



wwPDB EM Validation Summary Report ⓘ

Nov 17, 2025 – 04:59 PM JST

PDB ID : 9KMZ / pdb_00009kmz
EMDB ID : EMD-62450
Title : Bat MERSr-CoV NL140422 Nsp1 bound to the Human 40S Ribosomal subunit-State1
Authors : Yuan, S.; Yan, R.; Wu, M.
Deposited on : 2024-11-18
Resolution : 2.78 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:

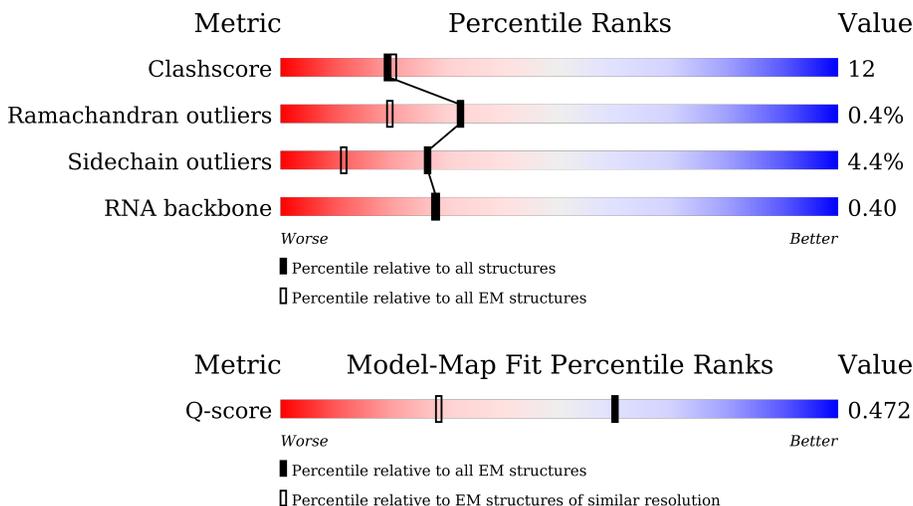
EMDB validation analysis : 0.0.1.dev129
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.46

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 2.78 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.



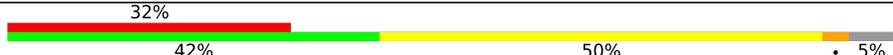
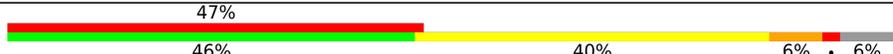
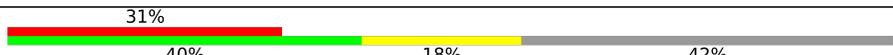
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	10754 (2.28 - 3.28)

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	1869	
2	A	295	
3	B	264	

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Mol	Chain	Length	Quality of chain
4	C	293	
5	D	243	
6	E	263	
7	F	204	
8	G	249	
9	H	194	
10	I	208	
11	J	194	
12	K	165	
13	L	158	
14	M	132	
15	N	151	
16	O	151	
17	P	145	
18	Q	146	
19	R	135	
20	S	152	
21	T	145	
22	U	119	
23	V	83	
24	W	130	
25	X	143	
26	Y	130	
27	Z	125	
28	a	101	

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Mol	Chain	Length	Quality of chain
29	b	82	
30	c	62	
31	d	55	
32	e	56	
33	f	74	
34	g	315	
35	h	25	
36	n	196	

2 Entry composition [i](#)

There are 36 unique types of molecules in this entry. The entry contains 74738 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 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	1669	35610	15907	6400	11643	1660	0	0

- Molecule 2 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	213	1686	1072	295	311	8	0	0

- Molecule 3 is a protein called Small ribosomal subunit protein eS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	B	213	1729	1098	309	308	14	0	0

- Molecule 4 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	C	218	1690	1094	289	297	10	0	0

- Molecule 5 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	D	225	1752	1117	315	313	7	0	0

- Molecule 6 is a protein called Small ribosomal subunit protein eS4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	E	262	2076	1324	386	358	8	0	0

- Molecule 7 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	F	189	1495	934	284	270	7	0	0

- Molecule 8 is a protein called Small ribosomal subunit protein eS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	G	230	1864	1164	373	320	7	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	221	ARG	LYS	variant	UNP P62753

- Molecule 9 is a protein called Small ribosomal subunit protein eS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	H	186	1501	957	276	267	1	0	0

- Molecule 10 is a protein called Small ribosomal subunit protein eS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	I	205	1682	1056	331	290	5	0	0

- Molecule 11 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	J	180	1499	955	300	242	2	0	0

- Molecule 12 is a protein called Small ribosomal subunit protein eS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	K	97	816	533	144	133	6	0	0

- Molecule 13 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	L	151	1229	782	230	211	6	0	0

- Molecule 14 is a protein called Small ribosomal subunit protein eS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	M	121	935	586	165	175	9	0	0

- Molecule 15 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	N	149	1202	770	228	203	1	0	0

- Molecule 16 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	O	135	1010	618	198	188	6	0	0

- Molecule 17 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	P	126	1037	659	196	175	7	0	0

- Molecule 18 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	Q	138	1097	698	206	190	3	0	0

- Molecule 19 is a protein called Small ribosomal subunit protein eS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	R	132	1068	670	199	195	4	0	0

- Molecule 20 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	S	143	Total	C	N	O	S	0	0
			1184	743	240	200	1		

- Molecule 21 is a protein called Small ribosomal subunit protein eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	T	144	Total	C	N	O	S	0	0
			1123	703	217	200	3		

- Molecule 22 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	U	101	Total	C	N	O	S	0	0
			803	504	153	142	4		

- Molecule 23 is a protein called Small ribosomal subunit protein eS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	V	82	Total	C	N	O	S	0	0
			625	384	116	120	5		

- Molecule 24 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	W	129	Total	C	N	O	S	0	0
			1034	659	193	176	6		

- Molecule 25 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	X	141	Total	C	N	O	S	0	0
			1098	693	219	183	3		

- Molecule 26 is a protein called Small ribosomal subunit protein eS24.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	Y	124	Total	C	N	O	S	0	0
			1014	641	198	170	5		

- Molecule 27 is a protein called Small ribosomal subunit protein eS25.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	Z	72	Total	C	N	O	S	0	0
			574	368	104	101	1		

- Molecule 28 is a protein called Small ribosomal subunit protein eS26.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	a	99	Total	C	N	O	S	0	0
			794	494	165	130	5		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	78	VAL	ALA	conflict	UNP P62854

- Molecule 29 is a protein called Small ribosomal subunit protein eS27.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	b	82	Total	C	N	O	S	0	0
			641	402	118	114	7		

- Molecule 30 is a protein called Small ribosomal subunit protein eS28.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	c	62	Total	C	N	O	S	0	0
			489	297	97	93	2		

- Molecule 31 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	d	55	Total	C	N	O	S	0	0
			459	286	94	74	5		

- Molecule 32 is a protein called Small ribosomal subunit protein eS30.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	e	56	Total	C	N	O	S	0	0
			442	273	96	72	1		

- Molecule 33 is a protein called Small ribosomal subunit protein eS31.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	f	74	Total	C	N	O	S	0	0
			611	385	117	102	7		

- Molecule 34 is a protein called Small ribosomal subunit protein RACK1.

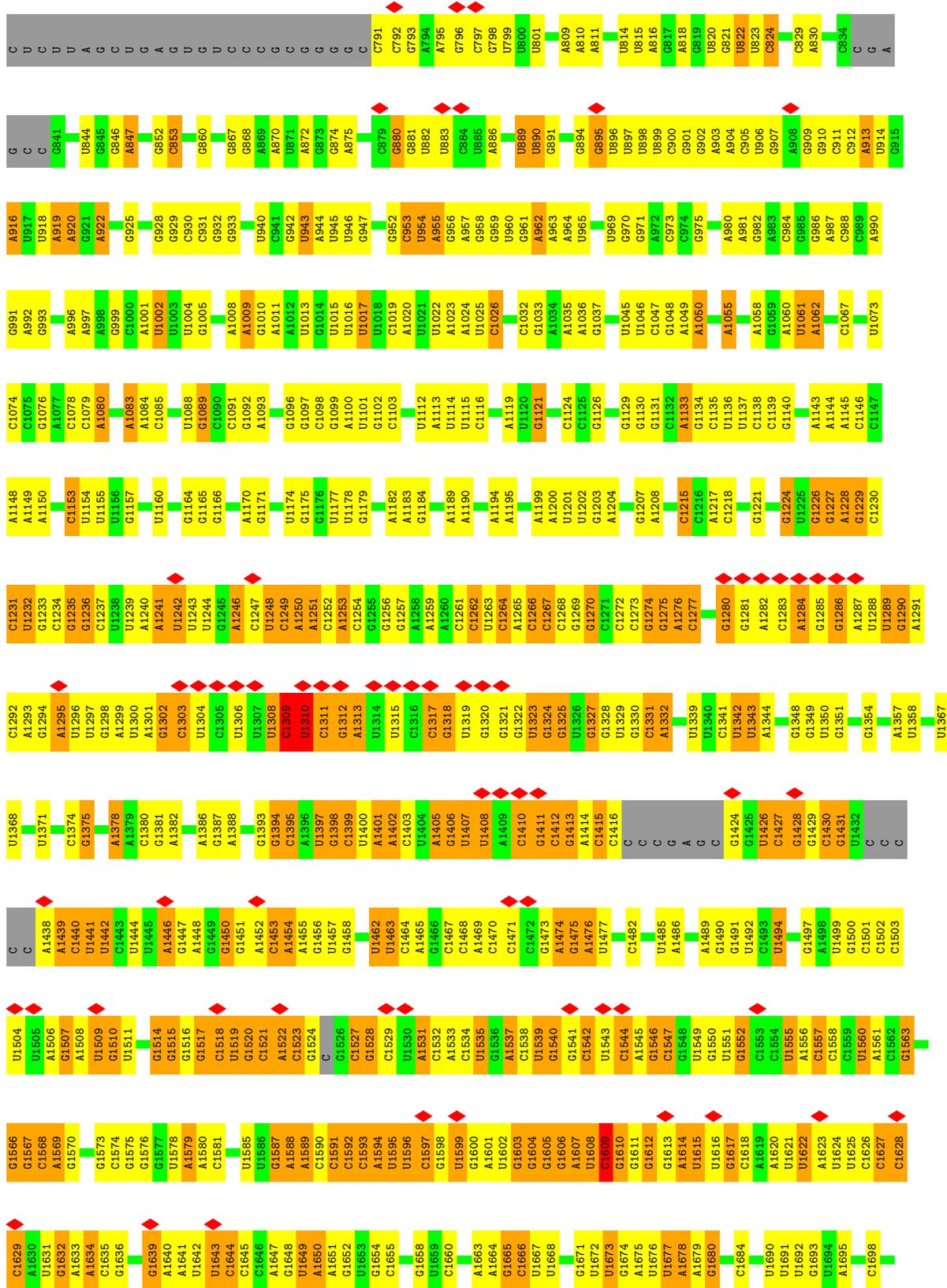
Mol	Chain	Residues	Atoms					AltConf	Trace
34	g	314	Total	C	N	O	S	0	0
			2441	1537	425	467	12		

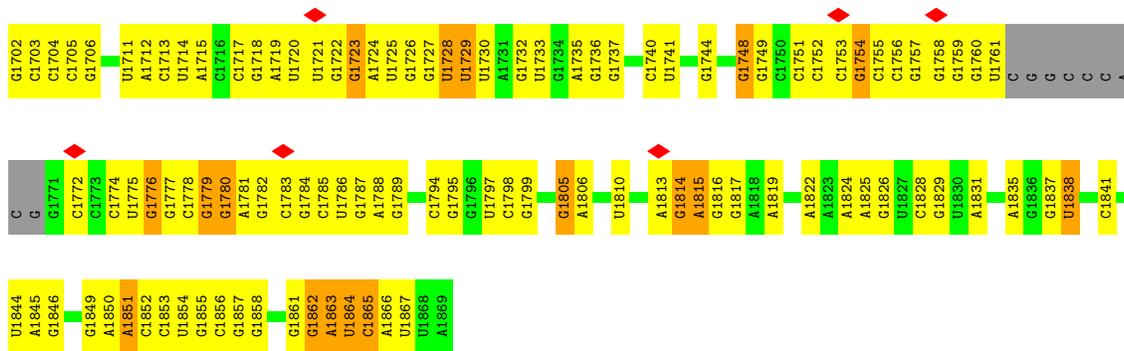
- Molecule 35 is a protein called Small ribosomal subunit protein eS32.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	h	22	Total	C	N	O	S	0	0
			213	130	57	23	3		

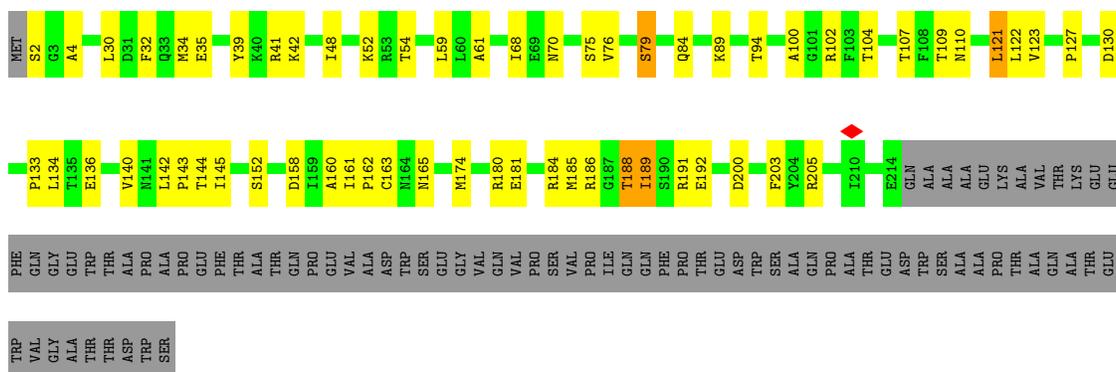
- Molecule 36 is a protein called ORF1ab polyprotein.

Mol	Chain	Residues	Atoms				AltConf	Trace
36	n	27	Total	C	N	O	0	0
			215	140	34	41		

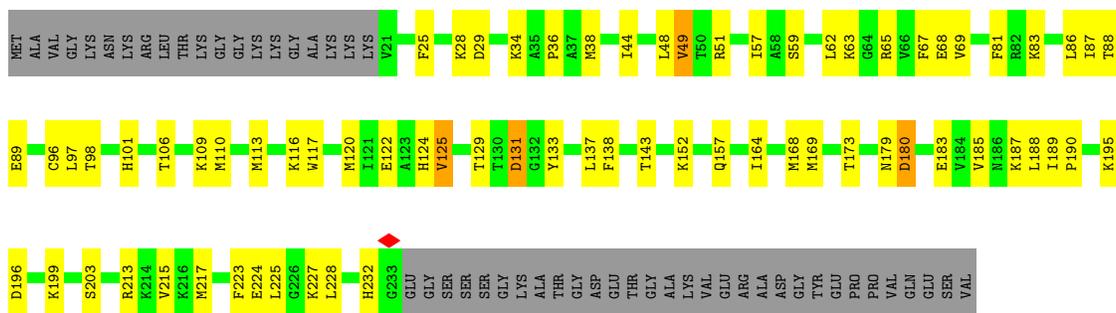




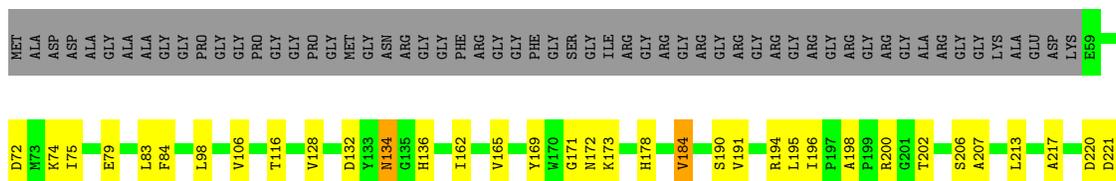
● Molecule 2: Small ribosomal subunit protein uS2

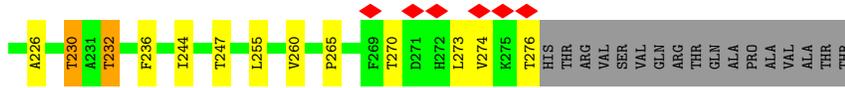


● Molecule 3: Small ribosomal subunit protein eS1

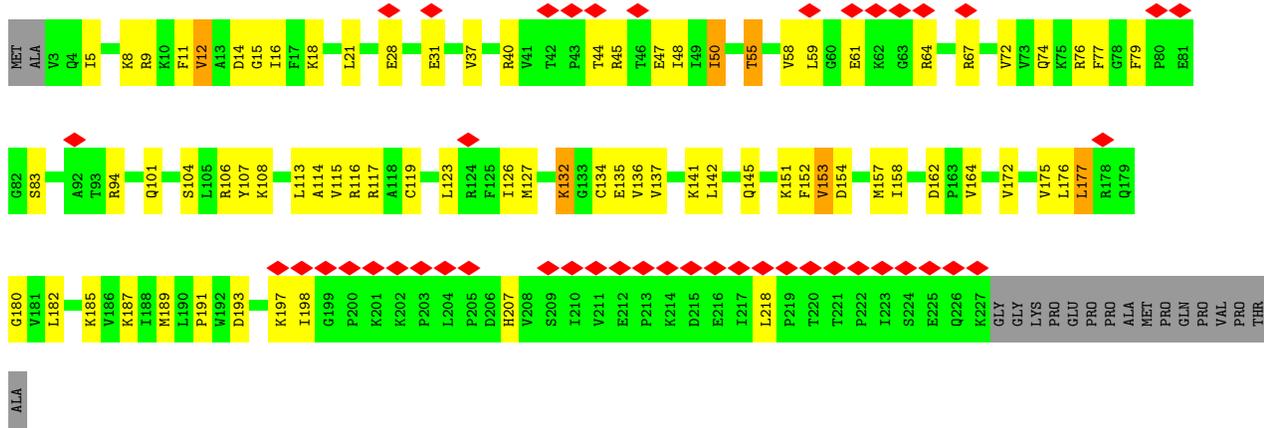


● Molecule 4: Small ribosomal subunit protein uS5

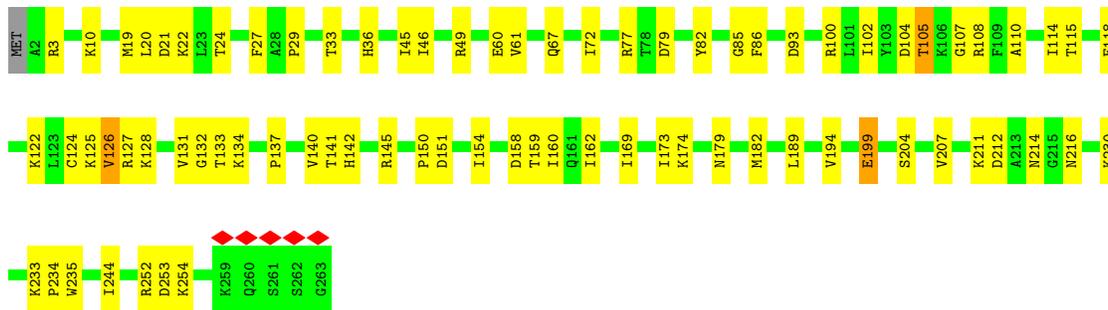




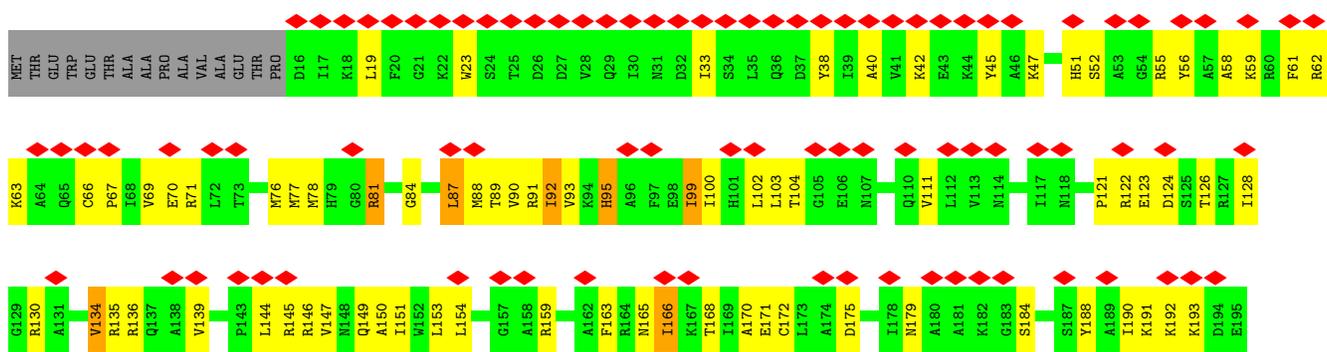
• Molecule 5: Small ribosomal subunit protein uS3



• Molecule 6: Small ribosomal subunit protein eS4, X isoform



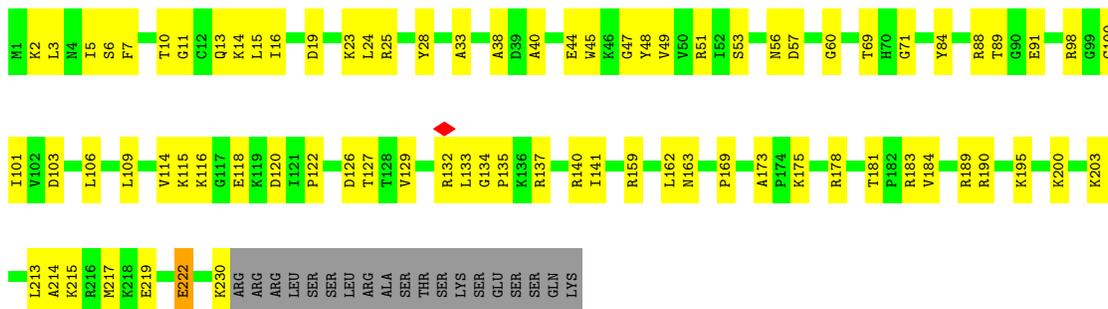
• Molecule 7: Small ribosomal subunit protein uS7





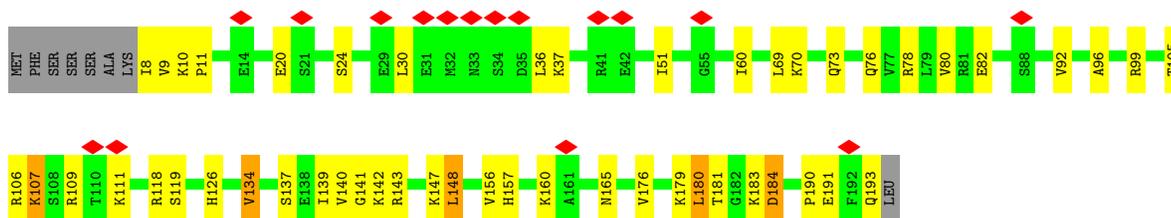
- Molecule 8: Small ribosomal subunit protein eS6

Chain G: 60% 32% 8%



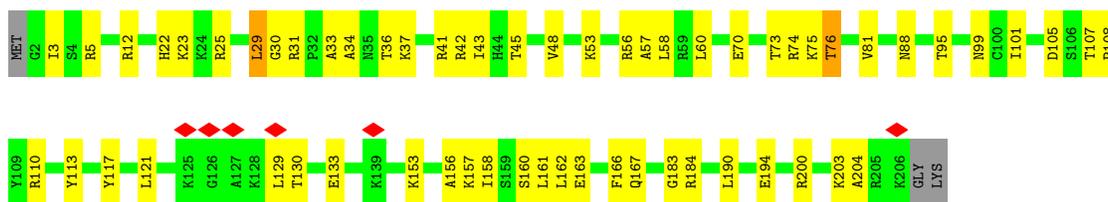
- Molecule 9: Small ribosomal subunit protein eS7

Chain H: 8% 70% 24%



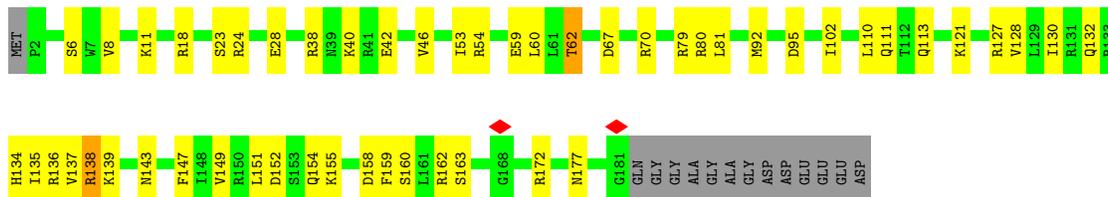
- Molecule 10: Small ribosomal subunit protein eS8

Chain I: 70% 28%

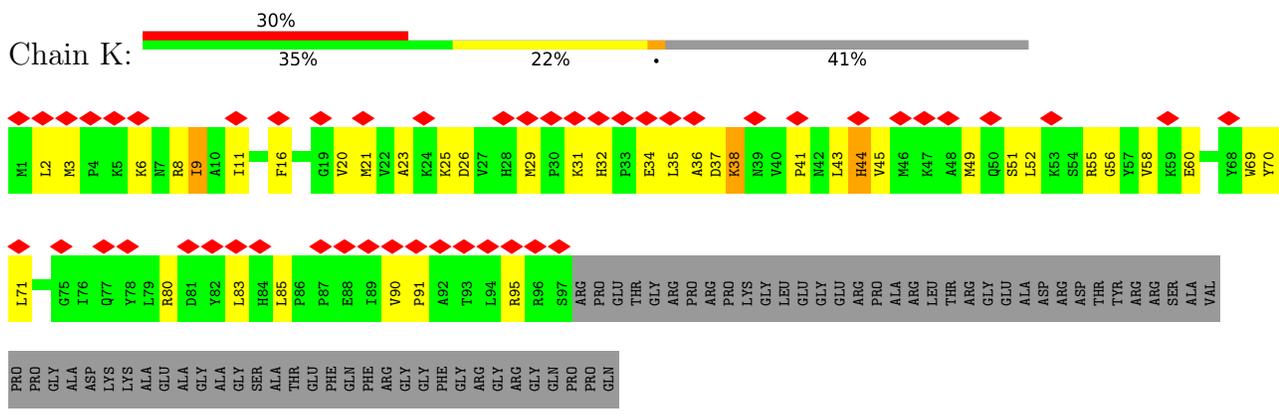


- Molecule 11: Small ribosomal subunit protein uS4

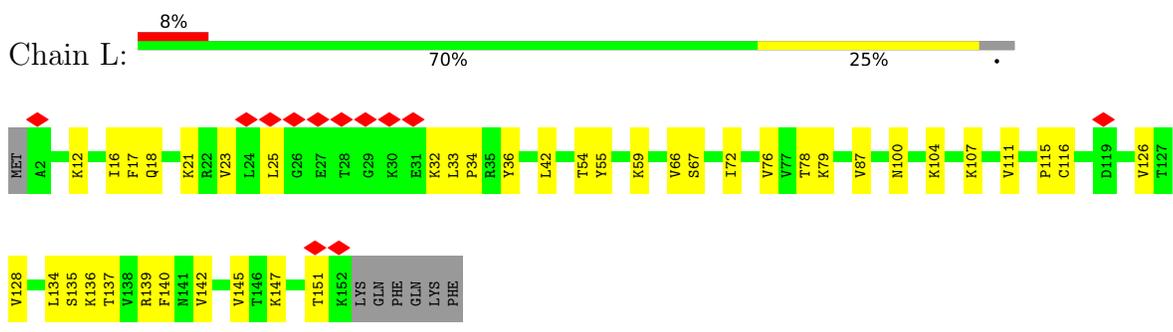
Chain J: 66% 26% 7%



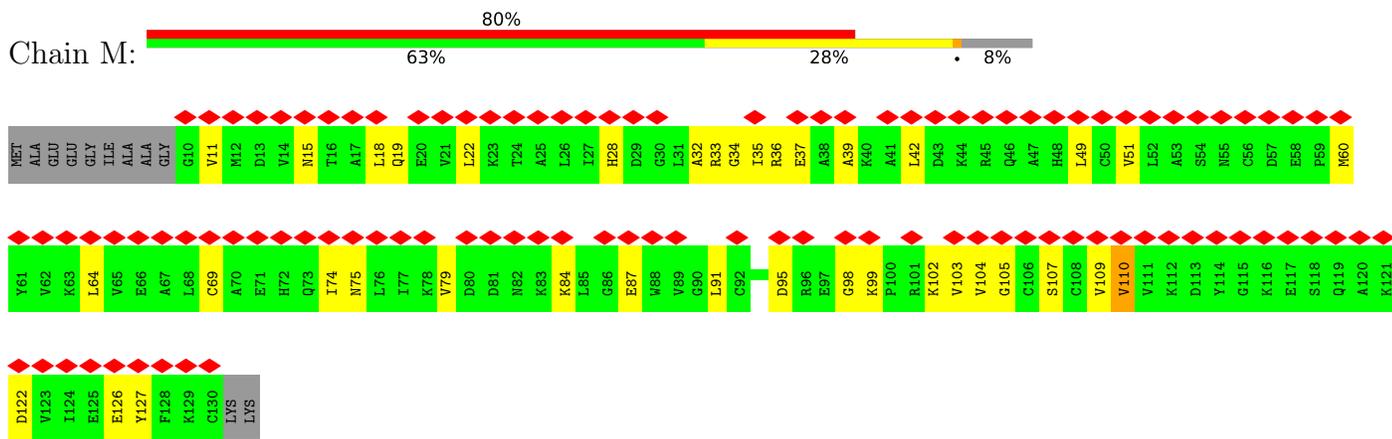
• Molecule 12: Small ribosomal subunit protein eS10



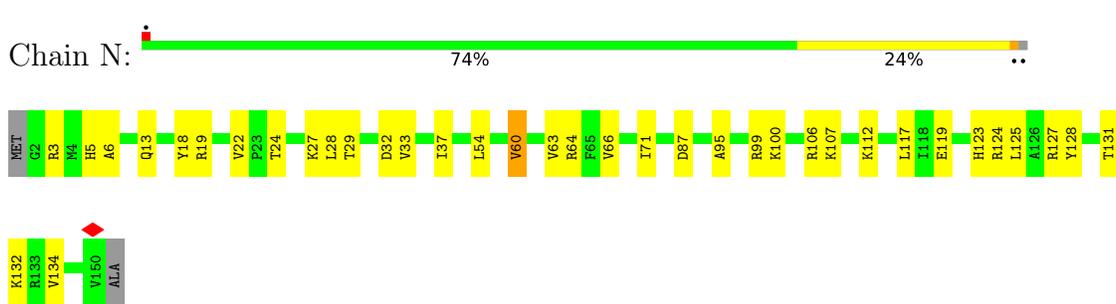
• Molecule 13: Small ribosomal subunit protein uS17



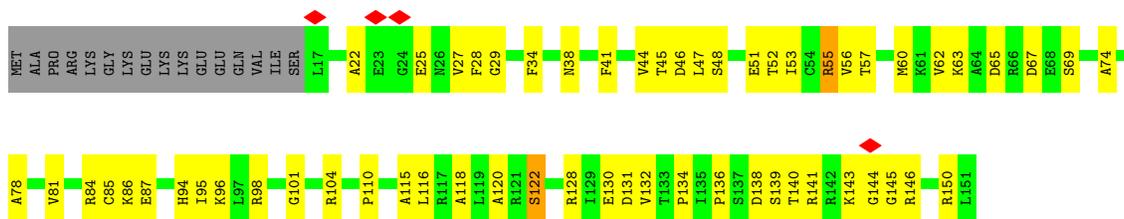
• Molecule 14: Small ribosomal subunit protein eS12



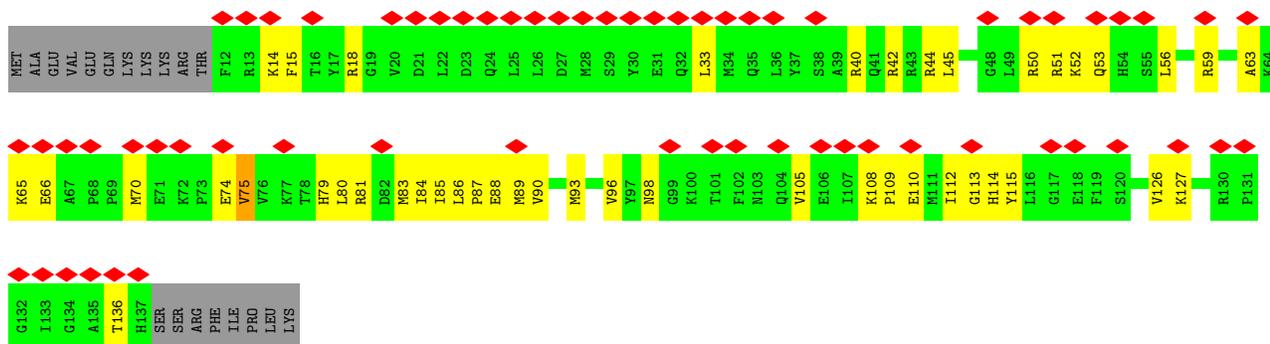
• Molecule 15: Small ribosomal subunit protein uS15



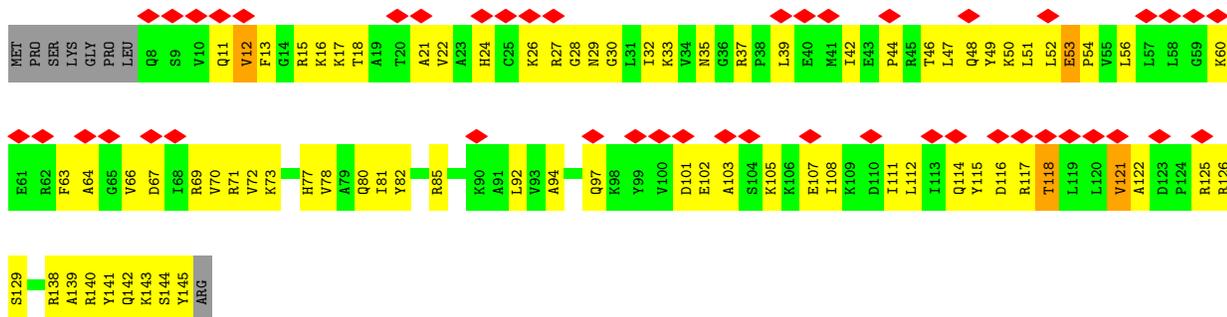
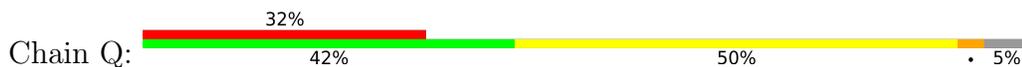
• Molecule 16: Small ribosomal subunit protein uS11



• Molecule 17: Small ribosomal subunit protein uS19



• Molecule 18: Small ribosomal subunit protein uS9

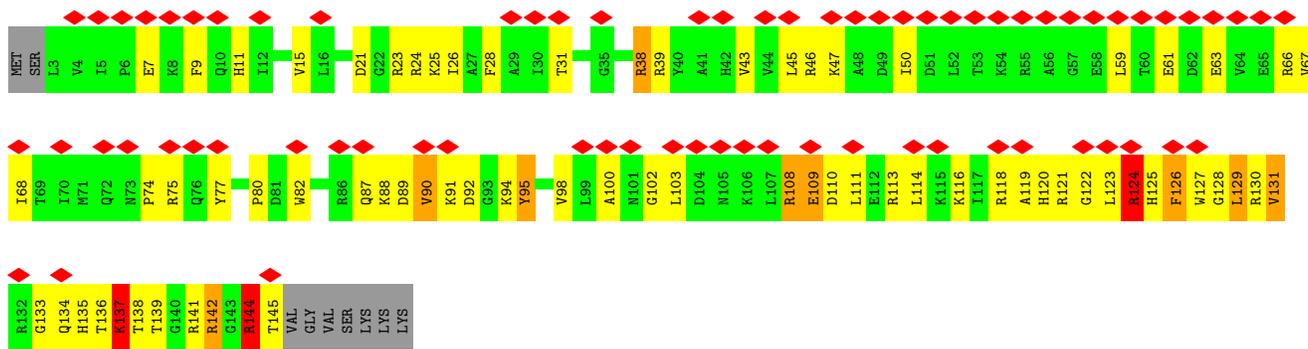


• Molecule 19: Small ribosomal subunit protein eS17

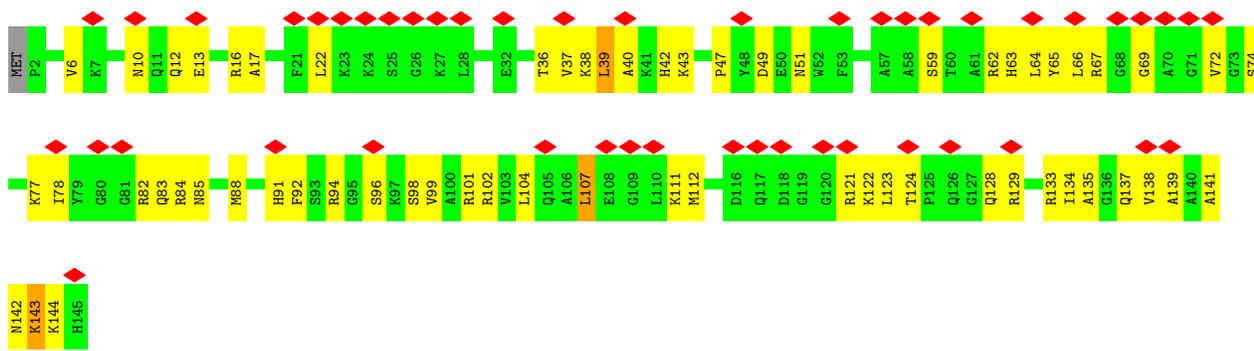




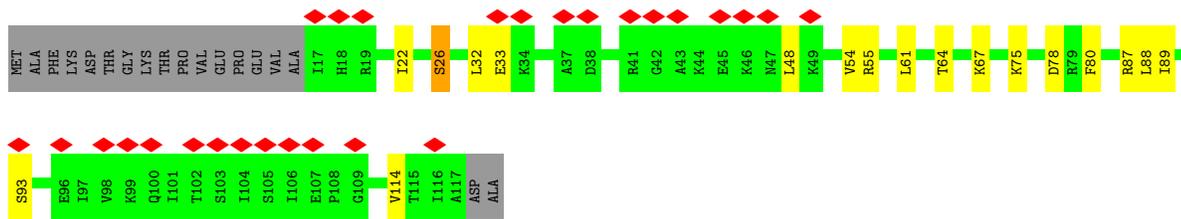
• Molecule 20: Small ribosomal subunit protein uS13



• Molecule 21: Small ribosomal subunit protein eS19



• Molecule 22: Small ribosomal subunit protein uS10



• Molecule 23: Small ribosomal subunit protein eS21





- Molecule 24: Small ribosomal subunit protein uS8



- Molecule 25: Small ribosomal subunit protein uS12



- Molecule 26: Small ribosomal subunit protein eS24



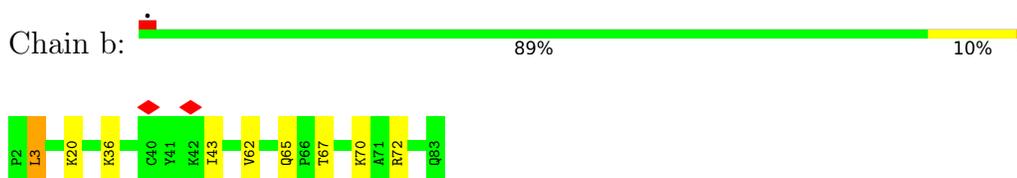
- Molecule 27: Small ribosomal subunit protein eS25



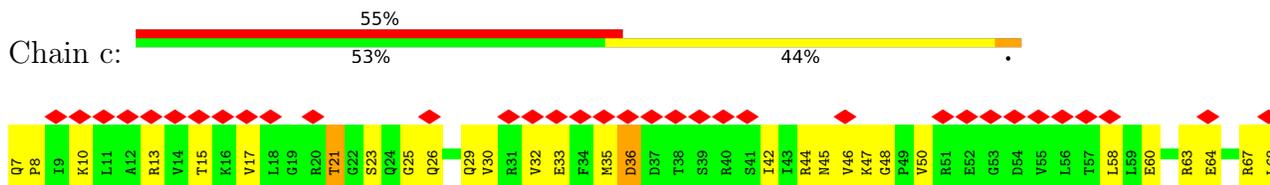
- Molecule 28: Small ribosomal subunit protein eS26



- Molecule 29: Small ribosomal subunit protein eS27



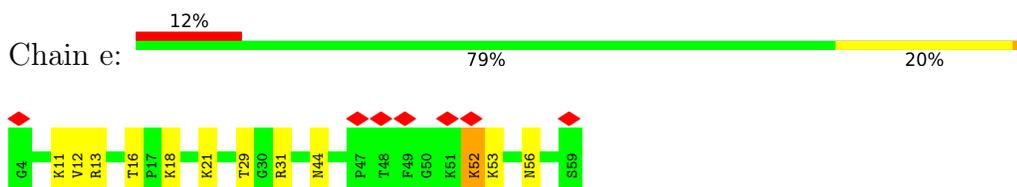
- Molecule 30: Small ribosomal subunit protein eS28



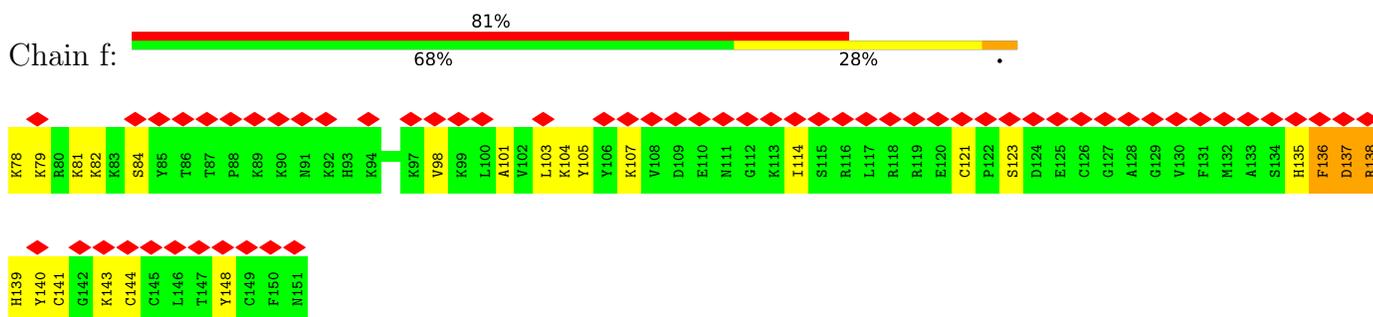
- Molecule 31: Small ribosomal subunit protein uS14



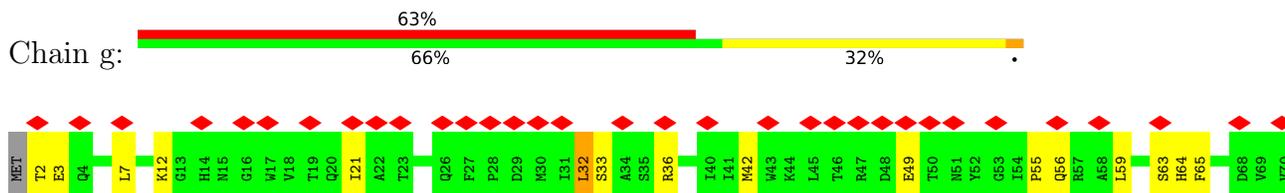
- Molecule 32: Small ribosomal subunit protein eS30



- Molecule 33: Small ribosomal subunit protein eS31



- Molecule 34: Small ribosomal subunit protein RACK1



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	99345	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	JEOL CRYO ARM 300	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 (6k x 4k)	Depositor
Maximum map value	1.866	Depositor
Minimum map value	-0.997	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.049	Depositor
Recommended contour level	0.14	Depositor
Map size (Å)	486.4, 486.4, 486.4	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.95, 0.95, 0.95	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	0.26	0/39823	0.32	5/62066 (0.0%)
2	A	0.21	0/1723	0.30	0/2341
3	B	0.22	0/1756	0.36	0/2350
4	C	0.27	0/1726	0.40	0/2332
5	D	0.25	0/1780	0.43	0/2397
6	E	0.28	0/2118	0.36	0/2849
7	F	0.17	0/1516	0.44	0/2037
8	G	0.26	0/1887	0.52	2/2513 (0.1%)
9	H	0.21	0/1524	0.43	0/2042
10	I	0.23	0/1711	0.35	0/2282
11	J	0.25	0/1524	0.33	0/2035
12	K	0.30	0/840	0.63	1/1133 (0.1%)
13	L	0.24	0/1250	0.30	0/1673
14	M	0.11	0/945	0.30	0/1269
15	N	0.22	0/1226	0.30	0/1649
16	O	0.21	0/1023	0.36	0/1372
17	P	0.17	0/1058	0.48	0/1414
18	Q	0.20	0/1114	0.48	0/1492
19	R	0.17	0/1082	0.38	0/1452
20	S	0.50	0/1202	0.84	4/1610 (0.2%)
21	T	0.20	0/1143	0.51	0/1530
22	U	0.16	0/813	0.32	0/1092
23	V	0.21	0/631	0.29	0/844
24	W	0.28	0/1051	0.35	0/1406
25	X	0.24	0/1116	0.33	0/1490
26	Y	0.23	0/1031	0.29	0/1370
27	Z	0.13	0/580	0.42	0/780
28	a	0.24	0/807	0.36	0/1082
29	b	0.20	0/654	0.33	0/876
30	c	0.15	0/491	0.36	0/656
31	d	0.25	0/470	0.45	0/623
32	e	0.19	0/447	0.33	0/587
33	f	0.26	0/623	0.51	0/822
34	g	0.13	0/2498	0.34	0/3399

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
35	h	0.22	0/214	0.42	0/272
36	n	0.15	0/219	0.21	0/293
All	All	0.25	0/79616	0.37	12/115430 (0.0%)

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
20	S	0	2
33	f	0	1
All	All	0	3

There are no bond length outliers.

The worst 5 of 12 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	2	1310	U	O3'-P-O5'	-8.31	91.54	104.00
1	2	1309	C	C1'-C2'-O2'	-7.58	97.03	108.40
20	S	103	LEU	N-CA-C	-6.09	103.09	110.88
1	2	1609	C	C2'-C3'-O3'	5.97	118.45	109.50
20	S	102	GLY	N-CA-C	-5.74	107.39	115.32

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
20	S	124	ARG	Sidechain
20	S	144	ARG	Sidechain
33	f	138	ARG	Sidechain

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	35610	0	18000	718	0
2	A	1686	0	1688	44	0
3	B	1729	0	1803	50	0
4	C	1690	0	1777	31	0
5	D	1752	0	1848	55	0
6	E	2076	0	2177	49	0
7	F	1495	0	1549	69	0
8	G	1864	0	2018	63	0
9	H	1501	0	1593	36	0
10	I	1682	0	1769	45	0
11	J	1499	0	1618	30	0
12	K	816	0	841	30	0
13	L	1229	0	1302	22	0
14	M	935	0	964	27	0
15	N	1202	0	1289	28	0
16	O	1010	0	1034	48	0
17	P	1037	0	1082	37	0
18	Q	1097	0	1161	75	0
19	R	1068	0	1121	35	0
20	S	1184	0	1244	78	0
21	T	1123	0	1153	60	0
22	U	803	0	873	14	0
23	V	625	0	628	16	0
24	W	1034	0	1080	28	0
25	X	1098	0	1167	22	0
26	Y	1014	0	1082	28	0
27	Z	574	0	627	14	0
28	a	794	0	849	26	0
29	b	641	0	665	8	0
30	c	489	0	514	27	0
31	d	459	0	452	19	0
32	e	442	0	487	8	0
33	f	611	0	638	50	0
34	g	2441	0	2396	75	0
35	h	213	0	258	6	0
36	n	215	0	220	4	0
All	All	74738	0	58967	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 12.

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)
33:f:141:CYS:SG	33:f:148:TYR:CE2	2.18	1.35
33:f:141:CYS:SG	33:f:148:TYR:CZ	2.39	1.13
33:f:141:CYS:SG	33:f:148:TYR:OH	2.15	1.04
1:2:1521:C:H2'	20:S:136:THR:HB	1.42	0.99
1:2:1033:G:H1	1:2:1080:A:HO2'	1.06	0.96

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	A	211/295 (72%)	205 (97%)	5 (2%)	1 (0%)	25	52
3	B	211/264 (80%)	207 (98%)	4 (2%)	0	100	100
4	C	216/293 (74%)	211 (98%)	5 (2%)	0	100	100
5	D	223/243 (92%)	214 (96%)	9 (4%)	0	100	100
6	E	260/263 (99%)	250 (96%)	10 (4%)	0	100	100
7	F	187/204 (92%)	166 (89%)	20 (11%)	1 (0%)	25	52
8	G	228/249 (92%)	220 (96%)	8 (4%)	0	100	100
9	H	184/194 (95%)	177 (96%)	7 (4%)	0	100	100
10	I	203/208 (98%)	194 (96%)	8 (4%)	1 (0%)	25	52
11	J	178/194 (92%)	167 (94%)	10 (6%)	1 (1%)	22	48
12	K	95/165 (58%)	83 (87%)	12 (13%)	0	100	100
13	L	149/158 (94%)	145 (97%)	4 (3%)	0	100	100
14	M	119/132 (90%)	112 (94%)	5 (4%)	2 (2%)	7	23
15	N	147/151 (97%)	147 (100%)	0	0	100	100
16	O	133/151 (88%)	125 (94%)	8 (6%)	0	100	100
17	P	124/145 (86%)	106 (86%)	17 (14%)	1 (1%)	16	41

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
18	Q	136/146 (93%)	119 (88%)	17 (12%)	0	100	100
19	R	130/135 (96%)	126 (97%)	4 (3%)	0	100	100
20	S	141/152 (93%)	118 (84%)	17 (12%)	6 (4%)	2	6
21	T	142/145 (98%)	128 (90%)	13 (9%)	1 (1%)	19	45
22	U	99/119 (83%)	93 (94%)	6 (6%)	0	100	100
23	V	80/83 (96%)	79 (99%)	1 (1%)	0	100	100
24	W	127/130 (98%)	122 (96%)	5 (4%)	0	100	100
25	X	139/143 (97%)	134 (96%)	5 (4%)	0	100	100
26	Y	122/130 (94%)	119 (98%)	3 (2%)	0	100	100
27	Z	70/125 (56%)	66 (94%)	4 (6%)	0	100	100
28	a	97/101 (96%)	91 (94%)	5 (5%)	1 (1%)	13	36
29	b	80/82 (98%)	75 (94%)	5 (6%)	0	100	100
30	c	60/62 (97%)	59 (98%)	1 (2%)	0	100	100
31	d	53/55 (96%)	48 (91%)	5 (9%)	0	100	100
32	e	54/56 (96%)	48 (89%)	5 (9%)	1 (2%)	6	20
33	f	72/74 (97%)	63 (88%)	8 (11%)	1 (1%)	9	27
34	g	312/315 (99%)	289 (93%)	23 (7%)	0	100	100
35	h	20/25 (80%)	19 (95%)	1 (5%)	0	100	100
36	n	25/196 (13%)	25 (100%)	0	0	100	100
All	All	4827/5583 (86%)	4550 (94%)	260 (5%)	17 (0%)	32	58

5 of 17 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	189	ILE
17	P	75	VAL
20	S	137	LYS
11	J	138	ARG
21	T	143	LYS

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	A	179/243 (74%)	174 (97%)	5 (3%)	38	69
3	B	194/231 (84%)	186 (96%)	8 (4%)	26	56
4	C	184/225 (82%)	173 (94%)	11 (6%)	16	40
5	D	189/202 (94%)	176 (93%)	13 (7%)	13	34
6	E	224/225 (100%)	216 (96%)	8 (4%)	30	61
7	F	159/170 (94%)	146 (92%)	13 (8%)	9	26
8	G	200/218 (92%)	194 (97%)	6 (3%)	36	67
9	H	167/174 (96%)	160 (96%)	7 (4%)	25	55
10	I	178/180 (99%)	174 (98%)	4 (2%)	47	76
11	J	160/168 (95%)	149 (93%)	11 (7%)	13	34
12	K	88/136 (65%)	82 (93%)	6 (7%)	13	34
13	L	135/142 (95%)	128 (95%)	7 (5%)	19	47
14	M	102/108 (94%)	99 (97%)	3 (3%)	37	68
15	N	130/131 (99%)	127 (98%)	3 (2%)	45	75
16	O	105/119 (88%)	100 (95%)	5 (5%)	21	50
17	P	112/130 (86%)	110 (98%)	2 (2%)	54	80
18	Q	114/121 (94%)	108 (95%)	6 (5%)	19	46
19	R	119/122 (98%)	114 (96%)	5 (4%)	25	55
20	S	124/132 (94%)	108 (87%)	16 (13%)	3	10
21	T	114/115 (99%)	112 (98%)	2 (2%)	54	80
22	U	93/107 (87%)	92 (99%)	1 (1%)	70	88
23	V	66/67 (98%)	65 (98%)	1 (2%)	60	84
24	W	112/113 (99%)	109 (97%)	3 (3%)	40	71
25	X	113/115 (98%)	106 (94%)	7 (6%)	15	39
26	Y	108/112 (96%)	105 (97%)	3 (3%)	38	69
27	Z	64/103 (62%)	63 (98%)	1 (2%)	58	83
28	a	87/89 (98%)	84 (97%)	3 (3%)	32	63
29	b	74/74 (100%)	73 (99%)	1 (1%)	62	85
30	c	55/55 (100%)	52 (94%)	3 (6%)	18	44
31	d	48/48 (100%)	44 (92%)	4 (8%)	9	26

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
32	e	45/45 (100%)	43 (96%)	2 (4%)	24	53
33	f	67/67 (100%)	64 (96%)	3 (4%)	23	52
34	g	272/273 (100%)	259 (95%)	13 (5%)	21	50
35	h	21/24 (88%)	20 (95%)	1 (5%)	21	50
36	n	24/162 (15%)	24 (100%)	0	100	100
All	All	4226/4746 (89%)	4039 (96%)	187 (4%)	26	53

5 of 187 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
18	Q	118	THR
24	W	30	CYS
19	R	71	ILE
20	S	108	ARG
25	X	100	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 43 such sidechains are listed below:

Mol	Chain	Res	Type
17	P	79	HIS
21	T	63	HIS
18	Q	48	GLN
19	R	121	GLN
26	Y	15	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1658/1869 (88%)	541 (32%)	26 (1%)

5 of 541 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	2	A
1	2	4	C
1	2	33	G
1	2	41	G
1	2	44	U

5 of 26 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	1440	C
1	2	1527	C
1	2	1643	U
1	2	1522	A
1	2	1546	G

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.

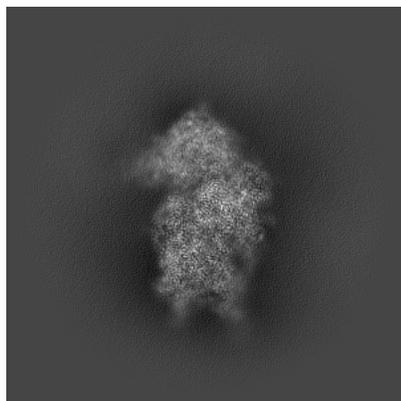
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-62450. These allow visual inspection of the internal detail of the map and identification of artifacts.

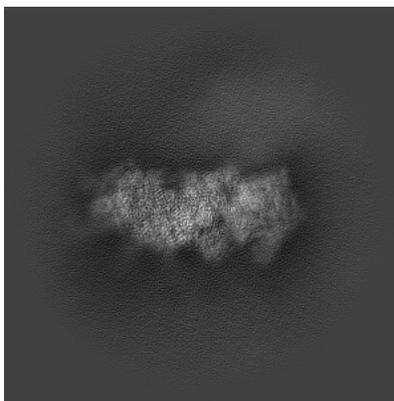
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

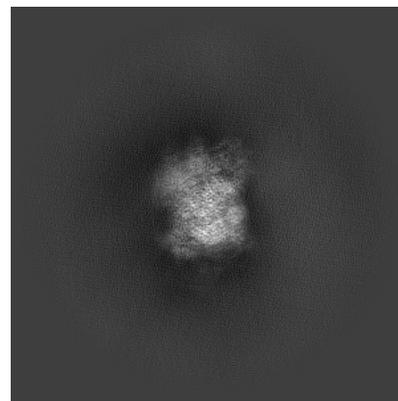
6.1.1 Primary map



X

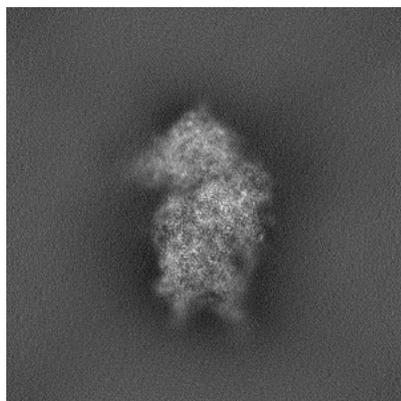


Y

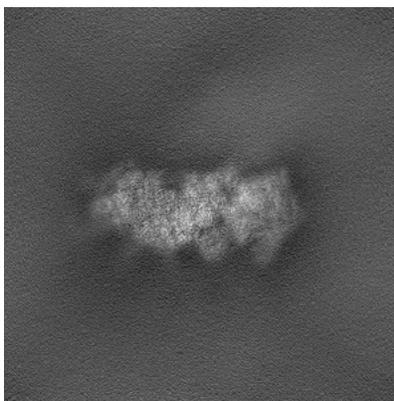


Z

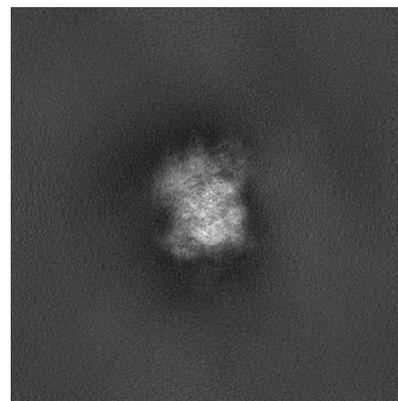
6.1.2 Raw map



X



Y

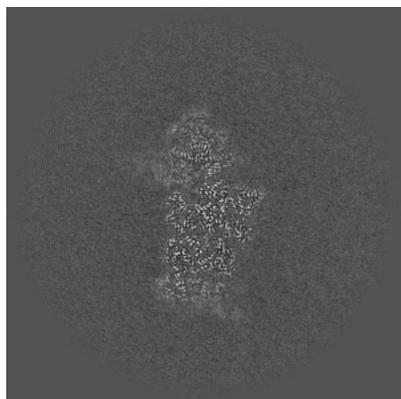


Z

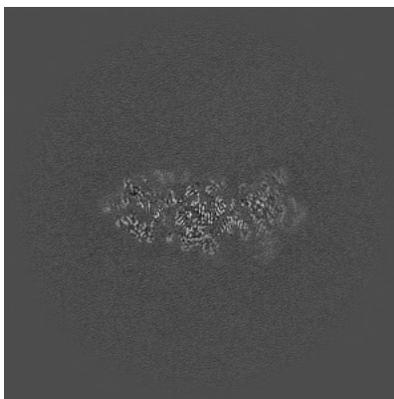
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

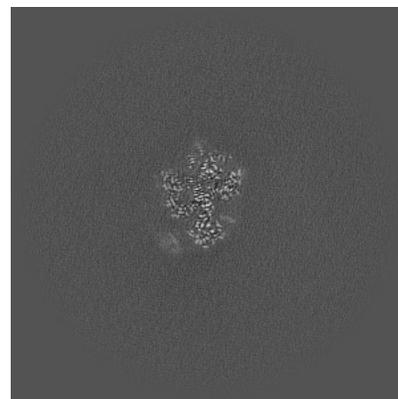
6.2.1 Primary map



X Index: 256

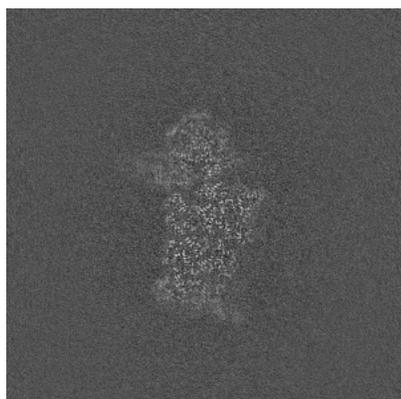


Y Index: 256

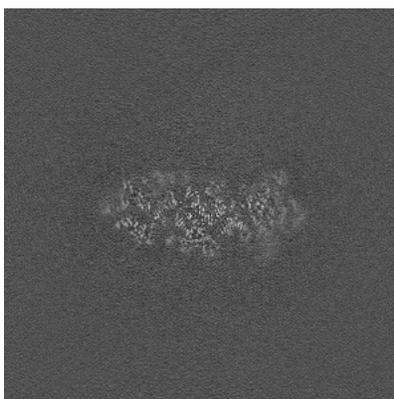


Z Index: 256

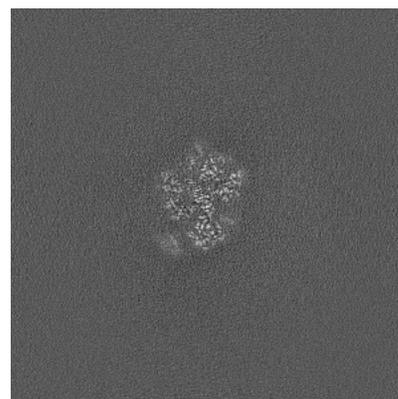
6.2.2 Raw map



X Index: 256



Y Index: 256

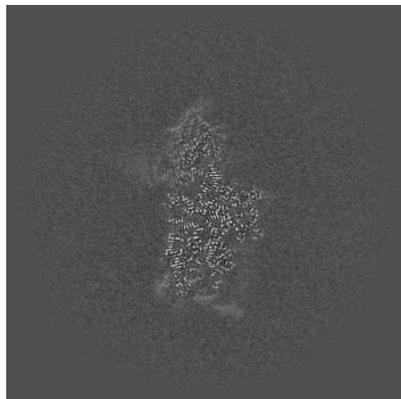


Z Index: 256

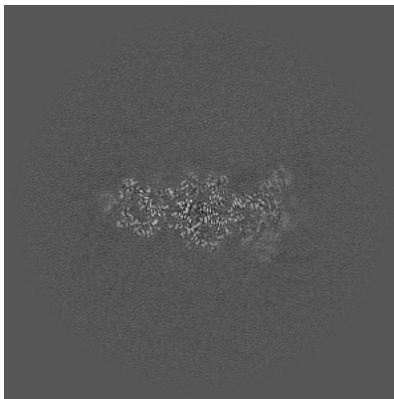
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

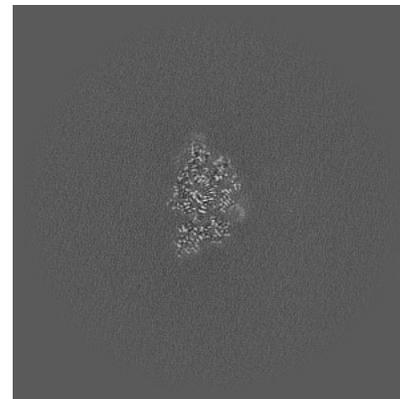
6.3.1 Primary map



X Index: 251

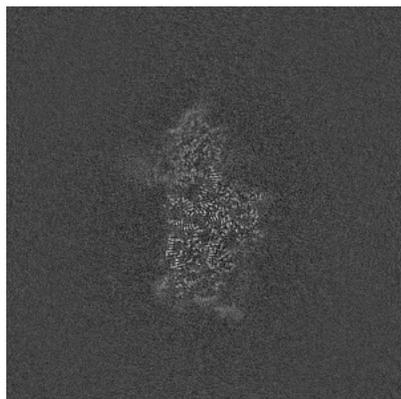


Y Index: 261

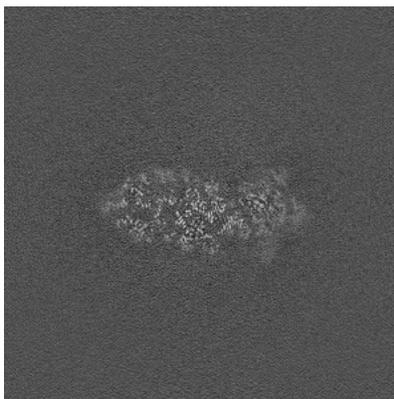


Z Index: 236

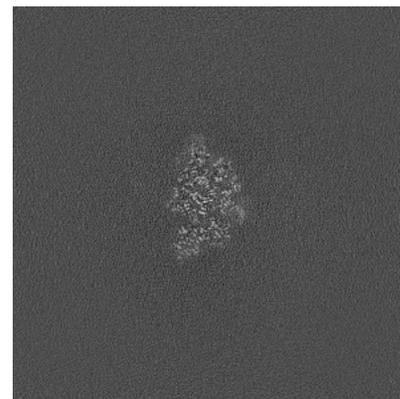
6.3.2 Raw map



X Index: 251



Y Index: 255

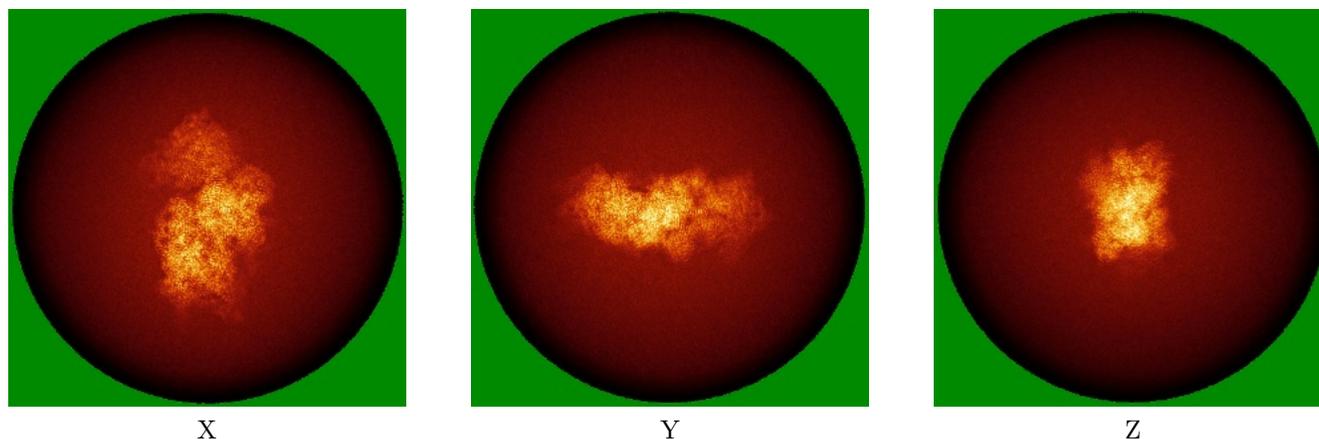


Z Index: 236

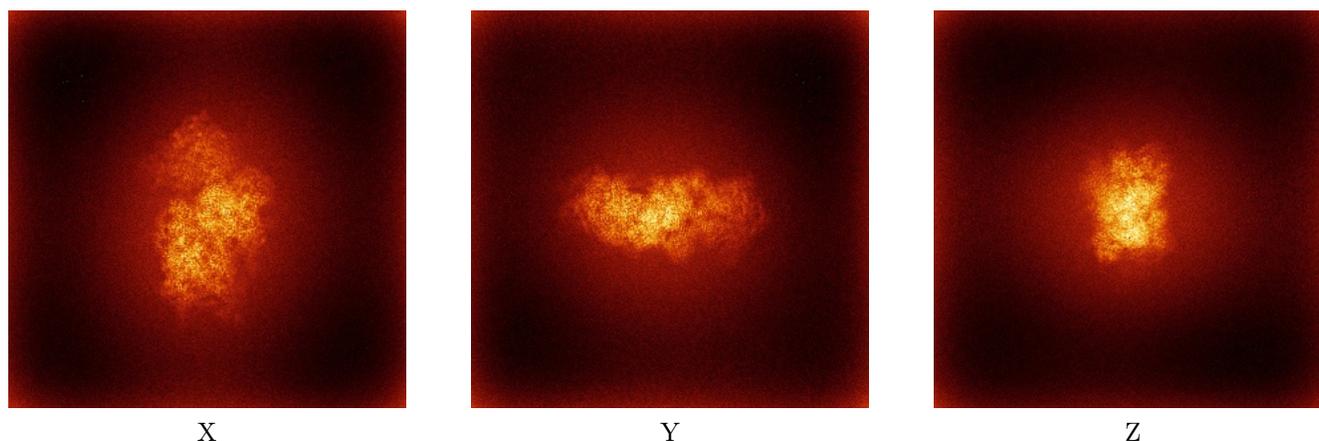
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



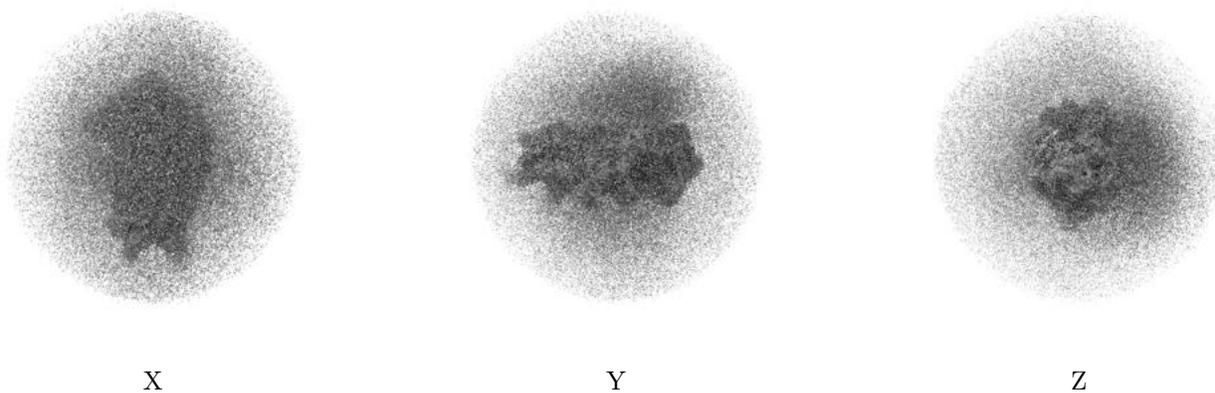
6.4.2 Raw map



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

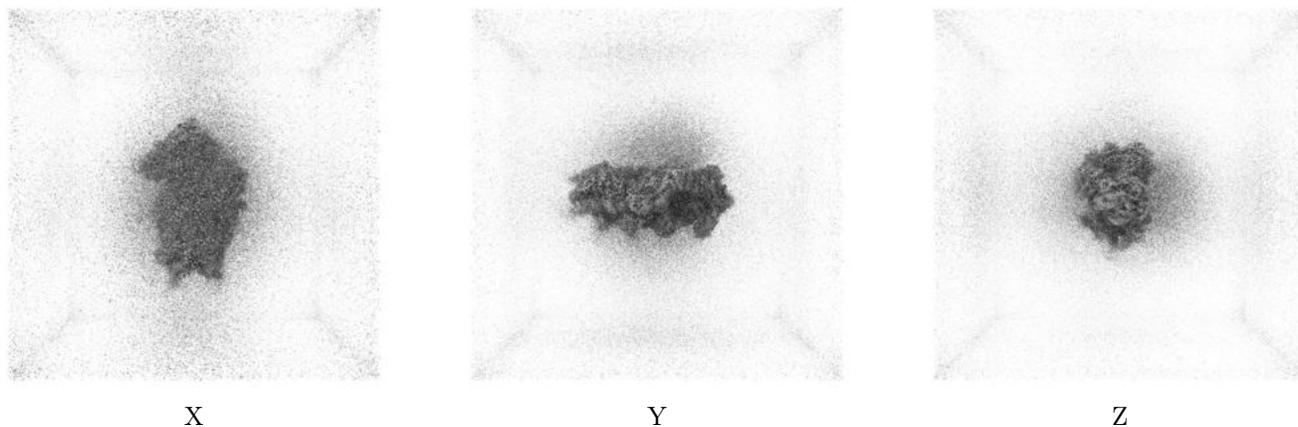
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.14. 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.

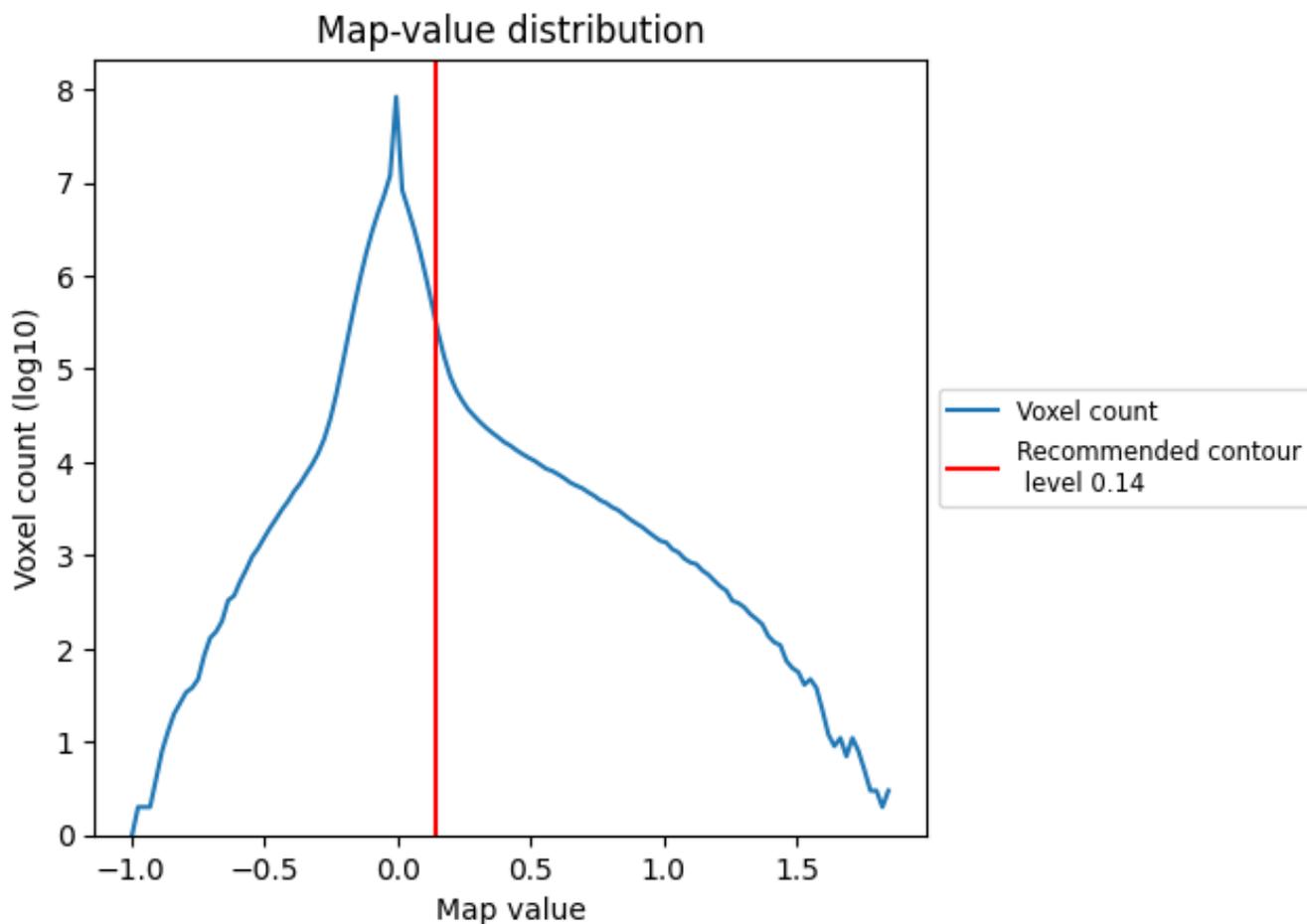
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

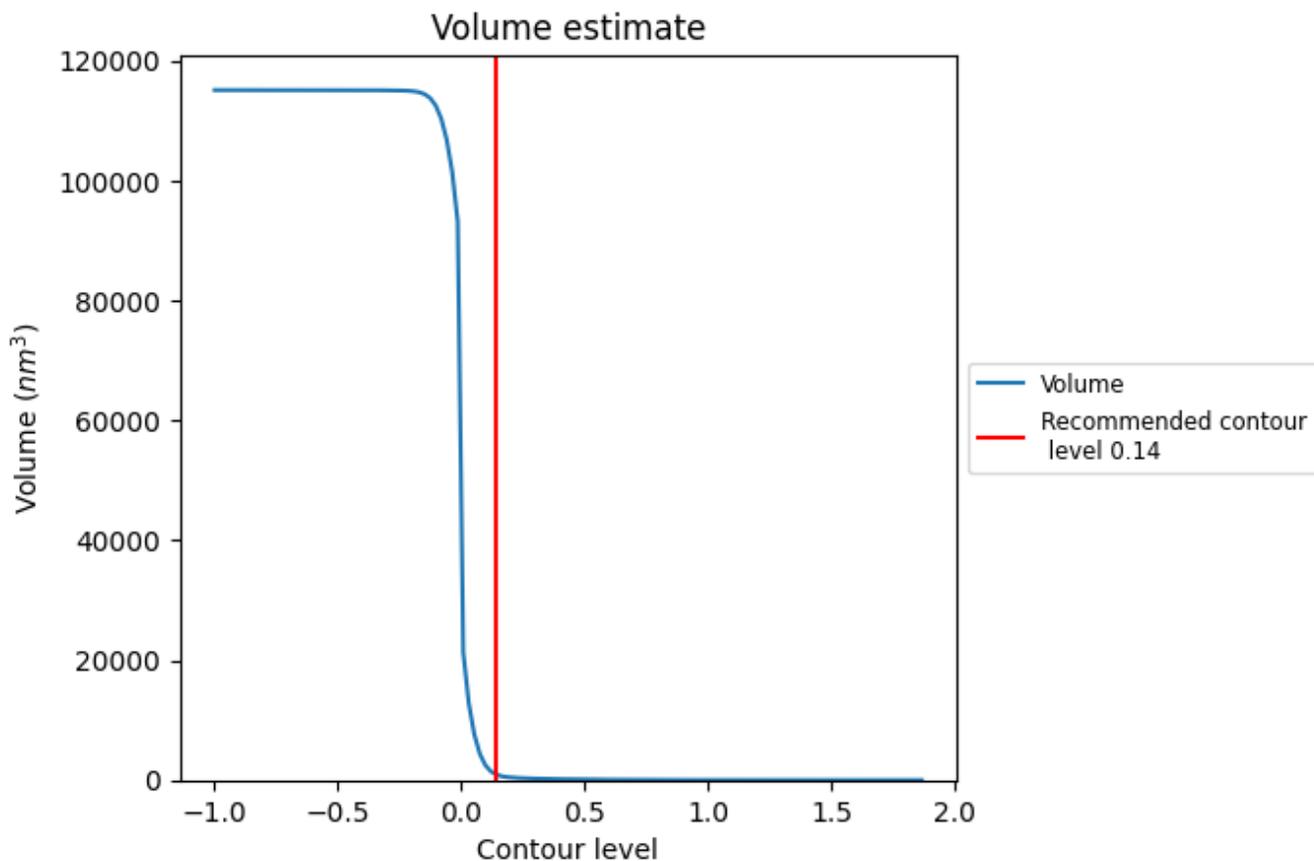
This section contains the results of statistical analysis of the map.

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.

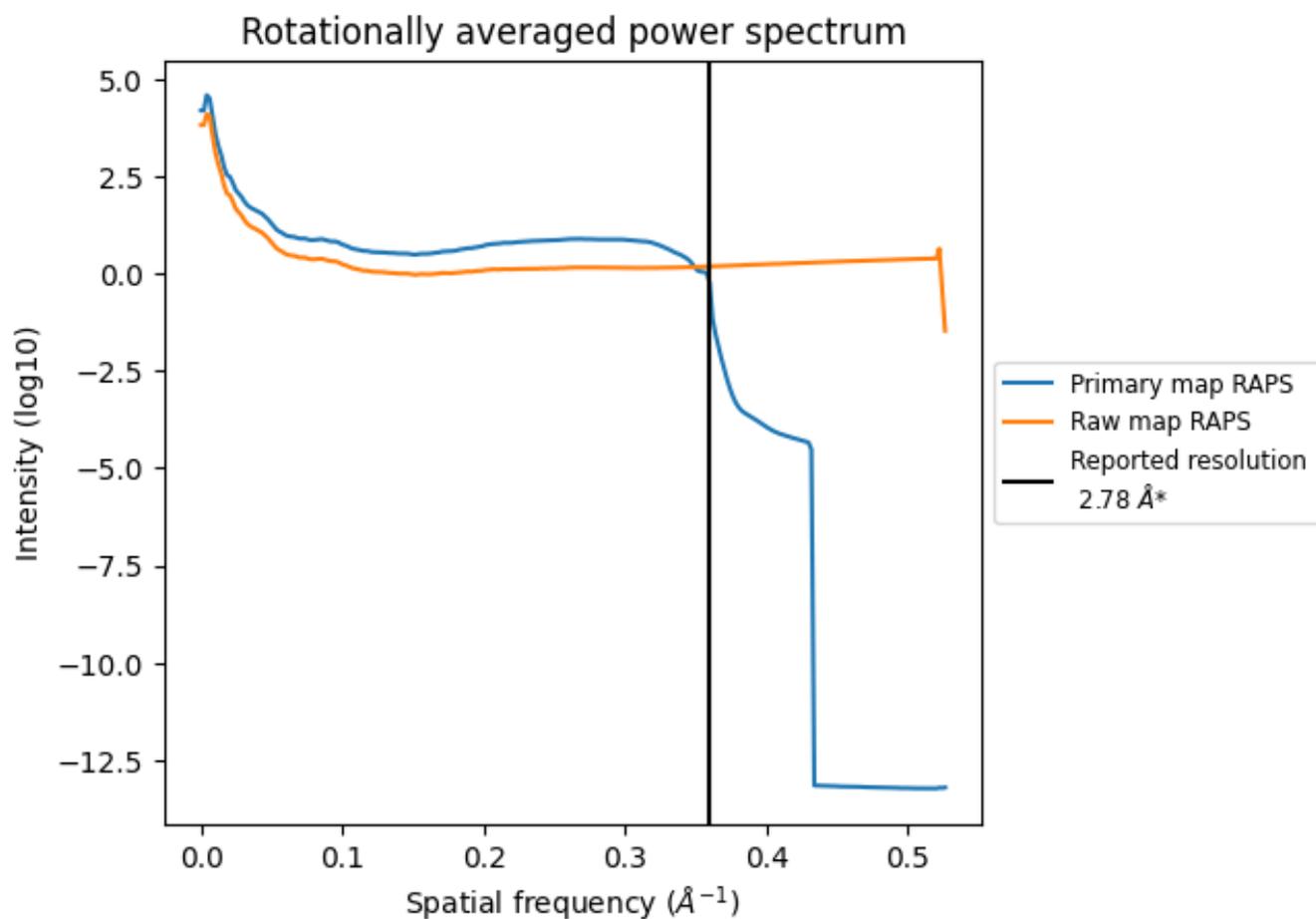
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1008 nm³; this corresponds to an approximate mass of 911 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](#)

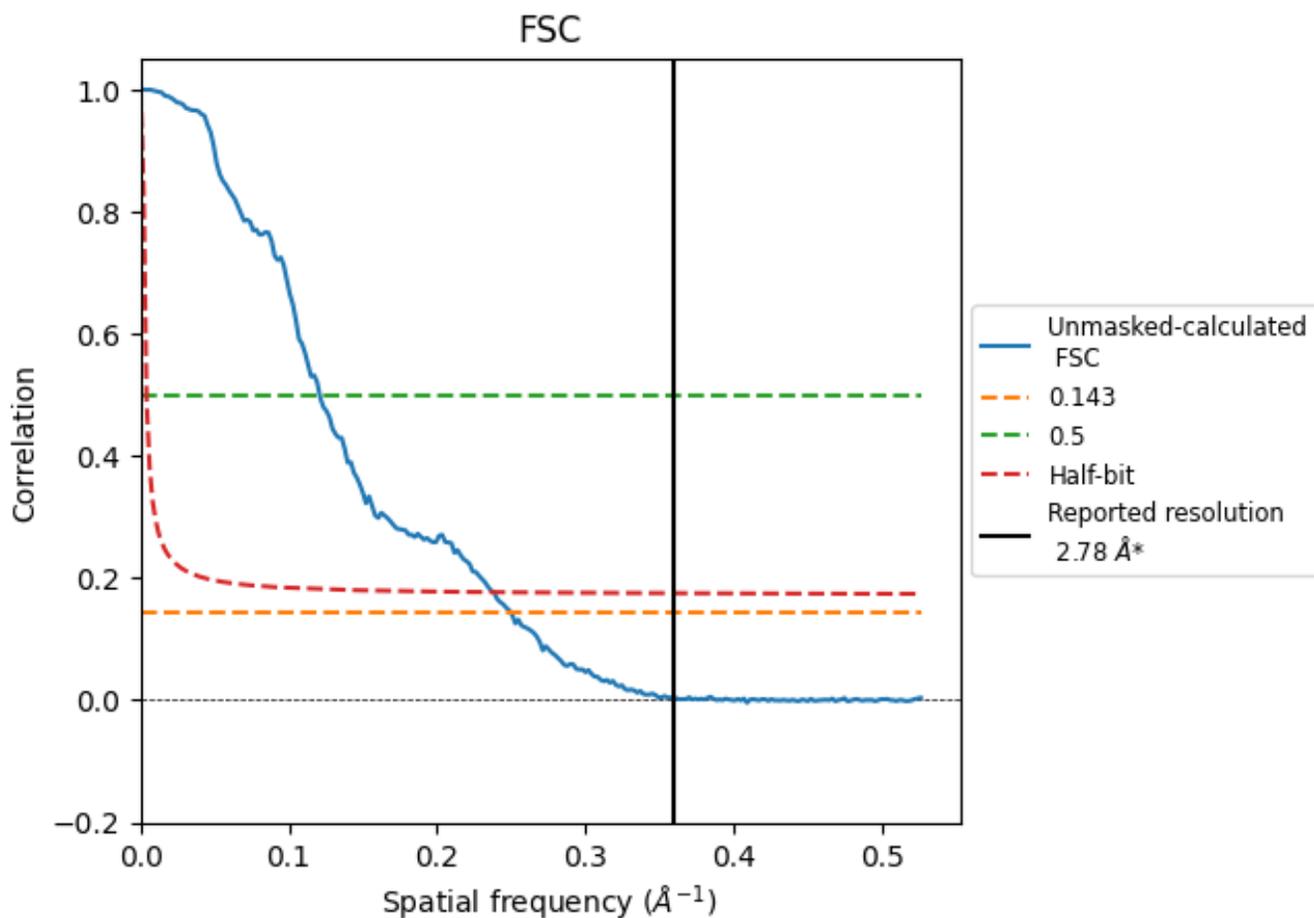


*Reported resolution corresponds to spatial frequency of 0.360 Å⁻¹

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 0.360 Å⁻¹

8.2 Resolution estimates [i](#)

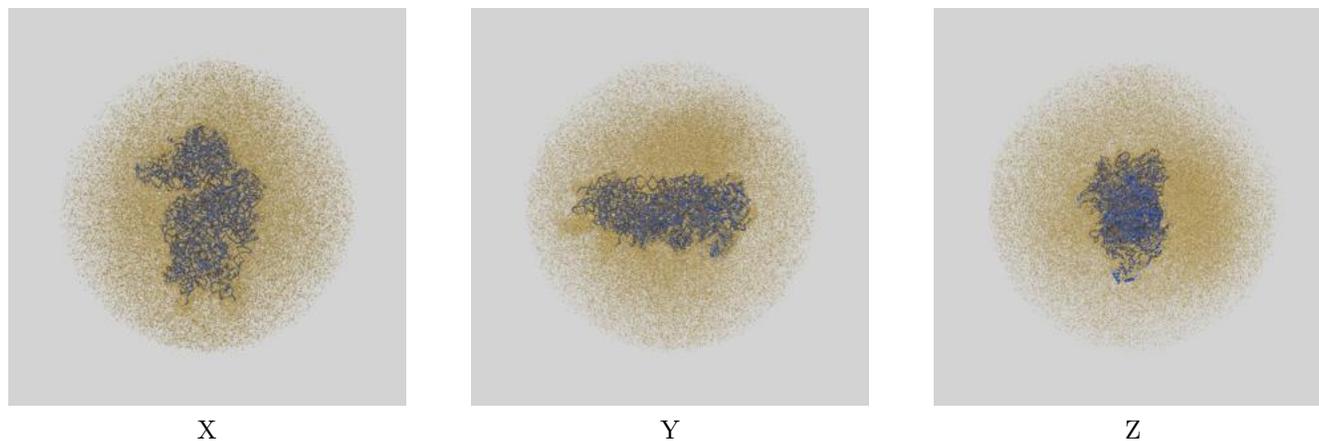
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.78	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.00	8.28	4.20

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.00 differs from the reported value 2.78 by more than 10 %

9 Map-model fit [i](#)

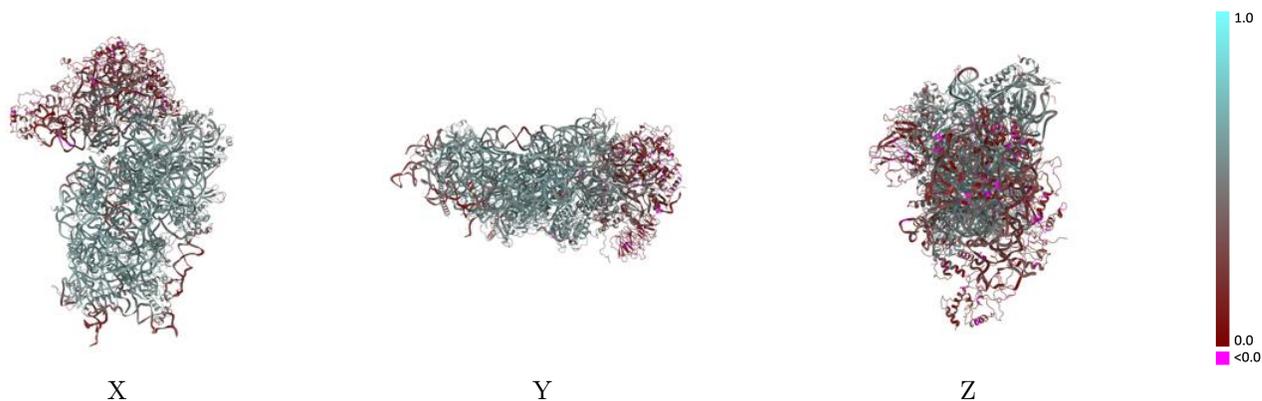
This section contains information regarding the fit between EMDB map EMD-62450 and PDB model 9KMZ. Per-residue inclusion information can be found in section [3](#) on page [11](#).

9.1 Map-model overlay [i](#)



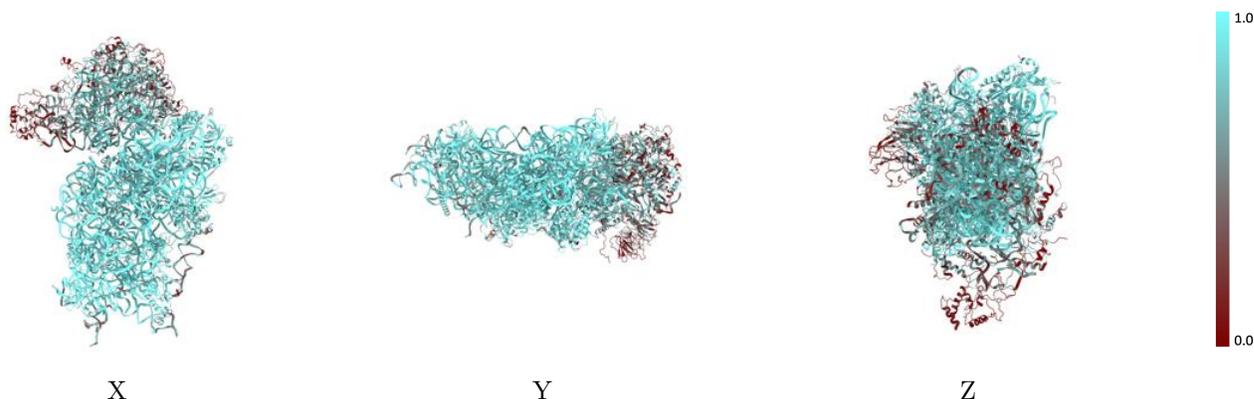
The images above show the 3D surface view of the map at the recommended contour level 0.14 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



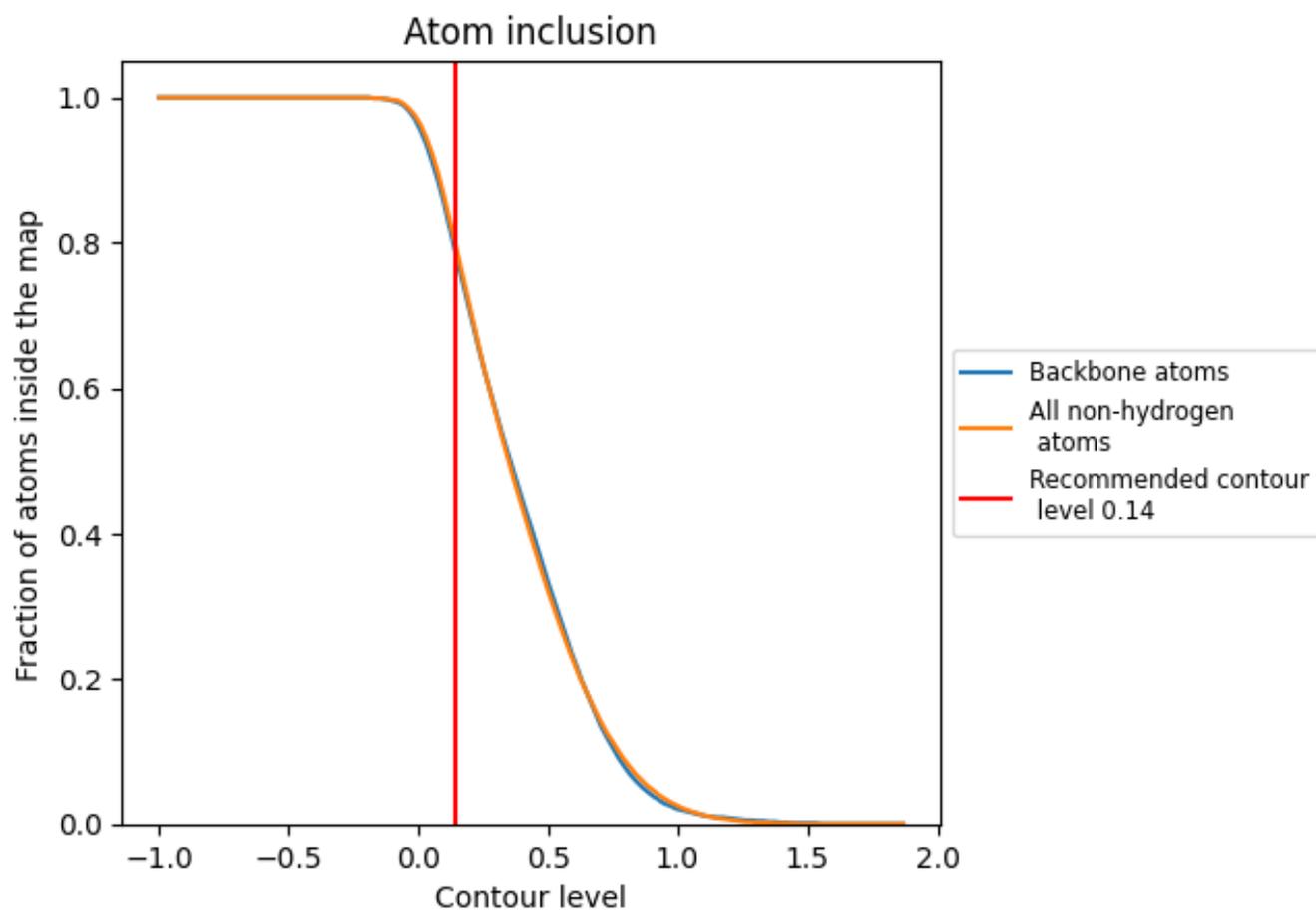
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.14).

9.4 Atom inclusion [i](#)

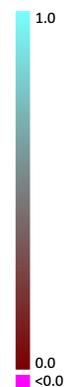


At the recommended contour level, 79% of all backbone atoms, 80% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.14) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8040	 0.4720
2	 0.8830	 0.4970
A	 0.9320	 0.5750
B	 0.9120	 0.5320
C	 0.9220	 0.5800
D	 0.6250	 0.3900
E	 0.9510	 0.6060
F	 0.4180	 0.2290
G	 0.9070	 0.5340
H	 0.7710	 0.4850
I	 0.8940	 0.5400
J	 0.9380	 0.5860
K	 0.4330	 0.2490
L	 0.9020	 0.5790
M	 0.1690	 0.2200
N	 0.9300	 0.5720
O	 0.8860	 0.5300
P	 0.4000	 0.2530
Q	 0.5870	 0.3020
R	 0.7440	 0.4640
S	 0.4160	 0.1990
T	 0.5650	 0.2300
U	 0.6200	 0.4080
V	 0.9390	 0.5870
W	 0.9670	 0.6130
X	 0.9630	 0.6050
Y	 0.9570	 0.5920
Z	 0.3720	 0.2200
a	 0.9270	 0.5770
b	 0.8700	 0.5350
c	 0.3690	 0.2830
d	 0.7480	 0.4400
e	 0.8410	 0.5410
f	 0.1670	 0.2160
g	 0.3230	 0.2180



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Chain	Atom inclusion	Q-score
h	 0.9120	 0.5590
n	 0.8500	 0.5340