



wwPDB EM Validation Summary Report ⓘ

Mar 5, 2026 – 12:49 AM UTC

PDB ID : 5XYM / pdb_00005xym
EMDB ID : EMD-6789
Title : Large subunit of Mycobacterium smegmatis
Authors : Li, Z.; Ge, X.; Zhang, Y.; Zheng, L.; Sanyal, S.; Gao, N.
Deposited on : 2017-07-09
Resolution : 3.08 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

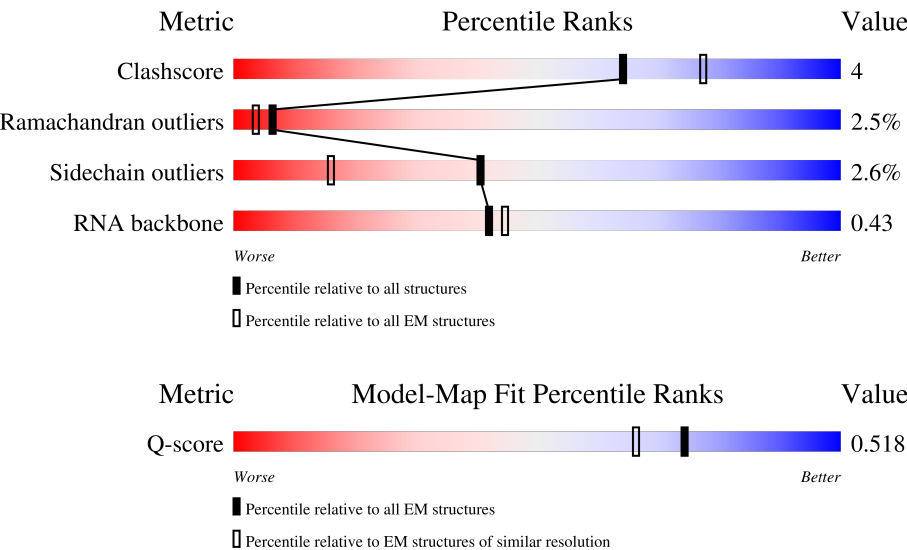
EMDB validation analysis : 0.0.1.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh &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

1 Overall quality at a glance i

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

The reported resolution of this entry is 3.08 Å.

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



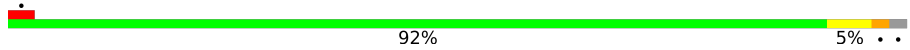
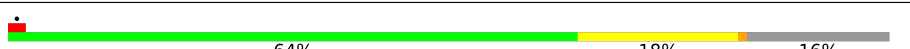
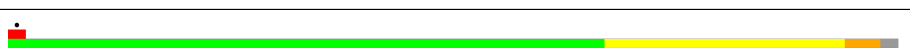
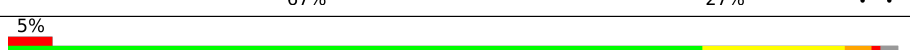
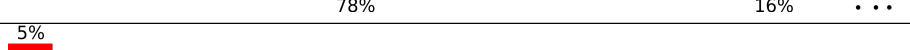
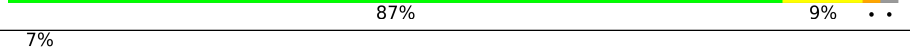
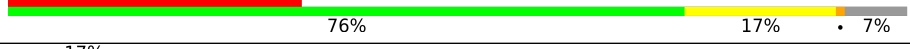
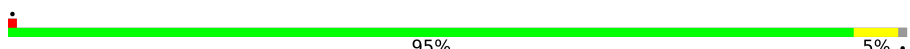
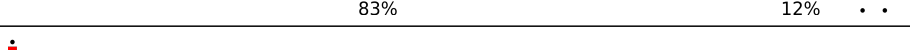
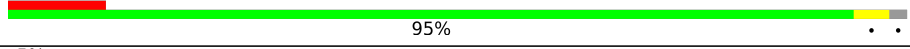
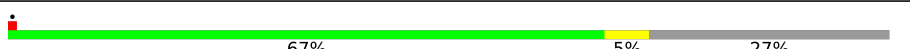
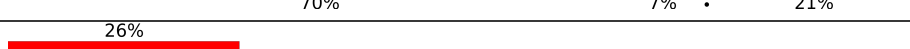
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	14000 (2.58 - 3.58)

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	0	57	11% 89%
2	1	54	17% 35% 41% 6% 19%
3	2	47	6% 96%

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Mol	Chain	Length	Quality of chain
4	3	64	
5	4	37	
6	A	3164	
7	B	118	
8	C	278	
9	D	217	
10	E	215	
11	F	187	
12	G	179	
13	H	151	
14	J	147	
15	K	122	
16	L	147	
17	M	138	
18	N	199	
19	O	127	
20	P	113	
21	Q	129	
22	R	103	
23	S	153	
24	T	100	
25	U	105	
26	V	215	
27	W	88	
28	X	64	

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Mol	Chain	Length	Quality of chain
29	Y	77	12% 65% 12% •• 21%
30	Z	61	• 87% 7% • 5%
31	a	24	8% 92% • •

2 Entry composition

There are 32 unique types of molecules in this entry. The entry contains 84069 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	0	55	Total	C	N	O	S	0	0
			432	266	95	70	1		

- Molecule 2 is a protein called 50S ribosomal protein L33 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
2	1	44	Total	C	N	O	0	0
			384	242	81	61		

- Molecule 3 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	2	46	Total	C	N	O	S	0	0
			377	225	97	54	1		

- Molecule 4 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms				AltConf	Trace
4	3	63	Total	C	N	O	0	0
			502	302	115	85		

- Molecule 5 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	4	37	Total	C	N	O	S	0	0
			298	181	66	46	5		

- Molecule 6 is a RNA chain called 23S RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	A	2665	Total	C	N	O	P	0	0
			57277	25527	10588	18497	2665		

- Molecule 7 is a RNA chain called 5S RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	B	116	Total	C	N	O	P	0	0
			2477	1106	457	798	116		

- Molecule 8 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	C	273	Total	C	N	O	S	0	0
			2097	1290	435	368	4		

- Molecule 9 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	D	212	Total	C	N	O	S	0	0
			1578	977	308	288	5		

- Molecule 10 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	E	208	Total	C	N	O	S	0	0
			1560	963	293	302	2		

- Molecule 11 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	F	174	Total	C	N	O	S	0	0
			1372	862	254	250	6		

- Molecule 12 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	G	139	Total	C	N	O	S	0	0
			1074	676	199	198	1		

- Molecule 13 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	H	34	Total	C	N	O	S	0	0
			255	164	43	47	1		

- Molecule 14 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	J	146	Total	C	N	O	S	0	0
			1130	722	207	200	1		

- Molecule 15 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	K	122	Total	C	N	O	S	0	0
			938	586	179	170	3		

- Molecule 16 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	L	144	Total	C	N	O	S	0	0
			1070	670	204	193	3		

- Molecule 17 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	M	134	Total	C	N	O	S	0	0
			1079	683	211	183	2		

- Molecule 18 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	N	116	Total	C	N	O	S	0	0
			910	572	177	159	2		

- Molecule 19 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	O	107	Total	C	N	O	0	0
			815	500	173	142		

- Molecule 20 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	P	111	Total	C	N	O	0	0
			888	559	166	163		

- Molecule 21 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	Q	124	Total	C	N	O	0	0
			988	613	203	172		

- Molecule 22 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms				AltConf	Trace
22	R	100	Total	C	N	O	0	0
			754	478	137	139		

- Molecule 23 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	S	111	Total	C	N	O	0	0
			850	528	168	154		

- Molecule 24 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	T	91	Total	C	N	O	0	0
			715	456	129	130		

- Molecule 25 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	U	83	Total	C	N	O	S	0	0
			636	399	120	115	2		

- Molecule 26 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	V	168	Total	C	N	O	0	0
			1264	785	229	250		

- Molecule 27 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	W	76	Total	C	N	O	0	0
			563	347	117	99		

- Molecule 28 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	X	62	Total	C	N	O	S	0	0
			465	280	102	79	4		

- Molecule 29 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	Y	61	Total	C	N	O	S	0	0
			516	316	100	99	1		

- Molecule 30 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms				AltConf	Trace
30	Z	58	Total	C	N	O	0	0
			470	290	94	86		

- Molecule 31 is a protein called Uncharacterized protein bL37.

Mol	Chain	Residues	Atoms				AltConf	Trace
31	a	23	Total	C	N	O	0	0
			189	111	50	28		

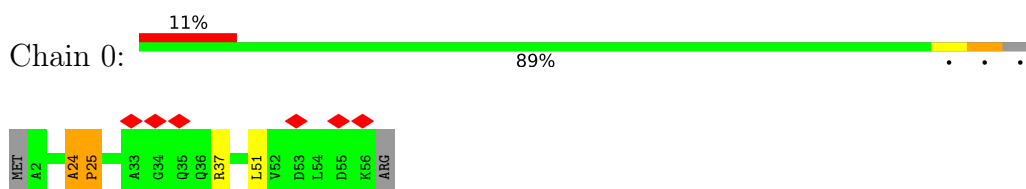
- Molecule 32 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
32	A	146	Total	Mg	0
			146	146	

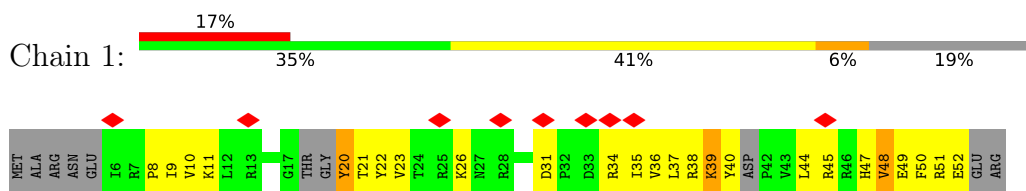
3 Residue-property plots [i](#)

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.

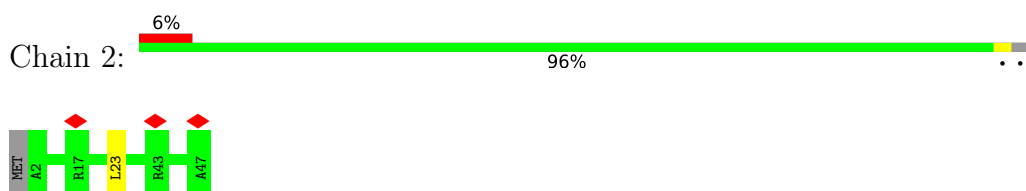
- Molecule 1: 50S ribosomal protein L32



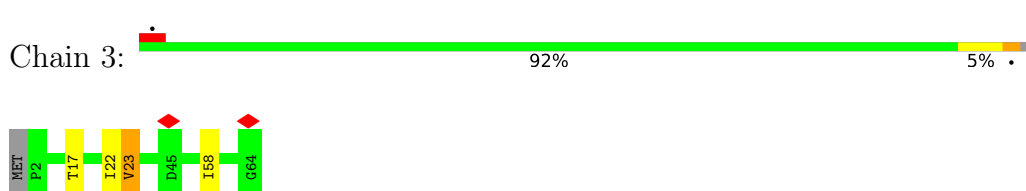
- Molecule 2: 50S ribosomal protein L33 2



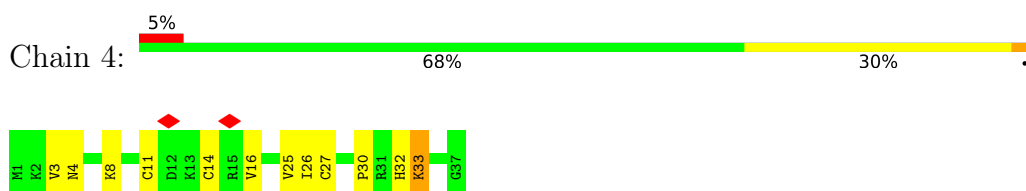
- Molecule 3: 50S ribosomal protein L34



- Molecule 4: 50S ribosomal protein L35

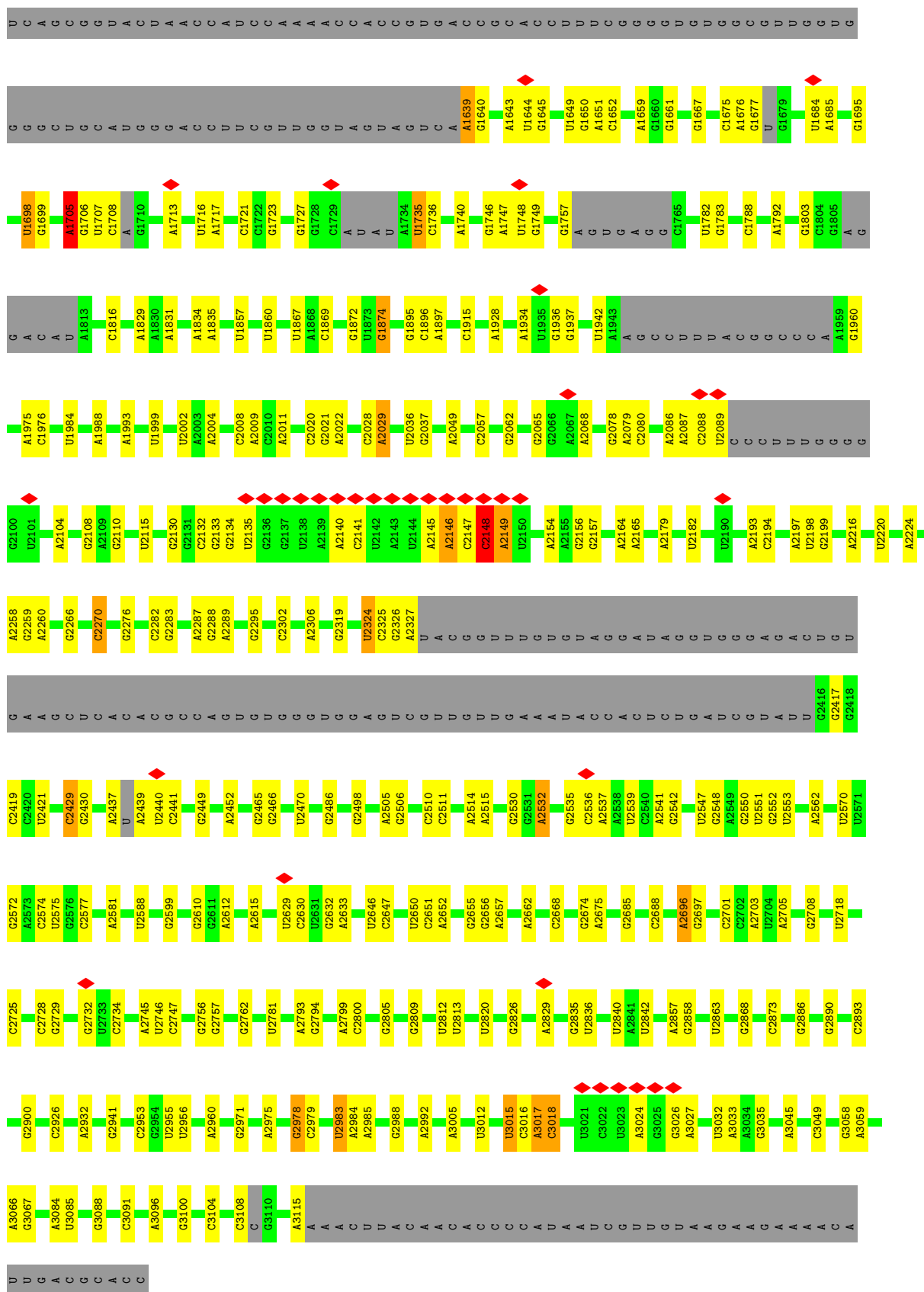


- Molecule 5: 50S ribosomal protein L36



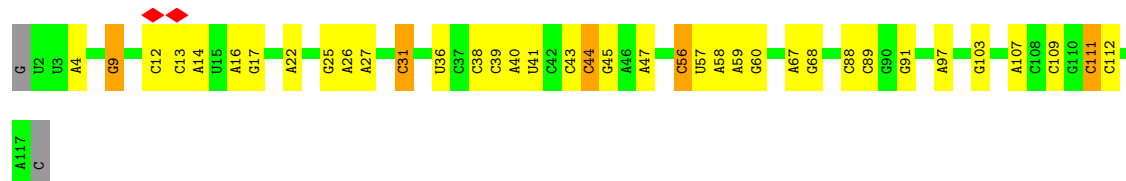
Chain A: 64% 18% 16%





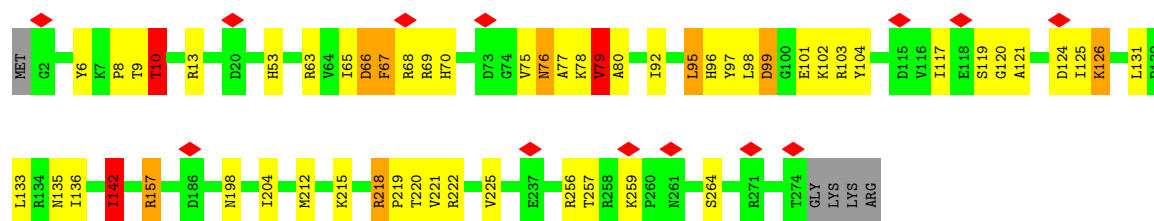
- Molecule 7: 5S RNA

Chain B: 



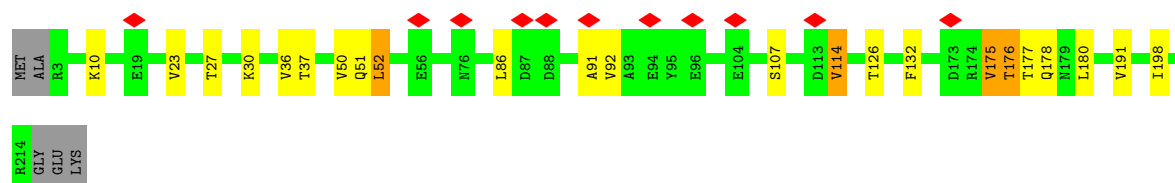
- Molecule 8: 50S ribosomal protein L2

Chain C: 



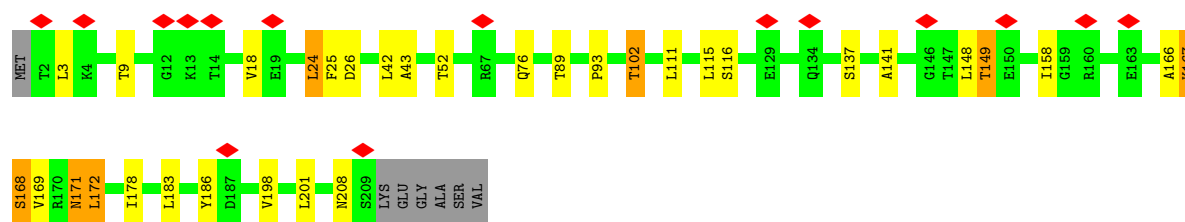
- Molecule 9: 50S ribosomal protein L3

Chain D: 



- Molecule 10: 50S ribosomal protein L4

Chain E: 

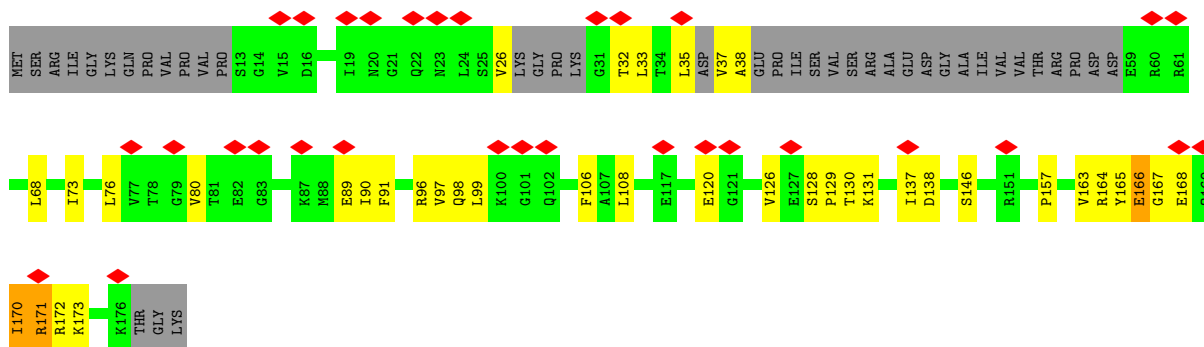


- Molecule 11: 50S ribosomal protein L5

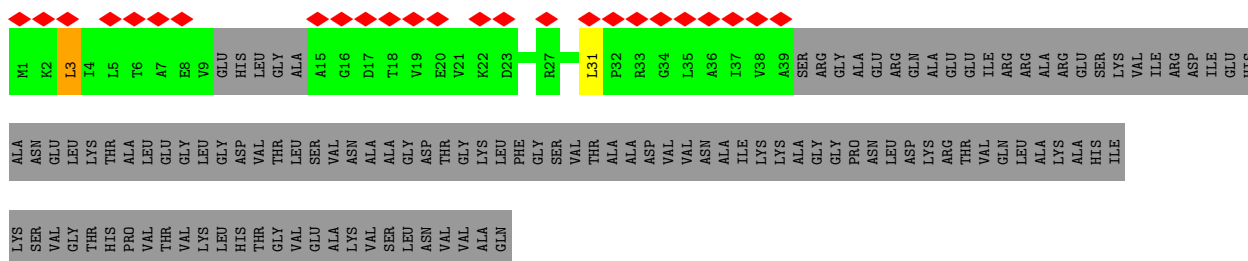
Chain F: 



- Molecule 12: 50S ribosomal protein L6



- Molecule 13: 50S ribosomal protein L9



- Molecule 14: 50S ribosomal protein L13



- Molecule 15: 50S ribosomal protein L14

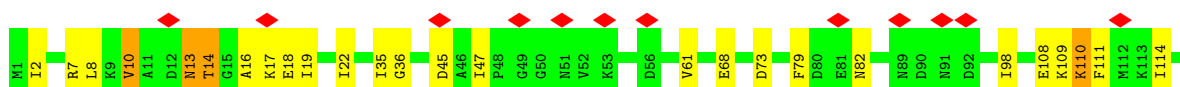
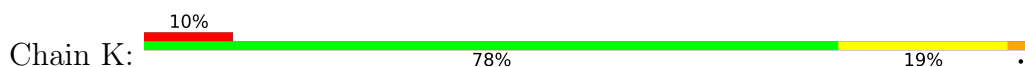
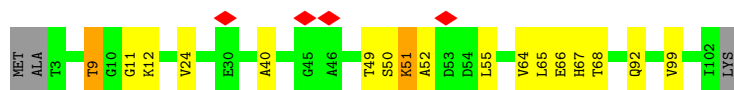


Figure 1 shows a schematic representation of the 120 amino acid residues of the protein. The residues are represented by colored blocks: MET (grey), A2 (green), R6 (yellow), T44 (yellow), R48 (yellow), E56 (green), W61 (yellow), T75 (yellow), E89 (green), V90 (green), D91 (green), L98 (yellow), P103 (yellow), A104 (yellow), T107 (orange), E119 (green), D120 (yellow), V121 (yellow), N122 (yellow), A123 (red), P124 (red), S125 (green), GLY (grey), GLU (grey), ALA (grey), and A1A (grey). Red diamonds indicate specific residues: A2, E56, E89, V90, D91, E119, and D120.

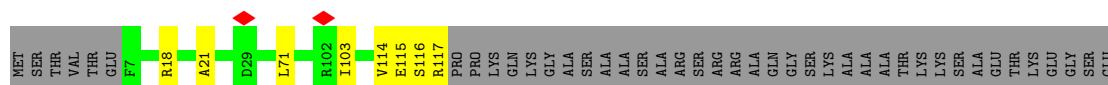
- Molecule 22: 50S ribosomal protein L21

Chain R:  81% 15% ..



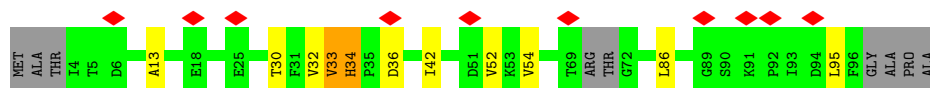
- Molecule 23: 50S ribosomal protein L22

Chain S:  67% 5% 27%



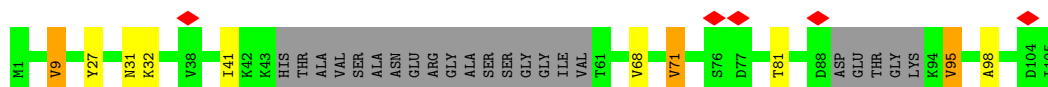
- Molecule 24: 50S ribosomal protein L23

Chain T:  10% 80% 9% 9%



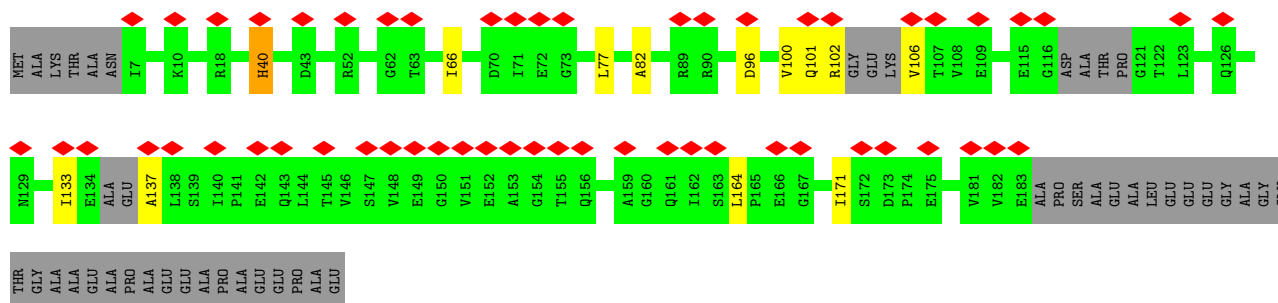
- Molecule 25: 50S ribosomal protein L24

Chain U:  5% 70% 7% 21%



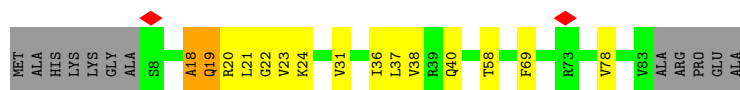
- Molecule 26: 50S ribosomal protein L25

Chain V:  26% 72% 6% 22%

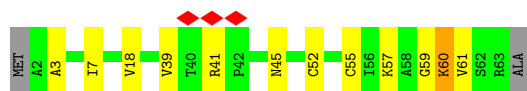
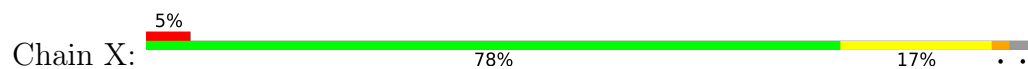


- Molecule 27: 50S ribosomal protein L27

Chain W:  69% 15% 14%



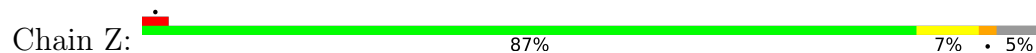
- Molecule 28: 50S ribosomal protein L28



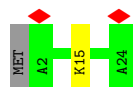
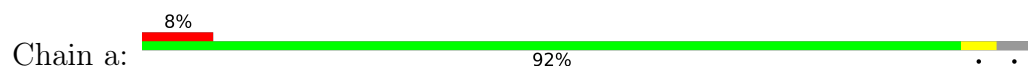
- Molecule 29: 50S ribosomal protein L29



- Molecule 30: 50S ribosomal protein L30



- Molecule 31: Uncharacterized protein bL37



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	71351	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	2	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.395	Depositor
Minimum map value	-0.243	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.012	Depositor
Recommended contour level	0.044	Depositor
Map size (Å)	369.6, 369.6, 369.6	wwPDB
Map dimensions	280, 280, 280	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.32, 1.32, 1.32	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	0	0.57	0/436	0.72	0/583
2	1	0.52	0/389	0.88	0/518
3	2	0.55	0/380	0.79	0/500
4	3	0.55	0/507	0.76	0/672
5	4	0.74	0/302	1.11	0/401
6	A	0.36	1/64129 (0.0%)	0.65	11/100026 (0.0%)
7	B	0.37	0/2770	0.67	3/4316 (0.1%)
8	C	0.61	0/2140	0.86	3/2879 (0.1%)
9	D	0.58	0/1600	0.74	0/2153
10	E	0.59	0/1583	0.92	5/2142 (0.2%)
11	F	0.55	0/1393	0.79	0/1874
12	G	0.56	0/1086	0.87	3/1456 (0.2%)
13	H	0.55	0/256	0.70	0/344
14	J	0.56	0/1157	0.73	0/1567
15	K	0.56	0/946	0.76	1/1268 (0.1%)
16	L	0.59	0/1083	0.87	2/1446 (0.1%)
17	M	0.56	0/1104	0.74	1/1486 (0.1%)
18	N	0.56	0/927	0.80	0/1244
19	O	0.56	0/821	0.78	0/1099
20	P	0.56	0/902	0.70	0/1212
21	Q	0.57	0/1000	0.87	1/1341 (0.1%)
22	R	0.52	0/764	0.80	2/1030 (0.2%)
23	S	0.54	0/862	0.73	0/1168
24	T	0.55	0/724	0.80	1/971 (0.1%)
25	U	0.59	0/640	0.76	0/854
26	V	0.53	0/1274	0.68	0/1734
27	W	0.60	0/571	0.85	1/765 (0.1%)
28	X	0.60	0/473	0.74	0/634
29	Y	0.58	0/519	0.94	1/693 (0.1%)
30	Z	0.57	0/473	0.77	0/635
31	a	0.54	0/191	0.89	0/247
All	All	0.43	1/91402 (0.0%)	0.69	35/137258 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1705	A	C1'-N9	-5.28	1.40	1.48

The worst 5 of 35 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
15	K	10	VAL	N-CA-C	8.83	121.29	109.37
10	E	171	ASN	N-CA-C	8.34	120.37	111.28
27	W	18	ALA	N-CA-C	7.86	119.84	111.28
6	A	2429	C	C4'-C3'-O3'	7.75	121.02	109.40
6	A	119	A	C2'-C3'-O3'	6.99	119.99	109.50

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	0	432	0	476	2	0
2	1	384	0	408	76	0
3	2	377	0	411	0	0
4	3	502	0	541	2	0
5	4	298	0	321	9	0
6	A	57277	0	28842	111	0
7	B	2477	0	1262	6	0
8	C	2097	0	2149	71	0
9	D	1578	0	1622	15	0
10	E	1560	0	1593	19	0
11	F	1372	0	1387	39	0
12	G	1074	0	1114	80	0
13	H	255	0	272	1	0
14	J	1130	0	1167	2	0
15	K	938	0	1000	29	0
16	L	1070	0	1140	23	0
17	M	1079	0	1118	19	0
18	N	910	0	953	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
19	O	815	0	851	12	0
20	P	888	0	913	2	0
21	Q	988	0	1038	18	0
22	R	754	0	802	15	0
23	S	850	0	889	4	0
24	T	715	0	756	8	0
25	U	636	0	689	6	0
26	V	1264	0	1296	11	0
27	W	563	0	576	9	0
28	X	465	0	476	4	0
29	Y	516	0	528	9	0
30	Z	470	0	497	2	0
31	a	189	0	205	0	0
32	A	146	0	0	0	0
All	All	84069	0	55292	555	0

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

The worst 5 of 555 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:A:2145:A:O2'	6:A:2147:C:N4	1.57	1.35
2:1:26:LYS:NZ	2:1:34:ARG:HG2	1.41	1.34
2:1:22:TYR:OH	6:A:2575:U:H5'	1.28	1.29
12:G:89:GLU:HG3	12:G:166:GLU:OE1	1.34	1.25
2:1:26:LYS:CE	2:1:34:ARG:HH11	1.49	1.25

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	
1	0	53/57 (93%)	45 (85%)	5 (9%)	3 (6%)	1	7
2	1	38/54 (70%)	32 (84%)	5 (13%)	1 (3%)	4	19
3	2	44/47 (94%)	39 (89%)	5 (11%)	0	100	100
4	3	61/64 (95%)	57 (93%)	3 (5%)	1 (2%)	7	28
5	4	35/37 (95%)	27 (77%)	4 (11%)	4 (11%)	0	1
8	C	271/278 (98%)	235 (87%)	26 (10%)	10 (4%)	2	13
9	D	210/217 (97%)	188 (90%)	18 (9%)	4 (2%)	6	24
10	E	206/215 (96%)	186 (90%)	16 (8%)	4 (2%)	6	24
11	F	170/187 (91%)	150 (88%)	14 (8%)	6 (4%)	3	14
12	G	131/179 (73%)	118 (90%)	12 (9%)	1 (1%)	16	44
13	H	30/151 (20%)	27 (90%)	2 (7%)	1 (3%)	3	15
14	J	144/147 (98%)	133 (92%)	9 (6%)	2 (1%)	9	31
15	K	120/122 (98%)	103 (86%)	15 (12%)	2 (2%)	7	27
16	L	142/147 (97%)	126 (89%)	14 (10%)	2 (1%)	9	31
17	M	130/138 (94%)	119 (92%)	8 (6%)	3 (2%)	5	21
18	N	114/199 (57%)	107 (94%)	7 (6%)	0	100	100
19	O	101/127 (80%)	90 (89%)	10 (10%)	1 (1%)	12	39
20	P	109/113 (96%)	98 (90%)	9 (8%)	2 (2%)	6	26
21	Q	122/129 (95%)	116 (95%)	3 (2%)	3 (2%)	4	19
22	R	98/103 (95%)	90 (92%)	5 (5%)	3 (3%)	3	16
23	S	109/153 (71%)	104 (95%)	3 (3%)	2 (2%)	6	26
24	T	87/100 (87%)	80 (92%)	5 (6%)	2 (2%)	5	21
25	U	77/105 (73%)	69 (90%)	7 (9%)	1 (1%)	9	33
26	V	160/215 (74%)	150 (94%)	8 (5%)	2 (1%)	9	33
27	W	74/88 (84%)	61 (82%)	7 (10%)	6 (8%)	1	3
28	X	60/64 (94%)	50 (83%)	4 (7%)	6 (10%)	0	2
29	Y	59/77 (77%)	51 (86%)	6 (10%)	2 (3%)	3	14
30	Z	56/61 (92%)	49 (88%)	6 (11%)	1 (2%)	6	26
31	a	21/24 (88%)	18 (86%)	2 (10%)	1 (5%)	2	10
All	All	3032/3598 (84%)	2718 (90%)	238 (8%)	76 (2%)	6	19

5 of 76 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
8	C	142	ILE
9	D	175	VAL
10	E	149	THR
11	F	51	ALA
15	K	13	ASN

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	0	44/46 (96%)	44 (100%)	0	100	100
2	1	42/50 (84%)	40 (95%)	2 (5%)	23	51
3	2	35/36 (97%)	34 (97%)	1 (3%)	37	63
4	3	53/54 (98%)	53 (100%)	0	100	100
5	4	35/35 (100%)	32 (91%)	3 (9%)	10	32
8	C	214/218 (98%)	204 (95%)	10 (5%)	23	52
9	D	160/163 (98%)	158 (99%)	2 (1%)	61	74
10	E	168/173 (97%)	160 (95%)	8 (5%)	23	51
11	F	143/156 (92%)	142 (99%)	1 (1%)	76	80
12	G	116/150 (77%)	113 (97%)	3 (3%)	40	65
13	H	26/116 (22%)	26 (100%)	0	100	100
14	J	119/120 (99%)	117 (98%)	2 (2%)	53	71
15	K	100/100 (100%)	97 (97%)	3 (3%)	36	62
16	L	111/114 (97%)	108 (97%)	3 (3%)	39	64
17	M	113/116 (97%)	108 (96%)	5 (4%)	25	54
18	N	95/158 (60%)	94 (99%)	1 (1%)	65	76
19	O	79/94 (84%)	78 (99%)	1 (1%)	61	74
20	P	98/100 (98%)	97 (99%)	1 (1%)	68	77
21	Q	97/99 (98%)	93 (96%)	4 (4%)	27	56
22	R	81/83 (98%)	80 (99%)	1 (1%)	63	75

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	S	87/117 (74%)	87 (100%)	0	100	100
24	T	79/85 (93%)	77 (98%)	2 (2%)	42	66
25	U	71/86 (83%)	68 (96%)	3 (4%)	26	55
26	V	140/168 (83%)	139 (99%)	1 (1%)	76	80
27	W	56/63 (89%)	55 (98%)	1 (2%)	51	70
28	X	50/51 (98%)	48 (96%)	2 (4%)	28	56
29	Y	57/66 (86%)	53 (93%)	4 (7%)	14	39
30	Z	52/54 (96%)	51 (98%)	1 (2%)	50	70
31	a	18/19 (95%)	18 (100%)	0	100	100
All	All	2539/2890 (88%)	2474 (97%)	65 (3%)	41	65

5 of 65 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
27	W	21	LEU
28	X	52	CYS
10	E	172	LEU
10	E	149	THR
29	Y	41	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 47 such sidechains are listed below:

Mol	Chain	Res	Type
18	N	61	HIS
22	R	13	GLN
18	N	102	ASN
20	P	79	ASN
23	S	48	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
6	A	2647/3164 (83%)	568 (21%)	36 (1%)
7	B	115/118 (97%)	33 (28%)	1 (0%)
All	All	2762/3282 (84%)	601 (21%)	37 (1%)

5 of 601 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
6	A	9	G
6	A	10	U
6	A	14	A
6	A	28	A
6	A	34	U

5 of 37 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
6	A	2551	U
6	A	3017	A
6	A	2552	G
6	A	2978	G
6	A	759	A

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 146 ligands modelled in this entry, 146 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.

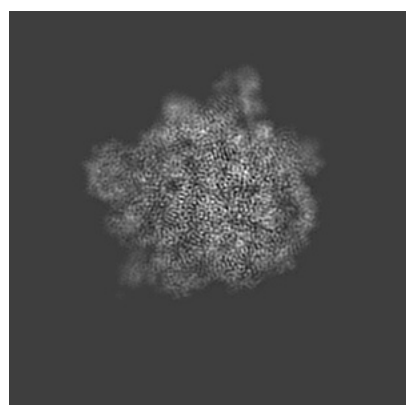
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-6789. These allow visual inspection of the internal detail of the map and identification of artifacts.

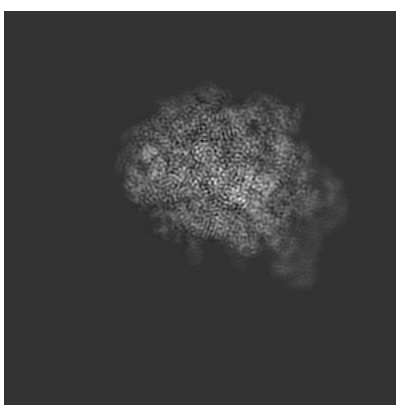
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

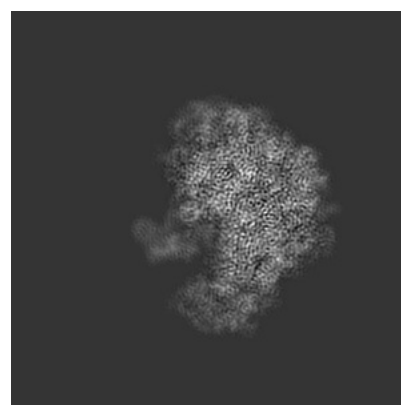
6.1.1 Primary map



X



Y

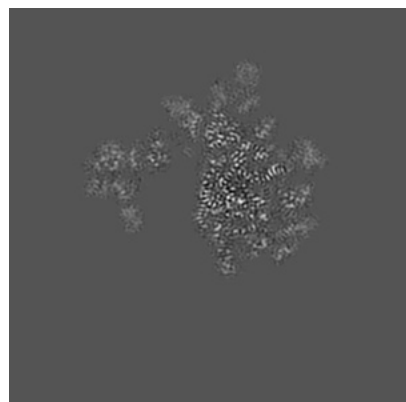


Z

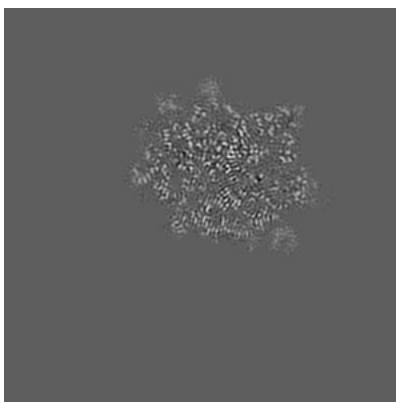
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

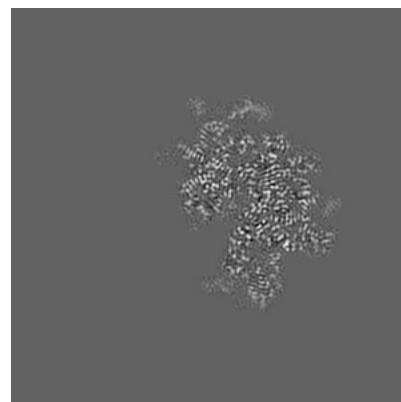
6.2.1 Primary map



X Index: 140



Y Index: 140

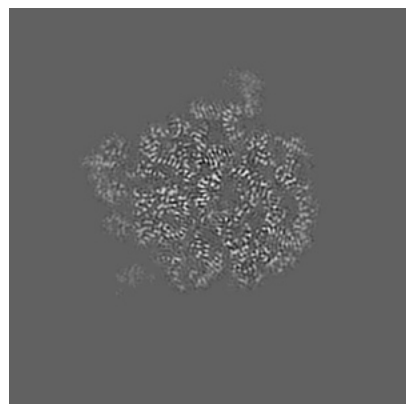


Z Index: 140

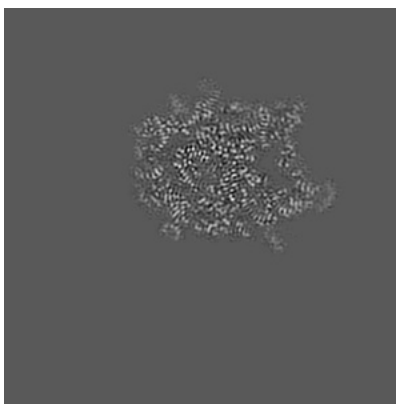
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

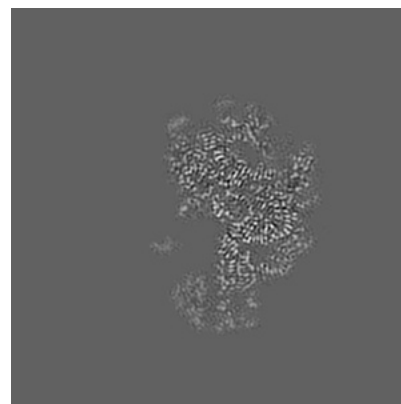
6.3.1 Primary map



X Index: 162



Y Index: 145

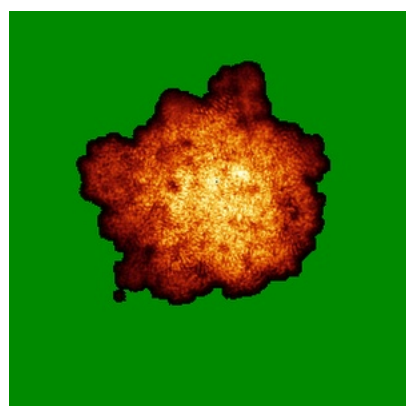


Z Index: 164

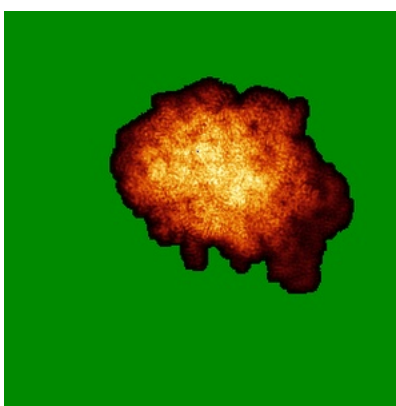
The images above show the largest variance slices of the map in three orthogonal directions.

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

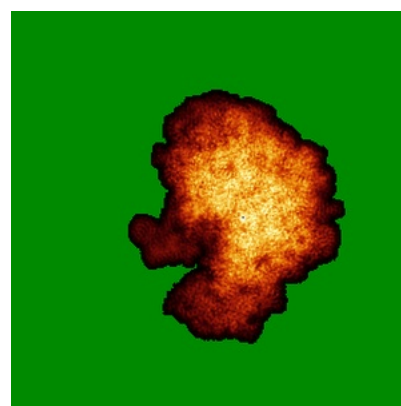
6.4.1 Primary map



X



Y

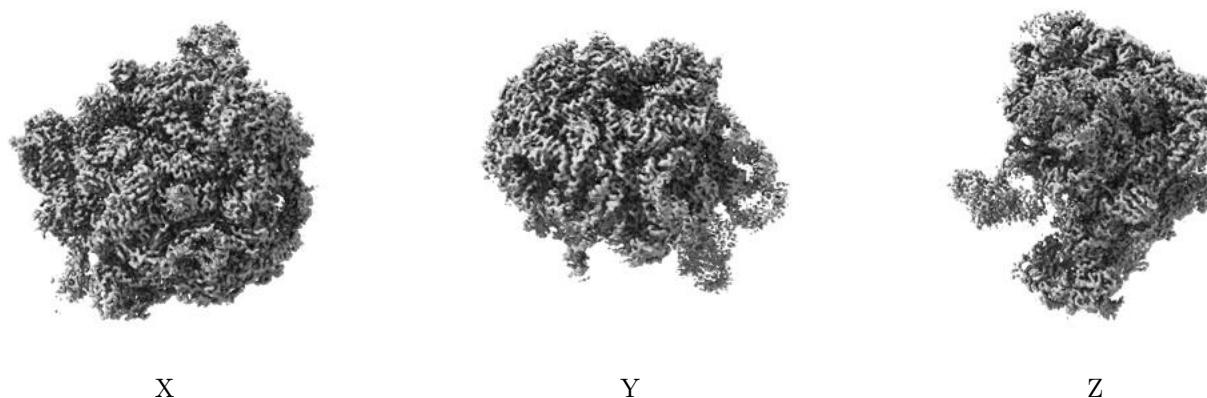


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.044. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

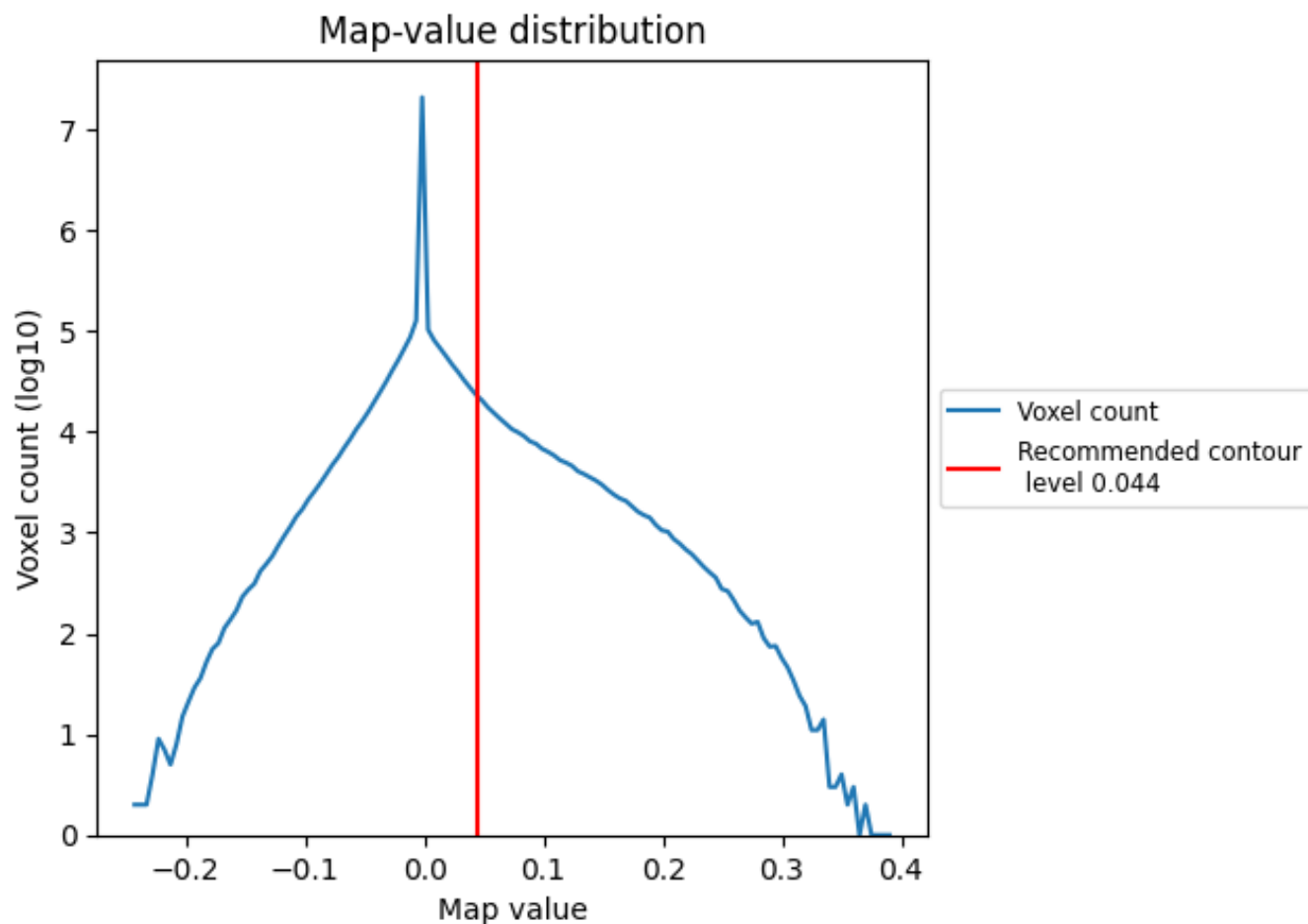
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

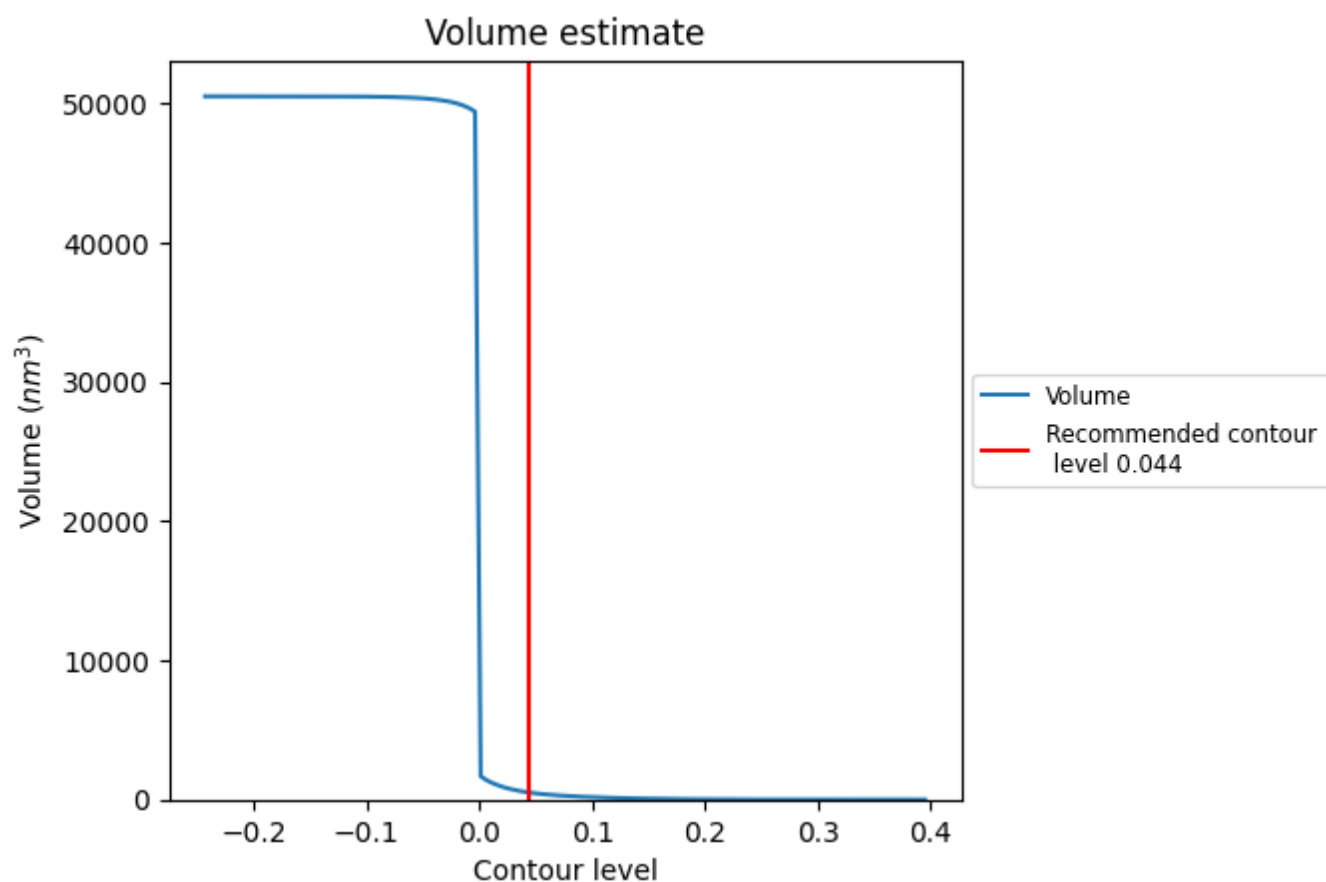
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

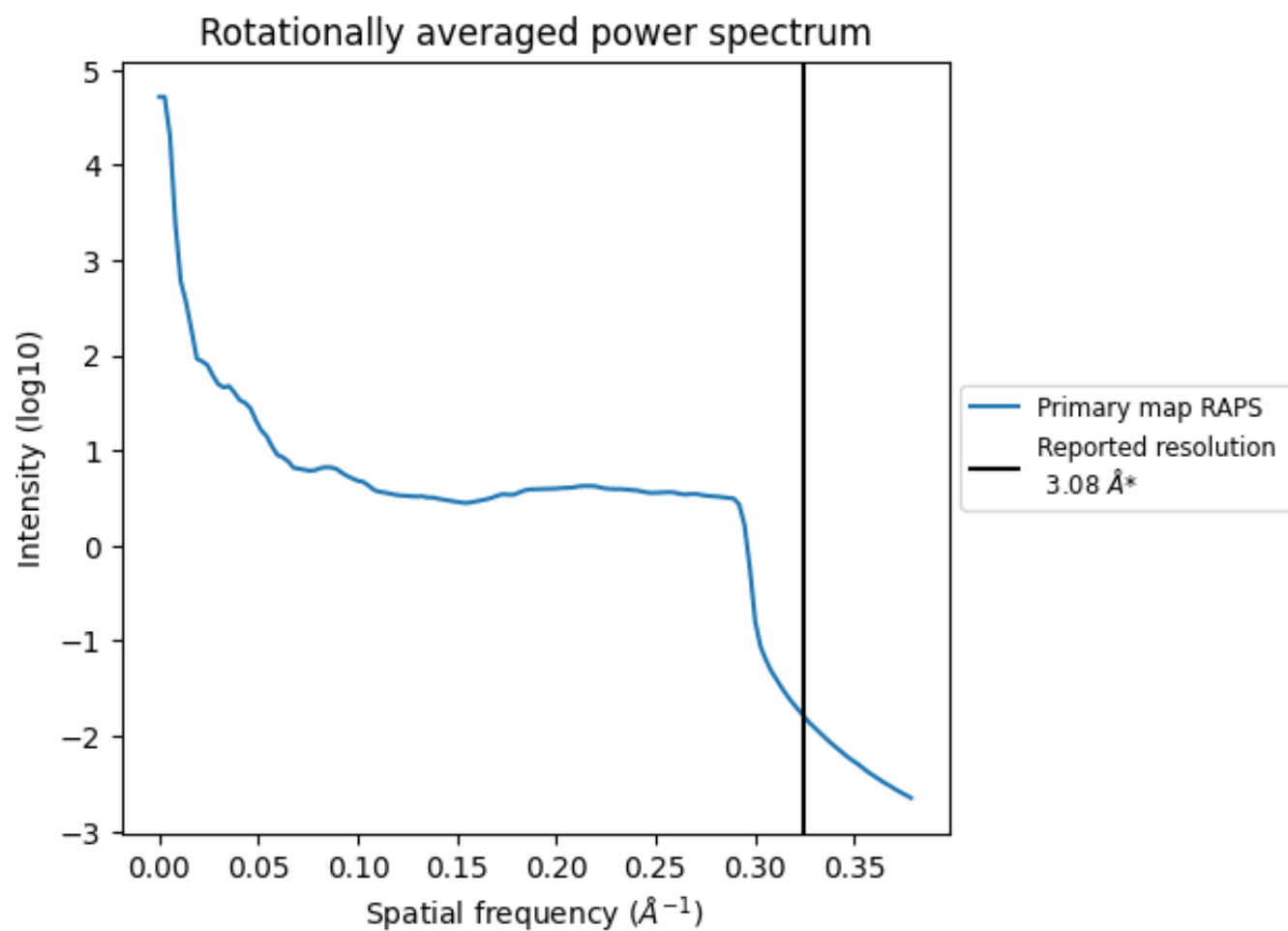
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 509 nm³; this corresponds to an approximate mass of 460 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ

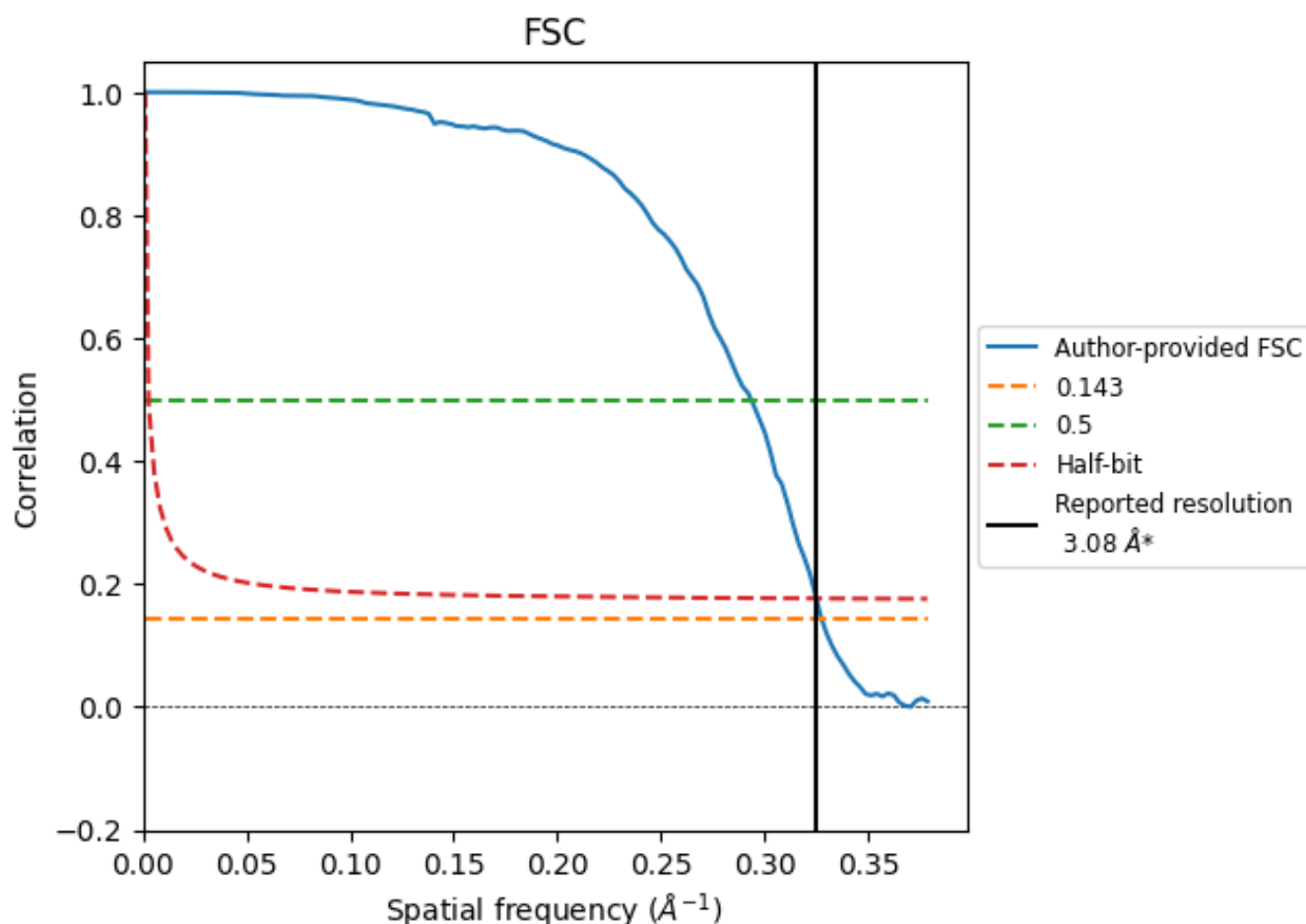


*Reported resolution corresponds to spatial frequency of 0.325 Å⁻¹

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 0.325 Å⁻¹

8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.08	-	-
Author-provided FSC curve	3.05	3.40	3.08
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

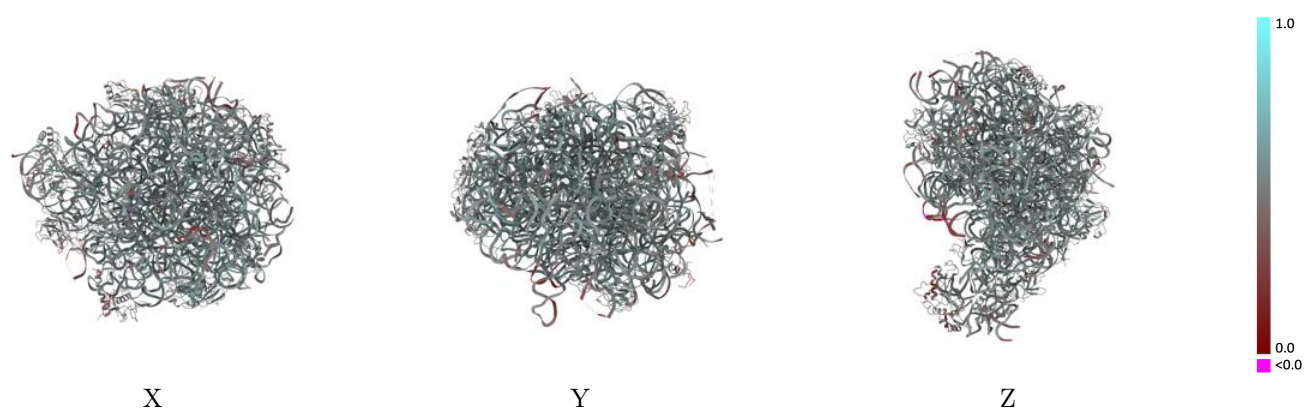
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-6789 and PDB model 5XYM. Per-residue inclusion information can be found in section 3 on page 10.

9.1 Map-model overlay [i](#)

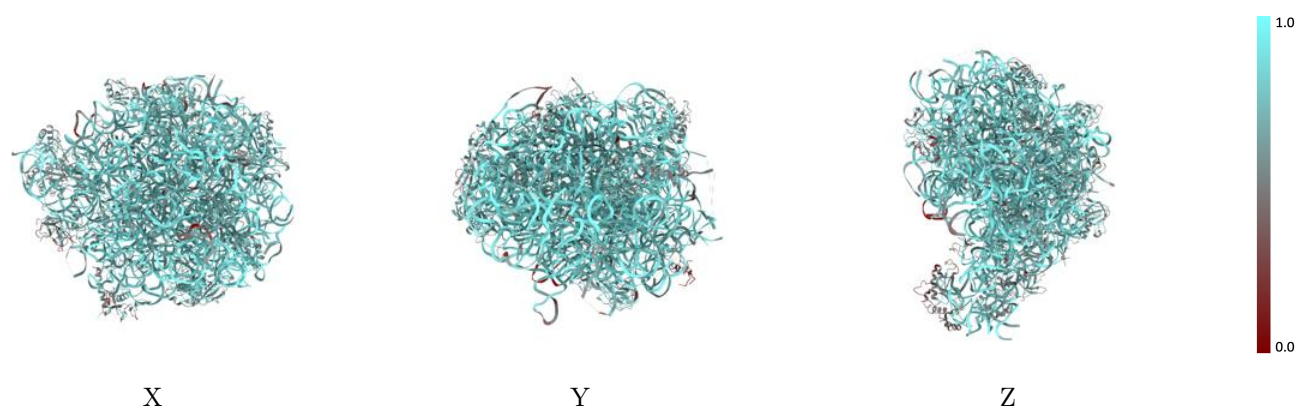
This section was not generated.

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



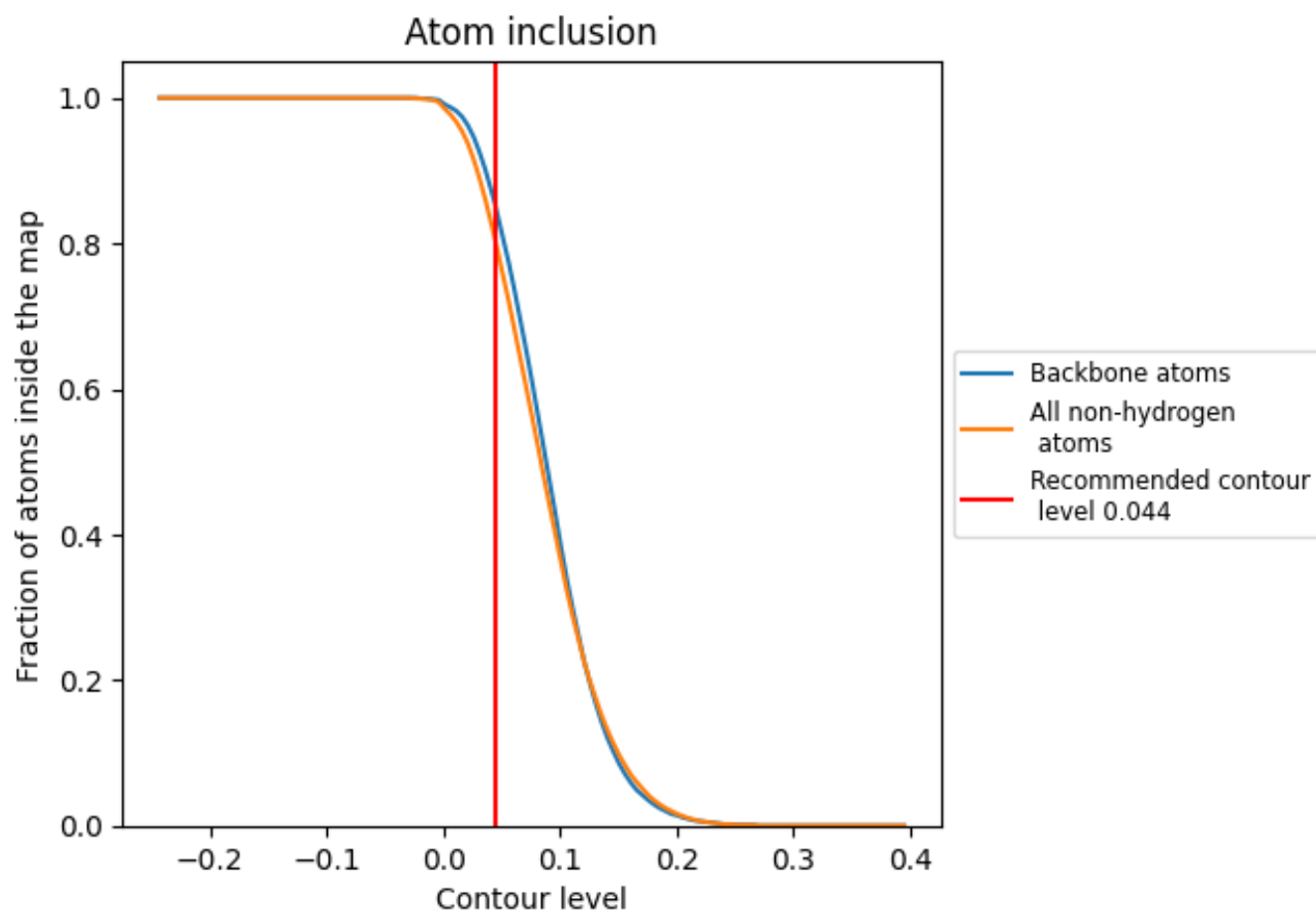
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.044).

9.4 Atom inclusion [i](#)



At the recommended contour level, 86% of all backbone atoms, 81% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.044) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8090	 0.5180
0	 0.6890	 0.4860
1	 0.5480	 0.4390
2	 0.7680	 0.5310
3	 0.7480	 0.5220
4	 0.7590	 0.4990
A	 0.8580	 0.5290
B	 0.8150	 0.4940
C	 0.7520	 0.5280
D	 0.7530	 0.5230
E	 0.7010	 0.4950
F	 0.4780	 0.3860
G	 0.5970	 0.4380
H	 0.2770	 0.3490
J	 0.7530	 0.5150
K	 0.6550	 0.4930
L	 0.7170	 0.5050
M	 0.7270	 0.5130
N	 0.7710	 0.5260
O	 0.6960	 0.4910
P	 0.6820	 0.4920
Q	 0.7600	 0.5290
R	 0.7220	 0.5120
S	 0.7300	 0.5240
T	 0.6960	 0.5070
U	 0.6490	 0.4750
V	 0.5340	 0.4380
W	 0.7650	 0.5250
X	 0.7300	 0.4990
Y	 0.6710	 0.4650
Z	 0.7230	 0.5050
a	 0.7710	 0.5320

