



## Full wwPDB EM Validation Report ⓘ

Mar 30, 2026 – 12:47 PM EDT

PDB ID : 10FZ / pdb\_000010fz  
EMDB ID : EMD-75144  
Title : 30S ribosomal subunit from E. coli missing the gene encoding for the 16S rRNA  
2'-O-methyltransferase RsmI  
Authors : Barmada, M.I.; Nandi, S.; Conn, G.L.  
Deposited on : 2026-01-18  
Resolution : 2.91 Å(reported)  
Based on initial model : 7oe1

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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:

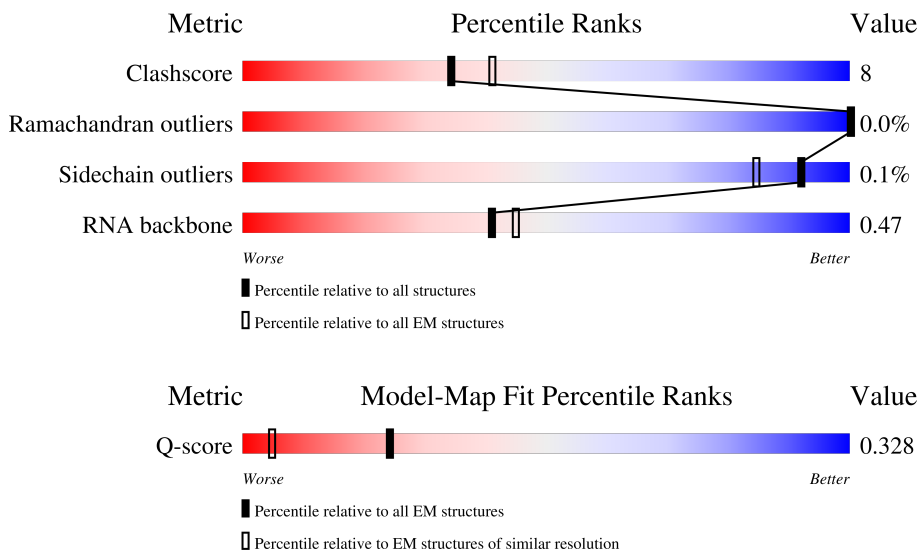
EMDB validation analysis : 0.0.1.dev132  
MolProbity : 4-5-2 with Phenix2.0  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.48.1

# 1 Overall quality at a glance i

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

The reported resolution of this entry is 2.91 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.



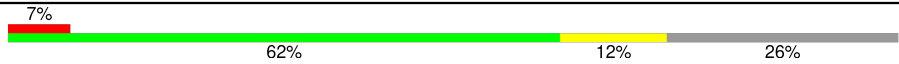






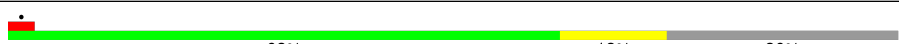
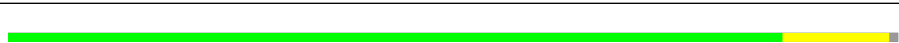






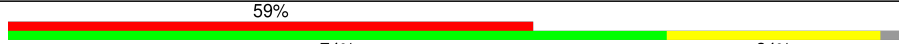


Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	12972 ( 2.41 - 3.41 )

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  $\geq 3$ , 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	1542	
2	D	205	
3	E	166	

*Continued on next page...*

Continued from previous page...

Mol	Chain	Length	Quality of chain
4	F	135	
5	H	129	
6	K	128	
7	L	123	
8	O	89	
9	P	82	
10	Q	83	
11	R	74	
12	T	86	
13	B	240	
14	U	71	
15	C	232	
16	G	178	
17	I	129	
18	J	103	
19	M	117	
20	N	100	
21	S	91	

## 2 Entry composition i

There are 23 unique types of molecules in this entry. The entry contains 51201 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
			Total	C	N	O	P		
1	A	1530	32831	14642	6024	10635	1530	0	0

- Molecule 2 is a protein called Small ribosomal subunit protein uS4.

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

- Molecule 3 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	E	150	1105	687	211	201	6	0	0

- Molecule 4 is a protein called Small ribosomal subunit protein bS6, fully modified isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	F	100	817	515	148	148	6	0	0

- Molecule 5 is a protein called Small ribosomal subunit protein uS8.

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

- Molecule 6 is a protein called Small ribosomal subunit protein uS11.

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

- Molecule 7 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	L	123	955	590	196	165	4	0	0

- Molecule 8 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	O	88	716	440	146	129	1	0	0

- Molecule 9 is a protein called Small ribosomal subunit protein bS16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	P	82	649	406	128	114	1	0	0

- Molecule 10 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	Q	80	648	411	121	113	3	0	0

- Molecule 11 is a protein called Small ribosomal subunit protein bS18.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
11	R	55	455	288	86	81	0	0

- Molecule 12 is a protein called Small ribosomal subunit protein bS20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	T	85	665	411	137	114	3	0	0

- Molecule 13 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	B	218	1704	1081	305	311	7	0	0

- Molecule 14 is a protein called Small ribosomal subunit protein bS21.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	U	18	Total	C	N	O	0	0
			148	94	28	26		

- Molecule 15 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	C	206	Total	C	N	O	S	0	0
			1624	1028	305	288	3		

- Molecule 16 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	G	150	Total	C	N	O	S	0	0
			1174	730	226	214	4		

- Molecule 17 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	I	127	Total	C	N	O	S	0	0
			1022	634	206	179	3		

- Molecule 18 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	J	98	Total	C	N	O	S	0	0
			786	493	150	142	1		

- Molecule 19 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	M	114	Total	C	N	O	S	0	0
			883	546	178	156	3		

- Molecule 20 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	N	96	Total	C	N	O	S	0	0
			774	483	160	128	3		

- Molecule 21 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	S	79	Total	C	N	O	S	0	0
			637	408	120	107	2		

- Molecule 22 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
22	A	76	Total	Mg	0
			76	76	
22	K	1	Total	Mg	0
			1	1	

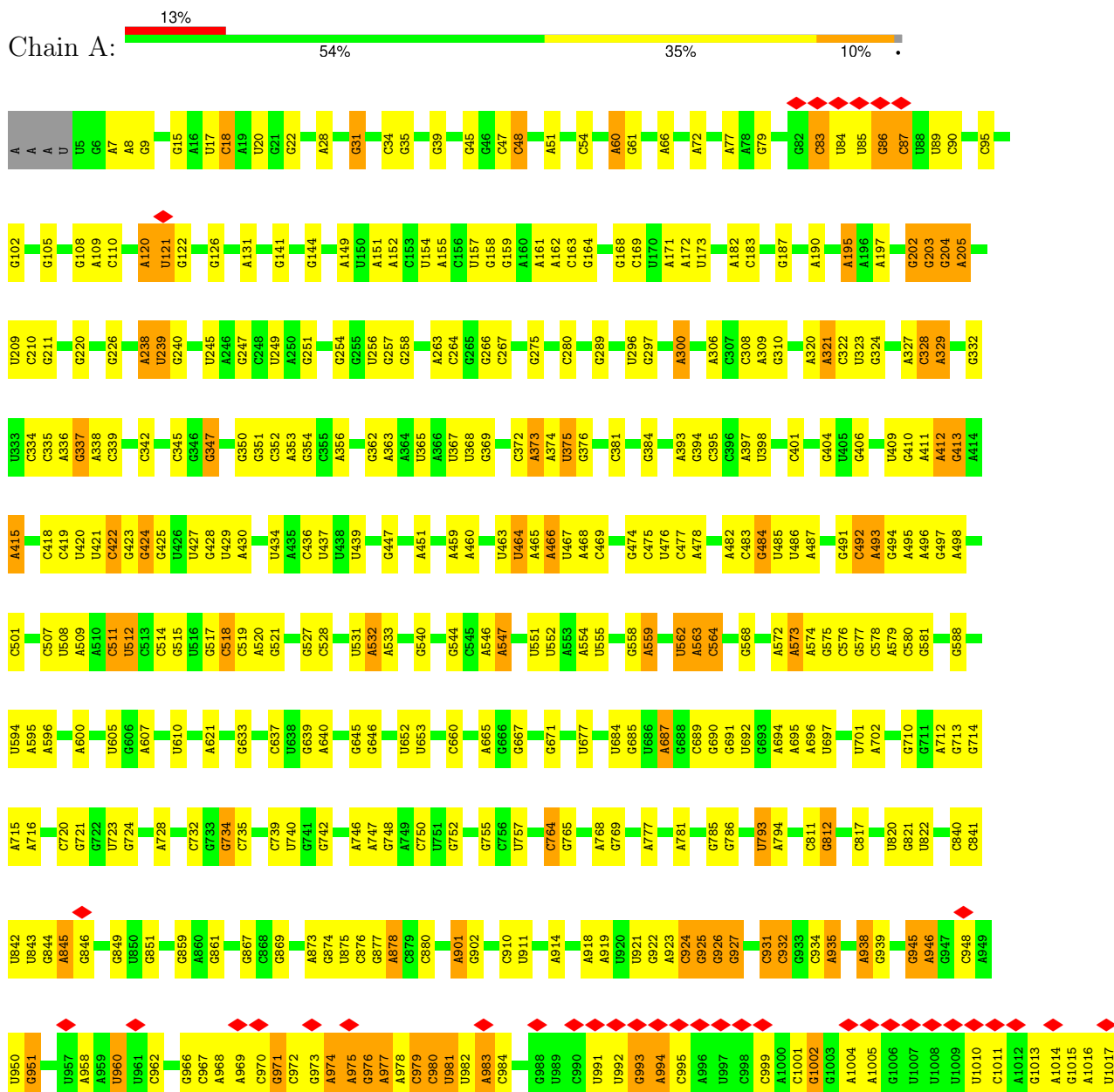
- Molecule 23 is water.

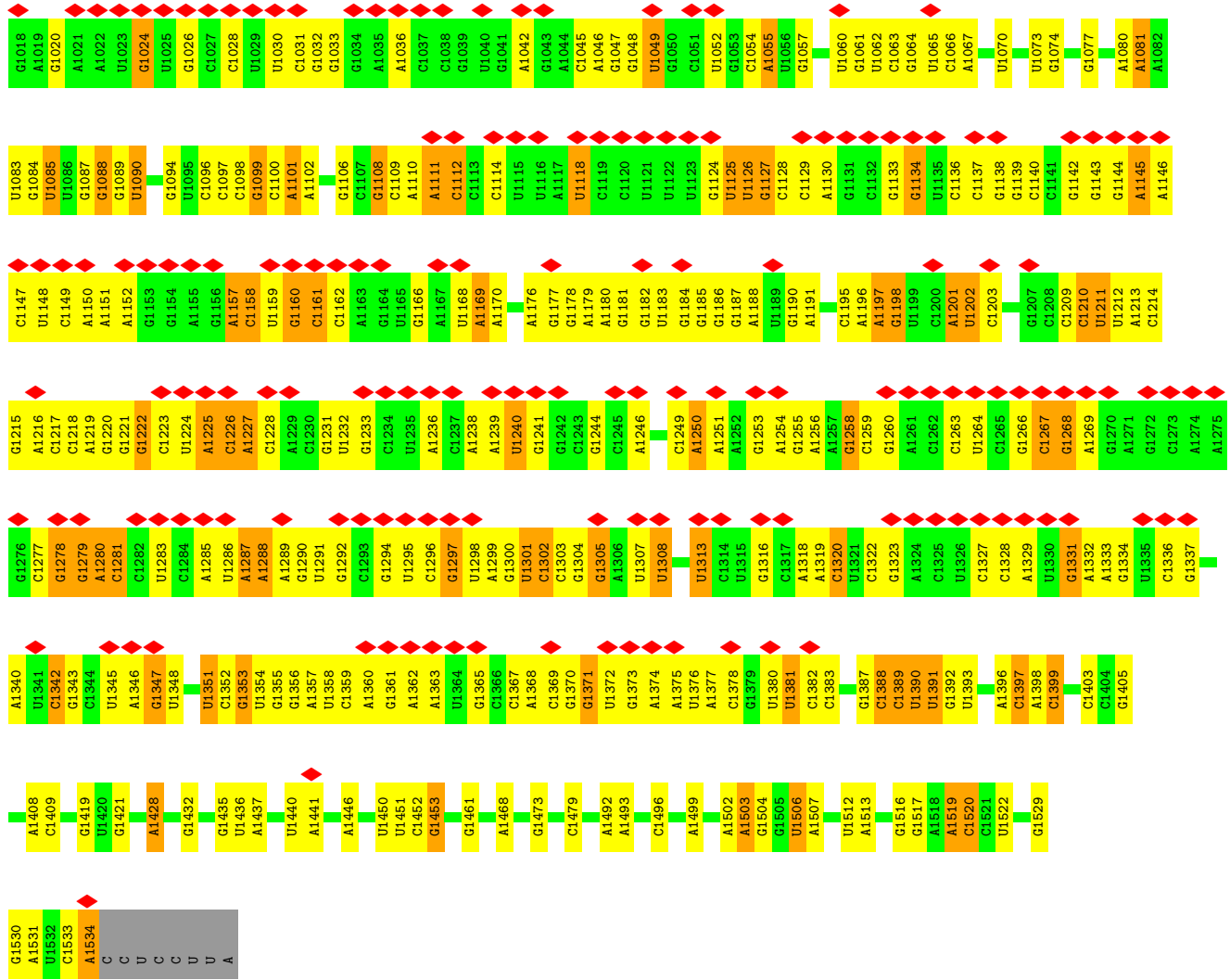
Mol	Chain	Residues	Atoms		AltConf
23	A	21	Total	O	0
			21	21	
23	D	2	Total	O	0
			2	2	
23	K	1	Total	O	0
			1	1	
23	L	1	Total	O	0
			1	1	
23	P	1	Total	O	0
			1	1	
23	R	1	Total	O	0
			1	1	
23	T	2	Total	O	0
			2	2	
23	B	3	Total	O	0
			3	3	

### 3 Residue-property plots

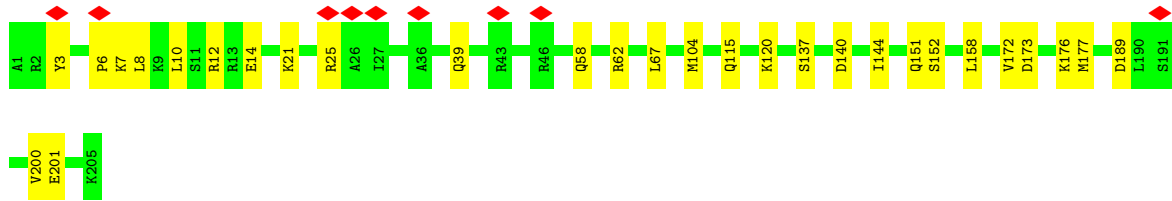
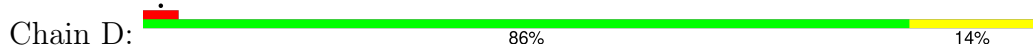
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

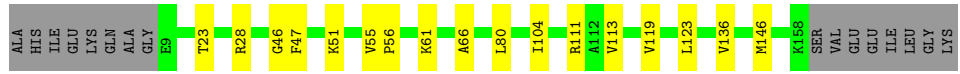
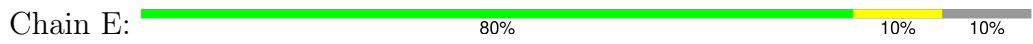




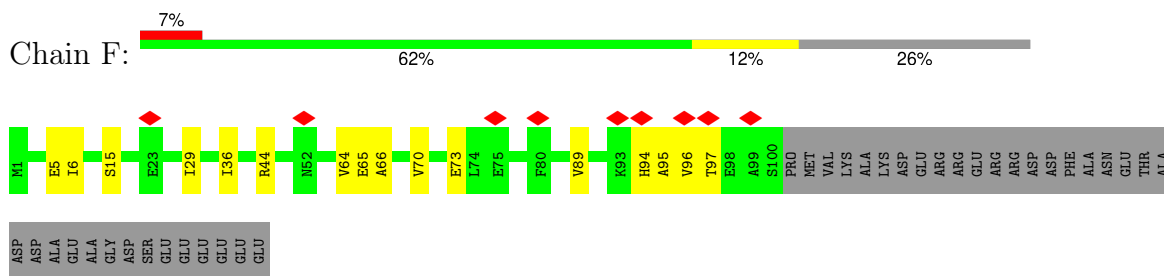
• Molecule 2: Small ribosomal subunit protein uS4



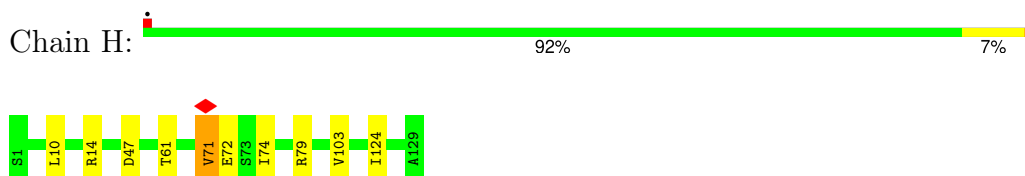
• Molecule 3: Small ribosomal subunit protein uS5



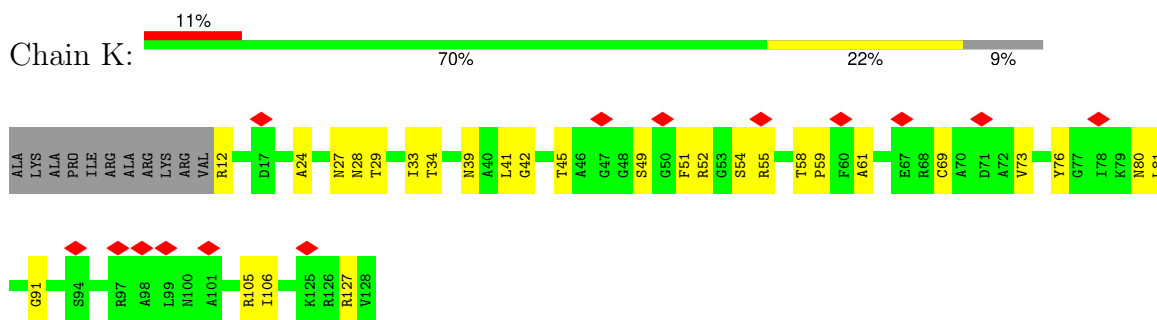
• Molecule 4: Small ribosomal subunit protein bS6, fully modified isoform



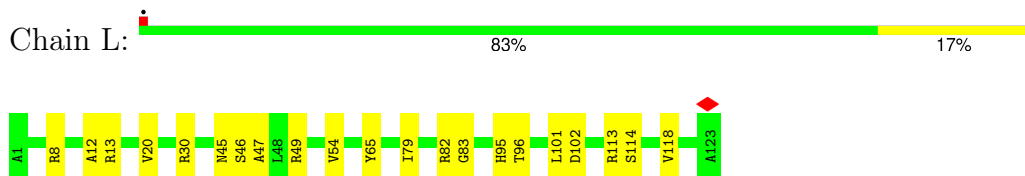
- Molecule 5: Small ribosomal subunit protein uS8



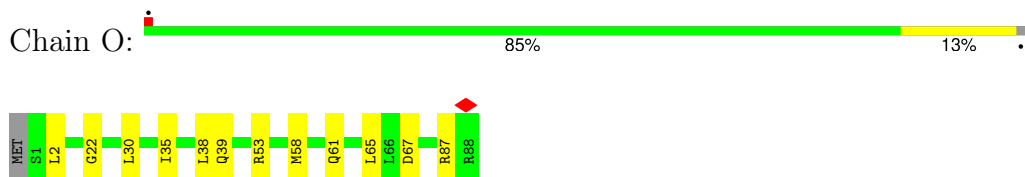
- Molecule 6: Small ribosomal subunit protein uS11



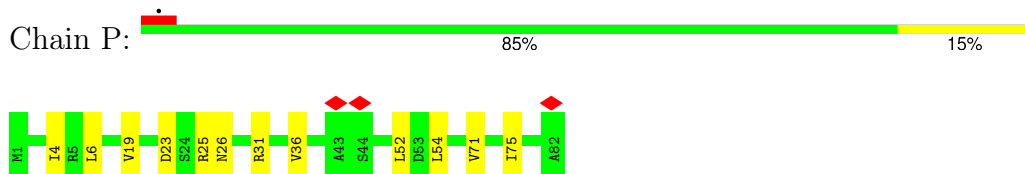
- Molecule 7: Small ribosomal subunit protein uS12



- Molecule 8: Small ribosomal subunit protein uS15

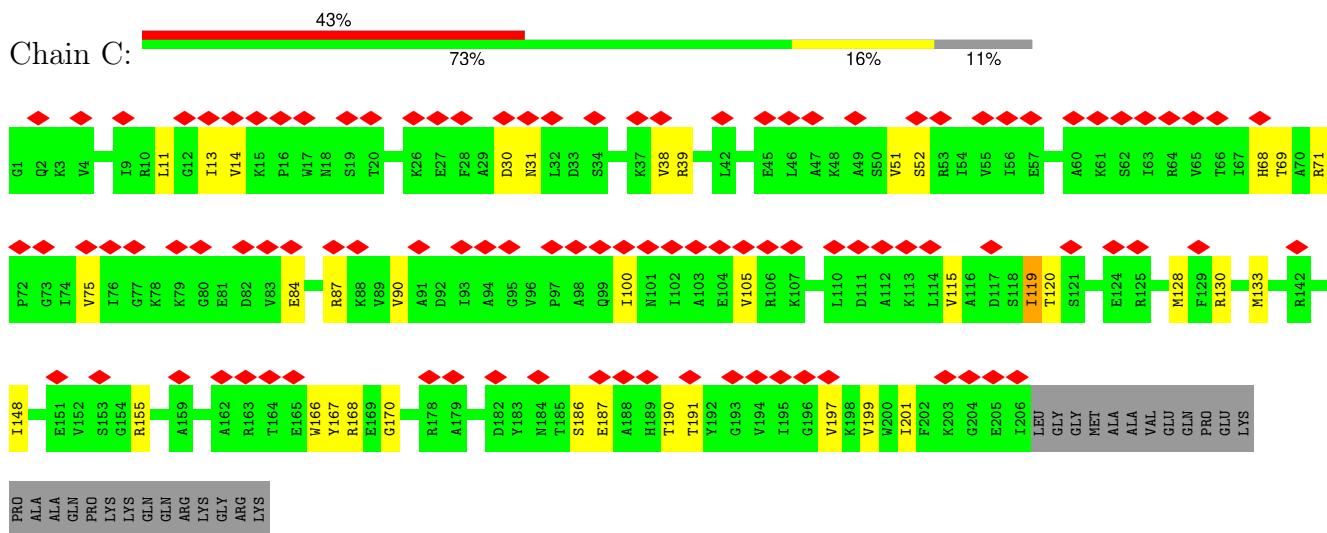


- Molecule 9: Small ribosomal subunit protein bS16

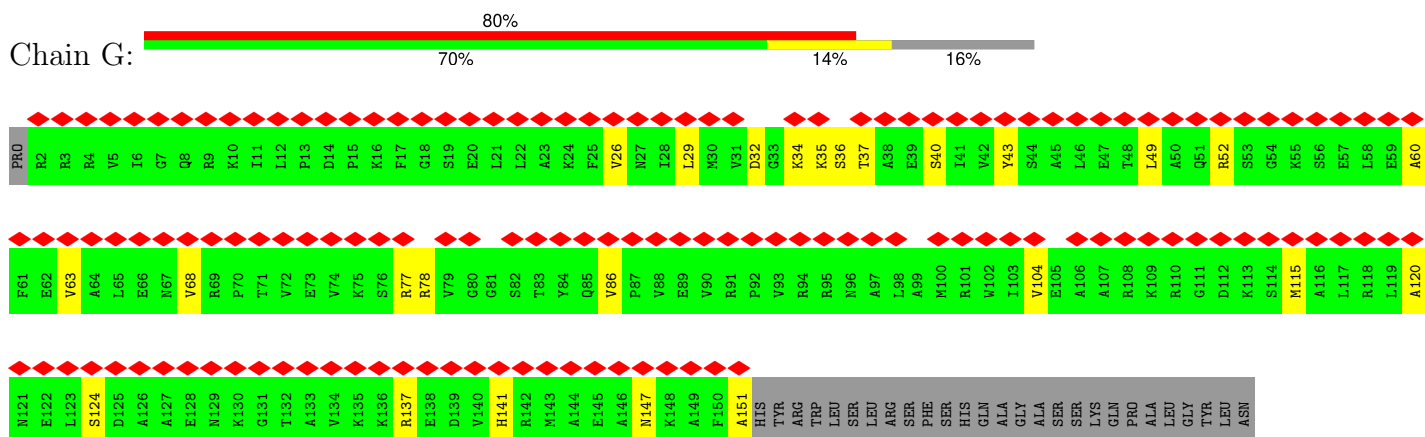


- Molecule 10: Small ribosomal subunit protein uS17

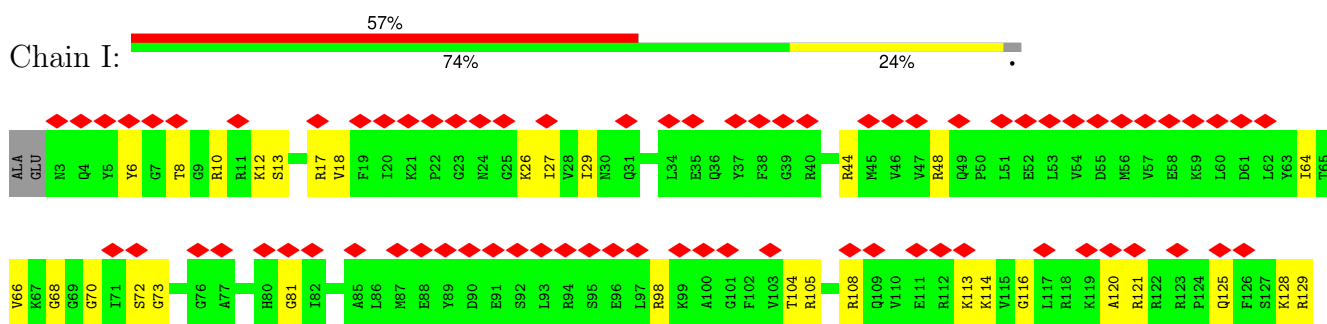




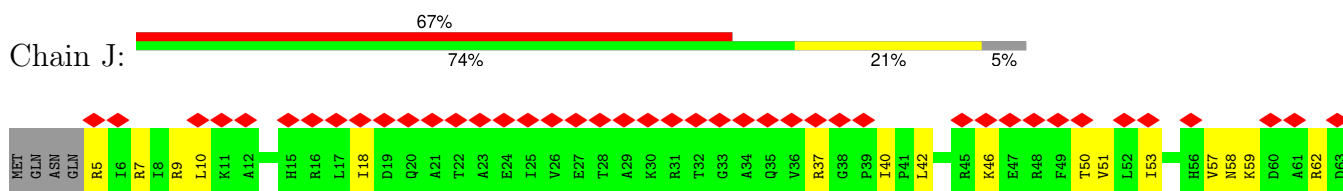
• Molecule 16: Small ribosomal subunit protein uS7

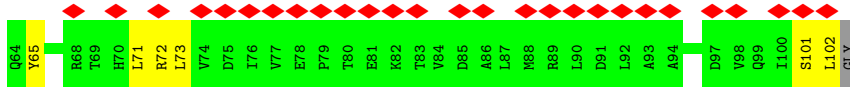


• Molecule 17: Small ribosomal subunit protein uS9

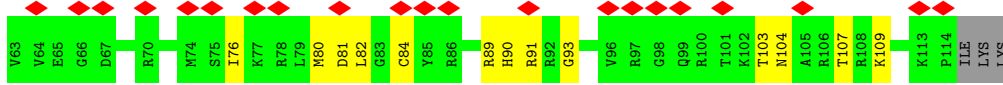
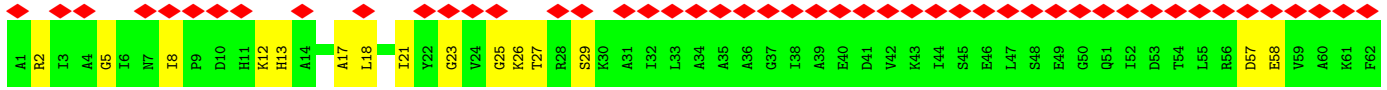
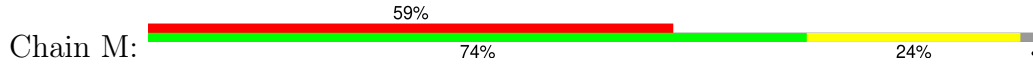


• Molecule 18: Small ribosomal subunit protein uS10

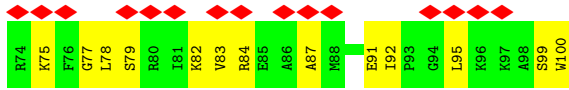
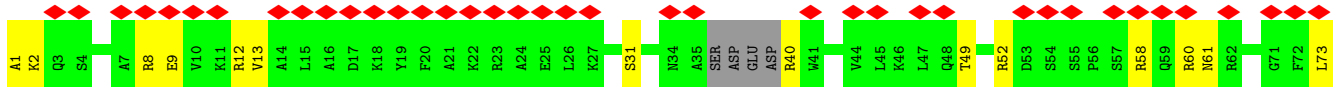




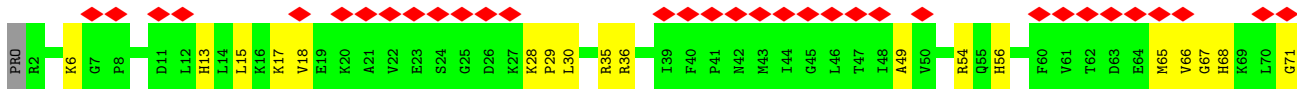
• Molecule 19: Small ribosomal subunit protein uS13



• Molecule 20: Small ribosomal subunit protein uS14



• Molecule 21: Small ribosomal subunit protein uS19



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	58273	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	49.27	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	2900	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.699	Depositor
Minimum map value	-0.259	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.027	Depositor
Recommended contour level	0.108	Depositor
Map size (Å)	369.6, 369.6, 369.6	wwPDB
Map dimensions	448, 448, 448	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.825, 0.825, 0.825	Depositor

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.08	0/36762	0.23	0/57350
2	D	0.09	0/1665	0.25	0/2227
3	E	0.10	0/1118	0.22	0/1504
4	F	0.12	0/835	0.31	0/1128
5	H	0.11	0/989	0.24	0/1326
6	K	0.11	0/893	0.27	0/1205
7	L	0.11	0/969	0.26	0/1300
8	O	0.11	0/724	0.22	0/966
9	P	0.11	0/659	0.27	0/884
10	Q	0.06	0/657	0.22	0/881
11	R	0.07	0/462	0.27	0/621
12	T	0.11	0/671	0.25	0/888
13	B	0.10	0/1735	0.26	0/2338
14	U	0.11	0/150	0.38	0/198
15	C	0.11	0/1651	0.24	0/2225
16	G	0.10	0/1187	0.26	0/1591
17	I	0.11	0/1034	0.32	0/1375
18	J	0.10	0/796	0.30	0/1077
19	M	0.10	0/892	0.26	0/1193
20	N	0.10	0/785	0.22	0/1043
21	S	0.09	0/652	0.24	0/877
All	All	0.09	0/55286	0.24	0/82197

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

## 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	32831	0	16521	422	0
2	D	1643	0	1710	31	0
3	E	1105	0	1148	13	0
4	F	817	0	808	10	0
5	H	979	0	1034	7	0
6	K	877	0	887	20	0
7	L	955	0	1019	18	0
8	O	716	0	742	7	0
9	P	649	0	666	11	0
10	Q	648	0	691	5	0
11	R	455	0	478	7	0
12	T	665	0	714	10	0
13	B	1704	0	1732	28	0
14	U	148	0	157	3	0
15	C	1624	0	1699	31	0
16	G	1174	0	1230	25	0
17	I	1022	0	1070	31	0
18	J	786	0	828	30	0
19	M	883	0	944	21	0
20	N	774	0	827	29	0
21	S	637	0	665	16	0
22	A	76	0	0	0	0
22	K	1	0	0	0	0
23	A	21	0	0	4	0
23	B	3	0	0	3	0
23	D	2	0	0	3	0
23	K	1	0	0	0	0
23	L	1	0	0	0	0
23	P	1	0	0	0	0
23	R	1	0	0	2	0
23	T	2	0	0	2	0
All	All	51201	0	35570	645	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 8.

All (645) 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)
11:R:59:LYS:HE3	23:R:101:HOH:O	1.41	1.20
11:R:55:ALA:HB1	23:R:101:HOH:O	1.49	1.10
2:D:158:LEU:HB2	23:D:301:HOH:O	1.57	1.05
1:A:1405:G:N2	1:A:1496:C:O2	1.93	1.02
1:A:1296:C:H3'	23:A:1704:HOH:O	1.63	0.97
1:A:342:C:O2	1:A:347:G:N2	2.03	0.90
13:B:71:THR:O	13:B:94:ARG:NH2	2.05	0.90
1:A:1328:C:OP1	19:M:27:THR:OG1	1.87	0.89
1:A:1145:A:N3	1:A:1147:C:N4	2.20	0.89
1:A:921:U:O2	3:E:23:THR:OG1	1.91	0.88
1:A:1421:G:N2	1:A:1479:C:O2	2.06	0.88
1:A:350:G:O2'	1:A:351:G:O4'	1.91	0.88
1:A:415:A:N1	1:A:428:G:O6	2.06	0.88
1:A:126:G:OP1	1:A:605:U:O2'	1.93	0.87
1:A:1096:C:O2	1:A:1170:A:O2'	1.92	0.87
1:A:1083:U:O2'	1:A:1102:A:OP2	1.91	0.87
1:A:720:C:OP2	1:A:721:G:O2'	1.94	0.86
1:A:1388:C:O2'	1:A:1389:C:OP1	1.93	0.86
1:A:547:A:OP2	2:D:3:TYR:OH	1.94	0.86
1:A:540:G:N2	2:D:39:GLN:OE1	2.09	0.85
1:A:152:A:N6	1:A:169:C:O2	2.10	0.85
1:A:690:G:N2	1:A:697:U:O4	2.10	0.85
1:A:1210:C:O2'	1:A:1211:U:O4'	1.95	0.84
1:A:1372:U:OP1	17:I:73:GLY:N	2.10	0.84
9:P:52:LEU:HD21	9:P:75:ILE:HD13	1.59	0.84
1:A:558:G:OP2	1:A:559:A:O2'	1.95	0.84
1:A:950:U:O2'	1:A:971:G:O4'	1.94	0.84
1:A:401:C:O2'	1:A:621:A:N3	2.10	0.83
1:A:811:C:O2'	1:A:901:A:N1	2.09	0.83
1:A:980:C:O2'	20:N:12:ARG:NH1	2.10	0.83
1:A:695:A:O2'	1:A:696:A:O4'	1.94	0.83
1:A:840:C:O2	1:A:846:G:N2	2.10	0.83
1:A:1239:A:N6	1:A:1299:A:N7	2.26	0.83
1:A:1074:G:N2	1:A:1101:A:O2'	2.12	0.83
1:A:982:U:O2	1:A:983:A:N6	2.13	0.81
1:A:60:A:C2	23:A:1705:HOH:O	2.34	0.80
13:B:23:ASN:ND2	13:B:191:ASP:OD1	2.14	0.80
1:A:945:G:N2	1:A:1334:G:O2'	2.14	0.80
1:A:950:U:O4	19:M:104:ASN:ND2	2.15	0.80
12:T:19:HIS:CE1	23:T:101:HOH:O	2.35	0.80
1:A:1267:C:O2'	1:A:1268:G:O4'	2.00	0.79
19:M:2:ARG:NE	19:M:5:GLY:O	2.14	0.79

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1231:G:OP1	17:I:128:LYS:NZ	2.15	0.79
1:A:1124:G:N7	1:A:1145:A:O2'	2.15	0.79
1:A:203:G:N2	1:A:205:A:N6	2.30	0.78
1:A:875:U:O2'	5:H:14:ARG:NH1	2.15	0.78
1:A:1148:U:OP2	1:A:1150:A:N6	2.16	0.78
13:B:112:ARG:HD3	23:B:301:HOH:O	1.83	0.78
1:A:1244:G:N1	1:A:1294:G:O6	2.15	0.78
2:D:14:GLU:OE2	2:D:62:ARG:NH2	2.17	0.78
1:A:1157:A:O2'	1:A:1158:C:OP2	2.02	0.78
15:C:119:ILE:HG21	15:C:197:VAL:HG21	1.65	0.78
1:A:507:C:OP2	1:A:508:U:O2'	2.00	0.77
1:A:1133:G:O2'	1:A:1134:G:O4'	2.01	0.77
1:A:157:U:O2	1:A:164:G:O6	2.01	0.77
1:A:501:C:OP1	7:L:113:ARG:NH2	2.18	0.77
1:A:28:A:O2'	1:A:296:U:OP1	2.03	0.76
1:A:297:G:N2	1:A:300:A:OP2	2.17	0.76
1:A:1060:U:O2'	18:J:58:ASN:ND2	2.19	0.76
1:A:1157:A:OP1	1:A:1180:A:N6	2.18	0.76
1:A:1239:A:O2'	1:A:1297:G:N2	2.19	0.76
1:A:1055:A:N3	15:C:155:ARG:NH1	2.33	0.76
15:C:130:ARG:NH2	15:C:133:MET:SD	2.59	0.76
1:A:1278:G:N3	1:A:1279:G:N2	2.34	0.75
1:A:1147:C:O2	17:I:17:ARG:NH1	2.19	0.75
1:A:1301:U:OP1	1:A:1331:G:O2'	2.03	0.75
1:A:951:G:N3	1:A:970:C:O2'	2.17	0.75
1:A:1278:G:OP1	18:J:101:SER:OG	2.04	0.75
1:A:203:G:H21	1:A:205:A:N6	1.83	0.75
1:A:1148:U:OP2	1:A:1149:C:N4	2.20	0.74
1:A:544:G:OP1	2:D:58:GLN:NE2	2.21	0.74
15:C:13:ILE:HG22	15:C:14:VAL:H	1.53	0.74
1:A:696:A:N3	1:A:786:G:O2'	2.19	0.74
1:A:1203:C:OP1	20:N:1:ALA:N	2.21	0.74
1:A:110:C:O2'	9:P:25:ARG:O	2.05	0.74
1:A:1534:A:OP1	14:U:46:ARG:NH1	2.21	0.74
1:A:1313:U:OP2	21:S:6:LYS:NZ	2.21	0.73
6:K:105:ARG:NH1	6:K:106:ILE:O	2.22	0.73
1:A:79:G:N2	1:A:90:C:O2	2.16	0.73
1:A:981:U:O4	1:A:1223:C:N4	2.20	0.73
1:A:1225:A:O2'	1:A:1226:C:OP1	2.06	0.72
1:A:105:G:OP2	12:T:12:GLN:NE2	2.22	0.72
1:A:203:G:O2'	1:A:204:G:O5'	2.07	0.72

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1125:U:C1'	18:J:73:LEU:HD21	2.19	0.72
1:A:1209:C:N4	1:A:1210:C:N4	2.36	0.72
1:A:1288:A:O2'	1:A:1289:A:O4'	2.02	0.72
13:B:153:MET:SD	13:B:155:GLY:N	2.62	0.72
1:A:203:G:N2	1:A:205:A:H61	1.87	0.72
1:A:203:G:HO2'	1:A:204:G:P	2.12	0.72
1:A:946:A:O2'	1:A:1333:A:N3	2.22	0.71
1:A:1291:U:OP1	16:G:40:SER:OG	2.06	0.71
1:A:427:U:OP2	1:A:428:G:O2'	2.05	0.71
1:A:1263:C:N4	1:A:1264:U:O4	2.24	0.71
1:A:1254:A:O2'	1:A:1357:A:OP1	2.09	0.71
20:N:52:ARG:O	20:N:58:ARG:NH2	2.24	0.71
1:A:1180:A:OP1	17:I:104:THR:OG1	2.09	0.71
1:A:1128:C:N4	1:A:1145:A:N1	2.38	0.71
6:K:33:ILE:HG21	6:K:73:VAL:HG11	1.71	0.70
18:J:9:ARG:HD2	18:J:71:LEU:HD12	1.73	0.70
1:A:975:A:O3'	1:A:1358:U:O2'	2.07	0.70
1:A:249:U:O2	1:A:275:G:O6	2.10	0.69
2:D:104:MET:CE	2:D:172:VAL:HG13	2.22	0.69
1:A:1251:A:N3	1:A:1369:C:O2'	2.24	0.69
1:A:1347:G:N2	1:A:1374:A:OP2	2.23	0.69
1:A:667:G:OP1	1:A:732:C:O2'	2.07	0.69
1:A:1118:U:OP2	17:I:10:ARG:NH2	2.26	0.68
2:D:10:LEU:HD21	2:D:62:ARG:HD2	1.75	0.68
13:B:53:LEU:HG	13:B:219:THR:HG21	1.74	0.68
1:A:420:U:O2'	1:A:423:G:O6	2.08	0.68
1:A:1290:G:O2'	16:G:36:SER:OG	2.06	0.68
1:A:1432:G:O2'	1:A:1468:A:N6	2.26	0.67
1:A:1118:U:OP1	17:I:105:ARG:NE	2.26	0.67
1:A:1239:A:H5''	16:G:115:MET:HE1	1.76	0.67
2:D:158:LEU:HD22	23:D:301:HOH:O	1.94	0.67
1:A:459:A:O2'	1:A:460:A:O4'	2.13	0.67
1:A:1342:C:O2'	17:I:125:GLN:OE1	2.03	0.67
1:A:562:U:O2'	7:L:12:ALA:O	2.13	0.66
1:A:578:C:O2'	1:A:728:A:N3	2.27	0.66
1:A:983:A:O2'	1:A:1049:U:O2'	2.02	0.66
1:A:1295:U:O2'	19:M:13:HIS:NE2	2.29	0.66
1:A:764:C:OP2	1:A:765:G:N2	2.29	0.66
1:A:1106:G:O2'	15:C:168:ARG:NE	2.28	0.66
1:A:1250:A:O2'	1:A:1251:A:O4'	2.12	0.66
1:A:518:C:O2'	7:L:46:SER:OG	2.12	0.65

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:976:G:N1	1:A:1362:A:O2'	2.29	0.65
1:A:1073:U:O2	13:B:102:ASN:ND2	2.30	0.65
20:N:78:LEU:HD22	20:N:83:VAL:HG13	1.79	0.65
1:A:1028:C:H5	23:A:1702:HOH:O	1.80	0.65
1:A:1074:G:O2'	1:A:1101:A:N1	2.30	0.65
1:A:1145:A:H1'	1:A:1147:C:H41	1.61	0.65
1:A:1397:C:OP2	3:E:28:ARG:NH2	2.29	0.65
7:L:83:GLY:O	7:L:95:HIS:N	2.29	0.65
16:G:29:LEU:HD13	16:G:104:VAL:HG21	1.79	0.65
16:G:147:ASN:O	16:G:151:ALA:N	2.31	0.64
1:A:1220:G:OP1	21:S:36:ARG:NH2	2.30	0.64
5:H:71:VAL:HG12	5:H:72:GLU:H	1.62	0.64
7:L:54:VAL:HG21	7:L:79:ILE:HD11	1.79	0.64
20:N:73:LEU:O	20:N:77:GLY:N	2.31	0.64
20:N:92:ILE:HD12	20:N:95:LEU:HG	1.79	0.64
1:A:972:C:OP2	18:J:59:LYS:NZ	2.23	0.64
1:A:1227:A:OP2	19:M:109:LYS:NZ	2.31	0.64
1:A:1308:U:N3	1:A:1329:A:N1	2.46	0.64
1:A:1522:U:OP1	6:K:127:ARG:NH2	2.31	0.64
1:A:1015:G:N2	1:A:1218:C:O2	2.30	0.63
1:A:327:A:O2'	1:A:328:C:O4'	2.15	0.63
1:A:1106:G:O3'	15:C:168:ARG:NH2	2.32	0.63
4:F:5:GLU:OE1	4:F:5:GLU:N	2.31	0.63
1:A:120:A:O2'	1:A:121:U:O5'	2.14	0.63
1:A:1357:A:OP2	1:A:1359:C:N4	2.31	0.63
1:A:552:U:O2'	7:L:82:ARG:O	2.14	0.62
13:B:132:GLU:OE2	13:B:136:ARG:NH1	2.33	0.62
19:M:80:MET:HE1	19:M:90:HIS:CE1	2.34	0.62
8:O:67:ASP:OD1	8:O:87:ARG:NH2	2.33	0.62
15:C:115:VAL:O	15:C:119:ILE:HD12	2.00	0.62
17:I:26:LYS:NZ	17:I:27:ILE:O	2.33	0.62
17:I:29:ILE:HG22	17:I:64:ILE:CG1	2.30	0.62
1:A:1240:U:C5	16:G:115:MET:HE2	2.35	0.61
1:A:927:G:O2'	1:A:1503:A:N7	2.26	0.61
1:A:1250:A:N1	1:A:1287:A:N6	2.48	0.61
1:A:483:C:OP2	1:A:484:G:O2'	2.16	0.61
1:A:1081:A:OP2	3:E:51:LYS:NZ	2.28	0.61
1:A:1233:G:O2'	1:A:1365:G:OP1	2.18	0.61
6:K:12:ARG:NH2	6:K:76:TYR:OH	2.34	0.61
6:K:45:THR:O	6:K:49:SER:OG	2.13	0.61
13:B:81:ASP:OD1	13:B:82:ALA:N	2.34	0.61

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1450:U:O2'	1:A:1453:G:O6	2.14	0.61
9:P:52:LEU:HD21	9:P:75:ILE:CD1	2.30	0.61
1:A:1067:A:N1	1:A:1108:G:O2'	2.30	0.61
1:A:83:C:O2	1:A:86:G:N2	2.32	0.61
1:A:1143:G:OP2	18:J:37:ARG:NH2	2.33	0.61
1:A:195:A:OP1	12:T:59:ARG:NH1	2.34	0.60
1:A:1143:G:N1	1:A:1144:G:O6	2.34	0.60
1:A:1291:U:P	16:G:40:SER:HG	2.24	0.60
1:A:1320:C:H41	21:S:36:ARG:HA	1.65	0.60
15:C:148:ILE:HD11	15:C:199:VAL:HB	1.82	0.60
21:S:13:HIS:O	21:S:17:LYS:NZ	2.35	0.60
1:A:931:C:O2'	1:A:932:C:OP1	2.17	0.60
1:A:159:G:N2	1:A:162:A:OP2	2.35	0.60
1:A:154:U:O4	1:A:155:A:N6	2.35	0.59
1:A:938:A:N3	1:A:1376:U:O2'	2.33	0.59
13:B:114:LYS:O	13:B:118:THR:OG1	2.20	0.59
15:C:51:VAL:HA	15:C:69:THR:HG22	1.84	0.59
1:A:1239:A:N3	1:A:1241:G:N2	2.50	0.59
9:P:23:ASP:OD1	9:P:26:ASN:ND2	2.34	0.59
13:B:112:ARG:CD	23:B:301:HOH:O	2.44	0.59
1:A:1280:A:OP1	18:J:71:LEU:HD11	2.02	0.59
1:A:1125:U:H1'	18:J:73:LEU:HD21	1.84	0.59
1:A:982:U:OP2	20:N:60:ARG:NH2	2.35	0.59
13:B:70:GLY:HA3	13:B:79:VAL:HG11	1.83	0.59
1:A:202:G:O2'	1:A:203:G:OP1	2.11	0.59
2:D:7:LYS:O	2:D:8:LEU:HD22	2.02	0.59
1:A:691:G:O6	6:K:52:ARG:NH2	2.36	0.58
1:A:1405:G:N1	1:A:1496:C:N3	2.51	0.58
1:A:31:G:O2'	1:A:48:C:N4	2.35	0.58
13:B:205:ALA:O	13:B:208:ALA:N	2.36	0.58
18:J:65:TYR:HB3	20:N:95:LEU:HD12	1.84	0.58
1:A:1305:G:N1	1:A:1331:G:N3	2.52	0.58
1:A:1359:C:OP1	20:N:61:ASN:ND2	2.37	0.58
2:D:173:ASP:O	2:D:177:MET:N	2.37	0.58
1:A:1073:U:OP1	3:E:61:LYS:NZ	2.36	0.58
2:D:104:MET:HE1	2:D:172:VAL:HG13	1.86	0.57
1:A:263:A:OP1	12:T:73:ARG:NE	2.37	0.57
13:B:8:MET:SD	13:B:8:MET:N	2.77	0.57
13:B:161:PHE:CZ	13:B:216:VAL:HG21	2.39	0.57
1:A:1405:G:N2	1:A:1496:C:C2	2.62	0.57
1:A:430:A:OP1	2:D:8:LEU:HD23	2.05	0.57

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:652:U:O4	1:A:752:G:O2'	2.21	0.57
1:A:1281:C:O2	18:J:7:ARG:NH2	2.37	0.57
2:D:6:PRO:CG	2:D:10:LEU:HD13	2.35	0.57
1:A:1355:G:N2	1:A:1356:G:N7	2.53	0.57
1:A:254:G:O2'	10:Q:17:GLU:O	2.21	0.57
16:G:77:ARG:HB2	16:G:86:VAL:HG21	1.87	0.57
21:S:35:ARG:NH2	21:S:74:ALA:O	2.38	0.56
1:A:979:C:N3	20:N:58:ARG:NH2	2.53	0.56
17:I:29:ILE:HG22	17:I:64:ILE:HB	1.86	0.56
1:A:723:U:OP2	14:U:44:ARG:NH1	2.37	0.56
1:A:579:A:O2'	8:O:53:ARG:NH1	2.38	0.56
2:D:137:SER:N	2:D:140:ASP:OD2	2.39	0.56
4:F:29:ILE:HD11	4:F:66:ALA:CB	2.35	0.56
1:A:1240:U:C6	16:G:115:MET:HE2	2.40	0.56
16:G:104:VAL:HG12	16:G:104:VAL:O	2.06	0.56
1:A:1210:C:O2'	1:A:1211:U:P	2.64	0.56
1:A:1436:U:OP1	12:T:17:ARG:NH2	2.39	0.56
4:F:15:SER:OG	4:F:44:ARG:NH2	2.39	0.56
1:A:1166:G:N2	1:A:1169:A:OP2	2.40	0.55
1:A:768:A:N3	1:A:1512:U:O2'	2.39	0.55
1:A:1320:C:H42	21:S:71:GLY:HA3	1.70	0.55
21:S:49:ALA:HB1	21:S:56:HIS:HB3	1.88	0.55
13:B:19:THR:HG22	13:B:37:VAL:HG12	1.88	0.55
1:A:427:U:OP1	2:D:12:ARG:NH1	2.38	0.55
1:A:925:G:O2'	1:A:926:G:OP2	2.25	0.55
6:K:29:THR:HG21	6:K:91:GLY:HA3	1.89	0.55
1:A:677:U:O2	1:A:777:A:O2'	2.25	0.55
1:A:1057:G:O2'	15:C:187:GLU:OE2	2.19	0.55
1:A:1148:U:H5''	17:I:8:THR:HG23	1.87	0.55
1:A:1048:G:OP1	20:N:2:LYS:N	2.40	0.54
1:A:356:A:N3	1:A:368:U:O2'	2.32	0.54
15:C:115:VAL:HG23	15:C:199:VAL:HG21	1.89	0.54
7:L:47:ALA:O	7:L:49:ARG:NH1	2.40	0.54
15:C:84:GLU:OE1	15:C:87:ARG:NH2	2.40	0.54
1:A:999:C:N3	1:A:1042:A:N6	2.57	0.53
7:L:113:ARG:HG3	7:L:118:VAL:HG13	1.90	0.53
20:N:78:LEU:HD21	20:N:82:LYS:HB2	1.89	0.53
1:A:845:A:O3'	11:R:47:ARG:NH2	2.41	0.53
1:A:1250:A:C2	1:A:1287:A:N6	2.77	0.53
1:A:1436:U:O4	1:A:1437:A:N6	2.41	0.53
1:A:979:C:N4	1:A:1318:A:H61	2.06	0.53

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:K:54:SER:OG	6:K:55:ARG:NH1	2.41	0.53
1:A:404:G:O2'	1:A:498:A:N1	2.38	0.53
9:P:4:ILE:HG22	9:P:4:ILE:O	2.07	0.53
1:A:1346:A:N3	17:I:108:ARG:NH2	2.56	0.53
1:A:447:G:O2'	1:A:487:A:N6	2.41	0.53
1:A:1077:G:N2	1:A:1080:A:OP2	2.33	0.53
2:D:6:PRO:HG2	2:D:10:LEU:HD22	1.91	0.53
1:A:203:G:C2	1:A:205:A:N6	2.78	0.52
1:A:1367:C:H4'	18:J:62:ARG:HE	1.73	0.52
1:A:1329:A:OP1	19:M:25:GLY:N	2.42	0.52
1:A:264:C:O2'	10:Q:65:PRO:O	2.27	0.52
1:A:1028:C:C5	23:A:1702:HOH:O	2.53	0.52
1:A:1209:C:H42	1:A:1210:C:N4	2.07	0.52
9:P:36:VAL:O	9:P:36:VAL:HG23	2.08	0.52
15:C:30:ASP:OD1	15:C:31:ASN:N	2.42	0.52
17:I:114:LYS:H	17:I:120:ALA:HB2	1.74	0.52
19:M:89:ARG:O	19:M:93:GLY:N	2.43	0.52
1:A:397:A:N7	1:A:547:A:O2'	2.39	0.52
1:A:973:G:OP2	1:A:974:A:O2'	2.14	0.52
1:A:1373:G:OP1	16:G:35:LYS:NZ	2.23	0.52
1:A:995:C:N3	1:A:1046:A:O2'	2.38	0.52
10:Q:68:LYS:O	10:Q:69:THR:OG1	2.16	0.52
2:D:6:PRO:HG2	2:D:10:LEU:HD13	1.91	0.52
12:T:66:ILE:HG23	12:T:70:LYS:HB3	1.92	0.52
19:M:57:ASP:OD1	19:M:58:GLU:N	2.42	0.52
13:B:125:PHE:O	13:B:130:LYS:NZ	2.31	0.52
1:A:363:A:OP2	7:L:30:ARG:NH1	2.43	0.51
1:A:1346:A:N6	1:A:1375:A:OP2	2.43	0.51
15:C:11:LEU:HD23	20:N:95:LEU:O	2.11	0.51
1:A:1126:U:OP1	18:J:5:ARG:NE	2.44	0.51
21:S:35:ARG:O	21:S:71:GLY:N	2.39	0.51
15:C:13:ILE:HG22	15:C:14:VAL:N	2.23	0.51
1:A:437:U:O2	2:D:115:GLN:NE2	2.43	0.51
18:J:18:ILE:HD11	18:J:72:ARG:HG2	1.93	0.51
1:A:1098:C:H2'	1:A:1099:G:C4	2.46	0.51
1:A:1185:G:O2'	1:A:1347:G:OP1	2.28	0.51
1:A:1258:G:O2'	1:A:1259:C:O4'	2.24	0.51
1:A:120:A:O2'	1:A:121:U:P	2.69	0.51
1:A:1096:C:H1'	1:A:1170:A:O2'	2.10	0.51
13:B:160:LEU:HD23	13:B:162:VAL:H	1.74	0.51
1:A:1147:C:O2'	17:I:6:TYR:OH	2.09	0.51

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1347:G:O2'	1:A:1373:G:O6	2.19	0.51
1:A:551:U:O2'	7:L:82:ARG:NH1	2.44	0.51
15:C:71:ARG:O	15:C:75:VAL:HG23	2.11	0.51
18:J:42:LEU:HD12	18:J:73:LEU:HB2	1.92	0.51
19:M:81:ASP:O	19:M:91:ARG:NH2	2.43	0.51
1:A:1047:G:H2'	1:A:1048:G:C8	2.46	0.51
1:A:238:A:H3'	1:A:239:U:H5''	1.93	0.50
1:A:692:U:OP2	6:K:27:ASN:ND2	2.39	0.50
1:A:492:C:H2'	1:A:493:A:N3	2.26	0.50
1:A:867:G:O2'	1:A:873:A:N1	2.37	0.50
18:J:50:THR:HG22	18:J:62:ARG:NH2	2.26	0.50
1:A:159:G:O2'	1:A:161:A:N7	2.34	0.50
1:A:923:A:O2'	1:A:924:C:H2'	2.10	0.50
15:C:190:THR:HG22	15:C:191:THR:N	2.27	0.50
1:A:1381:U:O2	16:G:78:ARG:N	2.44	0.50
19:M:18:LEU:HD23	19:M:29:SER:HA	1.94	0.50
1:A:197:A:N1	1:A:220:G:O2'	2.43	0.50
3:E:104:ILE:HD11	3:E:119:VAL:O	2.12	0.50
1:A:1389:C:C2	1:A:1390:U:C5	3.00	0.50
1:A:1390:U:H2'	1:A:1391:U:O4'	2.12	0.50
5:H:47:ASP:OD1	5:H:61:THR:OG1	2.30	0.50
6:K:34:THR:OG1	6:K:39:ASN:N	2.45	0.50
15:C:52:SER:OG	15:C:105:VAL:HG21	2.12	0.50
1:A:459:A:N6	1:A:474:G:O6	2.45	0.49
1:A:689:C:OP1	6:K:28:ASN:ND2	2.45	0.49
1:A:712:A:H2'	1:A:713:G:C8	2.47	0.49
1:A:1084:G:OP2	1:A:1085:U:O2'	2.22	0.49
13:B:185:ILE:HG23	13:B:185:ILE:O	2.12	0.49
1:A:645:G:C2	1:A:646:G:C8	3.01	0.49
1:A:714:G:H2'	1:A:715:A:C8	2.48	0.49
1:A:878:A:OP1	5:H:79:ARG:NH1	2.46	0.49
1:A:1013:G:N2	1:A:1015:G:O5'	2.46	0.49
1:A:1180:A:OP2	17:I:98:ARG:NH2	2.45	0.49
13:B:53:LEU:CG	13:B:219:THR:HG21	2.41	0.49
13:B:203:ASP:OD1	13:B:204:ASP:N	2.46	0.49
1:A:1221:G:C2'	1:A:1222:G:O5'	2.61	0.49
1:A:1259:C:O2'	1:A:1283:U:O2	2.20	0.49
1:A:20:U:O2'	1:A:573:A:N6	2.46	0.49
1:A:321:A:H5''	1:A:328:C:H42	1.78	0.49
1:A:415:A:N1	1:A:428:G:C6	2.79	0.49
20:N:78:LEU:HD23	20:N:79:SER:N	2.27	0.49

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:29:ILE:HD12	4:F:70:VAL:HG21	1.95	0.49
11:R:32:ILE:HD13	11:R:67:LEU:HD21	1.95	0.49
15:C:52:SER:N	15:C:68:HIS:O	2.38	0.49
1:A:639:G:C2	1:A:640:A:N7	2.81	0.49
1:A:1428:A:N6	1:A:1473:G:O6	2.46	0.49
1:A:1516:G:N2	1:A:1519:A:OP2	2.45	0.49
1:A:393:A:C2	1:A:394:G:C8	3.01	0.48
1:A:475:C:C2	1:A:476:U:C5	3.01	0.48
1:A:1097:C:C4	1:A:1098:C:N4	2.81	0.48
1:A:1005:A:OP2	1:A:1024:G:N2	2.47	0.48
21:S:65:MET:HE1	21:S:68:HIS:HB3	1.95	0.48
1:A:492:C:C4	1:A:493:A:N6	2.81	0.48
1:A:1176:A:N6	1:A:1177:G:O6	2.45	0.48
1:A:1201:A:H1'	1:A:1202:U:OP2	2.13	0.48
11:R:27:THR:O	11:R:28:LEU:HD22	2.13	0.48
12:T:66:ILE:HG22	12:T:67:HIS:N	2.27	0.48
1:A:418:C:H2'	1:A:419:C:C1'	2.42	0.48
1:A:1304:G:N2	1:A:1332:A:N7	2.62	0.48
1:A:1367:C:OP1	17:I:116:GLY:N	2.40	0.48
16:G:86:VAL:HG23	16:G:86:VAL:O	2.13	0.48
1:A:327:A:O2'	1:A:329:A:OP2	2.31	0.48
1:A:1098:C:H2'	1:A:1099:G:C5	2.48	0.48
18:J:53:ILE:HG23	20:N:84:ARG:NH1	2.29	0.48
1:A:187:G:N2	1:A:190:A:OP2	2.41	0.48
1:A:981:U:OP1	20:N:8:ARG:NH1	2.45	0.48
1:A:1096:C:H2'	1:A:1097:C:C6	2.49	0.48
1:A:528:C:N4	7:L:45:ASN:OD1	2.47	0.48
1:A:562:U:OP2	7:L:13:ARG:NH2	2.47	0.48
1:A:939:G:HO2'	1:A:1375:A:H2	1.61	0.48
1:A:514:C:N4	1:A:515:G:O6	2.47	0.47
1:A:660:C:N3	1:A:746:A:N6	2.61	0.47
1:A:697:U:O2'	1:A:785:G:O2'	2.31	0.47
1:A:1160:G:O6	1:A:1182:G:O6	2.32	0.47
1:A:1351:U:O2'	16:G:32:ASP:O	2.32	0.47
20:N:78:LEU:HD23	20:N:79:SER:O	2.14	0.47
1:A:102:G:O2'	1:A:151:A:N3	2.39	0.47
1:A:637:C:OP2	10:Q:5:ARG:NH1	2.46	0.47
18:J:9:ARG:C	18:J:10:LEU:HD12	2.40	0.47
6:K:58:THR:HB	6:K:59:PRO:HD2	1.97	0.47
6:K:69:CYS:O	6:K:73:VAL:HG22	2.14	0.47
1:A:310:G:OP1	9:P:31:ARG:N	2.48	0.47

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:687:A:N6	1:A:701:U:O4'	2.47	0.47
1:A:925:G:O2'	1:A:927:G:N2	2.48	0.47
1:A:1266:G:N2	1:A:1269:A:OP2	2.47	0.47
15:C:119:ILE:CG2	15:C:197:VAL:HG21	2.39	0.47
1:A:320:A:N1	1:A:334:C:C4	2.82	0.47
1:A:375:U:H2'	1:A:376:G:O4'	2.15	0.47
1:A:684:U:H2'	1:A:685:G:O4'	2.14	0.47
1:A:962:C:N4	1:A:974:A:H61	2.13	0.47
1:A:1209:C:H42	1:A:1210:C:H42	1.62	0.47
1:A:1352:C:N4	1:A:1371:G:O6	2.48	0.47
2:D:158:LEU:CB	23:D:301:HOH:O	2.38	0.47
16:G:26:VAL:HG11	16:G:43:TYR:HE1	1.79	0.47
18:J:50:THR:HG22	18:J:62:ARG:CZ	2.45	0.47
19:M:12:LYS:HB3	19:M:17:ALA:HB2	1.97	0.47
20:N:31:SER:O	20:N:40:ARG:NE	2.48	0.47
1:A:412:A:O2'	1:A:413:G:OP2	2.24	0.47
1:A:1267:C:H42	19:M:27:THR:HB	1.80	0.47
1:A:568:G:O2'	1:A:574:A:N1	2.28	0.47
17:I:44:ARG:O	17:I:48:ARG:NH1	2.48	0.47
18:J:51:VAL:HG22	20:N:83:VAL:HG21	1.96	0.47
1:A:1210:C:O2'	1:A:1211:U:O5'	2.32	0.47
1:A:919:A:O2'	1:A:1080:A:N1	2.46	0.46
4:F:96:VAL:HG12	4:F:97:THR:N	2.29	0.46
10:Q:57:VAL:HG23	10:Q:78:VAL:HG23	1.96	0.46
15:C:168:ARG:NH2	15:C:170:GLY:O	2.48	0.46
16:G:60:ALA:O	16:G:63:VAL:HG22	2.15	0.46
1:A:1246:A:N6	1:A:1292:G:O6	2.48	0.46
1:A:1287:A:C2'	1:A:1288:A:O5'	2.64	0.46
1:A:309:A:O2'	1:A:607:A:N1	2.40	0.46
1:A:1320:C:N4	21:S:35:ARG:O	2.47	0.46
3:E:55:VAL:HG23	3:E:56:PRO:HD3	1.98	0.46
5:H:10:LEU:HD22	5:H:74:ILE:HG21	1.95	0.46
9:P:52:LEU:HD23	9:P:54:LEU:HD21	1.96	0.46
17:I:29:ILE:HG22	17:I:64:ILE:CB	2.45	0.46
1:A:7:A:C8	3:E:123:LEU:HD13	2.51	0.46
1:A:880:C:OP1	7:L:8:ARG:NH1	2.49	0.46
1:A:1001:C:N4	1:A:1002:G:O6	2.48	0.46
9:P:6:LEU:CD2	9:P:19:VAL:HG22	2.45	0.46
1:A:161:A:N1	1:A:347:G:O2'	2.39	0.46
1:A:373:A:C2	1:A:482:A:C6	3.04	0.46
1:A:974:A:H4'	1:A:975:A:H5'	1.98	0.46

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:204:G:N3	1:A:204:G:H2'	2.30	0.46
1:A:1124:G:O2'	1:A:1127:G:O6	2.33	0.46
1:A:1148:U:C5'	17:I:8:THR:HG23	2.46	0.46
9:P:71:VAL:O	9:P:75:ILE:HG12	2.16	0.46
15:C:38:VAL:HG11	15:C:90:VAL:HG23	1.96	0.46
20:N:87:ALA:HA	20:N:92:ILE:HD11	1.98	0.46
1:A:211:G:P	1:A:211:G:H21	2.39	0.46
1:A:362:G:N2	1:A:365:U:OP2	2.48	0.46
1:A:563:A:C2'	1:A:564:C:OP2	2.63	0.46
1:A:1089:G:N7	1:A:1090:U:C5	2.84	0.46
6:K:33:ILE:HG22	6:K:42:GLY:O	2.16	0.46
8:O:38:LEU:HD12	8:O:58:MET:HE1	1.97	0.46
16:G:26:VAL:HG11	16:G:43:TYR:CE1	2.51	0.46
1:A:31:G:N1	1:A:48:C:O5'	2.50	0.45
1:A:1060:U:H2'	1:A:1061:G:H8	1.81	0.45
1:A:1266:G:N1	1:A:1269:A:OP2	2.45	0.45
1:A:977:A:O2'	1:A:981:U:O4	2.34	0.45
1:A:1148:U:O2	1:A:1148:U:H2'	2.15	0.45
1:A:1219:A:N6	1:A:1220:G:O6	2.49	0.45
6:K:58:THR:CB	6:K:59:PRO:HD2	2.46	0.45
15:C:190:THR:HG22	15:C:191:THR:H	1.81	0.45
1:A:1343:G:OP1	17:I:129:ARG:NH2	2.47	0.45
13:B:206:ILE:HD12	13:B:206:ILE:H	1.81	0.45
16:G:49:LEU:HD11	16:G:120:ALA:HA	1.99	0.45
1:A:918:A:H2'	1:A:919:A:O4'	2.16	0.45
3:E:46:GLY:O	3:E:47:PHE:C	2.59	0.45
1:A:8:A:N6	2:D:201:GLU:O	2.46	0.45
1:A:958:A:N6	21:S:76:THR:O	2.49	0.45
2:D:21:LYS:O	2:D:25:ARG:NH2	2.47	0.45
1:A:157:U:O2	1:A:164:G:C6	2.67	0.45
1:A:515:G:OP2	1:A:532:A:N6	2.49	0.45
1:A:1382:C:O2'	16:G:78:ARG:NH1	2.47	0.45
19:M:76:ILE:O	19:M:80:MET:N	2.45	0.45
1:A:120:A:HO2'	1:A:121:U:C5'	2.29	0.45
1:A:958:A:O4'	21:S:54:ARG:NH2	2.43	0.45
1:A:1217:C:OP1	20:N:8:ARG:NH2	2.46	0.45
1:A:769:G:H4'	1:A:1513:A:H4'	1.99	0.45
7:L:20:VAL:HG23	7:L:20:VAL:O	2.16	0.45
7:L:101:LEU:HG	7:L:102:ASP:H	1.82	0.45
21:S:66:VAL:HG23	21:S:67:GLY:N	2.31	0.45
1:A:1110:A:N1	1:A:1111:A:N6	2.65	0.45

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:R:27:THR:C	11:R:28:LEU:HD22	2.42	0.45
1:A:309:A:C2	1:A:310:G:N7	2.85	0.44
1:A:594:U:H2'	1:A:595:A:O4'	2.16	0.44
1:A:1268:G:H21	1:A:1327:C:H4'	1.82	0.44
13:B:129:THR:HA	23:B:303:HOH:O	2.17	0.44
1:A:439:U:O3'	2:D:120:LYS:NZ	2.50	0.44
1:A:1240:U:O2	16:G:34:LYS:NZ	2.41	0.44
2:D:200:VAL:HG23	2:D:201:GLU:OE1	2.17	0.44
1:A:554:A:C2	1:A:555:U:C4	3.06	0.44
1:A:1506:U:O2	6:K:127:ARG:NH1	2.44	0.44
2:D:6:PRO:HG3	2:D:10:LEU:HD13	1.99	0.44
3:E:113:VAL:HG11	3:E:136:VAL:HG23	1.99	0.44
6:K:51:PHE:HD2	6:K:61:ALA:HB2	1.82	0.44
1:A:337:G:H2'	1:A:338:A:C8	2.52	0.44
1:A:610:U:O2	1:A:610:U:O4'	2.35	0.44
4:F:70:VAL:O	4:F:73:GLU:HG3	2.17	0.44
15:C:148:ILE:HD12	15:C:201:ILE:HG13	1.98	0.44
18:J:7:ARG:NH2	18:J:102:LEU:O	2.48	0.44
20:N:73:LEU:HD23	20:N:75:LYS:CE	2.47	0.44
1:A:335:C:C2	1:A:336:A:C8	3.05	0.44
1:A:715:A:H2'	1:A:716:A:C8	2.53	0.44
1:A:793:U:O2	1:A:1516:G:O2'	2.36	0.44
1:A:875:U:N3	1:A:876:C:C5	2.86	0.44
7:L:65:TYR:O	7:L:96:THR:HG22	2.18	0.44
12:T:19:HIS:HE1	23:T:101:HOH:O	1.86	0.44
1:A:422:C:O3'	1:A:423:G:N2	2.51	0.44
1:A:1124:G:H5''	18:J:37:ARG:HB3	1.99	0.44
15:C:87:ARG:HG3	15:C:100:ILE:HG22	2.00	0.44
1:A:1186:G:N2	20:N:100:TRP:OXT	2.51	0.44
16:G:137:ARG:O	16:G:141:HIS:ND1	2.50	0.44
18:J:62:ARG:O	18:J:62:ARG:HD3	2.17	0.44
5:H:47:ASP:OD1	5:H:47:ASP:N	2.50	0.44
13:B:116:LEU:HD11	13:B:140:LEU:HD23	2.00	0.44
19:M:21:ILE:HG22	19:M:23:GLY:H	1.83	0.44
1:A:323:U:H2'	1:A:324:G:O4'	2.18	0.44
1:A:1391:U:O4'	1:A:1391:U:O2	2.36	0.44
17:I:18:VAL:HG21	17:I:81:GLY:C	2.42	0.44
1:A:600:A:C6	1:A:639:G:C6	3.06	0.43
1:A:1244:G:C6	1:A:1294:G:O6	2.70	0.43
2:D:144:ILE:HD13	2:D:177:MET:CE	2.47	0.43
4:F:36:ILE:HG22	4:F:64:VAL:HG22	2.00	0.43

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:K:41:LEU:H	6:K:41:LEU:HD23	1.83	0.43
1:A:739:C:H2'	1:A:740:U:O4'	2.18	0.43
1:A:994:A:N3	1:A:994:A:H2'	2.33	0.43
1:A:1287:A:O2'	1:A:1288:A:O5'	2.31	0.43
1:A:86:G:O2'	1:A:87:C:OP2	2.22	0.43
1:A:415:A:C6	1:A:428:G:O6	2.69	0.43
1:A:960:U:O2	1:A:960:U:O4'	2.36	0.43
1:A:994:A:N6	1:A:1216:A:O4'	2.51	0.43
1:A:1250:A:H4'	17:I:68:GLY:HA2	1.99	0.43
20:N:9:GLU:O	20:N:13:VAL:HG22	2.18	0.43
8:O:61:GLN:O	8:O:65:LEU:HD23	2.18	0.43
1:A:35:G:O2'	7:L:114:SER:O	2.30	0.43
1:A:204:G:C4	1:A:205:A:C8	3.07	0.43
1:A:1083:U:H3'	1:A:1084:G:C8	2.53	0.43
1:A:1109:C:H2'	1:A:1110:A:O4'	2.18	0.43
1:A:1210:C:O2'	1:A:1211:U:OP1	2.36	0.43
1:A:861:G:H21	1:A:874:G:H5'	1.83	0.43
4:F:64:VAL:HG12	4:F:65:GLU:N	2.33	0.43
6:K:80:ASN:C	6:K:81:LEU:HD22	2.44	0.43
17:I:66:VAL:HG13	17:I:66:VAL:O	2.19	0.43
1:A:935:A:C2'	1:A:1383:C:H42	2.32	0.43
1:A:1060:U:H5'	18:J:53:ILE:HG21	2.00	0.43
1:A:1061:G:C6	1:A:1197:A:C2	3.06	0.43
1:A:1387:G:H2'	1:A:1388:C:O4'	2.19	0.43
4:F:6:ILE:HG22	4:F:89:VAL:HA	1.99	0.43
1:A:859:G:OP2	1:A:869:G:N1	2.44	0.43
1:A:1408:A:N3	1:A:1408:A:H2'	2.33	0.43
2:D:151:GLN:HG3	2:D:152:SER:H	1.84	0.43
15:C:120:THR:HG21	15:C:186:SER:HB3	2.01	0.43
1:A:238:A:C2'	1:A:239:U:OP1	2.67	0.43
1:A:520:A:OP2	7:L:47:ALA:HB1	2.19	0.43
1:A:713:G:H2'	1:A:714:G:C8	2.54	0.43
9:P:6:LEU:HD21	9:P:19:VAL:HG22	2.01	0.43
19:M:103:THR:HG22	19:M:104:ASN:N	2.34	0.43
1:A:320:A:H2'	1:A:321:A:C8	2.54	0.43
1:A:424:G:H2'	1:A:425:G:C8	2.53	0.43
1:A:979:C:O2'	1:A:980:C:OP1	2.34	0.43
1:A:1061:G:C6	1:A:1062:U:C5	3.07	0.43
12:T:34:VAL:HG12	12:T:78:LEU:HD22	2.01	0.43
1:A:15:G:O4'	1:A:1396:A:O2'	2.35	0.42
1:A:436:C:H4'	2:D:152:SER:CB	2.49	0.42

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1327:C:C2	1:A:1328:C:C6	3.07	0.42
1:A:1368:A:N7	17:I:113:LYS:NZ	2.64	0.42
1:A:1441:A:H62	1:A:1461:G:N2	2.18	0.42
15:C:52:SER:CB	15:C:105:VAL:HG21	2.49	0.42
1:A:1114:C:O2'	20:N:99:SER:O	2.26	0.42
1:A:1352:C:H2'	1:A:1353:G:O4'	2.19	0.42
1:A:1354:U:H2'	1:A:1355:G:O4'	2.19	0.42
2:D:189:ASP:OD1	2:D:189:ASP:N	2.48	0.42
4:F:94:HIS:O	4:F:95:ALA:C	2.61	0.42
13:B:46:VAL:N	13:B:47:PRO:CD	2.82	0.42
13:B:192:PRO:O	13:B:195:VAL:HG22	2.20	0.42
18:J:40:ILE:HB	18:J:73:LEU:HB3	2.02	0.42
1:A:477:C:H2'	1:A:478:A:C8	2.55	0.42
1:A:1161:C:C2	1:A:1162:C:C5	3.07	0.42
1:A:922:G:H2'	1:A:923:A:O4'	2.19	0.42
1:A:1088:G:H2'	1:A:1089:G:C8	2.54	0.42
1:A:1399:C:O2	1:A:1502:A:N6	2.53	0.42
15:C:39:ARG:NH1	20:N:91:GLU:OE2	2.52	0.42
1:A:373:A:C2	1:A:374:A:C8	3.08	0.42
1:A:1060:U:H2'	1:A:1061:G:C8	2.55	0.42
2:D:176:LYS:C	2:D:177:MET:HG3	2.45	0.42
13:B:124:THR:O	13:B:130:LYS:NZ	2.32	0.42
19:M:82:LEU:C	19:M:84:CYS:H	2.27	0.42
1:A:238:A:O2'	1:A:239:U:OP1	2.30	0.42
2:D:144:ILE:HD13	2:D:177:MET:HE1	2.02	0.42
15:C:166:TRP:O	15:C:167:TYR:C	2.63	0.42
16:G:68:VAL:HG12	16:G:68:VAL:O	2.20	0.42
17:I:12:LYS:O	17:I:13:SER:OG	2.29	0.42
21:S:30:LEU:O	21:S:49:ALA:HB3	2.20	0.42
1:A:320:A:O2'	1:A:1435:G:O2'	2.34	0.42
1:A:328:C:C4'	1:A:329:A:OP2	2.67	0.42
1:A:1015:G:H2'	1:A:1016:A:O4'	2.20	0.42
3:E:46:GLY:O	3:E:66:ALA:HB1	2.20	0.42
1:A:580:C:H2'	1:A:581:G:O4'	2.19	0.42
1:A:1316:G:N2	1:A:1319:A:OP2	2.46	0.42
18:J:42:LEU:HD13	18:J:71:LEU:HG	2.01	0.42
1:A:972:C:O2'	18:J:57:VAL:O	2.31	0.41
1:A:1111:A:O2'	1:A:1112:C:P	2.78	0.41
1:A:1225:A:HO2'	1:A:1226:C:P	2.33	0.41
1:A:1328:C:H2'	1:A:1329:A:H8	1.85	0.41
3:E:80:LEU:HG	3:E:146:MET:HE1	2.01	0.41

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:350:G:H2'	1:A:351:G:C8	2.55	0.41
1:A:491:G:C6	1:A:492:C:N4	2.88	0.41
5:H:103:VAL:HG12	5:H:124:ILE:HA	2.02	0.41
11:R:25:ILE:HG22	11:R:29:LYS:NZ	2.35	0.41
1:A:1099:G:H2'	1:A:1100:C:O4'	2.19	0.41
1:A:1232:U:H2'	1:A:1233:G:C8	2.55	0.41
1:A:1302:C:HO2'	19:M:26:LYS:HZ2	1.59	0.41
1:A:1332:A:N3	19:M:107:THR:HG21	2.35	0.41
1:A:1371:G:H4'	17:I:70:GLY:HA3	2.02	0.41
3:E:55:VAL:N	3:E:56:PRO:HD2	2.35	0.41
8:O:2:LEU:HD23	8:O:30:LEU:HD11	2.03	0.41
1:A:511:C:O2'	1:A:512:U:OP2	2.27	0.41
1:A:600:A:N6	1:A:639:G:O6	2.53	0.41
1:A:993:G:H2'	1:A:993:G:N3	2.35	0.41
1:A:1180:A:H5'	17:I:104:THR:HG23	2.03	0.41
6:K:24:ALA:HA	6:K:29:THR:HG22	2.01	0.41
1:A:336:A:C2	1:A:337:G:C5	3.08	0.41
1:A:418:C:H2'	1:A:419:C:O4'	2.20	0.41
1:A:921:U:C2	1:A:922:G:C8	3.09	0.41
12:T:34:VAL:CG1	12:T:78:LEU:HD22	2.50	0.41
14:U:39:LYS:N	14:U:40:PRO:HD2	2.35	0.41
18:J:53:ILE:HG23	20:N:84:ARG:HH11	1.83	0.41
20:N:49:THR:HG22	20:N:49:THR:O	2.21	0.41
1:A:1125:U:O5'	18:J:37:ARG:NH1	2.54	0.41
1:A:1327:C:N3	1:A:1328:C:C5	2.88	0.41
19:M:2:ARG:HD3	19:M:8:ILE:HD13	2.03	0.41
20:N:73:LEU:HD23	20:N:75:LYS:HE3	2.02	0.41
1:A:734:G:C5	1:A:735:C:C5	3.09	0.41
1:A:750:C:O2'	8:O:22:GLY:N	2.46	0.41
1:A:1179:A:H4'	17:I:104:THR:HA	2.02	0.41
1:A:34:C:H2'	1:A:35:G:H8	1.86	0.41
1:A:464:U:N3	1:A:466:A:OP2	2.53	0.41
1:A:1087:G:C2'	1:A:1088:G:O5'	2.69	0.41
1:A:1144:G:H2'	1:A:1145:A:O4'	2.21	0.41
1:A:308:C:C2	1:A:309:A:C8	3.08	0.41
1:A:546:A:OP2	2:D:67:LEU:HD12	2.21	0.41
1:A:1197:A:C2	1:A:1198:G:C5	3.08	0.41
13:B:62:ARG:HD2	13:B:62:ARG:O	2.21	0.41
13:B:193:ASP:OD1	13:B:194:GLY:N	2.53	0.41
16:G:34:LYS:HD2	16:G:34:LYS:O	2.21	0.41
21:S:15:LEU:HD12	21:S:18:VAL:HG11	2.03	0.41

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:17:U:C2	1:A:18:C:C5	3.08	0.41
1:A:334:C:C2	1:A:335:C:C5	3.08	0.41
18:J:71:LEU:HD23	18:J:71:LEU:H	1.86	0.41
1:A:812:G:H2'	1:A:812:G:N3	2.36	0.40
1:A:876:C:C2	1:A:877:G:C8	3.10	0.40
1:A:910:C:C2	1:A:911:U:C5	3.09	0.40
1:A:1253:G:OP1	18:J:46:LYS:N	2.40	0.40
1:A:1014:A:C3'	1:A:1015:G:C8	3.04	0.40
1:A:1157:A:HO2'	1:A:1158:C:P	2.42	0.40
1:A:1346:A:OP1	17:I:121:ARG:NH1	2.52	0.40
15:C:128:MET:SD	15:C:130:ARG:N	2.91	0.40
1:A:757:U:OP1	1:A:822:U:O2'	2.34	0.40
1:A:877:G:C2'	1:A:878:A:H5'	2.51	0.40
1:A:1519:A:H3'	1:A:1520:C:C5'	2.51	0.40
3:E:104:ILE:O	3:E:111:ARG:NH1	2.55	0.40
15:C:38:VAL:CG1	15:C:90:VAL:HG23	2.51	0.40
16:G:34:LYS:HB2	16:G:37:THR:HB	2.02	0.40
21:S:28:LYS:O	21:S:29:PRO:C	2.64	0.40
1:A:17:U:HO2'	1:A:18:C:H6	1.65	0.40
1:A:1061:G:O6	1:A:1197:A:C6	2.74	0.40
1:A:1099:G:H2'	1:A:1100:C:C6	2.56	0.40
1:A:1197:A:N1	1:A:1198:G:C6	2.89	0.40
1:A:1372:U:H5''	17:I:72:SER:HB2	2.03	0.40
16:G:52:ARG:NH2	16:G:124:SER:OG	2.52	0.40
17:I:18:VAL:HG13	17:I:64:ILE:CD1	2.52	0.40
19:M:18:LEU:HD12	19:M:21:ILE:HG13	2.02	0.40
1:A:309:A:C2	1:A:310:G:C8	3.10	0.40
1:A:1388:C:O2'	1:A:1389:C:H5'	2.22	0.40
8:O:35:ILE:O	8:O:39:GLN:HG2	2.22	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	
2	D	203/205 (99%)	191 (94%)	12 (6%)	0	100	100
3	E	148/166 (89%)	136 (92%)	12 (8%)	0	100	100
4	F	98/135 (73%)	91 (93%)	7 (7%)	0	100	100
5	H	127/129 (98%)	122 (96%)	4 (3%)	1 (1%)	16	44
6	K	115/128 (90%)	105 (91%)	10 (9%)	0	100	100
7	L	121/123 (98%)	108 (89%)	13 (11%)	0	100	100
8	O	86/89 (97%)	86 (100%)	0	0	100	100
9	P	80/82 (98%)	73 (91%)	7 (9%)	0	100	100
10	Q	78/83 (94%)	76 (97%)	2 (3%)	0	100	100
11	R	53/74 (72%)	50 (94%)	3 (6%)	0	100	100
12	T	83/86 (96%)	82 (99%)	1 (1%)	0	100	100
13	B	216/240 (90%)	195 (90%)	21 (10%)	0	100	100
14	U	16/71 (22%)	13 (81%)	3 (19%)	0	100	100
15	C	204/232 (88%)	184 (90%)	20 (10%)	0	100	100
16	G	148/178 (83%)	143 (97%)	5 (3%)	0	100	100
17	I	125/129 (97%)	113 (90%)	12 (10%)	0	100	100
18	J	96/103 (93%)	81 (84%)	15 (16%)	0	100	100
19	M	112/117 (96%)	103 (92%)	9 (8%)	0	100	100
20	N	92/100 (92%)	88 (96%)	4 (4%)	0	100	100
21	S	77/91 (85%)	70 (91%)	7 (9%)	0	100	100
All	All	2278/2561 (89%)	2110 (93%)	167 (7%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	H	71	VAL

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	D	172/172 (100%)	172 (100%)	0	100	100
3	E	113/125 (90%)	113 (100%)	0	100	100
4	F	87/116 (75%)	87 (100%)	0	100	100
5	H	104/104 (100%)	104 (100%)	0	100	100
6	K	90/98 (92%)	90 (100%)	0	100	100
7	L	103/103 (100%)	103 (100%)	0	100	100
8	O	76/77 (99%)	76 (100%)	0	100	100
9	P	65/65 (100%)	65 (100%)	0	100	100
10	Q	74/77 (96%)	74 (100%)	0	100	100
11	R	48/64 (75%)	48 (100%)	0	100	100
12	T	65/65 (100%)	65 (100%)	0	100	100
13	B	180/198 (91%)	180 (100%)	0	100	100
14	U	15/61 (25%)	15 (100%)	0	100	100
15	C	170/189 (90%)	169 (99%)	1 (1%)	84	94
16	G	123/146 (84%)	123 (100%)	0	100	100
17	I	105/106 (99%)	105 (100%)	0	100	100
18	J	86/90 (96%)	86 (100%)	0	100	100
19	M	92/95 (97%)	92 (100%)	0	100	100
20	N	79/83 (95%)	79 (100%)	0	100	100
21	S	70/78 (90%)	70 (100%)	0	100	100
All	All	1917/2112 (91%)	1916 (100%)	1 (0%)	92	98

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
15	C	119	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
7	L	76	HIS
8	O	61	GLN
9	P	18	GLN
11	R	51	GLN
16	G	8	GLN

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
17	I	3	ASN
20	N	48	GLN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	1529/1542 (99%)	359 (23%)	17 (1%)

All (359) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	9	G
1	A	18	C
1	A	22	G
1	A	31	G
1	A	39	G
1	A	45	G
1	A	47	C
1	A	48	C
1	A	51	A
1	A	54	C
1	A	61	G
1	A	66	A
1	A	72	A
1	A	77	A
1	A	83	C
1	A	84	U
1	A	85	U
1	A	86	G
1	A	87	C
1	A	89	U
1	A	95	C
1	A	108	G
1	A	109	A
1	A	121	U
1	A	122	G
1	A	131	A
1	A	141	G
1	A	144	G
1	A	149	A
1	A	158	G

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	163	C
1	A	168	G
1	A	171	A
1	A	172	A
1	A	173	U
1	A	182	A
1	A	183	C
1	A	195	A
1	A	202	G
1	A	203	G
1	A	204	G
1	A	205	A
1	A	209	U
1	A	210	C
1	A	226	G
1	A	239	U
1	A	240	G
1	A	245	U
1	A	247	G
1	A	251	G
1	A	256	U
1	A	257	G
1	A	258	G
1	A	266	G
1	A	267	C
1	A	280	C
1	A	289	G
1	A	300	A
1	A	306	A
1	A	321	A
1	A	322	C
1	A	328	C
1	A	329	A
1	A	332	G
1	A	337	G
1	A	339	C
1	A	345	C
1	A	347	G
1	A	352	C
1	A	353	A
1	A	354	G
1	A	367	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	369	G
1	A	372	C
1	A	373	A
1	A	375	U
1	A	381	C
1	A	384	G
1	A	395	C
1	A	398	U
1	A	406	G
1	A	409	U
1	A	410	G
1	A	411	A
1	A	412	A
1	A	413	G
1	A	415	A
1	A	421	U
1	A	422	C
1	A	424	G
1	A	429	U
1	A	434	U
1	A	451	A
1	A	463	U
1	A	464	U
1	A	465	A
1	A	466	A
1	A	467	U
1	A	468	A
1	A	469	C
1	A	484	G
1	A	486	U
1	A	492	C
1	A	493	A
1	A	494	G
1	A	495	A
1	A	496	A
1	A	497	G
1	A	509	A
1	A	511	C
1	A	512	U
1	A	517	G
1	A	518	C
1	A	519	C

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	521	G
1	A	527	G
1	A	531	U
1	A	532	A
1	A	533	A
1	A	547	A
1	A	559	A
1	A	562	U
1	A	564	C
1	A	572	A
1	A	573	A
1	A	575	G
1	A	576	C
1	A	577	G
1	A	588	G
1	A	596	A
1	A	633	G
1	A	653	U
1	A	665	A
1	A	671	G
1	A	687	A
1	A	694	A
1	A	702	A
1	A	710	G
1	A	724	G
1	A	734	G
1	A	742	G
1	A	747	A
1	A	748	G
1	A	755	G
1	A	764	C
1	A	781	A
1	A	793	U
1	A	794	A
1	A	812	G
1	A	817	C
1	A	820	U
1	A	821	G
1	A	841	C
1	A	842	U
1	A	843	U
1	A	844	G

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	845	A
1	A	849	G
1	A	851	G
1	A	878	A
1	A	901	A
1	A	902	G
1	A	914	A
1	A	924	C
1	A	925	G
1	A	926	G
1	A	927	G
1	A	932	C
1	A	934	C
1	A	935	A
1	A	938	A
1	A	945	G
1	A	946	A
1	A	948	C
1	A	951	G
1	A	960	U
1	A	966	G
1	A	967	C
1	A	968	A
1	A	969	A
1	A	971	G
1	A	974	A
1	A	975	A
1	A	976	G
1	A	977	A
1	A	978	A
1	A	980	C
1	A	981	U
1	A	983	A
1	A	984	C
1	A	991	U
1	A	992	U
1	A	993	G
1	A	994	A
1	A	1002	G
1	A	1004	A
1	A	1010	U
1	A	1011	C

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	1017	U
1	A	1020	G
1	A	1024	G
1	A	1026	G
1	A	1030	U
1	A	1031	C
1	A	1032	G
1	A	1033	G
1	A	1036	A
1	A	1045	C
1	A	1049	U
1	A	1052	U
1	A	1054	C
1	A	1055	A
1	A	1063	C
1	A	1064	G
1	A	1065	U
1	A	1066	C
1	A	1070	U
1	A	1081	A
1	A	1085	U
1	A	1088	G
1	A	1090	U
1	A	1094	G
1	A	1099	G
1	A	1101	A
1	A	1108	G
1	A	1111	A
1	A	1112	C
1	A	1118	U
1	A	1125	U
1	A	1126	U
1	A	1127	G
1	A	1129	C
1	A	1130	A
1	A	1134	G
1	A	1136	C
1	A	1137	C
1	A	1138	G
1	A	1139	G
1	A	1140	C
1	A	1142	G

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	1145	A
1	A	1146	A
1	A	1151	A
1	A	1152	A
1	A	1157	A
1	A	1158	C
1	A	1159	U
1	A	1160	G
1	A	1161	C
1	A	1168	U
1	A	1169	A
1	A	1178	G
1	A	1181	G
1	A	1183	U
1	A	1184	G
1	A	1187	G
1	A	1188	A
1	A	1190	G
1	A	1191	A
1	A	1195	C
1	A	1196	A
1	A	1197	A
1	A	1198	G
1	A	1202	U
1	A	1211	U
1	A	1212	U
1	A	1213	A
1	A	1214	C
1	A	1215	G
1	A	1222	G
1	A	1224	U
1	A	1226	C
1	A	1227	A
1	A	1228	C
1	A	1236	A
1	A	1238	A
1	A	1240	U
1	A	1249	C
1	A	1250	A
1	A	1255	G
1	A	1256	A
1	A	1258	G

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	1260	G
1	A	1267	C
1	A	1268	G
1	A	1277	C
1	A	1278	G
1	A	1279	G
1	A	1280	A
1	A	1281	C
1	A	1285	A
1	A	1286	U
1	A	1287	A
1	A	1288	A
1	A	1297	G
1	A	1298	U
1	A	1300	G
1	A	1301	U
1	A	1302	C
1	A	1303	C
1	A	1305	G
1	A	1307	U
1	A	1308	U
1	A	1313	U
1	A	1320	C
1	A	1322	C
1	A	1323	G
1	A	1331	G
1	A	1336	C
1	A	1337	G
1	A	1340	A
1	A	1342	C
1	A	1345	U
1	A	1347	G
1	A	1348	U
1	A	1351	U
1	A	1353	G
1	A	1360	A
1	A	1361	G
1	A	1363	A
1	A	1370	G
1	A	1371	G
1	A	1377	A
1	A	1378	C

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	1380	U
1	A	1381	U
1	A	1388	C
1	A	1389	C
1	A	1390	U
1	A	1391	U
1	A	1392	G
1	A	1393	U
1	A	1397	C
1	A	1398	A
1	A	1399	C
1	A	1403	C
1	A	1409	C
1	A	1419	G
1	A	1428	A
1	A	1440	U
1	A	1446	A
1	A	1451	U
1	A	1452	C
1	A	1453	G
1	A	1492	A
1	A	1493	A
1	A	1499	A
1	A	1503	A
1	A	1504	G
1	A	1506	U
1	A	1507	A
1	A	1517	G
1	A	1519	A
1	A	1520	C
1	A	1529	G
1	A	1530	G
1	A	1531	A
1	A	1533	C
1	A	1534	A

All (17) RNA pucker outliers are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	60	A
1	A	120	A
1	A	202	G

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	A	203	G
1	A	238	A
1	A	328	C
1	A	485	U
1	A	493	A
1	A	563	A
1	A	931	C
1	A	979	C
1	A	1065	U
1	A	1201	A
1	A	1210	C
1	A	1225	A
1	A	1300	G
1	A	1388	C

#### 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 77 ligands modelled in this entry, 77 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

There are no chain breaks in this entry.

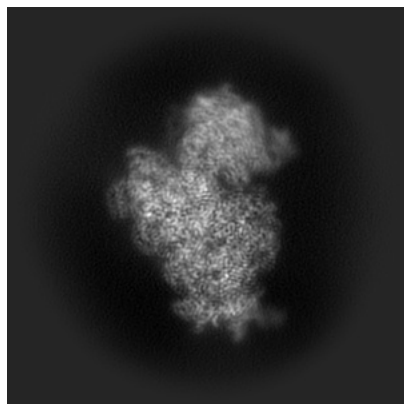
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-75144. These allow visual inspection of the internal detail of the map and identification of artifacts.

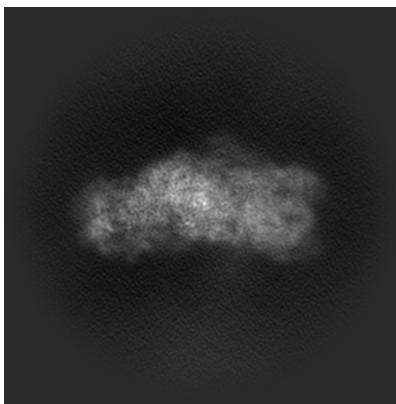
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

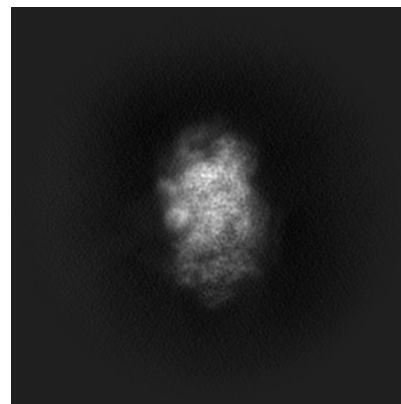
#### 6.1.1 Primary map



X

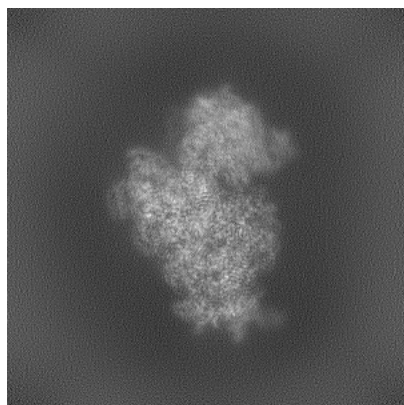


Y

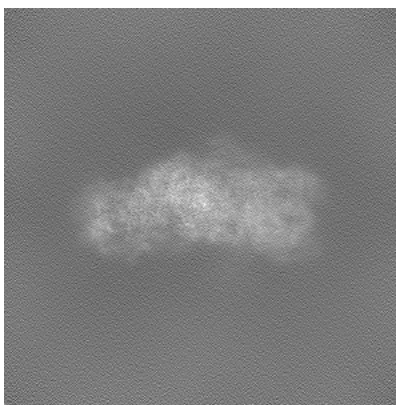


Z

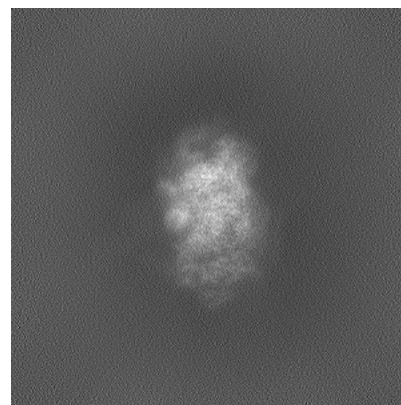
#### 6.1.2 Raw map



X



Y

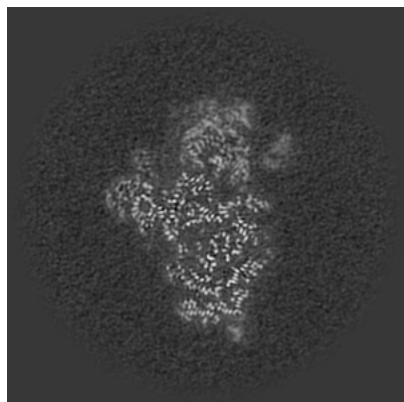


Z

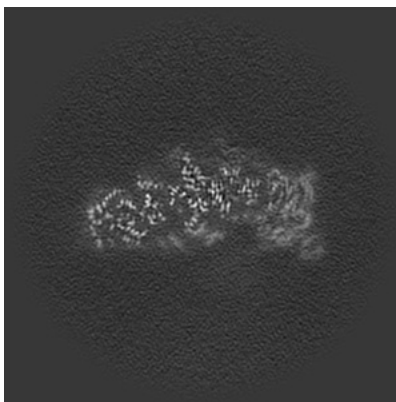
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

### 6.2.1 Primary map



X Index: 224

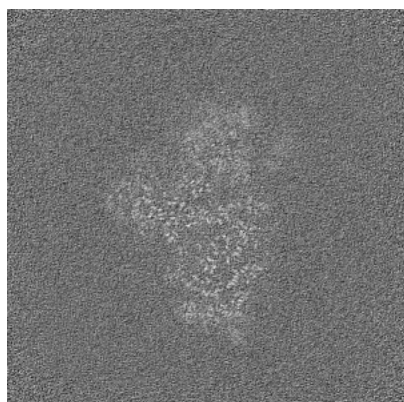


Y Index: 224

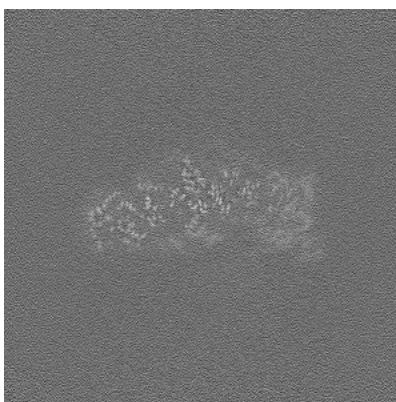


Z Index: 224

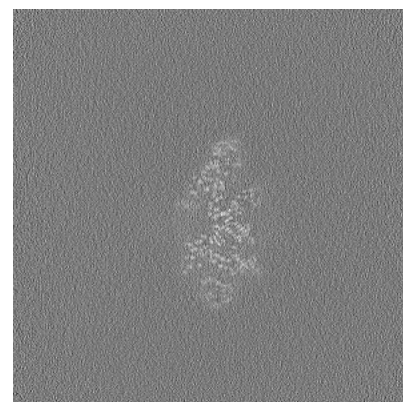
### 6.2.2 Raw map



X Index: 224



Y Index: 224

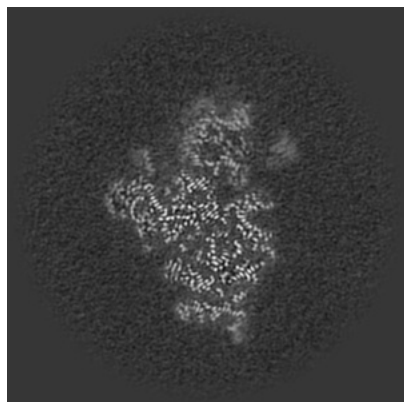


Z Index: 224

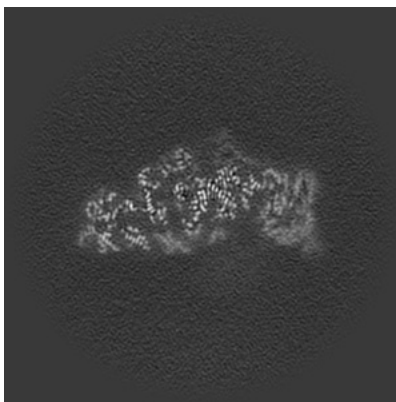
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

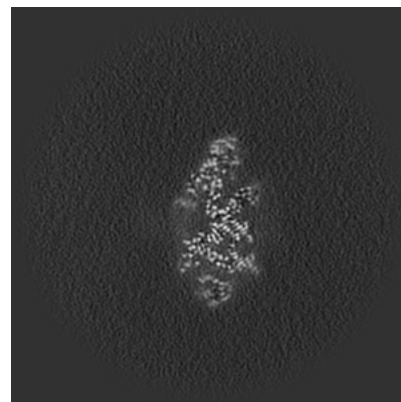
### 6.3.1 Primary map



X Index: 228

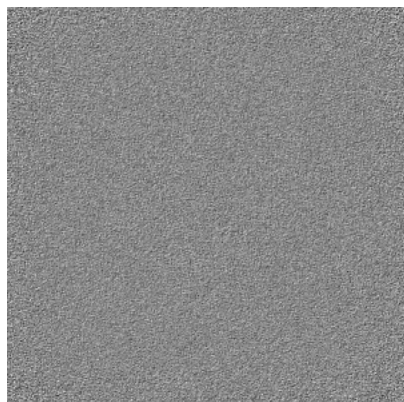


Y Index: 218

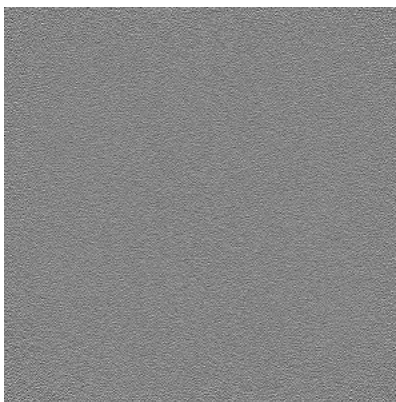


Z Index: 224

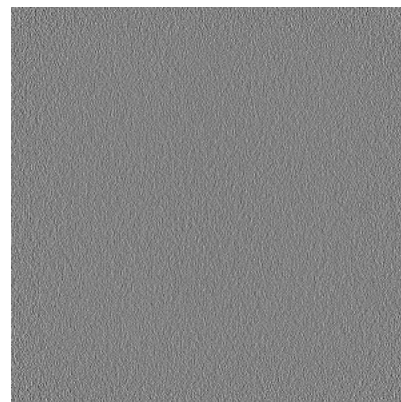
### 6.3.2 Raw map



X Index: 0



Y Index: 0

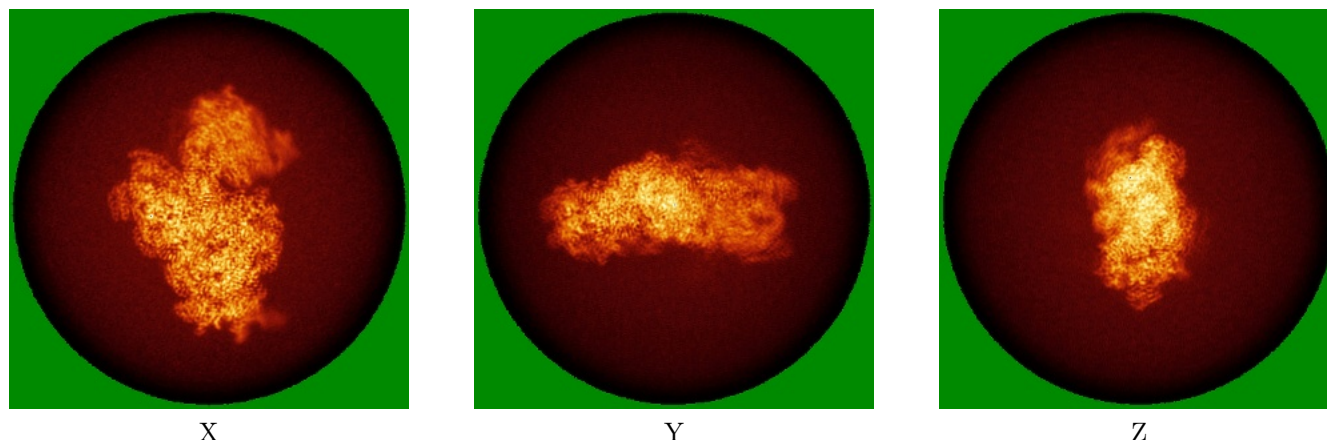


Z Index: 0

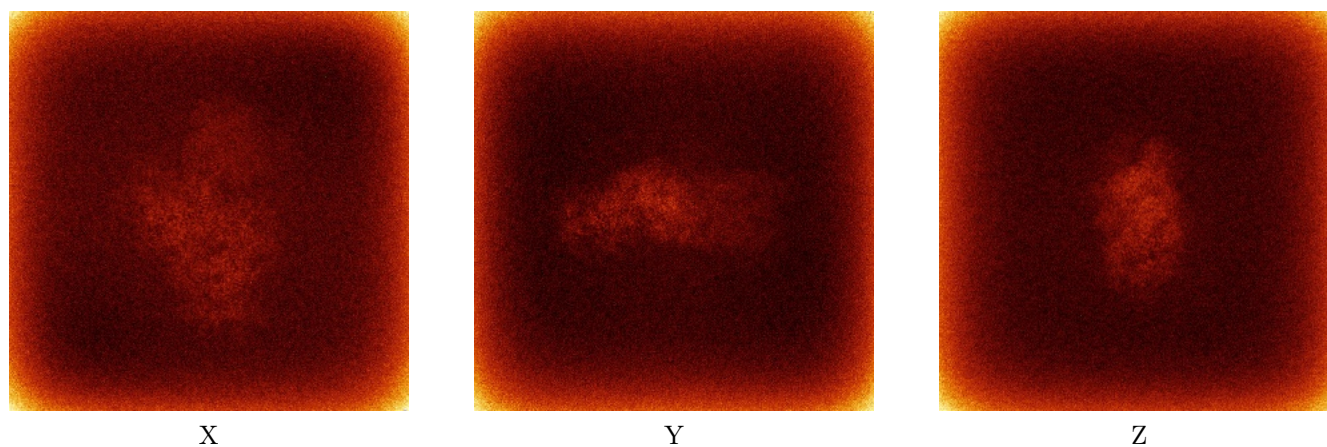
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



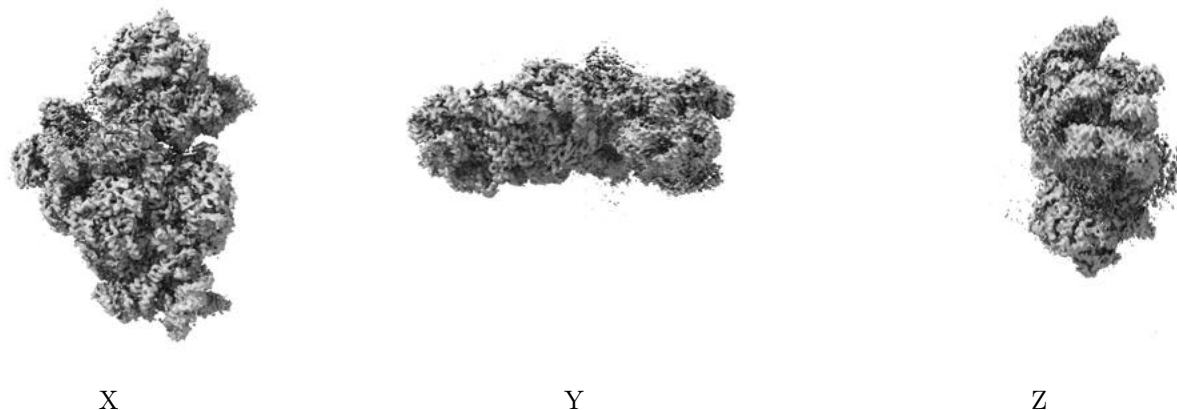
### 6.4.2 Raw map



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.

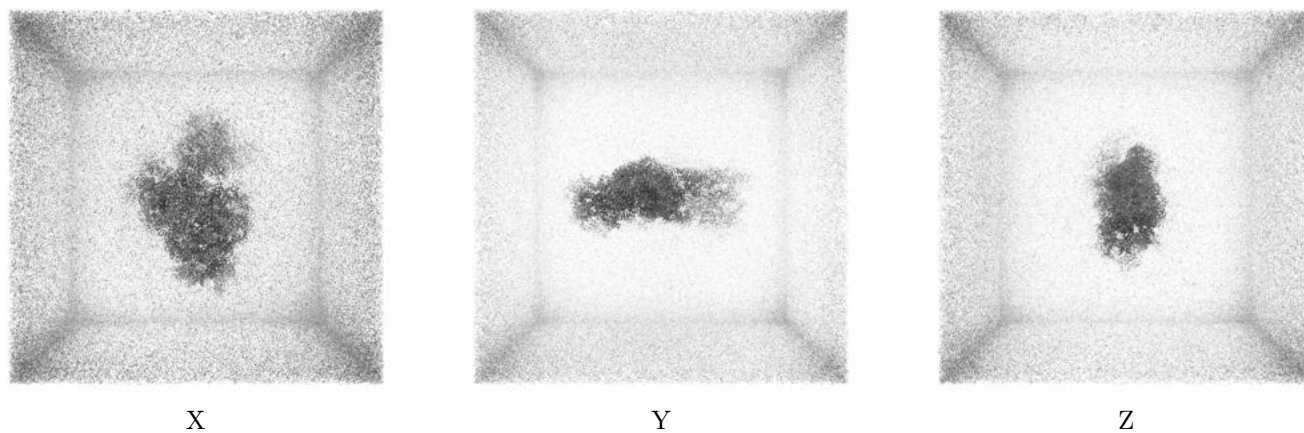
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.108. 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.

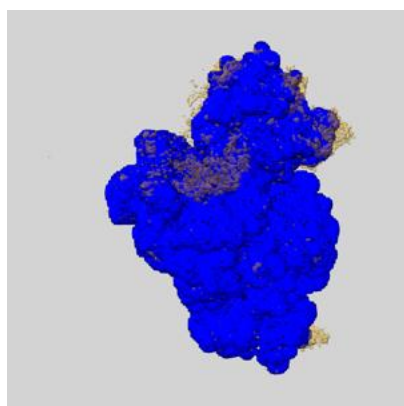
## 6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

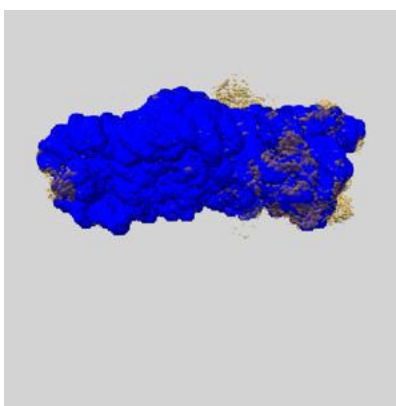
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

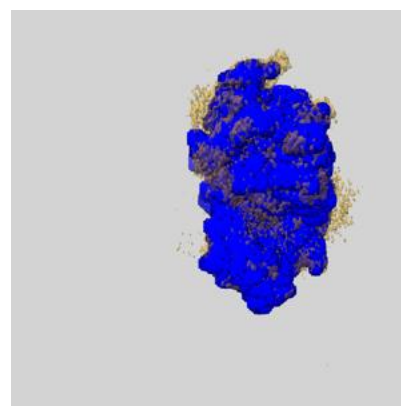
### 6.6.1 emd\_75144\_msk\_1.map [i](#)



X



Y

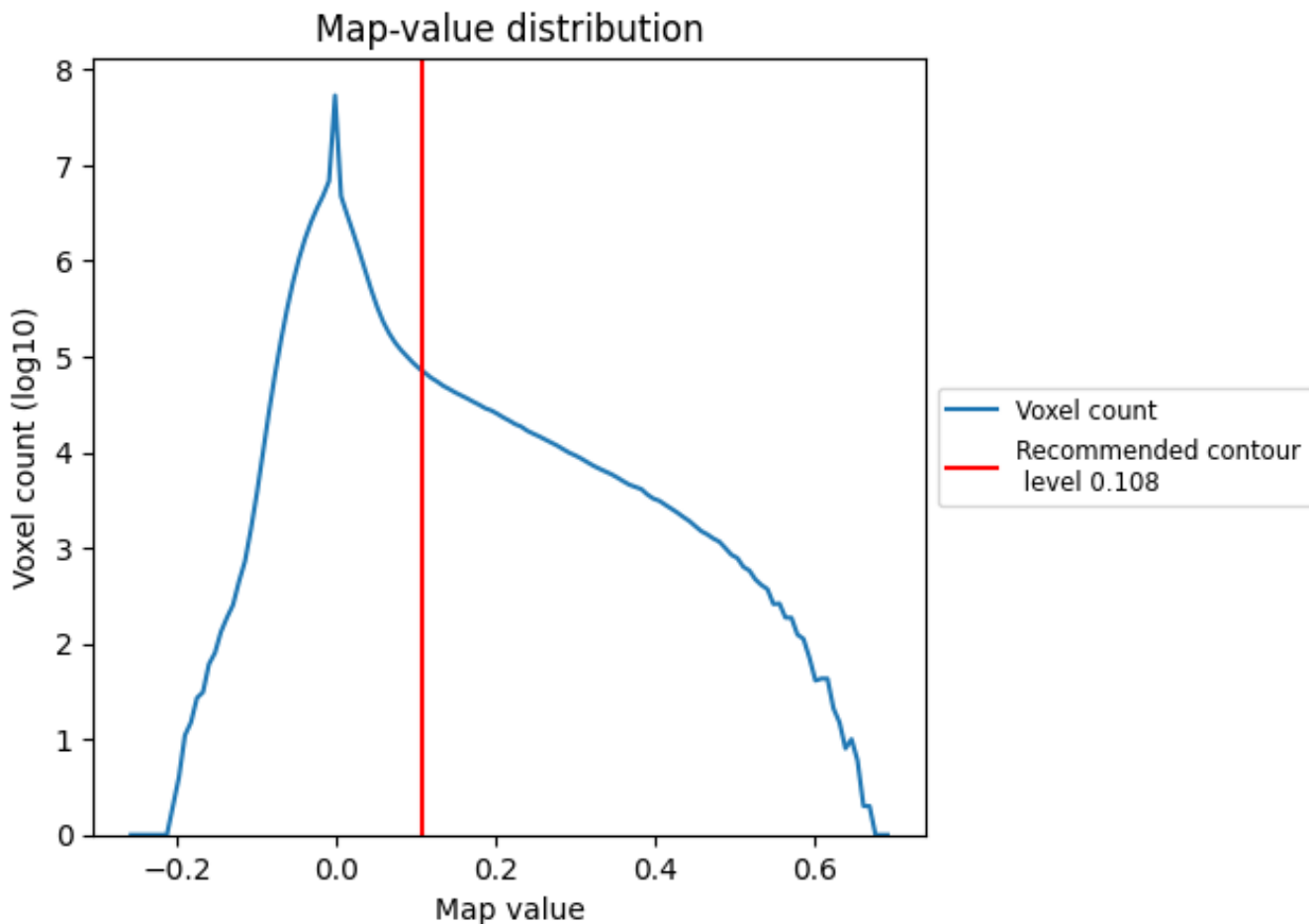


Z

## 7 Map analysis [i](#)

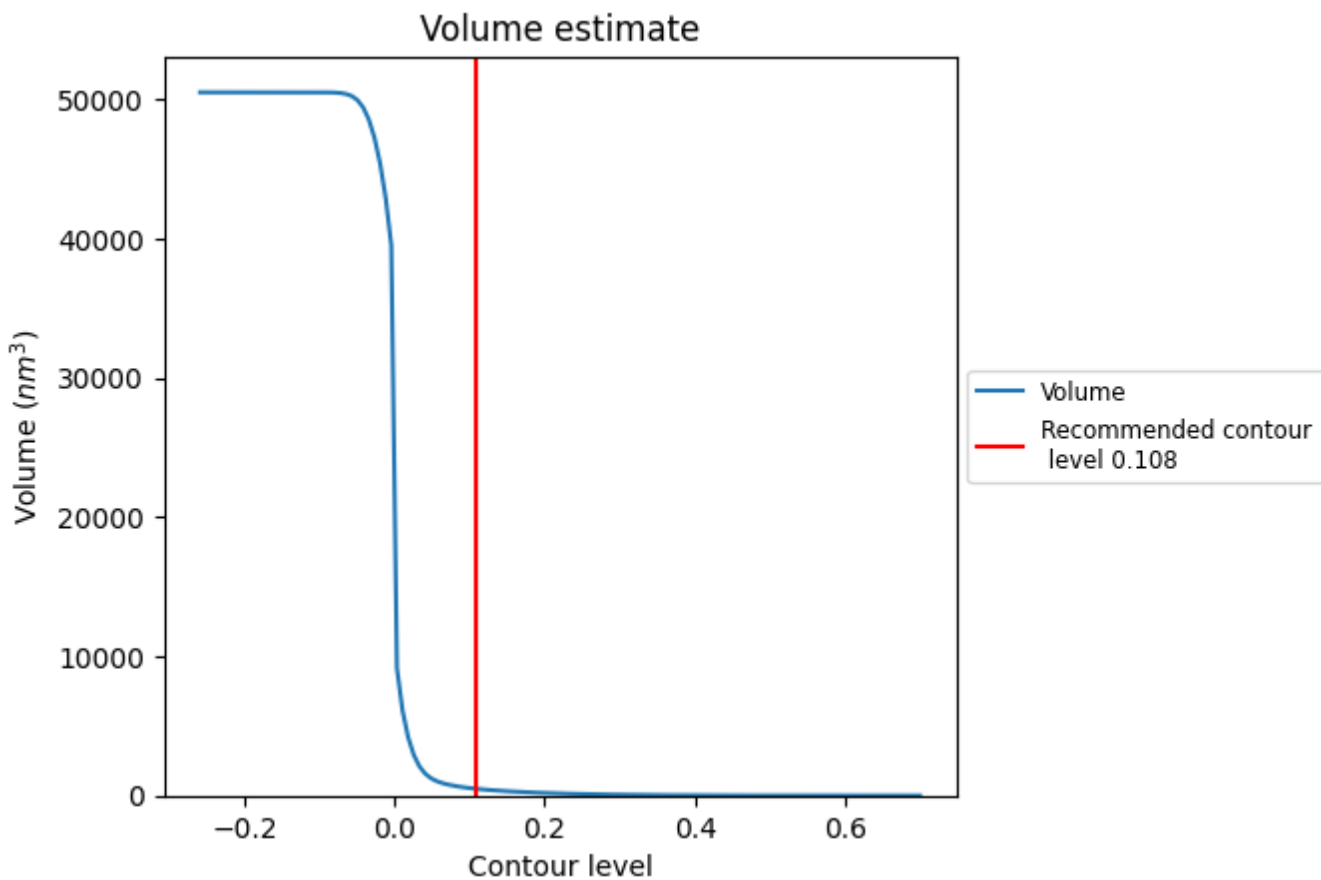
This section contains the results of statistical analysis of the map.

### 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.

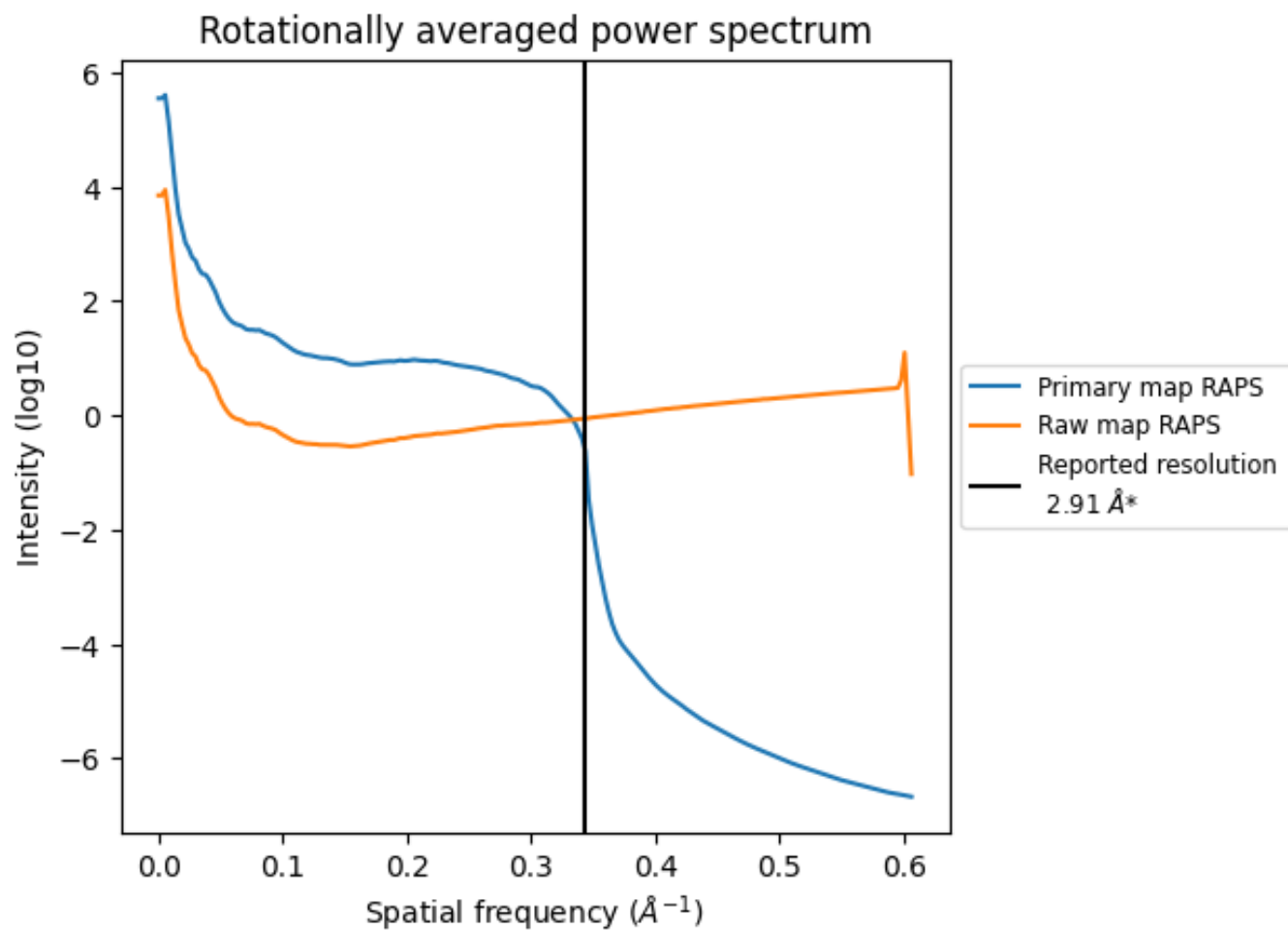
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 488 nm<sup>3</sup>; this corresponds to an approximate mass of 441 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

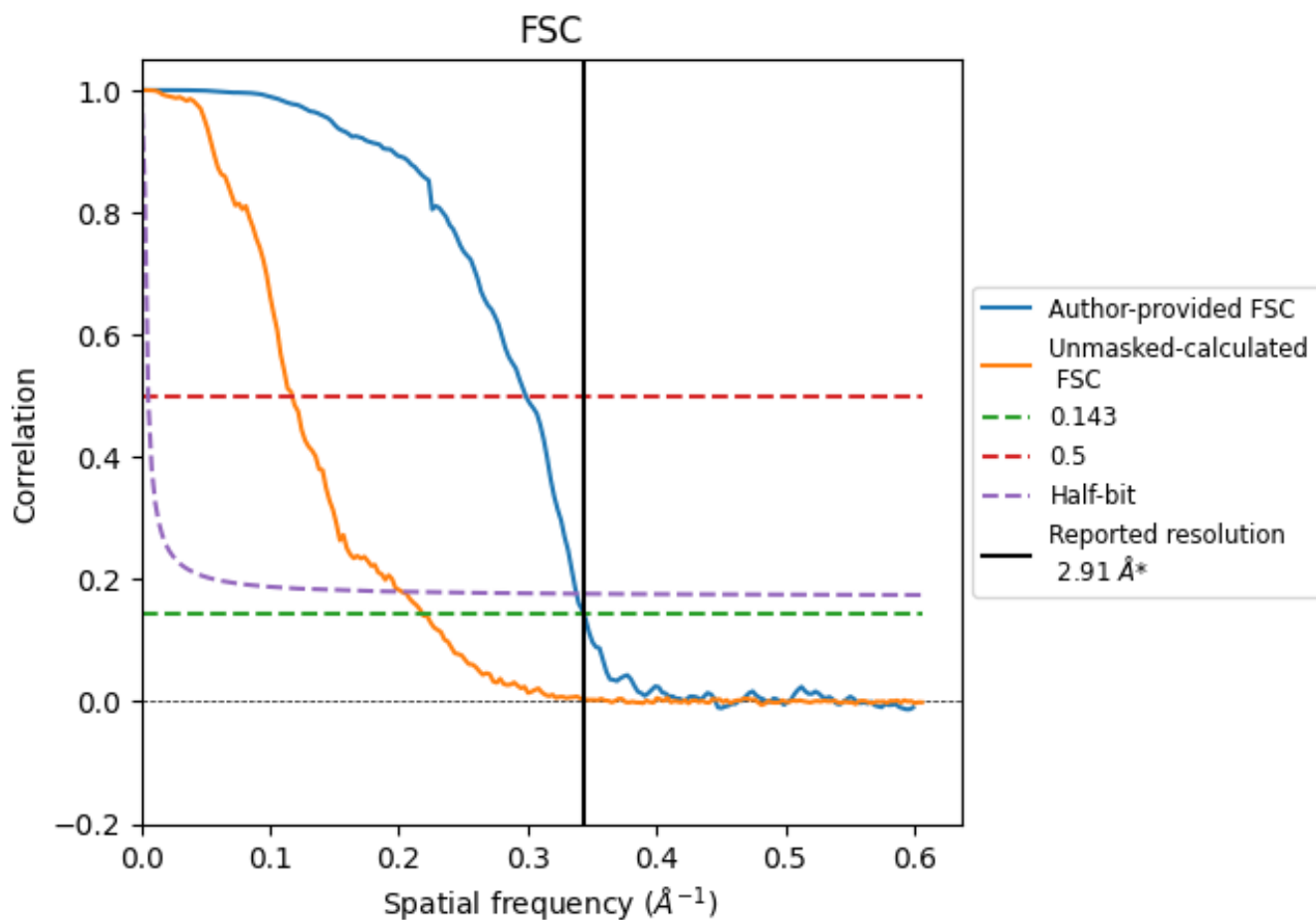


\*Reported resolution corresponds to spatial frequency of 0.344 Å<sup>-1</sup>

## 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 0.344 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

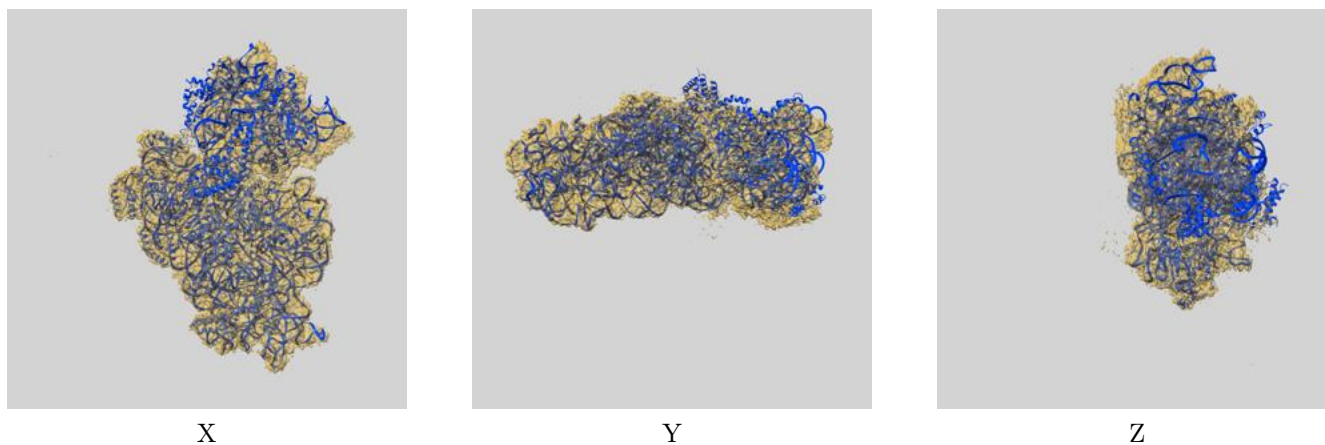
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.91	-	-
Author-provided FSC curve	2.91	3.35	2.96
Unmasked-calculated*	4.58	8.54	4.95

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.58 differs from the reported value 2.91 by more than 10 %

## 9 Map-model fit [i](#)

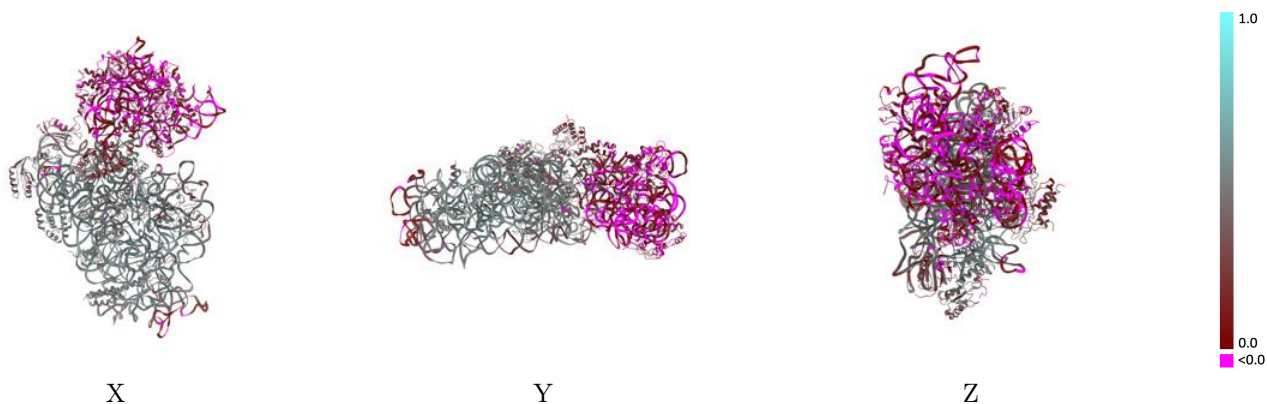
This section contains information regarding the fit between EMDB map EMD-75144 and PDB model 10FZ. Per-residue inclusion information can be found in section 3 on page 8.

### 9.1 Map-model overlay [i](#)



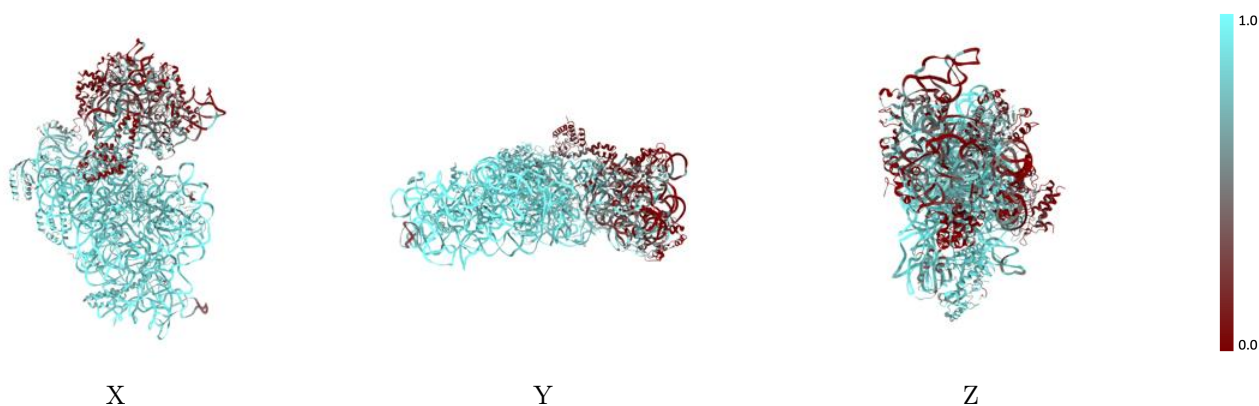
The images above show the 3D surface view of the map at the recommended contour level 0.108 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



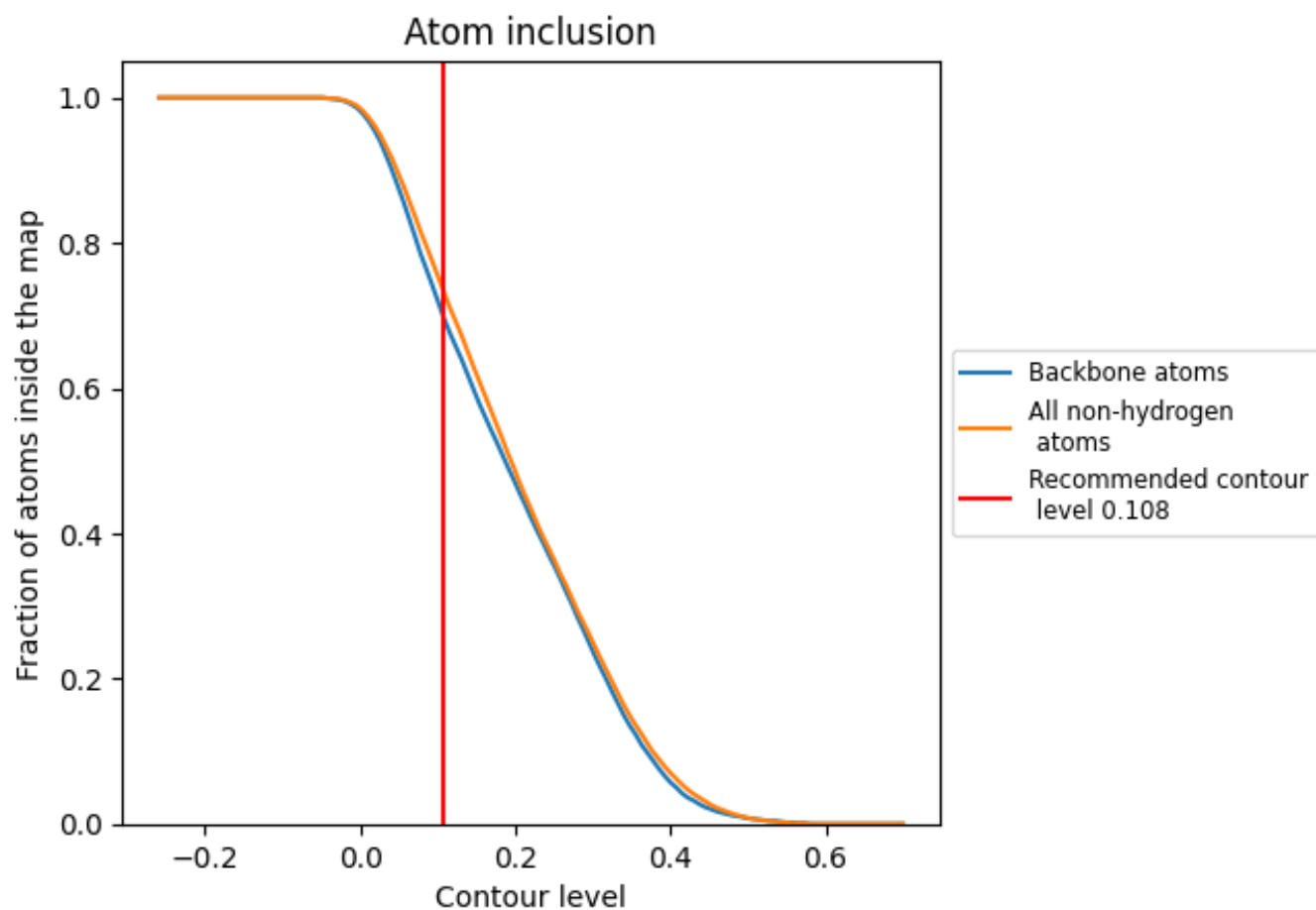
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.108).













































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 70% of all backbone atoms, 73% 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 (0.108) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7320	 0.3280
A	 0.8160	 0.3590
B	 0.2290	 0.2320
C	 0.4470	 0.0940
D	 0.8160	 0.4240
E	 0.8860	 0.4920
F	 0.7150	 0.3270
G	 0.0600	 0.0420
H	 0.8690	 0.4750
I	 0.3560	 0.0340
J	 0.2880	 0.0340
K	 0.7060	 0.2880
L	 0.8730	 0.4690
M	 0.3200	 0.0270
N	 0.3340	 0.0420
O	 0.8740	 0.4690
P	 0.9040	 0.4970
Q	 0.8730	 0.4850
R	 0.8300	 0.4250
S	 0.4510	 0.0750
T	 0.8600	 0.4570
U	 0.6850	 0.2660

