



## Full wwPDB EM Validation Report ⓘ

Dec 1, 2021 – 03:46 pm GMT

PDB ID : 7OHR  
EMDB ID : EMD-12906  
Title : Nog1-TAP associated immature ribosomal particle population E from *S. cerevisiae*  
Authors : Milkereit, P.; Poell, G.  
Deposited on : 2021-05-11  
Resolution : 4.72 Å (reported)  
Based on initial model : 6ELZ

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

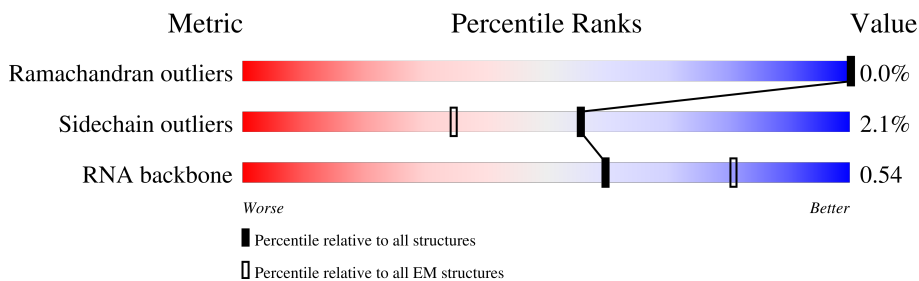
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.72 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.



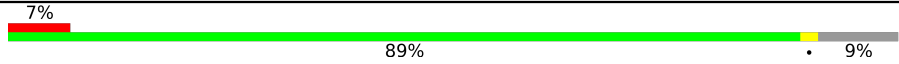

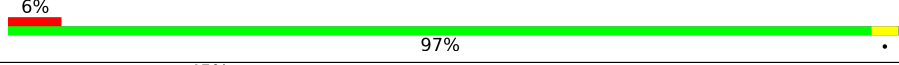

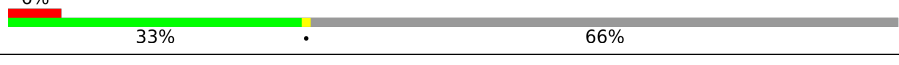
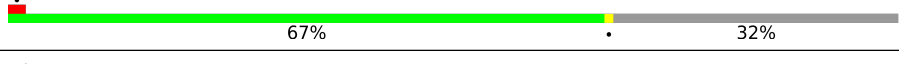
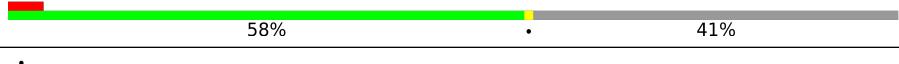
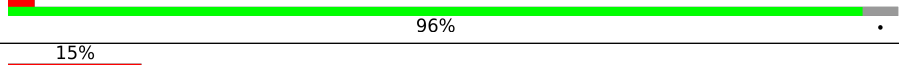
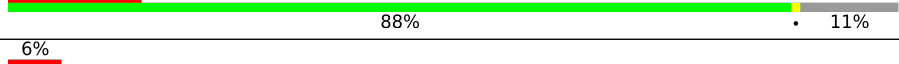
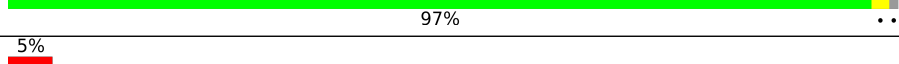

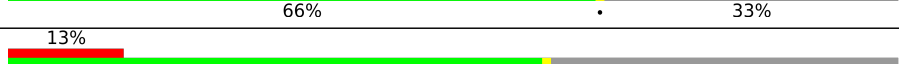
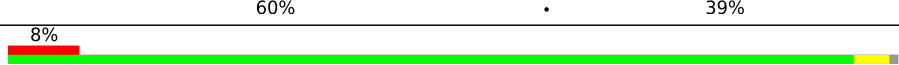
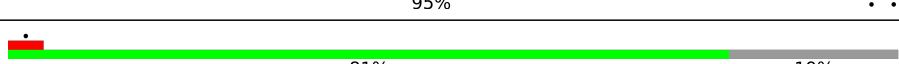
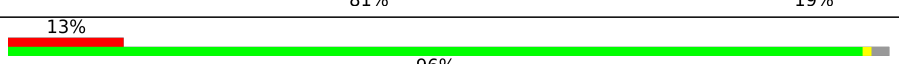
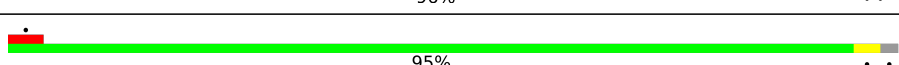
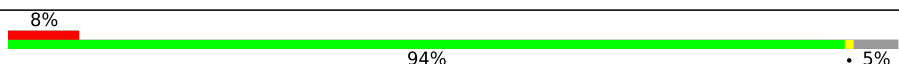
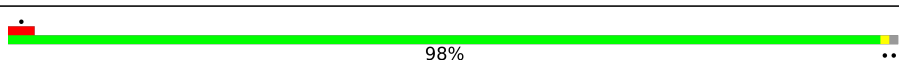
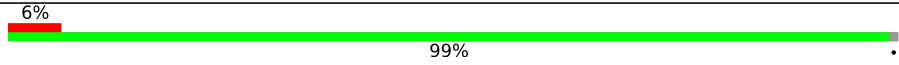

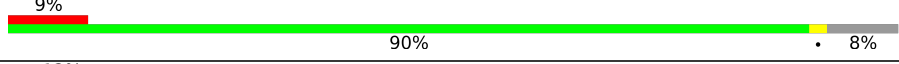
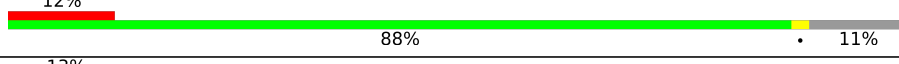
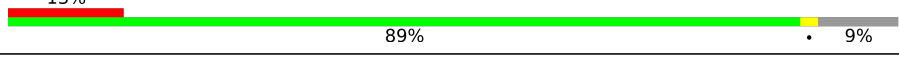
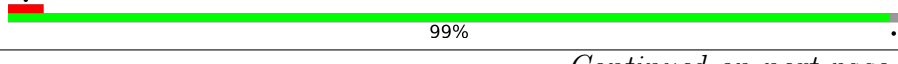

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	6	232	
4	A	291	
5	B	387	
6	C	362	
7	D	505	
8	E	176	

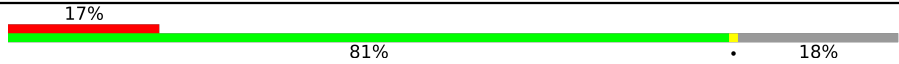
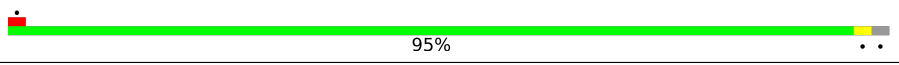
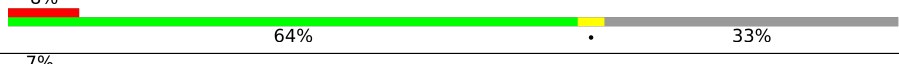

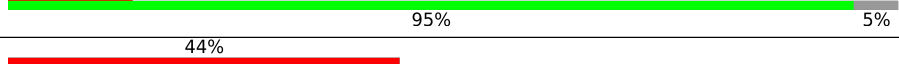
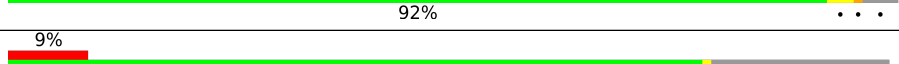
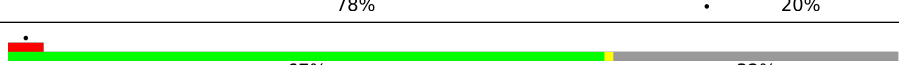
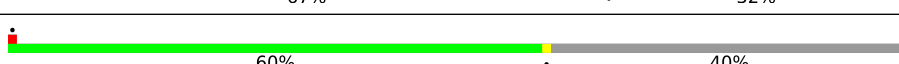
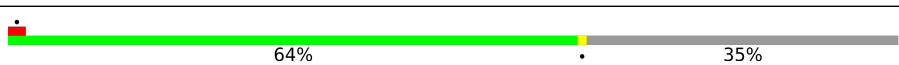


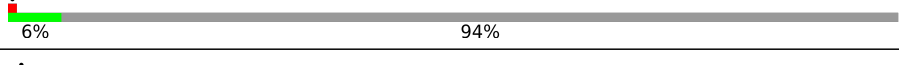
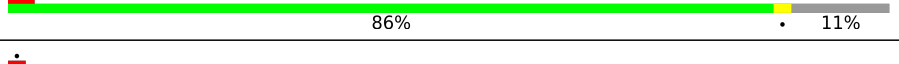


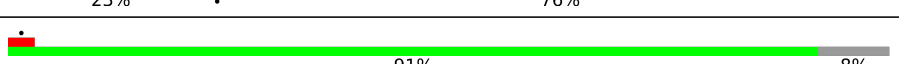


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Mol	Chain	Length	Quality of chain
9	F	244	
10	G	256	
11	H	191	
12	I	663	
13	J	427	
14	K	376	
15	L	199	
16	M	138	
17	N	204	
18	O	199	
19	P	184	
20	Q	186	
21	R	189	
22	S	172	
23	U	121	
24	V	137	
25	W	236	
26	X	142	
27	Y	127	
28	Z	136	
29	b	647	
30	c	105	
31	d	113	
32	e	130	
33	f	107	

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Mol	Chain	Length	Quality of chain
34	g	121	
35	h	120	
36	i	100	
37	j	88	
38	k	78	
39	l	181	
40	m	807	
41	n	605	
42	o	220	
43	p	460	
44	q	618	
45	r	261	
46	s	520	
47	t	322	
48	u	199	
49	v	231	
50	w	841	
51	y	245	

## 2 Entry composition [i](#)

There are 52 unique types of molecules in this entry. The entry contains 235846 atoms, of which 105613 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	2373	76327	22684	25519	9188	16564	2372	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	158	5048	1500	1695	586	1109	158	0	0

- Molecule 3 is a RNA chain called ITS2.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
3	6	65	2061	614	691	228	463	65	0	0

- Molecule 4 is a protein called Ribosome biogenesis protein BRX1.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
4	A	198	3250	1043	1627	284	290	6	0	0

- Molecule 5 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
5	B	335	5409	1694	2743	492	474	6	0	0

- Molecule 6 is a protein called 60S ribosomal protein L4-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
6	C	355	5556	1712	2841	514	486	3	0	0

- Molecule 7 is a protein called ATP-dependent RNA helicase HAS1.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
7	D	437	7106	2247	3620	600	627	12	0	0

- Molecule 8 is a protein called 60S ribosomal protein L6-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
8	E	141	2338	724	1217	203	193	1	0	0

- Molecule 9 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
9	F	222	3647	1151	1863	324	308	1	0	0

- Molecule 10 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
10	G	184	2960	930	1522	249	257	2	0	0

- Molecule 11 is a protein called 60S ribosomal protein L9-A.

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

- Molecule 12 is a protein called Nucleolar complex-associated protein 3.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
12	I	409	6733	2109	3445	557	606	16	0	0

- Molecule 13 is a protein called rRNA-processing protein EBP2.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
13	J	145	2461	759	1246	225	228	3	0	0

- Molecule 14 is a protein called Proteasome-interacting protein CIC1.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
14	K	257	4230	1337	2157	341	392	3	0	0

- Molecule 15 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
15	L	118	1976	605	1010	204	157	0	0

- Molecule 16 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
16	M	133	2168	665	1134	195	172	2	0	0

- Molecule 17 is a protein called 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
17	N	182	3172	978	1613	328	252	1	0	0

- Molecule 18 is a protein called 60S ribosomal protein L16-A.

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

- Molecule 19 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
19	P	161	2591	795	1315	253	228	0	0

- Molecule 20 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
20	Q	125	2008	617	1047	178	165	1	0	0

- Molecule 21 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
21	R	115	1934	589	1006	187	152	0	0

- Molecule 22 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
22	S	170	2903	922	1471	265	242	3	0	0

- Molecule 23 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
23	U	98	1570	505	792	127	146	0	0

- Molecule 24 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
24	V	134	2034	623	1041	187	176	7	0	0

- Molecule 25 is a protein called Ribosome assembly factor MRT4.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
25	W	232	3773	1184	1903	321	360	5	0	0

- Molecule 26 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
26	X	135	2182	675	1130	186	189	2	0	0

- Molecule 27 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
27	Y	126	2075	625	1082	192	176	0	0

- Molecule 28 is a protein called 60S ribosomal protein L27-A.



Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
28	Z	135	2248	710	1156	202	180	0	0

- Molecule 29 is a protein called Nucleolar GTP-binding protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
29	b	421	6876	2180	3466	585	627	18	0	0

- Molecule 30 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
30	c	97	1541	479	798	124	139	1	0	0

- Molecule 31 is a protein called 60S ribosomal protein L31-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
31	d	101	1700	526	875	157	141	1	0	0

- Molecule 32 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
32	e	118	1990	611	1029	195	154	1	0	0

- Molecule 33 is a protein called 60S ribosomal protein L33-A.

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

- Molecule 34 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
34	g	99	1595	477	824	154	136	4	0	0

- Molecule 35 is a protein called 60S ribosomal protein L35-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
35	h	117	Total	C	H	N	O	S	0	0
			2031	610	1071	184	165	1		

- Molecule 36 is a protein called 60S ribosomal protein L36-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
36	i	67	Total	C	H	N	O	S	0	0
			1133	335	589	116	92	1		

- Molecule 37 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace	
37	j	73	Total	C	H	N	O	S	0	0
			1169	353	589	126	96	5		

- Molecule 38 is a protein called 60S ribosomal protein L38.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	k	74	Total	C	H	N	O	0	0
			1256	380	662	111	103		

- Molecule 39 is a protein called 60S ribosome subunit biogenesis protein NIP7.

Mol	Chain	Residues	Atoms					AltConf	Trace	
39	l	174	Total	C	H	N	O	S	0	0
			2793	887	1416	242	241	7		

- Molecule 40 is a protein called Ribosome biogenesis protein ERB1.

Mol	Chain	Residues	Atoms					AltConf	Trace	
40	m	645	Total	C	H	N	O	S	0	0
			10426	3322	5203	907	979	15		

- Molecule 41 is a protein called Pescadillo homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace	
41	n	411	Total	C	H	N	O	S	0	0
			6868	2179	3499	585	592	13		

- Molecule 42 is a protein called Ribosome biogenesis protein 15.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
42	o	133	2267	716	1160	198	189	4	0	0

- Molecule 43 is a protein called Ribosome biogenesis protein YTM1.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
43	p	298	4619	1448	2298	410	457	6	0	0

- Molecule 44 is a protein called 25S rRNA (cytosine(2870)-C(5))-methyltransferase.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
44	q	305	4819	1532	2427	413	437	10	0	0

- Molecule 45 is a protein called Ribosome biogenesis protein NSA2.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
45	r	159	2682	819	1379	256	224	4	0	0

- Molecule 46 is a protein called Nuclear GTP-binding protein NUG1.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
46	s	31	555	156	300	57	41	1	0	0

- Molecule 47 is a protein called Ribosome biogenesis protein RLP7.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
47	t	286	4752	1455	2455	426	413	3	0	0

- Molecule 48 is a protein called Ribosome biogenesis protein RLP24.

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

- Molecule 49 is a protein called Nucleolar protein 16.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
49	v	130	2223	678	1136	211	195	3	0	0

- Molecule 50 is a protein called 27S pre-rRNA (guanosine(2922)-2'-O)-methyltransferase.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
50	w	198	3373	1040	1726	304	295	8	0	0

- Molecule 51 is a protein called Eukaryotic translation initiation factor 6.

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

- Molecule 52 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
52	j	1	1	1	0

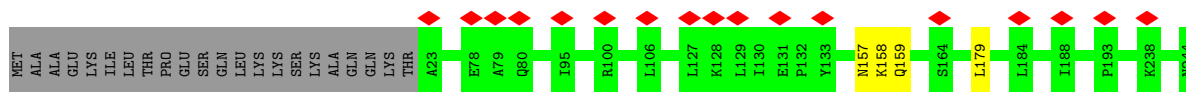




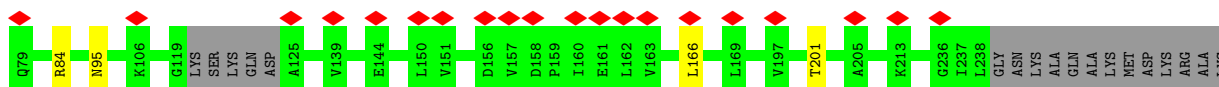
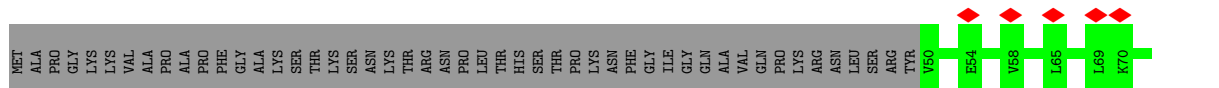




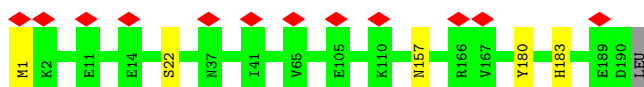




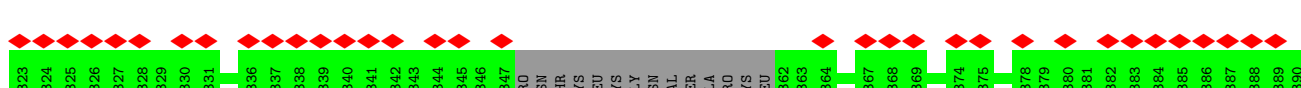
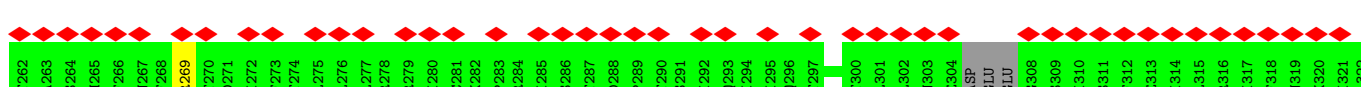
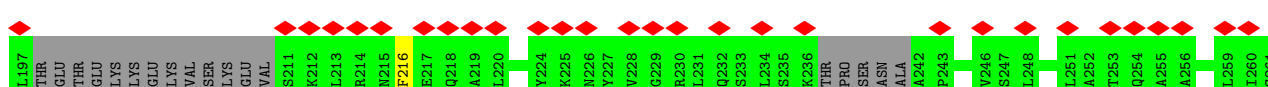
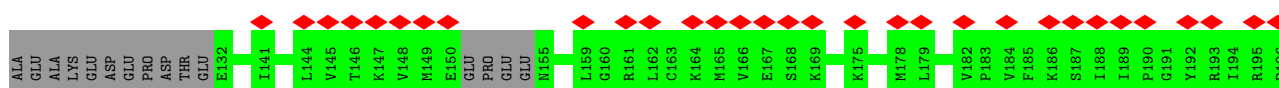
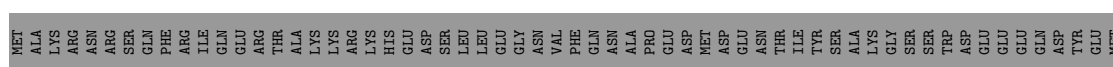
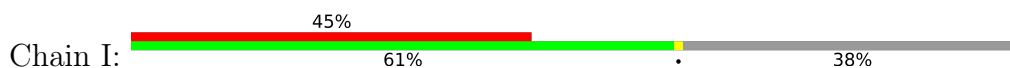
• Molecule 10: 60S ribosomal protein L8-A

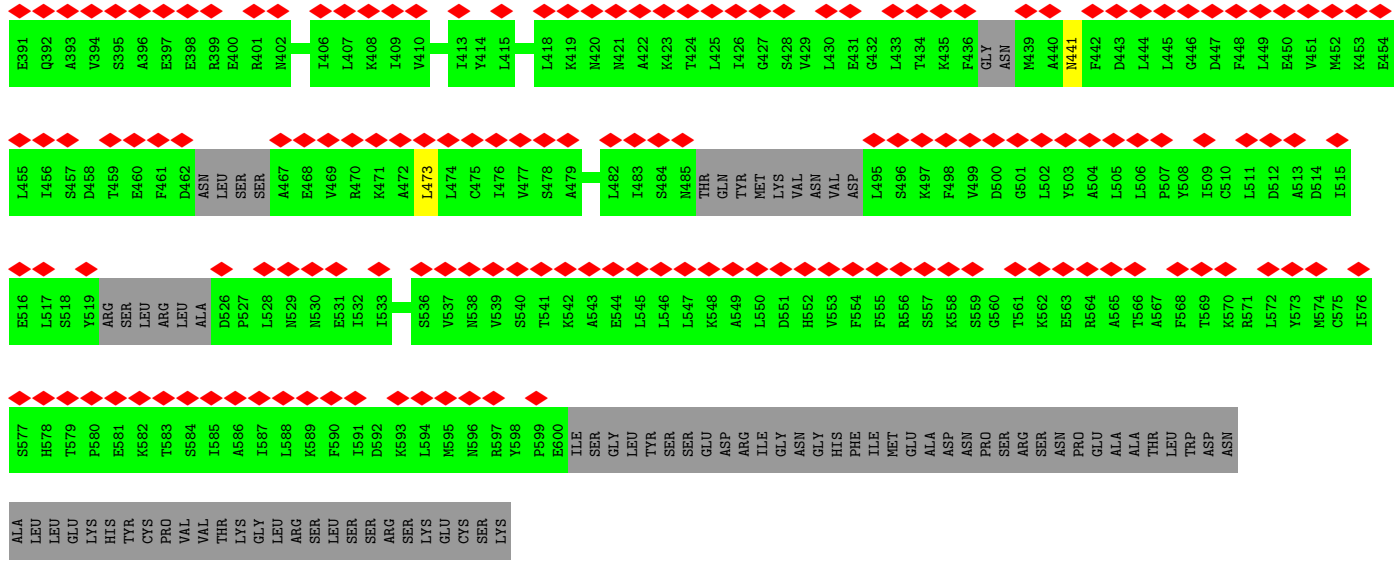


• Molecule 11: 60S ribosomal protein L9-A

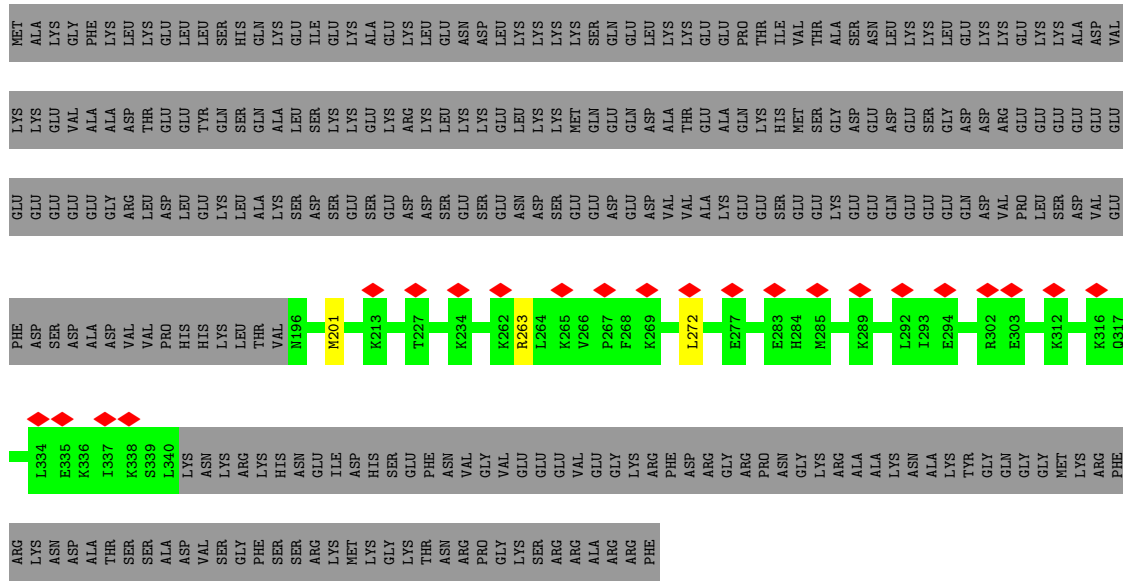


• Molecule 12: Nucleolar complex-associated protein 3

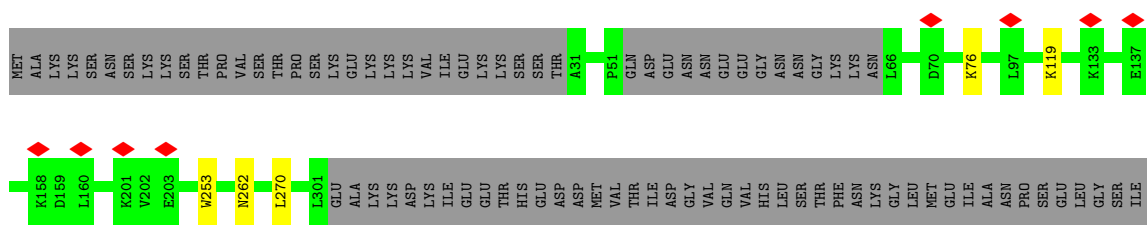




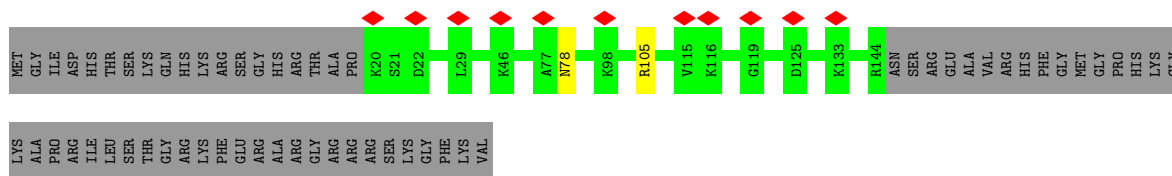
• Molecule 13: rRNA-processing protein EBP2



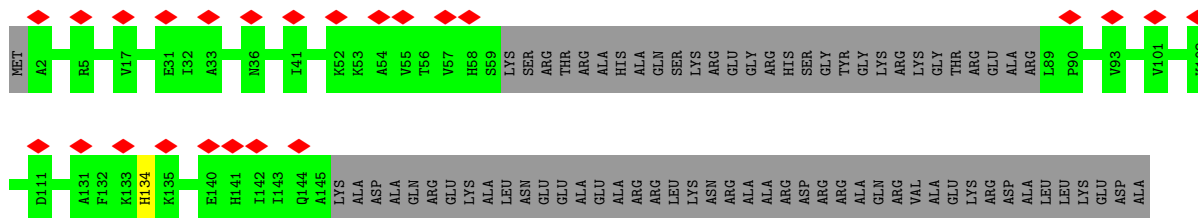
• Molecule 14: Proteasome-interacting protein CIC1



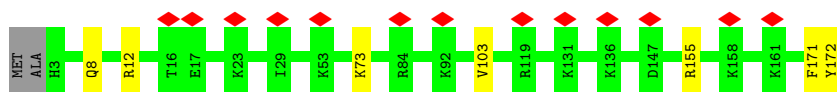




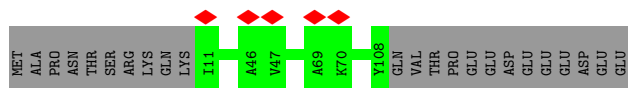
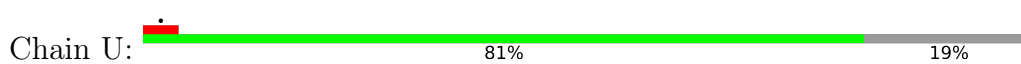
• Molecule 21: 60S ribosomal protein L19-A



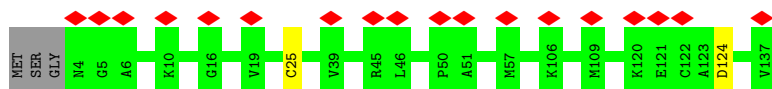
• Molecule 22: 60S ribosomal protein L20-A



• Molecule 23: 60S ribosomal protein L22-A



• Molecule 24: 60S ribosomal protein L23-A



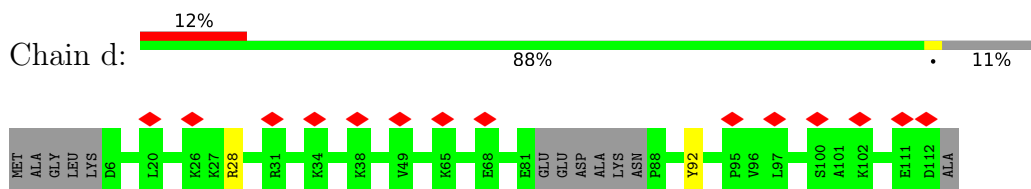
• Molecule 25: Ribosome assembly factor MRT4



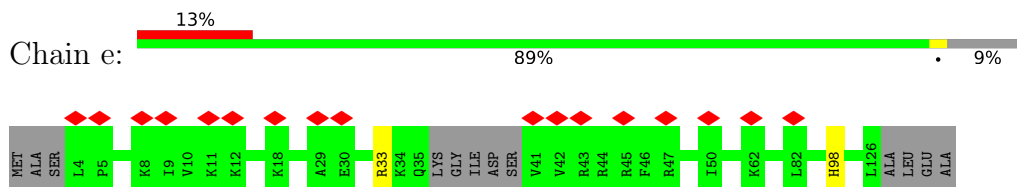
• Molecule 26: 60S ribosomal protein L25



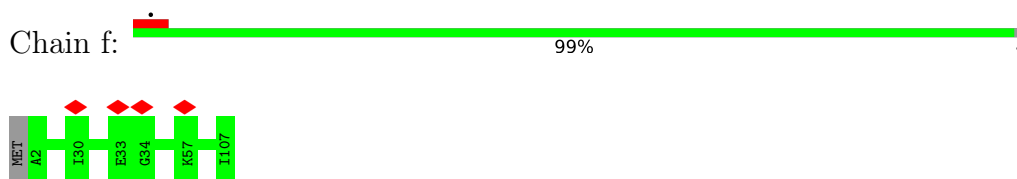
- Molecule 31: 60S ribosomal protein L31-A



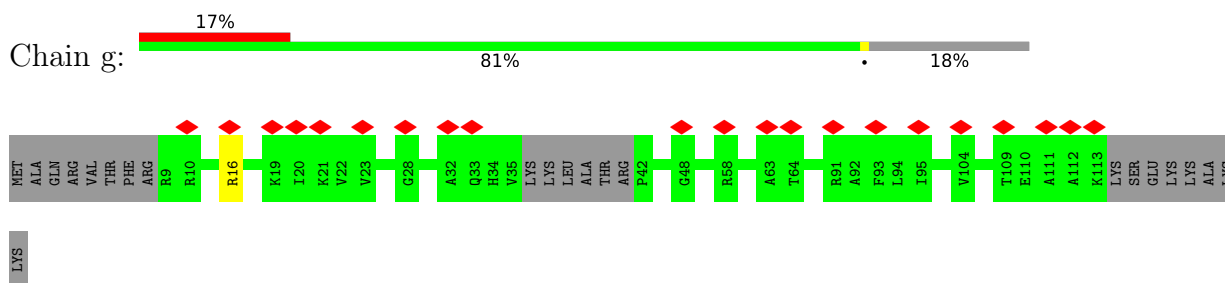
- Molecule 32: 60S ribosomal protein L32



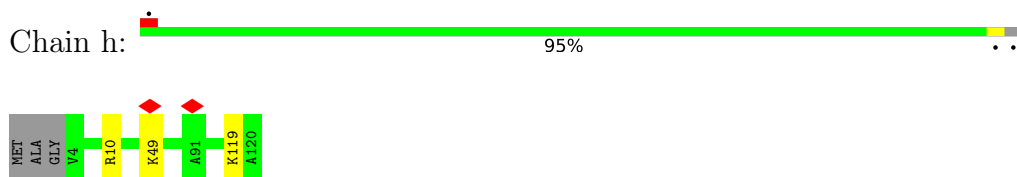
- Molecule 33: 60S ribosomal protein L33-A



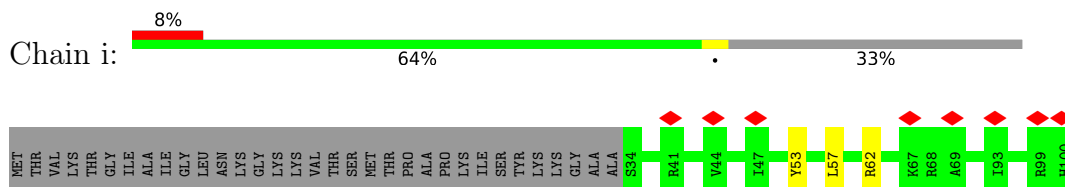
- Molecule 34: 60S ribosomal protein L34-A



- Molecule 35: 60S ribosomal protein L35-A



- Molecule 36: 60S ribosomal protein L36-A



- Molecule 37: 60S ribosomal protein L37-A



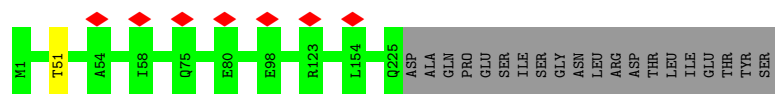
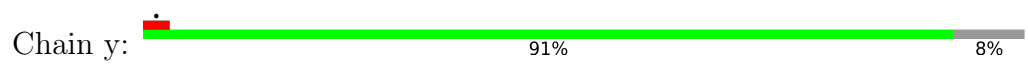












## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	8455	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 ( $e^-/\text{\AA}^2$ )	84.67	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	0.098	Depositor
Minimum map value	-0.032	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.007	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

### 5.1 Standard geometry

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	0.50	6/56847 (0.0%)	0.74	50/88571 (0.1%)
2	2	0.17	0/3746	0.75	1/5832 (0.0%)
3	6	0.16	0/1527	0.77	3/2371 (0.1%)
4	A	0.24	0/1663	0.40	0/2248
5	B	0.24	0/2720	0.42	0/3654
6	C	0.24	0/2765	0.41	0/3743
7	D	0.24	0/3552	0.40	0/4789
8	E	0.24	0/1137	0.40	0/1525
9	F	0.25	0/1821	0.40	0/2451
10	G	0.24	0/1463	0.39	0/1978
11	H	0.24	0/1531	0.42	0/2062
12	I	0.24	0/3327	0.38	0/4464
13	J	0.23	0/1232	0.36	0/1642
14	K	0.24	0/2107	0.40	0/2845
15	L	0.23	0/984	0.39	0/1322
16	M	0.23	0/1048	0.38	0/1410
17	N	0.23	0/1591	0.39	0/2128
18	O	0.24	0/1585	0.37	0/2128
19	P	0.24	0/1294	0.39	0/1734
20	Q	0.25	0/974	0.40	0/1316
21	R	0.23	0/941	0.37	0/1262
22	S	0.24	0/1468	0.43	0/1973
23	U	0.25	0/794	0.42	0/1076
24	V	0.25	0/1008	0.43	0/1356
25	W	0.24	0/1902	0.41	0/2564
26	X	0.23	0/1067	0.39	0/1436
27	Y	0.24	0/1004	0.40	0/1341
28	Z	0.24	0/1118	0.39	0/1497
29	b	0.24	0/3474	0.39	0/4683
30	c	0.24	0/751	0.39	0/1008
31	d	0.23	0/838	0.38	0/1123
32	e	0.23	0/981	0.40	0/1312

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	f	0.25	0/868	0.42	0/1168
34	g	0.24	0/779	0.42	0/1040
35	h	0.24	0/969	0.37	0/1289
36	i	0.24	0/548	0.35	0/726
37	j	0.24	0/592	0.42	0/785
38	k	0.24	0/599	0.41	0/800
39	l	0.61	2/1408 (0.1%)	0.60	2/1899 (0.1%)
40	m	0.24	0/5356	0.41	0/7264
41	n	0.24	0/3441	0.36	0/4625
42	o	0.24	0/1129	0.39	0/1502
43	p	0.23	0/2362	0.44	0/3200
44	q	0.24	0/2439	0.41	0/3297
45	r	0.23	0/1323	0.39	0/1765
46	s	0.24	0/255	0.36	0/327
47	t	0.24	0/2323	0.40	0/3113
48	u	0.24	0/996	0.39	0/1324
49	v	0.23	0/1100	0.36	0/1456
50	w	0.22	0/1663	0.36	0/2206
51	y	0.23	0/1722	0.43	0/2343
All	All	0.37	8/138132 (0.0%)	0.59	56/198973 (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
9	F	0	1
11	H	0	1
All	All	0	2

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	879	U	C2-N3	64.56	1.82	1.37
1	1	879	U	N3-C4	50.85	1.84	1.38
1	1	879	U	N1-C2	43.30	1.77	1.38
1	1	879	U	N1-C6	40.68	1.74	1.38
1	1	879	U	C4-C5	37.01	1.76	1.43
1	1	879	U	C5-C6	33.95	1.64	1.34
39	l	135	ALA	C-N	15.92	1.70	1.34
39	l	136	MET	N-CA	13.15	1.72	1.46

All (56) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
39	1	135	ALA	C-N-CA	13.48	155.41	121.70
39	1	136	MET	N-CA-C	7.33	130.79	111.00
1	1	879	U	C6-N1-C2	7.27	125.36	121.00
1	1	2972	G	OP1-P-OP2	-6.88	109.28	119.60
1	1	2802	A	OP1-P-OP2	-6.84	109.34	119.60
1	1	769	G	OP1-P-OP2	-6.81	109.38	119.60
1	1	1	G	OP1-P-OP2	-6.79	109.41	119.60
1	1	861	C	OP1-P-OP2	-6.79	109.41	119.60
1	1	1097	G	OP1-P-OP2	-6.79	109.41	119.60
1	1	2988	C	N3-C2-O2	-6.79	117.14	121.90
1	1	909	G	OP1-P-OP2	-6.79	109.42	119.60
1	1	714	G	OP1-P-OP2	-6.78	109.42	119.60
1	1	898	U	OP1-P-OP2	-6.78	109.43	119.60
1	1	1794	G	OP1-P-OP2	-6.78	109.43	119.60
1	1	3356	G	OP1-P-OP2	-6.78	109.44	119.60
1	1	2847	A	OP1-P-OP2	-6.77	109.44	119.60
3	6	1	C	OP1-P-OP2	-6.77	109.45	119.60
1	1	962	A	OP1-P-OP2	-6.76	109.46	119.60
1	1	870	G	OP1-P-OP2	-6.76	109.46	119.60
1	1	720	A	OP1-P-OP2	-6.76	109.47	119.60
1	1	1765	U	OP1-P-OP2	-6.76	109.47	119.60
1	1	894	G	OP1-P-OP2	-6.75	109.47	119.60
2	2	1	A	OP1-P-OP2	-6.75	109.47	119.60
1	1	2956	A	OP1-P-OP2	-6.75	109.47	119.60
1	1	310	U	OP1-P-OP2	-6.75	109.48	119.60
1	1	2595	A	OP1-P-OP2	-6.75	109.48	119.60
1	1	3079	U	OP1-P-OP2	-6.75	109.48	119.60
1	1	781	G	OP1-P-OP2	-6.74	109.49	119.60
1	1	925	A	OP1-P-OP2	-6.74	109.48	119.60
1	1	1851	G	OP1-P-OP2	-6.74	109.48	119.60
1	1	2333	C	OP1-P-OP2	-6.74	109.50	119.60
3	6	227	C	OP1-P-OP2	-6.74	109.50	119.60
1	1	494	G	OP1-P-OP2	-6.73	109.50	119.60
1	1	1200	A	OP1-P-OP2	-6.73	109.50	119.60
1	1	2822	U	OP1-P-OP2	-6.72	109.52	119.60
1	1	2947	G	OP1-P-OP2	-6.72	109.53	119.60
1	1	1059	G	OP1-P-OP2	-6.70	109.55	119.60
1	1	879	U	N1-C2-N3	-6.69	110.89	114.90
1	1	885	U	OP1-P-OP2	-6.68	109.58	119.60
1	1	3358	U	N3-C4-O4	-6.50	114.85	119.40
1	1	1805	C	N3-C2-O2	-6.44	117.39	121.90
1	1	2876	C	OP1-P-OP2	-6.42	109.96	119.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1	3347	A	N1-C6-N6	-6.39	114.77	118.60
1	1	2899	C	C2-N1-C1'	6.19	125.61	118.80
1	1	875	G	OP1-P-OP2	-6.11	110.44	119.60
1	1	717	C	C2-N1-C1'	6.09	125.50	118.80
1	1	3058	U	C2-N1-C1'	5.88	124.76	117.70
1	1	359	U	C2-N1-C1'	5.88	124.75	117.70
1	1	1805	C	C6-N1-C2	-5.68	118.03	120.30
1	1	2829	U	C2-N1-C1'	5.67	124.51	117.70
1	1	3347	A	C5-C6-N6	5.66	128.23	123.70
3	6	1	C	O4'-C1'-N1	5.64	112.72	108.20
1	1	2899	C	N1-C2-O2	5.24	122.04	118.90
1	1	1660	C	N3-C2-O2	-5.22	118.25	121.90
1	1	2988	C	N1-C2-O2	5.07	121.94	118.90
1	1	2953	U	C2-N1-C1'	5.01	123.71	117.70

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
9	F	157	ASN	Peptide
11	H	22	SER	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
4	A	192/291 (66%)	185 (96%)	7 (4%)	0	100 100
5	B	331/387 (86%)	318 (96%)	13 (4%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	C	351/362 (97%)	337 (96%)	14 (4%)	0	100	100
7	D	433/505 (86%)	423 (98%)	10 (2%)	0	100	100
8	E	137/176 (78%)	136 (99%)	1 (1%)	0	100	100
9	F	220/244 (90%)	209 (95%)	10 (4%)	1 (0%)	29	68
10	G	180/256 (70%)	173 (96%)	7 (4%)	0	100	100
11	H	188/191 (98%)	179 (95%)	9 (5%)	0	100	100
12	I	389/663 (59%)	371 (95%)	18 (5%)	0	100	100
13	J	143/427 (34%)	141 (99%)	2 (1%)	0	100	100
14	K	253/376 (67%)	240 (95%)	13 (5%)	0	100	100
15	L	116/199 (58%)	110 (95%)	6 (5%)	0	100	100
16	M	129/138 (94%)	128 (99%)	1 (1%)	0	100	100
17	N	178/204 (87%)	177 (99%)	1 (1%)	0	100	100
18	O	195/199 (98%)	193 (99%)	2 (1%)	0	100	100
19	P	153/184 (83%)	149 (97%)	4 (3%)	0	100	100
20	Q	123/186 (66%)	122 (99%)	1 (1%)	0	100	100
21	R	111/189 (59%)	108 (97%)	3 (3%)	0	100	100
22	S	168/172 (98%)	155 (92%)	13 (8%)	0	100	100
23	U	96/121 (79%)	94 (98%)	2 (2%)	0	100	100
24	V	132/137 (96%)	130 (98%)	2 (2%)	0	100	100
25	W	230/236 (98%)	228 (99%)	2 (1%)	0	100	100
26	X	131/142 (92%)	124 (95%)	7 (5%)	0	100	100
27	Y	124/127 (98%)	124 (100%)	0	0	100	100
28	Z	133/136 (98%)	130 (98%)	3 (2%)	0	100	100
29	b	413/647 (64%)	399 (97%)	14 (3%)	0	100	100
30	c	95/105 (90%)	95 (100%)	0	0	100	100
31	d	97/113 (86%)	94 (97%)	3 (3%)	0	100	100
32	e	114/130 (88%)	111 (97%)	3 (3%)	0	100	100
33	f	104/107 (97%)	102 (98%)	2 (2%)	0	100	100
34	g	95/121 (78%)	94 (99%)	1 (1%)	0	100	100
35	h	115/120 (96%)	107 (93%)	8 (7%)	0	100	100
36	i	65/100 (65%)	65 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
37	j	71/88 (81%)	70 (99%)	1 (1%)	0	100	100
38	k	70/78 (90%)	70 (100%)	0	0	100	100
39	l	172/181 (95%)	165 (96%)	6 (4%)	1 (1%)	25	65
40	m	641/807 (79%)	625 (98%)	16 (2%)	0	100	100
41	n	403/605 (67%)	393 (98%)	10 (2%)	0	100	100
42	o	131/220 (60%)	124 (95%)	7 (5%)	0	100	100
43	p	288/460 (63%)	280 (97%)	8 (3%)	0	100	100
44	q	297/618 (48%)	281 (95%)	14 (5%)	2 (1%)	22	62
45	r	151/261 (58%)	143 (95%)	8 (5%)	0	100	100
46	s	29/520 (6%)	29 (100%)	0	0	100	100
47	t	280/322 (87%)	263 (94%)	17 (6%)	0	100	100
48	u	114/199 (57%)	113 (99%)	1 (1%)	0	100	100
49	v	124/231 (54%)	123 (99%)	1 (1%)	0	100	100
50	w	180/841 (21%)	177 (98%)	3 (2%)	0	100	100
51	y	223/245 (91%)	220 (99%)	3 (1%)	0	100	100
All	All	9108/13367 (68%)	8827 (97%)	277 (3%)	4 (0%)	100	100

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
39	l	136	MET
44	q	429	VAL
9	F	159	GLN
44	q	430	ILE

### 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	
4	A	185/263 (70%)	179 (97%)	6 (3%)	39	62

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	B	282/323 (87%)	274 (97%)	8 (3%)	43	65
6	C	286/289 (99%)	278 (97%)	8 (3%)	43	65
7	D	381/440 (87%)	367 (96%)	14 (4%)	34	59
8	E	122/153 (80%)	120 (98%)	2 (2%)	62	79
9	F	186/205 (91%)	184 (99%)	2 (1%)	73	85
10	G	150/208 (72%)	146 (97%)	4 (3%)	44	66
11	H	170/171 (99%)	166 (98%)	4 (2%)	49	69
12	I	373/602 (62%)	369 (99%)	4 (1%)	73	85
13	J	133/383 (35%)	130 (98%)	3 (2%)	50	70
14	K	238/346 (69%)	233 (98%)	5 (2%)	53	72
15	L	97/159 (61%)	95 (98%)	2 (2%)	53	72
16	M	105/109 (96%)	105 (100%)	0	100	100
17	N	158/176 (90%)	156 (99%)	2 (1%)	69	82
18	O	160/162 (99%)	157 (98%)	3 (2%)	57	75
19	P	130/146 (89%)	128 (98%)	2 (2%)	65	80
20	Q	102/151 (68%)	100 (98%)	2 (2%)	55	73
21	R	98/154 (64%)	97 (99%)	1 (1%)	76	86
22	S	155/156 (99%)	148 (96%)	7 (4%)	27	53
23	U	85/107 (79%)	85 (100%)	0	100	100
24	V	103/105 (98%)	101 (98%)	2 (2%)	57	75
25	W	209/213 (98%)	202 (97%)	7 (3%)	38	61
26	X	111/118 (94%)	110 (99%)	1 (1%)	78	88
27	Y	109/110 (99%)	108 (99%)	1 (1%)	78	88
28	Z	115/116 (99%)	115 (100%)	0	100	100
29	b	377/573 (66%)	367 (97%)	10 (3%)	44	66
30	c	81/88 (92%)	79 (98%)	2 (2%)	47	68
31	d	89/97 (92%)	87 (98%)	2 (2%)	52	71
32	e	103/111 (93%)	101 (98%)	2 (2%)	57	75
33	f	90/91 (99%)	90 (100%)	0	100	100
34	g	84/103 (82%)	83 (99%)	1 (1%)	71	84
35	h	104/105 (99%)	101 (97%)	3 (3%)	42	64

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
36	i	57/82 (70%)	54 (95%)	3 (5%)	22	49
37	j	60/71 (84%)	59 (98%)	1 (2%)	60	78
38	k	67/69 (97%)	67 (100%)	0	100	100
39	l	149/156 (96%)	144 (97%)	5 (3%)	37	61
40	m	582/723 (80%)	570 (98%)	12 (2%)	53	72
41	n	371/548 (68%)	365 (98%)	6 (2%)	62	79
42	o	118/199 (59%)	116 (98%)	2 (2%)	60	78
43	p	265/413 (64%)	260 (98%)	5 (2%)	57	75
44	q	258/535 (48%)	251 (97%)	7 (3%)	44	66
45	r	142/229 (62%)	137 (96%)	5 (4%)	36	60
46	s	27/445 (6%)	26 (96%)	1 (4%)	34	59
47	t	256/287 (89%)	248 (97%)	8 (3%)	40	62
48	u	101/180 (56%)	99 (98%)	2 (2%)	55	73
49	v	116/205 (57%)	115 (99%)	1 (1%)	78	88
50	w	179/745 (24%)	174 (97%)	5 (3%)	43	65
51	y	193/211 (92%)	192 (100%)	1 (0%)	88	93
All	All	8112/11631 (70%)	7938 (98%)	174 (2%)	56	72

All (174) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	A	43	TYR
4	A	59	SER
4	A	82	ASN
4	A	106	ASN
4	A	142	ARG
4	A	225	LEU
5	B	28	ARG
5	B	34	LYS
5	B	167	ARG
5	B	182	GLN
5	B	332	ARG
5	B	340	LYS
5	B	345	ASN
5	B	370	PHE
6	C	43	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
6	C	93	MET
6	C	115	HIS
6	C	120	TYR
6	C	138	ARG
6	C	177	ASP
6	C	187	LEU
6	C	246	ARG
7	D	65	MET
7	D	124	ARG
7	D	145	PHE
7	D	222	ARG
7	D	224	SER
7	D	266	GLN
7	D	304	TYR
7	D	314	LEU
7	D	319	LEU
7	D	325	GLN
7	D	351	ARG
7	D	412	LEU
7	D	454	TYR
7	D	486	ASN
8	E	31	ARG
8	E	152	THR
9	F	158	LYS
9	F	179	LEU
10	G	84	ARG
10	G	95	ASN
10	G	166	LEU
10	G	201	THR
11	H	1	MET
11	H	157	ASN
11	H	180	TYR
11	H	183	HIS
12	I	216	PHE
12	I	269	ARG
12	I	441	ASN
12	I	473	LEU
13	J	201	MET
13	J	263	ARG
13	J	272	LEU
14	K	76	LYS
14	K	119	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
14	K	253	TRP
14	K	262	ASN
14	K	270	LEU
15	L	21	ARG
15	L	100	ARG
17	N	117	ASN
17	N	144	ARG
18	O	27	LEU
18	O	101	ARG
18	O	159	LYS
19	P	34	GLN
19	P	97	ASN
20	Q	78	ASN
20	Q	105	ARG
21	R	134	HIS
22	S	8	GLN
22	S	12	ARG
22	S	73	LYS
22	S	103	VAL
22	S	155	ARG
22	S	171	PHE
22	S	172	TYR
24	V	25	CYS
24	V	124	ASP
25	W	31	ARG
25	W	60	TRP
25	W	92	LEU
25	W	113	LYS
25	W	194	LYS
25	W	213	PHE
25	W	232	ASN
26	X	12	LYS
27	Y	51	ARG
29	b	45	PHE
29	b	86	TYR
29	b	92	LYS
29	b	168	ARG
29	b	169	THR
29	b	177	ASN
29	b	180	LYS
29	b	318	MET
29	b	403	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	b	430	ASP
30	c	24	THR
30	c	86	ARG
31	d	28	ARG
31	d	92	TYR
32	e	33	ARG
32	e	98	HIS
34	g	16	ARG
35	h	10	ARG
35	h	49	LYS
35	h	119	LYS
36	i	53	TYR
36	i	57	LEU
36	i	62	ARG
37	j	24	ARG
39	l	1	MET
39	l	40	GLN
39	l	60	ARG
39	l	85	SER
39	l	174	ARG
40	m	134	ARG
40	m	178	LYS
40	m	246	TRP
40	m	322	MET
40	m	336	GLU
40	m	359	TYR
40	m	375	ARG
40	m	428	ARG
40	m	635	PHE
40	m	661	TYR
40	m	705	LEU
40	m	730	ASN
41	n	92	ARG
41	n	160	GLN
41	n	199	TRP
41	n	366	TYR
41	n	394	ASP
41	n	566	LEU
42	o	102	PHE
42	o	146	MET
43	p	152	TYR
43	p	165	ARG

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Mol	Chain	Res	Type
43	p	300	ASN
43	p	326	ARG
43	p	406	ARG
44	q	282	ARG
44	q	350	LEU
44	q	408	PHE
44	q	456	LEU
44	q	496	ARG
44	q	542	PHE
44	q	546	PHE
45	r	156	PHE
45	r	163	ARG
45	r	167	LYS
45	r	168	MET
45	r	203	ASN
46	s	15	LEU
47	t	32	GLU
47	t	157	ASN
47	t	160	PHE
47	t	246	CYS
47	t	275	ARG
47	t	278	SER
47	t	291	GLN
47	t	293	GLU
48	u	5	GLN
48	u	113	ARG
49	v	46	MET
50	w	264	ARG
50	w	291	LYS
50	w	667	HIS
50	w	715	LYS
50	w	719	MET
51	y	51	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (41) such sidechains are listed below:

Mol	Chain	Res	Type
4	A	45	HIS
5	B	279	ASN
6	C	48	GLN
6	C	213	ASN
6	C	311	HIS

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Mol	Chain	Res	Type
7	D	69	GLN
7	D	166	ASN
7	D	251	ASN
7	D	424	ASN
7	D	441	GLN
9	F	186	HIS
10	G	59	GLN
10	G	95	ASN
10	G	192	GLN
11	H	139	ASN
14	K	233	GLN
19	P	96	GLN
19	P	118	GLN
25	W	232	ASN
27	Y	4	GLN
28	Z	29	HIS
28	Z	40	HIS
32	e	52	GLN
39	l	30	ASN
39	l	166	GLN
40	m	176	ASN
40	m	232	GLN
40	m	365	ASN
40	m	509	ASN
40	m	730	ASN
41	n	7	ASN
41	n	160	GLN
41	n	164	ASN
43	p	135	ASN
45	r	183	ASN
45	r	203	ASN
47	t	157	ASN
49	v	31	GLN
50	w	825	ASN
50	w	827	GLN
51	y	9	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	2344/3396 (69%)	454 (19%)	50 (2%)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	2	157/158 (99%)	34 (21%)	3 (1%)
3	6	64/232 (27%)	22 (34%)	3 (4%)
All	All	2565/3786 (67%)	510 (19%)	56 (2%)

All (510) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	2	U
1	1	7	C
1	1	14	U
1	1	26	A
1	1	41	G
1	1	42	C
1	1	43	A
1	1	48	A
1	1	49	A
1	1	60	A
1	1	65	A
1	1	66	A
1	1	90	C
1	1	92	G
1	1	94	G
1	1	109	A
1	1	110	G
1	1	111	C
1	1	117	U
1	1	118	U
1	1	122	A
1	1	135	C
1	1	136	G
1	1	156	G
1	1	157	A
1	1	165	A
1	1	166	C
1	1	170	G
1	1	190	U
1	1	191	U
1	1	200	C
1	1	207	U
1	1	210	U
1	1	213	A
1	1	218	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	219	A
1	1	221	A
1	1	231	G
1	1	234	G
1	1	240	U
1	1	241	G
1	1	243	G
1	1	248	U
1	1	249	U
1	1	250	U
1	1	251	G
1	1	252	U
1	1	255	A
1	1	265	A
1	1	267	G
1	1	268	A
1	1	269	G
1	1	283	G
1	1	284	A
1	1	285	A
1	1	298	U
1	1	305	U
1	1	311	C
1	1	323	A
1	1	324	A
1	1	329	U
1	1	339	C
1	1	352	A
1	1	370	U
1	1	374	A
1	1	376	G
1	1	401	U
1	1	402	A
1	1	403	C
1	1	404	G
1	1	421	G
1	1	422	A
1	1	439	C
1	1	440	A
1	1	495	G
1	1	521	A
1	1	535	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	536	U
1	1	544	C
1	1	547	G
1	1	548	G
1	1	552	G
1	1	557	A
1	1	559	A
1	1	569	A
1	1	578	A
1	1	579	G
1	1	589	A
1	1	592	A
1	1	593	C
1	1	597	G
1	1	604	G
1	1	611	A
1	1	620	U
1	1	621	A
1	1	622	A
1	1	636	C
1	1	638	C
1	1	650	C
1	1	660	A
1	1	677	A
1	1	681	U
1	1	691	A
1	1	705	A
1	1	717	C
1	1	721	G
1	1	722	G
1	1	725	G
1	1	735	A
1	1	742	G
1	1	743	C
1	1	757	C
1	1	758	C
1	1	760	G
1	1	761	A
1	1	771	A
1	1	775	A
1	1	779	G
1	1	785	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	801	A
1	1	818	C
1	1	819	U
1	1	822	G
1	1	848	A
1	1	857	G
1	1	876	A
1	1	877	C
1	1	878	G
1	1	879	U
1	1	887	G
1	1	888	A
1	1	891	G
1	1	895	A
1	1	896	A
1	1	900	G
1	1	904	A
1	1	914	A
1	1	916	G
1	1	918	C
1	1	937	G
1	1	938	C
1	1	944	C
1	1	958	C
1	1	959	C
1	1	960	U
1	1	963	G
1	1	964	G
1	1	976	U
1	1	977	C
1	1	979	U
1	1	980	A
1	1	982	C
1	1	991	G
1	1	1098	A
1	1	1103	A
1	1	1104	G
1	1	1105	A
1	1	1111	U
1	1	1112	A
1	1	1116	G
1	1	1117	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	1127	G
1	1	1129	A
1	1	1130	A
1	1	1132	C
1	1	1142	G
1	1	1144	U
1	1	1153	A
1	1	1154	A
1	1	1155	C
1	1	1159	A
1	1	1180	A
1	1	1181	U
1	1	1192	C
1	1	1193	A
1	1	1196	C
1	1	1201	C
1	1	1204	A
1	1	1217	A
1	1	1218	U
1	1	1220	U
1	1	1222	G
1	1	1223	A
1	1	1228	C
1	1	1242	G
1	1	1244	A
1	1	1245	A
1	1	1246	G
1	1	1248	C
1	1	1251	A
1	1	1252	A
1	1	1254	C
1	1	1262	G
1	1	1264	G
1	1	1272	C
1	1	1278	A
1	1	1285	G
1	1	1286	A
1	1	1287	A
1	1	1304	A
1	1	1307	G
1	1	1308	A
1	1	1330	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	1332	A
1	1	1348	U
1	1	1349	G
1	1	1350	A
1	1	1351	U
1	1	1352	A
1	1	1353	U
1	1	1354	G
1	1	1355	A
1	1	1356	U
1	1	1357	G
1	1	1386	A
1	1	1393	A
1	1	1399	A
1	1	1400	G
1	1	1405	U
1	1	1406	A
1	1	1407	A
1	1	1408	G
1	1	1417	G
1	1	1419	A
1	1	1434	G
1	1	1436	U
1	1	1437	C
1	1	1452	A
1	1	1453	A
1	1	1454	A
1	1	1455	U
1	1	1483	G
1	1	1485	G
1	1	1507	G
1	1	1508	C
1	1	1514	G
1	1	1528	G
1	1	1539	A
1	1	1556	C
1	1	1560	G
1	1	1561	G
1	1	1562	C
1	1	1566	A
1	1	1567	U
1	1	1568	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	1570	U
1	1	1571	A
1	1	1574	C
1	1	1575	A
1	1	1579	C
1	1	1582	C
1	1	1583	A
1	1	1587	A
1	1	1589	A
1	1	1593	A
1	1	1603	A
1	1	1605	A
1	1	1608	C
1	1	1628	C
1	1	1629	U
1	1	1631	C
1	1	1637	A
1	1	1638	A
1	1	1639	C
1	1	1642	A
1	1	1643	A
1	1	1645	U
1	1	1646	G
1	1	1647	A
1	1	1656	A
1	1	1717	U
1	1	1718	G
1	1	1725	C
1	1	1741	A
1	1	1750	A
1	1	1751	G
1	1	1760	A
1	1	1761	C
1	1	1770	G
1	1	1773	C
1	1	1775	G
1	1	1780	G
1	1	1790	G
1	1	1792	C
1	1	1795	U
1	1	1796	G
1	1	1797	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	1808	G
1	1	1814	A
1	1	1815	U
1	1	1817	G
1	1	1821	U
1	1	1835	A
1	1	1852	G
1	1	1853	U
1	1	1857	C
1	1	1862	U
1	1	1864	A
1	1	1865	A
1	1	1866	C
1	1	1867	A
1	1	1868	G
1	1	1878	G
1	1	1880	U
1	1	1900	A
1	1	1902	G
1	1	1905	G
1	1	1906	G
1	1	2336	U
1	1	2363	A
1	1	2373	A
1	1	2374	C
1	1	2375	G
1	1	2376	G
1	1	2377	G
1	1	2394	G
1	1	2410	U
1	1	2411	U
1	1	2413	A
1	1	2414	G
1	1	2415	C
1	1	2418	G
1	1	2419	A
1	1	2420	C
1	1	2434	U
1	1	2606	G
1	1	2607	G
1	1	2803	A
1	1	2807	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	2810	C
1	1	2812	C
1	1	2813	A
1	1	2816	G
1	1	2817	A
1	1	2820	A
1	1	2824	G
1	1	2825	C
1	1	2826	U
1	1	2838	A
1	1	2839	G
1	1	2842	U
1	1	2848	G
1	1	2857	C
1	1	2858	U
1	1	2877	G
1	1	2878	G
1	1	2879	C
1	1	2887	A
1	1	2898	G
1	1	2911	A
1	1	2922	G
1	1	2923	U
1	1	2926	A
1	1	2928	C
1	1	2930	A
1	1	2935	U
1	1	2936	A
1	1	2941	A
1	1	2942	C
1	1	2943	G
1	1	2945	G
1	1	2952	G
1	1	2957	G
1	1	2964	G
1	1	2965	U
1	1	2975	U
1	1	2976	A
1	1	2978	U
1	1	2979	U
1	1	2980	U
1	1	2984	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	2987	A
1	1	2989	U
1	1	2990	G
1	1	2996	U
1	1	2997	G
1	1	3012	A
1	1	3017	A
1	1	3021	A
1	1	3022	G
1	1	3029	A
1	1	3030	G
1	1	3032	A
1	1	3056	U
1	1	3057	U
1	1	3058	U
1	1	3059	G
1	1	3071	U
1	1	3072	C
1	1	3086	A
1	1	3092	C
1	1	3093	C
1	1	3099	C
1	1	3100	U
1	1	3101	G
1	1	3102	G
1	1	3104	U
1	1	3109	G
1	1	3129	A
1	1	3130	A
1	1	3131	U
1	1	3142	A
1	1	3143	C
1	1	3144	G
1	1	3153	U
1	1	3154	C
1	1	3156	U
1	1	3157	U
1	1	3165	A
1	1	3170	A
1	1	3173	G
1	1	3174	A
1	1	3176	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	3179	U
1	1	3181	C
1	1	3187	A
1	1	3196	U
1	1	3207	U
1	1	3217	C
1	1	3218	A
1	1	3219	G
1	1	3224	G
1	1	3229	G
1	1	3238	G
1	1	3243	A
1	1	3244	A
1	1	3245	A
1	1	3247	G
1	1	3259	U
1	1	3260	G
1	1	3270	U
1	1	3273	A
1	1	3276	G
1	1	3281	U
1	1	3283	U
1	1	3289	G
1	1	3294	A
1	1	3304	U
1	1	3313	U
1	1	3316	A
1	1	3317	U
1	1	3320	A
1	1	3334	U
1	1	3335	A
1	1	3341	U
1	1	3342	A
1	1	3345	G
1	1	3351	U
1	1	3352	U
1	1	3359	A
1	1	3363	U
1	1	3369	G
1	1	3375	A
1	1	3378	C
2	2	15	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	2	16	G
2	2	34	U
2	2	35	C
2	2	39	G
2	2	49	G
2	2	52	A
2	2	59	A
2	2	62	C
2	2	63	G
2	2	72	A
2	2	78	G
2	2	79	A
2	2	80	A
2	2	81	U
2	2	82	U
2	2	83	C
2	2	84	C
2	2	85	G
2	2	86	U
2	2	87	G
2	2	90	U
2	2	95	G
2	2	101	U
2	2	104	A
2	2	106	C
2	2	107	G
2	2	113	U
2	2	116	G
2	2	124	G
2	2	125	U
2	2	126	A
2	2	127	U
2	2	158	U
3	6	2	C
3	6	5	C
3	6	6	U
3	6	7	C
3	6	8	A
3	6	14	U
3	6	15	C
3	6	16	U
3	6	17	G

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Mol	Chain	Res	Type
3	6	34	A
3	6	36	U
3	6	38	U
3	6	39	U
3	6	40	U
3	6	42	G
3	6	43	A
3	6	54	A
3	6	56	U
3	6	57	U
3	6	59	C
3	6	229	U
3	6	232	A

All (56) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	1	13	A
1	1	116	A
1	1	165	A
1	1	304	G
1	1	494	G
1	1	603	A
1	1	649	A
1	1	720	A
1	1	734	C
1	1	917	A
1	1	981	U
1	1	990	U
1	1	1102	A
1	1	1104	G
1	1	1128	U
1	1	1129	A
1	1	1143	A
1	1	1200	A
1	1	1227	C
1	1	1241	U
1	1	1303	A
1	1	1307	G
1	1	1329	U
1	1	1352	A
1	1	1355	A

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Mol	Chain	Res	Type
1	1	1454	A
1	1	1574	C
1	1	1581	C
1	1	1582	C
1	1	1602	A
1	1	1636	U
1	1	1645	U
1	1	1794	G
1	1	1807	G
1	1	1820	U
1	1	1861	G
1	1	2419	A
1	1	2606	G
1	1	2841	G
1	1	2847	A
1	1	2922	G
1	1	2940	A
1	1	2986	U
1	1	2988	C
1	1	2995	A
1	1	3058	U
1	1	3218	A
1	1	3228	C
1	1	3269	U
1	1	3350	C
2	2	71	A
2	2	83	C
2	2	123	G
3	6	1	C
3	6	16	U
3	6	56	U

#### 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 1 ligands modelled in this entry, 1 is 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](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
39	1	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	1	135:ALA	C	136:MET	N	1.70

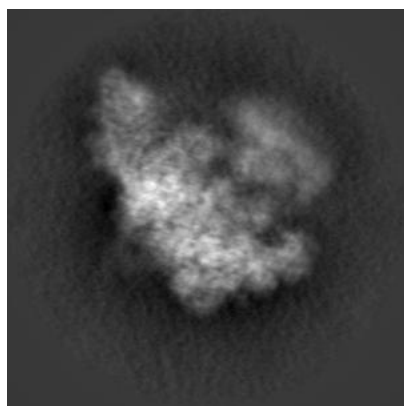
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-12906. These allow visual inspection of the internal detail of the map and identification of artifacts.

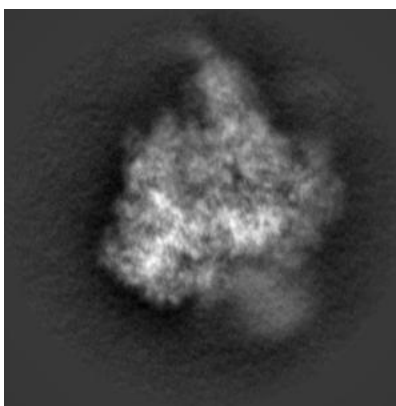
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

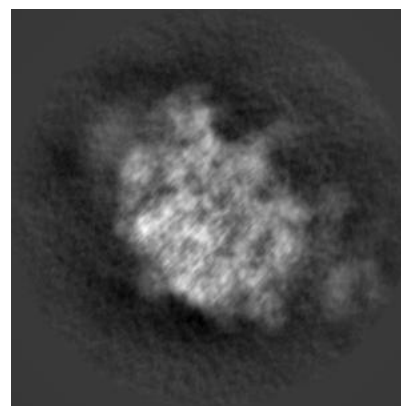
#### 6.1.1 Primary map



X

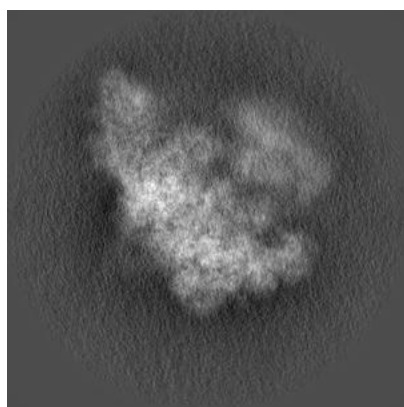


Y

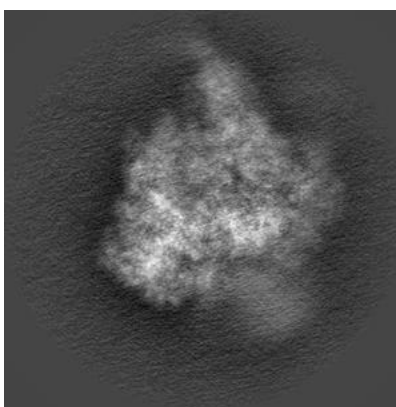


Z

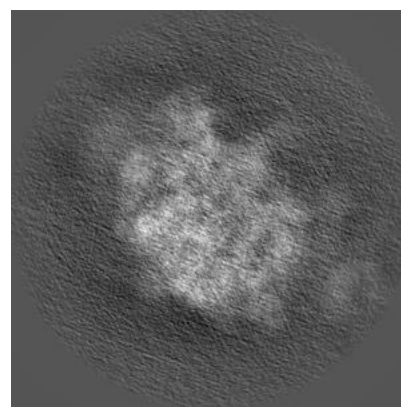
#### 6.1.2 Raw map



X



Y

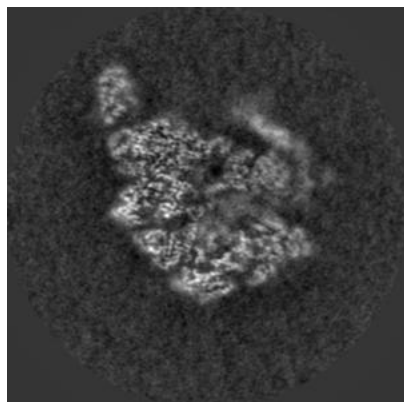


Z

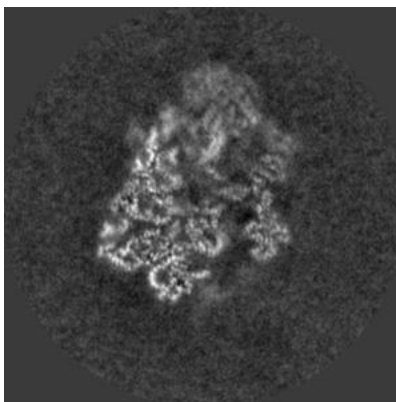
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

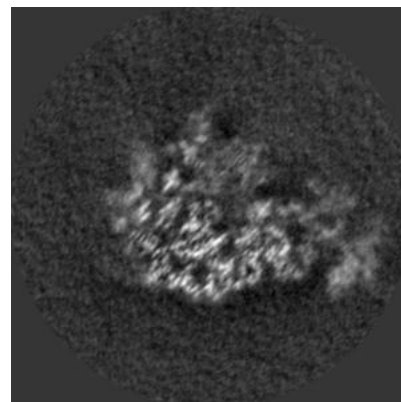
### 6.2.1 Primary map



X Index: 200

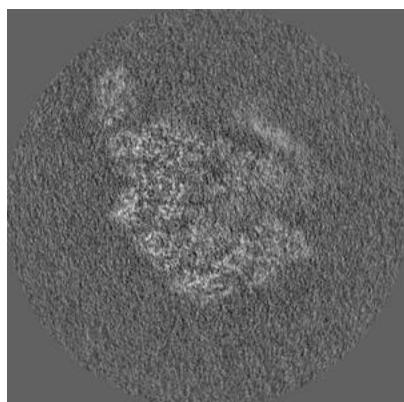


Y Index: 200

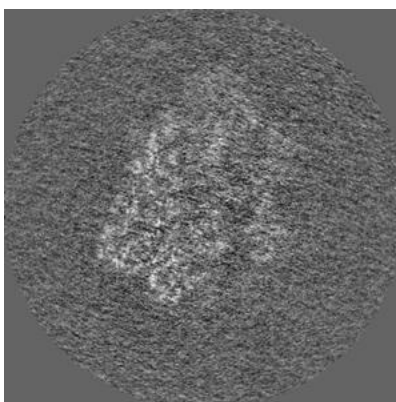


Z Index: 200

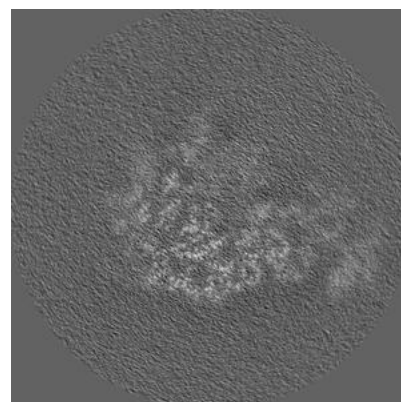
### 6.2.2 Raw map



X Index: 200



Y Index: 200

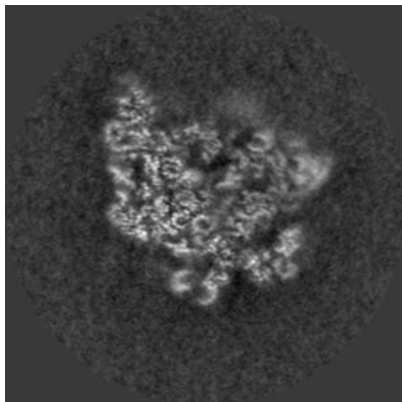


Z Index: 200

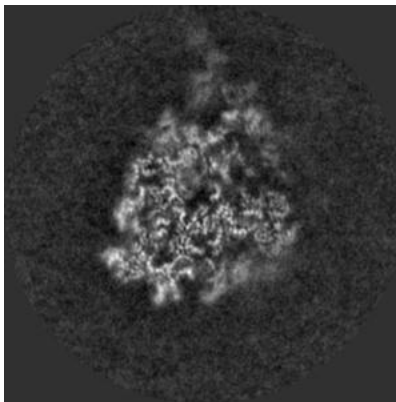
The images above show central slices of the map in three orthogonal directions.

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

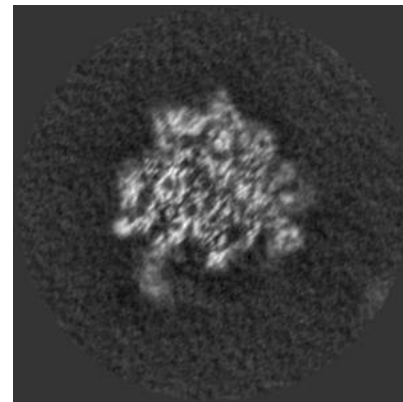
### 6.3.1 Primary map



X Index: 183

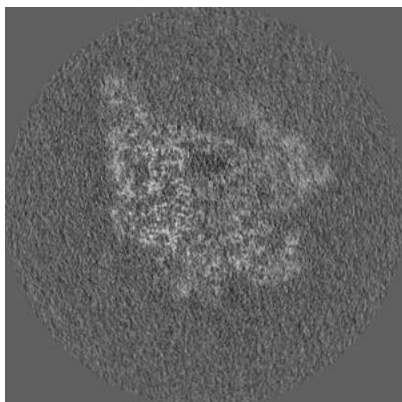


Y Index: 178

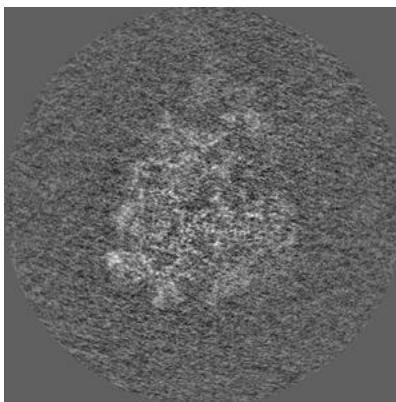


Z Index: 155

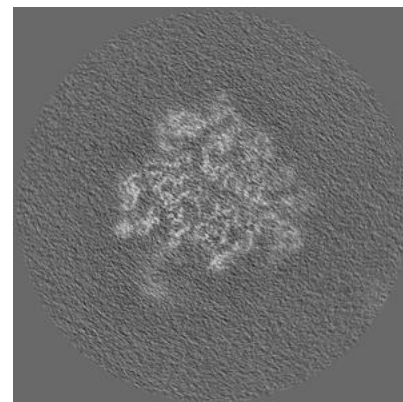
### 6.3.2 Raw map



X Index: 190



Y Index: 177

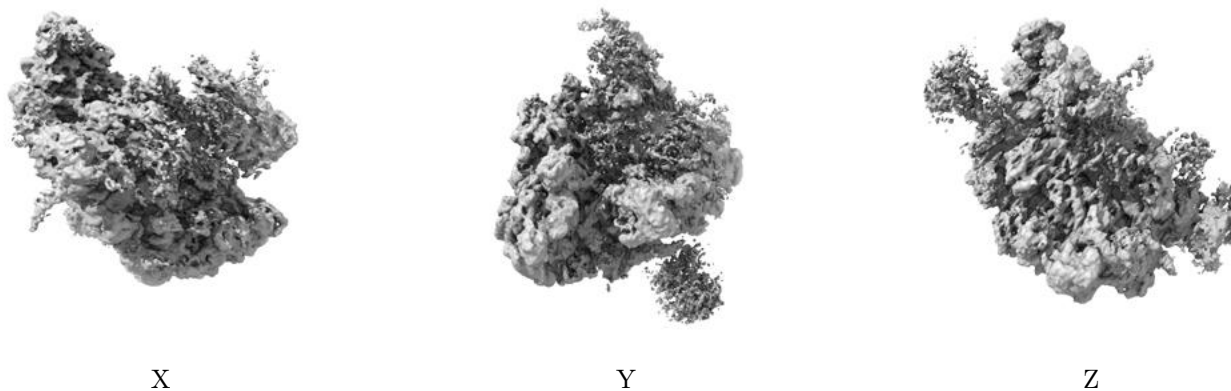


Z Index: 157

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

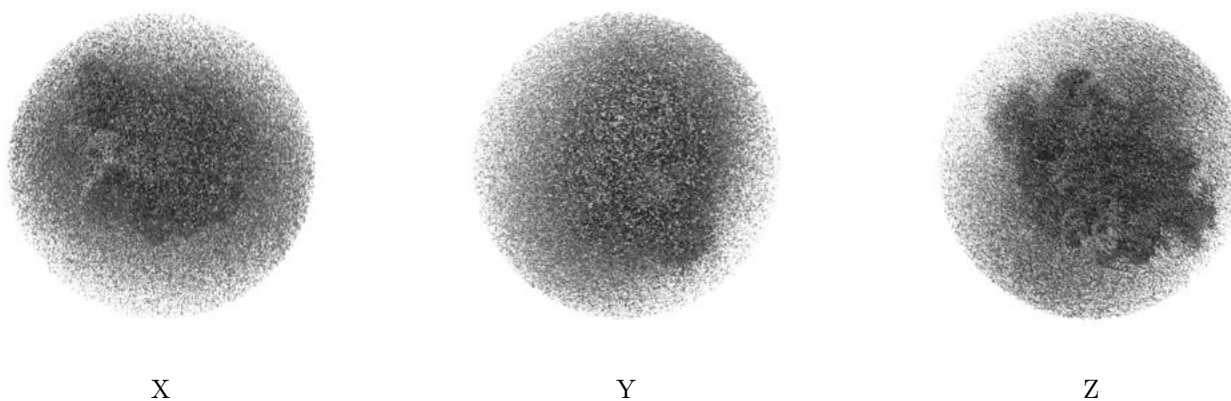
## 6.4 Orthogonal surface views [i](#)

### 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.

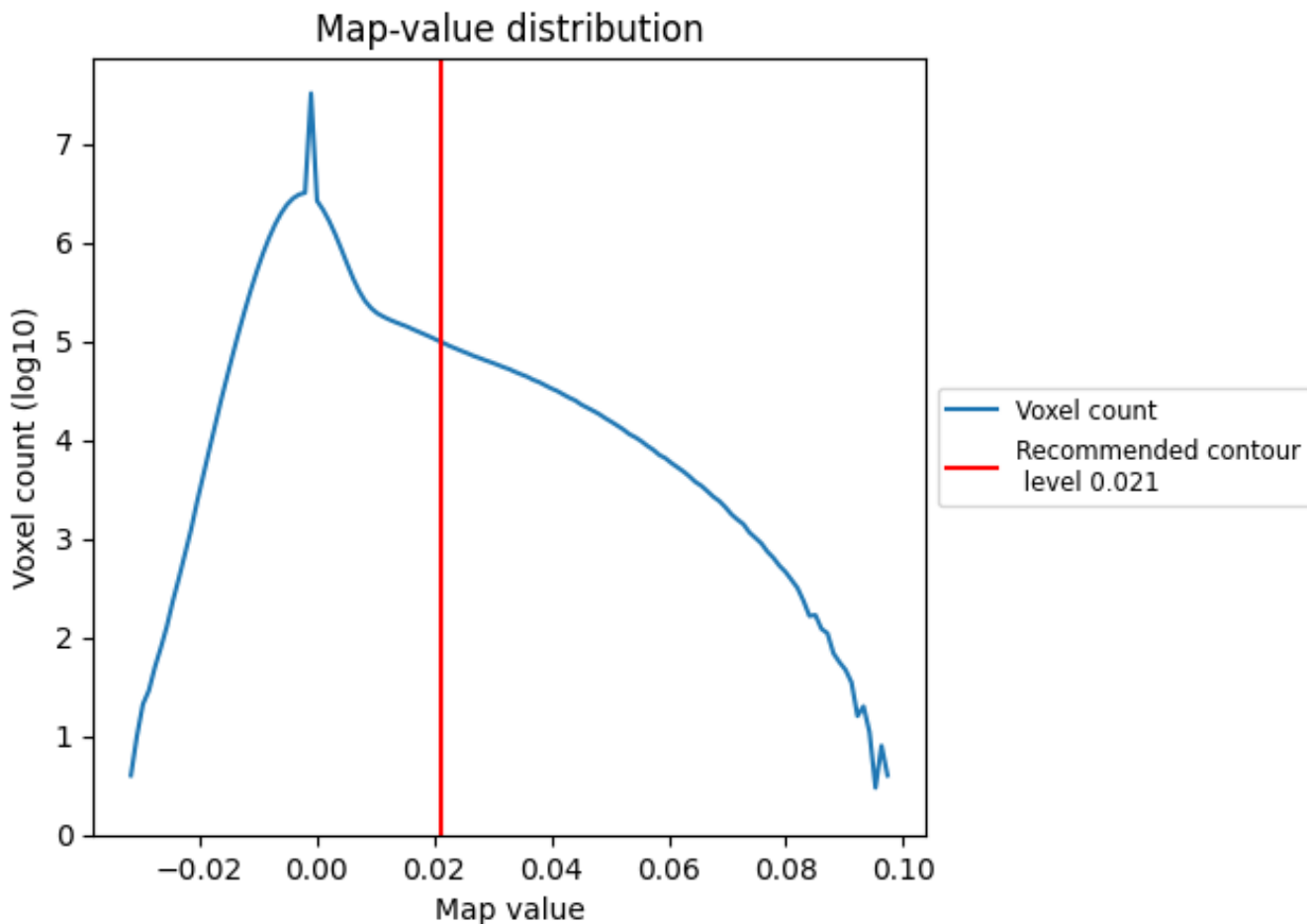
## 6.5 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

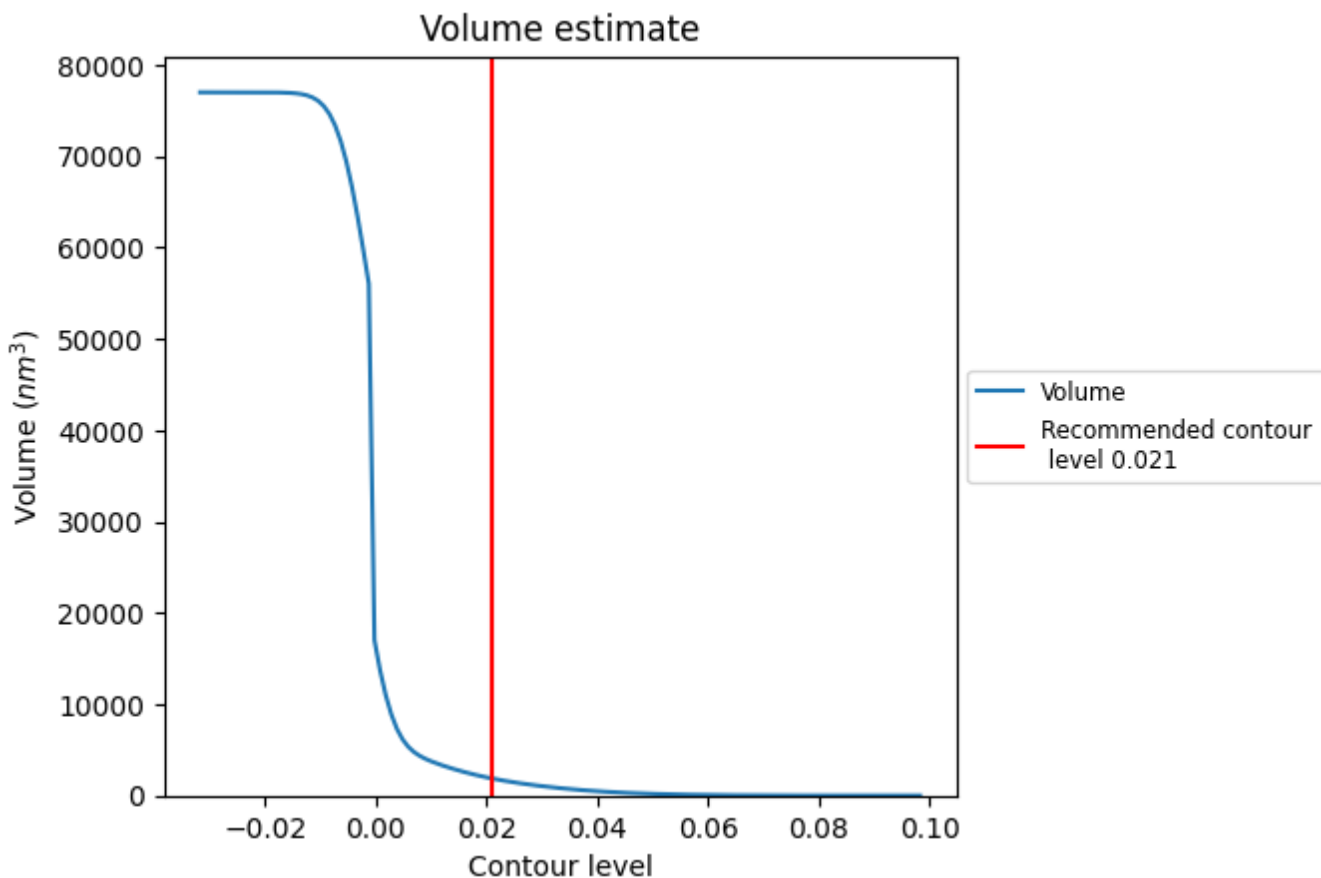
This section contains the results of statistical analysis of the map.

### 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.

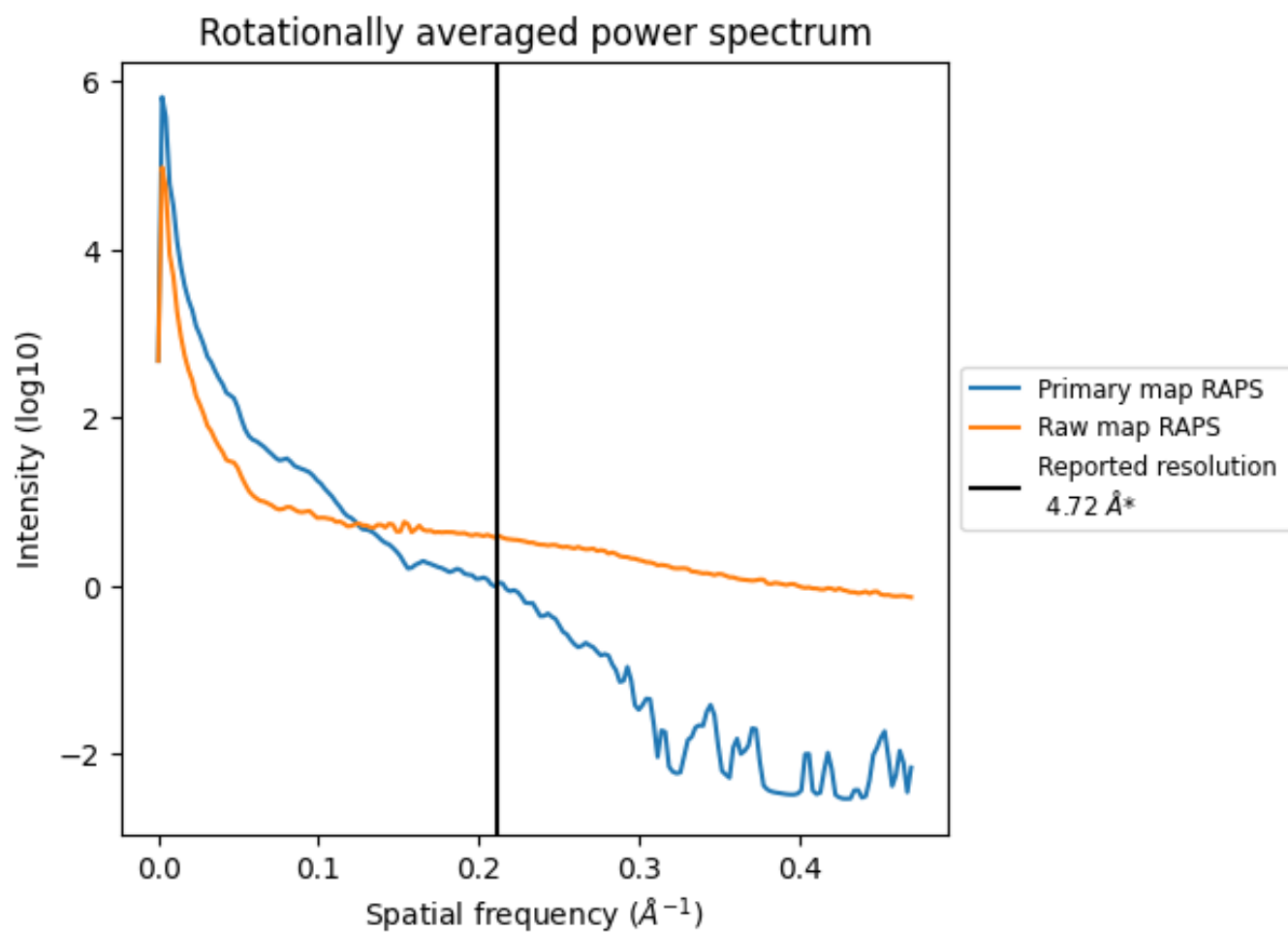
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1876 nm<sup>3</sup>; this corresponds to an approximate mass of 1695 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



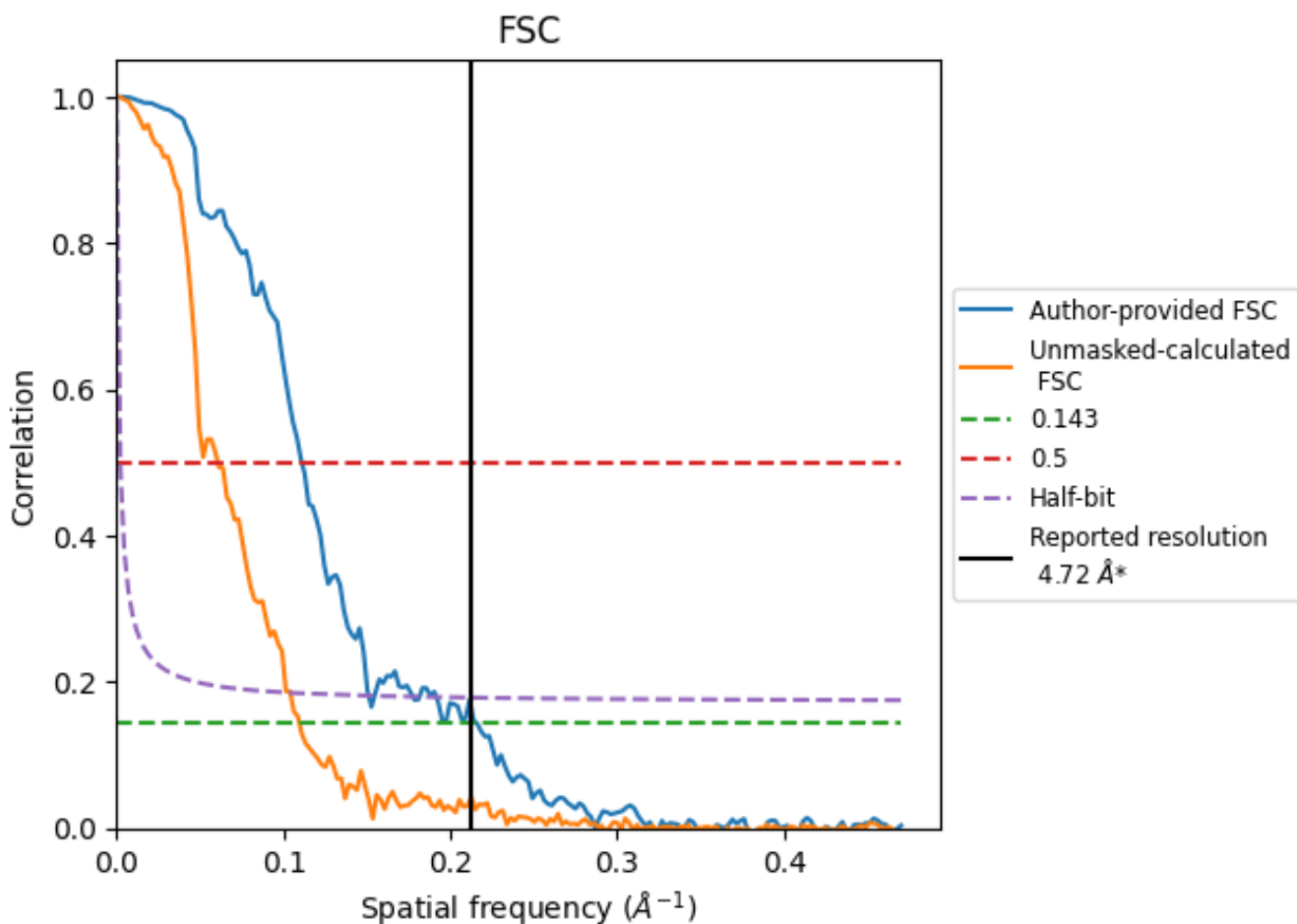
\*Reported resolution corresponds to spatial frequency of 0.212 Å<sup>-1</sup>



## 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  $0.212 \text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

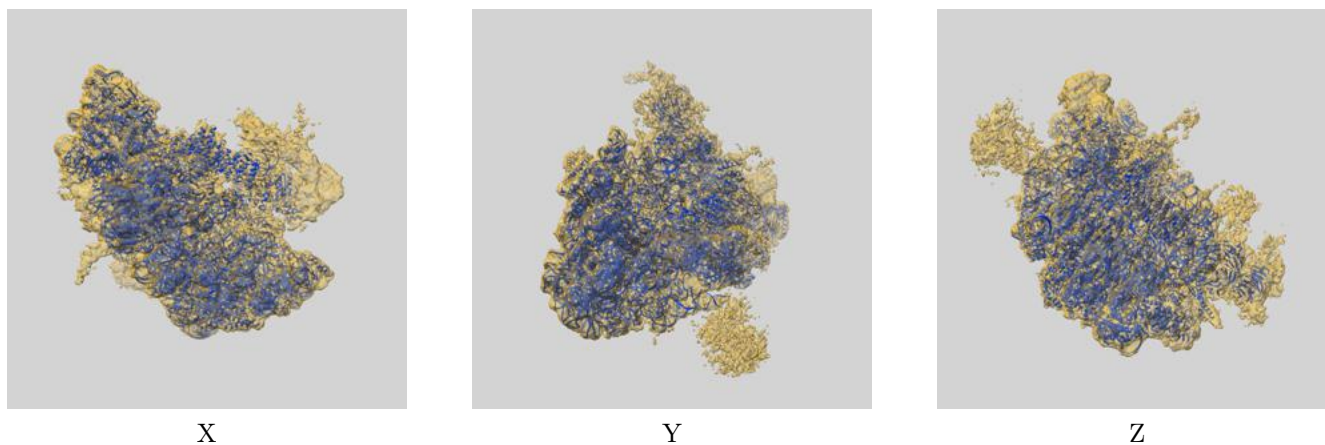
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.72	-	-
Author-provided FSC curve	4.64	9.00	6.61
Unmasked-calculated*	9.12	16.47	9.61

\*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 9.12 differs from the reported value 4.72 by more than 10 %

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

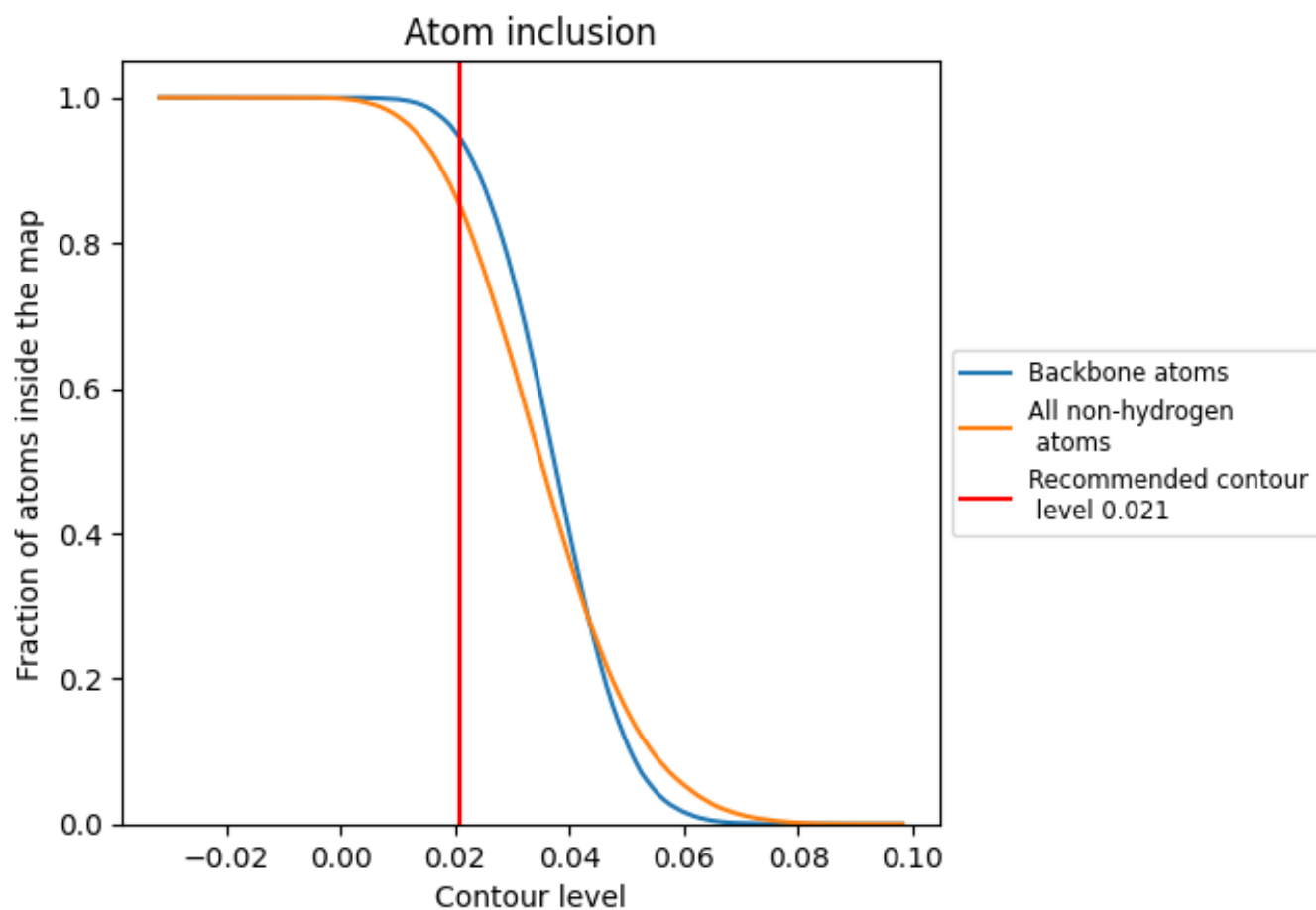
This section contains information regarding the fit between EMDB map EMD-12906 and PDB model 7OHR. Per-residue inclusion information can be found in section [3](#) on page [13](#).

### 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, 94% of all backbone atoms, 85% of all non-hydrogen atoms, are inside the map.