



Full wwPDB EM Validation Report ⓘ

Mar 24, 2026 – 10:29 PM UTC

PDB ID : 6GC8 / pdb_00006gc8
EMDB ID : EMD-4383
Title : 50S ribosomal subunit assembly intermediate - 50S rec*
Authors : Nikolay, R.; Hilal, T.; Qin, B.; Loerke, J.; Buerger, J.; Mielke, T.; Spahn, C.M.T.
Deposited on : 2018-04-17
Resolution : 3.80 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:

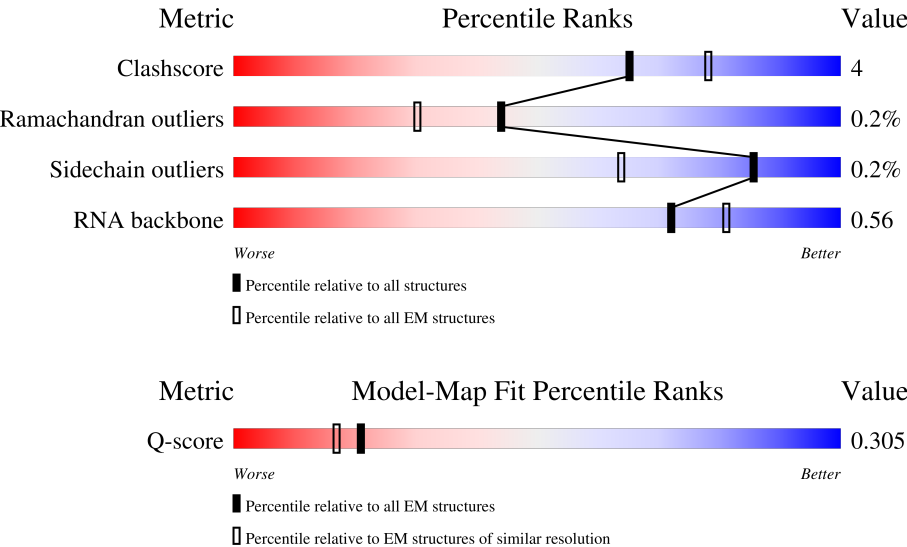
EMDB validation analysis : 0.0.1.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDb archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

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 3.80 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	10198 (3.30 - 4.30)

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	A	2904	
2	B	119	
3	C	271	

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Mol	Chain	Length	Quality of chain
4	D	209	
5	E	201	
6	F	177	
7	G	176	
8	H	54	
9	J	142	
10	K	122	
11	L	143	
12	M	136	
13	N	120	
14	O	116	
15	P	114	
16	Q	117	
17	R	103	
18	S	110	
19	T	93	
20	U	102	
21	V	94	
22	W	76	
23	X	77	
24	Y	63	
25	Z	58	
26	0	56	
27	1	50	
28	2	46	

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Mol	Chain	Length	Quality of chain
29	3	64	8% 88% 11%

2 Entry composition

There are 32 unique types of molecules in this entry. The entry contains 88884 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	2897	Total	C	N	O	P	0	0
			62195	27745	11446	20107	2897		

- Molecule 2 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	119	Total	C	N	O	P	0	0
			2548	1135	466	829	118		

- Molecule 3 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	271	Total	C	N	O	S	0	0
			2083	1288	423	365	7		

- Molecule 4 is a protein called 50S ribosomal protein L3.

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

- Molecule 5 is a protein called 50S ribosomal protein L4.

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

- Molecule 6 is a protein called 50S ribosomal protein L5.

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

- Molecule 7 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	176	Total	C	N	O	S	0	0
			1323	832	243	246	2		

- Molecule 8 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	54	Total	C	N	O	S	0	0
			417	267	75	74	1		

- Molecule 9 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	J	142	Total	C	N	O	S	0	0
			1129	714	212	199	4		

- Molecule 10 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	K	122	Total	C	N	O	S	0	0
			939	587	180	166	6		

- Molecule 11 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	L	143	Total	C	N	O	S	0	0
			1045	649	206	189	1		

- Molecule 12 is a protein called 50S ribosomal protein L16.

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

- Molecule 13 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	N	120	Total	C	N	O	S	0	0
			961	593	196	167	5		

- Molecule 14 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	O	116	Total	C	N	O	0	0
			892	552	178	162		

- Molecule 15 is a protein called 50S ribosomal protein L19.

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

- Molecule 16 is a protein called 50S ribosomal protein L20.

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

- Molecule 17 is a protein called 50S ribosomal protein L21.

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

- Molecule 18 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms				AltConf	Trace
18	S	110	Total	C	N	O	S	0
			857	532	166	156	3	0

- Molecule 19 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	T	93	Total	C	N	O	S	0
			739	466	139	132	2	0

- Molecule 20 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	U	102	Total	C	N	O		0
			780	492	146	142		0

- Molecule 21 is a protein called 50S ribosomal protein L25.

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

- Molecule 22 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	W	76	Total	C	N	O	S	0	0
			575	356	117	101	1		

- Molecule 23 is a protein called 50S ribosomal protein L28.

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

- Molecule 24 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Y	63	Total	C	N	O	S	0	0
			509	313	99	95	2		

- Molecule 25 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Z	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 26 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	0	56	Total	C	N	O	S	0	0
			444	269	94	80	1		

- Molecule 27 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	1	50	Total	C	N	O	0	0
			410	263	75	72		

- Molecule 28 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	2	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 29 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	3	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 30 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
30	A	1	Total	Zn	0
			1	1	

- Molecule 31 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
31	B	4	Total	Mg	0
			4	4	
31	Q	1	Total	Mg	0
			1	1	

- Molecule 32 is water.

Mol	Chain	Residues	Atoms		AltConf
32	A	17	Total	O	0
			17	17	
32	B	14	Total	O	0
			14	14	
32	C	2	Total	O	0
			2	2	
32	D	1	Total	O	0
			1	1	
32	E	1	Total	O	0
			1	1	
32	F	1	Total	O	0
			1	1	
32	L	2	Total	O	0
			2	2	
32	N	2	Total	O	0
			2	2	

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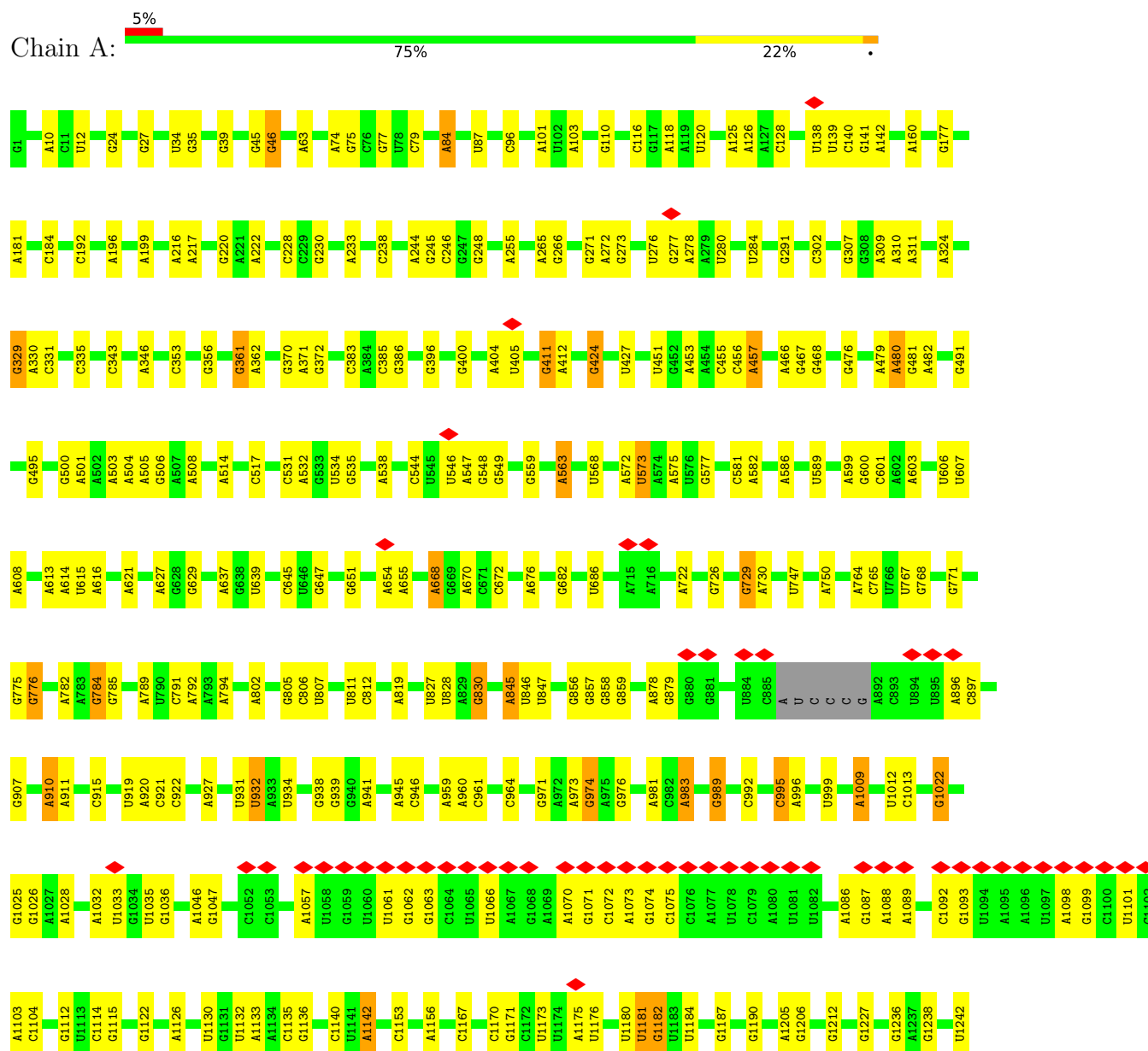
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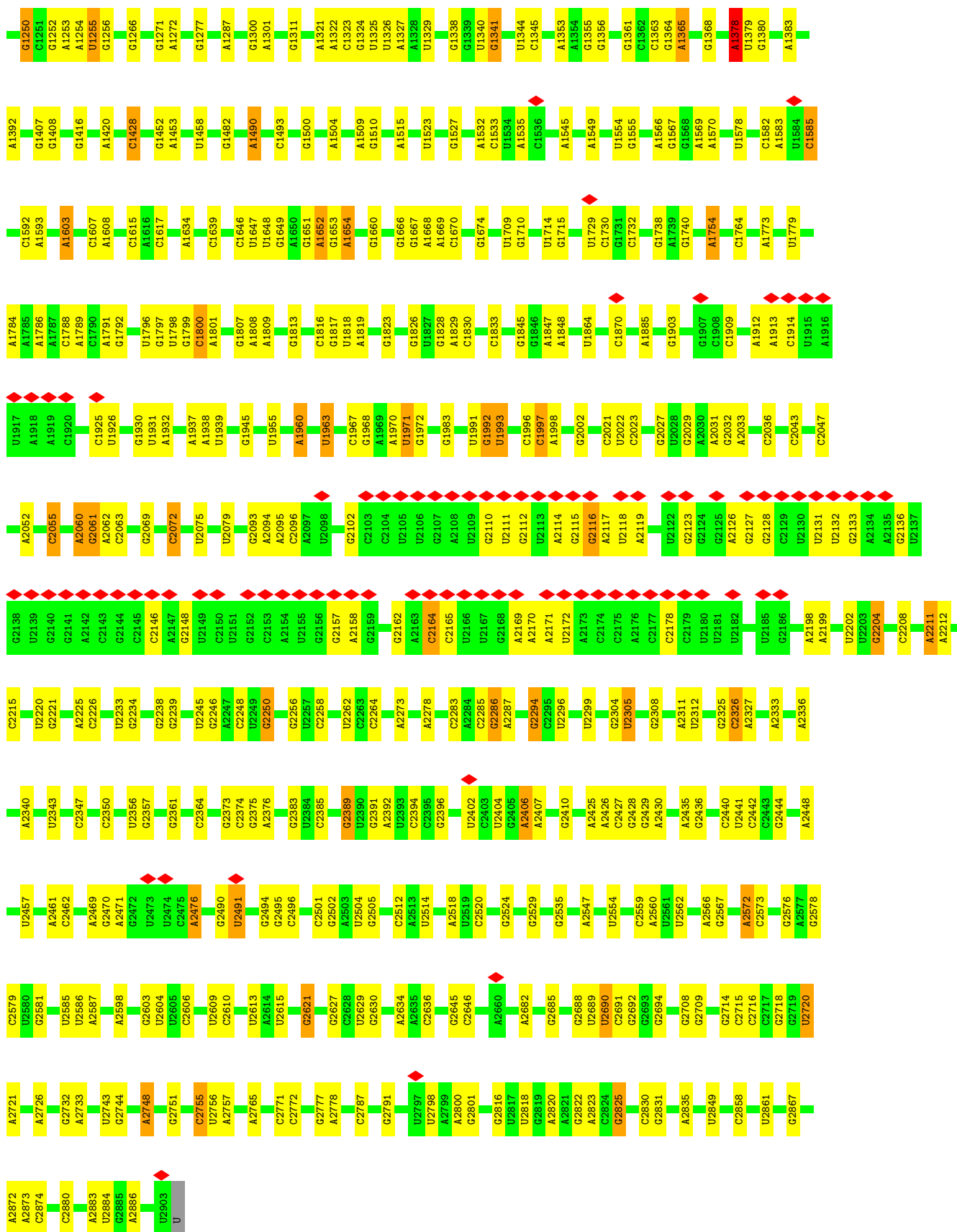
Mol	Chain	Residues	Atoms		AltConf
32	S	1	Total 1	O 1	0
32	2	1	Total 1	O 1	0

3 Residue-property plots

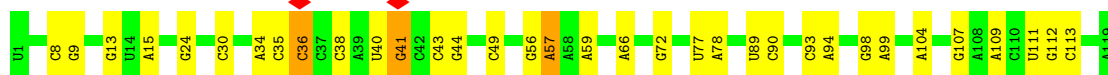
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

• Molecule 1: 23S ribosomal RNA



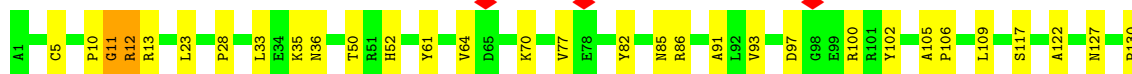


Chain B:  71% 26%



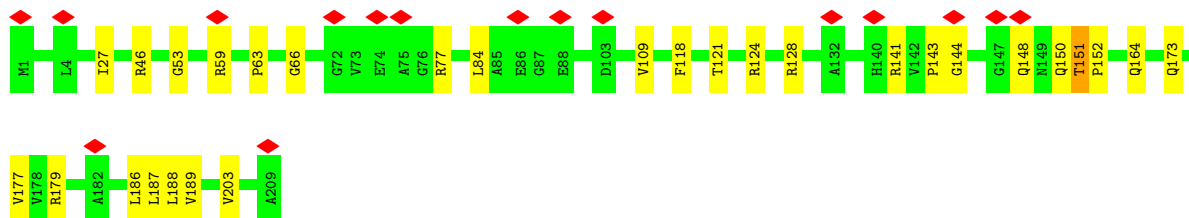
• Molecule 3: 50S ribosomal protein L2

Chain C:  80% 20%

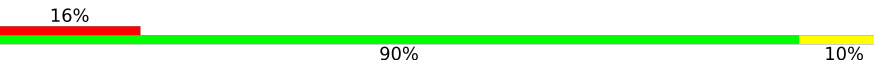


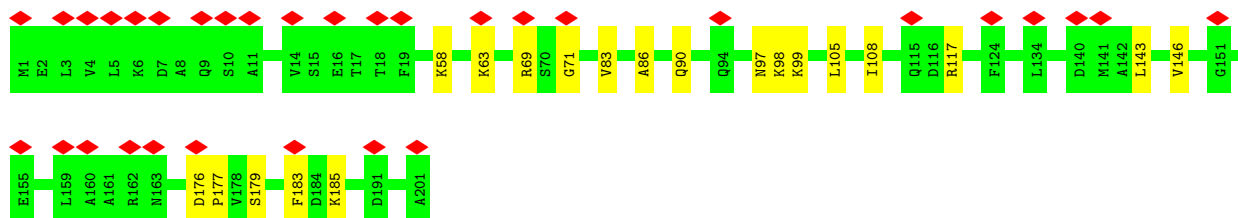
• Molecule 4: 50S ribosomal protein L3

Chain D:  8% 86% 13%



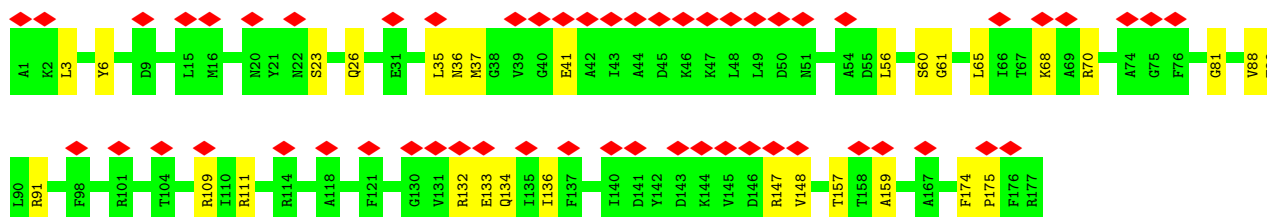
• Molecule 5: 50S ribosomal protein L4

Chain E:  16% 90% 10%

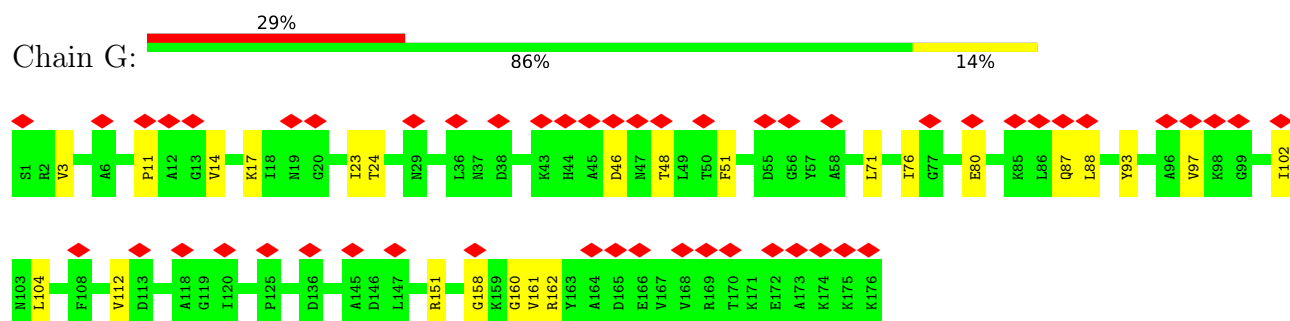


• Molecule 6: 50S ribosomal protein L5

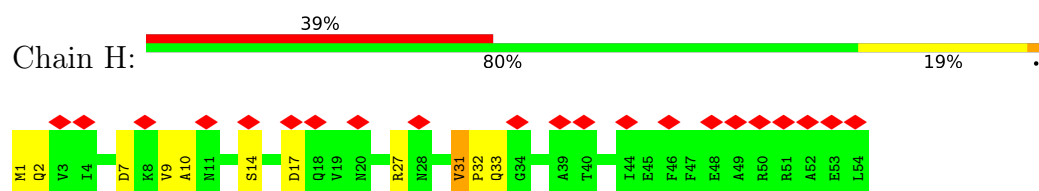
Chain F:  31% 83% 17%



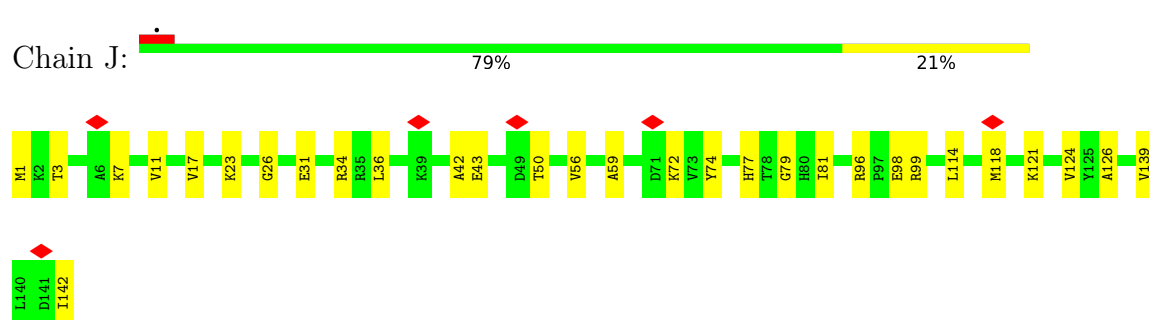
- Molecule 7: 50S ribosomal protein L6



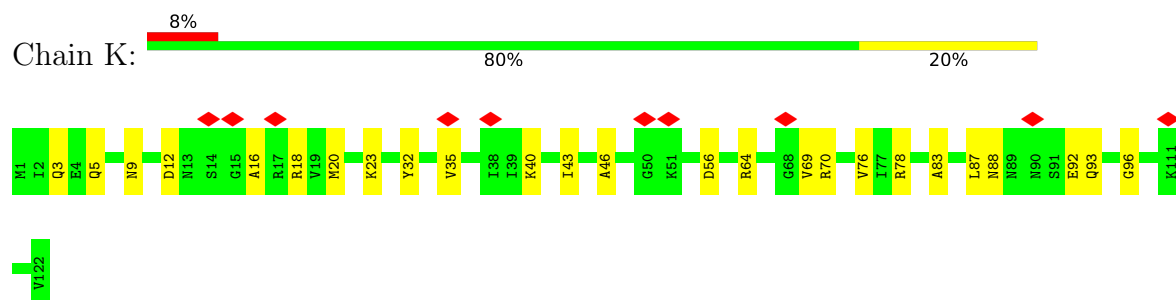
- Molecule 8: 50S ribosomal protein L9



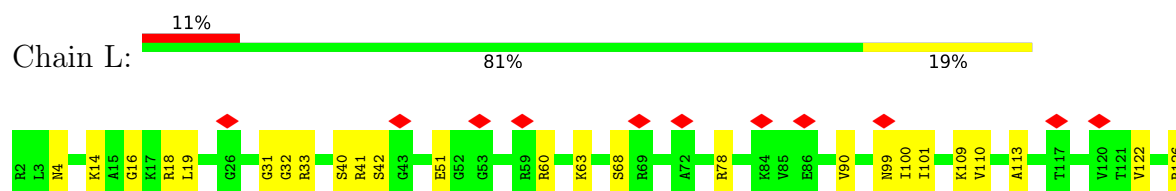
- Molecule 9: 50S ribosomal protein L13

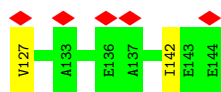


- Molecule 10: 50S ribosomal protein L14

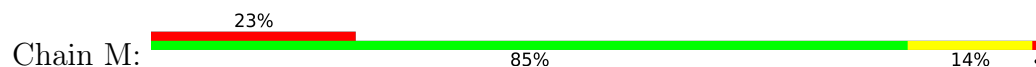


- Molecule 11: 50S ribosomal protein L15

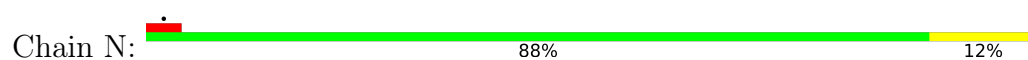




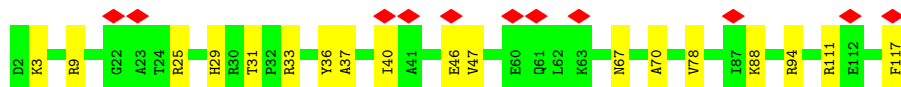
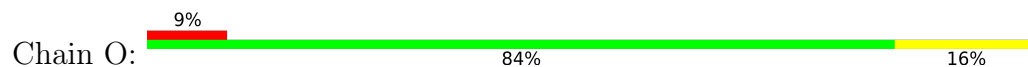
- Molecule 12: 50S ribosomal protein L16



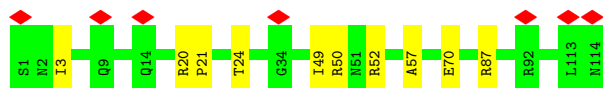
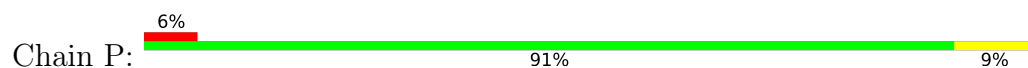
- Molecule 13: 50S ribosomal protein L17



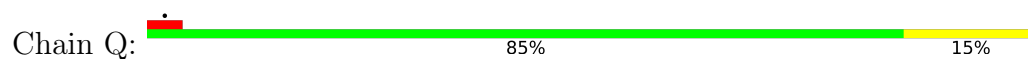
- Molecule 14: 50S ribosomal protein L18



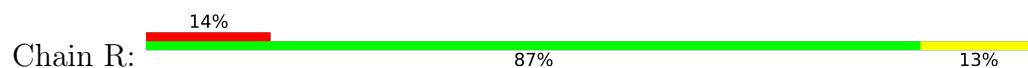
- Molecule 15: 50S ribosomal protein L19

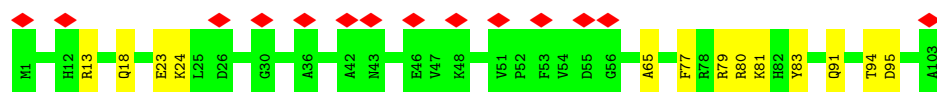


- Molecule 16: 50S ribosomal protein L20

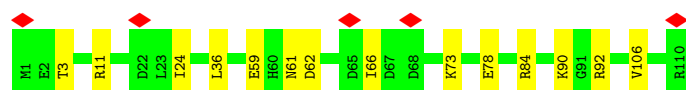
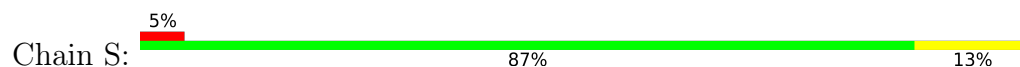


- Molecule 17: 50S ribosomal protein L21

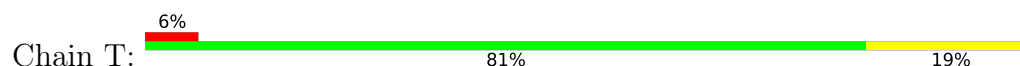




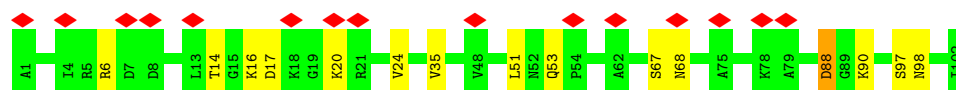
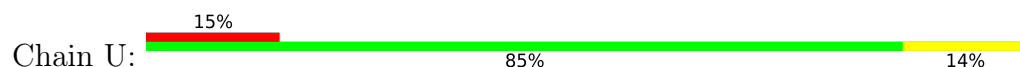
- Molecule 18: 50S ribosomal protein L22



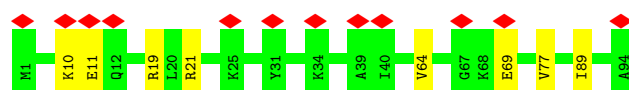
- Molecule 19: 50S ribosomal protein L23



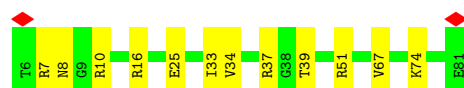
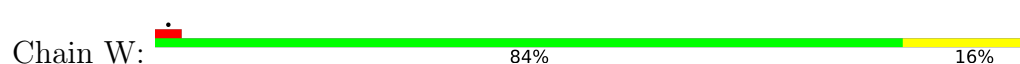
- Molecule 20: 50S ribosomal protein L24



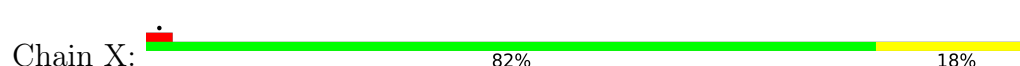
- Molecule 21: 50S ribosomal protein L25



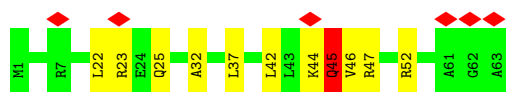
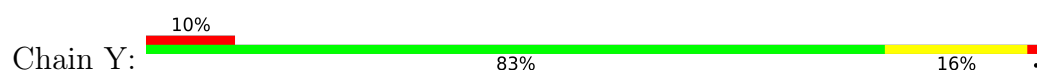
- Molecule 22: 50S ribosomal protein L27



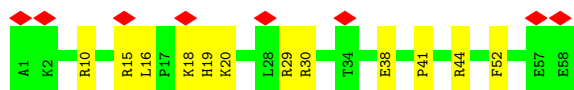
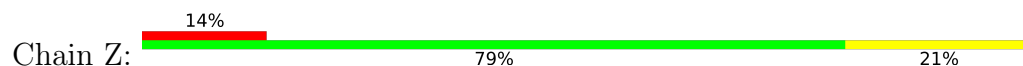
- Molecule 23: 50S ribosomal protein L28



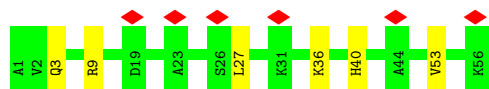
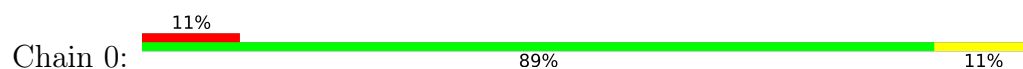
- Molecule 24: 50S ribosomal protein L29



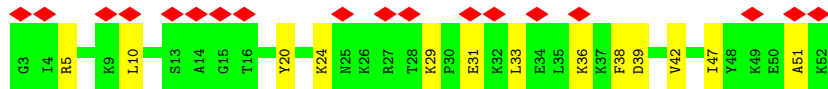
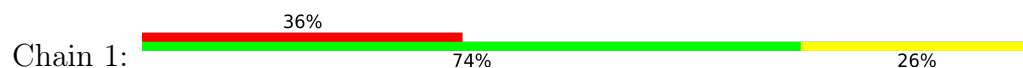
- Molecule 25: 50S ribosomal protein L30



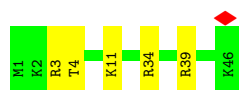
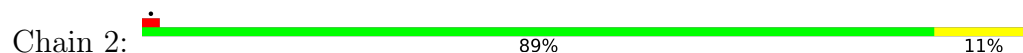
- Molecule 26: 50S ribosomal protein L32



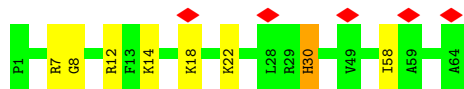
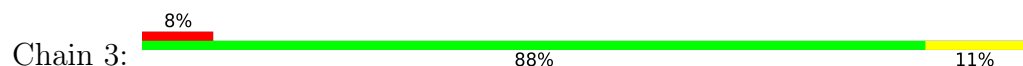
- Molecule 27: 50S ribosomal protein L33



- Molecule 28: 50S ribosomal protein L34



- Molecule 29: 50S ribosomal protein L35



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	60906	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI POLARA 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	25	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	5000	Depositor
Magnification	31000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	10.808	Depositor
Minimum map value	-5.740	Depositor
Average map value	0.070	Depositor
Map value standard deviation	0.537	Depositor
Recommended contour level	1.5	Depositor
Map size (Å)	334.8, 334.8, 334.8	wwPDB
Map dimensions	270, 270, 270	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.24, 1.24, 1.24	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, MG

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	A	0.09	0/69657	0.20	1/108664 (0.0%)
2	B	0.09	0/2847	0.18	0/4440
3	C	0.22	0/2122	0.65	2/2852 (0.1%)
4	D	0.22	0/1586	0.59	0/2134
5	E	0.17	0/1571	0.54	0/2113
6	F	0.26	0/1435	0.70	0/1926
7	G	0.21	0/1343	0.59	0/1816
8	H	0.25	0/422	0.95	1/567 (0.2%)
9	J	0.16	0/1152	0.51	0/1551
10	K	0.23	0/948	0.64	0/1268
11	L	0.24	0/1054	0.74	0/1403
12	M	0.18	0/1093	0.56	0/1460
13	N	0.26	0/974	0.70	0/1301
14	O	0.21	0/902	0.63	0/1209
15	P	0.17	0/929	0.55	0/1242
16	Q	0.17	0/960	0.52	0/1278
17	R	0.20	0/829	0.61	0/1107
18	S	0.16	0/864	0.55	0/1156
19	T	0.22	0/745	0.69	2/994 (0.2%)
20	U	0.33	0/788	0.79	3/1051 (0.3%)
21	V	0.16	0/766	0.45	0/1025
22	W	0.17	0/582	0.57	0/769
23	X	0.17	0/635	0.49	0/848
24	Y	0.23	0/510	0.77	2/677 (0.3%)
25	Z	0.18	0/453	0.46	0/605
26	0	0.19	0/450	0.64	0/599
27	1	0.19	0/417	0.62	0/554
28	2	0.16	0/380	0.56	0/498
29	3	0.17	0/513	0.58	0/676
All	All	0.13	0/96927	0.34	11/145783 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
3	C	0	1
4	D	0	1
6	F	0	2
8	H	0	2
10	K	0	1
12	M	0	1
20	U	0	2
24	Y	0	1
26	0	0	1
29	3	0	1
All	All	0	13

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
20	U	97	SER	CA-C-N	7.84	136.51	121.54
20	U	97	SER	C-N-CA	7.84	136.51	121.54
19	T	2	ILE	CA-C-N	6.67	133.71	121.70
19	T	2	ILE	C-N-CA	6.67	133.71	121.70
8	H	33	GLN	N-CA-C	-6.60	103.19	113.02
24	Y	45	GLN	CA-C-N	5.81	132.43	121.97
24	Y	45	GLN	C-N-CA	5.81	132.43	121.97
1	A	1378	A	P-O3'-C3'	5.05	127.77	120.20
20	U	53	GLN	N-CA-C	5.04	120.52	113.57
3	C	11	GLY	CA-C-N	5.01	131.12	121.54
3	C	11	GLY	C-N-CA	5.01	131.12	121.54

There are no chirality outliers.

All (13) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
26	0	53	VAL	Peptide
29	3	30	HIS	Peptide
3	C	11	GLY	Peptide
4	D	151	THR	Peptide
6	F	174	PHE	Peptide

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Mol	Chain	Res	Type	Group
6	F	175	PRO	Peptide
8	H	10	ALA	Peptide
8	H	31	VAL	Peptide
10	K	93	GLN	Peptide
12	M	58	LYS	Peptide
20	U	6	ARG	Peptide
20	U	88	ASP	Peptide
24	Y	45	GLN	Peptide

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	62195	0	31282	260	0
2	B	2548	0	1292	18	0
3	C	2083	0	2157	41	0
4	D	1565	0	1616	22	0
5	E	1552	0	1619	15	0
6	F	1411	0	1447	18	0
7	G	1323	0	1374	14	0
8	H	417	0	440	5	0
9	J	1129	0	1162	19	0
10	K	939	0	1012	15	0
11	L	1045	0	1117	17	0
12	M	1074	0	1157	12	0
13	N	961	0	1000	14	0
14	O	892	0	923	11	0
15	P	917	0	965	8	0
16	Q	947	0	1022	15	0
17	R	816	0	839	10	0
18	S	857	0	922	9	0
19	T	739	0	807	13	0
20	U	780	0	834	7	0
21	V	753	0	780	5	0
22	W	575	0	589	10	0
23	X	625	0	655	9	0
24	Y	509	0	543	8	0
25	Z	449	0	491	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
26	0	444	0	461	4	0
27	1	410	0	440	9	0
28	2	377	0	418	4	0
29	3	504	0	574	6	0
30	A	1	0	0	0	0
31	B	4	0	0	0	0
31	Q	1	0	0	0	0
32	2	1	0	0	0	0
32	A	17	0	0	1	0
32	B	14	0	0	1	0
32	C	2	0	0	0	0
32	D	1	0	0	0	0
32	E	1	0	0	0	0
32	F	1	0	0	0	0
32	L	2	0	0	1	0
32	N	2	0	0	0	0
32	S	1	0	0	0	0
All	All	88884	0	57938	464	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 (464) 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)
1:A:2709:G:H5'	13:N:22:ARG:HH22	1.60	0.67
2:B:78:A:H62	2:B:98:G:H21	1.43	0.67
11:L:14:LYS:HD3	11:L:16:GLY:H	1.61	0.65
1:A:606:U:H5''	5:E:97:ASN:HD21	1.63	0.64
3:C:10:PRO:HA	3:C:13:ARG:HB2	1.80	0.63
16:Q:43:GLN:HE21	17:R:77:PHE:HB3	1.63	0.63
14:O:31:THR:HG22	14:O:33:ARG:H	1.63	0.63
1:A:1668:A:H5''	10:K:5:GLN:HE21	1.63	0.63
27:1:36:LYS:HE2	27:1:47:ILE:HG13	1.82	0.62
11:L:33:ARG:HB3	11:L:40:SER:HA	1.82	0.61
11:L:90:VAL:HB	11:L:122:VAL:HA	1.83	0.61
7:G:87:GLN:HE21	7:G:162:ARG:HD2	1.66	0.60
24:Y:37:LEU:HD11	24:Y:42:LEU:HD12	1.84	0.60
3:C:143:VAL:HB	3:C:153:LEU:HB2	1.83	0.60
6:F:134:GLN:HE22	6:F:148:VAL:HA	1.67	0.59
1:A:1420:A:O2'	1:A:2211:A:N7	2.36	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:F:109:ARG:NH1	6:F:136:ILE:O	2.36	0.59
1:A:246:C:H41	29:3:7:ARG:HG2	1.67	0.59
1:A:1653:G:OP1	13:N:2:ARG:NH1	2.36	0.58
1:A:1361:G:HO2'	1:A:2215:C:HO2'	1.51	0.58
22:W:33:ILE:HG22	22:W:34:VAL:HG23	1.85	0.58
1:A:466:A:OP1	28:2:34:ARG:NH1	2.36	0.58
5:E:146:VAL:HG12	5:E:185:LYS:HB2	1.85	0.57
1:A:1789:A:OP2	3:C:220:ARG:NH1	2.36	0.57
3:C:166:ARG:HG2	3:C:171:VAL:HG12	1.86	0.57
1:A:2720:U:OP1	15:P:50:ARG:NH1	2.38	0.57
1:A:2495:G:OP1	12:M:81:ARG:NH1	2.38	0.57
1:A:1153:C:OP1	16:Q:91:ARG:NH2	2.38	0.57
1:A:807:U:O2'	1:A:2060:A:N1	2.37	0.56
1:A:1022:G:N2	1:A:1142:A:N1	2.53	0.56
3:C:77:VAL:HG21	3:C:109:LEU:HD11	1.86	0.56
12:M:50:ARG:HD3	12:M:65:ILE:HD11	1.87	0.56
1:A:500:G:N1	1:A:503:A:OP2	2.38	0.56
1:A:920:A:H5''	25:Z:18:LYS:HE3	1.87	0.56
1:A:2394:C:H5''	11:L:63:LYS:HE2	1.86	0.56
9:J:1:MET:SD	17:R:18:GLN:NE2	2.77	0.56
10:K:43:ILE:HD12	10:K:56:ASP:HB2	1.88	0.56
27:1:10:LEU:HD21	27:1:33:LEU:HD23	1.88	0.56
1:A:1779:U:OP2	1:A:1784:A:N6	2.38	0.56
4:D:148:GLN:HG2	4:D:152:PRO:HD2	1.87	0.56
1:A:682:G:O6	1:A:794:A:N6	2.38	0.56
1:A:244:A:OP2	29:3:7:ARG:NH1	2.38	0.56
1:A:1796:U:H3	1:A:1823:G:H1	1.54	0.56
1:A:2312:U:H2'	6:F:36:ASN:HD21	1.71	0.56
3:C:106:PRO:HD2	3:C:109:LEU:HD22	1.88	0.56
14:O:40:ILE:HG12	14:O:47:VAL:HG12	1.87	0.56
22:W:7:ARG:O	22:W:10:ARG:NH1	2.36	0.56
1:A:2032:G:N2	4:D:151:THR:OG1	2.39	0.55
25:Z:15:ARG:O	25:Z:20:LYS:NZ	2.39	0.55
6:F:41:GLU:HG3	6:F:147:ARG:HH12	1.71	0.55
1:A:2060:A:N7	5:E:69:ARG:NH2	2.54	0.55
1:A:807:U:OP1	1:A:830:G:N2	2.39	0.55
1:A:284:U:H3	1:A:356:G:H1	1.55	0.55
4:D:121:THR:HG21	4:D:143:PRO:HG3	1.89	0.55
1:A:2748:A:H5'	7:G:3:VAL:HG21	1.89	0.55
24:Y:42:LEU:HD23	24:Y:45:GLN:HE21	1.72	0.55
1:A:2027:G:H1	1:A:2036:C:H42	1.55	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2720:U:H4'	15:P:52:ARG:HH21	1.72	0.54
4:D:53:GLY:HA3	4:D:77:ARG:HE	1.72	0.54
1:A:807:U:OP2	11:L:41:ARG:NH1	2.40	0.54
1:A:1998:A:OP2	4:D:141:ARG:NH1	2.41	0.54
1:A:2743:U:OP2	1:A:2755:C:N4	2.39	0.54
1:A:2874:C:H5''	13:N:4:ARG:HE	1.72	0.54
3:C:257:ARG:NH2	3:C:262:THR:OG1	2.40	0.54
1:A:2627:G:N2	1:A:2777:G:OP2	2.41	0.54
1:A:589:U:O2'	5:E:90:GLN:NE2	2.40	0.54
1:A:2772:C:H5'	4:D:173:GLN:HE21	1.72	0.54
5:E:117:ARG:NH2	5:E:183:PHE:O	2.41	0.54
29:3:14:LYS:HD2	29:3:22:LYS:HE2	1.89	0.54
1:A:2060:A:H62	5:E:69:ARG:HH22	1.55	0.53
1:A:2047:C:O2'	1:A:2823:A:N1	2.40	0.53
1:A:2340:A:OP1	2:B:41:G:N2	2.41	0.53
1:A:77:G:OP1	24:Y:52:ARG:NH2	2.41	0.53
1:A:651:G:H5'	29:3:18:LYS:HG3	1.91	0.53
21:V:77:VAL:HG23	21:V:89:ILE:HG12	1.90	0.53
1:A:1992:G:N2	1:A:1996:C:O2'	2.42	0.53
1:A:309:A:N3	1:A:329:G:O2'	2.42	0.53
1:A:1365:A:O2'	23:X:10:ARG:NH1	2.41	0.53
19:T:38:ALA:HB1	19:T:43:ILE:HD11	1.89	0.53
1:A:959:A:N3	1:A:2457:U:O2'	2.41	0.53
1:A:2285:C:OP2	27:1:5:ARG:NH2	2.42	0.53
3:C:166:ARG:HA	3:C:171:VAL:HA	1.91	0.53
1:A:729:G:N2	3:C:10:PRO:O	2.42	0.53
1:A:2262:U:OP1	22:W:37:ARG:NH2	2.42	0.53
21:V:64:VAL:HG22	21:V:69:GLU:HG2	1.91	0.53
20:U:17:ASP:HB3	20:U:20:LYS:HB2	1.91	0.53
1:A:750:A:OP1	1:A:1615:C:N4	2.40	0.53
7:G:151:ARG:HG3	7:G:160:GLY:HA2	1.91	0.53
1:A:400:G:OP2	23:X:56:ARG:NH1	2.42	0.52
1:A:1945:G:N2	1:A:1963:U:O4	2.43	0.52
1:A:2294:G:OP2	14:O:94:ARG:NH1	2.42	0.52
3:C:28:PRO:HG2	3:C:33:LEU:HD11	1.90	0.52
9:J:23:LYS:NZ	9:J:142:ILE:OXT	2.37	0.52
3:C:144:GLU:HB2	3:C:187:CYS:HB3	1.91	0.52
19:T:56:GLU:HB2	19:T:88:LYS:HB2	1.91	0.52
1:A:563:A:OP2	17:R:79:ARG:NH2	2.42	0.52
2:B:41:G:H5''	6:F:65:LEU:HD22	1.91	0.52
1:A:531:C:O2'	16:Q:40:LYS:NZ	2.43	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:87:U:O2	24:Y:44:LYS:NZ	2.42	0.52
19:T:59:ASN:HB2	19:T:84:TYR:HB2	1.90	0.52
7:G:17:LYS:HB2	7:G:24:THR:HB	1.90	0.52
23:X:16:ASN:OD1	23:X:26:ARG:NH1	2.42	0.52
1:A:514:A:N3	1:A:581:C:O2'	2.41	0.52
1:A:2787:C:H5'	4:D:66:GLY:HA3	1.91	0.52
1:A:2822:G:OP1	4:D:164:GLN:NE2	2.43	0.52
6:F:23:SER:HB3	6:F:26:GLN:HG3	1.92	0.52
1:A:538:A:H4'	9:J:7:LYS:HG2	1.92	0.52
1:A:2392:A:OP2	29:3:30:HIS:NE2	2.43	0.52
5:E:83:VAL:HB	5:E:86:ALA:HB2	1.92	0.52
24:Y:25:GLN:HE21	24:Y:47:ARG:HA	1.75	0.52
1:A:1227:G:OP1	16:Q:12:ARG:NE	2.39	0.51
1:A:2404:U:O2'	11:L:68:SER:OG	2.27	0.51
1:A:411:G:OP2	1:A:2406:A:O2'	2.29	0.51
1:A:1363:C:O2'	1:A:1809:A:N3	2.39	0.51
1:A:1798:U:OP2	3:C:270:ARG:NH2	2.37	0.51
12:M:17:ASN:O	12:M:38:ARG:NH1	2.43	0.51
1:A:383:C:H2'	1:A:385:C:H41	1.76	0.51
1:A:517:C:OP2	26:0:9:ARG:NH2	2.43	0.51
1:A:1818:U:H5''	3:C:156:SER:HB2	1.92	0.51
3:C:106:PRO:HG2	3:C:109:LEU:HB2	1.92	0.51
24:Y:45:GLN:O	24:Y:47:ARG:N	2.44	0.51
1:A:1009:A:N3	1:A:1153:C:O2'	2.43	0.51
1:A:2286:G:OP1	27:1:29:LYS:NZ	2.44	0.51
1:A:1028:A:OP2	1:A:1126:A:N6	2.43	0.51
1:A:1800:C:H5'	3:C:145:MET:HE1	1.91	0.51
1:A:453:A:N3	1:A:457:A:O2'	2.44	0.51
1:A:501:A:OP1	20:U:16:LYS:NZ	2.41	0.51
1:A:1311:G:H21	1:A:1603:A:H62	1.59	0.51
1:A:1323:C:N4	1:A:1324:G:O6	2.43	0.51
16:Q:25:GLY:HA2	16:Q:29:ARG:HH21	1.76	0.51
17:R:23:GLU:OE2	17:R:91:GLN:NE2	2.44	0.51
1:A:960:A:H61	12:M:82:MET:HE3	1.76	0.51
1:A:1791:A:N6	1:A:1828:G:O2'	2.43	0.51
4:D:46:ARG:HB3	4:D:84:LEU:HD12	1.91	0.51
8:H:31:VAL:HG12	8:H:32:PRO:HD3	1.93	0.51
1:A:1992:G:O2'	1:A:1997:C:N4	2.43	0.51
3:C:23:LEU:HD21	3:C:82:TYR:HB2	1.93	0.51
17:R:65:ALA:HB3	17:R:95:ASP:HB2	1.92	0.51
1:A:2581:G:N2	1:A:2581:G:OP2	2.44	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:5:CYS:SG	3:C:12:ARG:NH1	2.84	0.50
3:C:257:ARG:NH1	3:C:263:ASP:OD1	2.40	0.50
1:A:568:U:O4	17:R:81:LYS:NZ	2.42	0.50
1:A:1788:C:OP1	3:C:220:ARG:NH2	2.44	0.50
5:E:105:LEU:HA	5:E:108:ILE:HG22	1.93	0.50
10:K:9:ASN:OD1	10:K:18:ARG:NH1	2.43	0.50
10:K:64:ARG:HB2	10:K:83:ALA:HB3	1.92	0.50
1:A:559:G:N3	16:Q:55:GLN:NE2	2.50	0.50
1:A:160:A:N3	1:A:2208:C:O2'	2.43	0.50
1:A:2576:G:O2'	1:A:2579:C:OP2	2.29	0.50
1:A:2002:G:OP2	13:N:9:GLN:NE2	2.45	0.50
1:A:2512:C:OP2	4:D:128:ARG:NH2	2.42	0.50
8:H:1:MET:SD	8:H:2:GLN:N	2.84	0.50
24:Y:22:LEU:HG	24:Y:23:ARG:HE	1.77	0.50
1:A:238:C:O2'	1:A:608:A:N3	2.44	0.50
1:A:582:A:OP1	16:Q:13:HIS:ND1	2.45	0.50
1:A:1364:G:H5'	1:A:1809:A:H1'	1.93	0.50
1:A:2296:U:OP2	14:O:9:ARG:NH2	2.45	0.50
13:N:12:ARG:O	13:N:17:ARG:NH2	2.45	0.50
20:U:24:VAL:HG22	20:U:35:VAL:HG22	1.92	0.50
23:X:5:GLN:O	23:X:73:ARG:NH1	2.44	0.50
1:A:177:G:OP2	1:A:177:G:N2	2.43	0.50
1:A:2199:A:OP1	23:X:36:ARG:NH1	2.44	0.50
1:A:2055:C:O2	4:D:150:GLN:NE2	2.41	0.49
1:A:2462:C:H1'	1:A:2491:U:H3	1.77	0.49
11:L:51:GLU:OE2	11:L:60:ARG:NH1	2.45	0.49
11:L:99:ASN:ND2	32:L:201:HOH:O	2.43	0.49
25:Z:10:ARG:NH2	25:Z:52:PHE:O	2.45	0.49
1:A:2079:U:O2'	23:X:22:ASN:OD1	2.30	0.49
1:A:2524:G:N2	32:A:3105:HOH:O	2.44	0.49
7:G:23:ILE:HG21	7:G:71:LEU:HD21	1.94	0.49
1:A:1035:U:H2'	1:A:1036:G:H8	1.78	0.49
7:G:97:VAL:HG22	7:G:102:ILE:HG12	1.94	0.49
8:H:27:ARG:HA	8:H:31:VAL:HB	1.94	0.49
11:L:109:LYS:HG2	11:L:126:ARG:HB2	1.94	0.49
12:M:77:PRO:HG2	12:M:80:VAL:HG21	1.93	0.49
1:A:668:A:H2'	1:A:670:A:H62	1.77	0.49
7:G:51:PHE:HZ	7:G:71:LEU:HD22	1.76	0.49
5:E:58:LYS:HG2	5:E:71:GLY:HA2	1.94	0.49
1:A:329:G:H1	20:U:16:LYS:HE2	1.78	0.49
3:C:132:ARG:NH2	3:C:186:ASP:OD1	2.45	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1287:A:O4'	13:N:103:ARG:NH1	2.45	0.49
7:G:88:LEU:HD23	7:G:93:TYR:HB3	1.93	0.49
1:A:1582:C:O2'	1:A:1585:C:N3	2.39	0.49
1:A:2258:C:O2'	1:A:2427:C:OP2	2.28	0.48
1:A:2816:G:N2	1:A:2830:C:O2	2.42	0.48
9:J:72:LYS:HE3	9:J:74:TYR:HE1	1.78	0.48
10:K:16:ALA:HA	10:K:46:ALA:HA	1.95	0.48
1:A:976:G:O2'	16:Q:54:ARG:NH2	2.46	0.48
1:A:1277:G:H5'	13:N:20:MET:HE2	1.95	0.48
9:J:11:VAL:HG21	9:J:50:THR:HG22	1.94	0.48
10:K:23:LYS:HB3	10:K:40:LYS:HB3	1.95	0.48
10:K:87:LEU:HD22	10:K:92:GLU:HB3	1.95	0.48
29:3:8:GLY:O	29:3:12:ARG:NH2	2.45	0.48
7:G:88:LEU:HG	7:G:161:VAL:HG22	1.95	0.48
1:A:84:A:H62	1:A:101:A:H2	1.60	0.48
1:A:228:C:N4	1:A:2407:A:N3	2.61	0.48
15:P:21:PRO:HD3	15:P:49:ILE:HD12	1.95	0.48
18:S:73:LYS:HB2	18:S:106:VAL:HB	1.96	0.48
1:A:1799:G:N2	1:A:1818:U:O2'	2.45	0.48
1:A:2504:U:O2'	1:A:2572:A:N1	2.38	0.48
2:B:36:C:N4	2:B:49:C:O2	2.46	0.48
5:E:143:LEU:HD13	5:E:146:VAL:HG11	1.96	0.48
23:X:67:LEU:HD23	23:X:70:LEU:HD12	1.94	0.48
1:A:1114:C:N4	1:A:1115:G:O6	2.47	0.48
1:A:2514:U:H5''	9:J:81:ILE:HD11	1.94	0.48
1:A:2615:U:H1'	26:O:3:GLN:HG2	1.95	0.48
9:J:96:ARG:HD2	9:J:99:ARG:HG2	1.95	0.48
18:S:24:ILE:HD13	18:S:36:LEU:HD11	1.94	0.48
1:A:1252:G:H1	16:Q:36:GLN:HE21	1.61	0.48
2:B:72:G:H21	2:B:104:A:H62	1.62	0.48
19:T:23:ALA:HB1	19:T:29:THR:HB	1.95	0.48
1:A:192:C:O2'	1:A:802:A:N3	2.44	0.48
1:A:676:A:HO2'	1:A:2442:C:HO2'	1.60	0.48
3:C:52:HIS:HA	3:C:216:ARG:HB2	1.96	0.48
1:A:931:U:N3	1:A:1167:C:O2	2.46	0.48
1:A:981:A:N1	1:A:2027:G:O2'	2.44	0.48
3:C:122:ALA:O	3:C:127:ASN:ND2	2.47	0.48
6:F:60:SER:OG	6:F:61:GLY:N	2.47	0.48
9:J:17:VAL:HB	9:J:139:VAL:HA	1.95	0.48
1:A:335:C:O2	20:U:67:SER:OG	2.32	0.47
1:A:1490:A:O2'	3:C:97:ASP:OD2	2.32	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:M:66:ARG:NH1	12:M:104:GLU:OE2	2.44	0.47
20:U:14:THR:OG1	20:U:68:ASN:ND2	2.46	0.47
1:A:910:A:N3	1:A:2264:C:O2'	2.39	0.47
1:A:45:G:H5'	1:A:46:G:H5'	1.95	0.47
1:A:1184:U:OP2	25:Z:30:ARG:NH2	2.47	0.47
1:A:1378:A:O2'	1:A:1380:G:OP2	2.31	0.47
21:V:10:LYS:HG2	21:V:11:GLU:HG3	1.96	0.47
1:A:116:C:O2'	1:A:126:A:N3	2.45	0.47
1:A:468:G:N7	28:2:39:ARG:NH2	2.56	0.47
1:A:280:U:O4	1:A:361:G:N2	2.47	0.47
1:A:1190:G:H5''	11:L:32:GLY:HA2	1.96	0.47
1:A:1813:G:N2	3:C:50:THR:OG1	2.46	0.47
1:A:2822:G:O2'	1:A:2825:G:N1	2.46	0.47
1:A:1500:G:H4'	3:C:100:ARG:HH12	1.80	0.47
1:A:1939:U:OP1	1:A:2604:U:O2'	2.32	0.47
6:F:37:MET:HE3	6:F:56:LEU:HD23	1.97	0.47
12:M:33:LEU:HD13	12:M:117:PHE:HB3	1.96	0.47
24:Y:32:ALA:HB2	24:Y:37:LEU:HD23	1.97	0.47
1:A:1340:U:OP1	19:T:19:LYS:NZ	2.46	0.47
1:A:1669:A:OP1	10:K:5:GLN:NE2	2.48	0.47
1:A:2751:G:OP1	1:A:2751:G:N2	2.41	0.47
2:B:34:A:N6	2:B:44:G:O2'	2.48	0.47
21:V:11:GLU:OE1	21:V:19:ARG:NH2	2.48	0.47
1:A:1792:G:O2'	1:A:1830:C:OP1	2.33	0.47
1:A:2874:C:OP1	13:N:4:ARG:NH2	2.48	0.47
1:A:307:G:N1	1:A:310:A:OP2	2.47	0.47
1:A:601:C:O2'	5:E:99:LYS:NZ	2.48	0.47
1:A:974:G:O2'	1:A:989:G:N2	2.48	0.47
1:A:1666:G:N3	10:K:3:GLN:NE2	2.63	0.47
9:J:42:ALA:HB2	16:Q:67:ALA:HB2	1.96	0.47
15:P:24:THR:HB	15:P:87:ARG:HB3	1.97	0.47
25:Z:16:LEU:HB2	25:Z:19:HIS:HD2	1.79	0.47
1:A:24:G:O2'	18:S:78:GLU:O	2.29	0.46
1:A:1754:A:N1	1:A:2716:C:O2'	2.47	0.46
2:B:30:C:H1'	2:B:57:A:H61	1.79	0.46
11:L:100:ILE:HG23	11:L:101:ILE:HG23	1.97	0.46
2:B:41:G:H3'	6:F:65:LEU:HD13	1.97	0.46
1:A:922:C:O2'	22:W:25:GLU:OE2	2.31	0.46
4:D:179:ARG:HB3	4:D:188:LEU:HD12	1.96	0.46
1:A:2248:C:H42	1:A:2256:G:H1	1.63	0.46
2:B:43:C:H1'	6:F:89:THR:HB	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1250:G:OP2	11:L:18:ARG:NH2	2.48	0.46
1:A:1527:G:H21	1:A:1545:A:H62	1.62	0.46
1:A:2336:A:H61	22:W:39:THR:HG21	1.81	0.46
19:T:32:LEU:HB2	19:T:83:ALA:HB3	1.98	0.46
1:A:2688:G:H22	1:A:2720:U:H5'	1.80	0.46
1:A:2883:A:O3'	26:O:40:HIS:NE2	2.45	0.46
16:Q:100:PHE:HB2	17:R:13:ARG:HH12	1.79	0.46
2:B:77:U:OP1	21:V:21:ARG:NH1	2.48	0.46
9:J:59:ALA:H	9:J:126:ALA:HA	1.80	0.46
13:N:28:LEU:HD13	13:N:34:ILE:HG12	1.98	0.46
1:A:1086:A:H1'	1:A:1103:A:H61	1.81	0.46
1:A:2694:G:H1	1:A:2715:C:H42	1.64	0.46
6:F:35:LEU:N	6:F:88:VAL:O	2.47	0.46
19:T:13:ALA:HB3	19:T:33:LYS:HE2	1.98	0.46
1:A:1818:U:OP2	3:C:86:ARG:NH1	2.48	0.46
1:A:2250:G:O2'	1:A:2496:C:OP1	2.33	0.46
8:H:14:SER:OG	8:H:17:ASP:OD2	2.34	0.46
12:M:42:THR:HG22	12:M:93:VAL:HG12	1.97	0.46
1:A:2771:C:O2'	4:D:173:GLN:NE2	2.48	0.46
3:C:180:MET:SD	3:C:268:ARG:NH2	2.85	0.46
10:K:70:ARG:HG2	10:K:76:VAL:HG22	1.98	0.45
14:O:111:ARG:NH2	14:O:117:PHE:OXT	2.49	0.45
28:2:3:ARG:HE	28:2:4:THR:H	1.62	0.45
1:A:845:A:H61	1:A:932:U:H3	1.63	0.45
1:A:1242:U:O2	11:L:4:ASN:ND2	2.47	0.45
1:A:1326:U:H2'	1:A:1327:A:H8	1.81	0.45
1:A:1428:C:N4	1:A:1570:A:OP2	2.47	0.45
1:A:1826:G:O2'	1:A:1971:U:OP2	2.30	0.45
3:C:106:PRO:HA	3:C:194:VAL:HA	1.98	0.45
1:A:931:U:OP1	25:Z:29:ARG:NH1	2.47	0.45
1:A:2440:C:H5''	1:A:2587:A:H4'	1.98	0.45
11:L:127:VAL:HG21	11:L:142:ILE:HD12	1.99	0.45
12:M:55:ARG:O	12:M:58:LYS:NZ	2.36	0.45
1:A:806:C:O2	1:A:2444:G:O2'	2.34	0.45
1:A:1945:G:O6	1:A:1960:A:N6	2.49	0.45
1:A:2559:C:H2'	1:A:2560:A:H8	1.81	0.45
2:B:30:C:OP1	14:O:3:LYS:NZ	2.47	0.45
2:B:59:A:N6	32:B:306:HOH:O	2.49	0.45
3:C:64:VAL:HA	3:C:102:TYR:HB2	1.98	0.45
5:E:176:ASP:OD1	5:E:179:SER:OG	2.34	0.45
18:S:90:LYS:HD2	18:S:92:ARG:HH12	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:324:A:OP2	1:A:1205:A:N6	2.49	0.45
1:A:2356:U:O3'	22:W:16:ARG:NH1	2.49	0.45
1:A:2461:A:N1	1:A:2490:G:N2	2.64	0.45
1:A:1407:G:H2'	1:A:1408:G:H8	1.81	0.45
11:L:78:ARG:HG3	11:L:113:ALA:HB3	1.99	0.45
1:A:2364:C:OP1	22:W:51:ARG:NH2	2.36	0.45
2:B:93:C:H2'	2:B:94:A:H8	1.82	0.45
8:H:7:ASP:HB3	8:H:9:VAL:HG23	1.98	0.45
14:O:67:ASN:H	14:O:70:ALA:HB3	1.82	0.45
26:O:27:LEU:HD23	26:O:36:LYS:HB3	1.98	0.45
1:A:476:G:N1	1:A:479:A:OP2	2.50	0.45
9:J:36:LEU:O	9:J:121:LYS:NZ	2.46	0.45
1:A:784:G:O6	1:A:2072:C:O2'	2.35	0.44
1:A:2787:C:H1'	4:D:63:PRO:HG3	1.98	0.44
1:A:2621:G:OP1	4:D:124:ARG:NH2	2.47	0.44
7:G:158:GLY:O	7:G:162:ARG:NH1	2.43	0.44
1:A:1341:G:H1'	19:T:59:ASN:HB3	1.99	0.44
3:C:70:LYS:O	3:C:117:SER:OG	2.36	0.44
7:G:46:ASP:O	7:G:48:THR:N	2.45	0.44
9:J:56:VAL:HB	9:J:124:VAL:HG12	1.99	0.44
9:J:114:LEU:HG	9:J:118:MET:HE3	1.99	0.44
13:N:82:GLU:OE2	13:N:86:ARG:NH2	2.50	0.44
1:A:776:G:H22	1:A:2072:C:H5'	1.82	0.44
1:A:857:G:N2	1:A:921:C:O2	2.50	0.44
1:A:2299:U:OP2	6:F:70:ARG:NH2	2.51	0.44
1:A:2690:U:OP1	13:N:14:SER:OG	2.33	0.44
14:O:37:ALA:HB3	14:O:78:VAL:HG21	1.98	0.44
3:C:77:VAL:HG22	3:C:93:VAL:HG12	1.99	0.44
4:D:109:VAL:HG22	4:D:203:VAL:HG22	1.99	0.44
7:G:104:LEU:HB2	7:G:112:VAL:HB	1.98	0.44
18:S:59:GLU:HG3	18:S:66:ILE:HD11	1.98	0.44
1:A:476:G:H1'	1:A:480:A:H61	1.83	0.44
1:A:2061:G:OP1	5:E:63:LYS:NZ	2.49	0.44
1:A:495:G:N3	18:S:61:ASN:ND2	2.64	0.44
1:A:672:C:OP2	11:L:42:SER:OG	2.29	0.44
1:A:1355:G:H2'	1:A:1356:G:H8	1.83	0.44
1:A:2116:G:H22	1:A:2164:C:H42	1.66	0.44
12:M:69:PRO:HA	12:M:94:ALA:HB2	1.99	0.44
1:A:767:U:H2'	1:A:768:G:H8	1.83	0.43
1:A:1392:A:N6	19:T:18:GLU:OE2	2.51	0.43
1:A:2063:C:N4	1:A:2501:C:O2	2.40	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:456:C:O2	19:T:73:ARG:NH1	2.51	0.43
1:A:857:G:H1	1:A:920:A:H61	1.66	0.43
1:A:964:C:O2'	1:A:2273:A:N3	2.45	0.43
1:A:1649:G:O2'	13:N:106:ASP:OD2	2.32	0.43
1:A:573:U:OP2	17:R:80:ARG:NH2	2.51	0.43
2:B:8:C:O2'	14:O:25:ARG:NH1	2.51	0.43
10:K:5:GLN:HA	10:K:20:MET:HE3	2.00	0.43
1:A:771:G:OP2	28:2:11:LYS:NZ	2.47	0.43
1:A:1086:A:O2'	1:A:1103:A:N1	2.39	0.43
1:A:1654:A:O2'	4:D:118:PHE:O	2.32	0.43
1:A:1670:C:O2	1:A:1993:U:O2'	2.34	0.43
1:A:1983:G:H4'	1:A:2606:C:H4'	1.99	0.43
10:K:78:ARG:HB3	15:P:70:GLU:HB2	2.01	0.43
1:A:2849:U:O4	15:P:20:ARG:NH2	2.49	0.43
6:F:157:THR:HG22	6:F:159:ALA:H	1.82	0.43
1:A:1353:A:O3'	3:C:35:LYS:NZ	2.51	0.43
1:A:1667:G:N1	1:A:1992:G:OP2	2.47	0.43
6:F:111:ARG:NH1	6:F:133:GLU:OE2	2.50	0.43
1:A:2305:U:H1'	6:F:132:ARG:HA	2.01	0.43
3:C:61:TYR:HA	3:C:85:ASN:HD21	1.83	0.43
9:J:43:GLU:HG3	16:Q:99:VAL:HG13	1.99	0.43
15:P:50:ARG:O	15:P:57:ALA:N	2.43	0.43
1:A:1932:A:H62	1:A:1968:G:H21	1.65	0.43
1:A:2646:C:OP2	1:A:2732:G:O2'	2.37	0.43
6:F:3:LEU:HA	6:F:6:TYR:HB3	2.01	0.43
14:O:29:HIS:HB3	14:O:36:TYR:HB2	2.01	0.43
23:X:30:PRO:HB2	23:X:32:LEU:HG	2.00	0.43
1:A:2708:G:O3'	13:N:22:ARG:NH1	2.46	0.43
6:F:68:LYS:HB3	6:F:81:GLY:HA2	2.01	0.43
25:Z:41:PRO:HA	25:Z:44:ARG:HB3	2.01	0.43
1:A:220:G:H22	1:A:427:U:H2'	1.84	0.42
1:A:911:A:N6	12:M:11:LYS:O	2.52	0.42
1:A:1322:A:O2'	18:S:84:ARG:NH1	2.52	0.42
22:W:67:VAL:HG22	22:W:74:LYS:HG2	2.00	0.42
1:A:1181:U:H2'	1:A:1182:G:C8	2.54	0.42
1:A:1321:A:O2'	18:S:11:ARG:NH2	2.42	0.42
1:A:2343:U:HO2'	1:A:2373:G:HO2'	1.60	0.42
1:A:1864:U:OP1	1:A:2410:G:O2'	2.31	0.42
2:B:43:C:O2	6:F:91:ARG:NH2	2.39	0.42
20:U:88:ASP:O	20:U:90:LYS:N	2.53	0.42
1:A:932:U:O2'	1:A:934:U:O4	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1818:U:H3'	3:C:156:SER:H	1.83	0.42
1:A:2691:C:H2'	1:A:2692:G:H8	1.84	0.42
1:A:629:G:N3	1:A:639:U:O2'	2.53	0.42
1:A:1187:G:H5''	17:R:83:TYR:CZ	2.54	0.42
1:A:2075:U:H5'	3:C:241:LYS:HZ1	1.84	0.42
9:J:77:HIS:CD2	9:J:79:GLY:H	2.37	0.42
1:A:938:G:H2'	1:A:939:G:H8	1.85	0.42
3:C:91:ALA:HB2	3:C:105:ALA:HB2	2.02	0.42
10:K:35:VAL:HA	10:K:69:VAL:HG12	2.02	0.42
27:1:20:TYR:OH	27:1:38:PHE:O	2.35	0.42
1:A:79:C:O2'	1:A:346:A:N3	2.42	0.42
1:A:971:G:O2'	1:A:983:A:N3	2.52	0.42
1:A:1996:C:N4	10:K:32:TYR:OH	2.53	0.42
1:A:2202:U:O2'	1:A:2204:G:OP1	2.33	0.42
1:A:2262:U:H5''	22:W:37:ARG:HH12	1.85	0.42
27:1:39:ASP:HB3	27:1:42:VAL:HG12	2.02	0.42
1:A:572:A:H61	1:A:2029:G:H21	1.68	0.42
1:A:607:U:H2'	1:A:608:A:H8	1.83	0.42
1:A:1032:A:H2	1:A:1122:G:H22	1.68	0.42
1:A:2578:G:H1'	4:D:144:GLY:HA2	2.01	0.42
2:B:111:U:H2'	2:B:112:G:H8	1.85	0.42
3:C:36:ASN:HB2	3:C:61:TYR:HB2	2.02	0.42
4:D:177:VAL:HA	4:D:189:VAL:HA	2.02	0.42
1:A:184:C:O2'	1:A:217:A:N3	2.44	0.42
1:A:534:U:H2'	1:A:535:G:H8	1.85	0.42
1:A:2245:U:H5''	1:A:2246:G:H5'	2.01	0.42
1:A:2374:C:N4	1:A:2375:G:O6	2.53	0.42
1:A:2645:G:OP1	1:A:2732:G:N2	2.45	0.42
16:Q:82:LEU:HB3	16:Q:87:VAL:HB	2.01	0.42
19:T:10:VAL:HG11	19:T:43:ILE:HA	2.02	0.42
1:A:995:C:O2	9:J:3:THR:OG1	2.30	0.41
1:A:2326:C:H42	1:A:2389:G:H1	1.66	0.41
1:A:577:G:O2'	1:A:1254:A:OP1	2.35	0.41
2:B:66:A:H61	2:B:107:G:H2'	1.85	0.41
1:A:992:C:OP1	16:Q:46:TYR:OH	2.35	0.41
2:B:113:C:H1'	14:O:46:GLU:HA	2.02	0.41
18:S:3:THR:OG1	18:S:62:ASP:OD2	2.33	0.41
1:A:1796:U:H2'	1:A:1797:G:H8	1.85	0.41
1:A:2471:A:N6	1:A:2476:A:O2'	2.53	0.41
5:E:97:ASN:HD22	5:E:98:LYS:H	1.66	0.41
1:A:2470:G:H2'	1:A:2471:A:H8	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:482:A:N6	1:A:506:G:O2'	2.54	0.41
3:C:130:PRO:HA	3:C:188:ARG:HA	2.03	0.41
4:D:186:LEU:HD21	15:P:3:ILE:HG21	2.03	0.41
10:K:12:ASP:HB2	10:K:96:GLY:HA3	2.02	0.41
16:Q:18:LYS:HA	16:Q:21:LYS:HE2	2.02	0.41
1:A:1140:C:H5'	9:J:26:GLY:HA3	2.03	0.41
1:A:1709:U:H2'	1:A:1710:G:H8	1.86	0.41
12:M:47:GLU:OE2	12:M:50:ARG:NH1	2.50	0.41
1:A:370:G:O2'	1:A:424:G:OP1	2.39	0.41
1:A:599:A:H2'	1:A:600:G:H8	1.85	0.41
1:A:927:A:O2'	25:Z:38:GLU:OE2	2.35	0.41
1:A:1549:A:O3'	1:A:1740:G:N2	2.53	0.41
1:A:1615:C:OP2	1:A:1617:C:N4	2.41	0.41
1:A:2233:U:H2'	1:A:2234:G:C8	2.55	0.41
7:G:11:PRO:HD2	7:G:14:VAL:HG21	2.02	0.41
9:J:31:GLU:OE2	9:J:34:ARG:NH2	2.41	0.41
9:J:96:ARG:HE	9:J:98:GLU:HB2	1.86	0.41
27:1:24:LYS:NZ	27:1:31:GLU:O	2.45	0.41
1:A:1338:G:O2'	19:T:18:GLU:OE2	2.38	0.41
1:A:1819:A:H5''	3:C:159:THR:HG21	2.02	0.41
1:A:2436:G:O2'	1:A:2598:A:N1	2.46	0.41
4:D:27:ILE:O	4:D:187:LEU:N	2.52	0.41
17:R:24:LYS:HA	17:R:94:THR:HG23	2.03	0.41
1:A:1254:A:H5''	1:A:1255:U:H5''	2.02	0.40
1:A:1592:C:H2'	1:A:1593:A:C8	2.56	0.40
1:A:2278:A:OP2	22:W:8:ASN:ND2	2.54	0.40
1:A:2831:G:N7	4:D:59:ARG:NH1	2.69	0.40
1:A:1652:A:N6	13:N:11:ASN:OD1	2.47	0.40
3:C:164:VAL:HG11	3:C:174:ARG:HE	1.86	0.40
5:E:176:ASP:HA	5:E:177:PRO:HD3	1.94	0.40
7:G:76:ILE:HG23	7:G:80:GLU:HB3	2.04	0.40
11:L:19:LEU:HD13	11:L:31:GLY:HA3	2.04	0.40
23:X:9:LYS:HE3	23:X:53:LYS:HD3	2.04	0.40
1:A:2220:U:H2'	1:A:2221:G:C8	2.57	0.40
1:A:2285:C:H5	27:1:5:ARG:HH12	1.70	0.40
27:1:33:LEU:H	27:1:51:ALA:HB3	1.86	0.40
1:A:1817:G:H5''	3:C:86:ARG:HB3	2.04	0.40
19:T:37:ASP:OD1	19:T:37:ASP:N	2.55	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	
3	C	269/271 (99%)	248 (92%)	20 (7%)	1 (0%)	30	62
4	D	207/209 (99%)	198 (96%)	9 (4%)	0	100	100
5	E	199/201 (99%)	190 (96%)	9 (4%)	0	100	100
6	F	175/177 (99%)	161 (92%)	14 (8%)	0	100	100
7	G	174/176 (99%)	166 (95%)	8 (5%)	0	100	100
8	H	52/54 (96%)	40 (77%)	12 (23%)	0	100	100
9	J	140/142 (99%)	134 (96%)	6 (4%)	0	100	100
10	K	120/122 (98%)	106 (88%)	14 (12%)	0	100	100
11	L	141/143 (99%)	124 (88%)	17 (12%)	0	100	100
12	M	134/136 (98%)	129 (96%)	4 (3%)	1 (1%)	18	51
13	N	118/120 (98%)	108 (92%)	10 (8%)	0	100	100
14	O	114/116 (98%)	109 (96%)	4 (4%)	1 (1%)	14	45
15	P	112/114 (98%)	108 (96%)	4 (4%)	0	100	100
16	Q	115/117 (98%)	111 (96%)	4 (4%)	0	100	100
17	R	101/103 (98%)	95 (94%)	6 (6%)	0	100	100
18	S	108/110 (98%)	104 (96%)	4 (4%)	0	100	100
19	T	91/93 (98%)	80 (88%)	11 (12%)	0	100	100
20	U	100/102 (98%)	88 (88%)	11 (11%)	1 (1%)	12	43
21	V	92/94 (98%)	92 (100%)	0	0	100	100
22	W	74/76 (97%)	70 (95%)	4 (5%)	0	100	100
23	X	75/77 (97%)	73 (97%)	2 (3%)	0	100	100
24	Y	61/63 (97%)	55 (90%)	4 (7%)	2 (3%)	3	24
25	Z	56/58 (97%)	54 (96%)	2 (4%)	0	100	100
26	0	54/56 (96%)	50 (93%)	4 (7%)	0	100	100
27	1	48/50 (96%)	46 (96%)	2 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
28	2	44/46 (96%)	42 (96%)	2 (4%)	0	100	100
29	3	62/64 (97%)	58 (94%)	4 (6%)	0	100	100
All	All	3036/3090 (98%)	2839 (94%)	191 (6%)	6 (0%)	44	73

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
24	Y	46	VAL
3	C	12	ARG
14	O	88	LYS
24	Y	45	GLN
12	M	58	LYS
20	U	98	ASN

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	
3	C	216/216 (100%)	216 (100%)	0	100	100
4	D	164/164 (100%)	164 (100%)	0	100	100
5	E	165/165 (100%)	165 (100%)	0	100	100
6	F	148/148 (100%)	148 (100%)	0	100	100
7	G	137/137 (100%)	137 (100%)	0	100	100
8	H	43/43 (100%)	43 (100%)	0	100	100
9	J	116/116 (100%)	116 (100%)	0	100	100
10	K	103/103 (100%)	102 (99%)	1 (1%)	68	74
11	L	102/102 (100%)	101 (99%)	1 (1%)	68	74
12	M	109/109 (100%)	109 (100%)	0	100	100
13	N	100/100 (100%)	100 (100%)	0	100	100
14	O	86/86 (100%)	86 (100%)	0	100	100
15	P	99/99 (100%)	99 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
16	Q	89/89 (100%)	89 (100%)	0	100	100
17	R	84/84 (100%)	84 (100%)	0	100	100
18	S	93/93 (100%)	93 (100%)	0	100	100
19	T	80/80 (100%)	80 (100%)	0	100	100
20	U	83/83 (100%)	82 (99%)	1 (1%)	63	72
21	V	78/78 (100%)	78 (100%)	0	100	100
22	W	56/58 (97%)	56 (100%)	0	100	100
23	X	67/67 (100%)	67 (100%)	0	100	100
24	Y	55/55 (100%)	55 (100%)	0	100	100
25	Z	48/48 (100%)	48 (100%)	0	100	100
26	0	47/47 (100%)	47 (100%)	0	100	100
27	1	45/45 (100%)	45 (100%)	0	100	100
28	2	38/38 (100%)	38 (100%)	0	100	100
29	3	51/51 (100%)	50 (98%)	1 (2%)	48	65
All	All	2502/2504 (100%)	2498 (100%)	4 (0%)	85	87

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
10	K	88	ASN
11	L	110	VAL
20	U	51	LEU
29	3	58	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (51) such sidechains are listed below:

Mol	Chain	Res	Type
4	D	42	ASN
4	D	49	GLN
4	D	173	GLN
5	E	41	GLN
5	E	90	GLN
5	E	97	ASN
5	E	136	GLN
5	E	163	ASN
6	F	62	GLN

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Mol	Chain	Res	Type
7	G	29	ASN
7	G	72	ASN
7	G	87	GLN
7	G	115	GLN
7	G	138	GLN
8	H	20	ASN
8	H	28	ASN
10	K	5	GLN
10	K	29	HIS
10	K	88	ASN
10	K	89	ASN
11	L	35	HIS
11	L	99	ASN
12	M	22	GLN
12	M	97	GLN
14	O	100	HIS
15	P	2	ASN
15	P	40	GLN
15	P	65	ASN
16	Q	36	GLN
16	Q	43	GLN
16	Q	51	GLN
17	R	12	HIS
17	R	89	HIS
18	S	9	HIS
18	S	57	ASN
19	T	70	HIS
21	V	75	GLN
22	W	8	ASN
23	X	5	GLN
23	X	35	HIS
24	Y	20	ASN
24	Y	25	GLN
24	Y	31	GLN
24	Y	45	GLN
24	Y	58	ASN
26	0	5	ASN
27	1	18	HIS
27	1	25	ASN
27	1	45	HIS
28	2	16	HIS
29	3	27	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	2893/2904 (99%)	434 (15%)	9 (0%)
2	B	118/119 (99%)	15 (12%)	0
All	All	3011/3023 (99%)	449 (14%)	9 (0%)

All (449) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	10	A
1	A	12	U
1	A	27	G
1	A	34	U
1	A	35	G
1	A	39	G
1	A	46	G
1	A	63	A
1	A	74	A
1	A	75	G
1	A	84	A
1	A	96	C
1	A	103	A
1	A	110	G
1	A	118	A
1	A	120	U
1	A	125	A
1	A	128	C
1	A	138	U
1	A	139	U
1	A	140	C
1	A	141	G
1	A	142	A
1	A	181	A
1	A	196	A
1	A	199	A
1	A	216	A
1	A	222	A
1	A	230	G
1	A	233	A
1	A	245	G
1	A	248	G
1	A	255	A
1	A	265	A

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Mol	Chain	Res	Type
1	A	266	G
1	A	271	G
1	A	272	A
1	A	273	G
1	A	276	U
1	A	277	G
1	A	278	A
1	A	291	G
1	A	302	C
1	A	311	A
1	A	329	G
1	A	330	A
1	A	331	C
1	A	343	C
1	A	353	C
1	A	361	G
1	A	362	A
1	A	371	A
1	A	372	G
1	A	386	G
1	A	396	G
1	A	405	U
1	A	411	G
1	A	412	A
1	A	424	G
1	A	451	U
1	A	455	C
1	A	457	A
1	A	467	G
1	A	480	A
1	A	481	G
1	A	491	G
1	A	504	A
1	A	505	A
1	A	508	A
1	A	532	A
1	A	544	C
1	A	546	U
1	A	547	A
1	A	548	G
1	A	549	G
1	A	563	A

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Mol	Chain	Res	Type
1	A	573	U
1	A	575	A
1	A	586	A
1	A	603	A
1	A	613	A
1	A	614	A
1	A	615	U
1	A	616	A
1	A	621	A
1	A	627	A
1	A	637	A
1	A	645	C
1	A	647	G
1	A	654	A
1	A	655	A
1	A	668	A
1	A	686	U
1	A	722	A
1	A	726	G
1	A	729	G
1	A	730	A
1	A	747	U
1	A	764	A
1	A	765	C
1	A	775	G
1	A	776	G
1	A	782	A
1	A	784	G
1	A	785	G
1	A	789	A
1	A	791	C
1	A	792	A
1	A	805	G
1	A	811	U
1	A	812	C
1	A	819	A
1	A	827	U
1	A	828	U
1	A	830	G
1	A	845	A
1	A	846	U
1	A	847	U

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Mol	Chain	Res	Type
1	A	856	G
1	A	858	G
1	A	859	G
1	A	878	A
1	A	879	G
1	A	896	A
1	A	897	C
1	A	907	G
1	A	910	A
1	A	915	C
1	A	919	U
1	A	932	U
1	A	941	A
1	A	945	A
1	A	946	C
1	A	961	C
1	A	973	A
1	A	974	G
1	A	983	A
1	A	989	G
1	A	995	C
1	A	996	A
1	A	999	U
1	A	1009	A
1	A	1012	U
1	A	1013	C
1	A	1022	G
1	A	1025	G
1	A	1026	G
1	A	1033	U
1	A	1046	A
1	A	1047	G
1	A	1057	A
1	A	1061	U
1	A	1062	G
1	A	1063	G
1	A	1066	U
1	A	1070	A
1	A	1071	G
1	A	1072	C
1	A	1073	A
1	A	1074	G

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Mol	Chain	Res	Type
1	A	1075	C
1	A	1087	G
1	A	1088	A
1	A	1089	A
1	A	1092	C
1	A	1093	G
1	A	1098	A
1	A	1099	G
1	A	1101	U
1	A	1104	C
1	A	1112	G
1	A	1130	U
1	A	1132	U
1	A	1133	A
1	A	1135	C
1	A	1136	G
1	A	1142	A
1	A	1156	A
1	A	1170	C
1	A	1171	G
1	A	1173	U
1	A	1175	A
1	A	1176	U
1	A	1180	U
1	A	1181	U
1	A	1182	G
1	A	1206	G
1	A	1212	G
1	A	1236	G
1	A	1238	G
1	A	1250	G
1	A	1253	A
1	A	1255	U
1	A	1256	G
1	A	1266	G
1	A	1271	G
1	A	1272	A
1	A	1300	G
1	A	1301	A
1	A	1325	U
1	A	1329	U
1	A	1341	G

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Mol	Chain	Res	Type
1	A	1345	C
1	A	1365	A
1	A	1368	G
1	A	1378	A
1	A	1379	U
1	A	1383	A
1	A	1416	G
1	A	1428	C
1	A	1452	G
1	A	1453	A
1	A	1458	U
1	A	1482	G
1	A	1490	A
1	A	1493	C
1	A	1504	A
1	A	1509	A
1	A	1510	G
1	A	1515	A
1	A	1523	U
1	A	1532	A
1	A	1533	C
1	A	1535	A
1	A	1554	U
1	A	1555	G
1	A	1566	A
1	A	1567	G
1	A	1569	A
1	A	1578	U
1	A	1583	A
1	A	1585	C
1	A	1603	A
1	A	1607	C
1	A	1608	A
1	A	1634	A
1	A	1639	C
1	A	1646	C
1	A	1647	U
1	A	1648	U
1	A	1651	G
1	A	1652	A
1	A	1654	A
1	A	1660	G

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Mol	Chain	Res	Type
1	A	1674	G
1	A	1714	U
1	A	1715	G
1	A	1729	U
1	A	1730	C
1	A	1732	C
1	A	1738	G
1	A	1754	A
1	A	1764	C
1	A	1773	A
1	A	1786	A
1	A	1800	C
1	A	1801	A
1	A	1807	G
1	A	1808	A
1	A	1816	C
1	A	1829	A
1	A	1833	C
1	A	1845	G
1	A	1847	A
1	A	1848	A
1	A	1870	C
1	A	1885	A
1	A	1903	G
1	A	1909	C
1	A	1912	A
1	A	1913	A
1	A	1914	C
1	A	1925	C
1	A	1926	U
1	A	1930	G
1	A	1931	U
1	A	1937	A
1	A	1938	A
1	A	1955	U
1	A	1960	A
1	A	1963	U
1	A	1967	C
1	A	1970	A
1	A	1971	U
1	A	1972	G
1	A	1991	U

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Mol	Chain	Res	Type
1	A	1992	G
1	A	1993	U
1	A	1997	C
1	A	2021	C
1	A	2022	U
1	A	2023	C
1	A	2031	A
1	A	2033	A
1	A	2043	C
1	A	2052	A
1	A	2055	C
1	A	2060	A
1	A	2061	G
1	A	2062	A
1	A	2069	G
1	A	2072	C
1	A	2093	G
1	A	2094	A
1	A	2095	A
1	A	2096	C
1	A	2102	G
1	A	2110	G
1	A	2111	U
1	A	2112	G
1	A	2114	A
1	A	2115	G
1	A	2116	G
1	A	2117	A
1	A	2118	U
1	A	2119	A
1	A	2123	G
1	A	2126	A
1	A	2128	G
1	A	2131	U
1	A	2132	U
1	A	2133	G
1	A	2136	G
1	A	2146	C
1	A	2148	G
1	A	2157	G
1	A	2158	A
1	A	2162	G

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Mol	Chain	Res	Type
1	A	2164	C
1	A	2165	C
1	A	2169	A
1	A	2170	A
1	A	2171	A
1	A	2172	U
1	A	2178	C
1	A	2198	A
1	A	2204	G
1	A	2211	A
1	A	2212	A
1	A	2225	A
1	A	2226	C
1	A	2238	G
1	A	2239	G
1	A	2250	G
1	A	2283	C
1	A	2286	G
1	A	2287	A
1	A	2294	G
1	A	2305	U
1	A	2308	G
1	A	2311	A
1	A	2325	G
1	A	2327	A
1	A	2333	A
1	A	2347	C
1	A	2350	C
1	A	2357	G
1	A	2361	G
1	A	2376	A
1	A	2383	G
1	A	2385	C
1	A	2389	G
1	A	2391	G
1	A	2396	G
1	A	2402	U
1	A	2406	A
1	A	2425	A
1	A	2426	A
1	A	2428	G
1	A	2429	G

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Mol	Chain	Res	Type
1	A	2430	A
1	A	2435	A
1	A	2441	U
1	A	2448	A
1	A	2469	A
1	A	2476	A
1	A	2491	U
1	A	2494	G
1	A	2502	G
1	A	2505	G
1	A	2518	A
1	A	2520	C
1	A	2529	G
1	A	2535	G
1	A	2547	A
1	A	2554	U
1	A	2562	U
1	A	2566	A
1	A	2567	G
1	A	2572	A
1	A	2573	C
1	A	2585	U
1	A	2586	U
1	A	2603	G
1	A	2609	U
1	A	2610	C
1	A	2613	U
1	A	2621	G
1	A	2629	U
1	A	2630	G
1	A	2634	A
1	A	2636	C
1	A	2682	A
1	A	2685	G
1	A	2689	U
1	A	2690	U
1	A	2714	G
1	A	2718	G
1	A	2720	U
1	A	2721	A
1	A	2726	A
1	A	2733	A

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Mol	Chain	Res	Type
1	A	2744	G
1	A	2748	A
1	A	2755	C
1	A	2757	A
1	A	2765	A
1	A	2778	A
1	A	2791	G
1	A	2798	U
1	A	2800	A
1	A	2801	G
1	A	2818	U
1	A	2820	A
1	A	2825	G
1	A	2835	A
1	A	2858	C
1	A	2861	U
1	A	2867	G
1	A	2872	A
1	A	2873	A
1	A	2880	C
1	A	2884	U
1	A	2886	A
2	B	9	G
2	B	13	G
2	B	15	A
2	B	24	G
2	B	35	C
2	B	36	C
2	B	38	C
2	B	40	U
2	B	41	G
2	B	56	G
2	B	57	A
2	B	89	U
2	B	90	C
2	B	99	A
2	B	109	A

All (9) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	271	G

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Mol	Chain	Res	Type
1	A	404	A
1	A	1344	U
1	A	1378	A
1	A	2127	G
1	A	2304	G
1	A	2326	C
1	A	2425	A
1	A	2756	U

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	2098:U	O3'	2099:U	P	9.02
1	A	2190:G	O3'	2191:A	P	4.43

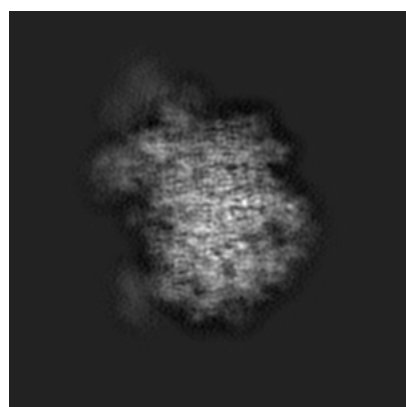
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-4383. These allow visual inspection of the internal detail of the map and identification of artifacts.

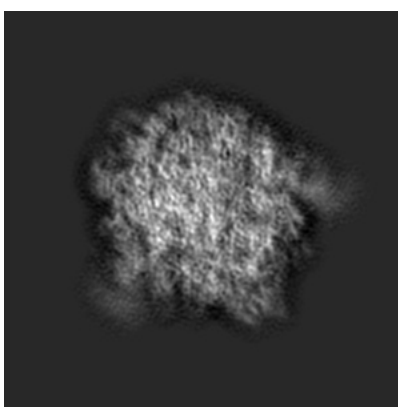
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

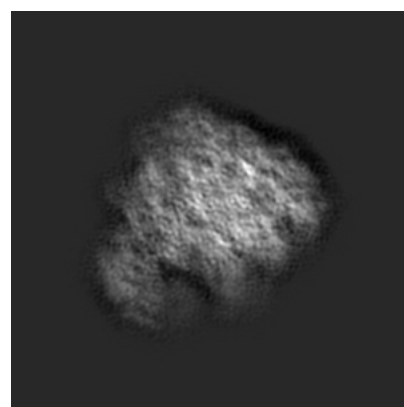
6.1.1 Primary map



X



Y

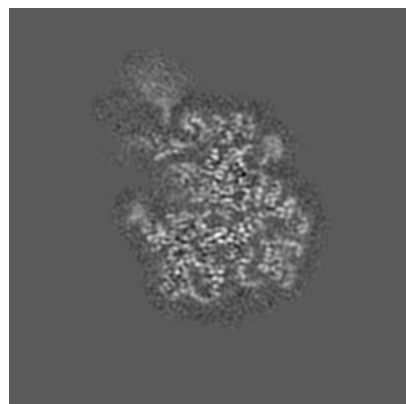


Z

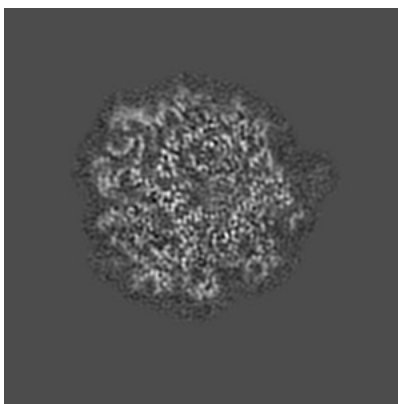
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

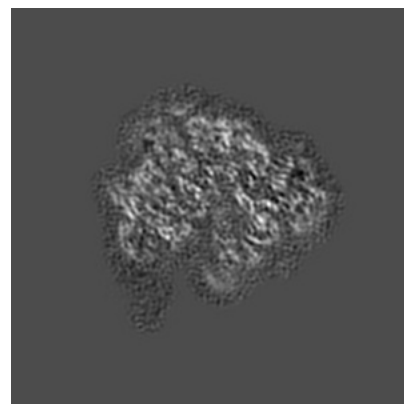
6.2.1 Primary map



X Index: 135



Y Index: 135

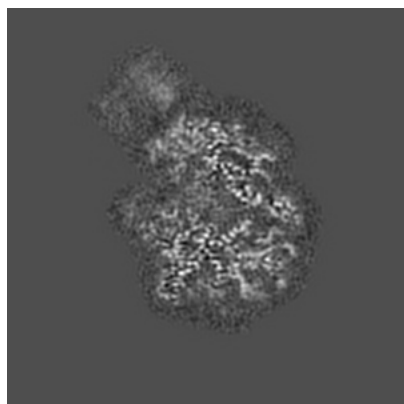


Z Index: 135

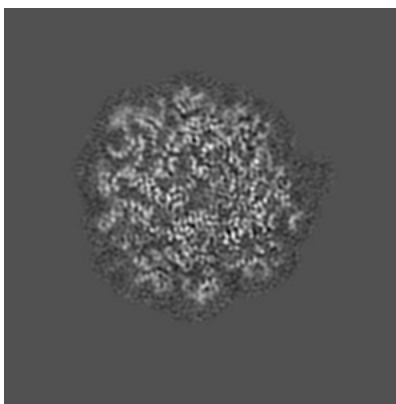
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

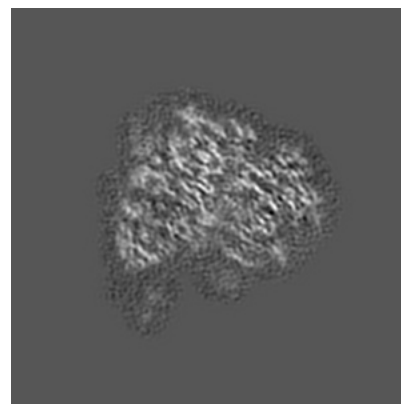
6.3.1 Primary map



X Index: 140



Y Index: 137

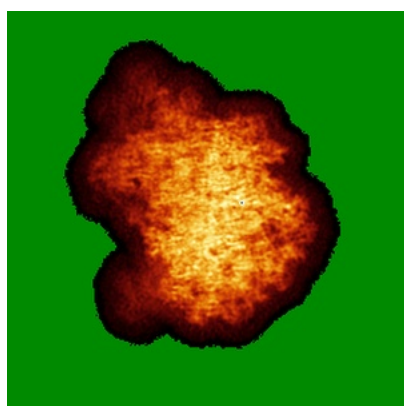


Z Index: 140

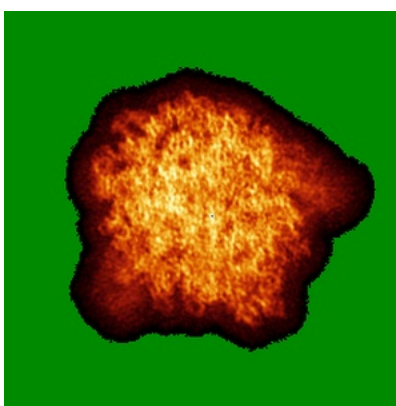
The images above show the largest variance slices of the map in three orthogonal directions.

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

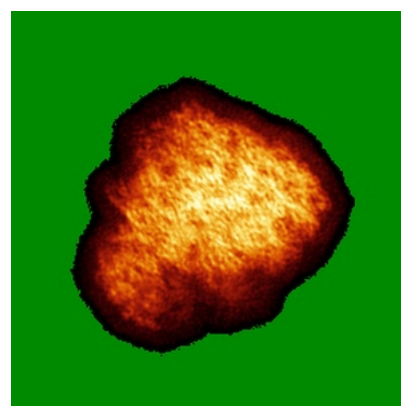
6.4.1 Primary map



X



Y

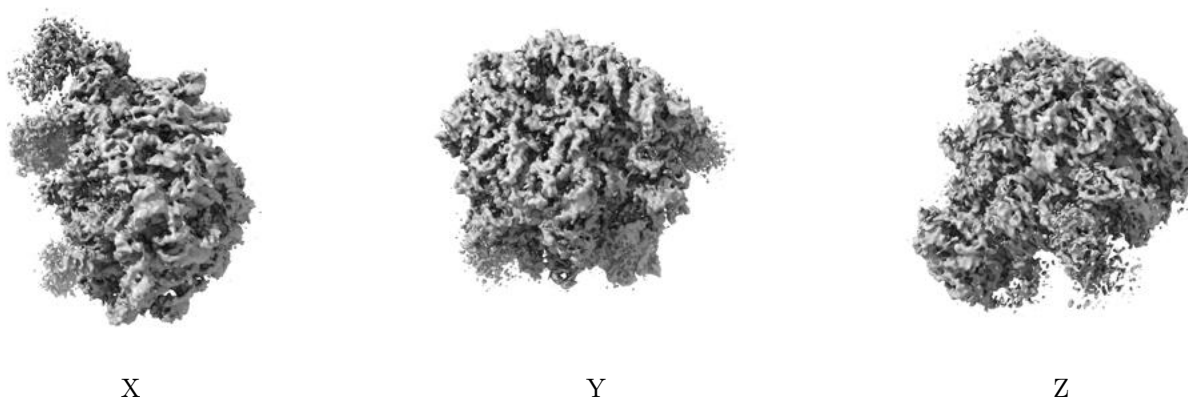


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 1.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

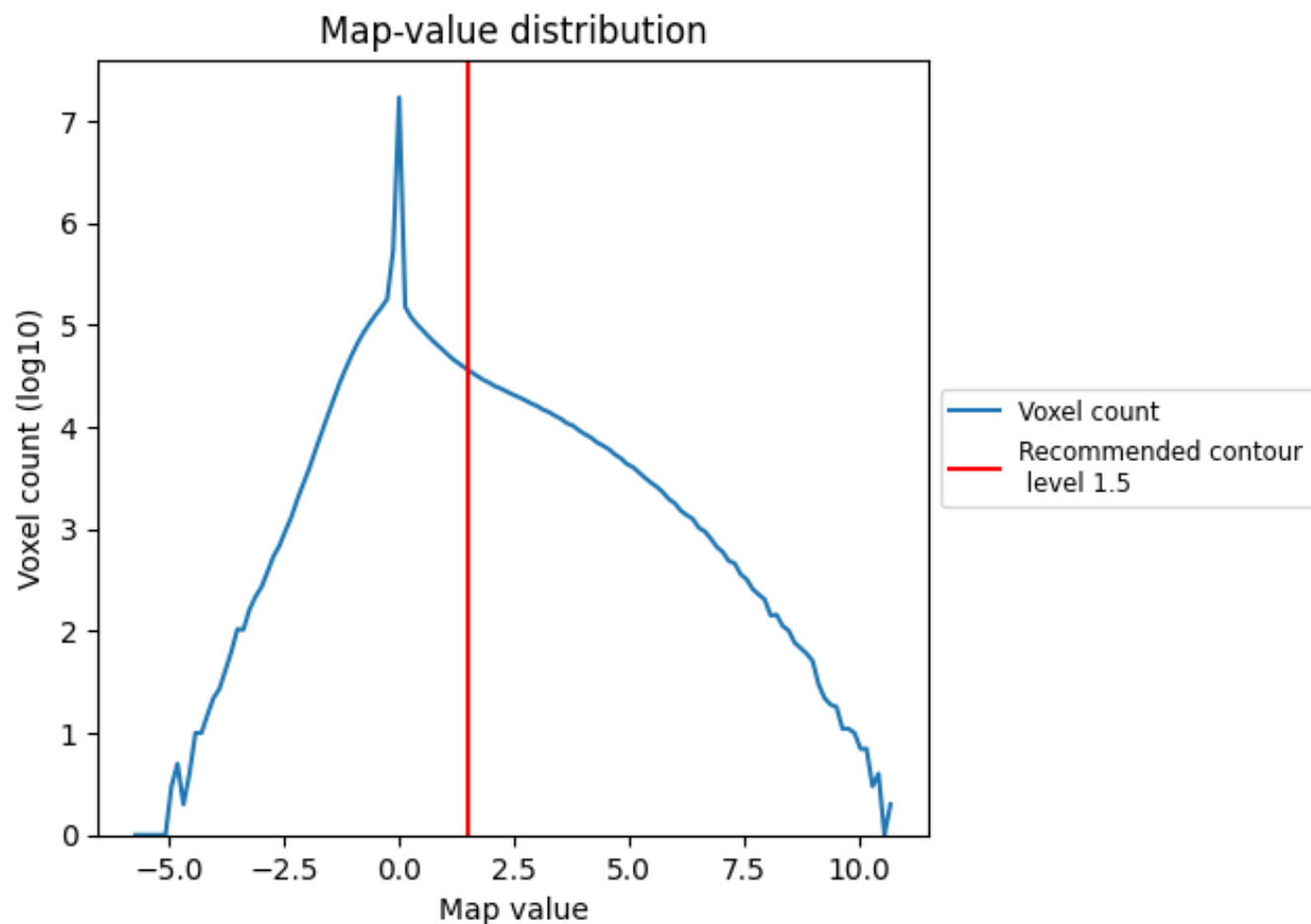
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

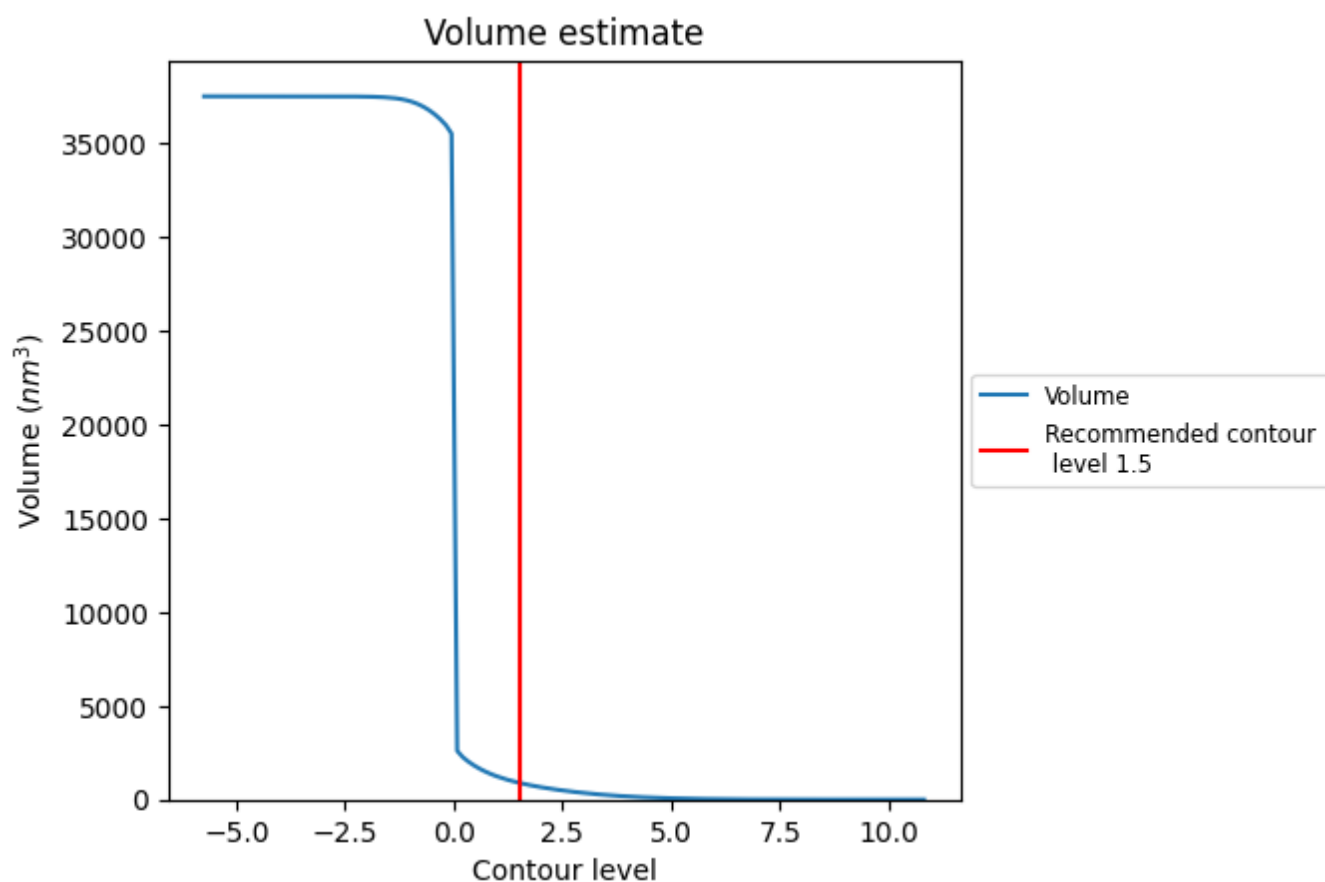
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

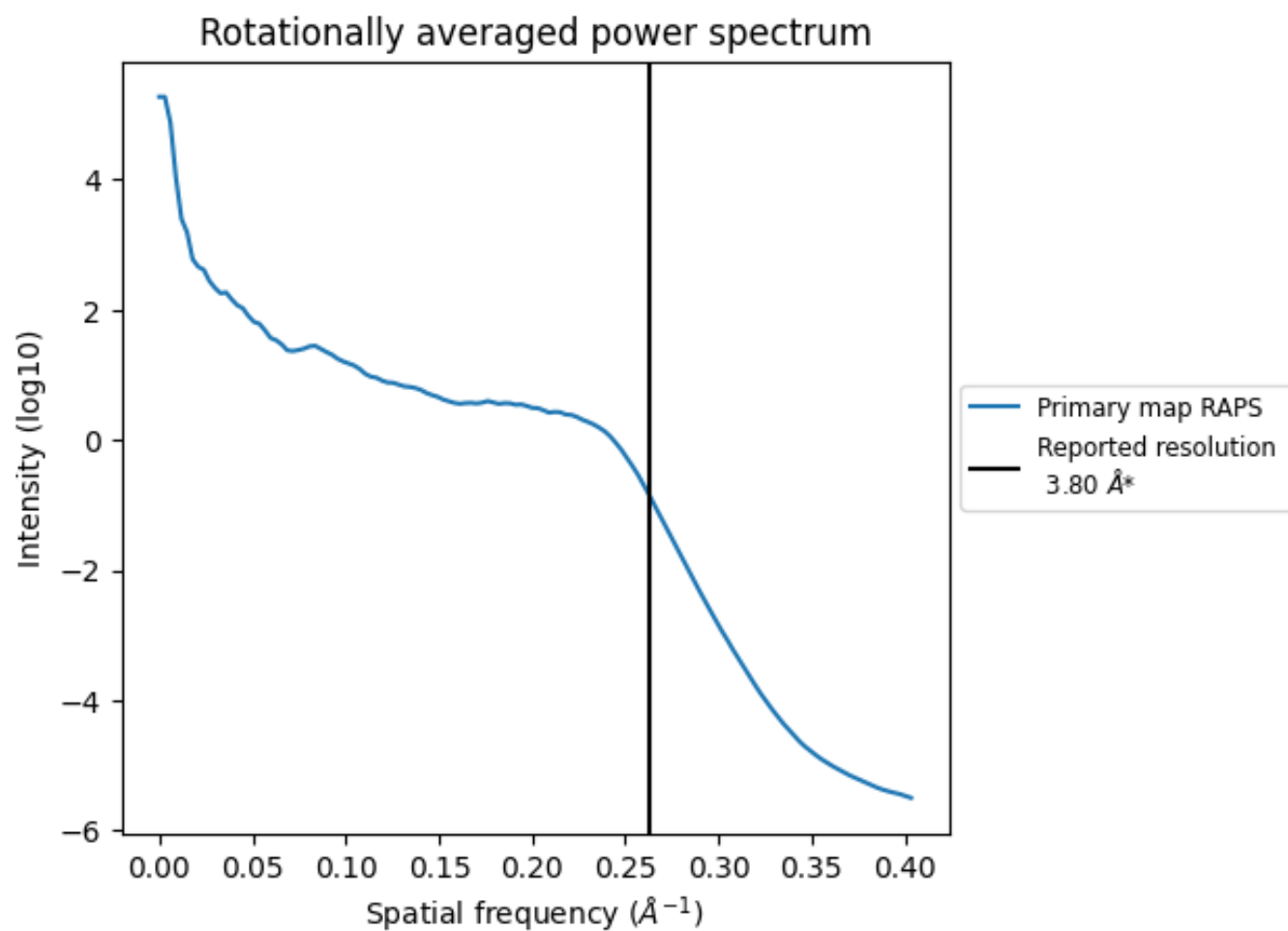
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 894 nm³; this corresponds to an approximate mass of 808 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 0.263 Å⁻¹

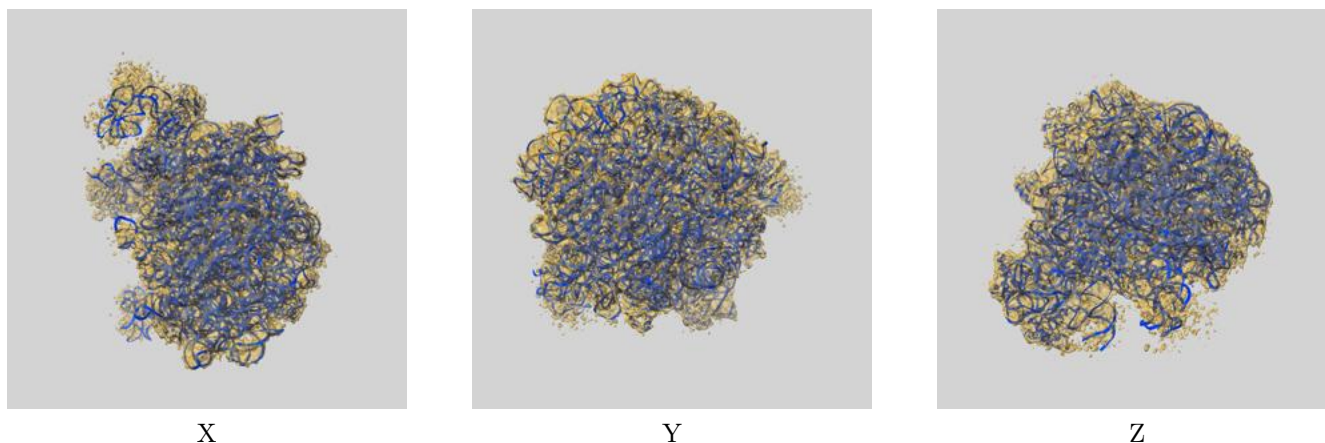
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

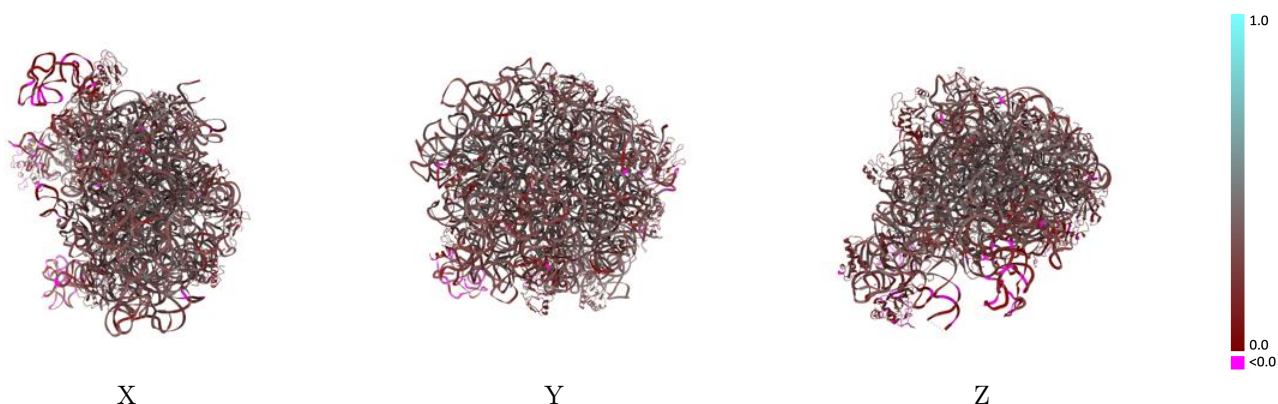
This section contains information regarding the fit between EMDB map EMD-4383 and PDB model 6GC8. Per-residue inclusion information can be found in section [3](#) on page [11](#).

9.1 Map-model overlay [i](#)



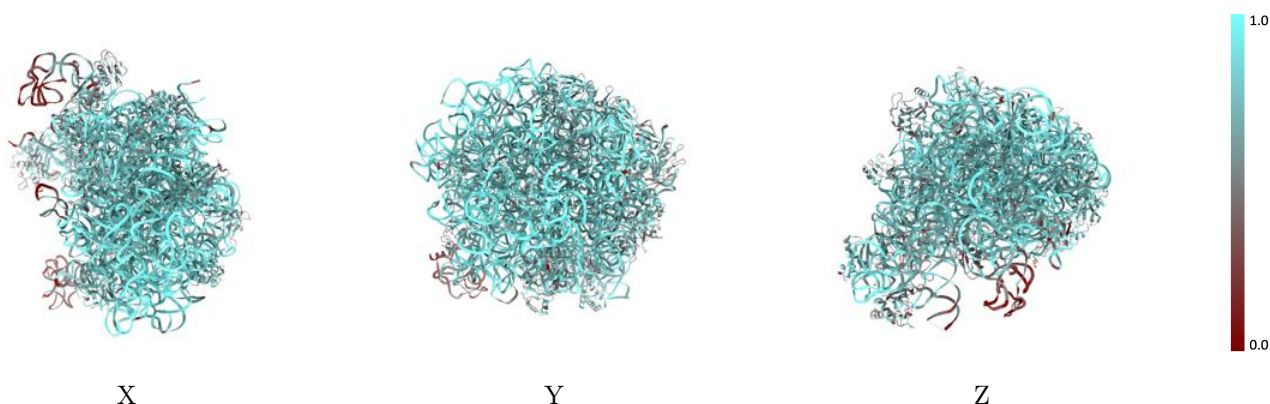
The images above show the 3D surface view of the map at the recommended contour level 1.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



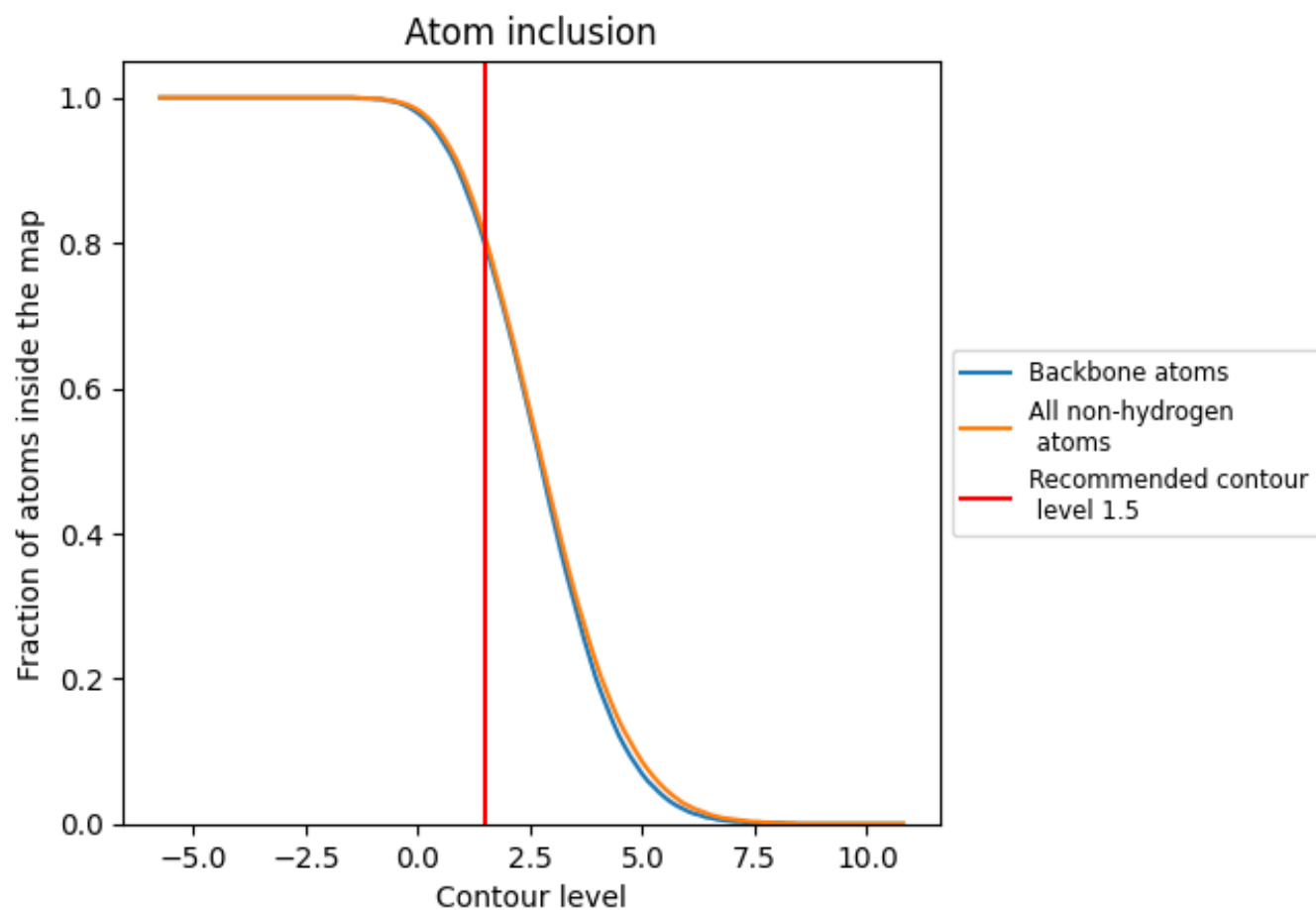
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (1.5).

9.4 Atom inclusion [i](#)



At the recommended contour level, 80% of all backbone atoms, 81% 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 (1.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8070	 0.3050
0	 0.7080	 0.3200
1	 0.4920	 0.2410
2	 0.7770	 0.3260
3	 0.6640	 0.3120
A	 0.8610	 0.3150
B	 0.8590	 0.3100
C	 0.7530	 0.3180
D	 0.7110	 0.3080
E	 0.6470	 0.2610
F	 0.5360	 0.1570
G	 0.5270	 0.2020
H	 0.4510	 0.1610
J	 0.7460	 0.3400
K	 0.7300	 0.2590
L	 0.6700	 0.2730
M	 0.5430	 0.3010
N	 0.7320	 0.3150
O	 0.7000	 0.2530
P	 0.7080	 0.2570
Q	 0.7560	 0.3350
R	 0.6520	 0.2730
S	 0.7210	 0.3250
T	 0.7360	 0.3120
U	 0.6190	 0.2250
V	 0.6150	 0.2940
W	 0.6890	 0.3360
X	 0.7420	 0.3080
Y	 0.7040	 0.2380
Z	 0.6520	 0.3190

