



## Full wwPDB EM Validation Report ⓘ

Nov 30, 2021 – 05:37 pm GMT

PDB ID : 7OHY  
EMDB ID : EMD-12913  
Title : Nog1-TAP associated immature ribosomal particles from *S. cerevisiae* after rpL34 expression shut down, population B  
Authors : Milkereit, P.; Poell, G.  
Deposited on : 2021-05-11  
Resolution : 3.90 Å (reported)  
Based on initial model : 6EM1

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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.

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

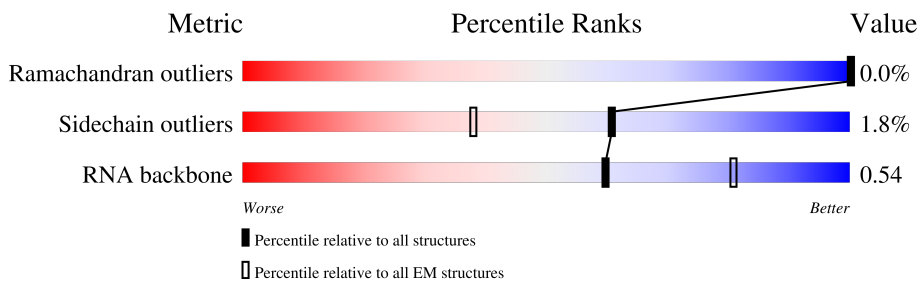
EMDB validation analysis : 0.0.0.dev97  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.23.2

# 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 3.90 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.




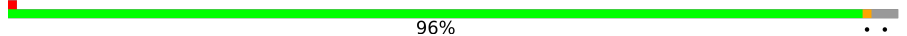

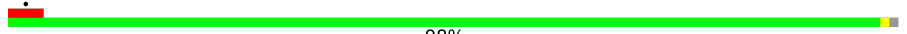



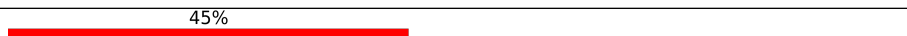
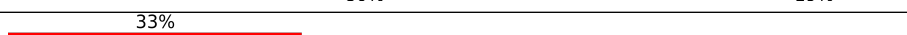
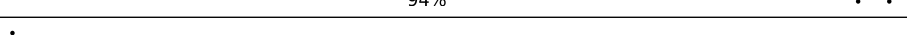
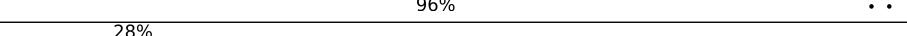

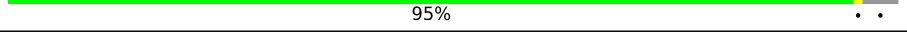
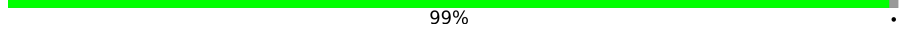
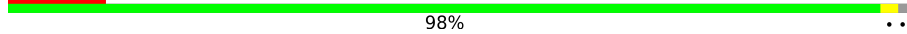



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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  $\geq 3$ , 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	1	3396	
2	2	158	
3	B	387	
4	C	362	
5	E	176	
6	F	244	
7	G	256	
8	H	191	

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Mol	Chain	Length	Quality of chain
9	L	199	 53% 46%
10	M	138	 96%
11	N	204	 84% 13%
12	O	199	 98%
13	P	184	 68% 32%
14	Q	186	 70% 30%
15	S	172	 97%
16	V	137	 80% 19%
17	W	236	 94%
18	Y	127	 96%
19	b	647	 56% 42%
20	e	130	 95%
21	f	107	 99%
22	h	120	 98%
23	j	88	 81% 19%
24	r	261	 73%
25	u	199	 56% 42%
26	y	245	 91% 8%

## 2 Entry composition [i](#)

There are 27 unique types of molecules in this entry. The entry contains 125318 atoms, of which 53608 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 25S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
1	1	1689	54311	16140	18161	6526	11795	1689	0	0

- Molecule 2 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
2	2	148	4733	1406	1590	554	1035	148	0	0

- Molecule 3 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
3	B	333	5374	1680	2728	490	470	6	0	0

- Molecule 4 is a protein called 60S ribosomal protein L4-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
4	C	343	5336	1643	2725	499	466	3	0	0

- Molecule 5 is a protein called 60S ribosomal protein L6-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
5	E	151	2497	780	1292	215	209	1	0	0

- Molecule 6 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
6	F	228	3749	1180	1917	334	317	1	0	0

- Molecule 7 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
7	G	108	1751	544	911	147	147	2	0	0

- Molecule 8 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
8	H	190	3086	957	1576	273	276	4	0	0

- Molecule 9 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
9	L	108	1782	541	918	180	143		0	0

- Molecule 10 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
10	M	134	2179	668	1138	197	174	2	0	0

- Molecule 11 is a protein called 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
11	N	177	3079	948	1566	320	244	1	0	0

- Molecule 12 is a protein called 60S ribosomal protein L16-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
12	O	197	3215	1003	1660	289	262	1	0	0

- Molecule 13 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
13	P	126	1998	624	1005	186	183		0	0

- Molecule 14 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
14	Q	131	Total	C	H	N	O	S	0	0
			2101	645	1092	190	173	1		

- Molecule 15 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
15	S	170	Total	C	H	N	O	S	0	0
			2904	922	1472	265	242	3		

- Molecule 16 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
16	V	111	Total	C	H	N	O	S	0	0
			1693	522	867	151	146	7		

- Molecule 17 is a protein called Ribosome assembly factor MRT4.

Mol	Chain	Residues	Atoms					AltConf	Trace	
17	W	227	Total	C	H	N	O	S	0	0
			3683	1157	1852	315	354	5		

- Molecule 18 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
18	Y	125	Total	C	H	N	O	S	0	0
			2060	620	1076	191	173			

- Molecule 19 is a protein called Nucleolar GTP-binding protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace	
19	b	375	Total	C	H	N	O	S	0	0
			6144	1950	3104	515	557	18		

- Molecule 20 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace	
20	e	125	Total	C	H	N	O	S	0	0
			2090	641	1081	203	164	1		

- Molecule 21 is a protein called 60S ribosomal protein L33-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
21	f	106	1731	540	881	165	144	1	0	0

- Molecule 22 is a protein called 60S ribosomal protein L35-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
22	h	119	2048	615	1079	186	167	1	0	0

- Molecule 23 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
23	j	71	1137	344	571	123	94	5	0	0

- Molecule 24 is a protein called Ribosome biogenesis protein NSA2.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
24	r	71	1250	377	638	130	104	1	0	0

- Molecule 25 is a protein called Ribosome biogenesis protein RLP24.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
25	u	116	1987	612	1011	200	155	9	0	0

- Molecule 26 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
26	y	225	3398	1056	1697	295	343	7	0	0

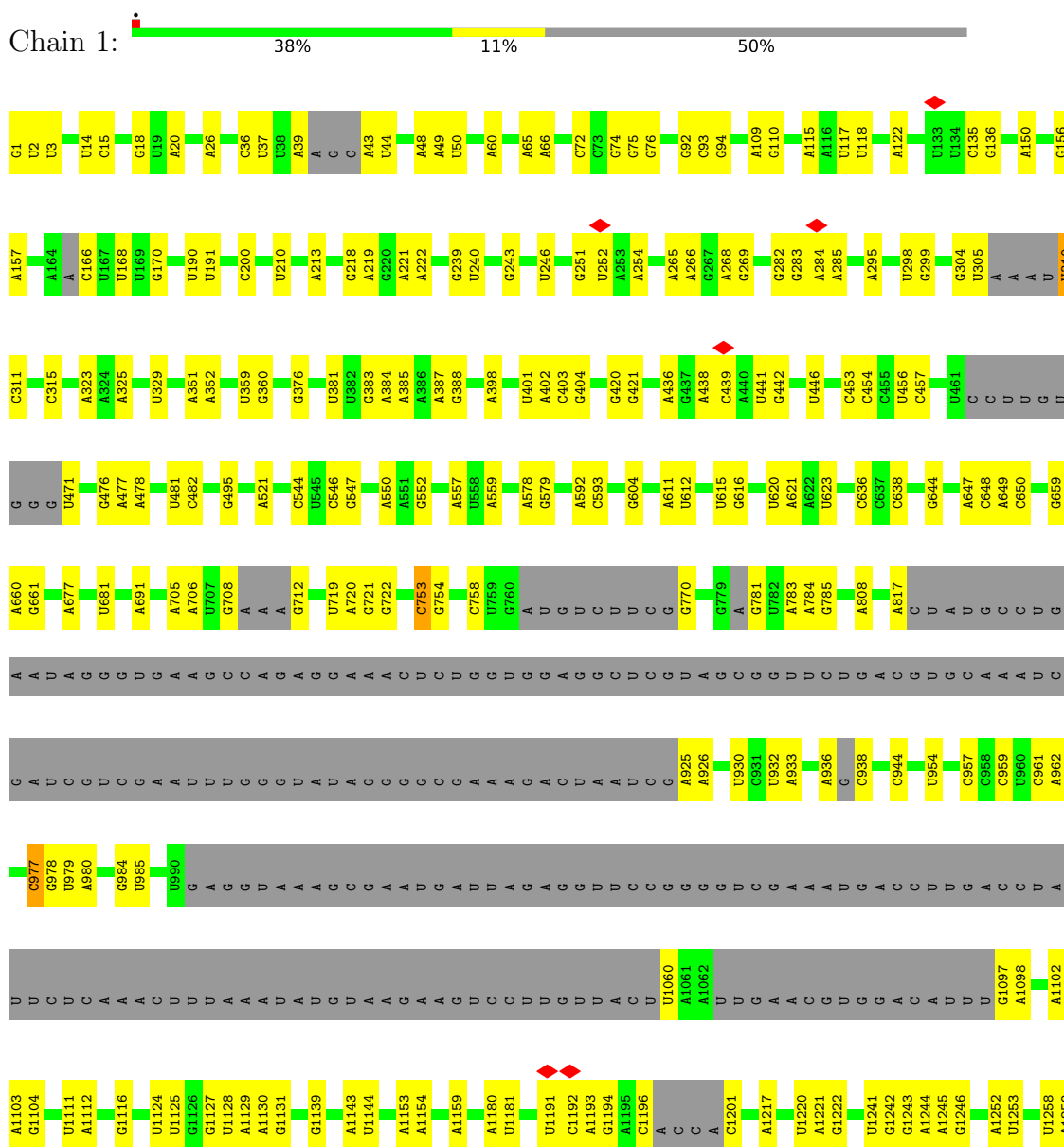
- Molecule 27 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
27	j	1	Total	Zn	0
			1	1	
27	u	1	Total	Zn	0
			1	1	

### 3 Residue-property plots [i](#)

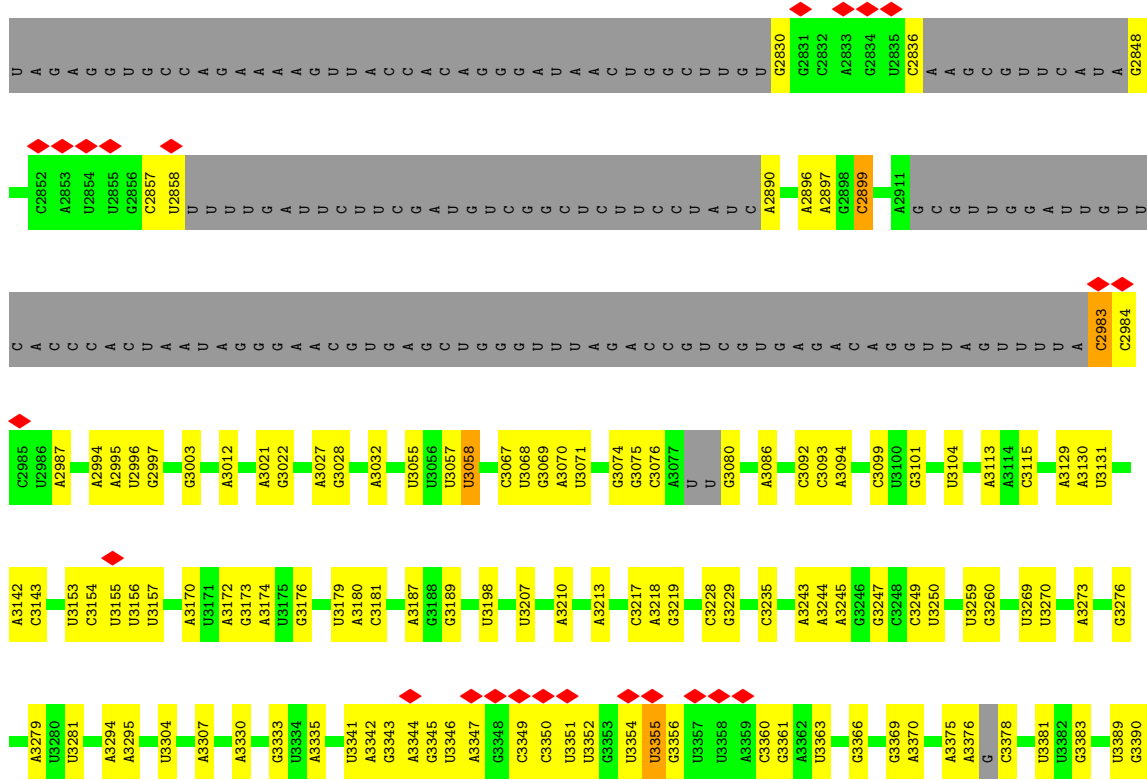
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: 25S rRNA

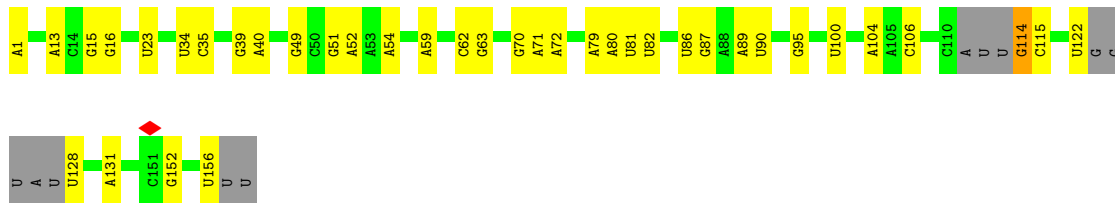




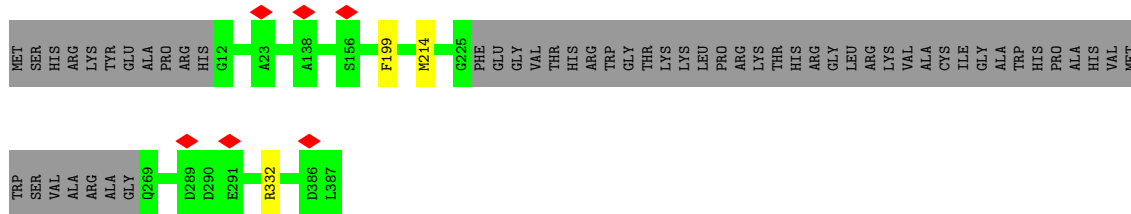
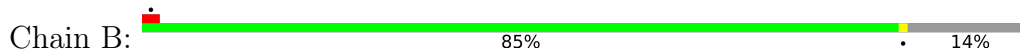




• Molecule 2: 5.8S rRNA

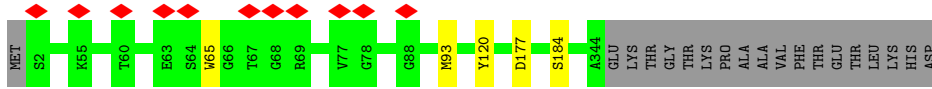


• Molecule 3: 60S ribosomal protein L3

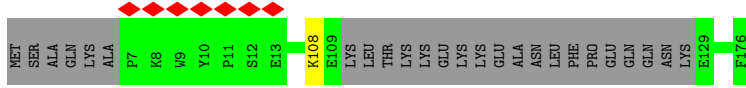
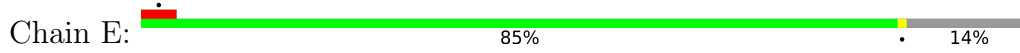


• Molecule 4: 60S ribosomal protein L4-A

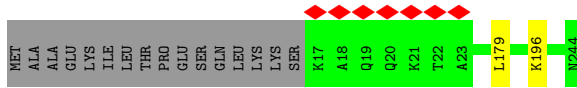




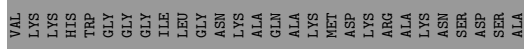
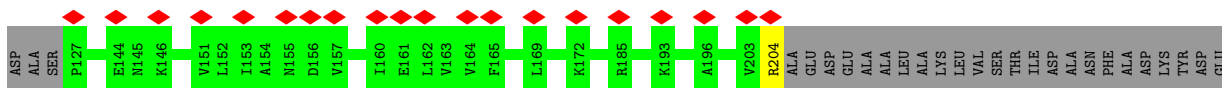
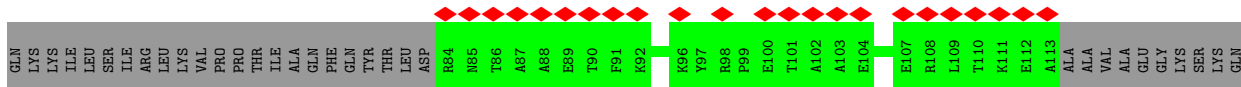
- Molecule 5: 60S ribosomal protein L6-A



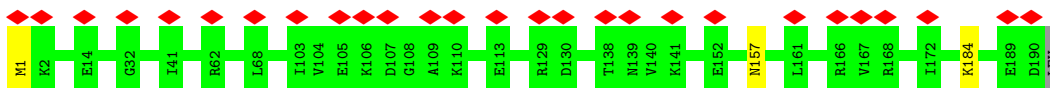
- Molecule 6: 60S ribosomal protein L7-A



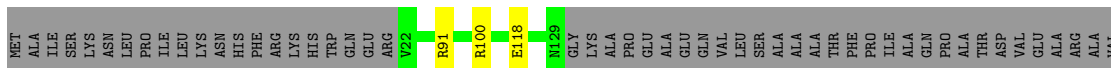
- Molecule 7: 60S ribosomal protein L8-A



- Molecule 8: 60S ribosomal protein L9-A

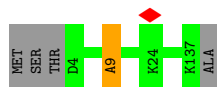


- Molecule 9: 60S ribosomal protein L13-A

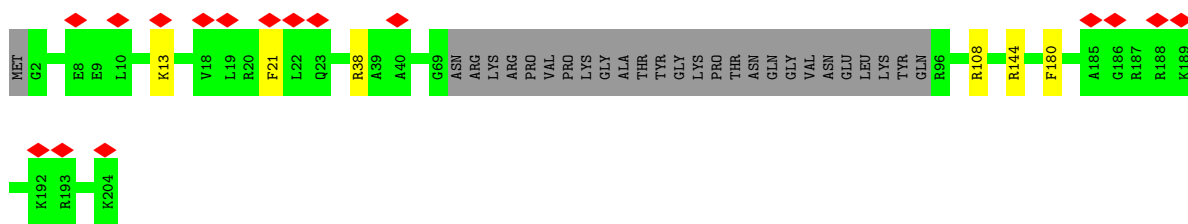
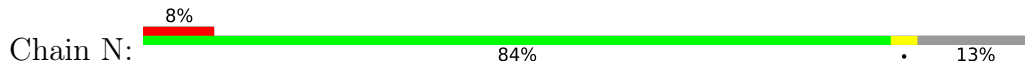


GLN ASP ASN ASP GLU SER SER PHE ARG THR LEU ARG ARG LEU LEU ARG ARG SER SER LYS LYS PHE ARG GLY ILE ARG GLU LYS LYS ARG ARG ALA ALA ALA ALA ALA ALA ALA ALA ALA ALA LYS LYS LYS

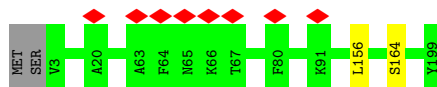
- Molecule 10: 60S ribosomal protein L14-A



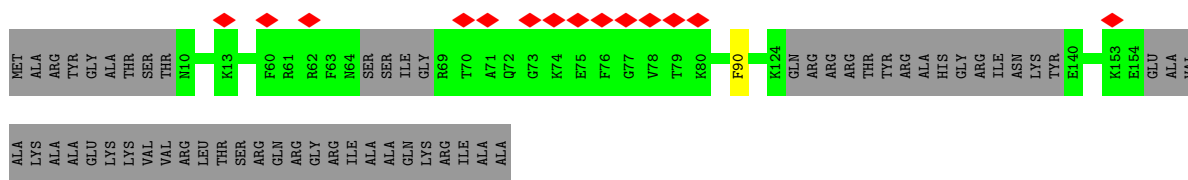
- Molecule 11: 60S ribosomal protein L15-A



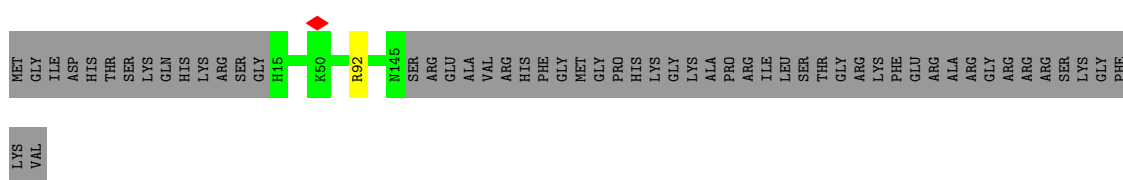
- Molecule 12: 60S ribosomal protein L16-A



- Molecule 13: 60S ribosomal protein L17-A

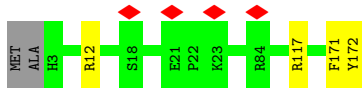


- Molecule 14: 60S ribosomal protein L18-A




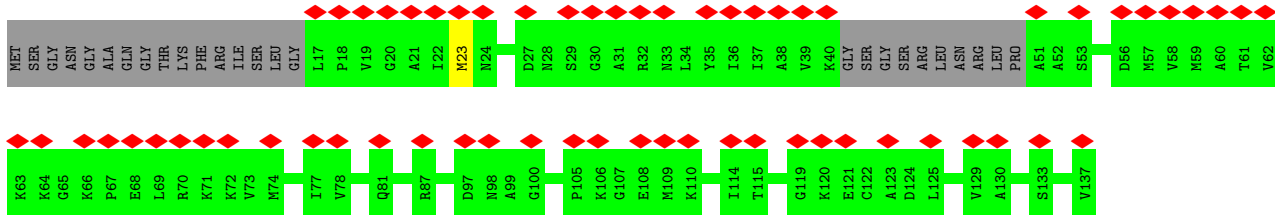
- Molecule 15: 60S ribosomal protein L20-A

Chain S:  97%

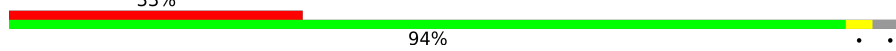


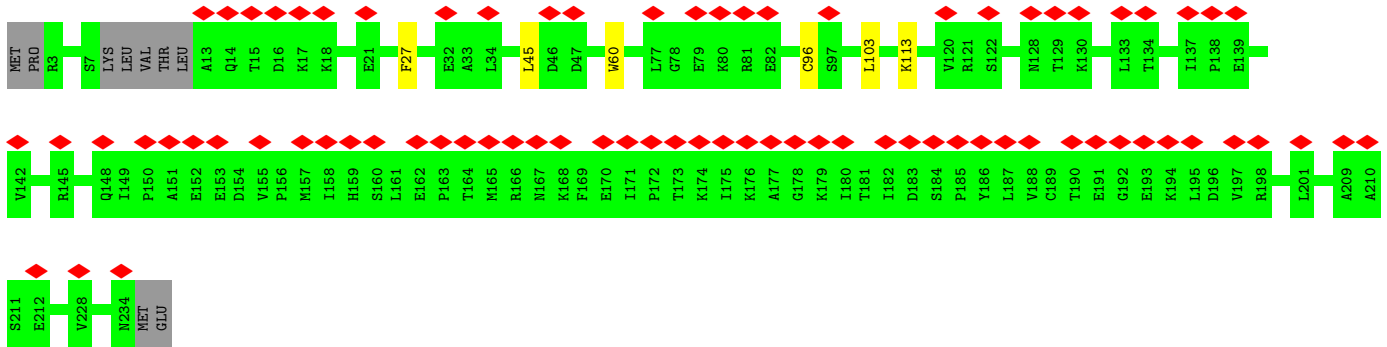
- Molecule 16: 60S ribosomal protein L23-A

Chain V:  45% 80% 19%



- Molecule 17: Ribosome assembly factor MRT4

Chain W:  33% 94%



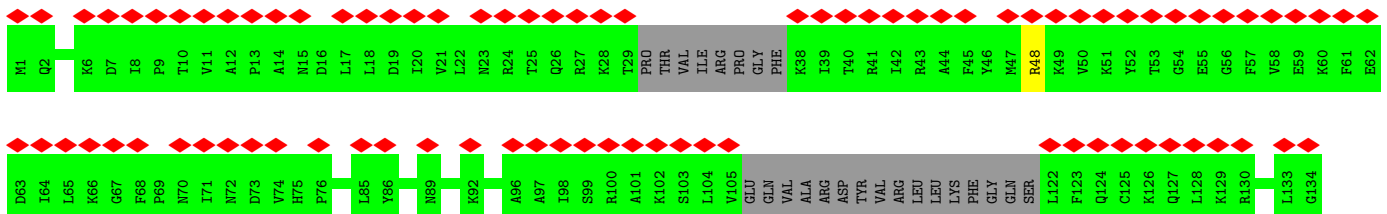
- Molecule 18: 60S ribosomal protein L26-A

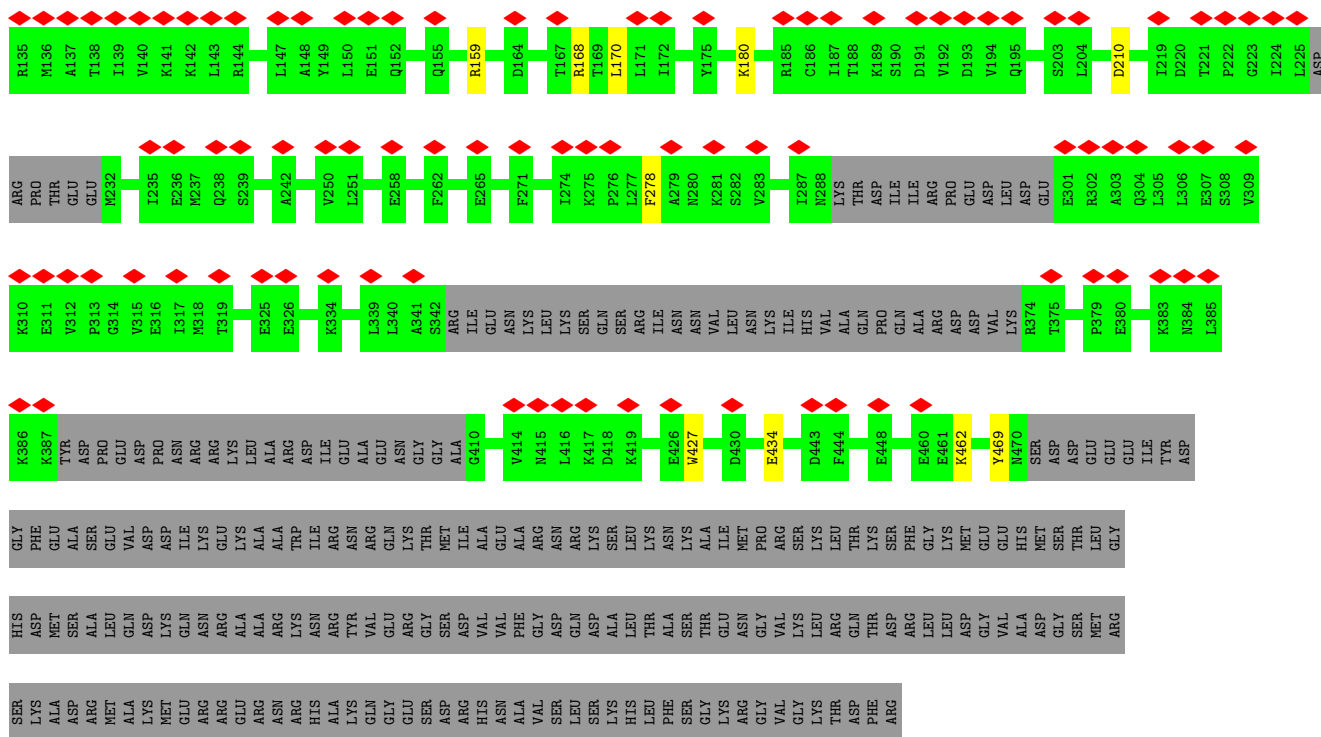
Chain Y:  96%



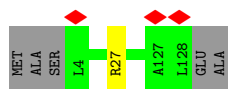
- Molecule 19: Nucleolar GTP-binding protein 1

Chain b:  28% 56% 42%





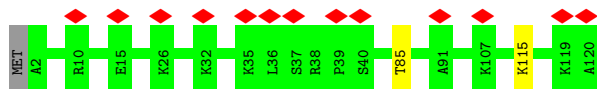
• Molecule 20: 60S ribosomal protein L32



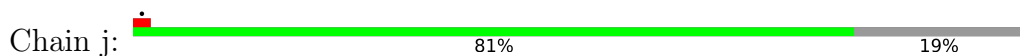
• Molecule 21: 60S ribosomal protein L33-A



• Molecule 22: 60S ribosomal protein L35-A



• Molecule 23: 60S ribosomal protein L37-A





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	18398	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	88	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.128	Depositor
Minimum map value	-0.043	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.021	Depositor
Map size (Å)	425.40002, 425.40002, 425.40002	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.0635, 1.0635, 1.0635	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:  
ZN

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	1	0.15	0/40444	0.73	32/63013 (0.1%)
2	2	0.18	0/3510	0.79	4/5460 (0.1%)
3	B	0.24	0/2699	0.43	0/3626
4	C	0.23	0/2660	0.41	0/3601
5	E	0.24	0/1226	0.40	0/1648
6	F	0.24	0/1869	0.38	0/2514
7	G	0.26	0/852	0.41	0/1148
8	H	0.24	0/1531	0.42	0/2062
9	L	0.24	0/877	0.42	0/1179
10	M	0.24	0/1056	0.39	0/1421
11	N	0.23	0/1544	0.39	0/2065
12	O	0.24	0/1585	0.40	0/2128
13	P	0.24	0/1010	0.38	0/1359
14	Q	0.24	0/1024	0.39	0/1385
15	S	0.24	0/1468	0.41	0/1973
16	V	0.25	0/838	0.43	0/1128
17	W	0.24	0/1862	0.42	0/2508
18	Y	0.23	0/995	0.41	0/1329
19	b	0.24	0/3093	0.39	0/4163
20	e	0.23	0/1030	0.40	0/1379
21	f	0.25	0/868	0.42	0/1168
22	h	0.24	0/978	0.38	0/1301
23	j	0.24	0/578	0.41	0/767
24	r	0.22	0/622	0.35	0/816
25	u	0.24	0/996	0.40	0/1324
26	y	0.23	0/1722	0.44	0/2343
All	All	0.19	0/76937	0.63	36/112808 (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
10	M	0	1

There are no bond length outliers.

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
1	1	781	G	OP1-P-OP2	-6.86	109.30	119.60
1	1	166	C	OP1-P-OP2	-6.82	109.37	119.60
2	2	114	G	OP1-P-OP2	-6.81	109.38	119.60
1	1	1309	U	OP1-P-OP2	-6.78	109.44	119.60
1	1	3378	C	OP1-P-OP2	-6.78	109.44	119.60
1	1	43	A	OP1-P-OP2	-6.77	109.45	119.60
2	2	128	U	OP1-P-OP2	-6.77	109.45	119.60
1	1	3080	G	OP1-P-OP2	-6.76	109.46	119.60
1	1	2352	A	OP1-P-OP2	-6.76	109.47	119.60
1	1	2374	C	OP1-P-OP2	-6.76	109.46	119.60
1	1	2848	G	OP1-P-OP2	-6.76	109.47	119.60
1	1	938	C	OP1-P-OP2	-6.75	109.47	119.60
1	1	2983	C	OP1-P-OP2	-6.75	109.47	119.60
2	2	1	A	OP1-P-OP2	-6.75	109.47	119.60
1	1	1060	U	OP1-P-OP2	-6.75	109.48	119.60
1	1	1	G	OP1-P-OP2	-6.75	109.48	119.60
1	1	1201	C	OP1-P-OP2	-6.75	109.48	119.60
1	1	310	U	OP1-P-OP2	-6.74	109.48	119.60
1	1	712	G	OP1-P-OP2	-6.74	109.49	119.60
1	1	471	U	OP1-P-OP2	-6.74	109.49	119.60
1	1	2830	G	OP1-P-OP2	-6.74	109.49	119.60
1	1	925	A	OP1-P-OP2	-6.73	109.50	119.60
1	1	2890	A	OP1-P-OP2	-6.73	109.51	119.60
1	1	1353	U	OP1-P-OP2	-6.72	109.51	119.60
1	1	1097	G	OP1-P-OP2	-6.72	109.52	119.60
1	1	770	G	OP1-P-OP2	-6.69	109.57	119.60
1	1	753	C	N1-C2-O2	6.62	122.87	118.90
1	1	753	C	N3-C2-O2	-6.31	117.48	121.90
1	1	954	U	C2-N1-C1'	6.24	125.19	117.70
2	2	156	U	C2-N1-C1'	6.09	125.01	117.70
1	1	3058	U	C2-N1-C1'	5.70	124.53	117.70
1	1	2899	C	C2-N1-C1'	5.57	124.93	118.80
1	1	3355	U	C2-N1-C1'	5.56	124.37	117.70
1	1	3249	C	N3-C2-O2	-5.48	118.06	121.90
1	1	977	C	C2-N1-C1'	5.36	124.69	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1	3153	U	C2-N1-C1'	5.28	124.03	117.70

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
10	M	9	ALA	Peptide

## 5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

## 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	
3	B	329/387 (85%)	309 (94%)	20 (6%)	0	100	100
4	C	341/362 (94%)	325 (95%)	16 (5%)	0	100	100
5	E	147/176 (84%)	143 (97%)	4 (3%)	0	100	100
6	F	226/244 (93%)	217 (96%)	9 (4%)	0	100	100
7	G	104/256 (41%)	98 (94%)	6 (6%)	0	100	100
8	H	188/191 (98%)	176 (94%)	12 (6%)	0	100	100
9	L	106/199 (53%)	98 (92%)	8 (8%)	0	100	100
10	M	132/138 (96%)	126 (96%)	5 (4%)	1 (1%)	19	57
11	N	173/204 (85%)	171 (99%)	2 (1%)	0	100	100
12	O	195/199 (98%)	190 (97%)	5 (3%)	0	100	100
13	P	120/184 (65%)	119 (99%)	1 (1%)	0	100	100
14	Q	129/186 (69%)	128 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
15	S	168/172 (98%)	155 (92%)	13 (8%)	0	100	100
16	V	107/137 (78%)	105 (98%)	2 (2%)	0	100	100
17	W	223/236 (94%)	218 (98%)	5 (2%)	0	100	100
18	Y	123/127 (97%)	120 (98%)	3 (2%)	0	100	100
19	b	361/647 (56%)	347 (96%)	14 (4%)	0	100	100
20	e	123/130 (95%)	120 (98%)	3 (2%)	0	100	100
21	f	104/107 (97%)	100 (96%)	4 (4%)	0	100	100
22	h	117/120 (98%)	107 (92%)	10 (8%)	0	100	100
23	j	69/88 (78%)	67 (97%)	2 (3%)	0	100	100
24	r	69/261 (26%)	63 (91%)	6 (9%)	0	100	100
25	u	114/199 (57%)	108 (95%)	6 (5%)	0	100	100
26	y	223/245 (91%)	214 (96%)	9 (4%)	0	100	100
All	All	3991/5195 (77%)	3824 (96%)	166 (4%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
10	M	9	ALA

### 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	B	280/323 (87%)	277 (99%)	3 (1%)	73	84
4	C	273/289 (94%)	268 (98%)	5 (2%)	59	77
5	E	131/153 (86%)	130 (99%)	1 (1%)	81	89
6	F	191/205 (93%)	189 (99%)	2 (1%)	76	86
7	G	89/208 (43%)	88 (99%)	1 (1%)	73	84
8	H	170/171 (99%)	167 (98%)	3 (2%)	59	77

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
9	L	87/159 (55%)	84 (97%)	3 (3%)	37	62
10	M	106/109 (97%)	106 (100%)	0	100	100
11	N	153/176 (87%)	147 (96%)	6 (4%)	32	59
12	O	160/162 (99%)	158 (99%)	2 (1%)	69	82
13	P	103/146 (70%)	102 (99%)	1 (1%)	76	86
14	Q	107/151 (71%)	106 (99%)	1 (1%)	78	87
15	S	155/156 (99%)	151 (97%)	4 (3%)	46	68
16	V	86/105 (82%)	85 (99%)	1 (1%)	71	83
17	W	204/213 (96%)	198 (97%)	6 (3%)	42	65
18	Y	108/110 (98%)	105 (97%)	3 (3%)	43	66
19	b	339/573 (59%)	328 (97%)	11 (3%)	39	63
20	e	108/111 (97%)	107 (99%)	1 (1%)	78	87
21	f	90/91 (99%)	90 (100%)	0	100	100
22	h	104/105 (99%)	102 (98%)	2 (2%)	57	75
23	j	59/71 (83%)	59 (100%)	0	100	100
24	r	63/229 (28%)	63 (100%)	0	100	100
25	u	101/180 (56%)	96 (95%)	5 (5%)	24	53
26	y	193/211 (92%)	190 (98%)	3 (2%)	62	79
All	All	3460/4407 (78%)	3396 (98%)	64 (2%)	61	77

All (64) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	B	199	PHE
3	B	214	MET
3	B	332	ARG
4	C	65	TRP
4	C	93	MET
4	C	120	TYR
4	C	177	ASP
4	C	184	SER
5	E	108	LYS
6	F	179	LEU
6	F	196	LYS
7	G	204	ARG
8	H	1	MET

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
8	H	157	ASN
8	H	184	LYS
9	L	91	ARG
9	L	100	ARG
9	L	118	GLU
11	N	13	LYS
11	N	21	PHE
11	N	38	ARG
11	N	108	ARG
11	N	144	ARG
11	N	180	PHE
12	O	156	LEU
12	O	164	SER
13	P	90	PHE
14	Q	92	ARG
15	S	12	ARG
15	S	117	ARG
15	S	171	PHE
15	S	172	TYR
16	V	23	MET
17	W	27	PHE
17	W	45	LEU
17	W	60	TRP
17	W	96	CYS
17	W	103	LEU
17	W	113	LYS
18	Y	3	LYS
18	Y	37	LYS
18	Y	74	TYR
19	b	48	ARG
19	b	159	ARG
19	b	168	ARG
19	b	170	LEU
19	b	180	LYS
19	b	210	ASP
19	b	278	PHE
19	b	427	TRP
19	b	434	GLU
19	b	462	LYS
19	b	469	TYR
20	e	27	ARG
22	h	85	THR

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Mol	Chain	Res	Type
22	h	115	LYS
25	u	6	CYS
25	u	32	CYS
25	u	55	PHE
25	u	83	ARG
25	u	113	ARG
26	y	101	LEU
26	y	102	SER
26	y	173	LEU

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

Mol	Chain	Res	Type
3	B	121	ASN
4	C	48	GLN
4	C	291	ASN
5	E	57	HIS
6	F	112	ASN
6	F	209	ASN
12	O	50	ASN
14	Q	58	ASN
20	e	98	HIS
22	h	59	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	1668/3396 (49%)	343 (20%)	43 (2%)
2	2	146/158 (92%)	34 (23%)	2 (1%)
All	All	1814/3554 (51%)	377 (20%)	45 (2%)

All (377) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	2	U
1	1	3	U
1	1	15	C
1	1	18	G
1	1	20	A
1	1	26	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	37	U
1	1	39	A
1	1	44	U
1	1	48	A
1	1	49	A
1	1	50	U
1	1	60	A
1	1	65	A
1	1	66	A
1	1	72	C
1	1	74	G
1	1	76	G
1	1	92	G
1	1	93	C
1	1	94	G
1	1	109	A
1	1	110	G
1	1	115	A
1	1	117	U
1	1	118	U
1	1	122	A
1	1	135	C
1	1	136	G
1	1	150	A
1	1	156	G
1	1	157	A
1	1	168	U
1	1	170	G
1	1	190	U
1	1	191	U
1	1	200	C
1	1	210	U
1	1	213	A
1	1	218	G
1	1	219	A
1	1	221	A
1	1	222	A
1	1	240	U
1	1	243	G
1	1	246	U
1	1	251	G
1	1	252	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	254	A
1	1	265	A
1	1	266	A
1	1	268	A
1	1	269	G
1	1	282	G
1	1	283	G
1	1	284	A
1	1	285	A
1	1	295	A
1	1	298	U
1	1	299	G
1	1	305	U
1	1	311	C
1	1	315	C
1	1	323	A
1	1	325	A
1	1	329	U
1	1	351	A
1	1	352	A
1	1	360	G
1	1	376	G
1	1	381	U
1	1	383	G
1	1	384	A
1	1	385	A
1	1	387	A
1	1	388	G
1	1	398	A
1	1	401	U
1	1	402	A
1	1	403	C
1	1	404	G
1	1	420	G
1	1	421	G
1	1	436	A
1	1	438	A
1	1	439	C
1	1	441	U
1	1	442	G
1	1	446	U
1	1	453	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	454	C
1	1	457	C
1	1	477	A
1	1	478	A
1	1	481	U
1	1	482	C
1	1	495	G
1	1	521	A
1	1	544	C
1	1	546	C
1	1	547	G
1	1	550	A
1	1	552	G
1	1	557	A
1	1	559	A
1	1	578	A
1	1	579	G
1	1	592	A
1	1	593	C
1	1	604	G
1	1	611	A
1	1	612	U
1	1	616	G
1	1	620	U
1	1	621	A
1	1	623	U
1	1	636	C
1	1	638	C
1	1	644	G
1	1	647	A
1	1	648	C
1	1	650	C
1	1	660	A
1	1	661	G
1	1	677	A
1	1	681	U
1	1	691	A
1	1	705	A
1	1	706	A
1	1	708	G
1	1	719	U
1	1	720	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	721	G
1	1	722	G
1	1	753	C
1	1	754	G
1	1	758	C
1	1	783	A
1	1	784	A
1	1	785	G
1	1	808	A
1	1	817	A
1	1	926	A
1	1	930	U
1	1	932	U
1	1	933	A
1	1	936	A
1	1	944	C
1	1	957	C
1	1	959	C
1	1	961	C
1	1	962	A
1	1	977	C
1	1	978	G
1	1	979	U
1	1	980	A
1	1	984	G
1	1	985	U
1	1	1098	A
1	1	1103	A
1	1	1104	G
1	1	1111	U
1	1	1112	A
1	1	1116	G
1	1	1124	U
1	1	1125	U
1	1	1127	G
1	1	1129	A
1	1	1130	A
1	1	1131	G
1	1	1139	G
1	1	1143	A
1	1	1144	U
1	1	1153	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	1154	A
1	1	1159	A
1	1	1180	A
1	1	1181	U
1	1	1191	U
1	1	1192	C
1	1	1193	A
1	1	1194	G
1	1	1196	C
1	1	1217	A
1	1	1220	U
1	1	1221	A
1	1	1222	G
1	1	1241	U
1	1	1242	G
1	1	1243	G
1	1	1244	A
1	1	1245	A
1	1	1246	G
1	1	1252	A
1	1	1253	U
1	1	1258	U
1	1	1259	A
1	1	1260	A
1	1	1262	G
1	1	1277	C
1	1	1278	A
1	1	1279	C
1	1	1282	G
1	1	1284	C
1	1	1285	G
1	1	1286	A
1	1	1287	A
1	1	1313	G
1	1	1330	A
1	1	1332	A
1	1	1348	U
1	1	1349	G
1	1	1350	A
1	1	1355	A
1	1	1357	G
1	1	1359	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	1386	A
1	1	1390	A
1	1	1399	A
1	1	1400	G
1	1	1406	A
1	1	1408	G
1	1	1417	G
1	1	1418	A
1	1	1419	A
1	1	1436	U
1	1	1437	C
1	1	2365	C
1	1	2370	G
1	1	2371	G
1	1	2372	A
1	1	2375	G
1	1	2377	G
1	1	2378	C
1	1	2391	G
1	1	2392	C
1	1	2393	G
1	1	2836	C
1	1	2858	U
1	1	2897	A
1	1	2899	C
1	1	2984	C
1	1	2987	A
1	1	2995	A
1	1	2996	U
1	1	2997	G
1	1	3003	G
1	1	3012	A
1	1	3021	A
1	1	3022	G
1	1	3027	A
1	1	3028	G
1	1	3032	A
1	1	3055	U
1	1	3057	U
1	1	3058	U
1	1	3067	C
1	1	3068	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	3069	G
1	1	3070	A
1	1	3071	U
1	1	3074	G
1	1	3075	G
1	1	3076	C
1	1	3086	A
1	1	3092	C
1	1	3093	C
1	1	3094	A
1	1	3099	C
1	1	3101	G
1	1	3104	U
1	1	3113	A
1	1	3115	C
1	1	3129	A
1	1	3130	A
1	1	3131	U
1	1	3142	A
1	1	3143	C
1	1	3154	C
1	1	3155	U
1	1	3156	U
1	1	3157	U
1	1	3170	A
1	1	3172	A
1	1	3173	G
1	1	3174	A
1	1	3176	G
1	1	3179	U
1	1	3180	A
1	1	3181	C
1	1	3187	A
1	1	3189	G
1	1	3198	U
1	1	3207	U
1	1	3210	A
1	1	3213	A
1	1	3217	C
1	1	3218	A
1	1	3219	G
1	1	3229	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	3235	C
1	1	3243	A
1	1	3244	A
1	1	3245	A
1	1	3247	G
1	1	3250	U
1	1	3259	U
1	1	3260	G
1	1	3270	U
1	1	3273	A
1	1	3276	G
1	1	3279	A
1	1	3281	U
1	1	3295	A
1	1	3304	U
1	1	3307	A
1	1	3330	A
1	1	3333	G
1	1	3335	A
1	1	3341	U
1	1	3342	A
1	1	3343	G
1	1	3344	A
1	1	3345	G
1	1	3346	U
1	1	3347	A
1	1	3349	C
1	1	3351	U
1	1	3352	U
1	1	3354	U
1	1	3355	U
1	1	3356	G
1	1	3361	G
1	1	3363	U
1	1	3366	G
1	1	3369	G
1	1	3370	A
1	1	3375	A
1	1	3376	A
1	1	3381	U
1	1	3383	G
1	1	3389	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	3390	G
2	2	13	A
2	2	15	G
2	2	16	G
2	2	23	U
2	2	34	U
2	2	35	C
2	2	39	G
2	2	40	A
2	2	49	G
2	2	51	G
2	2	52	A
2	2	54	A
2	2	59	A
2	2	62	C
2	2	63	G
2	2	70	G
2	2	71	A
2	2	72	A
2	2	79	A
2	2	80	A
2	2	81	U
2	2	82	U
2	2	86	U
2	2	87	G
2	2	89	A
2	2	90	U
2	2	95	G
2	2	100	U
2	2	104	A
2	2	106	C
2	2	115	C
2	2	122	U
2	2	131	A
2	2	152	G

All (45) RNA pucker outliers are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	14	U
1	1	36	C
1	1	75	G

*Continued on next page...*



*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	93	C
1	1	239	G
1	1	282	G
1	1	304	G
1	1	310	U
1	1	359	U
1	1	387	A
1	1	438	A
1	1	441	U
1	1	456	U
1	1	476	G
1	1	615	U
1	1	649	A
1	1	659	G
1	1	705	A
1	1	753	C
1	1	1102	A
1	1	1128	U
1	1	1129	A
1	1	1193	A
1	1	1241	U
1	1	1259	A
1	1	1276	U
1	1	1347	U
1	1	1358	C
1	1	1385	C
1	1	1405	U
1	1	2371	G
1	1	2857	C
1	1	2896	A
1	1	2983	C
1	1	2994	A
1	1	2995	A
1	1	3069	G
1	1	3228	C
1	1	3269	U
1	1	3294	A
1	1	3350	C
1	1	3360	C
1	1	3369	G
2	2	71	A
2	2	114	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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

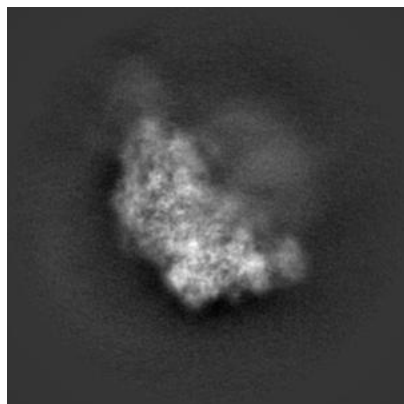
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-12913. These allow visual inspection of the internal detail of the map and identification of artifacts.

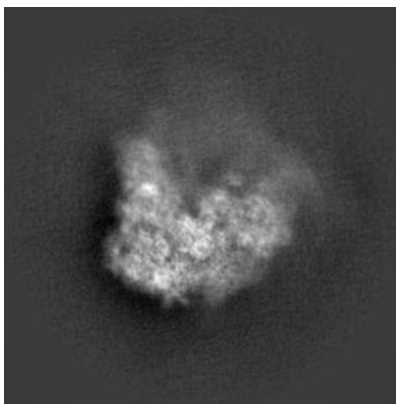
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

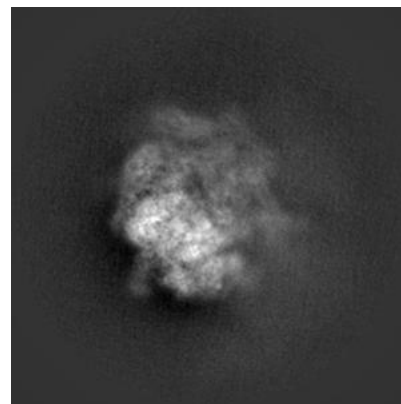
#### 6.1.1 Primary map



X

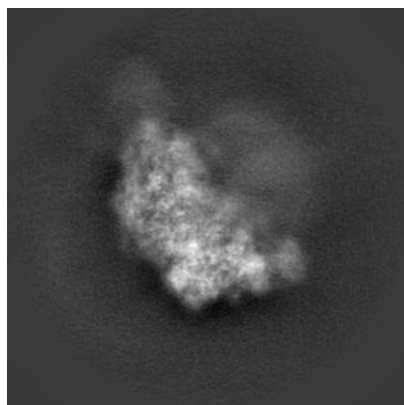


Y

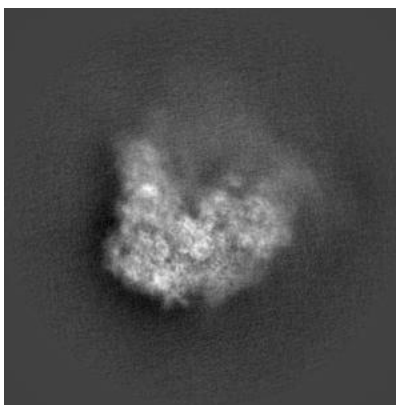


Z

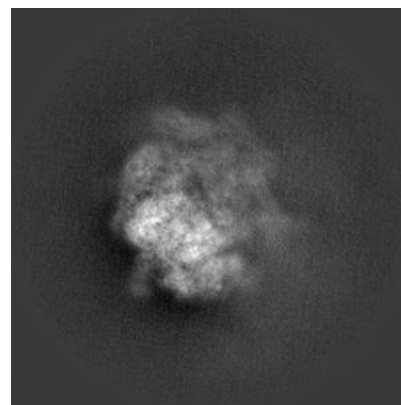
#### 6.1.2 Raw map



X



Y

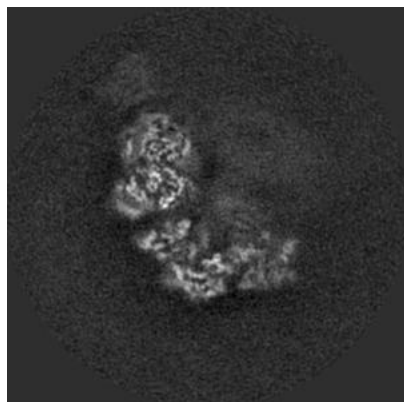


Z

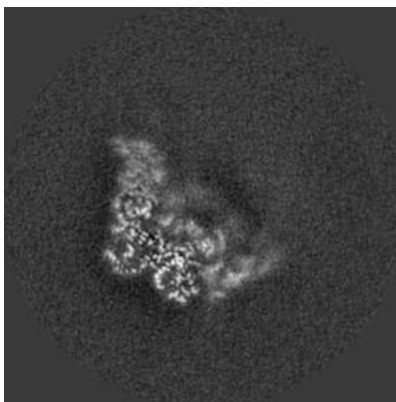
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

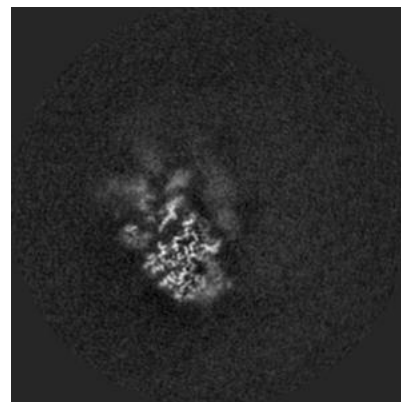
### 6.2.1 Primary map



X Index: 200

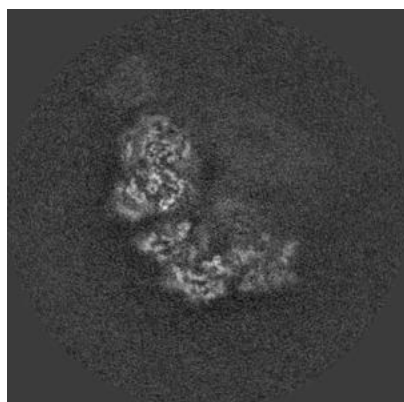


Y Index: 200

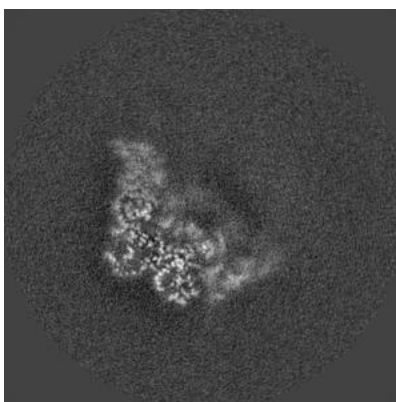


Z Index: 200

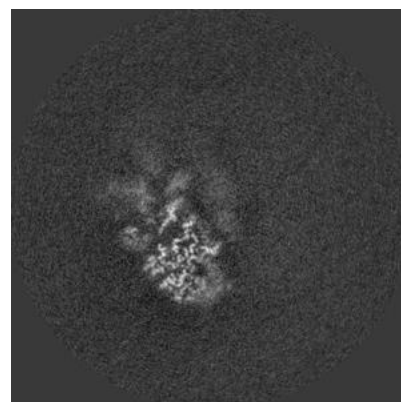
### 6.2.2 Raw map



X Index: 200



Y Index: 200

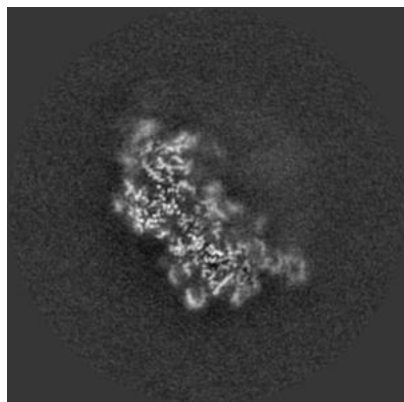


Z Index: 200

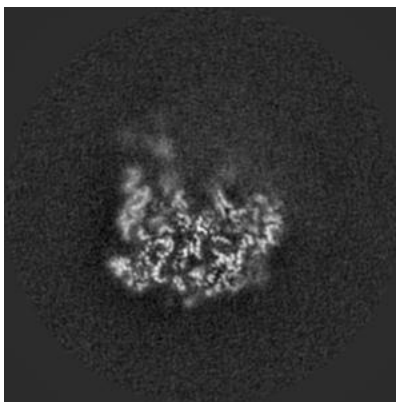
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

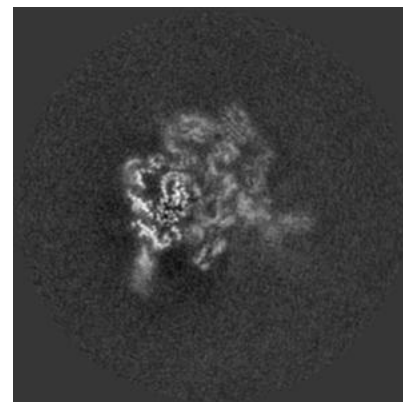
### 6.3.1 Primary map



X Index: 165

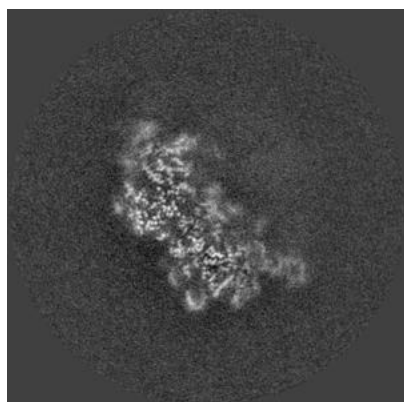


Y Index: 172

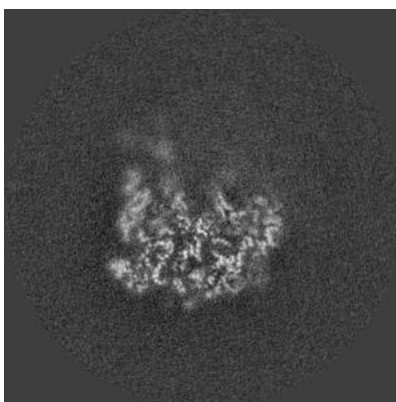


Z Index: 153

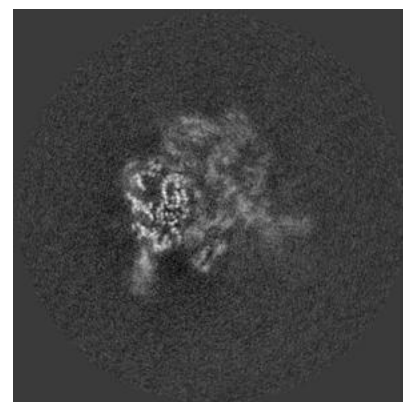
### 6.3.2 Raw map



X Index: 165



Y Index: 172

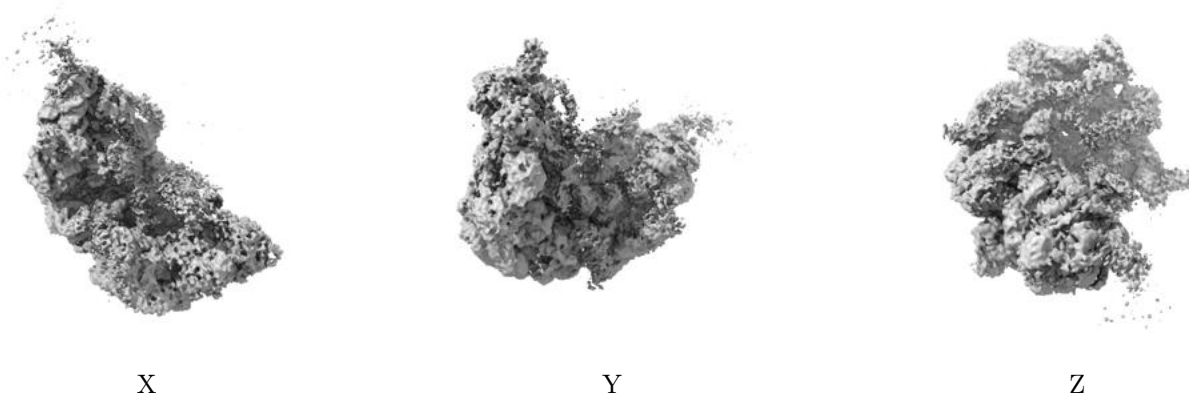


Z Index: 154

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

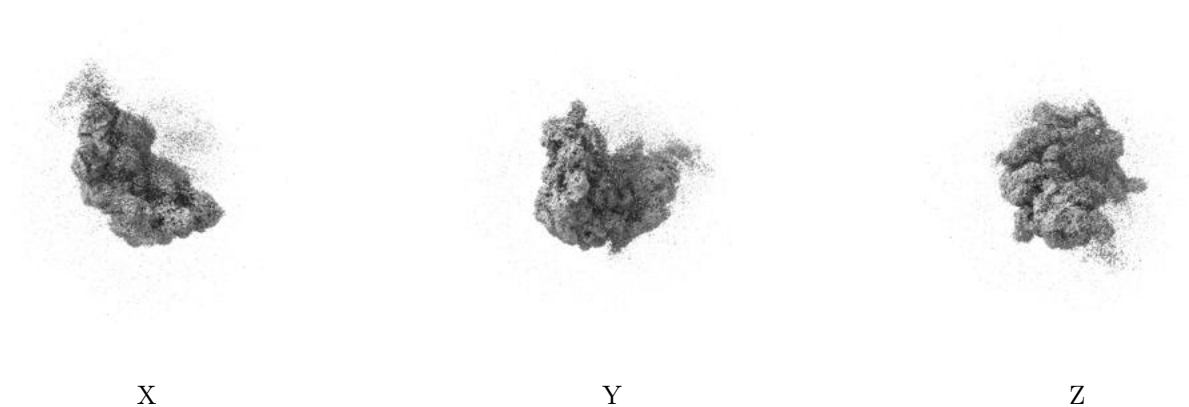
## 6.4 Orthogonal surface views [i](#)

### 6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.021. 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



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.

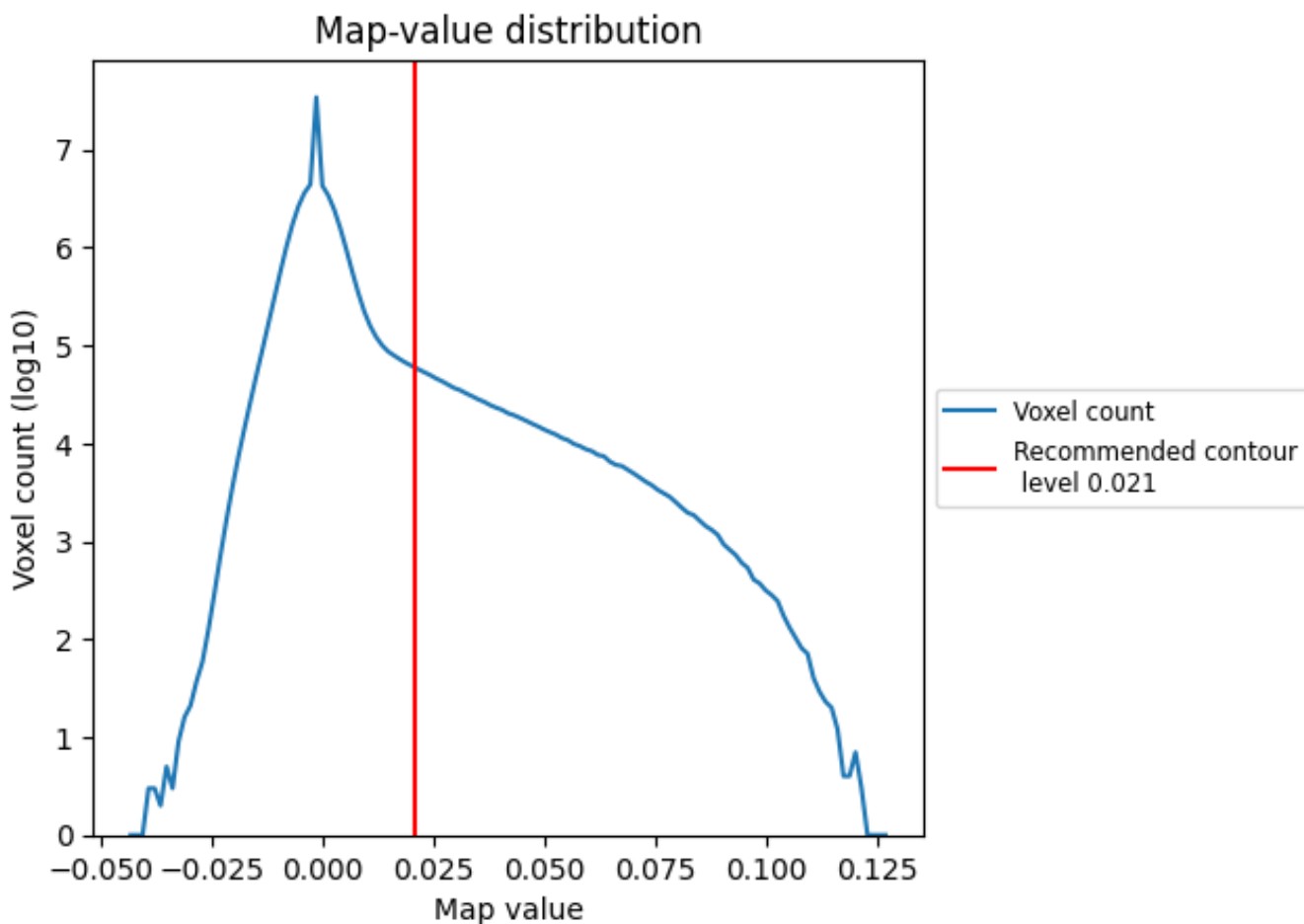
## 6.5 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

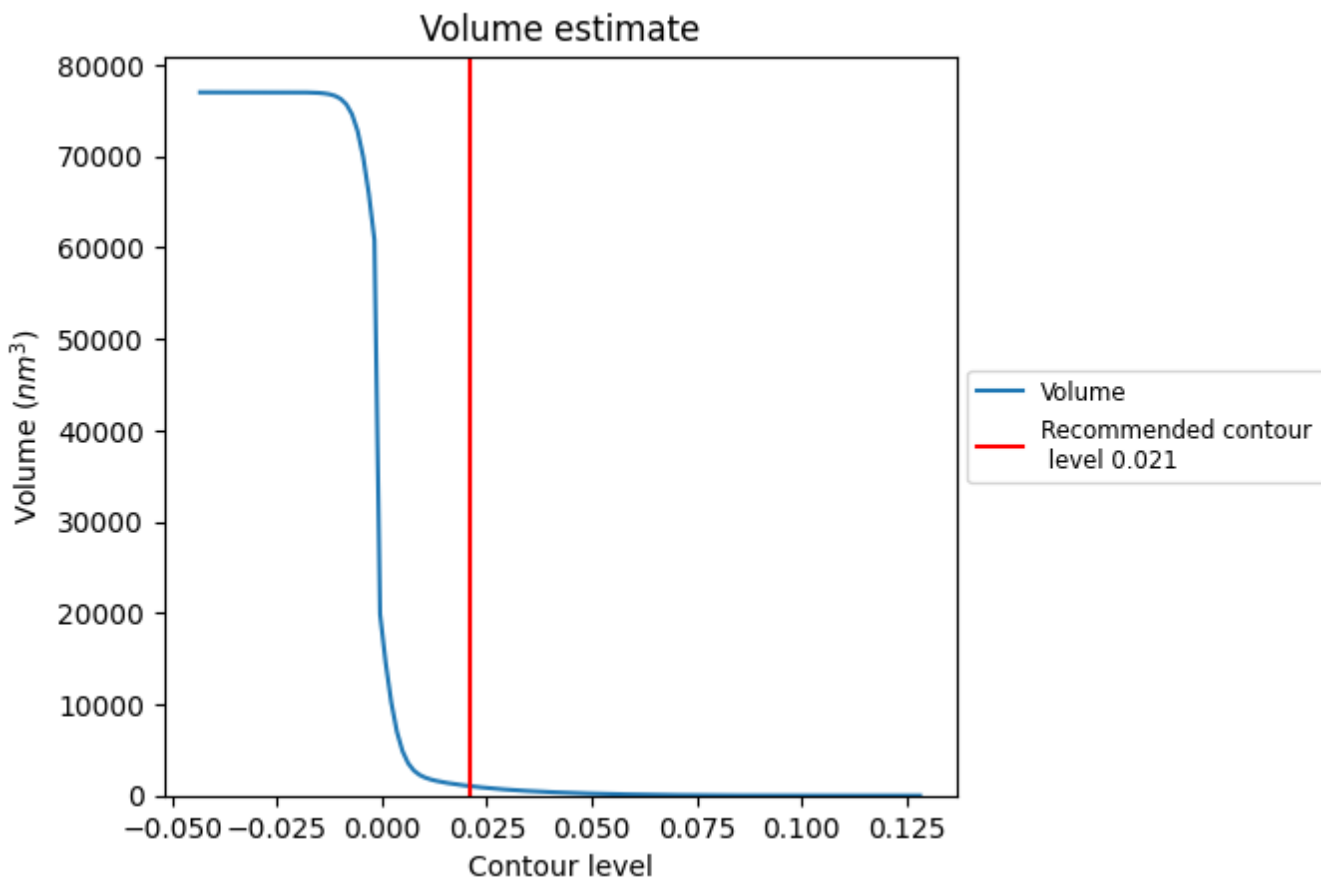
This section contains the results of statistical analysis of the map.

### 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](#)

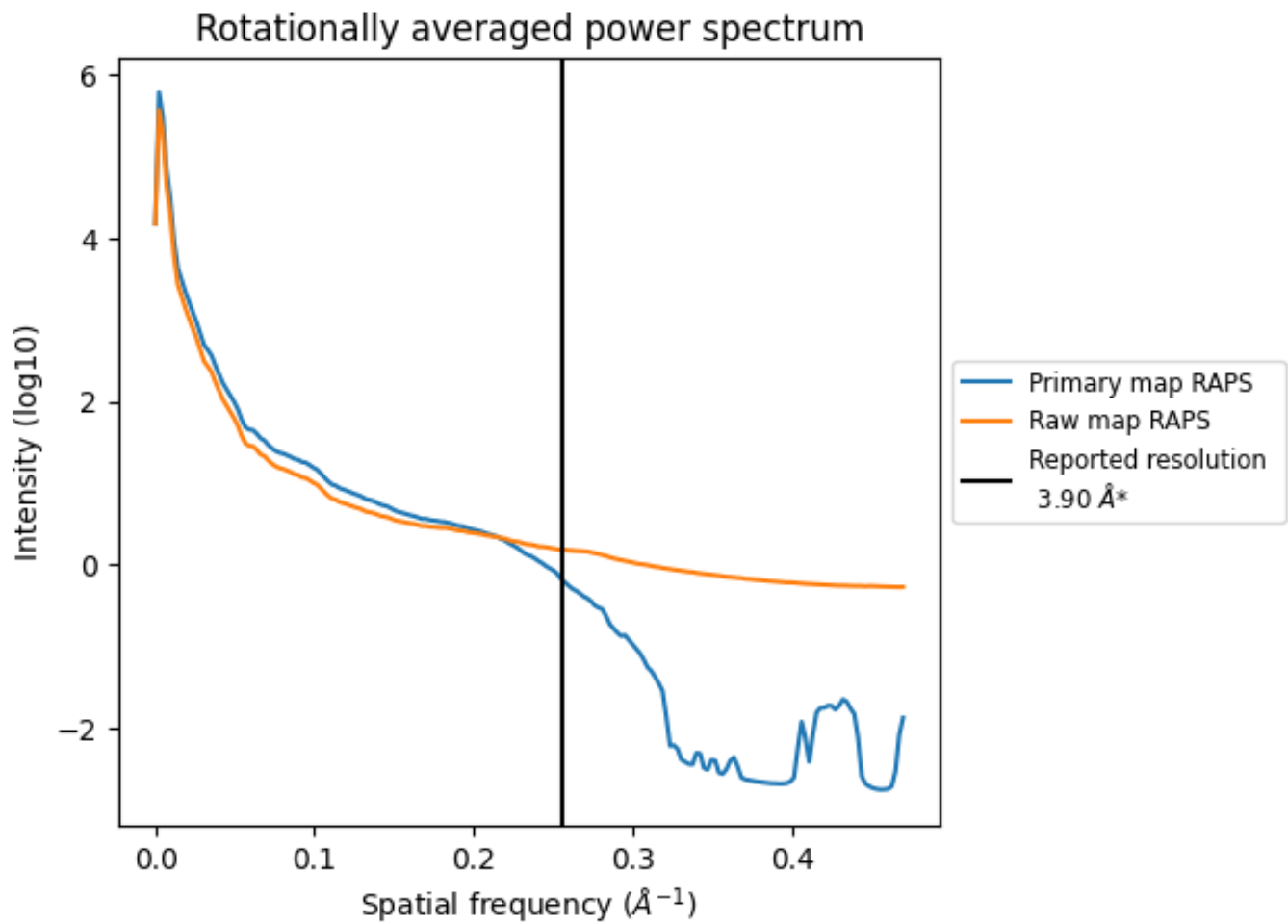


The volume at the recommended contour level is 1034 nm<sup>3</sup>; this corresponds to an approximate mass of 934 kDa.

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

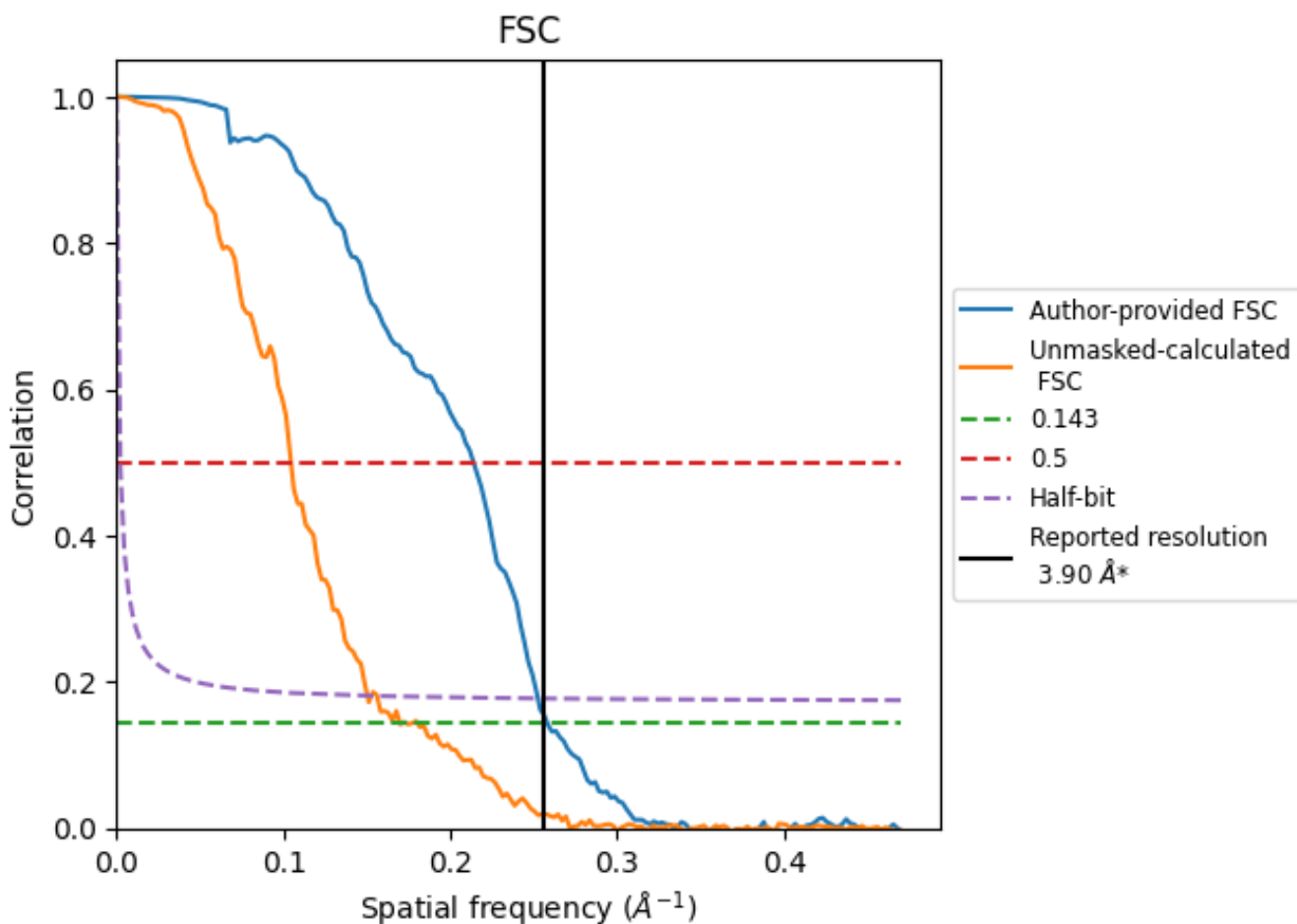


\*Reported resolution corresponds to spatial frequency of 0.256 Å<sup>-1</sup>

## 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 0.256 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

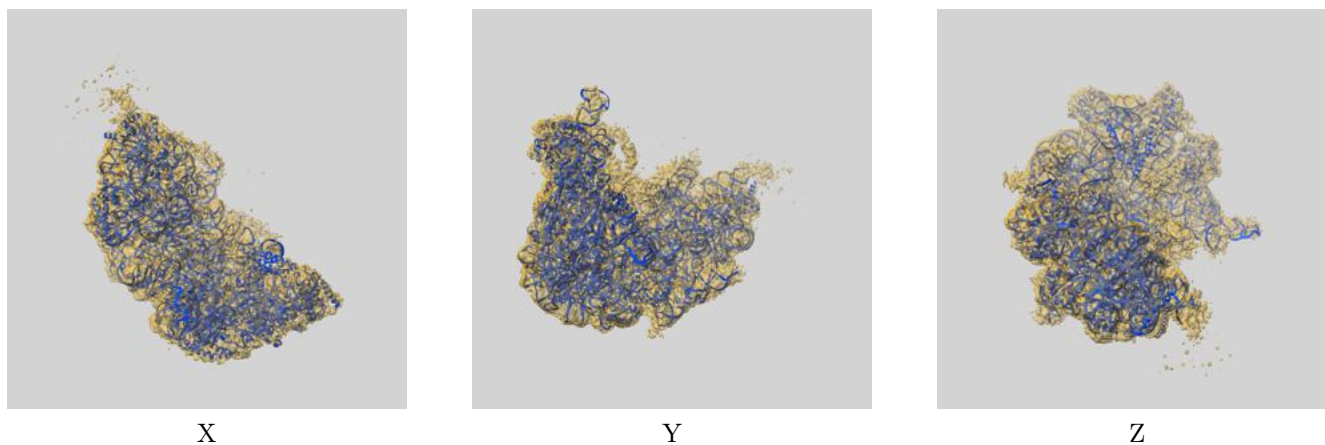
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.90	-	-
Author-provided FSC curve	3.87	4.68	3.96
Unmasked-calculated*	5.89	9.57	6.65

\*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 5.89 differs from the reported value 3.9 by more than 10 %

## 9 Map-model fit [i](#)

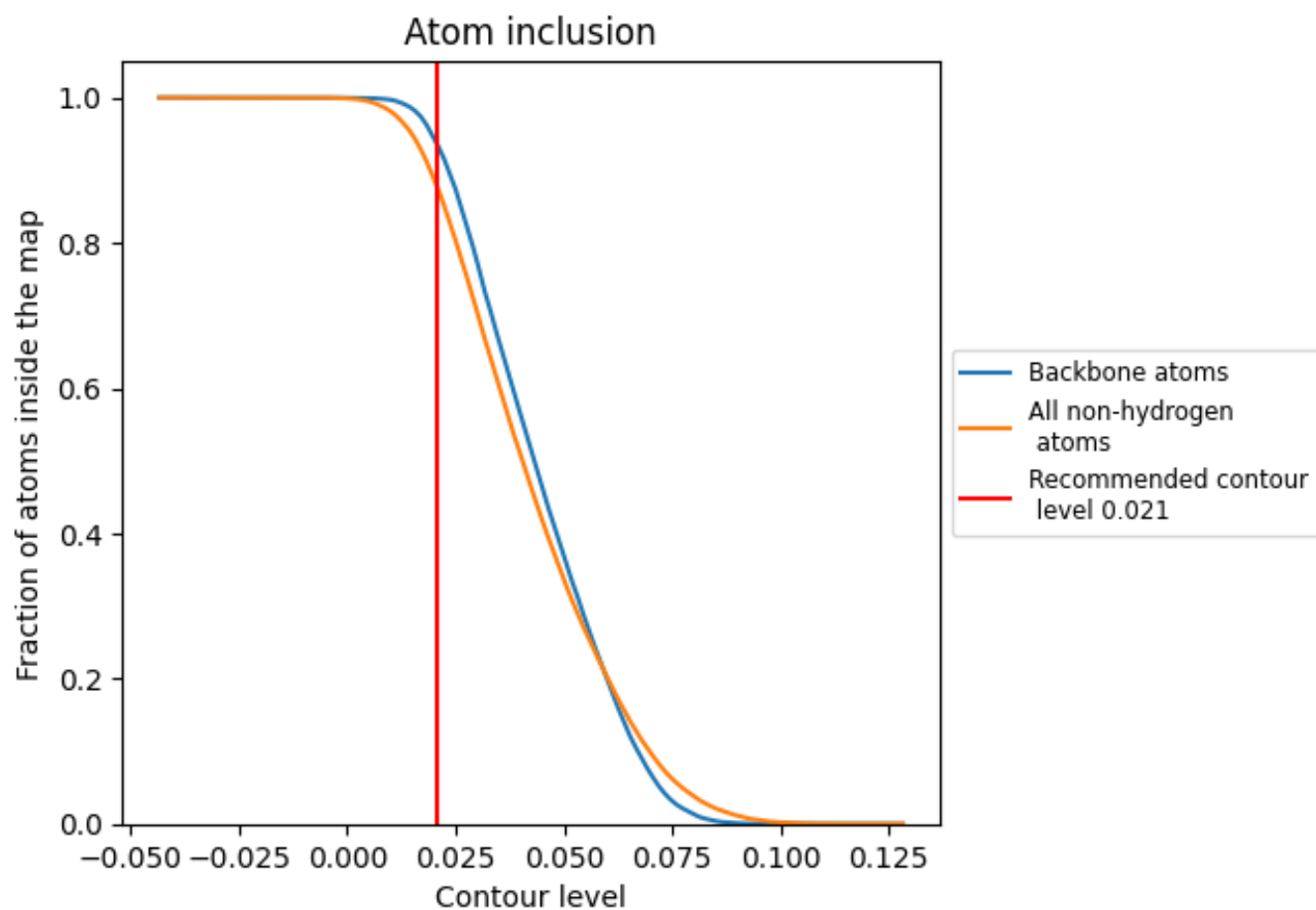
This section contains information regarding the fit between EMDB map EMD-12913 and PDB model 7OHY. Per-residue inclusion information can be found in section [3](#) on page [8](#).

### 9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.021 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 [i](#)



At the recommended contour level, 93% of all backbone atoms, 87% of all non-hydrogen atoms, are inside the map.