



wwPDB EM Validation Summary Report ⓘ

Mar 6, 2026 – 02:10 AM UTC

PDB ID : 8HL5 / pdb_00008hl5
EMDB ID : EMD-34870
Title : Cryo-EM Structures and Translocation Mechanism of Crenarchaeota Ribosome
Authors : Wang, Y.H.; Zhou, J.
Deposited on : 2022-11-28
Resolution : 5.72 Å(reported)

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:

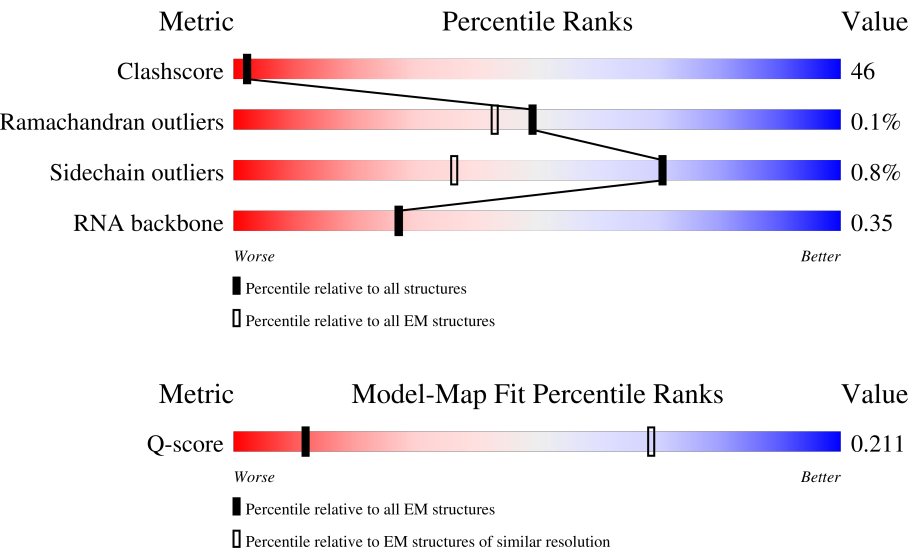
EMDB validation analysis : 0.0.1.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

1 Overall quality at a glance i

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

The reported resolution of this entry is 5.72 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	471 (5.23 - 6.22)

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	A23S	3022	68% 31%
2	A16S	1503	66% 33%
3	A5S	122	13% 68% 19%

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Mol	Chain	Length	Quality of chain	
4	AL2P	234	34%	99%
5	AL3P	339	18%	99%
6	AL4P	251	14%	100%
7	AL5P	168	43%	100%
8	AL6P	181	46%	99%
9	ALX0	76	42%	99%
10	L10E	164	30%	99%
11	L13P	140	16%	100%
12	L141	86	24%	100%
12	L142	86	43%	100%
13	L14P	134	55%	99%
14	L15E	169	16%	98%
15	L18E	112	8%	99%
16	L18P	193	28%	99%
17	L19E	144	7%	99%
18	L22P	150	18%	99%
19	L23P	81	38%	100%
20	L24E	54	24%	100%
21	L24P	122	12%	98%
22	L29P	63	33%	98%
23	L30E	94	16%	100%
24	L30P	155	27%	99%
25	L31E	75	13%	99%
26	L32E	123	28%	98%
27	L34E	77	36%	95%

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Mol	Chain	Length	Quality of chain
28	L37A	65	
29	L37E	54	
30	L39E	49	
31	L40E	55	
32	L44E	92	
33	L7A1	123	
33	L7A2	123	
33	SL7A	123	
34	L15P	144	
35	L21E	97	
36	L45A	101	
37	L46A	70	
38	L47A	80	
39	AL1P	216	
40	AS2P	196	
41	AS4E	240	
42	AS4P	166	
43	AS5P	204	
44	AS6E	105	
45	AS8E	126	
46	AS8P	130	
47	S11P	128	
48	S12P	143	
49	S15P	149	
50	S17P	111	

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Mol	Chain	Length	Quality of chain
51	S24E	96	
52	S27E	59	
53	S3AE	189	
54	AS3P	201	
55	AS7P	193	
56	S10P	100	
57	S13P	147	
58	S14P	52	
59	S17E	62	
60	S19E	150	
61	S19P	115	
62	AS9P	136	
63	S28E	63	
64	S27A	54	
65	AATN	76	
65	APTN	76	
66	AMRN	6	

2 Entry composition

There are 67 unique types of molecules in this entry. The entry contains 167486 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 23S rRNA (2991-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A23S	2991	Total	C	N	O	P	0	0
			64256	28627	11895	20743	2991		

- Molecule 2 is a RNA chain called 16S rRNA (1493-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A16S	1492	Total	C	N	O	P	0	0
			32040	14269	5925	10354	1492		

- Molecule 3 is a RNA chain called 5S rRNA (122-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
3	A5S	122	Total	C	N	O	P	0	0
			2609	1163	476	849	121		

- Molecule 4 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	AL2P	234	Total	C	N	O	S	0	0
			1754	1101	344	307	2		

- Molecule 5 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	AL3P	339	Total	C	N	O	S	0	0
			2695	1730	484	477	4		

- Molecule 6 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	AL4P	251	Total	C	N	O	S	0	0
			1926	1223	356	345	2		

- Molecule 7 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	AL5P	168	Total	C	N	O	S	0	0
			1343	854	253	232	4		

- Molecule 8 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	AL6P	181	Total	C	N	O	S	0	0
			1431	920	246	264	1		

- Molecule 9 is a protein called 50S ribosomal protein L18Ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	ALX0	76	Total	C	N	O	S	0	0
			629	403	110	115	1		

- Molecule 10 is a protein called 50S ribosomal protein L10e.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	L10E	164	Total	C	N	O	S	0	0
			1310	837	239	227	7		

- Molecule 11 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	L13P	140	Total	C	N	O	S	0	0
			1109	707	208	190	4		

- Molecule 12 is a protein called 50S ribosomal protein L14e.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L141	86	Total	C	N	O	S	0	0
			669	417	123	127	2		
12	L142	86	Total	C	N	O	S	0	0
			669	417	123	127	2		

- Molecule 13 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	L14P	134	Total	C	N	O	S	0	0
			1034	655	194	181	4		

- Molecule 14 is a protein called 50S ribosomal protein L15e.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	L15E	169	Total	C	N	O	S	0	0
			1423	899	283	236	5		

- Molecule 15 is a protein called 50S ribosomal protein L18e.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	L18E	112	Total	C	N	O	S	0	0
			895	576	163	153	3		

- Molecule 16 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	L18P	193	Total	C	N	O	S	0	0
			1539	990	274	274	1		

- Molecule 17 is a protein called 50S ribosomal protein L19e.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	L19E	144	Total	C	N	O	0	0
			1206	753	247	206		

- Molecule 18 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	L22P	150	Total	C	N	O	S	0	0
			1223	782	225	213	3		

- Molecule 19 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	L23P	81	Total	C	N	O	S	0	0
			650	419	109	121	1		

- Molecule 20 is a protein called 50S ribosomal protein L24e.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	L24E	54	Total	C	N	O	S	0	0
			441	282	80	73	6		

- Molecule 21 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	L24P	122	Total	C	N	O	S	0	0
			989	620	189	176	4		

- Molecule 22 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	L29P	63	Total	C	N	O	S	0	0
			513	319	95	96	3		

- Molecule 23 is a protein called 50S ribosomal protein L30e.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	L30E	94	Total	C	N	O	S	0	0
			729	474	116	136	3		

- Molecule 24 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	L30P	155	Total	C	N	O	S	0	0
			1254	804	222	223	5		

- Molecule 25 is a protein called 50S ribosomal protein L31e.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	L31E	75	Total	C	N	O	S	0	0
			625	398	126	97	4		

- Molecule 26 is a protein called 50S ribosomal protein L32e.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	L32E	123	Total	C	N	O	S	0	0
			1010	650	193	166	1		

- Molecule 27 is a protein called 50S ribosomal protein L34e.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	L34E	77	Total	C	N	O	S	0	0
			629	395	119	110	5		

- Molecule 28 is a protein called 50S ribosomal protein L37Ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	L37A	65	Total	C	N	O	S	0	0
			527	335	99	87	6		

- Molecule 29 is a protein called 50S ribosomal protein L37e.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	L37E	54	Total	C	N	O	S	0	0
			436	267	94	69	6		

- Molecule 30 is a protein called 50S ribosomal protein L39e.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	L39E	49	Total	C	N	O	S	0	0
			414	265	88	61			

- Molecule 31 is a protein called 50S ribosomal protein L40E.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	L40E	55	Total	C	N	O	S	0	0
			439	273	89	72	5		

- Molecule 32 is a protein called 50S ribosomal protein L44e.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	L44E	92	Total	C	N	O	S	0	0
			753	474	144	129	6		

- Molecule 33 is a protein called 50S ribosomal protein L7Ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	L7A1	123	Total	C	N	O	S	0	0
			935	593	155	184	3		
33	L7A2	123	Total	C	N	O	S	0	0
			935	593	155	184	3		
33	SL7A	123	Total	C	N	O	S	0	0
			935	593	155	184	3		

- Molecule 34 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	L15P	94	Total	C	N	O	S	0	0
			752	487	131	133	1		

- Molecule 35 is a protein called 50S ribosomal protein L21e.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	L21E	97	Total	C	N	O	S	0	0
			785	502	152	129	2		

- Molecule 36 is a protein called DUF2280 domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	L45A	101	Total	C	N	O	S	0	0
			816	515	141	156	4		

- Molecule 37 is a protein called Conserved protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	L46A	70	Total	C	N	O	S	0	0
			586	382	101	102	1		

- Molecule 38 is a protein called 50S ribosomal protein L47A.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	L47A	80	Total	C	N	O	S	0	0
			648	405	113	128	2		

- Molecule 39 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	AL1P	216	Total	C	N	O	S	0	0
			1715	1096	303	312	4		

- Molecule 40 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	AS2P	196	Total	C	N	O	S	0	0
			1587	1022	277	286	2		

- Molecule 41 is a protein called 30S ribosomal protein S4e.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	AS4E	240	Total	C	N	O	S	0	0
			1925	1238	335	348	4		

- Molecule 42 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	AS4P	166	Total	C	N	O	S	0	0
			1370	874	252	241	3		

- Molecule 43 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	AS5P	204	Total	C	N	O	S	0	0
			1600	1028	277	287	8		

- Molecule 44 is a protein called 30S ribosomal protein S6e.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	AS6E	105	Total	C	N	O	S	0	0
			805	506	149	147	3		

- Molecule 45 is a protein called 30S ribosomal protein S8e.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	AS8E	126	Total	C	N	O		0	0
			993	619	187	187			

- Molecule 46 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	AS8P	130	Total	C	N	O	S	0	0
			1028	661	181	182	4		

- Molecule 47 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	S11P	128	Total	C	N	O	S	0	0
			960	595	190	173	2		

- Molecule 48 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	S12P	143	Total	C	N	O	S	0	0
			1103	701	209	189	4		

- Molecule 49 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	S15P	149	Total	C	N	O	S	0	0
			1225	778	228	214	5		

- Molecule 50 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	S17P	111	Total	C	N	O	S	0	0
			885	557	165	160	3		

- Molecule 51 is a protein called 30S ribosomal protein S24e.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	S24E	96	Total	C	N	O	S	0	0
			759	479	133	147			

- Molecule 52 is a protein called 30S ribosomal protein S27e.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	S27E	59	Total	C	N	O	S	0	0
			458	294	83	76	5		

- Molecule 53 is a protein called 30S ribosomal protein S3Ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	S3AE	189	Total	C	N	O	S	0	0
			1545	1004	264	276	1		

- Molecule 54 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	AS3P	201	Total	C	N	O	S	0	0
			1576	1020	274	278	4		

- Molecule 55 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	AS7P	193	Total	C	N	O	S	0	0
			1537	969	285	279	4		

- Molecule 56 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	S10P	100	Total	C	N	O	S	0	0
			824	522	154	142	6		

- Molecule 57 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	S13P	147	Total	C	N	O	S	0	0
			1204	753	230	217	4		

- Molecule 58 is a protein called 30S ribosomal protein S14 type Z.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	S14P	52	Total	C	N	O	S	0	0
			432	273	85	69	5		

- Molecule 59 is a protein called 30S ribosomal protein S17e.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	S17E	62	Total	C	N	O	S	0	0
			517	326	92	99			

- Molecule 60 is a protein called 30S ribosomal protein S19e.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	S19E	150	Total	C	N	O	S	0	0
			1239	801	223	213	2		

- Molecule 61 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	S19P	115	Total	C	N	O	S	0	0
			968	620	181	162	5		

- Molecule 62 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
62	AS9P	136	Total	C	N	O	S	0	0
			1096	692	200	197	7		

- Molecule 63 is a protein called 30S ribosomal protein S28e.

Mol	Chain	Residues	Atoms				AltConf	Trace
63	S28E	63	Total	C	N	O	0	0
			498	308	99	91		

- Molecule 64 is a protein called 30S ribosomal protein S27ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
64	S27A	54	Total	C	N	O	S	0	0
			435	274	79	76	6		

- Molecule 65 is a RNA chain called tRNA (76-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
65	AATN	76	Total	C	N	O	P	0	0
			1619	723	290	531	75		
65	APTN	76	Total	C	N	O	P	0	0
			1619	723	290	531	75		

- Molecule 66 is a RNA chain called mRNA (5'-R(*UP*UP*UP*UP*UP*U)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
66	AMRN	6	Total	C	N	O	P	0	0
			117	54	12	46	5		

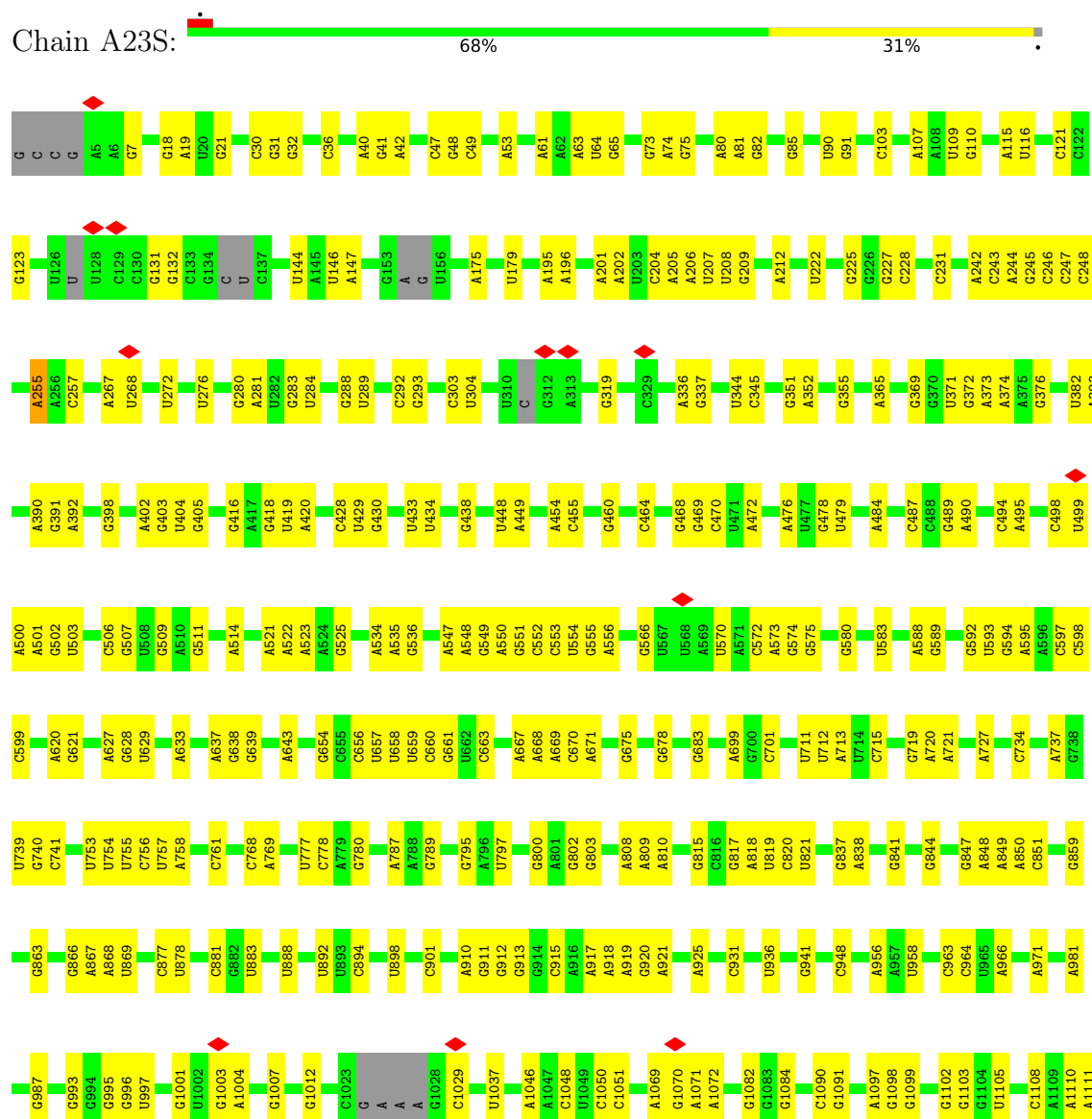
- Molecule 67 is UNKNOWN LIGAND (CCD ID: UNL) (formula:) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms				AltConf
67	A16S	1	Total	C	N	O	0
			5	3	1	1	
67	AS2P	28	Total	C	N	O	0
			141	84	28	29	
67	AS5P	20	Total	C	N	O	0
			100	60	20	20	
67	AS8P	8	Total	C	N	O	0
			40	24	8	8	

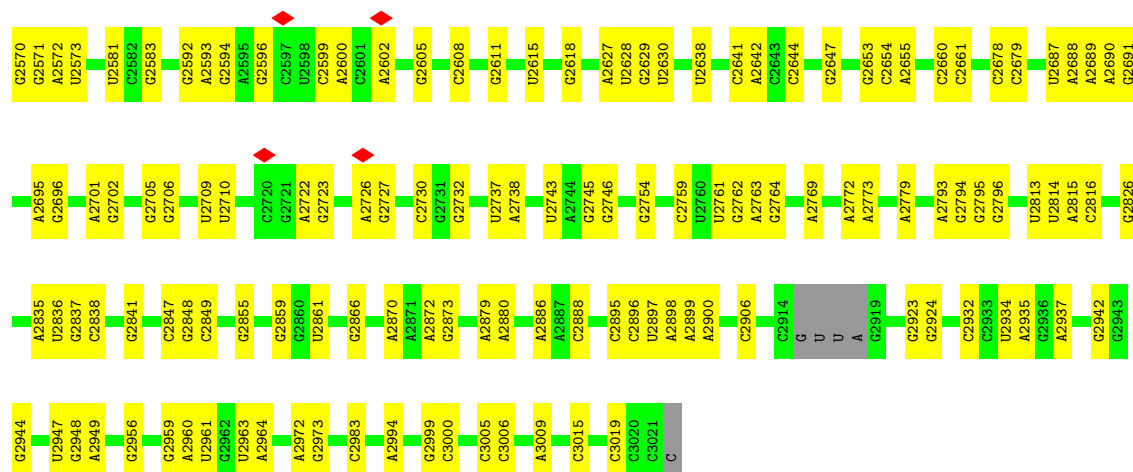
3 Residue-property plots

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.

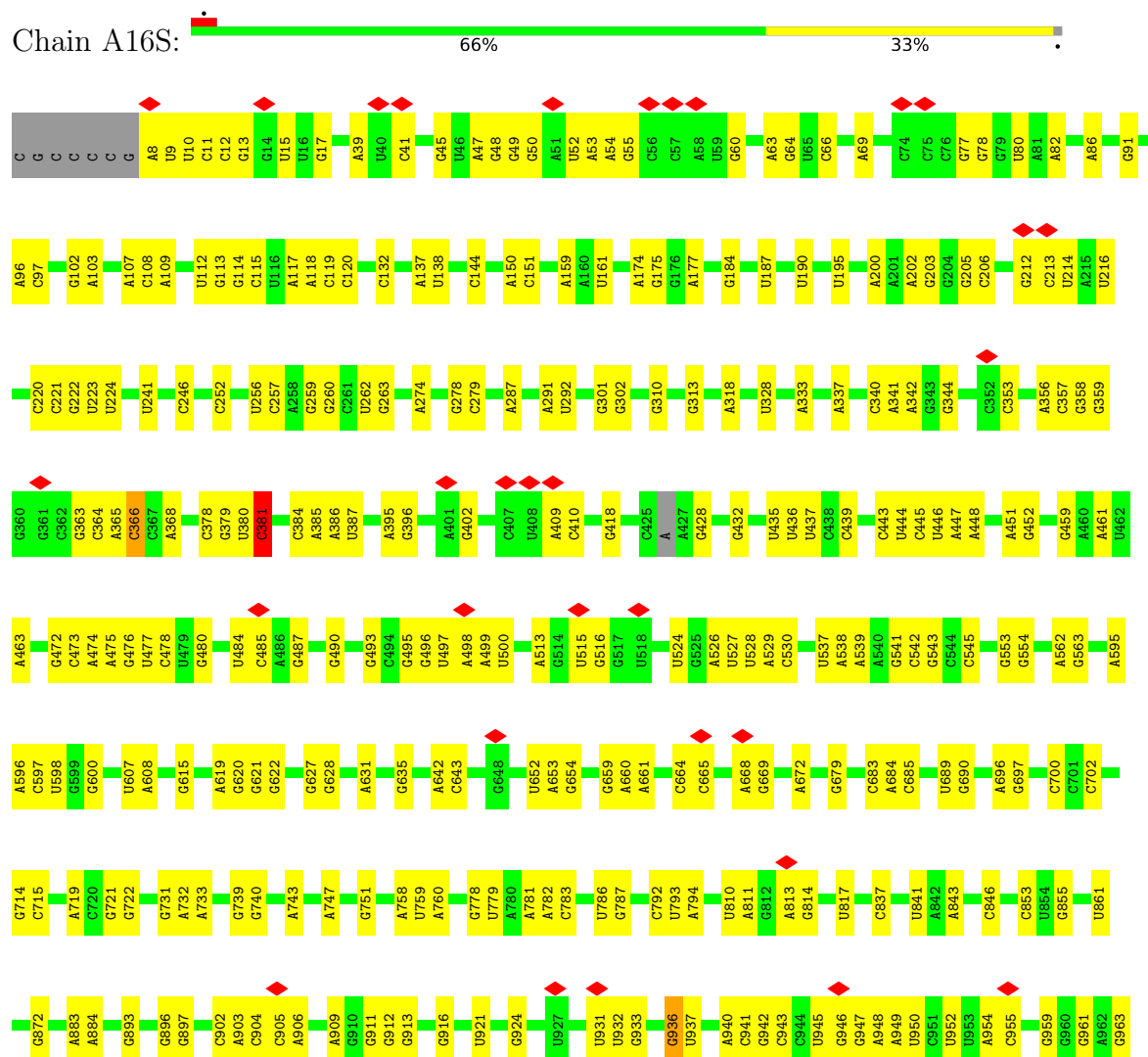
- Molecule 1: 23S rRNA (2991-MER)

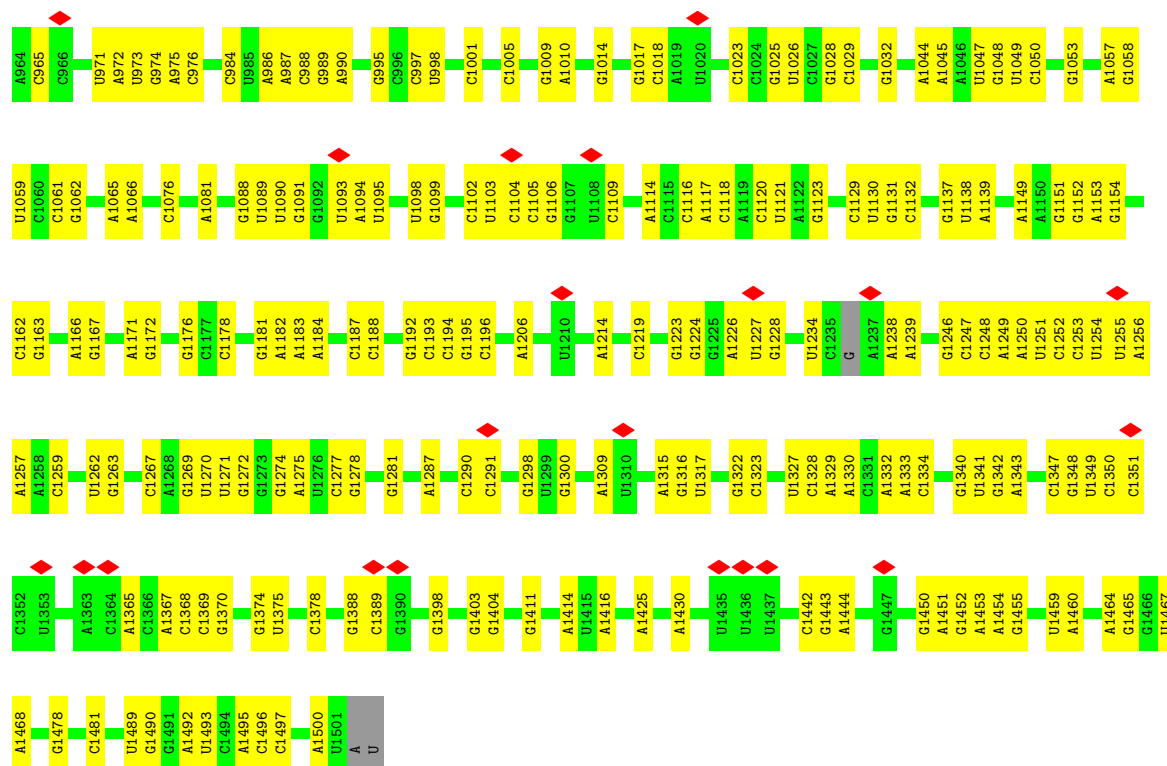


A2442	G2301	U2238	A2107	C2008	U1828	G1728	G1645	C1540	U1426	G1297	A1210	G1114
G2443	A2302	G2239	C2108	C2012	C1829	G1729	G1646	A1541	A1430	C1300	G1211	G1115
A2444	G2303	C2240	G2121	G2013	U1850	C1740	G1647	U1542	A1431	C1312	A1213	G1116
G2447	C2304	G2241	U2122	G2017	G1851	G1741	G1648	C1551	U1432	U1315	G1214	A1117
A2449	A2305	U2242	C2125	A2018	G1852	A1742	C1649	C1555	A1445	A1316	G1215	A1118
G2455	G2306	A2243	C2135	G2028	G1853	U1743	G1656	G1558	A1451	U1317	C1216	C1119
A2456	A2245	G2244	G2145	A2029	G1856	C1745	G1657	G1561	A1452	A1318	A1217	A1120
A2457	G2246	A2246	U2149	A2030	A1857	U1744	G1659	G1564	U1457	A	C1220	C1122
G2458	U2247	A2248	C2147	G2031	A1858	A1750	G1660	C1565	U1458	G1320	G1221	G1126
C2459	G2249	G2249	G2148	G2032	A1868	G1751	G1661	G1566	U1459	A1321	C1222	C1127
G2460	U2250	G2250	U2149	C2033	U1877	A1752	G1664	C1565	G1463	G1322	U1223	C1128
C2461	G2251	G2251	G2150	G2034	C1885	U1757	G1665	A1570	C1467	U1324	A1224	G1131
A2462	A2151	A2151	A2151	G2035	C1885	A1761	G1666	C1571	U1477	U1327	A1225	C1141
G2463	G2155	G2155	G2155	U2040	C1885	G1762	G1667	A1574	U1469	G1348	G1226	A1145
A2464	A2160	A2160	A2160	A	G1894	G1763	G1668	A1575	U1470	C1328	G1227	A1146
C2465	C2161	C2161	C2161	A	U1895	A1764	G1669	A1579	G1476	A1347	U1230	G1147
U2466	A2162	A2162	A2162	C	C1896	C1765	G1670	C1587	C1477	U1348	G1231	U1148
C2467	G2165	G2165	G2165	U	A1899	A1770	G1673	G1586	C1478	G1349	G1232	C1149
G2468	C2165	C2165	C2165	G	G1900	C1771	G1676	U1586	G1488	G1350	G1233	G1153
A2469	C2169	C2169	C2169	A2048	A1903	G1776	U1680	A1588	G1481	G1351	U1234	G1158
G2470	G2263	G2263	G2263	C2049	G1907	C1777	G1681	C1589	A1482	G1352	A1235	C1161
U2491	A2264	A2264	A2264	U2054	A1908	G1778	G1682	G1598	G1483	U1353	A1236	A1163
A2492	C2181	C2181	C2181	U2055	U1917	C1779	C1684	G1603	U1485	G1355	U1241	A1164
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G2494	G2188	G2188	G2188	A2057	G1920	G1786	U1691	A1609	C	G1363	C1249	A1167
C2495	A2189	A2189	A2189	G2058	G1920	U1789	G1693	G1610	G	U1369	A1251	A1168
G2500	C2190	C2190	C2190	U2060	U1926	A1790	G1694	C1614	U1492	U1379	G1257	U1175
C2501	A2191	A2191	A2191	A2065	U1934	A1795	G1697	A1615	U1500	A1380	A1266	C1178
G2502	G2198	G2198	G2198	A2066	A1935	A1796	U1700	C1616	A1501	C1381	A1269	G1187
C2503	C2199	C2199	C2199	A2067	C1944	U1796	U1701	G1617	G1502	A1395	U1270	A1188
G2504	C2205	C2205	C2205	U2068	U1945	U1801	C1704	G1618	G1503	G1396	U1271	A1196
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	A2292	A2292	A2292									
	A2293	A2293	A2293									
	A2294	A2294	A2294									
	G2297	G2297	G2297									
	A2298	A2298	A2298									
	A2299	A2299	A2299									
	A2300	A2300	A2300									



• Molecule 2: 16S rRNA (1493-MER)

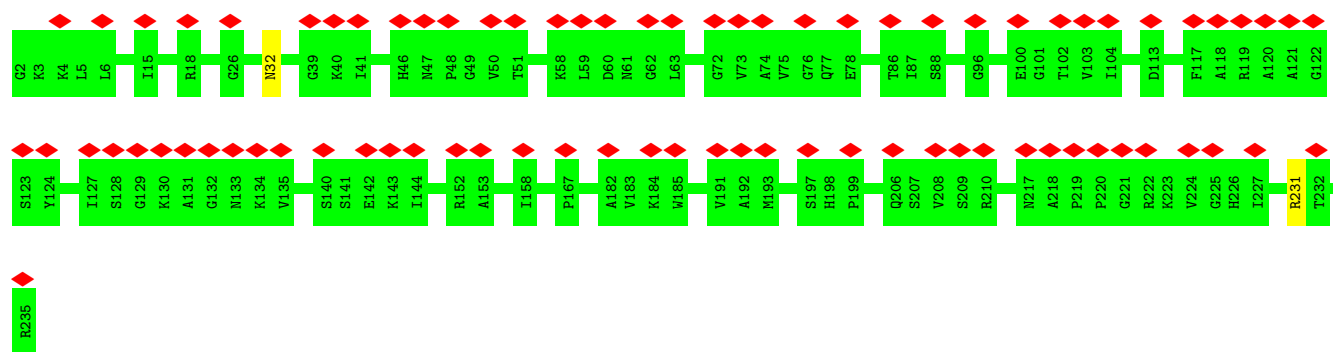




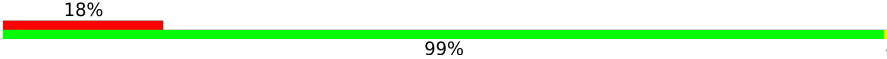
• Molecule 3: 5S rRNA (122-MER)

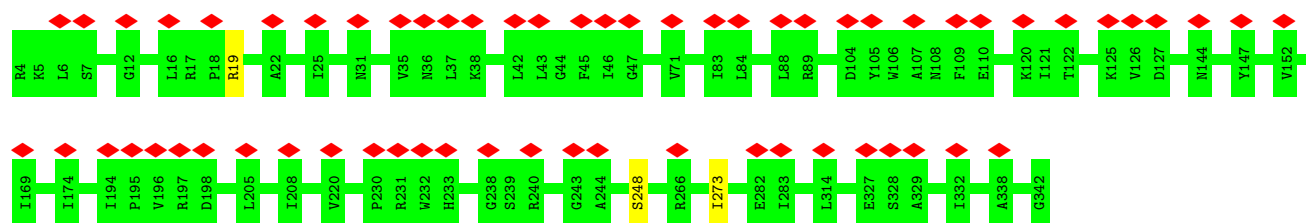


• Molecule 4: 50S ribosomal protein L2



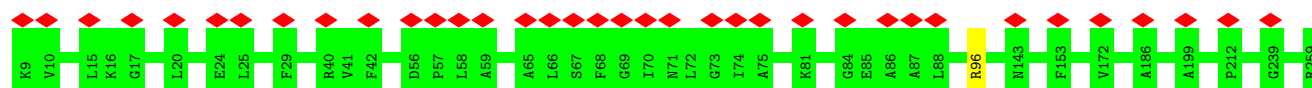
• Molecule 5: 50S ribosomal protein L3

Chain AL3P: 

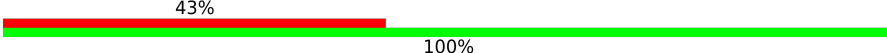


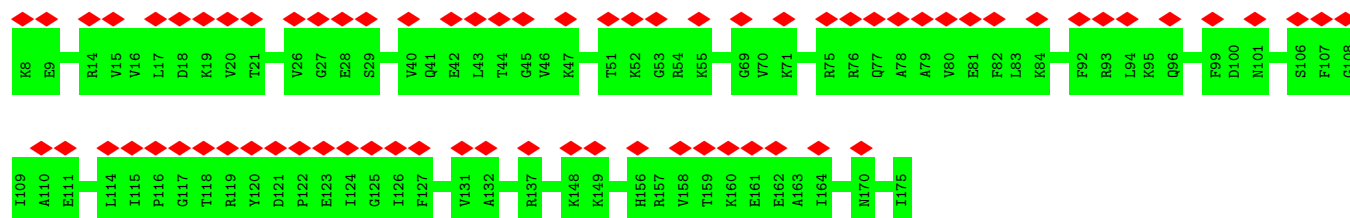
- Molecule 6: 50S ribosomal protein L4

Chain AL4P: 

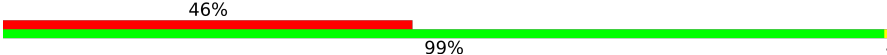


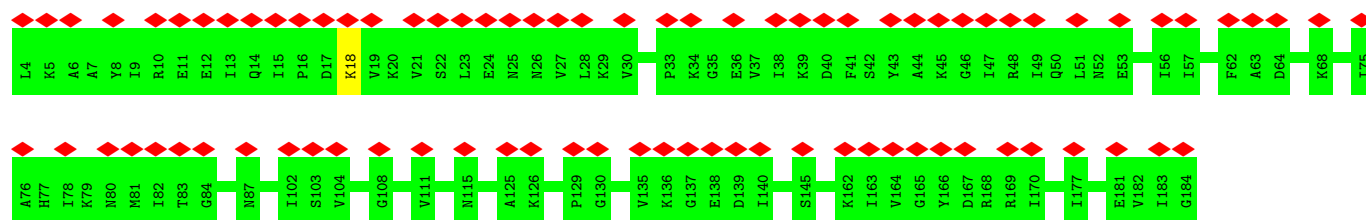
- Molecule 7: 50S ribosomal protein L5

Chain AL5P: 

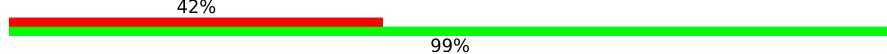


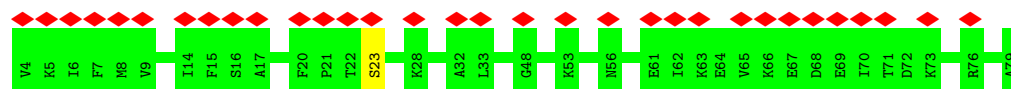
- Molecule 8: 50S ribosomal protein L6

Chain AL6P: 



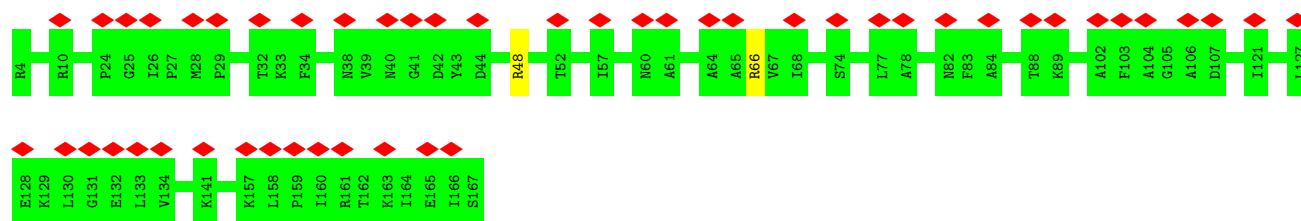
- Molecule 9: 50S ribosomal protein L18Ae

Chain ALX0: 

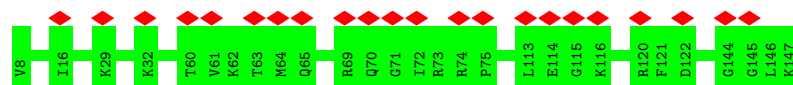


- Molecule 10: 50S ribosomal protein L10e

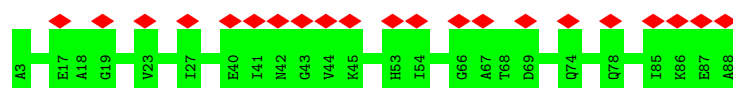
Chain L10E: 



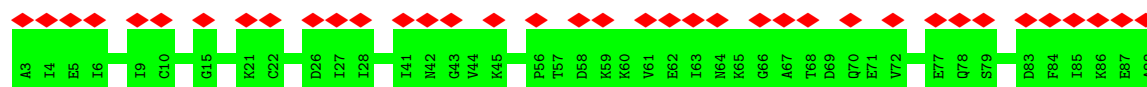
- Molecule 11: 50S ribosomal protein L13



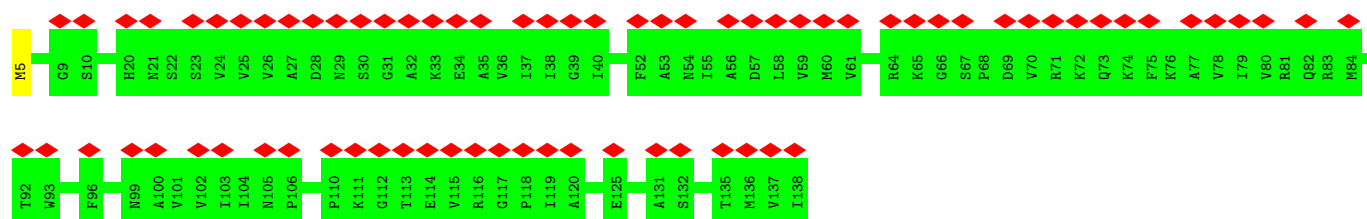
- Molecule 12: 50S ribosomal protein L14e



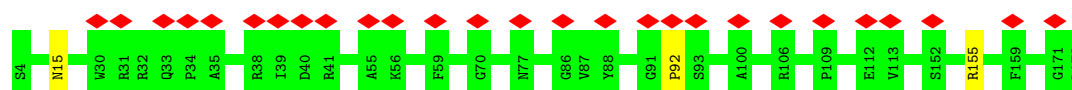
- Molecule 12: 50S ribosomal protein L14e



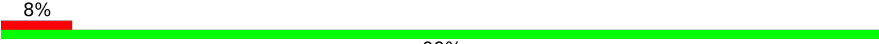
- Molecule 13: 50S ribosomal protein L14

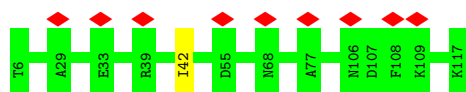


- Molecule 14: 50S ribosomal protein L15e



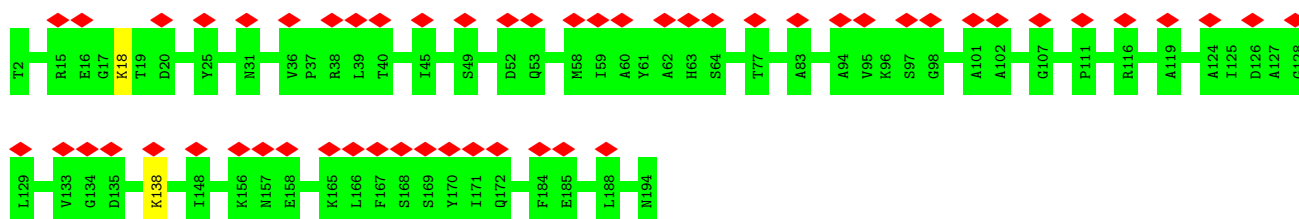
- Molecule 15: 50S ribosomal protein L18e

Chain L18E:  8% 99%



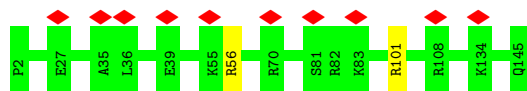
- Molecule 16: 50S ribosomal protein L18

Chain L18P:  28% 99%



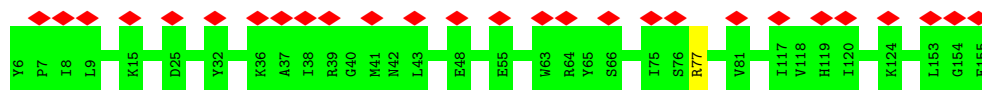
- Molecule 17: 50S ribosomal protein L19e

Chain L19E:  7% 99%



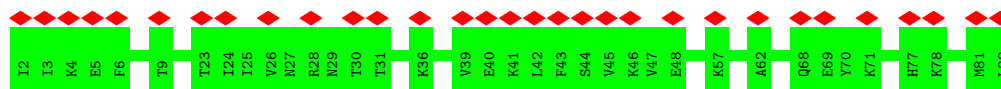
- Molecule 18: 50S ribosomal protein L22

Chain L22P:  18% 99%



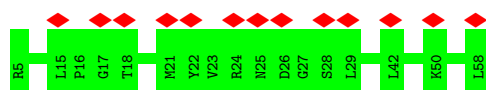
- Molecule 19: 50S ribosomal protein L23

Chain L23P:  38% 100%



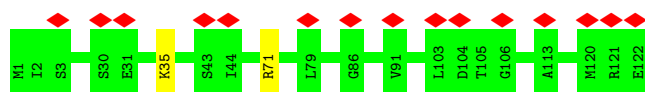
- Molecule 20: 50S ribosomal protein L24e

Chain L24E:  24% 100%

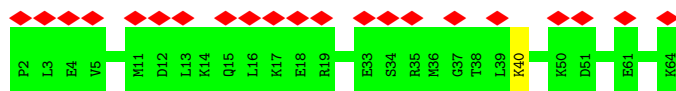


- Molecule 21: 50S ribosomal protein L24

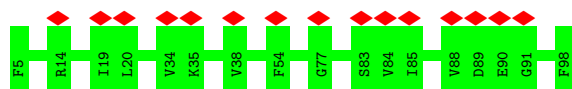
Chain L24P:  12% 98%



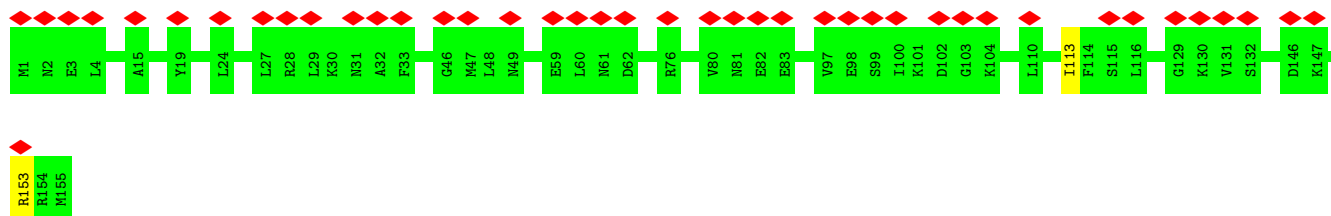
- Molecule 22: 50S ribosomal protein L29



- Molecule 23: 50S ribosomal protein L30e



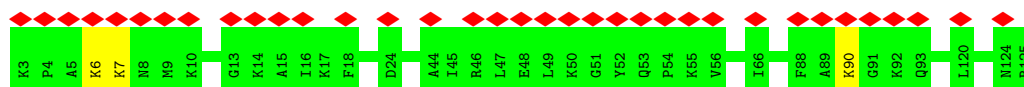
- Molecule 24: 50S ribosomal protein L30



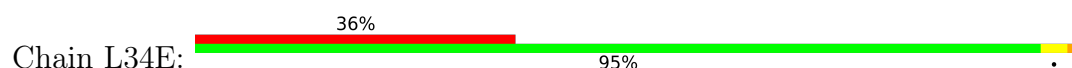
- Molecule 25: 50S ribosomal protein L31e

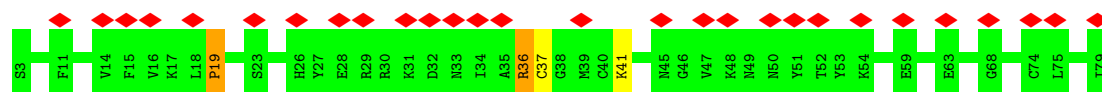


- Molecule 26: 50S ribosomal protein L32e

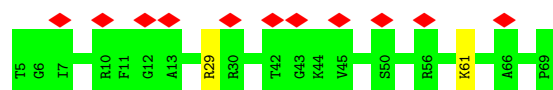


- Molecule 27: 50S ribosomal protein L34e

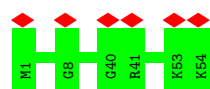




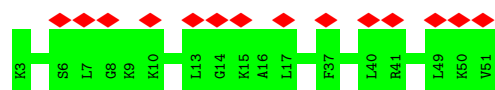
- Molecule 28: 50S ribosomal protein L37Ae



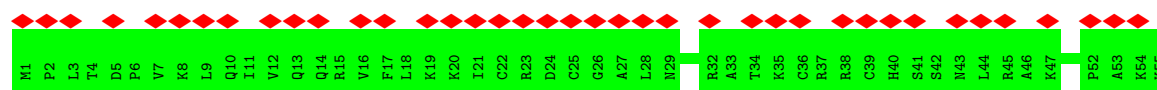
- Molecule 29: 50S ribosomal protein L37e



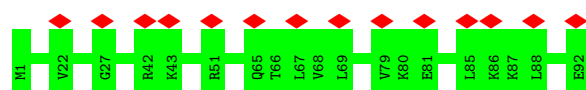
- Molecule 30: 50S ribosomal protein L39e



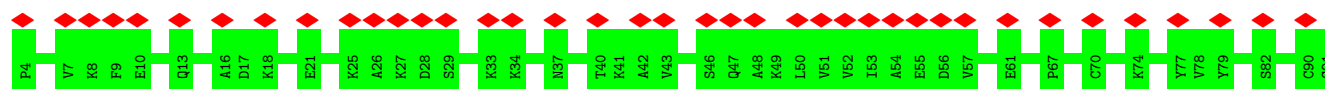
- Molecule 31: 50S ribosomal protein L40E

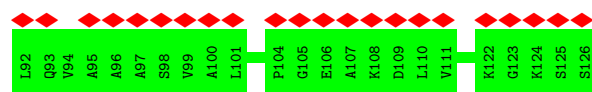


- Molecule 32: 50S ribosomal protein L44e

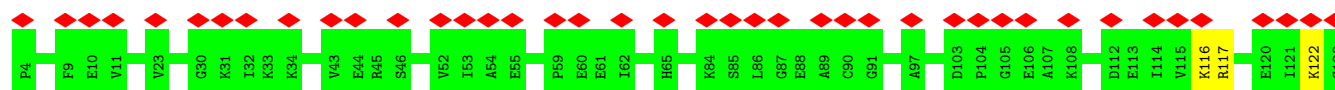


- Molecule 33: 50S ribosomal protein L7Ae

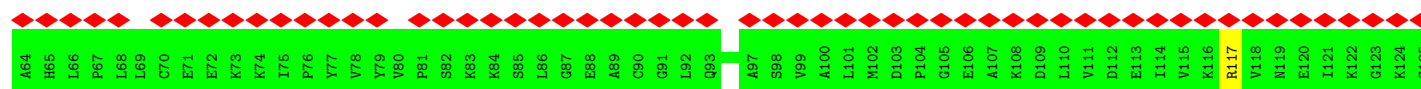
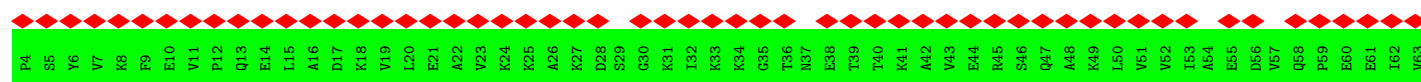




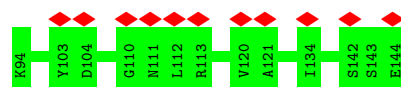
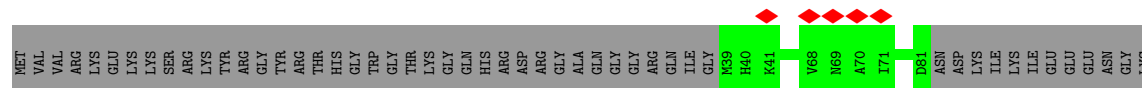
- Molecule 33: 50S ribosomal protein L7Ae



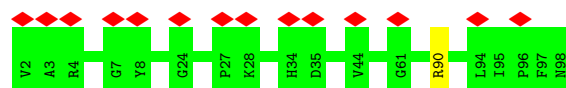
- Molecule 33: 50S ribosomal protein L7Ae



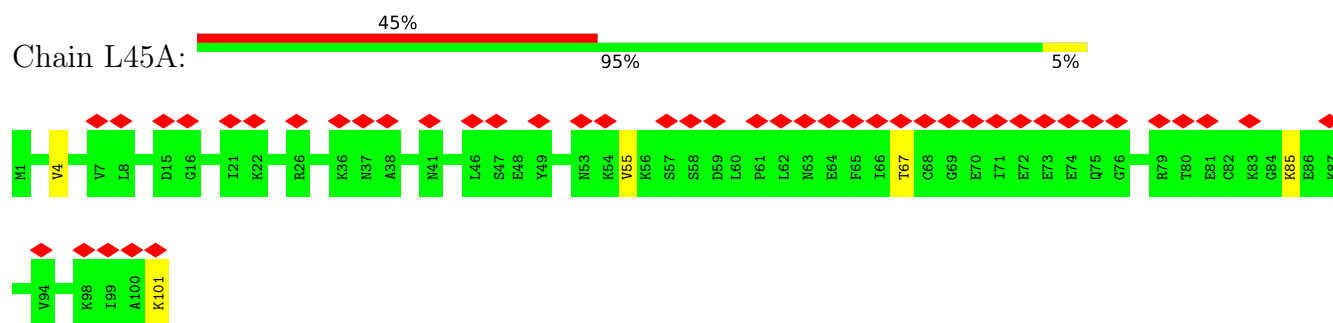
- Molecule 34: 50S ribosomal protein L15



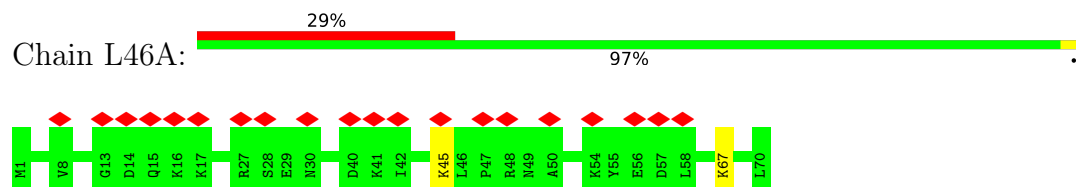
- Molecule 35: 50S ribosomal protein L21e



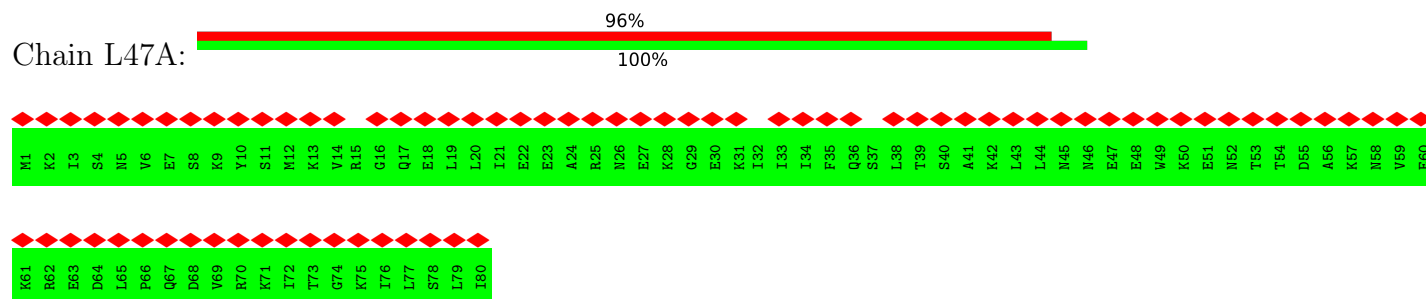
- Molecule 36: DUF2280 domain-containing protein



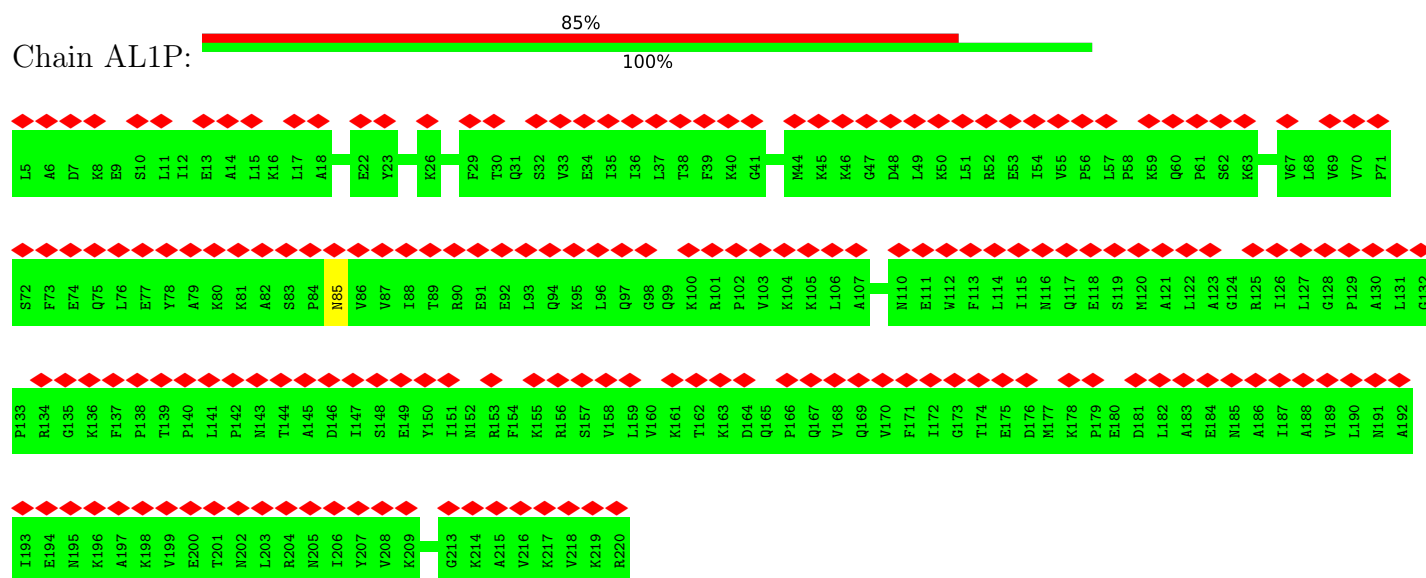
- Molecule 37: Conserved protein



- Molecule 38: 50S ribosomal protein L47A

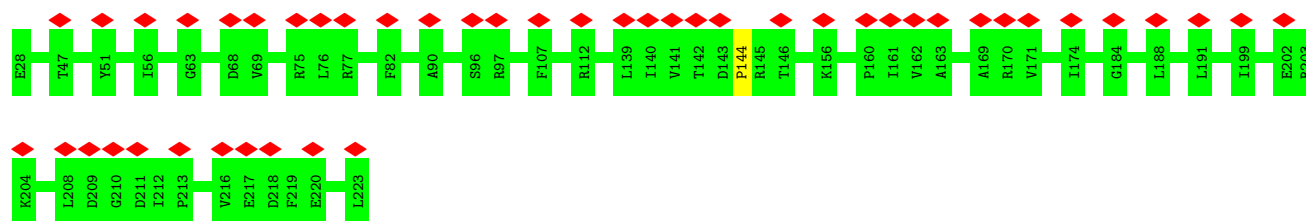


- Molecule 39: 50S ribosomal protein L1

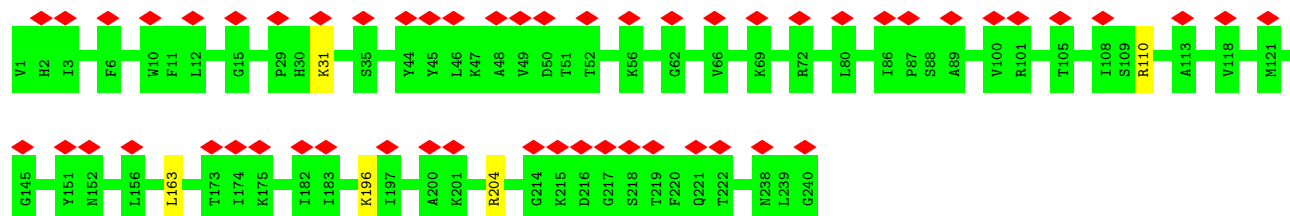


- Molecule 40: 30S ribosomal protein S2

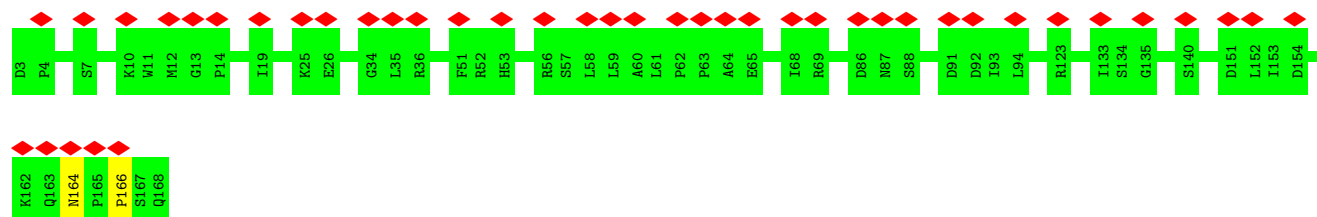




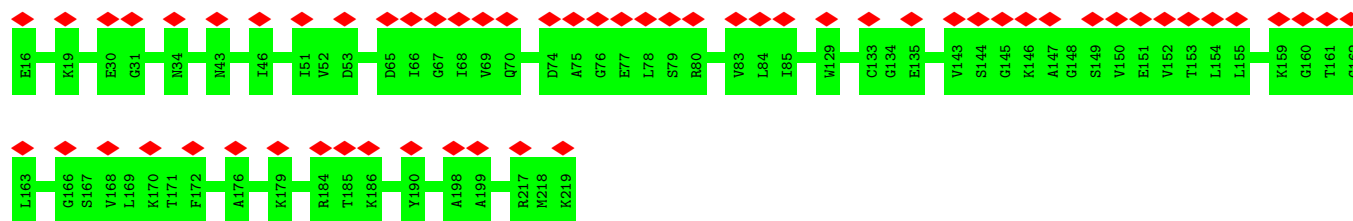
- Molecule 41: 30S ribosomal protein S4e



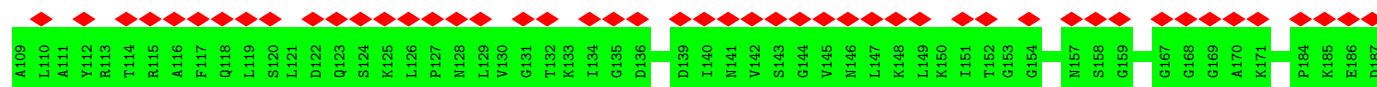
- Molecule 42: 30S ribosomal protein S4

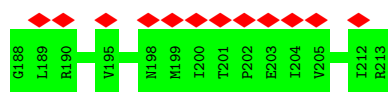


- Molecule 43: 30S ribosomal protein S5

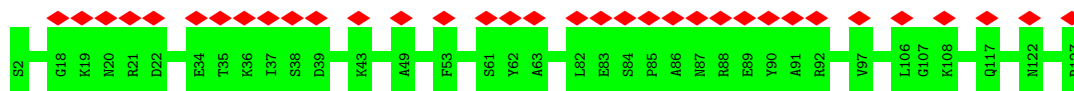


- Molecule 44: 30S ribosomal protein S6e

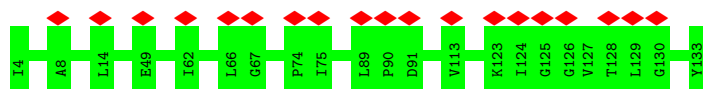




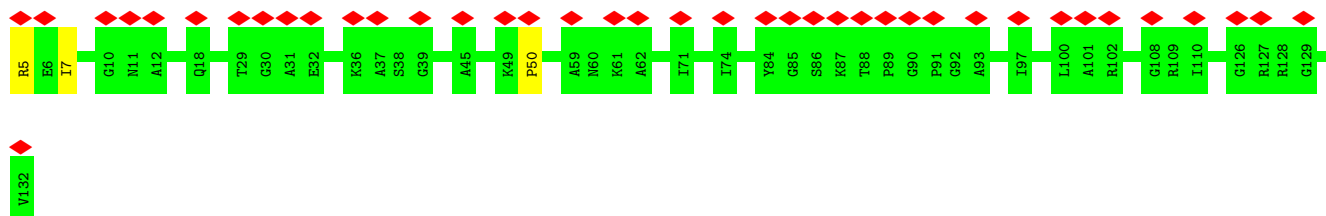
- Molecule 45: 30S ribosomal protein S8e



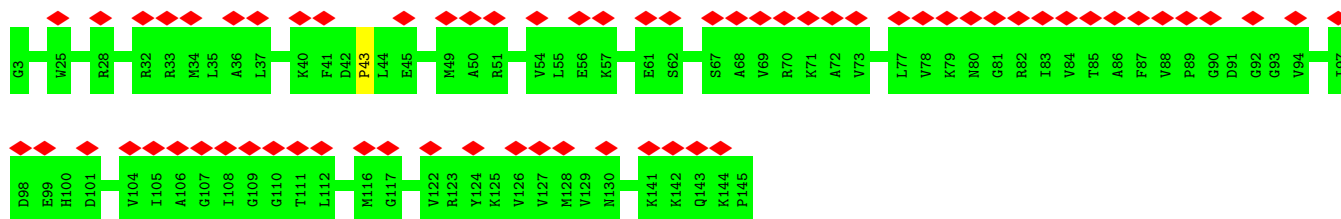
- Molecule 46: 30S ribosomal protein S8



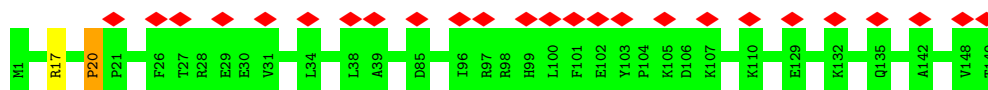
- Molecule 47: 30S ribosomal protein S11



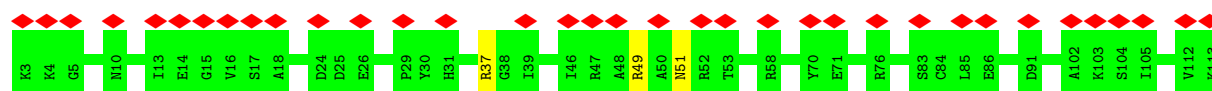
- Molecule 48: 30S ribosomal protein S12



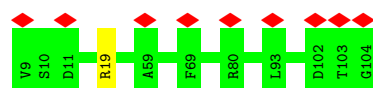
- Molecule 49: 30S ribosomal protein S15



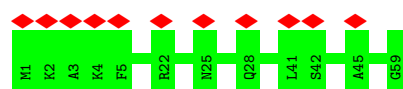
- Molecule 50: 30S ribosomal protein S17



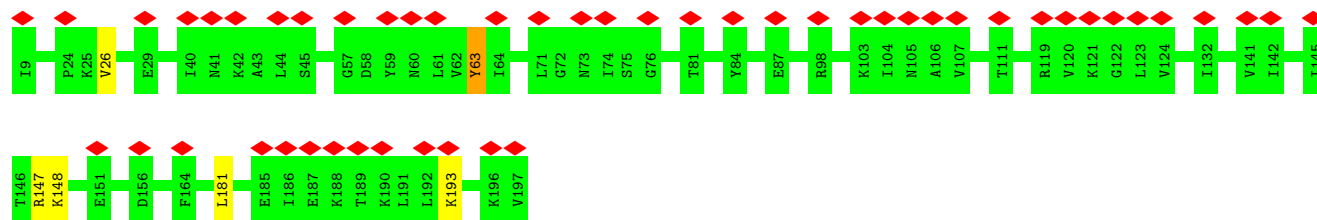
- Molecule 51: 30S ribosomal protein S24e



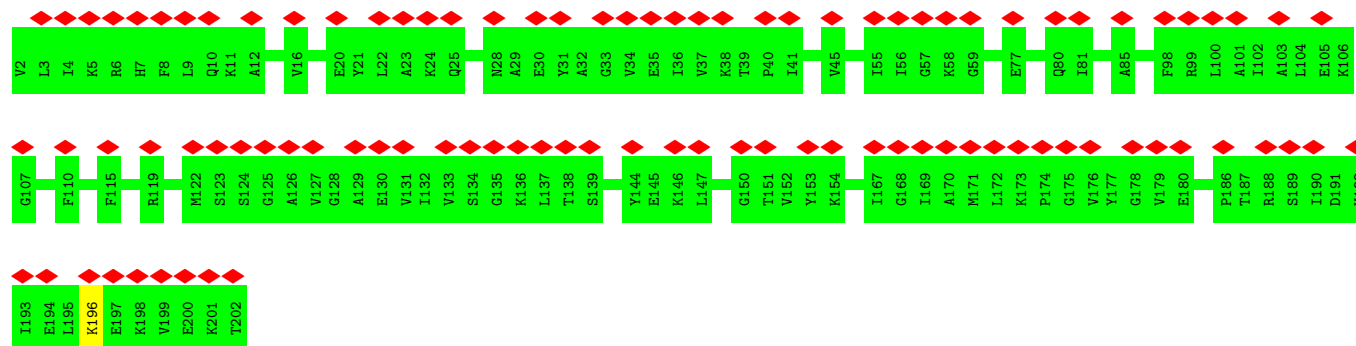
- Molecule 52: 30S ribosomal protein S27e



- Molecule 53: 30S ribosomal protein S3Ae

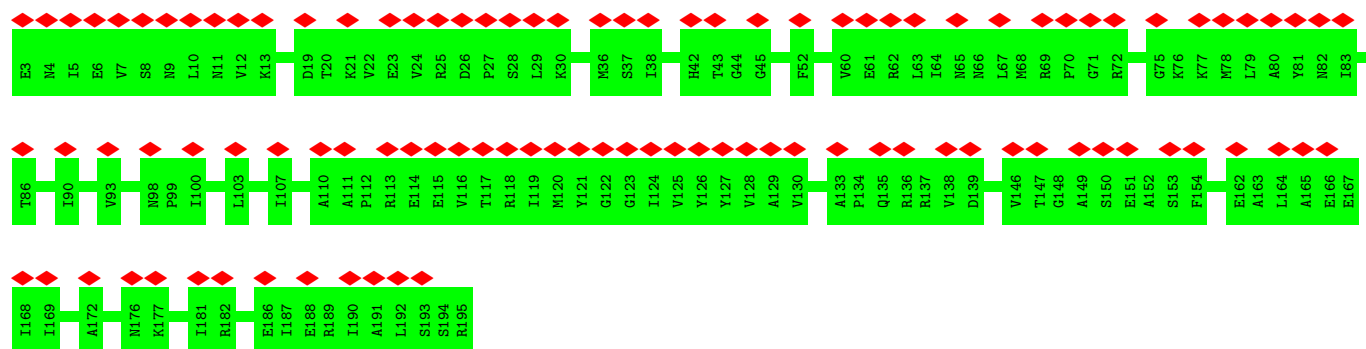


- Molecule 54: 30S ribosomal protein S3

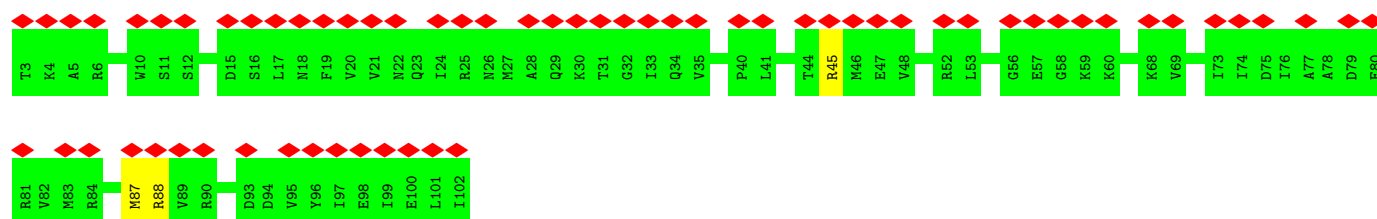


- Molecule 55: 30S ribosomal protein S7

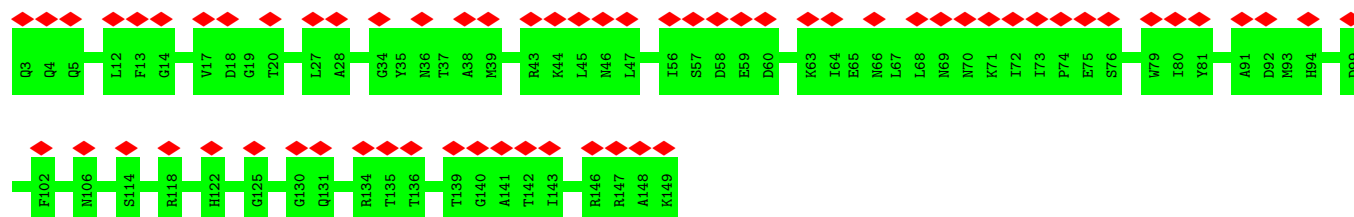




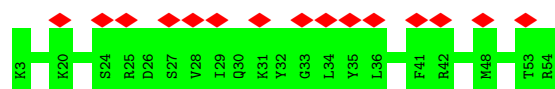
- Molecule 56: 30S ribosomal protein S10



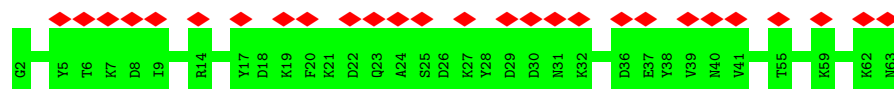
- Molecule 57: 30S ribosomal protein S13



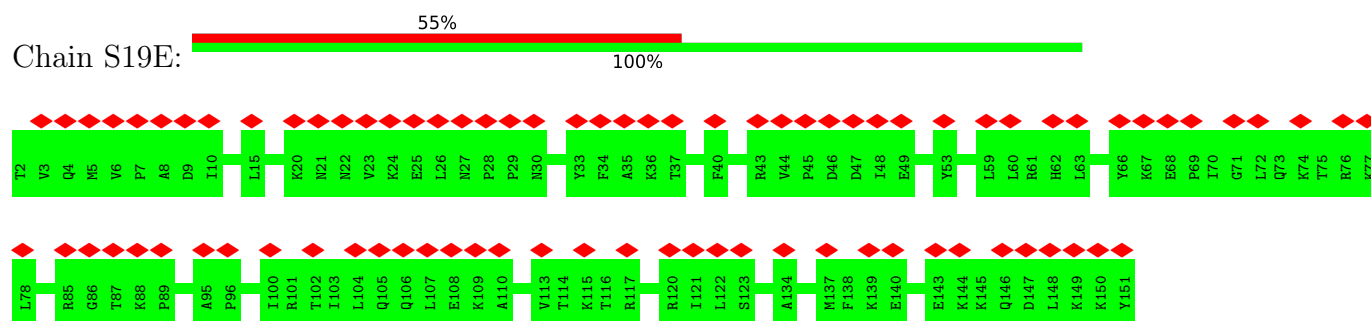
- Molecule 58: 30S ribosomal protein S14 type Z



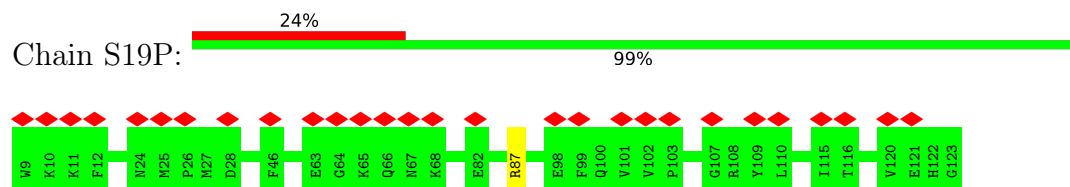
- Molecule 59: 30S ribosomal protein S17e



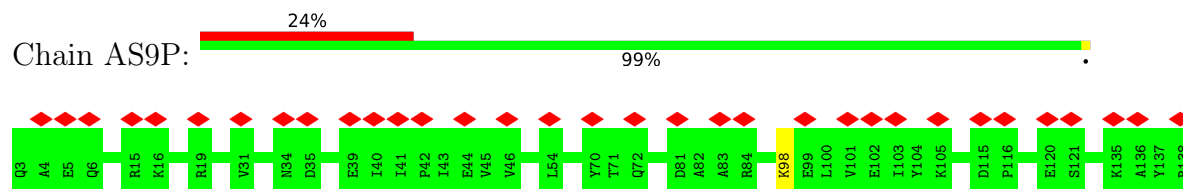
- Molecule 60: 30S ribosomal protein S19e



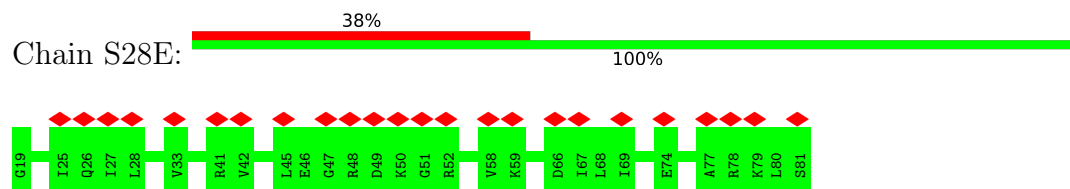
- Molecule 61: 30S ribosomal protein S19



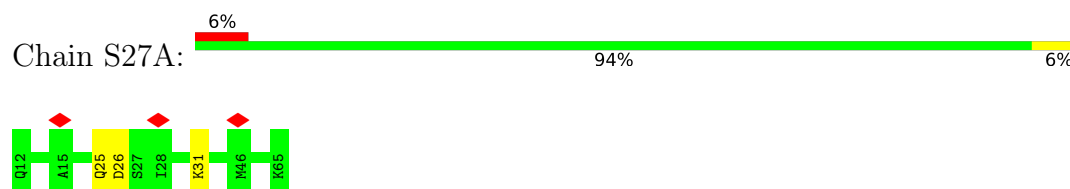
- Molecule 62: 30S ribosomal protein S9



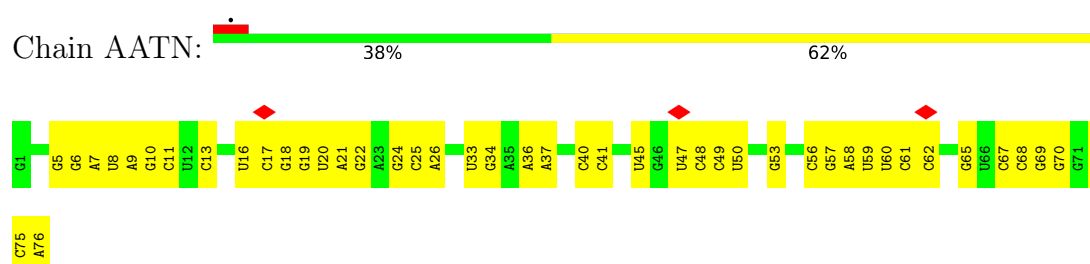
- Molecule 63: 30S ribosomal protein S28e



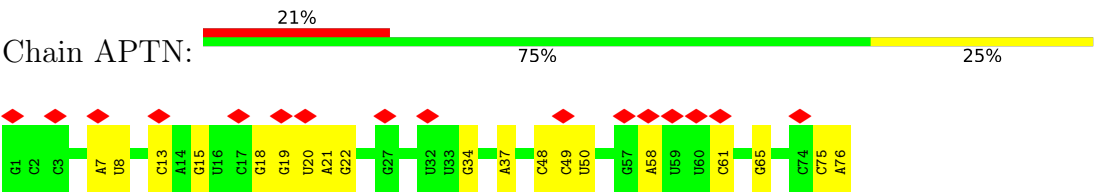
- Molecule 64: 30S ribosomal protein S27ae



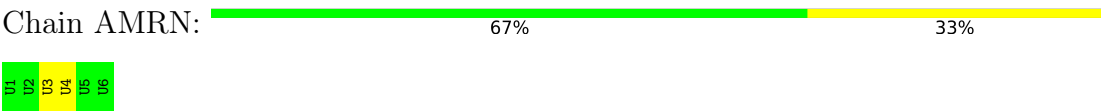
- Molecule 65: tRNA (76-MER)



● Molecule 65: tRNA (76-MER)



● Molecule 66: mRNA (5'-R(*UP*UP*UP*UP*UP*U)-3')



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1557	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 ($e^-/\text{\AA}^2$)	26.7	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	1.038	Depositor
Minimum map value	-0.448	Depositor
Average map value	0.006	Depositor
Map value standard deviation	0.086	Depositor
Recommended contour level	0.267	Depositor
Map size (Å)	413.06, 413.06, 413.06	wwPDB
Map dimensions	380, 380, 380	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.087, 1.087, 1.087	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	A23S	0.26	3/71935 (0.0%)	0.39	4/112230 (0.0%)
2	A16S	0.31	1/35862 (0.0%)	0.48	7/55957 (0.0%)
3	A5S	0.22	0/2917	0.31	0/4549
4	AL2P	0.20	0/1787	0.44	0/2409
5	AL3P	0.21	0/2758	0.47	1/3727 (0.0%)
6	AL4P	0.20	0/1956	0.40	0/2635
7	AL5P	0.24	0/1364	0.49	0/1827
8	AL6P	0.22	0/1450	0.42	0/1949
9	ALX0	0.30	0/638	0.59	0/851
10	L10E	0.22	0/1334	0.44	0/1787
11	L13P	0.21	0/1123	0.46	0/1502
12	L141	0.22	0/673	0.42	0/900
12	L142	0.22	0/673	0.44	0/900
13	L14P	0.26	0/1054	0.53	0/1425
14	L15E	0.22	0/1458	0.47	2/1956 (0.1%)
15	L18E	0.21	0/907	0.43	0/1214
16	L18P	0.20	0/1570	0.39	0/2115
17	L19E	0.21	0/1223	0.40	0/1622
18	L22P	0.21	0/1246	0.46	0/1671
19	L23P	0.27	0/655	0.53	0/874
20	L24E	0.22	0/451	0.41	0/599
21	L24P	0.22	0/1000	0.48	0/1329
22	L29P	0.21	0/513	0.44	0/678
23	L30E	0.19	0/738	0.36	0/985
24	L30P	0.28	0/1278	0.53	0/1713
25	L31E	0.22	0/632	0.49	0/837
26	L32E	0.22	0/1027	0.46	0/1366
27	L34E	0.30	0/642	0.77	3/854 (0.4%)
28	L37A	0.24	0/542	0.54	0/726
29	L37E	0.21	0/445	0.43	0/585
30	L39E	0.23	0/422	0.53	0/562
31	L40E	0.20	0/443	0.55	0/587

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	L44E	0.19	0/763	0.41	0/1008
33	L7A1	0.16	0/946	0.40	0/1272
33	L7A2	0.18	0/946	0.36	0/1272
33	SL7A	0.15	0/946	0.40	0/1272
34	L15P	0.21	0/766	0.43	0/1023
35	L21E	0.22	0/800	0.47	0/1067
36	L45A	0.20	0/824	0.56	0/1094
37	L46A	0.20	0/595	0.42	0/793
38	L47A	0.17	0/652	0.40	0/870
39	AL1P	0.17	0/1739	0.41	0/2338
40	AS2P	0.20	0/1621	0.44	1/2202 (0.0%)
41	AS4E	0.21	0/1956	0.53	0/2635
42	AS4P	0.21	0/1399	0.47	0/1883
43	AS5P	0.23	0/1631	0.49	0/2200
44	AS6E	0.24	0/815	0.51	0/1093
45	AS8E	0.22	0/1005	0.47	0/1342
46	AS8P	0.21	0/1046	0.43	0/1410
47	S11P	0.23	0/976	0.56	3/1315 (0.2%)
48	S12P	0.26	0/1120	0.58	0/1495
49	S15P	0.21	0/1250	0.47	0/1677
50	S17P	0.20	0/899	0.39	0/1203
51	S24E	0.21	0/769	0.38	0/1034
52	S27E	0.18	0/465	0.45	0/618
53	S3AE	0.20	0/1573	0.49	1/2115 (0.0%)
54	AS3P	0.18	0/1599	0.40	0/2147
55	AS7P	0.20	0/1561	0.48	0/2105
56	S10P	0.20	0/840	0.49	0/1132
57	S13P	0.18	0/1221	0.41	0/1634
58	S14P	0.21	0/441	0.50	0/583
59	S17E	0.19	0/523	0.42	0/696
60	S19E	0.19	0/1267	0.46	0/1705
61	S19P	0.18	0/985	0.43	0/1310
62	AS9P	0.19	0/1115	0.44	0/1496
63	S28E	0.18	0/500	0.39	0/669
64	S27A	0.26	0/444	0.64	0/590
65	AATN	0.25	0/1809	0.49	0/2819
65	APTn	0.25	0/1809	0.43	0/2819
66	AMRN	0.22	0/128	0.41	0/196
All	All	0.25	4/180460 (0.0%)	0.44	22/267053 (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
2	A16S	0	1
9	ALX0	0	1
27	L34E	0	1
35	L21E	0	1
41	AS4E	0	1
42	AS4P	0	1
49	S15P	0	2
53	S3AE	0	2
64	S27A	0	2
All	All	0	12

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A16S	381	C	C2-O2	-7.46	1.09	1.24
1	A23S	1318	U	C1'-N1	6.20	1.57	1.48
1	A23S	1316	A	C1'-N9	-5.60	1.38	1.47
1	A23S	1315	U	C1'-N1	5.18	1.56	1.48

The worst 5 of 22 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A16S	381	C	N1-C2-O2	-11.28	85.05	118.90
1	A23S	255	A	OP2-P-O3'	-9.06	80.82	108.00
1	A23S	2034	C	OP2-P-O3'	-8.46	82.63	108.00
1	A23S	2034	C	OP1-P-O3'	-8.41	82.77	108.00
1	A23S	255	A	OP1-P-O3'	-8.16	83.53	108.00

There are no chirality outliers.

5 of 12 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	A16S	381	C	Sidechain
9	ALX0	23	SER	Peptide
41	AS4E	163	LEU	Peptide
35	L21E	90	ARG	Peptide
27	L34E	36	ARG	Peptide

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A23S	64256	0	0	0	0
2	A16S	32040	0	0	0	0
3	A5S	2609	0	1324	149	0
4	AL2P	1754	0	0	0	0
5	AL3P	2695	0	0	0	0
6	AL4P	1926	0	0	0	0
7	AL5P	1343	0	0	0	0
8	AL6P	1431	0	0	0	0
9	ALX0	629	0	0	0	0
10	L10E	1310	0	0	0	0
11	L13P	1109	0	0	0	0
12	L141	669	0	0	0	0
12	L142	669	0	0	0	0
13	L14P	1034	0	0	0	0
14	L15E	1423	0	0	0	0
15	L18E	895	0	0	0	0
16	L18P	1539	0	0	0	0
17	L19E	1206	0	0	0	0
18	L22P	1223	0	0	0	0
19	L23P	650	0	0	0	0
20	L24E	441	0	0	0	0
21	L24P	989	0	0	0	0
22	L29P	513	0	0	0	0
23	L30E	729	0	0	0	0
24	L30P	1254	0	0	0	0
25	L31E	625	0	0	0	0
26	L32E	1010	0	0	0	0
27	L34E	629	0	0	0	0
28	L37A	527	0	0	0	0
29	L37E	436	0	0	0	0
30	L39E	414	0	0	0	0
31	L40E	439	0	0	0	0
32	L44E	753	0	0	0	0
33	L7A1	935	0	0	0	0
33	L7A2	935	0	0	0	0
33	SL7A	935	0	0	0	0
34	L15P	752	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
35	L21E	785	0	0	0	0
36	L45A	816	0	0	0	0
37	L46A	586	0	0	0	0
38	L47A	648	0	0	0	0
39	AL1P	1715	0	0	0	0
40	AS2P	1587	0	0	0	0
41	AS4E	1925	0	0	0	0
42	AS4P	1370	0	0	0	0
43	AS5P	1600	0	0	0	0
44	AS6E	805	0	0	0	0
45	AS8E	993	0	0	0	0
46	AS8P	1028	0	0	0	0
47	S11P	960	0	0	0	0
48	S12P	1103	0	0	0	0
49	S15P	1225	0	0	0	0
50	S17P	885	0	0	0	0
51	S24E	759	0	0	0	0
52	S27E	458	0	0	0	0
53	S3AE	1545	0	0	0	0
54	AS3P	1576	0	0	0	0
55	AS7P	1537	0	0	0	0
56	S10P	824	0	0	0	0
57	S13P	1204	0	0	0	0
58	S14P	432	0	0	0	0
59	S17E	517	0	0	0	0
60	S19E	1239	0	0	0	0
61	S19P	968	0	0	0	0
62	AS9P	1096	0	0	0	0
63	S28E	498	0	0	0	0
64	S27A	435	0	0	0	0
65	AATN	1619	0	0	0	0
65	APTn	1619	0	0	0	0
66	AMRN	117	0	0	0	0
67	A16S	5	0	0	0	0
67	AS2P	141	0	0	0	0
67	AS5P	100	0	0	0	0
67	AS8P	40	0	0	0	0
All	All	167486	0	1324	149	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 46.

The worst 5 of 149 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A5S:89:C:N3	3:A5S:94:G:N1	2.25	0.84
3:A5S:71:C:O2	3:A5S:111:G:N2	2.10	0.81
3:A5S:33:C:O2	3:A5S:51:G:N2	2.12	0.81
3:A5S:76:G:H1	3:A5S:106:U:H3	1.28	0.80
3:A5S:6:A:N6	3:A5S:119:A:N1	2.28	0.80

There are no symmetry-related clashes.

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	AL2P	232/234 (99%)	205 (88%)	27 (12%)	0	100	100
5	AL3P	337/339 (99%)	282 (84%)	55 (16%)	0	100	100
6	AL4P	249/251 (99%)	226 (91%)	23 (9%)	0	100	100
7	AL5P	166/168 (99%)	147 (89%)	19 (11%)	0	100	100
8	AL6P	179/181 (99%)	158 (88%)	21 (12%)	0	100	100
9	ALX0	74/76 (97%)	64 (86%)	10 (14%)	0	100	100
10	L10E	162/164 (99%)	138 (85%)	24 (15%)	0	100	100
11	L13P	138/140 (99%)	125 (91%)	13 (9%)	0	100	100
12	L141	84/86 (98%)	69 (82%)	15 (18%)	0	100	100
12	L142	84/86 (98%)	70 (83%)	14 (17%)	0	100	100
13	L14P	132/134 (98%)	118 (89%)	14 (11%)	0	100	100
14	L15E	167/169 (99%)	151 (90%)	16 (10%)	0	100	100
15	L18E	110/112 (98%)	102 (93%)	8 (7%)	0	100	100
16	L18P	191/193 (99%)	171 (90%)	20 (10%)	0	100	100
17	L19E	142/144 (99%)	129 (91%)	13 (9%)	0	100	100
18	L22P	148/150 (99%)	130 (88%)	18 (12%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
19	L23P	79/81 (98%)	69 (87%)	10 (13%)	0	100	100
20	L24E	52/54 (96%)	49 (94%)	3 (6%)	0	100	100
21	L24P	120/122 (98%)	107 (89%)	13 (11%)	0	100	100
22	L29P	61/63 (97%)	59 (97%)	2 (3%)	0	100	100
23	L30E	92/94 (98%)	84 (91%)	8 (9%)	0	100	100
24	L30P	153/155 (99%)	128 (84%)	25 (16%)	0	100	100
25	L31E	73/75 (97%)	61 (84%)	12 (16%)	0	100	100
26	L32E	121/123 (98%)	108 (89%)	13 (11%)	0	100	100
27	L34E	75/77 (97%)	53 (71%)	21 (28%)	1 (1%)	9	41
28	L37A	63/65 (97%)	51 (81%)	12 (19%)	0	100	100
29	L37E	52/54 (96%)	41 (79%)	11 (21%)	0	100	100
30	L39E	47/49 (96%)	39 (83%)	8 (17%)	0	100	100
31	L40E	53/55 (96%)	39 (74%)	14 (26%)	0	100	100
32	L44E	90/92 (98%)	82 (91%)	8 (9%)	0	100	100
33	L7A1	121/123 (98%)	116 (96%)	5 (4%)	0	100	100
33	L7A2	121/123 (98%)	112 (93%)	9 (7%)	0	100	100
33	SL7A	121/123 (98%)	110 (91%)	11 (9%)	0	100	100
34	L15P	90/144 (62%)	78 (87%)	12 (13%)	0	100	100
35	L21E	95/97 (98%)	89 (94%)	6 (6%)	0	100	100
36	L45A	99/101 (98%)	78 (79%)	17 (17%)	4 (4%)	2	18
37	L46A	68/70 (97%)	61 (90%)	7 (10%)	0	100	100
38	L47A	78/80 (98%)	73 (94%)	5 (6%)	0	100	100
39	AL1P	214/216 (99%)	191 (89%)	23 (11%)	0	100	100
40	AS2P	194/196 (99%)	177 (91%)	17 (9%)	0	100	100
41	AS4E	238/240 (99%)	193 (81%)	45 (19%)	0	100	100
42	AS4P	164/166 (99%)	141 (86%)	22 (13%)	1 (1%)	21	59
43	AS5P	202/204 (99%)	175 (87%)	27 (13%)	0	100	100
44	AS6E	103/105 (98%)	81 (79%)	22 (21%)	0	100	100
45	AS8E	124/126 (98%)	104 (84%)	20 (16%)	0	100	100
46	AS8P	128/130 (98%)	112 (88%)	16 (12%)	0	100	100
47	S11P	126/128 (98%)	100 (79%)	25 (20%)	1 (1%)	16	53

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
48	S12P	141/143 (99%)	115 (82%)	25 (18%)	1 (1%)	18	55
49	S15P	147/149 (99%)	126 (86%)	20 (14%)	1 (1%)	18	55
50	S17P	109/111 (98%)	99 (91%)	10 (9%)	0	100	100
51	S24E	94/96 (98%)	86 (92%)	8 (8%)	0	100	100
52	S27E	57/59 (97%)	46 (81%)	11 (19%)	0	100	100
53	S3AE	187/189 (99%)	154 (82%)	32 (17%)	1 (0%)	24	63
54	AS3P	199/201 (99%)	180 (90%)	19 (10%)	0	100	100
55	AS7P	191/193 (99%)	163 (85%)	28 (15%)	0	100	100
56	S10P	98/100 (98%)	93 (95%)	5 (5%)	0	100	100
57	S13P	145/147 (99%)	121 (83%)	24 (17%)	0	100	100
58	S14P	50/52 (96%)	43 (86%)	7 (14%)	0	100	100
59	S17E	60/62 (97%)	55 (92%)	5 (8%)	0	100	100
60	S19E	148/150 (99%)	128 (86%)	20 (14%)	0	100	100
61	S19P	113/115 (98%)	95 (84%)	18 (16%)	0	100	100
62	AS9P	134/136 (98%)	125 (93%)	9 (7%)	0	100	100
63	S28E	61/63 (97%)	55 (90%)	6 (10%)	0	100	100
64	S27A	52/54 (96%)	42 (81%)	10 (19%)	0	100	100
All	All	7998/8178 (98%)	6972 (87%)	1016 (13%)	10 (0%)	49	83

5 of 10 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
36	L45A	4	VAL
36	L45A	55	VAL
36	L45A	67	THR
36	L45A	85	LYS
27	L34E	19	PRO

5.3.2 Protein sidechains ⓘ

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	AL2P	181/181 (100%)	179 (99%)	2 (1%)	65	75
5	AL3P	297/297 (100%)	295 (99%)	2 (1%)	76	80
6	AL4P	212/212 (100%)	211 (100%)	1 (0%)	81	82
7	AL5P	144/144 (100%)	144 (100%)	0	100	100
8	AL6P	157/157 (100%)	156 (99%)	1 (1%)	78	82
9	ALX0	68/68 (100%)	68 (100%)	0	100	100
10	L10E	137/137 (100%)	135 (98%)	2 (2%)	57	71
11	L13P	121/121 (100%)	121 (100%)	0	100	100
12	L141	74/74 (100%)	74 (100%)	0	100	100
12	L142	74/74 (100%)	74 (100%)	0	100	100
13	L14P	110/110 (100%)	109 (99%)	1 (1%)	70	77
14	L15E	146/146 (100%)	144 (99%)	2 (1%)	59	71
15	L18E	98/98 (100%)	97 (99%)	1 (1%)	68	77
16	L18P	162/162 (100%)	160 (99%)	2 (1%)	63	74
17	L19E	126/126 (100%)	124 (98%)	2 (2%)	55	69
18	L22P	131/131 (100%)	130 (99%)	1 (1%)	73	79
19	L23P	74/74 (100%)	74 (100%)	0	100	100
20	L24E	50/50 (100%)	50 (100%)	0	100	100
21	L24P	108/108 (100%)	106 (98%)	2 (2%)	50	66
22	L29P	59/59 (100%)	58 (98%)	1 (2%)	53	68
23	L30E	83/83 (100%)	83 (100%)	0	100	100
24	L30P	136/136 (100%)	134 (98%)	2 (2%)	57	71
25	L31E	66/66 (100%)	65 (98%)	1 (2%)	57	71
26	L32E	106/106 (100%)	103 (97%)	3 (3%)	38	59
27	L34E	70/70 (100%)	69 (99%)	1 (1%)	59	71
28	L37A	53/53 (100%)	51 (96%)	2 (4%)	29	50
29	L37E	45/45 (100%)	45 (100%)	0	100	100
30	L39E	44/44 (100%)	44 (100%)	0	100	100
31	L40E	50/50 (100%)	50 (100%)	0	100	100
32	L44E	84/84 (100%)	84 (100%)	0	100	100
33	L7A1	104/104 (100%)	104 (100%)	0	100	100
33	L7A2	104/104 (100%)	100 (96%)	4 (4%)	29	50

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	SL7A	104/104 (100%)	103 (99%)	1 (1%)	68	77
34	L15P	78/118 (66%)	78 (100%)	0	100	100
35	L21E	85/85 (100%)	85 (100%)	0	100	100
36	L45A	91/91 (100%)	90 (99%)	1 (1%)	65	75
37	L46A	66/66 (100%)	64 (97%)	2 (3%)	36	57
38	L47A	74/74 (100%)	74 (100%)	0	100	100
39	AL1P	189/190 (100%)	188 (100%)	1 (0%)	81	82
40	AS2P	174/174 (100%)	174 (100%)	0	100	100
41	AS4E	210/210 (100%)	206 (98%)	4 (2%)	50	66
42	AS4P	149/149 (100%)	149 (100%)	0	100	100
43	AS5P	174/174 (100%)	174 (100%)	0	100	100
44	AS6E	88/88 (100%)	88 (100%)	0	100	100
45	AS8E	106/106 (100%)	106 (100%)	0	100	100
46	AS8P	111/111 (100%)	111 (100%)	0	100	100
47	S11P	94/94 (100%)	94 (100%)	0	100	100
48	S12P	116/116 (100%)	116 (100%)	0	100	100
49	S15P	133/133 (100%)	133 (100%)	0	100	100
50	S17P	97/97 (100%)	94 (97%)	3 (3%)	35	56
51	S24E	84/84 (100%)	83 (99%)	1 (1%)	63	74
52	S27E	51/51 (100%)	51 (100%)	0	100	100
53	S3AE	170/170 (100%)	167 (98%)	3 (2%)	51	67
54	AS3P	165/165 (100%)	164 (99%)	1 (1%)	78	82
55	AS7P	166/166 (100%)	166 (100%)	0	100	100
56	S10P	92/92 (100%)	89 (97%)	3 (3%)	33	54
57	S13P	129/129 (100%)	129 (100%)	0	100	100
58	S14P	45/45 (100%)	45 (100%)	0	100	100
59	S17E	57/57 (100%)	57 (100%)	0	100	100
60	S19E	134/134 (100%)	134 (100%)	0	100	100
61	S19P	106/106 (100%)	105 (99%)	1 (1%)	70	77
62	AS9P	113/113 (100%)	112 (99%)	1 (1%)	70	77
63	S28E	54/54 (100%)	54 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
64	S27A	47/47 (100%)	46 (98%)	1 (2%)	47 65
All	All	7026/7067 (99%)	6970 (99%)	56 (1%)	70 79

5 of 56 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
28	L37A	61	LYS
33	SL7A	117	ARG
37	L46A	67	LYS
64	S27A	31	LYS
56	S10P	45	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A23S	2981/3022 (98%)	909 (30%)	36 (1%)
2	A16S	1490/1503 (99%)	480 (32%)	51 (3%)
3	A5S	121/122 (99%)	26 (21%)	2 (1%)
65	AATN	75/76 (98%)	46 (61%)	6 (8%)
65	APTN	75/76 (98%)	19 (25%)	1 (1%)
66	AMRN	5/6 (83%)	2 (40%)	0
All	All	4747/4805 (98%)	1482 (31%)	96 (2%)

5 of 1482 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A23S	7	G
1	A23S	18	G
1	A23S	19	A
1	A23S	21	G
1	A23S	30	C

5 of 96 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	A16S	653	A
2	A16S	1171	A

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Mol	Chain	Res	Type
2	A16S	778	G
2	A16S	989	G
2	A16S	1269	G

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 57 ligands modelled in this entry, 57 are unknown - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

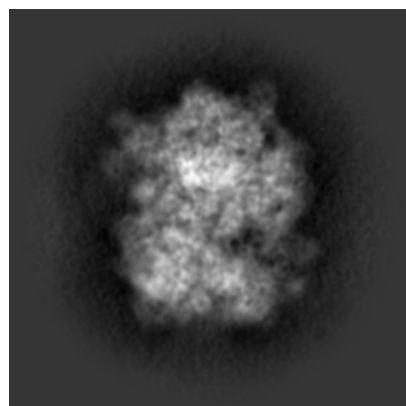
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-34870. These allow visual inspection of the internal detail of the map and identification of artifacts.

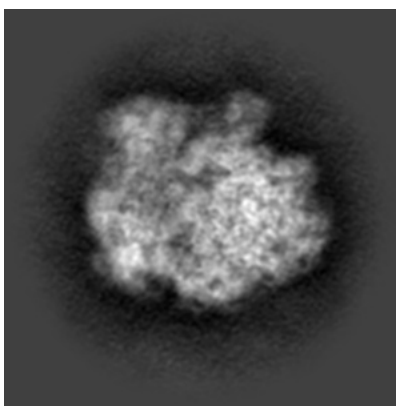
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

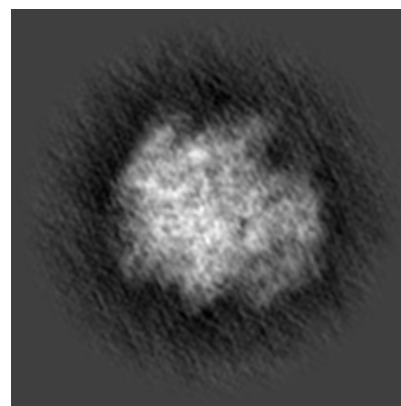
6.1.1 Primary map



X

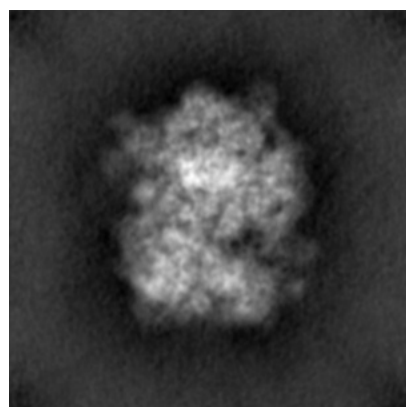


Y

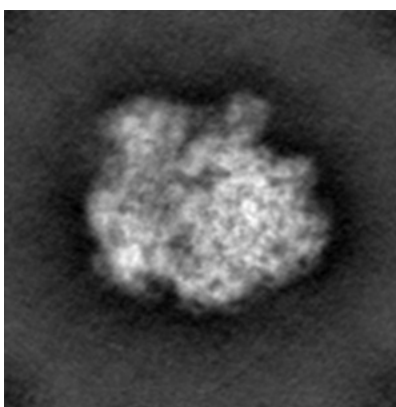


Z

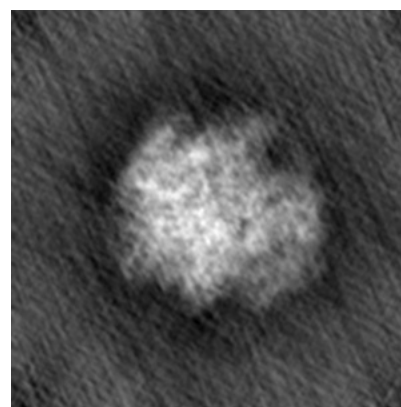
6.1.2 Raw map



X



Y

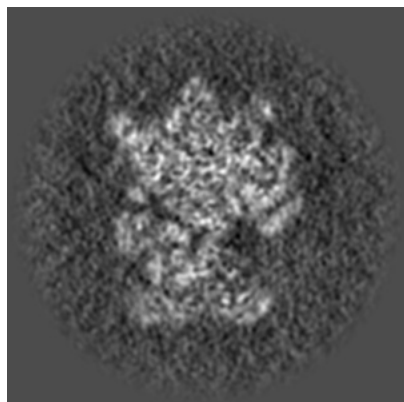


Z

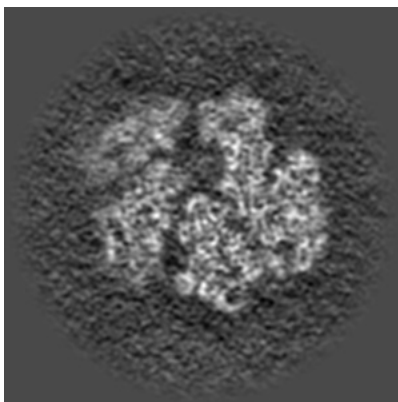
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

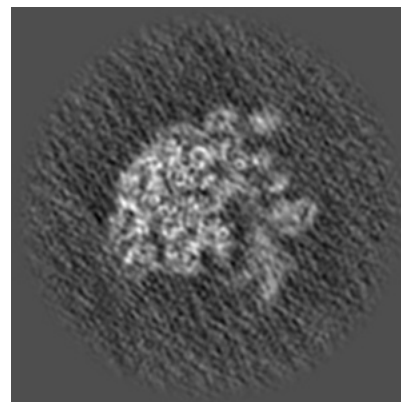
6.2.1 Primary map



X Index: 190

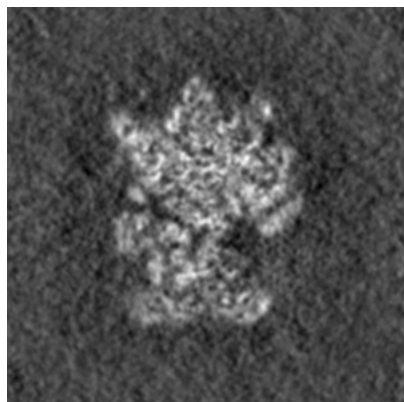


Y Index: 190

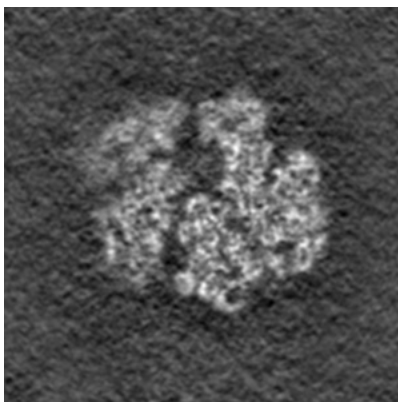


Z Index: 190

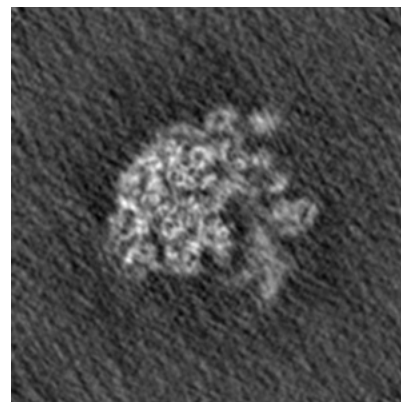
6.2.2 Raw map



X Index: 190



Y Index: 190

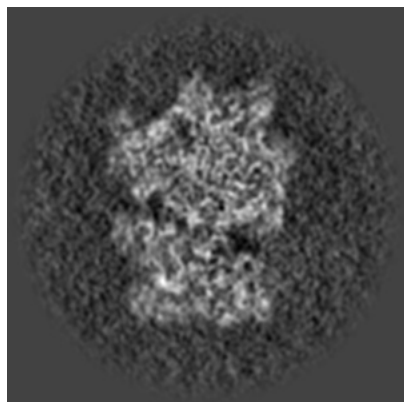


Z Index: 190

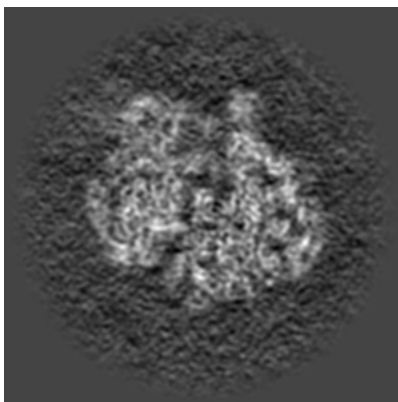
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

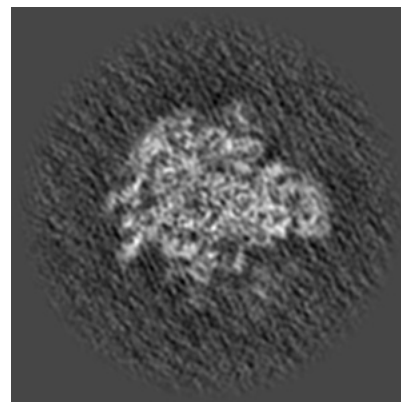
6.3.1 Primary map



X Index: 182

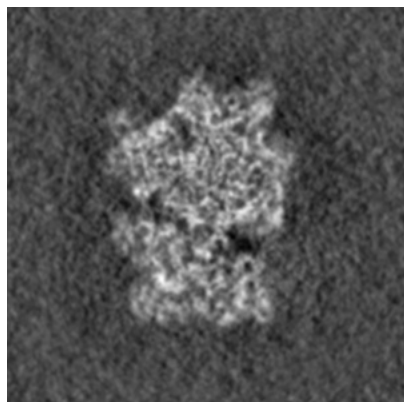


Y Index: 165

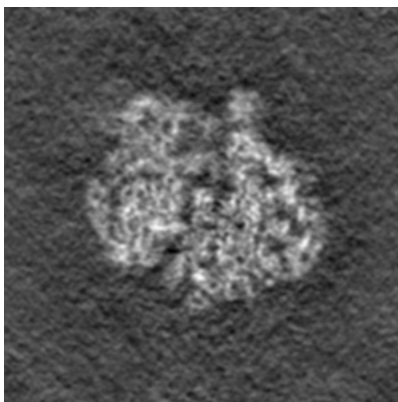


Z Index: 220

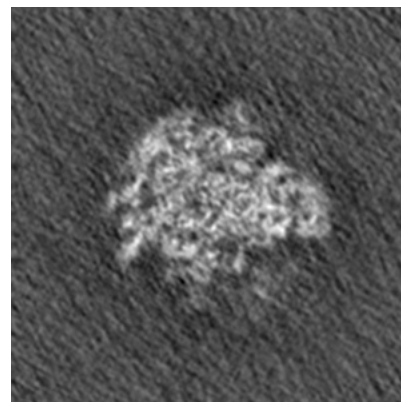
6.3.2 Raw map



X Index: 181



Y Index: 165

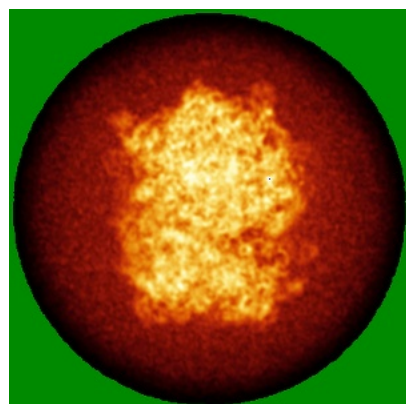


Z Index: 220

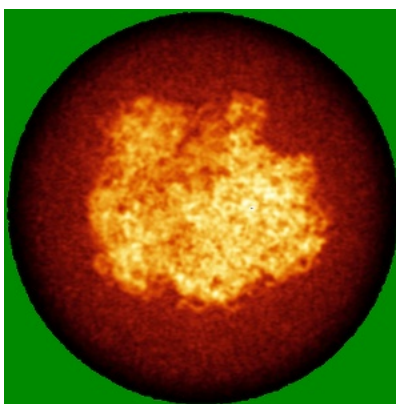
The images above show the largest variance slices of the map in three orthogonal directions.

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

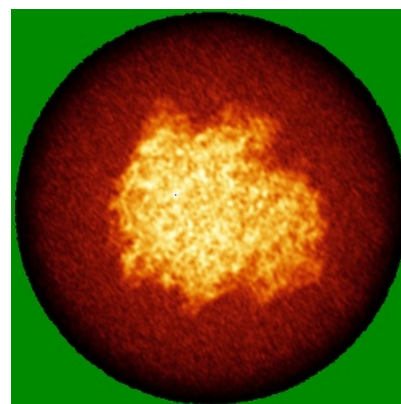
6.4.1 Primary map



X

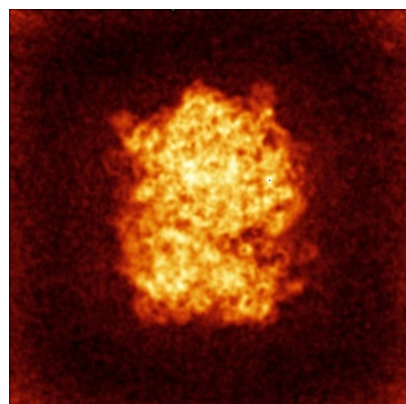


Y

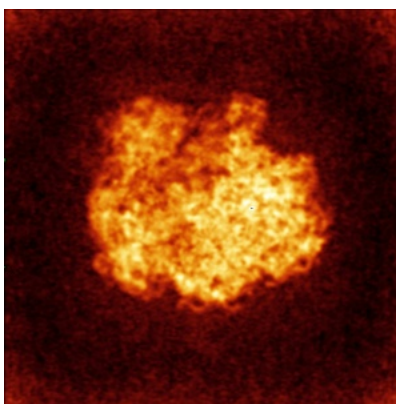


Z

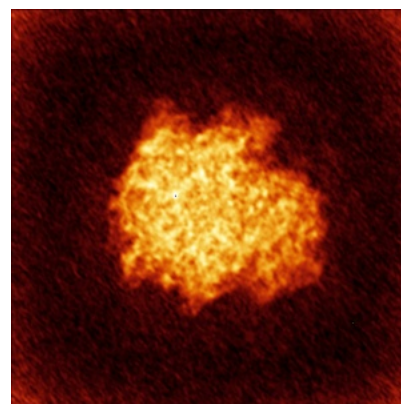
6.4.2 Raw map



X



Y



Z

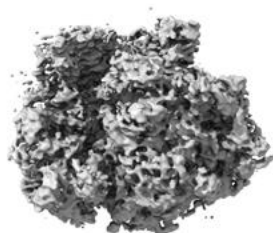
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

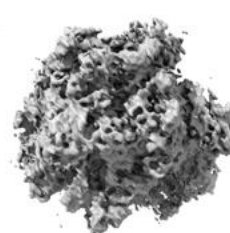
6.5.1 Primary map



X



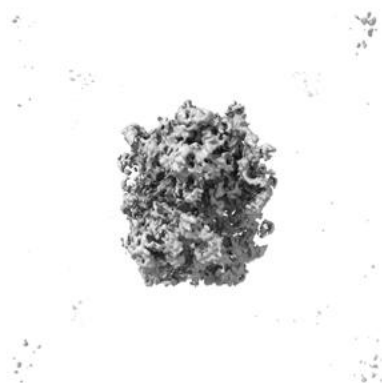
Y



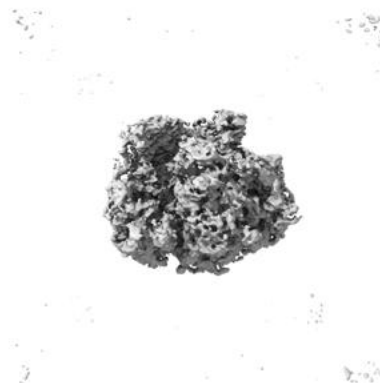
Z

The images above show the 3D surface view of the map at the recommended contour level 0.267. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

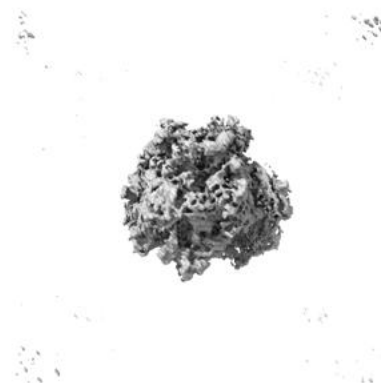
6.5.2 Raw map



X



Y



Z

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.

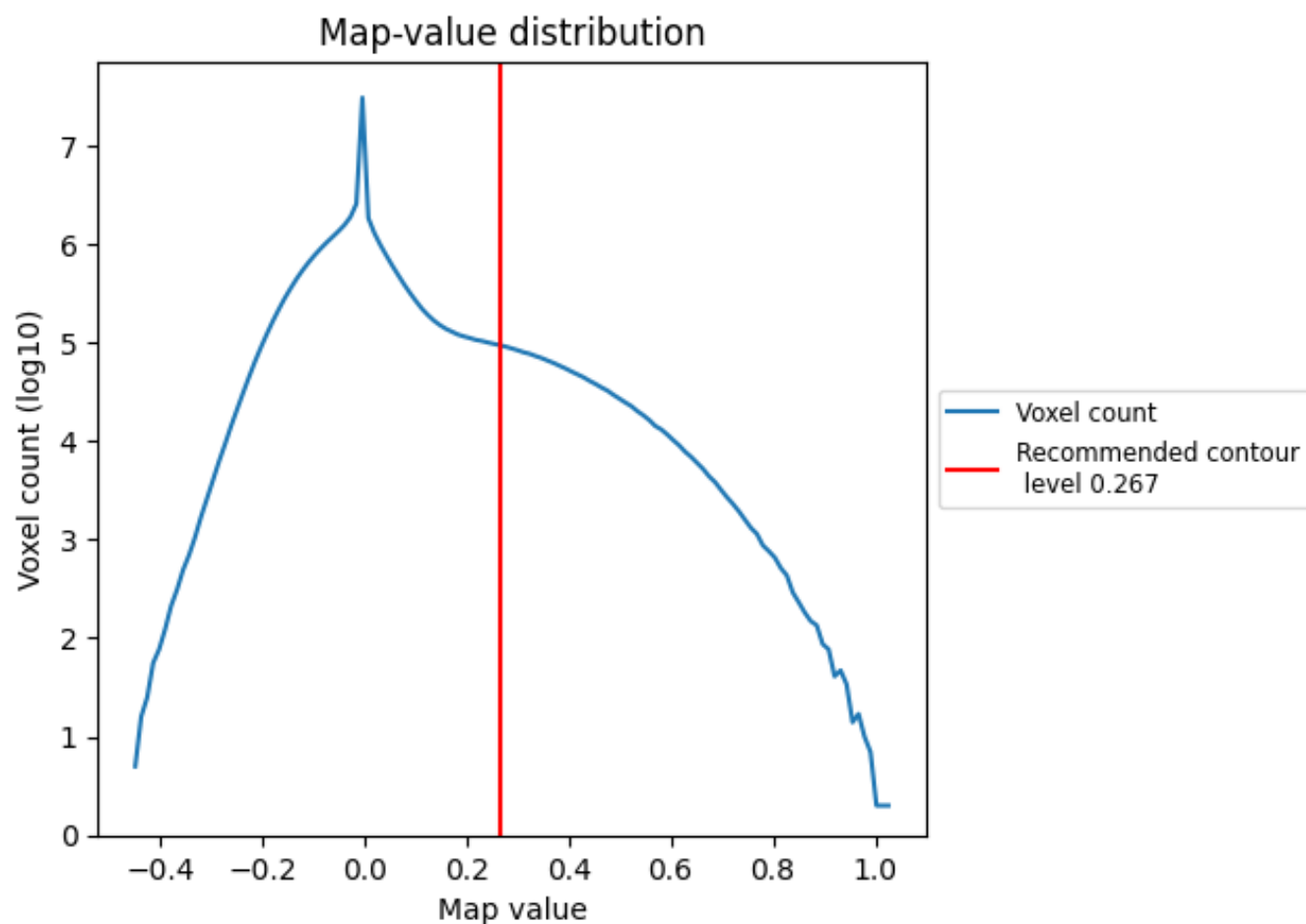
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

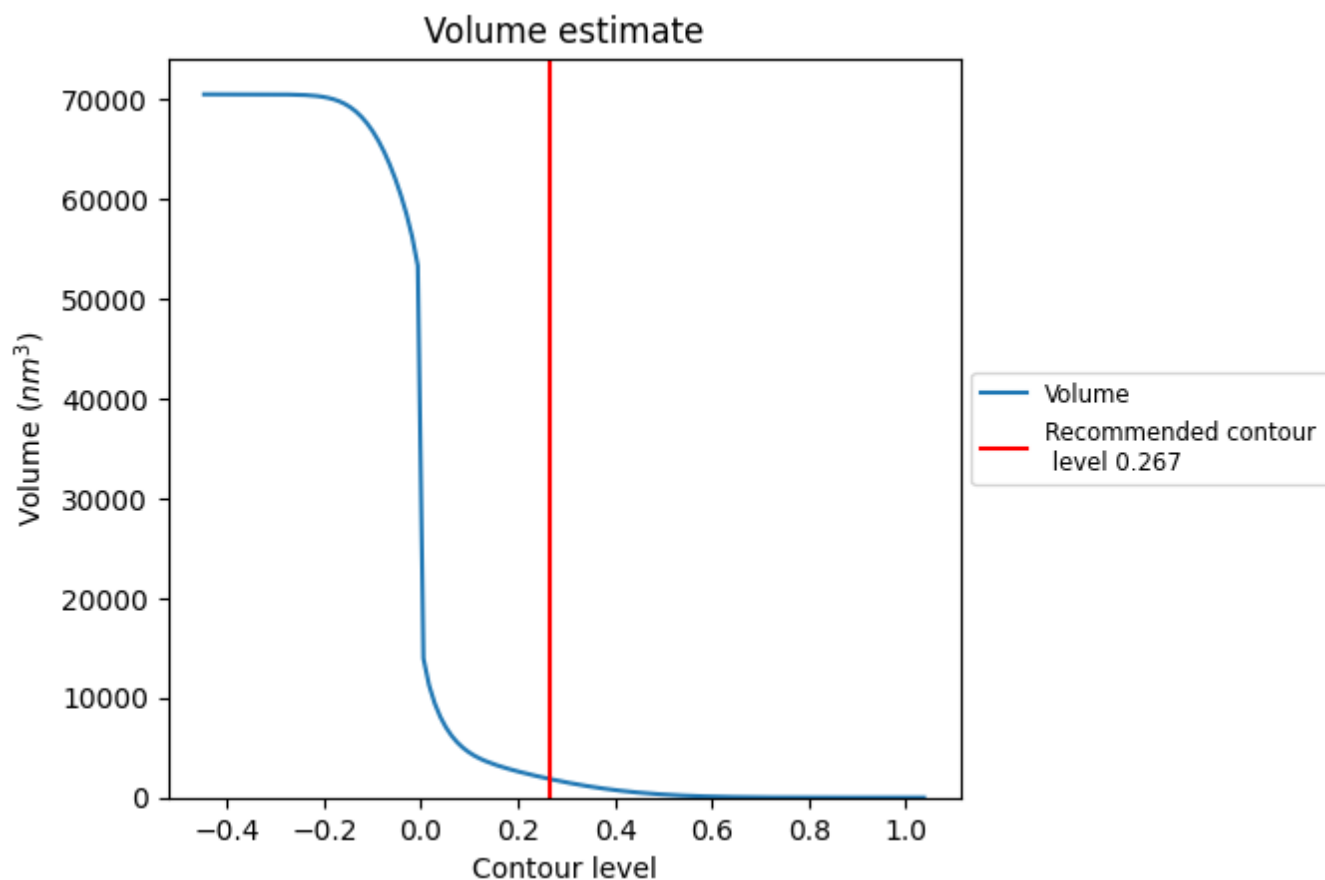
This section contains the results of statistical analysis of the map.

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.

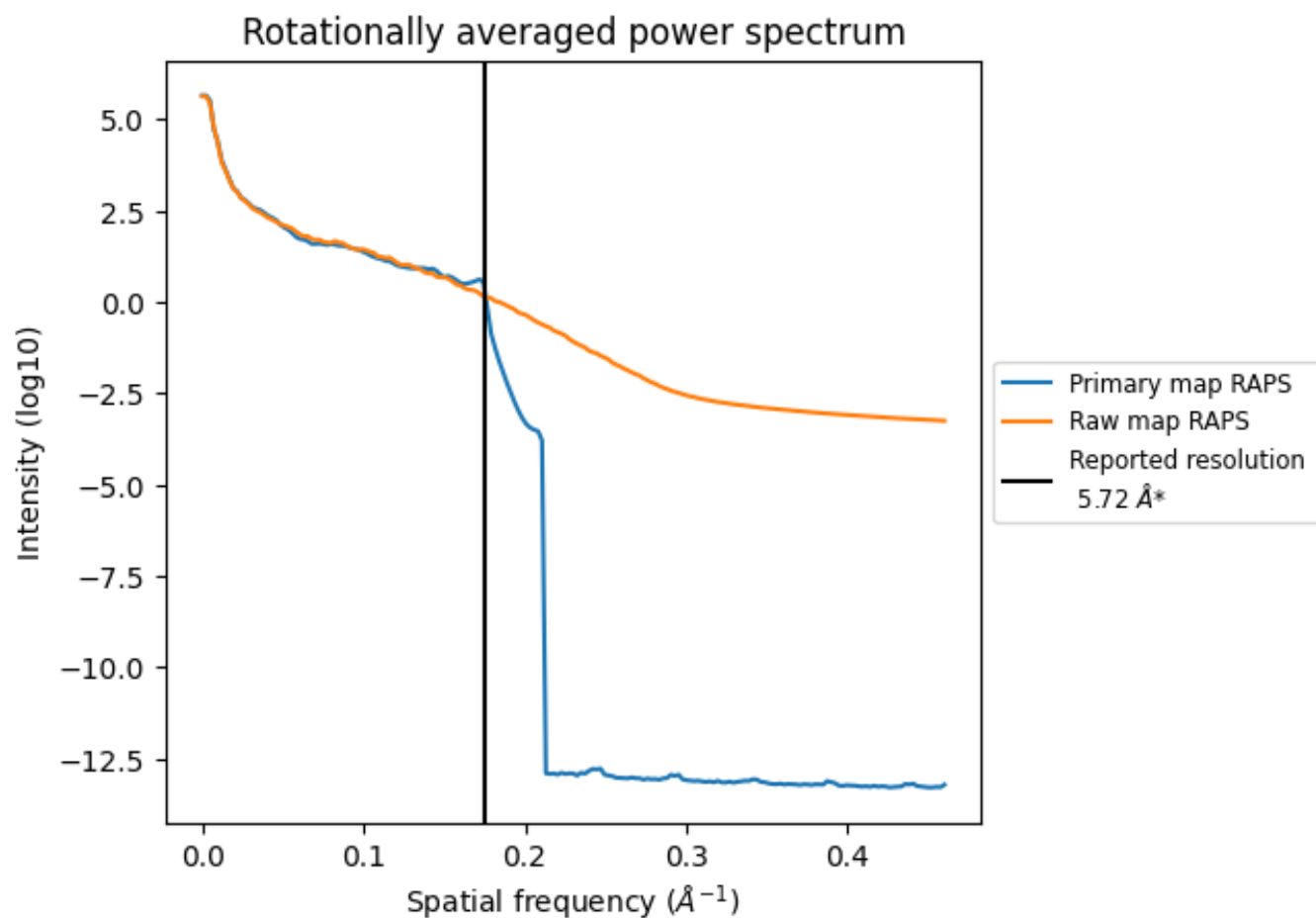
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1852 nm³; this corresponds to an approximate mass of 1673 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 ⓘ

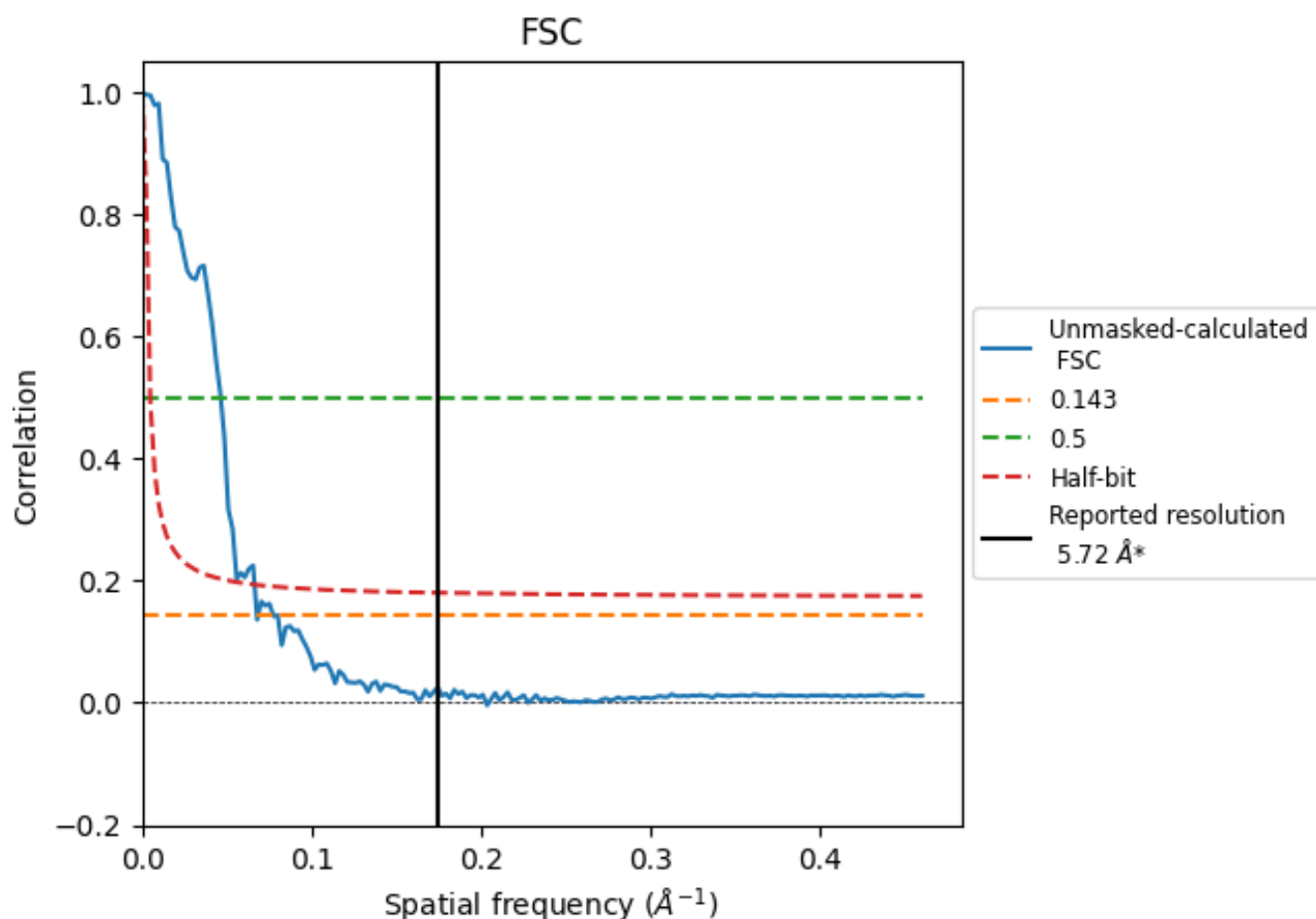


*Reported resolution corresponds to spatial frequency of 0.175 Å⁻¹

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 0.175 Å⁻¹

8.2 Resolution estimates [i](#)

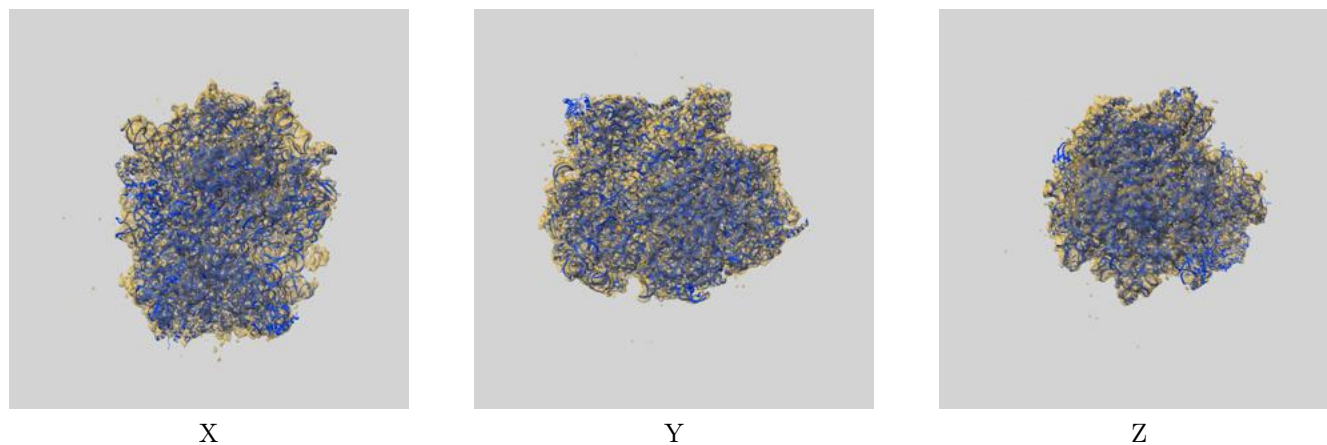
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	5.72	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	14.79	21.65	15.11

*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 14.79 differs from the reported value 5.72 by more than 10 %

9 Map-model fit [i](#)

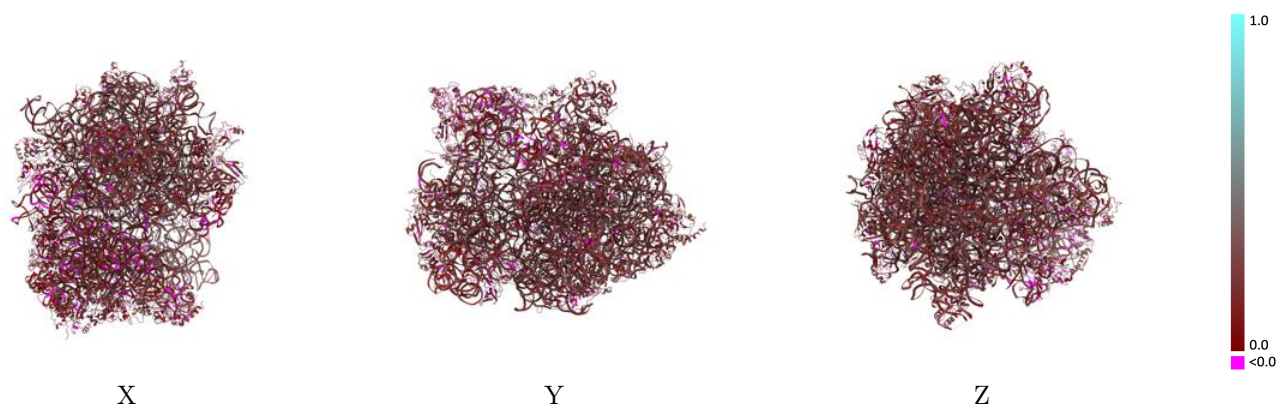
This section contains information regarding the fit between EMDB map EMD-34870 and PDB model 8HL5. Per-residue inclusion information can be found in section [3](#) on page [16](#).

9.1 Map-model overlay [i](#)



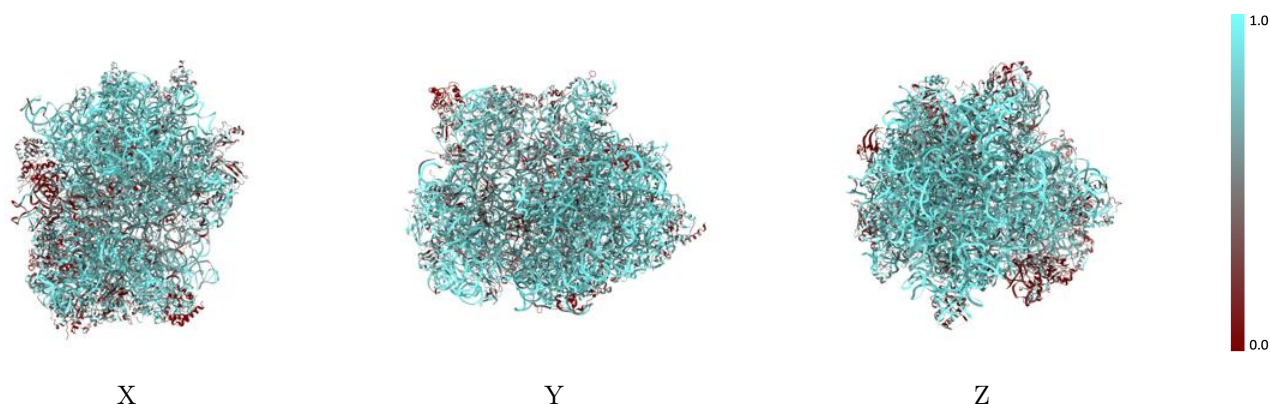
The images above show the 3D surface view of the map at the recommended contour level 0.267 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



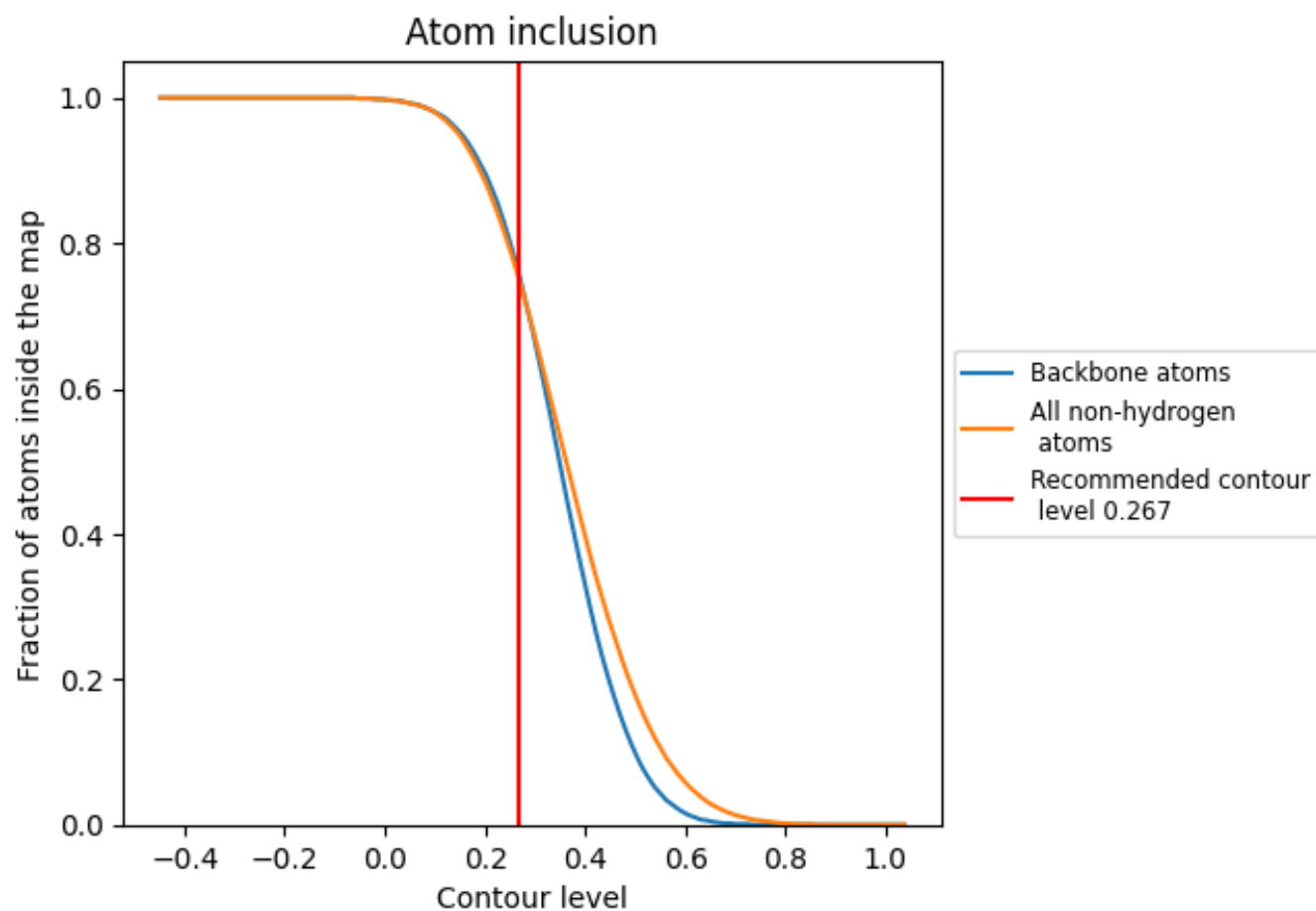
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.267).

9.4 Atom inclusion [i](#)



At the recommended contour level, 76% of all backbone atoms, 75% 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 (0.267) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7540	 0.2110
A16S	 0.8500	 0.2060
A23S	 0.8910	 0.2350
A5S	 0.8970	 0.2320
AATN	 0.7480	 0.1890
AL1P	 0.1410	 0.1360
AL2P	 0.5400	 0.2110
AL3P	 0.6730	 0.1870
AL4P	 0.7350	 0.2180
AL5P	 0.4630	 0.2020
AL6P	 0.4600	 0.1890
ALX0	 0.4590	 0.1860
AMRN	 0.9060	 0.2310
APTN	 0.6480	 0.1690
AS2P	 0.6420	 0.1970
AS3P	 0.4290	 0.1830
AS4E	 0.6330	 0.1810
AS4P	 0.6390	 0.2080
AS5P	 0.5900	 0.2100
AS6E	 0.3740	 0.1690
AS7P	 0.4390	 0.1480
AS8E	 0.6230	 0.1890
AS8P	 0.7230	 0.1980
AS9P	 0.6290	 0.1610
L10E	 0.5850	 0.2130
L13P	 0.7150	 0.2010
L141	 0.6240	 0.1770
L142	 0.4400	 0.1780
L14P	 0.3880	 0.2050
L15E	 0.6380	 0.2170
L15P	 0.6920	 0.2180
L18E	 0.7860	 0.2150
L18P	 0.5900	 0.1890
L19E	 0.7770	 0.2150
L21E	 0.7360	 0.2010



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Chain	Atom inclusion	Q-score
L22P	 0.6840	 0.2140
L23P	 0.4910	 0.2210
L24E	 0.6830	 0.2150
L24P	 0.7340	 0.2040
L29P	 0.5130	 0.2020
L30E	 0.6680	 0.2030
L30P	 0.5930	 0.1960
L31E	 0.7250	 0.2120
L32E	 0.6400	 0.2220
L34E	 0.5340	 0.1590
L37A	 0.6790	 0.1890
L37E	 0.7480	 0.2090
L39E	 0.6230	 0.2040
L40E	 0.2410	 0.1540
L44E	 0.7280	 0.1880
L45A	 0.4350	 0.2360
L46A	 0.5870	 0.2040
L47A	 0.0610	 0.1480
L7A1	 0.3730	 0.1980
L7A2	 0.5250	 0.2040
S10P	 0.3380	 0.1720
S11P	 0.5830	 0.1990
S12P	 0.4420	 0.1970
S13P	 0.4880	 0.1500
S14P	 0.6020	 0.1620
S15P	 0.7070	 0.2000
S17E	 0.4270	 0.1750
S17P	 0.5580	 0.1840
S19E	 0.3890	 0.1470
S19P	 0.6500	 0.1680
S24E	 0.7170	 0.1950
S27A	 0.8450	 0.1220
S27E	 0.7390	 0.1840
S28E	 0.4790	 0.1510
S3AE	 0.5820	 0.1880
SL7A	 0.0730	 0.1430