



wwPDB EM Validation Summary Report ⓘ

Jul 3, 2024 – 11:33 am BST

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

This is a wwPDB EM Validation Summary 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) : 2.37.1

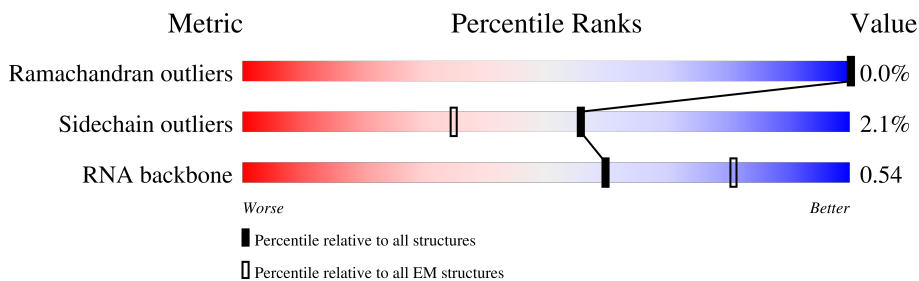
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.72 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	1	3396	
2	2	158	
3	6	232	
4	A	291	
5	B	387	
6	C	362	
7	D	505	
8	E	176	

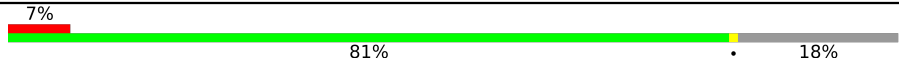
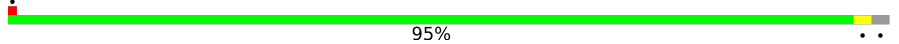


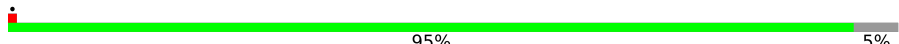


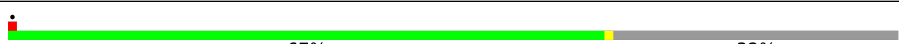
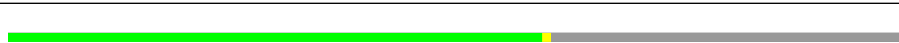



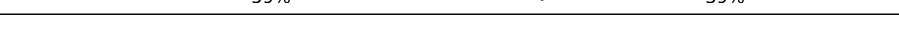
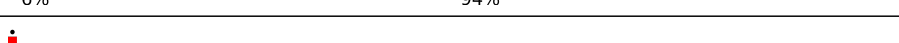
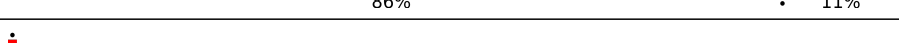
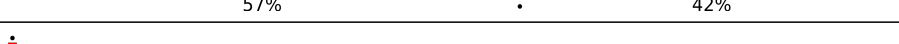
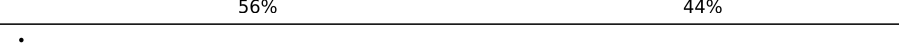

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Mol	Chain	Length	Quality of chain
9	F	244	89% 9%
10	G	256	70% 28%
11	H	191	97%
12	I	663	33% 61% 38%
13	J	427	33% 66%
14	K	376	67% 32%
15	L	199	58% 41%
16	M	138	96%
17	N	204	88% 11%
18	O	199	97%
19	P	184	86% 12%
20	Q	186	66% 33%
21	R	189	60% 39%
22	S	172	95%
23	U	121	81% 19%
24	V	137	6% 96%
25	W	236	95%
26	X	142	94% 5%
27	Y	127	98%
28	Z	136	99%
29	b	647	64% 35%
30	c	105	5% 90% 8%
31	d	113	88% 11%
32	e	130	89% 9%
33	f	107	99%

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Mol	Chain	Length	Quality of chain
34	g	121	 7% 81% 18%
35	h	120	 95%
36	i	100	 64% 33%
37	j	88	 5% 82% 17%
38	k	78	 95% 5%
39	l	181	 28% 92%
40	m	807	 5% 78% 20%
41	n	605	 67% 32%
42	o	220	 60% 40%
43	p	460	 64% 35%
44	q	618	 7% 48% 51%
45	r	261	 59% 39%
46	s	520	 6% 94%
47	t	322	 86% 11%
48	u	199	 57% 42%
49	v	231	 56% 44%
50	w	841	 23% 76%
51	y	245	 91% 8%

2 Entry composition [i](#)

There are 52 unique types of molecules in this entry. The entry contains 235846 atoms, of which 105613 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 25S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
1	1	2373	76327	22684	25519	9188	16564	2372	0	0

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

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
2	2	158	5048	1500	1695	586	1109	158	0	0

- Molecule 3 is a RNA chain called ITS2.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- Molecule 41 is a protein called Pescadillo homolog.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- Molecule 49 is a protein called Nucleolar protein 16.

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

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

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

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

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

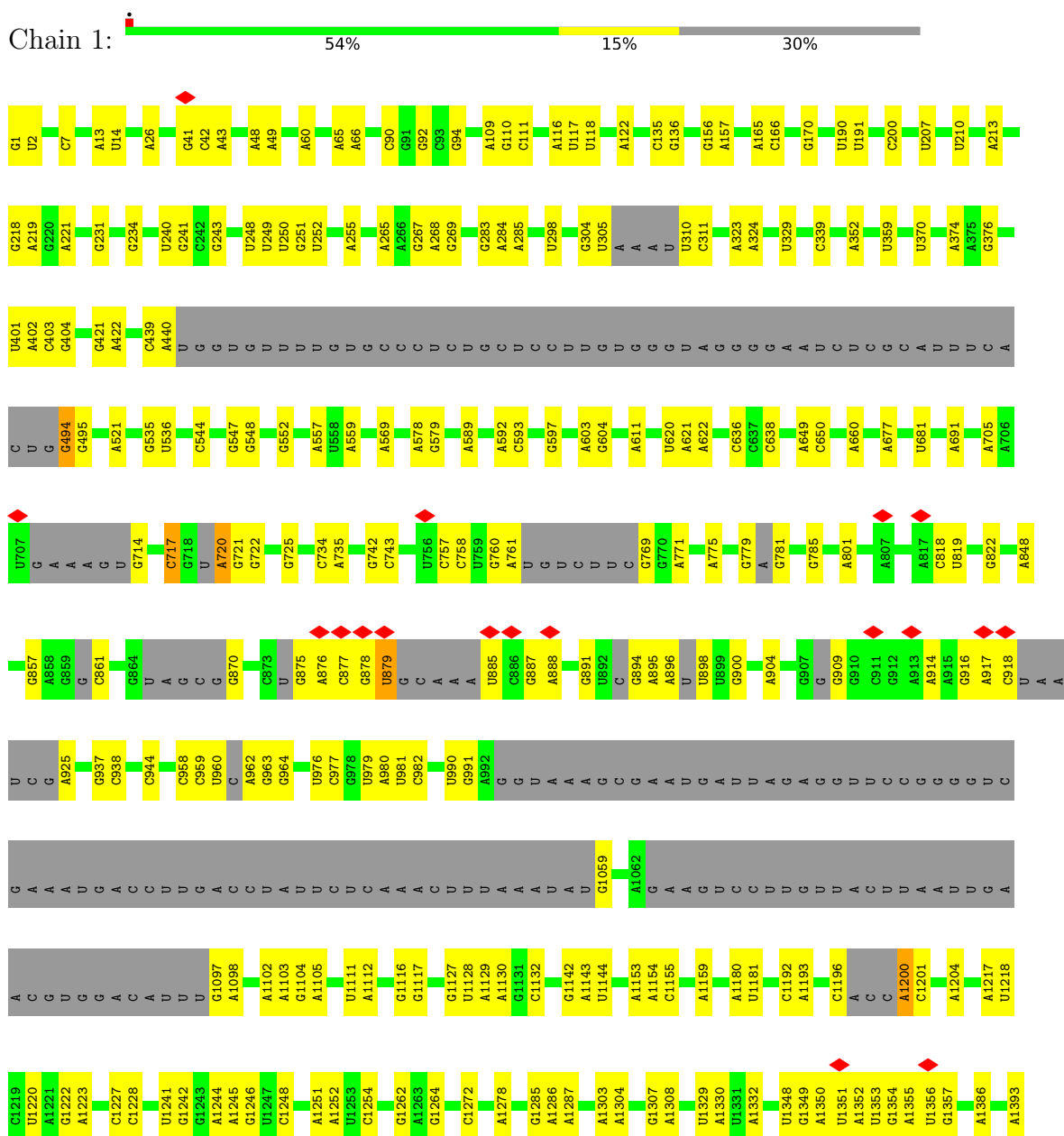
- Molecule 52 is ZINC ION (three-letter code: ZN) (formula: Zn).

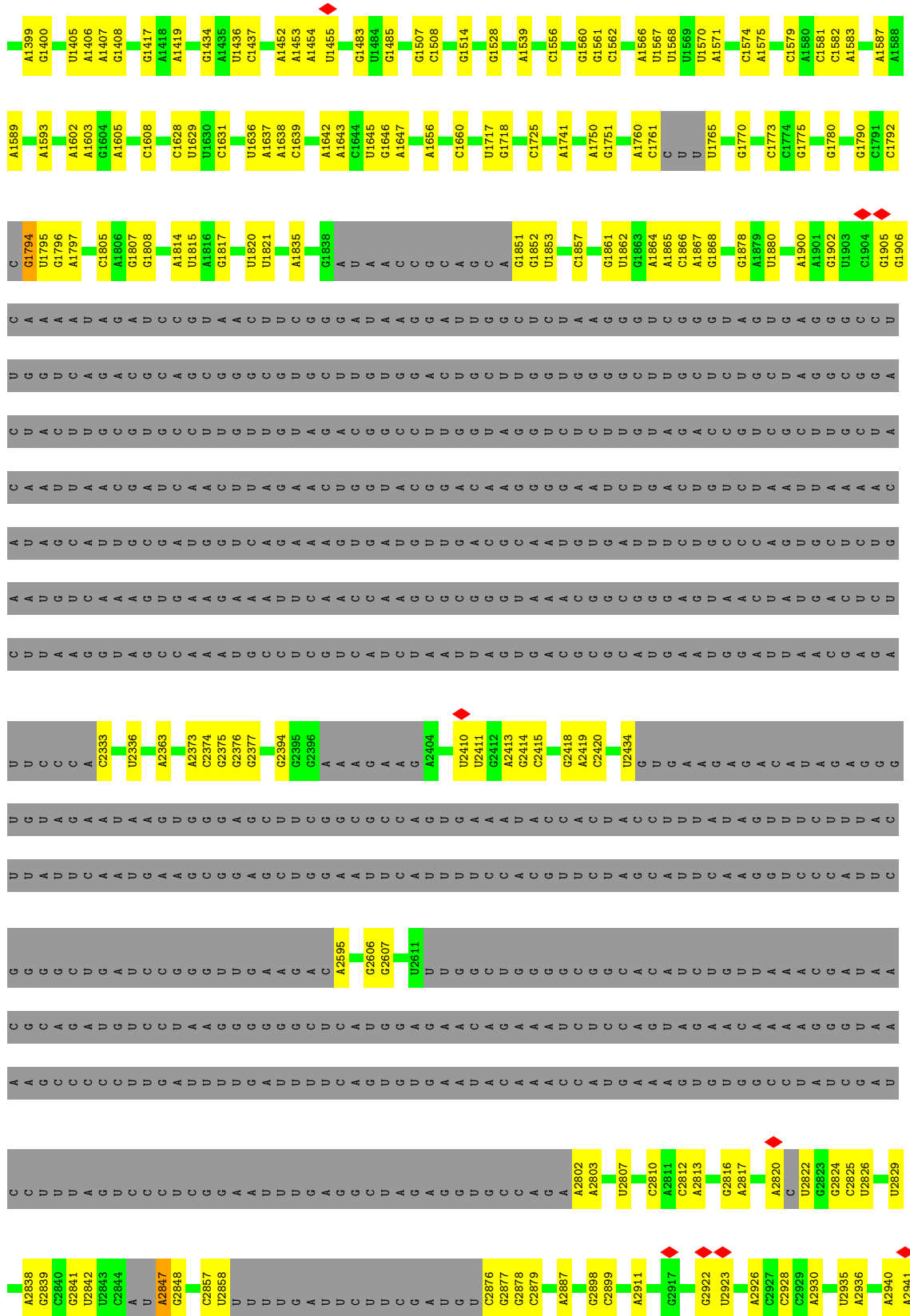
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
52	j	1	1	1	0

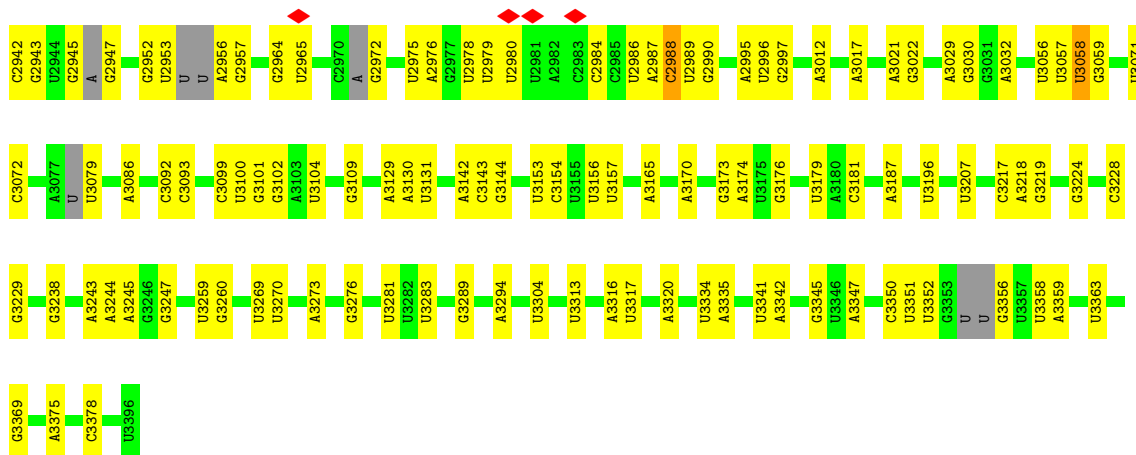
3 Residue-property plots

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

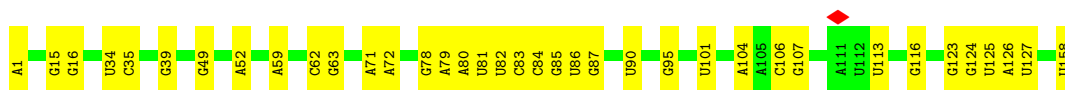
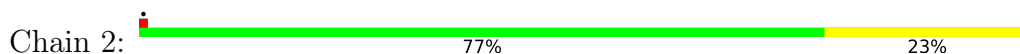
- Molecule 1: 25S rRNA



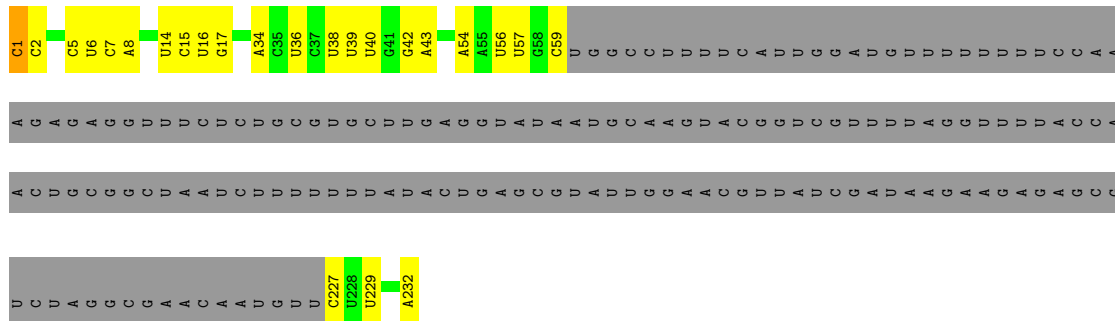




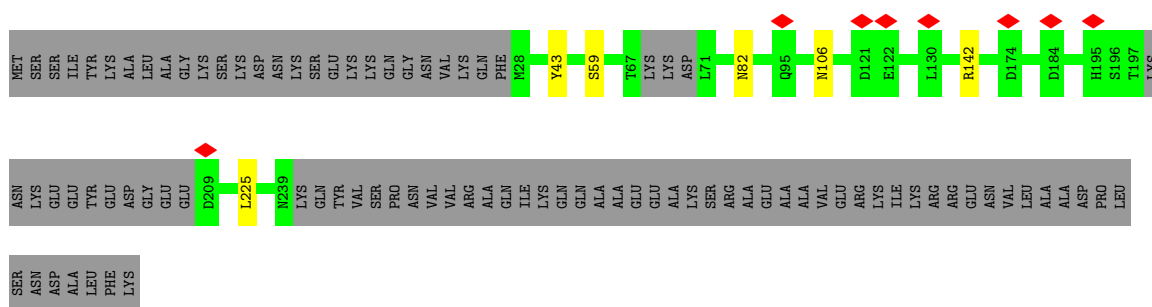
• Molecule 2: 5.8S rRNA



• Molecule 3: ITS2

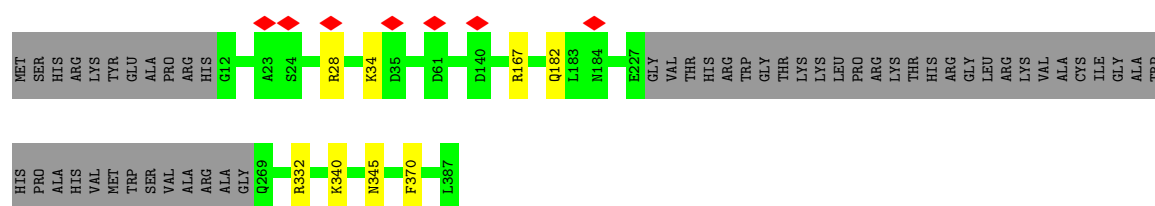


• Molecule 4: Ribosome biogenesis protein BRX1



• Molecule 5: 60S ribosomal protein L3

Chain B: 84% . 13%



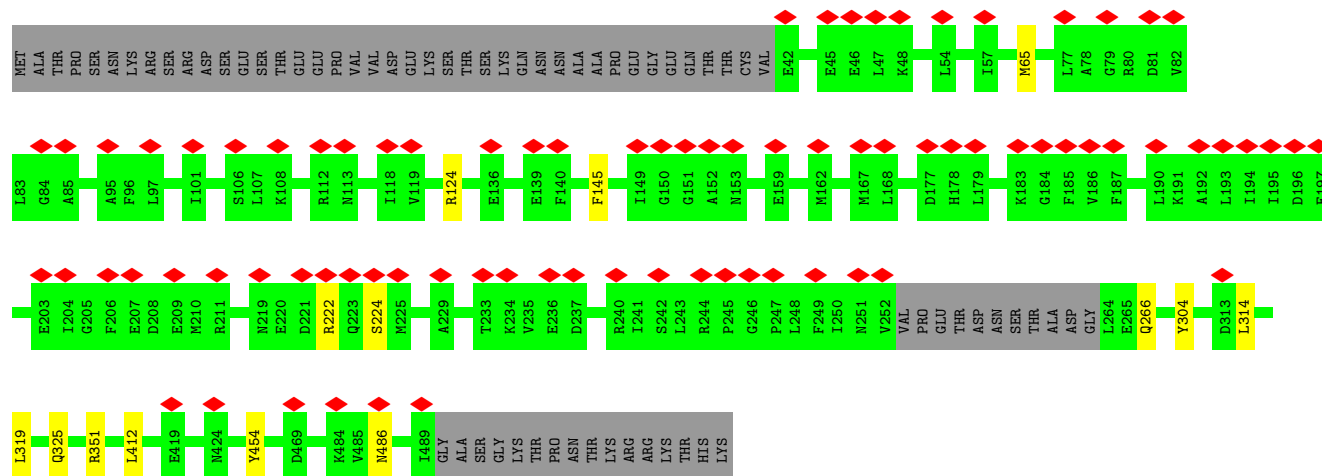
- Molecule 6: 60S ribosomal protein L4-A

Chain C: 96% ..



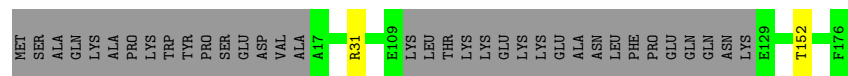
- Molecule 7: ATP-dependent RNA helicase HAS1

Chain D: 16% . 84% . 13%



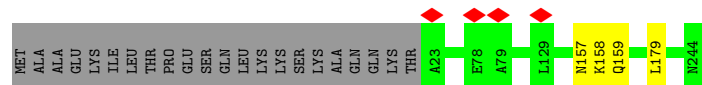
- Molecule 8: 60S ribosomal protein L6-A

Chain E: 79% . 20%



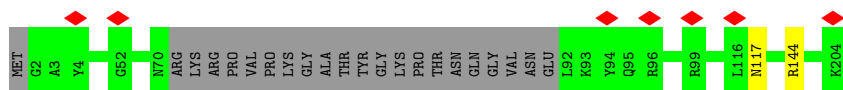
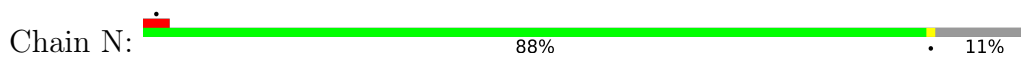
- Molecule 9: 60S ribosomal protein L7-A

Chain F: 89% . 9%



- Molecule 10: 60S ribosomal protein L8-A

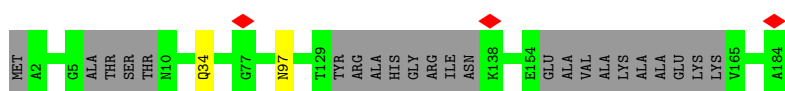
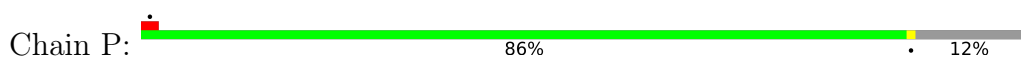
• Molecule 17: 60S ribosomal protein L15-A



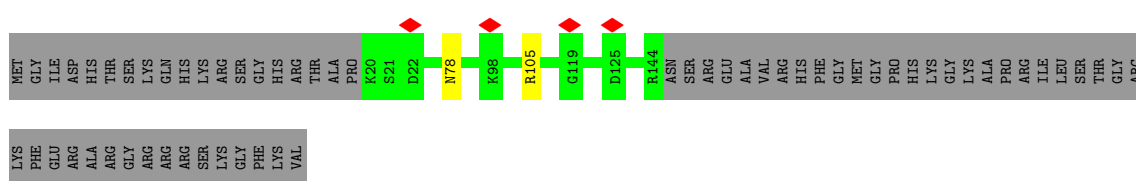
• Molecule 18: 60S ribosomal protein L16-A



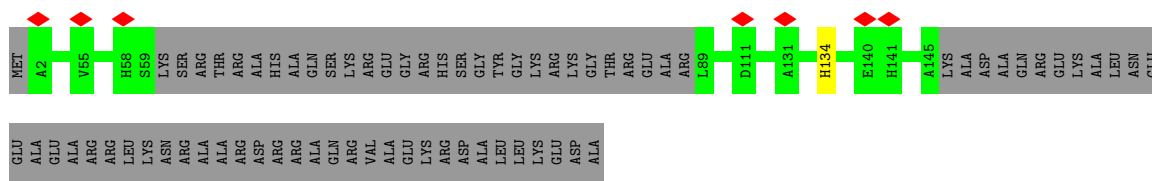
• Molecule 19: 60S ribosomal protein L17-A



• Molecule 20: 60S ribosomal protein L18-A




• Molecule 21: 60S ribosomal protein L19-A

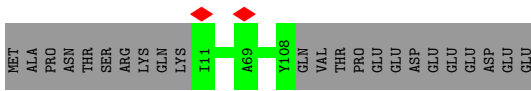


• Molecule 22: 60S ribosomal protein L20-A



- Molecule 23: 60S ribosomal protein L22-A

Chain U:  81% 19%



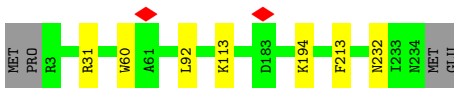
- Molecule 24: 60S ribosomal protein L23-A

Chain V:  6% 96% ..



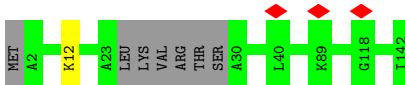
- Molecule 25: Ribosome assembly factor MRT4

Chain W:  95% ..



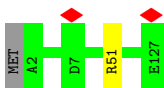
- Molecule 26: 60S ribosomal protein L25

Chain X:  94% . 5%



- Molecule 27: 60S ribosomal protein L26-A

Chain Y:  98% ..



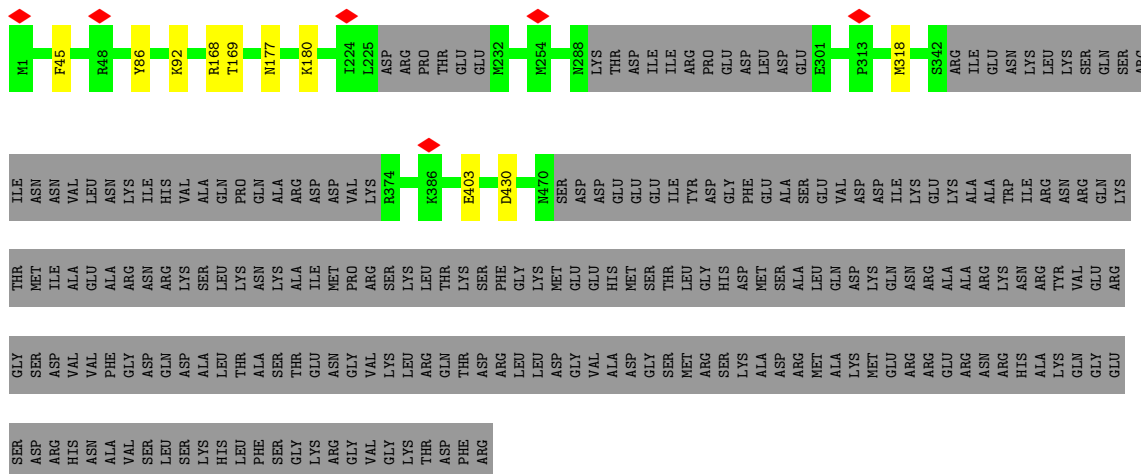
- Molecule 28: 60S ribosomal protein L27-A

Chain Z:  99% .

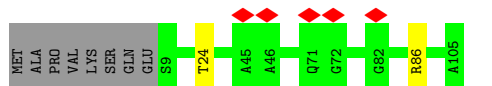
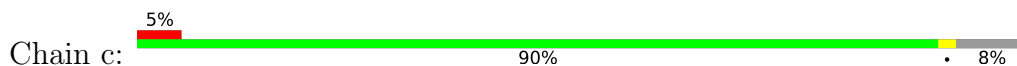


- Molecule 29: Nucleolar GTP-binding protein 1

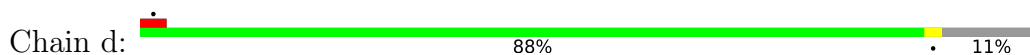
Chain b:  64% 35%



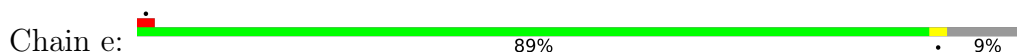
• Molecule 30: 60S ribosomal protein L30



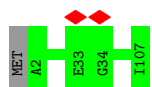
• Molecule 31: 60S ribosomal protein L31-A



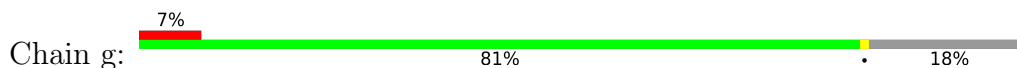
• Molecule 32: 60S ribosomal protein L32

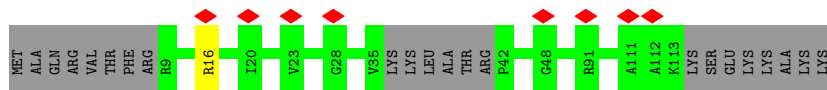


• Molecule 33: 60S ribosomal protein L33-A



• Molecule 34: 60S ribosomal protein L34-A

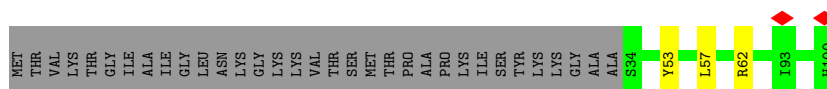




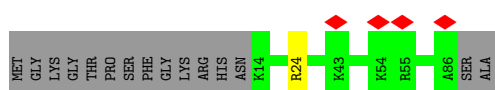
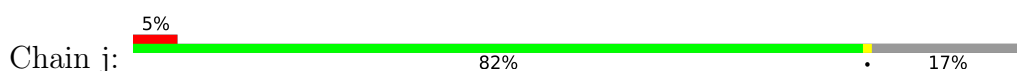
• Molecule 35: 60S ribosomal protein L35-A



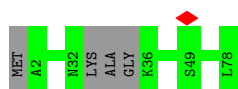
• Molecule 36: 60S ribosomal protein L36-A



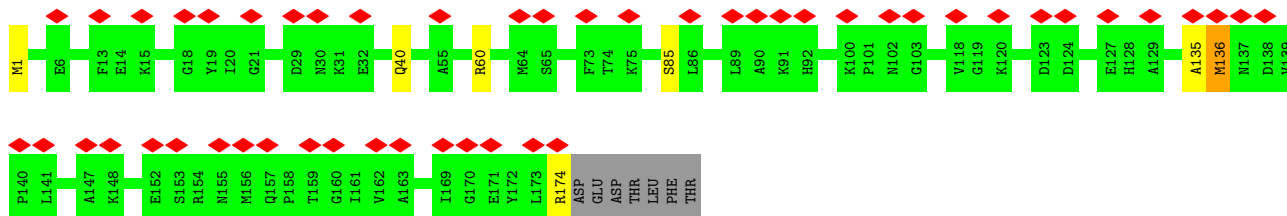
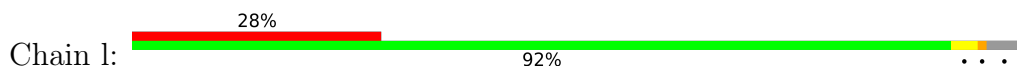
• Molecule 37: 60S ribosomal protein L37-A



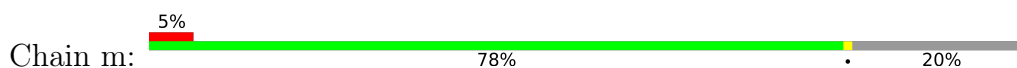
• Molecule 38: 60S ribosomal protein L38

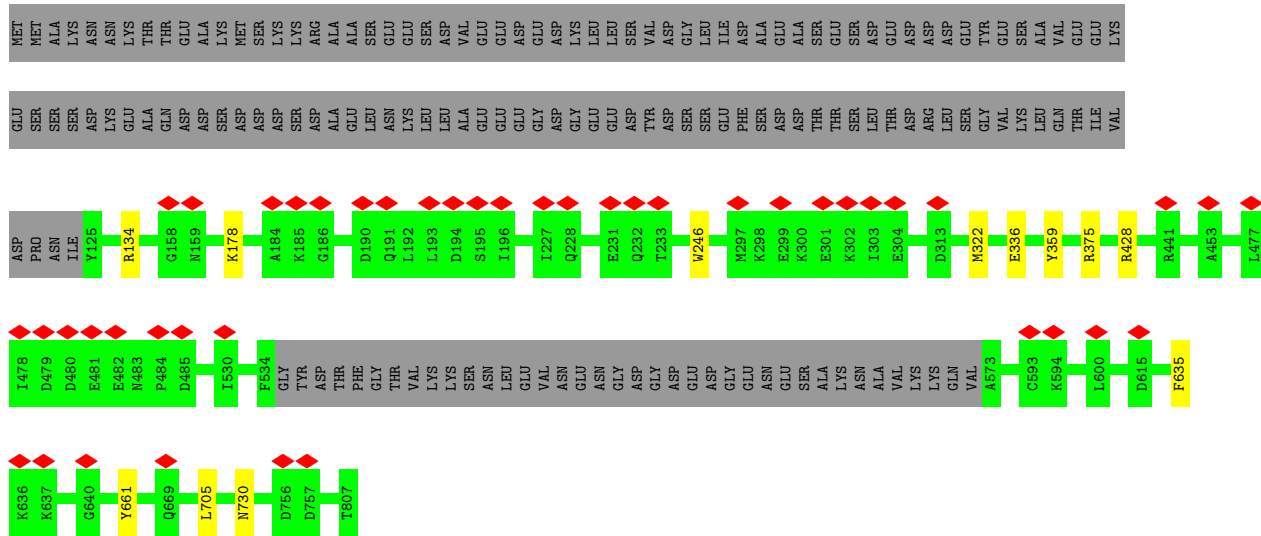


• Molecule 39: 60S ribosome subunit biogenesis protein NIP7

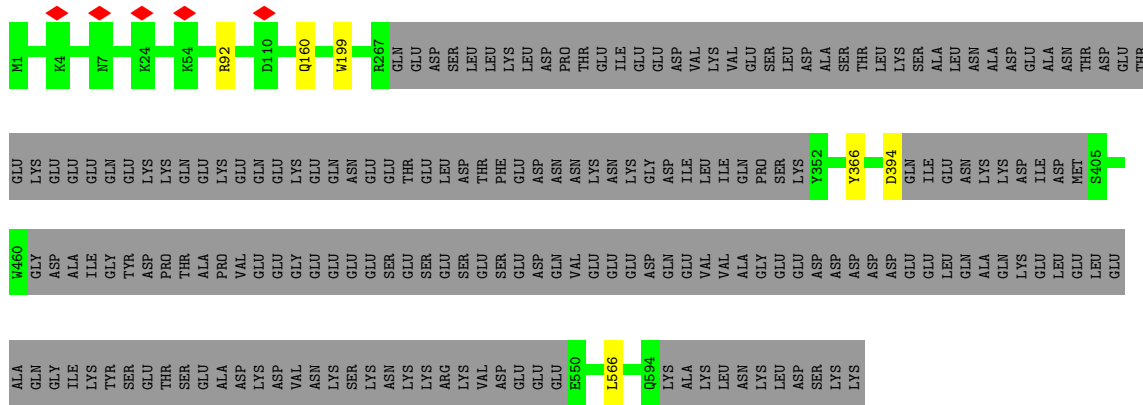


• Molecule 40: Ribosome biogenesis protein ERB1

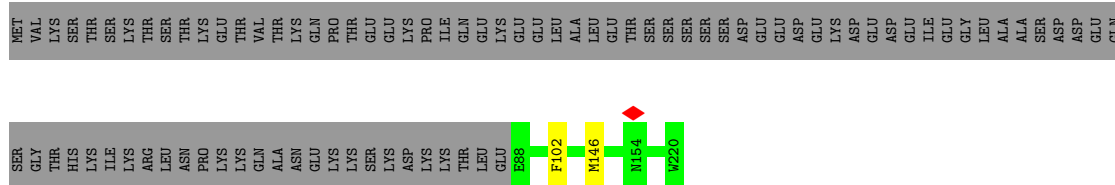




• Molecule 41: Pescadillo homolog



• Molecule 42: Ribosome biogenesis protein 15

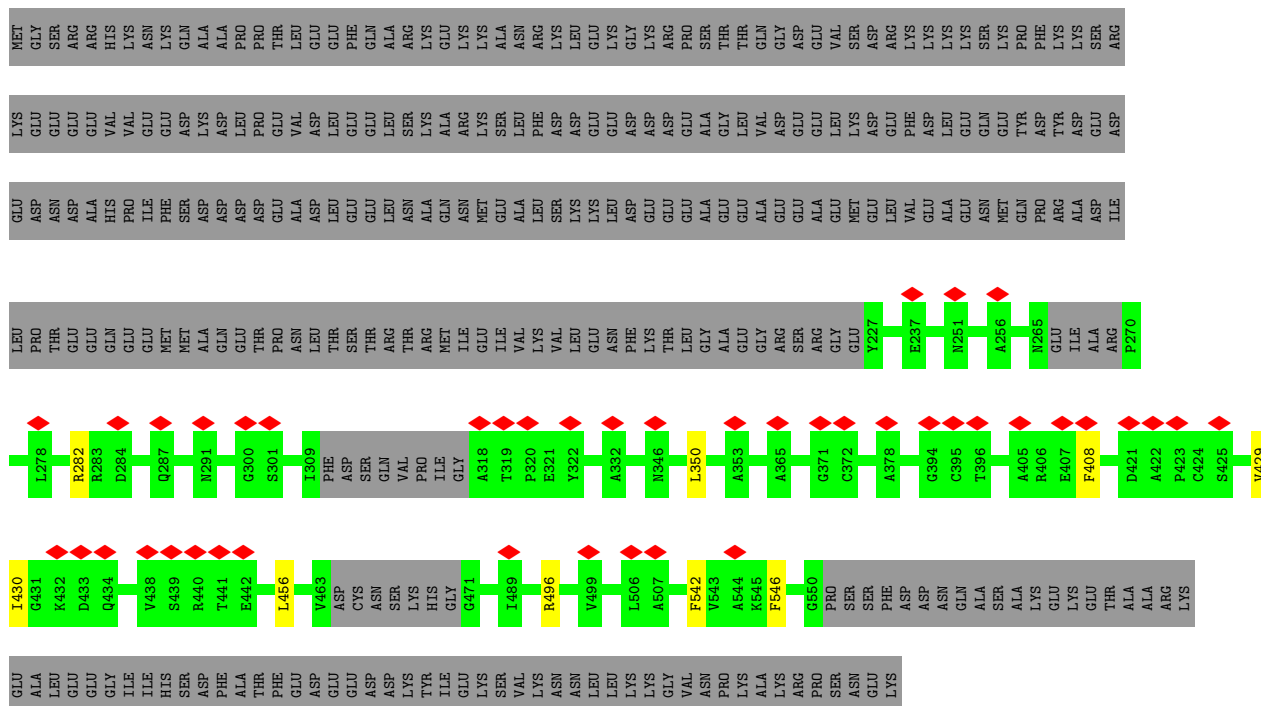


• Molecule 43: Ribosome biogenesis protein YTM1

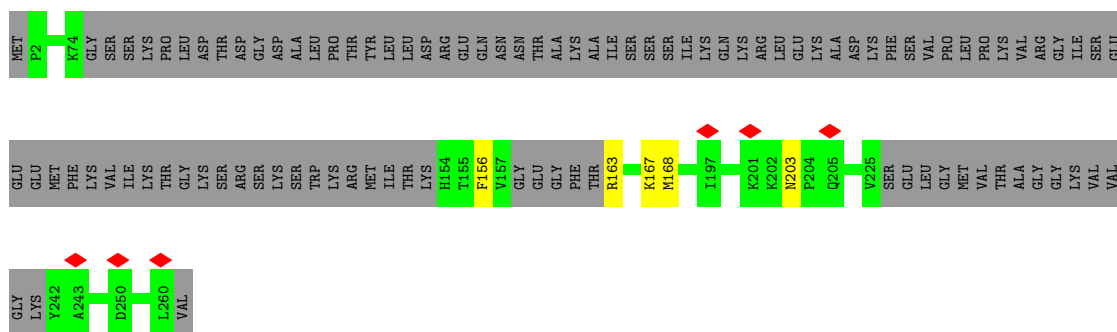




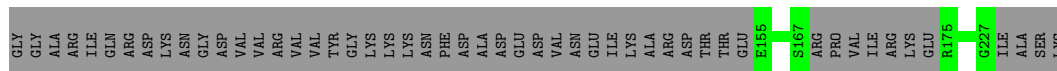
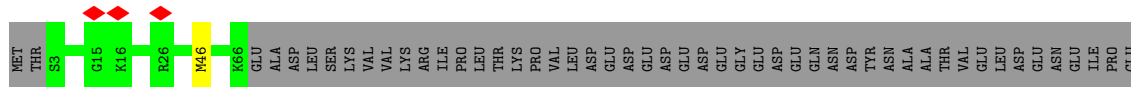
• Molecule 44: 25S rRNA (cytosine(2870)-C(5))-methyltransferase



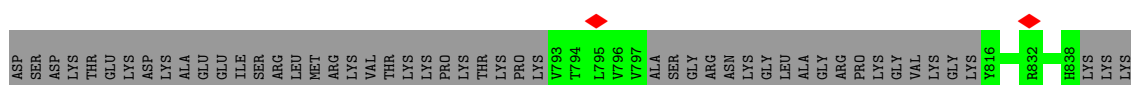
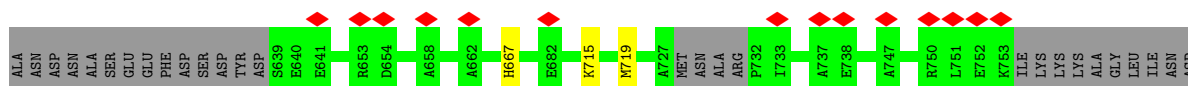
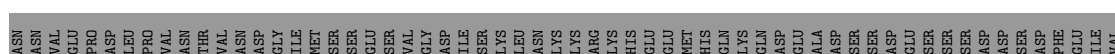
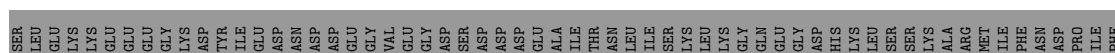
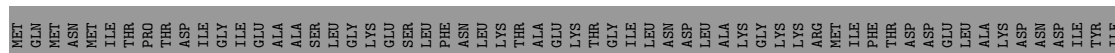
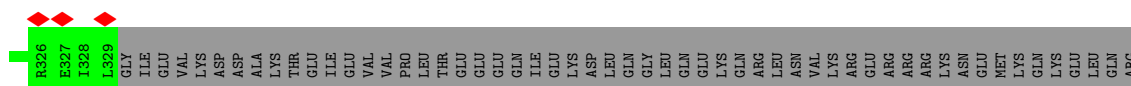
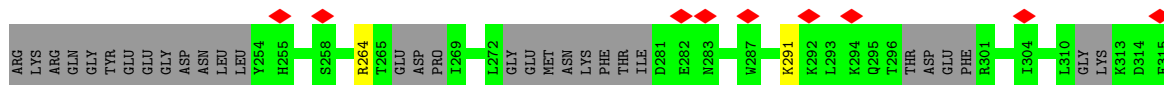
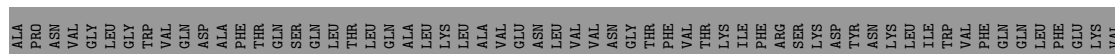
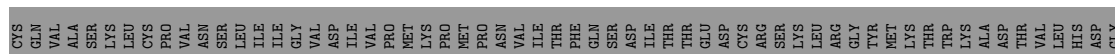
• Molecule 45: Ribosome biogenesis protein NSA2



• Molecule 46: Nuclear GTP-binding protein NUG1

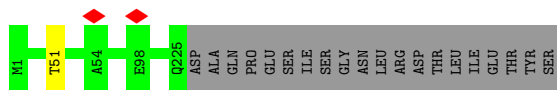


• Molecule 50: 27S pre-rRNA (guanosine(2922)-2'-O)-methyltransferase



• Molecule 51: Eukaryotic translation initiation factor 6





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	8455	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	84.67	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.098	Depositor
Minimum map value	-0.032	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.021	Depositor
Map size (Å)	425.40002, 425.40002, 425.40002	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.0635, 1.0635, 1.0635	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section:
ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

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

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

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
9	F	0	1
11	H	0	1
All	All	0	2

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	879	U	C2-N3	64.56	1.82	1.37
1	1	879	U	N3-C4	50.85	1.84	1.38
1	1	879	U	N1-C2	43.30	1.77	1.38
1	1	879	U	N1-C6	40.68	1.74	1.38
1	1	879	U	C4-C5	37.01	1.76	1.43

The worst 5 of 56 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
39	1	135	ALA	C-N-CA	13.48	155.41	121.70
39	1	136	MET	N-CA-C	7.33	130.79	111.00
1	1	879	U	C6-N1-C2	7.27	125.36	121.00
1	1	2972	G	OP1-P-OP2	-6.88	109.28	119.60
1	1	2802	A	OP1-P-OP2	-6.84	109.34	119.60

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
9	F	157	ASN	Peptide
11	H	22	SER	Peptide

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	A	192/291 (66%)	185 (96%)	7 (4%)	0	100	100
5	B	331/387 (86%)	318 (96%)	13 (4%)	0	100	100
6	C	351/362 (97%)	337 (96%)	14 (4%)	0	100	100
7	D	433/505 (86%)	423 (98%)	10 (2%)	0	100	100
8	E	137/176 (78%)	136 (99%)	1 (1%)	0	100	100
9	F	220/244 (90%)	209 (95%)	10 (4%)	1 (0%)	29	68
10	G	180/256 (70%)	173 (96%)	7 (4%)	0	100	100
11	H	188/191 (98%)	179 (95%)	9 (5%)	0	100	100
12	I	389/663 (59%)	371 (95%)	18 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
13	J	143/427 (34%)	141 (99%)	2 (1%)	0	100	100
14	K	253/376 (67%)	240 (95%)	13 (5%)	0	100	100
15	L	116/199 (58%)	110 (95%)	6 (5%)	0	100	100
16	M	129/138 (94%)	128 (99%)	1 (1%)	0	100	100
17	N	178/204 (87%)	177 (99%)	1 (1%)	0	100	100
18	O	195/199 (98%)	193 (99%)	2 (1%)	0	100	100
19	P	153/184 (83%)	149 (97%)	4 (3%)	0	100	100
20	Q	123/186 (66%)	122 (99%)	1 (1%)	0	100	100
21	R	111/189 (59%)	108 (97%)	3 (3%)	0	100	100
22	S	168/172 (98%)	155 (92%)	13 (8%)	0	100	100
23	U	96/121 (79%)	94 (98%)	2 (2%)	0	100	100
24	V	132/137 (96%)	130 (98%)	2 (2%)	0	100	100
25	W	230/236 (98%)	228 (99%)	2 (1%)	0	100	100
26	X	131/142 (92%)	124 (95%)	7 (5%)	0	100	100
27	Y	124/127 (98%)	124 (100%)	0	0	100	100
28	Z	133/136 (98%)	130 (98%)	3 (2%)	0	100	100
29	b	413/647 (64%)	399 (97%)	14 (3%)	0	100	100
30	c	95/105 (90%)	95 (100%)	0	0	100	100
31	d	97/113 (86%)	94 (97%)	3 (3%)	0	100	100
32	e	114/130 (88%)	111 (97%)	3 (3%)	0	100	100
33	f	104/107 (97%)	102 (98%)	2 (2%)	0	100	100
34	g	95/121 (78%)	94 (99%)	1 (1%)	0	100	100
35	h	115/120 (96%)	107 (93%)	8 (7%)	0	100	100
36	i	65/100 (65%)	65 (100%)	0	0	100	100
37	j	71/88 (81%)	70 (99%)	1 (1%)	0	100	100
38	k	70/78 (90%)	70 (100%)	0	0	100	100
39	l	172/181 (95%)	165 (96%)	6 (4%)	1 (1%)	25	65
40	m	641/807 (79%)	625 (98%)	16 (2%)	0	100	100
41	n	403/605 (67%)	393 (98%)	10 (2%)	0	100	100
42	o	131/220 (60%)	124 (95%)	7 (5%)	0	100	100
43	p	288/460 (63%)	280 (97%)	8 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
44	q	297/618 (48%)	281 (95%)	14 (5%)	2 (1%)	22	62
45	r	151/261 (58%)	143 (95%)	8 (5%)	0	100	100
46	s	29/520 (6%)	29 (100%)	0	0	100	100
47	t	280/322 (87%)	263 (94%)	17 (6%)	0	100	100
48	u	114/199 (57%)	113 (99%)	1 (1%)	0	100	100
49	v	124/231 (54%)	123 (99%)	1 (1%)	0	100	100
50	w	180/841 (21%)	177 (98%)	3 (2%)	0	100	100
51	y	223/245 (91%)	220 (99%)	3 (1%)	0	100	100
All	All	9108/13367 (68%)	8827 (97%)	277 (3%)	4 (0%)	100	100

All (4) Ramachandran outliers are listed below:

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

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	A	185/263 (70%)	179 (97%)	6 (3%)	39	62
5	B	282/323 (87%)	274 (97%)	8 (3%)	43	65
6	C	286/289 (99%)	278 (97%)	8 (3%)	43	65
7	D	381/440 (87%)	367 (96%)	14 (4%)	34	59
8	E	122/153 (80%)	120 (98%)	2 (2%)	62	79
9	F	186/205 (91%)	184 (99%)	2 (1%)	73	85
10	G	150/208 (72%)	146 (97%)	4 (3%)	44	66
11	H	170/171 (99%)	166 (98%)	4 (2%)	49	69

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
12	I	373/602 (62%)	369 (99%)	4 (1%)	73	85
13	J	133/383 (35%)	130 (98%)	3 (2%)	50	70
14	K	238/346 (69%)	233 (98%)	5 (2%)	53	72
15	L	97/159 (61%)	95 (98%)	2 (2%)	53	72
16	M	105/109 (96%)	105 (100%)	0	100	100
17	N	158/176 (90%)	156 (99%)	2 (1%)	69	82
18	O	160/162 (99%)	157 (98%)	3 (2%)	57	75
19	P	130/146 (89%)	128 (98%)	2 (2%)	65	80
20	Q	102/151 (68%)	100 (98%)	2 (2%)	55	73
21	R	98/154 (64%)	97 (99%)	1 (1%)	76	86
22	S	155/156 (99%)	148 (96%)	7 (4%)	27	53
23	U	85/107 (79%)	85 (100%)	0	100	100
24	V	103/105 (98%)	101 (98%)	2 (2%)	57	75
25	W	209/213 (98%)	202 (97%)	7 (3%)	38	61
26	X	111/118 (94%)	110 (99%)	1 (1%)	78	88
27	Y	109/110 (99%)	108 (99%)	1 (1%)	78	88
28	Z	115/116 (99%)	115 (100%)	0	100	100
29	b	377/573 (66%)	367 (97%)	10 (3%)	44	66
30	c	81/88 (92%)	79 (98%)	2 (2%)	47	68
31	d	89/97 (92%)	87 (98%)	2 (2%)	52	71
32	e	103/111 (93%)	101 (98%)	2 (2%)	57	75
33	f	90/91 (99%)	90 (100%)	0	100	100
34	g	84/103 (82%)	83 (99%)	1 (1%)	71	84
35	h	104/105 (99%)	101 (97%)	3 (3%)	42	64
36	i	57/82 (70%)	54 (95%)	3 (5%)	22	49
37	j	60/71 (84%)	59 (98%)	1 (2%)	60	78
38	k	67/69 (97%)	67 (100%)	0	100	100
39	l	149/156 (96%)	144 (97%)	5 (3%)	37	61
40	m	582/723 (80%)	570 (98%)	12 (2%)	53	72
41	n	371/548 (68%)	365 (98%)	6 (2%)	62	79
42	o	118/199 (59%)	116 (98%)	2 (2%)	60	78

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
43	p	265/413 (64%)	260 (98%)	5 (2%)	57	75
44	q	258/535 (48%)	251 (97%)	7 (3%)	44	66
45	r	142/229 (62%)	137 (96%)	5 (4%)	36	60
46	s	27/445 (6%)	26 (96%)	1 (4%)	34	59
47	t	256/287 (89%)	248 (97%)	8 (3%)	40	62
48	u	101/180 (56%)	99 (98%)	2 (2%)	55	73
49	v	116/205 (57%)	115 (99%)	1 (1%)	78	88
50	w	179/745 (24%)	174 (97%)	5 (3%)	43	65
51	y	193/211 (92%)	192 (100%)	1 (0%)	88	93
All	All	8112/11631 (70%)	7938 (98%)	174 (2%)	56	72

5 of 174 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
39	l	40	GLN
43	p	406	ARG
40	m	134	ARG
40	m	730	ASN
44	q	546	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 41 such sidechains are listed below:

Mol	Chain	Res	Type
40	m	509	ASN
45	r	203	ASN
40	m	730	ASN
41	n	164	ASN
49	v	31	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	2344/3396 (69%)	454 (19%)	50 (2%)
2	2	157/158 (99%)	34 (21%)	3 (1%)
3	6	64/232 (27%)	22 (34%)	3 (4%)
All	All	2565/3786 (67%)	510 (19%)	56 (2%)

5 of 510 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	2	U
1	1	7	C
1	1	14	U
1	1	26	A
1	1	41	G

5 of 56 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	1	1582	C
3	6	56	U
1	1	1861	G
3	6	16	U
1	1	3350	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 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

The following chains have linkage breaks:

Mol	Chain	Number of breaks
39	1	1

All chain breaks are listed below:

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

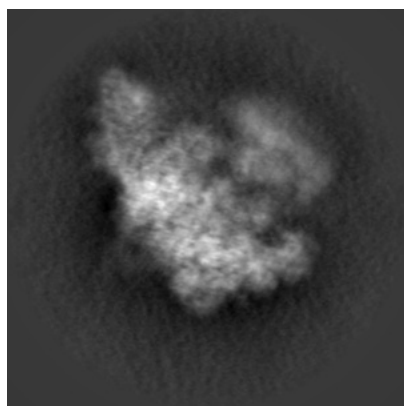
6 Map visualisation [i](#)

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

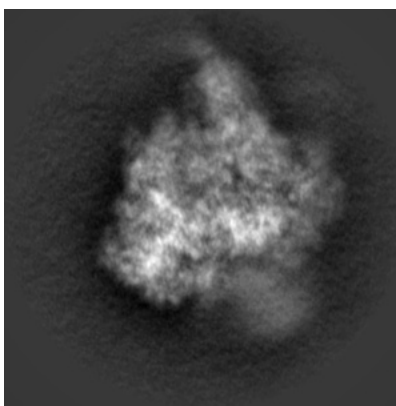
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

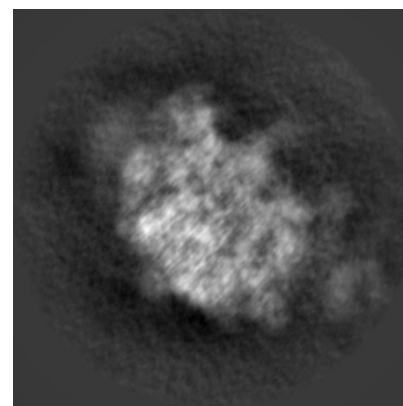
6.1.1 Primary map



X

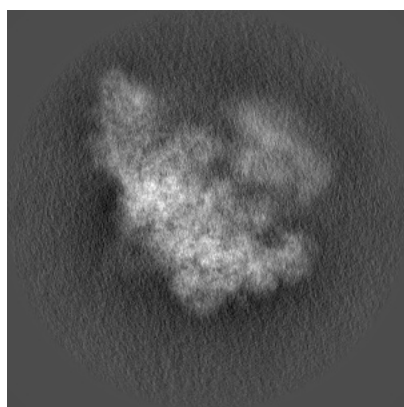


Y

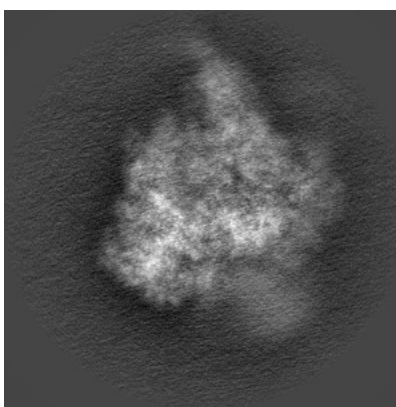


Z

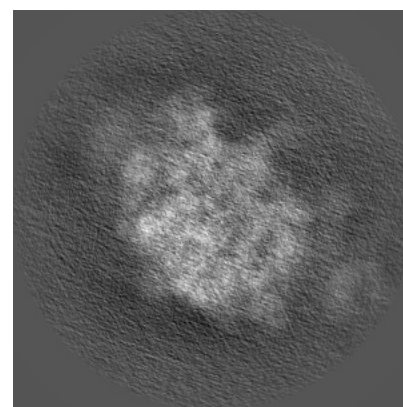
6.1.2 Raw map



X



Y

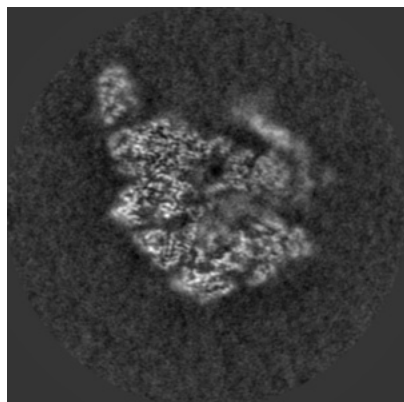


Z

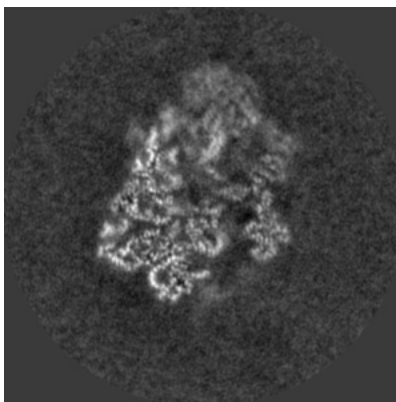
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

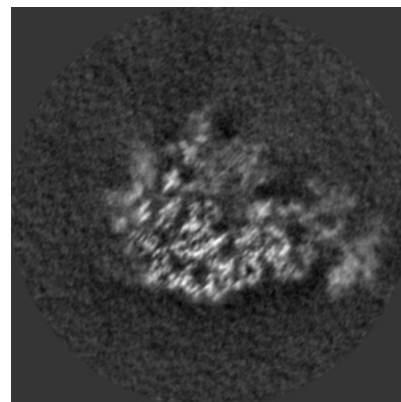
6.2.1 Primary map



X Index: 200

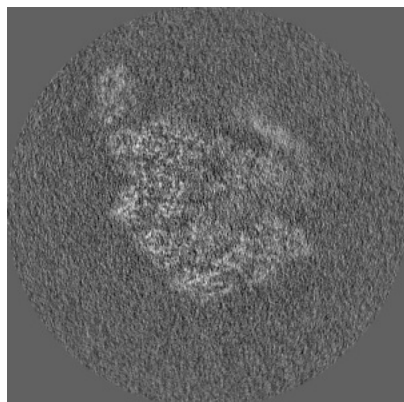


Y Index: 200

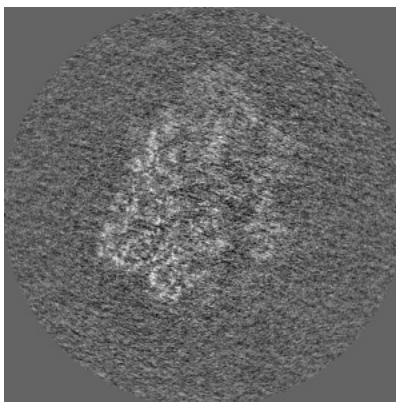


Z Index: 200

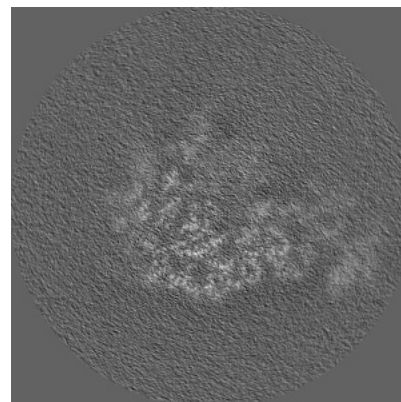
6.2.2 Raw map



X Index: 200



Y Index: 200

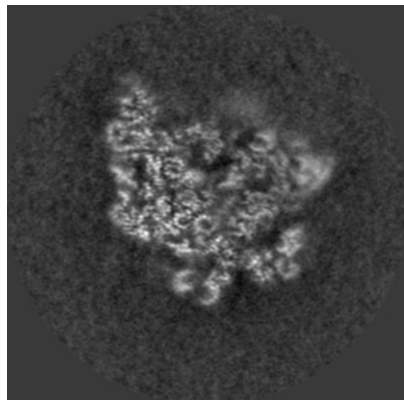


Z Index: 200

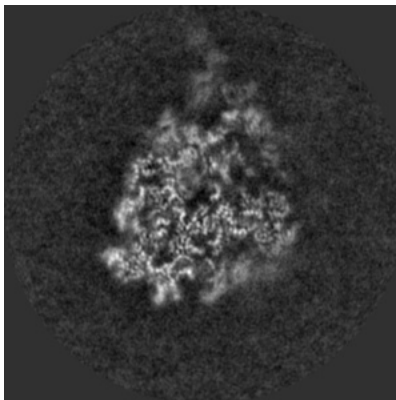
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

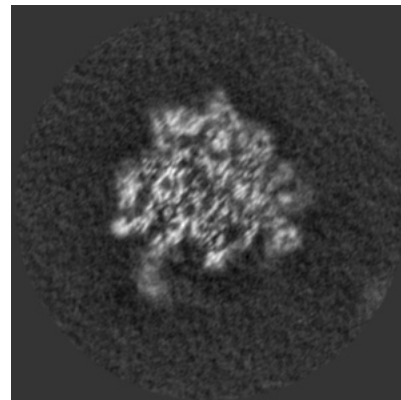
6.3.1 Primary map



X Index: 183

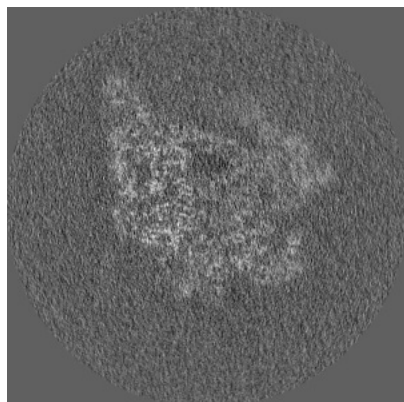


Y Index: 178

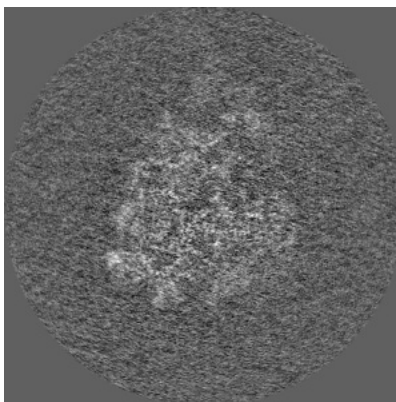


Z Index: 155

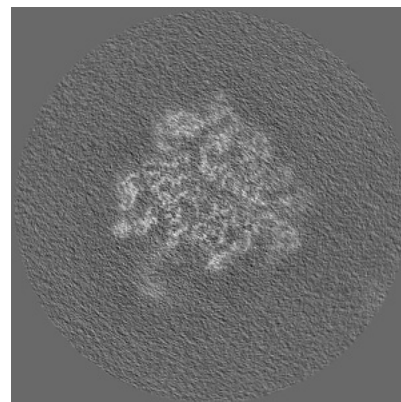
6.3.2 Raw map



X Index: 190



Y Index: 177

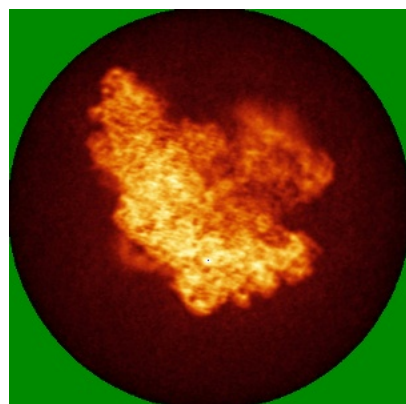


Z Index: 157

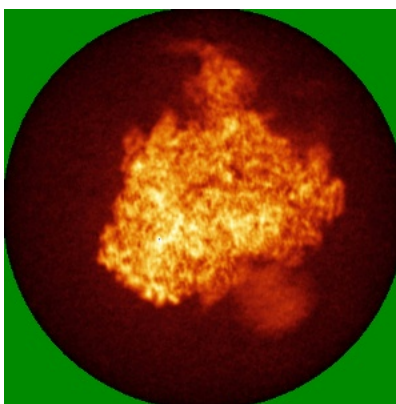
The images above show the largest variance slices of the map in three orthogonal directions.

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

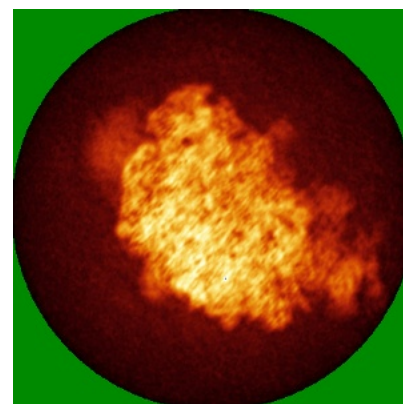
6.4.1 Primary map



X

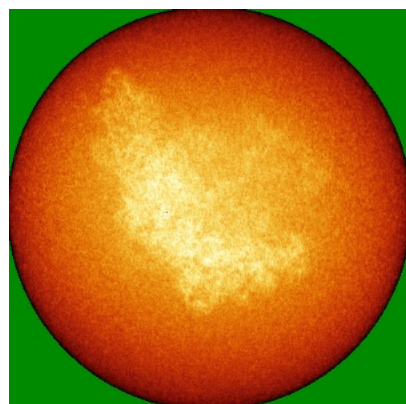


Y

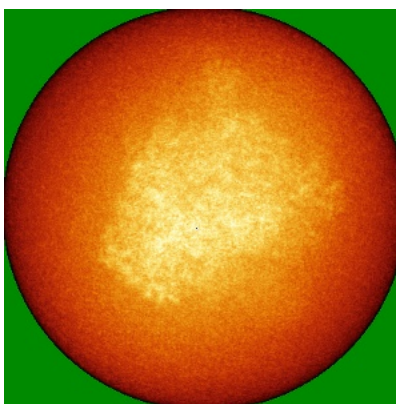


Z

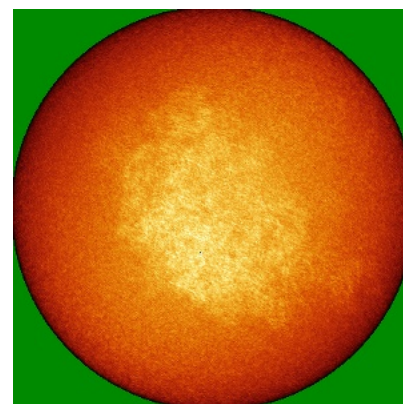
6.4.2 Raw map



X



Y

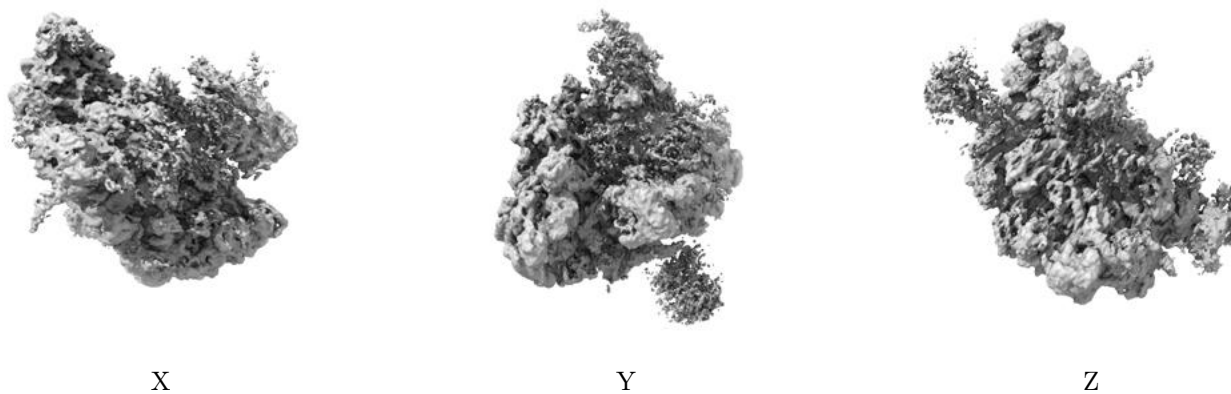


Z

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.

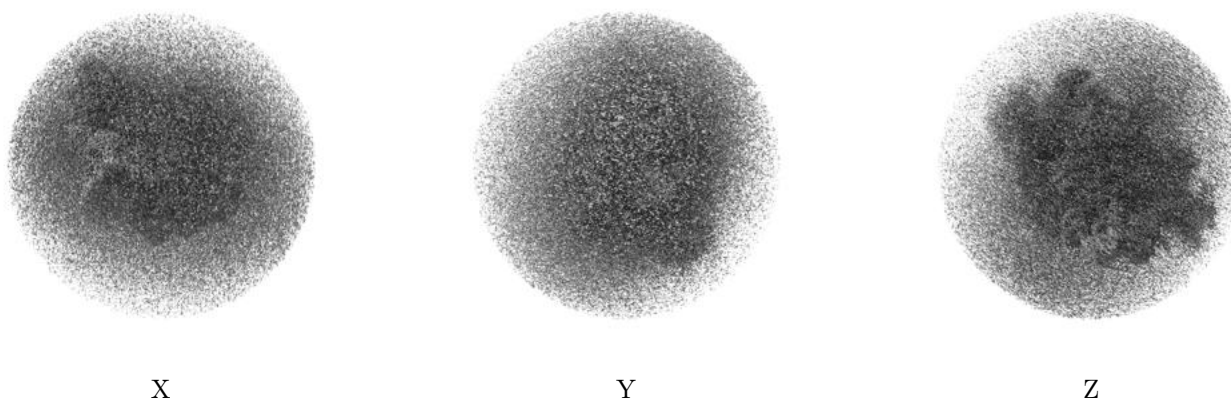
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.021. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

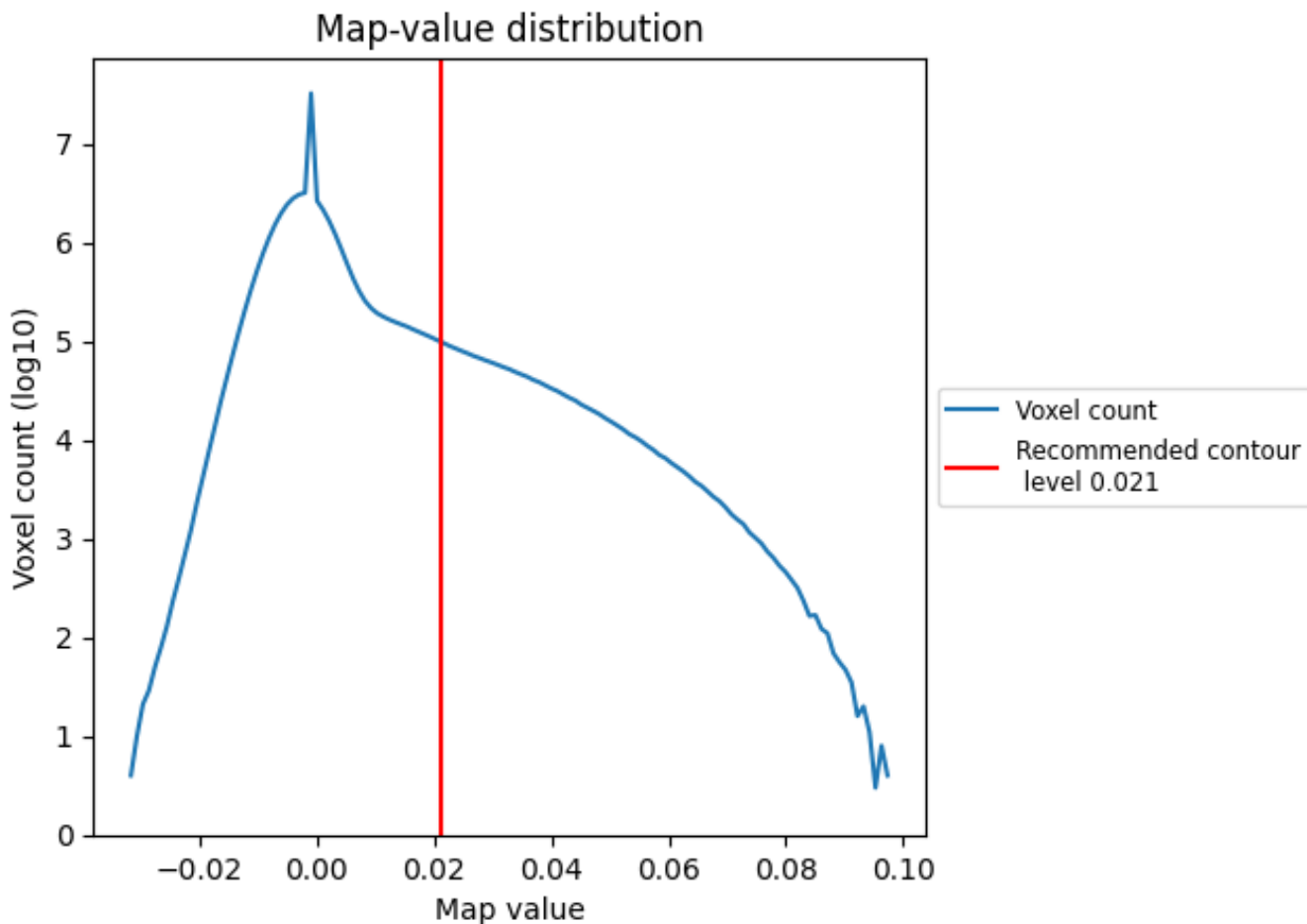
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

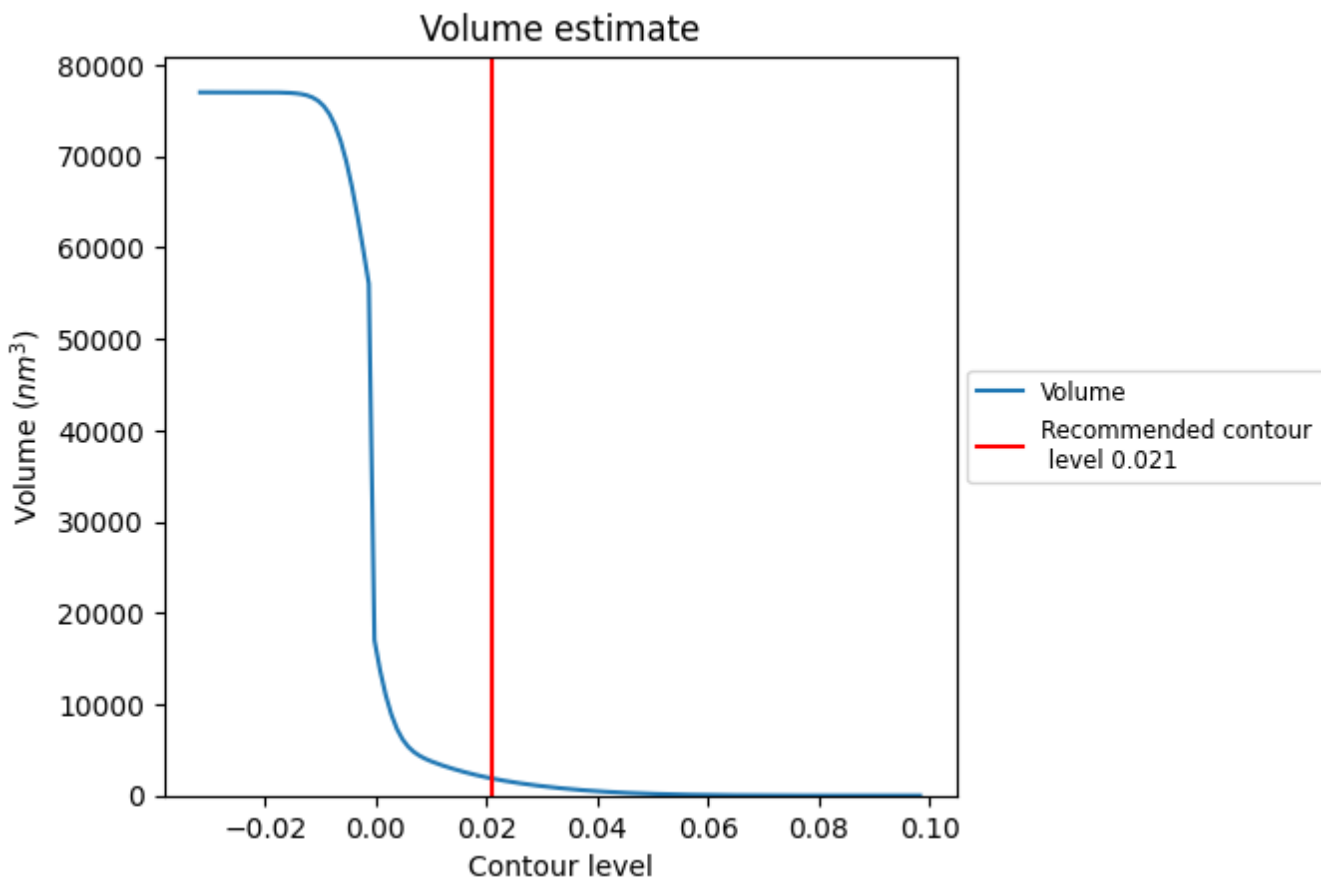
This section contains the results of statistical analysis of the map.

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.

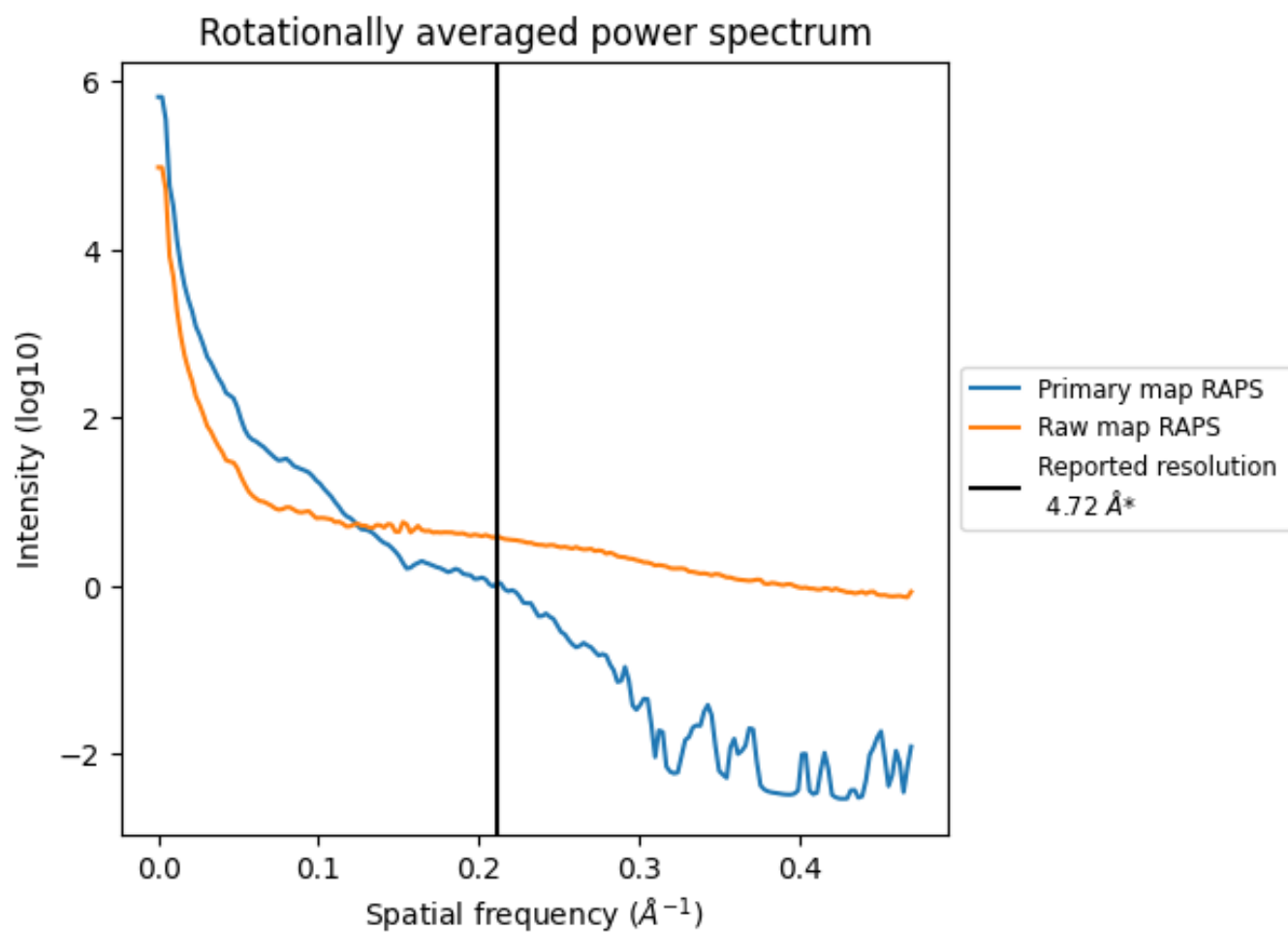
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1876 nm³; this corresponds to an approximate mass of 1695 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum i

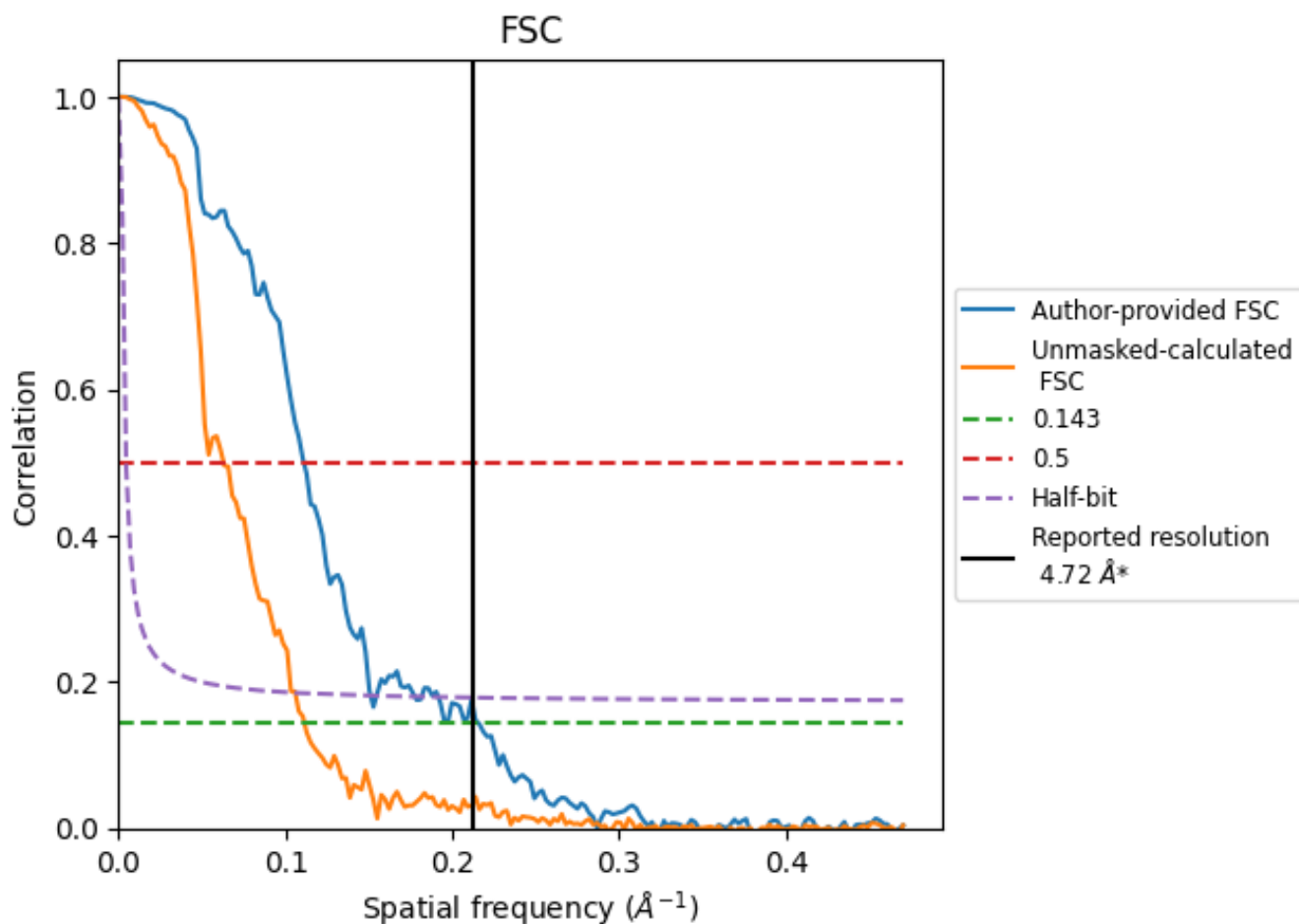


*Reported resolution corresponds to spatial frequency of 0.212 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.212 \AA^{-1}

8.2 Resolution estimates [i](#)

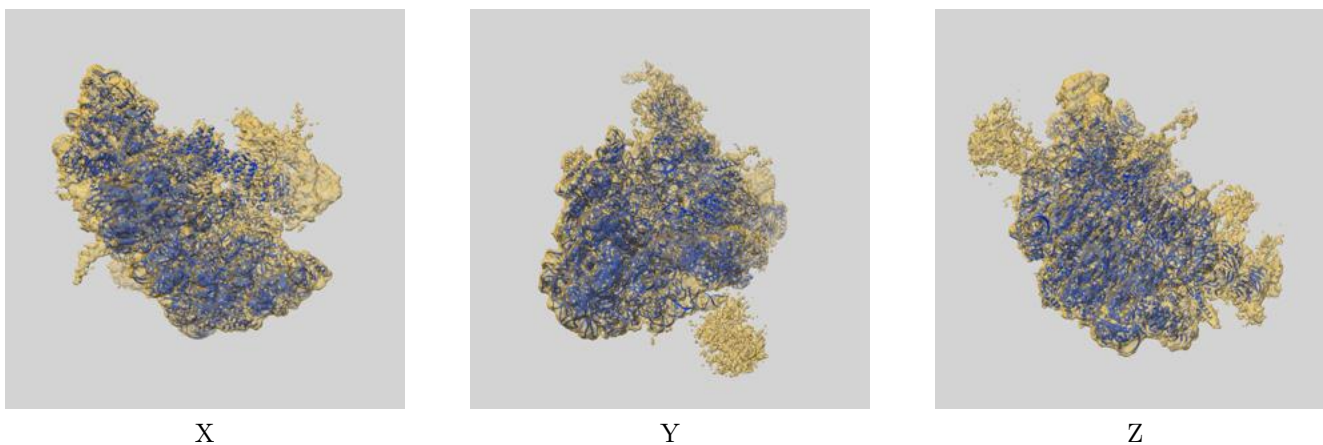
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.72	-	-
Author-provided FSC curve	4.64	9.00	6.61
Unmasked-calculated*	8.97	15.87	9.44

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 8.97 differs from the reported value 4.72 by more than 10 %

9 Map-model fit [i](#)

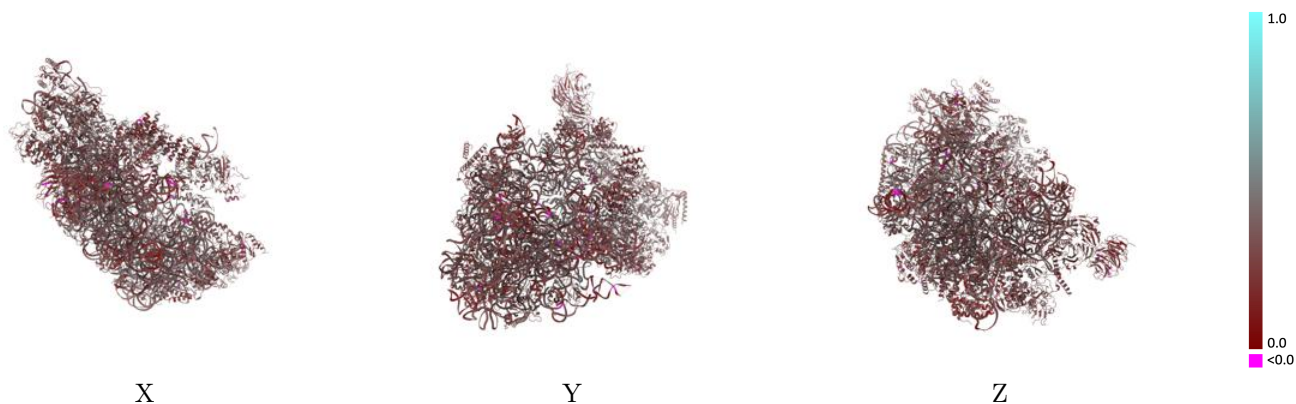
This section contains information regarding the fit between EMDB map EMD-12906 and PDB model 7OHR. Per-residue inclusion information can be found in section [3](#) on page [13](#).

9.1 Map-model overlay [i](#)



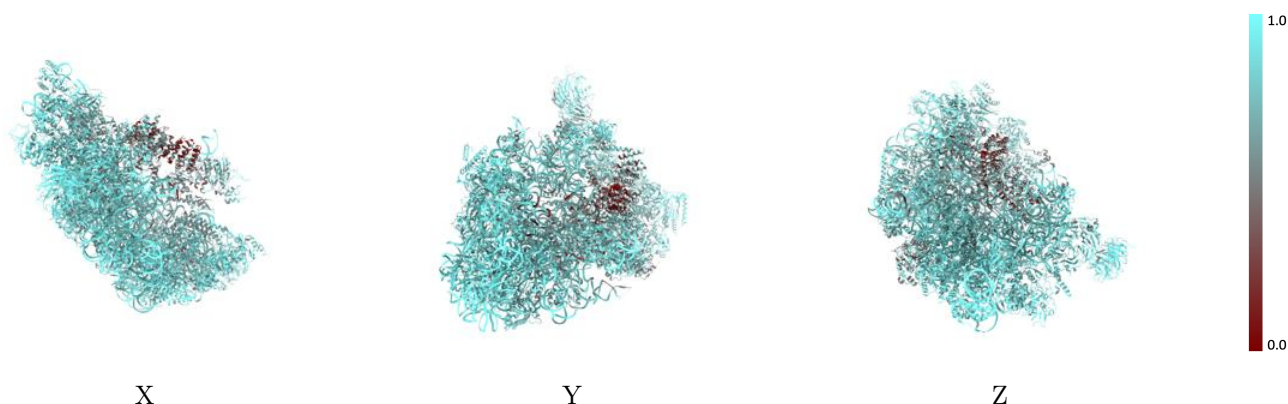
The images above show the 3D surface view of the map at the recommended contour level 0.021 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



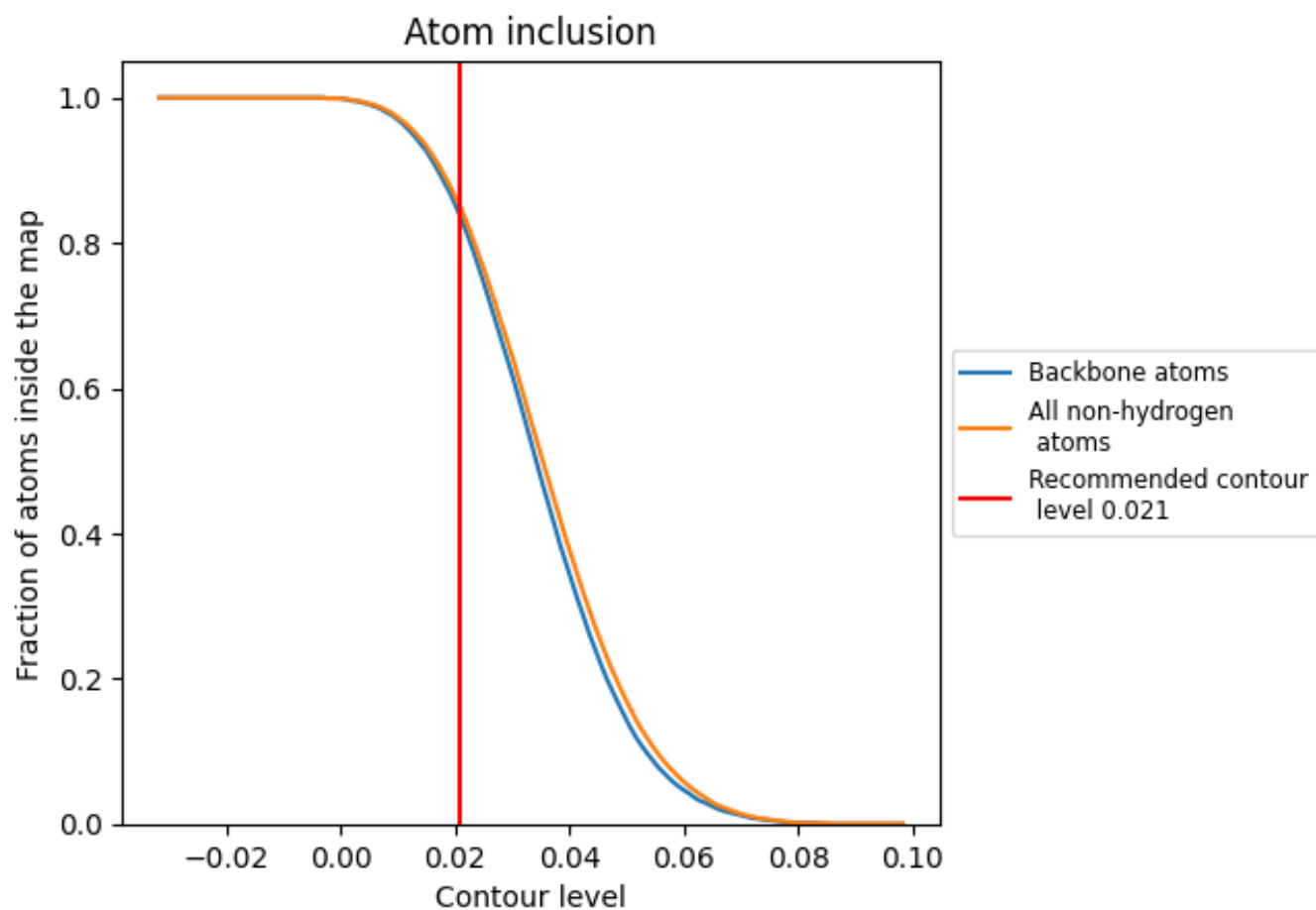
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.021).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 85% 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 (0.021) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8480	 0.3170
1	 0.9360	 0.3180
2	 0.9480	 0.3400
6	 0.9560	 0.3060
A	 0.7890	 0.3360
B	 0.8610	 0.3530
C	 0.8260	 0.3580
D	 0.6810	 0.2970
E	 0.8990	 0.3540
F	 0.8250	 0.3280
G	 0.7690	 0.3240
H	 0.8230	 0.3340
I	 0.3910	 0.2770
J	 0.7070	 0.2970
K	 0.8460	 0.2930
L	 0.7960	 0.3420
M	 0.8690	 0.3460
N	 0.7670	 0.3780
O	 0.8260	 0.3650
P	 0.7960	 0.3550
Q	 0.7990	 0.3460
R	 0.7430	 0.3200
S	 0.8190	 0.3260
U	 0.8480	 0.2680
V	 0.7710	 0.3330
W	 0.8810	 0.2720
X	 0.8120	 0.3570
Y	 0.8610	 0.3560
Z	 0.8530	 0.3000
b	 0.8010	 0.2710
c	 0.8180	 0.2790
d	 0.8120	 0.3470
e	 0.7790	 0.3730
f	 0.8470	 0.3800
g	 0.7430	 0.3140



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Chain	Atom inclusion	Q-score
h	 0.8190	 0.3520
i	 0.7750	 0.3550
j	 0.8010	 0.3740
k	 0.7250	 0.3070
l	 0.5750	 0.3030
m	 0.7940	 0.3030
n	 0.8480	 0.3270
o	 0.8710	 0.2930
p	 0.9240	 0.2240
q	 0.7000	 0.2640
r	 0.7150	 0.3110
s	 0.7290	 0.3340
t	 0.8410	 0.3010
u	 0.8870	 0.3110
v	 0.8100	 0.3250
w	 0.6230	 0.3050
y	 0.8600	 0.3110