



Full wwPDB EM Validation Report ⓘ

Oct 13, 2024 – 06:47 pm BST

PDB ID : 8CEE
EMDB ID : EMD-16607
Title : Rnase R bound to a 30S degradation intermediate (State I - head-turning)
Authors : Paternoga, H.; Dimitrova-Paternoga, L.; Wilson, D.N.
Deposited on : 2023-02-01
Resolution : 3.70 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:

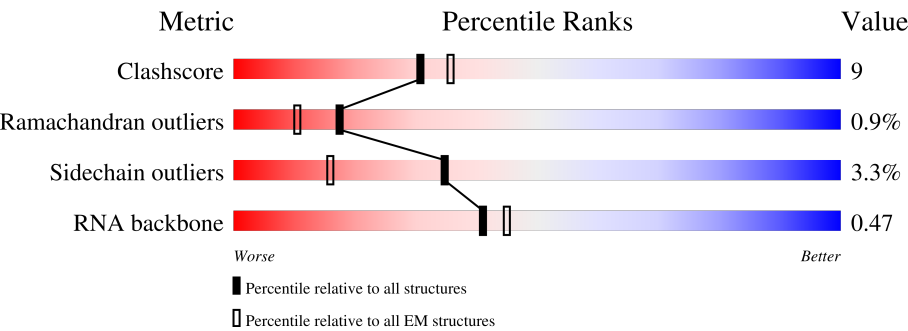
EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

1 Overall quality at a glance i

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

The reported resolution of this entry is 3.70 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	A	1554	32% 34%39%12%•14%
2	B	7	86% 29%43%29%
3	C	779	88% 84%6%9%
4	D	246	72% 76%11%•11%
5	F	200	26% 74%17%•8%
6	G	166	15% 72%22%•5%
7	I	132	12% 76%20%•••

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Mol	Chain	Length	Quality of chain
8	L	138	
9	O	89	
10	P	90	
11	Q	87	
12	S	88	
13	T	95	
14	U	79	
15	V	131	
16	E	218	
17	H	156	
18	J	130	
19	K	102	
20	M	121	
21	N	61	
22	R	92	

2 Entry composition

There are 22 unique types of molecules in this entry. The entry contains 51964 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 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1333	Total	C	N	O	P	0	0
			28597	12753	5245	9266	1333		

- Molecule 2 is a RNA chain called RNA Substrate.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	7	Total	C	N	O	P	0	0
			154	70	35	42	7		

- Molecule 3 is a protein called RNase R.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	708	Total	C	N	O	S	0	0
			5650	3559	962	1102	27		

- Molecule 4 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	218	Total	C	N	O	S	0	0
			1757	1119	309	323	6		

- Molecule 5 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	185	Total	C	N	O	S	0	0
			1490	942	276	270	2		

- Molecule 6 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	G	158	Total	C	N	O	S	0	0
			1170	736	216	216	2		

- Molecule 7 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	I	131	Total	C	N	O	S	0	0
			1036	655	191	187	3		

- Molecule 8 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	L	136	Total	C	N	O	S	0	0
			1052	653	211	186	2		

- Molecule 9 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	O	85	Total	C	N	O	S	0	0
			710	436	144	129	1		

- Molecule 10 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	P	88	Total	C	N	O	S	0	0
			695	441	128	124	2		

- Molecule 11 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	Q	84	Total	C	N	O	S	0	0
			691	435	128	126	2		

- Molecule 12 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	S	83	Total	C	N	O	S	0	0
			637	390	130	116	1		

- Molecule 13 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	T	95	Total	C	N	O	S	0	0
			784	492	138	152	2		

- Molecule 14 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	U	64	Total	C	N	O	S	0	0
			518	332	96	88	2		

- Molecule 15 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	V	101	Total	C	N	O	S	0	0
			730	450	136	143	1		

- Molecule 16 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	E	205	Total	C	N	O	S	0	0
			1615	1009	303	300	3		

- Molecule 17 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	H	149	Total	C	N	O	S	0	0
			1181	740	220	215	6		

- Molecule 18 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	J	108	Total	C	N	O	S	0	0
			826	510	160	155	1		

- Molecule 19 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	K	95	Total	C	N	O	S	0	0
			761	479	139	141	2		

- Molecule 20 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	M	108	Total	C	N	O		0	0
			868	534	176	158			

- Molecule 21 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	N	49	Total	C	N	O	S	0	0
			409	263	79	63	4		

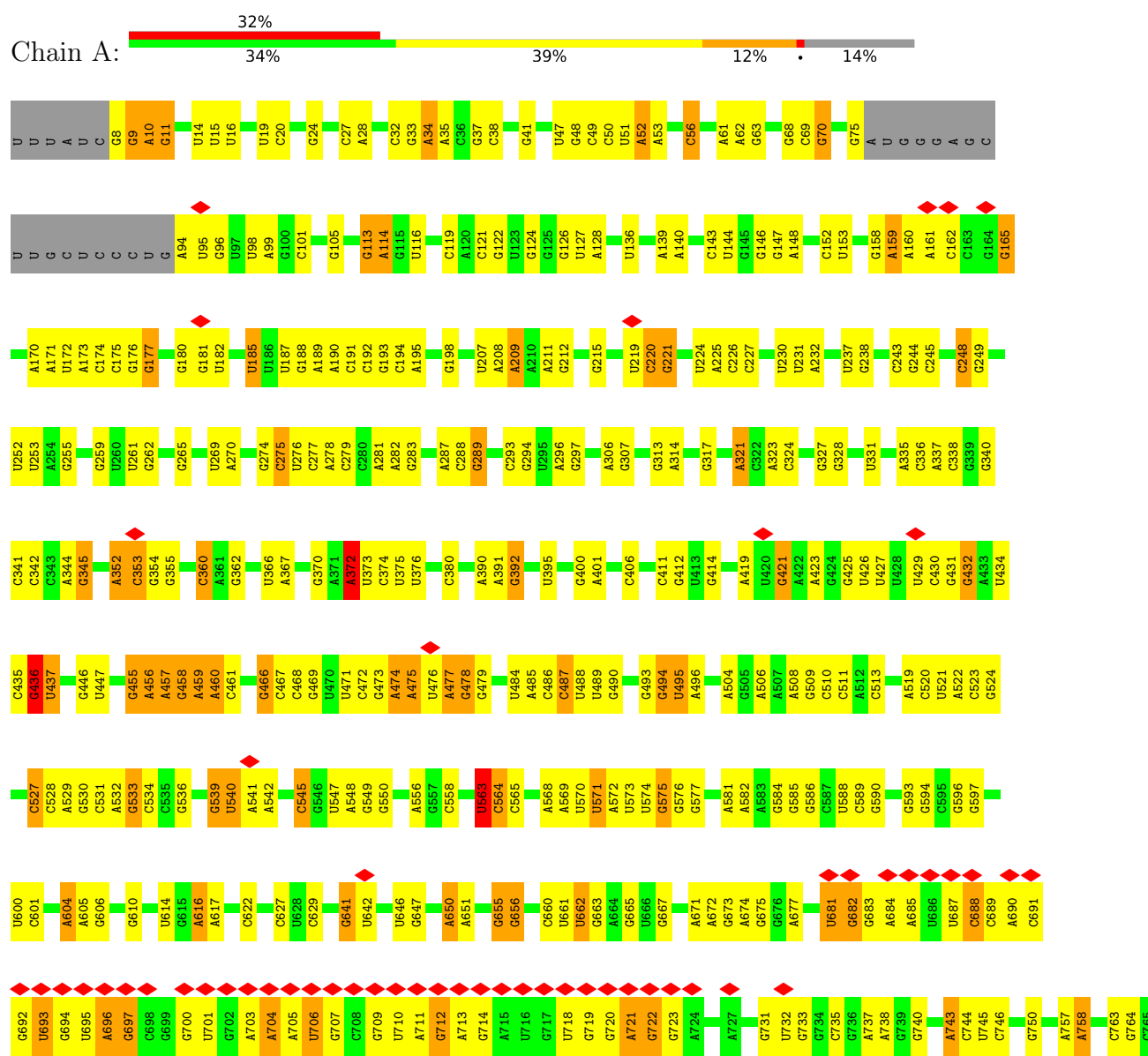
- Molecule 22 is a protein called 30S ribosomal protein S19.

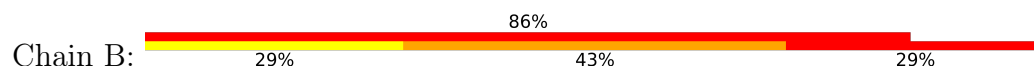
Mol	Chain	Residues	Atoms					AltConf	Trace
22	R	78	Total	C	N	O	S	0	0
			633	409	112	110	2		

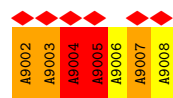
3 Residue-property plots

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.

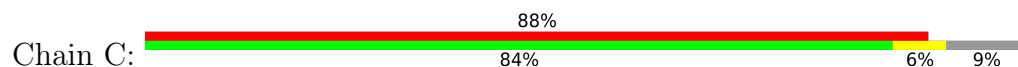
• Molecule 1: 16S rRNA





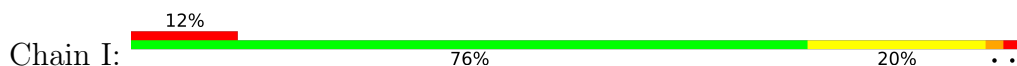
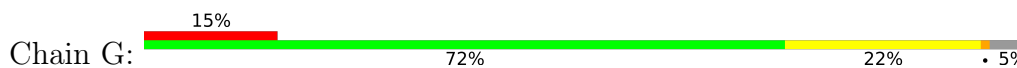
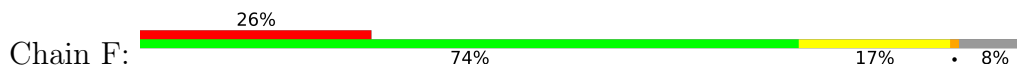


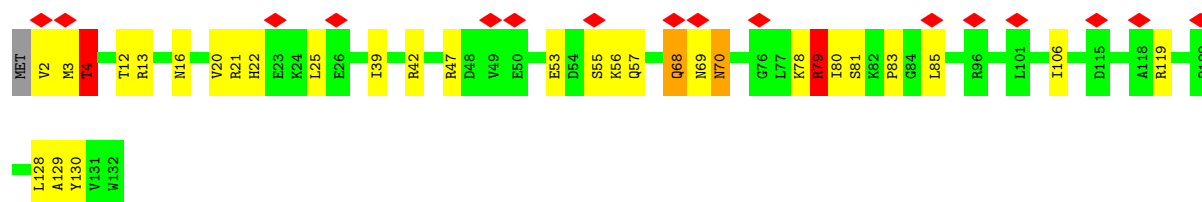
● Molecule 3: RNase R



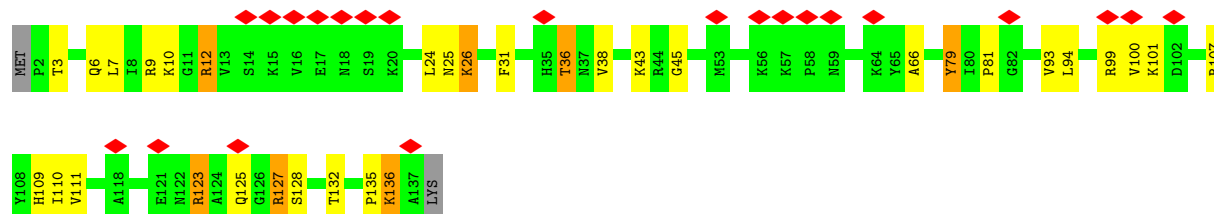
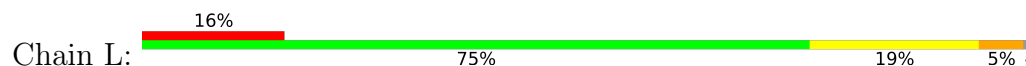
T61	D62	D63	Y64	Y65	R66	F67	D68	E69	Q70	H71	F72	A73	M74	I75	G76	E77	R78	T79	G80	N81	V82	F83	L84	I85	G86	D87	E88	I89	T90	V91	K92	G93	V94	D95	V96	N97	K98	D99	E00	R01	I02	I03	F04	F05	E06	I07	V08	G09	M10	LYS	GLY	THR	PRO	ARG	ARG	PRO	ARG	GLU	LEU																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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E41	K42	L43	Q44	K45	F46	L47	D48	D49	E50	T49	T49	F49	G49	Y49	V49	V49	K49	G49	T50	A50	G50	N50	I50	H50	P50	R50	A50	L50	Q50	S51	I51	D51	A51	V51	R51	D51	P51	E51	E51	T51	F51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V51	E51	L51	V

Chain D: 72% 76% 11% 11%

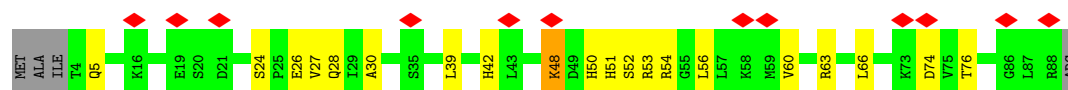
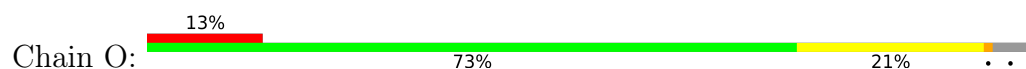




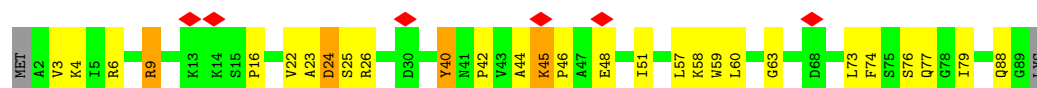
• Molecule 8: 30S ribosomal protein S12



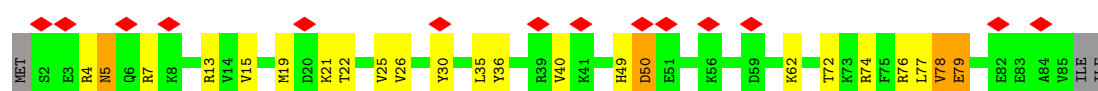
• Molecule 9: 30S ribosomal protein S15



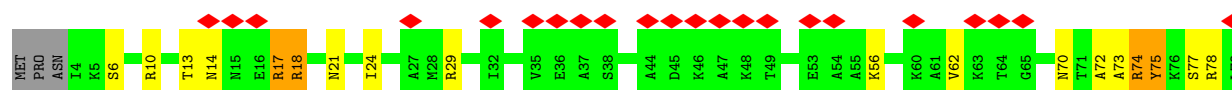
• Molecule 10: 30S ribosomal protein S16

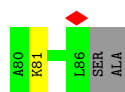


• Molecule 11: 30S ribosomal protein S17

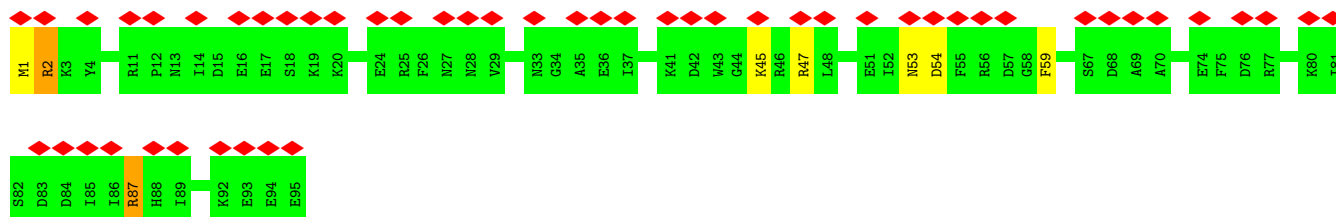
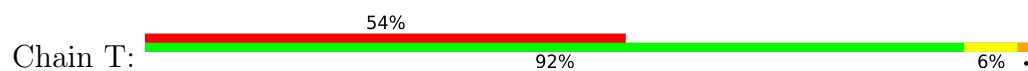


• Molecule 12: 30S ribosomal protein S20

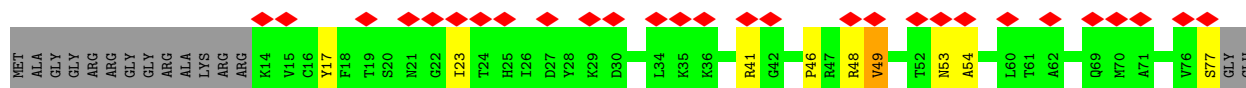




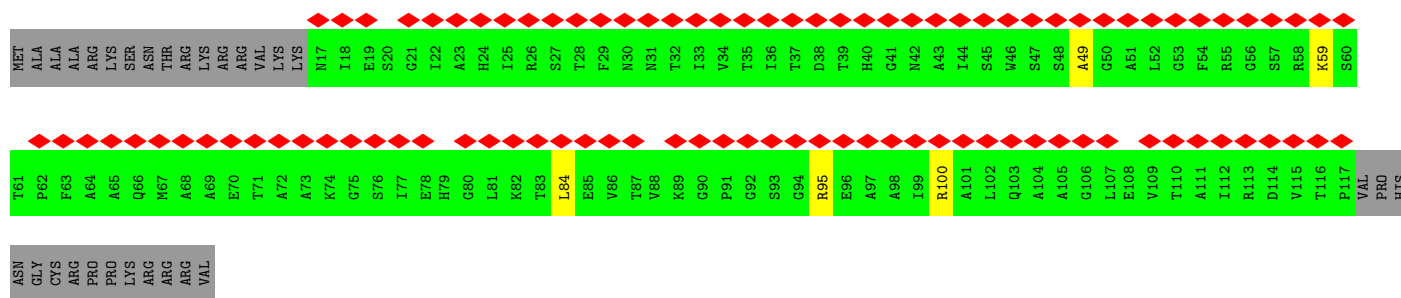
- Molecule 13: 30S ribosomal protein S6



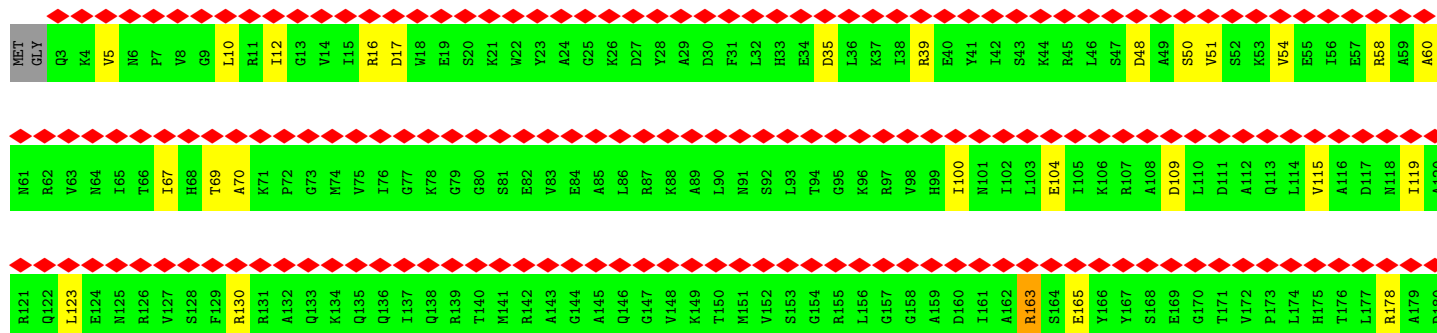
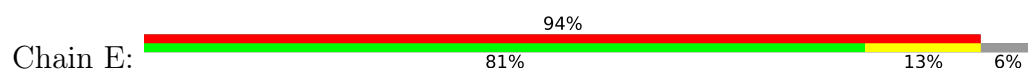
- Molecule 14: 30S ribosomal protein S18

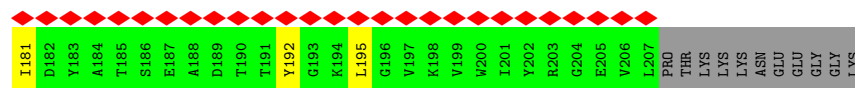


- Molecule 15: 30S ribosomal protein S11

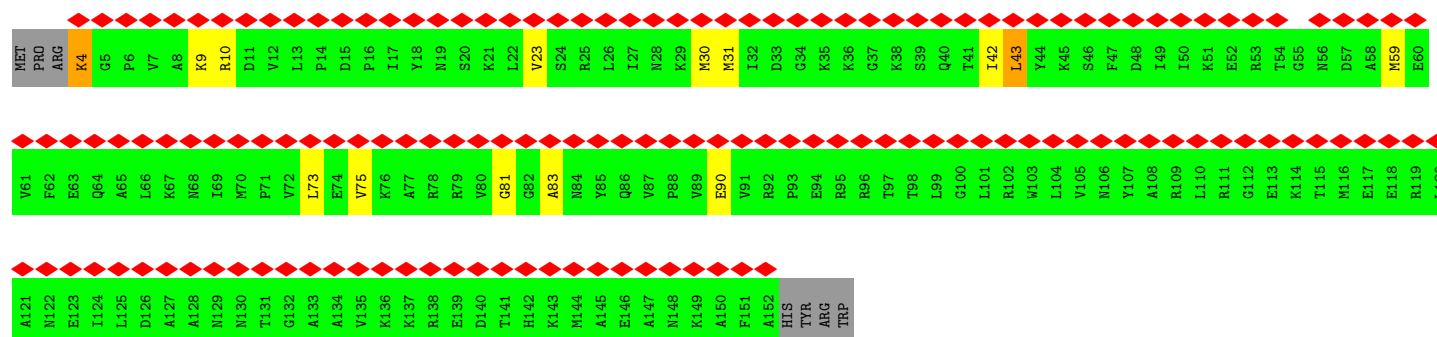
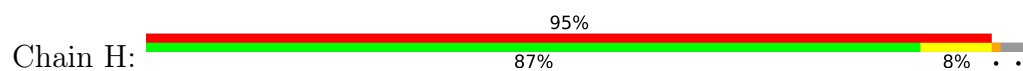


- Molecule 16: 30S ribosomal protein S3

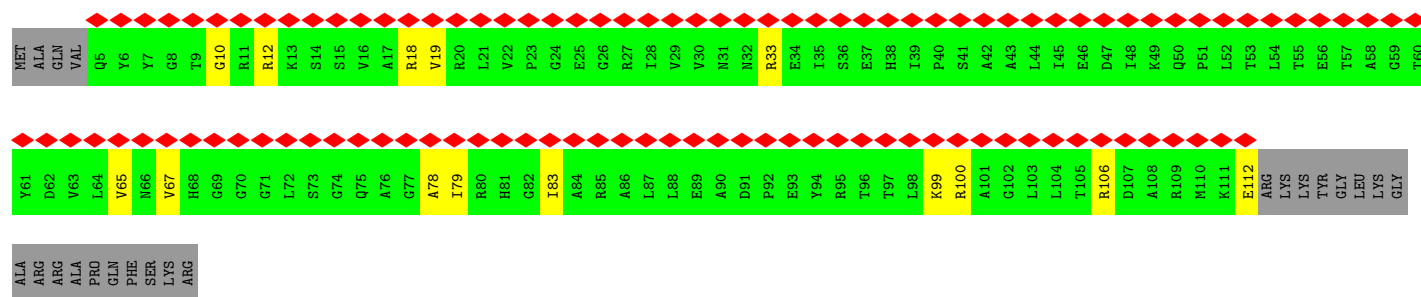
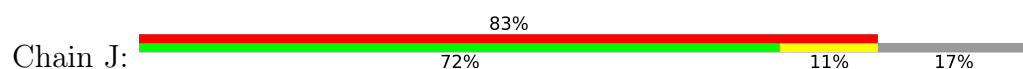




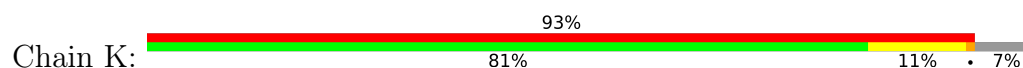
• Molecule 17: 30S ribosomal protein S7



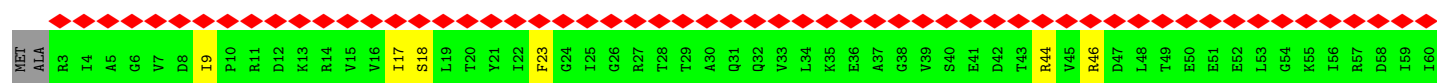
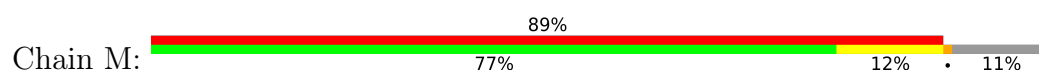
• Molecule 18: 30S ribosomal protein S9

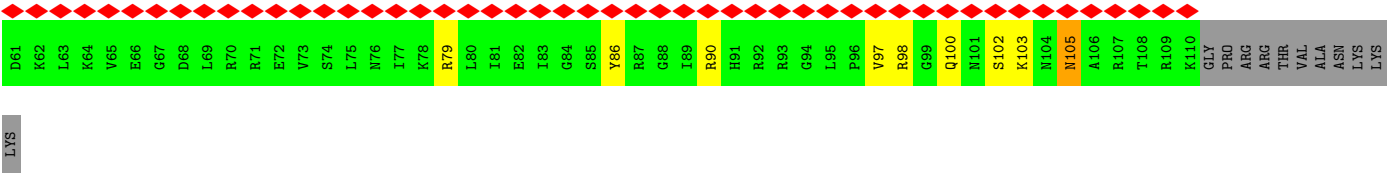


• Molecule 19: 30S ribosomal protein S10

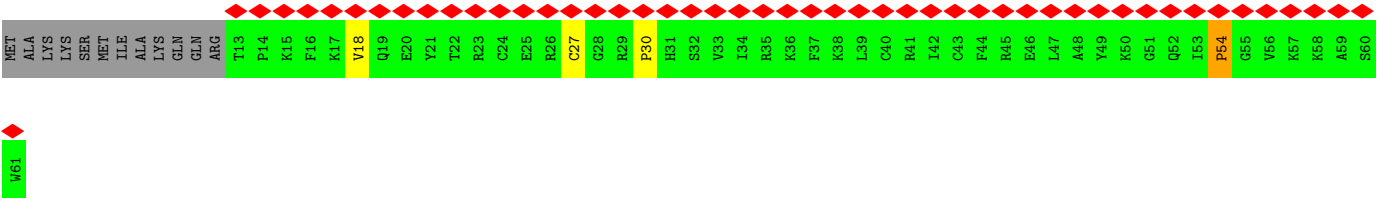
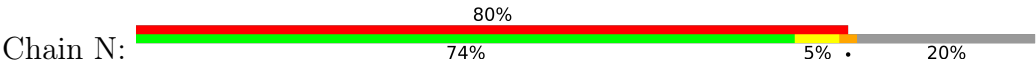


• Molecule 20: 30S ribosomal protein S13

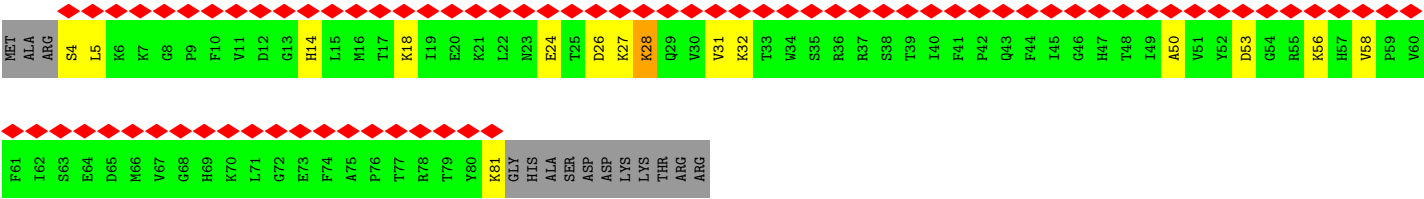
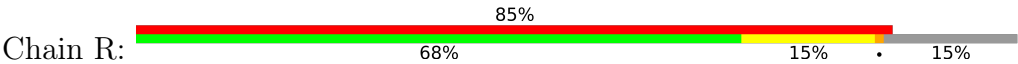




• Molecule 21: 30S ribosomal protein S14



• Molecule 22: 30S ribosomal protein S19



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	13611	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	900	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	0.067	Depositor
Minimum map value	-0.040	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.0114	Depositor
Map size (Å)	307.2, 307.2, 307.2	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.8, 0.8, 0.8	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	0.58	1/32015 (0.0%)	0.95	24/49936 (0.0%)
2	B	0.82	1/174 (0.6%)	1.85	8/269 (3.0%)
3	C	0.32	0/5748	0.67	0/7760
4	D	0.35	0/1782	0.82	3/2392 (0.1%)
5	F	0.45	0/1517	0.94	2/2036 (0.1%)
6	G	0.48	0/1182	1.03	1/1591 (0.1%)
7	I	0.52	0/1048	1.04	3/1407 (0.2%)
8	L	0.50	0/1069	1.08	4/1435 (0.3%)
9	O	0.48	0/718	1.00	0/960
10	P	0.58	0/708	1.13	1/950 (0.1%)
11	Q	0.51	0/699	1.08	2/933 (0.2%)
12	S	0.51	1/639 (0.2%)	0.99	2/852 (0.2%)
13	T	0.35	0/795	0.89	2/1067 (0.2%)
14	U	0.45	0/526	0.95	0/705
15	V	0.35	0/740	0.67	0/1002
16	E	0.35	0/1637	0.74	0/2203
17	H	0.33	0/1196	0.74	0/1604
18	J	0.36	0/836	0.76	0/1128
19	K	0.34	0/773	0.78	0/1044
20	M	0.33	0/873	0.74	0/1166
21	N	0.34	0/419	0.95	0/558
22	R	0.34	0/649	0.76	0/872
All	All	0.51	3/55743 (0.0%)	0.92	52/81870 (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
3	C	0	4
4	D	0	4
5	F	0	5

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Mol	Chain	#Chirality outliers	#Planarity outliers
6	G	0	2
7	I	0	4
8	L	0	3
10	P	0	5
11	Q	0	2
12	S	0	3
13	T	0	1
15	V	0	1
16	E	0	5
18	J	0	2
20	M	0	1
All	All	0	42

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	8	G	P-O5'	7.11	1.66	1.59
2	B	9002	A	P-O5'	5.96	1.65	1.59
12	S	77	SER	CA-CB	-5.30	1.45	1.52

All (52) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	9002	A	N1-C6-N6	-9.80	112.72	118.60
1	A	1113	C	C3'-C2'-C1'	-8.43	94.76	101.50
2	B	9002	A	C5-C6-N6	8.11	130.19	123.70
2	B	9005	A	P-O3'-C3'	-7.93	110.18	119.70
1	A	1113	C	O4'-C1'-N1	7.86	114.49	108.20
1	A	590	G	O5'-P-OP1	-7.51	98.94	105.70
4	D	110	ARG	NE-CZ-NH1	7.08	123.84	120.30
12	S	13	THR	CA-CB-OG1	-6.71	94.92	109.00
1	A	136	U	O5'-P-OP1	-6.70	99.67	105.70
4	D	110	ARG	NE-CZ-NH2	-6.68	116.96	120.30
1	A	1153	G	C3'-C2'-C1'	-6.47	96.32	101.50
1	A	622	C	O5'-P-OP1	-6.38	99.96	105.70
13	T	87	ARG	NE-CZ-NH1	6.30	123.45	120.30
1	A	321	A	O5'-P-OP1	-6.29	100.04	105.70
5	F	66	ARG	NE-CZ-NH2	6.29	123.45	120.30
13	T	87	ARG	CG-CD-NE	6.26	124.95	111.80
6	G	110	PRO	N-CD-CG	-6.06	94.11	103.20
2	B	9002	A	C4-C5-N7	-6.03	107.68	110.70
1	A	563	U	C4'-C3'-C2'	-6.03	96.57	102.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	L	127	ARG	NE-CZ-NH1	5.97	123.28	120.30
11	Q	74	ARG	NE-CZ-NH1	5.92	123.26	120.30
1	A	1344	C	C1'-O4'-C4'	-5.86	105.21	109.90
2	B	9004	A	P-O3'-C3'	-5.78	112.76	119.70
4	D	130	PRO	N-CA-C	5.77	127.10	112.10
8	L	109	HIS	CA-CB-CG	-5.76	103.81	113.60
2	B	9002	A	C5-N7-C8	5.74	106.77	103.90
7	I	69	ASN	CB-CA-C	5.73	121.86	110.40
5	F	66	ARG	CG-CD-NE	5.68	123.72	111.80
11	Q	5	ASN	CB-CA-C	-5.63	99.14	110.40
1	A	1397	C	C1'-O4'-C4'	-5.61	105.41	109.90
1	A	677	A	O5'-P-OP1	-5.60	100.66	105.70
2	B	9002	A	OP1-P-OP2	-5.59	111.22	119.60
10	P	23	ALA	CB-CA-C	-5.56	101.76	110.10
2	B	9007	A	O3'-P-O5'	-5.54	93.48	104.00
1	A	436	G	O5'-P-OP2	-5.52	100.73	105.70
1	A	1287	C	O4'-C1'-N1	5.49	112.59	108.20
1	A	1166	A	C3'-C2'-C1'	-5.45	97.14	101.50
7	I	79	ARG	NE-CZ-NH2	-5.38	117.61	120.30
1	A	487	C	C2'-C3'-O3'	5.37	122.29	113.70
1	A	1119	C	O4'-C1'-N1	5.35	112.48	108.20
1	A	589	C	O5'-P-OP1	-5.33	100.91	105.70
1	A	9	G	C1'-O4'-C4'	-5.32	105.64	109.90
12	S	75	TYR	CB-CG-CD2	-5.32	117.81	121.00
1	A	563	U	C2'-C3'-O3'	5.29	122.16	113.70
1	A	1183	G	C3'-C2'-C1'	-5.27	97.28	101.50
7	I	4	THR	N-CA-CB	5.23	120.24	110.30
8	L	12	ARG	CG-CD-NE	-5.16	100.96	111.80
1	A	1113	C	C1'-O4'-C4'	-5.10	105.82	109.90
1	A	1113	C	OP1-P-O3'	5.09	116.40	105.20
8	L	79	TYR	CB-CA-C	-5.09	100.22	110.40
1	A	1036	C	C3'-C2'-C1'	5.07	105.56	101.50
1	A	372	A	P-O3'-C3'	5.01	125.72	119.70

There are no chirality outliers.

All (42) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	C	441	ARG	Sidechain
3	C	573	ARG	Sidechain
3	C	69	MET	Peptide,Mainchain
4	D	10	LEU	Peptide

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Mol	Chain	Res	Type	Group
4	D	110	ARG	Sidechain
4	D	129	LEU	Peptide
4	D	130	PRO	Peptide
16	E	130	ARG	Sidechain
16	E	16	ARG	Sidechain
16	E	163	ARG	Sidechain
16	E	178	ARG	Sidechain
16	E	58	ARG	Sidechain
5	F	14	ARG	Sidechain
5	F	146	ARG	Sidechain
5	F	2	ALA	Peptide
5	F	3	ARG	Sidechain
5	F	58	ARG	Sidechain
6	G	14	ARG	Sidechain
6	G	32	ARG	Sidechain
7	I	119	ARG	Sidechain
7	I	47	ARG	Sidechain
7	I	68	GLN	Peptide
7	I	79	ARG	Sidechain
18	J	18	ARG	Sidechain
18	J	33	ARG	Sidechain
8	L	123	ARG	Sidechain
8	L	26	LYS	Peptide
8	L	9	ARG	Sidechain
20	M	46	ARG	Sidechain
10	P	44	ALA	Peptide
10	P	45	LYS	Peptide
10	P	6	ARG	Sidechain
10	P	63	GLY	Peptide
10	P	9	ARG	Sidechain
11	Q	4	ARG	Sidechain
11	Q	79	GLU	Peptide
12	S	17	ARG	Sidechain
12	S	29	ARG	Sidechain
12	S	74	ARG	Sidechain
13	T	47	ARG	Sidechain
15	V	84	LEU	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	28597	0	14401	546	0
2	B	154	0	78	20	0
3	C	5650	0	5619	51	0
4	D	1757	0	1830	27	0
5	F	1490	0	1518	20	0
6	G	1170	0	1245	21	0
7	I	1036	0	1095	19	0
8	L	1052	0	1112	21	0
9	O	710	0	735	14	0
10	P	695	0	721	13	0
11	Q	691	0	728	15	0
12	S	637	0	696	12	0
13	T	784	0	777	2	0
14	U	518	0	555	7	0
15	V	730	0	735	2	0
16	E	1615	0	1655	8	0
17	H	1181	0	1235	5	0
18	J	826	0	849	4	0
19	K	761	0	795	4	0
20	M	868	0	925	12	0
21	N	409	0	427	2	0
22	R	633	0	649	7	0
All	All	51964	0	38380	758	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 9.

All (758) 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:344:A:C2'	1:A:345:G:H5''	1.64	1.25
1:A:344:A:H2'	1:A:345:G:C5'	1.73	1.17
1:A:344:A:O2'	1:A:345:G:H5''	1.53	1.08
1:A:344:A:C2'	1:A:345:G:C5'	2.34	1.00
1:A:344:A:H2'	1:A:345:G:H5''	1.36	0.97
1:A:344:A:H2'	1:A:345:G:H5'	1.46	0.96
1:A:955:G:H1	1:A:1245:A:H61	1.12	0.94
1:A:979:A:O2'	1:A:980:C:O2	1.88	0.92
1:A:985:A:H2'	1:A:1374:G:H1'	1.52	0.92

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:458:G:H5'	1:A:459:A:H3'	1.52	0.91
1:A:721:A:H3'	1:A:722:G:H5''	1.57	0.86
1:A:1251:G:H1	1:A:1304:U:H3	1.23	0.82
4:D:10:LEU:HD22	4:D:15:HIS:CG	2.15	0.81
6:G:83:HIS:ND1	6:G:84:GLU:O	2.14	0.80
1:A:824:A:H1'	1:A:826:C:H3'	1.63	0.79
2:B:9002:A:H62	3:C:531:ARG:HD3	1.47	0.79
4:D:10:LEU:HD11	4:D:14:VAL:HB	1.65	0.78
3:C:66:PRO:C	3:C:70:ASN:H	1.85	0.78
7:I:39:ILE:HG12	7:I:42:ARG:HH12	1.49	0.78
1:A:980:C:H2'	19:K:57:LYS:HG2	1.66	0.78
2:B:9002:A:N7	3:C:531:ARG:NE	2.34	0.76
1:A:673:G:H22	1:A:750:G:H1	1.32	0.75
1:A:1134:G:H1	1:A:1158:C:H42	1.32	0.75
3:C:66:PRO:O	3:C:69:MET:N	2.20	0.74
1:A:720:G:H2'	1:A:721:A:H8	1.52	0.73
2:B:9004:A:C2	3:C:418:PHE:HB2	2.23	0.73
1:A:948:A:H1'	1:A:1386:A:H5'	1.71	0.73
1:A:474:A:H2'	1:A:475:A:C8	2.24	0.71
3:C:66:PRO:O	3:C:70:ASN:N	2.22	0.71
4:D:10:LEU:HD11	4:D:14:VAL:N	2.04	0.71
4:D:10:LEU:HD22	4:D:15:HIS:ND1	2.05	0.71
1:A:1045:G:H3'	1:A:1046:G:H5''	1.74	0.70
3:C:420:PHE:CE2	3:C:530:LEU:HD11	2.26	0.70
1:A:1174:U:H3	1:A:1180:A:H62	1.40	0.69
1:A:1111:A:H4'	1:A:1112:A:H4'	1.73	0.69
6:G:15:LEU:HD11	6:G:17:THR:O	1.93	0.69
4:D:10:LEU:HD11	4:D:14:VAL:CA	2.23	0.69
1:A:421:G:H21	1:A:436:G:H1'	1.56	0.68
1:A:655:G:H3'	1:A:656:G:H5''	1.74	0.68
1:A:456:A:H2	1:A:495:U:H3	1.39	0.68
1:A:775:A:H2'	1:A:776:A:O4'	1.94	0.68
4:D:10:LEU:HD21	4:D:13:GLY:C	2.14	0.68
1:A:663:G:H1	1:A:763:C:H5	1.42	0.68
1:A:1057:G:H2'	1:A:1058:G:H8	1.59	0.68
1:A:1219:C:H1'	1:A:1223:U:H2'	1.77	0.67
1:A:1337:C:H2'	1:A:1338:G:C8	2.29	0.67
1:A:955:G:H1	1:A:1245:A:N6	1.88	0.67
4:D:10:LEU:HD11	4:D:14:VAL:CB	2.24	0.67
1:A:989:C:H1'	1:A:1326:C:H42	1.61	0.66
1:A:1094:G:H1'	1:A:1113:C:H41	1.59	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1245:A:H4'	1:A:1313:G:H4'	1.77	0.66
4:D:176:ALA:HB3	4:D:183:ILE:HD11	1.76	0.66
1:A:1183:G:H4'	3:C:148:ARG:HG2	1.77	0.65
1:A:713:A:H2'	1:A:714:G:H8	1.62	0.65
1:A:1150:U:H2'	1:A:1151:G:C8	2.32	0.65
1:A:979:A:O2'	1:A:980:C:C2	2.44	0.65
1:A:1102:A:H2'	1:A:1103:A:C8	2.31	0.65
1:A:693:U:H3'	1:A:694:G:C8	2.32	0.65
1:A:1012:U:N3	1:A:1046:G:N7	2.45	0.65
1:A:1187:G:N7	18:J:99:LYS:NZ	2.44	0.64
1:A:1296:A:H2'	1:A:1297:A:C8	2.32	0.64
1:A:532:A:C2	8:L:101:LYS:HB3	2.32	0.64
1:A:713:A:H2'	1:A:714:G:C8	2.32	0.64
1:A:629:C:C2	5:F:128:ILE:HD13	2.32	0.64
3:C:58:THR:HG21	3:C:93:LEU:HD22	1.80	0.64
1:A:1314:G:H22	1:A:1340:G:H2'	1.61	0.63
3:C:567:ILE:HD13	3:C:596:ILE:HG21	1.80	0.63
4:D:10:LEU:CD1	4:D:14:VAL:HB	2.29	0.63
1:A:466:G:H1	1:A:484:U:H3	1.46	0.63
2:B:9004:A:C1'	3:C:530:LEU:HD22	2.28	0.63
1:A:224:U:H2'	1:A:225:A:C8	2.35	0.62
9:O:53:ARG:O	9:O:56:LEU:HB3	2.00	0.62
1:A:1385:U:H2'	1:A:1386:A:H8	1.64	0.62
1:A:720:G:H2'	1:A:721:A:C8	2.35	0.62
1:A:1385:U:H2'	1:A:1386:A:C8	2.34	0.62
1:A:1167:C:H4'	4:D:132:LYS:HE2	1.80	0.62
1:A:779:C:H2'	1:A:780:G:C8	2.35	0.62
1:A:1248:A:H62	1:A:1308:A:H62	1.47	0.62
1:A:974:A:H1'	1:A:980:C:H5'	1.81	0.62
18:J:65:VAL:HG11	18:J:79:ILE:HG12	1.82	0.62
1:A:27:C:H5'	1:A:533:G:H1'	1.82	0.61
8:L:79:TYR:HB2	8:L:100:VAL:HG21	1.82	0.61
1:A:269:U:OP2	12:S:74:ARG:NH2	2.34	0.61
1:A:277:C:H2'	1:A:278:A:C8	2.36	0.61
1:A:261:U:H2'	1:A:262:G:C8	2.36	0.61
1:A:1115:A:H2'	1:A:1116:G:C8	2.35	0.61
1:A:1020:C:H1'	1:A:1031:A:H1'	1.82	0.61
1:A:1097:G:N2	1:A:1109:G:H1'	2.16	0.61
1:A:931:U:H2'	1:A:932:G:C8	2.34	0.61
8:L:79:TYR:O	8:L:81:PRO:HD3	1.99	0.61
1:A:1265:C:H5''	1:A:1266:A:H5'	1.82	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1250:G:H2'	1:A:1251:G:C8	2.35	0.61
2:B:9002:A:N7	3:C:531:ARG:CZ	2.64	0.61
1:A:331:U:O4'	12:S:14:ASN:ND2	2.34	0.60
10:P:73:LEU:O	10:P:76:SER:OG	2.15	0.60
1:A:681:U:H2'	1:A:682:G:H8	1.66	0.60
1:A:411:C:H5''	5:F:129:PRO:HD2	1.83	0.60
1:A:528:C:H2'	1:A:529:A:C8	2.37	0.60
1:A:700:G:H1'	1:A:706:U:H3	1.66	0.60
1:A:1014:A:H2'	1:A:1015:C:C6	2.37	0.60
1:A:1050:A:H2'	1:A:1051:G:C8	2.37	0.60
1:A:827:G:H1	1:A:829:U:H2'	1.67	0.60
1:A:1098:G:H1	1:A:1107:C:H42	1.50	0.60
1:A:1128:A:H1'	1:A:1188:A:C5	2.37	0.60
5:F:139:ILE:N	5:F:139:ILE:HD12	2.16	0.59
12:S:21:ASN:O	12:S:24:ILE:N	2.35	0.59
1:A:1166:A:N6	1:A:1187:G:H1'	2.17	0.59
1:A:819:C:H1'	1:A:909:C:H41	1.67	0.59
1:A:1364:G:H2'	1:A:1365:G:C8	2.37	0.59
1:A:75:G:H1'	1:A:94:A:N6	2.17	0.59
1:A:70:G:H1	1:A:99:A:H62	1.48	0.59
1:A:596:G:H4'	7:I:4:THR:HA	1.84	0.59
3:C:491:THR:O	14:U:41:ARG:NH2	2.36	0.59
1:A:1337:C:H2'	1:A:1338:G:H8	1.68	0.58
3:C:484:GLN:HE22	15:V:100:ARG:HG3	1.68	0.58
1:A:1026:A:H4'	1:A:1227:C:H4'	1.85	0.58
1:A:1375:C:H2'	1:A:1376:C:C6	2.38	0.58
1:A:513:C:H42	1:A:550:G:H1	1.50	0.58
1:A:1053:G:H2'	1:A:1054:A:C8	2.38	0.58
1:A:159:A:H1'	1:A:352:A:C5	2.39	0.58
1:A:1263:G:H2'	1:A:1264:G:H8	1.68	0.58
1:A:1060:G:H1	1:A:1217:C:H42	1.52	0.58
5:F:54:LYS:HG3	5:F:197:PHE:CD2	2.39	0.58
1:A:1154:C:H4'	1:A:1155:A:H8	1.69	0.57
9:O:27:VAL:O	9:O:30:ALA:HB3	2.04	0.57
20:M:9:ILE:HB	20:M:18:SER:HB3	1.86	0.57
1:A:70:G:H1	1:A:99:A:N6	2.02	0.57
3:C:71:LEU:HD23	3:C:115:ARG:HA	1.85	0.57
1:A:745:U:H2'	1:A:746:C:C6	2.39	0.57
1:A:1024:A:H2'	1:A:1025:G:C8	2.39	0.57
2:B:9002:A:N6	3:C:531:ARG:HD3	2.19	0.57
1:A:573:U:P	8:L:12:ARG:HH21	2.27	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:O:63:ARG:O	9:O:66:LEU:N	2.36	0.57
1:A:949:G:H1'	1:A:1385:U:H1'	1.86	0.57
2:B:9004:A:C2	3:C:418:PHE:CB	2.87	0.57
3:C:563:TYR:CE2	3:C:567:ILE:HD11	2.40	0.57
1:A:19:U:H2'	1:A:20:C:C6	2.39	0.57
1:A:1123:C:H42	1:A:1196:G:H1	1.53	0.57
1:A:1202:G:H2'	1:A:1203:U:C6	2.39	0.57
1:A:777:A:H3'	1:A:778:G:C8	2.39	0.56
1:A:1227:C:H2'	1:A:1228:U:C6	2.40	0.56
3:C:524:VAL:HG11	3:C:685:ILE:HG23	1.86	0.56
7:I:39:ILE:HG12	7:I:42:ARG:NH1	2.19	0.56
1:A:1017:A:H2'	1:A:1018:U:O4'	2.04	0.56
1:A:1034:U:H4'	1:A:1035:C:H5	1.70	0.56
10:P:9:ARG:CZ	10:P:16:PRO:HB3	2.36	0.56
1:A:1220:U:H5''	1:A:1221:U:H5''	1.87	0.56
1:A:1109:G:H5''	1:A:1110:C:H5	1.71	0.56
1:A:1387:C:C2	1:A:1388:G:H1'	2.41	0.56
1:A:1129:U:H3	1:A:1163:G:H1	1.54	0.56
5:F:75:ALA:HB2	5:F:89:LEU:HD12	1.87	0.56
1:A:282:A:H1'	1:A:283:G:C8	2.42	0.55
1:A:950:C:H2'	1:A:951:G:C8	2.42	0.55
1:A:1332:G:H2'	1:A:1333:A:C8	2.42	0.55
1:A:1315:A:H61	1:A:1340:G:H1'	1.70	0.55
11:Q:21:LYS:HA	11:Q:50:ASP:O	2.06	0.55
1:A:531:C:H1'	1:A:545:C:H5''	1.88	0.55
1:A:1024:A:H5''	22:R:14:HIS:CD2	2.42	0.55
1:A:1315:A:N6	1:A:1340:G:H1'	2.20	0.55
1:A:681:U:H2'	1:A:682:G:C8	2.41	0.55
1:A:1020:C:N4	1:A:1029:G:H1	2.05	0.55
1:A:1045:G:H3'	1:A:1046:G:C5'	2.36	0.55
1:A:1044:G:H2'	1:A:1045:G:C8	2.42	0.55
1:A:1131:U:H2'	1:A:1132:U:C6	2.41	0.55
8:L:66:ALA:HB3	8:L:110:ILE:HD11	1.87	0.55
1:A:1275:G:N2	1:A:1277:G:H3'	2.22	0.55
2:B:9004:A:C2	2:B:9005:A:C4	2.94	0.55
19:K:26:VAL:HG21	19:K:39:PRO:HD3	1.89	0.55
1:A:901:U:H2'	1:A:902:A:H8	1.72	0.54
1:A:951:G:H1	1:A:1351:C:H42	1.55	0.54
1:A:1073:C:H5'	1:A:1202:G:H22	1.72	0.54
4:D:133:GLU:OE1	4:D:134:VAL:HA	2.08	0.54
14:U:53:ASN:OD1	14:U:54:ALA:N	2.40	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:27:C:H2'	1:A:28:A:C8	2.43	0.54
1:A:527:C:H2'	1:A:539:G:C8	2.42	0.54
1:A:1016:A:H62	1:A:1033:G:H21	1.55	0.54
1:A:1079:C:H42	1:A:1116:G:H1	1.55	0.54
5:F:54:LYS:HG3	5:F:197:PHE:CE2	2.42	0.54
1:A:1016:A:H61	1:A:1033:G:H2'	1.72	0.54
1:A:1261:A:H2'	1:A:1262:G:H8	1.71	0.54
1:A:1314:G:N2	1:A:1340:G:H2'	2.21	0.54
1:A:548:A:H2'	1:A:549:G:C8	2.43	0.54
1:A:1357:U:H2'	1:A:1358:A:H8	1.73	0.54
7:I:80:ILE:HD11	7:I:130:TYR:CD2	2.42	0.54
1:A:477:A:H2'	1:A:478:G:H5'	1.90	0.54
1:A:1228:U:H2'	1:A:1229:G:C8	2.43	0.54
4:D:10:LEU:HG	4:D:13:GLY:H	1.73	0.54
7:I:12:THR:O	7:I:13:ARG:C	2.43	0.54
1:A:113:G:H4'	1:A:114:A:O5'	2.08	0.54
1:A:1185:A:H2'	1:A:1186:G:C8	2.43	0.54
7:I:78:LYS:O	7:I:129:ALA:HA	2.07	0.54
1:A:390:A:H2'	1:A:391:A:C8	2.43	0.54
1:A:903:C:H2'	1:A:904:G:C8	2.43	0.54
1:A:1052:U:H2'	1:A:1053:G:C4	2.43	0.54
1:A:778:G:H21	1:A:820:C:H1'	1.72	0.53
1:A:827:G:N1	1:A:829:U:H2'	2.23	0.53
1:A:1068:G:H1	1:A:1208:U:H3	1.56	0.53
1:A:1134:G:H3'	1:A:1153:G:H22	1.72	0.53
1:A:127:U:OP2	11:Q:5:ASN:ND2	2.41	0.53
3:C:56:VAL:HG11	3:C:116:LEU:HD13	1.89	0.53
1:A:276:U:H2'	1:A:277:C:C6	2.44	0.53
1:A:818:G:H2'	1:A:819:C:C6	2.43	0.53
1:A:896:G:H1	1:A:921:U:H3	1.57	0.53
1:A:960:U:H2'	1:A:961:G:H8	1.72	0.53
1:A:777:A:H3'	1:A:778:G:H8	1.73	0.53
1:A:1341:A:H2'	1:A:1342:A:C8	2.44	0.53
1:A:1364:G:H2'	1:A:1365:G:H8	1.73	0.53
3:C:69:MET:O	3:C:71:LEU:HG	2.09	0.53
1:A:56:C:H2'	1:A:360:C:H41	1.72	0.53
1:A:956:A:H2'	1:A:957:G:C8	2.44	0.53
8:L:45:GLY:O	8:L:93:VAL:HG22	2.09	0.53
16:E:51:VAL:HG22	16:E:69:THR:HB	1.90	0.53
1:A:69:C:H2'	1:A:70:G:C8	2.43	0.53
1:A:1325:G:O6	22:R:4:SER:N	2.42	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:37:G:H2'	1:A:38:C:C6	2.44	0.52
3:C:116:LEU:HD22	3:C:125:GLN:HE21	1.74	0.52
1:A:1024:A:C2	1:A:1228:U:H1'	2.44	0.52
1:A:1150:U:H2'	1:A:1151:G:H8	1.72	0.52
9:O:50:HIS:O	9:O:53:ARG:N	2.42	0.52
1:A:1125:U:H3	1:A:1194:G:H1	1.58	0.52
1:A:1277:G:H2'	1:A:1278:A:C8	2.44	0.52
1:A:344:A:C3'	1:A:345:G:C5'	2.87	0.52
1:A:1174:U:H2'	1:A:1175:G:C8	2.45	0.52
8:L:127:ARG:HD2	8:L:132:THR:O	2.10	0.52
1:A:423:A:N6	1:A:436:G:H1	2.07	0.52
4:D:133:GLU:OE1	4:D:137:LEU:HD12	2.09	0.52
8:L:79:TYR:CB	8:L:100:VAL:HG21	2.39	0.52
1:A:909:C:H2'	1:A:910:A:C8	2.45	0.52
3:C:21:PRO:HB2	3:C:93:LEU:HD21	1.90	0.52
1:A:160:A:H2'	1:A:161:A:C8	2.44	0.52
1:A:1018:U:H2'	1:A:1031:A:H61	1.75	0.52
1:A:1010:U:H2'	1:A:1011:C:C6	2.45	0.52
1:A:1181:C:H2'	1:A:1182:C:C6	2.45	0.52
5:F:75:ALA:HA	5:F:78:LEU:HD13	1.91	0.52
1:A:61:A:H5''	1:A:395:U:H5''	1.91	0.52
1:A:1037:C:H2'	1:A:1038:C:C6	2.45	0.52
1:A:1091:G:OP2	6:G:52:LYS:HE3	2.09	0.51
1:A:1030:G:H2'	1:A:1031:A:H8	1.75	0.51
1:A:1082:G:H2'	1:A:1083:U:C6	2.46	0.51
10:P:57:LEU:O	10:P:58:LYS:C	2.48	0.51
1:A:997:G:H1	1:A:1227:C:H42	1.56	0.51
1:A:1187:G:N2	1:A:1189:A:H3'	2.25	0.51
1:A:1274:C:H2'	1:A:1275:G:C8	2.46	0.51
3:C:567:ILE:CD1	3:C:596:ILE:HG21	2.40	0.51
1:A:144:U:H3	1:A:176:G:H1	1.57	0.51
1:A:224:U:H1'	1:A:475:A:H61	1.76	0.51
1:A:527:C:H6	1:A:539:G:H5'	1.75	0.51
1:A:1014:A:H3'	1:A:1034:U:C2	2.46	0.51
1:A:1047:C:H2'	1:A:1048:A:C8	2.45	0.51
1:A:11:G:H5'	6:G:108:GLY:HA3	1.92	0.51
1:A:851:U:O2'	1:A:854:C:N4	2.42	0.51
1:A:958:C:H42	1:A:1242:G:H1	1.57	0.51
1:A:1175:G:H1'	1:A:1179:A:H61	1.74	0.51
1:A:943:G:H2'	1:A:945:A:C8	2.45	0.51
6:G:49:GLY:N	6:G:67:ALA:HB2	2.26	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:U:H2'	1:A:96:G:C8	2.46	0.51
3:C:418:PHE:HB3	3:C:420:PHE:CE2	2.46	0.51
12:S:72:ALA:O	12:S:75:TYR:N	2.44	0.51
1:A:523:C:H2'	1:A:524:G:H8	1.74	0.51
1:A:1167:C:O2'	1:A:1169:G:H5'	2.11	0.51
1:A:1291:C:H2'	1:A:1292:C:C6	2.46	0.51
1:A:176:G:H3'	1:A:177:G:H8	1.75	0.51
1:A:523:C:H2'	1:A:524:G:C8	2.46	0.51
1:A:588:U:O3'	9:O:54:ARG:NH1	2.43	0.51
1:A:1265:C:H3'	1:A:1287:C:N4	2.25	0.51
10:P:74:PHE:HB3	10:P:79:ILE:HB	1.93	0.51
1:A:779:C:H2'	1:A:780:G:H8	1.75	0.50
1:A:986:G:C2	1:A:1371:C:H2'	2.46	0.50
12:S:72:ALA:O	12:S:73:ALA:C	2.48	0.50
1:A:159:A:N6	1:A:355:G:H1'	2.27	0.50
1:A:495:U:H2'	1:A:496:A:H8	1.76	0.50
1:A:1235:C:H6	20:M:102:SER:HB2	1.77	0.50
1:A:1377:G:OP1	19:K:62:ARG:NH1	2.45	0.50
2:B:9003:A:H2'	3:C:531:ARG:HG2	1.93	0.50
3:C:66:PRO:HB2	3:C:70:ASN:HA	1.93	0.50
1:A:126:G:H5''	11:Q:5:ASN:HB3	1.93	0.50
1:A:1246:C:H4'	1:A:1309:G:H22	1.76	0.50
1:A:1347:G:H2'	1:A:1348:A:C8	2.45	0.50
5:F:191:GLU:O	5:F:194:ILE:HB	2.11	0.50
22:R:32:LYS:HA	22:R:50:ALA:HB3	1.92	0.50
1:A:980:C:H41	1:A:1240:G:H1'	1.77	0.50
1:A:400:G:H2'	1:A:401:A:C8	2.47	0.50
1:A:1005:C:H2'	1:A:1006:A:C8	2.47	0.50
1:A:1357:U:H2'	1:A:1358:A:C8	2.46	0.50
1:A:243:C:H2'	1:A:244:G:H8	1.76	0.50
1:A:1154:C:H4'	1:A:1155:A:C8	2.46	0.50
18:J:10:GLY:HA3	18:J:78:ALA:O	2.12	0.49
1:A:146:G:H2'	1:A:147:G:C8	2.47	0.49
1:A:527:C:C6	1:A:539:G:H5'	2.47	0.49
1:A:870:A:H61	1:A:879:A:H1'	1.77	0.49
1:A:937:G:H4'	1:A:938:G:O5'	2.12	0.49
1:A:533:G:H2'	1:A:534:C:C6	2.47	0.49
1:A:563:U:H2'	1:A:564:C:C6	2.47	0.49
5:F:57:LEU:O	5:F:60:MET:HB3	2.13	0.49
7:I:20:VAL:O	7:I:21:ARG:C	2.50	0.49
1:A:1107:C:H2'	1:A:1108:C:C6	2.48	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:65:GLU:O	5:F:68:PHE:N	2.45	0.49
2:B:9005:A:C6	2:B:9006:A:C5	3.01	0.49
6:G:135:ASN:O	6:G:136:MET:C	2.50	0.49
1:A:614:U:H3	1:A:641:G:H1	1.61	0.49
1:A:823:A:H2'	1:A:825:A:H5'	1.94	0.49
1:A:1085:U:O3'	4:D:178:LYS:NZ	2.45	0.49
1:A:1261:A:H2'	1:A:1262:G:C8	2.47	0.49
2:B:9002:A:N7	3:C:531:ARG:CD	2.75	0.49
11:Q:25:VAL:HG12	11:Q:26:VAL:N	2.28	0.49
1:A:1054:A:C5	1:A:1055:C:H1'	2.48	0.49
4:D:10:LEU:HD11	4:D:14:VAL:H	1.75	0.49
1:A:468:C:H2'	1:A:469:G:C8	2.48	0.49
1:A:663:G:N1	1:A:763:C:H5	2.10	0.49
1:A:1265:C:H5'	1:A:1267:G:H1'	1.94	0.49
5:F:29:ARG:O	5:F:31:TYR:N	2.46	0.49
1:A:215:G:H1	1:A:224:U:H3	1.60	0.49
1:A:1218:C:H2'	1:A:1219:C:H6	1.77	0.49
1:A:1228:U:H2'	1:A:1229:G:H8	1.76	0.49
1:A:1245:A:H2'	1:A:1246:C:O4'	2.12	0.49
1:A:352:A:H5'	1:A:353:C:C5	2.47	0.48
1:A:1273:C:H2'	1:A:1274:C:C6	2.48	0.48
3:C:495:TYR:CZ	3:C:516:VAL:HG12	2.47	0.48
1:A:328:G:H1	1:A:341:C:H42	1.61	0.48
1:A:1025:G:H2'	1:A:1026:A:C8	2.47	0.48
1:A:1077:A:H5''	1:A:1104:G:N7	2.29	0.48
1:A:1167:C:H5''	1:A:1190:G:H22	1.77	0.48
1:A:1207:A:H2'	1:A:1208:U:C6	2.48	0.48
3:C:524:VAL:HG11	3:C:685:ILE:CG2	2.43	0.48
7:I:78:LYS:O	7:I:130:TYR:N	2.46	0.48
10:P:4:LYS:O	10:P:22:VAL:HA	2.12	0.48
10:P:24:ASP:OD2	10:P:26:ARG:HB2	2.12	0.48
1:A:1167:C:H5''	1:A:1190:G:N2	2.28	0.48
10:P:40:TYR:CZ	10:P:42:PRO:HB3	2.48	0.48
16:E:69:THR:O	16:E:104:GLU:HA	2.13	0.48
1:A:14:U:H3	1:A:24:G:H1	1.60	0.48
3:C:66:PRO:C	3:C:70:ASN:N	2.63	0.48
3:C:667:PHE:CZ	3:C:669:GLU:HA	2.49	0.48
14:U:41:ARG:HG2	14:U:41:ARG:HH11	1.78	0.48
1:A:192:C:H2'	1:A:193:G:H8	1.78	0.48
1:A:697:G:N2	1:A:713:A:O2'	2.47	0.48
1:A:1004:A:H61	1:A:1057:G:C1'	2.26	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1178:A:H2'	1:A:1179:A:O4'	2.14	0.48
1:A:1250:G:H8	1:A:1250:G:H5''	1.78	0.48
1:A:1260:A:H2'	1:A:1261:A:C8	2.48	0.48
1:A:1396:G:H1'	1:A:1397:C:H1'	1.96	0.48
8:L:3:THR:O	8:L:6:GLN:HB2	2.13	0.48
16:E:50:SER:HB3	16:E:70:ALA:HB3	1.96	0.48
1:A:293:C:H2'	1:A:294:G:C8	2.48	0.48
4:D:10:LEU:CD2	4:D:15:HIS:H	2.26	0.48
10:P:3:VAL:CG1	10:P:22:VAL:HG13	2.43	0.48
10:P:74:PHE:CD2	10:P:79:ILE:HG21	2.49	0.48
20:M:86:TYR:O	20:M:90:ARG:HG2	2.14	0.48
1:A:1011:C:H42	1:A:1047:C:N4	2.12	0.48
11:Q:62:LYS:O	11:Q:78:VAL:HB	2.13	0.48
1:A:1032:C:H3'	1:A:1033:G:H8	1.79	0.48
1:A:1080:U:H2'	1:A:1081:C:C6	2.49	0.48
1:A:1265:C:H2'	1:A:1287:C:N3	2.29	0.48
1:A:988:A:C2	1:A:1327:A:H2'	2.49	0.47
1:A:1335:U:H2'	1:A:1336:G:H8	1.78	0.47
1:A:1383:A:H4'	17:H:31:MET:HE1	1.96	0.47
11:Q:15:VAL:HG12	11:Q:15:VAL:O	2.13	0.47
1:A:888:U:H5''	7:I:83:PRO:HB2	1.95	0.47
4:D:69:PHE:HB3	4:D:80:VAL:HG13	1.96	0.47
1:A:159:A:H2'	1:A:160:A:C8	2.50	0.47
1:A:1270:A:H1'	1:A:1284:A:C2	2.50	0.47
1:A:248:C:H2'	1:A:249:G:H8	1.80	0.47
1:A:610:G:H1	1:A:646:U:H3	1.62	0.47
1:A:1004:A:H61	1:A:1057:G:H1'	1.79	0.47
1:A:1246:C:O2'	1:A:1344:C:H5'	2.14	0.47
7:I:2:VAL:O	7:I:4:THR:N	2.47	0.47
11:Q:77:LEU:HD11	11:Q:79:GLU:O	2.15	0.47
1:A:344:A:HO2'	1:A:345:G:H5''	1.70	0.47
1:A:1004:A:C4	1:A:1225:A:H4'	2.49	0.47
1:A:1111:A:H61	4:D:102:THR:HG1	1.62	0.47
1:A:1262:G:H1'	1:A:1364:G:O2'	2.14	0.47
9:O:24:SER:OG	9:O:26:GLU:OE2	2.33	0.47
10:P:22:VAL:HG21	10:P:59:TRP:CG	2.50	0.47
1:A:660:C:H2'	1:A:661:U:C6	2.50	0.47
1:A:1057:G:H2'	1:A:1058:G:C8	2.44	0.47
1:A:1180:A:H2'	1:A:1181:C:C6	2.50	0.47
1:A:1267:G:H2'	1:A:1268:C:C6	2.50	0.47
1:A:1063:G:O6	1:A:1208:U:H2'	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1287:C:H4'	1:A:1288:A:C4	2.49	0.47
1:A:1325:G:H4'	21:N:18:VAL:CG1	2.45	0.47
2:B:9005:A:C6	2:B:9006:A:C6	3.03	0.47
3:C:69:MET:C	3:C:71:LEU:HG	2.35	0.47
1:A:208:A:H2'	1:A:209:A:H5''	1.97	0.47
1:A:527:C:H5''	1:A:528:C:C6	2.50	0.47
1:A:1323:C:H2'	1:A:1324:U:C6	2.49	0.47
3:C:494:GLY:HA2	14:U:41:ARG:CZ	2.45	0.47
17:H:23:VAL:CG1	17:H:43:LEU:HD21	2.45	0.47
1:A:817:C:H2'	1:A:817:C:O2	2.13	0.47
1:A:1297:A:H2'	1:A:1298:A:C8	2.50	0.47
4:D:10:LEU:CD2	4:D:15:HIS:ND1	2.76	0.47
1:A:185:U:H5''	12:S:81:LYS:HG3	1.96	0.46
1:A:485:A:H2'	1:A:486:C:C6	2.50	0.46
1:A:995:C:H2'	1:A:996:A:C8	2.49	0.46
1:A:1043:G:H2'	1:A:1044:G:C8	2.50	0.46
1:A:1048:A:H2'	1:A:1049:G:C8	2.50	0.46
1:A:1296:A:H61	1:A:1380:G:H4'	1.79	0.46
10:P:25:SER:OG	10:P:26:ARG:N	2.47	0.46
1:A:209:A:H1'	1:A:230:U:O2'	2.15	0.46
1:A:704:A:H2'	1:A:705:A:C8	2.50	0.46
1:A:1111:A:H4'	1:A:1112:A:O5'	2.15	0.46
2:B:9004:A:N1	2:B:9005:A:C5	2.83	0.46
1:A:986:G:N2	1:A:1372:A:O4'	2.49	0.46
1:A:1028:A:H2'	1:A:1029:G:C8	2.50	0.46
1:A:1099:G:H1'	1:A:1176:A:H61	1.80	0.46
11:Q:13:ARG:O	11:Q:15:VAL:HG23	2.16	0.46
16:E:109:ASP:HA	16:E:115:VAL:CG2	2.45	0.46
1:A:275:C:H2'	1:A:276:U:C6	2.49	0.46
1:A:955:G:C8	1:A:1346:G:H1'	2.50	0.46
1:A:1259:A:H61	1:A:1363:C:C4'	2.29	0.46
1:A:1286:C:H1'	1:A:1291:C:O2	2.16	0.46
2:B:9004:A:C2	2:B:9005:A:N9	2.84	0.46
11:Q:35:LEU:HD23	11:Q:36:TYR:CZ	2.50	0.46
1:A:116:U:H3'	1:A:296:A:H61	1.80	0.46
1:A:425:G:H2'	1:A:426:U:C6	2.50	0.46
1:A:1004:A:N6	1:A:1224:G:O2'	2.49	0.46
2:B:9002:A:H62	3:C:531:ARG:CD	2.25	0.46
14:U:46:PRO:O	14:U:49:VAL:HG12	2.15	0.46
1:A:230:U:H2'	1:A:231:U:C6	2.51	0.46
1:A:1070:U:H3'	1:A:1071:G:H8	1.81	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1237:C:H2'	1:A:1238:A:H8	1.80	0.46
7:I:80:ILE:HD11	7:I:130:TYR:CG	2.49	0.46
12:S:62:VAL:CG2	12:S:72:ALA:HB2	2.45	0.46
1:A:691:C:H2'	1:A:692:G:C8	2.51	0.46
1:A:1319:C:OP1	20:M:79:ARG:NH2	2.49	0.46
1:A:1332:G:H2'	1:A:1333:A:H8	1.77	0.46
1:A:1351:C:H2'	1:A:1352:G:C8	2.50	0.46
2:B:9004:A:N9	3:C:530:LEU:HD22	2.30	0.46
2:B:9008:A:N7	3:C:561:ARG:NH1	2.64	0.46
1:A:961:G:H5''	1:A:985:A:P	2.56	0.46
10:P:59:TRP:O	10:P:60:LEU:C	2.52	0.46
1:A:187:U:H2'	1:A:188:G:H8	1.81	0.46
1:A:940:C:N3	1:A:1397:C:H5	2.14	0.46
1:A:979:A:N3	1:A:979:A:H2'	2.31	0.46
4:D:14:VAL:HG13	4:D:202:ALA:HB1	1.97	0.46
5:F:193:LEU:O	5:F:197:PHE:N	2.40	0.46
9:O:60:VAL:O	9:O:63:ARG:HB3	2.16	0.46
14:U:41:ARG:O	14:U:77:SER:N	2.47	0.46
1:A:277:C:H2'	1:A:278:A:H8	1.80	0.46
8:L:99:ARG:HA	8:L:107:ARG:HA	1.97	0.46
1:A:471:U:H3	1:A:479:G:H1	1.63	0.45
1:A:513:C:N4	1:A:550:G:H1	2.14	0.45
1:A:547:U:H2'	1:A:548:A:H8	1.81	0.45
1:A:822:U:H5'	1:A:914:C:H5'	1.98	0.45
11:Q:19:MET:HB3	11:Q:22:THR:HB	1.98	0.45
1:A:1004:A:O5'	1:A:1004:A:H8	1.99	0.45
3:C:69:MET:HB2	3:C:71:LEU:H	1.82	0.45
1:A:220:C:H4'	1:A:221:G:C4	2.52	0.45
1:A:317:G:H1'	1:A:617:A:C2	2.51	0.45
1:A:391:A:C5	1:A:392:G:H1'	2.51	0.45
1:A:421:G:N2	1:A:436:G:H1'	2.29	0.45
1:A:456:A:H4'	1:A:456:A:OP1	2.16	0.45
1:A:958:C:C6	20:M:105:ASN:HB3	2.50	0.45
1:A:1023:G:N2	1:A:1025:G:H3'	2.32	0.45
1:A:1093:U:H5''	1:A:1096:U:H3	1.81	0.45
1:A:1247:A:N7	1:A:1308:A:N6	2.65	0.45
1:A:1270:A:H62	1:A:1283:A:H1'	1.81	0.45
3:C:296:GLU:OE1	3:C:592:ARG:NH1	2.49	0.45
6:G:89:PHE:CZ	6:G:138:ARG:HD3	2.52	0.45
13:T:2:ARG:HH11	13:T:2:ARG:HG3	1.82	0.45
22:R:26:ASP:O	22:R:28:LYS:N	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:457:A:H3'	1:A:458:G:H8	1.81	0.45
1:A:459:A:H4'	1:A:460:A:O5'	2.16	0.45
1:A:690:A:H2'	1:A:691:C:C6	2.51	0.45
1:A:1235:C:H2'	20:M:102:SER:HB3	1.98	0.45
1:A:1255:G:H2'	1:A:1256:A:O4'	2.16	0.45
1:A:1263:G:H2'	1:A:1264:G:C8	2.50	0.45
1:A:1355:A:N1	1:A:1383:A:H5''	2.32	0.45
1:A:1366:A:H2'	1:A:1367:U:C6	2.52	0.45
1:A:572:A:H4'	1:A:574:U:H5	1.81	0.45
1:A:743:A:C2	1:A:744:C:C2	3.04	0.45
1:A:981:G:H4'	1:A:982:C:OP2	2.17	0.45
1:A:1311:U:H5''	20:M:17:ILE:HD12	1.98	0.45
4:D:129:LEU:N	4:D:130:PRO:HD2	2.31	0.45
1:A:327:G:H1	1:A:342:C:H42	1.64	0.45
1:A:1032:C:H2'	1:A:1033:G:O4'	2.16	0.45
1:A:1307:C:H4'	1:A:1308:A:C5	2.52	0.45
22:R:18:LYS:HD2	22:R:31:VAL:HG13	1.98	0.45
1:A:47:U:H2'	1:A:48:G:C8	2.52	0.45
1:A:548:A:H2'	1:A:549:G:H8	1.80	0.45
1:A:864:U:H3'	1:A:881:U:H3	1.81	0.45
1:A:1014:A:H8	1:A:1034:U:O2'	2.00	0.45
1:A:1361:C:H2'	1:A:1362:G:H8	1.81	0.45
3:C:497:VAL:CG2	3:C:512:ILE:HD11	2.47	0.45
6:G:36:LEU:HD21	6:G:137:ILE:HD12	1.97	0.45
1:A:95:U:H2'	1:A:96:G:H8	1.82	0.45
1:A:248:C:H2'	1:A:249:G:C8	2.52	0.45
1:A:1041:C:H4'	1:A:1042:G:C2	2.51	0.45
1:A:1314:G:H1'	1:A:1341:A:N6	2.32	0.45
1:A:52:A:C4	8:L:31:PHE:CE2	3.05	0.45
10:P:51:ILE:HD12	10:P:77:GLN:HG3	1.99	0.45
1:A:600:U:H2'	1:A:601:C:C6	2.52	0.45
1:A:850:U:H3'	1:A:851:U:C6	2.52	0.45
1:A:1259:A:H2'	1:A:1260:A:C8	2.52	0.45
8:L:123:ARG:HD2	8:L:125:GLN:O	2.17	0.45
9:O:52:SER:O	9:O:53:ARG:C	2.55	0.45
1:A:114:A:H61	1:A:321:A:H1'	1.82	0.44
1:A:960:U:H2'	1:A:961:G:C8	2.51	0.44
1:A:1080:U:H4'	6:G:30:ARG:HH22	1.82	0.44
9:O:50:HIS:O	9:O:51:HIS:C	2.52	0.44
1:A:62:A:H4'	1:A:63:G:O5'	2.17	0.44
1:A:105:G:N7	12:S:10:ARG:NH2	2.62	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:121:C:H2'	1:A:122:G:H8	1.82	0.44
1:A:161:A:C5	1:A:162:C:H1'	2.53	0.44
1:A:458:G:C5'	1:A:459:A:H3'	2.35	0.44
1:A:1116:G:H2'	1:A:1117:C:C6	2.53	0.44
1:A:1326:C:H5	21:N:18:VAL:HG21	1.81	0.44
3:C:420:PHE:CE2	3:C:530:LEU:HD21	2.52	0.44
9:O:74:ASP:OD1	9:O:76:THR:HB	2.17	0.44
1:A:999:U:H2'	1:A:1000:C:C6	2.51	0.44
1:A:1003:G:H2'	1:A:1003:G:N3	2.33	0.44
1:A:1018:U:C2'	1:A:1031:A:H61	2.30	0.44
1:A:1034:U:H4'	1:A:1035:C:C5	2.52	0.44
1:A:1188:A:H2'	1:A:1189:A:C8	2.53	0.44
12:S:62:VAL:HG21	12:S:72:ALA:HB2	1.99	0.44
1:A:344:A:C3'	1:A:345:G:H5''	2.42	0.44
1:A:993:A:H1'	1:A:1059:U:O2	2.17	0.44
1:A:1125:U:H2'	1:A:1126:U:C6	2.53	0.44
1:A:1246:C:H4'	1:A:1309:G:N2	2.32	0.44
1:A:1339:U:H2'	1:A:1340:G:O4'	2.17	0.44
6:G:15:LEU:HD11	6:G:18:VAL:HG23	2.00	0.44
1:A:472:C:H2'	1:A:473:G:O4'	2.17	0.44
1:A:1094:G:C8	1:A:1095:U:H2'	2.53	0.44
1:A:1249:U:O4'	17:H:42:ILE:HD11	2.17	0.44
1:A:1323:C:C5	22:R:4:SER:HA	2.52	0.44
6:G:131:ASN:O	6:G:136:MET:HE2	2.18	0.44
1:A:158:G:N2	1:A:160:A:H3'	2.32	0.44
1:A:921:U:H2'	1:A:922:C:C6	2.53	0.44
1:A:980:C:N4	1:A:1240:G:H1'	2.32	0.44
1:A:1314:G:H1'	1:A:1341:A:H62	1.82	0.44
13:T:45:LYS:HB2	13:T:59:PHE:CE1	2.53	0.44
1:A:75:G:H1'	1:A:94:A:H61	1.82	0.44
1:A:427:U:H3	1:A:432:G:H1	1.64	0.44
1:A:511:C:OP1	8:L:128:SER:OG	2.29	0.44
1:A:671:A:H2'	1:A:672:A:C8	2.53	0.44
1:A:775:A:C6	1:A:823:A:H1'	2.53	0.44
1:A:1010:U:H1'	1:A:1051:G:H22	1.82	0.44
1:A:1094:G:H2'	1:A:1095:U:C6	2.52	0.44
6:G:110:PRO:O	6:G:113:ALA:HB3	2.17	0.44
1:A:34:A:H2'	1:A:35:A:C8	2.53	0.44
1:A:121:C:H2'	1:A:122:G:C8	2.53	0.44
1:A:180:G:H1	1:A:208:A:H2'	1.82	0.44
1:A:262:G:OP1	11:Q:72:THR:OG1	2.30	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1003:G:H21	1:A:1005:C:H42	1.64	0.44
1:A:1166:A:H61	1:A:1187:G:H1'	1.82	0.44
1:A:1367:U:H3	1:A:1372:A:H62	1.65	0.44
6:G:111:VAL:HG12	6:G:115:LEU:HD12	2.00	0.44
1:A:10:A:N6	5:F:196:GLU:O	2.51	0.44
1:A:511:C:OP1	8:L:128:SER:CB	2.66	0.44
1:A:1024:A:H2	1:A:1228:U:H1'	1.83	0.44
1:A:1386:A:H4'	1:A:1387:C:H5	1.82	0.44
12:S:17:ARG:O	12:S:18:ARG:C	2.56	0.44
1:A:243:C:H2'	1:A:244:G:C8	2.52	0.43
1:A:425:G:H1	1:A:434:U:H3	1.65	0.43
1:A:437:U:H5'	5:F:9:TRP:CE3	2.53	0.43
1:A:563:U:OP1	8:L:25:ASN:ND2	2.42	0.43
1:A:604:A:H61	1:A:650:A:H2'	1.83	0.43
1:A:1077:A:H3'	1:A:1078:G:H4'	2.00	0.43
1:A:1105:U:H2'	1:A:1106:C:O4'	2.18	0.43
1:A:1109:G:N3	1:A:1109:G:H2'	2.33	0.43
1:A:1143:A:C6	1:A:1151:G:C6	3.05	0.43
1:A:1149:U:H2'	1:A:1150:U:C2	2.53	0.43
1:A:1339:U:H4'	20:M:23:PHE:CE2	2.53	0.43
3:C:527:THR:HG22	3:C:531:ARG:CZ	2.48	0.43
1:A:1111:A:C4'	1:A:1112:A:H4'	2.45	0.43
2:B:9007:A:P	3:C:562:ARG:HH12	2.41	0.43
18:J:19:VAL:HG11	18:J:83:ILE:HA	2.00	0.43
1:A:564:C:H2'	1:A:565:C:C6	2.53	0.43
1:A:1046:G:OP1	1:A:1046:G:H4'	2.18	0.43
17:H:73:LEU:HD23	17:H:90:GLU:HA	1.99	0.43
1:A:68:G:H1	1:A:101:C:H42	1.64	0.43
1:A:989:C:N4	1:A:1369:A:H62	2.16	0.43
1:A:1038:C:H2'	1:A:1039:U:O4'	2.18	0.43
7:I:79:ARG:HD2	7:I:128:LEU:O	2.18	0.43
1:A:47:U:H2'	1:A:48:G:H8	1.83	0.43
1:A:1015:C:H5''	1:A:1048:A:H1'	2.00	0.43
1:A:1051:G:H2'	1:A:1052:U:O4'	2.19	0.43
1:A:1128:A:H1'	1:A:1188:A:C4	2.54	0.43
1:A:1317:C:H42	1:A:1338:G:H1	1.66	0.43
5:F:146:ARG:HH21	5:F:146:ARG:HG2	1.82	0.43
1:A:696:A:O2'	1:A:709:G:N2	2.51	0.43
1:A:918:A:H2'	1:A:919:A:C8	2.54	0.43
1:A:1319:C:H2'	1:A:1320:A:H8	1.84	0.43
2:B:9008:A:OP2	3:C:561:ARG:NH2	2.48	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:71:LEU:HA	3:C:114:VAL:O	2.18	0.43
11:Q:19:MET:CB	11:Q:22:THR:HB	2.48	0.43
1:A:170:A:H2'	1:A:171:A:C8	2.53	0.43
1:A:851:U:H2'	1:A:853:C:H5	1.84	0.43
1:A:907:C:H2'	1:A:908:G:C8	2.53	0.43
1:A:1004:A:N1	1:A:1057:G:H4'	2.34	0.43
1:A:224:U:H2'	1:A:225:A:H8	1.81	0.43
1:A:1023:G:H22	1:A:1025:G:H3'	1.82	0.43
5:F:69:ARG:O	5:F:72:PHE:N	2.52	0.43
6:G:110:PRO:HG2	6:G:136:MET:HE3	2.00	0.43
1:A:317:G:O2'	1:A:616:A:N1	2.46	0.43
1:A:821:G:H4'	1:A:822:U:C2	2.54	0.43
1:A:975:A:H1'	1:A:979:A:H5'	2.00	0.43
1:A:1224:G:H5'	1:A:1224:G:H8	1.84	0.43
1:A:1229:G:H2'	1:A:1230:G:O4'	2.19	0.43
9:O:50:HIS:O	9:O:53:ARG:HB3	2.19	0.43
1:A:344:A:C2'	1:A:345:G:H5'	2.25	0.43
1:A:539:G:OP1	1:A:540:U:H5'	2.19	0.43
1:A:1026:A:H1'	1:A:1227:C:H1'	2.01	0.43
1:A:1259:A:H61	1:A:1363:C:H4'	1.83	0.43
1:A:1299:U:H2'	1:A:1300:C:C6	2.54	0.43
3:C:248:ARG:NH2	3:C:339:LEU:HD13	2.34	0.43
4:D:10:LEU:HG	4:D:13:GLY:N	2.33	0.43
4:D:100:THR:HA	4:D:107:ILE:HG13	2.00	0.43
8:L:24:LEU:O	8:L:43:LYS:NZ	2.52	0.43
1:A:995:C:H2'	1:A:996:A:H8	1.84	0.42
1:A:996:A:H2'	1:A:997:G:C8	2.54	0.42
1:A:1017:A:H3'	1:A:1018:U:C6	2.54	0.42
1:A:1094:G:H1'	1:A:1113:C:N4	2.30	0.42
1:A:1266:A:H4'	1:A:1267:G:O5'	2.19	0.42
1:A:98:U:H1'	1:A:99:A:C2	2.54	0.42
1:A:113:G:H1'	1:A:114:A:N7	2.33	0.42
1:A:510:C:H2'	1:A:511:C:C6	2.54	0.42
1:A:737:A:H2'	1:A:738:A:C8	2.54	0.42
1:A:861:U:H2'	1:A:862:A:C8	2.54	0.42
1:A:696:A:OP2	1:A:712:G:N2	2.52	0.42
5:F:69:ARG:O	5:F:72:PHE:HB3	2.19	0.42
6:G:110:PRO:HG2	6:G:136:MET:CE	2.49	0.42
6:G:112:ARG:O	6:G:116:GLU:N	2.42	0.42
1:A:220:C:H4'	1:A:221:G:N3	2.34	0.42
1:A:244:G:H2'	1:A:245:C:O4'	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:721:A:H3'	1:A:722:G:C5'	2.39	0.42
1:A:942:C:H5''	17:H:4:LYS:HG2	2.00	0.42
1:A:1307:C:H4'	1:A:1308:A:C4	2.54	0.42
8:L:136:LYS:HE2	8:L:136:LYS:HA	2.01	0.42
1:A:174:C:H2'	1:A:175:C:C6	2.54	0.42
1:A:306:A:H2'	1:A:307:G:O4'	2.18	0.42
1:A:455:G:H3'	1:A:494:G:N1	2.35	0.42
1:A:665:G:O2'	9:O:28:GLN:OE1	2.37	0.42
1:A:1219:C:H1'	1:A:1223:U:C2'	2.45	0.42
1:A:1296:A:H61	1:A:1380:G:C4'	2.33	0.42
9:O:39:LEU:O	9:O:42:HIS:HB3	2.19	0.42
1:A:571:U:OP1	1:A:575:G:N2	2.53	0.42
1:A:835:C:H5'	7:I:13:ARG:NH2	2.34	0.42
1:A:1291:C:H2'	1:A:1292:C:H6	1.84	0.42
4:D:68:LEU:HD11	4:D:92:VAL:HG23	2.01	0.42
1:A:207:U:O3'	12:S:56:LYS:HG2	2.20	0.42
1:A:766:U:H2'	1:A:767:G:O4'	2.20	0.42
1:A:776:A:C4	1:A:777:A:H1'	2.55	0.42
1:A:989:C:H1'	1:A:1326:C:N4	2.31	0.42
1:A:1334:C:H2'	1:A:1335:U:C6	2.54	0.42
1:A:237:U:H2'	1:A:238:G:C8	2.55	0.42
1:A:870:A:N6	1:A:879:A:H1'	2.35	0.42
1:A:1010:U:H1'	1:A:1051:G:N2	2.35	0.42
1:A:1039:U:H3'	1:A:1041:C:O2	2.20	0.42
6:G:56:VAL:N	6:G:57:PRO:CD	2.82	0.42
6:G:96:LEU:HD22	6:G:123:ILE:HD11	2.02	0.42
1:A:226:C:H2'	1:A:227:C:C6	2.55	0.42
1:A:435:C:H2'	1:A:436:G:H21	1.83	0.42
1:A:593:G:H2'	1:A:594:G:C8	2.55	0.42
1:A:965:U:H2'	1:A:966:U:C6	2.55	0.42
1:A:1293:C:H3'	1:A:1294:A:H5''	2.01	0.42
7:I:20:VAL:HG23	7:I:22:HIS:CE1	2.55	0.42
1:A:1148:G:N3	1:A:1150:U:H5	2.17	0.42
3:C:76:ILE:HD11	3:C:112:VAL:HG21	2.01	0.42
1:A:1060:G:H2'	1:A:1060:G:N3	2.35	0.41
3:C:473:ARG:HD3	3:C:538:TYR:CE1	2.55	0.41
11:Q:30:TYR:HA	11:Q:40:VAL:O	2.20	0.41
1:A:688:C:H2'	1:A:689:C:C6	2.55	0.41
1:A:696:A:H62	1:A:712:G:H1'	1.84	0.41
1:A:820:C:H4'	1:A:911:A:H61	1.84	0.41
1:A:1141:G:N1	1:A:1142:C:N4	2.67	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1390:U:H2'	1:A:1391:C:O4'	2.20	0.41
6:G:90:GLY:O	6:G:91:ALA:HB3	2.20	0.41
1:A:662:U:H3	7:I:57:GLN:HE21	1.66	0.41
1:A:971:U:O2'	1:A:1210:A:N6	2.53	0.41
1:A:988:A:H2	1:A:1327:A:H2'	1.83	0.41
1:A:1363:C:H2'	1:A:1364:G:C8	2.55	0.41
3:C:483:LEU:HD21	3:C:504:ILE:HG21	2.02	0.41
4:D:79:SER:O	4:D:83:GLU:HG2	2.20	0.41
7:I:16:ASN:OD1	7:I:16:ASN:N	2.50	0.41
1:A:98:U:H1'	1:A:99:A:H2	1.84	0.41
1:A:182:U:H4'	1:A:232:A:H5''	2.00	0.41
1:A:370:G:N2	1:A:372:A:H3'	2.35	0.41
1:A:576:G:H2'	1:A:577:G:O4'	2.20	0.41
1:A:1036:C:H2'	1:A:1037:C:C6	2.55	0.41
5:F:131:TYR:CD1	5:F:131:TYR:C	2.94	0.41
6:G:82:PRO:HD2	6:G:147:LEU:HD22	2.02	0.41
8:L:7:LEU:HA	8:L:7:LEU:HD23	1.85	0.41
1:A:510:C:H1'	1:A:558:C:H1'	2.02	0.41
1:A:1146:C:H2'	1:A:1147:A:C8	2.56	0.41
1:A:1237:C:H41	20:M:103:LYS:HA	1.85	0.41
1:A:1317:C:H5''	20:M:97:VAL:HG22	2.02	0.41
7:I:79:ARG:HG3	7:I:81:SER:O	2.21	0.41
1:A:270:A:O2'	12:S:70:ASN:ND2	2.54	0.41
1:A:675:G:H5'	1:A:735:C:H1'	2.03	0.41
1:A:691:C:H2'	1:A:692:G:H8	1.85	0.41
1:A:718:U:H2'	1:A:719:G:H8	1.86	0.41
1:A:974:A:H8	1:A:974:A:O5'	2.03	0.41
1:A:1250:G:H5''	1:A:1250:G:C8	2.55	0.41
1:A:1305:C:H5''	20:M:44:ARG:NH2	2.36	0.41
7:I:106:ILE:HD12	7:I:106:ILE:N	2.35	0.41
8:L:36:THR:HG22	8:L:38:VAL:HG23	2.03	0.41
11:Q:49:HIS:O	11:Q:76:ARG:HA	2.21	0.41
1:A:124:G:OP1	1:A:641:G:N2	2.53	0.41
1:A:165:G:N3	1:A:165:G:H2'	2.36	0.41
1:A:521:U:H2'	1:A:522:A:C8	2.56	0.41
1:A:827:G:H2'	1:A:827:G:N3	2.36	0.41
1:A:1140:A:H2'	1:A:1141:G:C8	2.56	0.41
1:A:1153:G:O2'	1:A:1154:C:H5''	2.21	0.41
1:A:1293:C:H3'	1:A:1294:A:C5'	2.51	0.41
4:D:129:LEU:HB2	4:D:133:GLU:OE2	2.21	0.41
5:F:191:GLU:OE2	5:F:191:GLU:N	2.53	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:E:54:VAL:HG13	16:E:67:ILE:HG22	2.02	0.41
1:A:171:A:H2'	1:A:173:A:C8	2.56	0.41
1:A:293:C:H2'	1:A:294:G:H8	1.86	0.41
1:A:661:U:H1'	1:A:662:U:H6	1.86	0.41
1:A:780:G:N2	1:A:817:C:O2	2.52	0.41
1:A:890:C:H2'	1:A:891:G:H8	1.85	0.41
1:A:946:C:H4'	1:A:1392:C:C2	2.56	0.41
1:A:1004:A:H2'	1:A:1005:C:O4'	2.21	0.41
1:A:1019:C:H2'	1:A:1020:C:C6	2.56	0.41
1:A:1113:C:H1'	1:A:1114:G:P	2.61	0.41
1:A:1393:C:H2'	1:A:1394:G:C8	2.56	0.41
3:C:483:LEU:O	3:C:487:LEU:HG	2.21	0.41
8:L:26:LYS:O	8:L:43:LYS:NZ	2.46	0.41
1:A:757:A:H1'	1:A:758:A:N7	2.36	0.41
1:A:1219:C:H2'	1:A:1220:U:H5'	2.03	0.41
7:I:21:ARG:NH1	7:I:70:ASN:O	2.54	0.41
1:A:287:A:H5''	1:A:289:G:O4'	2.21	0.40
1:A:910:A:H2'	1:A:911:A:O4'	2.21	0.40
1:A:1336:G:N3	1:A:1336:G:H2'	2.36	0.40
1:A:1373:U:H4'	1:A:1374:G:OP1	2.21	0.40
8:L:94:LEU:O	8:L:111:VAL:HG23	2.21	0.40
1:A:366:U:H2'	1:A:367:A:C8	2.56	0.40
1:A:985:A:N6	1:A:1241:U:O2	2.53	0.40
1:A:1246:C:O2'	1:A:1343:G:H2'	2.21	0.40
1:A:1294:A:H1'	1:A:1295:C:H5''	2.01	0.40
1:A:1303:U:H2'	1:A:1304:U:C6	2.56	0.40
9:O:48:LYS:O	9:O:50:HIS:N	2.54	0.40
11:Q:15:VAL:HG21	11:Q:26:VAL:HB	2.02	0.40
14:U:17:TYR:CE2	14:U:23:ILE:HD12	2.56	0.40
16:E:39:ARG:NH1	16:E:54:VAL:O	2.54	0.40
1:A:547:U:H2'	1:A:548:A:C8	2.56	0.40
1:A:987:A:H1'	1:A:991:U:H3	1.86	0.40
1:A:1198:U:H5''	16:E:5:VAL:HG21	2.03	0.40
1:A:1215:G:H2'	1:A:1216:C:O4'	2.21	0.40
1:A:1318:G:N7	20:M:98:ARG:NH2	2.69	0.40
4:D:89:MET:HG3	4:D:221:ILE:HD13	2.02	0.40
5:F:15:LEU:HD13	5:F:56:LYS:HA	2.04	0.40
16:E:119:ILE:O	16:E:123:LEU:HG	2.21	0.40
1:A:278:A:H2'	1:A:279:C:C6	2.57	0.40
1:A:606:G:H2'	1:A:606:G:N3	2.36	0.40
1:A:841:G:H1	1:A:864:U:H3	1.69	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:937:G:H1'	1:A:938:G:N2	2.37	0.40
1:A:943:G:H1	1:A:1393:C:H42	1.69	0.40
1:A:1159:U:H4'	19:K:43:PRO:HG3	2.02	0.40
1:A:1279:G:H2'	1:A:1280:G:C8	2.57	0.40
1:A:1322:U:H5	22:R:5:LEU:HD22	1.86	0.40
15:V:49:ALA:HB1	15:V:59:LYS:HA	2.03	0.40
1:A:473:G:H8	1:A:473:G:O5'	2.04	0.40
1:A:970:U:H1'	1:A:1232:C:H5'	2.03	0.40
1:A:1004:A:C5	1:A:1225:A:H4'	2.57	0.40
2:B:9004:A:H1'	3:C:530:LEU:HD22	2.01	0.40
6:G:133:PRO:O	6:G:137:ILE:HG13	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	C	706/779 (91%)	691 (98%)	14 (2%)	1 (0%)	48	78
4	D	216/246 (88%)	201 (93%)	13 (6%)	2 (1%)	14	47
5	F	179/200 (90%)	164 (92%)	10 (6%)	5 (3%)	4	28
6	G	156/166 (94%)	143 (92%)	11 (7%)	2 (1%)	10	40
7	I	129/132 (98%)	118 (92%)	7 (5%)	4 (3%)	3	27
8	L	134/138 (97%)	123 (92%)	10 (8%)	1 (1%)	19	51
9	O	83/89 (93%)	76 (92%)	7 (8%)	0	100	100
10	P	86/90 (96%)	78 (91%)	5 (6%)	3 (4%)	3	25
11	Q	82/87 (94%)	75 (92%)	6 (7%)	1 (1%)	11	41
12	S	81/88 (92%)	72 (89%)	9 (11%)	0	100	100
13	T	93/95 (98%)	88 (95%)	5 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
14	U	62/79 (78%)	56 (90%)	6 (10%)	0	100	100
15	V	99/131 (76%)	95 (96%)	4 (4%)	0	100	100
16	E	203/218 (93%)	169 (83%)	33 (16%)	1 (0%)	25	57
17	H	147/156 (94%)	138 (94%)	7 (5%)	2 (1%)	9	39
18	J	106/130 (82%)	100 (94%)	6 (6%)	0	100	100
19	K	93/102 (91%)	87 (94%)	6 (6%)	0	100	100
20	M	106/121 (88%)	101 (95%)	5 (5%)	0	100	100
21	N	47/61 (77%)	42 (89%)	4 (8%)	1 (2%)	5	33
22	R	76/92 (83%)	72 (95%)	2 (3%)	2 (3%)	4	29
All	All	2884/3200 (90%)	2689 (93%)	170 (6%)	25 (1%)	17	47

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	D	130	PRO
5	F	24	LYS
5	F	181	GLU
5	F	182	ARG
6	G	8	LYS
8	L	135	PRO
22	R	27	LYS
3	C	70	ASN
6	G	90	GLY
7	I	3	MET
7	I	4	THR
10	P	88	GLN
17	H	83	ALA
7	I	56	LYS
7	I	85	LEU
16	E	60	ALA
21	N	54	PRO
10	P	46	PRO
22	R	28	LYS
5	F	180	PRO
17	H	81	GLY
4	D	71	GLY
5	F	62	GLY
10	P	45	LYS
11	Q	78	VAL

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	628/692 (91%)	623 (99%)	5 (1%)	79	85
4	D	189/212 (89%)	186 (98%)	3 (2%)	58	74
5	F	159/173 (92%)	154 (97%)	5 (3%)	35	57
6	G	123/130 (95%)	120 (98%)	3 (2%)	44	63
7	I	111/112 (99%)	106 (96%)	5 (4%)	23	50
8	L	114/116 (98%)	111 (97%)	3 (3%)	41	61
9	O	80/83 (96%)	78 (98%)	2 (2%)	42	62
10	P	74/76 (97%)	71 (96%)	3 (4%)	26	52
11	Q	77/80 (96%)	75 (97%)	2 (3%)	41	61
12	S	66/70 (94%)	63 (96%)	3 (4%)	23	50
13	T	84/84 (100%)	79 (94%)	5 (6%)	16	43
14	U	56/64 (88%)	54 (96%)	2 (4%)	30	55
15	V	74/100 (74%)	73 (99%)	1 (1%)	62	76
16	E	168/178 (94%)	157 (94%)	11 (6%)	14	41
17	H	125/132 (95%)	118 (94%)	7 (6%)	17	45
18	J	85/102 (83%)	80 (94%)	5 (6%)	16	44
19	K	86/92 (94%)	78 (91%)	8 (9%)	7	30
20	M	94/104 (90%)	92 (98%)	2 (2%)	48	67
21	N	44/54 (82%)	41 (93%)	3 (7%)	13	40
22	R	70/81 (86%)	65 (93%)	5 (7%)	12	39
All	All	2507/2735 (92%)	2424 (97%)	83 (3%)	35	57

All (83) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	C	11	LEU
3	C	69	MET
3	C	147	THR

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Mol	Chain	Res	Type
3	C	148	ARG
3	C	506	PRO
4	D	23	TRP
4	D	33	THR
4	D	123	ASN
5	F	66	ARG
5	F	71	LEU
5	F	146	ARG
5	F	178	ARG
5	F	181	GLU
6	G	10	GLU
6	G	151	GLU
6	G	157	ARG
7	I	25	LEU
7	I	53	GLU
7	I	55	SER
7	I	68	GLN
7	I	70	ASN
8	L	10	LYS
8	L	36	THR
8	L	136	LYS
9	O	5	GLN
9	O	48	LYS
10	P	24	ASP
10	P	40	TYR
10	P	48	GLU
11	Q	7	ARG
11	Q	50	ASP
12	S	6	SER
12	S	18	ARG
12	S	78	ARG
13	T	1	MET
13	T	2	ARG
13	T	53	ASN
13	T	54	ASP
13	T	87	ARG
14	U	48	ARG
14	U	49	VAL
15	V	95	ARG
16	E	10	LEU
16	E	12	ILE
16	E	17	ASP

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Mol	Chain	Res	Type
16	E	35	ASP
16	E	48	ASP
16	E	100	ILE
16	E	163	ARG
16	E	165	GLU
16	E	181	ILE
16	E	192	TYR
16	E	195	LEU
17	H	4	LYS
17	H	9	LYS
17	H	10	ARG
17	H	30	MET
17	H	43	LEU
17	H	59	MET
17	H	75	VAL
18	J	12	ARG
18	J	67	VAL
18	J	100	ARG
18	J	106	ARG
18	J	112	GLU
19	K	52	LEU
19	K	55	VAL
19	K	56	HIS
19	K	57	LYS
19	K	60	ASP
19	K	80	THR
19	K	91	ASP
19	K	98	ILE
20	M	100	GLN
20	M	105	ASN
21	N	27	CYS
21	N	30	PRO
21	N	54	PRO
22	R	24	GLU
22	R	53	ASP
22	R	56	LYS
22	R	58	VAL
22	R	81	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
3	C	125	GLN
3	C	484	GLN
6	G	142	GLN
7	I	57	GLN
7	I	70	ASN
8	L	5	ASN
9	O	83	ASN
12	S	14	ASN
12	S	70	ASN
13	T	61	GLN
14	U	69	GLN
18	J	5	GLN
18	J	75	GLN
20	M	105	ASN
22	R	14	HIS

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	1330/1554 (85%)	346 (26%)	101 (7%)
2	B	6/7 (85%)	3 (50%)	0
All	All	1336/1561 (85%)	349 (26%)	101 (7%)

All (349) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	9	G
1	A	10	A
1	A	11	G
1	A	15	U
1	A	16	U
1	A	32	C
1	A	33	G
1	A	34	A
1	A	41	G
1	A	49	C
1	A	50	C
1	A	51	U
1	A	52	A
1	A	53	A
1	A	56	C
1	A	70	G

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Mol	Chain	Res	Type
1	A	114	A
1	A	119	C
1	A	128	A
1	A	139	A
1	A	140	A
1	A	143	C
1	A	148	A
1	A	152	C
1	A	153	U
1	A	159	A
1	A	165	G
1	A	172	U
1	A	177	G
1	A	181	G
1	A	185	U
1	A	189	A
1	A	190	A
1	A	191	C
1	A	194	C
1	A	195	A
1	A	198	G
1	A	209	A
1	A	211	A
1	A	212	G
1	A	219	U
1	A	220	C
1	A	221	G
1	A	248	C
1	A	252	U
1	A	253	U
1	A	255	G
1	A	259	G
1	A	265	G
1	A	274	G
1	A	275	C
1	A	281	A
1	A	288	C
1	A	289	G
1	A	297	G
1	A	313	G
1	A	314	A
1	A	324	C

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Mol	Chain	Res	Type
1	A	336	C
1	A	337	A
1	A	338	C
1	A	340	G
1	A	345	G
1	A	352	A
1	A	353	C
1	A	354	G
1	A	360	C
1	A	362	G
1	A	373	U
1	A	374	C
1	A	375	U
1	A	376	U
1	A	380	C
1	A	392	G
1	A	406	C
1	A	412	G
1	A	414	G
1	A	419	A
1	A	421	G
1	A	429	U
1	A	430	C
1	A	431	G
1	A	432	G
1	A	436	G
1	A	437	U
1	A	446	G
1	A	447	U
1	A	456	A
1	A	458	G
1	A	459	A
1	A	460	A
1	A	461	C
1	A	466	G
1	A	467	C
1	A	474	A
1	A	475	A
1	A	476	U
1	A	477	A
1	A	478	G
1	A	488	U

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Mol	Chain	Res	Type
1	A	489	U
1	A	493	G
1	A	494	G
1	A	495	U
1	A	504	A
1	A	506	A
1	A	509	G
1	A	519	A
1	A	520	C
1	A	527	C
1	A	530	G
1	A	533	G
1	A	536	G
1	A	539	G
1	A	540	U
1	A	541	A
1	A	542	A
1	A	545	C
1	A	556	A
1	A	564	C
1	A	568	A
1	A	569	A
1	A	571	U
1	A	575	G
1	A	581	A
1	A	582	A
1	A	585	G
1	A	586	G
1	A	597	G
1	A	604	A
1	A	605	A
1	A	616	A
1	A	627	C
1	A	641	G
1	A	642	U
1	A	647	G
1	A	650	A
1	A	651	A
1	A	656	G
1	A	662	U
1	A	667	G
1	A	674	A

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Mol	Chain	Res	Type
1	A	682	G
1	A	683	G
1	A	684	A
1	A	685	A
1	A	687	U
1	A	688	C
1	A	693	U
1	A	695	U
1	A	696	A
1	A	697	G
1	A	701	U
1	A	703	A
1	A	704	A
1	A	706	U
1	A	707	G
1	A	710	U
1	A	711	A
1	A	712	G
1	A	721	A
1	A	722	G
1	A	723	G
1	A	732	U
1	A	733	G
1	A	740	G
1	A	743	A
1	A	758	A
1	A	764	G
1	A	768	A
1	A	775	A
1	A	777	A
1	A	779	C
1	A	818	G
1	A	819	C
1	A	822	U
1	A	824	A
1	A	825	A
1	A	826	C
1	A	828	A
1	A	829	U
1	A	830	G
1	A	845	G
1	A	850	U

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Mol	Chain	Res	Type
1	A	852	U
1	A	853	C
1	A	865	G
1	A	883	A
1	A	895	G
1	A	909	C
1	A	934	C
1	A	935	G
1	A	936	G
1	A	937	G
1	A	938	G
1	A	939	G
1	A	940	C
1	A	941	C
1	A	942	C
1	A	943	G
1	A	944	C
1	A	945	A
1	A	946	C
1	A	947	A
1	A	966	U
1	A	968	A
1	A	970	U
1	A	971	U
1	A	972	C
1	A	975	A
1	A	980	C
1	A	981	G
1	A	982	C
1	A	983	G
1	A	985	A
1	A	986	G
1	A	987	A
1	A	988	A
1	A	992	U
1	A	1002	U
1	A	1003	G
1	A	1004	A
1	A	1007	U
1	A	1008	C
1	A	1010	U
1	A	1012	U

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Mol	Chain	Res	Type
1	A	1013	G
1	A	1014	A
1	A	1015	C
1	A	1017	A
1	A	1019	C
1	A	1023	G
1	A	1024	A
1	A	1028	A
1	A	1033	G
1	A	1035	C
1	A	1036	C
1	A	1037	C
1	A	1040	U
1	A	1041	C
1	A	1042	G
1	A	1046	G
1	A	1053	G
1	A	1054	A
1	A	1059	U
1	A	1060	G
1	A	1064	C
1	A	1065	A
1	A	1066	U
1	A	1071	G
1	A	1072	U
1	A	1073	C
1	A	1074	G
1	A	1075	U
1	A	1076	C
1	A	1077	A
1	A	1078	G
1	A	1095	U
1	A	1096	U
1	A	1111	A
1	A	1112	A
1	A	1113	C
1	A	1114	G
1	A	1134	G
1	A	1135	U
1	A	1136	U
1	A	1139	C
1	A	1140	A

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Mol	Chain	Res	Type
1	A	1145	U
1	A	1147	A
1	A	1148	G
1	A	1149	U
1	A	1153	G
1	A	1154	C
1	A	1166	A
1	A	1167	C
1	A	1168	U
1	A	1169	G
1	A	1173	G
1	A	1177	C
1	A	1184	G
1	A	1185	A
1	A	1190	G
1	A	1193	G
1	A	1195	G
1	A	1199	G
1	A	1201	C
1	A	1202	G
1	A	1205	A
1	A	1209	C
1	A	1210	A
1	A	1211	U
1	A	1215	G
1	A	1222	A
1	A	1224	G
1	A	1225	A
1	A	1233	U
1	A	1234	A
1	A	1235	C
1	A	1236	A
1	A	1247	A
1	A	1250	G
1	A	1254	A
1	A	1257	A
1	A	1259	A
1	A	1265	C
1	A	1266	A
1	A	1267	G
1	A	1269	G
1	A	1271	A

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Mol	Chain	Res	Type
1	A	1282	U
1	A	1287	C
1	A	1288	A
1	A	1289	A
1	A	1294	A
1	A	1295	C
1	A	1296	A
1	A	1307	C
1	A	1308	A
1	A	1309	G
1	A	1310	U
1	A	1311	U
1	A	1314	G
1	A	1321	G
1	A	1325	G
1	A	1328	A
1	A	1329	C
1	A	1341	A
1	A	1344	C
1	A	1345	U
1	A	1347	G
1	A	1354	U
1	A	1355	A
1	A	1357	U
1	A	1369	A
1	A	1372	A
1	A	1373	U
1	A	1374	G
1	A	1387	C
1	A	1388	G
1	A	1389	U
1	A	1390	U
1	A	1392	C
1	A	1395	G
1	A	1396	G
1	A	1397	C
2	B	9003	A
2	B	9004	A
2	B	9005	A

All (101) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	9	G
1	A	10	A
1	A	15	U
1	A	51	U
1	A	113	G
1	A	128	A
1	A	139	A
1	A	189	A
1	A	190	A
1	A	194	C
1	A	211	A
1	A	219	U
1	A	220	C
1	A	259	G
1	A	313	G
1	A	323	A
1	A	335	A
1	A	336	C
1	A	337	A
1	A	372	A
1	A	374	C
1	A	419	A
1	A	436	G
1	A	446	G
1	A	455	G
1	A	457	A
1	A	459	A
1	A	475	A
1	A	487	C
1	A	490	G
1	A	508	A
1	A	520	C
1	A	527	C
1	A	540	U
1	A	542	A
1	A	563	U
1	A	570	U
1	A	584	G
1	A	604	A
1	A	641	G
1	A	650	A
1	A	655	G
1	A	662	U

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Mol	Chain	Res	Type
1	A	681	U
1	A	684	A
1	A	707	G
1	A	710	U
1	A	712	G
1	A	721	A
1	A	722	G
1	A	731	G
1	A	817	C
1	A	824	A
1	A	894	U
1	A	935	G
1	A	937	G
1	A	938	G
1	A	942	C
1	A	944	C
1	A	956	A
1	A	965	U
1	A	970	U
1	A	980	C
1	A	981	G
1	A	984	A
1	A	986	G
1	A	988	A
1	A	1001	U
1	A	1003	G
1	A	1016	A
1	A	1032	C
1	A	1036	C
1	A	1040	U
1	A	1041	C
1	A	1059	U
1	A	1072	U
1	A	1075	U
1	A	1076	C
1	A	1077	A
1	A	1095	U
1	A	1111	A
1	A	1113	C
1	A	1139	C
1	A	1146	C
1	A	1153	G

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Mol	Chain	Res	Type
1	A	1166	A
1	A	1168	U
1	A	1176	A
1	A	1184	G
1	A	1233	U
1	A	1265	C
1	A	1266	A
1	A	1287	C
1	A	1294	A
1	A	1307	C
1	A	1308	A
1	A	1323	C
1	A	1344	C
1	A	1372	A
1	A	1373	U
1	A	1389	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](#)

There are no ligands in this entry.

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.

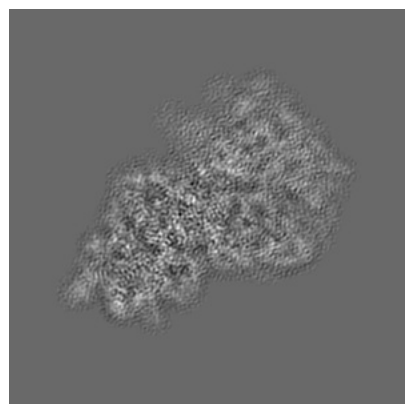
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-16607. These allow visual inspection of the internal detail of the map and identification of artifacts.

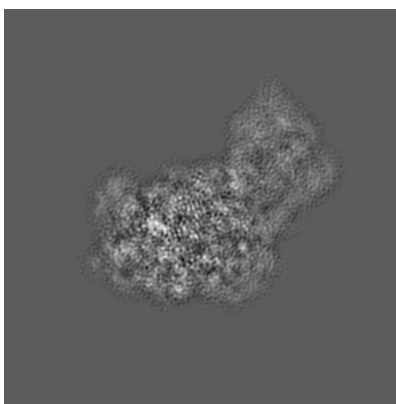
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

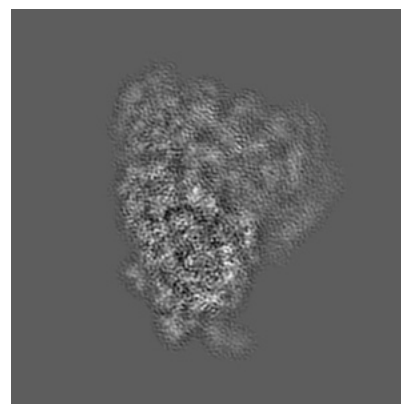
6.1.1 Primary map



X

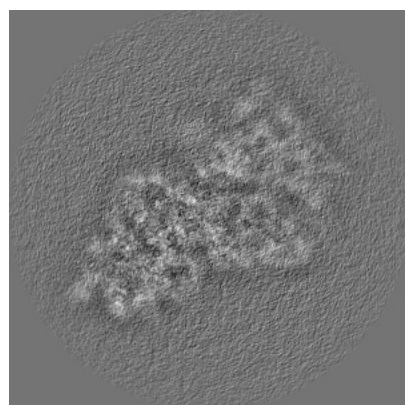


Y

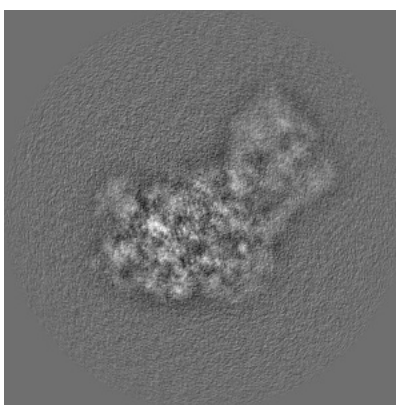


Z

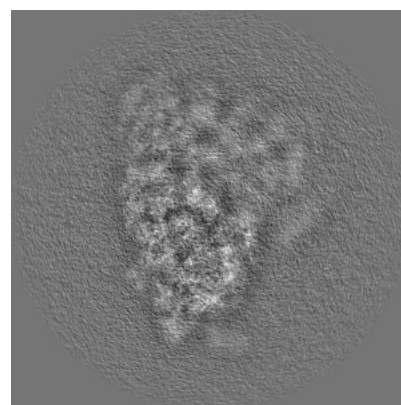
6.1.2 Raw map



X



Y

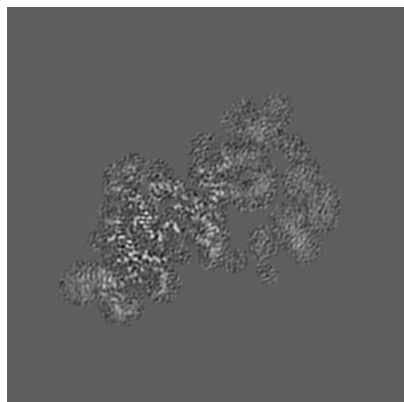


Z

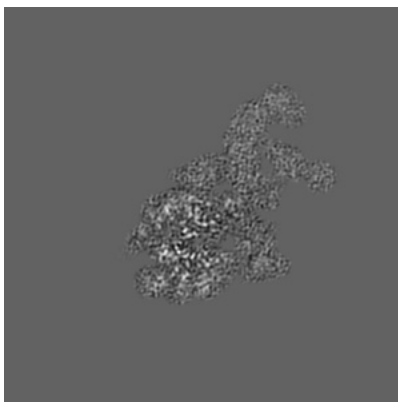
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

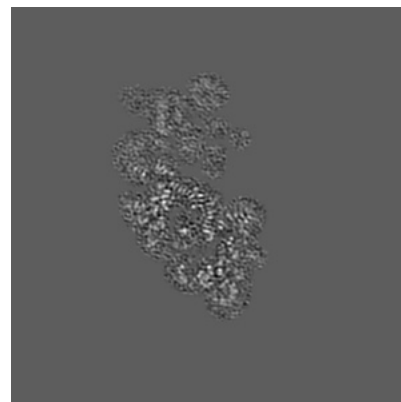
6.2.1 Primary map



X Index: 192

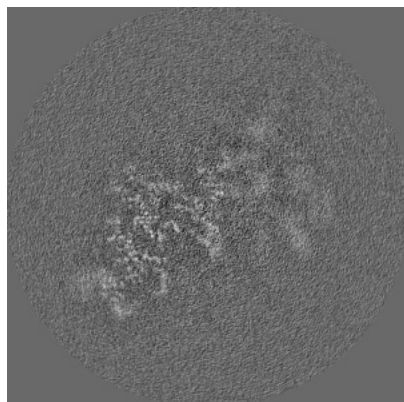


Y Index: 192

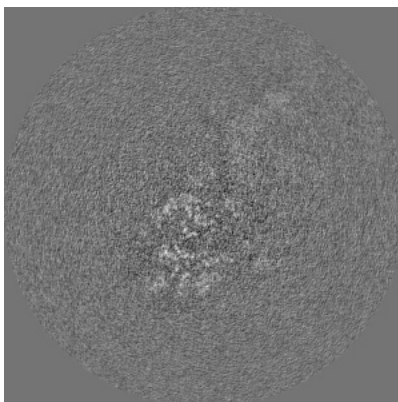


Z Index: 192

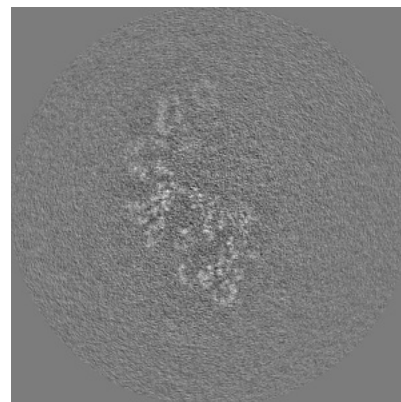
6.2.2 Raw map



X Index: 192



Y Index: 192

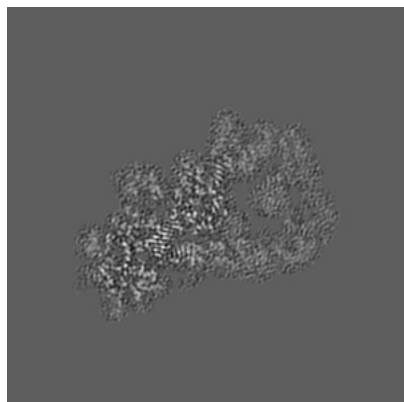


Z Index: 192

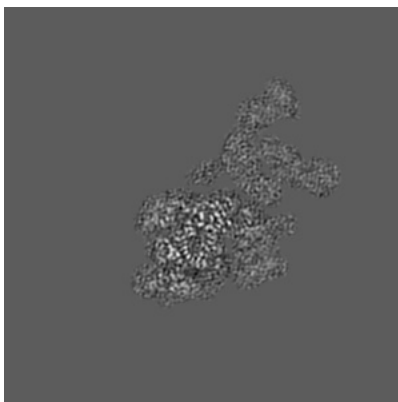
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

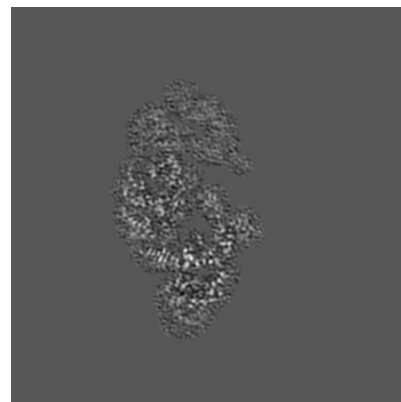
6.3.1 Primary map



X Index: 173

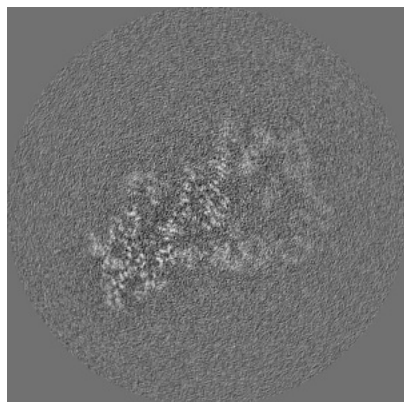


Y Index: 199

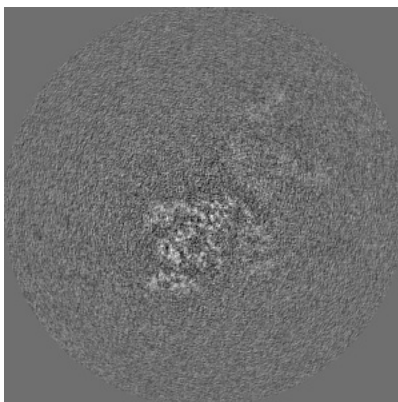


Z Index: 163

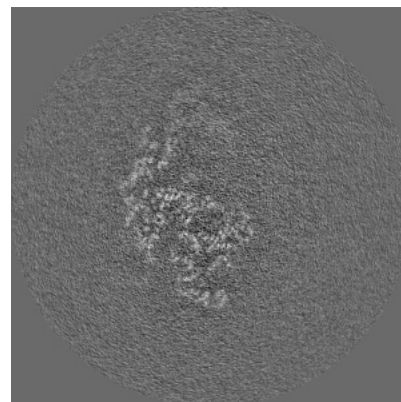
6.3.2 Raw map



X Index: 176



Y Index: 198

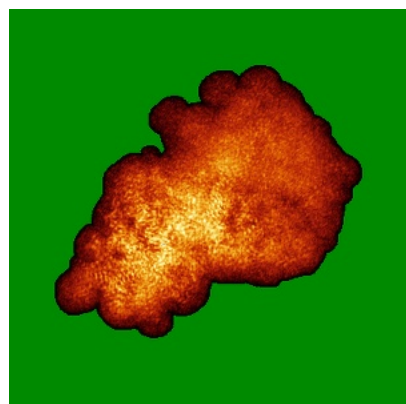


Z Index: 174

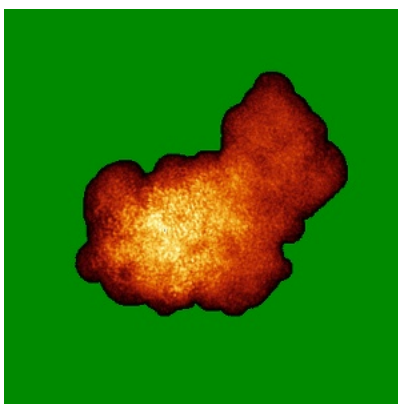
The images above show the largest variance slices of the map in three orthogonal directions.

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

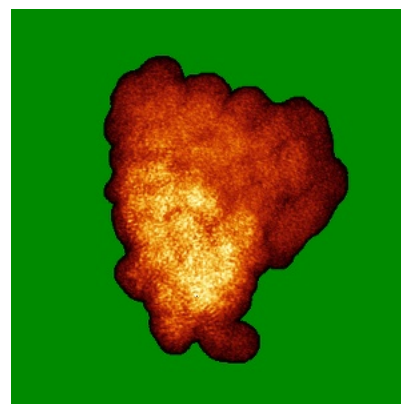
6.4.1 Primary map



X

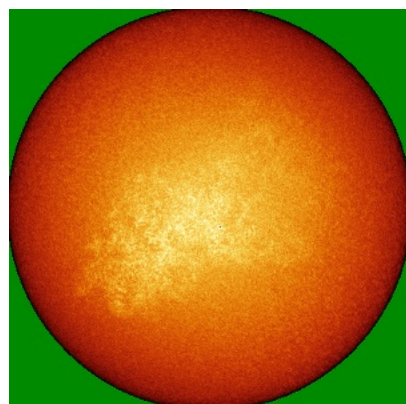


Y

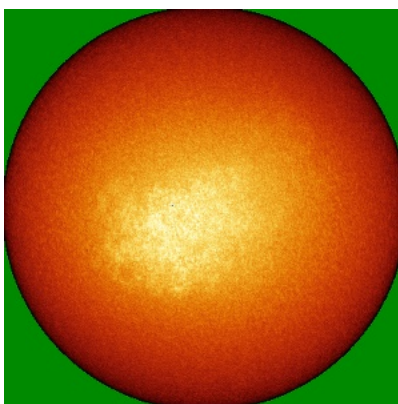


Z

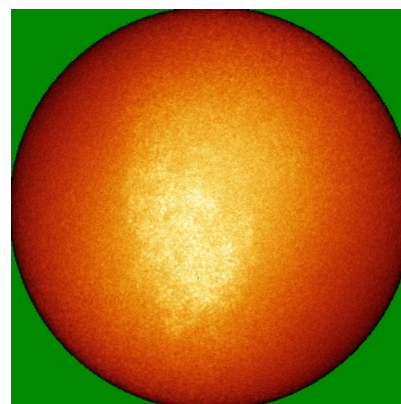
6.4.2 Raw map



X



Y

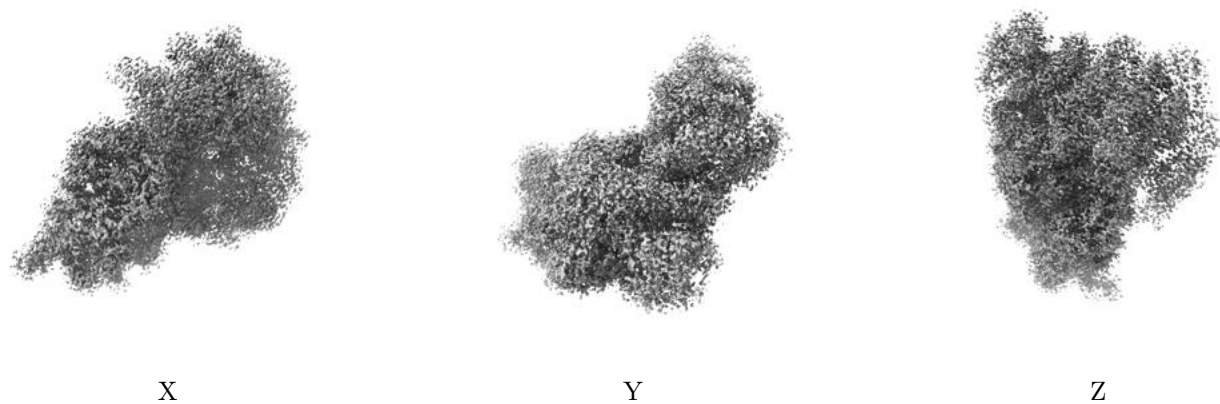


Z

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.

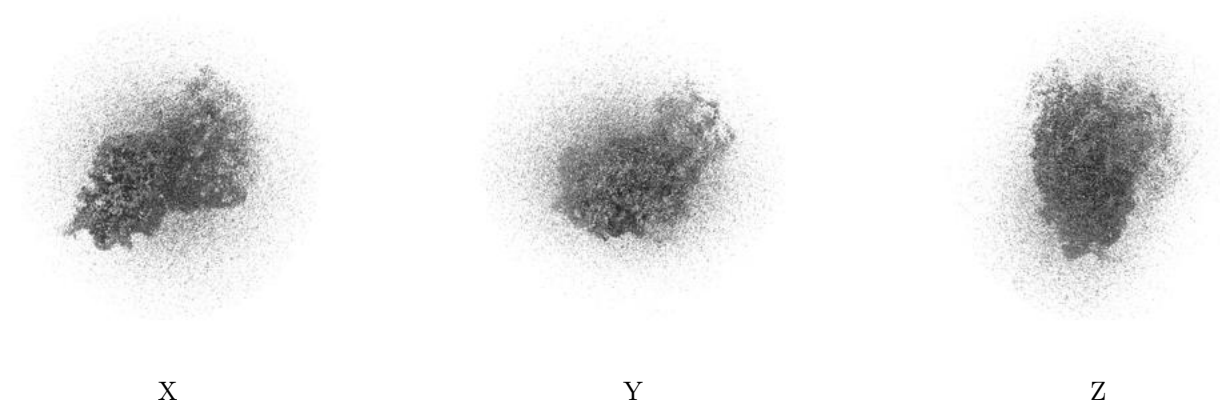
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.0114. 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



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.

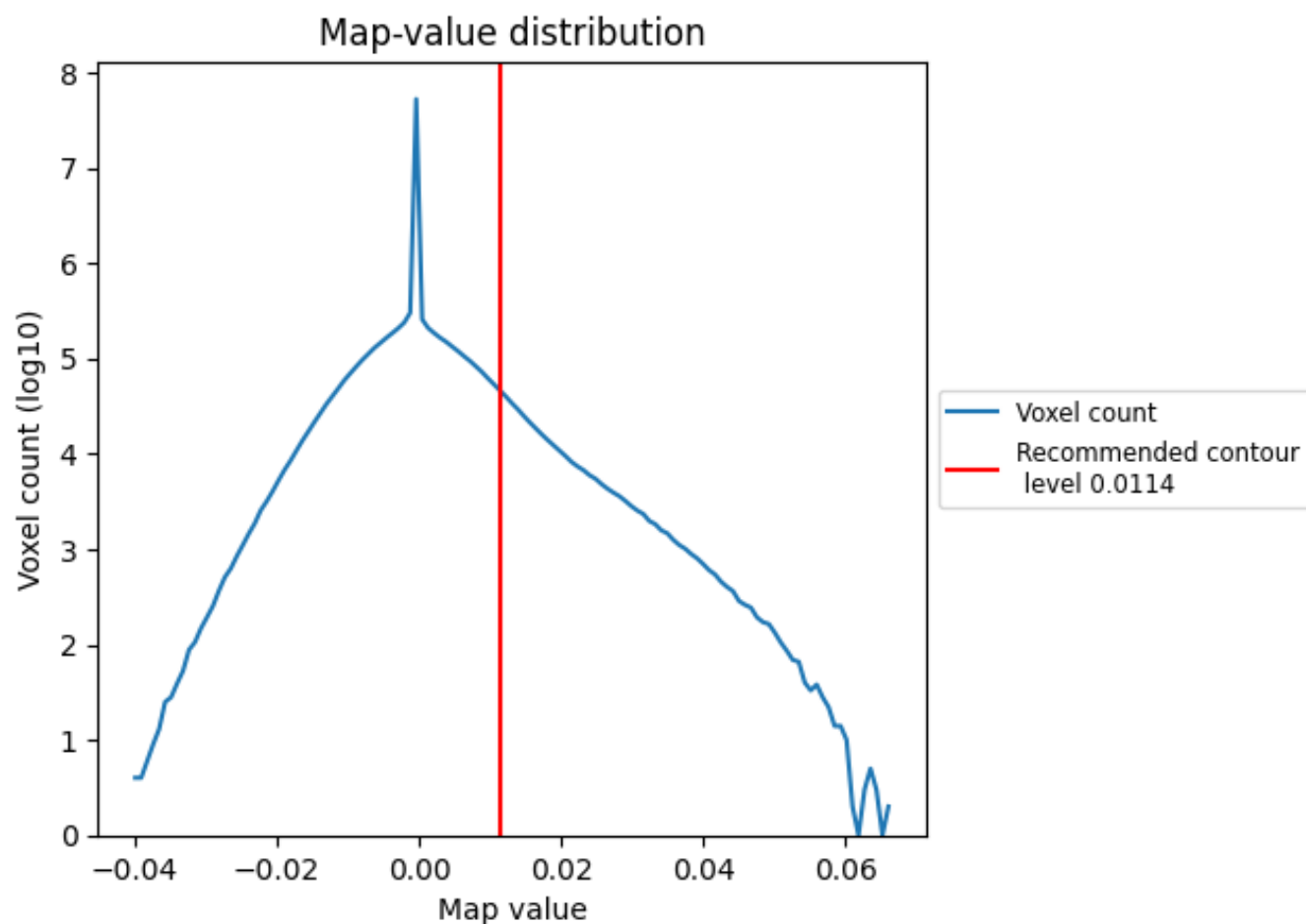
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

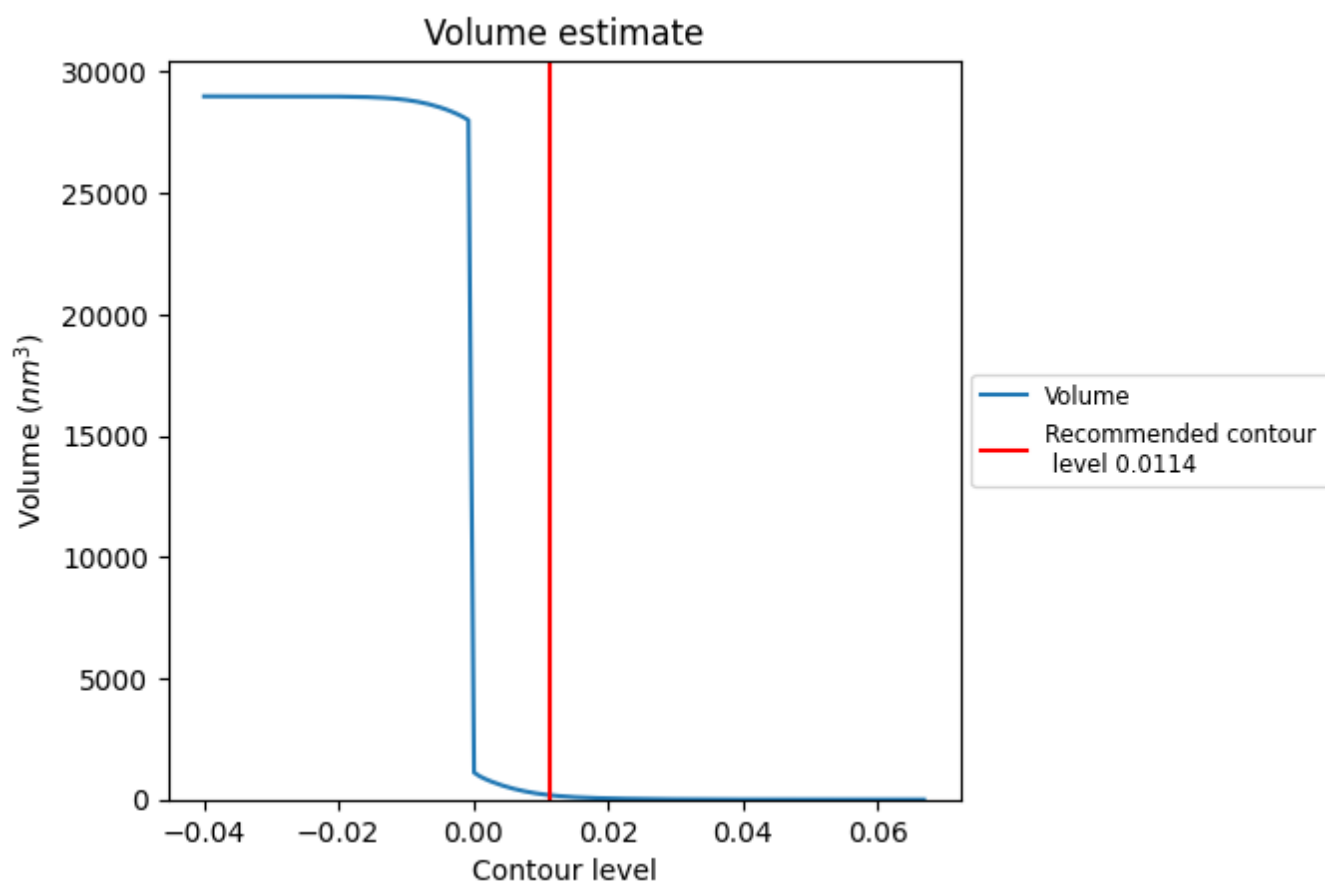
This section contains the results of statistical analysis of the map.

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.

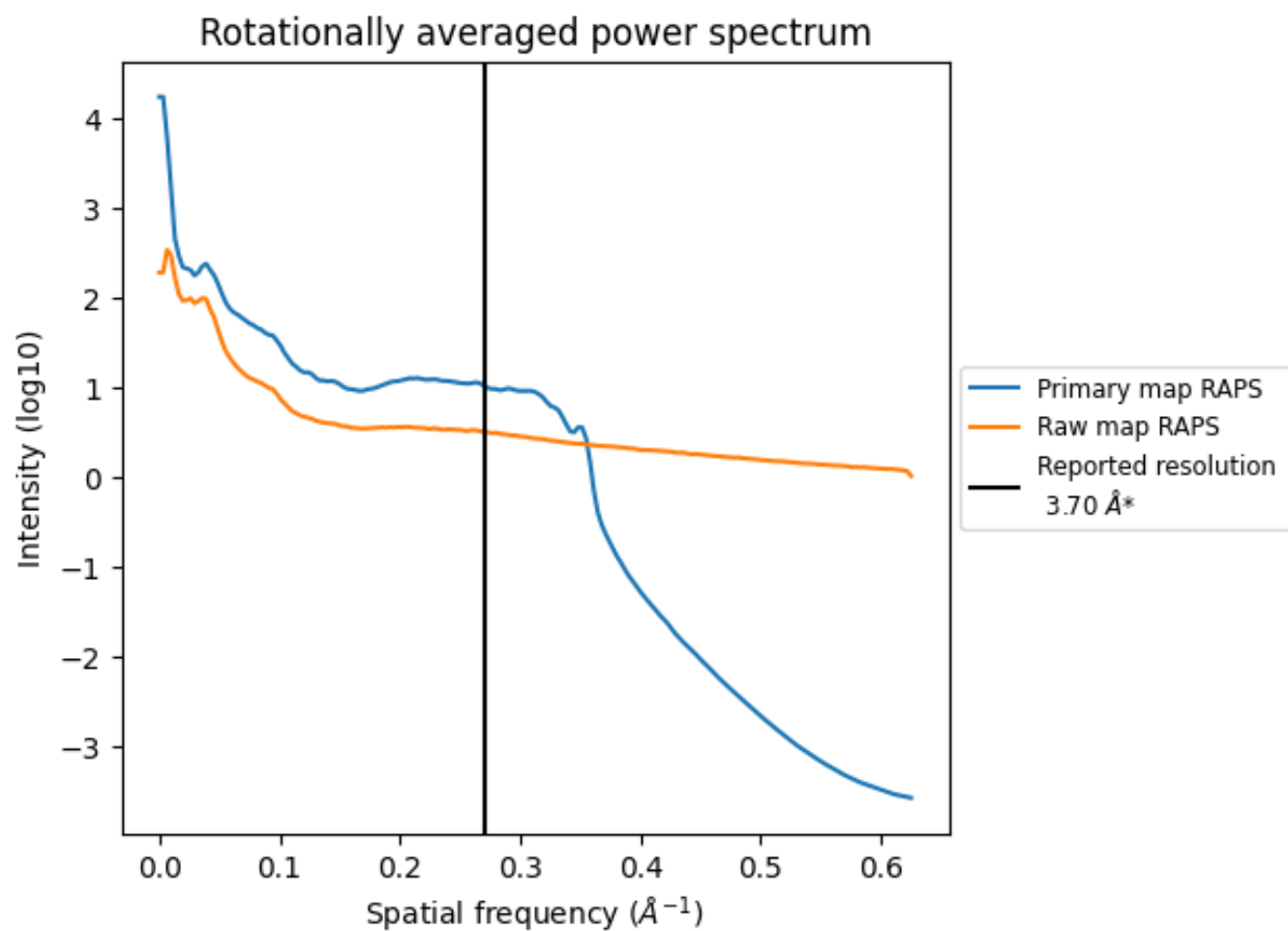
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 182 nm³; this corresponds to an approximate mass of 164 kDa.

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

7.3 Rotationally averaged power spectrum [i](#)

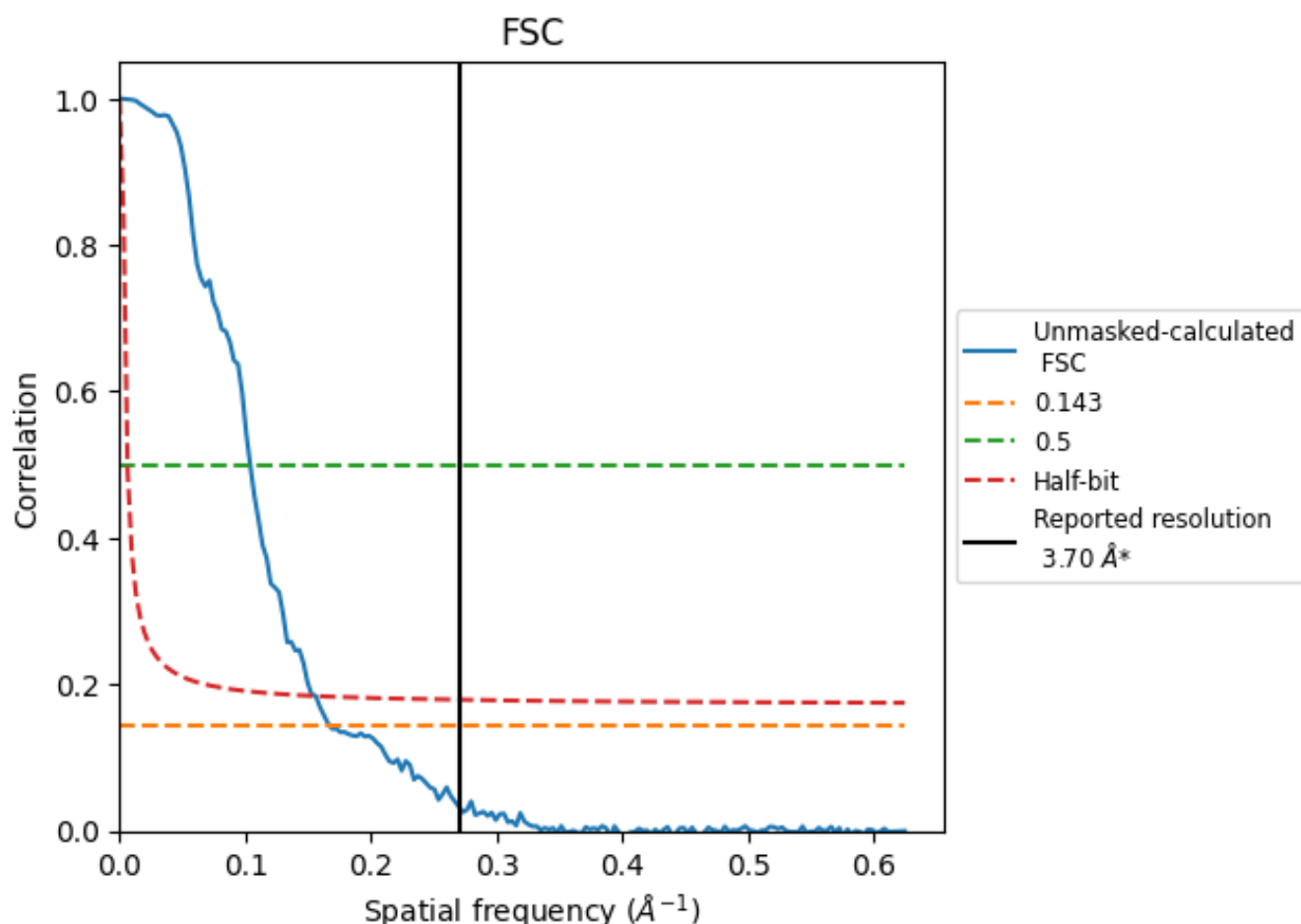


*Reported resolution corresponds to spatial frequency of $0.270 \text{ \AA}^{-1}$

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 0.270 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

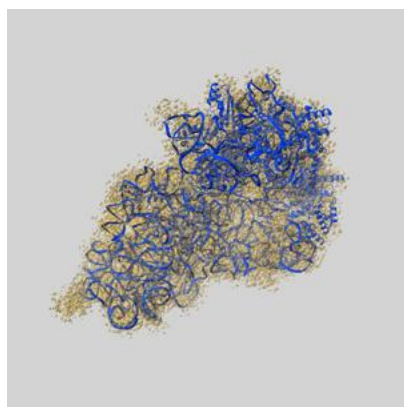
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	5.97	9.62	6.40

*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 5.97 differs from the reported value 3.7 by more than 10 %

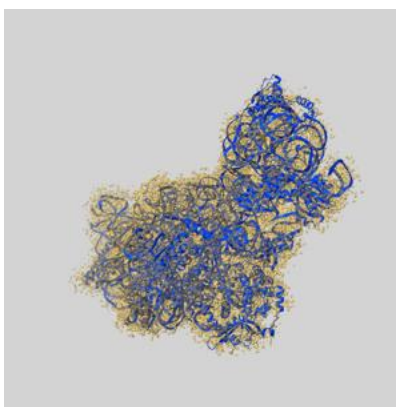
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-16607 and PDB model 8CEE. Per-residue inclusion information can be found in section 3 on page 8.

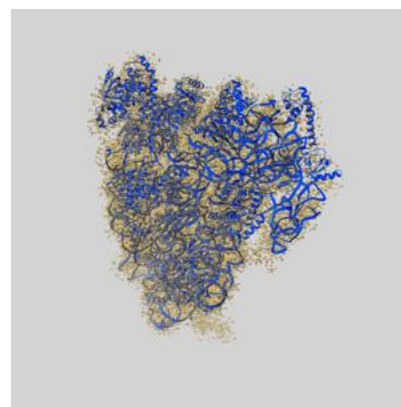
9.1 Map-model overlay [i](#)



X



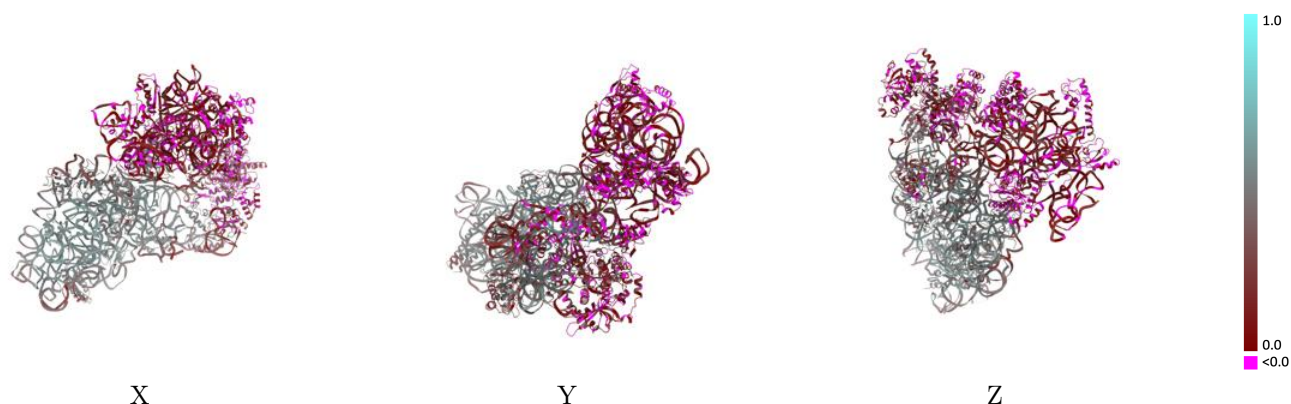
Y



Z

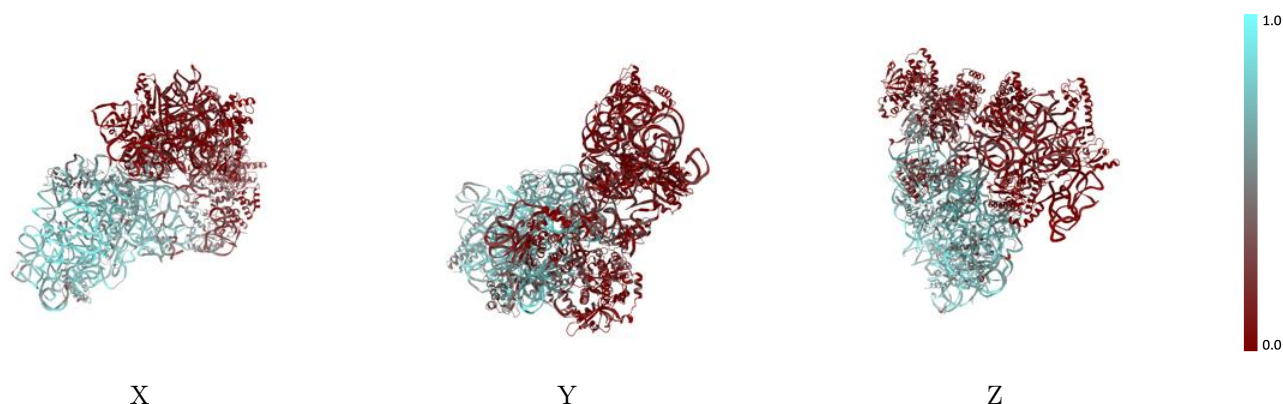
The images above show the 3D surface view of the map at the recommended contour level 0.0114 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



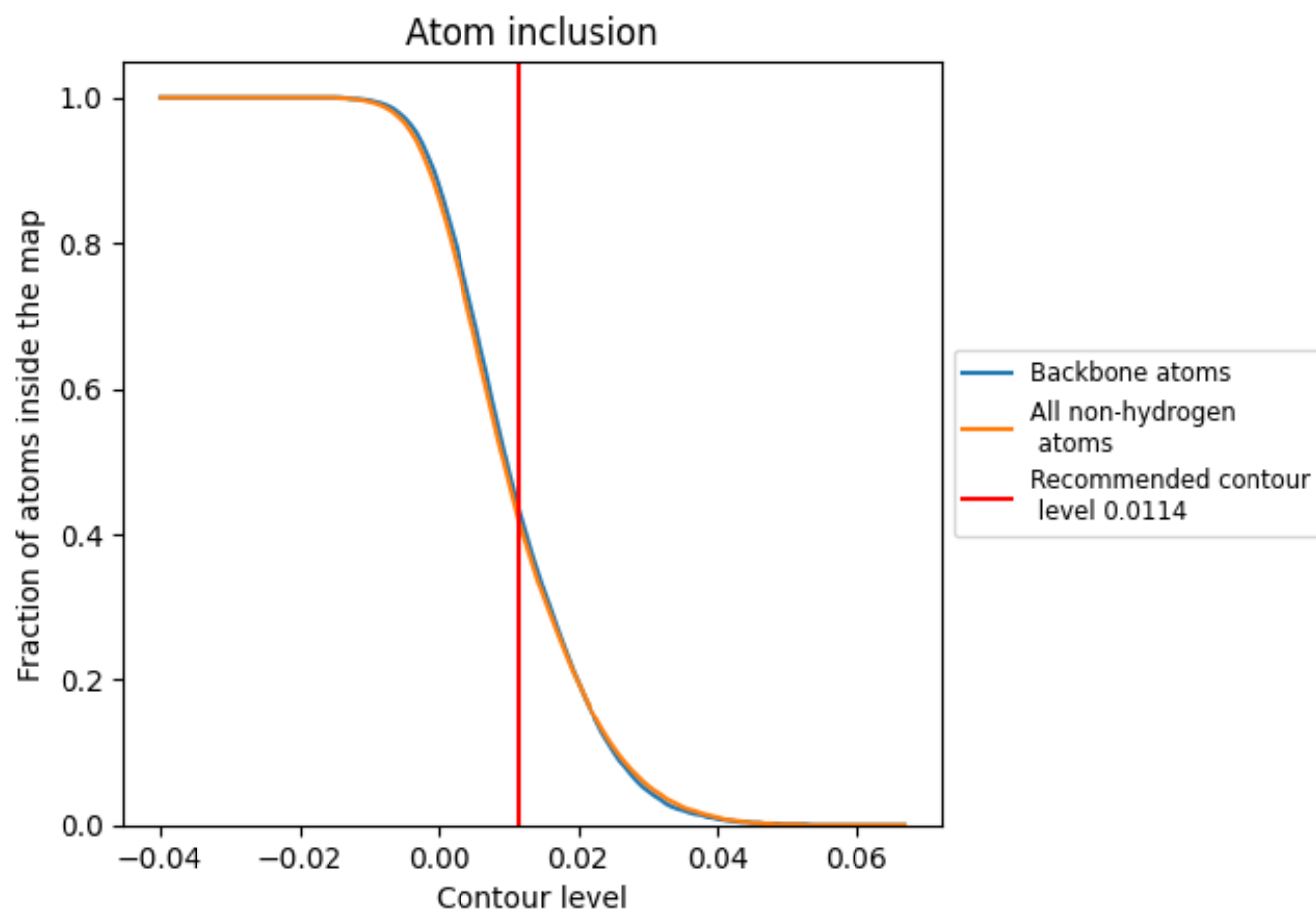
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0114).

9.4 Atom inclusion [i](#)



At the recommended contour level, 44% of all backbone atoms, 42% 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 (0.0114) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.4230	 0.2980
A	 0.5420	 0.3640
B	 0.2270	 0.1760
C	 0.1120	 0.0950
D	 0.2430	 0.2360
E	 0.0490	 0.0250
F	 0.5080	 0.4070
G	 0.5920	 0.4350
H	 0.0550	 0.0370
I	 0.6480	 0.4810
J	 0.0430	 0.0550
K	 0.0500	 0.0600
L	 0.6050	 0.4530
M	 0.0230	 0.0240
N	 0.0280	 0.0570
O	 0.6180	 0.4370
P	 0.6800	 0.5090
Q	 0.6170	 0.4570
R	 0.0240	 0.0220
S	 0.5510	 0.4120
T	 0.3970	 0.2970
U	 0.4540	 0.3740
V	 0.1140	 0.1600

