



wwPDB EM Validation Summary Report ⓘ

Dec 18, 2022 – 07:31 am GMT

PDB ID : 7ASN
EMDB ID : EMD-11901
Title : Staphylococcus aureus 50S after 30 minutes incubation a 37C
Authors : Camicata, G.; Bashan, A.; Yonath, A.
Deposited on : 2020-10-27
Resolution : 2.73 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:

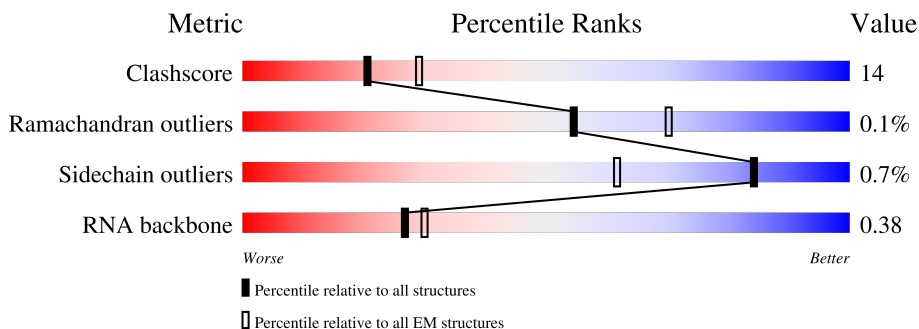
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

1 Overall quality at a glance

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

The reported resolution of this entry is 2.73 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	2742	
2	B	106	
3	1	47	
4	2	43	
5	3	64	
6	F	274	
7	D	215	

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Mol	Chain	Length	Quality of chain
8	E	206	83% 17%
9	H	144	73% 26%
10	L	146	80% 19%
11	Y	137	66% 34%
12	G	122	68% 30%
13	M	117	68% 32%
14	N	114	67% 32%
15	O	116	72% 28%
16	P	102	83% 15%
17	Q	112	79% 19%
18	R	89	69% 31%
19	S	103	66% 34%
20	T	94	55% 45%
21	a	79	100%
22	V	49	71% 29%
23	W	67	67% 33%
24	X	58	86% 12%
25	b	48	100%

2 Entry composition

There are 25 unique types of molecules in this entry. The entry contains 80694 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 23S.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	2742	58787	26244	10755	19046	2742	0	0

- Molecule 2 is a RNA chain called 5S.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	B	106	2260	1010	407	737	106	0	0

- Molecule 3 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	1	47	390	238	78	70	4	0	0

- Molecule 4 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	2	43	367	225	89	52	1	0	0

- Molecule 5 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	3	64	521	324	113	82	2	0	0

- Molecule 6 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	274	2094	1303	415	371	5	0	0

- Molecule 7 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	D	215	1627	1018	299	305	5	0	0

- Molecule 8 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	E	206	1572	986	288	296	2	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	H	144	1132	708	204	217	3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	1	MET	-	initiating methionine	UNP W8TUE6

- Molecule 10 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	L	146	1086	674	214	197	1	0	0

- Molecule 11 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	Y	137	1071	689	203	175	4	0	0

- Molecule 12 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	G	122	918	572	174	168	4	0	0

- Molecule 13 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				AltConf	Trace
13	M	117	Total	C	N	O	0	0
			872	543	172	157		

- Molecule 14 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	N	113	Total	C	N	O	0	0
			878	557	171	150		

- Molecule 15 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	O	116	Total	C	N	O	S	0	0
			942	593	189	156	4		

- Molecule 16 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	102	Total	C	N	O	S	0	0
			790	503	142	144	1		

- Molecule 17 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Q	112	Total	C	N	O	S	0	0
			854	534	164	153	3		

- Molecule 18 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	R	89	Total	C	N	O	S	0	0
			715	453	127	131	4		

- Molecule 19 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	S	103	Total	C	N	O	S	0	0
			770	486	142	141	1		

- Molecule 20 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	T	94	Total	C	N	O	0	0
			722	463	130	129		

- Molecule 21 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	a	79	Total	C	N	O	0	0
			597	369	117	111		

- Molecule 22 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms				AltConf	Trace
22	V	49	Total	C	N	O	0	0
			379	234	82	63		

- Molecule 23 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	W	67	Total	C	N	O	0	0
			541	333	102	106		

- Molecule 24 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	X	58	Total	C	N	O	0	0
			449	280	85	84		

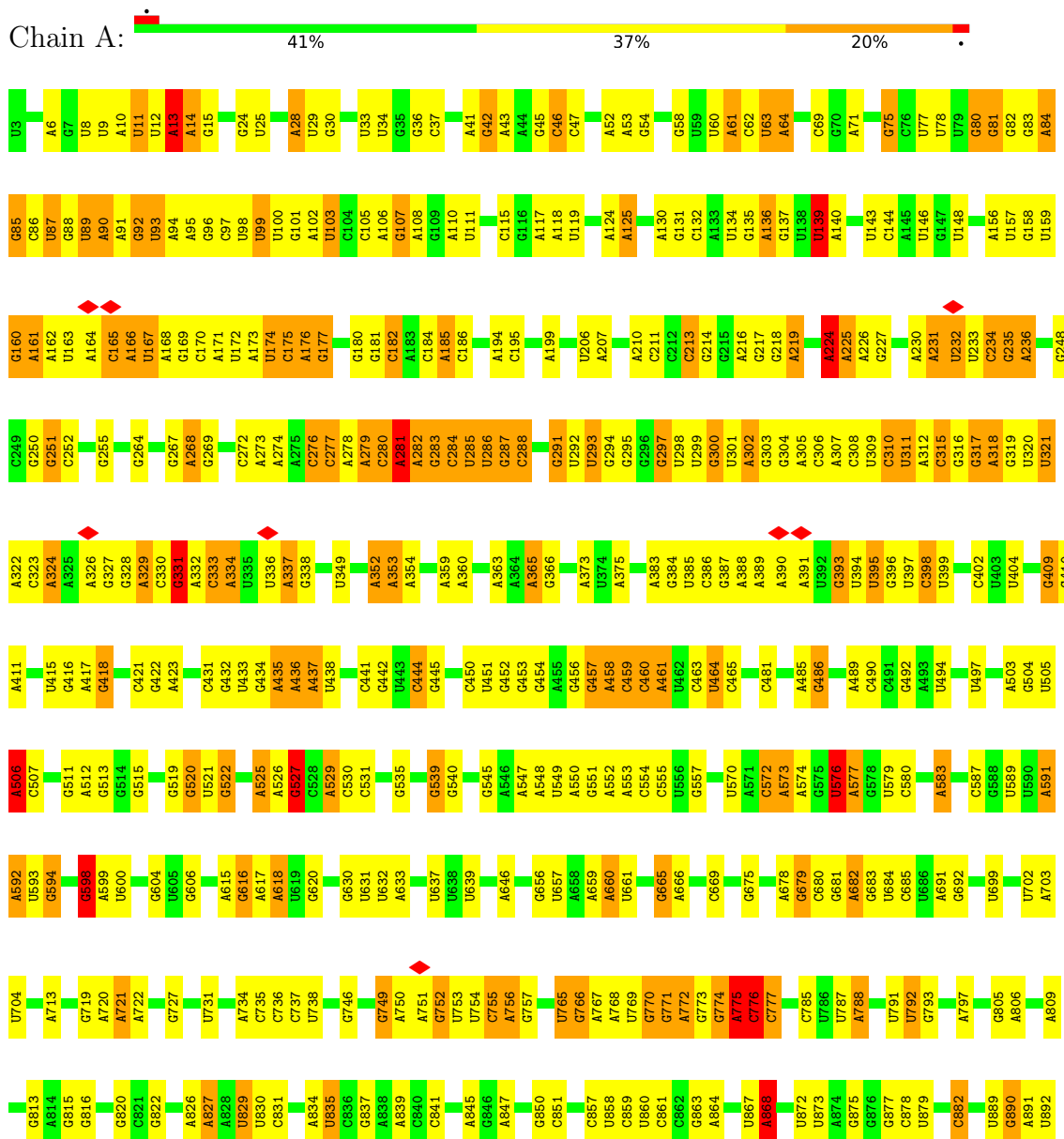
- Molecule 25 is a protein called 50S ribosomal protein L32.

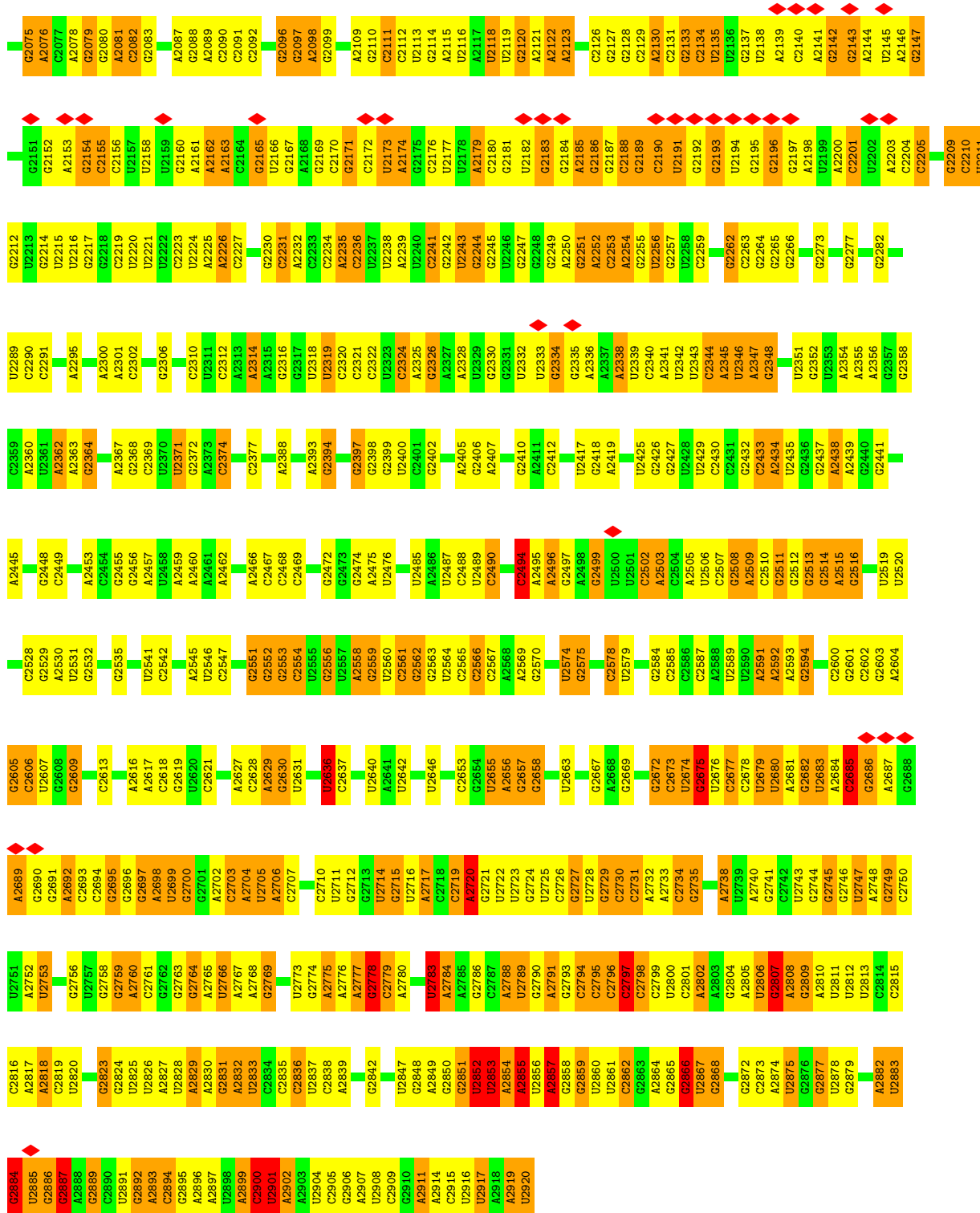
Mol	Chain	Residues	Atoms					AltConf	Trace
25	b	48	Total	C	N	O	S	0	0
			360	222	77	59	2		

3 Residue-property plots [i](#)

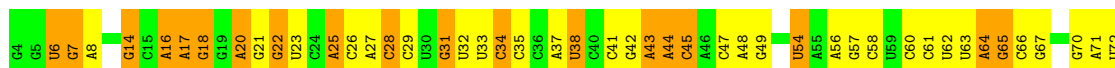
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

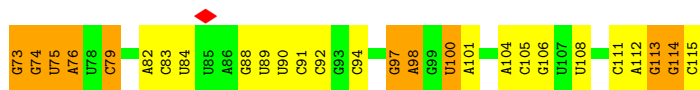
• Molecule 1: 23S



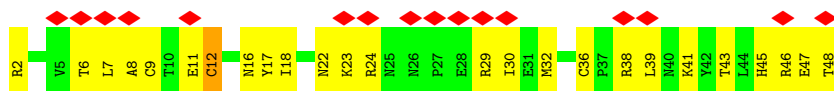


• Molecule 2: 5S

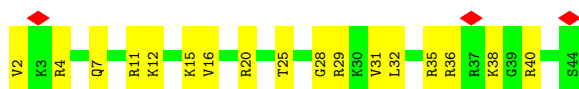




- Molecule 3: 50S ribosomal protein L33



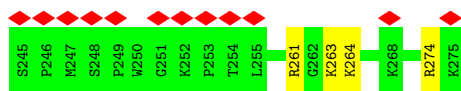
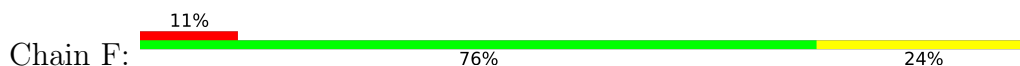
- Molecule 4: 50S ribosomal protein L34



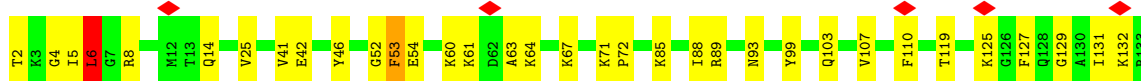
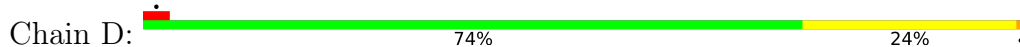
- Molecule 5: 50S ribosomal protein L35

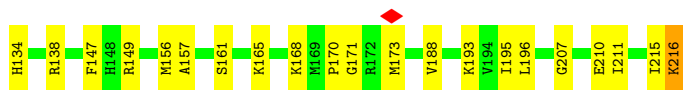


- Molecule 6: 50S ribosomal protein L2

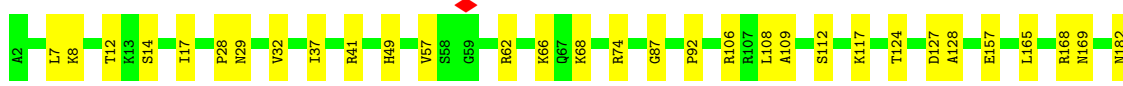
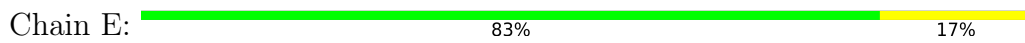


- Molecule 7: 50S ribosomal protein L3





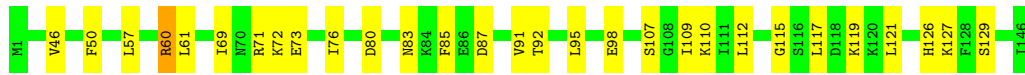
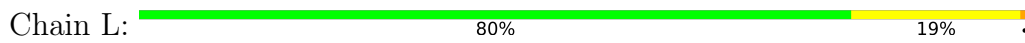
• Molecule 8: 50S ribosomal protein L4



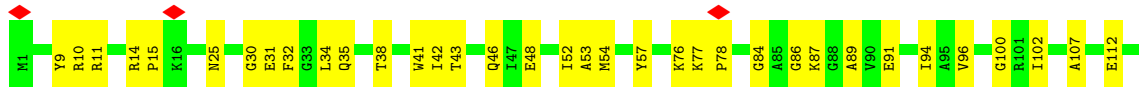
• Molecule 9: 50S ribosomal protein L13



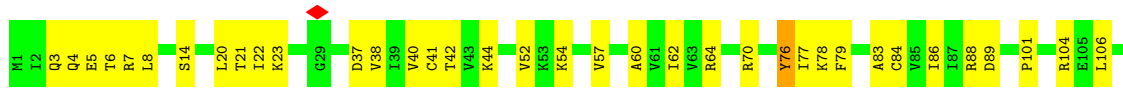
• Molecule 10: 50S ribosomal protein L15



• Molecule 11: 50S ribosomal protein L16



• Molecule 12: 50S ribosomal protein L14





- Molecule 13: 50S ribosomal protein L18



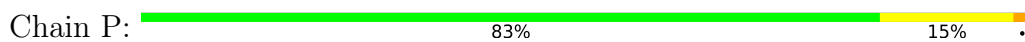
- Molecule 14: 50S ribosomal protein L19



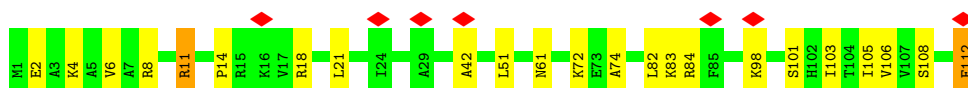
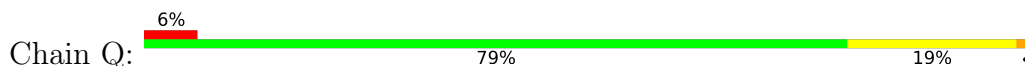
- Molecule 15: 50S ribosomal protein L20



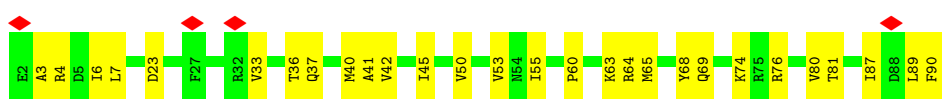
- Molecule 16: 50S ribosomal protein L21



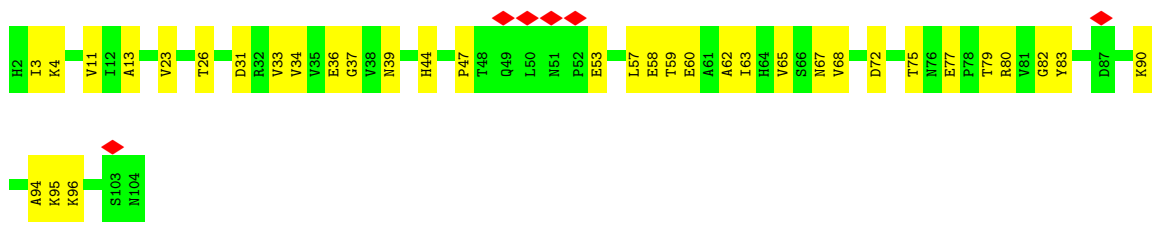
- Molecule 17: 50S ribosomal protein L22



- Molecule 18: 50S ribosomal protein L23



• Molecule 19: 50S ribosomal protein L24



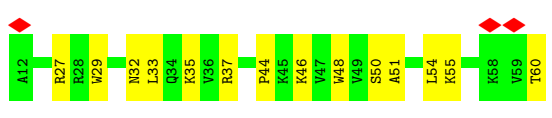
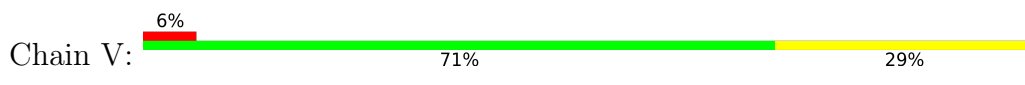
• Molecule 20: 50S ribosomal protein L25



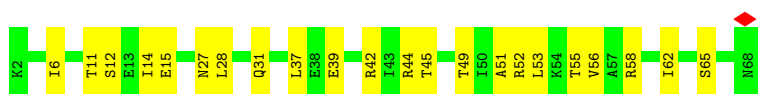
• Molecule 21: 50S ribosomal protein L27




• Molecule 22: 50S ribosomal protein L28



• Molecule 23: 50S ribosomal protein L29



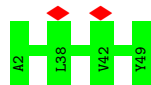
- Molecule 24: 50S ribosomal protein L30

Chain X:  86% 12%



- Molecule 25: 50S ribosomal protein L32

Chain b:  100%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	175844	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	47	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	0.029	Depositor
Minimum map value	-0.011	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.0026	Depositor
Map size (\AA)	281.42398, 281.42398, 281.42398	wwPDB
Map dimensions	328, 328, 328	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.8579999, 0.8579999, 0.8579999	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: 2MA, 5MU

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.80	8/65753 (0.0%)	1.09	257/102527 (0.3%)
2	B	0.44	0/2523	1.01	4/3920 (0.1%)
3	1	0.37	0/395	0.80	1/530 (0.2%)
4	2	0.47	0/371	0.79	0/484
5	3	0.38	0/526	0.65	0/690
6	F	0.41	0/2129	0.65	0/2858
7	D	0.44	0/1651	0.69	0/2215
8	E	0.43	0/1595	0.63	0/2154
9	H	0.48	0/1153	0.59	0/1553
10	L	0.41	0/1100	0.69	1/1467 (0.1%)
11	Y	0.36	0/1095	0.60	0/1472
12	G	0.52	1/925 (0.1%)	0.65	0/1242
13	M	0.29	0/881	0.58	0/1180
14	N	0.44	0/889	0.65	0/1192
15	O	0.49	0/954	0.71	1/1264 (0.1%)
16	P	0.47	0/800	0.69	0/1070
17	Q	0.40	0/862	0.63	0/1161
18	R	0.37	0/723	0.59	0/966
19	S	0.35	0/779	0.59	0/1043
20	T	0.30	0/730	0.60	0/981
21	a	0.42	0/603	0.53	0/802
22	V	0.30	0/384	0.58	0/515
23	W	0.33	0/542	0.57	0/722
24	X	0.38	0/451	0.58	0/606
25	b	0.38	0/366	0.71	0/489
All	All	0.73	9/88180 (0.0%)	1.02	264/133103 (0.2%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
3	1	0	1
7	D	0	2
8	E	0	1
9	H	0	1
All	All	0	5

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	2802	A	N9-C4	-7.11	1.33	1.37
1	A	2715	G	C2-N3	-6.53	1.27	1.32
1	A	2715	G	N3-C4	-6.21	1.31	1.35
1	A	2720	A	N9-C4	-6.05	1.34	1.37
1	A	882	C	N3-C4	-5.91	1.29	1.33

The worst 5 of 264 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	2855	A	N1-C6-N6	11.88	125.73	118.60
1	A	2855	A	C5-C6-N6	-10.89	114.99	123.70
1	A	1751	G	N3-C4-N9	10.65	132.39	126.00
1	A	2715	G	N3-C4-N9	-10.63	119.62	126.00
1	A	2866	G	C2-N3-C4	-9.42	107.19	111.90

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	1	11	GLU	Peptide
7	D	53	PHE	Peptide
7	D	6	LEU	Peptide
8	E	12	THR	Peptide
9	H	58	ILE	Peptide

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	A	58787	0	29564	1152	0
2	B	2260	0	1148	59	0
3	1	390	0	394	23	0
4	2	367	0	415	14	0
5	3	521	0	586	13	0
6	F	2094	0	2205	56	0
7	D	1627	0	1667	46	0
8	E	1572	0	1619	23	0
9	H	1132	0	1120	33	0
10	L	1086	0	1125	21	0
11	Y	1071	0	1123	38	0
12	G	918	0	981	36	0
13	M	872	0	893	33	0
14	N	878	0	923	34	0
15	O	942	0	1014	34	0
16	P	790	0	830	13	0
17	Q	854	0	914	18	0
18	R	715	0	748	21	0
19	S	770	0	809	32	0
20	T	722	0	766	31	0
21	a	597	0	604	0	0
22	V	379	0	400	10	0
23	W	541	0	563	18	0
24	X	449	0	491	5	0
25	b	360	0	358	0	0
All	All	80694	0	51260	1646	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 14.

The worst 5 of 1646 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2432:G:H21	1:A:2439:A:N6	1.39	1.21
1:A:2432:G:N2	1:A:2439:A:H62	1.44	1.14
1:A:2171:G:H21	1:A:2174:A:N6	1.50	1.09
1:A:2852:U:H1'	1:A:2853:U:H5'	1.38	1.05
1:A:307:A:N6	1:A:409:G:C6	2.26	1.04

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	1	45/47 (96%)	41 (91%)	4 (9%)	0	100	100
4	2	41/43 (95%)	40 (98%)	1 (2%)	0	100	100
5	3	62/64 (97%)	59 (95%)	3 (5%)	0	100	100
6	F	272/274 (99%)	247 (91%)	25 (9%)	0	100	100
7	D	213/215 (99%)	172 (81%)	40 (19%)	1 (0%)	29	48
8	E	204/206 (99%)	188 (92%)	16 (8%)	0	100	100
9	H	141/144 (98%)	124 (88%)	17 (12%)	0	100	100
10	L	144/146 (99%)	128 (89%)	16 (11%)	0	100	100
11	Y	135/137 (98%)	119 (88%)	16 (12%)	0	100	100
12	G	120/122 (98%)	105 (88%)	15 (12%)	0	100	100
13	M	115/117 (98%)	101 (88%)	14 (12%)	0	100	100
14	N	109/114 (96%)	91 (84%)	18 (16%)	0	100	100
15	O	114/116 (98%)	111 (97%)	3 (3%)	0	100	100
16	P	100/102 (98%)	88 (88%)	10 (10%)	2 (2%)	7	13
17	Q	110/112 (98%)	104 (94%)	6 (6%)	0	100	100
18	R	87/89 (98%)	77 (88%)	10 (12%)	0	100	100
19	S	101/103 (98%)	82 (81%)	19 (19%)	0	100	100
20	T	92/94 (98%)	76 (83%)	16 (17%)	0	100	100
21	a	77/79 (98%)	70 (91%)	7 (9%)	0	100	100
22	V	47/49 (96%)	44 (94%)	3 (6%)	0	100	100
23	W	65/67 (97%)	58 (89%)	7 (11%)	0	100	100
24	X	56/58 (97%)	52 (93%)	4 (7%)	0	100	100
25	b	46/48 (96%)	35 (76%)	11 (24%)	0	100	100
All	All	2496/2546 (98%)	2212 (89%)	281 (11%)	3 (0%)	54	75

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
16	P	51	PRO
7	D	6	LEU
16	P	78	ARG

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	
3	1	44/45 (98%)	44 (100%)	0	100	100
4	2	39/39 (100%)	39 (100%)	0	100	100
5	3	55/55 (100%)	55 (100%)	0	100	100
6	F	221/221 (100%)	221 (100%)	0	100	100
7	D	173/173 (100%)	172 (99%)	1 (1%)	86	91
8	E	168/168 (100%)	167 (99%)	1 (1%)	86	91
9	H	121/122 (99%)	121 (100%)	0	100	100
10	L	109/112 (97%)	109 (100%)	0	100	100
11	Y	108/114 (95%)	108 (100%)	0	100	100
12	G	100/100 (100%)	99 (99%)	1 (1%)	76	85
13	M	83/93 (89%)	81 (98%)	2 (2%)	49	68
14	N	92/100 (92%)	91 (99%)	1 (1%)	73	84
15	O	96/96 (100%)	95 (99%)	1 (1%)	76	85
16	P	84/86 (98%)	83 (99%)	1 (1%)	71	83
17	Q	89/91 (98%)	87 (98%)	2 (2%)	52	71
18	R	78/80 (98%)	77 (99%)	1 (1%)	69	82
19	S	81/88 (92%)	80 (99%)	1 (1%)	71	83
20	T	78/82 (95%)	77 (99%)	1 (1%)	69	82
21	a	59/62 (95%)	59 (100%)	0	100	100
22	V	39/41 (95%)	38 (97%)	1 (3%)	46	66

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	W	58/60 (97%)	58 (100%)	0	100	100
24	X	52/52 (100%)	51 (98%)	1 (2%)	57	74
25	b	35/44 (80%)	35 (100%)	0	100	100
All	All	2062/2124 (97%)	2047 (99%)	15 (1%)	84	90

5 of 15 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
16	P	52	THR
22	V	60	THR
17	Q	11	ARG
24	X	58	GLU
19	S	80	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 7 such sidechains are listed below:

Mol	Chain	Res	Type
11	Y	46	GLN
16	P	18	GLN
23	W	31	GLN
19	S	39	ASN
10	L	78	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	2728/2742 (99%)	946 (34%)	51 (1%)
2	B	101/106 (95%)	44 (43%)	3 (2%)
All	All	2829/2848 (99%)	990 (34%)	54 (1%)

5 of 990 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	11	U
1	A	14	A
1	A	15	G
1	A	24	G
1	A	25	U

5 of 54 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	2003	U
1	A	2081	A
1	A	2883	U
1	A	2006	C
1	A	2020	U

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

3 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	2MA	A	2530	1	17,25,26	2.37	5 (29%)	17,37,40	1.63	4 (23%)
1	5MU	A	792	1	19,22,23	4.90	7 (36%)	28,32,35	3.87	11 (39%)
1	5MU	A	1966	1	19,22,23	5.11	7 (36%)	28,32,35	3.57	12 (42%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	2MA	A	2530	1	-	3/3/25/26	0/3/3/3
1	5MU	A	792	1	-	0/7/25/26	0/2/2/2
1	5MU	A	1966	1	-	2/7/25/26	0/2/2/2

The worst 5 of 19 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1966	5MU	C2-N1	12.55	1.58	1.38
1	A	792	5MU	C2-N1	11.62	1.57	1.38
1	A	1966	5MU	C6-N1	10.75	1.56	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1966	5MU	C4-C5	10.48	1.62	1.44
1	A	792	5MU	C6-N1	10.16	1.55	1.38

The worst 5 of 27 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	792	5MU	C5-C4-N3	12.50	125.98	115.31
1	A	1966	5MU	C5-C4-N3	11.60	125.21	115.31
1	A	792	5MU	C5-C6-N1	-10.42	112.62	123.34
1	A	1966	5MU	C5-C6-N1	-9.34	113.73	123.34
1	A	792	5MU	C4-N3-C2	-5.52	120.20	127.35

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1966	5MU	C2'-C1'-N1-C2
1	A	2530	2MA	O4'-C4'-C5'-O5'
1	A	1966	5MU	C2'-C1'-N1-C6
1	A	2530	2MA	C3'-C4'-C5'-O5'
1	A	2530	2MA	C4'-C5'-O5'-P

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	1966	5MU	2	0

5.5 Carbohydrates [i](#)

There are no monosaccharides 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

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	11
2	B	4
9	H	1

The worst 5 of 16 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	1067:U	O3'	1074:G	P	32.56
1	A	1509:G	O3'	1598:U	P	17.87
1	A	2911:A	O3'	2914:A	P	16.95
1	A	1096:C	O3'	1151:G	P	15.42
1	A	758:G	O3'	764:C	P	14.44

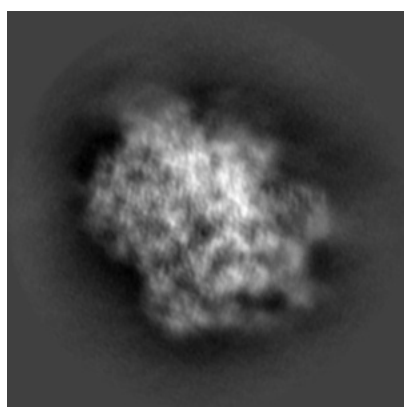
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11901. These allow visual inspection of the internal detail of the map and identification of artifacts.

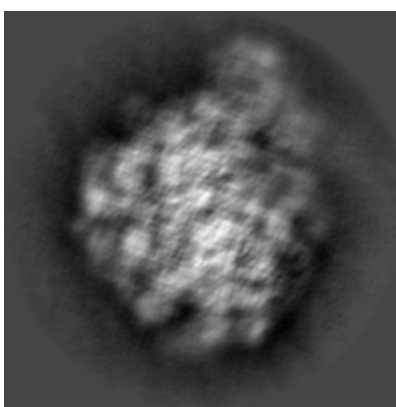
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

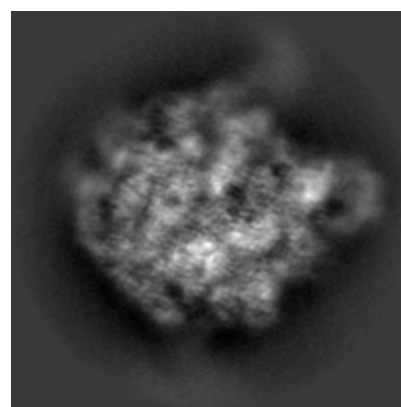
6.1.1 Primary map



X



Y

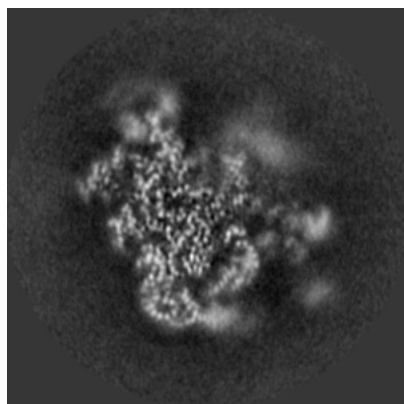


Z

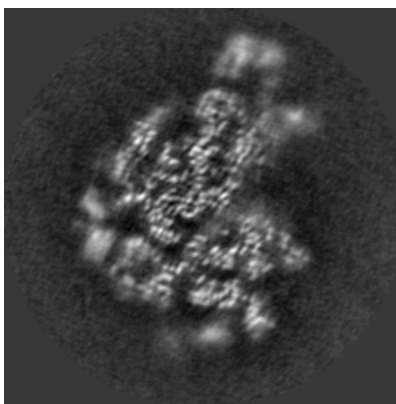
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

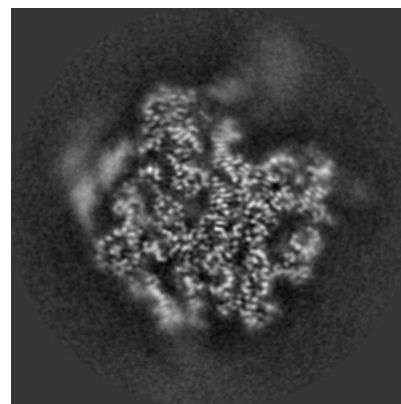
6.2.1 Primary map



X Index: 164



Y Index: 164

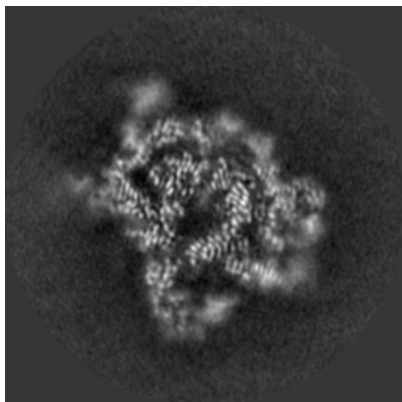


Z Index: 164

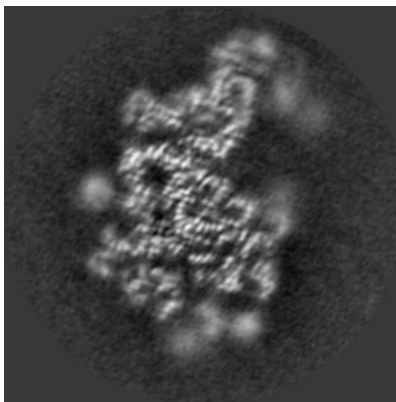
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

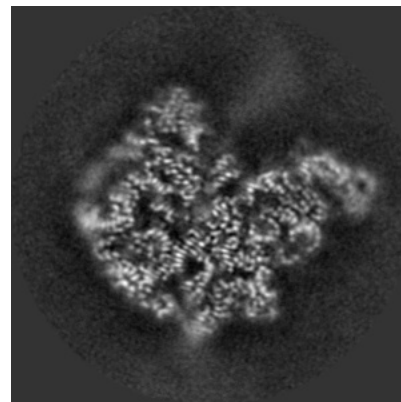
6.3.1 Primary map



X Index: 146



Y Index: 188



Z Index: 180

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

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0026. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

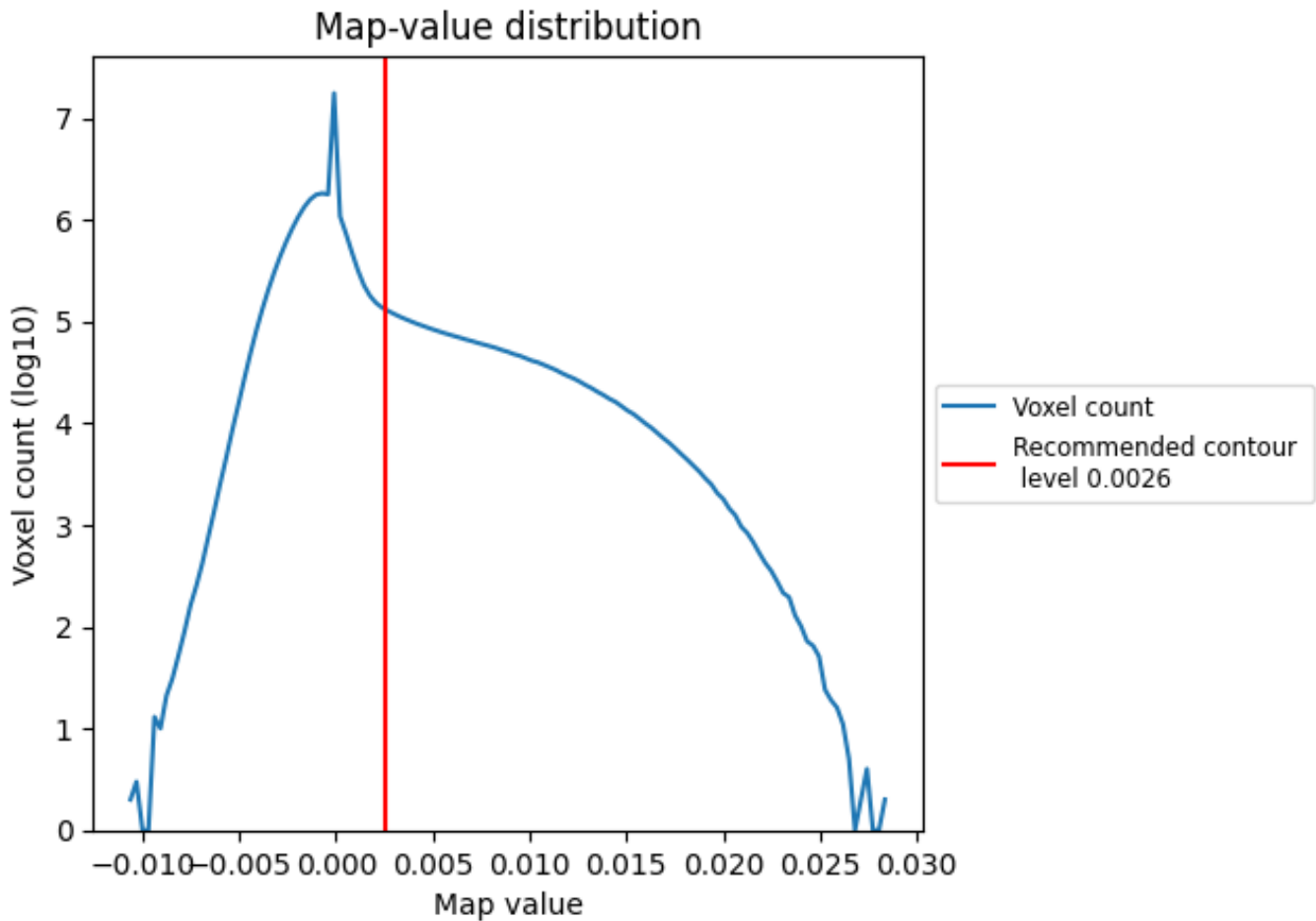
6.5 Mask visualisation

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

7 Map analysis [i](#)

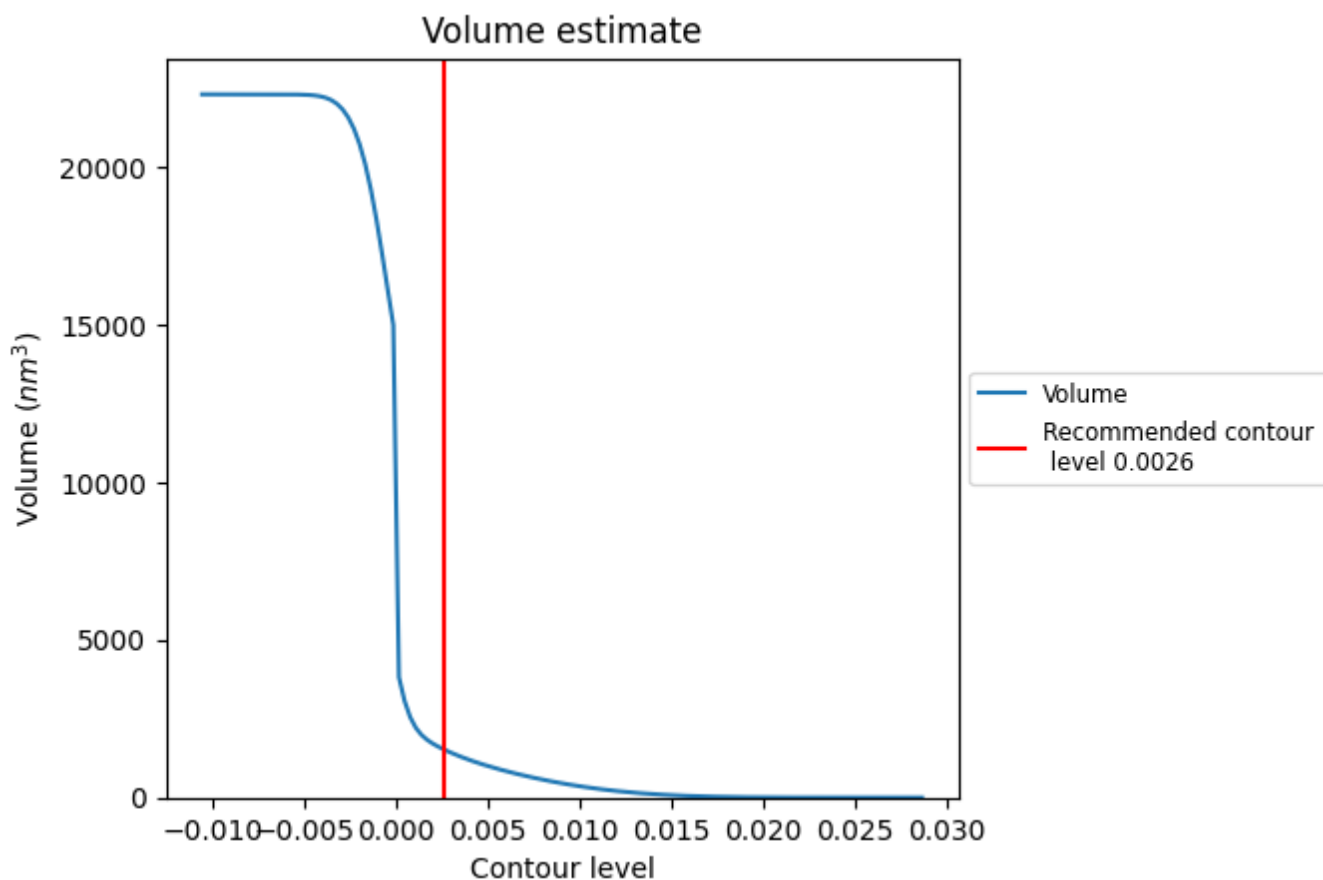
This section contains the results of statistical analysis of the map.

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.

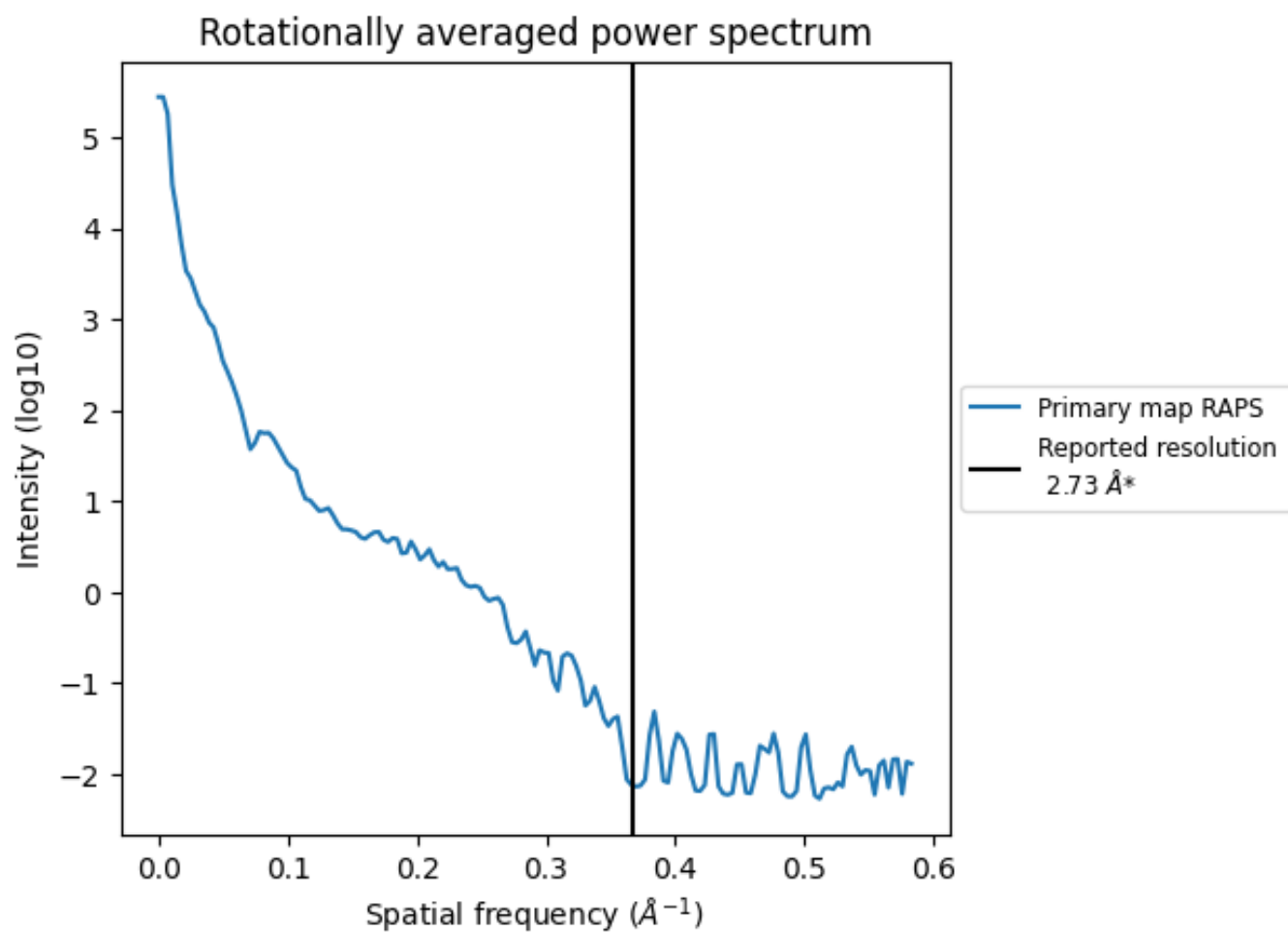
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1520 nm³; this corresponds to an approximate mass of 1373 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 0.366 \AA^{-1}

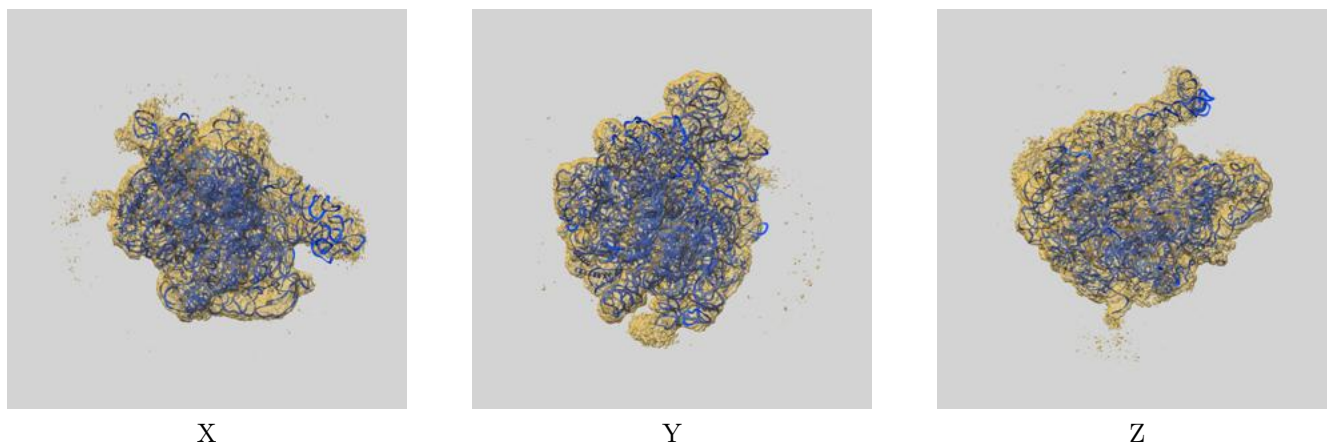
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

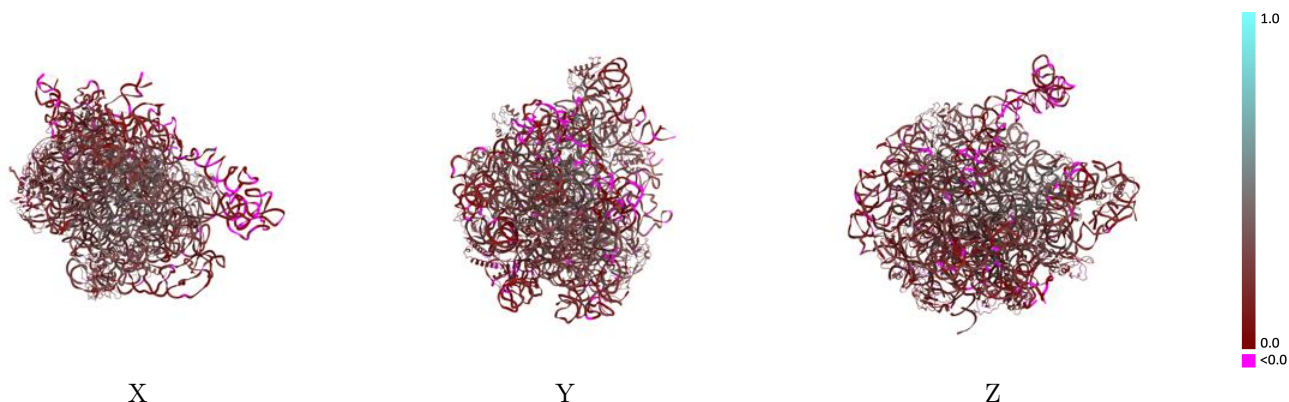
This section contains information regarding the fit between EMDB map EMD-11901 and PDB model 7ASN. Per-residue inclusion information can be found in section 3 on page 8.

9.1 Map-model overlay [i](#)



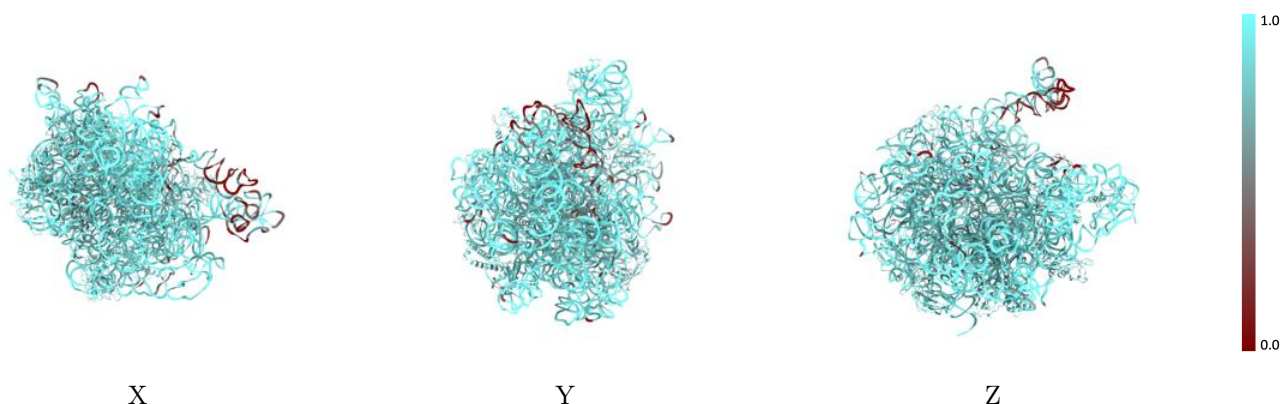
The images above show the 3D surface view of the map at the recommended contour level 0.0026 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



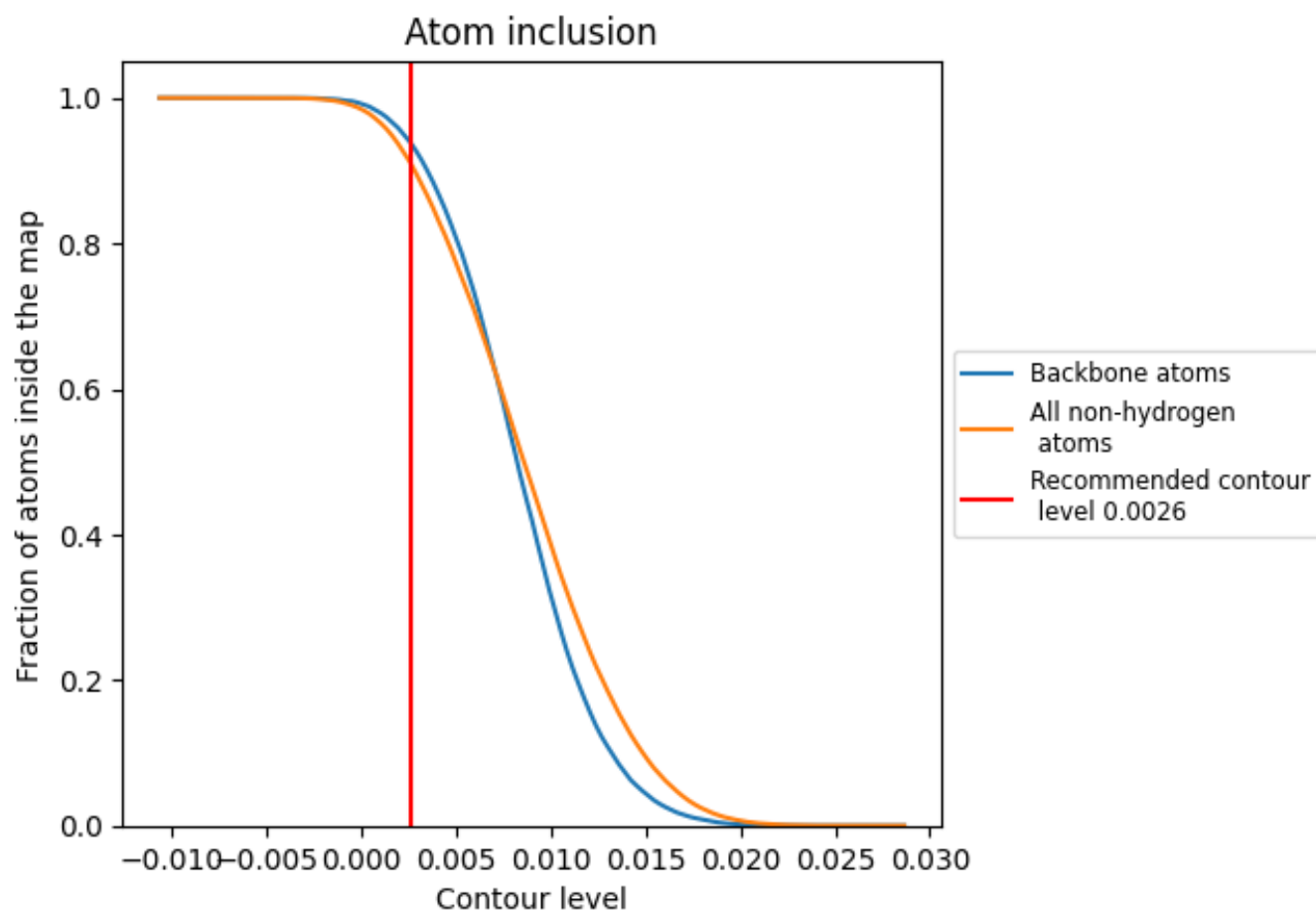
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0026).





















































9.4 Atom inclusion [i](#)



At the recommended contour level, 94% of all backbone atoms, 91% 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 (0.0026) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9116	 0.2140
1	 0.5333	 0.1980
2	 0.8092	 0.2330
3	 0.8645	 0.2920
A	 0.9334	 0.2160
B	 0.9850	 0.1650
D	 0.8366	 0.1770
E	 0.8877	 0.2570
F	 0.7900	 0.2430
G	 0.8559	 0.2280
H	 0.8285	 0.1950
L	 0.8881	 0.2940
M	 0.9235	 0.2080
N	 0.7812	 0.1890
O	 0.8306	 0.2050
P	 0.8676	 0.2180
Q	 0.8005	 0.1710
R	 0.8197	 0.1170
S	 0.8401	 0.1490
T	 0.7419	 0.1570
V	 0.8192	 0.2360
W	 0.8629	 0.1370
X	 0.8798	 0.2830
Y	 0.8825	 0.2480
a	 0.9273	 0.3170
b	 0.8098	 0.1200

