



Full wwPDB EM Validation Report ⓘ

Apr 6, 2026 – 10:34 AM EDT

PDB ID : 9OYV / pdb_00009oyv
EMDB ID : EMD-71035
Title : Flavobacterium johnsoniae 30S ribosomal subunit, ZAM64 mutant.
Authors : Ortega, J.; Arpin, D.
Deposited on : 2025-06-04
Resolution : 2.70 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:

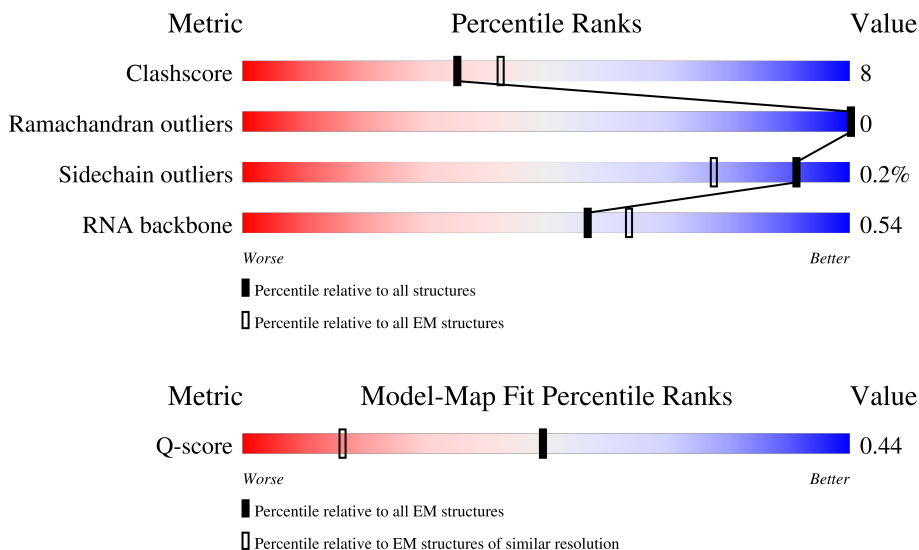
EMDB validation analysis : 0.0.1.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & 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 2.70 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.






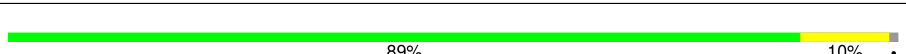
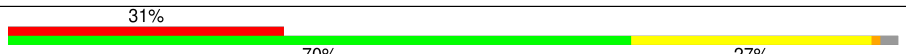

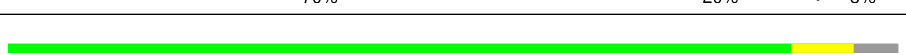

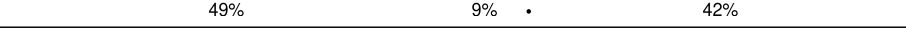
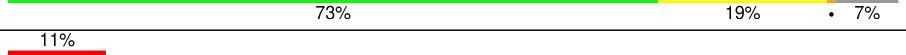


Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	10327 (2.20 - 3.20)

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	2	1520	
2	h	252	
3	i	201	

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Mol	Chain	Length	Quality of chain
4	j	173	 88% 12%
5	k	113	 68% 27% 5%
6	l	158	 52% 19% 29%
7	m	132	 89% 10%
8	n	128	 31% 70% 27%
9	o	101	 72% 74% 23%
10	p	127	 70% 20% 8%
11	q	127	 88% 7% 5%
12	r	124	 73% 51% 23% 27%
13	s	89	 65% 74% 25%
14	t	88	 85% 15%
15	u	188	 11% 49% 9% 42%
16	v	86	 73% 19% 7%
17	w	98	 11% 50% 16% 34%
18	x	92	 87% 59% 32% 10%
19	y	83	 81% 14% 5%

2 Entry composition [i](#)

There are 19 unique types of molecules in this entry. The entry contains 47150 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	2	1470	31506	14067	5771	10198	1470	0	0

- Molecule 2 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	h	215	1600	1015	290	289	6	0	0

- Molecule 3 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	i	200	1576	998	291	284	3	0	0

- Molecule 4 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	j	172	1179	744	229	205	1	0	0

- Molecule 5 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	k	107	815	534	149	130	2	0	0

- Molecule 6 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	l	112	901	572	172	152	5	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	m	131	961	623	167	169	2	0	0

- Molecule 8 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	n	125	972	612	188	168	4	0	0

- Molecule 9 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	o	98	701	450	123	126	2	0	0

- Molecule 10 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	p	117	802	502	154	142	4	0	0

- Molecule 11 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	q	121	922	567	195	157	3	0	0

- Molecule 12 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	r	91	667	413	129	123	2	0	0

- Molecule 13 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	s	88	665	416	136	110	3	0	0

- Molecule 14 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
14	t	88	694	443	136	115	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
t	71	ARG	LYS	conflict	UNP A0A1M6QTP8

- Molecule 15 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
15	u	109	783	492	151	140	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
u	56	ILE	ALA	conflict	UNP A0A1M6QGN9
u	62	GLN	ASN	conflict	UNP A0A1M6QGN9

- Molecule 16 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	v	80	638	404	124	107	3	0	0

- Molecule 17 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	w	65	517	339	95	81	2	0	0

- Molecule 18 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	x	83	636	406	118	110	2	0	0

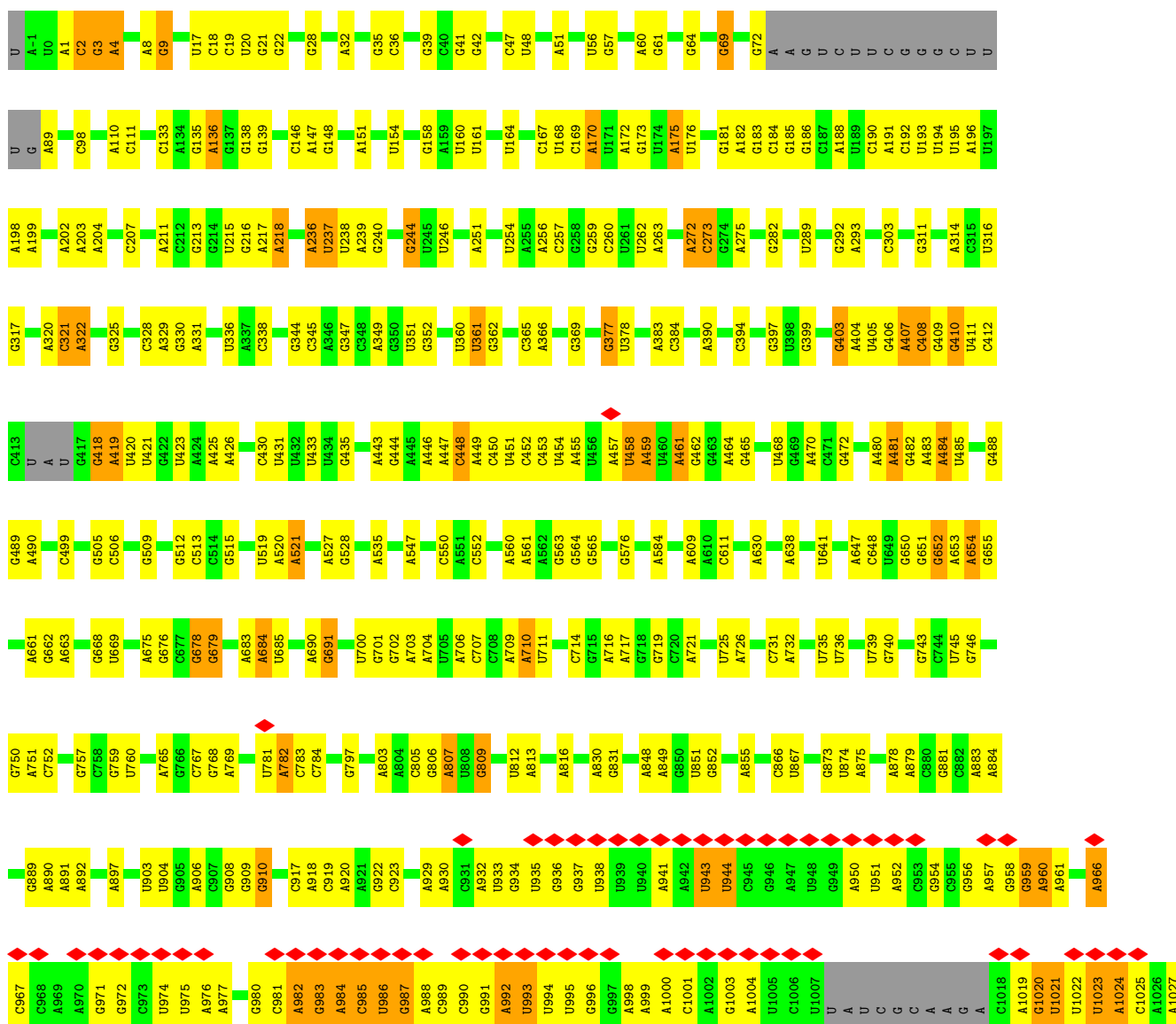
- Molecule 19 is a protein called 30S ribosomal protein S20.

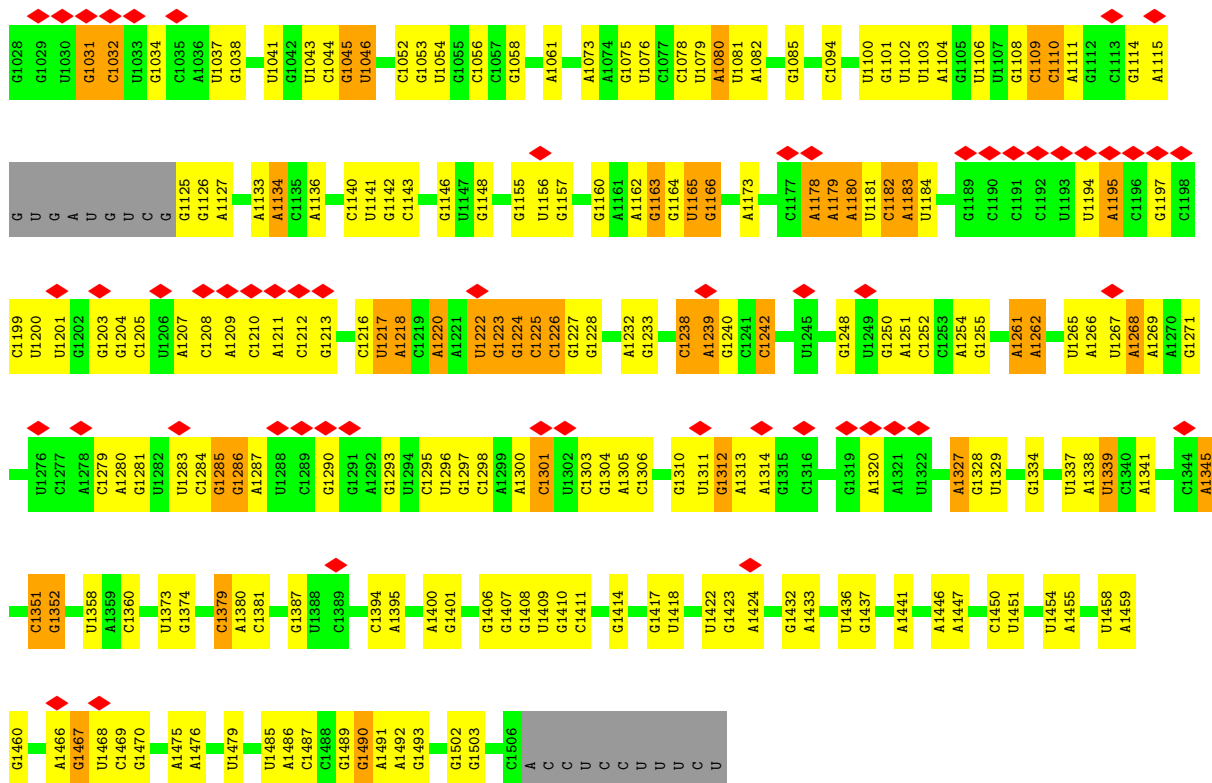
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	y	79	615	381	129	104	1	0	0

3 Residue-property plots [i](#)

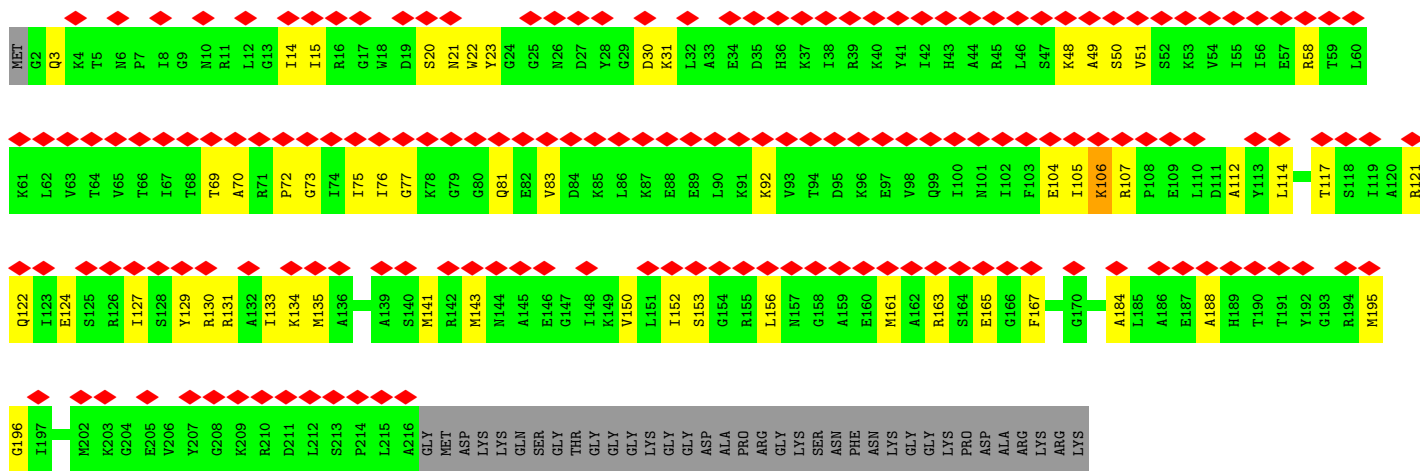
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: 16S rRNA

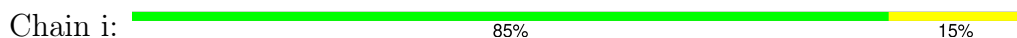





• Molecule 2: 30S ribosomal protein S3



• Molecule 3: 30S ribosomal protein S4



• Molecule 4: 30S ribosomal protein S5

Chain j:  88% 12%



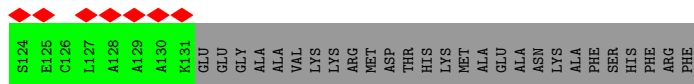
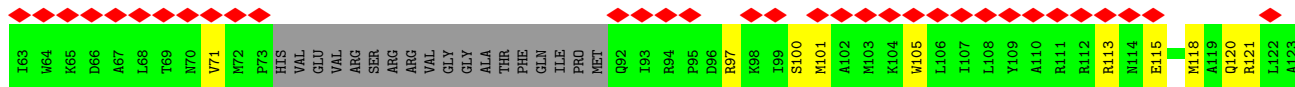
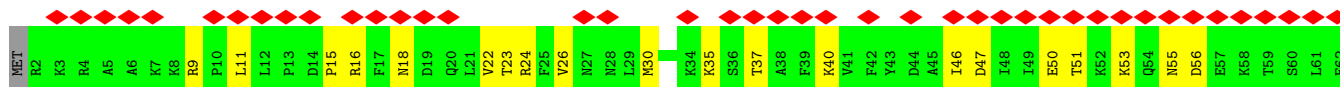
- Molecule 5: 30S ribosomal protein S6

Chain k:  68% 27% 5%



- Molecule 6: 30S ribosomal protein S7

Chain l:  52% 19% 29%



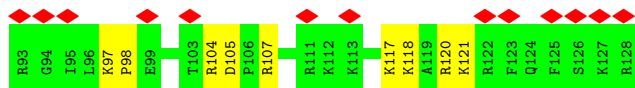
- Molecule 7: 30S ribosomal protein S8

Chain m:  89% 10%



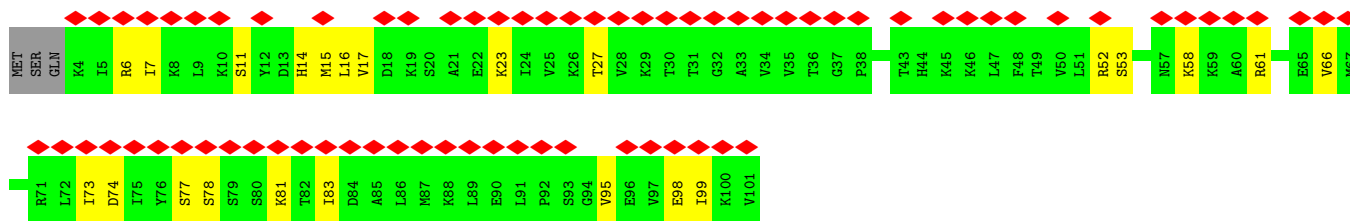
- Molecule 8: 30S ribosomal protein S9

Chain n:  31% 70% 27%



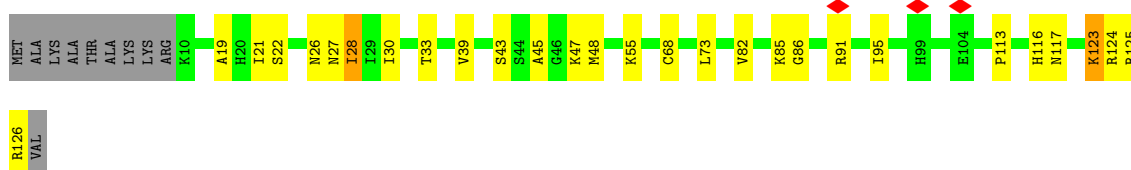
- Molecule 9: 30S ribosomal protein S10

Chain o:  72% 74% 23%



- Molecule 10: 30S ribosomal protein S11

Chain p:



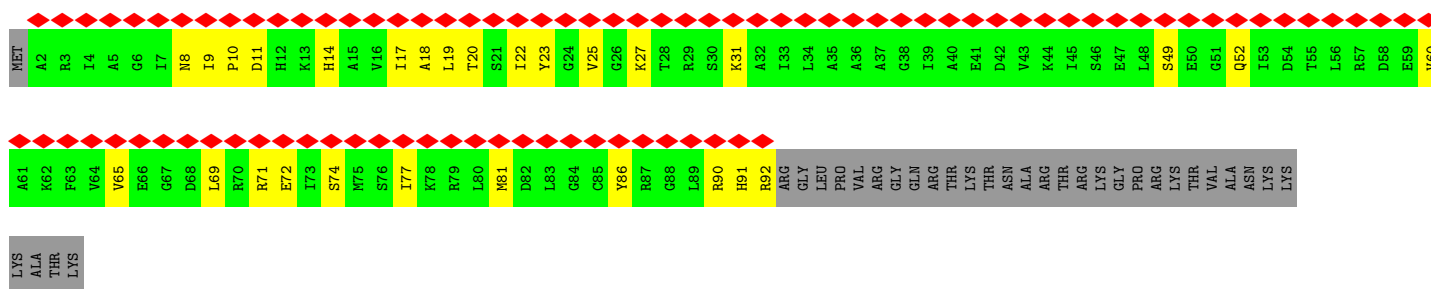
- Molecule 11: 30S ribosomal protein S12

Chain q:



- Molecule 12: 30S ribosomal protein S13

Chain r:

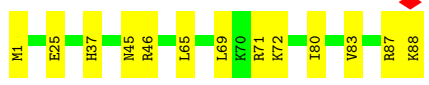
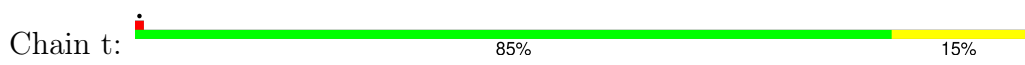


- Molecule 13: 30S ribosomal protein S14

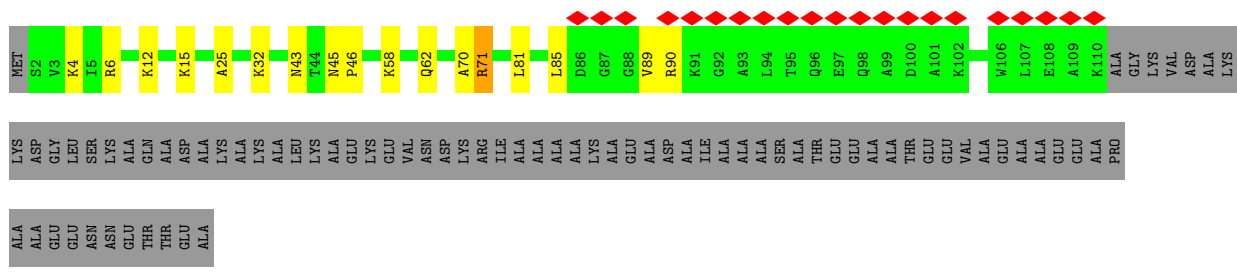
Chain s:



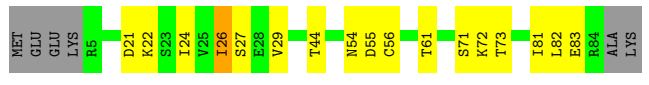
- Molecule 14: 30S ribosomal protein S15



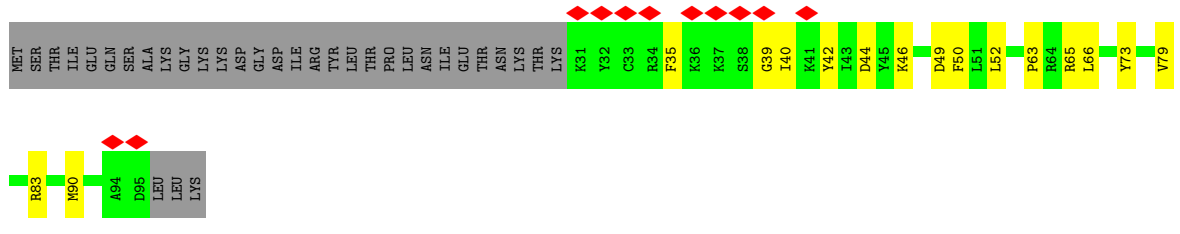
• Molecule 15: 30S ribosomal protein S16



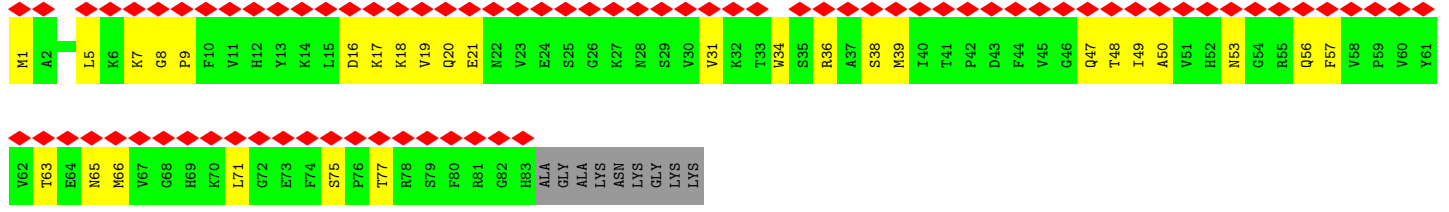
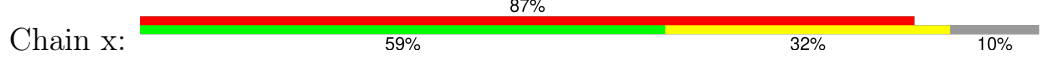
• Molecule 16: 30S ribosomal protein S17



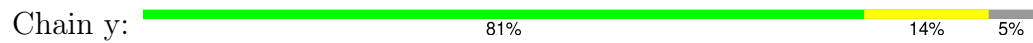
• Molecule 17: 30S ribosomal protein S18



• Molecule 18: 30S ribosomal protein S19



• Molecule 19: 30S ribosomal protein S20



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	313409	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.346	Depositor
Minimum map value	-0.088	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.012	Depositor
Recommended contour level	0.05	Depositor
Map size (Å)	342.0, 342.0, 342.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.855, 0.855, 0.855	Depositor

5 Model quality i

5.1 Standard geometry i

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	2	0.21	0/35278	0.30	0/55009
2	h	0.19	0/1623	0.51	2/2190 (0.1%)
3	i	0.17	0/1606	0.36	1/2157 (0.0%)
4	j	0.25	1/1194 (0.1%)	0.47	2/1615 (0.1%)
5	k	0.16	0/834	0.43	0/1129
6	l	0.16	0/916	0.46	0/1228
7	m	0.21	0/976	0.29	0/1324
8	n	0.20	0/986	0.56	2/1322 (0.2%)
9	o	0.19	0/712	0.61	3/973 (0.3%)
10	p	0.20	0/816	0.57	1/1111 (0.1%)
11	q	0.20	0/935	0.30	0/1258
12	r	0.14	0/673	0.51	0/906
13	s	0.20	0/676	0.46	0/906
14	t	0.20	0/704	0.42	1/946 (0.1%)
15	u	0.48	0/799	0.54	2/1086 (0.2%)
16	v	0.20	0/646	0.50	1/866 (0.1%)
17	w	0.18	0/527	0.40	0/706
18	x	0.20	0/652	0.64	1/881 (0.1%)
19	y	0.20	0/619	0.41	0/825
All	All	0.21	1/51172 (0.0%)	0.36	16/76438 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	j	88	PRO	N-CD	-5.55	1.40	1.47

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	o	83	ILE	N-CA-C	-7.68	102.97	110.72
8	n	86	CYS	N-CA-C	7.59	121.64	112.38
4	j	118	ARG	N-CA-C	7.46	119.41	111.28
15	u	90	ARG	N-CA-C	-7.02	103.98	112.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	o	81	LYS	N-CA-C	6.72	118.26	111.07
2	h	105	ILE	N-CA-C	6.67	118.18	108.58
8	n	54	GLU	CA-CB-CG	5.86	125.82	114.10
9	o	83	ILE	N-CA-CB	5.82	119.30	110.58
15	u	71	ARG	N-CA-C	-5.80	104.96	111.28
3	i	10	LYS	N-CA-C	5.74	117.53	111.28
16	v	26	ILE	N-CA-C	5.60	117.40	108.89
2	h	106	LYS	N-CA-CB	5.43	118.21	110.44
18	x	48	THR	N-CA-C	5.42	119.06	109.96
14	t	45	ASN	N-CA-C	5.27	117.70	108.52
4	j	160	ALA	N-CA-C	5.19	116.94	111.28
10	p	123	LYS	N-CA-C	5.19	117.82	110.50

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	2	31506	0	15862	331	0
2	h	1600	0	1604	39	0
3	i	1576	0	1592	20	0
4	j	1179	0	1185	13	0
5	k	815	0	780	21	0
6	l	901	0	931	29	0
7	m	961	0	978	8	0
8	n	972	0	1005	28	0
9	o	701	0	694	18	0
10	p	802	0	774	19	0
11	q	922	0	973	6	0
12	r	667	0	658	19	0
13	s	665	0	669	18	0
14	t	694	0	703	12	0
15	u	783	0	739	11	0
16	v	638	0	684	11	0
17	w	517	0	542	11	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
18	x	636	0	628	25	0
19	y	615	0	672	8	0
All	All	47150	0	31673	597	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 (597) 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)
6:l:15:PRO:HG3	8:n:41:THR:HG22	1.53	0.89
1:2:418:G:H3'	1:2:419:A:H8	1.44	0.81
1:2:446:A:H62	1:2:468:U:H3	1.25	0.81
1:2:661:A:H2'	1:2:662:G:C8	2.19	0.77
1:2:1286:G:N2	1:2:1312:G:O2'	2.16	0.77
8:n:87:GLU:N	8:n:87:GLU:OE2	2.18	0.77
9:o:15:MET:HE2	9:o:15:MET:H	1.49	0.75
1:2:933:U:H3	1:2:1213:G:H1	1.31	0.75
16:v:24:ILE:HD12	16:v:26:ILE:HD11	1.68	0.74
1:2:986:U:O2	1:2:1020:G:N2	2.19	0.73
1:2:136:A:N6	1:2:168:U:O4	2.17	0.73
1:2:453:C:H42	1:2:461:A:H61	1.37	0.73
1:2:701:G:H2'	1:2:702:G:C8	2.25	0.71
1:2:1339:U:H3	1:2:1345:A:H62	1.35	0.71
1:2:1379:C:OP2	4:j:35:ARG:NH2	2.23	0.71
12:r:69:LEU:HA	12:r:72:GLU:HB2	1.72	0.70
18:x:1:MET:N	18:x:8:GLY:O	2.22	0.70
18:x:63:THR:OG1	18:x:65:ASN:OD1	2.10	0.70
8:n:104:ARG:NH1	8:n:105:ASP:O	2.26	0.69
9:o:11:SER:HB3	9:o:17:VAL:CG1	2.23	0.69
1:2:1293:G:H5'	18:x:5:LEU:HD11	1.77	0.67
1:2:303:C:H5''	15:u:32:LYS:HG2	1.76	0.67
6:l:55:ASN:OD1	6:l:56:ASP:N	2.28	0.67
1:2:702:G:H2'	1:2:703:A:C8	2.30	0.67
18:x:38:SER:HB2	18:x:71:LEU:HD12	1.75	0.67
19:y:32:ILE:HD11	19:y:55:ILE:HD11	1.77	0.66
1:2:983:G:H3'	1:2:984:A:H8	1.59	0.66
1:2:1173:A:OP2	2:h:3:GLN:NE2	2.28	0.66
15:u:58:LYS:O	15:u:62:GLN:HB2	1.94	0.66
10:p:86:GLY:O	10:p:91:ARG:NH2	2.28	0.66
10:p:43:SER:HB3	10:p:68:CYS:HB2	1.77	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:o:15:MET:HE2	9:o:15:MET:N	2.12	0.65
1:2:959:G:OP2	1:2:1339:U:O2'	2.13	0.65
3:i:144:GLU:HA	3:i:147:LYS:HE3	1.78	0.65
5:k:20:LYS:O	5:k:24:THR:HG23	1.97	0.65
12:r:74:SER:HA	12:r:77:ILE:HD13	1.79	0.64
19:y:8:LEU:O	19:y:12:ARG:NH1	2.31	0.64
1:2:662:G:H2'	1:2:663:A:H8	1.62	0.63
1:2:1327:A:OP1	8:n:120:ARG:NH1	2.28	0.63
6:l:24:ARG:NH2	6:l:100:SER:OG	2.28	0.63
18:x:50:ALA:HB1	18:x:57:PHE:HB3	1.79	0.63
1:2:17:U:H2'	1:2:18:C:C6	2.34	0.63
1:2:675:A:H4'	10:p:47:LYS:HE2	1.80	0.63
1:2:930:A:H61	1:2:1216:C:H42	1.44	0.63
3:i:96:ASP:OD1	3:i:97:ASN:N	2.30	0.63
8:n:105:ASP:OD2	8:n:107:ARG:NH1	2.32	0.62
18:x:17:LYS:HD2	18:x:21:GLU:OE1	1.98	0.62
18:x:47:GLN:OE1	18:x:47:GLN:N	2.27	0.62
1:2:985:C:H2'	1:2:986:U:N3	2.15	0.62
1:2:418:G:H3'	1:2:419:A:C8	2.31	0.62
1:2:1469:C:H2'	1:2:1470:G:H8	1.65	0.62
10:p:33:THR:HG22	10:p:39:VAL:HG23	1.82	0.62
13:s:71:THR:O	13:s:75:MET:HG3	1.99	0.62
1:2:944:U:OP2	1:2:1205:C:O2'	2.13	0.62
8:n:21:GLU:OE1	8:n:21:GLU:N	2.32	0.61
12:r:81:MET:HE3	12:r:91:HIS:HB3	1.81	0.61
1:2:982:A:H3'	1:2:983:G:H8	1.65	0.61
6:l:22:VAL:O	6:l:26:VAL:HG13	2.01	0.61
2:h:14:ILE:HG22	2:h:15:ILE:HG23	1.82	0.61
1:2:1079:U:H2'	1:2:1080:A:C8	2.36	0.61
1:2:1041:U:OP1	13:s:73:ARG:NH2	2.34	0.60
8:n:91:GLU:N	8:n:91:GLU:OE2	2.35	0.60
6:l:118:MET:SD	6:l:118:MET:N	2.74	0.60
12:r:19:LEU:HA	12:r:22:ILE:HD12	1.82	0.60
1:2:446:A:N6	1:2:468:U:H3	1.97	0.59
4:j:99:ARG:HG3	4:j:99:ARG:HH11	1.66	0.59
1:2:994:U:O2	1:2:1003:G:O6	2.20	0.59
10:p:48:MET:SD	10:p:48:MET:N	2.75	0.59
1:2:1394:C:H2'	1:2:1395:A:C8	2.37	0.59
1:2:254:U:OP1	19:y:68:LYS:NZ	2.33	0.59
1:2:1491:A:H2'	1:2:1492:A:C8	2.37	0.59
1:2:703:A:H2'	1:2:704:A:C8	2.38	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1337:U:H2'	1:2:1338:A:C8	2.38	0.58
1:2:349:A:N3	1:2:361:U:O2'	2.34	0.58
1:2:446:A:H5''	1:2:446:A:H8	1.67	0.58
1:2:1058:G:N2	1:2:1061:A:OP2	2.31	0.58
1:2:716:A:H2'	1:2:717:A:C8	2.39	0.58
8:n:26:ILE:HD12	8:n:61:VAL:HB	1.84	0.58
1:2:272:A:H5''	1:2:273:C:H3'	1.85	0.58
7:m:23:VAL:HG11	7:m:60:LYS:HE3	1.86	0.58
1:2:1250:G:H2'	1:2:1251:A:C8	2.37	0.58
9:o:77:SER:OG	9:o:78:SER:N	2.33	0.58
1:2:138:G:H2'	1:2:139:G:C8	2.38	0.57
1:2:710:A:H2	1:2:721:A:H61	1.51	0.57
1:2:935:U:H2'	1:2:936:G:H8	1.68	0.57
13:s:51:ARG:NH1	13:s:56:GLY:O	2.37	0.57
15:u:89:VAL:O	15:u:89:VAL:HG22	2.03	0.57
1:2:409:G:H3'	1:2:410:G:H8	1.70	0.57
14:t:46:ARG:HB2	14:t:46:ARG:NH1	2.20	0.57
4:j:10:VAL:O	4:j:13:SER:OG	2.16	0.57
9:o:11:SER:HB3	9:o:17:VAL:HG13	1.87	0.57
1:2:1417:G:H2'	1:2:1418:U:C6	2.40	0.57
1:2:489:G:H2'	1:2:490:A:H8	1.70	0.57
1:2:1358:U:O4	6:l:9:ARG:NH2	2.35	0.57
6:l:115:GLU:HB3	6:l:120:GLN:HE21	1.69	0.56
1:2:1268:A:H2'	1:2:1269:A:C8	2.39	0.56
1:2:1486:A:H2'	1:2:1487:C:C6	2.40	0.56
1:2:407:A:H3'	1:2:408:C:H5''	1.87	0.56
1:2:330:G:H2'	1:2:331:A:H8	1.71	0.56
1:2:1052:C:H2'	1:2:1053:G:H8	1.69	0.56
1:2:330:G:H2'	1:2:331:A:C8	2.40	0.56
1:2:1222:U:H1'	6:l:37:THR:CG2	2.35	0.56
4:j:121:LEU:HD13	4:j:129:VAL:HG21	1.86	0.56
1:2:489:G:H2'	1:2:490:A:C8	2.40	0.56
13:s:53:LYS:C	13:s:54:LEU:HD12	2.31	0.55
11:q:99:ARG:NH2	11:q:105:SER:O	2.39	0.55
6:l:15:PRO:HG3	8:n:41:THR:CG2	2.32	0.55
10:p:125:ARG:HG2	10:p:125:ARG:HH11	1.71	0.55
17:w:79:VAL:HG12	17:w:83:ARG:HD2	1.88	0.55
1:2:328:C:H2'	1:2:329:A:H8	1.71	0.55
1:2:941:A:N6	18:x:77:THR:O	2.39	0.55
1:2:998:A:H2'	1:2:999:A:C8	2.42	0.55
7:m:69:THR:HG23	7:m:71:GLU:HB3	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1038:G:H5''	2:h:153:SER:HB2	1.89	0.55
7:m:10:LEU:HD22	7:m:77:ILE:HD11	1.87	0.55
1:2:1337:U:H2'	1:2:1338:A:H8	1.70	0.55
1:2:1446:A:H2'	1:2:1447:A:C8	2.42	0.55
1:2:8:A:N6	3:i:201:LYS:HB2	2.22	0.55
5:k:29:PHE:O	5:k:33:ARG:NH1	2.40	0.55
6:l:47:ASP:HA	6:l:50:GLU:HG2	1.88	0.55
9:o:7:ILE:HG23	9:o:73:ILE:HB	1.89	0.55
1:2:662:G:H2'	1:2:663:A:C8	2.42	0.55
2:h:141:MET:HE3	2:h:141:MET:HA	1.89	0.55
5:k:105:ARG:NH1	5:k:105:ARG:HB2	2.22	0.55
12:r:25:VAL:HG22	12:r:65:VAL:HB	1.87	0.55
1:2:1297:G:N1	1:2:1300:A:OP2	2.40	0.54
10:p:21:ILE:HG22	10:p:30:ILE:HG23	1.89	0.54
2:h:153:SER:OG	2:h:196:GLY:N	2.40	0.54
2:h:133:ILE:HD12	2:h:150:VAL:HG11	1.89	0.54
1:2:1467:G:H2'	1:2:1468:U:C6	2.43	0.54
1:2:69:G:N1	1:2:89:A:OP1	2.34	0.54
1:2:1224:G:H2'	1:2:1225:C:H6	1.73	0.54
4:j:59:SER:OG	4:j:60:LYS:N	2.41	0.54
4:j:99:ARG:HG3	4:j:99:ARG:NH1	2.21	0.54
17:w:44:ASP:OD2	17:w:46:LYS:NZ	2.40	0.54
1:2:1110:C:OP1	8:n:16:ARG:NH1	2.41	0.54
1:2:236:A:H4'	1:2:237:U:O5'	2.07	0.54
1:2:1133:A:O2'	1:2:1134:A:O5'	2.25	0.54
1:2:987:G:H1	1:2:1020:G:H1	1.56	0.54
8:n:50:LEU:HD21	8:n:81:LEU:HD22	1.89	0.54
1:2:1024:A:H2'	1:2:1025:C:C6	2.43	0.53
18:x:34:TRP:HE1	18:x:57:PHE:HZ	1.55	0.53
13:s:33:TYR:HA	13:s:36:LEU:HD12	1.89	0.53
1:2:420:U:H2'	1:2:421:U:C6	2.43	0.53
1:2:958:G:H4'	1:2:959:G:H5''	1.89	0.53
6:l:11:LEU:HD23	6:l:23:THR:HG22	1.90	0.53
1:2:1160:G:N2	1:2:1163:G:OP2	2.40	0.53
4:j:9:LEU:O	4:j:9:LEU:HD12	2.07	0.53
1:2:935:U:H2'	1:2:936:G:C8	2.43	0.53
1:2:1000:A:N6	1:2:1001:C:O2	2.42	0.53
1:2:198:A:H2'	1:2:199:A:C8	2.44	0.53
1:2:651:G:H2'	1:2:652:G:C8	2.43	0.53
1:2:998:A:C4	18:x:34:TRP:HZ3	2.27	0.53
2:h:134:LYS:HB2	2:h:135:MET:HE2	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1000:A:C6	1:2:1001:C:H1'	2.44	0.53
1:2:878:A:H2'	1:2:879:A:H8	1.74	0.52
1:2:980:G:H2'	1:2:981:C:C6	2.44	0.52
14:t:80:ILE:HA	14:t:83:VAL:HG12	1.91	0.52
2:h:131:ARG:O	2:h:135:MET:HG2	2.09	0.52
13:s:7:LYS:NZ	13:s:55:THR:O	2.42	0.52
13:s:52:CYS:HB3	13:s:56:GLY:H	1.74	0.52
12:r:17:ILE:O	12:r:20:THR:OG1	2.27	0.52
15:u:71:ARG:NH1	15:u:71:ARG:HB2	2.23	0.52
18:x:31:VAL:HB	18:x:49:ILE:HG22	1.92	0.52
2:h:107:ARG:NH2	2:h:143:MET:O	2.42	0.52
12:r:86:TYR:CZ	12:r:90:ARG:HD2	2.44	0.52
1:2:1224:G:H2'	1:2:1225:C:C6	2.45	0.52
3:i:52:LEU:O	3:i:56:GLN:HG2	2.09	0.52
3:i:125:GLU:OE2	3:i:125:GLU:N	2.27	0.52
8:n:47:LEU:HA	8:n:50:LEU:HD23	1.91	0.52
12:r:14:HIS:O	12:r:18:ALA:N	2.40	0.52
1:2:1201:U:OP1	13:s:41:LYS:NZ	2.43	0.52
12:r:9:ILE:HG13	12:r:10:PRO:HD2	1.92	0.52
16:v:71:SER:OG	16:v:72:LYS:N	2.41	0.52
1:2:443:A:H2'	1:2:444:G:O4'	2.10	0.52
1:2:1409:U:H2'	1:2:1410:G:H8	1.75	0.52
17:w:49:ASP:HA	17:w:52:LEU:HD23	1.91	0.52
1:2:1358:U:OP1	6:l:24:ARG:NH2	2.43	0.51
9:o:52:ARG:NH1	9:o:61:ARG:O	2.43	0.51
15:u:45:ASN:HB3	15:u:46:PRO:HD3	1.92	0.51
1:2:1163:G:O2'	1:2:1164:G:N7	2.38	0.51
5:k:99:SER:OG	5:k:103:ARG:NH1	2.43	0.51
1:2:684:A:H2'	1:2:685:U:C6	2.46	0.51
6:l:30:MET:HE2	6:l:35:LYS:HG3	1.91	0.51
13:s:53:LYS:O	13:s:54:LEU:HD12	2.10	0.51
18:x:75:SER:O	18:x:75:SER:OG	2.26	0.51
8:n:80:ALA:O	8:n:84:VAL:HG23	2.10	0.51
16:v:56:CYS:SG	16:v:81:ILE:HD11	2.50	0.51
9:o:23:LYS:O	9:o:27:THR:HG22	2.10	0.51
1:2:661:A:H2'	1:2:662:G:H8	1.75	0.51
6:l:71:VAL:HG12	6:l:71:VAL:O	2.10	0.51
16:v:21:ASP:OD1	16:v:21:ASP:N	2.32	0.51
1:2:1458:U:H2'	1:2:1459:A:H8	1.75	0.51
2:h:20:SER:C	2:h:21:ASN:HD22	2.18	0.51
10:p:26:ASN:O	10:p:55:LYS:HE3	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:p:85:LYS:HD3	10:p:113:PRO:HD3	1.91	0.51
1:2:957:A:H4'	1:2:958:G:H3'	1.93	0.51
1:2:984:A:N3	1:2:984:A:H2'	2.26	0.51
11:q:50:ARG:HD2	11:q:90:LEU:HD11	1.93	0.51
1:2:448:C:H2'	1:2:449:A:C8	2.45	0.51
1:2:757:G:H4'	1:2:1486:A:H4'	1.92	0.51
1:2:960:A:H2'	1:2:961:A:H5''	1.93	0.51
1:2:1203:G:H4'	18:x:77:THR:HG21	1.93	0.50
5:k:105:ARG:HB2	5:k:105:ARG:HH11	1.76	0.50
1:2:21:G:H2'	1:2:22:G:C8	2.46	0.50
1:2:383:A:H2'	1:2:384:C:C6	2.46	0.50
1:2:983:G:H2'	1:2:983:G:N3	2.27	0.50
1:2:512:G:H2'	1:2:513:C:C6	2.47	0.50
2:h:77:GLY:HA3	2:h:81:GLN:HE22	1.76	0.50
6:l:71:VAL:HG12	6:l:105:TRP:HE3	1.75	0.50
1:2:1222:U:H1'	6:l:37:THR:HG21	1.93	0.50
1:2:1341:A:C5	13:s:46:VAL:HG23	2.47	0.50
1:2:56:U:H2'	1:2:57:G:C8	2.46	0.50
1:2:198:A:H2'	1:2:199:A:H8	1.77	0.50
1:2:527:A:H2'	1:2:528:G:C8	2.46	0.50
1:2:878:A:H2'	1:2:879:A:C8	2.46	0.50
1:2:881:G:N2	1:2:884:A:OP2	2.43	0.50
12:r:49:SER:OG	12:r:52:GLN:OE1	2.28	0.50
1:2:35:G:H2'	1:2:36:C:C6	2.45	0.50
1:2:292:G:H2'	1:2:293:A:C8	2.47	0.50
19:y:40:ASP:OD1	19:y:41:LYS:N	2.44	0.50
1:2:1080:A:H2'	1:2:1081:U:O4'	2.11	0.50
1:2:1295:C:H2'	1:2:1296:U:C6	2.47	0.50
2:h:76:ILE:HA	2:h:83:VAL:HG13	1.94	0.50
1:2:1126:G:H2'	1:2:1127:A:C8	2.46	0.50
1:2:1489:G:N2	1:2:1492:A:OP2	2.45	0.49
4:j:168:GLU:OE1	4:j:172:LYS:NZ	2.45	0.49
1:2:930:A:N6	1:2:1216:C:H42	2.10	0.49
1:2:1400:A:N6	1:2:1455:A:O2'	2.45	0.49
18:x:17:LYS:HE2	18:x:18:LYS:N	2.27	0.49
1:2:407:A:H3'	1:2:408:C:C5'	2.42	0.49
1:2:1373:U:H2'	1:2:1374:G:C8	2.48	0.49
18:x:16:ASP:O	18:x:20:GLN:HG2	2.13	0.49
1:2:1031:G:O2'	1:2:1032:C:OP1	2.29	0.49
1:2:1422:U:H2'	1:2:1423:G:O4'	2.12	0.49
2:h:133:ILE:HG13	2:h:152:ILE:HD11	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:678:G:N3	1:2:678:G:H2'	2.28	0.49
1:2:906:A:O2'	1:2:1381:C:OP2	2.28	0.49
16:v:29:VAL:HG22	16:v:44:THR:HG22	1.94	0.49
16:v:55:ASP:C	16:v:55:ASP:OD1	2.56	0.49
7:m:21:HIS:O	7:m:65:TYR:OH	2.30	0.49
1:2:703:A:H2'	1:2:704:A:H8	1.77	0.49
3:i:182:ALA:H	3:i:185:GLN:NE2	2.10	0.49
6:l:50:GLU:HA	6:l:53:LYS:HE3	1.95	0.49
3:i:158:ASN:OD1	3:i:158:ASN:N	2.46	0.49
12:r:60:VAL:HG13	12:r:65:VAL:HG23	1.94	0.49
1:2:700:U:H2'	1:2:701:G:C8	2.47	0.48
1:2:1109:C:O2'	1:2:1110:C:OP1	2.29	0.48
1:2:1286:G:O2'	1:2:1287:A:OP2	2.27	0.48
1:2:1486:A:H2'	1:2:1487:C:H6	1.77	0.48
2:h:48:LYS:HE2	2:h:48:LYS:HA	1.95	0.48
3:i:23:ASP:OD2	3:i:26:PHE:N	2.36	0.48
3:i:51:GLN:HB3	3:i:198:LEU:HB2	1.95	0.48
1:2:170:A:N6	1:2:203:A:H62	2.11	0.48
1:2:1407:G:H2'	1:2:1408:G:H8	1.78	0.48
1:2:848:A:H2'	1:2:849:A:C8	2.48	0.48
1:2:1101:G:H2'	1:2:1102:U:C6	2.49	0.48
1:2:1458:U:H2'	1:2:1459:A:C8	2.47	0.48
11:q:46:ASN:ND2	11:q:89:ASP:OD2	2.29	0.48
1:2:983:G:N1	1:2:1023:U:C2	2.82	0.48
9:o:58:LYS:HE3	9:o:61:ARG:HH21	1.78	0.48
1:2:411:U:H2'	1:2:412:C:C6	2.48	0.48
1:2:851:U:H2'	1:2:852:G:O4'	2.14	0.48
5:k:14:LEU:HD11	5:k:84:ARG:HG2	1.96	0.48
6:l:113:ARG:O	6:l:121:ARG:NH1	2.46	0.48
1:2:9:G:OP2	4:j:132:LYS:NZ	2.37	0.48
13:s:19:LYS:HG2	13:s:20:TYR:N	2.29	0.48
1:2:1285:G:O2'	1:2:1286:G:OP1	2.26	0.48
1:2:1222:U:OP2	6:l:118:MET:HB3	2.14	0.48
1:2:1242:C:OP1	1:2:1266:A:O2'	2.22	0.48
2:h:73:GLY:H	2:h:76:ILE:HG13	1.78	0.48
2:h:122:GLN:HB3	2:h:127:ILE:HD11	1.95	0.48
3:i:95:LEU:HA	3:i:134:LEU:HD11	1.95	0.48
1:2:706:A:H5'	10:p:117:ASN:OD1	2.14	0.47
1:2:745:U:H2'	1:2:746:G:O4'	2.14	0.47
7:m:9:TYR:HH	7:m:36:THR:HG1	1.58	0.47
1:2:377:G:H2'	1:2:378:U:H6	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:41:G:H2'	1:2:42:G:H8	1.79	0.47
1:2:215:U:H2'	1:2:216:G:H8	1.79	0.47
1:2:419:A:N3	1:2:419:A:H2'	2.28	0.47
1:2:377:G:H2'	1:2:378:U:C6	2.49	0.47
18:x:63:THR:H	18:x:66:MET:HE3	1.79	0.47
1:2:943:U:O2	1:2:1204:G:O2'	2.26	0.47
5:k:27:GLU:O	5:k:31:THR:HG22	2.15	0.47
1:2:28:G:O2'	1:2:289:U:OP1	2.32	0.47
1:2:435:G:H1	1:2:481:A:N6	2.13	0.47
1:2:505:G:N1	1:2:521:A:OP2	2.46	0.47
1:2:678:G:H3'	1:2:679:G:H8	1.78	0.47
1:2:1044:C:OP2	1:2:1045:G:O2'	2.30	0.47
1:2:1216:C:H2'	1:2:1217:U:C6	2.49	0.47
1:2:1238:C:O2'	1:2:1239:A:OP2	2.28	0.47
2:h:130:ARG:O	2:h:134:LYS:HG2	2.14	0.47
5:k:47:LYS:HD2	5:k:48:MET:O	2.14	0.47
1:2:451:U:H2'	1:2:452:C:C6	2.50	0.47
1:2:998:A:N9	18:x:34:TRP:HZ3	2.13	0.47
1:2:1298:C:P	13:s:24:ARG:HH21	2.38	0.47
1:2:1485:U:H2'	1:2:1486:A:C8	2.50	0.47
3:i:42:ARG:HB3	3:i:42:ARG:NH1	2.29	0.47
5:k:85:VAL:HG13	5:k:85:VAL:O	2.13	0.47
10:p:123:LYS:HG2	10:p:124:ARG:N	2.29	0.47
1:2:985:C:H2'	1:2:986:U:H3	1.79	0.47
1:2:1232:A:H2'	1:2:1233:G:C8	2.49	0.47
1:2:1304:G:H2'	1:2:1305:A:C8	2.50	0.47
1:2:1101:G:H2'	1:2:1102:U:H6	1.79	0.47
2:h:121:ARG:NH2	2:h:124:GLU:OE2	2.42	0.47
1:2:767:C:H2'	1:2:768:G:O4'	2.15	0.46
1:2:1024:A:H2'	1:2:1025:C:H6	1.80	0.46
5:k:15:SER:O	5:k:19:VAL:HG13	2.15	0.46
8:n:26:ILE:HB	8:n:33:PHE:HB2	1.97	0.46
18:x:1:MET:H3	18:x:7:LYS:HG3	1.79	0.46
1:2:403:G:H21	1:2:426:A:H62	1.62	0.46
1:2:1000:A:O2'	1:2:1199:C:O2'	2.19	0.46
1:2:1182:C:H4'	1:2:1183:A:H5'	1.98	0.46
17:w:65:ARG:HH11	17:w:65:ARG:HG3	1.81	0.46
1:2:369:G:H5''	15:u:6:ARG:HB3	1.98	0.46
1:2:630:A:C5	7:m:109:SER:HA	2.51	0.46
1:2:930:A:H61	1:2:1216:C:N4	2.13	0.46
17:w:63:PRO:HD2	17:w:66:LEU:HD22	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:316:U:H2'	1:2:317:G:O4'	2.15	0.46
1:2:430:C:H2'	1:2:431:U:C6	2.50	0.46
1:2:1285:G:H21	1:2:1314:A:H62	1.61	0.46
1:2:167:C:H2'	1:2:168:U:O2	2.16	0.46
1:2:812:U:H2'	1:2:813:A:C8	2.50	0.46
1:2:1021:U:H2'	1:2:1022:U:C6	2.51	0.46
1:2:1313:A:H2'	1:2:1314:A:H8	1.81	0.46
10:p:19:ALA:HB3	10:p:82:VAL:HA	1.97	0.46
1:2:1114:G:C5	1:2:1125:G:H5''	2.51	0.46
11:q:73:ASN:OD1	11:q:73:ASN:N	2.47	0.46
1:2:1485:U:H2'	1:2:1486:A:H8	1.79	0.46
8:n:47:LEU:O	8:n:47:LEU:HD23	2.15	0.46
14:t:71:ARG:O	14:t:71:ARG:NH1	2.49	0.46
17:w:42:TYR:HE1	17:w:44:ASP:HA	1.80	0.46
7:m:4:ASP:HB3	7:m:7:ALA:HB3	1.98	0.46
1:2:937:G:H2'	1:2:938:U:C6	2.51	0.46
5:k:4:TYR:CE1	5:k:72:LEU:HD11	2.51	0.46
9:o:98:GLU:C	9:o:99:ILE:HD13	2.40	0.46
1:2:1261:A:H2'	1:2:1261:A:N3	2.31	0.45
6:l:47:ASP:O	6:l:51:THR:HG23	2.17	0.45
9:o:66:VAL:HG22	13:s:84:VAL:HG22	1.98	0.45
13:s:70:VAL:O	13:s:74:GLU:HG2	2.16	0.45
17:w:35:PHE:O	17:w:39:GLY:N	2.49	0.45
1:2:1052:C:H2'	1:2:1053:G:C8	2.49	0.45
1:2:1313:A:H2'	1:2:1314:A:C8	2.51	0.45
2:h:106:LYS:C	2:h:107:ARG:HG2	2.41	0.45
18:x:49:ILE:HD12	18:x:49:ILE:O	2.17	0.45
11:q:111:THR:O	11:q:111:THR:OG1	2.25	0.45
1:2:966:A:H5''	1:2:967:C:OP2	2.16	0.45
1:2:1045:G:H4'	1:2:1046:U:OP1	2.16	0.45
14:t:1:MET:HA	14:t:37:HIS:ND1	2.32	0.45
1:2:41:G:H2'	1:2:42:G:C8	2.52	0.45
10:p:126:ARG:HG3	10:p:126:ARG:HH11	1.81	0.45
1:2:950:A:OP2	1:2:951:U:O2'	2.31	0.45
1:2:17:U:H2'	1:2:18:C:H6	1.78	0.45
1:2:317:G:N1	1:2:320:A:OP2	2.47	0.45
1:2:328:C:H2'	1:2:329:A:C8	2.51	0.45
1:2:679:G:H1'	1:2:684:A:N6	2.32	0.45
1:2:1305:A:H2'	1:2:1306:C:C6	2.52	0.45
1:2:1417:G:H2'	1:2:1418:U:H6	1.78	0.45
8:n:46:VAL:C	8:n:48:GLN:H	2.25	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:170:A:H62	1:2:203:A:H62	1.63	0.45
1:2:678:G:H3'	1:2:679:G:C8	2.50	0.45
1:2:217:A:H2'	1:2:218:A:H8	1.82	0.45
1:2:891:A:H2'	1:2:892:A:H8	1.82	0.45
1:2:1286:G:HO2'	1:2:1287:A:P	2.39	0.45
1:2:185:G:H2'	1:2:186:G:H8	1.82	0.45
5:k:81:ARG:HB2	5:k:81:ARG:CZ	2.47	0.45
14:t:25:GLU:OE1	14:t:25:GLU:N	2.46	0.45
1:2:739:U:H2'	1:2:740:G:O4'	2.17	0.44
3:i:88:LEU:HD23	3:i:88:LEU:HA	1.82	0.44
6:l:40:LYS:HE3	6:l:40:LYS:HB3	1.71	0.44
8:n:69:GLY:O	8:n:73:GLN:HG3	2.17	0.44
18:x:53:ASN:ND2	18:x:56:GLN:O	2.50	0.44
1:2:679:G:H1'	1:2:684:A:H61	1.82	0.44
2:h:112:ALA:O	2:h:184:ALA:HB3	2.18	0.44
14:t:71:ARG:HH12	14:t:72:LYS:HA	1.82	0.44
1:2:410:G:N3	1:2:410:G:H2'	2.33	0.44
1:2:961:A:O2'	1:2:1303:C:N3	2.45	0.44
14:t:69:LEU:HD23	14:t:69:LEU:HA	1.77	0.44
18:x:66:MET:O	18:x:66:MET:HG3	2.16	0.44
1:2:60:A:H62	1:2:98:C:H4'	1.83	0.44
1:2:216:G:H2'	1:2:217:A:H8	1.82	0.44
1:2:1223:G:H2'	1:2:1224:G:H8	1.82	0.44
1:2:1414:G:O2'	1:2:1441:A:N6	2.50	0.44
3:i:170:ASN:O	3:i:173:LYS:NZ	2.40	0.44
6:l:97:ARG:HG2	6:l:101:MET:SD	2.58	0.44
8:n:117:LYS:HB3	8:n:121:LYS:HD3	1.99	0.44
1:2:56:U:H2'	1:2:57:G:H8	1.83	0.44
1:2:751:A:H2'	1:2:752:C:C6	2.53	0.44
1:2:1301:C:O2	18:x:36:ARG:NH2	2.51	0.44
2:h:133:ILE:HG21	2:h:167:PHE:CD1	2.52	0.44
8:n:84:VAL:O	8:n:88:VAL:HG23	2.18	0.44
10:p:116:HIS:O	10:p:117:ASN:C	2.61	0.44
1:2:195:U:H2'	1:2:196:A:C8	2.52	0.44
1:2:998:A:H2'	1:2:999:A:O4'	2.18	0.44
5:k:18:GLN:HE21	5:k:84:ARG:HH12	1.66	0.44
1:2:731:C:H2'	1:2:732:A:H8	1.82	0.44
1:2:956:G:OP1	9:o:58:LYS:NZ	2.41	0.44
1:2:1103:U:O4	1:2:1104:A:N6	2.51	0.44
5:k:12:PRO:HB3	5:k:45:LEU:HD21	2.00	0.44
17:w:90:MET:HE2	17:w:90:MET:HB3	1.77	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:654:A:H5'	1:2:714:C:H1'	2.00	0.44
1:2:999:A:H2'	1:2:1000:A:C8	2.53	0.44
1:2:1310:G:C5	1:2:1311:U:C5	3.05	0.44
1:2:351:U:H2'	1:2:352:G:H8	1.83	0.44
1:2:408:C:N4	1:2:421:U:H3	2.16	0.44
1:2:1200:U:H2'	1:2:1201:U:C6	2.53	0.43
5:k:94:ASP:OD1	5:k:94:ASP:N	2.48	0.43
16:v:72:LYS:O	16:v:73:THR:OG1	2.34	0.43
1:2:1043:U:H2'	1:2:1044:C:C6	2.52	0.43
1:2:1109:C:HO2'	8:n:16:ARG:HH12	1.65	0.43
5:k:5:GLU:HA	5:k:64:GLU:HA	2.00	0.43
3:i:94:ARG:NH1	3:i:96:ASP:OD2	2.50	0.43
5:k:107:LYS:HE3	5:k:107:LYS:HB2	1.86	0.43
1:2:172:A:H2'	1:2:173:G:C2	2.53	0.43
1:2:480:A:H2'	1:2:481:A:N3	2.34	0.43
1:2:706:A:C8	10:p:116:HIS:CG	3.07	0.43
1:2:1126:G:O5'	1:2:1126:G:H8	2.02	0.43
6:l:15:PRO:CG	8:n:41:THR:HG22	2.36	0.43
14:t:71:ARG:NH1	14:t:71:ARG:C	2.76	0.43
1:2:397:G:OP2	3:i:112:ARG:NH1	2.52	0.43
1:2:488:G:H2'	1:2:489:G:H8	1.82	0.43
1:2:1351:C:H2'	1:2:1352:G:C8	2.53	0.43
1:2:995:U:H2'	1:2:996:G:H8	1.83	0.43
1:2:35:G:H2'	1:2:36:C:H6	1.83	0.43
1:2:175:A:H2'	1:2:176:U:C6	2.53	0.43
1:2:458:U:H1'	1:2:459:A:C8	2.53	0.43
1:2:684:A:H2'	1:2:685:U:H6	1.83	0.43
1:2:1078:C:H2'	1:2:1079:U:C6	2.54	0.43
1:2:1222:U:H5''	6:l:118:MET:HE2	1.99	0.43
2:h:188:ALA:HB3	2:h:195:MET:HB3	1.99	0.43
6:l:16:ARG:C	6:l:18:ASN:H	2.27	0.43
16:v:83:GLU:N	16:v:83:GLU:OE1	2.51	0.43
2:h:195:MET:HB2	2:h:195:MET:HE2	1.85	0.43
8:n:4:ILE:HD12	8:n:4:ILE:N	2.34	0.43
9:o:58:LYS:HE3	9:o:61:ARG:NH2	2.34	0.43
1:2:683:A:H2'	1:2:684:A:C8	2.53	0.43
1:2:873:G:O2'	1:2:889:G:O6	2.27	0.43
1:2:903:U:H2'	1:2:904:U:C6	2.53	0.43
3:i:70:ARG:HA	3:i:70:ARG:HD2	1.67	0.43
1:2:1:A:H2'	1:2:2:C:C6	2.54	0.43
1:2:488:G:H2'	1:2:489:G:C8	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:866:C:O2'	1:2:867:U:H5'	2.17	0.43
1:2:874:U:H2'	1:2:875:A:H8	1.84	0.43
1:2:1184:U:H1'	13:s:70:VAL:HG21	2.00	0.43
8:n:52:MET:HE2	8:n:52:MET:HB2	1.82	0.43
17:w:40:ILE:O	17:w:73:TYR:OH	2.32	0.43
18:x:16:ASP:O	18:x:19:VAL:HG12	2.19	0.43
1:2:1023:U:H2'	1:2:1024:A:H8	1.84	0.42
1:2:1395:A:H2	1:2:1460:G:H22	1.67	0.42
8:n:58:ASN:O	8:n:58:ASN:ND2	2.52	0.42
12:r:19:LEU:HB3	12:r:25:VAL:HG11	2.01	0.42
1:2:183:G:H2'	1:2:184:C:C6	2.55	0.42
1:2:394:C:O2'	1:2:609:A:N3	2.47	0.42
1:2:1053:G:H2'	1:2:1054:U:C6	2.54	0.42
1:2:1134:A:H4'	9:o:14:HIS:NE2	2.34	0.42
1:2:1381:C:O2	1:2:1475:A:N6	2.52	0.42
1:2:1489:G:H2'	1:2:1491:A:OP2	2.18	0.42
1:2:1491:A:OP2	1:2:1491:A:H8	2.02	0.42
2:h:72:PRO:HG3	2:h:104:GLU:CB	2.49	0.42
2:h:165:GLU:N	2:h:165:GLU:OE1	2.52	0.42
6:l:46:ILE:O	6:l:50:GLU:HG2	2.19	0.42
19:y:61:LYS:HA	19:y:61:LYS:HD2	1.85	0.42
1:2:991:G:C2	1:2:992:A:C5	3.08	0.42
1:2:999:A:C6	1:2:1000:A:C5	3.07	0.42
2:h:20:SER:O	13:s:82:PRO:HB3	2.19	0.42
2:h:49:ALA:HB2	2:h:75:ILE:HD11	2.00	0.42
8:n:29:ASN:HD22	8:n:36:TYR:HE2	1.67	0.42
1:2:1109:C:HO2'	1:2:1110:C:P	2.41	0.42
2:h:130:ARG:HE	2:h:130:ARG:HB3	1.74	0.42
15:u:15:LYS:HB3	15:u:43:ASN:HD21	1.84	0.42
1:2:647:A:H2'	1:2:648:C:C6	2.54	0.42
1:2:668:G:H2'	1:2:669:U:C6	2.54	0.42
1:2:1106:U:C2	1:2:1108:G:C8	3.07	0.42
1:2:1436:U:H2'	1:2:1437:G:H8	1.83	0.42
6:l:115:GLU:H	6:l:121:ARG:HH11	1.68	0.42
14:t:88:LYS:HA	14:t:88:LYS:HD3	1.84	0.42
1:2:19:C:H2'	1:2:20:U:C6	2.54	0.42
1:2:784:C:O3'	10:p:125:ARG:NH1	2.53	0.42
4:j:80:ILE:HD12	4:j:150:LEU:HB3	2.02	0.42
9:o:16:LEU:HD21	9:o:95:VAL:HG11	2.02	0.42
12:r:8:ASN:OD1	12:r:8:ASN:N	2.48	0.42
1:2:1000:A:C5	1:2:1001:C:H1'	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:i:122:VAL:HG23	3:i:127:VAL:HB	2.00	0.42
5:k:12:PRO:HA	5:k:59:PHE:CE1	2.54	0.42
16:v:26:ILE:HG22	16:v:27:SER:N	2.34	0.42
17:w:44:ASP:OD1	17:w:46:LYS:N	2.41	0.42
1:2:527:A:H2'	1:2:528:G:H8	1.85	0.42
1:2:690:A:H5''	1:2:691:G:N7	2.35	0.42
1:2:750:G:H2'	1:2:751:A:C8	2.55	0.42
1:2:1454:U:H2'	1:2:1455:A:H8	1.85	0.42
5:k:94:ASP:O	5:k:98:ILE:HG12	2.18	0.42
13:s:32:ASP:OD2	13:s:32:ASP:C	2.63	0.42
1:2:684:A:C4	1:2:685:U:C5	3.08	0.42
1:2:710:A:N3	1:2:710:A:H2'	2.35	0.42
1:2:1179:A:O2'	1:2:1180:A:OP1	2.35	0.42
2:h:30:ASP:OD1	2:h:31:LYS:N	2.53	0.42
4:j:93:GLY:HA3	4:j:149:ALA:HB2	2.02	0.42
4:j:150:LEU:HD23	4:j:150:LEU:HA	1.89	0.42
1:2:725:U:H2'	1:2:726:A:C8	2.55	0.42
1:2:971:G:C6	1:2:972:G:C5	3.07	0.42
1:2:1108:G:H5'	1:2:1262:A:O2'	2.20	0.42
9:o:6:ARG:NH2	9:o:74:ASP:OD2	2.49	0.42
15:u:70:ALA:O	15:u:71:ARG:C	2.61	0.42
17:w:35:PHE:HE1	17:w:50:PHE:HZ	1.66	0.42
1:2:980:G:H2'	1:2:981:C:O4'	2.20	0.41
1:2:999:A:C2	1:2:1000:A:C4	3.08	0.41
1:2:1290:G:C6	1:2:1310:G:C6	3.08	0.41
2:h:129:TYR:O	2:h:133:ILE:HG12	2.20	0.41
12:r:9:ILE:HG23	12:r:11:ASP:N	2.35	0.41
1:2:336:U:H2'	1:2:338:C:C5	2.55	0.41
1:2:482:G:O2'	1:2:484:A:H1'	2.20	0.41
1:2:1220:A:N3	1:2:1220:A:H2'	2.34	0.41
1:2:1432:G:C2	1:2:1433:A:C8	3.08	0.41
2:h:22:TRP:CG	2:h:58:ARG:HD2	2.55	0.41
8:n:30:LYS:H	8:n:62:LYS:NZ	2.18	0.41
1:2:932:A:O2'	1:2:1345:A:OP2	2.37	0.41
1:2:1178:A:N1	2:h:161:MET:HE1	2.35	0.41
1:2:1450:C:H2'	1:2:1451:U:C6	2.55	0.41
12:r:27:LYS:O	12:r:31:LYS:HG3	2.20	0.41
16:v:61:THR:HG22	16:v:82:LEU:HD12	2.02	0.41
1:2:992:A:H2'	1:2:993:U:O4'	2.21	0.41
1:2:999:A:H2'	1:2:1000:A:H8	1.85	0.41
10:p:91:ARG:O	10:p:95:ILE:HG12	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:r:23:TYR:CE2	12:r:71:ARG:HD3	2.56	0.41
19:y:23:TYR:O	19:y:27:THR:HG23	2.20	0.41
1:2:169:C:H2'	1:2:170:A:H5''	2.03	0.41
1:2:611:C:O2	15:u:12:LYS:NZ	2.49	0.41
1:2:630:A:N7	7:m:109:SER:HA	2.36	0.41
1:2:782:A:H2'	1:2:783:C:C6	2.55	0.41
1:2:1142:G:C2	1:2:1143:C:C6	3.09	0.41
10:p:22:SER:O	10:p:28:ILE:HD12	2.20	0.41
12:r:77:ILE:HD12	12:r:77:ILE:H	1.86	0.41
12:r:81:MET:HG2	12:r:92:ARG:NH2	2.35	0.41
19:y:43:ASP:OD1	19:y:43:ASP:N	2.54	0.41
1:2:1268:A:C6	1:2:1269:A:C6	3.08	0.41
3:i:200:ASN:ND2	4:j:112:ILE:HG12	2.35	0.41
1:2:563:G:O2'	1:2:809:G:OP2	2.35	0.41
1:2:1225:C:HO2'	1:2:1226:C:P	2.44	0.41
5:k:10:LEU:HB2	5:k:59:PHE:HB2	2.03	0.41
1:2:922:G:H2'	1:2:923:C:C6	2.56	0.41
5:k:19:VAL:O	5:k:23:VAL:HG23	2.21	0.41
1:2:181:G:H1	1:2:194:U:H3	1.69	0.41
1:2:239:A:C2	1:2:275:A:C5	3.08	0.41
1:2:244:G:N2	1:2:246:U:C4	2.88	0.41
1:2:256:A:H2'	1:2:257:C:C6	2.56	0.41
1:2:321:C:H1'	1:2:322:A:OP2	2.20	0.41
1:2:1195:A:O2'	1:2:1197:G:N7	2.37	0.41
1:2:1248:G:N2	1:2:1251:A:OP2	2.34	0.41
1:2:1490:G:H2'	1:2:1491:A:C8	2.56	0.41
2:h:92:LYS:HB3	2:h:92:LYS:HE2	1.65	0.41
3:i:125:GLU:H	3:i:125:GLU:CD	2.21	0.41
8:n:97:LYS:HB3	8:n:98:PRO:HD3	2.02	0.41
8:n:118:LYS:HB2	8:n:121:LYS:HB3	2.03	0.41
12:r:9:ILE:HG23	12:r:11:ASP:H	1.86	0.41
14:t:1:MET:HA	14:t:37:HIS:CG	2.56	0.41
16:v:22:LYS:H	16:v:54:ASN:ND2	2.19	0.41
1:2:425:A:C4	1:2:426:A:C8	3.09	0.41
1:2:759:G:H2'	1:2:760:U:C6	2.56	0.41
1:2:1222:U:H5'	6:l:118:MET:HG3	2.03	0.41
1:2:1265:U:H2'	1:2:1266:A:C8	2.56	0.41
2:h:50:SER:OG	2:h:70:ALA:HB3	2.21	0.41
2:h:51:VAL:HA	2:h:69:THR:HB	2.02	0.41
1:2:202:A:OP1	19:y:60:LYS:NZ	2.41	0.40
1:2:321:C:H4'	1:2:322:A:H5'	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:435:G:H1	1:2:481:A:H62	1.70	0.40
1:2:919:C:C4	1:2:920:A:N7	2.89	0.40
1:2:1217:U:H2'	1:2:1218:A:C8	2.56	0.40
1:2:1468:U:H2'	1:2:1469:C:O4'	2.20	0.40
10:p:27:ASN:OD1	10:p:45:ALA:HB3	2.20	0.40
18:x:9:PRO:HB3	18:x:39:MET:HG2	2.04	0.40
1:2:929:A:H2'	1:2:930:A:C8	2.56	0.40
1:2:934:G:H2'	1:2:935:U:H6	1.85	0.40
1:2:1165:U:O2'	1:2:1166:G:OP1	2.31	0.40
1:2:1407:G:H2'	1:2:1408:G:C8	2.56	0.40
2:h:117:THR:O	2:h:121:ARG:HG2	2.21	0.40
1:2:151:A:OP1	1:2:151:A:H8	2.04	0.40
1:2:262:U:H2'	1:2:263:A:H8	1.86	0.40
1:2:908:G:C2	1:2:910:G:C8	3.09	0.40
1:2:1295:C:H2'	1:2:1296:U:H6	1.86	0.40
2:h:50:SER:HB2	2:h:114:LEU:HD22	2.04	0.40
13:s:33:TYR:CE1	18:x:7:LYS:HB3	2.56	0.40
15:u:4:LYS:HG3	15:u:25:ALA:HB2	2.03	0.40
15:u:81:LEU:O	15:u:85:LEU:HG	2.21	0.40
1:2:195:U:H2'	1:2:196:A:H8	1.85	0.40
1:2:806:G:O2'	1:2:807:A:O5'	2.37	0.40
1:2:1041:U:O2'	9:o:53:SER:HB2	2.21	0.40
1:2:1100:U:H2'	1:2:1101:G:H8	1.87	0.40
2:h:23:TYR:HB2	9:o:95:VAL:O	2.21	0.40
6:l:71:VAL:O	6:l:71:VAL:CG1	2.69	0.40
14:t:65:LEU:HD23	14:t:65:LEU:HA	1.92	0.40
1:2:3:G:H2'	1:2:4:A:O4'	2.21	0.40
1:2:883:A:H2'	1:2:884:A:C8	2.56	0.40
1:2:1180:A:H2'	1:2:1181:U:O4'	2.22	0.40
2:h:156:LEU:HD12	2:h:163:ARG:HB3	2.03	0.40
3:i:165:TRP:CD2	3:i:181:PRO:HB3	2.57	0.40
11:q:18:LYS:HE3	11:q:18:LYS:HB2	1.69	0.40
14:t:87:ARG:HD3	14:t:88:LYS:H	1.87	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	
2	h	213/252 (84%)	197 (92%)	16 (8%)	0	100	100
3	i	198/201 (98%)	190 (96%)	8 (4%)	0	100	100
4	j	170/173 (98%)	163 (96%)	7 (4%)	0	100	100
5	k	105/113 (93%)	101 (96%)	4 (4%)	0	100	100
6	l	108/158 (68%)	104 (96%)	4 (4%)	0	100	100
7	m	129/132 (98%)	126 (98%)	3 (2%)	0	100	100
8	n	123/128 (96%)	115 (94%)	8 (6%)	0	100	100
9	o	96/101 (95%)	89 (93%)	7 (7%)	0	100	100
10	p	115/127 (91%)	111 (96%)	4 (4%)	0	100	100
11	q	119/127 (94%)	114 (96%)	5 (4%)	0	100	100
12	r	89/124 (72%)	81 (91%)	8 (9%)	0	100	100
13	s	86/89 (97%)	79 (92%)	7 (8%)	0	100	100
14	t	86/88 (98%)	84 (98%)	2 (2%)	0	100	100
15	u	107/188 (57%)	105 (98%)	2 (2%)	0	100	100
16	v	78/86 (91%)	74 (95%)	4 (5%)	0	100	100
17	w	63/98 (64%)	63 (100%)	0	0	100	100
18	x	81/92 (88%)	77 (95%)	4 (5%)	0	100	100
19	y	77/83 (93%)	75 (97%)	2 (3%)	0	100	100
All	All	2043/2360 (87%)	1948 (95%)	95 (5%)	0	100	100

There are no Ramachandran outliers to report.

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	h	153/201 (76%)	153 (100%)	0	100	100
3	i	163/173 (94%)	163 (100%)	0	100	100
4	j	111/138 (80%)	111 (100%)	0	100	100
5	k	74/101 (73%)	74 (100%)	0	100	100
6	l	92/136 (68%)	92 (100%)	0	100	100
7	m	93/111 (84%)	93 (100%)	0	100	100
8	n	99/107 (92%)	98 (99%)	1 (1%)	73	89
9	o	72/94 (77%)	72 (100%)	0	100	100
10	p	75/102 (74%)	73 (97%)	2 (3%)	40	69
11	q	97/107 (91%)	97 (100%)	0	100	100
12	r	63/100 (63%)	63 (100%)	0	100	100
13	s	61/73 (84%)	61 (100%)	0	100	100
14	t	66/79 (84%)	66 (100%)	0	100	100
15	u	68/136 (50%)	68 (100%)	0	100	100
16	v	71/81 (88%)	71 (100%)	0	100	100
17	w	51/87 (59%)	51 (100%)	0	100	100
18	x	67/78 (86%)	67 (100%)	0	100	100
19	y	65/72 (90%)	65 (100%)	0	100	100
All	All	1541/1976 (78%)	1538 (100%)	3 (0%)	91	98

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
8	n	86	CYS
10	p	28	ILE
10	p	73	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
3	i	170	ASN
5	k	2	ASN
5	k	3	HIS

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Mol	Chain	Res	Type
5	k	96	HIS
6	l	120	GLN
8	n	29	ASN
10	p	99	HIS
14	t	41	HIS
15	u	43	ASN
17	w	86	HIS

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1465/1520 (96%)	268 (18%)	24 (1%)

All (268) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	3	G
1	2	4	A
1	2	9	G
1	2	32	A
1	2	39	G
1	2	47	C
1	2	48	U
1	2	51	A
1	2	61	G
1	2	64	G
1	2	69	G
1	2	72	G
1	2	110	A
1	2	111	C
1	2	133	C
1	2	135	G
1	2	136	A
1	2	146	C
1	2	147	A
1	2	148	G
1	2	154	U
1	2	158	G
1	2	160	U
1	2	161	U
1	2	164	U

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Mol	Chain	Res	Type
1	2	170	A
1	2	175	A
1	2	182	A
1	2	188	A
1	2	190	C
1	2	191	A
1	2	192	C
1	2	193	U
1	2	204	A
1	2	207	C
1	2	211	A
1	2	213	G
1	2	218	A
1	2	237	U
1	2	238	U
1	2	240	G
1	2	244	G
1	2	251	A
1	2	259	G
1	2	260	C
1	2	272	A
1	2	273	C
1	2	282	G
1	2	311	G
1	2	314	A
1	2	321	C
1	2	322	A
1	2	325	G
1	2	344	G
1	2	345	C
1	2	347	G
1	2	360	U
1	2	361	U
1	2	362	G
1	2	365	C
1	2	366	A
1	2	377	G
1	2	390	A
1	2	399	G
1	2	403	G
1	2	404	A
1	2	405	U

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Mol	Chain	Res	Type
1	2	406	G
1	2	407	A
1	2	408	C
1	2	410	G
1	2	418	G
1	2	419	A
1	2	423	U
1	2	433	U
1	2	447	A
1	2	448	C
1	2	450	C
1	2	454	U
1	2	455	A
1	2	457	A
1	2	458	U
1	2	459	A
1	2	461	A
1	2	462	G
1	2	464	A
1	2	465	G
1	2	470	A
1	2	472	G
1	2	481	A
1	2	483	A
1	2	484	A
1	2	485	U
1	2	499	C
1	2	506	C
1	2	509	G
1	2	515	G
1	2	519	U
1	2	520	A
1	2	521	A
1	2	535	A
1	2	547	A
1	2	550	C
1	2	552	C
1	2	560	A
1	2	561	A
1	2	564	G
1	2	565	G
1	2	576	G

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Mol	Chain	Res	Type
1	2	584	A
1	2	638	A
1	2	641	U
1	2	650	G
1	2	652	G
1	2	653	A
1	2	654	A
1	2	655	G
1	2	676	G
1	2	678	G
1	2	679	G
1	2	684	A
1	2	691	G
1	2	707	C
1	2	709	A
1	2	710	A
1	2	711	U
1	2	719	G
1	2	735	U
1	2	736	U
1	2	743	G
1	2	765	A
1	2	769	A
1	2	781	U
1	2	782	A
1	2	797	G
1	2	803	A
1	2	805	C
1	2	807	A
1	2	809	G
1	2	816	A
1	2	830	A
1	2	831	G
1	2	855	A
1	2	890	A
1	2	897	A
1	2	909	G
1	2	910	G
1	2	917	C
1	2	918	A
1	2	943	U
1	2	944	U

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Mol	Chain	Res	Type
1	2	952	A
1	2	954	G
1	2	959	G
1	2	960	A
1	2	966	A
1	2	974	U
1	2	975	U
1	2	976	A
1	2	977	A
1	2	982	A
1	2	983	G
1	2	984	A
1	2	985	C
1	2	986	U
1	2	987	G
1	2	988	A
1	2	989	C
1	2	990	C
1	2	992	A
1	2	993	U
1	2	1004	A
1	2	1019	A
1	2	1020	G
1	2	1021	U
1	2	1023	U
1	2	1024	A
1	2	1027	A
1	2	1032	C
1	2	1034	G
1	2	1037	U
1	2	1046	U
1	2	1056	C
1	2	1073	A
1	2	1075	G
1	2	1076	U
1	2	1080	A
1	2	1082	A
1	2	1085	G
1	2	1094	C
1	2	1110	C
1	2	1111	A
1	2	1115	A

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Mol	Chain	Res	Type
1	2	1134	A
1	2	1136	A
1	2	1140	C
1	2	1141	U
1	2	1146	G
1	2	1148	G
1	2	1155	G
1	2	1156	U
1	2	1157	G
1	2	1162	A
1	2	1163	G
1	2	1166	G
1	2	1178	A
1	2	1179	A
1	2	1180	A
1	2	1182	C
1	2	1183	A
1	2	1194	U
1	2	1195	A
1	2	1207	A
1	2	1208	C
1	2	1209	A
1	2	1210	C
1	2	1212	C
1	2	1218	A
1	2	1220	A
1	2	1222	U
1	2	1223	G
1	2	1225	C
1	2	1226	C
1	2	1227	G
1	2	1228	G
1	2	1239	A
1	2	1240	G
1	2	1242	C
1	2	1252	C
1	2	1254	A
1	2	1255	G
1	2	1261	A
1	2	1262	A
1	2	1267	U
1	2	1268	A

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Mol	Chain	Res	Type
1	2	1271	G
1	2	1279	C
1	2	1280	A
1	2	1281	G
1	2	1283	U
1	2	1284	C
1	2	1286	G
1	2	1301	C
1	2	1312	G
1	2	1320	A
1	2	1327	A
1	2	1328	G
1	2	1329	U
1	2	1334	G
1	2	1339	U
1	2	1345	A
1	2	1352	G
1	2	1360	C
1	2	1379	C
1	2	1380	A
1	2	1387	G
1	2	1401	G
1	2	1406	G
1	2	1411	C
1	2	1424	A
1	2	1466	A
1	2	1467	G
1	2	1476	A
1	2	1479	U
1	2	1490	G
1	2	1493	G
1	2	1502	G
1	2	1503	G

All (24) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	2	C
1	2	3	G
1	2	110	A
1	2	236	A
1	2	321	C

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Mol	Chain	Res	Type
1	2	984	A
1	2	992	A
1	2	1031	G
1	2	1045	G
1	2	1109	C
1	2	1156	U
1	2	1165	U
1	2	1179	A
1	2	1211	A
1	2	1217	U
1	2	1224	G
1	2	1225	C
1	2	1227	G
1	2	1238	C
1	2	1280	A
1	2	1285	G
1	2	1328	G
1	2	1351	C
1	2	1379	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](#)

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.

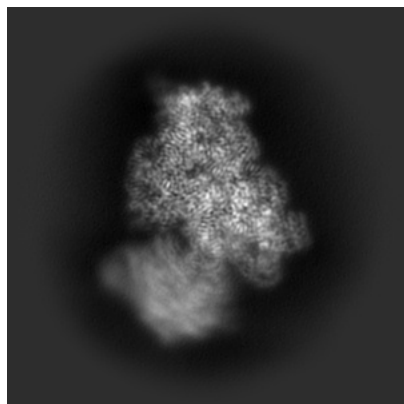
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-71035. These allow visual inspection of the internal detail of the map and identification of artifacts.

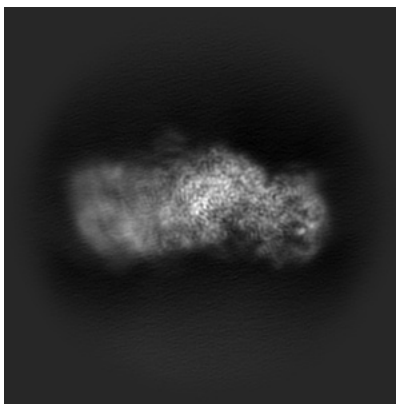
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

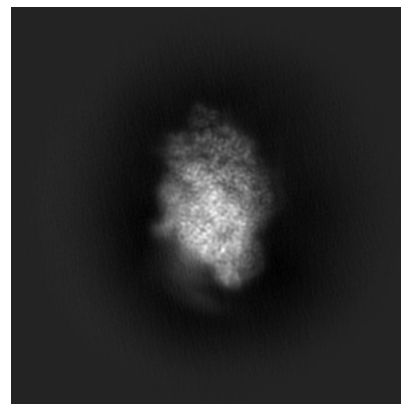
6.1.1 Primary map



X

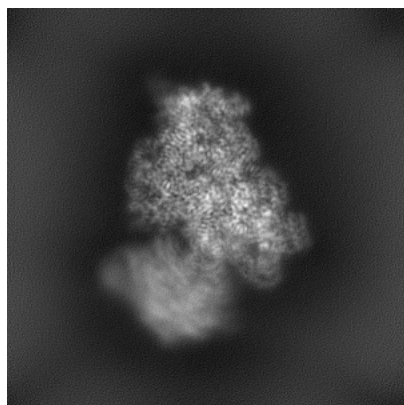


Y

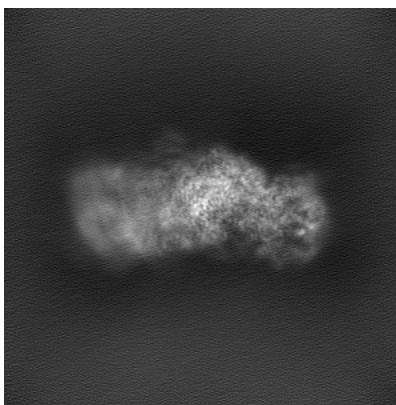


Z

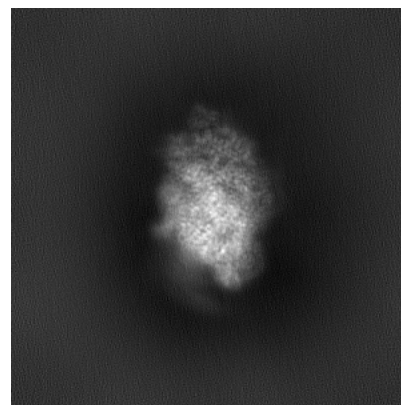
6.1.2 Raw map



X



Y

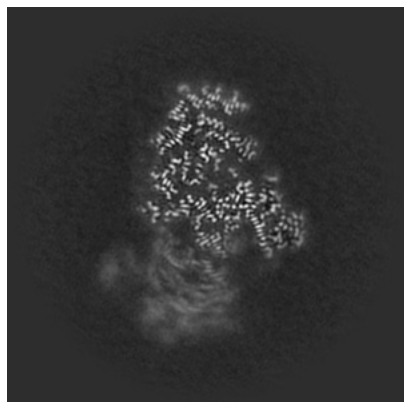


Z

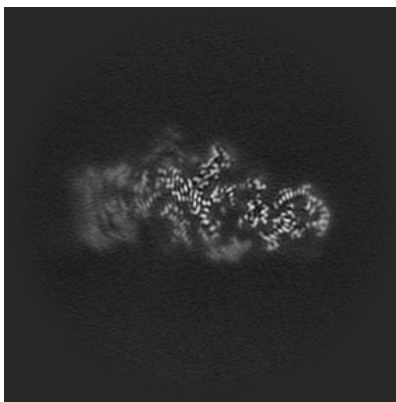
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

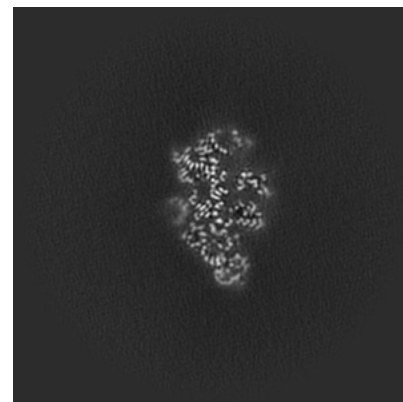
6.2.1 Primary map



X Index: 200

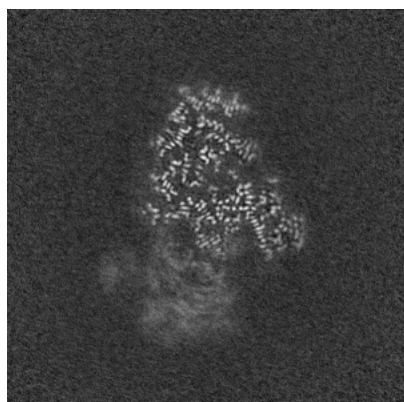


Y Index: 200

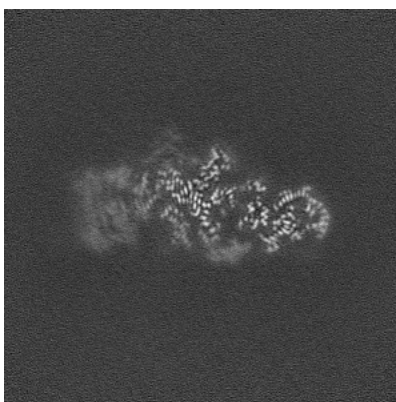


Z Index: 200

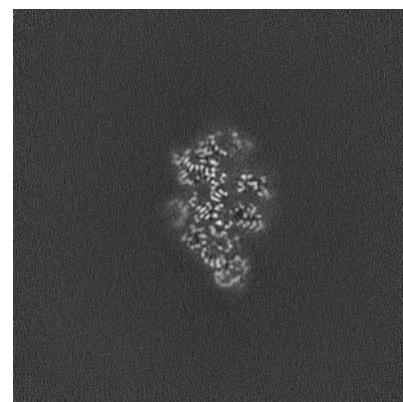
6.2.2 Raw map



X Index: 200



Y Index: 200

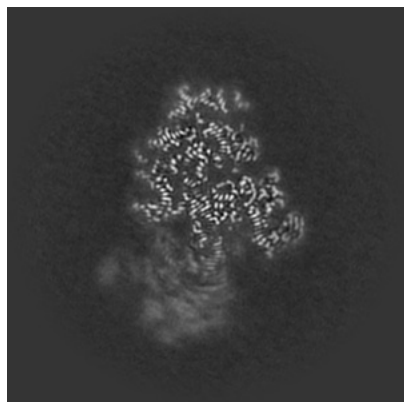


Z Index: 200

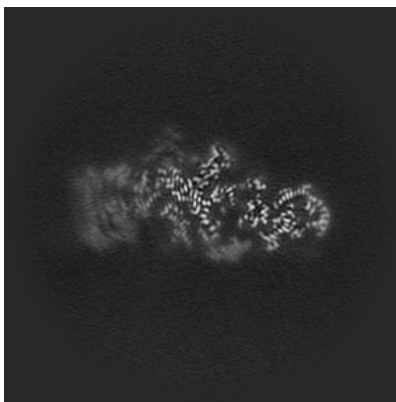
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

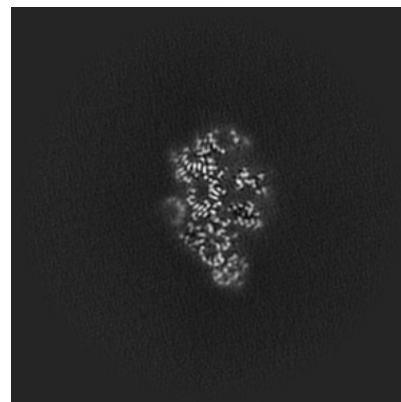
6.3.1 Primary map



X Index: 204

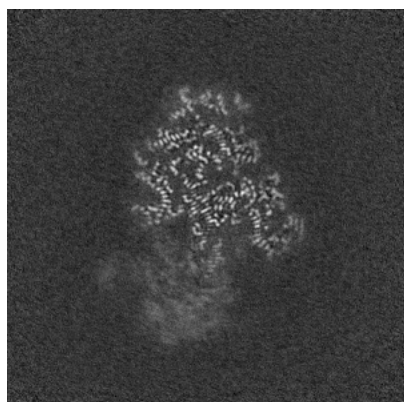


Y Index: 200

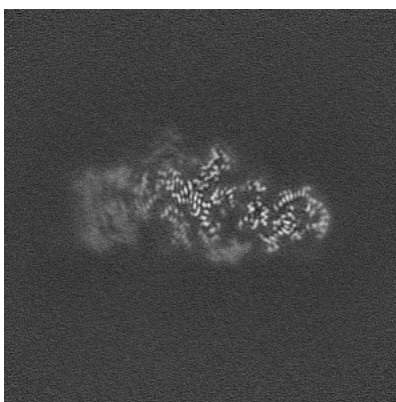


Z Index: 201

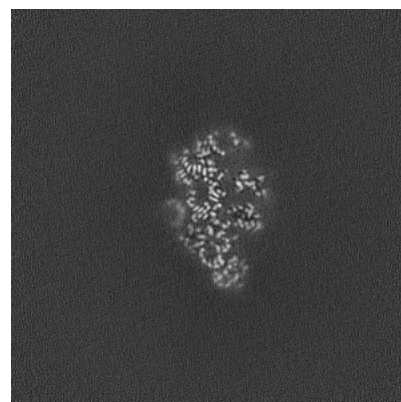
6.3.2 Raw map



X Index: 205



Y Index: 200

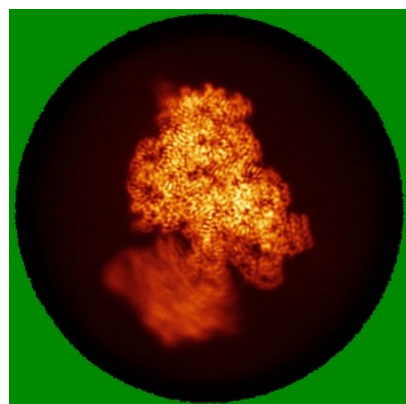


Z Index: 201

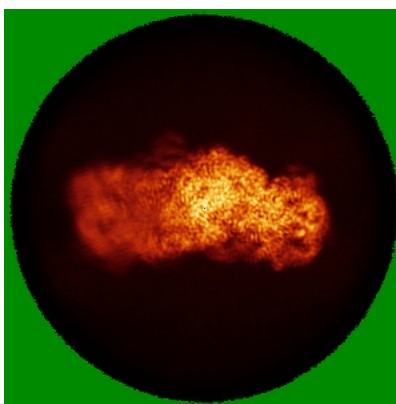
The images above show the largest variance slices of the map in three orthogonal directions.

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

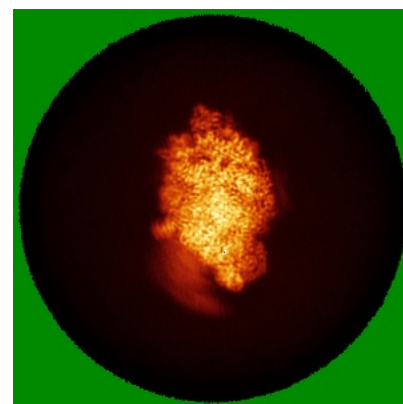
6.4.1 Primary map



X

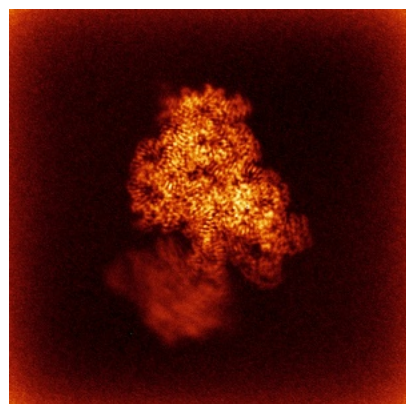


Y



Z

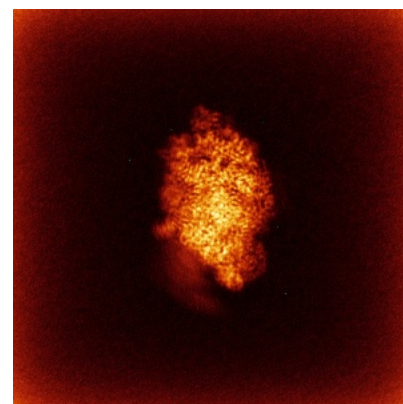
6.4.2 Raw map



X



Y

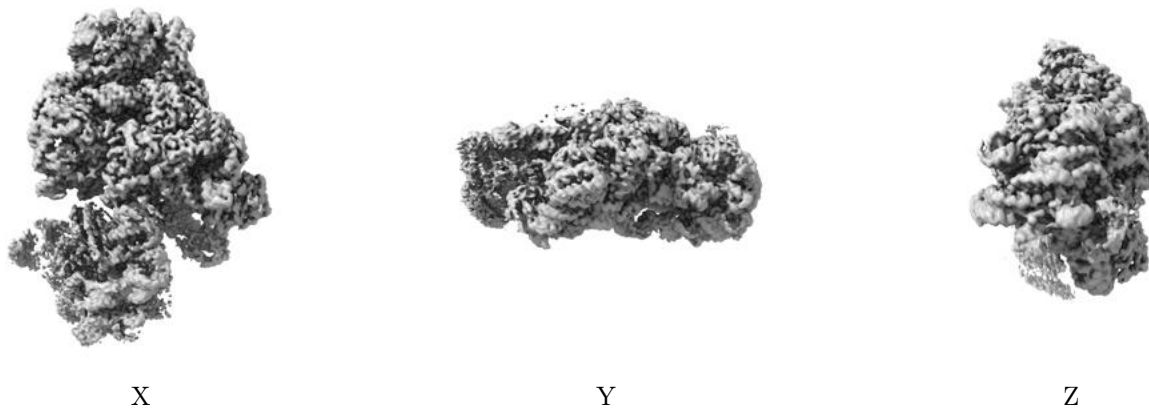


Z

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.

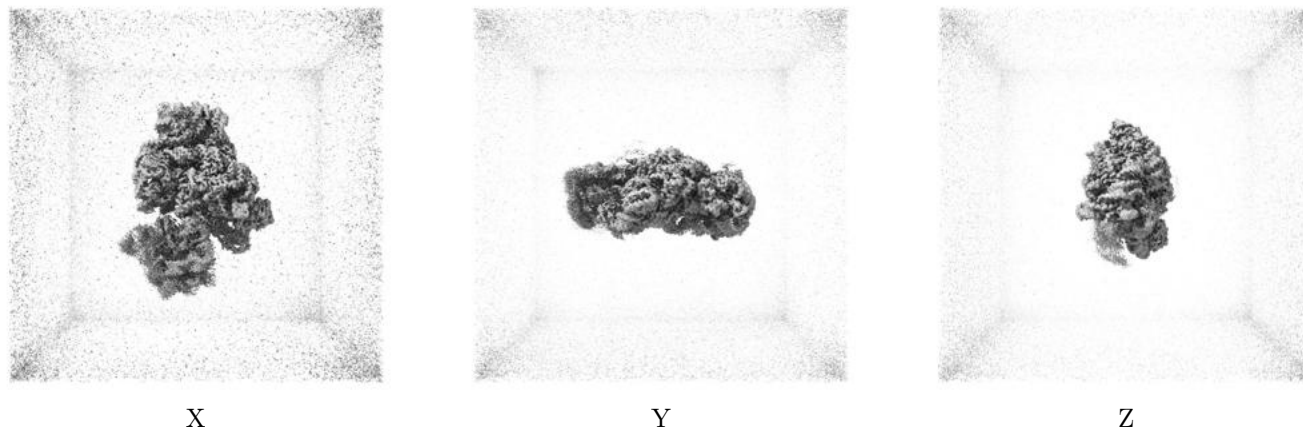
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.05. 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.

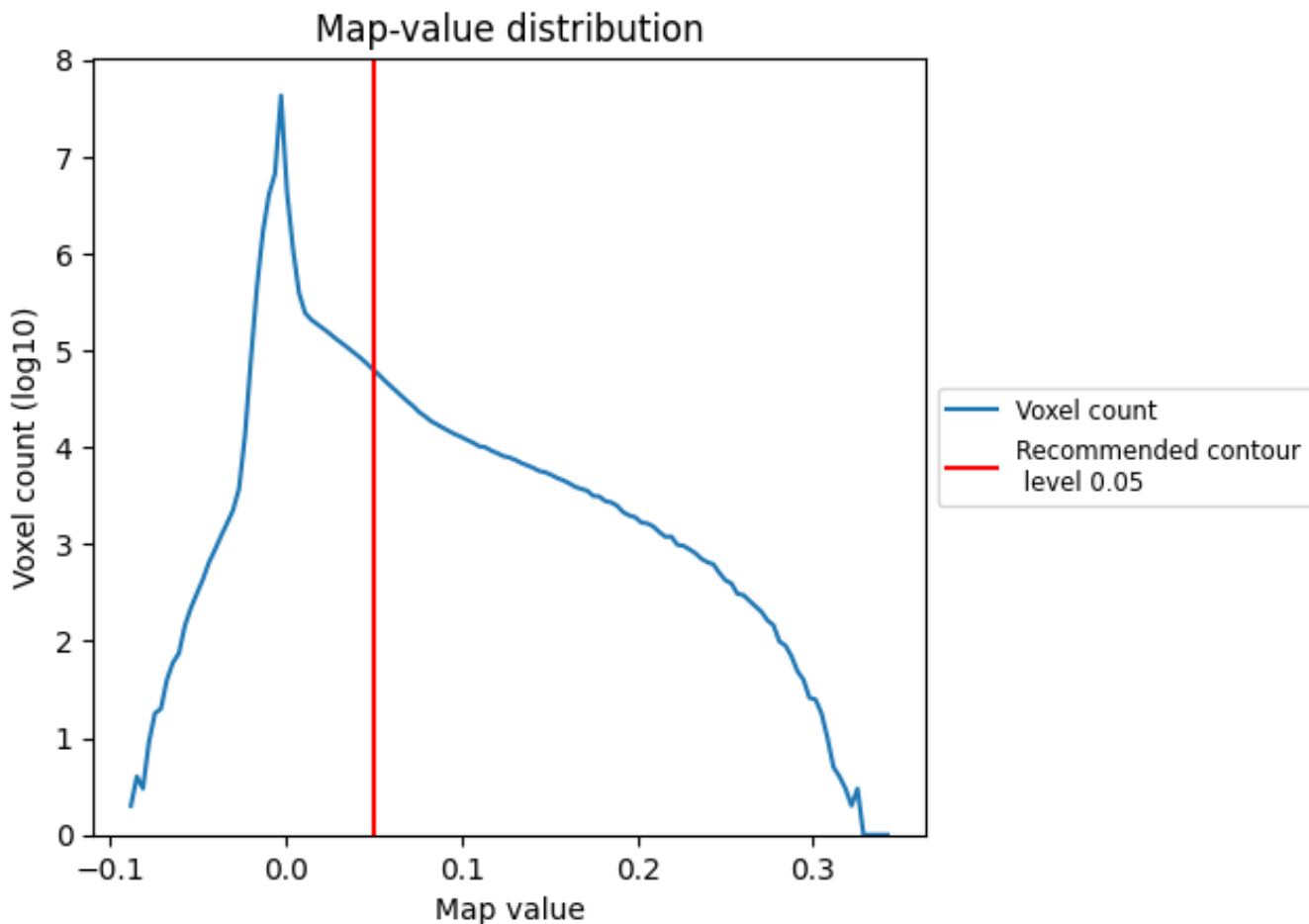
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

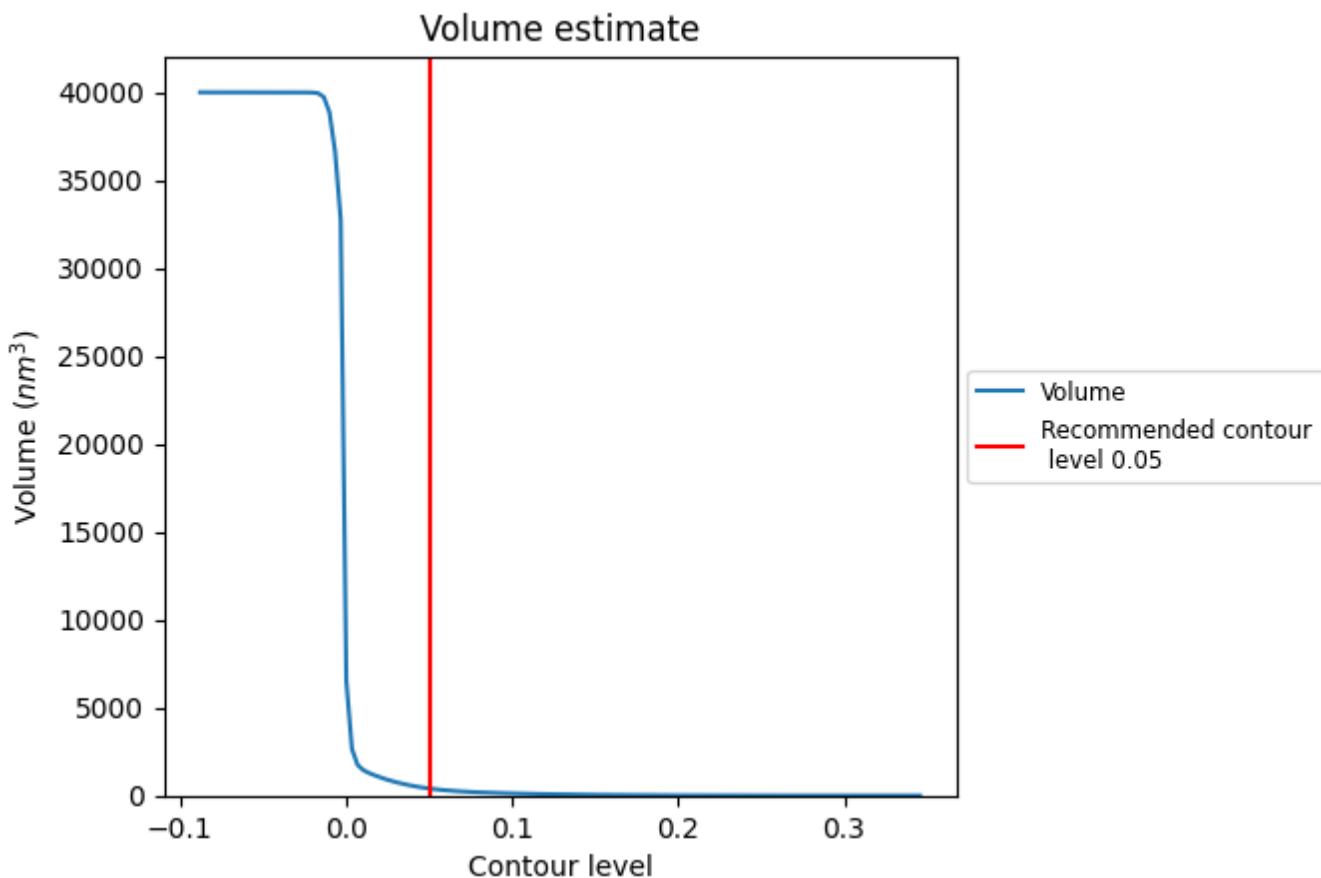
This section contains the results of statistical analysis of the map.

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.

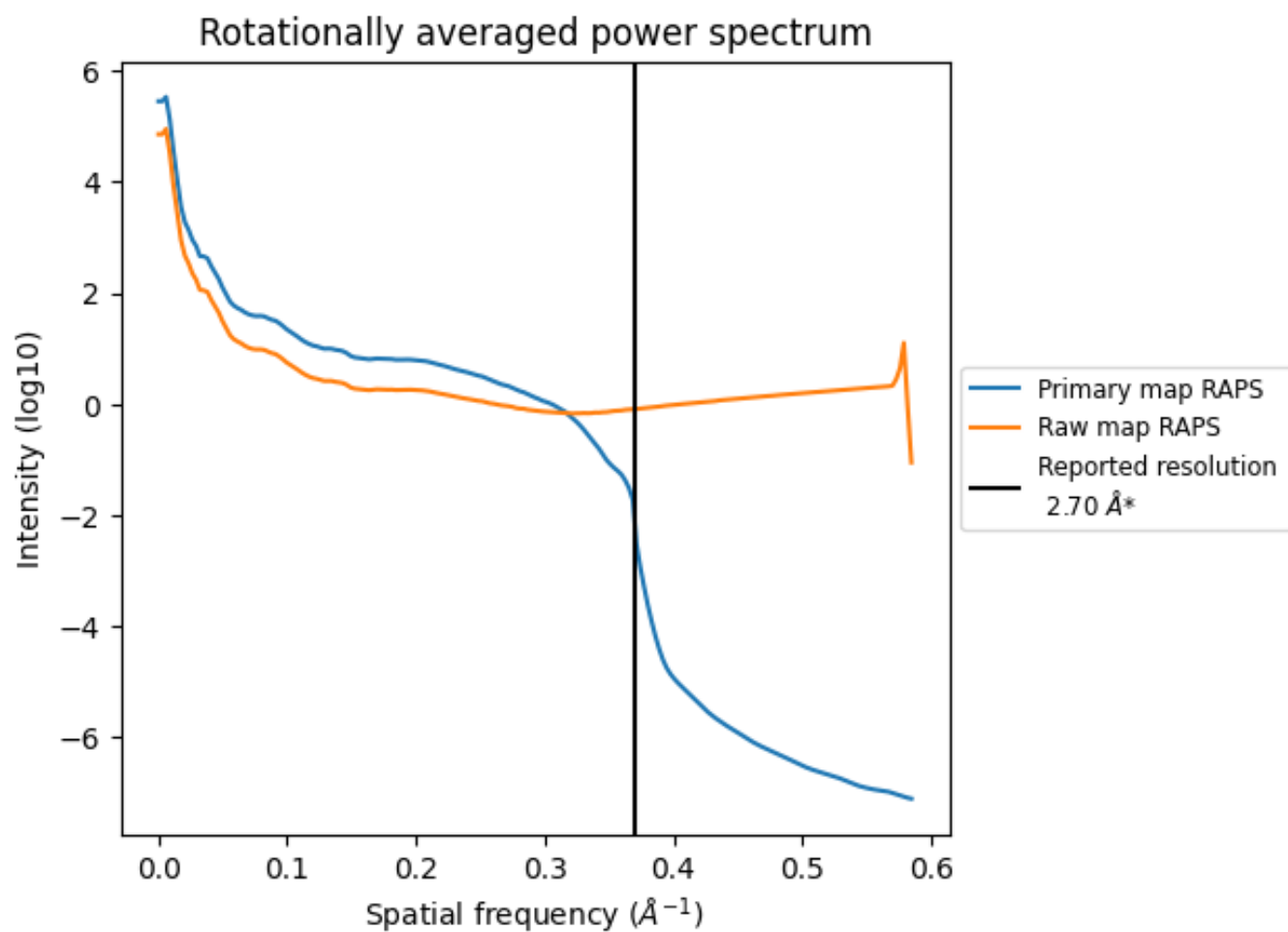
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 402 nm³; this corresponds to an approximate mass of 363 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](#)

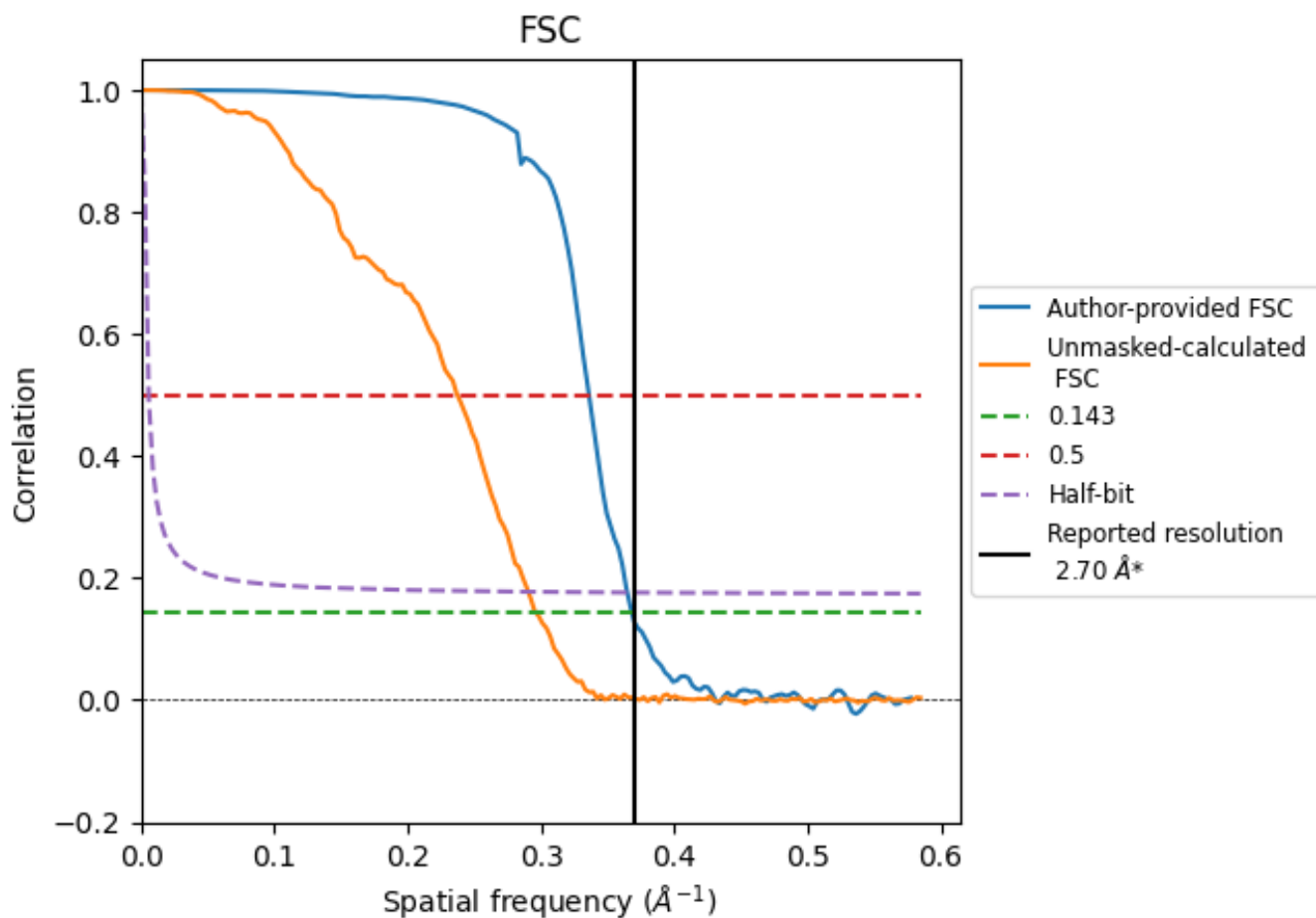


*Reported resolution corresponds to spatial frequency of 0.370 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.370 \AA^{-1}

8.2 Resolution estimates [i](#)

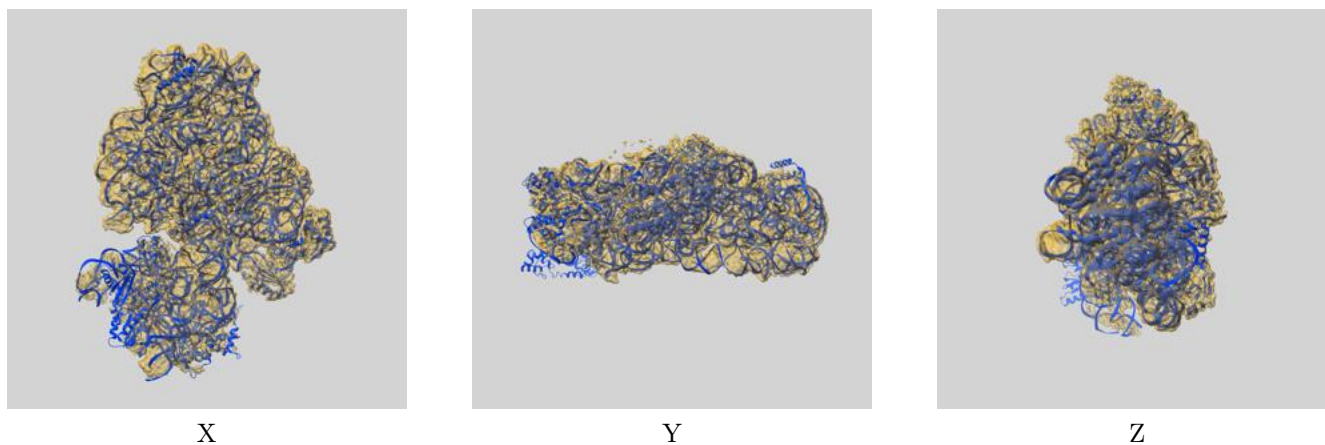
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.70	-	-
Author-provided FSC curve	2.72	2.98	2.74
Unmasked-calculated*	3.37	4.21	3.44

*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 3.37 differs from the reported value 2.7 by more than 10 %

9 Map-model fit [i](#)

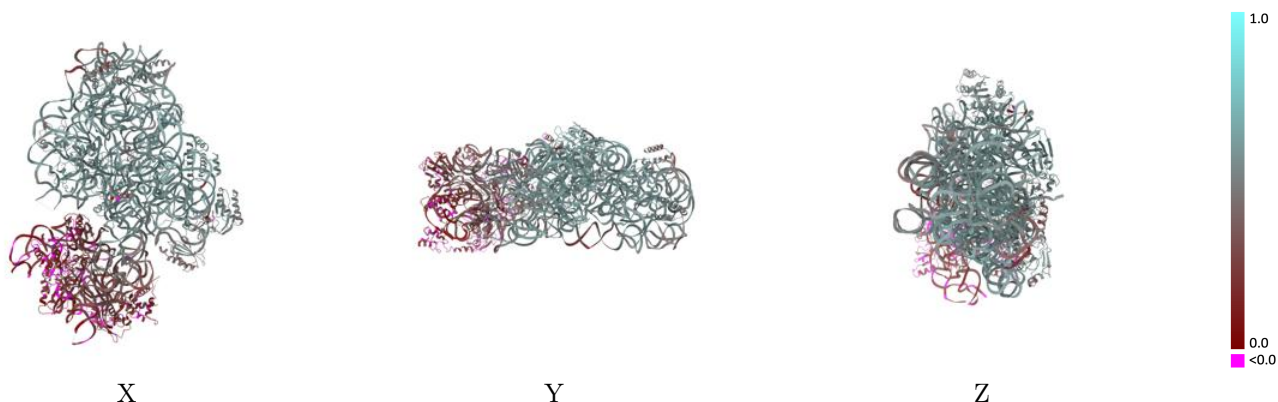
This section contains information regarding the fit between EMDB map EMD-71035 and PDB model 9OYV. Per-residue inclusion information can be found in section [3](#) on page [8](#).

9.1 Map-model overlay [i](#)



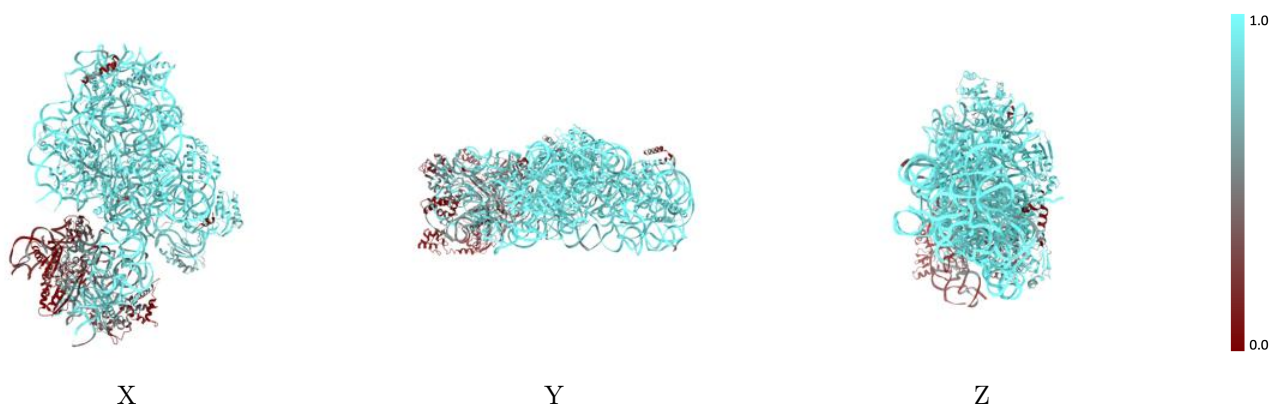
The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



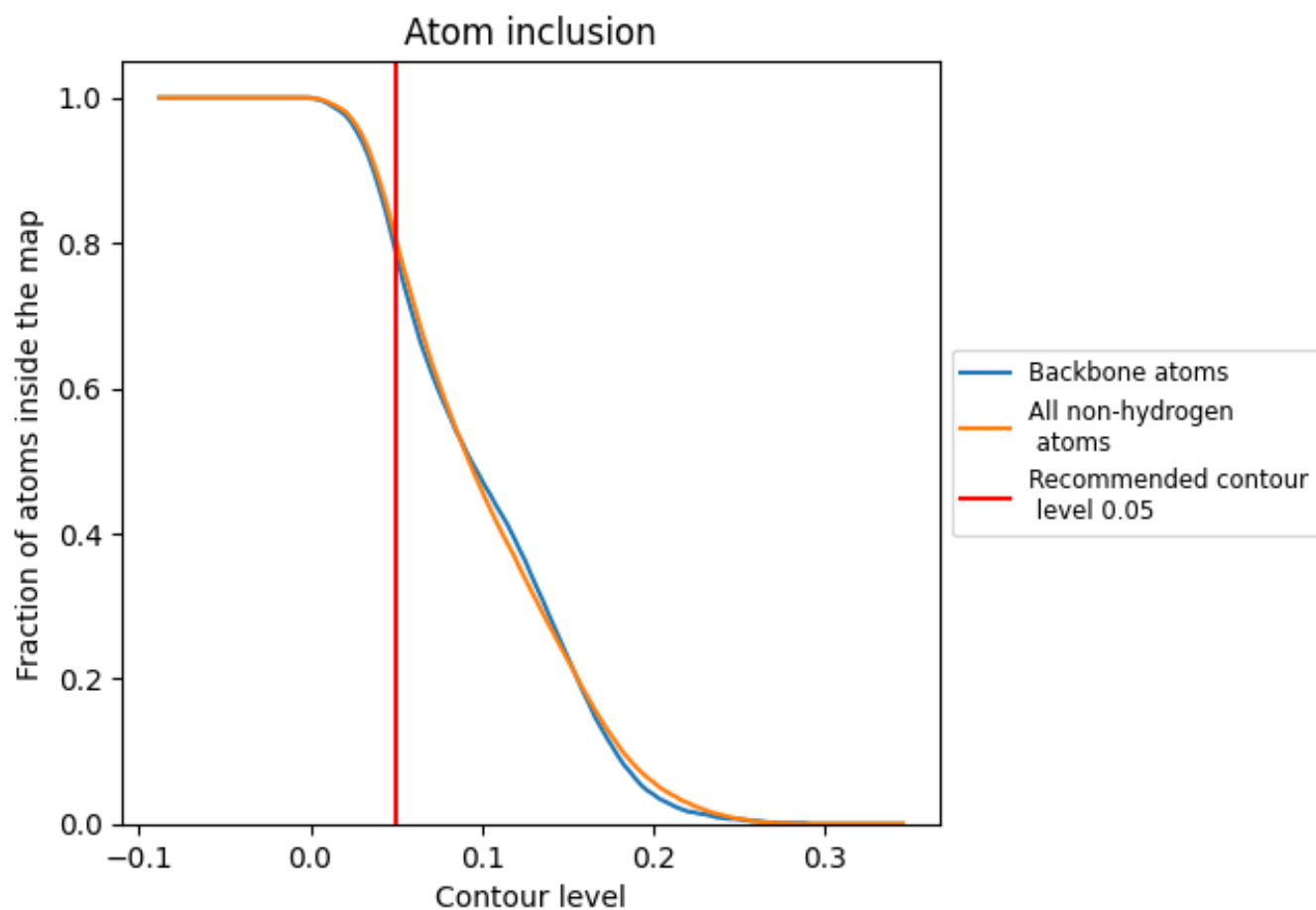
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.05).









































9.4 Atom inclusion [i](#)



At the recommended contour level, 79% of all backbone atoms, 80% 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 (0.05) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8040	 0.4400
2	 0.8770	 0.4630
h	 0.2280	 0.1750
i	 0.9060	 0.5520
j	 0.9540	 0.5660
k	 0.9240	 0.5190
l	 0.2390	 0.1470
m	 0.9850	 0.5910
n	 0.5200	 0.2180
o	 0.2680	 0.1870
p	 0.7890	 0.4700
q	 0.9700	 0.5920
r	 0.0060	 0.0680
s	 0.3160	 0.1350
t	 0.9510	 0.5570
u	 0.8490	 0.5520
v	 0.9580	 0.5850
w	 0.8220	 0.4790
x	 0.0370	 0.0590
y	 0.9620	 0.5450

