U
43	2	4699	U
43	2	4913	G
43	2	5022	U
43	2	5035	U
44	8	125	C

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

62 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$
43	A2M	2	398	43	18,25,26	3.59	8 (44%)	18,36,39	3.44	3 (16%)
43	OMG	2	2773	43	18,26,27	2.92	8 (44%)	19,38,41	1.43	4 (21%)
43	M7A	2	4564	43	20,25,26	2.05	3 (15%)	28,37,40	3.91	8 (28%)
44	OMU	8	14	44,43	19,22,23	2.99	8 (42%)	26,31,34	1.83	6 (23%)
43	P7G	2	3880	43	24,28,29	4.05	11 (45%)	27,41,44	1.45	3 (11%)
43	B8W	2	4185	43	18,26,27	2.12	2 (11%)	21,38,41	2.50	7 (33%)
43	OMG	2	4870	43	18,26,27	2.91	8 (44%)	19,38,41	1.52	4 (21%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
43	B8T	2	4671	43	19,22,23	3.59	8 (42%)	26,31,34	0.92	1 (3%)
43	OMC	2	3887	43	19,22,23	3.04	8 (42%)	26,31,34	1.03	1 (3%)
43	1MA	2	4415	43	16,25,26	4.36	4 (25%)	18,37,40	1.75	3 (16%)
43	A2M	2	1524	43	18,25,26	3.58	8 (44%)	18,36,39	3.45	4 (22%)
43	OMC	2	2422	43	19,22,23	3.04	8 (42%)	26,31,34	1.01	2 (7%)
43	B8W	2	4472	43	18,26,27	2.11	2 (11%)	21,38,41	2.49	7 (33%)
43	OMG	2	1883	43	18,26,27	2.91	8 (44%)	19,38,41	1.53	4 (21%)
43	OMG	2	373	43	18,26,27	2.86	8 (44%)	19,38,41	1.56	5 (26%)
43	7MG	2	4550	43	22,26,27	3.87	10 (45%)	29,39,42	1.99	9 (31%)
43	I4U	2	1659	43	21,24,25	3.58	9 (42%)	27,34,37	1.19	2 (7%)
43	A2M	2	3825	43	18,25,26	3.60	8 (44%)	18,36,39	3.41	4 (22%)
43	5MU	2	4083	43	19,22,23	7.26	8 (42%)	28,32,35	3.33	10 (35%)
43	B9B	2	1574	43	21,28,29	2.02	3 (14%)	23,40,43	6.49	4 (17%)
43	OMU	2	4620	43	19,22,23	2.97	8 (42%)	26,31,34	1.69	4 (15%)
43	P4U	2	1348	43	21,24,25	3.58	8 (38%)	27,33,36	1.07	1 (3%)
43	OMG	2	1522	43	18,26,27	2.88	8 (44%)	19,38,41	1.49	5 (26%)
43	A2M	2	2363	43	18,25,26	3.57	8 (44%)	18,36,39	3.42	4 (22%)
43	B9H	2	2786	43	20,25,26	3.20	4 (20%)	22,35,38	1.69	4 (18%)
43	OMC	2	3909	43	19,22,23	3.13	8 (42%)	26,31,34	1.86	7 (26%)
43	B8T	2	4483	43	19,22,23	3.61	8 (42%)	26,31,34	1.27	4 (15%)
43	B8K	2	4690	43	24,28,29	3.35	12 (50%)	30,42,45	2.59	12 (40%)
43	A2M	2	3867	43	18,25,26	3.59	8 (44%)	18,36,39	3.47	4 (22%)
43	B9B	2	237	43	21,28,29	2.00	3 (14%)	23,40,43	6.60	5 (21%)
43	OMG	2	1625	43	18,26,27	2.95	8 (44%)	19,38,41	1.49	4 (21%)
43	OMC	2	2804	43	19,22,23	2.99	8 (42%)	26,31,34	0.70	0
43	OMC	2	2861	43	19,22,23	3.09	8 (42%)	26,31,34	1.26	3 (11%)
43	OMC	2	3869	43	19,22,23	3.04	8 (42%)	26,31,34	0.99	1 (3%)
43	OMG	2	2050	43	18,26,27	2.82	8 (44%)	19,38,41	1.50	5 (26%)
43	A2M	2	2401	43	18,25,26	3.60	8 (44%)	18,36,39	3.40	3 (16%)
43	A2M	2	4523	43	18,25,26	3.55	8 (44%)	18,36,39	3.56	5 (27%)
43	B8K	2	3897	43	24,28,29	3.47	11 (45%)	30,42,45	2.53	12 (40%)
43	OMG	2	4494	43	18,26,27	2.90	8 (44%)	19,38,41	1.49	4 (21%)
43	7MG	2	2522	43	22,26,27	3.85	10 (45%)	29,39,42	1.95	8 (27%)
43	A2M	2	1534	43	18,25,26	3.59	8 (44%)	18,36,39	3.54	3 (16%)
43	OMG	2	1316	43	18,26,27	2.89	8 (44%)	19,38,41	1.53	5 (26%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
43	2MG	2	1517	43	18,26,27	2.69	6 (33%)	16,38,41	1.43	3 (18%)
43	B9B	2	2754	43	21,28,29	2.02	3 (14%)	23,40,43	6.52	4 (17%)
43	OMG	2	4623	43	18,26,27	2.84	8 (44%)	19,38,41	1.53	5 (26%)
43	OMC	2	2365	43	19,22,23	2.98	8 (42%)	26,31,34	0.71	0
43	OMG	2	4637	43	18,26,27	2.85	8 (44%)	19,38,41	1.52	4 (21%)
43	E7G	2	2297	43	24,27,28	4.02	11 (45%)	30,40,43	2.15	9 (30%)
43	OMG	2	2364	43	18,26,27	2.84	8 (44%)	19,38,41	1.46	4 (21%)
43	OMG	2	2424	43	18,26,27	2.90	8 (44%)	19,38,41	1.47	4 (21%)
43	E7G	2	1797	43	24,27,28	4.11	11 (45%)	30,40,43	2.16	9 (30%)
43	B8W	2	2380	43	18,26,27	2.10	2 (11%)	21,38,41	2.42	7 (33%)
43	B8Q	2	1456	43	17,22,23	2.99	4 (23%)	22,32,35	2.35	6 (27%)
43	2MG	2	978	43	18,26,27	2.75	6 (33%)	16,38,41	1.38	3 (18%)
43	A2M	2	1326	43	18,25,26	3.60	8 (44%)	18,36,39	3.42	3 (16%)
43	P7G	2	1909	43	24,28,29	4.11	11 (45%)	27,41,44	1.56	3 (11%)
43	BGH	2	3899	43	25,29,30	4.62	17 (68%)	31,43,46	2.56	11 (35%)
43	UR3	2	4597	43	19,22,23	2.83	7 (36%)	26,32,35	1.86	3 (11%)
43	2MG	2	4872	43	18,26,27	2.62	6 (33%)	16,38,41	1.64	4 (25%)
43	7MG	2	1605	43	22,26,27	3.90	10 (45%)	29,39,42	1.96	9 (31%)
43	2MG	2	729	43	18,26,27	2.68	6 (33%)	16,38,41	1.38	3 (18%)
43	A2M	2	1871	43	18,25,26	3.60	9 (50%)	18,36,39	3.43	3 (16%)

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
43	A2M	2	398	43	-	2/5/27/28	0/3/3/3
43	OMG	2	2773	43	-	0/5/27/28	0/3/3/3
43	M7A	2	4564	43	-	0/7/37/38	0/3/3/3
44	OMU	8	14	44,43	-	1/9/27/28	0/2/2/2
43	P7G	2	3880	43	-	2/10/40/41	0/3/3/3
43	B8W	2	4185	43	-	2/5/27/28	0/3/3/3
43	OMG	2	4870	43	-	3/5/27/28	0/3/3/3
43	B8T	2	4671	43	-	0/7/27/28	0/2/2/2
43	OMC	2	3887	43	-	1/9/27/28	0/2/2/2
43	1MA	2	4415	43	-	1/3/25/26	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
43	A2M	2	1524	43	-	0/5/27/28	0/3/3/3
43	OMC	2	2422	43	-	1/9/27/28	0/2/2/2
43	B8W	2	4472	43	-	2/5/27/28	0/3/3/3
43	OMG	2	1883	43	-	2/5/27/28	0/3/3/3
43	OMG	2	373	43	-	1/5/27/28	0/3/3/3
43	7MG	2	4550	43	-	2/7/37/38	0/3/3/3
43	I4U	2	1659	43	-	2/9/29/30	0/2/2/2
43	A2M	2	3825	43	-	0/5/27/28	0/3/3/3
43	5MU	2	4083	43	-	7/7/25/26	0/2/2/2
43	B9B	2	1574	43	-	5/7/29/30	0/3/3/3
43	OMU	2	4620	43	-	0/9/27/28	0/2/2/2
43	P4U	2	1348	43	-	1/10/29/30	0/2/2/2
43	OMG	2	1522	43	-	1/5/27/28	0/3/3/3
43	A2M	2	2363	43	-	0/5/27/28	0/3/3/3
43	B9H	2	2786	43	-	0/12/47/48	0/2/2/2
43	OMC	2	3909	43	-	1/9/27/28	0/2/2/2
43	B8T	2	4483	43	-	0/7/27/28	0/2/2/2
43	B8K	2	4690	43	-	0/11/41/42	0/3/3/3
43	A2M	2	3867	43	-	2/5/27/28	0/3/3/3
43	B9B	2	237	43	-	4/7/29/30	0/3/3/3
43	OMG	2	1625	43	-	3/5/27/28	0/3/3/3
43	OMC	2	2804	43	-	0/9/27/28	0/2/2/2
43	OMC	2	2861	43	-	0/9/27/28	0/2/2/2
43	OMC	2	3869	43	-	1/9/27/28	0/2/2/2
43	OMG	2	2050	43	-	0/5/27/28	0/3/3/3
43	A2M	2	2401	43	-	0/5/27/28	0/3/3/3
43	A2M	2	4523	43	-	2/5/27/28	0/3/3/3
43	B8K	2	3897	43	-	2/11/41/42	0/3/3/3
43	OMG	2	4494	43	-	0/5/27/28	0/3/3/3
43	7MG	2	2522	43	-	0/7/37/38	0/3/3/3
43	A2M	2	1534	43	-	2/5/27/28	0/3/3/3
43	OMG	2	1316	43	-	2/5/27/28	0/3/3/3
43	2MG	2	1517	43	-	2/5/27/28	0/3/3/3
43	B9B	2	2754	43	-	5/7/29/30	0/3/3/3
43	OMG	2	4623	43	-	0/5/27/28	0/3/3/3
43	OMC	2	2365	43	-	0/9/27/28	0/2/2/2
43	OMG	2	4637	43	-	3/5/27/28	0/3/3/3
43	E7G	2	2297	43	-	1/9/39/40	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
43	OMG	2	2364	43	-	2/5/27/28	0/3/3/3
43	OMG	2	2424	43	-	2/5/27/28	0/3/3/3
43	E7G	2	1797	43	-	0/9/39/40	0/3/3/3
43	B8W	2	2380	43	-	2/5/27/28	0/3/3/3
43	B8Q	2	1456	43	-	0/7/42/43	0/2/2/2
43	2MG	2	978	43	-	0/5/27/28	0/3/3/3
43	A2M	2	1326	43	-	0/5/27/28	0/3/3/3
43	P7G	2	1909	43	-	4/10/40/41	0/3/3/3
43	BGH	2	3899	43	-	0/13/43/44	0/3/3/3
43	UR3	2	4597	43	-	0/7/25/26	0/2/2/2
43	2MG	2	4872	43	-	2/5/27/28	0/3/3/3
43	7MG	2	1605	43	-	0/7/37/38	0/3/3/3
43	2MG	2	729	43	-	2/5/27/28	0/3/3/3
43	A2M	2	1871	43	-	2/5/27/28	0/3/3/3

All (473) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	4083	5MU	C4-C5	21.05	1.79	1.44
43	2	4415	1MA	C2-N3	16.13	1.48	1.29
43	2	4083	5MU	C6-N1	16.04	1.65	1.38
43	2	4083	5MU	C6-C5	-11.31	1.16	1.34
43	2	4083	5MU	C4-N3	-10.99	1.18	1.38
43	2	1659	I4U	C4-N3	10.68	1.45	1.31
43	2	1348	P4U	C4-N3	10.49	1.44	1.31
43	2	1797	E7G	C8-N9	9.97	1.51	1.46
43	2	2297	E7G	C5-N7	9.77	1.46	1.35
43	2	2786	B9H	C2-N3	9.58	1.49	1.37
43	2	1605	7MG	C8-N9	9.43	1.51	1.46
43	2	3880	P7G	C5-N7	9.41	1.46	1.35
43	2	3897	B8K	C8-N9	9.33	1.51	1.46
43	2	1909	P7G	C5-N7	9.31	1.46	1.35
43	2	1797	E7G	C5-N7	9.30	1.46	1.35
43	2	1909	P7G	C8-N9	9.21	1.51	1.46
43	2	2522	7MG	C8-N9	9.18	1.51	1.46
43	2	4550	7MG	C8-N9	9.00	1.51	1.46
43	2	3880	P7G	C8-N9	8.97	1.51	1.46
43	2	1871	A2M	C3'-C4'	-8.97	1.30	1.53
43	2	4690	B8K	C8-N9	8.89	1.50	1.46
43	2	2297	E7G	C8-N9	8.88	1.50	1.46
43	2	3899	BGH	O4'-C1'	8.85	1.63	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	1605	7MG	C5-N7	8.83	1.45	1.35
43	2	1524	A2M	C3'-C4'	-8.82	1.30	1.53
43	2	398	A2M	C3'-C4'	-8.82	1.30	1.53
43	2	2522	7MG	C5-N7	8.80	1.45	1.35
43	2	4550	7MG	C5-N7	8.77	1.45	1.35
43	2	1326	A2M	C3'-C4'	-8.77	1.30	1.53
43	2	2363	A2M	C3'-C4'	-8.73	1.30	1.53
43	2	2401	A2M	C3'-C4'	-8.73	1.30	1.53
43	2	3899	BGH	C8-N9	8.73	1.50	1.46
43	2	1534	A2M	C3'-C4'	-8.73	1.30	1.53
43	2	3867	A2M	C3'-C4'	-8.72	1.30	1.53
43	2	3899	BGH	C2'-C1'	-8.72	1.30	1.53
43	2	3825	A2M	C3'-C4'	-8.71	1.30	1.53
43	2	1456	B8Q	C6-C5	8.32	1.52	1.33
43	2	4523	A2M	C3'-C4'	-8.24	1.31	1.53
43	2	4185	B8W	C2-N2	8.06	1.50	1.33
43	2	4472	B8W	C2-N2	7.98	1.49	1.33
43	2	2380	B8W	C2-N2	7.90	1.49	1.33
43	2	4523	A2M	O4'-C4'	7.80	1.62	1.45
43	2	2401	A2M	O4'-C4'	7.78	1.62	1.45
43	2	1534	A2M	O4'-C4'	7.74	1.62	1.45
43	2	1871	A2M	O4'-C4'	7.70	1.62	1.45
43	2	3825	A2M	O4'-C4'	7.69	1.62	1.45
43	2	398	A2M	O4'-C4'	7.65	1.62	1.45
43	2	1326	A2M	O4'-C4'	7.64	1.62	1.45
43	2	3899	BGH	O4'-C4'	-7.59	1.28	1.45
43	2	1524	A2M	O4'-C4'	7.58	1.61	1.45
43	2	2363	A2M	O4'-C4'	7.54	1.61	1.45
43	2	3867	A2M	O4'-C4'	7.43	1.61	1.45
43	2	4483	B8T	C2-N3	7.35	1.51	1.36
43	2	3867	A2M	O4'-C1'	-7.29	1.30	1.41
43	2	4671	B8T	C2-N3	7.25	1.51	1.36
43	2	1326	A2M	O4'-C1'	-7.22	1.31	1.41
44	8	14	OMU	C2-N1	7.14	1.49	1.38
43	2	3825	A2M	O4'-C1'	-7.14	1.31	1.41
43	2	2786	B9H	C6-C5	7.12	1.49	1.33
43	2	4523	A2M	O4'-C1'	-7.10	1.31	1.41
43	2	4671	B8T	C4-N3	7.06	1.45	1.32
43	2	1524	A2M	O4'-C1'	-7.05	1.31	1.41
43	2	4483	B8T	C4-N3	7.03	1.45	1.32
43	2	4620	OMU	C2-N1	7.03	1.49	1.38
43	2	398	A2M	O4'-C1'	-7.02	1.31	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	2401	A2M	O4'-C1'	-7.00	1.31	1.41
43	2	2363	A2M	O4'-C1'	-6.98	1.31	1.41
43	2	1534	A2M	O4'-C1'	-6.97	1.31	1.41
43	2	978	2MG	C2-N2	6.90	1.48	1.33
43	2	4671	B8T	C6-C5	6.87	1.51	1.35
43	2	2786	B9H	C2-N1	6.86	1.48	1.38
43	2	4597	UR3	C6-C5	6.79	1.50	1.35
43	2	1456	B8Q	C2-N3	6.76	1.46	1.35
43	2	1517	2MG	C2-N2	6.75	1.48	1.33
43	2	4483	B8T	C6-C5	6.75	1.50	1.35
43	2	1871	A2M	O4'-C1'	-6.75	1.31	1.41
44	8	14	OMU	C2-N3	6.70	1.49	1.38
43	2	729	2MG	C2-N2	6.70	1.48	1.33
43	2	3909	OMC	C6-C5	6.64	1.50	1.35
43	2	3897	B8K	C2-N3	6.59	1.49	1.33
43	2	4690	B8K	C2-N3	6.58	1.49	1.33
43	2	1909	P7G	C4-N9	6.58	1.45	1.35
43	2	4620	OMU	C2-N3	6.53	1.49	1.38
43	2	2422	OMC	C2-N3	6.47	1.49	1.36
43	2	2861	OMC	C2-N3	6.45	1.49	1.36
43	2	4872	2MG	C2-N2	6.40	1.47	1.33
43	2	3869	OMC	C2-N3	6.37	1.49	1.36
43	2	3887	OMC	C2-N3	6.36	1.49	1.36
43	2	2804	OMC	C2-N3	6.35	1.49	1.36
43	2	4597	UR3	C2-N3	6.31	1.51	1.39
43	2	1625	OMG	C2-N3	6.31	1.48	1.33
43	2	1909	P7G	C4-N3	6.30	1.48	1.37
43	2	2297	E7G	C8-N7	6.29	1.51	1.45
43	2	4483	B8T	C4-N4	6.28	1.48	1.35
43	2	2754	B9B	O6-C6	6.27	1.40	1.35
43	2	1797	E7G	C8-N7	6.27	1.51	1.45
43	2	2773	OMG	C2-N3	6.27	1.48	1.33
43	2	2424	OMG	C2-N3	6.26	1.48	1.33
43	2	1574	B9B	O6-C6	6.25	1.40	1.35
43	2	4671	B8T	C4-N4	6.25	1.48	1.35
43	2	2365	OMC	C2-N3	6.23	1.49	1.36
43	2	1883	OMG	C2-N3	6.21	1.48	1.33
43	2	3880	P7G	C4-N3	6.20	1.48	1.37
43	2	1659	I4U	C2-N3	6.19	1.48	1.36
43	2	4870	OMG	C2-N3	6.19	1.48	1.33
43	2	1348	P4U	C2-N3	6.16	1.48	1.36
43	2	1659	I4U	C6-C5	6.14	1.49	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	4597	UR3	C2-N1	6.13	1.47	1.38
43	2	2364	OMG	C2-N3	6.10	1.48	1.33
43	2	2773	OMG	C2-N2	6.10	1.48	1.34
43	2	4494	OMG	C2-N3	6.10	1.48	1.33
43	2	3880	P7G	C4-N9	6.09	1.44	1.35
43	2	237	B9B	O6-C6	6.09	1.40	1.35
43	2	1348	P4U	C6-C5	6.09	1.49	1.35
43	2	1625	OMG	C2-N2	6.09	1.48	1.34
43	2	1316	OMG	C2-N3	6.07	1.48	1.33
43	2	2424	OMG	C2-N2	6.06	1.48	1.34
43	2	4564	M7A	C4-N9	6.06	1.49	1.38
43	2	4870	OMG	C2-N2	6.05	1.48	1.34
43	2	3899	BGH	C4-N9	6.05	1.44	1.37
43	2	1883	OMG	C2-N2	6.05	1.48	1.34
43	2	4494	OMG	C2-N2	6.04	1.48	1.34
43	2	2861	OMC	C6-C5	6.04	1.49	1.35
43	2	2365	OMC	C6-C5	6.02	1.49	1.35
43	2	4637	OMG	C2-N3	6.01	1.47	1.33
43	2	1522	OMG	C2-N3	6.00	1.47	1.33
43	2	3880	P7G	C8-N7	5.99	1.51	1.45
43	2	1522	OMG	C2-N2	5.98	1.48	1.34
43	2	1316	OMG	C2-N2	5.97	1.48	1.34
43	2	3887	OMC	C6-C5	5.97	1.48	1.35
43	2	2422	OMC	C6-C5	5.97	1.48	1.35
43	2	2804	OMC	C6-C5	5.95	1.48	1.35
43	2	1909	P7G	C2-N2	5.94	1.48	1.34
43	2	4637	OMG	C2-N2	5.93	1.48	1.34
43	2	2364	OMG	C2-N2	5.92	1.48	1.34
43	2	3869	OMC	C6-C5	5.92	1.48	1.35
43	2	1909	P7G	C8-N7	5.92	1.51	1.45
43	2	2050	OMG	C2-N3	5.90	1.47	1.33
43	2	4623	OMG	C2-N3	5.90	1.47	1.33
43	2	373	OMG	C2-N2	5.88	1.48	1.34
43	2	373	OMG	C2-N3	5.88	1.47	1.33
43	2	3880	P7G	C2-N2	5.87	1.48	1.34
43	2	1797	E7G	C2-N3	5.87	1.47	1.33
43	2	4623	OMG	C2-N2	5.83	1.48	1.34
43	2	2050	OMG	C2-N2	5.82	1.48	1.34
43	2	4550	7MG	C2-N3	5.82	1.47	1.33
43	2	2754	B9B	C2-N2	5.80	1.45	1.33
43	2	1797	E7G	C4-N9	5.80	1.44	1.37
43	2	1797	E7G	C4-N3	5.79	1.48	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	1574	B9B	C2-N2	5.78	1.45	1.33
43	2	2297	E7G	C4-N9	5.77	1.44	1.37
43	2	3897	B8K	C4-N9	5.77	1.44	1.37
43	2	237	B9B	C2-N2	5.75	1.45	1.33
43	2	3899	BGH	C2-N3	5.75	1.47	1.33
43	2	2297	E7G	C2-N3	5.74	1.47	1.33
43	2	1605	7MG	C2-N3	5.73	1.47	1.33
43	2	3899	BGH	C4-N3	5.73	1.47	1.34
43	2	2522	7MG	C2-N3	5.70	1.46	1.33
43	2	2297	E7G	C4-N3	5.68	1.47	1.34
43	2	3909	OMC	C2-N3	5.66	1.47	1.36
43	2	4550	7MG	C4-N3	5.63	1.47	1.34
43	2	4620	OMU	C6-C5	5.59	1.48	1.35
43	2	4550	7MG	C4-N9	5.57	1.44	1.37
43	2	2522	7MG	C4-N3	5.55	1.47	1.34
43	2	3909	OMC	C4-N4	5.54	1.47	1.33
43	2	1605	7MG	C4-N3	5.52	1.47	1.34
43	2	3909	OMC	C2-N1	5.43	1.51	1.40
43	2	1605	7MG	C4-N9	5.39	1.44	1.37
43	2	2522	7MG	C4-N9	5.35	1.43	1.37
44	8	14	OMU	C6-C5	5.32	1.47	1.35
43	2	729	2MG	C4-N3	5.32	1.50	1.37
43	2	3880	P7G	C2-N1	5.30	1.46	1.33
43	2	2861	OMC	C2-N1	5.26	1.51	1.40
43	2	1909	P7G	C2-N1	5.22	1.45	1.33
43	2	1797	E7G	C2-N2	5.22	1.46	1.34
43	2	978	2MG	C4-N3	5.19	1.50	1.37
43	2	2804	OMC	C4-N3	5.17	1.44	1.34
43	2	1517	2MG	C4-N3	5.16	1.49	1.37
43	2	2297	E7G	C2-N2	5.15	1.46	1.34
43	2	4690	B8K	C4-N9	5.14	1.43	1.37
43	2	2365	OMC	C4-N3	5.11	1.44	1.34
43	2	2422	OMC	C4-N3	5.10	1.44	1.34
43	2	3869	OMC	C4-N3	5.08	1.44	1.34
43	2	2861	OMC	C4-N3	5.08	1.44	1.34
43	2	3887	OMC	C4-N3	5.03	1.44	1.34
43	2	3887	OMC	C2-N1	5.03	1.50	1.40
43	2	2861	OMC	C4-N4	4.98	1.45	1.33
43	2	1456	B8Q	C2-N1	4.96	1.45	1.38
43	2	2422	OMC	C2-N1	4.93	1.50	1.40
43	2	1625	OMG	C4-N3	4.93	1.49	1.37
43	2	3899	BGH	C2-N2	4.93	1.45	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	3869	OMC	C2-N1	4.90	1.50	1.40
43	2	3869	OMC	C4-N4	4.88	1.45	1.33
43	2	2804	OMC	C4-N4	4.88	1.45	1.33
43	2	1659	I4U	C5-C4	4.87	1.49	1.43
43	2	2365	OMC	C4-N4	4.87	1.45	1.33
43	2	1883	OMG	C4-N3	4.85	1.49	1.37
43	2	2424	OMG	C4-N3	4.85	1.49	1.37
43	2	2422	OMC	C4-N4	4.84	1.45	1.33
43	2	2773	OMG	C4-N3	4.84	1.49	1.37
43	2	1348	P4U	O4-C4	4.84	1.40	1.35
43	2	1605	7MG	C2-N2	4.83	1.45	1.34
43	2	4872	2MG	C4-N3	4.83	1.49	1.37
43	2	3887	OMC	C4-N4	4.83	1.45	1.33
43	2	4494	OMG	C4-N3	4.83	1.49	1.37
43	2	4483	B8T	C2-N1	4.82	1.50	1.40
43	2	4870	OMG	C4-N3	4.80	1.49	1.37
43	2	373	OMG	C6-N1	4.79	1.45	1.37
43	2	4550	7MG	C2-N2	4.79	1.45	1.34
43	2	2522	7MG	C2-N2	4.78	1.45	1.34
43	2	1316	OMG	C6-N1	4.72	1.44	1.37
43	2	2364	OMG	C4-N3	4.69	1.48	1.37
43	2	3899	BGH	C5-N7	4.69	1.47	1.39
43	2	4671	B8T	C2-N1	4.68	1.50	1.40
43	2	1522	OMG	C4-N3	4.67	1.48	1.37
43	2	1625	OMG	C6-N1	4.66	1.44	1.37
43	2	2773	OMG	C6-N1	4.66	1.44	1.37
43	2	1522	OMG	C6-N1	4.65	1.44	1.37
43	2	1316	OMG	C4-N3	4.65	1.48	1.37
43	2	4637	OMG	C4-N3	4.65	1.48	1.37
43	2	4083	5MU	C2-N3	4.63	1.46	1.38
43	2	3909	OMC	C4-N3	4.61	1.43	1.34
43	2	4623	OMG	C6-N1	4.60	1.44	1.37
43	2	4494	OMG	C6-N1	4.55	1.44	1.37
43	2	2424	OMG	C6-N1	4.55	1.44	1.37
43	2	1883	OMG	C6-N1	4.54	1.44	1.37
43	2	2050	OMG	C6-N1	4.54	1.44	1.37
43	2	373	OMG	C4-N3	4.54	1.48	1.37
43	2	4623	OMG	C4-N3	4.51	1.48	1.37
43	2	2050	OMG	C4-N3	4.51	1.48	1.37
43	2	4870	OMG	C6-N1	4.51	1.44	1.37
43	2	4690	B8K	C4-N3	4.48	1.44	1.34
43	2	3897	B8K	C4-N3	4.46	1.44	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	4637	OMG	C6-N1	4.45	1.44	1.37
43	2	2364	OMG	C6-N1	4.42	1.44	1.37
43	2	3899	BGH	C5-C6	4.37	1.54	1.43
43	2	3897	B8K	C5-C6	4.34	1.54	1.43
43	2	978	2MG	C2-N1	4.34	1.43	1.36
43	2	4564	M7A	C6-N6	4.34	1.45	1.34
43	2	3897	B8K	C5-N7	4.33	1.47	1.39
43	2	2804	OMC	C2-N1	4.32	1.49	1.40
43	2	1659	I4U	C2-N1	4.32	1.49	1.40
43	2	1348	P4U	C2-N1	4.29	1.49	1.40
43	2	2365	OMC	C2-N1	4.29	1.49	1.40
43	2	4690	B8K	C5-N7	4.28	1.47	1.39
43	2	1348	P4U	C5-C4	4.28	1.48	1.43
43	2	1517	2MG	C2-N1	4.25	1.43	1.36
43	2	4872	2MG	C2-N1	4.20	1.43	1.36
43	2	729	2MG	C2-N1	4.14	1.43	1.36
44	8	14	OMU	C4-N3	4.08	1.45	1.38
43	2	4415	1MA	C4-N3	4.08	1.50	1.37
43	2	4690	B8K	C5-C6	4.07	1.54	1.43
43	2	4415	1MA	C2-N1	4.01	1.43	1.35
43	2	4620	OMU	C4-N3	3.98	1.45	1.38
43	2	4671	B8T	C5-C4	3.88	1.49	1.40
43	2	4564	M7A	C5-N7	3.88	1.48	1.39
43	2	4550	7MG	C5-C6	3.85	1.53	1.43
43	2	1909	P7G	C2-N3	3.83	1.47	1.37
43	2	1605	7MG	C5-C6	3.82	1.53	1.43
43	2	978	2MG	C6-N1	3.81	1.43	1.37
43	2	2297	E7G	C5-C6	3.79	1.53	1.43
43	2	4872	2MG	C6-N1	3.79	1.43	1.37
43	2	3897	B8K	C6-N1	3.78	1.45	1.38
43	2	2522	7MG	C5-C6	3.78	1.53	1.43
43	2	1797	E7G	C5-C6	3.75	1.53	1.43
43	2	1605	7MG	C2-N1	3.73	1.46	1.37
43	2	3899	BGH	O2'-C2'	3.72	1.52	1.42
43	2	3880	P7G	C2-N3	3.70	1.46	1.37
43	2	4550	7MG	C2-N1	3.68	1.46	1.37
43	2	1517	2MG	C6-N1	3.67	1.43	1.37
43	2	1797	E7G	C2-N1	3.65	1.46	1.37
43	2	4083	5MU	C2-N1	3.65	1.44	1.38
43	2	2522	7MG	C2-N1	3.64	1.46	1.37
43	2	4872	2MG	C5-C6	3.64	1.54	1.47
43	2	3909	OMC	C6-N1	3.61	1.46	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	4483	B8T	C5-C4	3.61	1.48	1.40
43	2	4483	B8T	C6-N1	3.60	1.46	1.38
43	2	4690	B8K	C6-N1	3.60	1.45	1.38
43	2	3899	BGH	C71-N7	3.60	1.47	1.39
43	2	3897	B8K	C2-N2	3.59	1.42	1.34
43	2	4690	B8K	C71-N7	3.58	1.47	1.39
43	2	978	2MG	C5-C6	3.58	1.54	1.47
43	2	2297	E7G	C2-N1	3.57	1.46	1.37
43	2	3880	P7G	C6-N1	3.55	1.44	1.38
43	2	3899	BGH	C6-N1	3.55	1.45	1.38
43	2	729	2MG	C6-N1	3.54	1.43	1.37
43	2	4690	B8K	C2-N2	3.53	1.42	1.34
43	2	3897	B8K	C71-N7	3.53	1.47	1.39
43	2	1517	2MG	C5-C6	3.53	1.54	1.47
43	2	1909	P7G	C6-N1	3.48	1.44	1.38
43	2	1797	E7G	C6-N1	3.45	1.45	1.38
43	2	3897	B8K	C2-N1	3.45	1.46	1.37
43	2	729	2MG	C5-C6	3.44	1.54	1.47
43	2	3869	OMC	C6-N1	3.44	1.46	1.38
43	2	1909	P7G	C5-C4	3.44	1.44	1.37
43	2	1605	7MG	C6-N1	3.43	1.45	1.38
43	2	4550	7MG	C6-N1	3.39	1.45	1.38
43	2	1348	P4U	C6-N1	3.38	1.46	1.38
43	2	3899	BGH	C2-N1	3.37	1.46	1.37
43	2	2297	E7G	C6-N1	3.36	1.45	1.38
43	2	373	OMG	C5-C6	3.34	1.54	1.47
43	2	1316	OMG	C5-C6	3.33	1.54	1.47
43	2	4870	OMG	C5-C6	3.33	1.54	1.47
43	2	1625	OMG	C5-C6	3.31	1.54	1.47
43	2	2861	OMC	C6-N1	3.31	1.46	1.38
43	2	4623	OMG	C5-C6	3.30	1.54	1.47
43	2	4637	OMG	C5-C6	3.30	1.54	1.47
43	2	2773	OMG	C5-C6	3.30	1.54	1.47
43	2	2522	7MG	C6-N1	3.29	1.44	1.38
43	2	3887	OMC	C6-N1	3.28	1.45	1.38
43	2	1522	OMG	C5-C6	3.27	1.54	1.47
43	2	3880	P7G	C5-C4	3.26	1.43	1.37
43	2	2365	OMC	C6-N1	3.26	1.45	1.38
43	2	4690	B8K	C2-N1	3.26	1.45	1.37
43	2	1659	I4U	C6-N1	3.25	1.45	1.38
43	2	4494	OMG	C5-C6	3.25	1.54	1.47
43	2	2422	OMC	C6-N1	3.24	1.45	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	2050	OMG	C5-C6	3.24	1.54	1.47
43	2	2804	OMC	C6-N1	3.22	1.45	1.38
43	2	2364	OMG	C5-C6	3.21	1.53	1.47
43	2	4523	A2M	O3'-C3'	3.21	1.50	1.43
43	2	1909	P7G	O6-C6	-3.20	1.18	1.23
43	2	4597	UR3	C6-N1	3.19	1.45	1.38
43	2	4523	A2M	C6-N6	3.17	1.45	1.34
43	2	3867	A2M	C6-N6	3.17	1.45	1.34
43	2	4671	B8T	C6-N1	3.17	1.45	1.38
43	2	1524	A2M	C6-N6	3.16	1.45	1.34
43	2	2401	A2M	C6-N6	3.15	1.45	1.34
43	2	1871	A2M	C6-N6	3.14	1.45	1.34
43	2	3825	A2M	C6-N6	3.14	1.45	1.34
43	2	1326	A2M	C6-N6	3.12	1.45	1.34
43	2	398	A2M	C6-N6	3.12	1.45	1.34
43	2	1534	A2M	C6-N6	3.12	1.45	1.34
43	2	2424	OMG	C5-C6	3.12	1.53	1.47
43	2	2363	A2M	C6-N6	3.11	1.45	1.34
43	2	3880	P7G	O6-C6	-3.10	1.18	1.23
43	2	1883	OMG	C5-C6	3.04	1.53	1.47
43	2	4620	OMU	O4-C4	-3.00	1.18	1.24
43	2	2401	A2M	O3'-C3'	2.99	1.50	1.43
43	2	3825	A2M	O3'-C3'	2.98	1.50	1.43
43	2	3899	BGH	O3'-C3'	-2.97	1.36	1.43
44	8	14	OMU	O4-C4	-2.95	1.18	1.24
43	2	3897	B8K	C5-C4	2.93	1.47	1.38
43	2	3867	A2M	O3'-C3'	2.91	1.49	1.43
43	2	1534	A2M	O3'-C3'	2.90	1.49	1.43
43	2	2363	A2M	O3'-C3'	2.89	1.49	1.43
43	2	398	A2M	O3'-C3'	2.85	1.49	1.43
43	2	1659	I4U	O4-C4	2.84	1.41	1.35
43	2	1871	A2M	O3'-C3'	2.81	1.49	1.43
43	2	4872	2MG	C5-C4	-2.81	1.35	1.43
43	2	2050	OMG	O6-C6	-2.81	1.17	1.23
43	2	4671	B8T	O2-C2	-2.81	1.18	1.23
43	2	1883	OMG	O6-C6	-2.80	1.17	1.23
43	2	1524	A2M	O3'-C3'	2.80	1.49	1.43
43	2	4083	5MU	O4-C4	-2.80	1.18	1.23
43	2	4483	B8T	O2-C2	-2.78	1.18	1.23
43	2	4623	OMG	O6-C6	-2.78	1.17	1.23
43	2	978	2MG	C5-C4	-2.78	1.36	1.43
43	2	1326	A2M	O3'-C3'	2.78	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	1534	A2M	O2'-C2'	-2.78	1.35	1.42
43	2	1625	OMG	O6-C6	-2.77	1.17	1.23
43	2	4637	OMG	O6-C6	-2.76	1.17	1.23
43	2	237	B9B	C5-C4	-2.75	1.33	1.40
44	8	14	OMU	C6-N1	2.75	1.44	1.38
43	2	2364	OMG	O6-C6	-2.74	1.17	1.23
43	2	2424	OMG	O6-C6	-2.74	1.17	1.23
43	2	2804	OMC	O2-C2	-2.74	1.18	1.23
43	2	1522	OMG	O6-C6	-2.73	1.17	1.23
43	2	729	2MG	C5-C4	-2.73	1.36	1.43
43	2	1659	I4U	O2-C2	-2.73	1.18	1.23
43	2	1574	B9B	C5-C4	-2.73	1.33	1.40
43	2	4870	OMG	O6-C6	-2.72	1.17	1.23
43	2	4690	B8K	C5-C4	2.72	1.47	1.38
43	2	1517	2MG	C5-C4	-2.71	1.36	1.43
43	2	1316	OMG	O6-C6	-2.71	1.17	1.23
43	2	1659	I4U	O4-C41	-2.71	1.40	1.47
43	2	4494	OMG	O6-C6	-2.71	1.17	1.23
43	2	2365	OMC	O2-C2	-2.71	1.18	1.23
43	2	1348	P4U	O2-C2	-2.71	1.18	1.23
43	2	2380	B8W	C5-C4	-2.70	1.33	1.40
43	2	4620	OMU	C6-N1	2.70	1.44	1.38
43	2	2363	A2M	O2'-C2'	-2.66	1.35	1.42
43	2	4472	B8W	C5-C4	-2.66	1.33	1.40
43	2	1534	A2M	C5-C4	-2.65	1.33	1.40
43	2	373	OMG	O6-C6	-2.65	1.17	1.23
43	2	3899	BGH	O6-C6	-2.64	1.18	1.23
43	2	3909	OMC	C5-C4	2.64	1.49	1.42
43	2	2401	A2M	O2'-C2'	-2.63	1.35	1.42
43	2	1871	A2M	C5-C4	-2.63	1.34	1.40
43	2	398	A2M	O2'-C2'	-2.62	1.35	1.42
43	2	2773	OMG	O6-C6	-2.62	1.18	1.23
43	2	4185	B8W	C5-C4	-2.61	1.34	1.40
43	2	3887	OMC	O2-C2	-2.61	1.18	1.23
43	2	3867	A2M	O2'-C2'	-2.60	1.36	1.42
43	2	2401	A2M	C5-C4	-2.60	1.34	1.40
43	2	3869	OMC	O2-C2	-2.59	1.18	1.23
43	2	1524	A2M	O2'-C2'	-2.59	1.36	1.42
43	2	2754	B9B	C5-C4	-2.59	1.34	1.40
43	2	1326	A2M	C5-C4	-2.58	1.34	1.40
43	2	373	OMG	C2-N1	2.58	1.44	1.37
43	2	2422	OMC	O2-C2	-2.57	1.18	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	3867	A2M	C2-N3	2.57	1.36	1.32
43	2	398	A2M	C5-C4	-2.57	1.34	1.40
43	2	1871	A2M	O2'-C2'	-2.56	1.36	1.42
43	2	1625	OMG	C2-N1	2.55	1.44	1.37
43	2	4083	5MU	O2-C2	-2.55	1.18	1.23
43	2	3825	A2M	C5-C4	-2.55	1.34	1.40
43	2	2363	A2M	C5-C4	-2.54	1.34	1.40
43	2	2861	OMC	O2-C2	-2.52	1.19	1.23
43	2	3867	A2M	C5-C4	-2.52	1.34	1.40
43	2	4523	A2M	C5-C4	-2.52	1.34	1.40
43	2	2773	OMG	C2-N1	2.52	1.43	1.37
43	2	3825	A2M	O2'-C2'	-2.51	1.36	1.42
43	2	1316	OMG	C2-N1	2.50	1.43	1.37
43	2	4550	7MG	O6-C6	-2.49	1.18	1.23
43	2	1522	OMG	C2-N1	2.48	1.43	1.37
43	2	4494	OMG	C2-N1	2.47	1.43	1.37
43	2	1456	B8Q	C6-N1	2.47	1.44	1.38
43	2	2522	7MG	O6-C6	-2.47	1.18	1.23
43	2	1524	A2M	C5-C4	-2.46	1.34	1.40
43	2	1326	A2M	O2'-C2'	-2.46	1.36	1.42
43	2	4623	OMG	C2-N1	2.46	1.43	1.37
43	2	1605	7MG	O6-C6	-2.45	1.18	1.23
43	2	2050	OMG	C2-N1	2.45	1.43	1.37
43	2	2424	OMG	C2-N1	2.45	1.43	1.37
44	8	14	OMU	O2-C2	-2.45	1.18	1.23
43	2	4870	OMG	C2-N1	2.45	1.43	1.37
43	2	2363	A2M	C2-N3	2.45	1.36	1.32
43	2	2297	E7G	O6-C6	-2.44	1.18	1.23
43	2	1883	OMG	C2-N1	2.44	1.43	1.37
43	2	2804	OMC	C5-C4	2.43	1.48	1.42
43	2	2861	OMC	C5-C4	2.42	1.48	1.42
43	2	4523	A2M	O2'-C2'	-2.40	1.36	1.42
43	2	1797	E7G	O6-C6	-2.40	1.19	1.23
43	2	2422	OMC	C5-C4	2.40	1.48	1.42
43	2	4637	OMG	C2-N1	2.40	1.43	1.37
43	2	3887	OMC	C5-C4	2.39	1.48	1.42
43	2	2364	OMG	C2-N1	2.38	1.43	1.37
43	2	2365	OMC	C5-C4	2.37	1.48	1.42
43	2	4620	OMU	O2-C2	-2.35	1.18	1.23
43	2	373	OMG	C5-C4	-2.35	1.37	1.43
43	2	1883	OMG	C5-C4	-2.34	1.37	1.43
43	2	4623	OMG	C5-C4	-2.34	1.37	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
43	2	4415	1MA	C5-C4	-2.34	1.37	1.43
43	2	3825	A2M	C2-N3	2.34	1.35	1.32
43	2	4523	A2M	C2-N3	2.32	1.35	1.32
43	2	1534	A2M	C2-N3	2.31	1.35	1.32
43	2	1871	A2M	C2-N3	2.31	1.35	1.32
43	2	4620	OMU	C5-C4	2.30	1.48	1.43
43	2	3909	OMC	O2-C2	-2.29	1.19	1.23
43	2	1522	OMG	C5-C4	-2.27	1.37	1.43
43	2	1524	A2M	C2-N3	2.27	1.35	1.32
43	2	2050	OMG	C5-C4	-2.24	1.37	1.43
43	2	2401	A2M	C2-N3	2.24	1.35	1.32
43	2	1326	A2M	C2-N3	2.23	1.35	1.32
43	2	3869	OMC	C5-C4	2.23	1.48	1.42
43	2	398	A2M	C2-N3	2.23	1.35	1.32
43	2	2786	B9H	C31-N3	-2.23	1.43	1.46
43	2	4597	UR3	C5-C4	2.22	1.49	1.43
43	2	1316	OMG	C5-C4	-2.22	1.37	1.43
43	2	4637	OMG	C5-C4	-2.21	1.37	1.43
44	8	14	OMU	C5-C4	2.21	1.48	1.43
43	2	4870	OMG	C5-C4	-2.19	1.37	1.43
43	2	4494	OMG	C5-C4	-2.19	1.37	1.43
43	2	3899	BGH	C5-C4	2.17	1.45	1.38
43	2	2364	OMG	C5-C4	-2.16	1.37	1.43
43	2	2424	OMG	C5-C4	-2.15	1.37	1.43
43	2	4597	UR3	C4-N3	2.10	1.45	1.40
43	2	4690	B8K	O6-C6	-2.08	1.19	1.23
43	2	4597	UR3	O2-C2	-2.05	1.18	1.22
43	2	2773	OMG	C5-C4	-2.04	1.37	1.43
43	2	1625	OMG	C5-C4	-2.04	1.37	1.43
43	2	1871	A2M	O5'-C5'	-2.00	1.39	1.44

All (291) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
43	2	237	B9B	O6-C6-N1	-30.27	93.99	120.12
43	2	2754	B9B	O6-C6-N1	-29.85	94.36	120.12
43	2	1574	B9B	O6-C6-N1	-29.78	94.41	120.12
43	2	4564	M7A	C5-C6-N6	13.72	147.17	123.74
43	2	4564	M7A	N6-C6-N1	-11.68	92.76	118.35
43	2	1534	A2M	C5-C6-N6	10.75	136.68	120.35
43	2	4523	A2M	C5-C6-N6	10.52	136.34	120.35
43	2	398	A2M	C5-C6-N6	10.51	136.33	120.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
43	2	1326	A2M	C5-C6-N6	10.48	136.28	120.35
43	2	3867	A2M	C5-C6-N6	10.43	136.20	120.35
43	2	3825	A2M	C5-C6-N6	10.39	136.14	120.35
43	2	1524	A2M	C5-C6-N6	10.38	136.13	120.35
43	2	1871	A2M	C5-C6-N6	10.35	136.08	120.35
43	2	2401	A2M	C5-C6-N6	10.32	136.03	120.35
43	2	2363	A2M	C5-C6-N6	10.30	136.00	120.35
43	2	4083	5MU	C5-C4-N3	10.08	123.92	115.31
43	2	4083	5MU	C5-C6-N1	-7.88	115.23	123.34
43	2	1534	A2M	N6-C6-N1	-7.66	102.68	118.57
43	2	4597	UR3	C4-N3-C2	-7.42	117.58	124.56
43	2	3867	A2M	N6-C6-N1	-7.37	103.27	118.57
43	2	398	A2M	N6-C6-N1	-7.36	103.31	118.57
43	2	4523	A2M	N6-C6-N1	-7.34	103.34	118.57
43	2	1326	A2M	N6-C6-N1	-7.28	103.47	118.57
43	2	3825	A2M	N6-C6-N1	-7.24	103.55	118.57
43	2	2363	A2M	N6-C6-N1	-7.23	103.57	118.57
43	2	2401	A2M	N6-C6-N1	-7.23	103.57	118.57
43	2	1871	A2M	N6-C6-N1	-7.20	103.64	118.57
43	2	1524	A2M	N6-C6-N1	-7.16	103.70	118.57
43	2	4083	5MU	C4-N3-C2	-6.82	118.52	127.35
43	2	2401	A2M	N3-C2-N1	-6.42	118.64	128.68
43	2	1534	A2M	N3-C2-N1	-6.38	118.70	128.68
43	2	1871	A2M	N3-C2-N1	-6.33	118.78	128.68
43	2	4690	B8K	C72-C71-N7	6.33	128.38	118.86
43	2	3825	A2M	N3-C2-N1	-6.30	118.83	128.68
43	2	1326	A2M	N3-C2-N1	-6.29	118.85	128.68
43	2	398	A2M	N3-C2-N1	-6.27	118.88	128.68
43	2	4523	A2M	N3-C2-N1	-6.26	118.89	128.68
43	2	2363	A2M	N3-C2-N1	-6.20	118.99	128.68
43	2	3867	A2M	N3-C2-N1	-6.17	119.04	128.68
43	2	4690	B8K	C5-C6-N1	6.10	121.75	110.99
43	2	3897	B8K	C72-C71-N7	6.10	128.03	118.86
43	2	1524	A2M	N3-C2-N1	-6.08	119.18	128.68
43	2	4564	M7A	N3-C2-N1	-5.97	119.26	128.60
43	2	3899	BGH	C72-C71-N7	5.97	127.83	118.86
43	2	1456	B8Q	N3-C2-N1	5.91	124.07	117.13
43	2	4185	B8W	N2-C2-N3	5.87	127.35	117.79
43	2	2380	B8W	N2-C2-N3	5.83	127.30	117.79
43	2	4472	B8W	N2-C2-N3	5.76	127.18	117.79
43	2	3899	BGH	C5-C6-N1	5.76	121.14	110.99
43	2	3897	B8K	C5-C6-N1	5.64	120.92	110.99

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
43	2	4472	B8W	N3-C2-N1	-5.60	119.75	127.22
43	2	237	B9B	N3-C2-N1	-5.54	119.83	127.22
43	2	1574	B9B	N3-C2-N1	-5.48	119.92	127.22
43	2	3909	OMC	O2-C2-N3	-5.43	113.49	122.33
43	2	2754	B9B	N3-C2-N1	-5.40	120.02	127.22
43	2	4415	1MA	N1-C2-N3	-5.35	119.79	126.02
44	8	14	OMU	C4-N3-C2	-5.25	119.65	126.58
43	2	4185	B8W	N3-C2-N1	-5.24	120.23	127.22
43	2	1797	E7G	C5-C6-N1	5.22	120.20	110.99
43	2	2297	E7G	C5-C6-N1	5.16	120.08	110.99
43	2	2380	B8W	N3-C2-N1	-5.15	120.35	127.22
43	2	3880	P7G	C4-C5-N7	5.10	109.36	106.67
43	2	1909	P7G	C4-C5-N7	5.10	109.36	106.67
43	2	4620	OMU	C4-N3-C2	-5.09	119.86	126.58
43	2	4550	7MG	C5-C6-N1	5.05	119.90	110.99
43	2	4564	M7A	N3-C4-N9	5.02	133.21	126.87
43	2	3899	BGH	C2-N3-C4	5.01	121.23	112.30
43	2	1456	B8Q	O2-C2-N3	-4.98	115.64	122.95
43	2	2297	E7G	C4-C5-N7	4.96	109.32	104.91
43	2	3897	B8K	C2-N3-C4	4.91	121.04	112.30
43	2	1797	E7G	C4-C5-N7	4.90	109.27	104.91
43	2	1605	7MG	C5-C6-N1	4.89	119.62	110.99
43	2	4083	5MU	C5M-C5-C6	-4.89	116.32	122.85
43	2	1456	B8Q	C31-N3-C4	4.84	121.54	114.25
43	2	4690	B8K	C2-N3-C4	4.83	120.91	112.30
43	2	2522	7MG	C5-C6-N1	4.83	119.50	110.99
43	2	2754	B9B	C2-N3-C4	4.73	120.75	115.36
43	2	237	B9B	C2-N3-C4	4.72	120.75	115.36
43	2	4083	5MU	N3-C2-N1	4.66	121.07	114.89
43	2	2786	B9H	C31-N3-C2	4.63	123.00	117.21
43	2	2297	E7G	C2-N3-C4	4.55	120.41	112.30
43	2	1797	E7G	C2-N3-C4	4.51	120.33	112.30
43	2	4690	B8K	C4-C5-N7	4.48	108.89	104.91
43	2	2754	B9B	N2-C2-N3	4.47	125.08	117.79
43	2	1574	B9B	C2-N3-C4	4.46	120.45	115.36
43	2	237	B9B	N2-C2-N3	4.45	125.04	117.79
43	2	4550	7MG	C2-N3-C4	4.42	120.18	112.30
43	2	1456	B8Q	C6-N1-C2	-4.37	117.87	121.79
43	2	4472	B8W	C2-N3-C4	4.31	120.28	115.36
43	2	3897	B8K	C5-C4-N9	4.31	111.94	106.35
43	2	1605	7MG	C2-N3-C4	4.30	119.96	112.30
43	2	2522	7MG	C2-N3-C4	4.30	119.96	112.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
43	2	1574	B9B	N2-C2-N3	4.27	124.75	117.79
43	2	3899	BGH	C5-C4-N9	4.25	111.87	106.35
43	2	1659	I4U	C5-C4-N3	-4.21	118.51	124.91
43	2	2380	B8W	C2-N3-C4	4.14	120.08	115.36
43	2	3909	OMC	O2-C2-N1	4.10	127.36	118.89
43	2	2786	B9H	C6-N1-C2	-4.10	118.12	121.79
43	2	4185	B8W	O6-C6-N1	4.09	124.70	119.03
43	2	3899	BGH	N9-C8-N7	4.05	108.76	103.33
43	2	4185	B8W	C1'-N9-C4	-4.00	119.61	126.64
43	2	4415	1MA	C5-C6-N1	4.00	119.86	113.90
43	2	4083	5MU	C5M-C5-C4	3.97	123.14	118.77
43	2	4872	2MG	CM2-N2-C2	-3.97	115.08	123.86
43	2	3899	BGH	C4-C5-N7	3.95	108.42	104.91
43	2	4185	B8W	C2-N3-C4	3.94	119.86	115.36
43	2	2380	B8W	O6-C6-N1	3.93	124.48	119.03
43	2	3897	B8K	N9-C8-N7	3.84	108.49	103.33
43	2	4690	B8K	C5-C4-N9	3.82	111.30	106.35
43	2	3897	B8K	C4-C5-N7	3.82	108.31	104.91
43	2	2297	E7G	C5-C4-N3	-3.79	120.90	128.13
43	2	1797	E7G	C5-C4-N3	-3.77	120.94	128.13
43	2	4472	B8W	C1'-N9-C4	-3.73	120.08	126.64
43	2	4550	7MG	C5-C4-N3	-3.69	121.09	128.13
43	2	4620	OMU	N3-C2-N1	3.69	119.79	114.89
43	2	4083	5MU	O4-C4-C5	-3.67	120.64	124.90
43	2	1605	7MG	C5-C4-N9	3.67	111.11	106.35
43	2	1348	P4U	C5-C4-N3	-3.67	119.33	124.91
44	8	14	OMU	N3-C2-N1	3.66	119.75	114.89
43	2	1883	OMG	C5-C6-N1	3.61	120.32	113.95
43	2	4564	M7A	C2-N3-C4	3.60	120.27	111.75
43	2	1797	E7G	C5-C4-N9	3.60	111.02	106.35
43	2	2522	7MG	C5-C4-N9	3.58	111.00	106.35
43	2	1517	2MG	C5-C6-N1	3.57	120.25	113.95
43	2	2522	7MG	C5-C4-N3	-3.57	121.33	128.13
43	2	1605	7MG	C5-C4-N3	-3.56	121.34	128.13
43	2	978	2MG	C5-C6-N1	3.56	120.24	113.95
43	2	4690	B8K	N9-C8-N7	3.55	108.10	103.33
43	2	4870	OMG	C5-C6-N1	3.55	120.22	113.95
43	2	4637	OMG	C5-C6-N1	3.53	120.19	113.95
43	2	2424	OMG	C5-C6-N1	3.51	120.14	113.95
43	2	4550	7MG	C5-C4-N9	3.50	110.89	106.35
43	2	729	2MG	C5-C6-N1	3.48	120.10	113.95
43	2	4494	OMG	C5-C6-N1	3.47	120.07	113.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
43	2	2861	OMC	O2-C2-N3	-3.45	116.71	122.33
43	2	3899	BGH	C5-C4-N3	-3.45	121.55	128.13
43	2	2364	OMG	C5-C6-N1	3.45	120.04	113.95
43	2	1625	OMG	C5-C6-N1	3.43	120.01	113.95
43	2	4690	B8K	C6-C5-C4	-3.41	115.58	122.62
43	2	2050	OMG	C5-C6-N1	3.40	119.96	113.95
43	2	2297	E7G	C5-C4-N9	3.40	110.76	106.35
43	2	4872	2MG	C5-C6-N1	3.40	119.96	113.95
43	2	1316	OMG	C5-C6-N1	3.39	119.94	113.95
43	2	4623	OMG	C5-C6-N1	3.38	119.92	113.95
43	2	2773	OMG	C5-C6-N1	3.36	119.89	113.95
43	2	1522	OMG	C5-C6-N1	3.35	119.87	113.95
43	2	4620	OMU	C5-C4-N3	3.35	119.85	114.84
43	2	373	OMG	C5-C6-N1	3.34	119.84	113.95
43	2	1909	P7G	N9-C8-N7	3.32	108.12	103.38
44	8	14	OMU	C5-C4-N3	3.32	119.80	114.84
43	2	4637	OMG	C2-N1-C6	-3.27	119.08	125.10
43	2	2050	OMG	C2-N1-C6	-3.23	119.16	125.10
43	2	2380	B8W	C1'-N9-C4	-3.21	121.01	126.64
43	2	2364	OMG	C2-N1-C6	-3.20	119.21	125.10
43	2	3897	B8K	C6-C5-C4	-3.19	116.05	122.62
43	2	2380	B8W	N2-C2-N1	-3.15	112.35	117.25
43	2	3897	B8K	C5-C4-N3	-3.13	122.17	128.13
43	2	1883	OMG	C2-N1-C6	-3.11	119.37	125.10
43	2	4185	B8W	N2-C2-N1	-3.11	112.42	117.25
44	8	14	OMU	O4-C4-C5	-3.10	119.71	125.16
43	2	2861	OMC	C1'-N1-C2	3.10	125.33	118.42
43	2	4623	OMG	C2-N1-C6	-3.09	119.40	125.10
43	2	2424	OMG	C2-N1-C6	-3.08	119.42	125.10
43	2	4870	OMG	C2-N1-C6	-3.07	119.45	125.10
43	2	1316	OMG	C2-N1-C6	-3.07	119.45	125.10
43	2	4494	OMG	C2-N1-C6	-3.05	119.48	125.10
43	2	3867	A2M	C1'-N9-C4	3.05	132.00	126.64
43	2	373	OMG	C2-N1-C6	-3.04	119.50	125.10
43	2	3899	BGH	C6-C5-C4	-3.04	116.36	122.62
43	2	4690	B8K	C5-C4-N3	-3.01	122.40	128.13
43	2	4083	5MU	C6-C5-C4	3.00	120.54	118.03
43	2	3887	OMC	O2-C2-N3	-2.96	117.52	122.33
43	2	1625	OMG	C2-N1-C6	-2.95	119.66	125.10
43	2	2363	A2M	C1'-N9-C4	2.94	131.81	126.64
43	2	1522	OMG	C2-N1-C6	-2.94	119.69	125.10
43	2	4483	B8T	O3'-C3'-C2'	2.93	121.31	111.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
43	2	2773	OMG	C2-N1-C6	-2.92	119.72	125.10
43	2	4564	M7A	C4-N9-C1'	-2.89	119.73	126.60
43	2	4597	UR3	C6-N1-C2	-2.89	119.20	121.79
43	2	1605	7MG	N9-C8-N7	2.89	107.50	103.38
43	2	2522	7MG	N9-C8-N7	2.87	107.49	103.38
43	2	4597	UR3	C3U-N3-C2	2.85	122.31	117.31
43	2	4620	OMU	O4-C4-C5	-2.84	120.17	125.16
43	2	3909	OMC	C4-N3-C2	2.83	124.82	120.25
43	2	4472	B8W	C2-N1-C6	2.79	120.56	116.08
44	8	14	OMU	C1'-N1-C2	2.77	122.58	117.57
43	2	2522	7MG	C4-C5-N7	2.76	109.36	105.53
43	2	2422	OMC	O2-C2-N3	-2.74	117.87	122.33
43	2	3869	OMC	O2-C2-N3	-2.74	117.88	122.33
43	2	2297	E7G	N9-C8-N7	2.74	107.29	103.38
43	2	4472	B8W	O6-C6-N1	2.72	122.81	119.03
43	2	3899	BGH	O6-C6-N1	-2.72	114.91	120.12
43	2	4415	1MA	C8-N7-C5	2.70	108.13	102.99
43	2	4472	B8W	N2-C2-N1	-2.69	113.07	117.25
43	2	3909	OMC	C5-C4-N3	-2.68	116.77	121.33
43	2	1909	P7G	C71-N7-C5	2.68	130.87	124.52
43	2	4564	M7A	C5-C4-N3	-2.67	120.35	126.62
43	2	1797	E7G	N9-C8-N7	2.67	107.19	103.38
43	2	1605	7MG	C4-C5-N7	2.66	109.23	105.53
43	2	4872	2MG	C8-N7-C5	2.66	108.05	102.99
43	2	1456	B8Q	C31-N3-C2	2.62	121.59	117.79
43	2	3909	OMC	C5-C4-N4	2.61	124.69	120.57
43	2	4690	B8K	C2-N1-C6	-2.61	120.33	125.10
43	2	4550	7MG	C4-C5-N7	2.61	109.15	105.53
43	2	1797	E7G	C2-N1-C6	-2.60	120.36	125.10
43	2	4671	B8T	C6-C5-C4	2.60	120.14	116.96
43	2	1524	A2M	C1'-N9-C4	2.59	131.20	126.64
43	2	978	2MG	C8-N7-C5	2.58	107.90	102.99
43	2	2297	E7G	C2-N1-C6	-2.56	120.42	125.10
43	2	1883	OMG	O6-C6-C5	-2.56	119.37	124.37
43	2	3880	P7G	N9-C8-N7	2.55	107.03	103.38
43	2	4550	7MG	N9-C8-N7	2.53	107.00	103.38
43	2	4550	7MG	C2-N1-C6	-2.53	120.48	125.10
43	2	4523	A2M	C2'-C3'-C4'	2.52	107.47	101.99
43	2	729	2MG	C8-N7-C5	2.51	107.78	102.99
43	2	3897	B8K	O6-C6-N1	-2.51	115.31	120.12
43	2	1517	2MG	C8-N7-C5	2.49	107.74	102.99
44	8	14	OMU	CM2-O2'-C2'	2.49	121.05	114.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
43	2	1456	B8Q	C1'-N1-C2	2.48	121.18	116.99
43	2	1605	7MG	C2-N1-C6	-2.45	120.63	125.10
43	2	4083	5MU	O4-C4-N3	-2.44	115.44	120.12
43	2	1625	OMG	C8-N7-C5	2.44	107.63	102.99
43	2	4483	B8T	O3'-C3'-C4'	2.43	118.08	111.05
43	2	3899	BGH	C2-N1-C6	-2.42	120.68	125.10
43	2	1316	OMG	C8-N7-C5	2.42	107.59	102.99
43	2	373	OMG	C8-N7-C5	2.38	107.52	102.99
43	2	4870	OMG	C8-N7-C5	2.38	107.52	102.99
43	2	4623	OMG	C8-N7-C5	2.36	107.49	102.99
43	2	3897	B8K	C2-N1-C6	-2.35	120.81	125.10
43	2	373	OMG	N2-C2-N1	2.35	121.71	116.71
43	2	2424	OMG	O6-C6-C5	-2.34	119.81	124.37
43	2	4690	B8K	O6-C6-N1	-2.34	115.64	120.12
43	2	4185	B8W	C2-N1-C6	2.34	119.83	116.08
43	2	4637	OMG	C8-N7-C5	2.33	107.43	102.99
43	2	3897	B8K	N1-C2-N3	-2.32	119.00	123.32
43	2	978	2MG	O6-C6-C5	-2.31	119.85	124.37
43	2	4690	B8K	N1-C2-N3	-2.30	119.03	123.32
43	2	3899	BGH	N1-C2-N3	-2.30	119.03	123.32
43	2	4083	5MU	O2-C2-N1	-2.29	119.74	122.79
43	2	2522	7MG	C2-N1-C6	-2.29	120.92	125.10
43	2	2861	OMC	O2-C2-N1	2.29	123.61	118.89
43	2	1625	OMG	O6-C6-C5	-2.26	119.96	124.37
43	2	2364	OMG	O6-C6-C5	-2.25	119.97	124.37
43	2	1522	OMG	C8-N7-C5	2.25	107.28	102.99
43	2	2786	B9H	O2-C2-N1	-2.23	117.49	122.72
43	2	1797	E7G	O6-C6-C5	-2.23	122.06	127.54
43	2	3909	OMC	C6-N1-C2	-2.23	116.63	120.49
43	2	4494	OMG	C8-N7-C5	2.23	107.23	102.99
43	2	4623	OMG	N2-C2-N1	2.22	121.45	116.71
43	2	2773	OMG	O6-C6-C5	-2.22	120.04	124.37
43	2	4483	B8T	C6-C5-C4	2.21	119.67	116.96
43	2	1517	2MG	O6-C6-C5	-2.21	120.06	124.37
43	2	4872	2MG	O6-C6-C5	-2.20	120.07	124.37
43	2	1659	I4U	O2-C2-N3	-2.19	118.77	122.33
43	2	3880	P7G	C71-N7-C5	2.19	129.70	124.52
43	2	1883	OMG	C8-N7-C5	2.18	107.15	102.99
43	2	4870	OMG	O6-C6-C5	-2.18	120.11	124.37
43	2	2786	B9H	O3'-C3'-C4'	2.18	117.35	111.05
43	2	1522	OMG	O6-C6-C5	-2.17	120.13	124.37
43	2	729	2MG	O6-C6-C5	-2.17	120.13	124.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
43	2	4637	OMG	O6-C6-C5	-2.16	120.14	124.37
43	2	373	OMG	O6-C6-C5	-2.16	120.15	124.37
43	2	2050	OMG	O6-C6-C5	-2.16	120.15	124.37
43	2	2050	OMG	C8-N7-C5	2.16	107.10	102.99
43	2	2050	OMG	N2-C2-N1	2.15	121.28	116.71
43	2	2380	B8W	C2-N1-C6	2.15	119.53	116.08
43	2	1316	OMG	N2-C2-N1	2.14	121.26	116.71
43	2	2773	OMG	C8-N7-C5	2.13	107.04	102.99
43	2	2422	OMC	C1'-N1-C2	2.13	123.17	118.42
43	2	3909	OMC	C1'-N1-C2	2.12	123.16	118.42
43	2	4494	OMG	O6-C6-C5	-2.12	120.23	124.37
43	2	2297	E7G	O6-C6-C5	-2.12	122.33	127.54
43	2	4523	A2M	C3'-C2'-C1'	2.10	106.84	102.89
43	2	2364	OMG	C8-N7-C5	2.09	106.97	102.99
43	2	1316	OMG	O6-C6-C5	-2.08	120.32	124.37
43	2	3825	A2M	C1'-N9-C4	2.07	130.28	126.64
43	2	4623	OMG	O6-C6-C5	-2.07	120.33	124.37
43	2	2297	E7G	C6-C5-C4	-2.05	118.40	122.62
43	2	1797	E7G	C6-C5-C4	-2.04	118.42	122.62
43	2	237	B9B	C61-O6-C6	-2.03	113.71	117.51
43	2	4564	M7A	C71-N7-C5	-2.03	116.21	124.01
43	2	4550	7MG	O6-C6-C5	-2.03	122.56	127.54
43	2	2424	OMG	C8-N7-C5	2.02	106.84	102.99
43	2	4550	7MG	C6-C5-C4	-2.02	118.46	122.62
43	2	2522	7MG	C6-C5-C4	-2.02	118.46	122.62
43	2	1605	7MG	C6-C5-C4	-2.02	118.46	122.62
43	2	3897	B8K	N2-C2-N1	2.02	121.01	116.71
43	2	4483	B8T	O2-C2-N3	-2.01	119.06	122.33
43	2	1522	OMG	N2-C2-N1	2.01	121.00	116.71
43	2	1605	7MG	O6-C6-C5	-2.01	122.61	127.54
43	2	4690	B8K	O6-C6-C5	-2.01	122.61	127.54

There are no chirality outliers.

All (82) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
44	8	14	OMU	C1'-C2'-O2'-CM2
43	2	237	B9B	C5-C6-O6-C61
43	2	237	B9B	N1-C6-O6-C61
43	2	237	B9B	C3'-C4'-C5'-O5'
43	2	237	B9B	O4'-C4'-C5'-O5'
43	2	398	A2M	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
43	2	1316	OMG	O4'-C4'-C5'-O5'
43	2	1316	OMG	C3'-C4'-C5'-O5'
43	2	1348	P4U	N3-C4-O4-C41
43	2	1574	B9B	C5-C6-O6-C61
43	2	1574	B9B	N1-C6-O6-C61
43	2	1625	OMG	C3'-C4'-C5'-O5'
43	2	1871	A2M	O4'-C4'-C5'-O5'
43	2	1871	A2M	C3'-C4'-C5'-O5'
43	2	1883	OMG	O4'-C4'-C5'-O5'
43	2	1883	OMG	C3'-C4'-C5'-O5'
43	2	2364	OMG	O4'-C4'-C5'-O5'
43	2	2380	B8W	C5-C6-O6-C61
43	2	2424	OMG	O4'-C4'-C5'-O5'
43	2	2424	OMG	C3'-C4'-C5'-O5'
43	2	2754	B9B	C5-C6-O6-C61
43	2	2754	B9B	N1-C6-O6-C61
43	2	4083	5MU	O4'-C4'-C5'-O5'
43	2	4185	B8W	C5-C6-O6-C61
43	2	4472	B8W	C5-C6-O6-C61
43	2	4472	B8W	N1-C6-O6-C61
43	2	4550	7MG	O4'-C4'-C5'-O5'
43	2	4550	7MG	C3'-C4'-C5'-O5'
43	2	4637	OMG	O4'-C4'-C5'-O5'
43	2	4637	OMG	C1'-C2'-O2'-CM2
43	2	4870	OMG	C3'-C4'-C5'-O5'
43	2	729	2MG	O4'-C4'-C5'-O5'
43	2	2364	OMG	C3'-C4'-C5'-O5'
43	2	4083	5MU	C3'-C4'-C5'-O5'
43	2	4523	A2M	O4'-C4'-C5'-O5'
43	2	4637	OMG	C3'-C4'-C5'-O5'
43	2	4870	OMG	O4'-C4'-C5'-O5'
43	2	2380	B8W	N1-C6-O6-C61
43	2	398	A2M	C3'-C4'-C5'-O5'
43	2	1625	OMG	O4'-C4'-C5'-O5'
43	2	3897	B8K	O4'-C4'-C5'-O5'
43	2	4872	2MG	O4'-C4'-C5'-O5'
43	2	4872	2MG	C3'-C4'-C5'-O5'
43	2	4083	5MU	C2'-C1'-N1-C6
43	2	3897	B8K	C3'-C4'-C5'-O5'
43	2	729	2MG	C3'-C4'-C5'-O5'
43	2	4523	A2M	C3'-C4'-C5'-O5'
43	2	1625	OMG	C4'-C5'-O5'-P

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Mol	Chain	Res	Type	Atoms
43	2	4083	5MU	O4'-C1'-N1-C6
43	2	2297	E7G	C72-C71-N7-C8
43	2	1517	2MG	C4'-C5'-O5'-P
43	2	4083	5MU	C4'-C5'-O5'-P
43	2	4083	5MU	C2'-C1'-N1-C2
43	2	3869	OMC	C3'-C2'-O2'-CM2
43	2	1909	P7G	O4'-C4'-C5'-O5'
43	2	3867	A2M	C3'-C4'-C5'-O5'
43	2	3867	A2M	C4'-C5'-O5'-P
43	2	4870	OMG	C4'-C5'-O5'-P
43	2	1574	B9B	O4'-C4'-C5'-O5'
43	2	4185	B8W	N1-C6-O6-C61
43	2	1909	P7G	C72-C71-N7-C8
43	2	4083	5MU	O4'-C1'-N1-C2
43	2	1534	A2M	C4'-C5'-O5'-P
43	2	373	OMG	C4'-C5'-O5'-P
43	2	2754	B9B	O6-C61-C62-C63
43	2	3887	OMC	C4'-C5'-O5'-P
43	2	1659	I4U	C42-C41-O4-C4
43	2	1659	I4U	C43-C41-O4-C4
43	2	1574	B9B	C62-C61-O6-C6
43	2	2422	OMC	O4'-C4'-C5'-O5'
43	2	2754	B9B	C4'-C5'-O5'-P
43	2	1522	OMG	O4'-C4'-C5'-O5'
43	2	3880	P7G	O4'-C4'-C5'-O5'
43	2	1574	B9B	C3'-C4'-C5'-O5'
43	2	1517	2MG	O4'-C4'-C5'-O5'
43	2	3880	P7G	C3'-C4'-C5'-O5'
43	2	3909	OMC	C2'-C1'-N1-C2
43	2	2754	B9B	C62-C61-O6-C6
43	2	1534	A2M	O4'-C4'-C5'-O5'
43	2	1909	P7G	C3'-C4'-C5'-O5'
43	2	1909	P7G	N7-C71-C72-C73
43	2	4415	1MA	C4'-C5'-O5'-P

There are no ring outliers.

16 monomers are involved in 19 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
43	2	2773	OMG	1	0
43	2	1524	A2M	1	0
43	2	1883	OMG	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
43	2	4083	5MU	2	0
43	2	1574	B9B	1	0
43	2	4620	OMU	2	0
43	2	2363	A2M	1	0
43	2	4523	A2M	1	0
43	2	4494	OMG	1	0
43	2	2522	7MG	2	0
43	2	1517	2MG	1	0
43	2	2364	OMG	1	0
43	2	978	2MG	1	0
43	2	4872	2MG	1	0
43	2	729	2MG	1	0
43	2	1871	A2M	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 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	$\# Z > 2$
54	GTP	w	801	55	26,34,34	0.98	2 (7%)	32,54,54	0.82	0

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
54	GTP	w	801	55	-	3/18/38/38	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
54	w	801	GTP	C5-C6	-2.70	1.41	1.47
54	w	801	GTP	C8-N7	-2.12	1.31	1.35

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

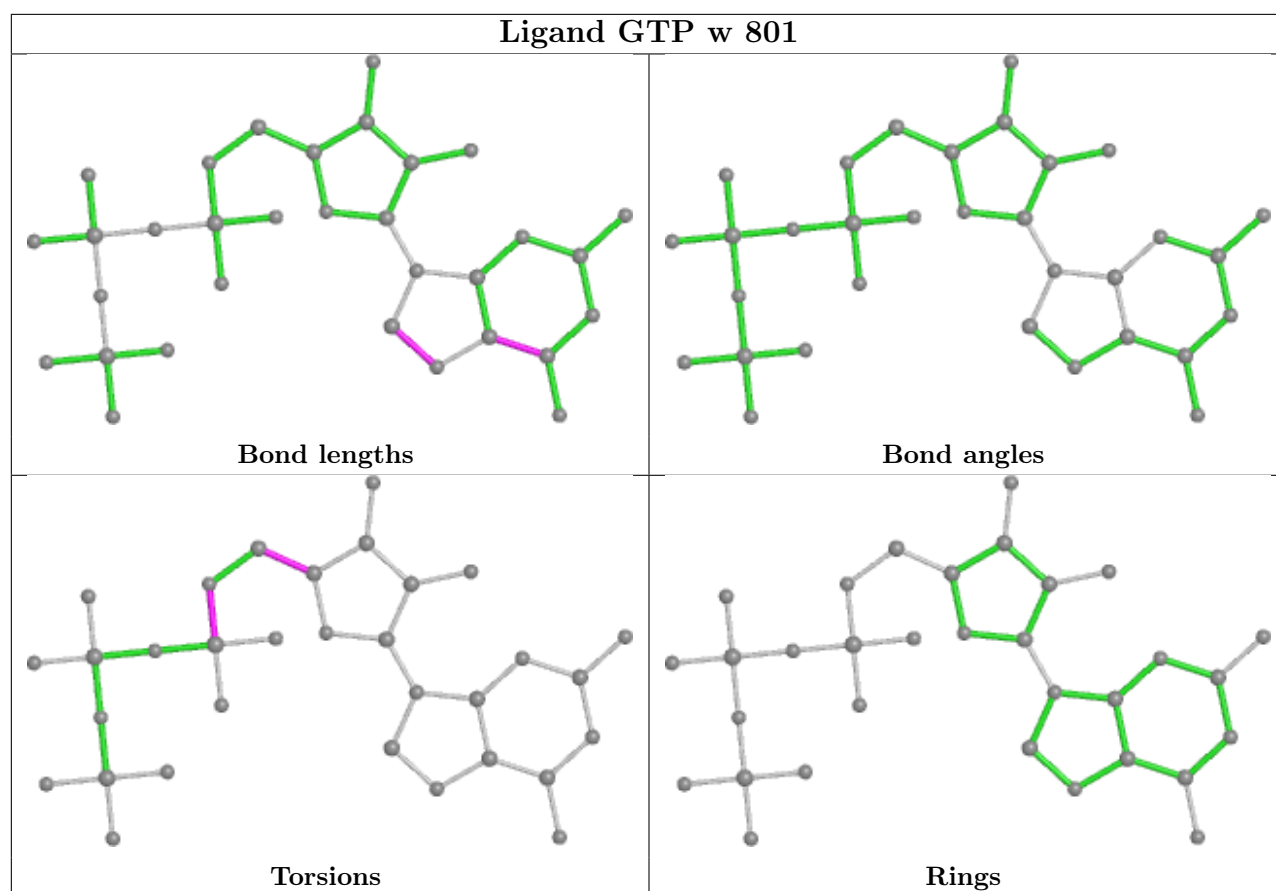
Mol	Chain	Res	Type	Atoms
54	w	801	GTP	C3'-C4'-C5'-O5'
54	w	801	GTP	O4'-C4'-C5'-O5'
54	w	801	GTP	C5'-O5'-PA-O1A

There are no ring outliers.

1 monomer is involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
54	w	801	GTP	14	0

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 [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

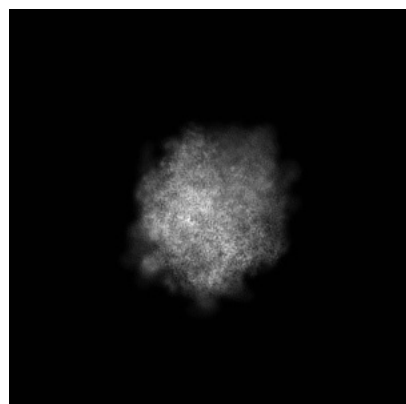
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-35672. These allow visual inspection of the internal detail of the map and identification of artifacts.

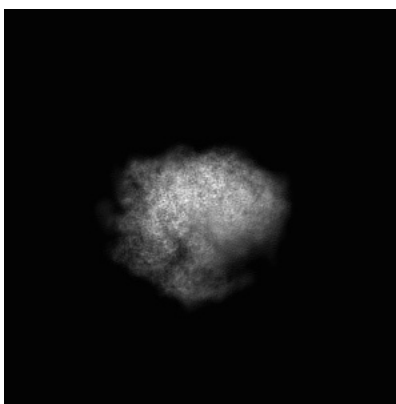
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

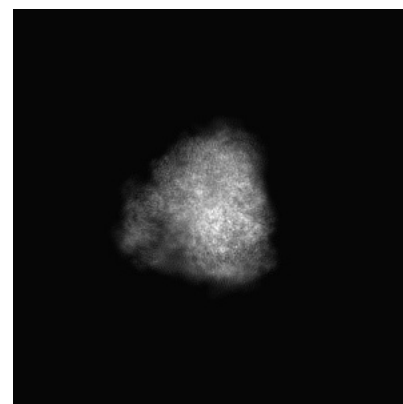
6.1.1 Primary map



X

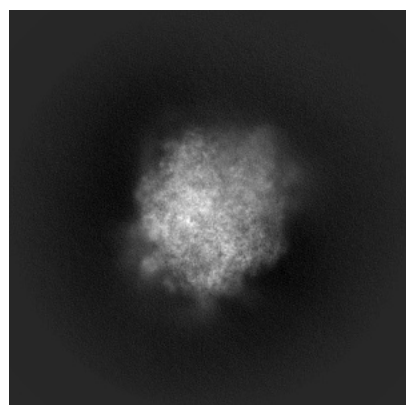


Y

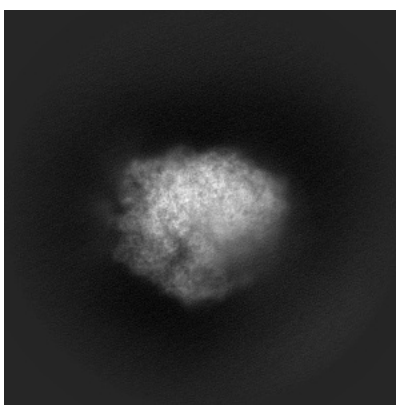


Z

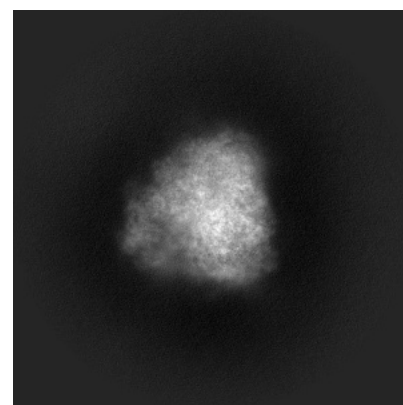
6.1.2 Raw map



X



Y

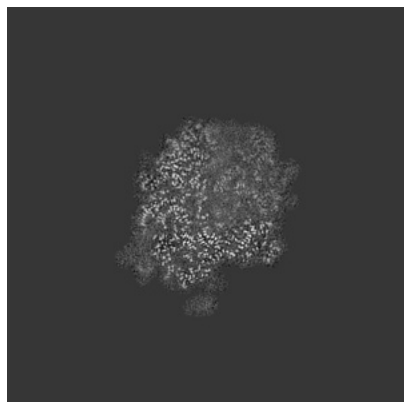


Z

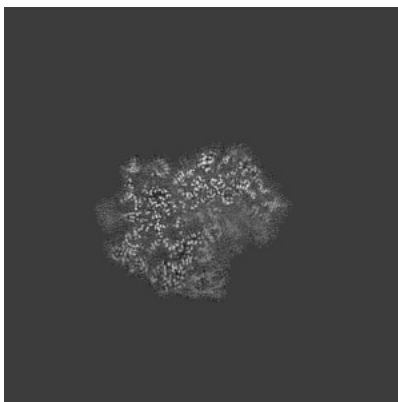
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

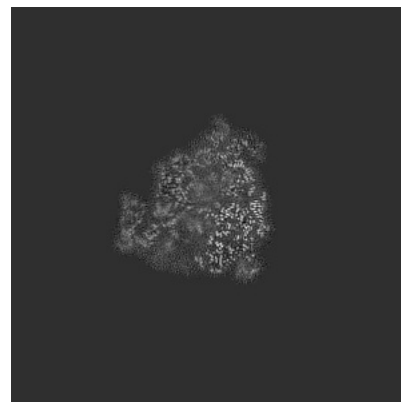
6.2.1 Primary map



X Index: 200

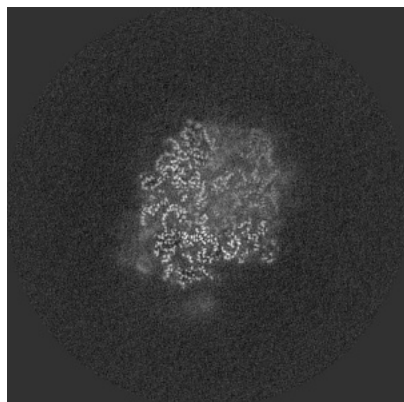


Y Index: 200

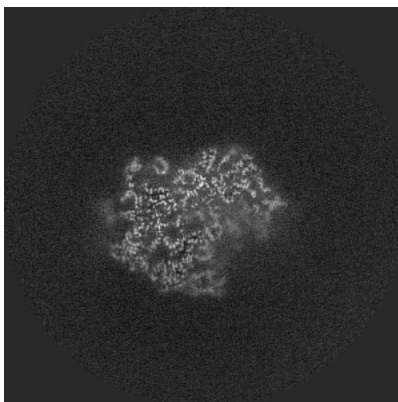


Z Index: 200

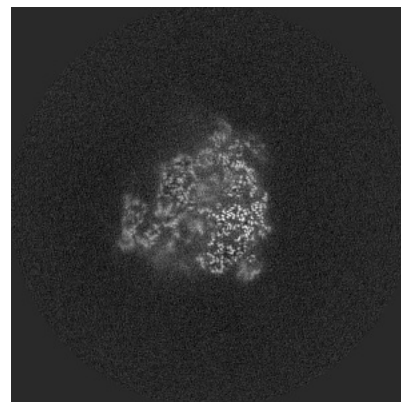
6.2.2 Raw map



X Index: 200



Y Index: 200

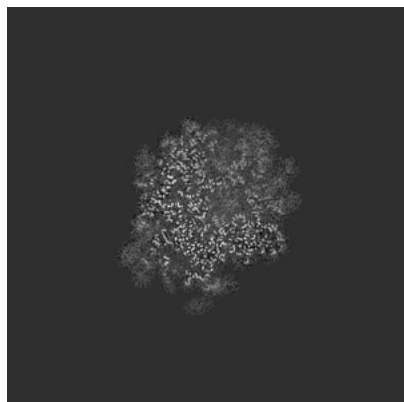


Z Index: 200

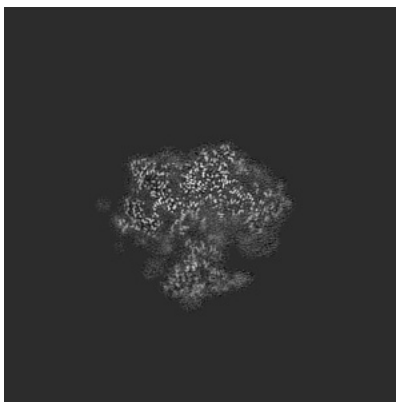
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

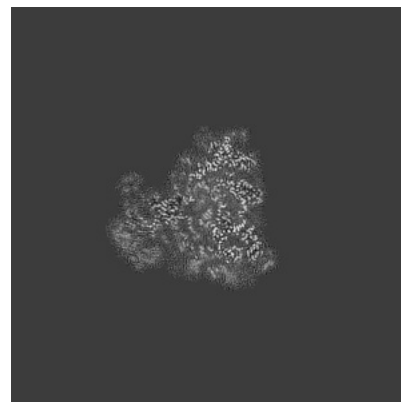
6.3.1 Primary map



X Index: 206

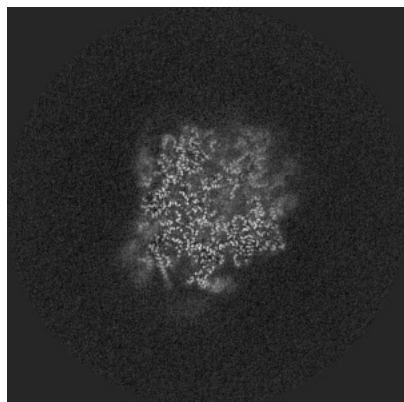


Y Index: 180

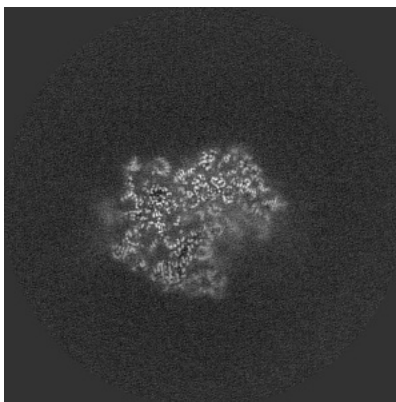


Z Index: 183

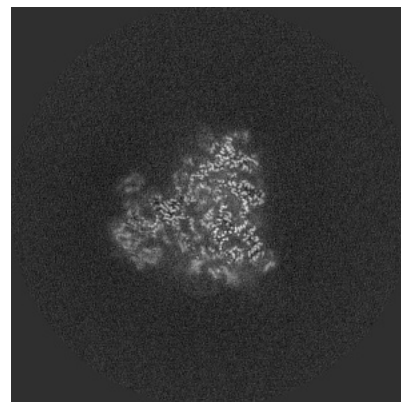
6.3.2 Raw map



X Index: 210



Y Index: 199

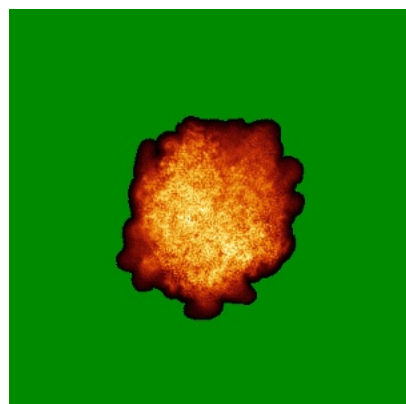


Z Index: 184

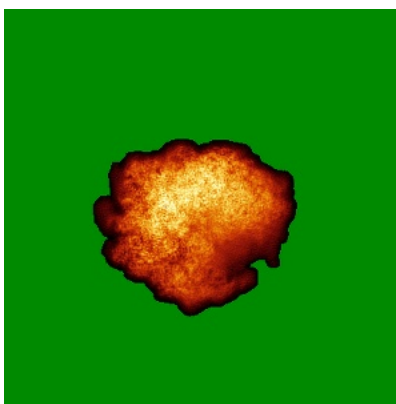
The images above show the largest variance slices of the map in three orthogonal directions.

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

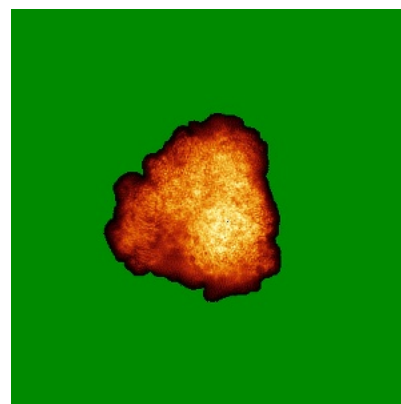
6.4.1 Primary map



X

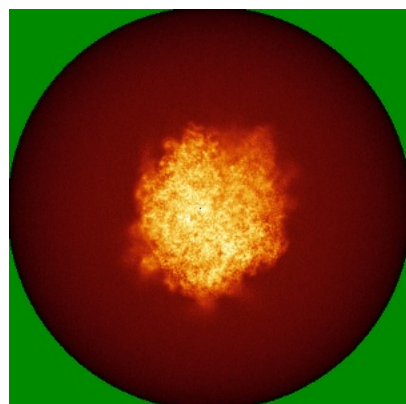


Y

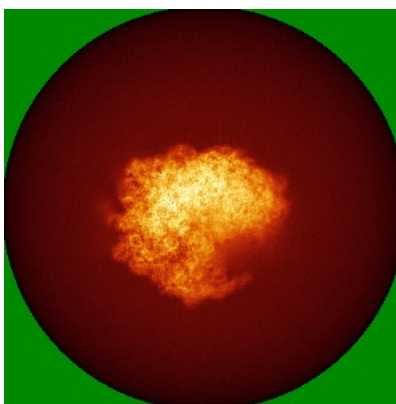


Z

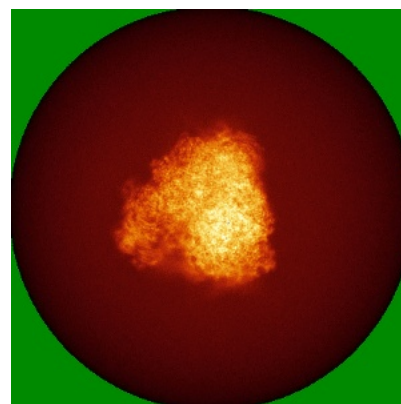
6.4.2 Raw map



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



X



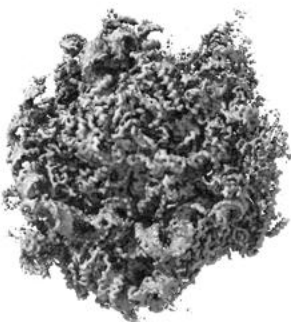
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.038. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X



Y



Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

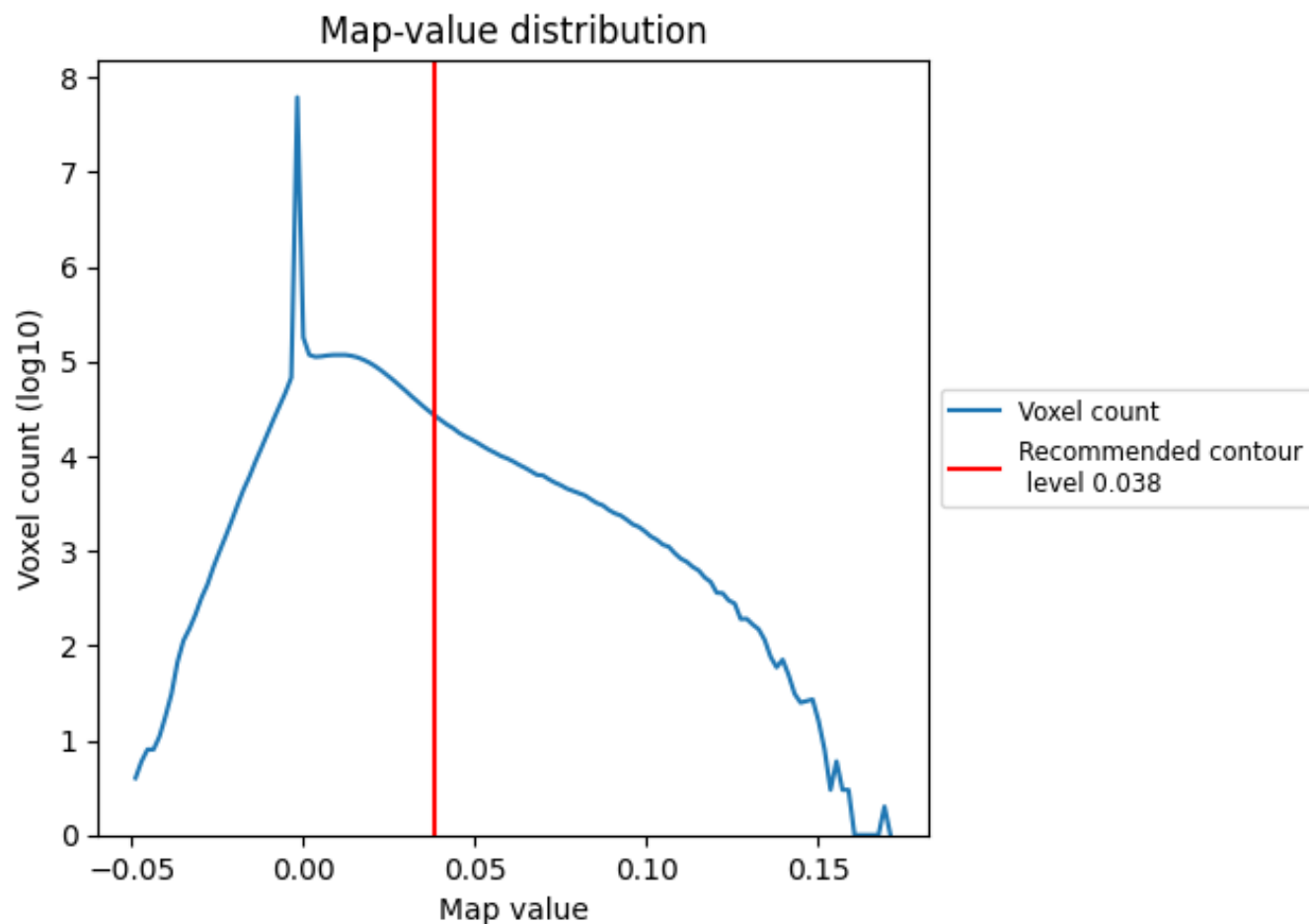
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

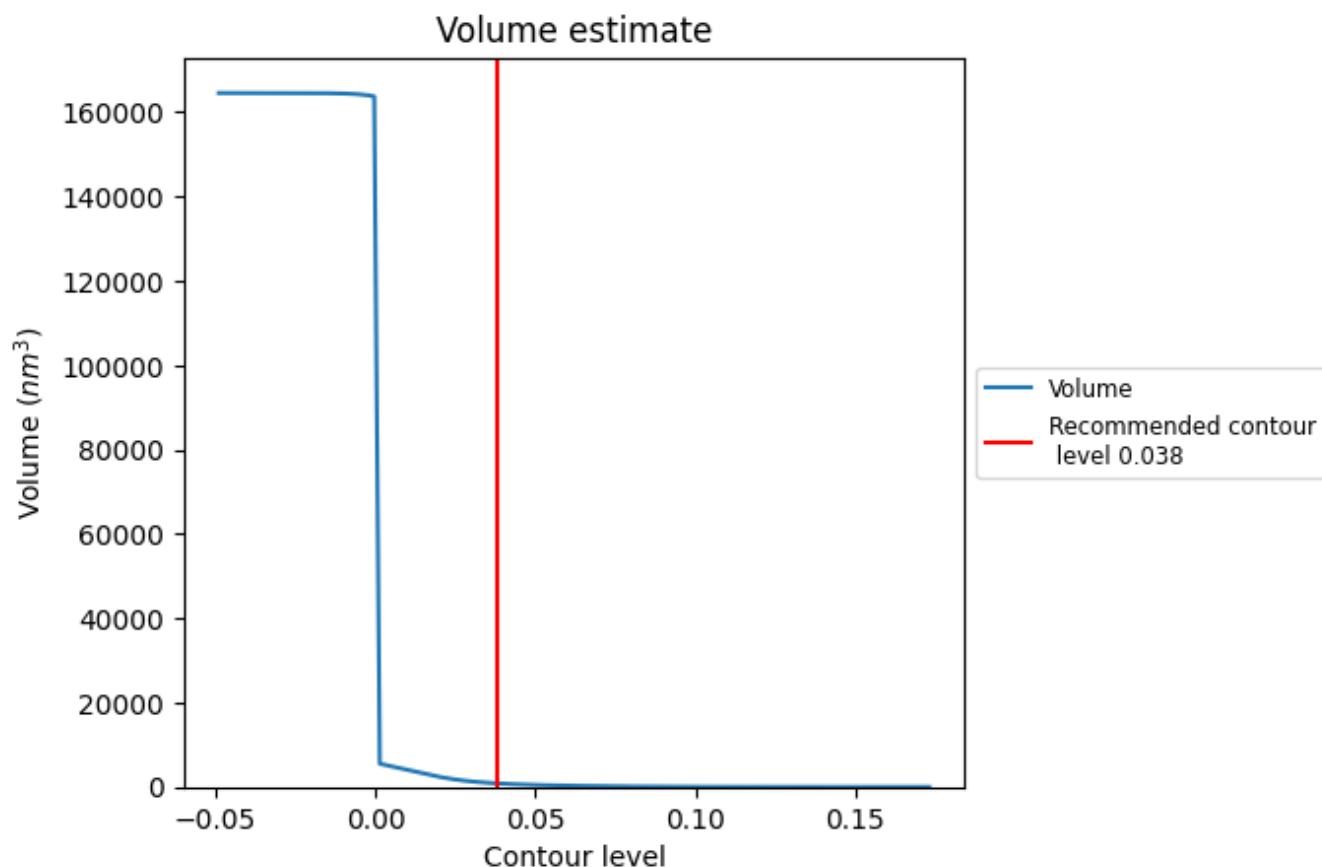
This section contains the results of statistical analysis of the map.

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.

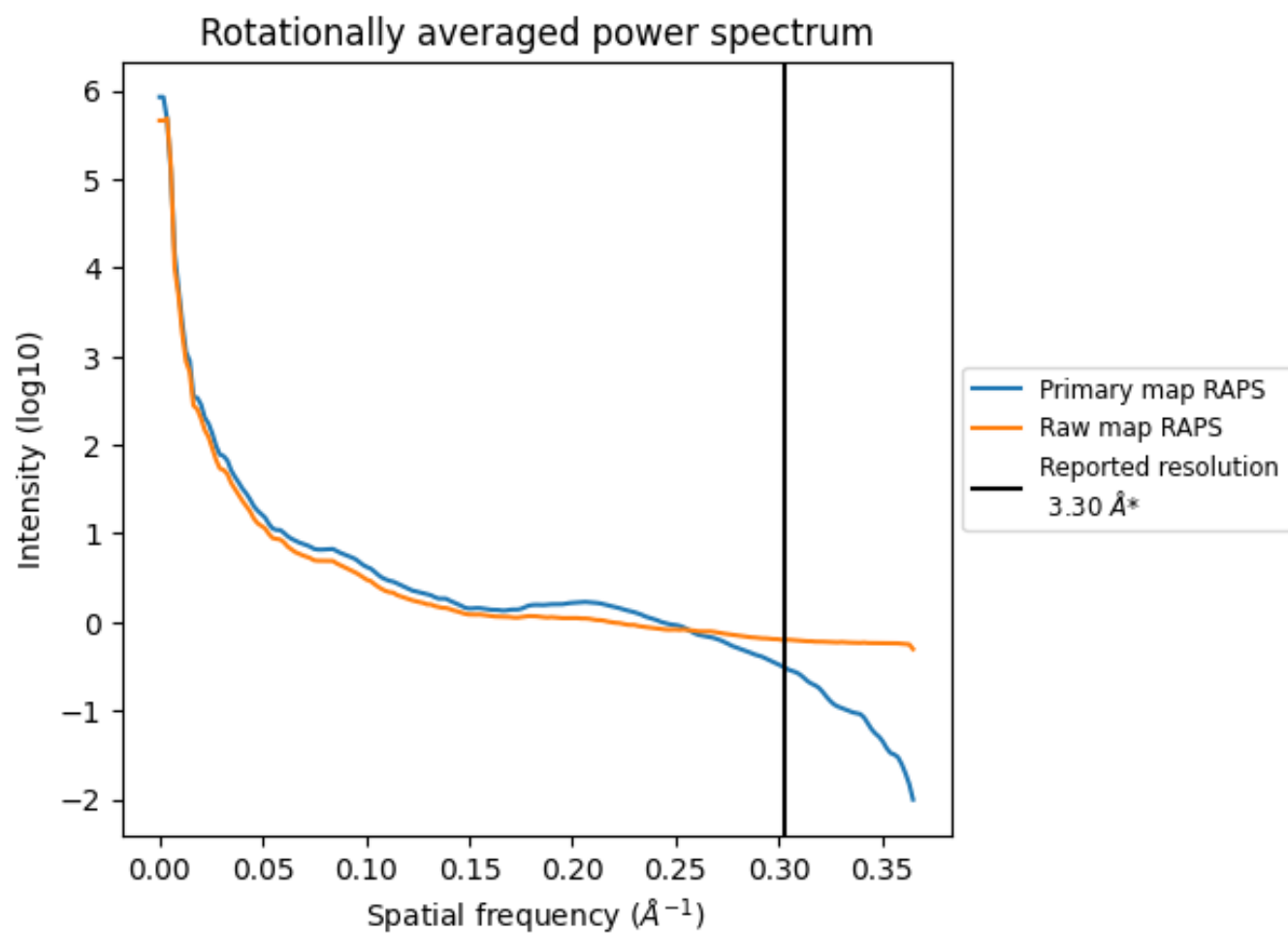
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 851 nm^3 ; this corresponds to an approximate mass of 769 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ

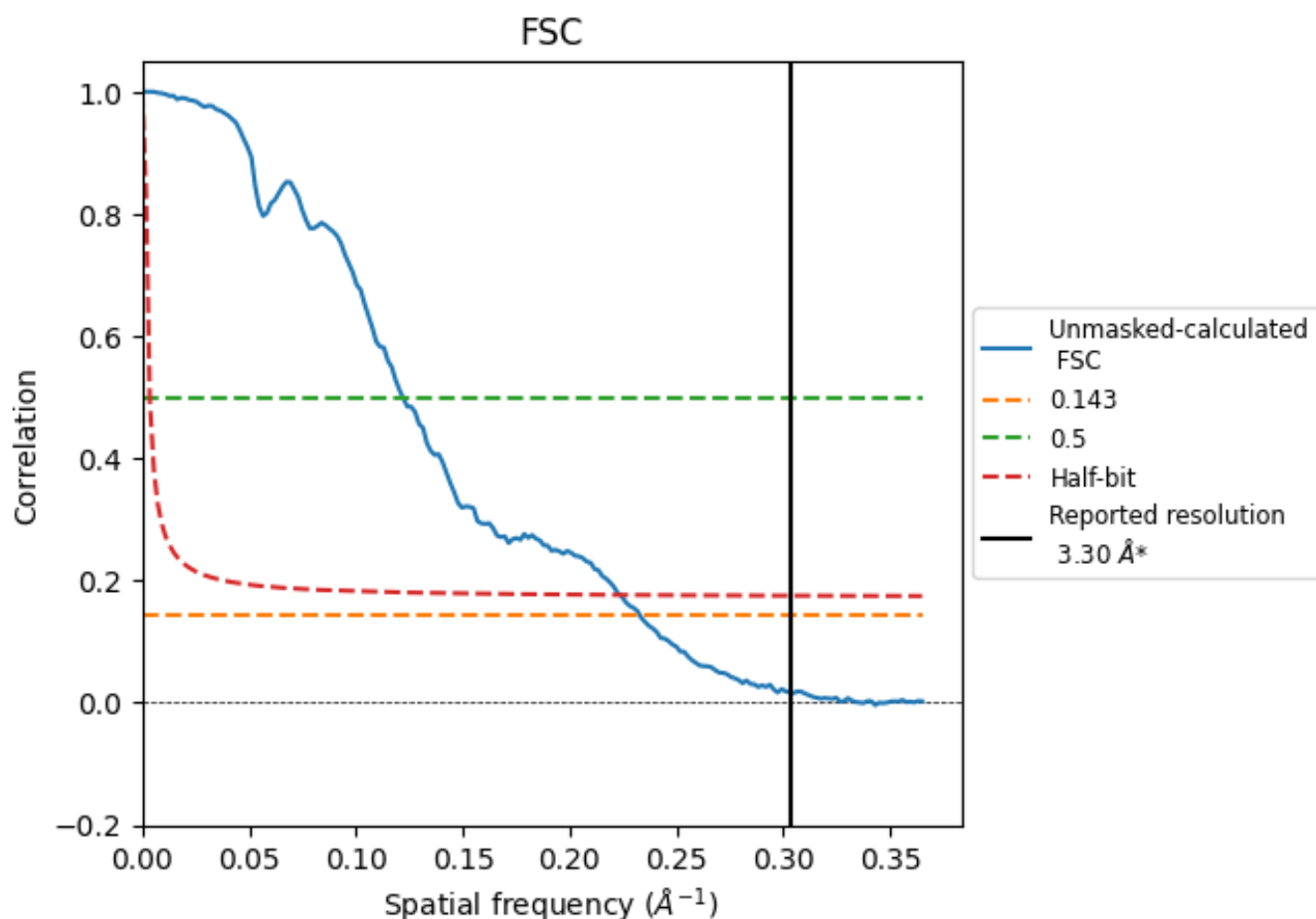


*Reported resolution corresponds to spatial frequency of 0.303 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of $0.303 \text{ \AA}^{-1}$

8.2 Resolution estimates [i](#)

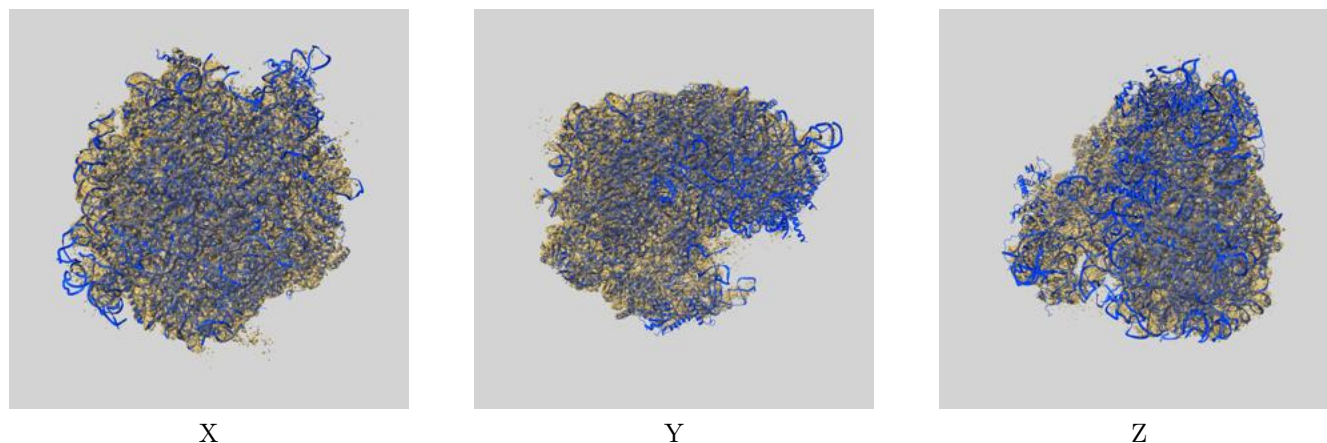
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.29	8.20	4.47

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.29 differs from the reported value 3.3 by more than 10 %

9 Map-model fit [i](#)

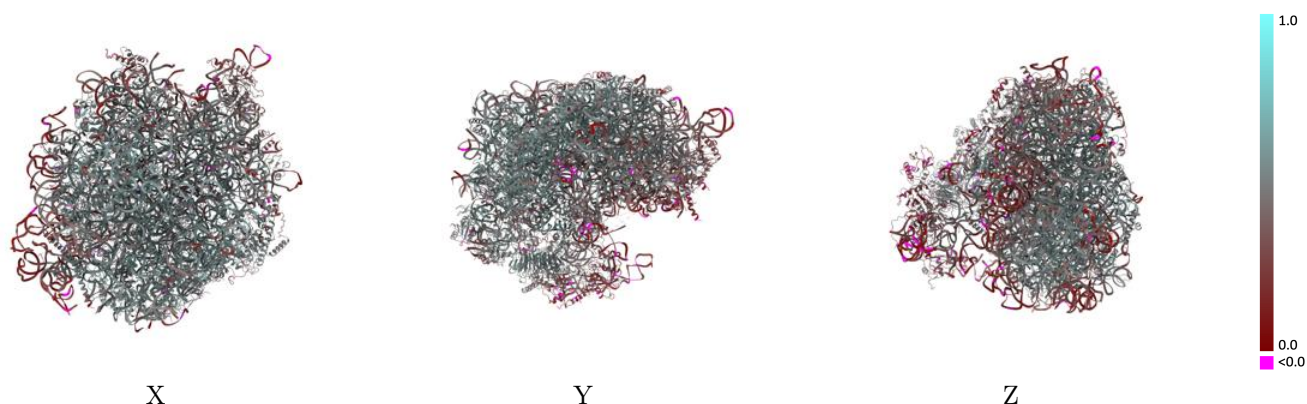
This section contains information regarding the fit between EMDB map EMD-35672 and PDB model 8IR1. Per-residue inclusion information can be found in section 3 on page 14.

9.1 Map-model overlay [i](#)



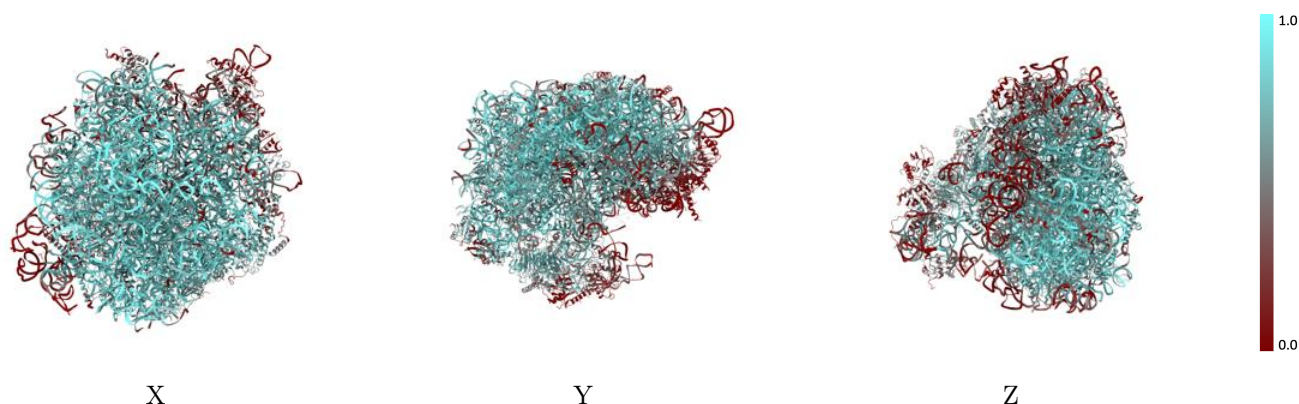
The images above show the 3D surface view of the map at the recommended contour level 0.038 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



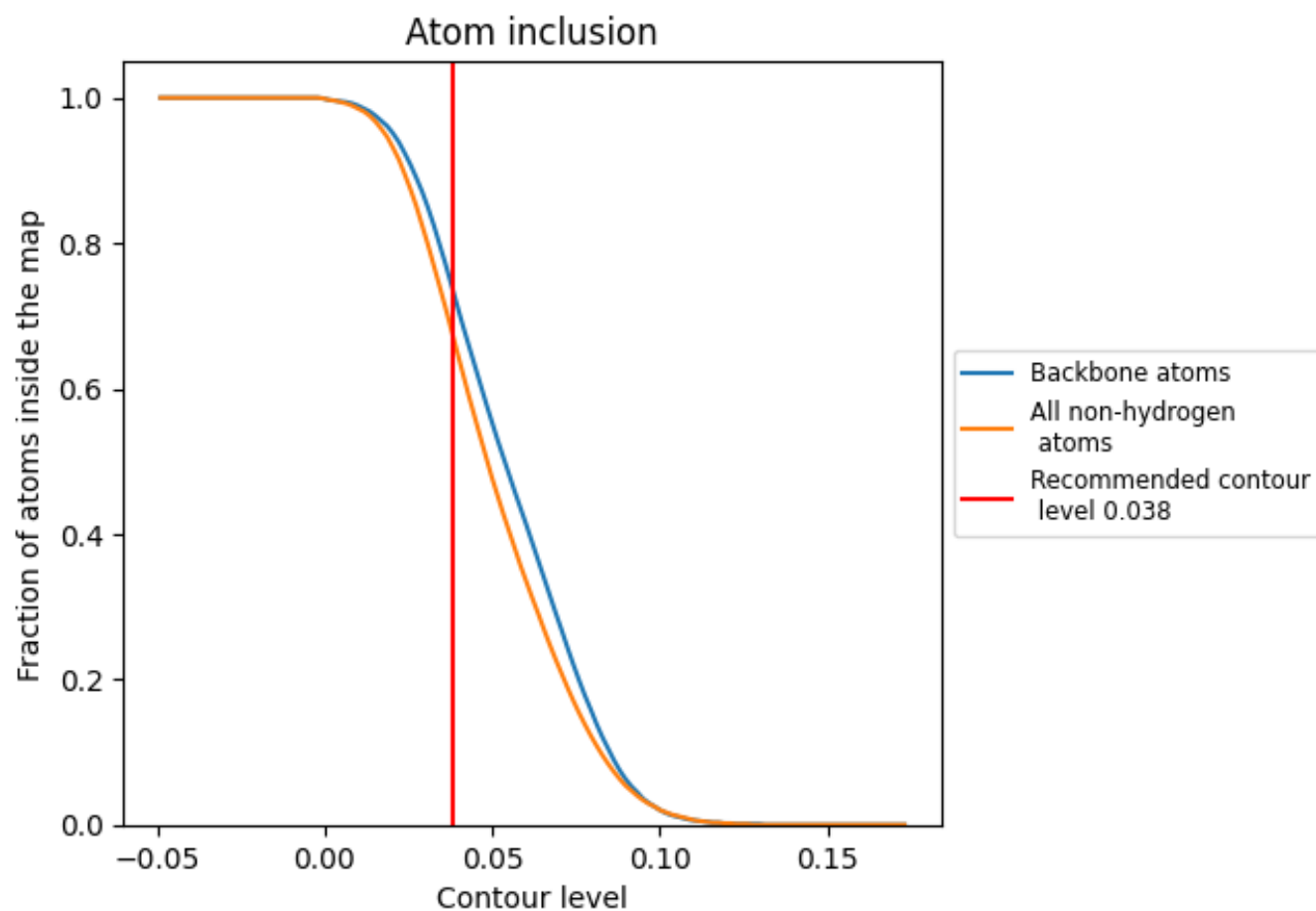
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.038).

9.4 Atom inclusion [i](#)



At the recommended contour level, 74% of all backbone atoms, 68% 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 (0.038) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6780	 0.4490
2	 0.7250	 0.4370
4	 0.6150	 0.4570
6	 0.7140	 0.5030
7	 0.7440	 0.5220
8	 0.8450	 0.4840
9	 0.0100	 0.0940
A	 0.3290	 0.3340
B	 0.8130	 0.5420
C	 0.4970	 0.3990
D	 0.8510	 0.5470
E	 0.0990	 0.3640
F	 0.4620	 0.4560
G	 0.3790	 0.3730
H	 0.7110	 0.4960
I	 0.7560	 0.5350
J	 0.7560	 0.5240
K	 0.5990	 0.4350
L	 0.7900	 0.5260
M	 0.8200	 0.5270
N	 0.5820	 0.4550
O	 0.2320	 0.4160
P	 0.8200	 0.5460
Q	 0.7030	 0.4790
R	 0.3680	 0.3490
S	 0.8080	 0.5390
T	 0.2760	 0.2420
U	 0.8460	 0.5370
V	 0.8480	 0.5480
W	 0.4800	 0.2340
X	 0.3120	 0.3960
Y	 0.7740	 0.5230
Z	 0.8520	 0.5500
a	 0.5480	 0.4660
b	 0.8200	 0.5470



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Chain	Atom inclusion	Q-score
c	 0.5630	 0.4190
d	 0.5690	 0.4810
e	 0.8310	 0.5360
g	 0.6150	 0.4880
h	 0.7980	 0.5370
i	 0.0770	 0.3350
j	 0.7600	 0.5190
k	 0.8770	 0.5590
l	 0.8600	 0.5530
m	 0.1920	 0.3490
n	 0.8820	 0.5640
o	 0.6720	 0.4860
p	 0.8000	 0.5240
r	 0.0380	 0.2700
u	 0.4680	 0.3770
v	 0.6160	 0.4850
w	 0.6200	 0.4320
y	 0.4340	 0.3930
z	 0.5940	 0.4560