W O R L D W I D E
wwPDB
P R O T E I N   D A T A   B A N K

wwPDB EM Validation Summary Report (i)

Sep 14, 2022 – 09:38 am BST

PDB ID	:	7QIY
EMDB ID	:	EMD-14003
Title	:	Specific features and methylation sites of a plant ribosome. 40S head ribosomal subunit.
Authors	:	Cottilli, P.; Itoh, Y.; Amunts, A.
Deposited on	:	2021-12-16
Resolution	:	2.58 Å(reported)

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 2.58 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.

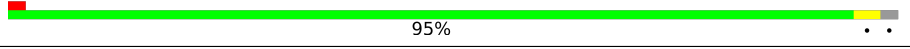| Metric	Percentile Ranks	Value
Clashscore		2
Ramachandran outliers		0
Sidechain outliers		0.1%
RNA backbone		0.63

Worse   *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures
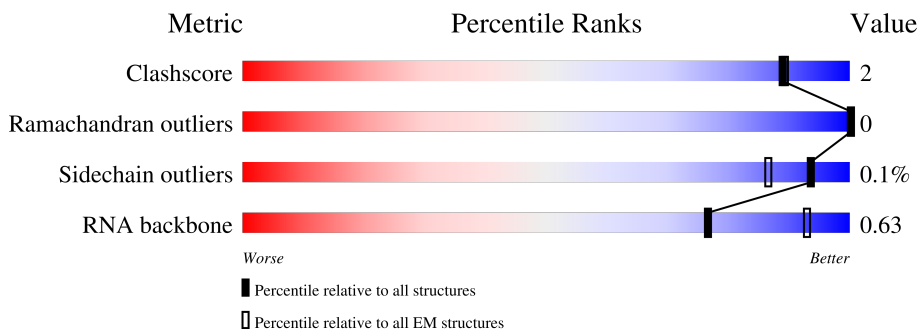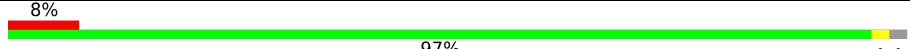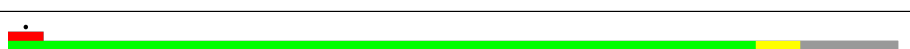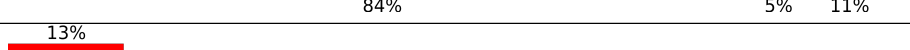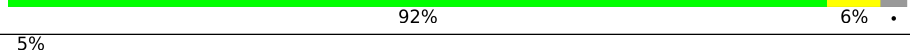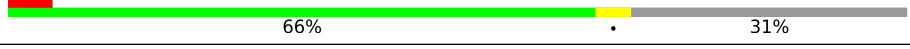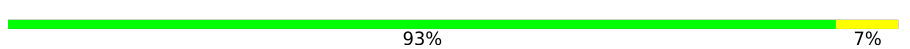
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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 <=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	1806	21% 5% 74%
2	D	239	84% 5% 11%
3	E	211	81% 7% 12%
4	F	180	49% • 49%
5	G	151	79% 5% 17%
6	H	147	93% • 5%
7	I	144	6% 52% 5% 43%

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Mol	Chain	Length	Quality of chain
8	J	152	88%　　　　　　　　　　　　　　　　6%　7%
9	K	143	95%
10	L	123	81%　　　　　　　　　15%
11	M	65	8%　　　97%
12	N	56	84%　　　　　5%　11%
13	O	326	13%　　　92%　　　　6%
14	P	108	5%　　　66%　　　　31%
15	Q	14	93%　　　7%
16	R	3	100%

2 Entry composition ⓘ

There are 22 unique types of molecules in this entry. The entry contains 44140 atoms, of which 19577 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 rRNA head.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	2	474	Total	C	H	N	O	P	0	0
			15216	4518	5115	1765	3344	474		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
2	?	-	U	deletion	GB 2090998067
2	1194	I2T	U	modified residue	GB 2090998067
2	1282A	4AC	C	modified residue	GB 2090998067
2	?	-	C	deletion	GB 2090998067

- Molecule 2 is a protein called KH type-2 domain-containing protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	D	213	Total	C	H	N	O	S	0	0
			3429	1060	1751	307	302	9		

- Molecule 3 is a protein called Ribosomal_S7 domain-containing protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	E	185	Total	C	H	N	O	S	0	0
			2965	912	1499	277	269	8		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	37	GLY	ASP	conflict	UNP A0A3Q7IVL4
E	43	MET	ILE	conflict	UNP A0A3Q7IVL4
E	60	MET	THR	conflict	UNP A0A3Q7IVL4
E	117	GLN	LEU	conflict	UNP A0A3Q7IVL4

- Molecule 4 is a protein called S10_plectin domain-containing protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	F	92	Total	C	H	N	O	S	0	0
			1572	514	790	128	136	4		

- Molecule 5 is a protein called 40S head ribosomal protein uS19.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	G	126	Total	C	H	N	O	S	0	0
			2096	650	1078	190	173	5		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	75	GLN	PRO	conflict	UNP A0A3Q7F5X2

- Molecule 6 is a protein called 40S head ribosomal protein uS9.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	H	140	Total	C	H	N	O	S	0	0
			2339	722	1204	220	189	4		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	62	HIS	GLN	conflict	UNP A0A3Q7GDB0
H	105	GLN	THR	conflict	UNP A0A3Q7GDB0

- Molecule 7 is a protein called 40S ribosomal protein S17.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	I	82	Total	C	H	N	O	S	0	0
			1420	426	738	135	118	3		

- Molecule 8 is a protein called 40S head ribosomal protein uS13.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	J	142	Total	C	H	N	O	S	0	0
			2343	720	1189	227	202	5		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
J	67	LEU	VAL	conflict	UNP A0A3Q7FJL7

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- Molecule 9 is a protein called 40S head ribosomal protein eS19.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	K	140	Total	C	H	N	O	S	0	0
			2208	692	1104	215	194	3		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	6	SER	ASN	conflict	UNP A0A3Q7FTS1
K	14	ASP	GLU	conflict	UNP A0A3Q7FTS1

- Molecule 10 is a protein called Ribosomal_S10 domain-containing protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	L	104	Total	C	H	N	O	S	0	0
			1701	515	880	152	150	4		

- Molecule 11 is a protein called 40S head ribosomal protein eS28.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	M	64	Total	C	H	N	O	S	0	0
			1070	319	551	105	93	2		

- Molecule 12 is a protein called 40S ribosomal protein S29.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	N	50	Total	C	H	N	O	S	0	0
			805	253	400	82	64	6		

- Molecule 13 is a protein called Mitogen-activated protein kinase.

Mol	Chain	Residues	Atoms						AltConf	Trace
13	O	317	Total	C	H	N	O	S	0	0
			4898	1554	2434	427	472	11		

- Molecule 14 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms						AltConf	Trace
14	P	75	Total	C	H	N	O	S	0	0
			1228	373	636	108	108	3		

- Molecule 15 is a RNA chain called tRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
15	Q	14	Total 451	C 134	H 152	N 55	O 96	P 14	0	0

- Molecule 16 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
16	R	3	Total 95	C 28	H 33	N 10	O 21	P 3	0	0

- Molecule 17 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
17	2	7	Total 7	K 7	0
17	J	1	Total 1	K 1	0
17	K	1	Total 1	K 1	0
17	N	1	Total 1	K 1	0

- Molecule 18 is 1,4-DIAMINOBUTANE (three-letter code: PUT) (formula: $C_4H_{12}N_2$).
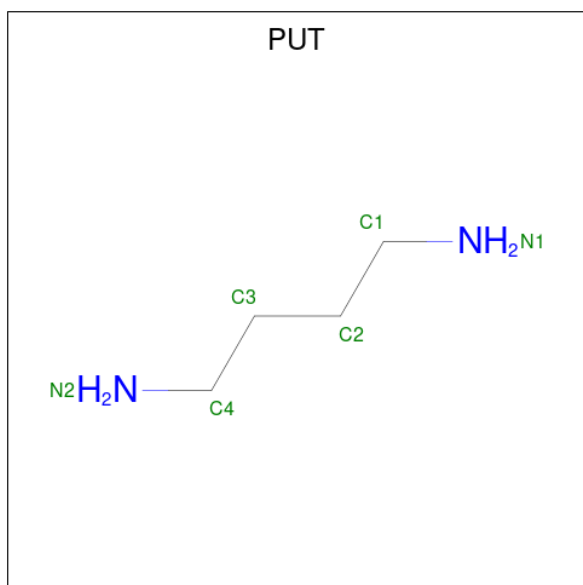
Mol	Chain	Residues	Atoms				AltConf
18	2	1	Total 18	C 4	H 12	N 2	0

- Molecule 19 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
19	2	27	Total 27	Mg 27	0
19	J	1	Total 1	Mg 1	0

- Molecule 20 is beta-D-glucopyranose (three-letter code: BGC) (formula: $C_6H_{12}O_6$).
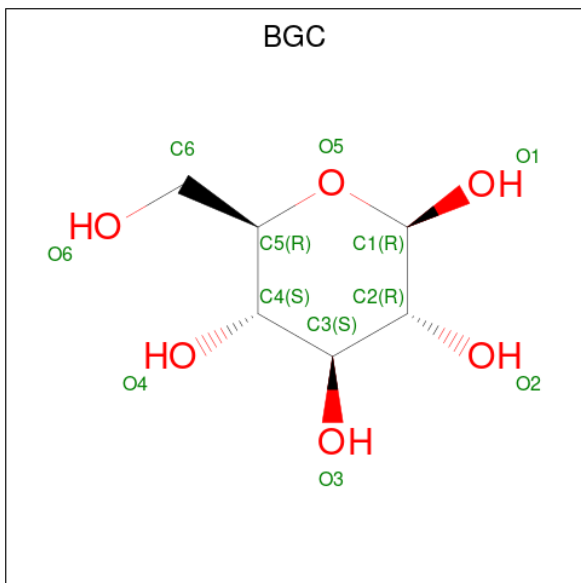
Mol	Chain	Residues	Atoms				AltConf
20	D	1	Total 22	C 6	H 11	O 5	0

- Molecule 21 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
21	N	1	Total 1	Zn 1	0

- Molecule 22 is water.

Mol	Chain	Residues	Atoms		AltConf
22	2	166	Total 166	O 166	0
22	E	10	Total 10	O 10	0
22	G	1	Total 1	O 1	0

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Mol	Chain	Residues	Atoms		AltConf
22	H	4	Total 4	O 4	0
22	J	6	Total 6	O 6	0
22	K	24	Total 24	O 24	0
22	L	7	Total 7	O 7	0
22	M	1	Total 1	O 1	0
22	N	2	Total 2	O 2	0
22	P	4	Total 4	O 4	0

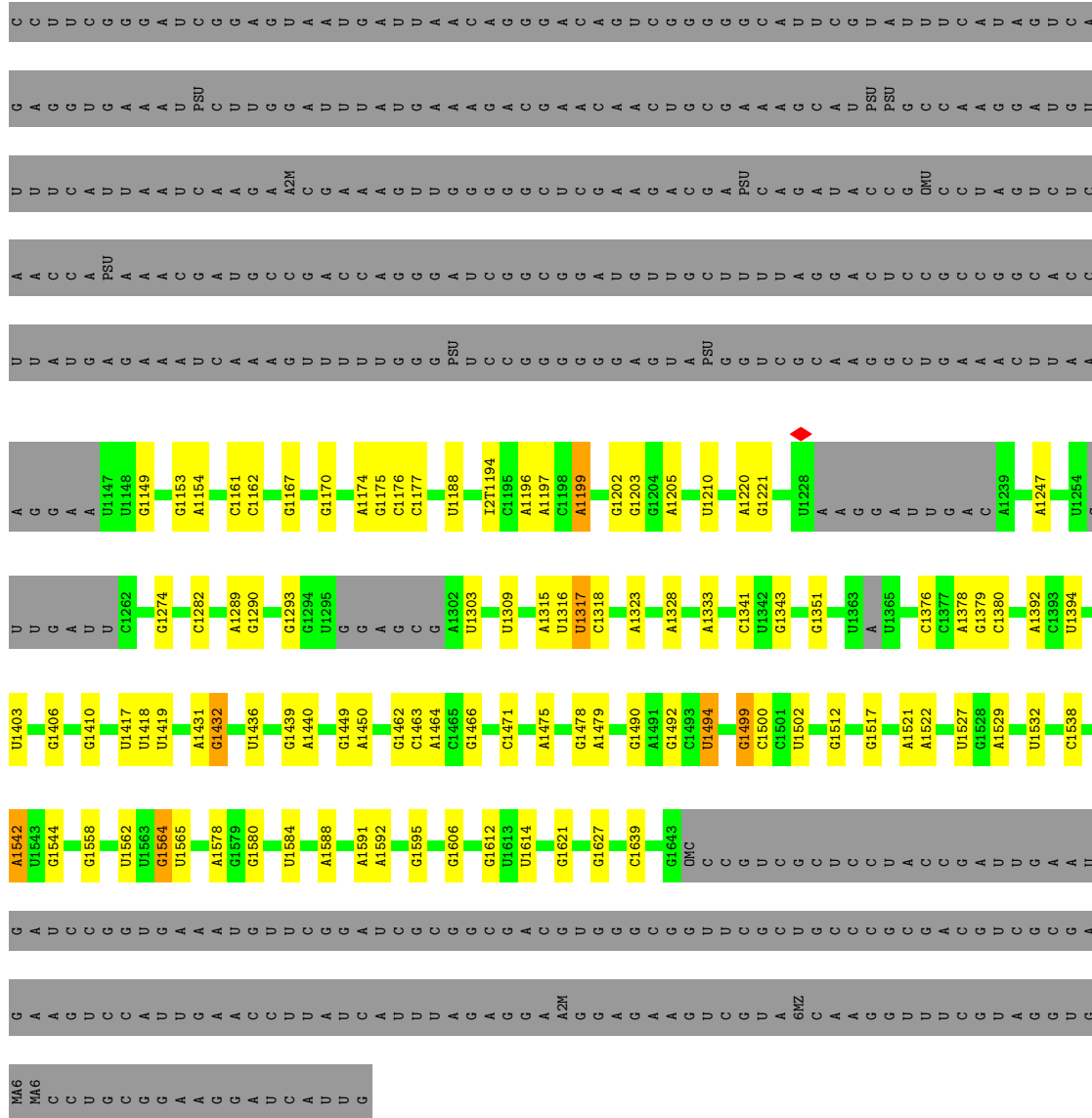# 3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.
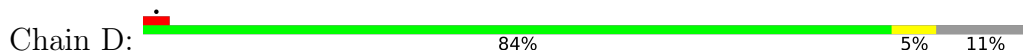
• Molecule 1: 18S rRNA head

Chain 2:

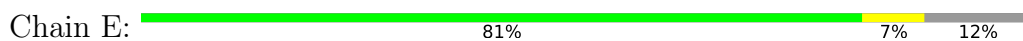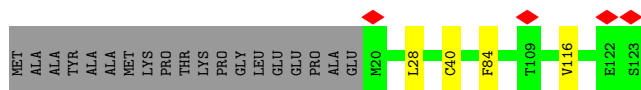- Molecule 2: KH type-2 domain-containing protein

Chain D: 84%   5%   11%

- Molecule 3: Ribosomal_S7 domain-containing protein

Chain E: 81%   7%   12%

- Molecule 4: S10_plectin domain-containing protein

Chain F:
49%   49%

M1 I11 L45 R77 N81 L82 P83 S84 E85 I86 V87 K92 LYS SER ALA LYS PRO LEU GLY ARG PRO MET GLY PRO PRO GLY ASP ARG ARG GLY PRO ARG GLU GLY ASP ARG PRO ARG PHE GLY ASP ARG ASP TYR ARG GLY PRO ALA GLY ARG GLY

PRO PRO GLY PHE GLY GLY GLU LYS GLY GLY ALA PRO ALA ASP TYR GLN PRO ALA PHE ARG GLY GLY GLY ARG PRO GLY PHE GLY ARG GLY ALA GLY GLY PHE GLY ALA PRO SER SER SER

• Molecule 5: 40S head ribosomal protein uS19

Chain G:
79%   5%   17%

MET ALA GLU VAL GLU ALA ASP VAL ALA THR GLY GLN PRO ARG LYS ARG THR PHE K19 K20 R24 R57 K58 P59 Q75 G76 E77 V99 E112 I118 S119 R136 S144 SER ARG PHE ILE PRO LEU LYS

• Molecule 6: 40S head ribosomal protein uS9

Chain H:
93%   5%

MET GLN ALA ALA PRO ALA THR V8 R30 D117 R118 T119 R136 R147

• Molecule 7: 40S ribosomal protein S17

Chain I:
6%
52%   5%   43%

MET G2 R5 K10 K32 R45 L57 V66 I69 K72 L73 E77 R78 E79 R80 R81 M82 D83 PHE VAL PRO ASP GLU SER ALA ILE LYS THR ASP LEU ILE GLU GLU VAL ASP LYS GLU THR LEU ASP MET LEU SER ALA LEU GLY MET SER ASP LEU PRO GLY

VAL VAL LYS GLN ALA ALA GLU PRO GLN ALA VAL ALA ALA LEU PRO SER TYR GLY ARG GLY GLY GLY PHE GLY ARG LYS TYR

• Molecule 8: 40S head ribosomal protein uS13

Chain J:
88%   6%   7%

MET S2 L3 E7 I50 L67 R75 D81 K88 G133 R142 G143 LYS THR VAL GLY VAL SER LYS LYS ARG

• Molecule 9: 40S head ribosomal protein eS19

Chain K:
95%

MET GLU P3 A4 D9 V38 I114 R122 A141 A142 ASN

• Molecule 10: Ribosomal_S10 domain-containing protein

Chain L:

81%   15%

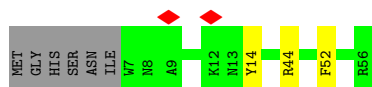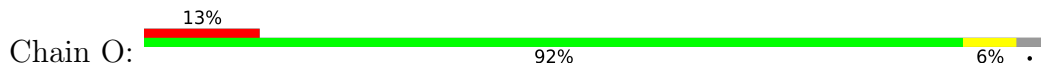MET ALA ALA TYR ALA ALA MET LYS PRO THR LYS PRO GLY LEU GLU GLU GLU PRO ALA GLU M20 L28 C40 F84 T109 V116 E122 S123

• Molecule 11: 40S head ribosomal protein eS28

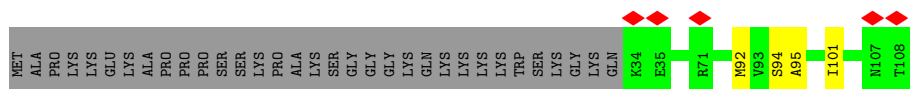Chain M:

8%

97%

MET E2 S3 Q34 E56 R63 L64 R65

• Molecule 12: 40S ribosomal protein S29

Chain N:

84%   5%   11%

MET GLY HIS SER ASN ILE W7 N8 A9 K12 N13 Y14 R44 F52 R56
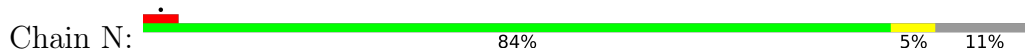
• Molecule 13: Mitogen-activated protein kinase

Chain O:

13%

92%   6%

MET SER Q3 E4 S5 L6 V7 L8 R9 K13 I32 V33 L46 T47 K48 D49 G50 S51 L72 R119 A124 L136 G137 E138 C139 K140 I143 Q144 E145 Q146 D147 V156 N162 L163 Q164 K185 L190 D205 G206 S207 L208 W221 D222 L223 A224 E225

G226 K227 K228 L229 A234 R247 K259 D262 L263 E264 S265 K266 S267 I268 V269 L276 K277 Q278 E279 S280 E281 M282 F283 G284 THR ALA ALA THR ASP SER K291 T292 K293 I323 G324 R325 TYR
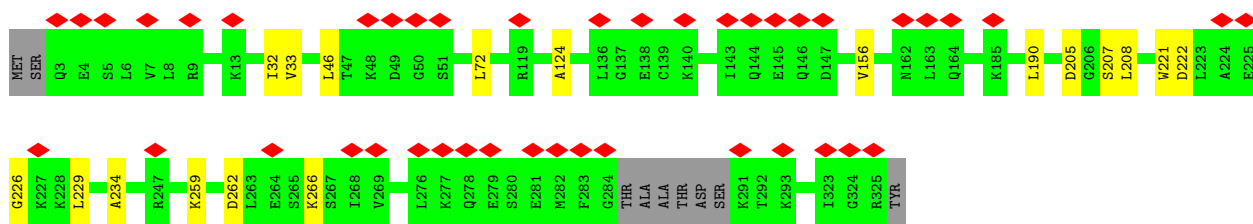
• Molecule 14: 40S ribosomal protein S25

Chain P:

5%

66%   31%

MET ALA PRO LYS LYS GLU PRO ALA PRO PRO SER SER LYS PRO ALA LYS SER GLY GLY LYS GLN LYS LYS LYS LYS TRP SER LYS GLY LYS GLN K34 E35 R71 M92 V93 S94 A95 I101 N107 T108

• Molecule 15: tRNA

Chain Q:

93%   7%

A1 G2 A14

• Molecule 16: mRNA

Chain R:

100%

There are no outlier residues recorded for this chain.

4   Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	335806	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 $(e^-/\text{Å}^2)$	30.2	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2800	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.340	Depositor
Minimum map value	-0.152	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.0197	Depositor
Map size (Å)	448.19998, 448.19998, 448.19998	wwPDB
Map dimensions	540, 540, 540	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83, 0.83, 0.83	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: K, BGC, A2M, I2T, OMC, PUT, 4AC, MG, OMU, PSU, 7MG, ZN, OMG

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	0.42	0/10642	0.72	0/16571
2	D	0.26	0/1702	0.51	0/2285
3	E	0.25	0/1488	0.51	0/2005
4	F	0.26	0/804	0.44	0/1087
5	G	0.28	0/1039	0.52	0/1391
6	H	0.26	0/1154	0.56	0/1540
7	I	0.25	0/689	0.53	0/913
8	J	0.25	0/1171	0.53	0/1565
9	K	0.27	0/1128	0.52	0/1515
10	L	0.25	0/831	0.51	0/1118
11	M	0.26	0/522	0.59	0/694
12	N	0.27	0/416	0.54	0/555
13	O	0.24	0/2516	0.49	0/3414
14	P	0.25	0/598	0.52	0/800
15	Q	0.25	0/334	0.65	0/518
16	R	0.21	0/68	0.62	0/103
All	All	0.33	0/25102	0.62	0/36074

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (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	10101	5115	5109	29	0
2	D	1678	1751	1748	8	0
3	E	1466	1499	1497	8	0
4	F	782	790	789	2	0
5	G	1018	1078	1077	4	0
6	H	1135	1204	1202	2	0
7	I	682	738	737	5	0
8	J	1154	1189	1188	6	0
9	K	1104	1104	1116	3	0
10	L	821	880	879	3	0
11	M	519	551	550	1	0
12	N	405	400	398	3	0
13	O	2464	2434	2435	10	0
14	P	592	636	635	2	0
15	Q	299	152	152	1	0
16	R	62	33	33	0	0
17	2	7	0	0	0	0
17	J	1	0	0	0	0
17	K	1	0	0	0	0
17	N	1	0	0	0	0
18	2	6	12	12	0	0
19	2	27	0	0	0	0
19	J	1	0	0	0	0
20	D	11	11	10	1	0
21	N	1	0	0	0	0
22	2	166	0	0	5	0
22	E	10	0	0	0	0
22	G	1	0	0	0	0
22	H	4	0	0	0	0
22	J	6	0	0	0	0
22	K	24	0	0	2	0
22	L	7	0	0	0	0
22	M	1	0	0	0	0
22	N	2	0	0	0	0
22	P	4	0	0	0	0
All	All	24563	19577	19567	76	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 2.

The worst 5 of 76 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)
1:2:1196:A:OP1	22:2:2001:HOH:O	2.04	0.74
1:2:1558:G:O2'	12:N:14:TYR:OH	2.05	0.73
1:2:1532:U:O4	22:2:2002:HOH:O	2.06	0.72
1:2:1584:U:OP1	22:2:2003:HOH:O	2.12	0.67
11:M:56:GLU:N	11:M:56:GLU:OE1	2.29	0.65

There are no symmetry-related clashes.

5.3　Torsion angles ⓘ

5.3.1　Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	D	211/239 (88%)	207 (98%)	4 (2%)	0	100	100
3	E	181/211 (86%)	176 (97%)	5 (3%)	0	100	100
4	F	90/180 (50%)	88 (98%)	2 (2%)	0	100	100
5	G	124/151 (82%)	123 (99%)	1 (1%)	0	100	100
6	H	138/147 (94%)	135 (98%)	3 (2%)	0	100	100
7	I	80/144 (56%)	79 (99%)	1 (1%)	0	100	100
8	J	140/152 (92%)	137 (98%)	3 (2%)	0	100	100
9	K	138/143 (96%)	137 (99%)	1 (1%)	0	100	100
10	L	102/123 (83%)	101 (99%)	1 (1%)	0	100	100
11	M	62/65 (95%)	61 (98%)	1 (2%)	0	100	100
12	N	48/56 (86%)	48 (100%)	0	0	100	100
13	O	313/326 (96%)	309 (99%)	4 (1%)	0	100	100
14	P	73/108 (68%)	73 (100%)	0	0	100	100
All	All	1700/2045 (83%)	1674 (98%)	26 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	
2	D	180/204 (88%)	180 (100%)	0	100	100
3	E	157/178 (88%)	157 (100%)	0	100	100
4	F	86/141 (61%)	86 (100%)	0	100	100
5	G	111/132 (84%)	111 (100%)	0	100	100
6	H	118/122 (97%)	117 (99%)	1 (1%)	81	92
7	I	76/123 (62%)	76 (100%)	0	100	100
8	J	122/131 (93%)	122 (100%)	0	100	100
9	K	113/116 (97%)	113 (100%)	0	100	100
10	L	96/109 (88%)	96 (100%)	0	100	100
11	M	57/58 (98%)	57 (100%)	0	100	100
12	N	42/47 (89%)	42 (100%)	0	100	100
13	O	275/282 (98%)	275 (100%)	0	100	100
14	P	65/91 (71%)	65 (100%)	0	100	100
All	All	1498/1734 (86%)	1497 (100%)	1 (0%)	93	98

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

Mol	Chain	Res	Type
6	H	30	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
2	D	177	HIS
2	D	214	HIS

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	467/1806 (25%)	62 (13%)	1 (0%)
15	Q	13/14 (92%)	0	0
16	R	2/3 (66%)	0	0
All	All	482/1823 (26%)	62 (12%)	1 (0%)

5 of 62 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	1149	G
1	2	1153	G
1	2	1154	A
1	2	1161	C
1	2	1162	C

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	1462	G

5.4　Non-standard residues in protein, DNA, RNA chains ⓘ

27 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	OMU	2	1272	1,19	19,22,23	0.26	0	26,31,34	0.47	0
1	PSU	2	1307	1	18,21,22	0.50	0	22,30,33	0.37	0
1	PSU	2	1178	1	18,21,22	0.49	0	22,30,33	0.61	0
1	A2M	2	1578	1	18,25,26	0.65	0	18,36,39	0.75	1 (5%)
1	PSU	2	1184	1	18,21,22	0.50	0	22,30,33	0.57	0
1	PSU	2	1484	1	18,21,22	0.52	0	22,30,33	0.56	0
1	PSU	2	1303	1	18,21,22	0.50	0	22,30,33	0.57	0
1	PSU	2	1292	1	18,21,22	0.48	0	22,30,33	0.57	0
1	PSU	2	1534	1	18,21,22	0.50	0	22,30,33	0.55	0
1	I2T	2	1194	1	24,29,30	0.61	0	29,42,45	0.66	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
1	A2M	2	1328	1	18,25,26	0.68	0	18,36,39	0.80	1 (5%)
1	OMU	2	1263	1	19,22,23	0.28	0	26,31,34	0.44	0
1	PSU	2	1312	1	18,21,22	0.49	0	22,30,33	0.57	0
1	OMU	2	1382	1,19	19,22,23	0.33	0	26,31,34	0.46	0
1	PSU	2	1633	1	18,21,22	0.51	0	22,30,33	0.55	0
1	PSU	2	1217	1	18,21,22	0.52	0	22,30,33	0.55	0
1	OMU	2	1265	1	19,22,23	0.28	0	26,31,34	0.49	0
1	OMU	2	1446	1	19,22,23	0.28	0	26,31,34	0.46	0
1	PSU	2	1190	1	18,21,22	0.48	0	22,30,33	0.56	0
1	PSU	2	1210	1	18,21,22	0.49	0	22,30,33	0.42	0
1	7MG	2	1580	1,15	22,26,27	1.16	1 (4%)	29,39,42	0.81	1 (3%)
1	OMC	2	1218	1	19,22,23	0.30	0	26,31,34	0.39	0
1	OMG	2	1274	1,17	18,26,27	0.99	3 (16%)	19,38,41	0.64	0
1	OMG	2	1432	1,19	18,26,27	0.99	3 (16%)	19,38,41	0.59	0
1	PSU	2	1537	1	18,21,22	0.51	0	22,30,33	0.56	0
1	PSU	2	1566	1	18,21,22	0.48	0	22,30,33	0.54	0
1	4AC	2	1282(A)	1	21,24,25	0.33	0	29,34,37	0.43	0

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	OMU	2	1272	1,19	-	1/9/27/28	0/2/2/2
1	PSU	2	1307	1	-	1/7/25/26	0/2/2/2
1	PSU	2	1178	1	-	0/7/25/26	0/2/2/2
1	A2M	2	1578	1	-	2/5/27/28	0/3/3/3
1	PSU	2	1184	1	-	0/7/25/26	0/2/2/2
1	PSU	2	1484	1	-	0/7/25/26	0/2/2/2
1	PSU	2	1303	1	-	2/7/25/26	0/2/2/2
1	PSU	2	1292	1	-	0/7/25/26	0/2/2/2
1	PSU	2	1534	1	-	0/7/25/26	0/2/2/2
1	I2T	2	1194	1	-	6/16/34/35	0/2/2/2
1	A2M	2	1328	1	-	0/5/27/28	0/3/3/3
1	OMU	2	1263	1	-	0/9/27/28	0/2/2/2
1	PSU	2	1312	1	-	0/7/25/26	0/2/2/2
1	OMU	2	1382	1,19	-	0/9/27/28	0/2/2/2
1	PSU	2	1633	1	-	0/7/25/26	0/2/2/2
1	PSU	2	1217	1	-	0/7/25/26	0/2/2/2
1	OMU	2	1265	1	-	0/9/27/28	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	OMU	2	1446	1	-	0/9/27/28	0/2/2/2
1	PSU	2	1190	1	-	0/7/25/26	0/2/2/2
1	PSU	2	1210	1	-	1/7/25/26	0/2/2/2
1	7MG	2	1580	1,15	-	0/7/37/38	0/3/3/3
1	OMC	2	1218	1	-	0/9/27/28	0/2/2/2
1	OMG	2	1274	1,17	-	0/5/27/28	0/3/3/3
1	OMG	2	1432	1,19	-	1/5/27/28	0/3/3/3
1	PSU	2	1537	1	-	0/7/25/26	0/2/2/2
1	PSU	2	1566	1	-	0/7/25/26	0/2/2/2
1	4AC	2	1282(A)	1	-	0/11/29/30	0/2/2/2

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	2	1580	7MG	C5-N7	4.81	1.41	1.35
1	2	1274	OMG	C5-C6	-2.47	1.42	1.47
1	2	1432	OMG	C5-C6	-2.39	1.42	1.47
1	2	1432	OMG	C8-N7	-2.21	1.31	1.35
1	2	1274	OMG	C8-N7	-2.08	1.31	1.35

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	1328	A2M	C5-C6-N6	2.39	123.98	120.35
1	2	1578	A2M	C5-C6-N6	2.30	123.85	120.35
1	2	1580	7MG	C5-C4-N9	2.27	109.29	106.35

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	2	1303	PSU	O4'-C4'-C5'-O5'
1	2	1194	I2T	C32-C31-N3-C4
1	2	1194	I2T	N3-C31-C32-C33
1	2	1303	PSU	C3'-C4'-C5'-O5'
1	2	1194	I2T	C32-C31-N3-C2

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	2	1194	I2T	1	0

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 41 ligands modelled in this entry, 39 are monoatomic - leaving 2 for Mogul analysis.

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	$\#|Z| > 2$
18	PUT	2	1908	-	5,5,5	0.15	0	4,4,4	0.17	0
20	BGC	D	301	2	11,11,12	0.20	0	15,15,17	0.37	0

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
18	PUT	2	1908	-	-	2/3/3/3	-
20	BGC	D	301	2	-	1/2/19/22	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
20	D	301	BGC	O5-C5-C6-O6
18	2	1908	PUT	C2-C3-C4-N2
18	2	1908	PUT	C1-C2-C3-C4

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
20	D	301	BGC	1	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6   Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-14003. 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 ⓘ
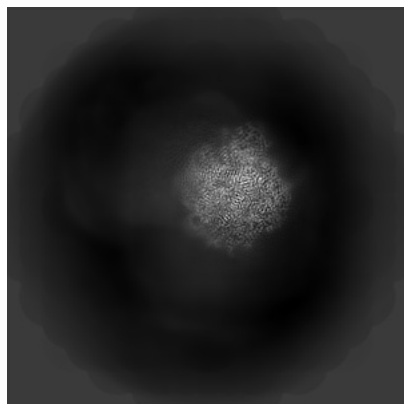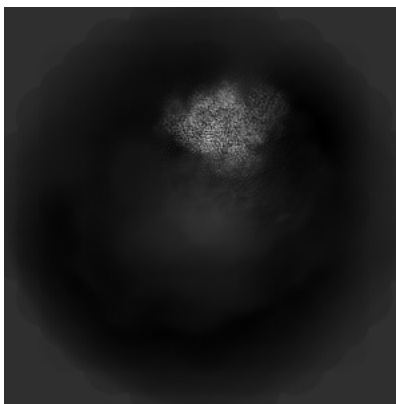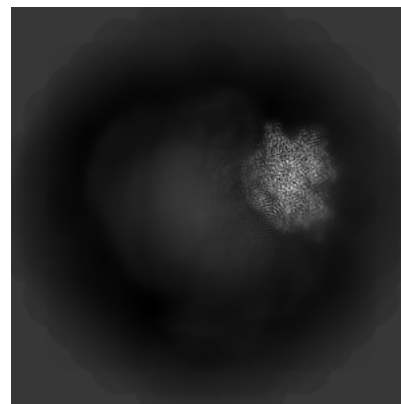
6.1.1   Primary map

X   Y   Z

6.1.2   Raw map

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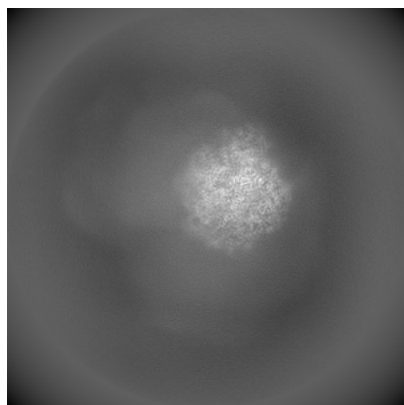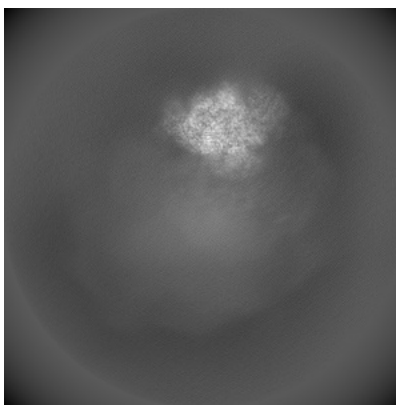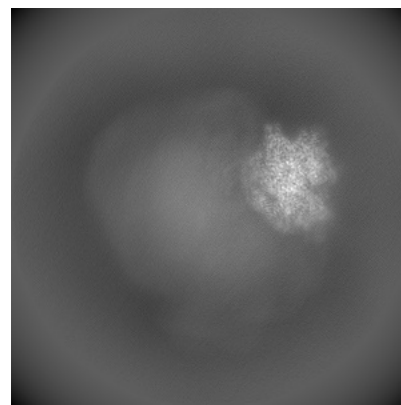
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
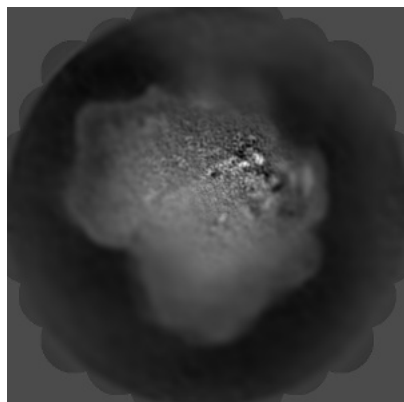
6.2.1   Primary map

X Index: 270   Y Index: 270   Z Index: 270

6.2.2   Raw map
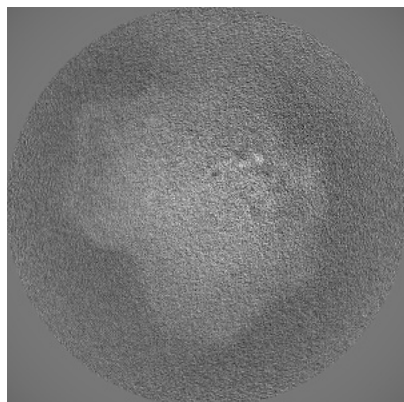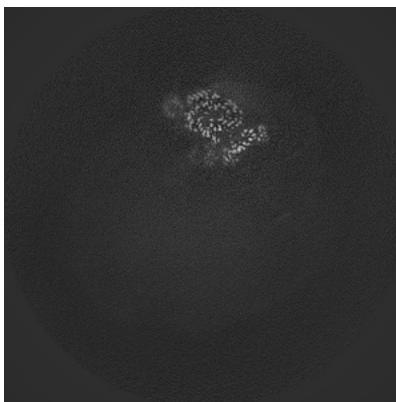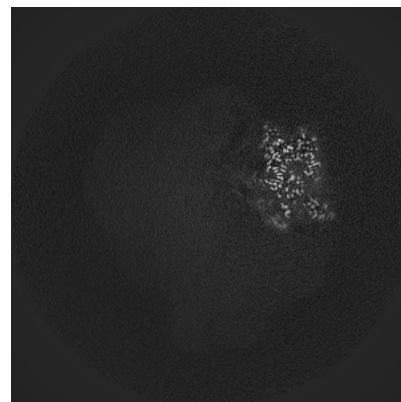
X Index: 270   Y Index: 270   Z Index: 270

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

6.3 Largest variance slices (i)

6.3.1 Primary map
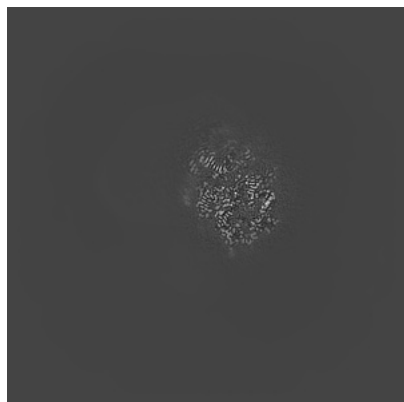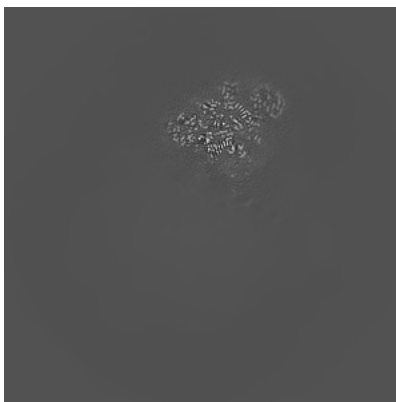
X Index: 373	Y Index: 316	Z Index: 275

6.3.2 Raw map
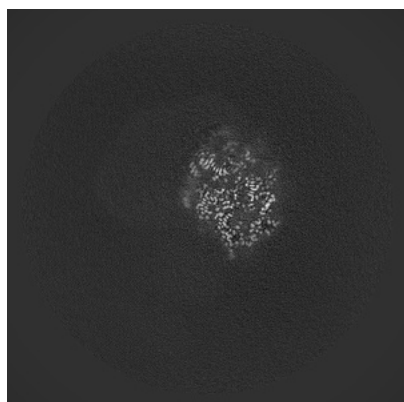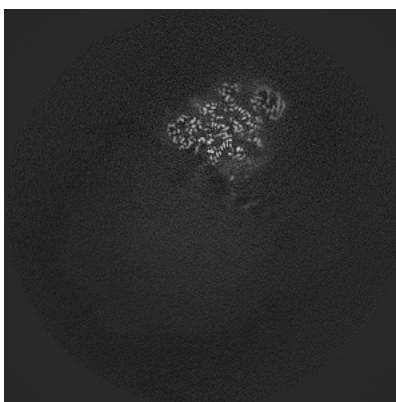
X Index: 373	Y Index: 315	Z Index: 308
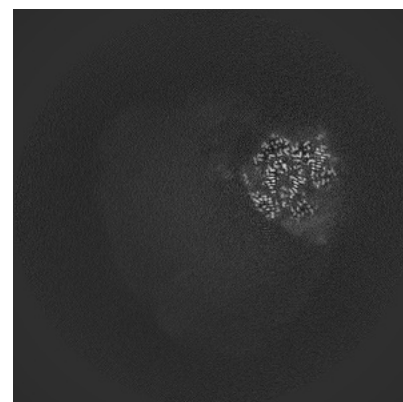
The images above show the largest variance slices of the map in three orthogonal directions.

6.4   Orthogonal surface views ⓘ

6.4.1   Primary map

| X | Y | Z |
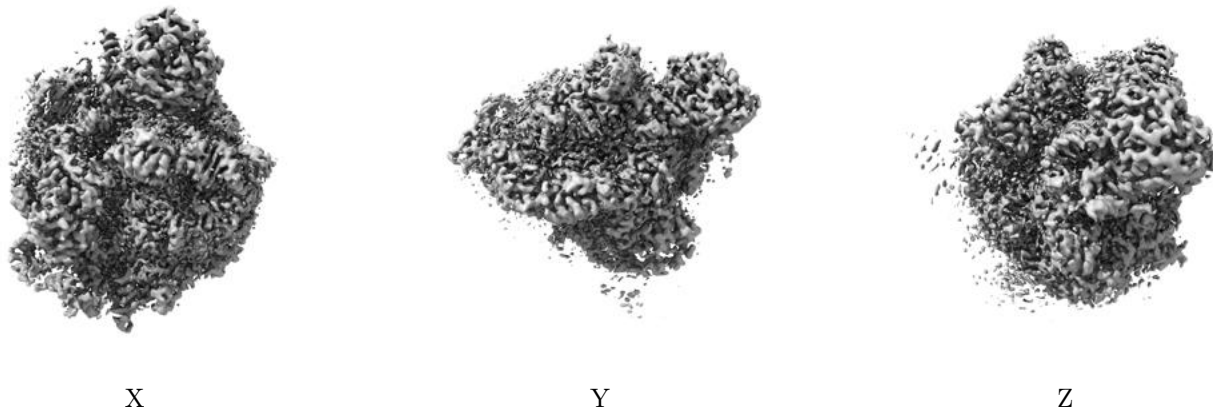
The images above show the 3D surface view of the map at the recommended contour level 0.0197. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2   Raw map

| X | Y | Z |
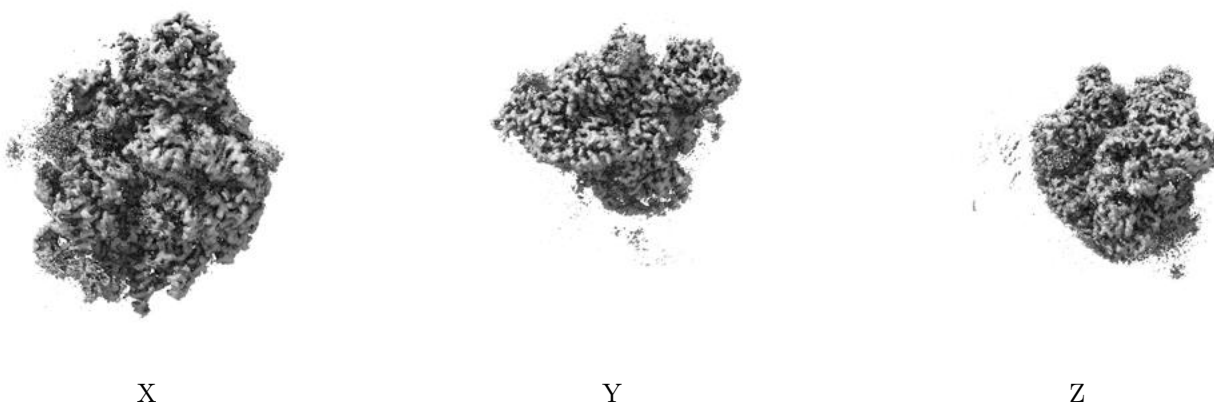
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.5   Mask visualisation (i)

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

A mask typically either:

- Encompasses the whole structure

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

6.5.1   emd_14003_msk_1.map (i)

X   Y   Z
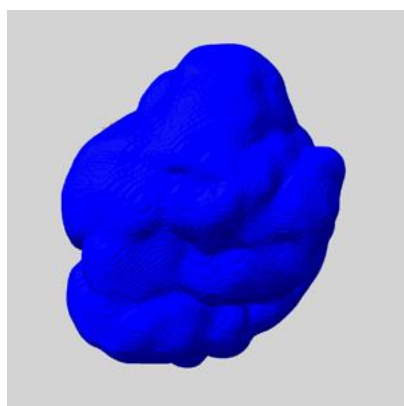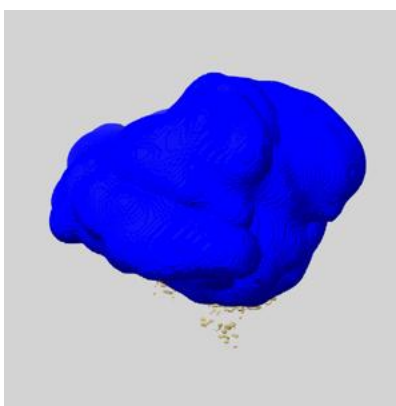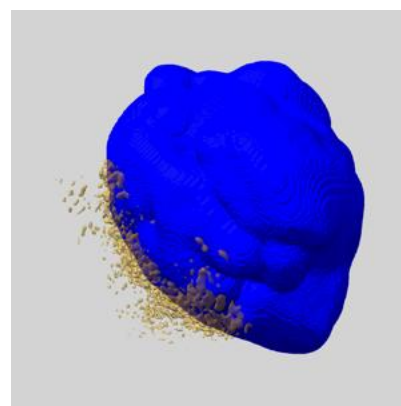
7   Map analysis ⓘ

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

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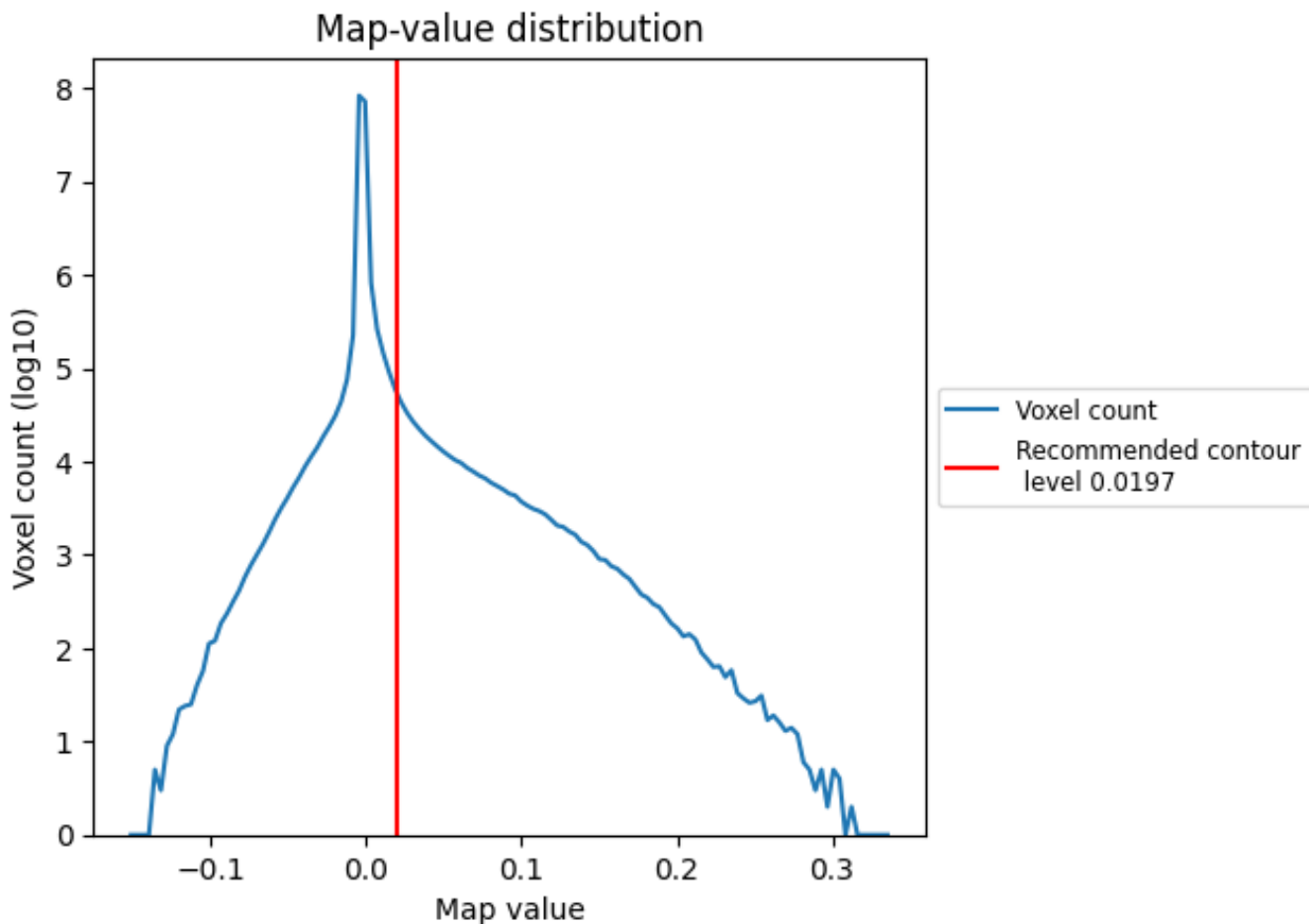
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2　Volume estimate ⓘ
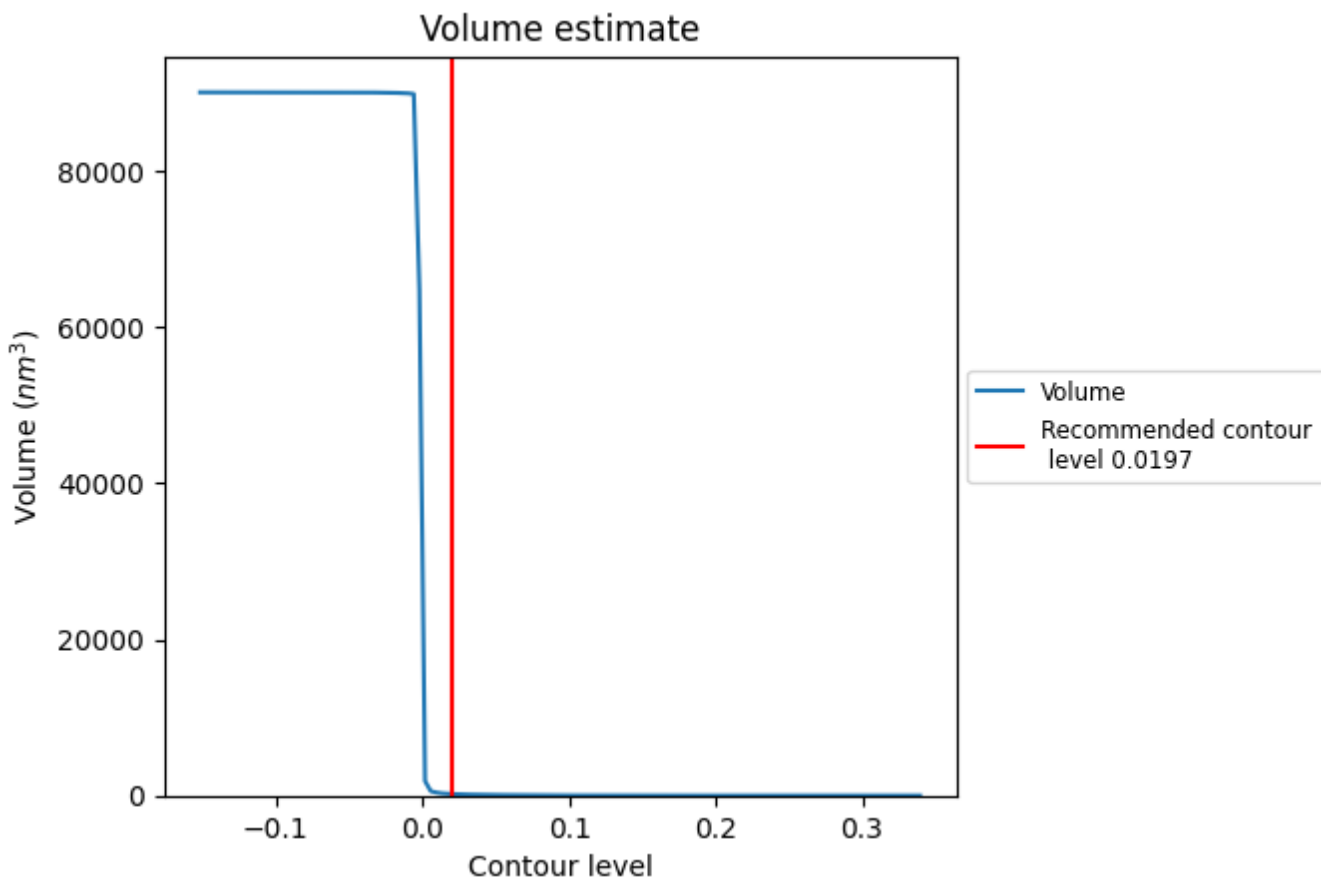
The volume at the recommended contour level is 202 nm^3; this corresponds to an approximate mass of 183 kDa.

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 ⓘ
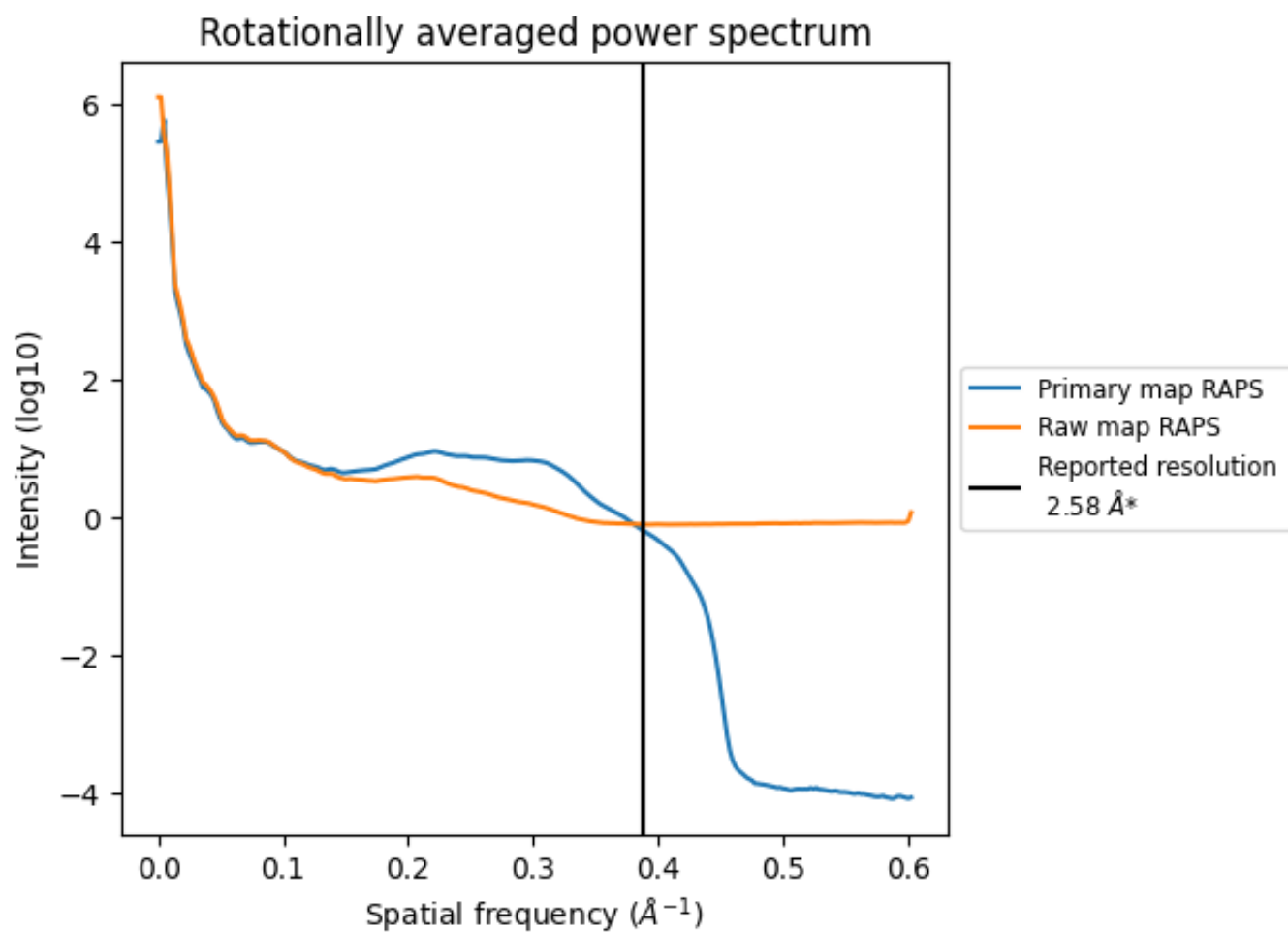
*Reported resolution corresponds to spatial frequency of 0.388 Å^{-1}

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)
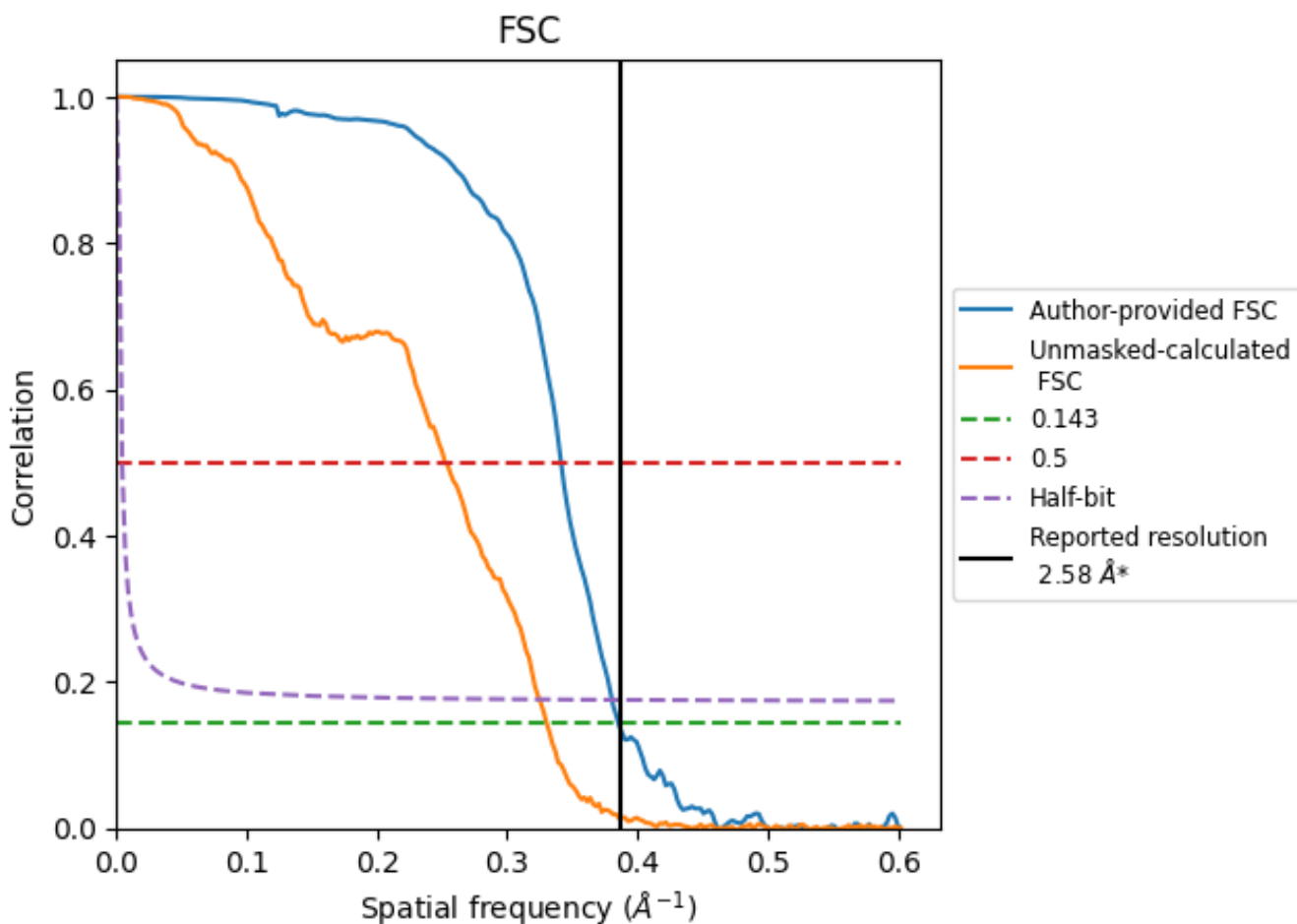
*Reported resolution corresponds to spatial frequency of 0.388 Å^{-1}

8.2   Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.58	-	-
Author-provided FSC curve	2.59	2.93	2.63
Unmasked-calculated*	3.03	3.96	3.08

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.03 differs from the reported value 2.58 by more than 10 %

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-14003 and PDB model 7QIY. Per-residue inclusion information can be found in section 3 on page 10.

9.1   Map-model overlay ⓘ

| X | Y | Z |
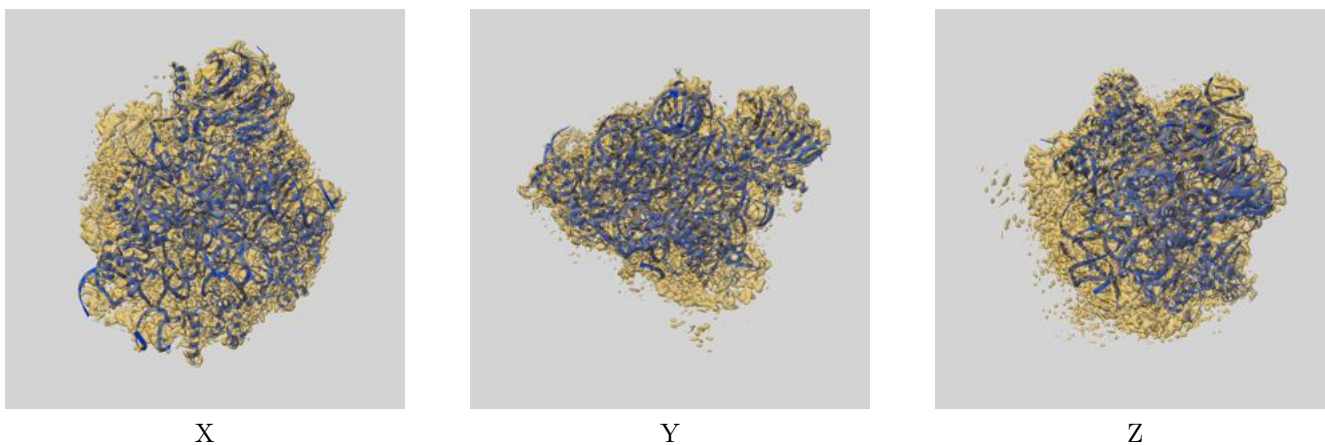
The images above show the 3D surface view of the map at the recommended contour level 0.0197 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Atom inclusion ⓘ
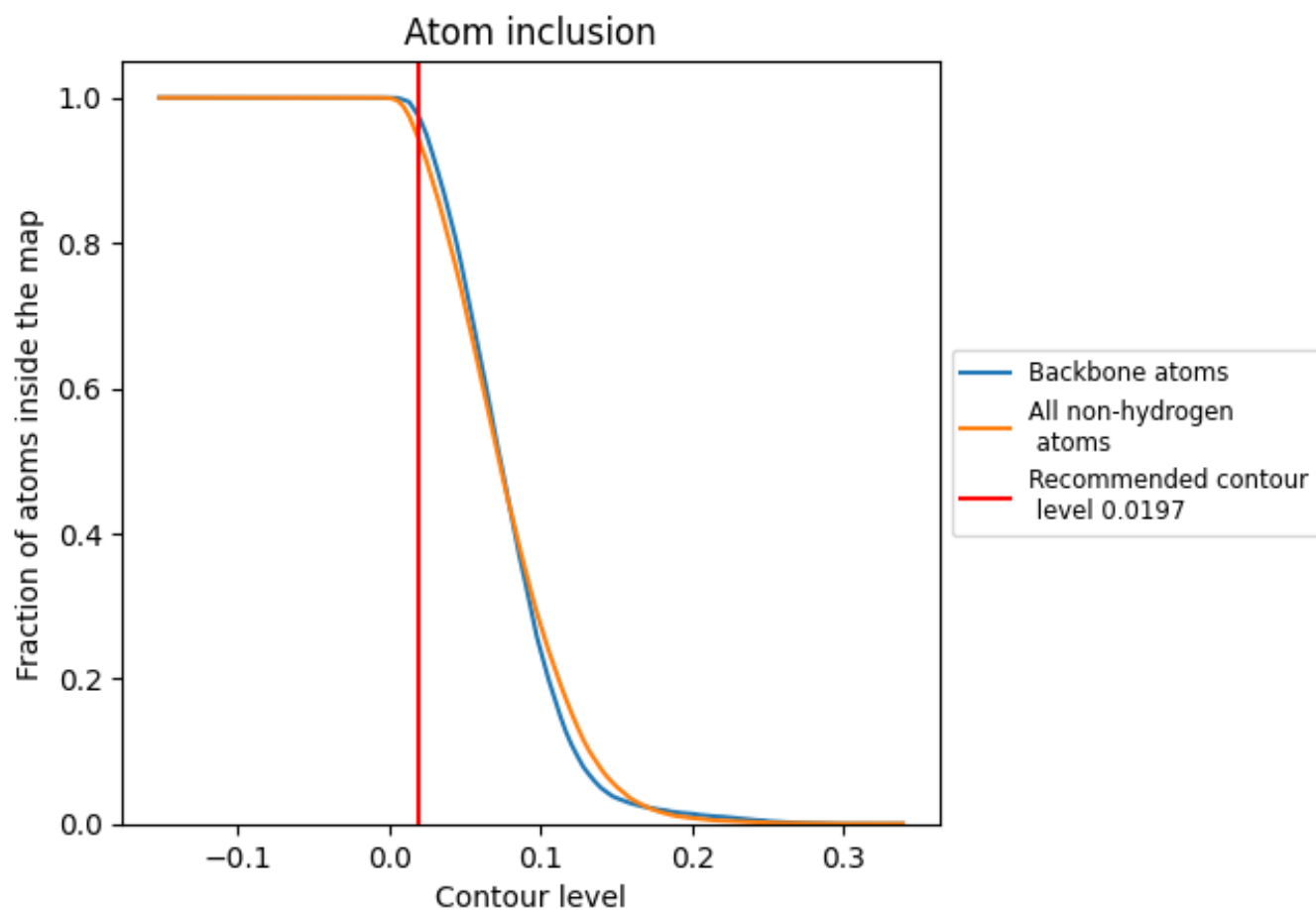
At the recommended contour level, 97% of all backbone atoms, 94% of all non-hydrogen atoms, are inside the map.