



Full wwPDB EM Validation Report ⓘ

Nov 21, 2022 – 04:20 PM EST

PDB ID : 8EUP
EMDB ID : EMD-24410
Title : Ytm1 associated 60S nascent ribosome State 1A
Authors : Zhou, X.; Bilokapic, S.; Deshmukh, A.A.; Halic, M.
Deposited on : 2022-10-19
Resolution : 3.10 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

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:

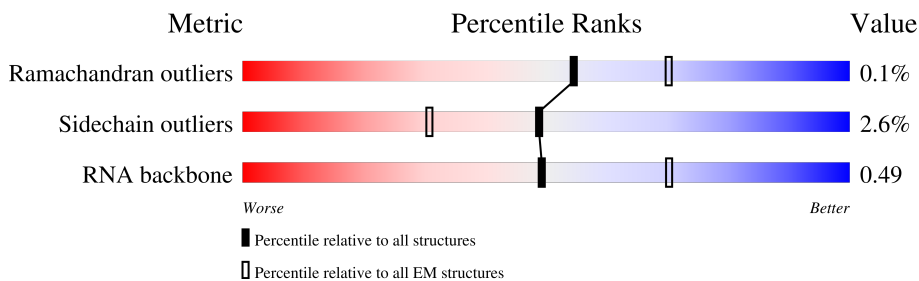
EMDB validation analysis : 0.0.1.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

1 Overall quality at a glance

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

The reported resolution of this entry is 3.10 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	1	3497	
2	2	165	
3	3	302	
4	4	217	
5	5	387	
6	6	300	
7	A	295	
8	B	388	

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Mol	Chain	Length	Quality of chain
9	C	363	
10	D	578	
11	E	195	
12	F	250	
13	G	259	
14	H	190	
15	J	333	
16	K	373	
17	L	208	
18	M	134	
19	N	201	
20	O	197	
21	P	187	
22	Q	187	
23	S	176	
24	V	139	
25	Y	126	
26	b	642	
27	e	127	
28	f	108	
29	h	122	
30	i	99	
31	j	91	
32	m	740	
33	o	276	

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Mol	Chain	Length	Quality of chain
34	r	260	<p>22% 22% 78%</p>
35	t	249	<p>8% 9% 91%</p>
36	u	192	<p>45% 53% 47%</p>
37	v	209	<p>5% 75% 24%</p>
38	x	306	<p>96%</p>
39	y	244	<p>91% 91% 9%</p>
40	T	160	<p>8% 11% 89%</p>

2 Entry composition [i](#)

There are 41 unique types of molecules in this entry. The entry contains 78722 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 (1422-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	1	1422	30438	13596	5508	9912	1422	0	0

- Molecule 2 is a RNA chain called RNA (146-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	2	146	3109	1391	555	1017	146	0	0

- Molecule 3 is a protein called Protein mak16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	3	194	1613	1020	307	279	7	0	0

- Molecule 4 is a protein called Ribosomal RNA-processing protein 1 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	4	207	1746	1138	298	302	8	0	0

- Molecule 5 is a protein called Ribosome biogenesis protein nsal.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	5	338	2669	1705	466	487	11	0	0

- Molecule 6 is a RNA chain called RNA (55-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	6	55	1167	524	204	384	55	0	0

- Molecule 7 is a protein called Ribosome biogenesis protein brx1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	A	253	2049	1299	372	370	8	0	0

- Molecule 8 is a protein called 60S ribosomal protein L3-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
8	B	315	1552	922	315	315	0	0

- Molecule 9 is a protein called 60S ribosomal protein L4-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	C	328	2568	1629	486	450	3	0	0

- Molecule 10 is a protein called RNA helicase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	D	400	3055	1966	532	548	9	0	0

- Molecule 11 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	E	170	1328	854	243	228	3	0	0

- Molecule 12 is a protein called 60S ribosomal protein L7-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	F	239	1939	1247	355	334	3	0	0

- Molecule 13 is a protein called 60S ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	G	163	1277	818	224	233	2	2	0

- Molecule 14 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
14	H	175	862	512	175	175	0	0

- Molecule 15 is a protein called Probable rRNA-processing protein ebp2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
15	J	94	469	281	94	94	0	0

- Molecule 16 is a protein called Putative ribosome biogenesis protein C8F11.04.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
16	K	247	1225	731	247	247	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	116	942	592	198	151	1	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
18	M	123	609	363	123	123	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	166	1406	883	291	229	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	181	1437	925	271	238	3	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
21	P	130	Total	C	N	O	S	0	0
			1037	663	187	184	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Q	134	Total	C	N	O	S	0	0
			1041	655	201	184	1		

- Molecule 23 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	S	168	Total	C	N	O	S	0	0
			1408	909	263	231	5		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
24	V	126	Total	C	N	O	0	0
			619	366	126	127		

- Molecule 25 is a protein called Ribosomal protein L26.

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

- Molecule 26 is a protein called Probable nucleolar GTP-binding protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	b	151	Total	C	N	O	0	0
			749	447	151	151		

- Molecule 27 is a protein called 60S ribosomal protein L32-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	e	124	Total	C	N	O	S	0	0
			995	621	202	167	5		

- Molecule 28 is a protein called 60S ribosomal protein L33-B.

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

- Molecule 29 is a protein called 60S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	h	120	993	626	193	174		0	0

- Molecule 30 is a protein called 60S ribosomal protein L36-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	i	98	783	487	164	131	1	0	0

- Molecule 31 is a protein called 60S ribosomal protein L37-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	j	71	563	346	121	90	6	0	0

- Molecule 32 is a protein called Ribosome biogenesis protein erb1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
32	m	73	595	368	107	120	0	0

- Molecule 33 is a protein called Uncharacterized RNA-binding protein C1827.05c.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
33	o	136	673	401	136	136	0	0

- Molecule 34 is a protein called Ribosome biogenesis protein nsa2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
34	r	56	278	166	56	56	0	0

- Molecule 35 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
35	t	23	Total	C	N	O	0	0
			167	105	32	30		

- Molecule 36 is a protein called Ribosome biogenesis protein rlp24.

Mol	Chain	Residues	Atoms				AltConf	Trace
36	u	102	Total	C	N	O	0	0
			506	302	102	102		

- Molecule 37 is a protein called Nucleolar protein 16.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	v	158	Total	C	N	O	S	0	0
			1276	804	240	229	3		

- Molecule 38 is a protein called Brix domain-containing protein C4F8.04.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	x	306	Total	C	N	O	S	0	0
			2524	1583	464	468	9		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
39	y	222	Total	C	N	O	0	0
			1092	648	222	222		

- Molecule 40 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
40	T	18	Total	C	N	O	0	0
			125	80	23	22		

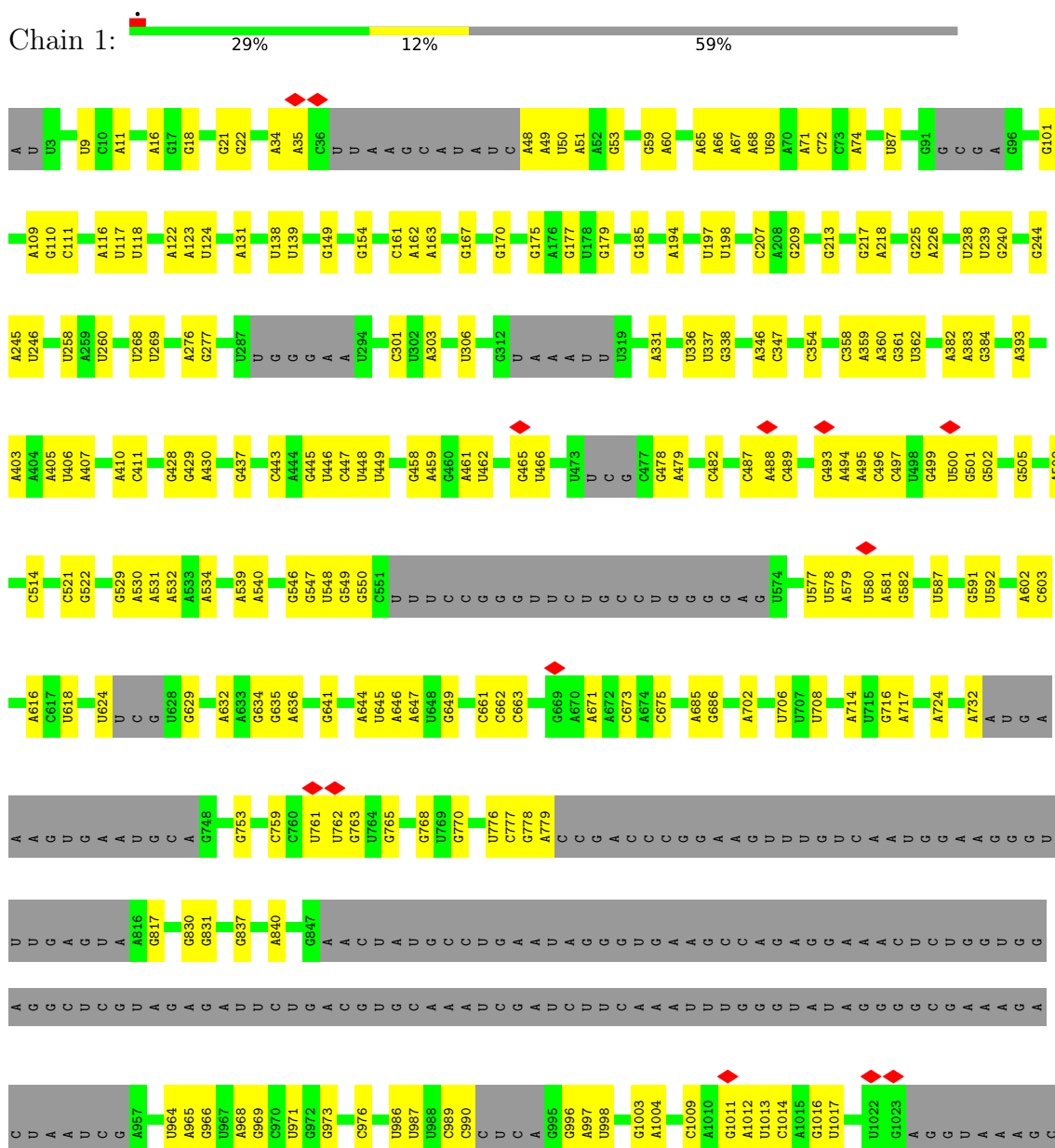
- Molecule 41 is ZINC ION (three-letter code: ZN) (formula: Zn).

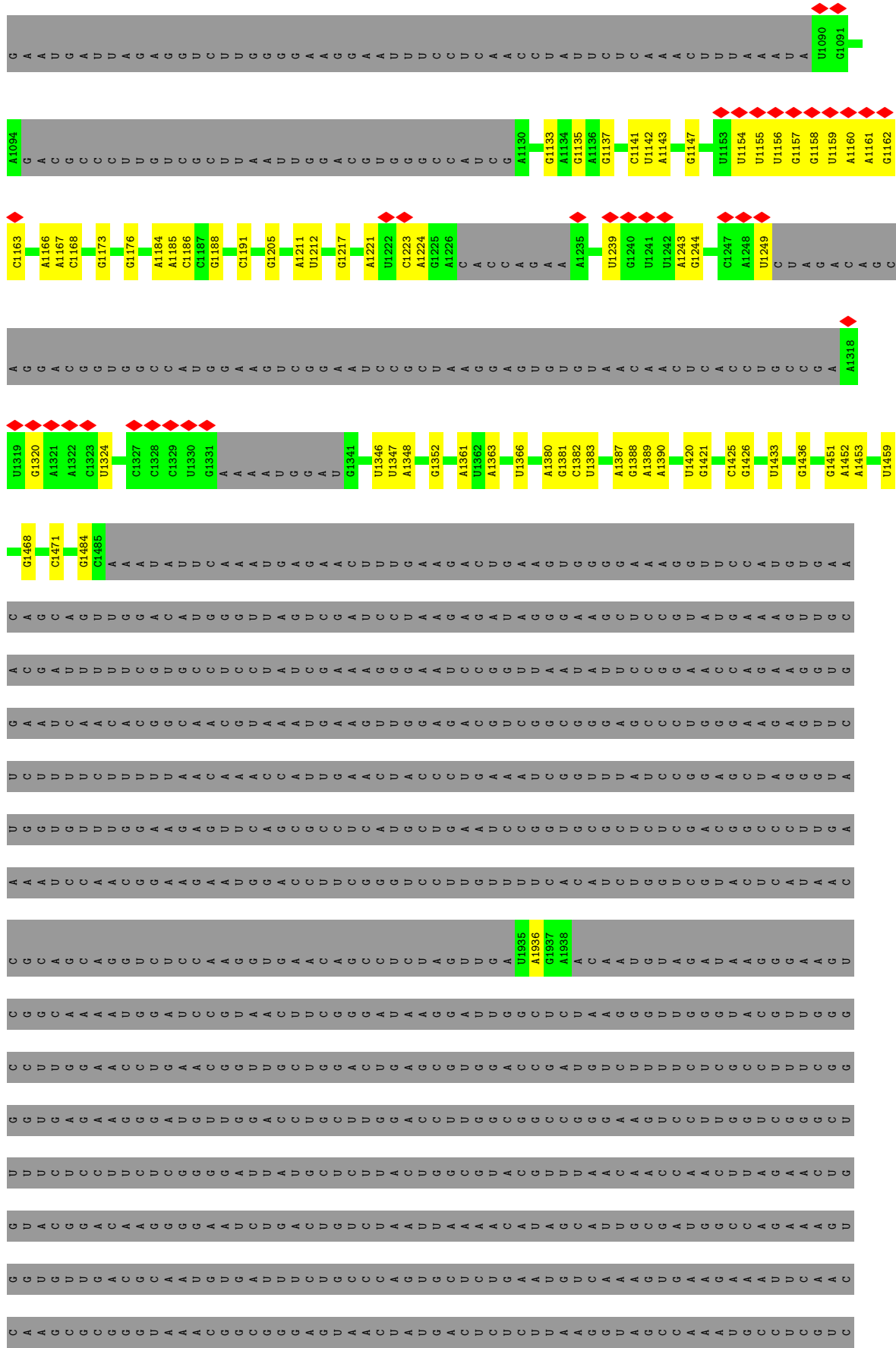
Mol	Chain	Residues	Atoms		AltConf
41	j	1	Total	Zn	0
			1	1	

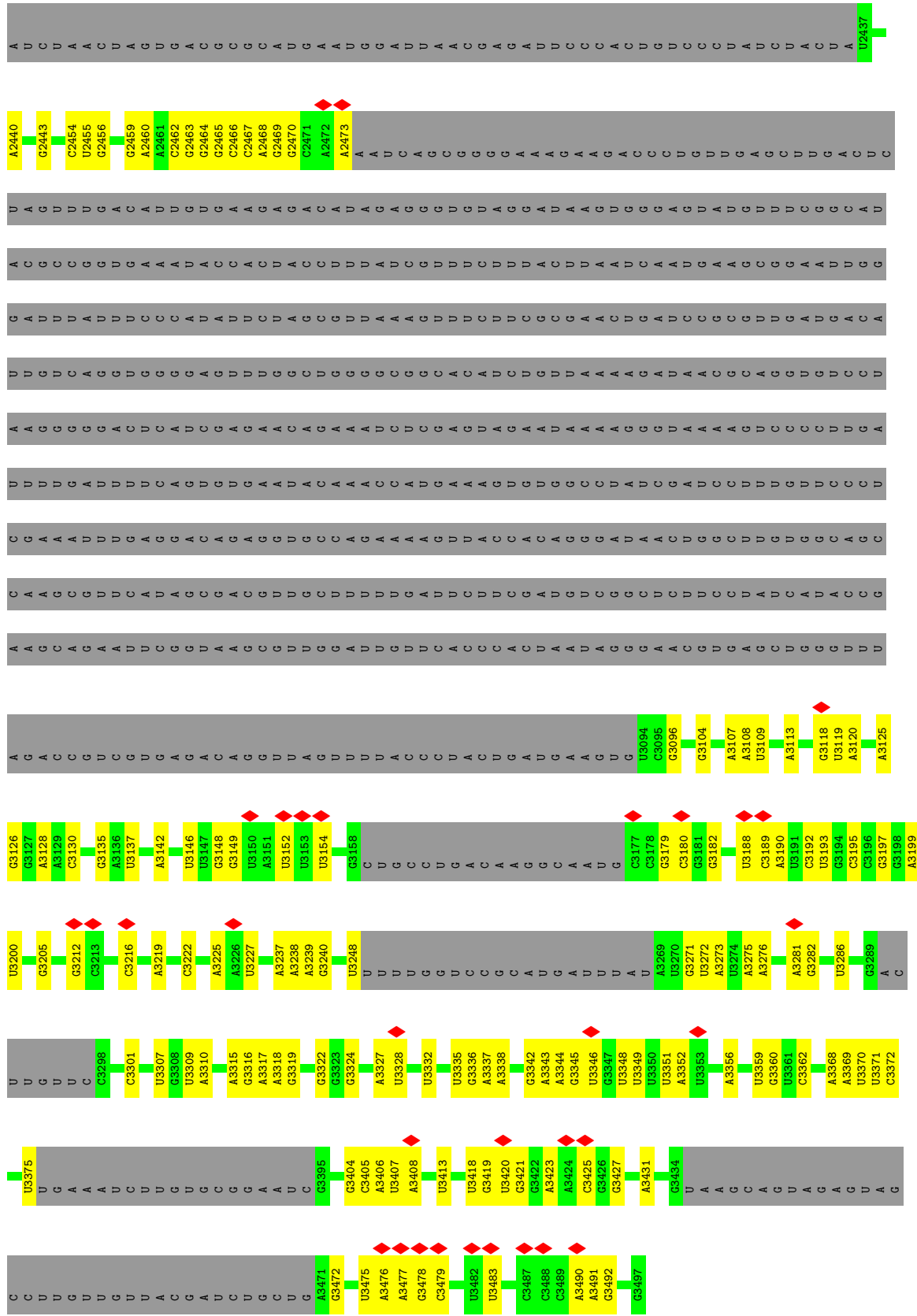
3 Residue-property plots [i](#)

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

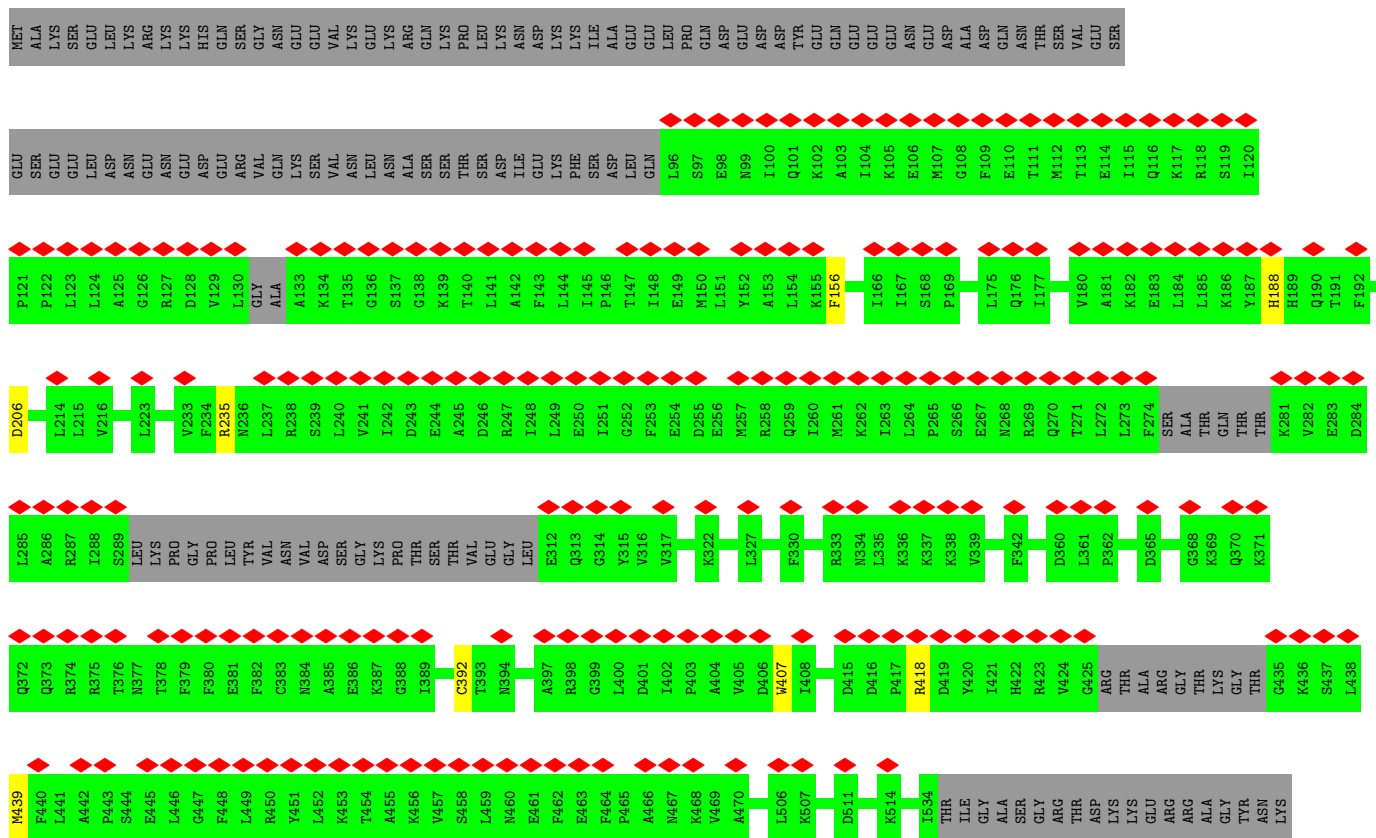
- Molecule 1: RNA (1422-MER)



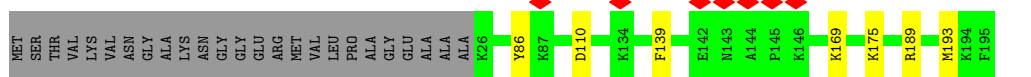
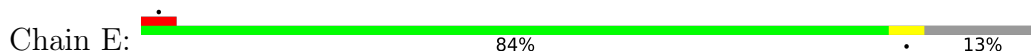




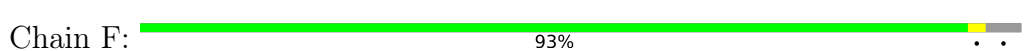
● Molecule 2: RNA (146-MER)



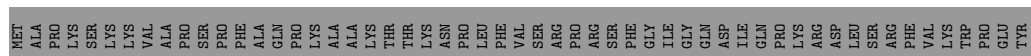
• Molecule 11: 60S ribosomal protein L6

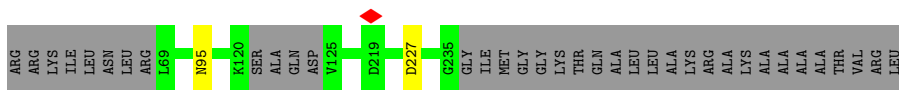


• Molecule 12: 60S ribosomal protein L7-B

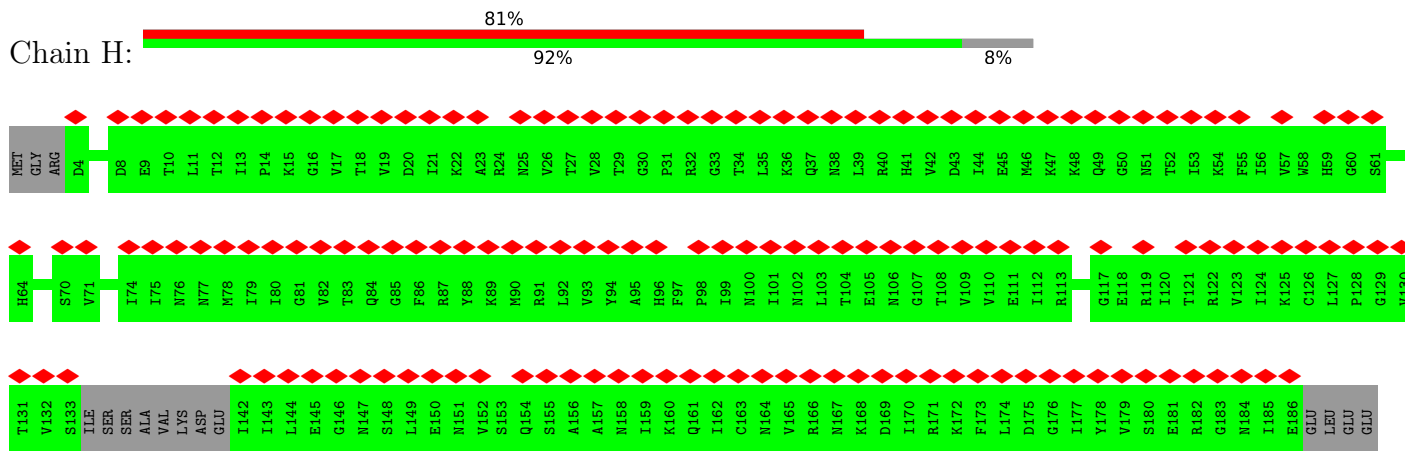


• Molecule 13: 60S ribosomal protein L8

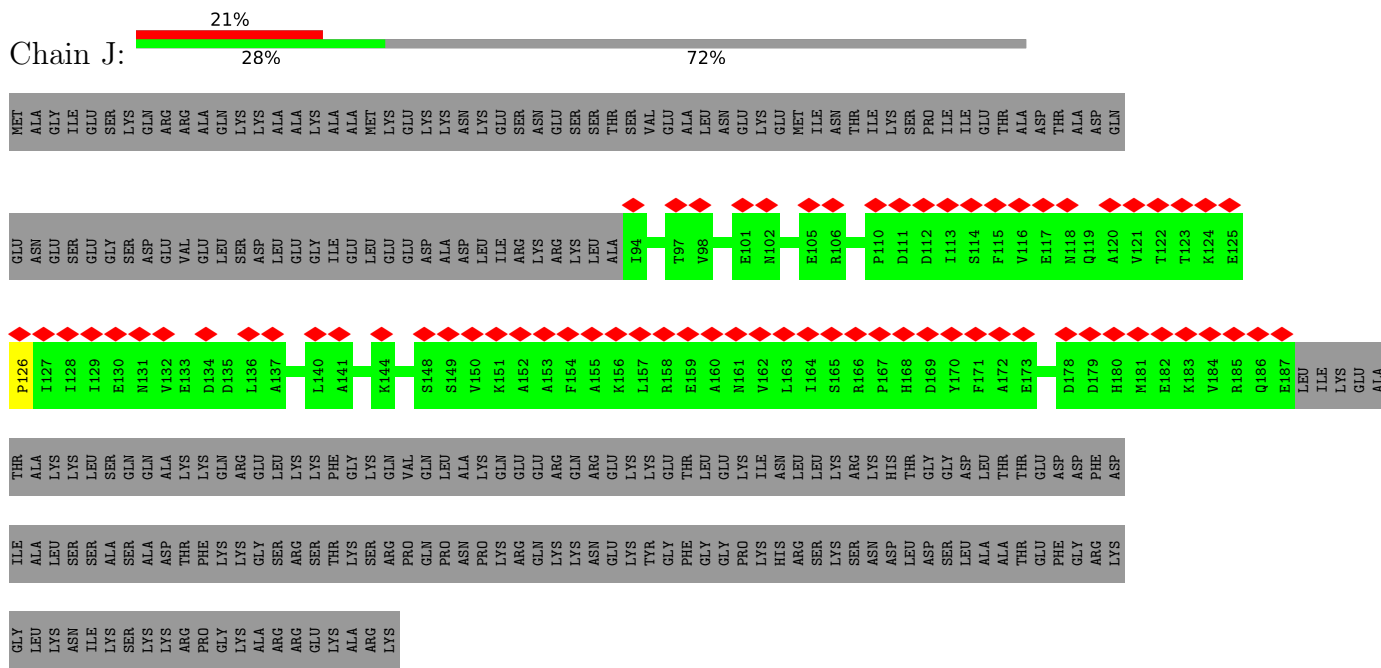




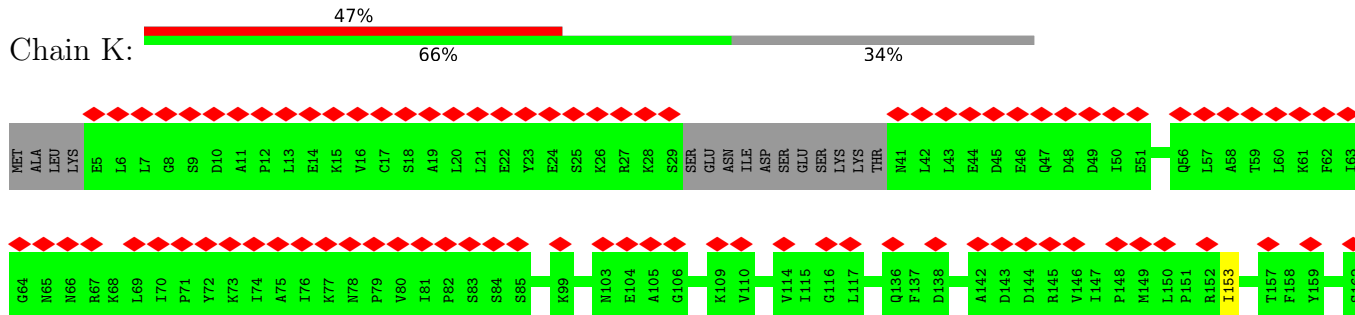
- Molecule 14: 60S ribosomal protein L9-A

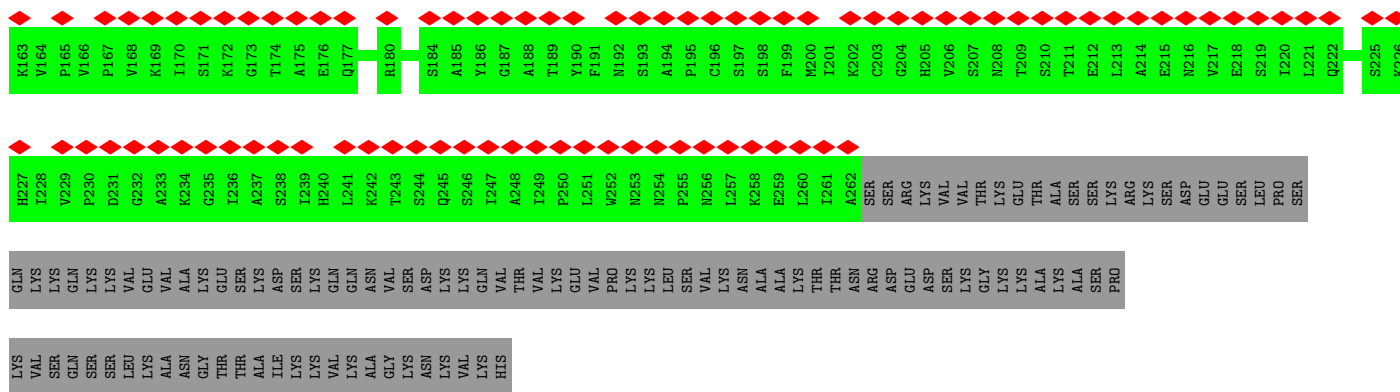


- Molecule 15: Probable rRNA-processing protein ebp2

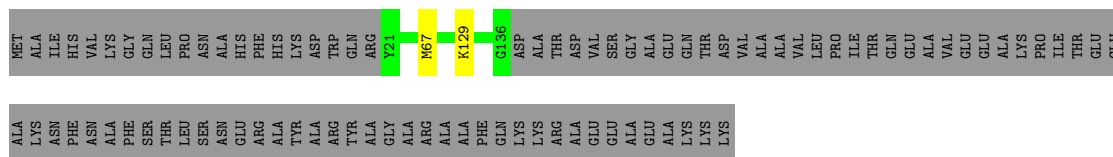


- Molecule 16: Putative ribosome biogenesis protein C8F11.04

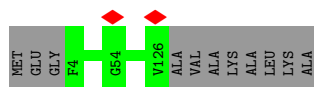




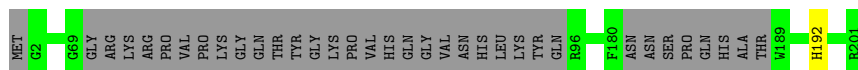
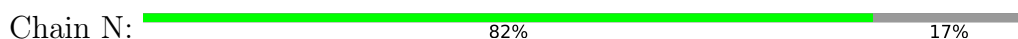
• Molecule 17: 60S ribosomal protein L13



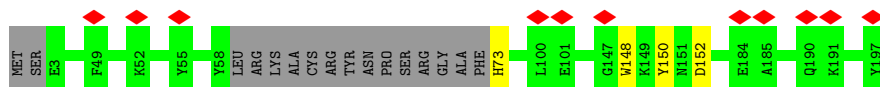
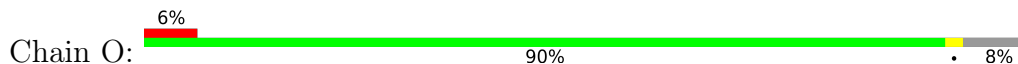
• Molecule 18: 60S ribosomal protein L14



• Molecule 19: 60S ribosomal protein L15-A

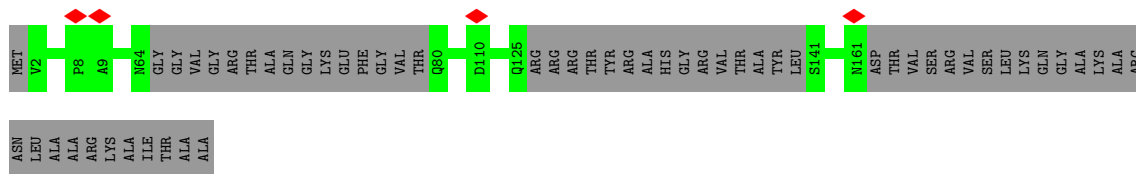


• Molecule 20: 60S ribosomal protein L16-B

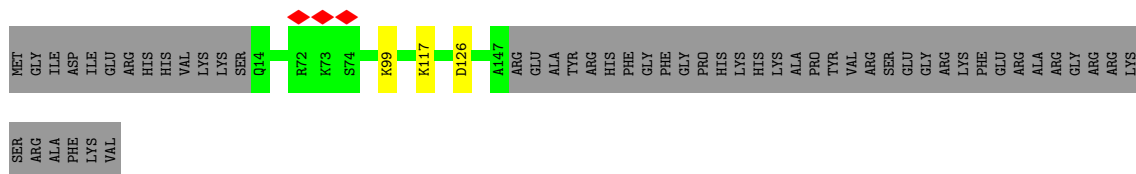


• Molecule 21: 60S ribosomal protein L17-A

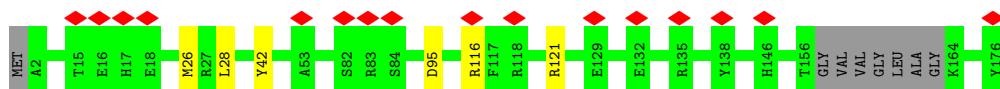




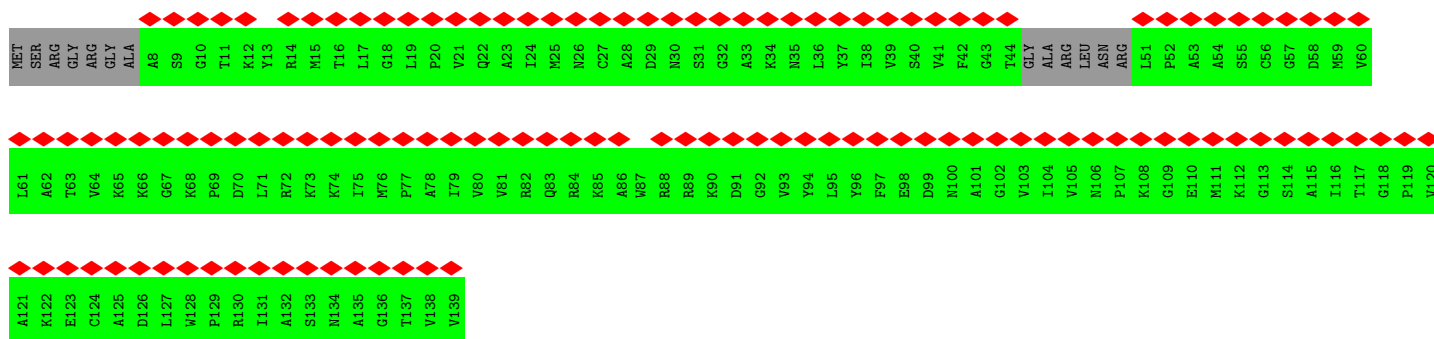
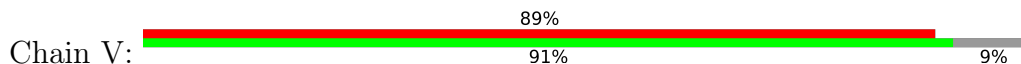
• Molecule 22: 60S ribosomal protein L18-A



• Molecule 23: 60S ribosomal protein L20-A



• Molecule 24: 60S ribosomal protein L23-A

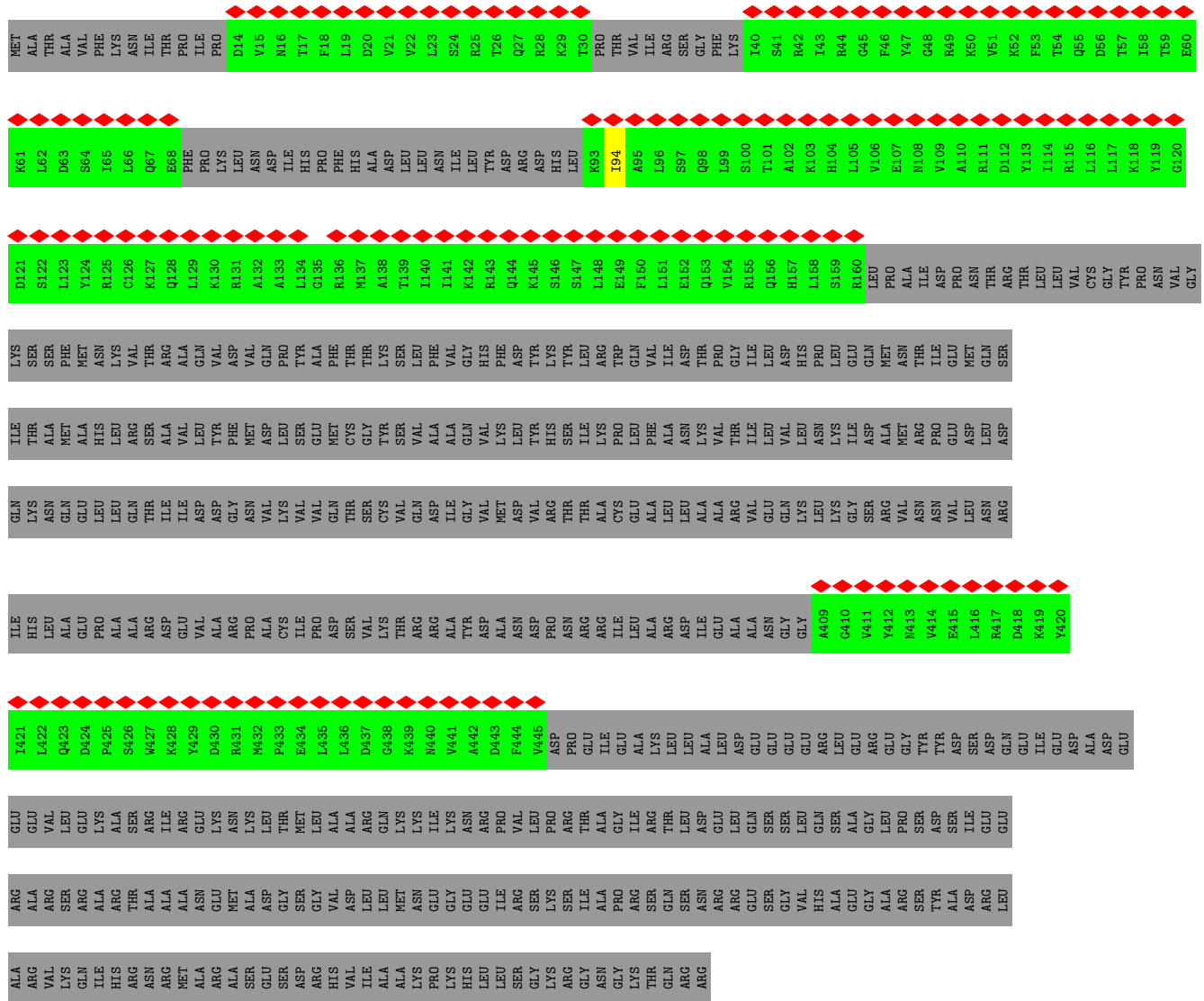


• Molecule 25: Ribosomal protein L26



• Molecule 26: Probable nucleolar GTP-binding protein 1





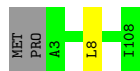
- Molecule 27: 60S ribosomal protein L32-A

Chain e: 96%



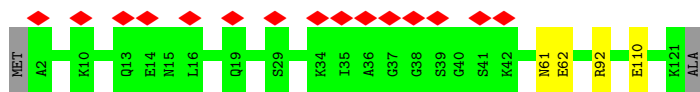
- Molecule 28: 60S ribosomal protein L33-B

Chain f: 97%



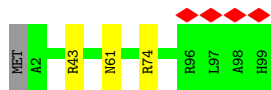
- Molecule 29: 60S ribosomal protein L35

Chain h: 12% 95%



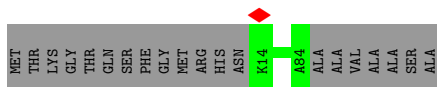
- Molecule 30: 60S ribosomal protein L36-B

Chain i: 96%



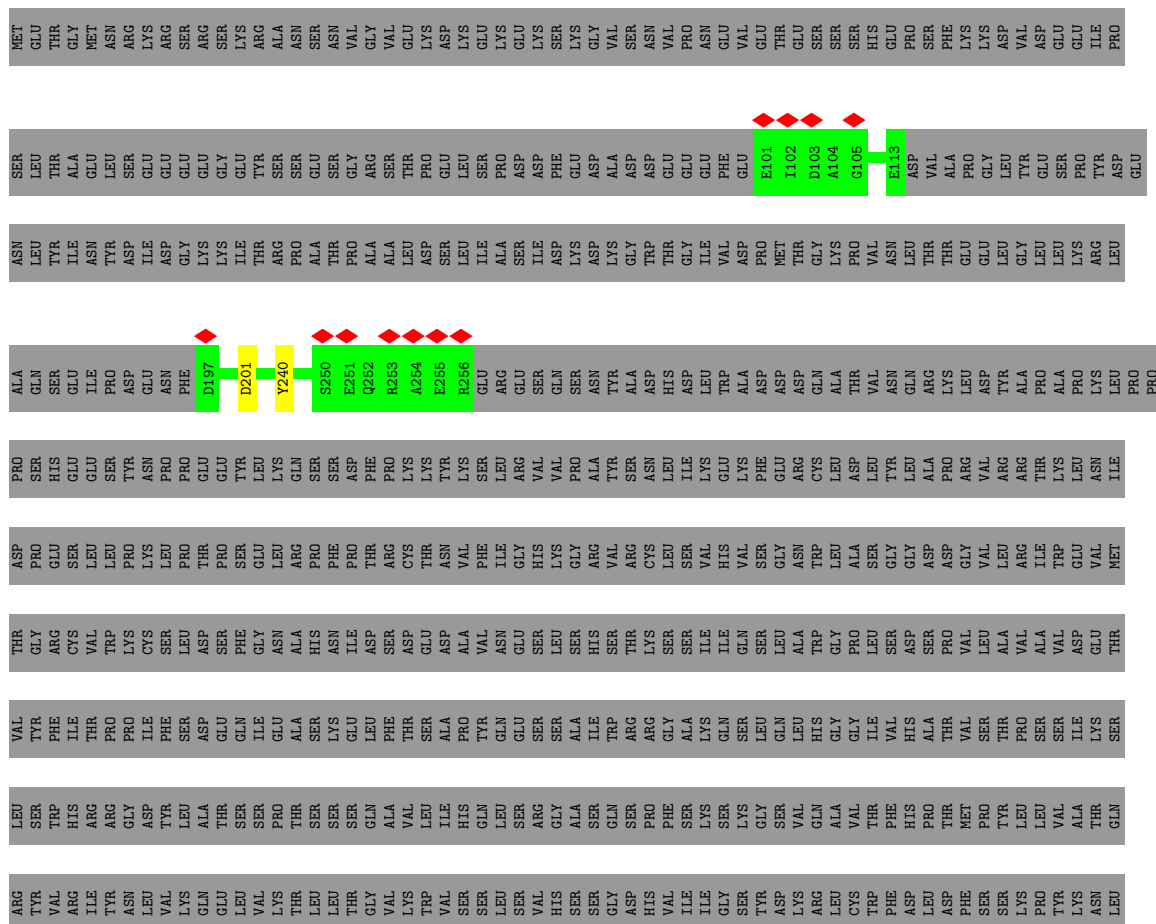
- Molecule 31: 60S ribosomal protein L37-B

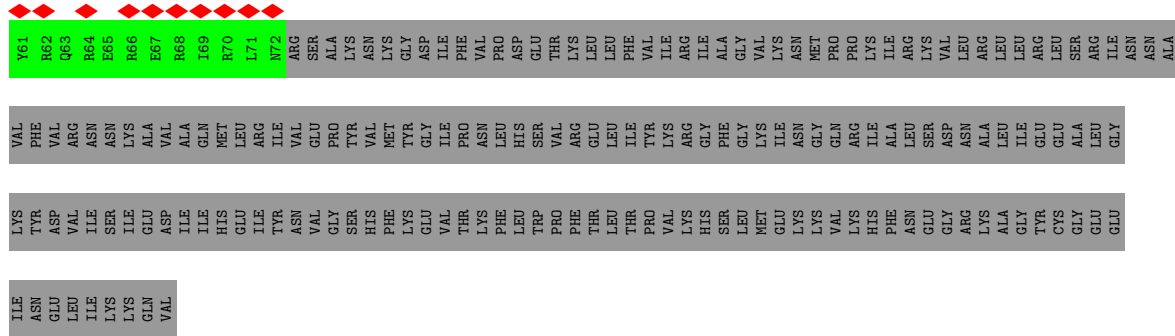
Chain j: 78%



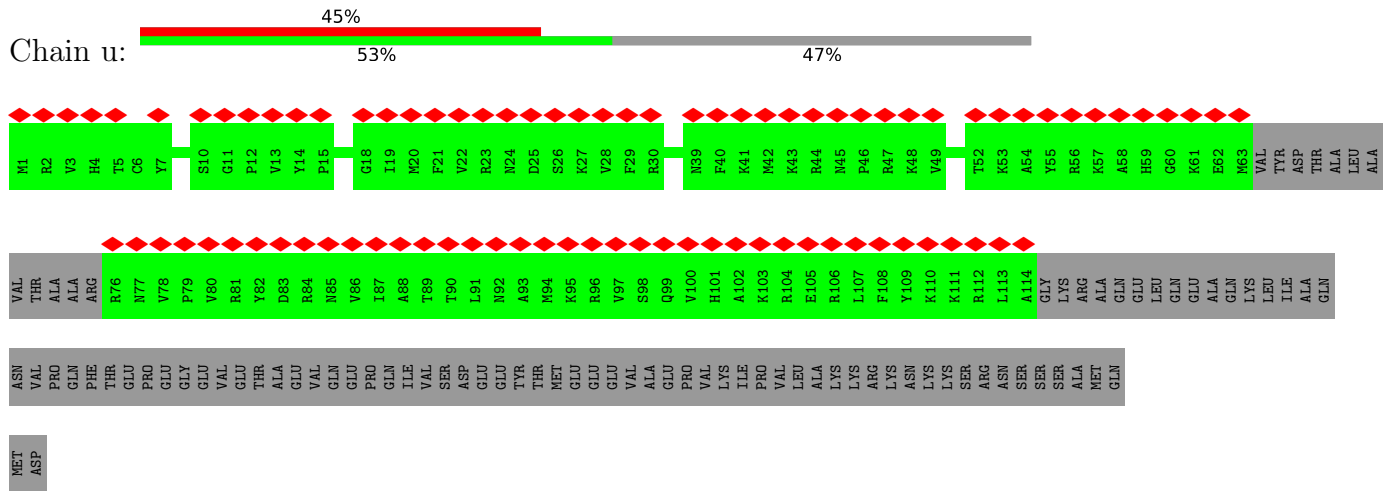
- Molecule 32: Ribosome biogenesis protein erb1

Chain m: 10%

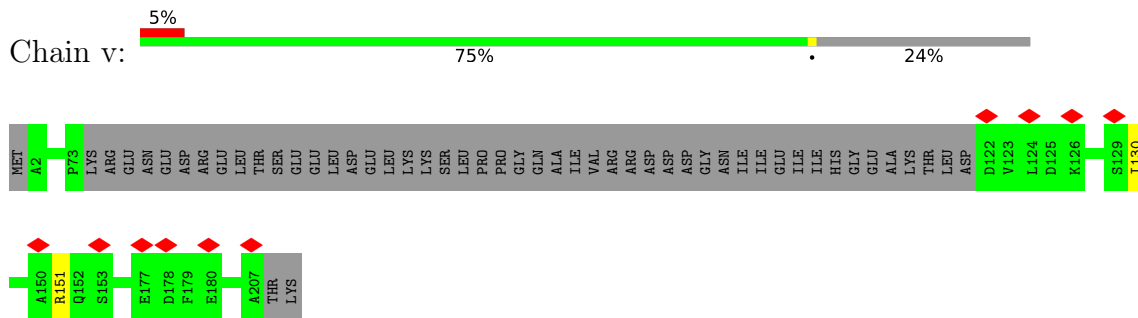




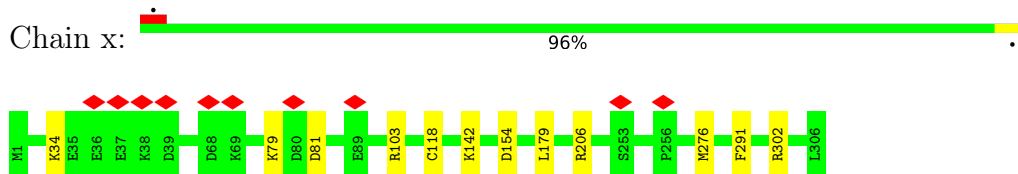
- Molecule 36: Ribosome biogenesis protein rlp24



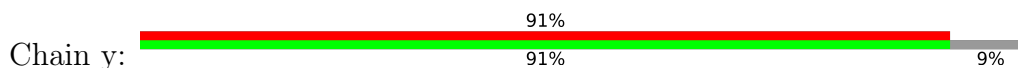
- Molecule 37: Nucleolar protein 16



- Molecule 38: Brix domain-containing protein C4F8.04



- Molecule 39: Eukaryotic translation initiation factor 6



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	71000	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	0.590	Depositor
Minimum map value	-0.339	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.008	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	0.48	0/34054	0.75	0/53038
2	2	0.46	0/3474	0.73	0/5403
3	3	0.41	0/1644	0.53	0/2210
4	4	0.33	0/1792	0.51	0/2421
5	5	0.29	0/2722	0.52	0/3679
6	6	0.15	0/1303	0.66	0/2021
7	A	0.27	0/2088	0.51	0/2815
8	B	0.24	0/1550	0.44	0/2153
9	C	0.39	0/2614	0.55	0/3526
10	D	0.26	0/3108	0.48	0/4197
11	E	0.31	0/1356	0.54	0/1829
12	F	0.31	0/1977	0.49	0/2651
13	G	0.31	0/1295	0.47	0/1748
14	H	0.24	0/860	0.43	0/1193
15	J	0.23	0/468	0.34	0/653
16	K	0.24	0/1223	0.40	0/1703
17	L	0.41	0/960	0.60	0/1288
18	M	0.24	0/608	0.41	0/846
19	N	0.42	0/1436	0.60	0/1920
20	O	0.26	0/1464	0.46	0/1961
21	P	0.29	0/1057	0.48	0/1419
22	Q	0.34	0/1052	0.58	0/1413
23	S	0.26	0/1444	0.54	0/1939
24	V	0.25	0/617	0.42	0/852
25	Y	0.31	0/1008	0.59	0/1341
26	b	0.22	0/745	0.31	0/1033
27	e	0.40	0/1009	0.58	0/1345
28	f	0.33	0/859	0.53	0/1152
29	h	0.33	0/1002	0.57	0/1333
30	i	0.29	0/791	0.59	0/1050
31	j	0.31	0/575	0.57	0/761
32	m	0.30	0/607	0.55	0/818

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	o	0.24	0/672	0.39	0/935
34	r	0.24	0/277	0.35	0/385
35	t	0.27	0/169	0.46	0/228
36	u	0.23	0/504	0.37	0/700
37	v	0.31	0/1296	0.54	0/1737
38	x	0.30	0/2570	0.55	0/3442
39	y	0.23	0/1091	0.42	0/1515
40	T	0.24	0/129	0.43	0/179
All	All	0.39	0/83470	0.64	0/120832

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	192/302 (64%)	185 (96%)	7 (4%)	0	100	100
4	4	205/217 (94%)	198 (97%)	7 (3%)	0	100	100
5	5	334/387 (86%)	297 (89%)	37 (11%)	0	100	100
7	A	249/295 (84%)	235 (94%)	12 (5%)	2 (1%)	19	54
8	B	311/388 (80%)	306 (98%)	5 (2%)	0	100	100
9	C	324/363 (89%)	295 (91%)	29 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
10	D	390/578 (68%)	380 (97%)	10 (3%)	0	100	100
11	E	168/195 (86%)	152 (90%)	16 (10%)	0	100	100
12	F	237/250 (95%)	223 (94%)	12 (5%)	2 (1%)	19	54
13	G	161/259 (62%)	144 (89%)	15 (9%)	2 (1%)	13	44
14	H	171/190 (90%)	170 (99%)	1 (1%)	0	100	100
15	J	92/333 (28%)	86 (94%)	5 (5%)	1 (1%)	14	46
16	K	243/373 (65%)	236 (97%)	6 (2%)	1 (0%)	34	69
17	L	114/208 (55%)	107 (94%)	7 (6%)	0	100	100
18	M	121/134 (90%)	118 (98%)	3 (2%)	0	100	100
19	N	160/201 (80%)	153 (96%)	7 (4%)	0	100	100
20	O	177/197 (90%)	175 (99%)	2 (1%)	0	100	100
21	P	124/187 (66%)	112 (90%)	12 (10%)	0	100	100
22	Q	132/187 (71%)	123 (93%)	9 (7%)	0	100	100
23	S	164/176 (93%)	155 (94%)	9 (6%)	0	100	100
24	V	122/139 (88%)	112 (92%)	10 (8%)	0	100	100
25	Y	123/126 (98%)	116 (94%)	7 (6%)	0	100	100
26	b	143/642 (22%)	139 (97%)	3 (2%)	1 (1%)	22	57
27	e	122/127 (96%)	112 (92%)	10 (8%)	0	100	100
28	f	104/108 (96%)	97 (93%)	7 (7%)	0	100	100
29	h	118/122 (97%)	115 (98%)	3 (2%)	0	100	100
30	i	96/99 (97%)	88 (92%)	8 (8%)	0	100	100
31	j	69/91 (76%)	64 (93%)	5 (7%)	0	100	100
32	m	69/740 (9%)	66 (96%)	3 (4%)	0	100	100
33	o	134/276 (49%)	128 (96%)	6 (4%)	0	100	100
34	r	54/260 (21%)	53 (98%)	1 (2%)	0	100	100
35	t	21/249 (8%)	21 (100%)	0	0	100	100
36	u	98/192 (51%)	96 (98%)	2 (2%)	0	100	100
37	v	154/209 (74%)	144 (94%)	9 (6%)	1 (1%)	25	59
38	x	304/306 (99%)	288 (95%)	16 (5%)	0	100	100
39	y	220/244 (90%)	201 (91%)	19 (9%)	0	100	100
40	T	16/160 (10%)	16 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	6036/9510 (64%)	5706 (94%)	320 (5%)	10 (0%)	54 79

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
7	A	249	VAL
15	J	126	PRO
37	v	130	ILE
7	A	248	PHE
16	K	153	ILE
13	G	227[A]	ASP
13	G	227[B]	ASP
26	b	94	ILE
12	F	13	ILE
12	F	15	ALA

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
3	3	171/271 (63%)	168 (98%)	3 (2%)	59 82
4	4	188/197 (95%)	177 (94%)	11 (6%)	19 50
5	5	299/345 (87%)	291 (97%)	8 (3%)	44 74
7	A	227/266 (85%)	221 (97%)	6 (3%)	46 74
9	C	275/297 (93%)	268 (98%)	7 (2%)	47 75
10	D	306/505 (61%)	298 (97%)	8 (3%)	46 74
11	E	139/155 (90%)	132 (95%)	7 (5%)	24 57
12	F	201/210 (96%)	197 (98%)	4 (2%)	55 80
13	G	136/212 (64%)	135 (99%)	1 (1%)	84 93
17	L	97/167 (58%)	95 (98%)	2 (2%)	53 79
19	N	146/176 (83%)	145 (99%)	1 (1%)	84 93
20	O	149/162 (92%)	145 (97%)	4 (3%)	44 74

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
21	P	109/149 (73%)	109 (100%)	0	100	100
22	Q	115/159 (72%)	112 (97%)	3 (3%)	46	74
23	S	150/154 (97%)	144 (96%)	6 (4%)	31	65
25	Y	110/111 (99%)	109 (99%)	1 (1%)	78	91
27	e	106/107 (99%)	104 (98%)	2 (2%)	57	81
28	f	89/91 (98%)	88 (99%)	1 (1%)	73	89
29	h	106/107 (99%)	102 (96%)	4 (4%)	33	66
30	i	83/84 (99%)	80 (96%)	3 (4%)	35	67
31	j	58/71 (82%)	58 (100%)	0	100	100
32	m	65/659 (10%)	63 (97%)	2 (3%)	40	70
35	t	12/223 (5%)	12 (100%)	0	100	100
37	v	135/181 (75%)	134 (99%)	1 (1%)	84	93
38	x	273/273 (100%)	261 (96%)	12 (4%)	28	61
40	T	12/139 (9%)	11 (92%)	1 (8%)	11	38
All	All	3757/5471 (69%)	3659 (97%)	98 (3%)	49	74

All (98) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	3	43	CYS
3	3	79	ARG
3	3	123	ARG
4	4	15	ASP
4	4	28	ARG
4	4	34	LYS
4	4	93	ARG
4	4	99	ASP
4	4	107	TYR
4	4	108	LEU
4	4	113	PHE
4	4	153	PHE
4	4	163	ASP
4	4	212	TYR
5	5	18	LYS
5	5	83	ASP
5	5	95	MET
5	5	114	ARG

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Mol	Chain	Res	Type
5	5	122	ARG
5	5	191	ASN
5	5	221	LEU
5	5	274	ARG
7	A	67	MET
7	A	130	HIS
7	A	201	ARG
7	A	231	ASN
7	A	246	ASP
7	A	255	ARG
9	C	100	ARG
9	C	116	ASN
9	C	122	TYR
9	C	155	ASP
9	C	291	ARG
9	C	324	LYS
9	C	337	TYR
10	D	156	PHE
10	D	188	HIS
10	D	206	ASP
10	D	235	ARG
10	D	392	CYS
10	D	407	TRP
10	D	418	ARG
10	D	439	MET
11	E	86	TYR
11	E	110	ASP
11	E	139	PHE
11	E	169	LYS
11	E	175	LYS
11	E	189	ARG
11	E	193	MET
12	F	116	LEU
12	F	143	TYR
12	F	190	ASP
12	F	234	ASP
13	G	95	ASN
17	L	67	MET
17	L	129	LYS
19	N	192	HIS
20	O	73	HIS
20	O	148	TRP

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Mol	Chain	Res	Type
20	O	150	TYR
20	O	152	ASP
22	Q	99	LYS
22	Q	117	LYS
22	Q	126	ASP
23	S	26	MET
23	S	28	LEU
23	S	42	TYR
23	S	95	ASP
23	S	116	ARG
23	S	121	ARG
25	Y	90	ASN
27	e	125	SER
27	e	127	GLU
28	f	8	LEU
29	h	61	ASN
29	h	62	GLU
29	h	92	ARG
29	h	110	GLU
30	i	43	ARG
30	i	61	ASN
30	i	74	ARG
32	m	201	ASP
32	m	240	TYR
37	v	151	ARG
38	x	34	LYS
38	x	79	LYS
38	x	81	ASP
38	x	103	ARG
38	x	118	CYS
38	x	142	LYS
38	x	154	ASP
38	x	179	LEU
38	x	206	ARG
38	x	276	MET
38	x	291	PHE
38	x	302	ARG
40	T	151	LEU

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	71	HIS
4	4	62	GLN
5	5	68	ASN
5	5	70	ASN
5	5	71	GLN
7	A	70	HIS
9	C	50	GLN
19	N	117	ASN
20	O	51	ASN
22	Q	78	GLN
27	e	66	ASN
29	h	21	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	1397/3497 (39%)	419 (29%)	19 (1%)
2	2	142/165 (86%)	31 (21%)	0
6	6	52/300 (17%)	16 (30%)	0
All	All	1591/3962 (40%)	466 (29%)	19 (1%)

All (466) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	9	U
1	1	11	A
1	1	16	A
1	1	18	G
1	1	21	G
1	1	22	G
1	1	34	A
1	1	35	A
1	1	49	A
1	1	50	U
1	1	51	A
1	1	53	G
1	1	59	G
1	1	60	A
1	1	65	A
1	1	66	A
1	1	67	A
1	1	68	A

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Mol	Chain	Res	Type
1	1	69	U
1	1	71	A
1	1	72	C
1	1	74	A
1	1	87	U
1	1	101	G
1	1	109	A
1	1	110	G
1	1	111	C
1	1	116	A
1	1	117	U
1	1	118	U
1	1	122	A
1	1	123	A
1	1	124	U
1	1	131	A
1	1	138	U
1	1	139	U
1	1	149	G
1	1	154	G
1	1	161	C
1	1	162	A
1	1	163	A
1	1	167	G
1	1	170	G
1	1	175	G
1	1	177	G
1	1	179	G
1	1	185	G
1	1	194	A
1	1	197	U
1	1	198	U
1	1	207	C
1	1	209	G
1	1	213	G
1	1	217	G
1	1	218	A
1	1	225	G
1	1	226	A
1	1	238	U
1	1	239	U
1	1	240	G

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Mol	Chain	Res	Type
1	1	244	G
1	1	245	A
1	1	246	U
1	1	258	U
1	1	260	U
1	1	268	U
1	1	269	U
1	1	276	A
1	1	277	G
1	1	301	C
1	1	303	A
1	1	306	U
1	1	331	A
1	1	336	U
1	1	337	U
1	1	338	G
1	1	346	A
1	1	347	C
1	1	354	C
1	1	358	C
1	1	359	A
1	1	360	A
1	1	361	G
1	1	362	U
1	1	383	A
1	1	384	G
1	1	393	A
1	1	403	A
1	1	405	A
1	1	406	U
1	1	407	A
1	1	410	A
1	1	411	C
1	1	428	G
1	1	429	G
1	1	430	A
1	1	437	G
1	1	443	C
1	1	445	G
1	1	446	U
1	1	447	C
1	1	448	U

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Mol	Chain	Res	Type
1	1	449	U
1	1	458	G
1	1	459	A
1	1	461	A
1	1	462	U
1	1	465	G
1	1	466	U
1	1	478	G
1	1	479	A
1	1	482	C
1	1	488	A
1	1	489	C
1	1	493	G
1	1	494	A
1	1	495	A
1	1	497	C
1	1	499	G
1	1	500	U
1	1	501	G
1	1	502	G
1	1	505	G
1	1	509	A
1	1	514	C
1	1	521	C
1	1	522	G
1	1	529	G
1	1	530	A
1	1	531	A
1	1	532	A
1	1	534	A
1	1	539	A
1	1	540	A
1	1	546	G
1	1	547	G
1	1	548	U
1	1	549	G
1	1	550	G
1	1	577	U
1	1	578	U
1	1	579	A
1	1	580	U
1	1	581	A

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Mol	Chain	Res	Type
1	1	582	G
1	1	587	U
1	1	591	G
1	1	592	U
1	1	602	A
1	1	603	C
1	1	616	A
1	1	618	U
1	1	624	U
1	1	629	G
1	1	632	A
1	1	634	G
1	1	635	G
1	1	636	A
1	1	641	G
1	1	644	A
1	1	645	U
1	1	646	A
1	1	647	A
1	1	649	G
1	1	661	C
1	1	662	C
1	1	663	C
1	1	671	A
1	1	673	C
1	1	675	C
1	1	685	A
1	1	686	G
1	1	702	A
1	1	706	U
1	1	708	U
1	1	714	A
1	1	716	G
1	1	717	A
1	1	724	A
1	1	732	A
1	1	753	G
1	1	759	C
1	1	761	U
1	1	762	U
1	1	763	G
1	1	765	G

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Mol	Chain	Res	Type
1	1	768	G
1	1	770	G
1	1	776	U
1	1	777	C
1	1	778	G
1	1	779	A
1	1	817	G
1	1	830	G
1	1	831	G
1	1	837	G
1	1	840	A
1	1	964	U
1	1	965	A
1	1	966	G
1	1	968	A
1	1	969	G
1	1	971	U
1	1	973	G
1	1	976	C
1	1	986	U
1	1	987	U
1	1	989	C
1	1	990	C
1	1	996	G
1	1	997	A
1	1	998	U
1	1	1003	G
1	1	1004	A
1	1	1009	C
1	1	1011	G
1	1	1012	A
1	1	1013	U
1	1	1014	C
1	1	1016	G
1	1	1017	U
1	1	1133	G
1	1	1135	G
1	1	1137	G
1	1	1141	C
1	1	1142	U
1	1	1143	A
1	1	1147	G

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Mol	Chain	Res	Type
1	1	1154	U
1	1	1155	U
1	1	1156	U
1	1	1157	G
1	1	1158	G
1	1	1159	U
1	1	1160	A
1	1	1161	A
1	1	1162	G
1	1	1163	C
1	1	1166	A
1	1	1167	A
1	1	1168	C
1	1	1173	G
1	1	1176	G
1	1	1184	A
1	1	1186	C
1	1	1188	G
1	1	1191	C
1	1	1205	G
1	1	1211	A
1	1	1212	U
1	1	1217	G
1	1	1221	A
1	1	1223	C
1	1	1224	A
1	1	1239	U
1	1	1243	A
1	1	1244	G
1	1	1249	U
1	1	1320	G
1	1	1324	U
1	1	1346	U
1	1	1347	U
1	1	1348	A
1	1	1352	G
1	1	1361	A
1	1	1363	A
1	1	1366	U
1	1	1380	A
1	1	1381	G
1	1	1382	C

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Mol	Chain	Res	Type
1	1	1383	U
1	1	1387	A
1	1	1388	G
1	1	1389	A
1	1	1390	A
1	1	1420	U
1	1	1421	G
1	1	1425	C
1	1	1426	G
1	1	1433	U
1	1	1436	G
1	1	1451	G
1	1	1452	A
1	1	1453	A
1	1	1459	U
1	1	1468	G
1	1	1471	C
1	1	1484	G
1	1	1936	A
1	1	2440	A
1	1	2443	G
1	1	2454	C
1	1	2455	U
1	1	2456	G
1	1	2459	G
1	1	2460	A
1	1	2462	C
1	1	2463	G
1	1	2464	G
1	1	2465	G
1	1	2466	C
1	1	2467	C
1	1	2468	A
1	1	2469	G
1	1	2470	G
1	1	2473	A
1	1	3096	G
1	1	3104	G
1	1	3107	A
1	1	3108	A
1	1	3109	U
1	1	3113	A

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Mol	Chain	Res	Type
1	1	3118	G
1	1	3119	U
1	1	3120	A
1	1	3125	A
1	1	3126	G
1	1	3128	A
1	1	3130	C
1	1	3135	G
1	1	3137	U
1	1	3142	A
1	1	3146	U
1	1	3148	G
1	1	3149	G
1	1	3152	U
1	1	3154	U
1	1	3179	G
1	1	3180	C
1	1	3182	G
1	1	3188	U
1	1	3189	C
1	1	3190	A
1	1	3192	C
1	1	3193	U
1	1	3195	C
1	1	3197	G
1	1	3199	A
1	1	3200	U
1	1	3205	G
1	1	3212	G
1	1	3216	C
1	1	3219	A
1	1	3222	C
1	1	3225	A
1	1	3227	U
1	1	3237	A
1	1	3238	A
1	1	3239	A
1	1	3240	G
1	1	3248	U
1	1	3271	G
1	1	3272	U
1	1	3273	A

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Mol	Chain	Res	Type
1	1	3275	A
1	1	3276	A
1	1	3281	A
1	1	3282	G
1	1	3286	U
1	1	3301	C
1	1	3307	U
1	1	3309	U
1	1	3310	A
1	1	3315	A
1	1	3316	G
1	1	3317	A
1	1	3318	A
1	1	3319	G
1	1	3322	G
1	1	3324	G
1	1	3327	A
1	1	3328	U
1	1	3332	U
1	1	3335	U
1	1	3336	G
1	1	3337	A
1	1	3338	A
1	1	3342	G
1	1	3343	A
1	1	3344	A
1	1	3345	G
1	1	3346	U
1	1	3348	U
1	1	3349	U
1	1	3351	U
1	1	3352	A
1	1	3356	A
1	1	3359	U
1	1	3360	G
1	1	3362	C
1	1	3368	A
1	1	3369	A
1	1	3370	U
1	1	3371	U
1	1	3372	C
1	1	3375	U

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Mol	Chain	Res	Type
1	1	3404	G
1	1	3405	C
1	1	3406	A
1	1	3408	A
1	1	3413	U
1	1	3418	U
1	1	3419	G
1	1	3420	U
1	1	3421	G
1	1	3423	A
1	1	3425	C
1	1	3427	G
1	1	3431	A
1	1	3472	G
1	1	3475	U
1	1	3476	A
1	1	3477	A
1	1	3478	G
1	1	3479	C
1	1	3483	U
1	1	3490	A
1	1	3491	A
1	1	3492	G
2	2	9	A
2	2	30	U
2	2	42	U
2	2	43	C
2	2	57	G
2	2	58	C
2	2	59	G
2	2	60	A
2	2	67	A
2	2	69	A
2	2	71	G
2	2	72	U
2	2	76	G
2	2	79	A
2	2	84	C
2	2	87	A
2	2	98	U
2	2	99	C
2	2	103	G

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Mol	Chain	Res	Type
2	2	104	A
2	2	112	A
2	2	114	C
2	2	115	G
2	2	124	G
2	2	130	G
2	2	132	G
2	2	144	G
2	2	157	A
2	2	159	U
2	2	160	G
2	2	165	U
6	6	3	A
6	6	5	U
6	6	6	C
6	6	8	U
6	6	9	C
6	6	47	U
6	6	58	A
6	6	59	A
6	6	82	A
6	6	83	A
6	6	85	U
6	6	92	G
6	6	93	A
6	6	94	A
6	6	97	C
6	6	99	A

All (19) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	1	48	A
1	1	360	A
1	1	382	A
1	1	447	C
1	1	487	C
1	1	488	A
1	1	493	G
1	1	496	C
1	1	500	U
1	1	661	C

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Mol	Chain	Res	Type
1	1	761	U
1	1	965	A
1	1	996	G
1	1	1159	U
1	1	1185	A
1	1	1380	A
1	1	1389	A
1	1	3337	A
1	1	3407	U

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 1 ligands modelled in this entry, 1 is monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	1	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	1	505:G	O3'	506:G	P	6.68

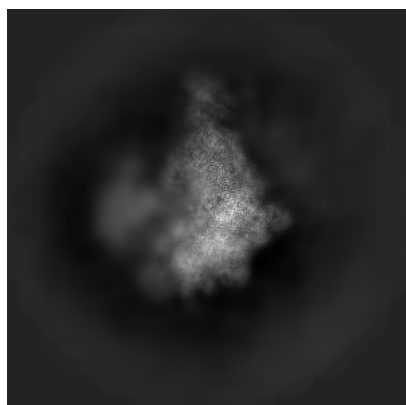
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-24410. These allow visual inspection of the internal detail of the map and identification of artifacts.

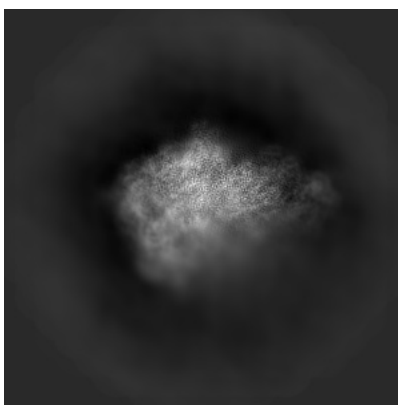
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

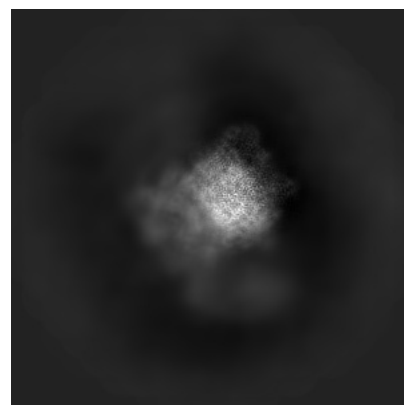
6.1.1 Primary map



X



Y

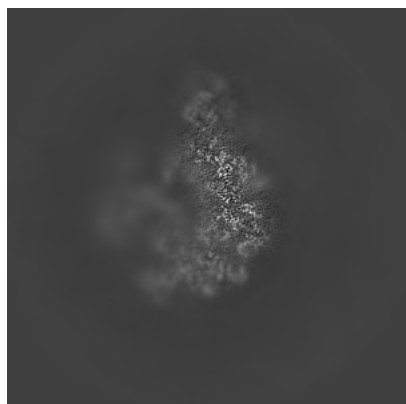


Z

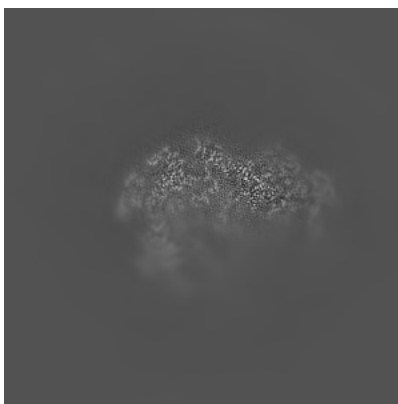
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

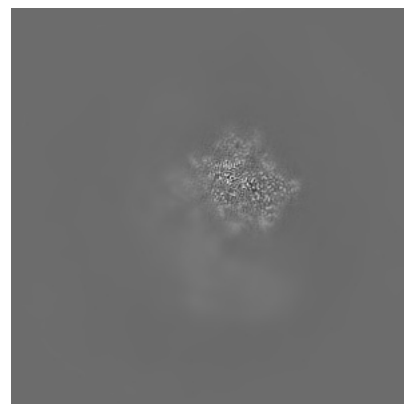
6.2.1 Primary map



X Index: 256



Y Index: 256

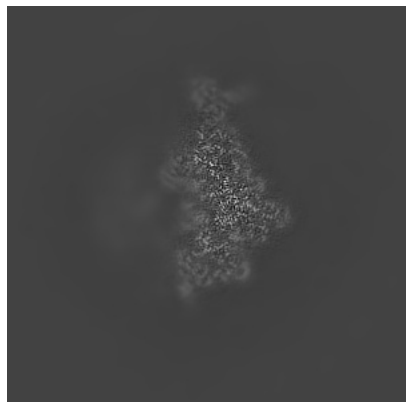


Z Index: 256

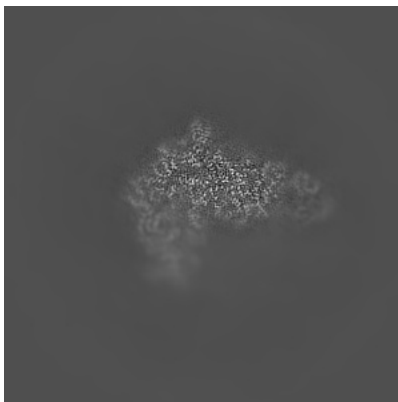
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

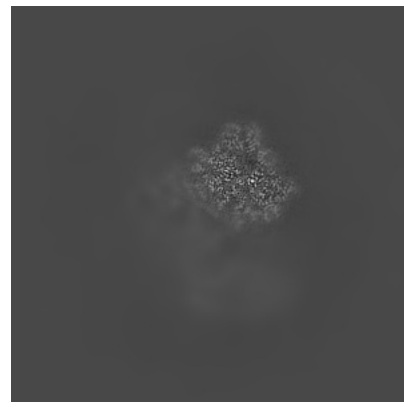
6.3.1 Primary map



X Index: 286



Y Index: 274



Z Index: 249

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

6.4 Orthogonal surface views [i](#)

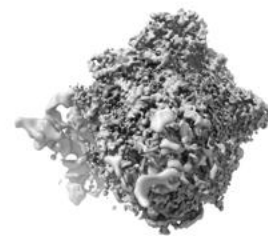
6.4.1 Primary map



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.

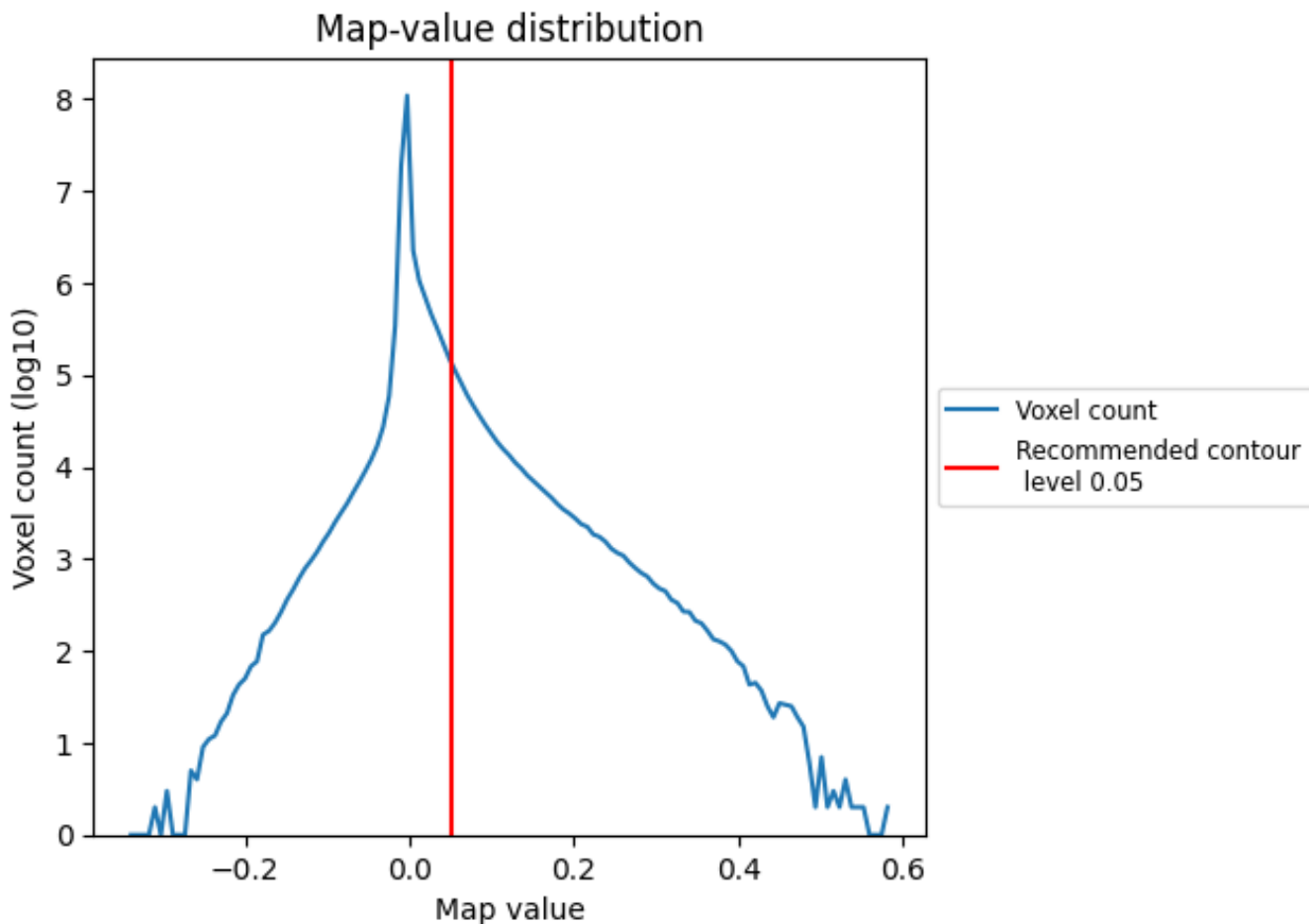
6.5 Mask visualisation

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

7 Map analysis [i](#)

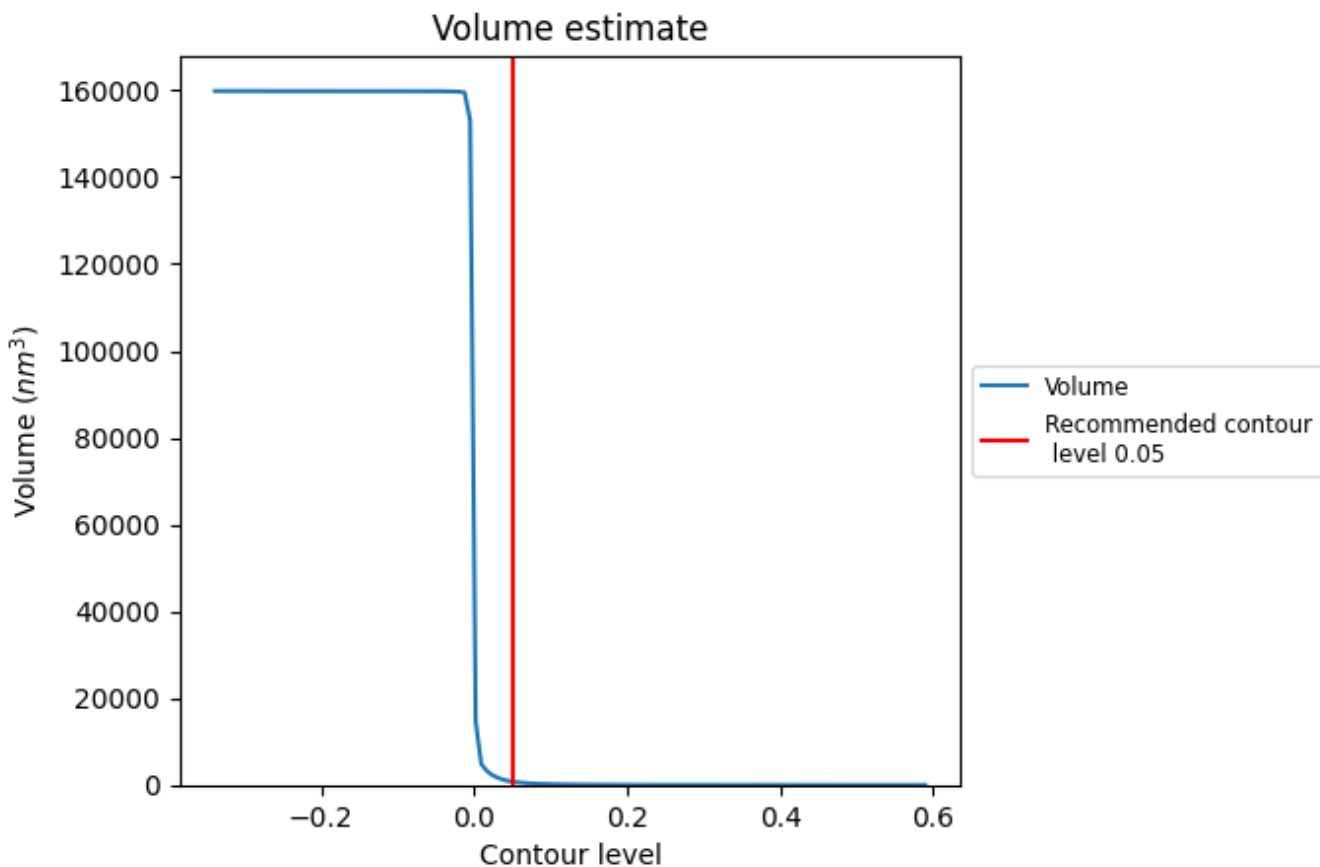
This section contains the results of statistical analysis of the map.

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.

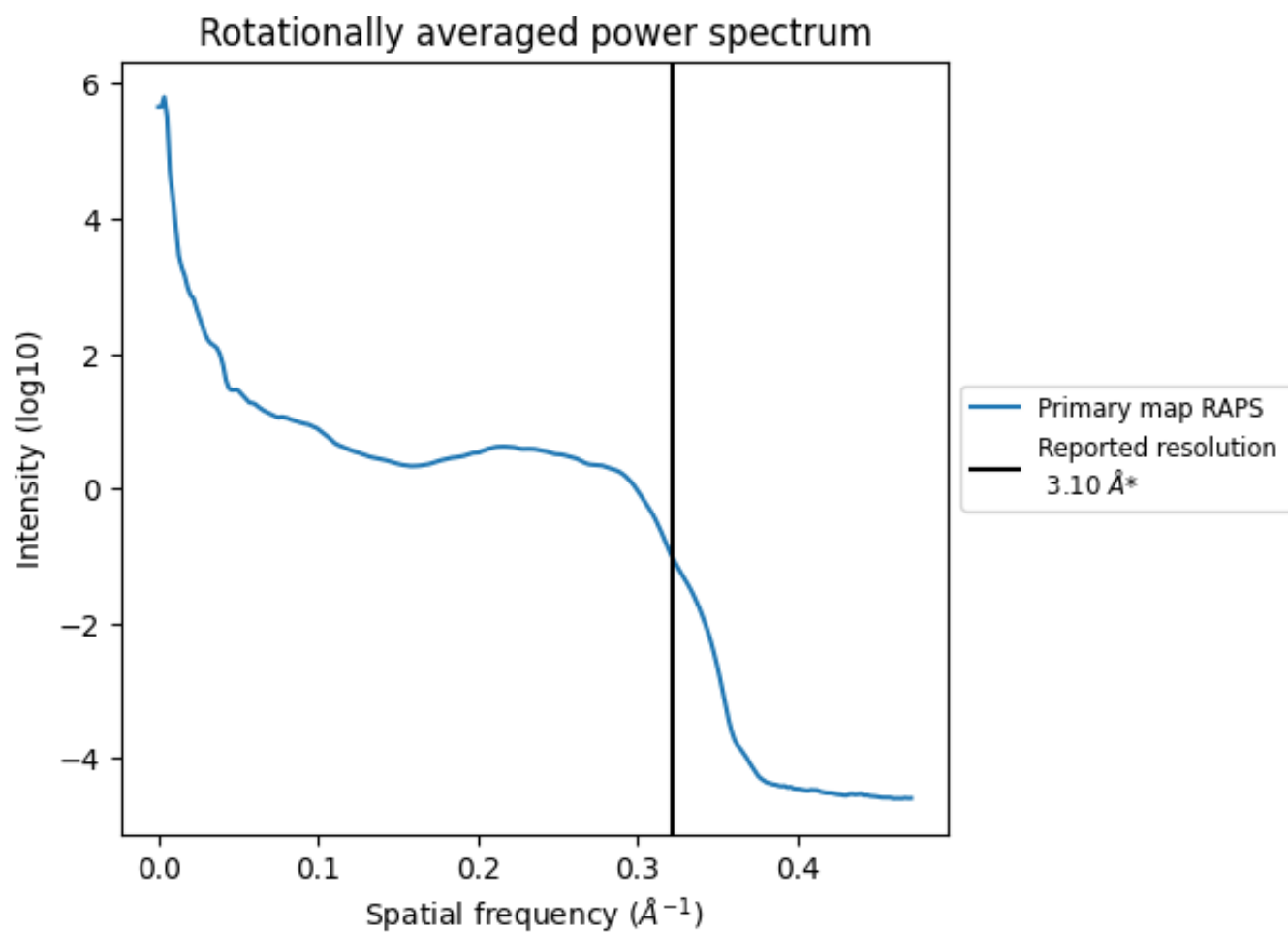
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 765 nm^3 ; this corresponds to an approximate mass of 691 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 0.323 Å⁻¹

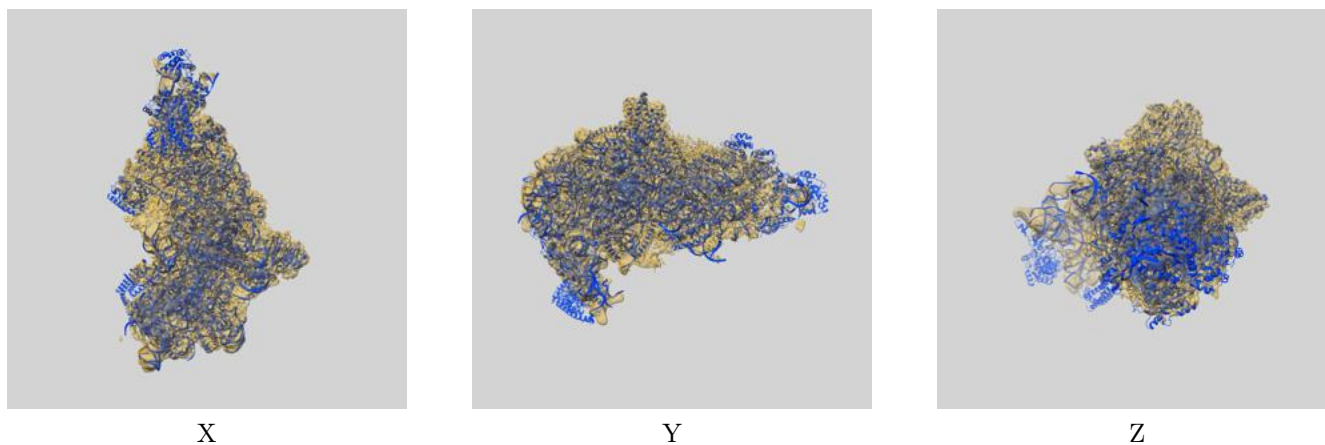
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

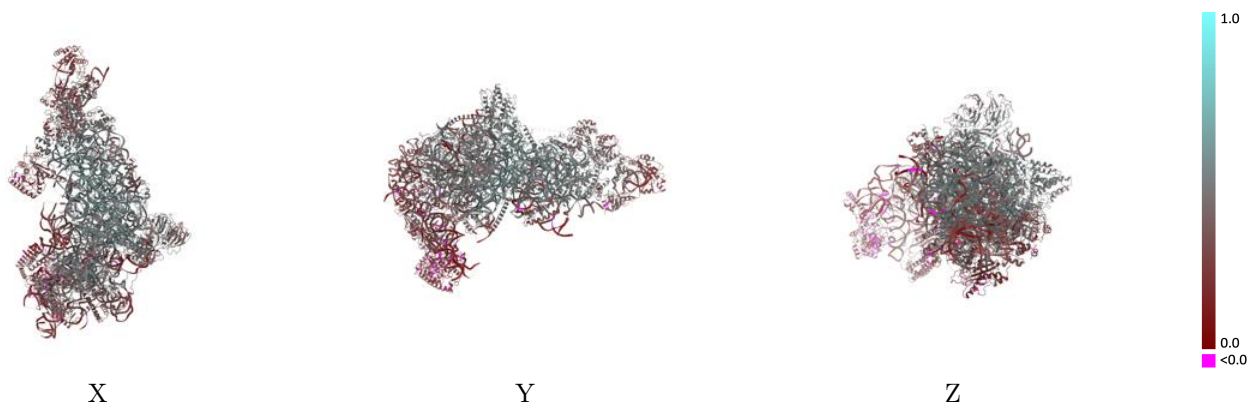
This section contains information regarding the fit between EMDB map EMD-24410 and PDB model 8EUP. Per-residue inclusion information can be found in section 3 on page 11.

9.1 Map-model overlay [i](#)



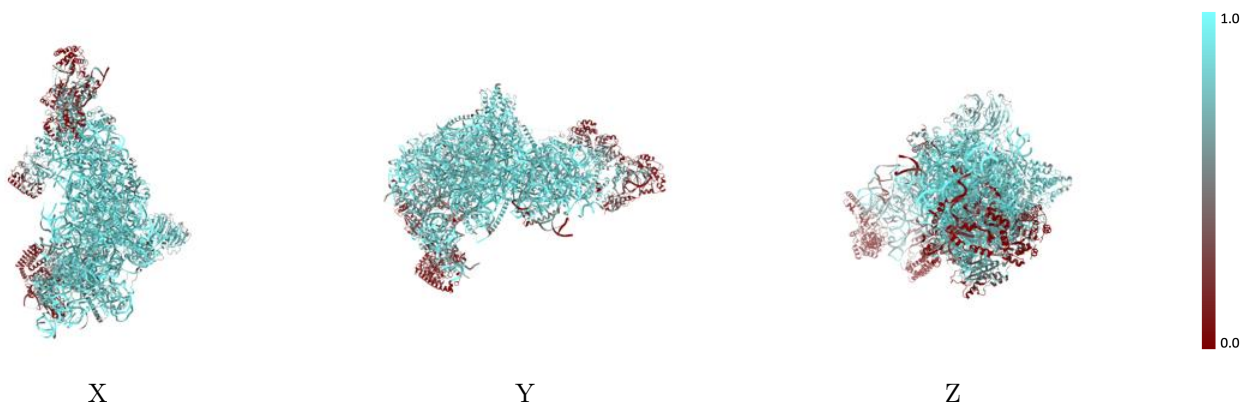
The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



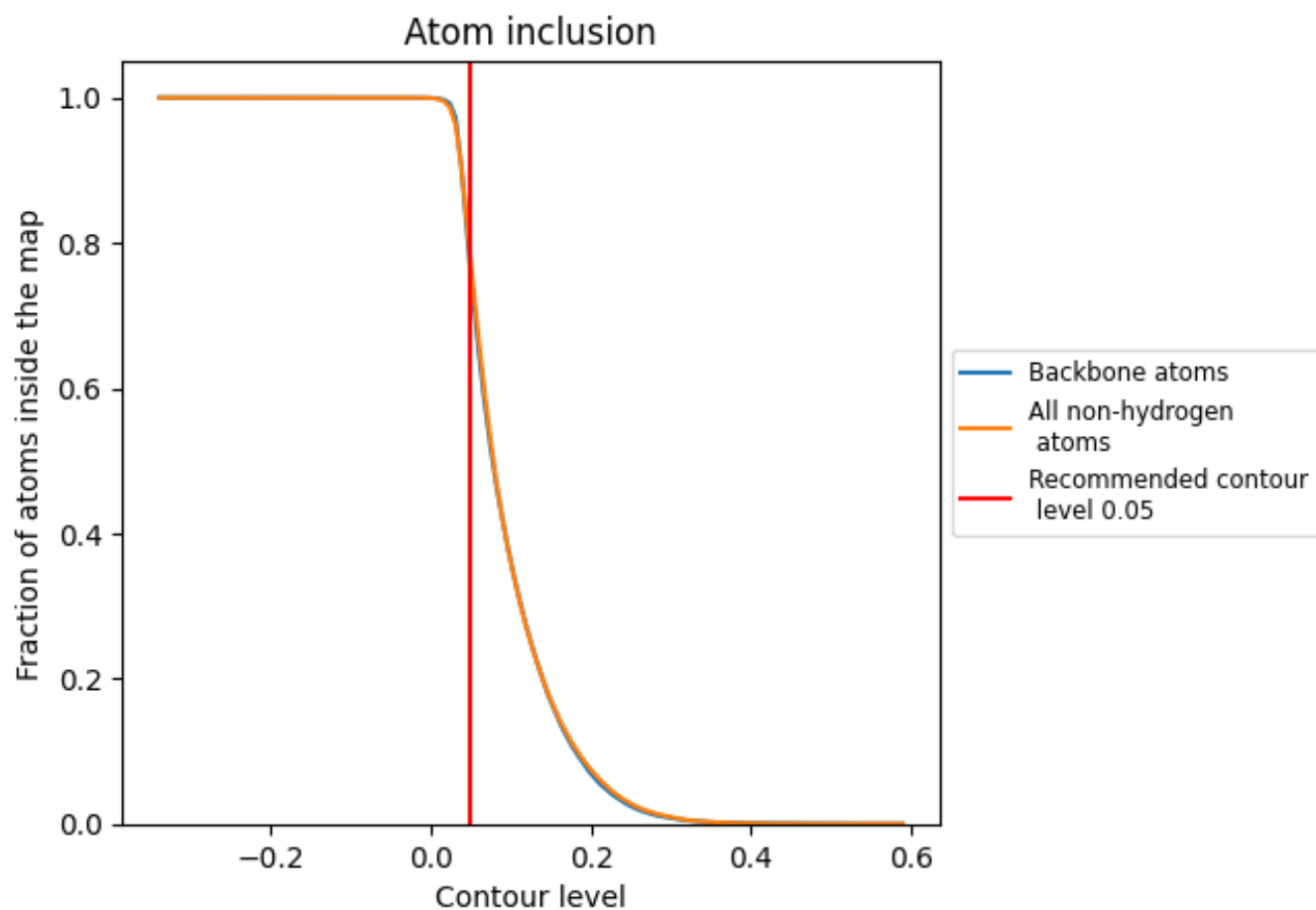
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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, 75% of all backbone atoms, 77% 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	 0.7704	 0.3950
1	 0.8881	 0.3820
2	 0.8202	 0.3820
3	 0.8760	 0.5110
4	 0.8407	 0.4880
5	 0.7832	 0.4390
6	 0.3822	 0.2380
A	 0.6608	 0.3020
B	 0.6585	 0.2340
C	 0.9210	 0.5340
D	 0.4047	 0.3710
E	 0.8232	 0.4210
F	 0.8595	 0.4750
G	 0.8809	 0.4930
H	 0.1427	 0.2360
J	 0.2516	 0.2300
K	 0.2718	 0.3170
L	 0.9544	 0.5490
M	 0.9524	 0.3990
N	 0.9588	 0.5460
O	 0.7290	 0.3430
P	 0.8557	 0.4510
Q	 0.9001	 0.5080
S	 0.7217	 0.3540
T	 0.2400	 0.3360
V	 0.0291	 0.1220
Y	 0.9096	 0.5150
b	 0.0067	 0.1780
e	 0.9468	 0.5390
f	 0.9288	 0.5070
h	 0.7604	 0.4280
i	 0.8843	 0.4760
j	 0.8944	 0.5020
m	 0.7878	 0.4440
o	 0.2660	 0.3240



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Chain	Atom inclusion	Q-score
r	 0.0108	 0.2110
t	 0.1790	 0.3170
u	 0.1423	 0.1310
v	 0.8215	 0.4710
x	 0.8356	 0.4730
y	 0.0009	 0.1050