



Full wwPDB EM Validation Report ⓘ

May 19, 2024 – 10:09 am BST

PDB ID : 6RZZ
EMDB ID : EMD-10068
Title : Cryo-EM structures of Lsg1-TAP pre-60S ribosomal particles
Authors : Kargas, V.; Warren, A.J.
Deposited on : 2019-06-13
Resolution : 3.20 Å (reported)
Based on initial model : 4V88

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

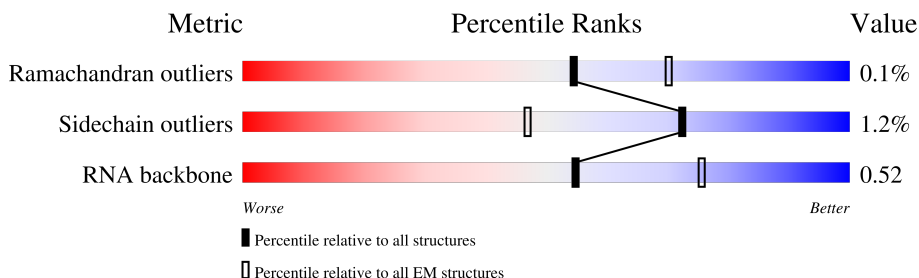
EMDB validation analysis : 0.0.1.dev92
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

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 3.20 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.



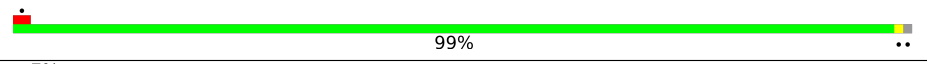
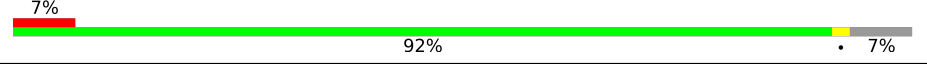
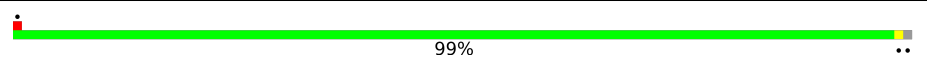
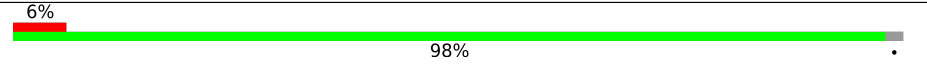
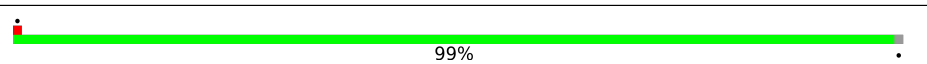
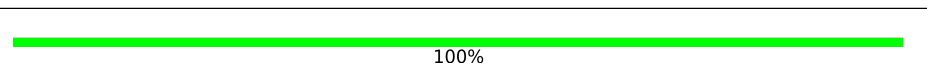

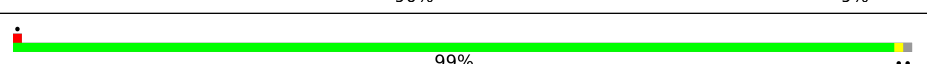
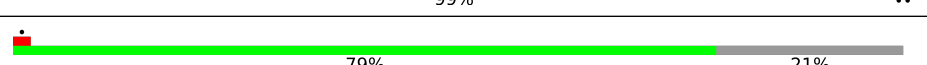
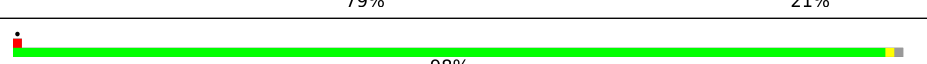
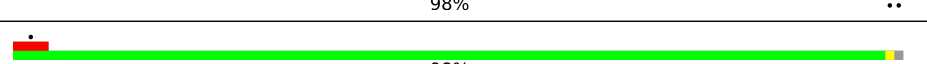
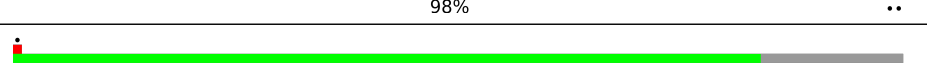

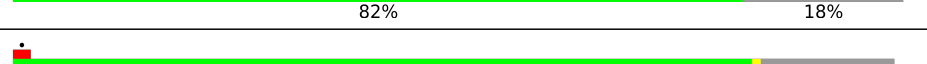

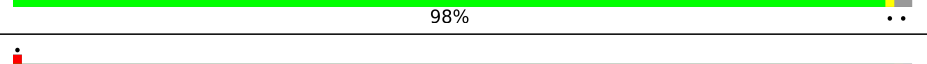
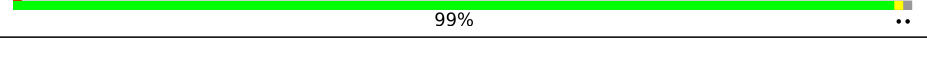
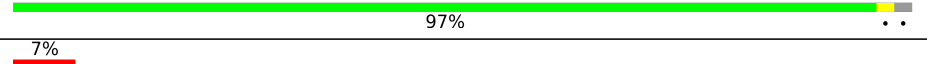

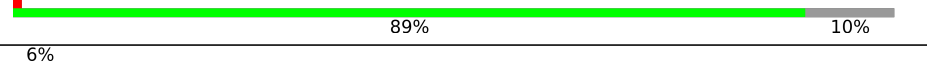
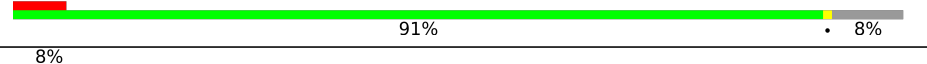
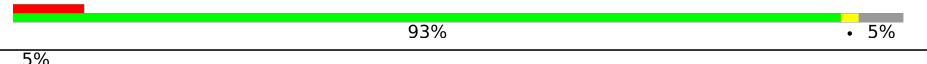
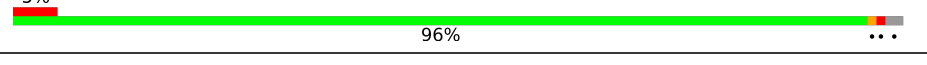
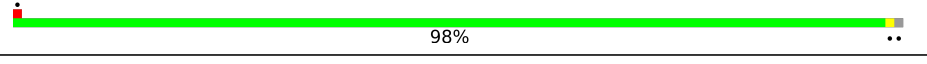

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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 ≥ 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	A	3396	
2	B	254	
3	C	387	
4	D	362	
5	E	174	
6	F	191	
7	G	176	
8	H	256	

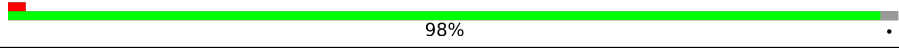
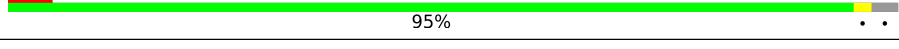
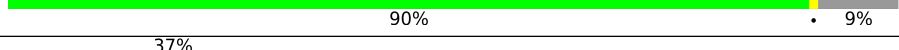

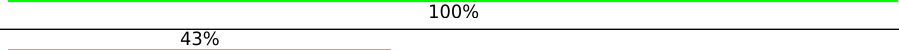
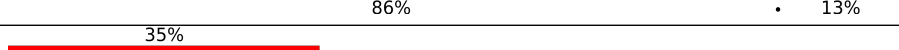
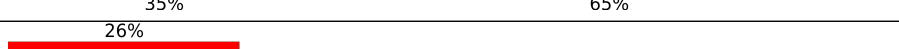
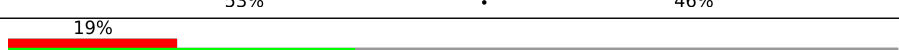


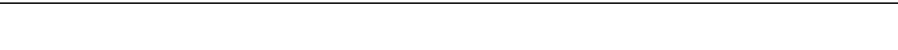
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Mol	Chain	Length	Quality of chain
9	J	198	 99%
10	K	199	 92% 7%
11	L	137	 99%
12	M	138	 98% 6%
13	N	149	 99%
14	O	204	 100%
15	P	297	 90% 9%
16	Q	186	 99%
17	R	189	 79% 21%
18	S	172	 98%
19	T	160	 98%
20	U	184	 84% 16%
21	V	121	 82% 18%
22	W	142	 83% 15%
23	X	127	 98%
24	Y	136	 99%
25	Z	120	 97%
26	a	59	 88% 12%
27	b	244	 89% 10%
28	c	105	 91% 8%
29	d	113	 93% 8% 5%
30	e	130	 96% 5%
31	f	107	 98%
32	g	121	 83% 15%
33	h	100	 98% 18%

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Mol	Chain	Length	Quality of chain
34	i	88	 93% 5%
35	j	78	 96%
36	k	51	 98%
37	l	106	 87% 11%
38	m	92	 95%
39	n	245	 90% 9%
40	o	640	 49% 37% 50%
41	p	210	 100% 31%
42	r	593	 86% 43% 13%
43	s	364	 65% 35% 35%
44	u	393	 53% 26% 46%
45	v	155	 61% 19% 39%
46	w	518	 72% 25% 25%
47	x	121	 84% 16%
48	y	158	 81% 17%

2 Entry composition [i](#)

There are 49 unique types of molecules in this entry. The entry contains 134359 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 25S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	3146	67292	30062	12142	21944	3144	0	0

- Molecule 2 is a protein called 60S ribosomal protein L2-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	247	1878	1170	381	326	1	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	381	3039	1928	577	526	8	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	361	2748	1730	522	493	3	0	0

- Molecule 5 is a protein called 60S ribosomal protein L11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	169	1352	847	253	248	4	0	0

- Molecule 6 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	189	1502	953	272	273	4	0	0

- Molecule 7 is a protein called 60S ribosomal protein L6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	G	175	1399	902	251	245	1	0	0

- Molecule 8 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	H	223	1742	1117	309	313	3	0	0

- Molecule 9 is a protein called 60S ribosomal protein L16-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	J	197	1563	1005	292	265	1	0	0

- Molecule 10 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
10	K	186	1486	929	304	253	0	0

- Molecule 11 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	L	136	1002	628	189	178	7	0	0

- Molecule 12 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	M	135	1045	669	197	177	2	0	0

- Molecule 13 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	N	148	1172	749	231	189	3	0	0

- Molecule 14 is a protein called 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	O	203	Total	C	N	O	S	0	0
			1719	1077	361	280	1		

- Molecule 15 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	269	Total	C	N	O	S	0	0
			2176	1378	375	421	2		

- Molecule 16 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	Q	185	Total	C	N	O	S	0	0
			1440	908	290	240	2		

- Molecule 17 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	R	150	Total	C	N	O	0	0
			1209	752	257	200		

- Molecule 18 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	S	171	Total	C	N	O	S	0	0
			1436	925	266	242	3		

- Molecule 19 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	T	159	Total	C	N	O	S	0	0
			1275	805	246	220	4		

- Molecule 20 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	U	154	Total	C	N	O	0	0
			1222	761	237	224		

- Molecule 21 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	V	99	Total	C	N	O	0	0
			786	510	129	147		

- Molecule 22 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	W	120	Total	C	N	O	S	0	0
			958	617	168	171	2		

- Molecule 23 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	X	125	Total	C	N	O	0	0
			984	620	191	173		

- Molecule 24 is a protein called 60S ribosomal protein L27-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	Y	135	Total	C	N	O	0	0
			1091	710	202	179		

- Molecule 25 is a protein called 60S ribosomal protein L35-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Z	118	Total	C	N	O	S	0	0
			963	612	185	165	1		

- Molecule 26 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	a	52	Total	C	N	O	0	0
			415	259	90	66		

- Molecule 27 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	b	219	Total	C	N	O	S	0	0
			1760	1138	320	301	1		

- Molecule 28 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	c	97	Total	C	N	O	S	0	0
			741	479	124	137	1		

- Molecule 29 is a protein called 60S ribosomal protein L31-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	d	107	Total	C	N	O	S	0	0
			872	553	165	153	1		

- Molecule 30 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	e	127	Total	C	N	O	S	0	0
			1020	646	205	167	2		

- Molecule 31 is a protein called 60S ribosomal protein L33-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	f	106	Total	C	N	O	S	0	0
			849	540	165	143	1		

- Molecule 32 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	g	103	Total	C	N	O	S	0	0
			812	504	167	137	4		

- Molecule 33 is a protein called 60S ribosomal protein L36-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	h	98	Total	C	N	O	S	0	0
			763	477	155	129	2		

- Molecule 34 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	i	84	Total	C	N	O	S	0	0
			665	405	145	110	5		

- Molecule 35 is a protein called 60S ribosomal protein L38.

Mol	Chain	Residues	Atoms				AltConf	Trace
35	j	77	Total	C	N	O	0	0
			611	391	115	105		

- Molecule 36 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	k	50	Total	C	N	O	S	0	0
			435	272	97	64	2		

- Molecule 37 is a protein called 60S ribosomal protein L42-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	l	94	Total	C	N	O	S	0	0
			756	476	153	122	5		

- Molecule 38 is a protein called 60S ribosomal protein L43-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	m	89	Total	C	N	O	S	0	0
			680	421	136	117	6		

- Molecule 39 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	n	224	Total	C	N	O	S	0	0
			1691	1051	293	340	7		

- Molecule 40 is a protein called Large subunit GTPase 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	o	320	Total	C	N	O	S	0	0
			2574	1648	444	475	7		

- Molecule 41 is a protein called uL1.

Mol	Chain	Residues	Atoms				AltConf	Trace
41	p	210	Total	C	N	O	0	0
			1050	630	210	210		

- Molecule 42 is a protein called Probable metalloprotease ARX1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	r	516	3999	2530	688	766	15	0	0

- Molecule 43 is a protein called Tyrosine-protein phosphatase YVH1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	s	128	991	625	179	179	8	0	0

- Molecule 44 is a protein called Cytoplasmic 60S subunit biogenesis factor REI1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	u	211	1724	1095	307	314	8	0	0

- Molecule 45 is a protein called 60S ribosomal protein L24-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	v	60	500	322	98	79	1	0	0

- Molecule 46 is a protein called 60S ribosomal export protein NMD3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	w	389	3076	1955	530	571	20	0	0

- Molecule 47 is a RNA chain called 5S ribosomal RNA.

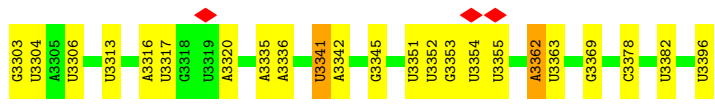
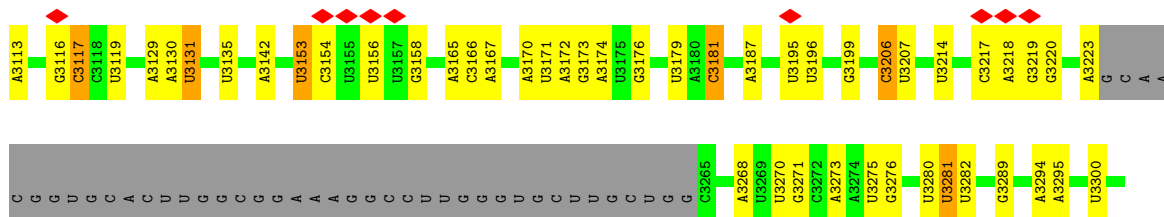
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
47	x	121	2576	1152	461	843	120	0	0

- Molecule 48 is a RNA chain called 5.8S ribosomal RNA.

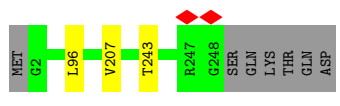
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
48	y	156	3310	1482	582	1091	155	0	0

- Molecule 49 is ZINC ION (three-letter code: ZN) (formula: Zn).

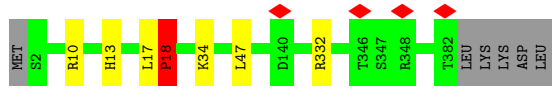
Mol	Chain	Residues	Atoms		AltConf
49	g	1	Total 1	Zn 1	0
49	i	1	Total 1	Zn 1	0
49	l	1	Total 1	Zn 1	0
49	m	1	Total 1	Zn 1	0
49	s	2	Total 2	Zn 2	0
49	u	2	Total 2	Zn 2	0
49	w	2	Total 2	Zn 2	0



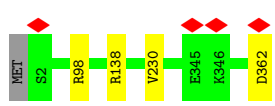
● Molecule 2: 60S ribosomal protein L2-A



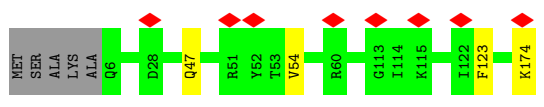
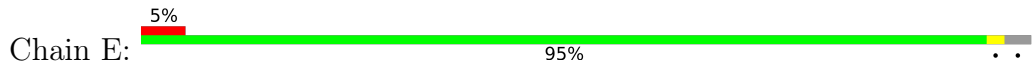
● Molecule 3: 60S ribosomal protein L3



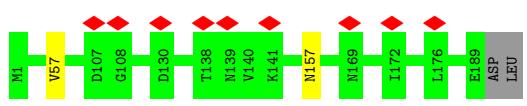
● Molecule 4: 60S ribosomal protein L4-A



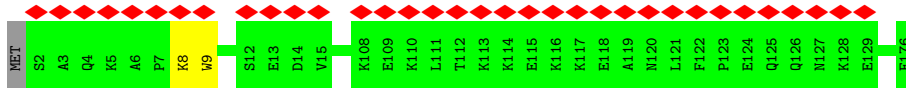
● Molecule 5: 60S ribosomal protein L11-A



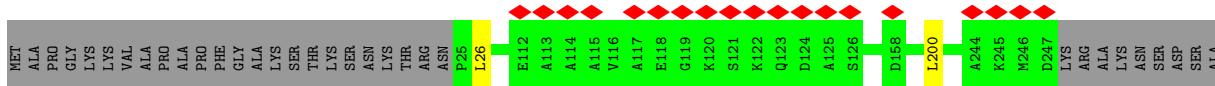
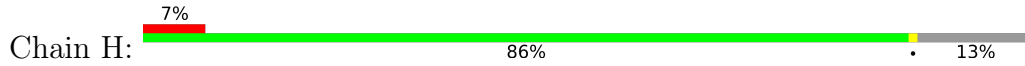
● Molecule 6: 60S ribosomal protein L9-A



● Molecule 7: 60S ribosomal protein L6-A



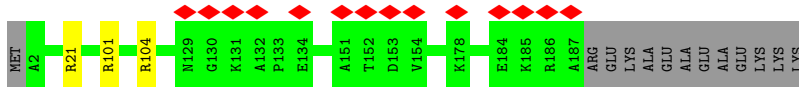
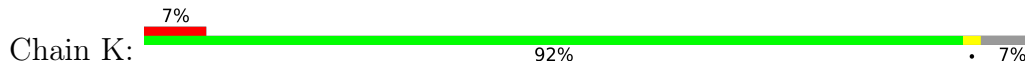
- Molecule 8: 60S ribosomal protein L8-A



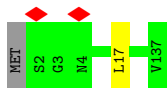
- Molecule 9: 60S ribosomal protein L16-B



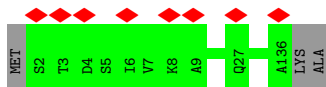
- Molecule 10: 60S ribosomal protein L13-A



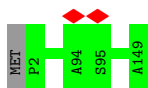
- Molecule 11: 60S ribosomal protein L23-A



- Molecule 12: 60S ribosomal protein L14-A



- Molecule 13: 60S ribosomal protein L28




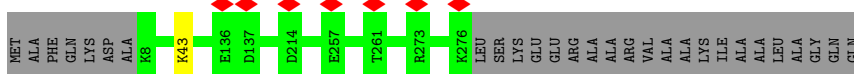
- Molecule 14: 60S ribosomal protein L15-A

Chain O:  100%



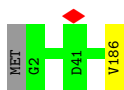
- Molecule 15: 60S ribosomal protein L5

Chain P:  90%




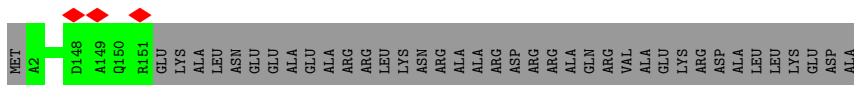
- Molecule 16: 60S ribosomal protein L18-A

Chain Q:  99%



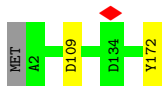
- Molecule 17: 60S ribosomal protein L19-A

Chain R:  79%



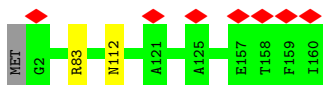
- Molecule 18: 60S ribosomal protein L20-A

Chain S:  98%




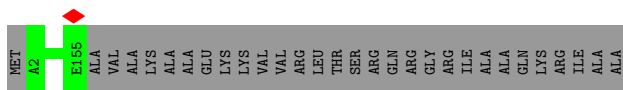
- Molecule 19: 60S ribosomal protein L21-A

Chain T:  98%

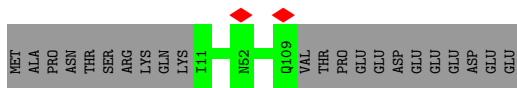
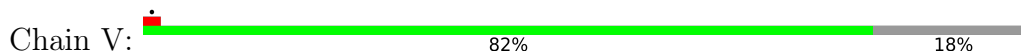


- Molecule 20: 60S ribosomal protein L17-A

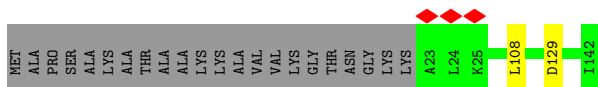
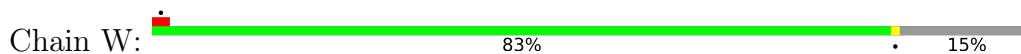
Chain U:  84%



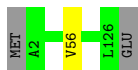
• Molecule 21: 60S ribosomal protein L22-A



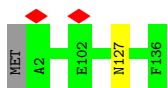
• Molecule 22: 60S ribosomal protein L25



• Molecule 23: 60S ribosomal protein L26-A



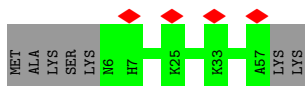
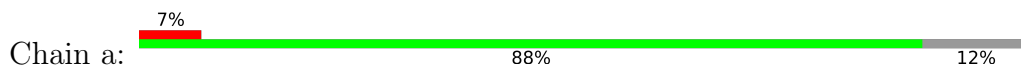
• Molecule 24: 60S ribosomal protein L27-A



• Molecule 25: 60S ribosomal protein L35-A

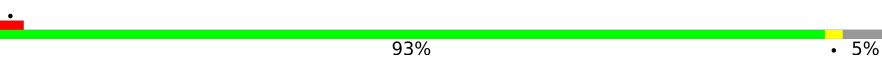


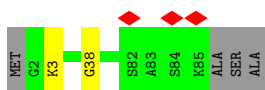
• Molecule 26: 60S ribosomal protein L29



• Molecule 27: 60S ribosomal protein L7-A

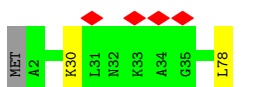
- Molecule 34: 60S ribosomal protein L37-A

Chain i:  93% 5%



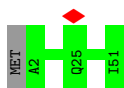
- Molecule 35: 60S ribosomal protein L38

Chain j:  96% 5%




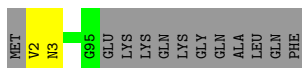
- Molecule 36: 60S ribosomal protein L39

Chain k:  98%



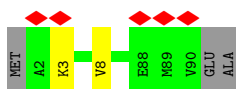
- Molecule 37: 60S ribosomal protein L42-A

Chain l:  87% 11%

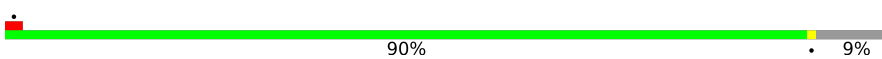


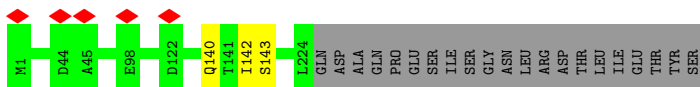
- Molecule 38: 60S ribosomal protein L43-A

Chain m:  95%



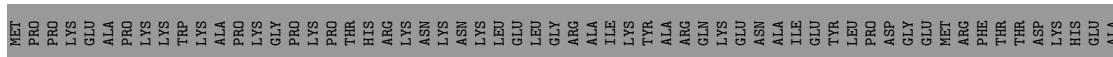
- Molecule 39: Eukaryotic translation initiation factor 6

Chain n:  90% 9%



- Molecule 40: Large subunit GTPase 1

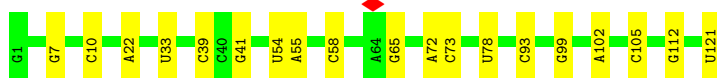
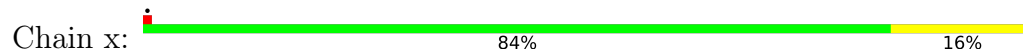
Chain o:  49% 37% 50%



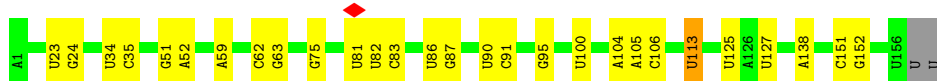
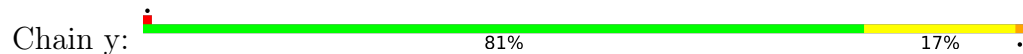
LYS
GLU
HIS
LYS
ASP
ILE
ASP
ALA
SER
LEU
ASP
TYR
ASN
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ARG
ALA
GLN
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LEU
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LEU
ARG
ALA
GLU
LYS
MET
THR
LEU
GLU
ASP
GLY
VAL
GLU
ASN
THR
PRO
VAL
SER
GLN
GLN

• Molecule 47: 5S ribosomal RNA



• Molecule 48: 5.8S ribosomal RNA



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	216403	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	63	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	0.638	Depositor
Minimum map value	-0.372	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.023	Depositor
Recommended contour level	0.07	Depositor
Map size (\AA)	383.40002, 383.40002, 383.40002	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.065, 1.065, 1.065	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	A	0.80	2/75327 (0.0%)	1.07	302/117440 (0.3%)
2	B	0.46	0/1912	0.60	1/2569 (0.0%)
3	C	0.47	0/3110	0.62	3/4184 (0.1%)
4	D	0.46	0/2800	0.56	0/3791
5	E	0.31	0/1373	0.54	0/1841
6	F	0.33	0/1523	0.54	0/2051
7	G	0.35	0/1423	0.57	0/1911
8	H	0.38	0/1774	0.55	2/2395 (0.1%)
9	J	0.42	0/1593	0.52	0/2137
10	K	0.40	0/1511	0.52	0/2031
11	L	0.43	0/1017	0.58	1/1368 (0.1%)
12	M	0.36	0/1060	0.55	0/1428
13	N	0.48	0/1203	0.53	0/1611
14	O	0.50	0/1756	0.57	0/2353
15	P	0.37	0/2225	0.53	0/3004
16	Q	0.42	0/1464	0.54	0/1964
17	R	0.40	0/1226	0.48	0/1637
18	S	0.45	0/1472	0.55	1/1979 (0.1%)
19	T	0.44	0/1299	0.53	0/1742
20	U	0.47	0/1245	0.55	0/1676
21	V	0.38	0/802	0.55	0/1087
22	W	0.43	0/973	0.62	2/1313 (0.2%)
23	X	0.43	0/995	0.57	0/1329
24	Y	0.36	0/1117	0.52	0/1496
25	Z	0.38	0/972	0.51	0/1293
26	a	0.34	0/426	0.47	0/570
27	b	0.45	0/1797	0.56	0/2419
28	c	0.34	0/749	0.56	1/1007 (0.1%)
29	d	0.47	0/886	0.59	1/1190 (0.1%)
30	e	0.43	0/1041	0.56	1/1393 (0.1%)
31	f	0.48	0/867	0.68	1/1167 (0.1%)
32	g	0.44	0/822	0.54	0/1099

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	h	0.32	0/770	0.52	0/1023
34	i	0.50	0/680	0.59	0/901
35	j	0.37	0/617	0.54	0/825
36	k	0.41	0/442	0.51	0/587
37	l	0.44	0/768	0.55	0/1016
38	m	0.49	0/687	0.57	0/915
39	n	0.34	0/1712	0.58	0/2330
40	o	0.35	0/2628	0.66	3/3557 (0.1%)
42	r	0.28	0/4069	0.58	1/5520 (0.0%)
43	s	0.31	0/1016	0.66	1/1368 (0.1%)
44	u	0.32	0/1759	0.57	0/2363
45	v	0.30	0/512	0.48	0/680
46	w	0.36	0/3135	0.61	1/4255 (0.0%)
47	x	0.67	0/2880	1.01	9/4487 (0.2%)
48	y	0.83	0/3699	1.02	4/5760 (0.1%)
All	All	0.66	2/143134 (0.0%)	0.90	335/210062 (0.2%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	2258	U	C1'-N1	5.95	1.57	1.48
1	A	2971	A	N9-C4	5.11	1.41	1.37

All (335) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1012	G	N1-C6-O6	-10.55	113.57	119.90
1	A	2567	C	N3-C2-O2	-10.35	114.66	121.90
1	A	2567	C	N1-C2-O2	9.86	124.82	118.90
1	A	960	U	C2-N1-C1'	9.65	129.28	117.70
1	A	922	U	C2-N1-C1'	9.58	129.19	117.70
1	A	960	U	N1-C2-O2	9.46	129.43	122.80
1	A	1012	G	C5-C6-O6	9.34	134.20	128.60
1	A	2622	C	N1-C2-O2	9.29	124.47	118.90
3	C	18	PRO	CA-N-CD	-9.24	98.57	111.50
1	A	2444	C	N1-C2-O2	9.20	124.42	118.90
47	x	105	C	N1-C2-O2	9.05	124.33	118.90
1	A	3181	C	N1-C2-O2	8.85	124.21	118.90
1	A	3181	C	C2-N1-C1'	8.62	128.29	118.80
31	f	40	ASP	CB-CG-OD1	8.62	126.06	118.30
1	A	982	C	C2-N1-C1'	8.59	128.25	118.80
1	A	960	U	N3-C2-O2	-8.36	116.35	122.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	2444	C	N3-C2-O2	-8.13	116.21	121.90
1	A	3306	U	C2-N1-C1'	8.09	127.41	117.70
1	A	3306	U	N3-C2-O2	-8.05	116.56	122.20
1	A	2489	C	N1-C2-O2	7.96	123.68	118.90
28	c	104	LEU	CA-CB-CG	7.92	133.51	115.30
1	A	1289	G	O5'-P-OP1	7.89	120.17	110.70
1	A	1496	C	C2-N1-C1'	7.79	127.37	118.80
1	A	2567	C	C6-N1-C2	-7.73	117.21	120.30
1	A	2470	C	C5-C6-N1	7.72	124.86	121.00
1	A	1872	C	N1-C2-O2	7.72	123.53	118.90
1	A	922	U	N1-C2-O2	7.71	128.20	122.80
1	A	2506	U	N3-C2-O2	-7.68	116.83	122.20
1	A	2622	C	N3-C2-O2	-7.64	116.55	121.90
1	A	1279	C	N1-C2-O2	7.64	123.48	118.90
47	x	105	C	C2-N1-C1'	7.63	127.19	118.80
1	A	1004	U	C2-N1-C1'	7.62	126.84	117.70
1	A	270	U	N1-C2-O2	7.60	128.12	122.80
1	A	3181	C	N3-C2-O2	-7.57	116.60	121.90
1	A	1333	C	C5-C6-N1	7.51	124.76	121.00
1	A	2506	U	C2-N1-C1'	7.47	126.66	117.70
1	A	113	C	C2-N1-C1'	7.45	127.00	118.80
1	A	1279	C	C5-C6-N1	7.44	124.72	121.00
1	A	406	G	O4'-C1'-N9	7.43	114.15	108.20
1	A	1279	C	C2-N1-C1'	7.42	126.97	118.80
1	A	2928	C	C6-N1-C2	-7.40	117.34	120.30
1	A	3057	U	N3-C2-O2	-7.29	117.10	122.20
1	A	2444	C	C2-N1-C1'	7.29	126.81	118.80
1	A	922	U	N3-C2-O2	-7.25	117.12	122.20
1	A	1279	C	C6-N1-C2	-7.20	117.42	120.30
1	A	3104	U	N3-C2-O2	-7.16	117.19	122.20
1	A	78	U	N3-C2-O2	-7.11	117.22	122.20
1	A	3092	C	C2-N1-C1'	7.08	126.59	118.80
1	A	969	C	C6-N1-C2	-7.06	117.47	120.30
1	A	1815	U	P-O3'-C3'	7.05	128.16	119.70
1	A	1004	U	N1-C2-O2	7.02	127.72	122.80
1	A	1496	C	C5-C6-N1	7.02	124.51	121.00
1	A	2489	C	C2-N1-C1'	7.01	126.51	118.80
1	A	3104	U	N1-C2-O2	6.98	127.69	122.80
1	A	524	U	N1-C2-O2	6.97	127.68	122.80
1	A	1907	C	N1-C2-O2	6.96	123.07	118.90
1	A	1604	G	C4-N9-C1'	6.94	135.53	126.50
40	o	171	GLU	C-N-CA	6.93	139.02	121.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	x	105	C	N3-C2-O2	-6.90	117.07	121.90
1	A	2444	C	C6-N1-C2	-6.88	117.55	120.30
1	A	3058	U	N1-C2-O2	6.87	127.61	122.80
1	A	621	A	P-O3'-C3'	6.86	127.93	119.70
1	A	960	U	C6-N1-C1'	-6.83	111.64	121.20
1	A	1878	G	C4-N9-C1'	6.80	135.34	126.50
1	A	2112	U	P-O3'-C3'	6.79	127.85	119.70
22	W	129	ASP	CB-CG-OD1	6.76	124.39	118.30
1	A	1333	C	C6-N1-C2	-6.76	117.60	120.30
1	A	270	U	N3-C2-O2	-6.75	117.48	122.20
1	A	2726	C	N3-C2-O2	-6.71	117.20	121.90
48	y	100	U	C2-N1-C1'	6.69	125.73	117.70
1	A	1604	G	N3-C4-N9	6.69	130.01	126.00
1	A	3057	U	N1-C2-O2	6.68	127.48	122.80
1	A	2484	A	C2-N3-C4	6.63	113.92	110.60
1	A	252	U	C2-N1-C1'	6.62	125.64	117.70
1	A	3034	C	N1-C2-O2	6.62	122.87	118.90
1	A	524	U	N3-C2-O2	-6.60	117.58	122.20
1	A	2928	C	C5-C6-N1	6.58	124.29	121.00
47	x	105	C	C6-N1-C2	-6.58	117.67	120.30
1	A	2506	U	N1-C2-O2	6.57	127.40	122.80
1	A	3306	U	N1-C2-O2	6.55	127.39	122.80
1	A	1283	C	N1-C2-O2	6.54	122.82	118.90
1	A	2726	C	C2-N1-C1'	6.54	125.99	118.80
1	A	3117	C	N1-C2-O2	6.51	122.81	118.90
1	A	315	C	C6-N1-C2	-6.50	117.70	120.30
1	A	3092	C	N1-C2-O2	6.50	122.80	118.90
1	A	2622	C	C2-N1-C1'	6.49	125.94	118.80
1	A	2101	C	P-O3'-C3'	6.48	127.48	119.70
8	H	26	LEU	CA-CB-CG	6.48	130.21	115.30
1	A	922	U	C6-N1-C1'	-6.48	112.13	121.20
1	A	2899	C	N1-C2-O2	6.46	122.77	118.90
1	A	3058	U	C2-N1-C1'	6.45	125.44	117.70
1	A	2366	C	C5-C6-N1	6.44	124.22	121.00
47	x	39	C	N1-C2-O2	6.40	122.74	118.90
1	A	1872	C	N3-C2-O2	-6.39	117.42	121.90
1	A	1710	C	C2-N1-C1'	6.37	125.80	118.80
1	A	1448	U	N3-C2-O2	-6.36	117.75	122.20
1	A	2666	C	C6-N1-C2	-6.35	117.76	120.30
1	A	3057	U	C2-N1-C1'	6.34	125.31	117.70
1	A	2497	U	N1-C2-O2	6.33	127.23	122.80
1	A	1309	U	N1-C2-O2	6.32	127.22	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	2971	A	C2-N3-C4	6.30	113.75	110.60
1	A	1496	C	C6-N1-C2	-6.29	117.79	120.30
1	A	2666	C	C2-N1-C1'	6.29	125.71	118.80
1	A	315	C	C5-C6-N1	6.28	124.14	121.00
1	A	663	C	C5-C6-N1	6.28	124.14	121.00
1	A	1309	U	N3-C2-O2	-6.27	117.81	122.20
1	A	3153	U	N1-C2-O2	6.27	127.19	122.80
1	A	1604	G	C8-N9-C1'	-6.27	118.85	127.00
1	A	3058	U	N3-C2-O2	-6.27	117.81	122.20
1	A	3174	A	C2-N3-C4	6.26	113.73	110.60
1	A	3153	U	N3-C2-O2	-6.24	117.83	122.20
1	A	3214	U	C2-N1-C1'	6.24	125.19	117.70
1	A	241	G	C4-N9-C1'	6.24	134.61	126.50
1	A	2274	U	N1-C2-O2	6.24	127.17	122.80
2	B	96	LEU	CA-CB-CG	6.22	129.61	115.30
1	A	3206	C	C6-N1-C2	-6.20	117.82	120.30
1	A	2600	C	C5-C6-N1	6.20	124.10	121.00
1	A	1283	C	N3-C2-O2	-6.18	117.57	121.90
1	A	2489	C	N3-C2-O2	-6.18	117.58	121.90
1	A	2378	C	C2-N1-C1'	6.13	125.54	118.80
47	x	105	C	C5-C6-N1	6.11	124.06	121.00
1	A	2983	C	C2-N1-C1'	6.11	125.52	118.80
48	y	113	U	C2-N1-C1'	6.10	125.02	117.70
1	A	1854	C	C6-N1-C2	-6.08	117.87	120.30
1	A	3048	A	O4'-C1'-N9	6.08	113.06	108.20
1	A	982	C	C6-N1-C1'	-6.08	113.51	120.80
1	A	2274	U	C2-N1-C1'	6.07	124.99	117.70
1	A	270	U	C2-N1-C1'	6.07	124.98	117.70
1	A	1155	C	C6-N1-C2	-6.05	117.88	120.30
1	A	1064	A	P-O3'-C3'	6.04	126.94	119.70
1	A	1190	A	C4-N9-C1'	5.98	137.06	126.30
1	A	3181	C	C6-N1-C2	-5.97	117.91	120.30
1	A	2552	C	C2-N1-C1'	5.96	125.36	118.80
1	A	1732	U	N3-C2-O2	-5.95	118.03	122.20
1	A	2476	C	C6-N1-C2	-5.95	117.92	120.30
1	A	2899	C	C2-N1-C1'	5.95	125.34	118.80
1	A	890	C	N3-C2-O2	-5.94	117.74	121.90
1	A	2470	C	C6-N1-C2	-5.93	117.93	120.30
42	r	251	LEU	CA-CB-CG	5.93	128.95	115.30
1	A	1115	G	C4-N9-C1'	5.93	134.21	126.50
1	A	252	U	N3-C2-O2	-5.93	118.05	122.20
1	A	1289	G	O5'-P-OP2	-5.92	100.37	105.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	113	C	N1-C2-O2	5.92	122.45	118.90
1	A	2983	C	N3-C2-O2	-5.91	117.76	121.90
1	A	982	C	C5-C6-N1	5.90	123.95	121.00
1	A	3317	U	N1-C2-O2	5.89	126.92	122.80
1	A	3300	U	N3-C2-O2	-5.88	118.09	122.20
1	A	2726	C	C6-N1-C2	-5.88	117.95	120.30
1	A	916	G	P-O3'-C3'	5.87	126.75	119.70
1	A	2928	C	N1-C2-O2	5.87	122.42	118.90
1	A	1279	C	N3-C2-O2	-5.87	117.80	121.90
1	A	1425	U	N3-C2-O2	-5.87	118.09	122.20
1	A	3362	A	N7-C8-N9	5.86	116.73	113.80
1	A	3181	C	C6-N1-C1'	-5.86	113.77	120.80
1	A	969	C	C5-C6-N1	5.86	123.93	121.00
1	A	2366	C	C6-N1-C2	-5.85	117.96	120.30
1	A	42	C	C5-C6-N1	5.84	123.92	121.00
1	A	3153	U	C2-N1-C1'	5.83	124.69	117.70
1	A	1854	C	C5-C6-N1	5.82	123.91	121.00
1	A	3092	C	C6-N1-C1'	-5.82	113.82	120.80
1	A	2137	U	C2-N1-C1'	5.81	124.68	117.70
1	A	3105	U	C2-N1-C1'	5.80	124.66	117.70
1	A	1448	U	N1-C2-O2	5.79	126.85	122.80
1	A	3317	U	C2-N1-C1'	5.79	124.64	117.70
1	A	2373	A	C2-N3-C4	5.79	113.49	110.60
1	A	982	C	C6-N1-C2	-5.78	117.99	120.30
1	A	2585	G	N3-C4-C5	-5.77	125.72	128.60
1	A	2600	C	C6-N1-C2	-5.76	117.99	120.30
1	A	241	G	N3-C4-C5	-5.76	125.72	128.60
1	A	2489	C	C5-C6-N1	5.75	123.88	121.00
1	A	2873	U	N3-C2-O2	-5.75	118.17	122.20
1	A	1496	C	N1-C2-O2	5.75	122.35	118.90
1	A	1604	G	N3-C4-C5	-5.75	125.72	128.60
11	L	17	LEU	CA-CB-CG	5.74	128.51	115.30
47	x	39	C	C2-N1-C1'	5.73	125.10	118.80
1	A	1004	U	N3-C2-O2	-5.72	118.20	122.20
1	A	2551	U	N3-C2-O2	-5.72	118.20	122.20
1	A	1118	C	C6-N1-C2	-5.71	118.01	120.30
1	A	1217	A	P-O3'-C3'	5.71	126.56	119.70
1	A	2373	A	N3-C4-N9	5.71	131.97	127.40
1	A	2207	A	O4'-C1'-N9	5.71	112.77	108.20
40	o	134	LEU	CA-CB-CG	5.71	128.43	115.30
1	A	1355	A	P-O3'-C3'	5.71	126.55	119.70
1	A	2857	C	N3-C2-O2	-5.70	117.91	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	18	PRO	CB-CA-C	5.70	126.25	112.00
1	A	315	C	C2-N1-C1'	5.68	125.05	118.80
1	A	2638	C	N1-C2-O2	5.67	122.30	118.90
1	A	3042	U	C5-C6-N1	5.66	125.53	122.70
1	A	1878	G	C8-N9-C1'	-5.66	119.64	127.00
1	A	1155	C	C5-C6-N1	5.66	123.83	121.00
1	A	2418	G	C4-N9-C1'	5.65	133.84	126.50
1	A	105	C	C6-N1-C2	-5.64	118.04	120.30
29	d	44	MET	CA-CB-CG	5.64	122.89	113.30
1	A	915	A	C4-N9-C1'	5.64	136.45	126.30
1	A	1878	G	N3-C4-C5	-5.63	125.79	128.60
1	A	113	C	C5-C6-N1	5.62	123.81	121.00
1	A	1239	C	N1-C2-O2	5.62	122.27	118.90
1	A	663	C	C6-N1-C2	-5.60	118.06	120.30
1	A	1269	U	C2-N1-C1'	5.59	124.41	117.70
1	A	2497	U	C5-C6-N1	5.57	125.49	122.70
1	A	2894	C	C6-N1-C2	-5.57	118.07	120.30
1	A	2189	U	N3-C2-O2	-5.57	118.30	122.20
1	A	2622	C	C6-N1-C2	-5.57	118.07	120.30
1	A	1275	C	C6-N1-C2	-5.56	118.08	120.30
1	A	2484	A	N3-C4-N9	5.55	131.84	127.40
1	A	911	C	C6-N1-C2	-5.54	118.08	120.30
1	A	1732	U	N1-C2-O2	5.54	126.68	122.80
1	A	982	C	N1-C2-O2	5.54	122.22	118.90
1	A	1706	C	C6-N1-C2	-5.54	118.08	120.30
1	A	3131	U	C2-N1-C1'	5.54	124.34	117.70
1	A	1907	C	N3-C2-O2	-5.54	118.02	121.90
43	s	288	LEU	CA-CB-CG	5.53	128.02	115.30
1	A	311	C	C2-N1-C1'	5.52	124.88	118.80
1	A	1576	G	N3-C4-N9	5.52	129.31	126.00
1	A	2716	U	N3-C2-O2	-5.52	118.34	122.20
48	y	100	U	N1-C2-O2	5.51	126.66	122.80
1	A	2378	C	N1-C2-O2	5.51	122.20	118.90
1	A	3317	U	N3-C2-O2	-5.50	118.35	122.20
1	A	2774	C	C6-N1-C2	-5.50	118.10	120.30
1	A	2489	C	C6-N1-C2	-5.49	118.10	120.30
1	A	2689	A	C2-N3-C4	5.48	113.34	110.60
1	A	2274	U	N3-C2-O2	-5.48	118.37	122.20
1	A	2585	G	N3-C4-N9	5.45	129.27	126.00
1	A	283	G	C4-N9-C1'	5.44	133.57	126.50
1	A	2552	C	N1-C2-O2	5.43	122.16	118.90
47	x	78	U	N1-C2-O2	5.43	126.60	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1805	C	C6-N1-C2	-5.43	118.13	120.30
1	A	241	G	N3-C4-N9	5.43	129.26	126.00
1	A	3104	U	C2-N1-C1'	5.42	124.21	117.70
1	A	1004	U	C6-N1-C1'	-5.42	113.61	121.20
1	A	2132	C	C6-N1-C2	-5.42	118.13	120.30
1	A	1499	C	C5-C6-N1	5.42	123.71	121.00
1	A	2783	U	N3-C2-O2	-5.41	118.41	122.20
1	A	3341	U	N1-C2-O2	5.41	126.59	122.80
1	A	979	U	N3-C2-O2	-5.41	118.42	122.20
1	A	2366	C	C2-N1-C1'	5.41	124.75	118.80
1	A	2726	C	N1-C2-O2	5.40	122.14	118.90
1	A	1448	U	C2-N1-C1'	5.40	124.18	117.70
1	A	2189	U	N1-C2-O2	5.40	126.58	122.80
1	A	1705	U	N1-C2-O2	5.38	126.57	122.80
1	A	2112	U	OP2-P-O3'	5.38	117.04	105.20
18	S	109	ASP	CB-CG-OD1	5.38	123.14	118.30
1	A	621	A	OP2-P-O3'	5.37	117.02	105.20
1	A	1878	G	N3-C4-N9	5.37	129.22	126.00
1	A	180	C	C6-N1-C2	-5.37	118.15	120.30
1	A	1155	C	C2-N1-C1'	5.37	124.70	118.80
1	A	2470	C	N1-C2-O2	5.37	122.12	118.90
1	A	496	C	N1-C2-O2	5.36	122.12	118.90
48	y	100	U	C5-C6-N1	5.35	125.38	122.70
1	A	2764	C	N1-C2-O2	5.34	122.11	118.90
1	A	682	U	C2-N1-C1'	5.33	124.09	117.70
1	A	1705	U	N3-C2-O2	-5.33	118.47	122.20
1	A	915	A	C2-N3-C4	5.32	113.26	110.60
1	A	981	U	C5-C6-N1	5.31	125.36	122.70
1	A	1710	C	C5-C6-N1	5.30	123.65	121.00
1	A	354	U	N1-C2-O2	5.29	126.50	122.80
1	A	2497	U	OP1-P-O3'	5.29	116.84	105.20
1	A	421	G	N3-C4-N9	5.29	129.17	126.00
1	A	1115	G	N3-C4-C5	-5.28	125.96	128.60
1	A	2821	C	C6-N1-C2	-5.28	118.19	120.30
1	A	2971	A	N3-C4-N9	5.28	131.62	127.40
1	A	915	A	N7-C8-N9	5.28	116.44	113.80
1	A	2617	U	N3-C2-O2	-5.27	118.51	122.20
1	A	263	C	C6-N1-C2	-5.27	118.19	120.30
1	A	1115	G	N3-C4-N9	5.27	129.16	126.00
1	A	713	U	N3-C2-O2	-5.26	118.52	122.20
1	A	3097	C	C6-N1-C2	-5.25	118.20	120.30
1	A	271	C	N1-C2-O2	5.25	122.05	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	3300	U	N1-C2-O2	5.23	126.46	122.80
1	A	252	U	N1-C2-O2	5.23	126.46	122.80
1	A	1710	C	C6-N1-C2	-5.23	118.21	120.30
22	W	108	LEU	CA-CB-CG	5.23	127.33	115.30
1	A	3034	C	N3-C2-O2	-5.23	118.24	121.90
1	A	1190	A	C8-N9-C1'	-5.23	118.29	127.70
1	A	2988	C	C5-C6-N1	5.22	123.61	121.00
1	A	2487	U	C2-N1-C1'	-5.21	111.45	117.70
1	A	2497	U	N3-C2-O2	-5.21	118.56	122.20
1	A	3306	U	O4'-C1'-N1	5.19	112.35	108.20
1	A	1525	G	C4-N9-C1'	5.19	133.24	126.50
1	A	2476	C	C5-C6-N1	5.18	123.59	121.00
40	o	175	ASP	CB-CG-OD2	5.18	122.97	118.30
1	A	113	C	C6-N1-C2	-5.18	118.23	120.30
1	A	97	U	N3-C2-O2	-5.18	118.58	122.20
1	A	962	A	C4-N9-C1'	5.17	135.62	126.30
1	A	2773	C	C6-N1-C2	-5.17	118.23	120.30
1	A	3135	U	N3-C2-O2	-5.17	118.58	122.20
8	H	200	LEU	CA-CB-CG	5.16	127.18	115.30
1	A	1076	C	C6-N1-C2	-5.16	118.23	120.30
1	A	2652	U	N3-C2-O2	-5.16	118.59	122.20
1	A	2852	C	C6-N1-C2	-5.15	118.24	120.30
1	A	3105	U	N1-C2-O2	5.15	126.41	122.80
1	A	2373	A	O4'-C1'-N9	-5.15	104.08	108.20
1	A	2484	A	N3-C4-C5	-5.14	123.20	126.80
1	A	1115	G	C8-N9-C1'	-5.14	120.32	127.00
1	A	2418	G	C8-N9-C1'	-5.14	120.31	127.00
1	A	1425	U	N1-C2-O2	5.14	126.40	122.80
1	A	2764	C	N3-C2-O2	-5.14	118.30	121.90
3	C	47	LEU	CA-CB-CG	5.13	127.11	115.30
1	A	1907	C	C2-N1-C1'	5.13	124.44	118.80
1	A	2497	U	C2-N1-C1'	5.13	123.85	117.70
1	A	1533	U	N3-C2-O2	-5.13	118.61	122.20
1	A	1496	C	C6-N1-C1'	-5.12	114.65	120.80
1	A	113	C	C6-N1-C1'	-5.12	114.66	120.80
1	A	3117	C	N3-C2-O2	-5.11	118.32	121.90
1	A	2904	U	C2-N1-C1'	5.10	123.82	117.70
1	A	3027	A	C2-N3-C4	5.09	113.15	110.60
1	A	271	C	N3-C2-O2	-5.09	118.34	121.90
1	A	2407	C	C6-N1-C2	-5.08	118.27	120.30
1	A	962	A	N7-C8-N9	5.08	116.34	113.80
1	A	1608	C	N1-C2-O2	5.08	121.95	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	2274	U	C5-C6-N1	5.07	125.24	122.70
1	A	2652	U	N1-C2-O2	5.07	126.35	122.80
1	A	2689	A	C4-N9-C1'	5.07	135.42	126.30
1	A	3084	C	C6-N1-C2	-5.07	118.27	120.30
1	A	149	U	N3-C2-O2	-5.07	118.65	122.20
1	A	2356	A	C5-C6-N6	-5.07	119.65	123.70
1	A	2857	C	N1-C2-O2	5.06	121.94	118.90
30	e	7	PRO	N-CA-CB	-5.06	97.04	102.60
1	A	3214	U	N3-C2-O2	-5.05	118.66	122.20
1	A	3341	U	C2-N1-C1'	5.04	123.75	117.70
1	A	241	G	C8-N9-C1'	-5.04	120.45	127.00
1	A	2904	U	N1-C2-O2	5.04	126.33	122.80
1	A	2304	C	N3-C2-O2	-5.03	118.38	121.90
1	A	2617	U	C2-N1-C1'	5.03	123.73	117.70
1	A	849	C	N1-C2-O2	5.02	121.91	118.90
1	A	2899	C	N3-C2-O2	-5.02	118.38	121.90
1	A	3281	U	C2-N1-C1'	5.02	123.73	117.70
47	x	58	C	C5-C6-N1	5.02	123.51	121.00
1	A	1819	U	N1-C2-O2	5.01	126.31	122.80
1	A	1597	C	C5-C6-N1	5.01	123.51	121.00
1	A	1608	C	C2-N1-C1'	5.01	124.31	118.80
46	w	197	LEU	CA-CB-CG	5.01	126.83	115.30
1	A	3078	U	C2-N1-C1'	5.00	123.71	117.70
1	A	2359	C	C5-C6-N1	5.00	123.50	121.00
1	A	2490	C	C2-N1-C1'	5.00	124.30	118.80

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	
2	B	245/254 (96%)	224 (91%)	21 (9%)	0	100	100
3	C	379/387 (98%)	352 (93%)	26 (7%)	1 (0%)	41	74
4	D	359/362 (99%)	342 (95%)	17 (5%)	0	100	100
5	E	167/174 (96%)	154 (92%)	13 (8%)	0	100	100
6	F	187/191 (98%)	178 (95%)	9 (5%)	0	100	100
7	G	173/176 (98%)	159 (92%)	13 (8%)	1 (1%)	25	64
8	H	221/256 (86%)	210 (95%)	11 (5%)	0	100	100
9	J	195/198 (98%)	193 (99%)	2 (1%)	0	100	100
10	K	184/199 (92%)	174 (95%)	10 (5%)	0	100	100
11	L	134/137 (98%)	125 (93%)	9 (7%)	0	100	100
12	M	133/138 (96%)	128 (96%)	5 (4%)	0	100	100
13	N	146/149 (98%)	132 (90%)	14 (10%)	0	100	100
14	O	201/204 (98%)	191 (95%)	10 (5%)	0	100	100
15	P	267/297 (90%)	253 (95%)	14 (5%)	0	100	100
16	Q	183/186 (98%)	179 (98%)	4 (2%)	0	100	100
17	R	148/189 (78%)	147 (99%)	1 (1%)	0	100	100
18	S	169/172 (98%)	163 (96%)	6 (4%)	0	100	100
19	T	157/160 (98%)	152 (97%)	5 (3%)	0	100	100
20	U	152/184 (83%)	144 (95%)	8 (5%)	0	100	100
21	V	97/121 (80%)	91 (94%)	6 (6%)	0	100	100
22	W	118/142 (83%)	108 (92%)	10 (8%)	0	100	100
23	X	123/127 (97%)	118 (96%)	5 (4%)	0	100	100
24	Y	133/136 (98%)	124 (93%)	9 (7%)	0	100	100
25	Z	116/120 (97%)	114 (98%)	2 (2%)	0	100	100
26	a	50/59 (85%)	45 (90%)	5 (10%)	0	100	100
27	b	217/244 (89%)	209 (96%)	8 (4%)	0	100	100
28	c	95/105 (90%)	93 (98%)	2 (2%)	0	100	100
29	d	105/113 (93%)	92 (88%)	13 (12%)	0	100	100
30	e	125/130 (96%)	118 (94%)	5 (4%)	2 (2%)	9	43
31	f	104/107 (97%)	96 (92%)	8 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
32	g	101/121 (84%)	92 (91%)	8 (8%)	1 (1%)	15	54
33	h	96/100 (96%)	95 (99%)	1 (1%)	0	100	100
34	i	82/88 (93%)	74 (90%)	7 (8%)	1 (1%)	13	49
35	j	75/78 (96%)	72 (96%)	3 (4%)	0	100	100
36	k	48/51 (94%)	44 (92%)	4 (8%)	0	100	100
37	l	92/106 (87%)	89 (97%)	3 (3%)	0	100	100
38	m	87/92 (95%)	80 (92%)	6 (7%)	1 (1%)	14	51
39	n	222/245 (91%)	208 (94%)	14 (6%)	0	100	100
40	o	314/640 (49%)	265 (84%)	48 (15%)	1 (0%)	41	74
42	r	508/593 (86%)	475 (94%)	33 (6%)	0	100	100
43	s	126/364 (35%)	105 (83%)	21 (17%)	0	100	100
44	u	207/393 (53%)	193 (93%)	13 (6%)	1 (0%)	29	67
45	v	58/155 (37%)	58 (100%)	0	0	100	100
46	w	387/518 (75%)	348 (90%)	38 (10%)	1 (0%)	41	74
All	All	7486/8961 (84%)	7006 (94%)	470 (6%)	10 (0%)	54	83

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	18	PRO
32	g	81	CYS
30	e	7	PRO
44	u	221	ASN
7	G	9	TRP
46	w	142	GLN
40	o	231	ASN
30	e	4	LEU
34	i	38	GLY
38	m	8	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	
2	B	189/196 (96%)	187 (99%)	2 (1%)	73	88
3	C	317/323 (98%)	311 (98%)	6 (2%)	57	81
4	D	288/289 (100%)	284 (99%)	4 (1%)	67	86
5	E	147/150 (98%)	143 (97%)	4 (3%)	44	75
6	F	169/171 (99%)	167 (99%)	2 (1%)	71	88
7	G	152/153 (99%)	151 (99%)	1 (1%)	84	94
8	H	183/208 (88%)	183 (100%)	0	100	100
9	J	163/164 (99%)	162 (99%)	1 (1%)	86	94
10	K	149/159 (94%)	146 (98%)	3 (2%)	55	80
11	L	104/105 (99%)	104 (100%)	0	100	100
12	M	107/109 (98%)	107 (100%)	0	100	100
13	N	118/119 (99%)	118 (100%)	0	100	100
14	O	175/176 (99%)	175 (100%)	0	100	100
15	P	227/245 (93%)	226 (100%)	1 (0%)	91	95
16	Q	150/151 (99%)	149 (99%)	1 (1%)	84	94
17	R	124/154 (80%)	124 (100%)	0	100	100
18	S	155/156 (99%)	154 (99%)	1 (1%)	86	94
19	T	136/137 (99%)	134 (98%)	2 (2%)	65	85
20	U	125/146 (86%)	125 (100%)	0	100	100
21	V	86/107 (80%)	86 (100%)	0	100	100
22	W	104/118 (88%)	104 (100%)	0	100	100
23	X	108/110 (98%)	107 (99%)	1 (1%)	78	91
24	Y	115/116 (99%)	114 (99%)	1 (1%)	78	91
25	Z	104/105 (99%)	102 (98%)	2 (2%)	57	81
26	a	41/47 (87%)	41 (100%)	0	100	100
27	b	184/205 (90%)	183 (100%)	1 (0%)	88	95
28	c	81/88 (92%)	81 (100%)	0	100	100
29	d	94/97 (97%)	93 (99%)	1 (1%)	73	88
30	e	109/111 (98%)	107 (98%)	2 (2%)	59	82
31	f	90/91 (99%)	90 (100%)	0	100	100
32	g	88/103 (85%)	86 (98%)	2 (2%)	50	78

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	h	80/82 (98%)	80 (100%)	0	100	100
34	i	69/71 (97%)	68 (99%)	1 (1%)	67	86
35	j	68/69 (99%)	66 (97%)	2 (3%)	42	74
36	k	45/46 (98%)	45 (100%)	0	100	100
37	l	81/91 (89%)	79 (98%)	2 (2%)	47	77
38	m	70/72 (97%)	69 (99%)	1 (1%)	67	86
39	n	192/211 (91%)	189 (98%)	3 (2%)	62	84
40	o	282/555 (51%)	276 (98%)	6 (2%)	53	79
42	r	453/520 (87%)	447 (99%)	6 (1%)	69	87
43	s	110/323 (34%)	110 (100%)	0	100	100
44	u	181/359 (50%)	179 (99%)	2 (1%)	73	88
45	v	53/129 (41%)	53 (100%)	0	100	100
46	w	348/467 (74%)	333 (96%)	15 (4%)	29	64
All	All	6414/7604 (84%)	6338 (99%)	76 (1%)	72	88

All (76) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	207	VAL
2	B	243	THR
3	C	10	ARG
3	C	13	HIS
3	C	17	LEU
3	C	18	PRO
3	C	34	LYS
3	C	332	ARG
4	D	98	ARG
4	D	138	ARG
4	D	230	VAL
4	D	362	ASP
5	E	47	GLN
5	E	54	VAL
5	E	123	PHE
5	E	174	LYS
6	F	57	VAL
6	F	157	ASN
7	G	8	LYS

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Mol	Chain	Res	Type
9	J	26	VAL
10	K	21	ARG
10	K	101	ARG
10	K	104	ARG
15	P	43	LYS
16	Q	186	VAL
18	S	172	TYR
19	T	83	ARG
19	T	112	ASN
23	X	56	VAL
24	Y	127	ASN
25	Z	10	ARG
25	Z	93	THR
27	b	229	PHE
29	d	64	VAL
30	e	4	LEU
30	e	7	PRO
32	g	46	ASP
32	g	47	CYS
34	i	3	LYS
35	j	30	LYS
35	j	78	LEU
37	l	2	VAL
37	l	3	ASN
38	m	3	LYS
39	n	140	GLN
39	n	142	ILE
39	n	143	SER
40	o	157	GLU
40	o	159	PHE
40	o	160	LEU
40	o	166	LEU
40	o	170	GLN
40	o	171	GLU
42	r	58	GLN
42	r	134	ARG
42	r	243	ARG
42	r	362	ARG
42	r	504	CYS
42	r	575	MET
44	u	220	CYS
44	u	354	LYS

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Mol	Chain	Res	Type
46	w	20	CYS
46	w	57	PHE
46	w	61	CYS
46	w	63	ARG
46	w	64	PHE
46	w	66	GLN
46	w	73	ARG
46	w	94	LYS
46	w	106	GLU
46	w	108	HIS
46	w	141	MET
46	w	142	GLN
46	w	143	CYS
46	w	145	ASP
46	w	332	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
20	U	125	GLN
40	o	170	GLN
40	o	399	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	3141/3396 (92%)	678 (21%)	15 (0%)
47	x	120/121 (99%)	15 (12%)	0
48	y	155/158 (98%)	27 (17%)	0
All	All	3416/3675 (92%)	720 (21%)	15 (0%)

All (720) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	6	A
1	A	26	A
1	A	40	A
1	A	43	A
1	A	48	A
1	A	49	A

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Mol	Chain	Res	Type
1	A	59	G
1	A	60	A
1	A	65	A
1	A	66	A
1	A	70	A
1	A	72	C
1	A	73	C
1	A	75	G
1	A	92	G
1	A	99	A
1	A	109	A
1	A	110	G
1	A	111	C
1	A	116	A
1	A	117	U
1	A	119	U
1	A	120	G
1	A	121	A
1	A	122	A
1	A	133	U
1	A	134	U
1	A	135	C
1	A	136	G
1	A	148	G
1	A	154	U
1	A	156	G
1	A	157	A
1	A	167	U
1	A	171	G
1	A	176	G
1	A	181	U
1	A	187	A
1	A	190	U
1	A	191	U
1	A	192	C
1	A	194	U
1	A	198	A
1	A	200	C
1	A	206	G
1	A	211	A
1	A	213	A
1	A	218	G

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Mol	Chain	Res	Type
1	A	219	A
1	A	220	G
1	A	234	G
1	A	238	A
1	A	239	G
1	A	241	G
1	A	243	G
1	A	246	U
1	A	248	U
1	A	249	U
1	A	250	U
1	A	251	G
1	A	252	U
1	A	253	A
1	A	263	C
1	A	265	A
1	A	266	A
1	A	269	G
1	A	281	G
1	A	286	U
1	A	295	A
1	A	305	U
1	A	315	C
1	A	329	U
1	A	351	A
1	A	359	U
1	A	376	G
1	A	390	G
1	A	398	A
1	A	399	A
1	A	401	U
1	A	402	A
1	A	403	C
1	A	420	G
1	A	421	G
1	A	422	A
1	A	438	A
1	A	439	C
1	A	440	A
1	A	496	C
1	A	503	C
1	A	521	A

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Mol	Chain	Res	Type
1	A	523	A
1	A	536	U
1	A	542	G
1	A	545	U
1	A	547	G
1	A	551	A
1	A	555	U
1	A	556	U
1	A	557	A
1	A	559	A
1	A	569	A
1	A	578	A
1	A	579	G
1	A	604	G
1	A	611	A
1	A	619	A
1	A	620	U
1	A	621	A
1	A	622	A
1	A	637	C
1	A	649	A
1	A	662	U
1	A	677	A
1	A	681	U
1	A	689	U
1	A	691	A
1	A	699	A
1	A	705	A
1	A	712	G
1	A	715	A
1	A	716	A
1	A	718	G
1	A	719	U
1	A	720	A
1	A	725	G
1	A	761	A
1	A	767	U
1	A	774	G
1	A	776	U
1	A	777	U
1	A	780	A
1	A	781	G

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Mol	Chain	Res	Type
1	A	785	G
1	A	786	A
1	A	801	A
1	A	806	A
1	A	815	G
1	A	817	A
1	A	830	A
1	A	832	G
1	A	845	G
1	A	847	A
1	A	848	A
1	A	849	C
1	A	861	C
1	A	874	U
1	A	879	U
1	A	880	G
1	A	884	A
1	A	896	A
1	A	907	G
1	A	908	G
1	A	914	A
1	A	916	G
1	A	917	A
1	A	921	A
1	A	923	C
1	A	924	G
1	A	925	A
1	A	937	G
1	A	944	C
1	A	953	G
1	A	959	C
1	A	960	U
1	A	963	G
1	A	979	U
1	A	980	A
1	A	981	U
1	A	982	C
1	A	999	G
1	A	1001	G
1	A	1004	U
1	A	1006	A
1	A	1007	U

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Mol	Chain	Res	Type
1	A	1009	A
1	A	1010	G
1	A	1011	A
1	A	1012	G
1	A	1013	G
1	A	1014	U
1	A	1016	C
1	A	1017	C
1	A	1018	G
1	A	1025	A
1	A	1027	A
1	A	1028	U
1	A	1029	G
1	A	1030	A
1	A	1031	C
1	A	1032	C
1	A	1033	U
1	A	1036	A
1	A	1037	C
1	A	1038	C
1	A	1039	U
1	A	1043	C
1	A	1045	C
1	A	1048	A
1	A	1050	U
1	A	1051	U
1	A	1063	G
1	A	1064	A
1	A	1065	A
1	A	1072	G
1	A	1081	U
1	A	1087	G
1	A	1093	A
1	A	1094	U
1	A	1095	U
1	A	1096	U
1	A	1097	G
1	A	1098	A
1	A	1103	A
1	A	1104	G
1	A	1116	G
1	A	1117	G

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Mol	Chain	Res	Type
1	A	1118	C
1	A	1130	A
1	A	1131	G
1	A	1144	U
1	A	1153	A
1	A	1159	A
1	A	1179	A
1	A	1180	A
1	A	1181	U
1	A	1190	A
1	A	1192	C
1	A	1193	A
1	A	1195	A
1	A	1196	C
1	A	1201	C
1	A	1209	G
1	A	1218	U
1	A	1220	U
1	A	1222	G
1	A	1235	U
1	A	1236	G
1	A	1238	C
1	A	1240	A
1	A	1241	U
1	A	1242	G
1	A	1243	G
1	A	1245	A
1	A	1246	G
1	A	1247	U
1	A	1248	C
1	A	1249	G
1	A	1252	A
1	A	1253	U
1	A	1254	C
1	A	1258	U
1	A	1260	A
1	A	1262	G
1	A	1263	A
1	A	1265	U
1	A	1266	G
1	A	1270	A
1	A	1271	A

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Mol	Chain	Res	Type
1	A	1272	C
1	A	1273	A
1	A	1274	A
1	A	1277	C
1	A	1278	A
1	A	1279	C
1	A	1280	C
1	A	1285	G
1	A	1287	A
1	A	1289	G
1	A	1302	A
1	A	1303	A
1	A	1305	U
1	A	1307	G
1	A	1309	U
1	A	1313	G
1	A	1325	U
1	A	1330	A
1	A	1331	U
1	A	1332	A
1	A	1348	U
1	A	1349	G
1	A	1350	A
1	A	1352	A
1	A	1353	U
1	A	1354	G
1	A	1355	A
1	A	1356	U
1	A	1386	A
1	A	1392	G
1	A	1399	A
1	A	1400	G
1	A	1418	A
1	A	1419	A
1	A	1434	G
1	A	1436	U
1	A	1437	C
1	A	1446	A
1	A	1450	G
1	A	1455	U
1	A	1467	A
1	A	1475	A

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Mol	Chain	Res	Type
1	A	1481	A
1	A	1482	A
1	A	1494	U
1	A	1508	C
1	A	1523	U
1	A	1527	C
1	A	1533	U
1	A	1546	A
1	A	1555	U
1	A	1556	C
1	A	1562	C
1	A	1563	C
1	A	1565	G
1	A	1566	A
1	A	1567	U
1	A	1568	U
1	A	1569	U
1	A	1570	U
1	A	1572	U
1	A	1573	G
1	A	1574	C
1	A	1576	G
1	A	1578	C
1	A	1583	A
1	A	1587	A
1	A	1589	A
1	A	1590	G
1	A	1593	A
1	A	1618	G
1	A	1619	A
1	A	1620	U
1	A	1629	U
1	A	1630	U
1	A	1631	C
1	A	1642	A
1	A	1643	A
1	A	1645	U
1	A	1657	C
1	A	1658	G
1	A	1677	G
1	A	1715	A
1	A	1724	U

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Mol	Chain	Res	Type
1	A	1725	C
1	A	1741	A
1	A	1742	U
1	A	1749	A
1	A	1750	A
1	A	1751	G
1	A	1760	A
1	A	1762	C
1	A	1763	U
1	A	1765	U
1	A	1775	G
1	A	1780	G
1	A	1797	A
1	A	1813	A
1	A	1814	A
1	A	1815	U
1	A	1816	A
1	A	1820	U
1	A	1821	U
1	A	1835	A
1	A	1839	A
1	A	1842	A
1	A	1849	C
1	A	1850	A
1	A	1866	C
1	A	1878	G
1	A	1880	U
1	A	1886	A
1	A	1893	A
1	A	1906	G
1	A	1907	C
1	A	1908	A
1	A	1930	A
1	A	1951	C
1	A	1952	G
1	A	1953	G
1	A	1954	G
1	A	2095	G
1	A	2096	A
1	A	2100	A
1	A	2101	C
1	A	2102	U

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Mol	Chain	Res	Type
1	A	2111	G
1	A	2113	A
1	A	2121	G
1	A	2122	G
1	A	2131	A
1	A	2140	U
1	A	2144	A
1	A	2145	A
1	A	2155	G
1	A	2158	A
1	A	2168	A
1	A	2169	G
1	A	2176	U
1	A	2187	G
1	A	2188	A
1	A	2195	C
1	A	2205	U
1	A	2206	G
1	A	2210	G
1	A	2232	A
1	A	2244	A
1	A	2249	G
1	A	2252	A
1	A	2255	A
1	A	2257	C
1	A	2259	A
1	A	2260	U
1	A	2261	G
1	A	2262	A
1	A	2266	U
1	A	2268	U
1	A	2269	U
1	A	2270	A
1	A	2273	G
1	A	2281	A
1	A	2282	U
1	A	2295	A
1	A	2298	U
1	A	2307	G
1	A	2308	C
1	A	2309	A
1	A	2310	U

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Mol	Chain	Res	Type
1	A	2313	A
1	A	2314	U
1	A	2315	G
1	A	2334	U
1	A	2335	G
1	A	2336	U
1	A	2364	G
1	A	2372	A
1	A	2373	A
1	A	2374	C
1	A	2375	G
1	A	2388	U
1	A	2393	G
1	A	2397	A
1	A	2401	A
1	A	2402	A
1	A	2404	A
1	A	2405	C
1	A	2411	U
1	A	2419	A
1	A	2437	G
1	A	2440	G
1	A	2442	G
1	A	2445	A
1	A	2446	U
1	A	2448	G
1	A	2449	A
1	A	2450	G
1	A	2454	G
1	A	2455	U
1	A	2458	A
1	A	2459	A
1	A	2460	U
1	A	2461	A
1	A	2462	A
1	A	2463	G
1	A	2464	U
1	A	2465	G
1	A	2466	G
1	A	2467	G
1	A	2468	A
1	A	2470	C

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Mol	Chain	Res	Type
1	A	2471	U
1	A	2472	U
1	A	2473	C
1	A	2474	G
1	A	2475	G
1	A	2479	C
1	A	2481	G
1	A	2483	G
1	A	2484	A
1	A	2485	A
1	A	2486	A
1	A	2488	A
1	A	2489	C
1	A	2490	C
1	A	2492	C
1	A	2493	U
1	A	2494	A
1	A	2495	C
1	A	2496	C
1	A	2497	U
1	A	2498	U
1	A	2501	U
1	A	2502	A
1	A	2503	G
1	A	2505	U
1	A	2506	U
1	A	2511	A
1	A	2514	U
1	A	2515	A
1	A	2549	G
1	A	2550	U
1	A	2551	U
1	A	2560	C
1	A	2561	A
1	A	2566	C
1	A	2568	C
1	A	2569	A
1	A	2571	U
1	A	2572	C
1	A	2573	G
1	A	2585	G
1	A	2593	A

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Mol	Chain	Res	Type
1	A	2594	C
1	A	2606	G
1	A	2607	G
1	A	2614	G
1	A	2618	G
1	A	2626	A
1	A	2628	A
1	A	2629	U
1	A	2635	A
1	A	2651	G
1	A	2652	U
1	A	2656	A
1	A	2672	G
1	A	2674	A
1	A	2677	G
1	A	2678	A
1	A	2679	A
1	A	2680	A
1	A	2681	U
1	A	2689	A
1	A	2691	A
1	A	2694	A
1	A	2705	A
1	A	2714	G
1	A	2719	U
1	A	2728	G
1	A	2729	U
1	A	2753	G
1	A	2755	C
1	A	2761	G
1	A	2771	U
1	A	2772	C
1	A	2773	C
1	A	2777	G
1	A	2778	G
1	A	2791	G
1	A	2796	G
1	A	2799	A
1	A	2800	G
1	A	2801	A
1	A	2802	A
1	A	2809	C

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Mol	Chain	Res	Type
1	A	2810	C
1	A	2814	G
1	A	2817	A
1	A	2819	A
1	A	2820	A
1	A	2826	U
1	A	2827	U
1	A	2828	G
1	A	2836	C
1	A	2839	G
1	A	2842	U
1	A	2843	U
1	A	2844	C
1	A	2845	A
1	A	2847	A
1	A	2851	A
1	A	2853	A
1	A	2861	U
1	A	2865	U
1	A	2867	C
1	A	2871	G
1	A	2872	A
1	A	2887	A
1	A	2889	C
1	A	2898	G
1	A	2899	C
1	A	2911	A
1	A	2914	G
1	A	2918	G
1	A	2922	G
1	A	2923	U
1	A	2928	C
1	A	2933	A
1	A	2935	U
1	A	2936	A
1	A	2938	G
1	A	2940	A
1	A	2941	A
1	A	2942	C
1	A	2947	G
1	A	2948	C
1	A	2954	U

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Mol	Chain	Res	Type
1	A	2971	A
1	A	2977	G
1	A	2983	C
1	A	2990	G
1	A	2997	G
1	A	3011	A
1	A	3012	A
1	A	3022	G
1	A	3027	A
1	A	3028	G
1	A	3046	A
1	A	3056	U
1	A	3059	G
1	A	3078	U
1	A	3080	G
1	A	3092	C
1	A	3101	G
1	A	3105	U
1	A	3109	G
1	A	3113	A
1	A	3116	G
1	A	3117	C
1	A	3119	U
1	A	3129	A
1	A	3130	A
1	A	3131	U
1	A	3142	A
1	A	3153	U
1	A	3154	C
1	A	3156	U
1	A	3158	G
1	A	3165	A
1	A	3166	C
1	A	3167	A
1	A	3170	A
1	A	3171	U
1	A	3172	A
1	A	3173	G
1	A	3176	G
1	A	3179	U
1	A	3181	C
1	A	3187	A

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Mol	Chain	Res	Type
1	A	3195	U
1	A	3196	U
1	A	3199	G
1	A	3207	U
1	A	3217	C
1	A	3218	A
1	A	3219	G
1	A	3220	G
1	A	3223	A
1	A	3268	A
1	A	3270	U
1	A	3271	G
1	A	3273	A
1	A	3275	U
1	A	3276	G
1	A	3280	U
1	A	3281	U
1	A	3282	U
1	A	3289	G
1	A	3294	A
1	A	3295	A
1	A	3303	G
1	A	3304	U
1	A	3313	U
1	A	3316	A
1	A	3320	A
1	A	3335	A
1	A	3336	A
1	A	3341	U
1	A	3342	A
1	A	3345	G
1	A	3351	U
1	A	3352	U
1	A	3353	G
1	A	3354	U
1	A	3355	U
1	A	3362	A
1	A	3363	U
1	A	3369	G
1	A	3378	C
1	A	3382	U
1	A	3396	U

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Mol	Chain	Res	Type
47	x	7	G
47	x	10	C
47	x	22	A
47	x	33	U
47	x	41	G
47	x	54	U
47	x	55	A
47	x	65	G
47	x	72	A
47	x	73	C
47	x	93	C
47	x	99	G
47	x	102	A
47	x	112	G
47	x	121	U
48	y	23	U
48	y	24	G
48	y	34	U
48	y	35	C
48	y	51	G
48	y	52	A
48	y	59	A
48	y	62	C
48	y	63	G
48	y	75	G
48	y	81	U
48	y	82	U
48	y	83	C
48	y	86	U
48	y	87	G
48	y	90	U
48	y	91	C
48	y	95	G
48	y	104	A
48	y	105	A
48	y	106	C
48	y	113	U
48	y	125	U
48	y	127	U
48	y	138	A
48	y	151	C
48	y	152	G

All (15) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	621	A
1	A	916	G
1	A	1064	A
1	A	1217	A
1	A	1355	A
1	A	1569	U
1	A	1629	U
1	A	1815	U
1	A	2101	C
1	A	2112	U
1	A	2400	G
1	A	2404	A
1	A	2459	A
1	A	3027	A
1	A	3206	C

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 10 ligands modelled in this entry, 10 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

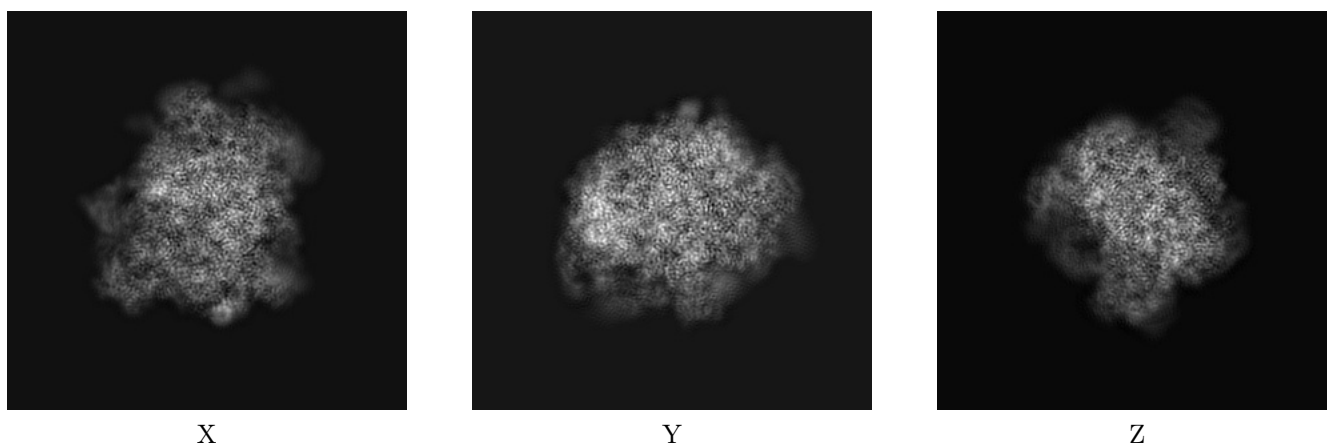
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-10068. 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](#)

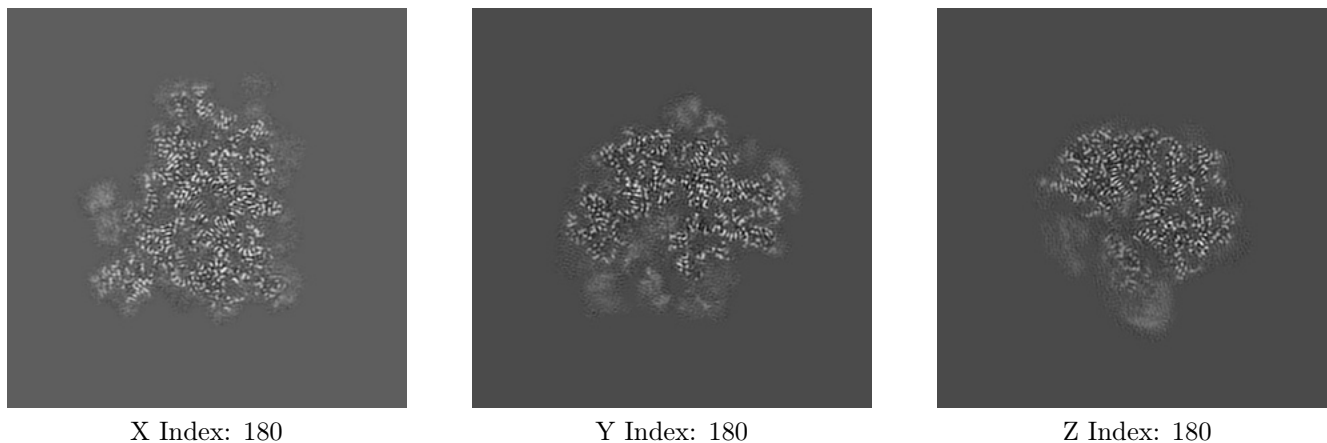
6.1.1 Primary map



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

6.2 Central slices [i](#)

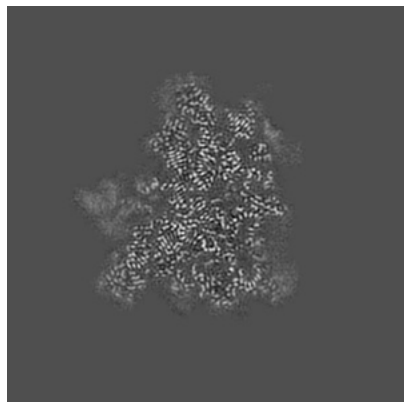
6.2.1 Primary map



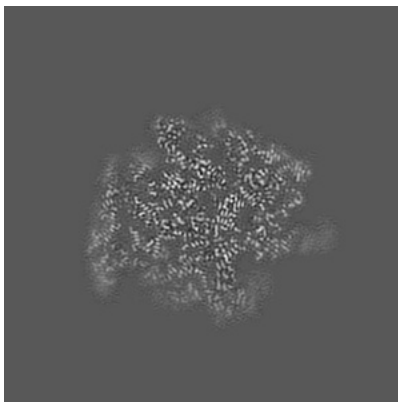
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

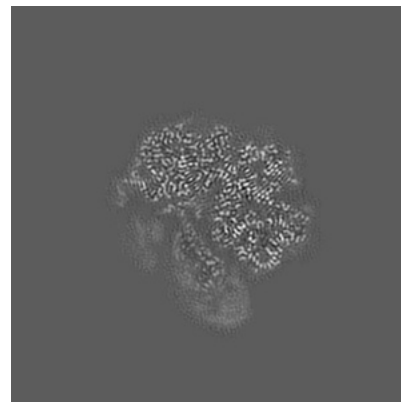
6.3.1 Primary map



X Index: 189



Y Index: 196

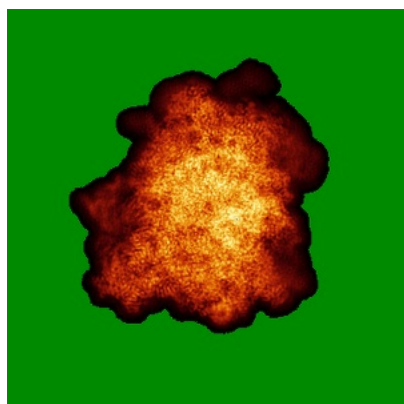


Z Index: 177

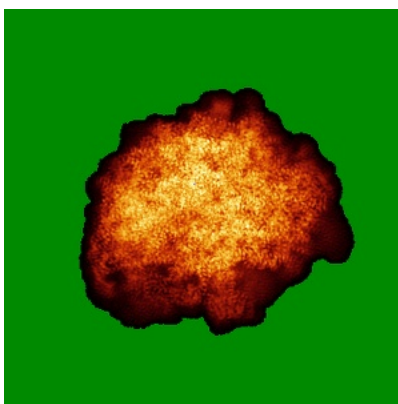
The images above show the largest variance slices of the map in three orthogonal directions.

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

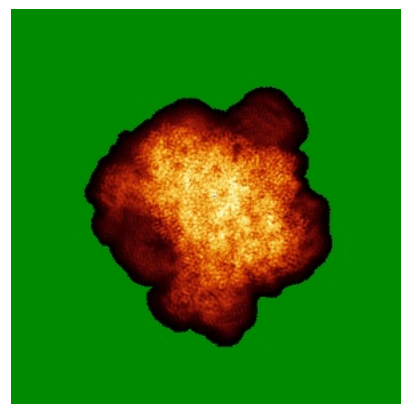
6.4.1 Primary map



X



Y

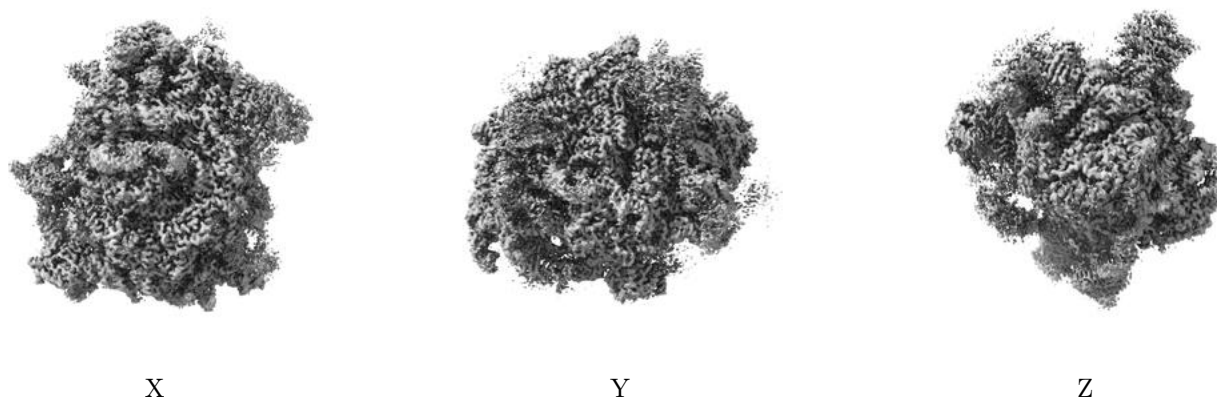


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.07. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

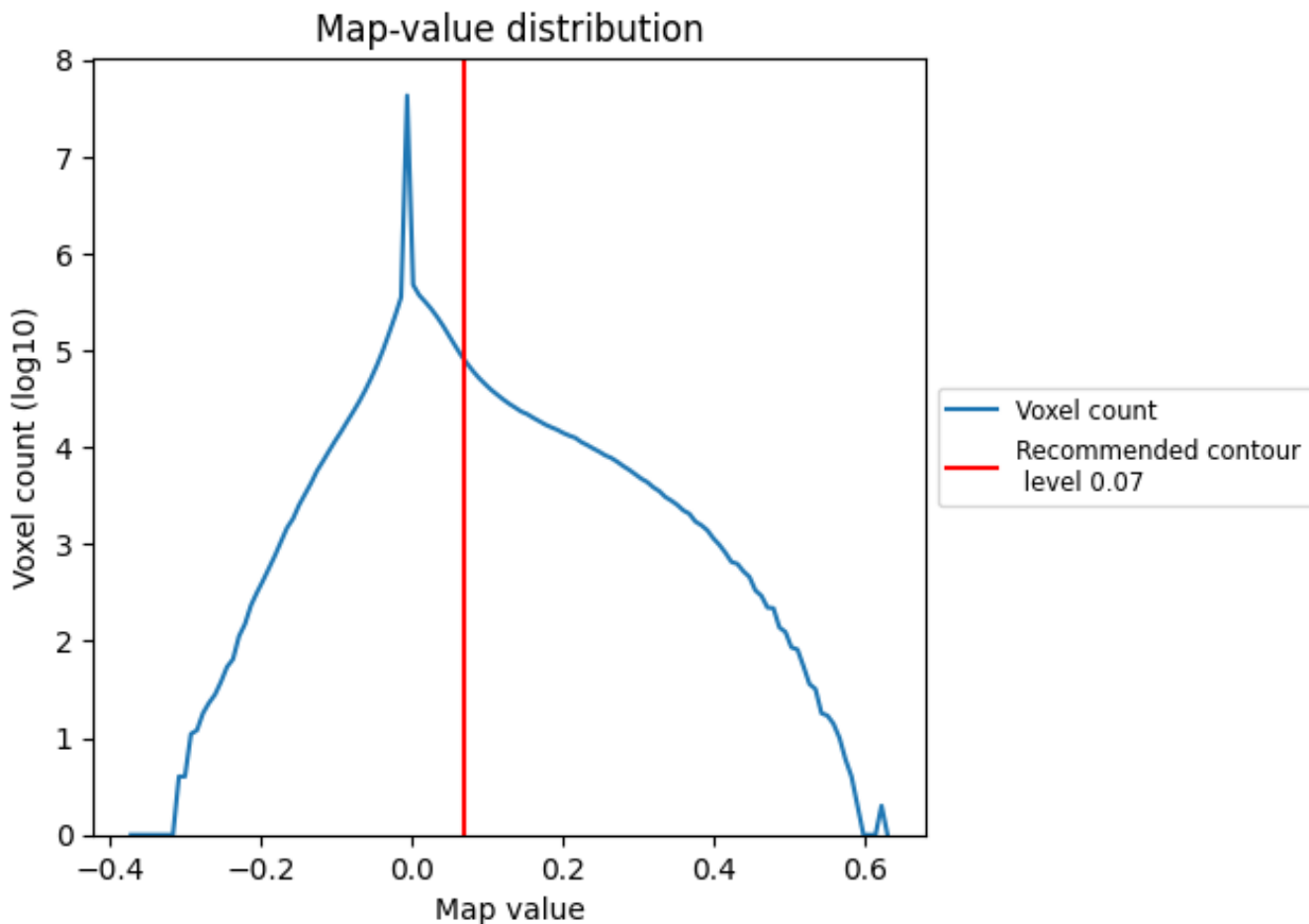
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

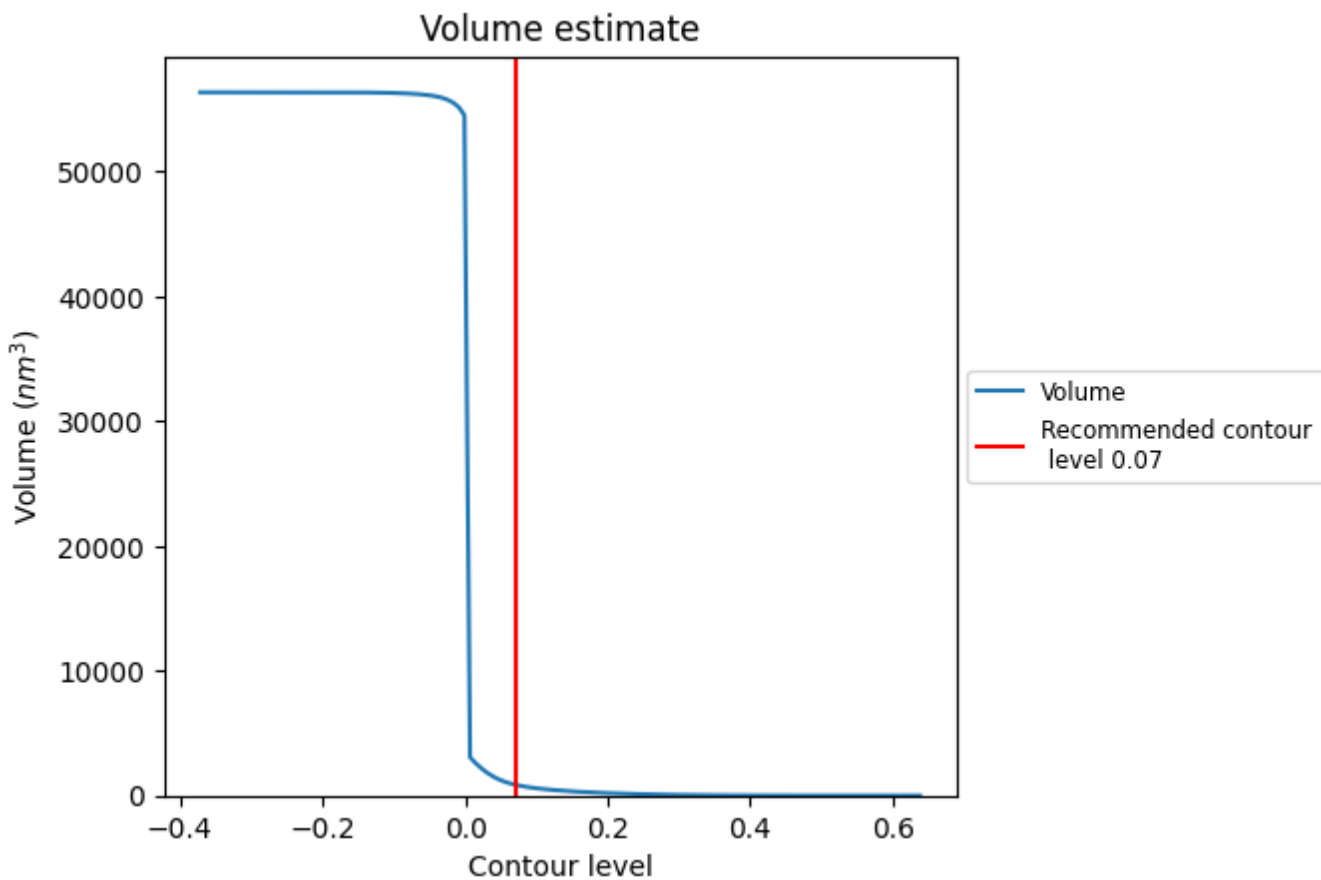
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

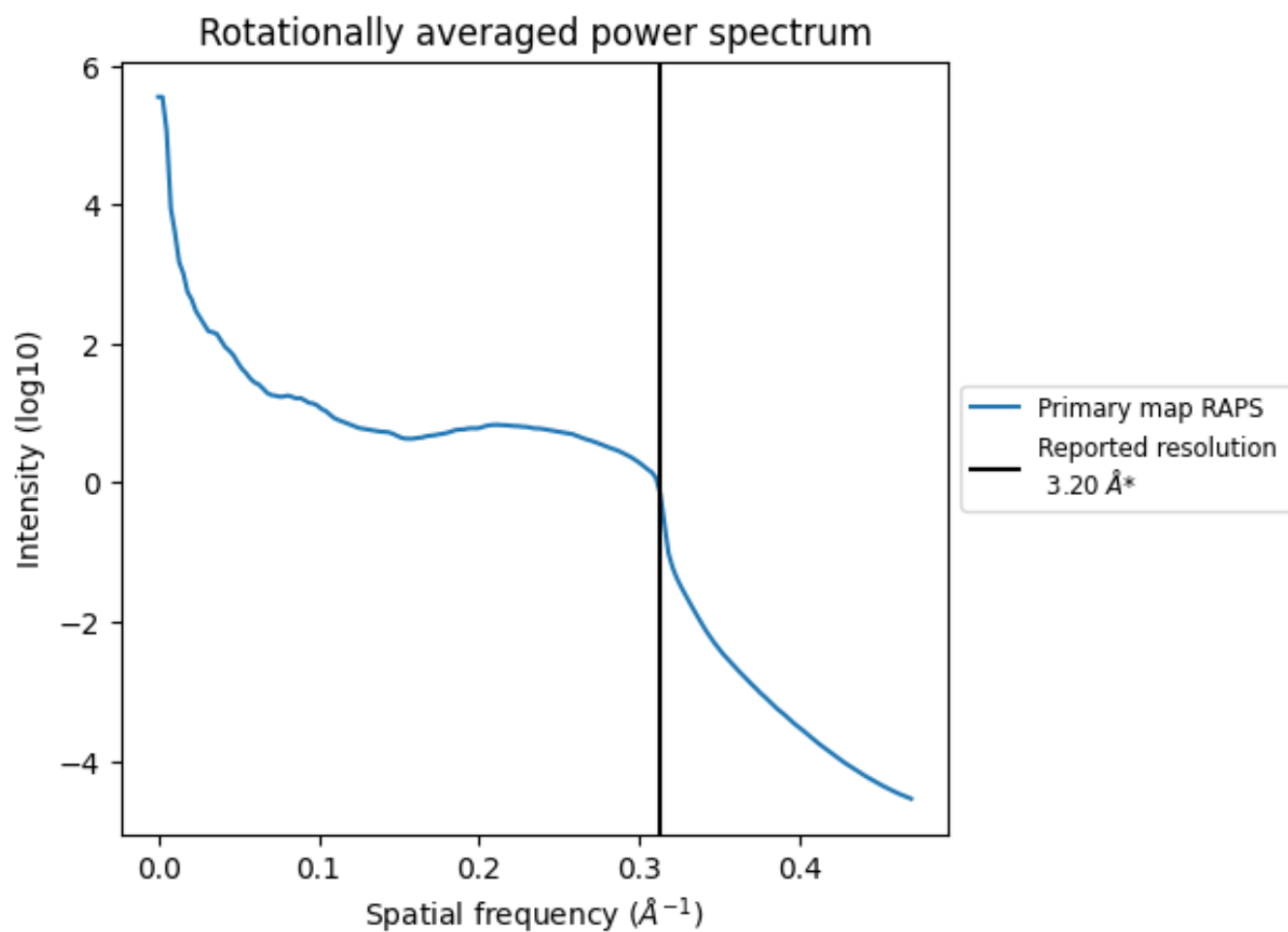
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 871 nm^3 ; this corresponds to an approximate mass of 787 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 0.312\AA^{-1}

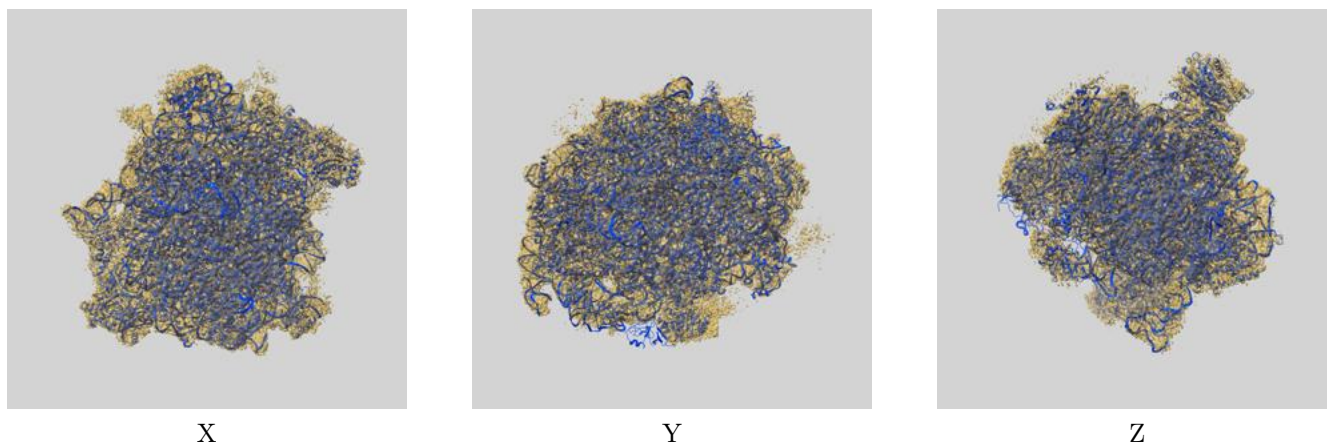
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

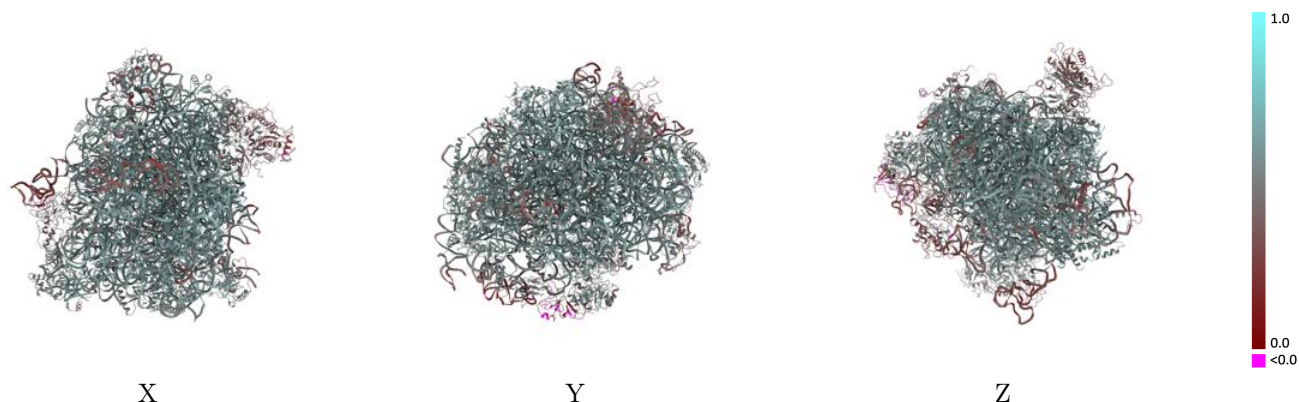
This section contains information regarding the fit between EMDB map EMD-10068 and PDB model 6RZZ. Per-residue inclusion information can be found in section 3 on page 13.

9.1 Map-model overlay [i](#)



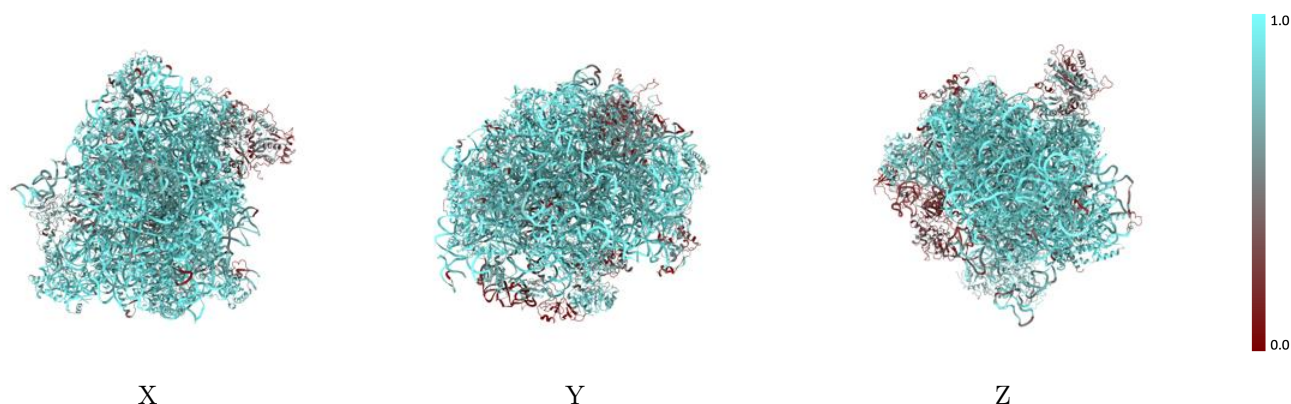
The images above show the 3D surface view of the map at the recommended contour level 0.07 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



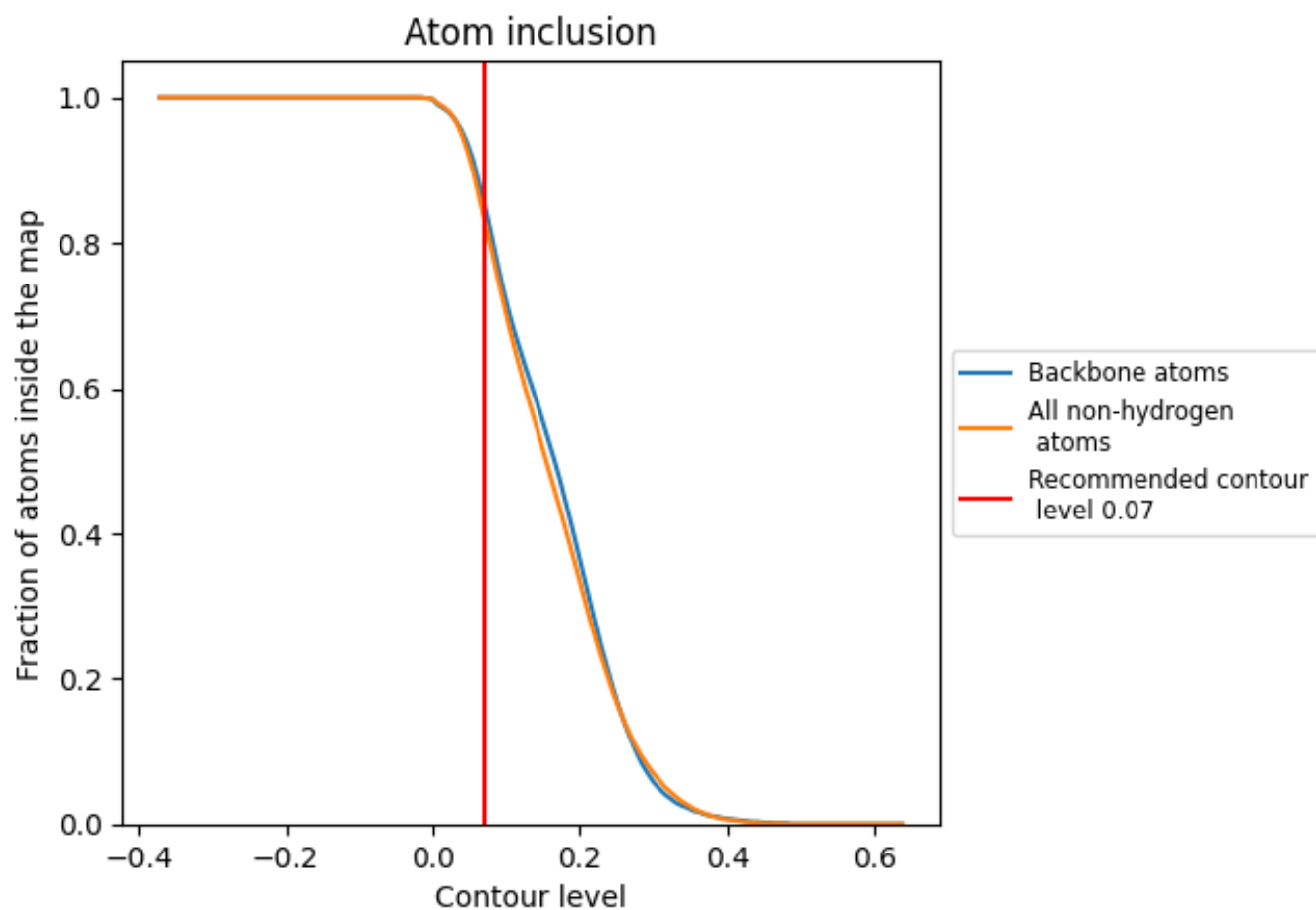
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.07).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 85% of all backbone atoms, 83% 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 (0.07) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8320	 0.5300
A	 0.8910	 0.5350
B	 0.8990	 0.5870
C	 0.8930	 0.5770
D	 0.8980	 0.5820
E	 0.7620	 0.4720
F	 0.7440	 0.5210
G	 0.7010	 0.4950
H	 0.8180	 0.5400
J	 0.8840	 0.5770
K	 0.8550	 0.5680
L	 0.8790	 0.5830
M	 0.8390	 0.5480
N	 0.9120	 0.5870
O	 0.9080	 0.5990
P	 0.8560	 0.5380
Q	 0.9250	 0.5930
R	 0.8790	 0.5690
S	 0.8950	 0.5770
T	 0.8480	 0.5610
U	 0.9060	 0.5900
V	 0.8430	 0.5390
W	 0.8470	 0.5700
X	 0.8900	 0.5840
Y	 0.8240	 0.5210
Z	 0.8710	 0.5690
a	 0.8070	 0.5630
b	 0.9050	 0.5810
c	 0.8080	 0.5110
d	 0.8310	 0.5690
e	 0.8700	 0.5790
f	 0.9050	 0.5900
g	 0.8780	 0.5820
h	 0.7030	 0.5210
i	 0.9170	 0.6030



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Chain	Atom inclusion	Q-score
j	 0.8280	 0.5320
k	 0.8620	 0.5950
l	 0.8930	 0.5930
m	 0.8430	 0.5700
n	 0.7920	 0.4990
o	 0.2820	 0.3550
p	 0.6140	 0.3850
r	 0.4140	 0.3880
s	 0.0040	 0.1110
u	 0.4260	 0.4540
v	 0.4440	 0.5140
w	 0.5320	 0.4450
x	 0.9740	 0.5520
y	 0.9610	 0.5760