



## Full wwPDB EM Validation Report ⓘ

Nov 21, 2022 – 03:08 PM EST

PDB ID : 8EUG  
EMDB ID : EMD-24412  
Title : Ytm1 associated nascent 60S ribosome State 3  
Authors : Zhou, X.; Bilokapic, S.; Deshmukh, A.A.; Halic, M.  
Deposited on : 2022-10-18  
Resolution : 2.80 Å (reported)

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.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

---

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

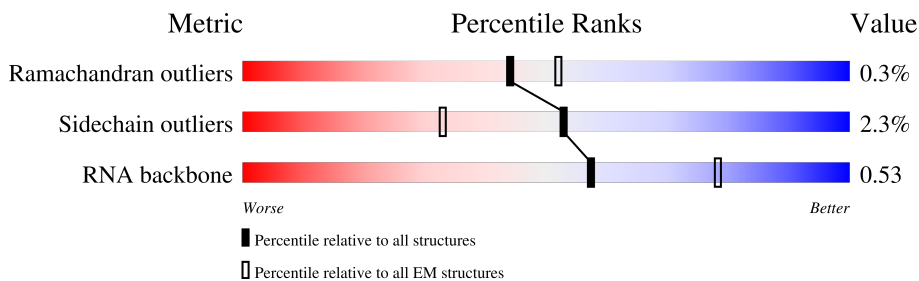
EMDB validation analysis : 0.0.1.dev43  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.2

# 1 Overall quality at a glance i

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

The reported resolution of this entry is 2.80 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.



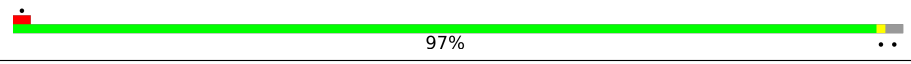

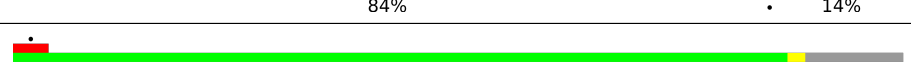
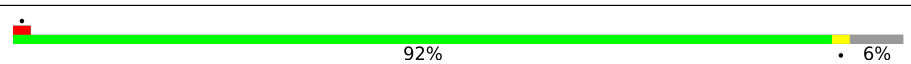

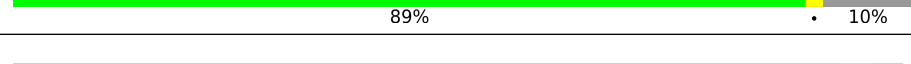
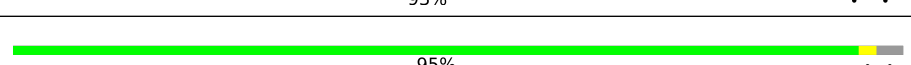
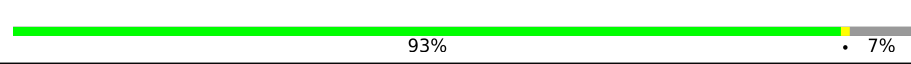
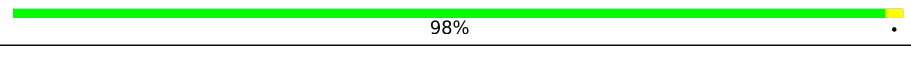
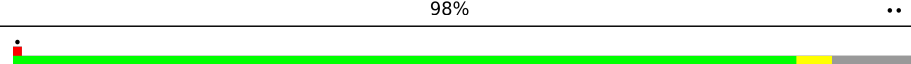
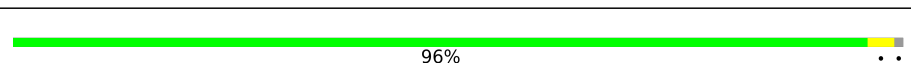

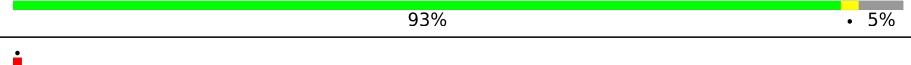
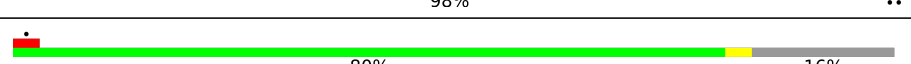
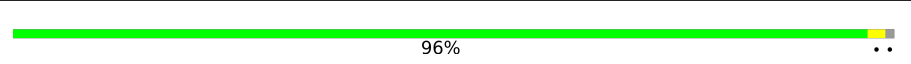
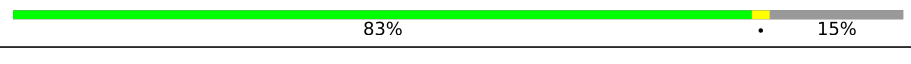
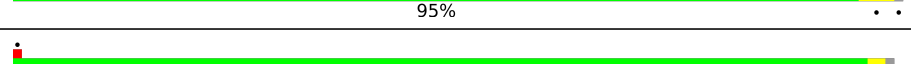
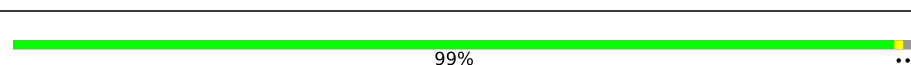
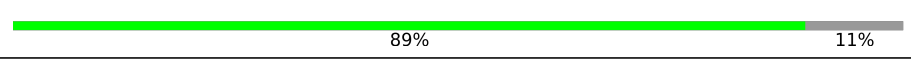




Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	3498	
2	2	165	
3	3	302	
4	8	51	
5	9	229	
6	A	253	
7	B	388	
8	C	363	


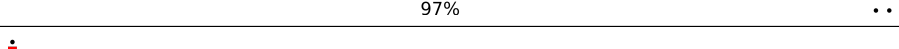

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
9	D	294	 97%
10	E	195	 85% 12%
11	F	250	 84% 14%
12	G	259	 87% 11%
13	H	190	 92% 6%
14	I	221	 76% 23%
15	J	174	 89% 10%
16	K	94	 93%
17	L	208	 95%
18	M	134	 93% 7%
19	N	201	 98%
20	O	197	 98%
21	P	187	 88% 9%
22	Q	187	 96%
23	R	193	 75% 23%
24	S	176	 93% 5%
25	T	160	 98%
26	U	117	 80% 16%
27	V	139	 96%
28	X	141	 83% 15%
29	Y	126	 95%
30	Z	136	 96%
31	a	148	 99%
32	b	61	89% 11%
33	c	117	76% 5% 19%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
34	d	113	 89% 10%
35	e	127	 90% 8%
36	f	108	 97% ..
37	g	112	 92% 5%
38	h	122	 98% ..
39	i	99	 97% .
40	j	91	 91% 9%
41	k	74	 89% 7%
42	m	740	 53% 46%
43	n	607	 7% 57% 42%
44	o	106	 89% 8%
45	p	440	 36% 66% 34%
46	u	192	 28% 69%

## 2 Entry composition

There are 47 unique types of molecules in this entry. The entry contains 123162 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called RNA (2863-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	1	2869	61386	27430	11112	19975	2869	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1	1746	C	U	conflict	GB 157310483
1	2185	U	C	conflict	GB 157310483

- Molecule 2 is a RNA chain called RNA (152-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	2	151	3211	1437	569	1054	151	0	0

- Molecule 3 is a protein called Protein mak16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	3	119	1006	637	188	175	6	0	0

- Molecule 4 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	8	50	437	273	98	65	1	0	0

- Molecule 5 is a RNA chain called RNA (118-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	9	118	2519	1124	452	825	118	0	0

- Molecule 6 is a protein called 60S ribosomal protein L2-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	A	244	1847	1152	370	320	5	0	0

- Molecule 7 is a protein called 60S ribosomal protein L3-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	B	377	3003	1901	567	525	10	0	0

- Molecule 8 is a protein called 60S ribosomal protein L4-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	C	359	2795	1765	536	491	3	0	0

- Molecule 9 is a protein called 60S ribosomal protein L5-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	D	287	2305	1457	409	435	4	0	0

- Molecule 10 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	E	172	1338	860	245	230	3	0	0

- Molecule 11 is a protein called 60S ribosomal protein L7-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	F	214	1745	1124	320	298	3	0	0

- Molecule 12 is a protein called 60S ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	G	230	1817	1161	334	319	3	1	0

- Molecule 13 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	H	178	1415	892	260	257	6	0	0

- Molecule 14 is a protein called 60S ribosomal protein L10-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	I	170	1372	869	256	242	5	0	0

- Molecule 15 is a protein called 60S ribosomal protein L11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	J	157	1276	806	242	223	5	0	0

- Molecule 16 is a protein called 60S ribosomal protein L43-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	K	90	695	428	144	117	6	0	0

- Molecule 17 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	L	202	1612	1008	321	282	1	0	0

- Molecule 18 is a protein called 60S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	M	125	1007	644	191	168	4	0	0

- Molecule 19 is a protein called 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	N	200	1676	1050	348	275	3	0	0

- Molecule 20 is a protein called 60S ribosomal protein L16-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	O	196	1557	999	297	257	4	0	0

- Molecule 21 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	P	171	1357	857	262	235	3	0	0

- Molecule 22 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	Q	186	1486	933	300	252	1	0	0

- Molecule 23 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	R	148	1220	759	259	197	5	0	0

- Molecule 24 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	S	167	1388	896	259	228	5	0	0

- Molecule 25 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	T	158	1282	807	247	225	3	0	0

- Molecule 26 is a protein called 60S ribosomal protein L22.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
26	U	98	791	513	137	141	0	0

- Molecule 27 is a protein called 60S ribosomal protein L23-A.



Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	V	137	1026	644	193	181	8	0	0

- Molecule 28 is a protein called 60S ribosomal protein L25-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	X	120	962	614	178	169	1	0	0

- Molecule 29 is a protein called 60S ribosomal protein L26.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	Y	125	998	622	201	173	2	0	0

- Molecule 30 is a protein called 60S ribosomal protein L27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	Z	134	1072	693	199	178	2	0	0

- Molecule 31 is a protein called 60S ribosomal protein L28-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	a	147	1169	740	235	192	2	0	0

- Molecule 32 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
32	b	54	463	281	106	76	0	0

- Molecule 33 is a protein called 60S ribosomal protein L30-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	c	95	714	454	124	132	4	0	0

- Molecule 34 is a protein called 60S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	d	102	Total	C	N	O	S	0	0
			849	534	165	147	3		

- Molecule 35 is a protein called 60S ribosomal protein L32-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	e	117	Total	C	N	O	S	0	0
			939	588	190	156	5		

- Molecule 36 is a protein called 60S ribosomal protein L33-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	f	106	Total	C	N	O	S	0	0
			839	534	162	140	3		

- Molecule 37 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	g	106	Total	C	N	O	S	0	0
			861	540	177	142	2		

- Molecule 38 is a protein called 60S ribosomal protein L35.

Mol	Chain	Residues	Atoms				AltConf	Trace
38	h	121	Total	C	N	O	0	0
			999	629	194	176		

- Molecule 39 is a protein called 60S ribosomal protein L36-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	i	96	Total	C	N	O	S	0	0
			767	478	160	128	1		

- Molecule 40 is a protein called 60S ribosomal protein L37-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	j	83	Total	C	N	O	S	0	0
			657	402	141	107	7		

- Molecule 41 is a protein called 60S ribosomal protein L38-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	k	69	Total	C	N	O	S	0	0
			560	355	103	101	1		

- Molecule 42 is a protein called Ribosome biogenesis protein erb1.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	m	398	Total	C	N	O	S	0	0
			3127	2001	557	558	11		

- Molecule 43 is a protein called Pescadillo homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	n	354	Total	C	N	O	S	0	0
			2903	1892	496	503	12		

- Molecule 44 is a protein called 60S ribosomal protein L42.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	o	97	Total	C	N	O	S	0	0
			789	498	158	128	5		

- Molecule 45 is a protein called Ribosome biogenesis protein ytm1.

Mol	Chain	Residues	Atoms				AltConf	Trace
45	p	290	Total	C	N	O	0	0
			1431	851	290	290		

- Molecule 46 is a protein called Ribosome biogenesis protein rlp24.

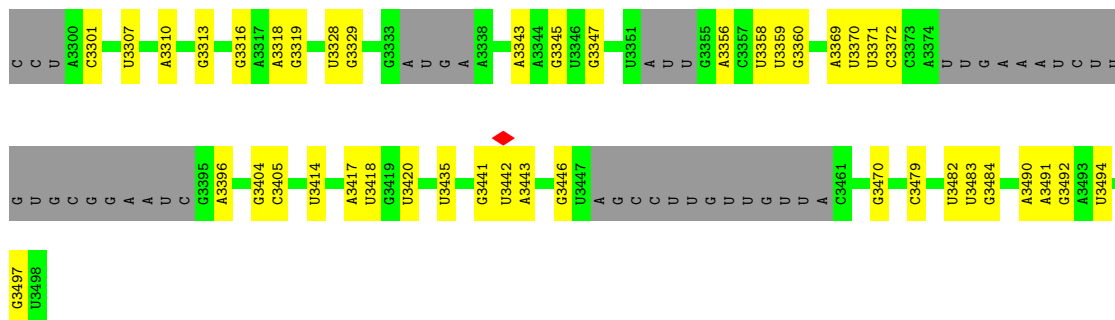
Mol	Chain	Residues	Atoms					AltConf	Trace
46	u	59	Total	C	N	O	S	0	0
			493	315	100	72	6		

- Molecule 47 is ZINC ION (three-letter code: ZN) (formula: Zn).

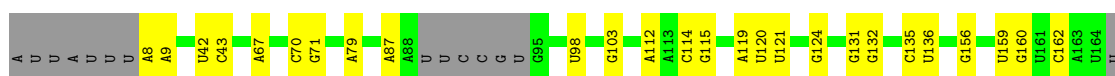
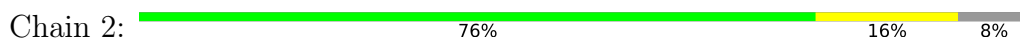
Mol	Chain	Residues	Atoms		AltConf
47	j	1	Total	Zn	0
			1	1	



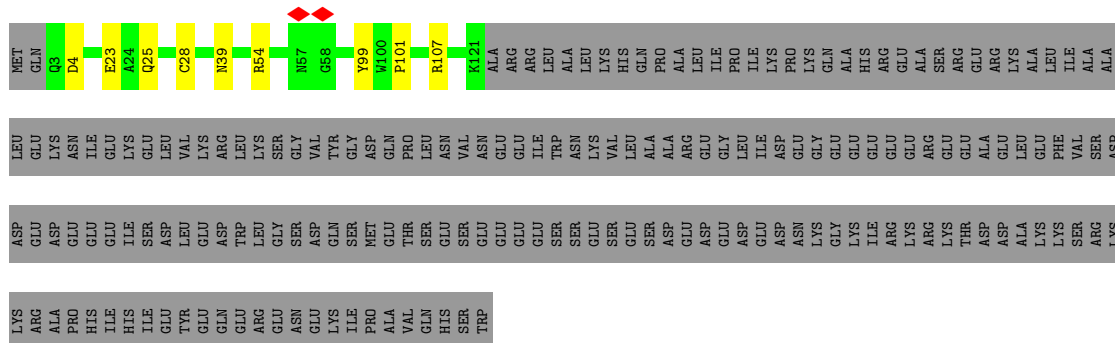




• Molecule 2: RNA (152-MER)



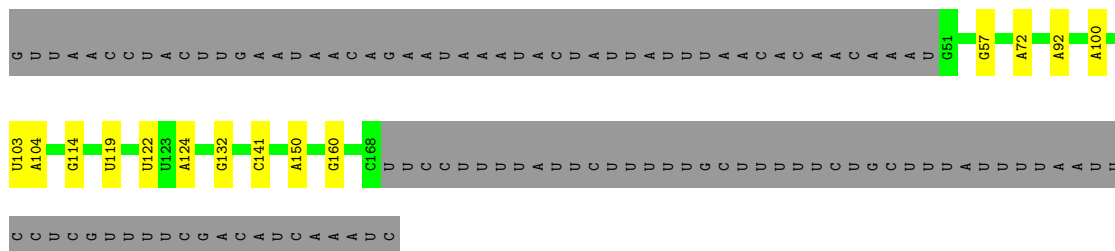
• Molecule 3: Protein mak16



• Molecule 4: 60S ribosomal protein L39

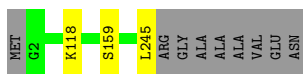


• Molecule 5: RNA (118-MER)



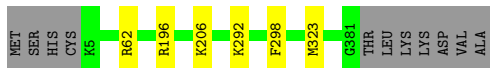
- Molecule 6: 60S ribosomal protein L2-A

Chain A:  95%



- Molecule 7: 60S ribosomal protein L3-A

Chain B:  96%



- Molecule 8: 60S ribosomal protein L4-B

Chain C:  96%




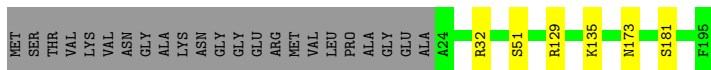
- Molecule 9: 60S ribosomal protein L5-A

Chain D:  97%




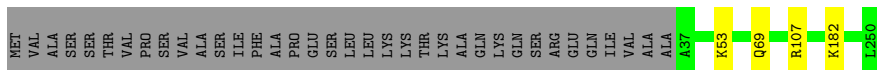
- Molecule 10: 60S ribosomal protein L6

Chain E:  85% 12%




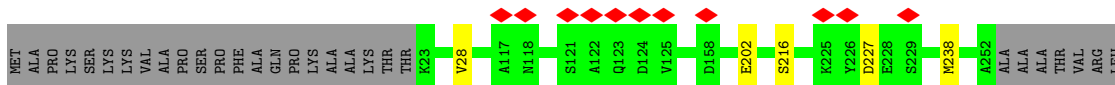
- Molecule 11: 60S ribosomal protein L7-B

Chain F:  84% 14%

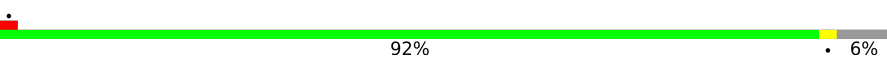


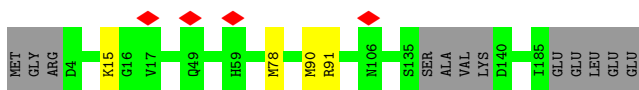
- Molecule 12: 60S ribosomal protein L8

Chain G:  87% 11%



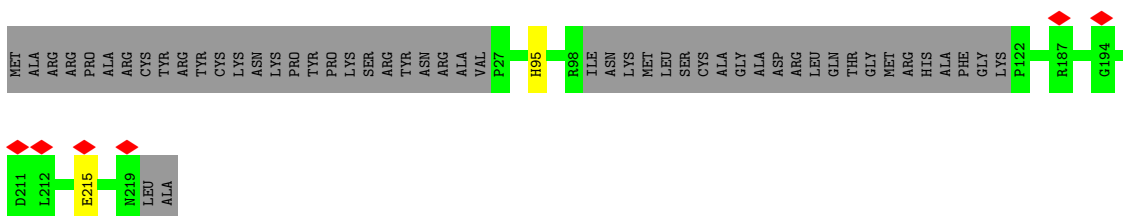
- Molecule 13: 60S ribosomal protein L9-A

Chain H:  92% 6%




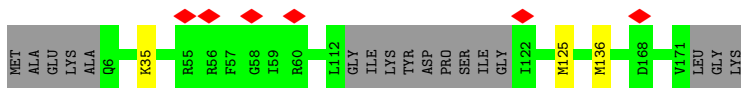
- Molecule 14: 60S ribosomal protein L10-A

Chain I:  76% 23%



- Molecule 15: 60S ribosomal protein L11-A

Chain J:  89% 10%



- Molecule 16: 60S ribosomal protein L43-A

Chain K:  93%



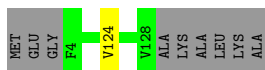
- Molecule 17: 60S ribosomal protein L13

Chain L:  95%



- Molecule 18: 60S ribosomal protein L14

Chain M:  93% 7%



- Molecule 19: 60S ribosomal protein L15-A



Chain N:  98%




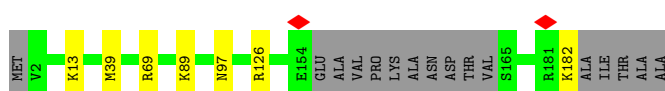
- Molecule 20: 60S ribosomal protein L16-B

Chain O:  98%



- Molecule 21: 60S ribosomal protein L17-A

Chain P:  88% 9%



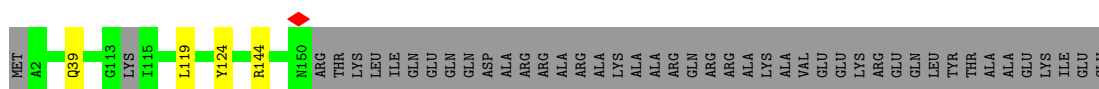
- Molecule 22: 60S ribosomal protein L18-A

Chain Q:  96%



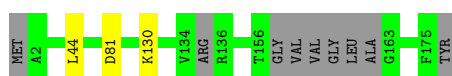
- Molecule 23: 60S ribosomal protein L19-A

Chain R:  75% 23%



- Molecule 24: 60S ribosomal protein L20-A

Chain S:  93% 5%




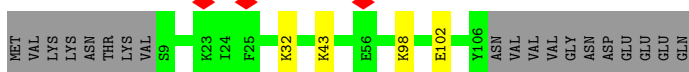
- Molecule 25: 60S ribosomal protein L21-A

Chain T:  98%



- Molecule 26: 60S ribosomal protein L22

Chain U:  80% 16%




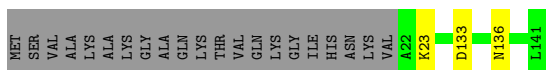
- Molecule 27: 60S ribosomal protein L23-A

Chain V:  96%



- Molecule 28: 60S ribosomal protein L25-A

Chain X:  83% 15%



- Molecule 29: 60S ribosomal protein L26

Chain Y:  95%



- Molecule 30: 60S ribosomal protein L27-A

Chain Z:  96%




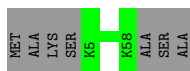
- Molecule 31: 60S ribosomal protein L28-A

Chain a:  99%

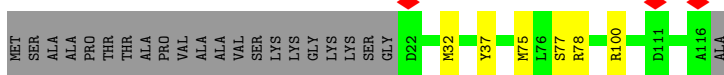
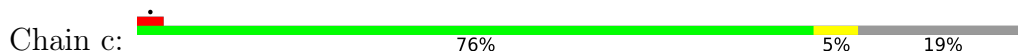


- Molecule 32: 60S ribosomal protein L29

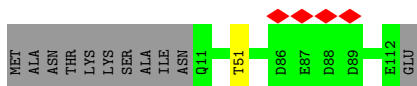
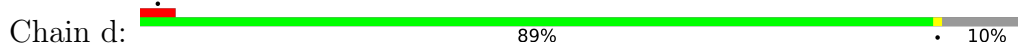
Chain b:  89% 11%



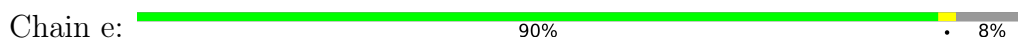
- Molecule 33: 60S ribosomal protein L30-2



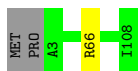
- Molecule 34: 60S ribosomal protein L31



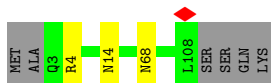
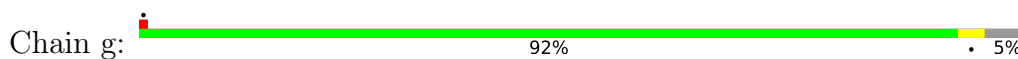
- Molecule 35: 60S ribosomal protein L32-A



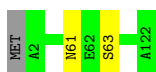
- Molecule 36: 60S ribosomal protein L33-B



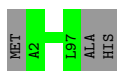
- Molecule 37: 60S ribosomal protein L34-A



- Molecule 38: 60S ribosomal protein L35



- Molecule 39: 60S ribosomal protein L36-B



- Molecule 40: 60S ribosomal protein L37-B







MET	R2	S10	V13	R30	K43	Y55	R69	LYS	GLU	MET	VAL	TYR	ASP	THR	ALA	LEU	ALA	ALA	ALA	ARG	ARG	ASN	VAL	PRO	VAL	GLY	GLU	TYR	ASP	ARG	ASN	VAL	ILE	GLN	ALA	THR	THR	LEU	ASN	ALA	VAL	ASP	LYS	ARG	VAL	SER	THR	GLN	MET	VAL	HIS	ALA	LYS	ARG	VAL	GLU	ALA	ARG													
LEU	PHE	TYR	LYS	PRO	ARG	LEU	ALA	GLY	LYS	ARG	ALA	GLN	GLU	LEU	GLN	GLU	GLU	ALA	ALA	VAL	TYR	LYS	LEU	ILE	ALA	ALA	GLN	ASN	VAL	PRO	ALA	GLN	PHE	THR	THR	GLU	PRO	GLU	GLY	VAL	GLU	THR	ALA	GLU	VAL	ILE	GLN	GLU	PRO	THR	GLN	ILE	VAL	SER	ASP	GLU	GLU	TYR	THR	MET	THR	GLN	VAL	HIS	ALA	LYS	ARG	VAL	GLU	ALA	ARG
PRO	VAL	LYS	ILE	PRO	VAL	LEU	ALA	LYS	ARG	LYS	ASN	LYS	LYS	LYS	SER	ARG	ASN	SER	SER	SER	ALA	MET	GLN	MET	ASP																																														

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	35000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	60	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.870	Depositor
Minimum map value	-0.492	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.015	Depositor
Recommended contour level	0.05	Depositor
Map size (Å)	542.72, 542.72, 542.72	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	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	0.22	0/68700	0.73	0/107035
2	2	0.22	0/3589	0.72	0/5586
3	3	0.31	0/1028	0.64	0/1384
4	8	0.25	0/448	0.58	0/597
5	9	0.17	0/2816	0.70	0/4388
6	A	0.26	0/1885	0.57	0/2542
7	B	0.26	0/3069	0.54	0/4130
8	C	0.26	0/2848	0.52	0/3842
9	D	0.25	0/2354	0.49	0/3166
10	E	0.27	0/1366	0.54	0/1843
11	F	0.26	0/1781	0.49	0/2389
12	G	0.26	0/1846	0.50	0/2485
13	H	0.24	0/1433	0.54	0/1931
14	I	0.26	0/1398	0.55	0/1873
15	J	0.25	0/1296	0.59	0/1732
16	K	0.25	0/704	0.58	0/941
17	L	0.26	0/1644	0.53	0/2215
18	M	0.24	0/1024	0.52	0/1375
19	N	0.26	0/1717	0.57	0/2304
20	O	0.26	0/1588	0.51	0/2128
21	P	0.27	0/1381	0.54	0/1849
22	Q	0.25	0/1510	0.57	0/2017
23	R	0.24	0/1238	0.56	0/1647
24	S	0.25	0/1422	0.52	0/1909
25	T	0.27	0/1309	0.52	0/1761
26	U	0.26	0/805	0.57	0/1080
27	V	0.27	0/1042	0.55	0/1402
28	X	0.26	0/978	0.51	0/1314
29	Y	0.25	0/1008	0.61	0/1341
30	Z	0.27	0/1095	0.52	0/1467
31	a	0.26	0/1198	0.56	0/1608
32	b	0.29	0/471	0.55	0/623



Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	c	0.26	0/723	0.50	0/973
34	d	0.24	0/864	0.55	0/1161
35	e	0.25	0/953	0.54	0/1271
36	f	0.26	0/859	0.52	0/1152
37	g	0.27	0/873	0.58	0/1170
38	h	0.25	0/1008	0.52	0/1340
39	i	0.25	0/774	0.56	0/1028
40	j	0.26	0/671	0.57	0/888
41	k	0.28	0/566	0.59	0/757
42	m	0.25	0/3209	0.51	0/4357
43	n	0.26	0/2971	0.48	0/3997
44	o	0.25	0/803	0.54	0/1064
45	p	0.24	0/1426	0.44	0/1977
46	u	0.28	0/509	0.54	0/678
All	All	0.23	0/132200	0.66	0/193717

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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

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	3	117/302 (39%)	102 (87%)	13 (11%)	2 (2%)	9	29
4	8	48/51 (94%)	47 (98%)	1 (2%)	0	100	100

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	A	242/253 (96%)	235 (97%)	7 (3%)	0	100	100
7	B	375/388 (97%)	365 (97%)	10 (3%)	0	100	100
8	C	357/363 (98%)	336 (94%)	20 (6%)	1 (0%)	41	72
9	D	285/294 (97%)	279 (98%)	6 (2%)	0	100	100
10	E	170/195 (87%)	160 (94%)	9 (5%)	1 (1%)	25	56
11	F	212/250 (85%)	209 (99%)	3 (1%)	0	100	100
12	G	229/259 (88%)	219 (96%)	7 (3%)	3 (1%)	12	36
13	H	174/190 (92%)	168 (97%)	6 (3%)	0	100	100
14	I	166/221 (75%)	162 (98%)	4 (2%)	0	100	100
15	J	153/174 (88%)	151 (99%)	2 (1%)	0	100	100
16	K	88/94 (94%)	85 (97%)	3 (3%)	0	100	100
17	L	200/208 (96%)	194 (97%)	4 (2%)	2 (1%)	15	44
18	M	123/134 (92%)	118 (96%)	4 (3%)	1 (1%)	19	49
19	N	198/201 (98%)	184 (93%)	12 (6%)	2 (1%)	15	44
20	O	194/197 (98%)	190 (98%)	4 (2%)	0	100	100
21	P	167/187 (89%)	161 (96%)	5 (3%)	1 (1%)	25	56
22	Q	184/187 (98%)	173 (94%)	8 (4%)	3 (2%)	9	31
23	R	144/193 (75%)	139 (96%)	4 (3%)	1 (1%)	22	53
24	S	161/176 (92%)	157 (98%)	4 (2%)	0	100	100
25	T	156/160 (98%)	154 (99%)	2 (1%)	0	100	100
26	U	96/117 (82%)	91 (95%)	5 (5%)	0	100	100
27	V	135/139 (97%)	133 (98%)	2 (2%)	0	100	100
28	X	118/141 (84%)	116 (98%)	2 (2%)	0	100	100
29	Y	123/126 (98%)	122 (99%)	1 (1%)	0	100	100
30	Z	132/136 (97%)	123 (93%)	8 (6%)	1 (1%)	19	49
31	a	145/148 (98%)	139 (96%)	6 (4%)	0	100	100
32	b	52/61 (85%)	50 (96%)	2 (4%)	0	100	100
33	c	93/117 (80%)	91 (98%)	2 (2%)	0	100	100
34	d	100/113 (88%)	95 (95%)	5 (5%)	0	100	100
35	e	115/127 (91%)	114 (99%)	1 (1%)	0	100	100
36	f	104/108 (96%)	97 (93%)	7 (7%)	0	100	100

*Continued on next page...*

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
37	g	104/112 (93%)	99 (95%)	5 (5%)	0	100	100
38	h	119/122 (98%)	118 (99%)	1 (1%)	0	100	100
39	i	94/99 (95%)	88 (94%)	6 (6%)	0	100	100
40	j	81/91 (89%)	78 (96%)	3 (4%)	0	100	100
41	k	67/74 (90%)	67 (100%)	0	0	100	100
42	m	384/740 (52%)	361 (94%)	21 (6%)	2 (0%)	29	61
43	n	344/607 (57%)	329 (96%)	15 (4%)	0	100	100
44	o	95/106 (90%)	92 (97%)	3 (3%)	0	100	100
45	p	280/440 (64%)	271 (97%)	9 (3%)	0	100	100
46	u	57/192 (30%)	55 (96%)	2 (4%)	0	100	100
All	All	6981/8593 (81%)	6717 (96%)	244 (4%)	20 (0%)	44	72

All (20) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
12	G	28	VAL
12	G	227[A]	ASP
12	G	227[B]	ASP
42	m	369	ARG
17	L	47	ALA
19	N	183	SER
22	Q	75	ALA
23	R	124	TYR
3	3	23	GLU
22	Q	73	LYS
22	Q	184	ALA
42	m	372	PRO
3	3	101	PRO
8	C	345	SER
10	E	135	LYS
17	L	3	ILE
30	Z	57	MET
19	N	181	ASN
21	P	126	ARG
18	M	124	VAL

### 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	3	108/271 (40%)	101 (94%)	7 (6%)	17	44
4	8	46/47 (98%)	45 (98%)	1 (2%)	52	83
6	A	187/192 (97%)	184 (98%)	3 (2%)	62	88
7	B	316/326 (97%)	310 (98%)	6 (2%)	57	85
8	C	296/297 (100%)	286 (97%)	10 (3%)	37	71
9	D	235/241 (98%)	232 (99%)	3 (1%)	69	91
10	E	139/155 (90%)	134 (96%)	5 (4%)	35	69
11	F	180/210 (86%)	176 (98%)	4 (2%)	52	83
12	G	192/212 (91%)	189 (98%)	3 (2%)	62	88
13	H	160/170 (94%)	156 (98%)	4 (2%)	47	80
14	I	146/187 (78%)	144 (99%)	2 (1%)	67	90
15	J	134/146 (92%)	131 (98%)	3 (2%)	52	83
16	K	71/75 (95%)	68 (96%)	3 (4%)	30	63
17	L	162/167 (97%)	159 (98%)	3 (2%)	57	85
18	M	108/113 (96%)	108 (100%)	0	100	100
19	N	175/176 (99%)	173 (99%)	2 (1%)	73	92
20	O	161/162 (99%)	159 (99%)	2 (1%)	71	92
21	P	138/149 (93%)	132 (96%)	6 (4%)	29	62
22	Q	158/159 (99%)	155 (98%)	3 (2%)	57	85
23	R	126/162 (78%)	123 (98%)	3 (2%)	49	81
24	S	148/154 (96%)	145 (98%)	3 (2%)	55	84
25	T	137/139 (99%)	135 (98%)	2 (2%)	65	89
26	U	85/103 (82%)	81 (95%)	4 (5%)	26	59
27	V	105/107 (98%)	102 (97%)	3 (3%)	42	76
28	X	106/122 (87%)	103 (97%)	3 (3%)	43	77
29	Y	110/111 (99%)	105 (96%)	5 (4%)	27	60

*Continued on next page...*

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
30	Z	113/115 (98%)	111 (98%)	2 (2%)	59	86
31	a	121/122 (99%)	120 (99%)	1 (1%)	81	94
32	b	47/51 (92%)	47 (100%)	0	100	100
33	c	77/91 (85%)	71 (92%)	6 (8%)	12	35
34	d	93/102 (91%)	92 (99%)	1 (1%)	73	92
35	e	100/107 (94%)	97 (97%)	3 (3%)	41	75
36	f	89/91 (98%)	88 (99%)	1 (1%)	73	92
37	g	92/97 (95%)	89 (97%)	3 (3%)	38	72
38	h	106/107 (99%)	104 (98%)	2 (2%)	57	85
39	i	82/84 (98%)	82 (100%)	0	100	100
40	j	68/71 (96%)	68 (100%)	0	100	100
41	k	63/66 (96%)	60 (95%)	3 (5%)	25	58
42	m	344/659 (52%)	339 (98%)	5 (2%)	65	89
43	n	312/532 (59%)	307 (98%)	5 (2%)	62	88
44	o	87/93 (94%)	84 (97%)	3 (3%)	37	71
46	u	52/168 (31%)	47 (90%)	5 (10%)	8	24
All	All	5775/6909 (84%)	5642 (98%)	133 (2%)	53	82

All (133) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	3	4	ASP
3	3	25	GLN
3	3	28	CYS
3	3	39	ASN
3	3	54	ARG
3	3	99	TYR
3	3	107	ARG
4	8	37	TYR
6	A	118	LYS
6	A	159	SER
6	A	245	LEU
7	B	62	ARG
7	B	196	ARG
7	B	206	LYS
7	B	292	LYS

Continued on next page...

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
7	B	298	PHE
7	B	323	MET
8	C	14	ASP
8	C	95	MET
8	C	178	ARG
8	C	215	THR
8	C	276	ASN
8	C	323	ASN
8	C	324	LYS
8	C	328	SER
8	C	344	ASN
8	C	346	GLU
9	D	67	SER
9	D	192	ASP
9	D	280	ARG
10	E	32	ARG
10	E	51	SER
10	E	129	ARG
10	E	173	ASN
10	E	181	SER
11	F	53	LYS
11	F	69	GLN
11	F	107	ARG
11	F	182	LYS
12	G	202	GLU
12	G	216	SER
12	G	238	MET
13	H	15	LYS
13	H	78	MET
13	H	90	MET
13	H	91	ARG
14	I	95	HIS
14	I	215	GLU
15	J	35	LYS
15	J	125	MET
15	J	136	MET
16	K	45	ASN
16	K	83	SER
16	K	89	ARG
17	L	67	MET
17	L	168	GLU
17	L	180	SER

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
19	N	24	ARG
19	N	73	ARG
20	O	60	ARG
20	O	175	LYS
21	P	13	LYS
21	P	39	MET
21	P	69	ARG
21	P	89	LYS
21	P	97	ASN
21	P	182	LYS
22	Q	99	LYS
22	Q	110	SER
22	Q	131	ARG
23	R	39	GLN
23	R	119	LEU
23	R	144	ARG
24	S	44	LEU
24	S	81	ASP
24	S	130	LYS
25	T	99	SER
25	T	102	ARG
26	U	32	LYS
26	U	43	LYS
26	U	98	LYS
26	U	102	GLU
27	V	25	MET
27	V	27	CYS
27	V	76	MET
28	X	23	LYS
28	X	133	ASP
28	X	136	ASN
29	Y	2	LYS
29	Y	6	ASP
29	Y	73	TYR
29	Y	112	LYS
29	Y	124	LYS
30	Z	35	SER
30	Z	84	ARG
31	a	120	THR
33	c	32	MET
33	c	37	TYR
33	c	75	MET

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
33	c	77	SER
33	c	78	ARG
33	c	100	ARG
34	d	51	THR
35	e	20	ASP
35	e	78	ASP
35	e	110	ARG
36	f	66	ARG
37	g	4	ARG
37	g	14	ASN
37	g	68	ASN
38	h	61	ASN
38	h	63	SER
41	k	9	LYS
41	k	18	LYS
41	k	52	LYS
42	m	290	LYS
42	m	413	MET
42	m	492	GLU
42	m	665	TYR
42	m	705	ARG
43	n	173	ARG
43	n	175	ASN
43	n	197	GLN
43	n	248	LYS
43	n	374	ARG
44	o	24	ARG
44	o	73	GLU
44	o	90	HIS
46	u	10	SER
46	u	13	VAL
46	u	30	ARG
46	u	43	LYS
46	u	55	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
3	3	26	ASN
8	C	344	ASN
9	D	272	GLN
12	G	95	ASN

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Res	Type
16	K	45	ASN
21	P	120	ASN
25	T	24	GLN
27	V	134	ASN
28	X	67	ASN
30	Z	91	ASN
43	n	190	GLN
43	n	349	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	2837/3498 (81%)	600 (21%)	19 (0%)
2	2	150/165 (90%)	24 (16%)	2 (1%)
5	9	117/229 (51%)	14 (11%)	0
All	All	3104/3892 (79%)	638 (20%)	21 (0%)

All (638) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	26	A
1	1	28	G
1	1	30	G
1	1	40	A
1	1	43	A
1	1	49	A
1	1	57	A
1	1	59	G
1	1	60	A
1	1	65	A
1	1	66	A
1	1	67	A
1	1	91	G
1	1	92	G
1	1	96	G
1	1	99	A
1	1	105	G
1	1	110	G
1	1	111	C
1	1	121	A
1	1	122	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	132	C
1	1	149	G
1	1	161	C
1	1	162	A
1	1	163	A
1	1	165	A
1	1	167	G
1	1	168	C
1	1	169	U
1	1	170	G
1	1	175	G
1	1	177	G
1	1	180	U
1	1	188	C
1	1	189	G
1	1	190	G
1	1	193	U
1	1	195	A
1	1	197	U
1	1	198	U
1	1	213	G
1	1	217	G
1	1	220	A
1	1	225	G
1	1	226	A
1	1	227	G
1	1	240	G
1	1	243	C
1	1	244	G
1	1	247	U
1	1	253	U
1	1	257	A
1	1	258	U
1	1	259	A
1	1	260	U
1	1	261	A
1	1	266	G
1	1	269	U
1	1	270	U
1	1	277	G
1	1	289	G
1	1	292	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	293	A
1	1	303	A
1	1	310	U
1	1	311	G
1	1	312	G
1	1	313	U
1	1	319	U
1	1	321	A
1	1	331	A
1	1	337	U
1	1	345	G
1	1	347	C
1	1	350	A
1	1	357	A
1	1	359	A
1	1	360	A
1	1	377	A
1	1	378	U
1	1	382	A
1	1	384	G
1	1	403	A
1	1	405	A
1	1	406	U
1	1	410	A
1	1	411	C
1	1	415	A
1	1	429	G
1	1	430	A
1	1	437	G
1	1	449	U
1	1	532	A
1	1	534	A
1	1	535	G
1	1	540	A
1	1	544	A
1	1	546	G
1	1	547	G
1	1	551	C
1	1	577	U
1	1	578	U
1	1	579	A
1	1	580	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	581	A
1	1	582	G
1	1	590	U
1	1	591	G
1	1	592	U
1	1	602	A
1	1	603	C
1	1	606	G
1	1	616	A
1	1	618	U
1	1	629	G
1	1	634	G
1	1	635	G
1	1	636	A
1	1	646	A
1	1	647	A
1	1	661	C
1	1	673	C
1	1	674	A
1	1	685	A
1	1	702	A
1	1	706	U
1	1	713	G
1	1	714	A
1	1	732	A
1	1	739	G
1	1	742	A
1	1	747	A
1	1	748	G
1	1	749	G
1	1	765	G
1	1	766	G
1	1	768	G
1	1	769	U
1	1	771	C
1	1	774	C
1	1	775	A
1	1	778	G
1	1	788	G
1	1	789	A
1	1	792	U
1	1	794	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	795	G
1	1	796	U
1	1	797	C
1	1	798	A
1	1	802	G
1	1	803	A
1	1	806	G
1	1	808	U
1	1	809	U
1	1	812	A
1	1	813	G
1	1	816	A
1	1	817	G
1	1	839	A
1	1	847	G
1	1	849	A
1	1	862	A
1	1	877	G
1	1	878	A
1	1	879	A
1	1	882	U
1	1	889	G
1	1	893	C
1	1	902	A
1	1	903	U
1	1	906	U
1	1	911	U
1	1	916	A
1	1	939	G
1	1	940	G
1	1	946	A
1	1	948	G
1	1	949	A
1	1	953	A
1	1	955	C
1	1	956	G
1	1	957	A
1	1	969	G
1	1	976	C
1	1	985	G
1	1	991	C
1	1	992	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	993	C
1	1	995	G
1	1	1006	A
1	1	1011	G
1	1	1012	A
1	1	1013	U
1	1	1014	C
1	1	1016	G
1	1	1023	G
1	1	1026	G
1	1	1033	G
1	1	1034	A
1	1	1042	G
1	1	1046	U
1	1	1069	C
1	1	1073	U
1	1	1079	A
1	1	1080	A
1	1	1081	C
1	1	1095	G
1	1	1096	A
1	1	1097	C
1	1	1112	A
1	1	1113	U
1	1	1119	G
1	1	1126	A
1	1	1127	U
1	1	1129	G
1	1	1130	A
1	1	1135	G
1	1	1147	G
1	1	1148	G
1	1	1162	G
1	1	1166	A
1	1	1175	U
1	1	1176	G
1	1	1184	A
1	1	1185	A
1	1	1186	C
1	1	1190	A
1	1	1205	G
1	1	1211	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	1212	U
1	1	1217	G
1	1	1220	C
1	1	1222	U
1	1	1223	C
1	1	1224	A
1	1	1227	C
1	1	1228	A
1	1	1231	A
1	1	1232	G
1	1	1233	A
1	1	1239	U
1	1	1240	G
1	1	1322	A
1	1	1323	C
1	1	1333	A
1	1	1334	A
1	1	1336	U
1	1	1338	G
1	1	1339	A
1	1	1340	U
1	1	1360	C
1	1	1361	A
1	1	1380	A
1	1	1388	G
1	1	1389	A
1	1	1390	A
1	1	1421	G
1	1	1433	U
1	1	1453	A
1	1	1459	U
1	1	1463	G
1	1	1468	G
1	1	1470	U
1	1	1471	C
1	1	1484	G
1	1	1487	A
1	1	1492	U
1	1	1503	C
1	1	1504	U
1	1	1515	A
1	1	1517	G

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	1521	G
1	1	1528	U
1	1	1536	G
1	1	1537	A
1	1	1542	C
1	1	1565	C
1	1	1571	A
1	1	1581	G
1	1	1588	A
1	1	1589	U
1	1	1590	G
1	1	1594	G
1	1	1600	C
1	1	1602	A
1	1	1603	U
1	1	1604	U
1	1	1606	U
1	1	1608	C
1	1	1609	G
1	1	1618	A
1	1	1622	A
1	1	1624	A
1	1	1625	G
1	1	1629	A
1	1	1640	A
1	1	1655	G
1	1	1664	A
1	1	1666	C
1	1	1674	C
1	1	1677	A
1	1	1678	A
1	1	1693	G
1	1	1697	G
1	1	1713	G
1	1	1723	U
1	1	1724	U
1	1	1728	U
1	1	1730	U
1	1	1738	C
1	1	1747	A
1	1	1752	G
1	1	1754	A

*Continued on next page...*



*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	1756	U
1	1	1757	C
1	1	1764	U
1	1	1780	G
1	1	1781	G
1	1	1786	U
1	1	1790	A
1	1	1791	G
1	1	1792	A
1	1	1796	C
1	1	1811	A
1	1	1819	G
1	1	1821	G
1	1	1837	G
1	1	1838	A
1	1	1839	A
1	1	1849	G
1	1	1871	U
1	1	1873	U
1	1	1874	U
1	1	1876	U
1	1	1879	C
1	1	1880	A
1	1	1897	A
1	1	1901	C
1	1	1904	C
1	1	1905	A
1	1	1913	A
1	1	1919	A
1	1	1921	C
1	1	1933	G
1	1	1934	A
1	1	1935	U
1	1	1936	A
1	1	1940	C
1	1	1941	A
1	1	1948	A
1	1	1960	G
1	1	1961	G
1	1	1963	A
1	1	1990	G
1	1	1999	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	2001	A
1	1	2188	A
1	1	2189	C
1	1	2190	U
1	1	2192	A
1	1	2193	G
1	1	2194	A
1	1	2195	A
1	1	2199	G
1	1	2200	U
1	1	2202	C
1	1	2203	G
1	1	2204	G
1	1	2209	G
1	1	2210	G
1	1	2214	A
1	1	2215	U
1	1	2219	A
1	1	2228	U
1	1	2232	A
1	1	2246	A
1	1	2247	U
1	1	2248	G
1	1	2257	G
1	1	2280	C
1	1	2298	G
1	1	2311	A
1	1	2313	U
1	1	2323	C
1	1	2360	G
1	1	2361	G
1	1	2364	G
1	1	2369	A
1	1	2371	G
1	1	2386	U
1	1	2395	G
1	1	2396	C
1	1	2397	A
1	1	2398	U
1	1	2401	A
1	1	2403	G
1	1	2406	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	2422	U
1	1	2423	G
1	1	2435	U
1	1	2453	C
1	1	2461	A
1	1	2462	C
1	1	2463	G
1	1	2464	G
1	1	2473	A
1	1	2477	C
1	1	2481	G
1	1	2482	G
1	1	2485	A
1	1	2486	A
1	1	2489	A
1	1	2490	A
1	1	2491	G
1	1	2492	A
1	1	2499	U
1	1	2507	A
1	1	2508	C
1	1	2523	G
1	1	2524	U
1	1	2526	A
1	1	2605	U
1	1	2610	U
1	1	2611	A
1	1	2620	A
1	1	2621	G
1	1	2622	C
1	1	2647	U
1	1	2649	U
1	1	2650	A
1	1	2651	G
1	1	2654	U
1	1	2656	A
1	1	2657	A
1	1	2658	A
1	1	2668	C
1	1	2669	G
1	1	2670	A
1	1	2674	G

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	2675	A
1	1	2676	U
1	1	2680	C
1	1	2681	G
1	1	2686	U
1	1	2688	A
1	1	2689	C
1	1	2692	U
1	1	2696	A
1	1	2701	G
1	1	2709	G
1	1	2721	A
1	1	2722	C
1	1	2723	A
1	1	2730	A
1	1	2733	A
1	1	2746	G
1	1	2747	U
1	1	2751	A
1	1	2768	A
1	1	2769	A
1	1	2777	C
1	1	2778	U
1	1	2780	G
1	1	2781	A
1	1	2784	A
1	1	2786	A
1	1	2787	A
1	1	2789	A
1	1	2799	A
1	1	2800	A
1	1	2809	G
1	1	2815	G
1	1	2823	G
1	1	2824	U
1	1	2832	C
1	1	2835	A
1	1	2847	U
1	1	2848	G
1	1	2850	C
1	1	2866	U
1	1	2867	C

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	2872	G
1	1	2873	A
1	1	2875	A
1	1	2889	G
1	1	2894	A
1	1	2895	G
1	1	2896	A
1	1	2897	A
1	1	2905	C
1	1	2908	A
1	1	2909	G
1	1	2912	A
1	1	2917	U
1	1	2918	G
1	1	2930	C
1	1	2932	A
1	1	2933	A
1	1	2948	G
1	1	2949	U
1	1	2966	G
1	1	2970	U
1	1	2971	C
1	1	2982	A
1	1	2991	A
1	1	3002	G
1	1	3006	A
1	1	3018	U
1	1	3021	A
1	1	3025	A
1	1	3030	U
1	1	3031	A
1	1	3033	G
1	1	3037	C
1	1	3041	A
1	1	3042	G
1	1	3046	G
1	1	3050	U
1	1	3066	A
1	1	3067	G
1	1	3072	G
1	1	3075	U
1	1	3078	C

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	3084	U
1	1	3085	G
1	1	3108	A
1	1	3117	A
1	1	3118	G
1	1	3127	G
1	1	3135	G
1	1	3155	G
1	1	3173	A
1	1	3175	U
1	1	3182	G
1	1	3189	C
1	1	3195	C
1	1	3196	C
1	1	3197	G
1	1	3220	G
1	1	3221	C
1	1	3225	A
1	1	3226	A
1	1	3227	U
1	1	3237	A
1	1	3238	A
1	1	3239	A
1	1	3248	U
1	1	3269	A
1	1	3270	U
1	1	3271	G
1	1	3272	U
1	1	3273	A
1	1	3275	A
1	1	3276	A
1	1	3281	A
1	1	3282	G
1	1	3283	A
1	1	3301	C
1	1	3307	U
1	1	3310	A
1	1	3313	G
1	1	3316	G
1	1	3318	A
1	1	3319	G
1	1	3328	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	3329	G
1	1	3343	A
1	1	3345	G
1	1	3347	G
1	1	3356	A
1	1	3358	U
1	1	3359	U
1	1	3360	G
1	1	3369	A
1	1	3370	U
1	1	3371	U
1	1	3372	C
1	1	3396	A
1	1	3404	G
1	1	3405	C
1	1	3414	U
1	1	3417	A
1	1	3418	U
1	1	3420	U
1	1	3435	U
1	1	3442	U
1	1	3443	A
1	1	3446	G
1	1	3470	G
1	1	3479	C
1	1	3482	U
1	1	3483	U
1	1	3484	G
1	1	3490	A
1	1	3491	A
1	1	3492	G
1	1	3494	U
1	1	3497	G
2	2	9	A
2	2	42	U
2	2	43	C
2	2	67	A
2	2	70	C
2	2	71	G
2	2	79	A
2	2	87	A
2	2	98	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	2	103	G
2	2	112	A
2	2	114	C
2	2	115	G
2	2	119	A
2	2	120	U
2	2	121	U
2	2	124	G
2	2	132	G
2	2	135	C
2	2	136	U
2	2	156	G
2	2	159	U
2	2	160	G
2	2	162	C
5	9	57	G
5	9	72	A
5	9	92	A
5	9	100	A
5	9	103	U
5	9	104	A
5	9	114	G
5	9	119	U
5	9	122	U
5	9	124	A
5	9	132	G
5	9	141	C
5	9	150	A
5	9	160	G

All (21) RNA pucker outliers are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	269	U
1	1	310	U
1	1	311	G
1	1	628	U
1	1	672	A
1	1	770	G
1	1	805	G
1	1	948	G
1	1	1096	A

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Res	Type
1	1	1238	G
1	1	1388	G
1	1	1628	A
1	1	1751	U
1	1	2198	G
1	1	2657	A
1	1	2673	U
1	1	3174	A
1	1	3358	U
1	1	3441	G
2	2	8	A
2	2	131	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 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

There are no chain breaks in this entry.

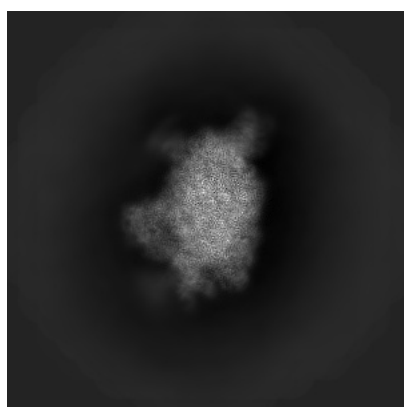
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-24412. These allow visual inspection of the internal detail of the map and identification of artifacts.

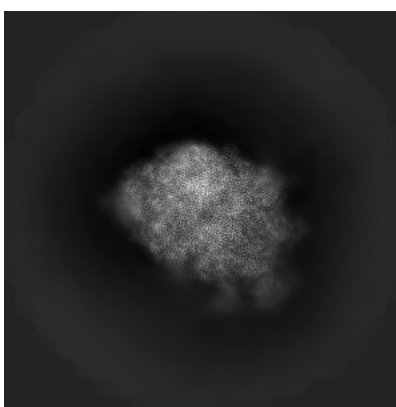
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

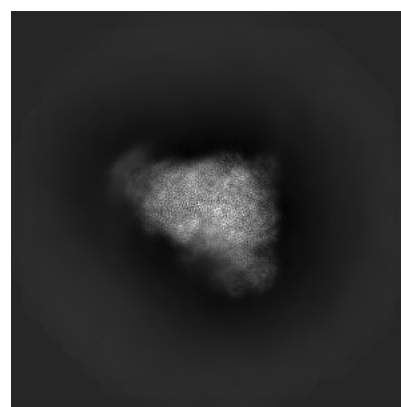
#### 6.1.1 Primary map



X



Y

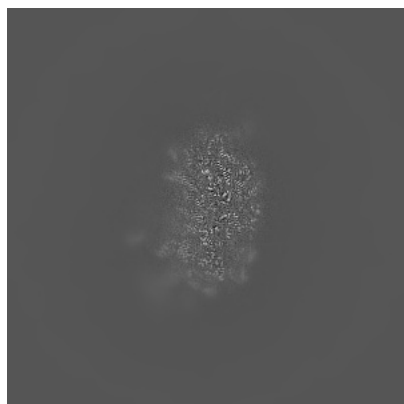


Z

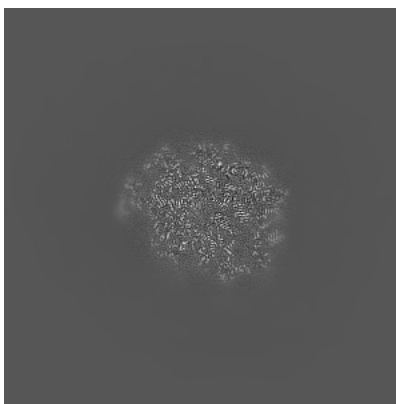
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

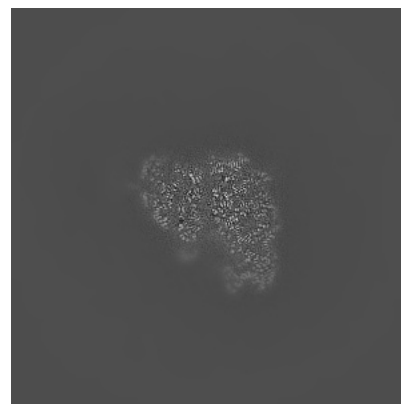
#### 6.2.1 Primary map



X Index: 256



Y Index: 256

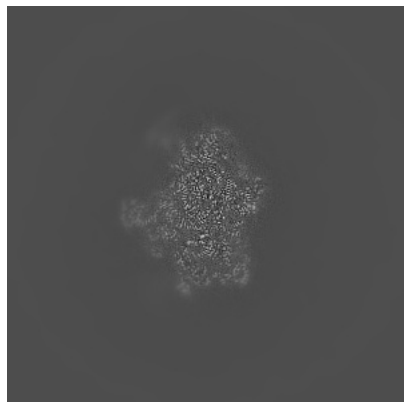


Z Index: 256

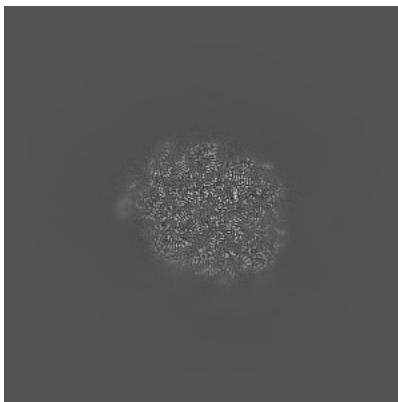
The images above show central slices of the map in three orthogonal directions.

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

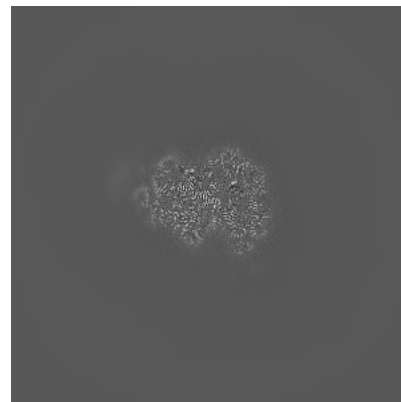
### 6.3.1 Primary map



X Index: 283



Y Index: 263



Z Index: 276

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

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

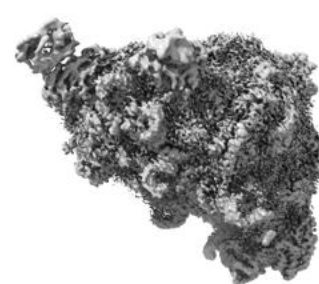
### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.05. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

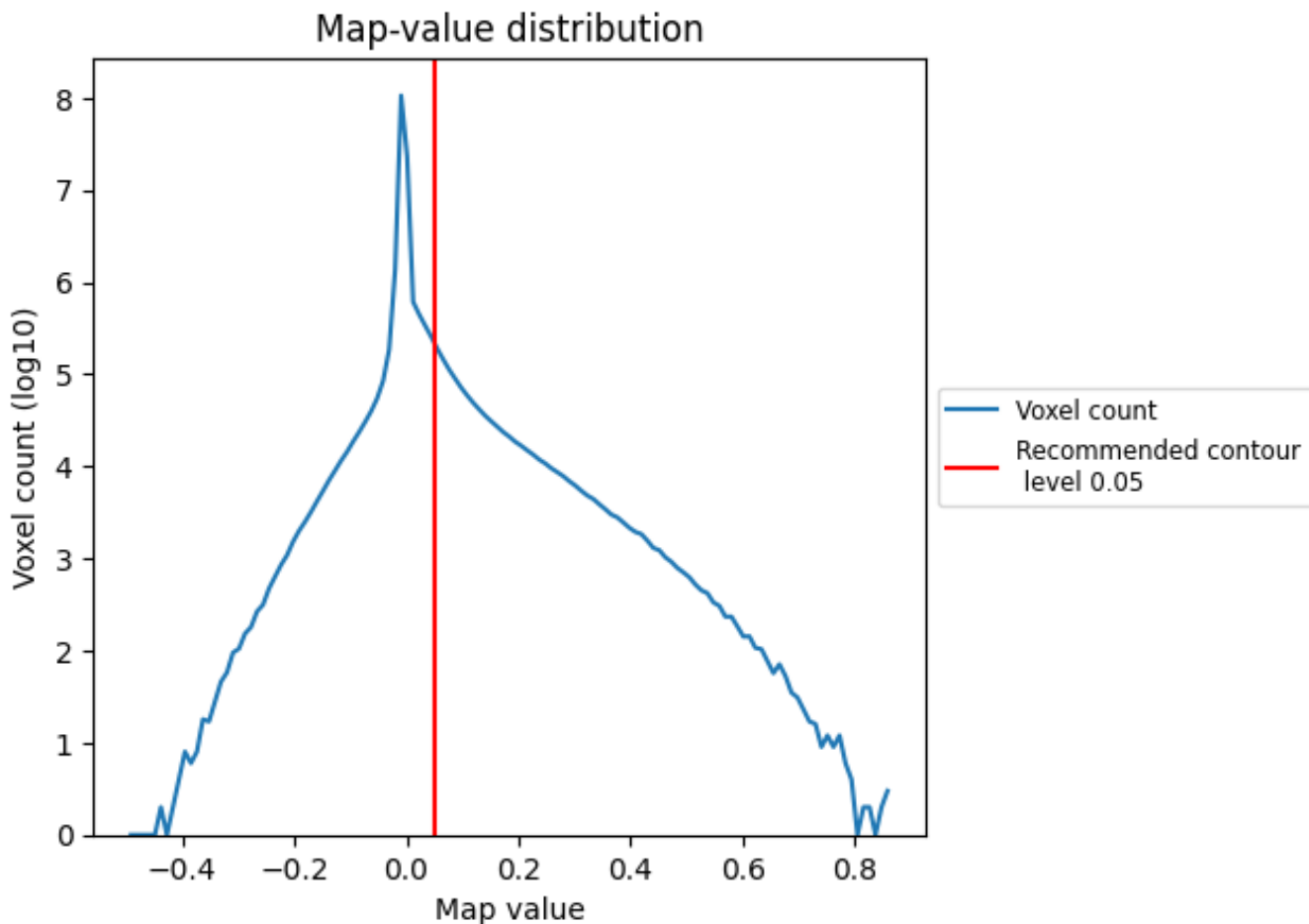
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

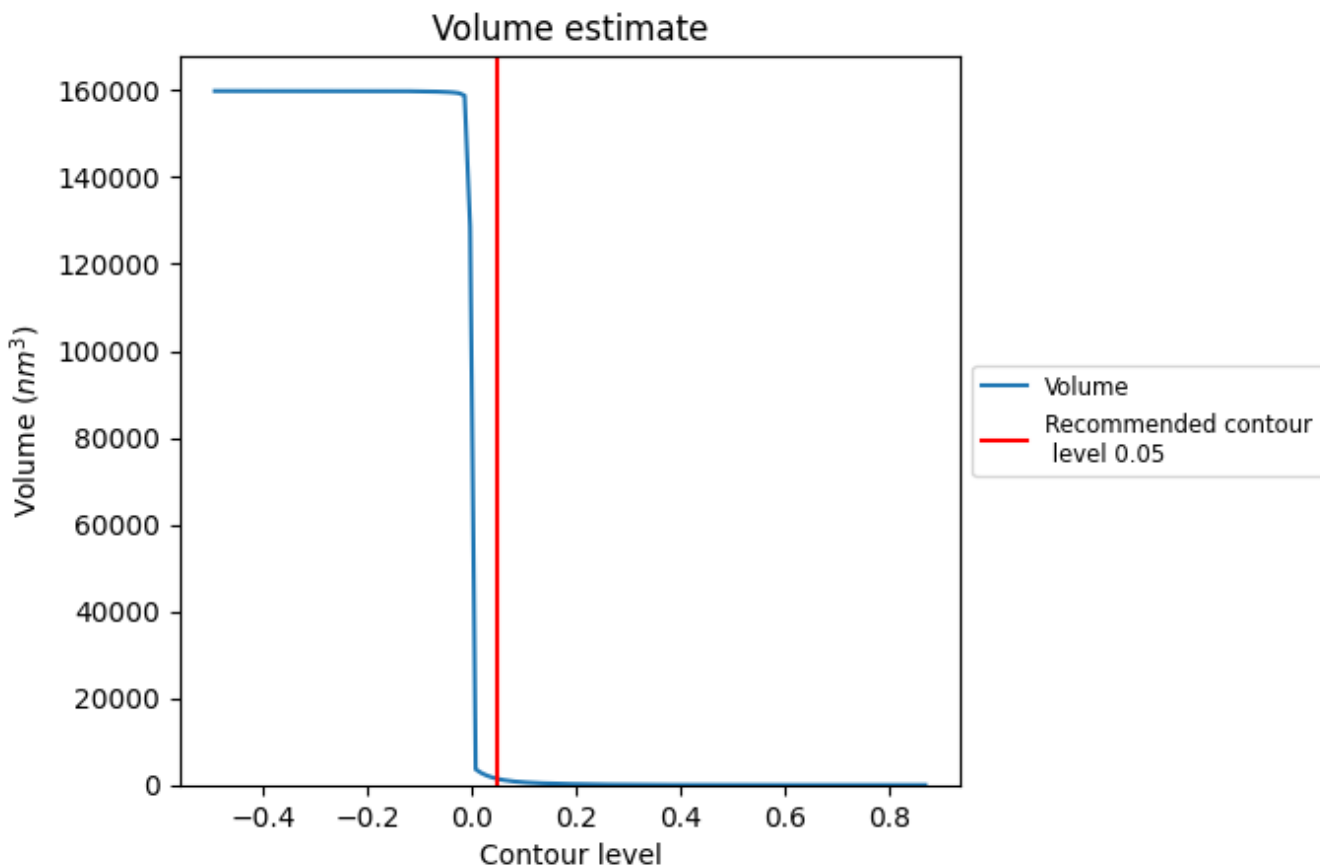
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

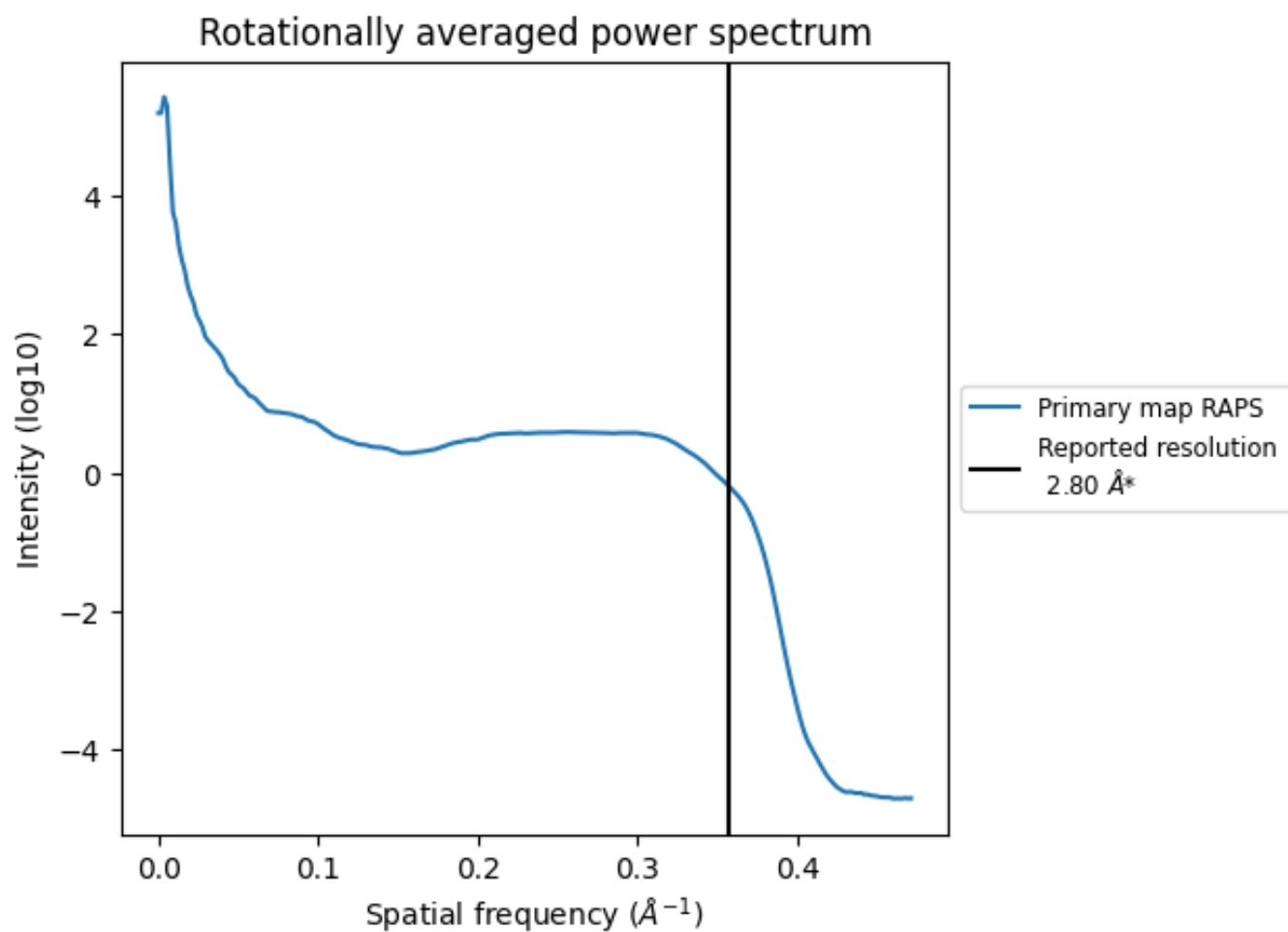
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1408 nm<sup>3</sup>; this corresponds to an approximate mass of 1272 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 0.357 Å<sup>-1</sup>



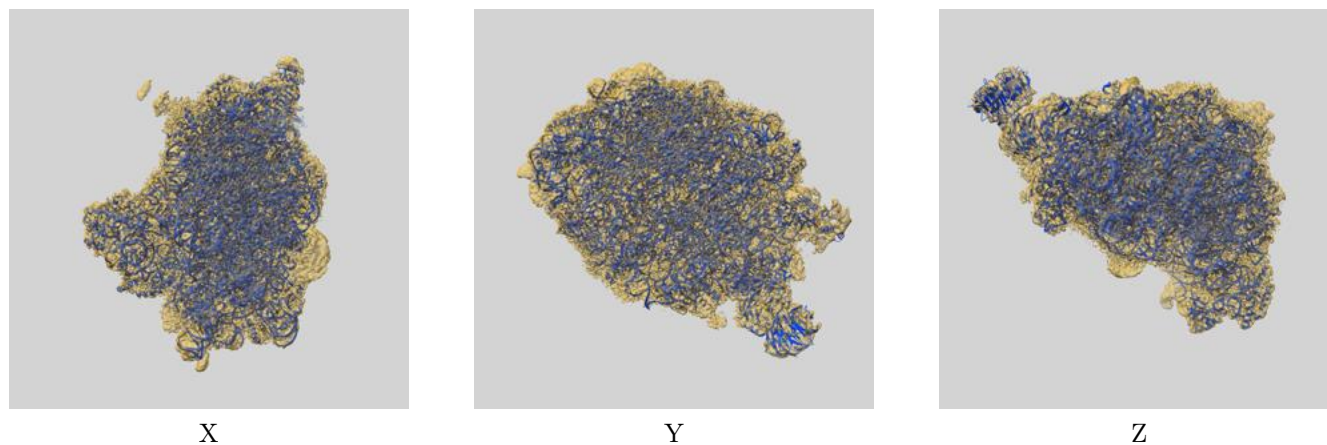
## 8 Fourier-Shell correlation

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

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

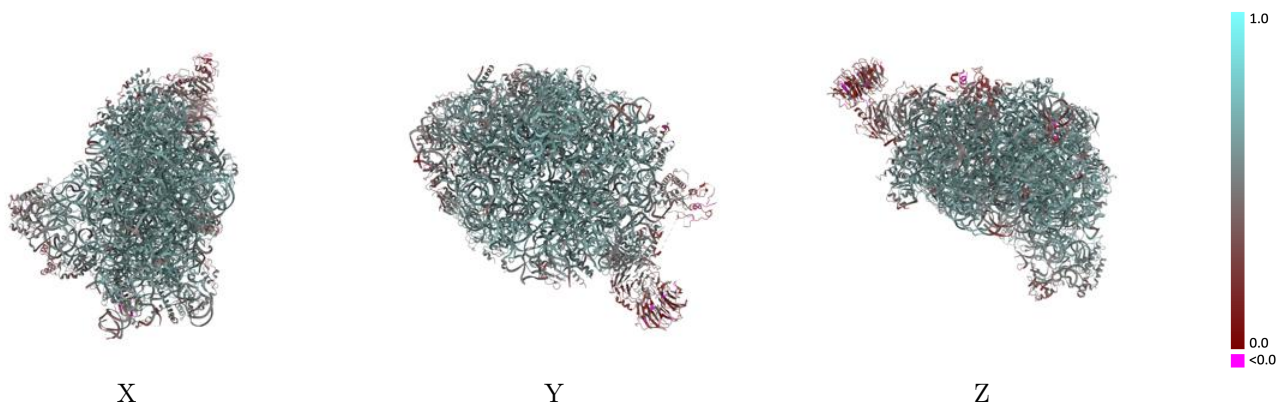
This section contains information regarding the fit between EMDB map EMD-24412 and PDB model 8EUG. Per-residue inclusion information can be found in section 3 on page 12.

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



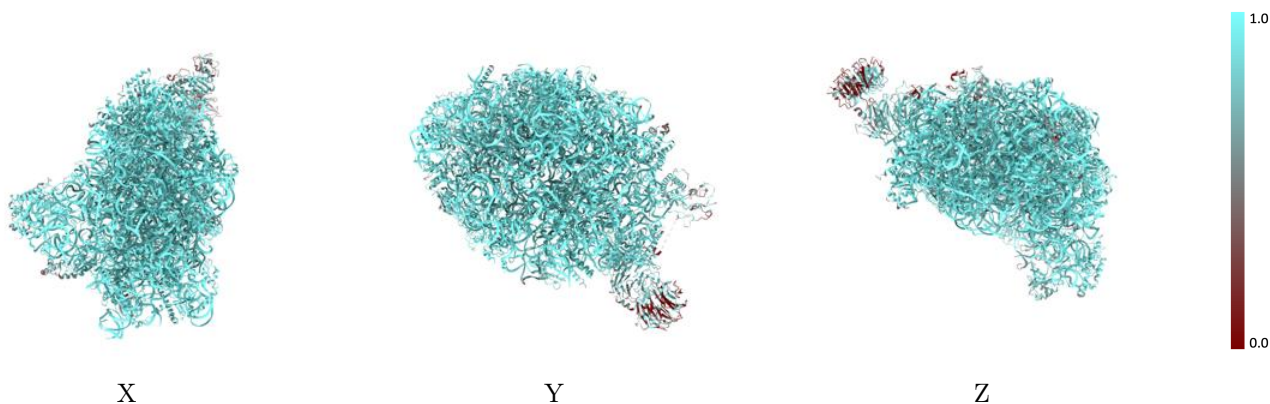
The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



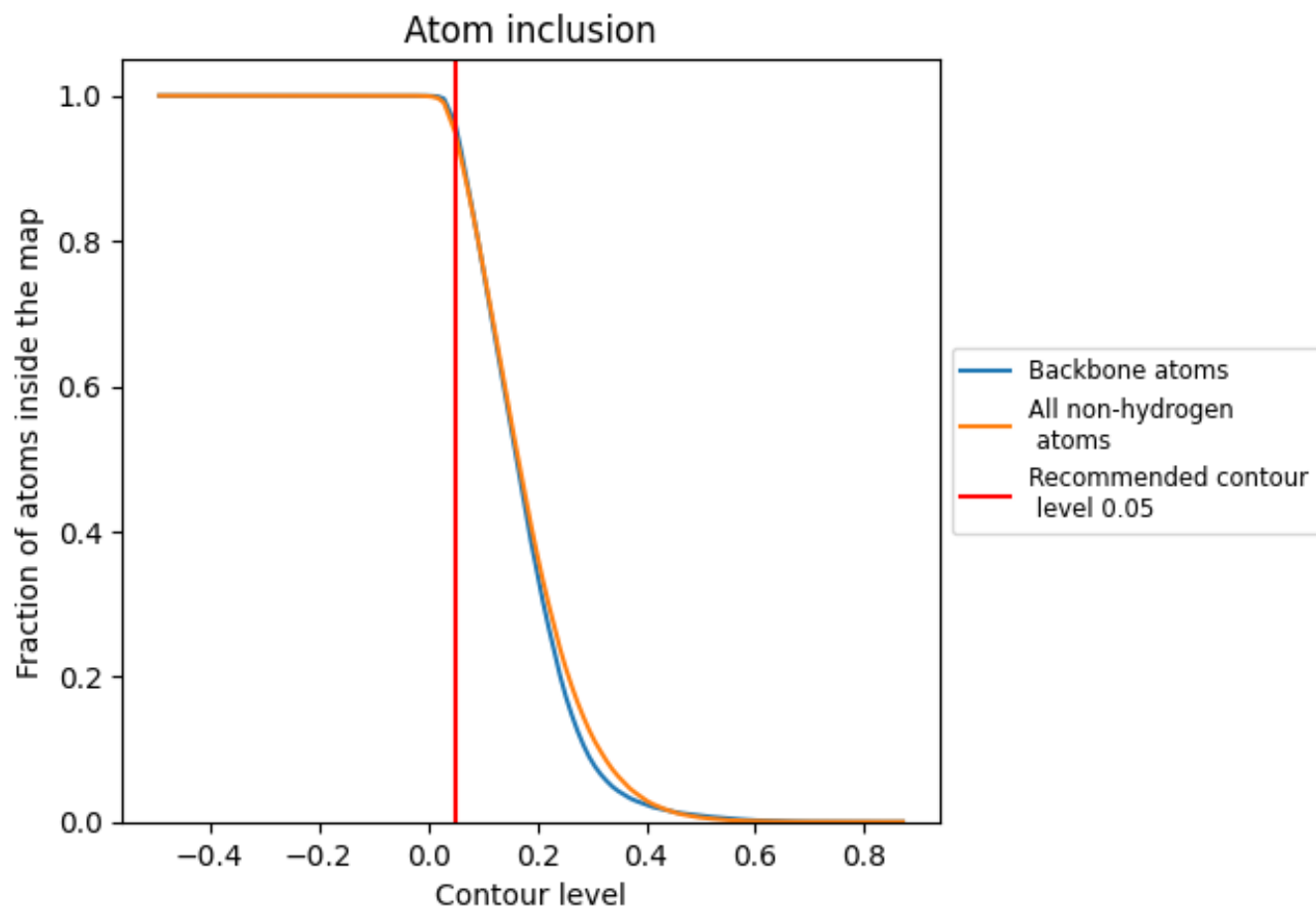
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

## 9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.05).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 96% of all backbone atoms, 95% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

























The table lists the average atom inclusion at the recommended contour level (0.05) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9491	 0.5670
1	 0.9863	 0.5950
2	 0.9907	 0.6210
3	 0.8356	 0.4530
8	 0.9904	 0.6190
9	 0.9921	 0.5370
A	 0.9821	 0.6130
B	 0.9726	 0.5920
C	 0.9743	 0.6030
D	 0.8878	 0.4980
E	 0.9280	 0.5250
F	 0.9624	 0.5920
G	 0.8954	 0.5310
H	 0.7751	 0.3480
I	 0.8445	 0.4870
J	 0.7798	 0.3820
K	 0.9580	 0.6010
L	 0.9576	 0.6030
M	 0.9488	 0.5140
N	 0.9894	 0.6350
O	 0.9617	 0.5810
P	 0.9500	 0.5850
Q	 0.9798	 0.6020
R	 0.9607	 0.5850
S	 0.9576	 0.5600
T	 0.9534	 0.5770
U	 0.7951	 0.4340
V	 0.9659	 0.5790
X	 0.9692	 0.6000
Y	 0.9709	 0.5930
Z	 0.9321	 0.5370
a	 0.9655	 0.6130
b	 0.9483	 0.5460
c	 0.8944	 0.5330
d	 0.9305	 0.5790



*Continued on next page...*

*Continued from previous page...*

Chain	Atom inclusion	Q-score
e	 0.9823	 0.6130
f	 0.9816	 0.6060
g	 0.9661	 0.6040
h	 0.9586	 0.5880
i	 0.9538	 0.5710
j	 0.9905	 0.6440
k	 0.8846	 0.5210
m	 0.7330	 0.3910
n	 0.7601	 0.4050
o	 0.9389	 0.5650
p	 0.4403	 0.2640
u	 0.9474	 0.5350