



wwPDB EM Validation Summary Report ⓘ

Apr 23, 2024 – 06:10 PM EDT

PDB ID : 8VSA
EMDB ID : EMD-43491
Title : Endogenous trans-translation complex with tmRNA*SmpB in the P site and alanyl-tRNA in the A site of E. coli 70S ribosome
Authors : Teran, D.; Zhang, Y.; Korostelev, A.A.
Deposited on : 2024-01-23
Resolution : 3.70 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:

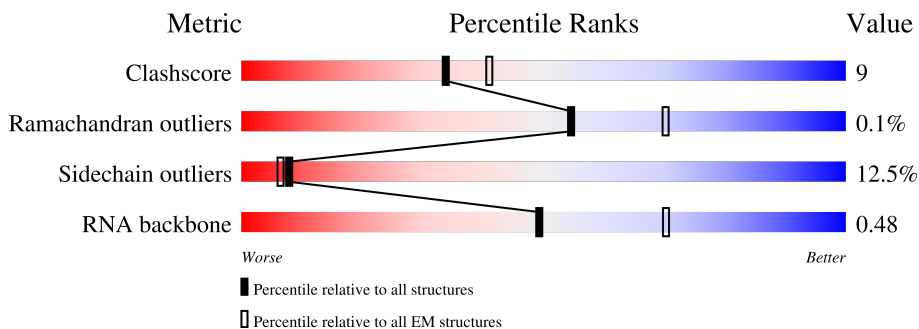
EMDB validation analysis : 0.0.1.dev92
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

1 Overall quality at a glance i

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

The reported resolution of this entry is 3.70 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.














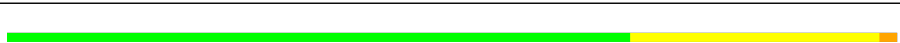

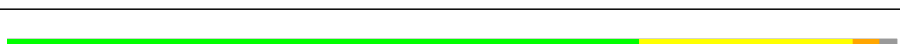



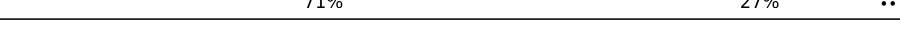
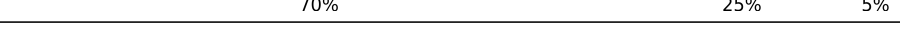
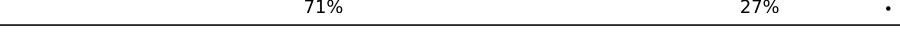





Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	L02	273	69% 26% . .
2	L03	209	72% 25% .
3	L04	201	73% 25% .
4	L05	179	60% 31% 8% .
5	L06	177	65% 31% . .
6	L09	149	60% 70% 28% .
7	L1	234	37% 18% . 43%

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Mol	Chain	Length	Quality of chain
8	L10	165	 18% 49% 25% 5% 21%
9	L11	142	 8% 60% 35% . .
10	L13	142	 71% 28% .
11	L14	123	 73% 23% . .
12	L15	144	 . 70% 25% . .
13	L16	136	 73% 23% .
14	L17	127	 67% 25% . 6%
15	L18	117	 60% 38% . .
16	L19	115	 63% 33% . .
17	L20	118	 71% 27% . .
18	L21	103	 66% 29% 5%
19	L22	110	 70% 28% .
20	L23	100	 . 64% 26% . 7%
21	L24	104	 71% 24% . .
22	L25	94	 72% 24% .
23	L27	85	 . 62% 24% . 12%
24	L28	78	 71% 27% . .
25	L29	63	 70% 25% 5%
26	L30	59	 71% 27% .
27	L31	45	 56% 31% 13%
28	L32	57	 . 77% 16% 5% .
29	L33	55	 58% 25% 7% 9%
30	L34	46	 63% 33% .
31	L35	65	 75% 18% 5% .
32	L36	38	 63% 34% .


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Mol	Chain	Length	Quality of chain
33	23S	2903	56% 37% 7%
34	5S	120	53% 38% 7%
35	TMRN	363	50% 45%
36	16S	1539	51% 41% 8%
37	ATRN	76	74% 25%
38	S02	241	69% 19% 5% 7%
39	S03	233	55% 30% 12%
40	S04	206	54% 40% 6%
41	S05	167	62% 29% 6%
42	S06	135	44% 27% 26%
43	S07	179	60% 23% 16%
44	S08	130	68% 28%
45	S09	130	54% 38% 5%
46	S10	103	53% 35% 7% 5%
47	S11	129	57% 30% 10%
48	S12	124	65% 33%
49	S13	118	71% 23%
50	S14	101	50% 43% 7%
51	S15	89	75% 22%
52	S16	82	66% 29% 5%
53	S17	84	56% 33% 6% 5%
54	S18	75	67% 16% 13%
55	S19	92	54% 29% 14%
56	S20	87	71% 24%
57	S21	71	52% 35% 8%

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Mol	Chain	Length	Quality of chain
58	SMPB	150	 85% 15%

2 Entry composition [i](#)

There are 58 unique types of molecules in this entry. The entry contains 155832 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 protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	L02	271	2082	1288	423	364	7	0	0

- Molecule 2 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	L03	209	1565	979	288	294	4	0	0

- Molecule 3 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	L04	201	1552	974	283	290	5	0	0

- Molecule 4 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	L05	177	1410	899	249	256	6	0	0

- Molecule 5 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	L06	176	1323	832	243	246	2	0	0

- Molecule 6 is a protein called Large ribosomal subunit protein bL9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	L09	149	1111	699	197	214	1	0	0

- Molecule 7 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	L1	134	Total	C	N	O	S	0	0
			1026	645	186	193	2		

- Molecule 8 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	L10	131	Total	C	N	O	S	0	0
			988	625	175	183	5		

- Molecule 9 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	L11	141	Total	C	N	O	S	0	0
			1032	651	179	196	6		

- Molecule 10 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	L13	142	Total	C	N	O	S	0	0
			1129	714	212	199	4		

- Molecule 11 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	L14	122	Total	C	N	O	S	0	0
			938	587	180	165	6		

- Molecule 12 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	L15	143	Total	C	N	O	S	0	0
			1045	649	206	189	1		

- Molecule 13 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	L16	136	Total	C	N	O	S	0	0
			1074	686	205	177	6		

- Molecule 14 is a protein called Large ribosomal subunit protein bL17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	L17	120	960	593	196	166	5	0	0

- Molecule 15 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	L18	116	892	552	178	162		0	0

- Molecule 16 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	L19	114	917	574	179	163	1	0	0

- Molecule 17 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	L20	117	947	604	192	151		0	0

- Molecule 18 is a protein called Ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	L21	103	816	516	153	145	2	0	0

- Molecule 19 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	L22	110	857	532	166	156	3	0	0

- Molecule 20 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	L23	93	738	466	139	131	2	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
21	L24	102	Total	C	N	O	0	0
			779	492	146	141		

- Molecule 22 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	L25	94	Total	C	N	O	S	0	0
			753	479	137	134	3		

- Molecule 23 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	L27	75	Total	C	N	O	S	0	0
			575	356	116	102	1		

- Molecule 24 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	L28	77	Total	C	N	O	S	0	0
			625	388	129	106	2		

- Molecule 25 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	L29	63	Total	C	N	O	S	0	0
			509	313	99	95	2		

- Molecule 26 is a protein called Large ribosomal subunit protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	L30	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 27 is a protein called Large ribosomal subunit protein bL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	L31	45	Total	C	N	O	S	0	0
			351	219	61	65	6		

- Molecule 28 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	L32	56	444	269	94	80	1	0	0

- Molecule 29 is a protein called Large ribosomal subunit protein bL33.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
29	L33	50	409	263	75	71	0	0

- Molecule 30 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	L34	46	377	228	90	57	2	0	0

- Molecule 31 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	L35	64	504	323	105	74	2	0	0

- Molecule 32 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	L36	38	302	185	65	48	4	0	0

- Molecule 33 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
33	23S	2903	62317	27801	11468	20146	2902	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
23S	747	C	U	variant	GB 1036415628

- Molecule 34 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
34	5S	120	2568	1145	471	833	119	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
5S	120	A	U	conflict	GB 1370526515

- Molecule 35 is a RNA chain called TMRN.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
35	TMRN	363	7758	3465	1410	2520	363	0	0

- Molecule 36 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
36	16S	1539	33012	14725	6052	10697	1538	0	0

- Molecule 37 is a RNA chain called A-tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
37	ATRN	76	1621	722	289	534	76	0	0

- Molecule 38 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	S02	225	1756	1111	315	322	8	0	0

- Molecule 39 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	S03	206	1624	1028	305	288	3	0	0

- Molecule 40 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	S04	205	1643	1026	315	298	4	0	0

- Molecule 41 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	S05	157	1156	719	218	213	6	0	0

- Molecule 42 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	S06	100	817	515	148	148	6	0	0

- Molecule 43 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	S07	151	1181	735	227	215	4	0	0

- Molecule 44 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	S08	129	979	616	173	184	6	0	0

- Molecule 45 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	S09	127	1022	634	206	179	3	0	0

- Molecule 46 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	S10	98	786	493	150	142	1	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	S11	116	869	535	173	158	3	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	S12	123	955	590	196	165	4	0	0

- Molecule 49 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	S13	114	883	546	178	156	3	0	0

- Molecule 50 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	S14	100	805	499	164	139	3	0	0

- Molecule 51 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	S15	88	714	439	144	130	1	0	0

- Molecule 52 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	S16	82	649	406	128	114	1	0	0

- Molecule 53 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	S17	80	648	411	121	113	3	0	0

- Molecule 54 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	S18	65	Total	C	N	O	S	0	0
			535	339	100	95	1		

- Molecule 55 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	S19	79	Total	C	N	O	S	0	0
			637	408	120	107	2		

- Molecule 56 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	S20	85	Total	C	N	O	S	0	0
			665	411	137	114	3		

- Molecule 57 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	S21	65	Total	C	N	O	S	0	0
			544	335	117	91	1		

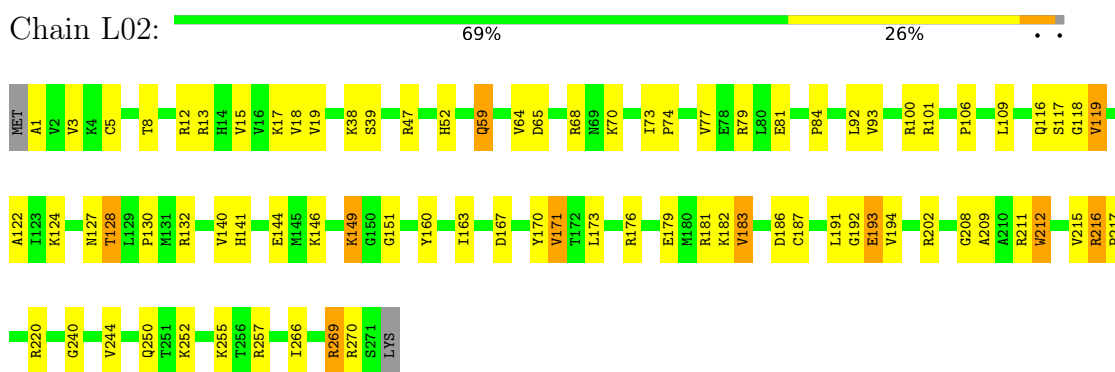
- Molecule 58 is a protein called SsrA-binding protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	SMPB	150	Total	C	N	O	S	0	0
			1209	763	226	216	4		

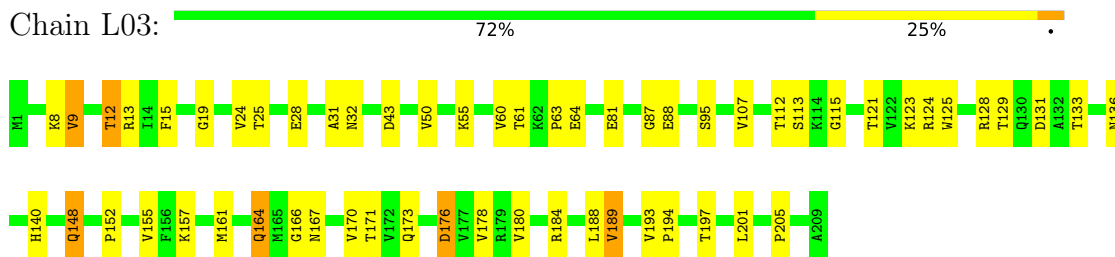
3 Residue-property plots [i](#)

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

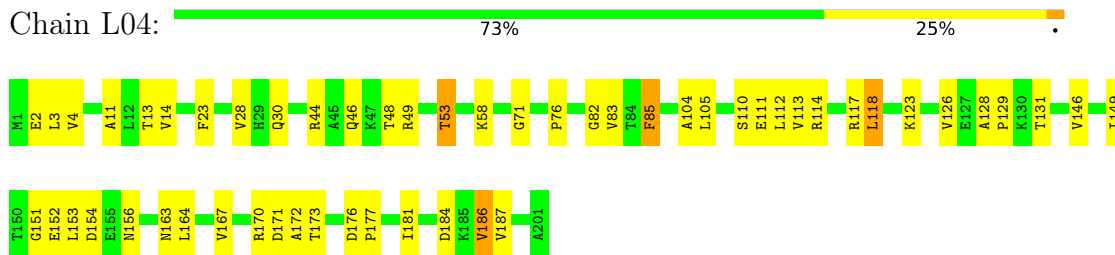
- Molecule 1: 50S ribosomal protein L2



- Molecule 2: 50S ribosomal protein L3

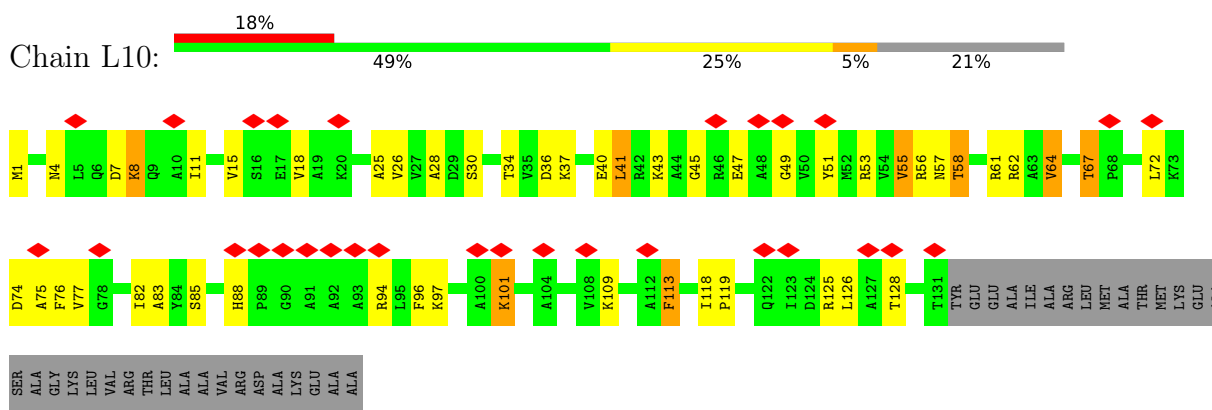


- Molecule 3: 50S ribosomal protein L4

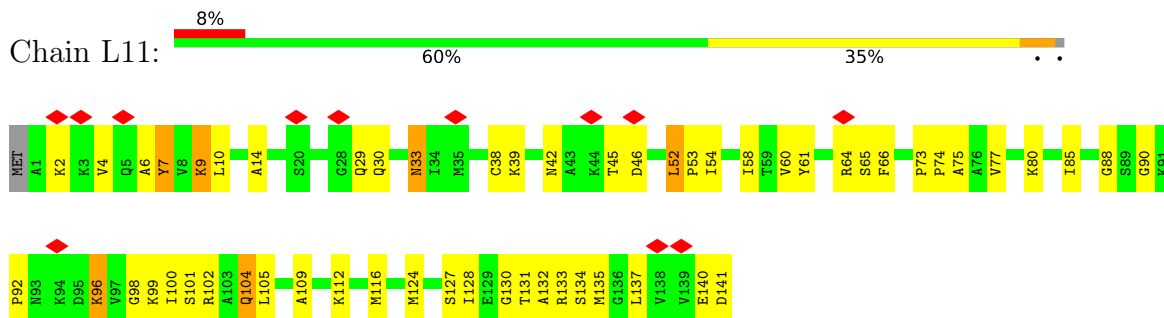


- Molecule 4: 50S ribosomal protein L5

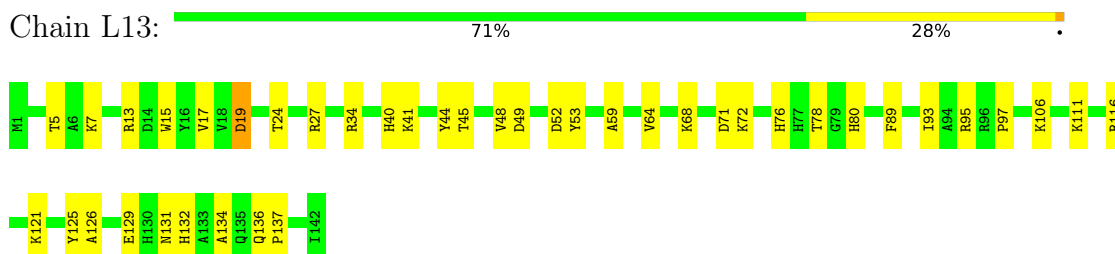




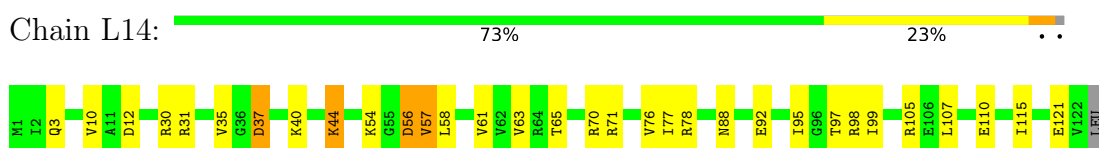
• Molecule 9: 50S ribosomal protein L11



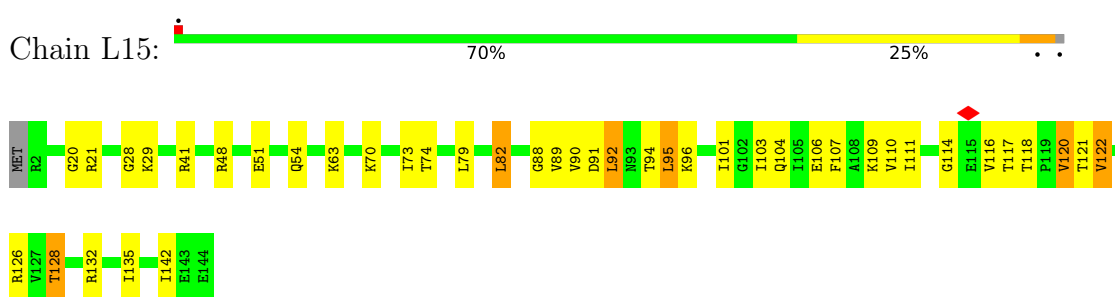
• Molecule 10: 50S ribosomal protein L13



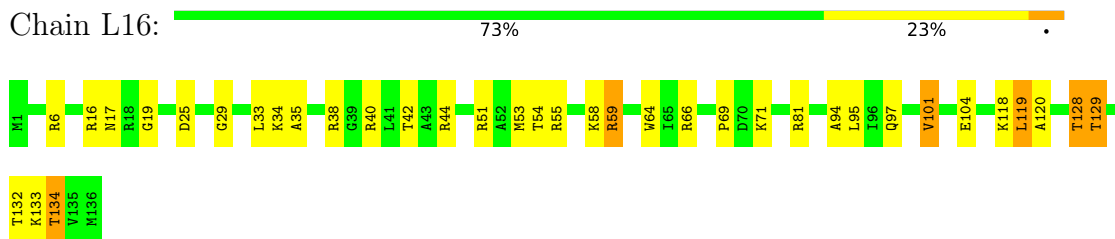
• Molecule 11: 50S ribosomal protein L14



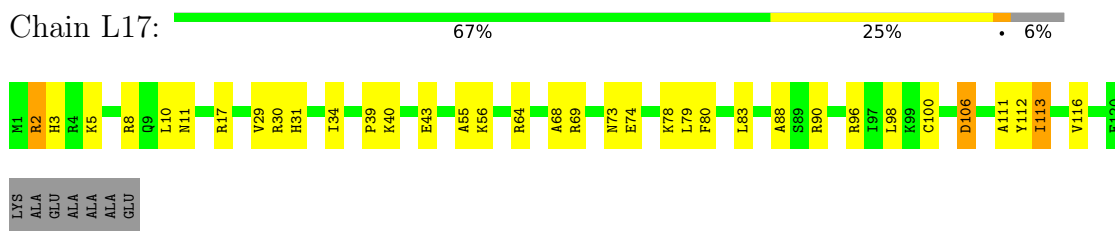
• Molecule 12: 50S ribosomal protein L15



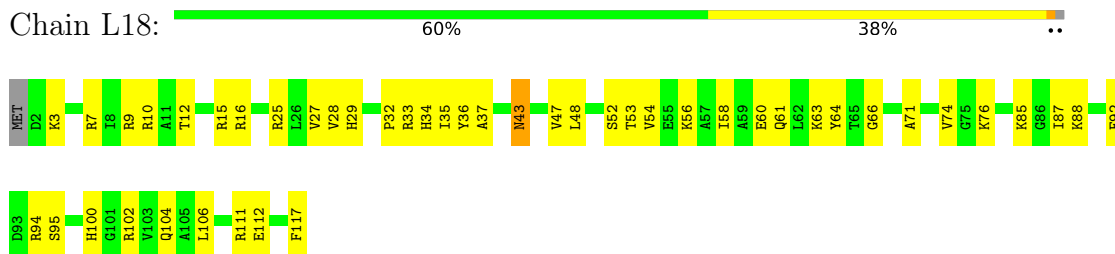
- Molecule 13: 50S ribosomal protein L16



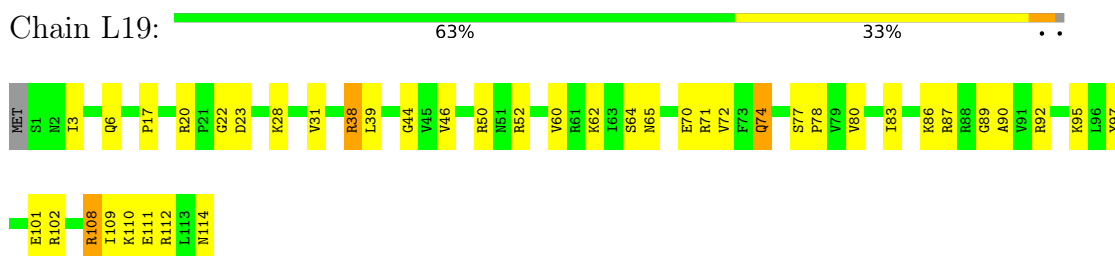
- Molecule 14: Large ribosomal subunit protein bL17



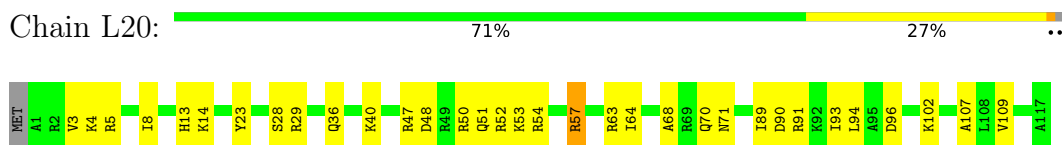
- Molecule 15: 50S ribosomal protein L18



- Molecule 16: 50S ribosomal protein L19

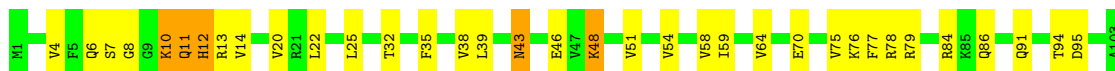


- Molecule 17: 50S ribosomal protein L20



- Molecule 18: Ribosomal protein L21

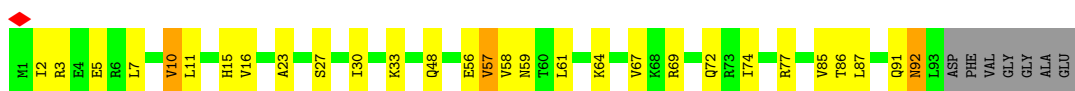




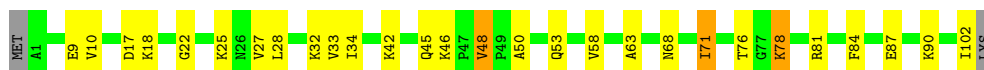
• Molecule 19: 50S ribosomal protein L22



• Molecule 20: 50S ribosomal protein L23



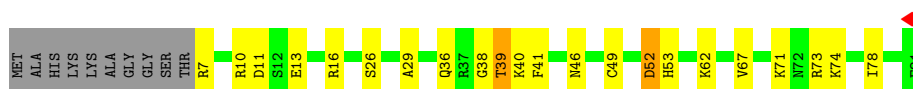
• Molecule 21: 50S ribosomal protein L24



• Molecule 22: 50S ribosomal protein L25



• Molecule 23: 50S ribosomal protein L27



• Molecule 24: 50S ribosomal protein L28



• Molecule 25: 50S ribosomal protein L29





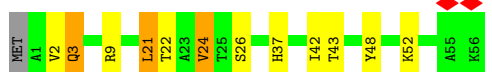
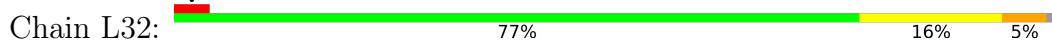
- Molecule 26: Large ribosomal subunit protein uL30



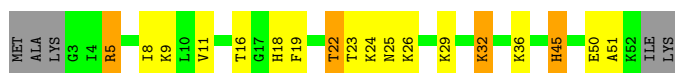
- Molecule 27: Large ribosomal subunit protein bL31



- Molecule 28: 50S ribosomal protein L32



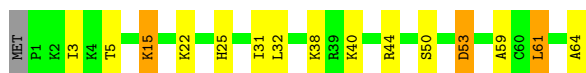
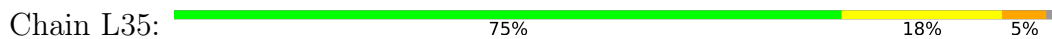
- Molecule 29: Large ribosomal subunit protein bL33



- Molecule 30: 50S ribosomal protein L34



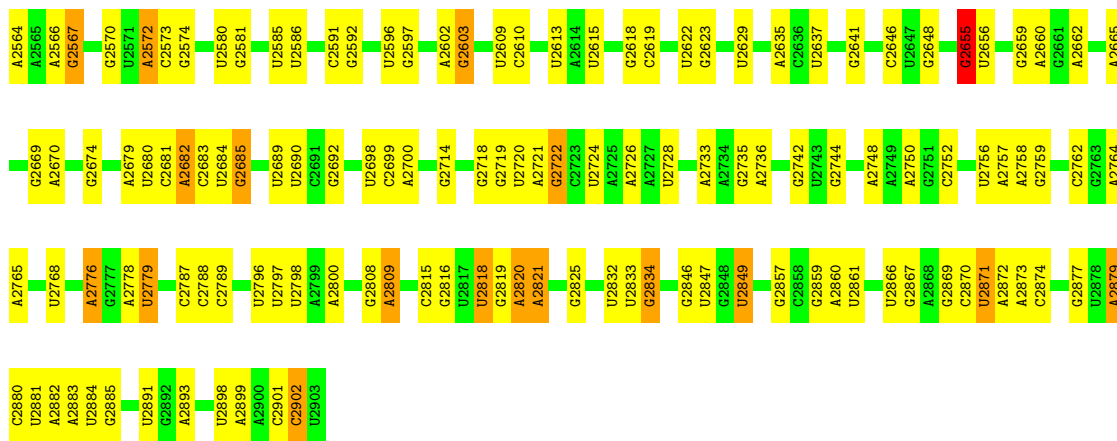
- Molecule 31: 50S ribosomal protein L35



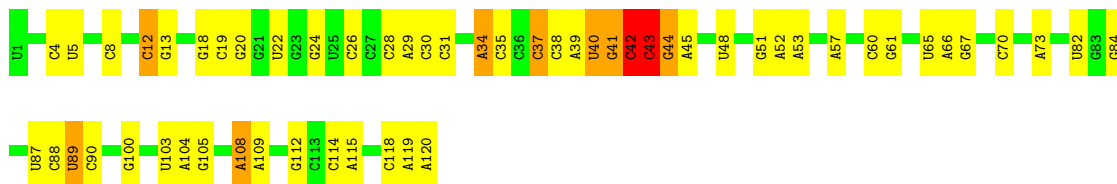
- Molecule 32: 50S ribosomal protein L36



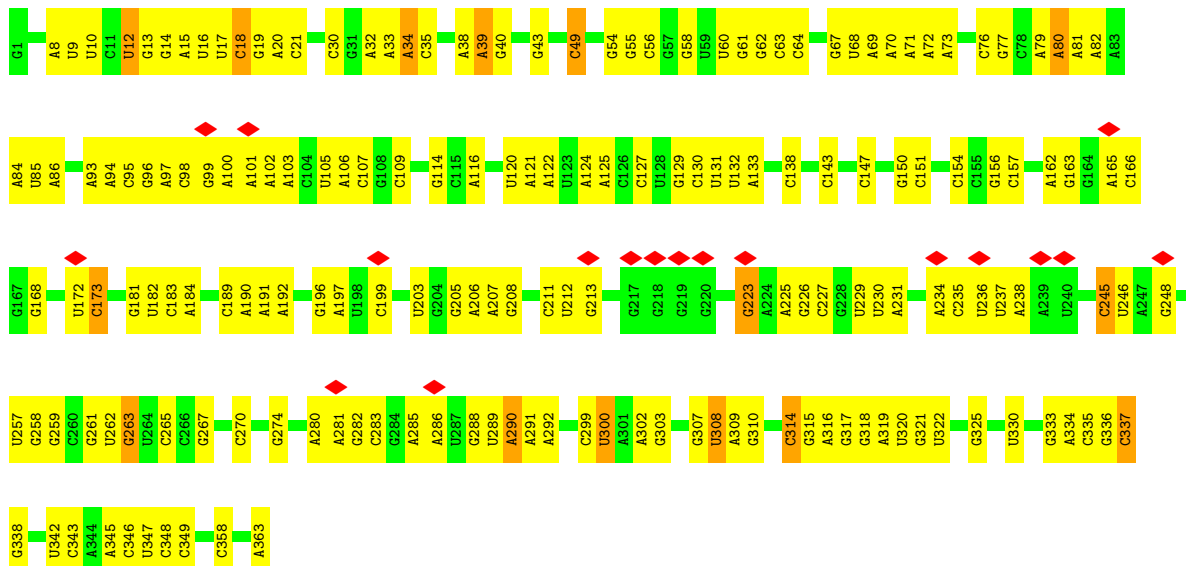
U1174	A1275	A1378	A1469	A1566	G1660	A1783	U1882	U1971	U2074	G2144	G2218	G2304	G2385	U2479
A1175	C1278	U1379	A1470	G1567	A1664	A1784	U1883	G1972	U2075	C2145	U2219	U2305	G2480	C2480
U1176	G1279	G1380	G1475	A1568	A1666	A1786	G1884	G1980	U2076	C2146	U2220	U2306	G2481	C2481
G1177	G1283	A1383	G1478	A1570	G1667	A1787	U1889	U1982	A2147	U2148	G2221	G2307	A2482	C2482
C1178	A1286	A1384	G1482	A1571	A1669	C1788	A1889	G1983	C2078	U2149	G2223	G2308	U2483	C2483
G1179	A1286	A1385	G1483	C1574	A1674	A1791	G1891	G1983	U2079	C2150	G2224	A2309	C2484	C2484
U1180	U1294	A1386	G1484	U1578	C1675	U1796	G1891	U1991	G2083	U2151	A2225	C2310	G2486	C2486
G1182	U1294	A1388	G1488	U1579	C1676	G1797	U1898	U1991	C2084	G2152	G2226	U2312	U2489	C2489
G1186	U1297	G1388	C1488	A1580	C1677	G1797	G1992	U1993	U2085	U2155	U2233	U2313	G2494	C2494
U1187	C1297	A1392	C1489	A1580	A1677	U1798	A1899	U1993	U2086	U2156	G2234	A2314	C2495	C2495
A1188	G1299	A1393	A1490	G1581	A1678	G1799	A1900	C1996	G2087	G2157	G2235	G2315	C2496	C2496
U1189	G1300	U1394	G1491	U1584	A1678	C1799	A1901	C1997	A2088	A2158	U2236	G2316	G2497	C2497
G1190	A1301	A1395	G1492	U1584	U1693	C1800	G1906	C1997	U2092	A2159	G2237	A2317	C2498	C2498
U1199	A1302	G1401	U1497	G1587	U1709	A1802	G1907	C1998	G2093	G2162	G2238	U2318	A2406	C2498
G1206	A1305	U1402	U1497	G1588	U1709	A1802	C1908	C1999	U2093	A2163	G2239	U2319	U2408	C2498
G1212	C1306	A1403	G1501	U1589	G1715	A1807	G1909	G2002	C2096	C2164	G2240	U2320	U2409	C2498
G1218	A1307	A1404	G1504	U1590	U1716	A1808	G1910	G2010	A2097	C2165	A2241	U2321	G2410	C2498
C1221	A1310	G1406	A1504	U1591	U1720	A1809	U1911	G2011	U2099	U2166	G2242	C2326	A2411	C2498
U1222	G1310	U1407	A1509	U1594	G1724	A1814	U1912	A2011	G2100	U2167	U2243	A2327	C2420	C2498
G1223	U1313	G1408	G1510	U1594	U1724	A1816	U1915	A2014	A2101	A2170	U2244	G2330	U2420	C2498
U1224	U1314	U1412	U1513	A1597	U1729	G1817	A1918	A2015	G2102	A2171	G2250	G2331	U2423	C2498
U1225	C1315	C1413	G1514	A1598	U1730	U1818	A1919	A2015	C2104	U2172	C2258	C2332	C2424	C2498
G1226	C1319	C1414	G1515	G1601	G1731	A1819	G1920	A2020	G2107	A2173	G2259	A2333	A2425	C2498
A1226	C1320	C1415	G1516	G1602	C1732	A1820	G1921	C2021	G2110	C2174	C2263	U2334	A2426	C2498
G1227	A1321	G1416	A1522	C1607	C1733	A1822	G1922	C2022	G2111	A2175	C2264	A2335	G2427	C2498
U1231	A1322	U1419	U1524	A1608	G1734	U1827	U1923	C2023	G2112	C2177	U2265	C2339	G2428	C2498
U1234	C1323	A1420	A1525	A1608	A1735	U1827	G1929	A2030	G2113	C2178	A2266	G2340	G2429	C2498
G1235	G1331	G1427	A1527	C1611	U1736	U1828	G1930	A2031	A2114	C2179	A2267	A2341	A2430	C2498
G1236	G1332	G1428	G1527	C1612	G1737	U1829	G1931	A2032	A2115	C2180	A2268	U2342	A2435	C2498
A1237	G1333	G1429	G1530	C1613	U1738	A1829	U1932	A2033	A2116	A2182	G2271	U2343	A2439	C2498
C1251	G1334	G1430	C1531	C1614	A1739	U1837	G1933	A2034	A2117	A2184	U2272	U2344	G2440	C2498
G1252	G1335	A1433	C1532	C1615	G1740	U1837	U1936	G2035	U2118	U2185	C2179	A2346	U2441	C2498
A1253	G1336	G1435	A1533	C1616	A1744	U1842	A1937	U2039	A2119	U2186	C2180	U2347	G2442	C2498
A1254	G1337	G1436	C1534	C1617	A1754	C1844	A1938	G2040	G2120	U2187	A2278	U2348	C2443	C2498
U1255	U1344	U1438	C1535	A1618	A1755	U1847	U1943	C2043	G2121	U2188	G2279	U2349	G2444	C2498
G1256	C1345	A1439	G1537	C1619	A1758	U1851	U1944	C2044	G2122	U2189	G2283	C2350	G2445	C2498
C1257	U1352	A1447	U1539	A1620	C1760	U1852	G1945	A2052	G2123	A2190	A2284	G2351	G2446	C2498
G1259	G1356	G1448	U1540	C1621	A1764	U1854	U1955	G2055	G2124	G2190	A2285	G2352	G2447	C2498
A1262	G1360	G1449	A1544	C1622	U1769	U1857	A1960	G2056	U2131	U2202	A2286	G2353	A2448	C2498
A1265	G1360	G1450	A1548	C1623	G1770	G1880	C1961	A2060	U2132	U2203	A2287	G2354	U2449	C2498
A1268	A1365	G1451	A1549	C1624	A1773	U1884	U1962	G2061	G2133	G2204	A2288	A2369	A2451	C2498
A1269	A1453	G1452	A1554	C1625	A1774	U1864	U1963	A2062	A2134	U2205	A2289	U2372	U2457	C2498
C1270	G1368	U1458	U1554	C1626	C1774	U1865	U1964	A2063	A2135	C2207	A2290	U2373	A2469	C2498
G1271	U1461	U1559	U1559	C1627	U1775	A1866	U1965	C2069	G2136	G2209	G2289	C2379	G2472	C2498
U1272	U1375	G1560	G1565	C1628	U1779	A1870	U1967	A2070	U2139	G2210	G2290	C2380	U2473	C2498
A1274	U1468	U1468	C1565	C1629	U1781	A1871	U1968	A2071	G2140	A2211	A2291	U2381	U2474	C2498
					U1782	G1875	A1969	C2072	G2141	A2212	C2300	G2382	G2475	C2498
							A1970	C2073	A2142	G2217	C2301	U2384	A2476	C2498
									C2143			U2384	A2478	C2498



• Molecule 34: 5S ribosomal RNA

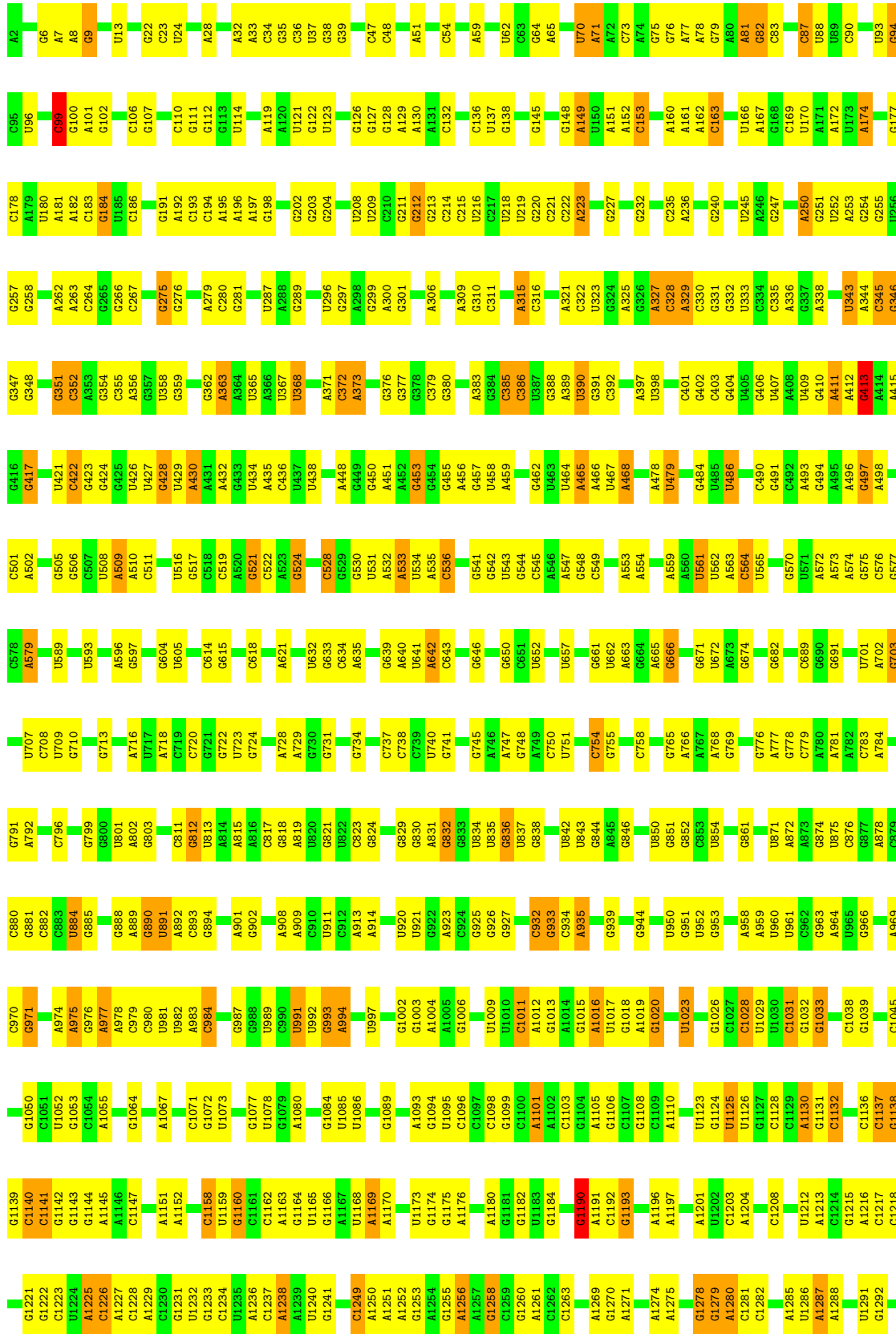


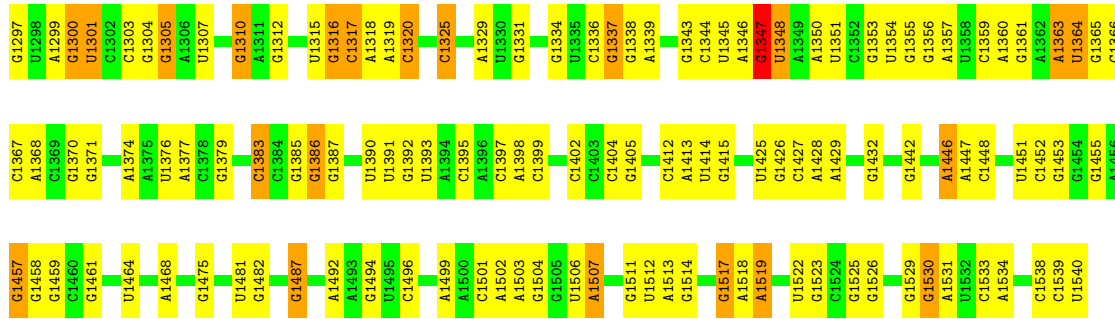
• Molecule 35: TMRN



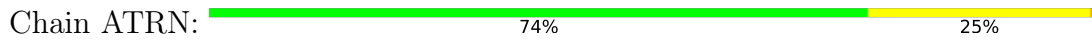
• Molecule 36: 16S ribosomal RNA



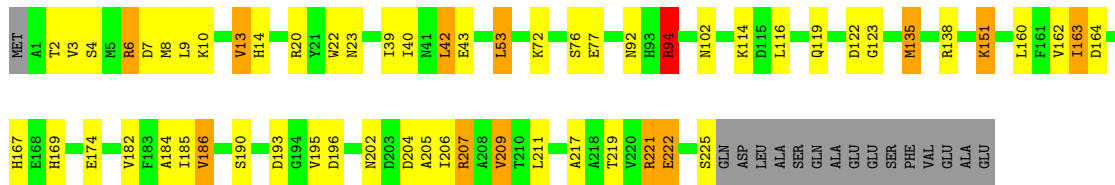




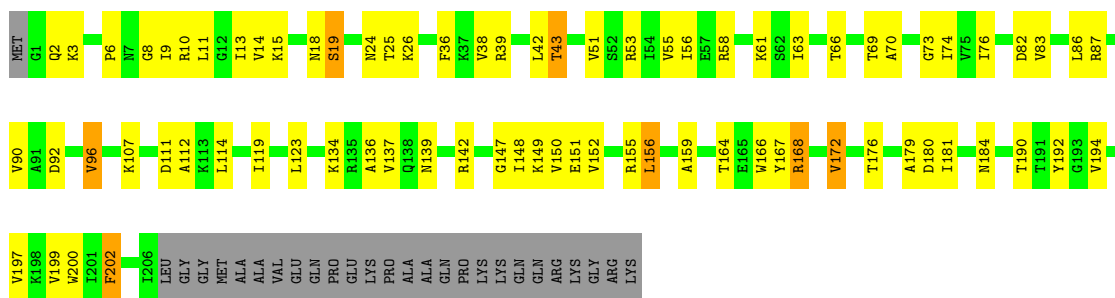
• Molecule 37: A-tRNA



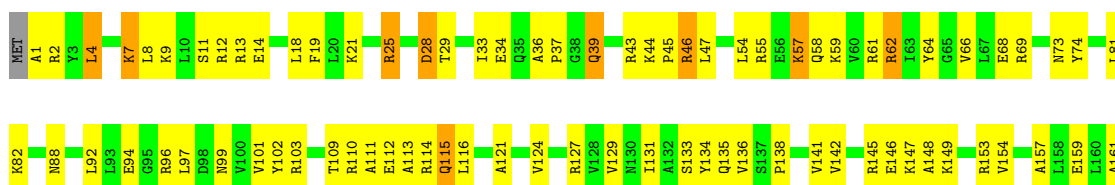
• Molecule 38: 30S ribosomal protein S2



• Molecule 39: 30S ribosomal protein S3

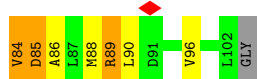
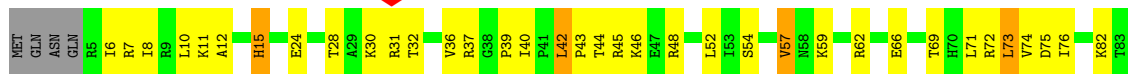


• Molecule 40: 30S ribosomal protein S4

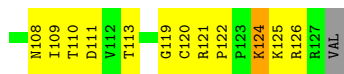




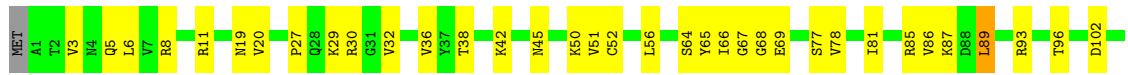
• Molecule 46: 30S ribosomal protein S10



• Molecule 47: 30S ribosomal protein S11



• Molecule 48: 30S ribosomal protein S12

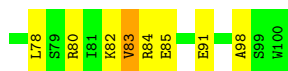


• Molecule 49: 30S ribosomal protein S13

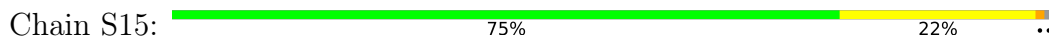


• Molecule 50: Small ribosomal subunit protein uS14





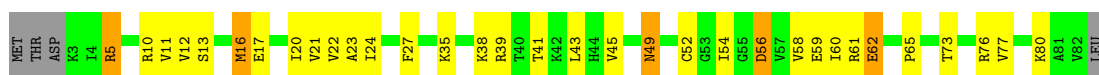
- Molecule 51: Small ribosomal subunit protein uS15



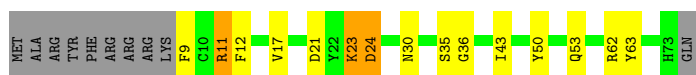
- Molecule 52: 30S ribosomal protein S16



- Molecule 53: Small ribosomal subunit protein uS17



- Molecule 54: 30S ribosomal protein S18



- Molecule 55: 30S ribosomal protein S19

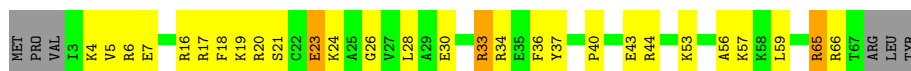


- Molecule 56: 30S ribosomal protein S20



- Molecule 57: 30S ribosomal protein S21

Chain S21:  52% 35% 8%



• Molecule 58: SsrA-binding protein

Chain SMPB:  85% 15%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	5956	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	29.9	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1100	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	24.823	Depositor
Minimum map value	-10.783	Depositor
Average map value	0.006	Depositor
Map value standard deviation	1.735	Depositor
Recommended contour level	3.0	Depositor
Map size (Å)	487.2, 487.2, 487.2	wwPDB
Map dimensions	560, 560, 560	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.87, 0.87, 0.87	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	L02	0.32	0/2121	0.60	0/2852
2	L03	0.31	0/1586	0.55	0/2134
3	L04	0.27	0/1571	0.52	0/2113
4	L05	0.29	0/1434	0.63	0/1926
5	L06	0.28	0/1343	0.54	0/1816
6	L09	0.27	0/1122	0.53	0/1515
7	L1	0.26	0/1033	0.56	0/1387
8	L10	0.29	0/1001	0.61	0/1350
9	L11	0.29	0/1046	0.55	0/1410
10	L13	0.30	0/1152	0.53	0/1551
11	L14	0.31	0/947	0.60	0/1268
12	L15	0.29	0/1054	0.63	0/1403
13	L16	0.31	0/1093	0.59	0/1460
14	L17	0.28	0/973	0.63	0/1301
15	L18	0.26	0/902	0.61	0/1209
16	L19	0.30	0/929	0.57	0/1242
17	L20	0.30	0/960	0.51	0/1278
18	L21	0.30	0/829	0.57	0/1107
19	L22	0.28	0/864	0.56	0/1156
20	L23	0.28	0/744	0.54	0/994
21	L24	0.29	0/787	0.58	0/1051
22	L25	0.30	0/766	0.54	0/1025
23	L27	0.31	0/582	0.56	0/769
24	L28	0.29	0/635	0.59	0/848
25	L29	0.26	0/510	0.56	0/677
26	L30	0.26	0/453	0.56	0/605
27	L31	0.31	0/358	0.69	0/480
28	L32	0.27	0/450	0.60	0/599
29	L33	0.29	0/416	0.53	0/554
30	L34	0.28	0/380	0.67	0/498
31	L35	0.30	0/513	0.60	0/676
32	L36	0.30	0/303	0.57	0/397
33	23S	0.49	0/69796	0.94	95/108888 (0.1%)
34	5S	0.43	0/2872	1.05	14/4479 (0.3%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
35	TMRN	0.37	0/8681	1.05	39/13532 (0.3%)
36	16S	0.42	0/36963	0.94	47/57662 (0.1%)
37	ATRN	0.44	0/1810	0.97	1/2820 (0.0%)
38	S02	0.27	0/1787	0.53	0/2408
39	S03	0.27	0/1651	0.54	0/2225
40	S04	0.28	0/1665	0.59	1/2227 (0.0%)
41	S05	0.29	0/1169	0.59	0/1573
42	S06	0.28	0/835	0.60	1/1128 (0.1%)
43	S07	0.27	0/1195	0.56	0/1602
44	S08	0.29	0/989	0.53	0/1326
45	S09	0.28	0/1034	0.67	0/1375
46	S10	0.25	0/796	0.61	0/1077
47	S11	0.29	0/885	0.59	0/1195
48	S12	0.31	0/969	0.67	0/1300
49	S13	0.27	0/892	0.61	0/1193
50	S14	0.27	0/817	0.59	0/1088
51	S15	0.26	0/722	0.59	0/964
52	S16	0.27	0/659	0.62	1/884 (0.1%)
53	S17	0.30	0/657	0.59	0/881
54	S18	0.28	0/544	0.58	0/731
55	S19	0.28	0/652	0.55	0/877
56	S20	0.25	0/671	0.51	0/888
57	S21	0.30	0/550	0.70	0/728
58	SMPB	0.31	0/1231	0.62	0/1655
All	All	0.41	0/169349	0.87	199/253357 (0.1%)

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
4	L05	0	1
11	L14	0	1
27	L31	0	1
41	S05	0	2
All	All	0	5

There are no bond length outliers.

The worst 5 of 199 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
36	16S	1158	C	C2-N1-C1'	8.98	128.68	118.80
34	5S	12	C	N1-C2-O2	8.93	124.26	118.90
33	23S	2207	C	N3-C2-O2	-8.51	115.94	121.90
33	23S	1064	C	N1-C2-O2	8.51	124.00	118.90
33	23S	62	U	N1-C2-O2	8.47	128.73	122.80

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	L05	61	GLY	Peptide
11	L14	92	GLU	Peptide
27	L31	1	MET	Peptide
41	S05	120	HIS	Peptide
41	S05	121	ASN	Peptide

5.2 Too-close contacts [i](#)

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	L02	2082	0	2157	55	0
2	L03	1565	0	1616	32	0
3	L04	1552	0	1619	28	0
4	L05	1410	0	1447	46	0
5	L06	1323	0	1374	32	0
6	L09	1111	0	1148	21	0
7	L1	1026	0	1092	25	0
8	L10	988	0	1025	26	0
9	L11	1032	0	1088	37	0
10	L13	1129	0	1162	25	0
11	L14	938	0	1012	19	0
12	L15	1045	0	1117	27	0
13	L16	1074	0	1157	23	0
14	L17	960	0	1000	24	0
15	L18	892	0	923	27	0
16	L19	917	0	965	35	0
17	L20	947	0	1022	24	0
18	L21	816	0	839	18	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
19	L22	857	0	922	19	0
20	L23	738	0	807	11	0
21	L24	779	0	834	13	0
22	L25	753	0	780	11	0
23	L27	575	0	592	16	0
24	L28	625	0	655	12	0
25	L29	509	0	543	12	0
26	L30	449	0	491	7	0
27	L31	351	0	350	16	0
28	L32	444	0	461	8	0
29	L33	409	0	440	10	0
30	L34	377	0	418	15	0
31	L35	504	0	574	12	0
32	L36	302	0	343	8	0
33	23S	62317	0	31346	666	0
34	5S	2568	0	1303	30	0
35	TMRN	7758	0	0	0	0
36	16S	33012	0	16618	453	0
37	ATRN	1621	0	0	0	0
38	S02	1756	0	1787	28	0
39	S03	1624	0	1699	38	0
40	S04	1643	0	1710	56	0
41	S05	1156	0	1199	24	0
42	S06	817	0	808	26	0
43	S07	1181	0	1240	20	0
44	S08	979	0	1034	24	0
45	S09	1022	0	1070	43	0
46	S10	786	0	828	32	0
47	S11	869	0	878	29	0
48	S12	955	0	1019	28	0
49	S13	883	0	944	16	0
50	S14	805	0	847	36	0
51	S15	714	0	737	10	0
52	S16	649	0	666	19	0
53	S17	648	0	691	21	0
54	S18	535	0	552	9	0
55	S19	637	0	665	18	0
56	S20	665	0	714	14	0
57	S21	544	0	579	21	0
58	SMPB	1209	0	0	0	0
All	All	155832	0	98907	2005	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 9.

The worst 5 of 2005 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)
36:16S:978:A:N6	36:16S:1360:A:C2	2.19	1.10
33:23S:2104:C:N4	33:23S:2185:U:H3	1.51	1.06
36:16S:372:C:N4	36:16S:389:A:H62	1.53	1.05
36:16S:978:A:C2	36:16S:1316:G:N2	2.26	1.04
33:23S:1040:A:N6	33:23S:1115:G:H1	1.56	1.04

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	
1	L02	269/273 (98%)	243 (90%)	26 (10%)	0	100	100
2	L03	207/209 (99%)	197 (95%)	10 (5%)	0	100	100
3	L04	199/201 (99%)	187 (94%)	11 (6%)	1 (0%)	29	66
4	L05	175/179 (98%)	152 (87%)	23 (13%)	0	100	100
5	L06	174/177 (98%)	162 (93%)	12 (7%)	0	100	100
6	L09	147/149 (99%)	129 (88%)	17 (12%)	1 (1%)	22	59
7	L1	130/234 (56%)	117 (90%)	13 (10%)	0	100	100
8	L10	129/165 (78%)	100 (78%)	28 (22%)	1 (1%)	19	56
9	L11	139/142 (98%)	118 (85%)	21 (15%)	0	100	100
10	L13	140/142 (99%)	132 (94%)	8 (6%)	0	100	100
11	L14	120/123 (98%)	106 (88%)	14 (12%)	0	100	100
12	L15	141/144 (98%)	125 (89%)	16 (11%)	0	100	100
13	L16	134/136 (98%)	125 (93%)	9 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
14	L17	118/127 (93%)	106 (90%)	12 (10%)	0	100	100
15	L18	114/117 (97%)	109 (96%)	5 (4%)	0	100	100
16	L19	112/115 (97%)	105 (94%)	7 (6%)	0	100	100
17	L20	115/118 (98%)	114 (99%)	1 (1%)	0	100	100
18	L21	101/103 (98%)	89 (88%)	11 (11%)	1 (1%)	15	51
19	L22	108/110 (98%)	98 (91%)	10 (9%)	0	100	100
20	L23	91/100 (91%)	85 (93%)	6 (7%)	0	100	100
21	L24	100/104 (96%)	84 (84%)	16 (16%)	0	100	100
22	L25	92/94 (98%)	87 (95%)	5 (5%)	0	100	100
23	L27	73/85 (86%)	69 (94%)	4 (6%)	0	100	100
24	L28	75/78 (96%)	72 (96%)	3 (4%)	0	100	100
25	L29	61/63 (97%)	56 (92%)	5 (8%)	0	100	100
26	L30	56/59 (95%)	53 (95%)	3 (5%)	0	100	100
27	L31	43/45 (96%)	35 (81%)	8 (19%)	0	100	100
28	L32	54/57 (95%)	52 (96%)	2 (4%)	0	100	100
29	L33	48/55 (87%)	45 (94%)	3 (6%)	0	100	100
30	L34	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
31	L35	62/65 (95%)	55 (89%)	6 (10%)	1 (2%)	9	43
32	L36	36/38 (95%)	31 (86%)	5 (14%)	0	100	100
38	S02	223/241 (92%)	212 (95%)	10 (4%)	1 (0%)	34	69
39	S03	204/233 (88%)	195 (96%)	9 (4%)	0	100	100
40	S04	203/206 (98%)	180 (89%)	23 (11%)	0	100	100
41	S05	155/167 (93%)	138 (89%)	17 (11%)	0	100	100
42	S06	98/135 (73%)	81 (83%)	17 (17%)	0	100	100
43	S07	149/179 (83%)	141 (95%)	8 (5%)	0	100	100
44	S08	127/130 (98%)	122 (96%)	5 (4%)	0	100	100
45	S09	125/130 (96%)	107 (86%)	18 (14%)	0	100	100
46	S10	96/103 (93%)	84 (88%)	12 (12%)	0	100	100
47	S11	114/129 (88%)	98 (86%)	16 (14%)	0	100	100
48	S12	121/124 (98%)	100 (83%)	21 (17%)	0	100	100
49	S13	112/118 (95%)	101 (90%)	11 (10%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
50	S14	98/101 (97%)	88 (90%)	10 (10%)	0	100	100
51	S15	86/89 (97%)	73 (85%)	12 (14%)	1 (1%)	13	48
52	S16	80/82 (98%)	71 (89%)	9 (11%)	0	100	100
53	S17	78/84 (93%)	65 (83%)	13 (17%)	0	100	100
54	S18	63/75 (84%)	60 (95%)	3 (5%)	0	100	100
55	S19	77/92 (84%)	70 (91%)	7 (9%)	0	100	100
56	S20	83/87 (95%)	80 (96%)	3 (4%)	0	100	100
57	S21	63/71 (89%)	42 (67%)	21 (33%)	0	100	100
58	SMPB	148/150 (99%)	124 (84%)	23 (16%)	1 (1%)	22	59
All	All	6110/6579 (93%)	5513 (90%)	589 (10%)	8 (0%)	54	83

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
8	L10	118	ILE
31	L35	31	ILE
58	SMPB	81	VAL
38	S02	94	ARG
3	L04	83	VAL

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	L02	216/218 (99%)	197 (91%)	19 (9%)	10	38
2	L03	164/164 (100%)	145 (88%)	19 (12%)	5	27
3	L04	165/165 (100%)	152 (92%)	13 (8%)	12	42
4	L05	148/150 (99%)	121 (82%)	27 (18%)	1	11
5	L06	137/138 (99%)	118 (86%)	19 (14%)	3	20
6	L09	114/114 (100%)	101 (89%)	13 (11%)	5	27
7	L1	110/181 (61%)	91 (83%)	19 (17%)	2	12

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
8	L10	100/123 (81%)	83 (83%)	17 (17%)	2	13
9	L11	109/110 (99%)	95 (87%)	14 (13%)	4	23
10	L13	116/116 (100%)	110 (95%)	6 (5%)	23	55
11	L14	103/104 (99%)	89 (86%)	14 (14%)	3	21
12	L15	102/103 (99%)	91 (89%)	11 (11%)	6	29
13	L16	109/109 (100%)	98 (90%)	11 (10%)	7	31
14	L17	100/103 (97%)	95 (95%)	5 (5%)	24	55
15	L18	86/87 (99%)	77 (90%)	9 (10%)	7	30
16	L19	99/100 (99%)	91 (92%)	8 (8%)	11	41
17	L20	89/90 (99%)	81 (91%)	8 (9%)	9	37
18	L21	84/84 (100%)	68 (81%)	16 (19%)	1	9
19	L22	93/93 (100%)	89 (96%)	4 (4%)	29	58
20	L23	80/84 (95%)	63 (79%)	17 (21%)	1	7
21	L24	83/85 (98%)	71 (86%)	12 (14%)	3	18
22	L25	78/78 (100%)	66 (85%)	12 (15%)	2	17
23	L27	57/63 (90%)	54 (95%)	3 (5%)	22	54
24	L28	67/68 (98%)	61 (91%)	6 (9%)	9	37
25	L29	55/55 (100%)	49 (89%)	6 (11%)	6	29
26	L30	48/49 (98%)	44 (92%)	4 (8%)	11	40
27	L31	42/42 (100%)	29 (69%)	13 (31%)	0	2
28	L32	47/48 (98%)	41 (87%)	6 (13%)	4	23
29	L33	45/49 (92%)	36 (80%)	9 (20%)	1	8
30	L34	38/38 (100%)	34 (90%)	4 (10%)	7	30
31	L35	51/52 (98%)	47 (92%)	4 (8%)	12	42
32	L36	34/34 (100%)	30 (88%)	4 (12%)	5	26
38	S02	186/199 (94%)	159 (86%)	27 (14%)	3	18
39	S03	170/190 (90%)	144 (85%)	26 (15%)	2	17
40	S04	172/173 (99%)	139 (81%)	33 (19%)	1	9
41	S05	119/126 (94%)	96 (81%)	23 (19%)	1	9
42	S06	87/116 (75%)	79 (91%)	8 (9%)	9	36
43	S07	124/147 (84%)	110 (89%)	14 (11%)	6	28

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
44	S08	104/105 (99%)	96 (92%)	8 (8%)	13	43
45	S09	105/107 (98%)	91 (87%)	14 (13%)	4	22
46	S10	86/90 (96%)	76 (88%)	10 (12%)	5	27
47	S11	89/99 (90%)	81 (91%)	8 (9%)	9	37
48	S12	103/104 (99%)	97 (94%)	6 (6%)	20	52
49	S13	92/96 (96%)	82 (89%)	10 (11%)	6	29
50	S14	83/84 (99%)	68 (82%)	15 (18%)	1	11
51	S15	76/77 (99%)	68 (90%)	8 (10%)	7	30
52	S16	65/65 (100%)	56 (86%)	9 (14%)	3	21
53	S17	74/78 (95%)	64 (86%)	10 (14%)	4	21
54	S18	56/65 (86%)	48 (86%)	8 (14%)	3	19
55	S19	70/79 (89%)	60 (86%)	10 (14%)	3	19
56	S20	65/66 (98%)	57 (88%)	8 (12%)	4	24
57	S21	55/61 (90%)	48 (87%)	7 (13%)	4	23
58	SMPB	125/125 (100%)	103 (82%)	22 (18%)	2	12
All	All	5075/5349 (95%)	4439 (88%)	636 (12%)	8	23

5 of 636 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
42	S06	14	GLN
53	S17	20	ILE
43	S07	86	VAL
42	S06	10	VAL
47	S11	85	VAL

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

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
33	23S	2902/2903 (99%)	618 (21%)	14 (0%)
34	5S	119/120 (99%)	29 (24%)	1 (0%)
35	TMRN	362/363 (99%)	168 (46%)	13 (3%)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
36	16S	1538/1539 (99%)	321 (20%)	5 (0%)
37	ATRN	75/76 (98%)	20 (26%)	1 (1%)
All	All	4996/5001 (99%)	1156 (23%)	34 (0%)

5 of 1156 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
33	23S	10	A
33	23S	12	U
33	23S	15	G
33	23S	23	G
33	23S	34	U

5 of 34 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
36	16S	70	U
36	16S	890	G
36	16S	1347	G
33	23S	2655	G
33	23S	2391	G

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

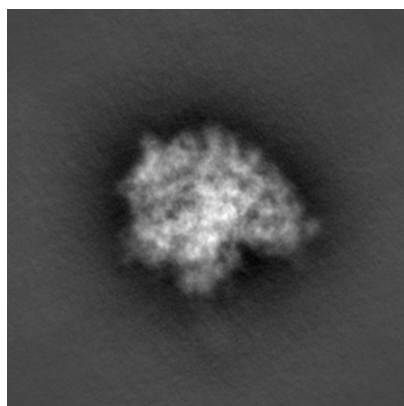
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-43491. These allow visual inspection of the internal detail of the map and identification of artifacts.

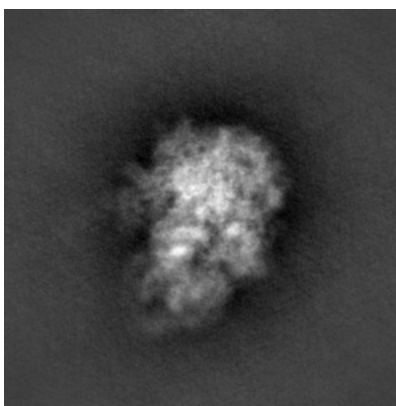
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

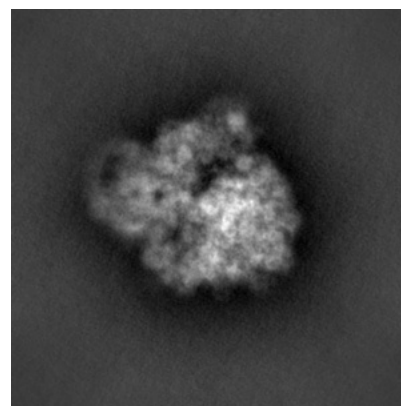
6.1.1 Primary map



X

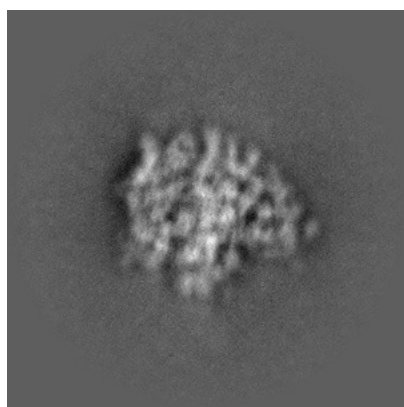


Y

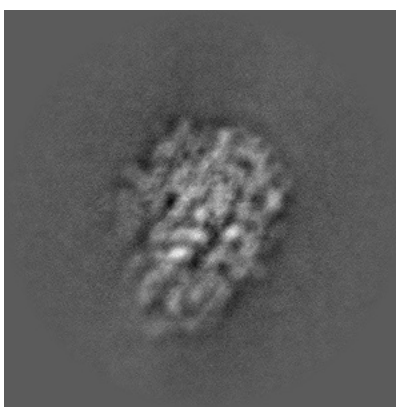


Z

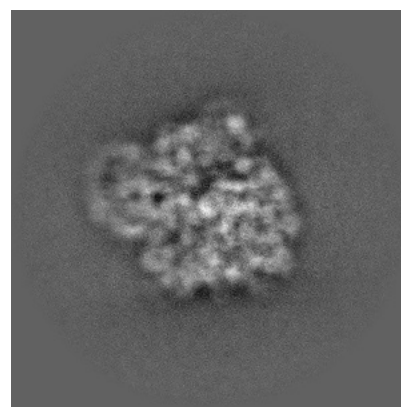
6.1.2 Raw map



X



Y

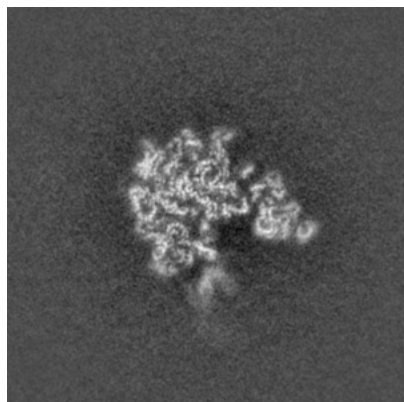


Z

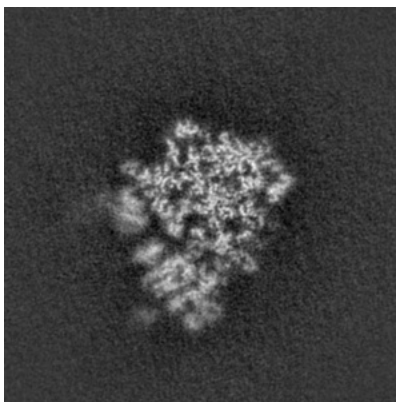
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

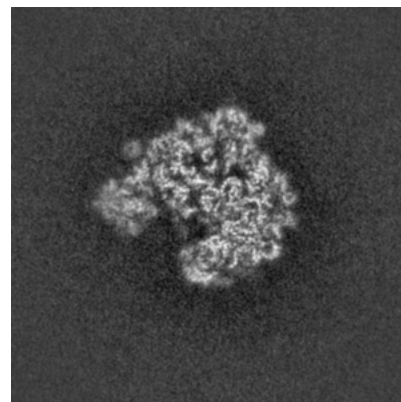
6.2.1 Primary map



X Index: 280

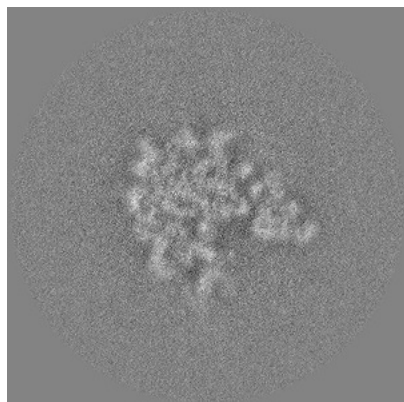


Y Index: 280

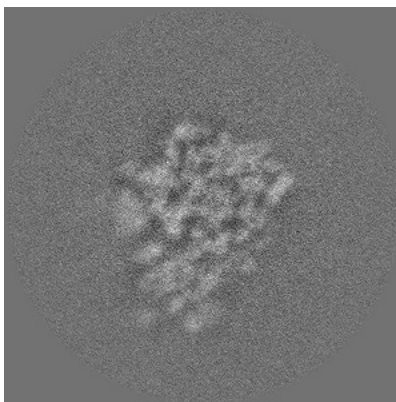


Z Index: 280

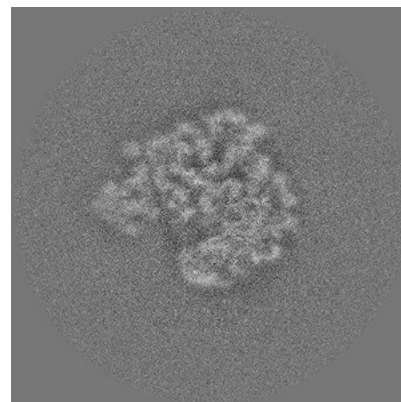
6.2.2 Raw map



X Index: 280



Y Index: 280

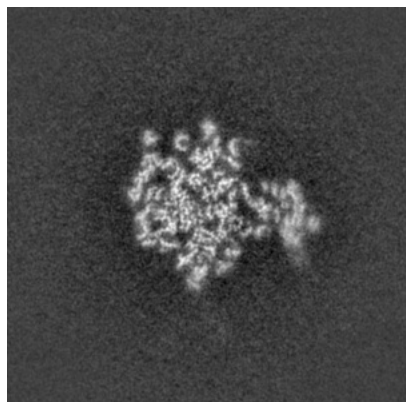


Z Index: 280

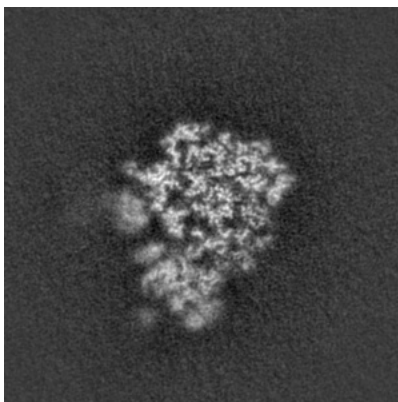
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

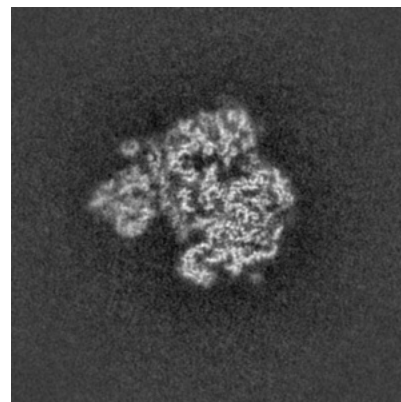
6.3.1 Primary map



X Index: 310

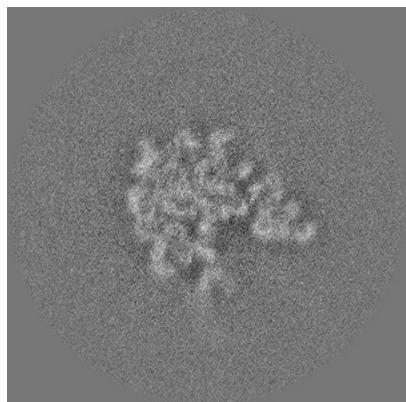


Y Index: 284

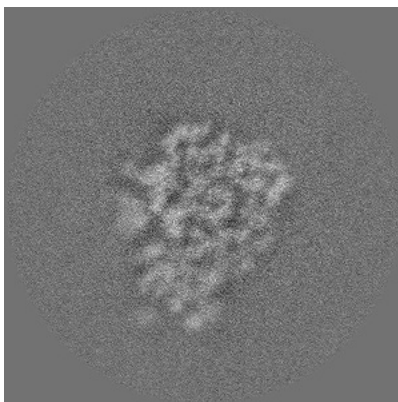


Z Index: 273

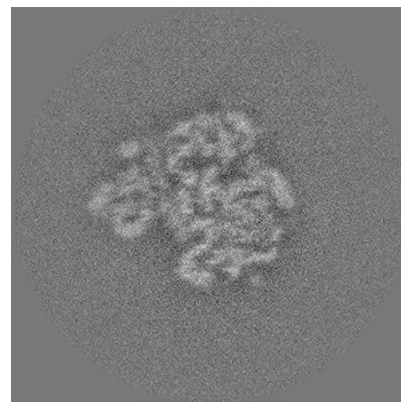
6.3.2 Raw map



X Index: 279



Y Index: 283

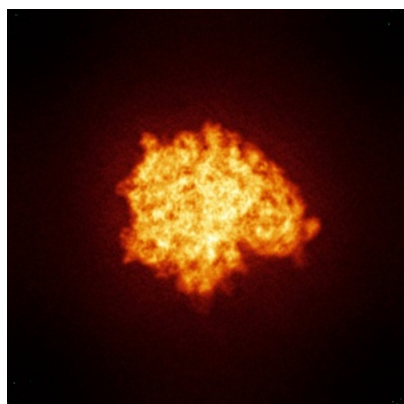


Z Index: 271

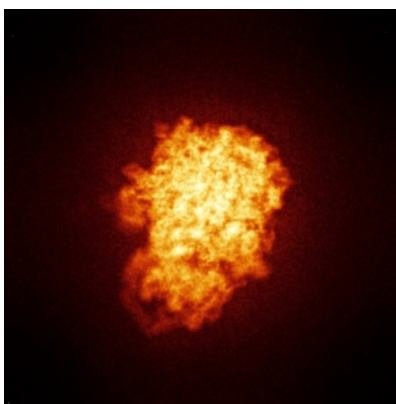
The images above show the largest variance slices of the map in three orthogonal directions.

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

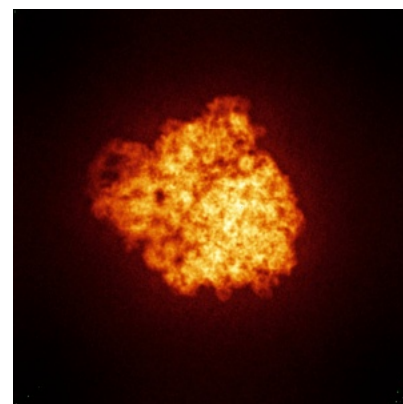
6.4.1 Primary map



X

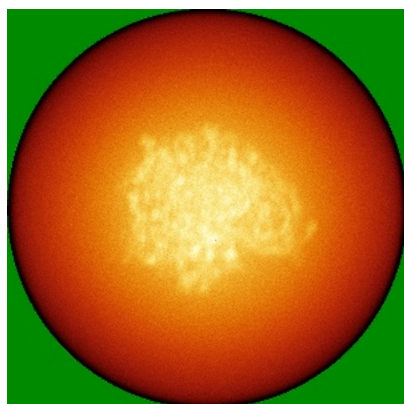


Y

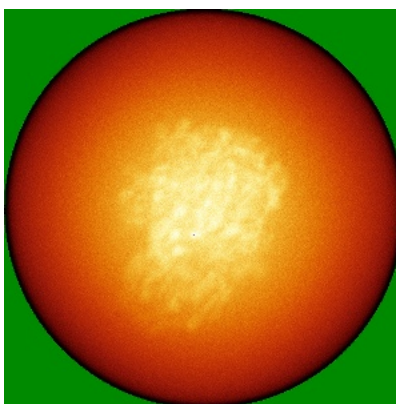


Z

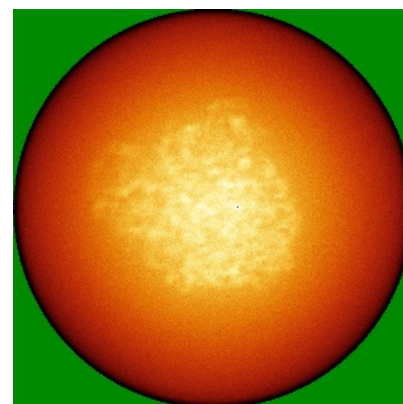
6.4.2 Raw map



X



Y

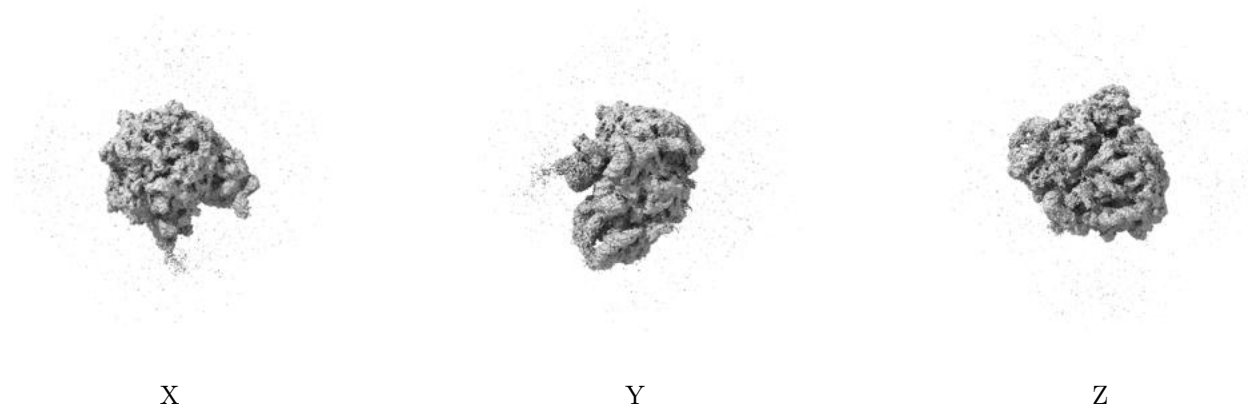


Z

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.

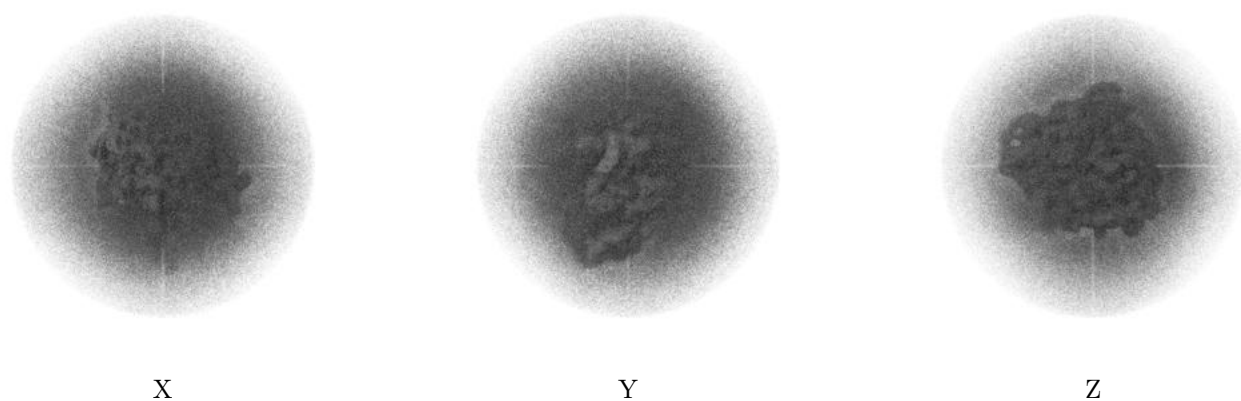
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 3.0. 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.

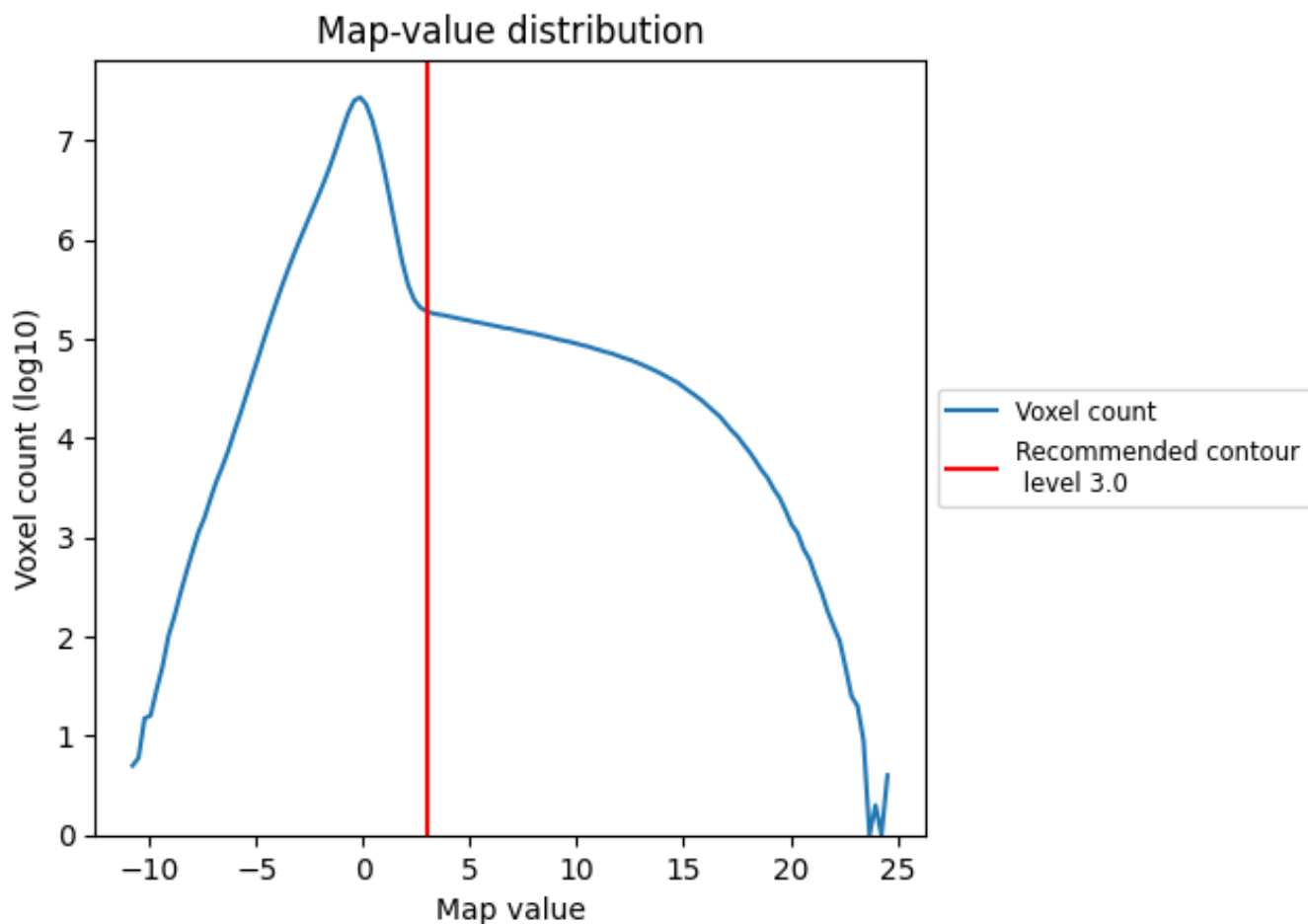
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

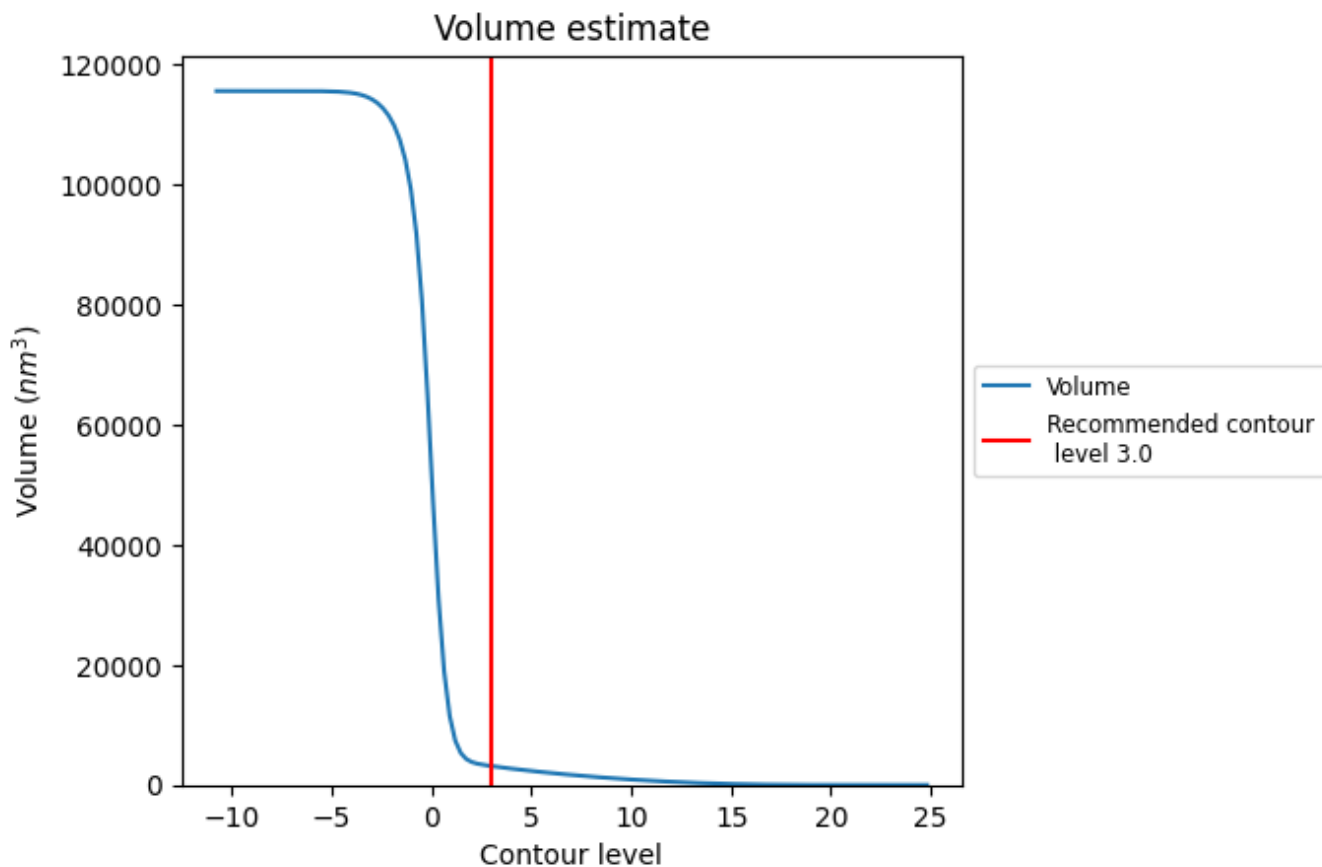
This section contains the results of statistical analysis of the map.

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.

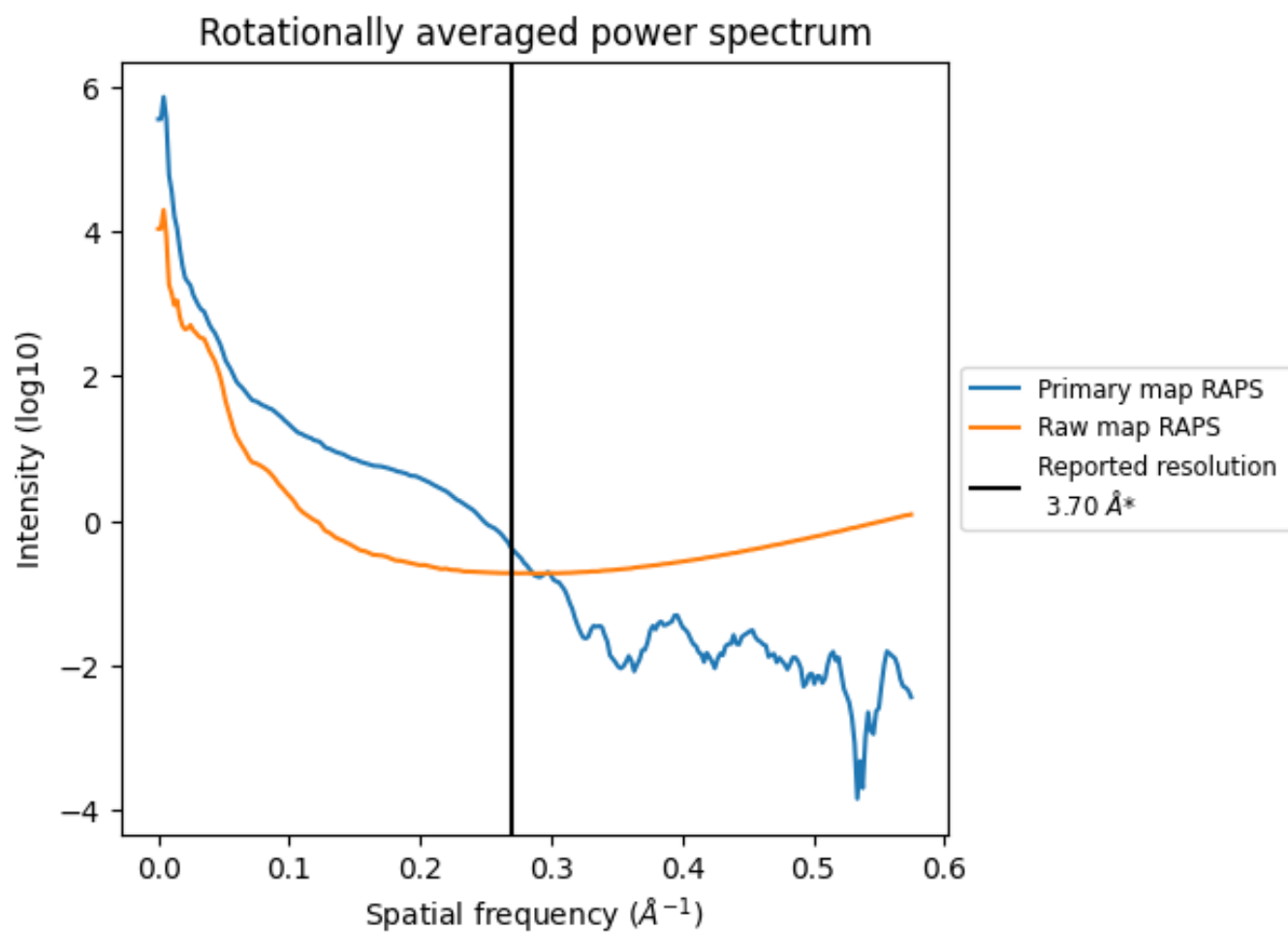
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 3143 nm³; this corresponds to an approximate mass of 2839 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

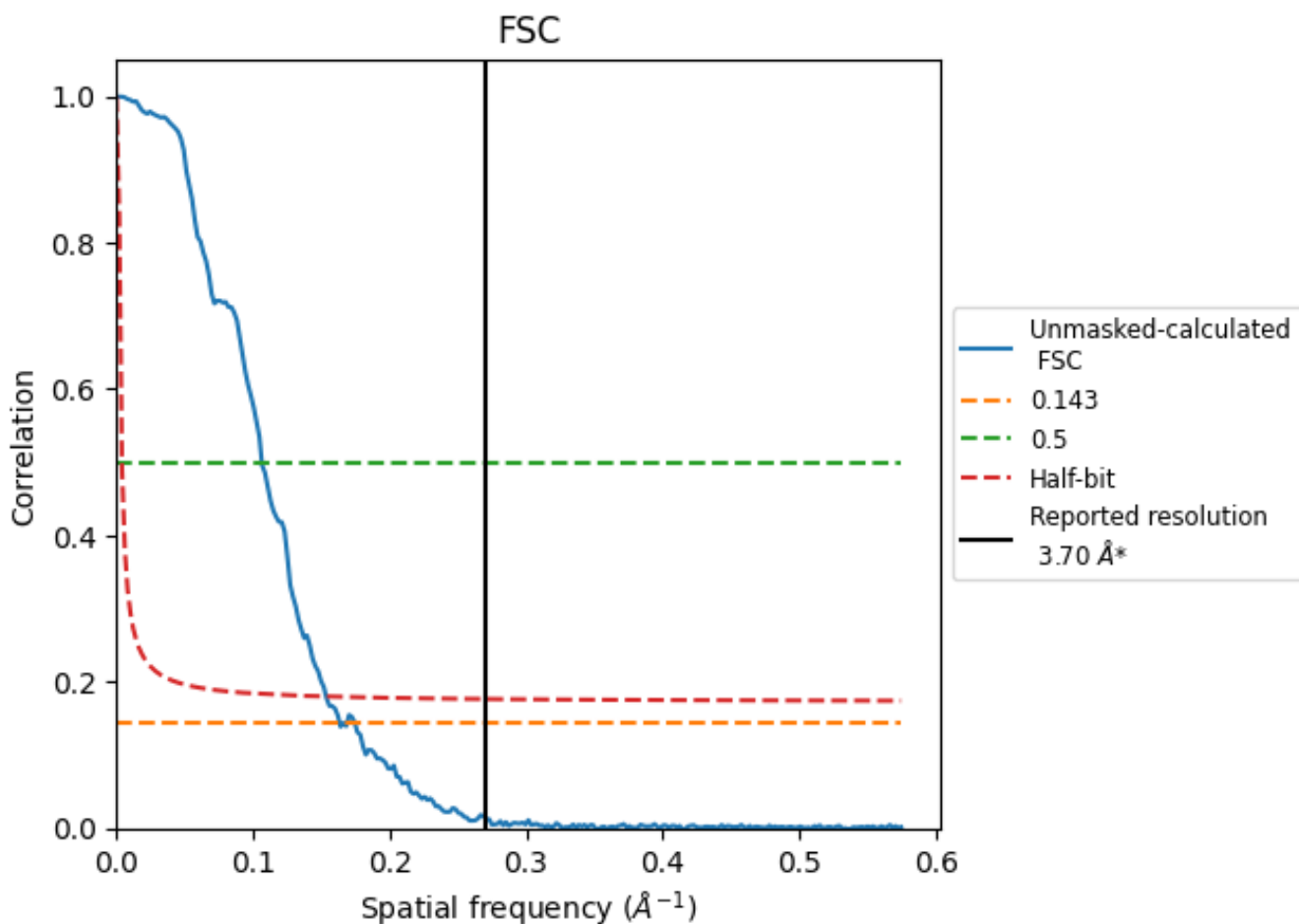


*Reported resolution corresponds to spatial frequency of 0.270 Å⁻¹

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 0.270 Å⁻¹

8.2 Resolution estimates [i](#)

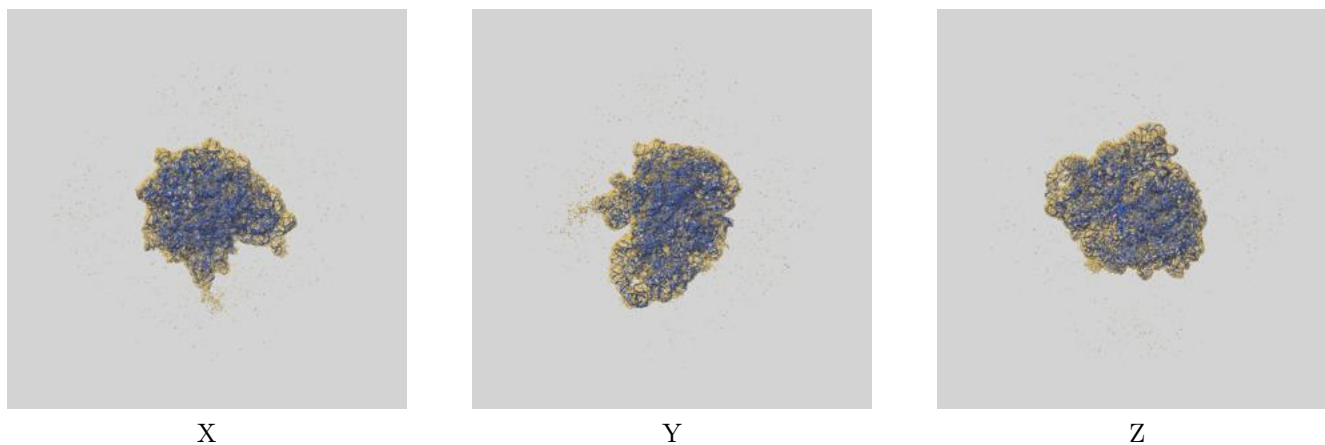
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	6.12	9.39	6.51

*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 6.12 differs from the reported value 3.7 by more than 10 %

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-43491 and PDB model 8VSA. Per-residue inclusion information can be found in section 3 on page 15.

9.1 Map-model overlay [i](#)



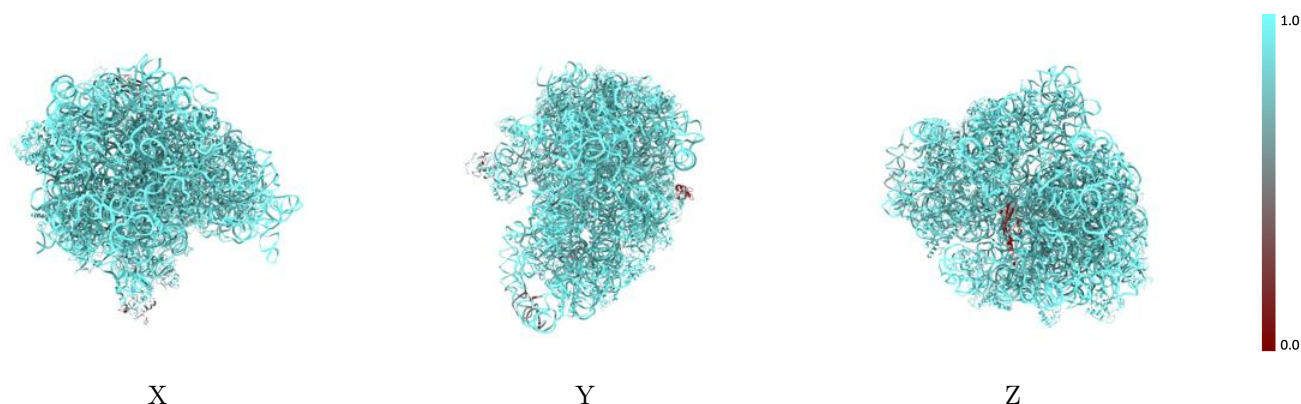
The images above show the 3D surface view of the map at the recommended contour level 3.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



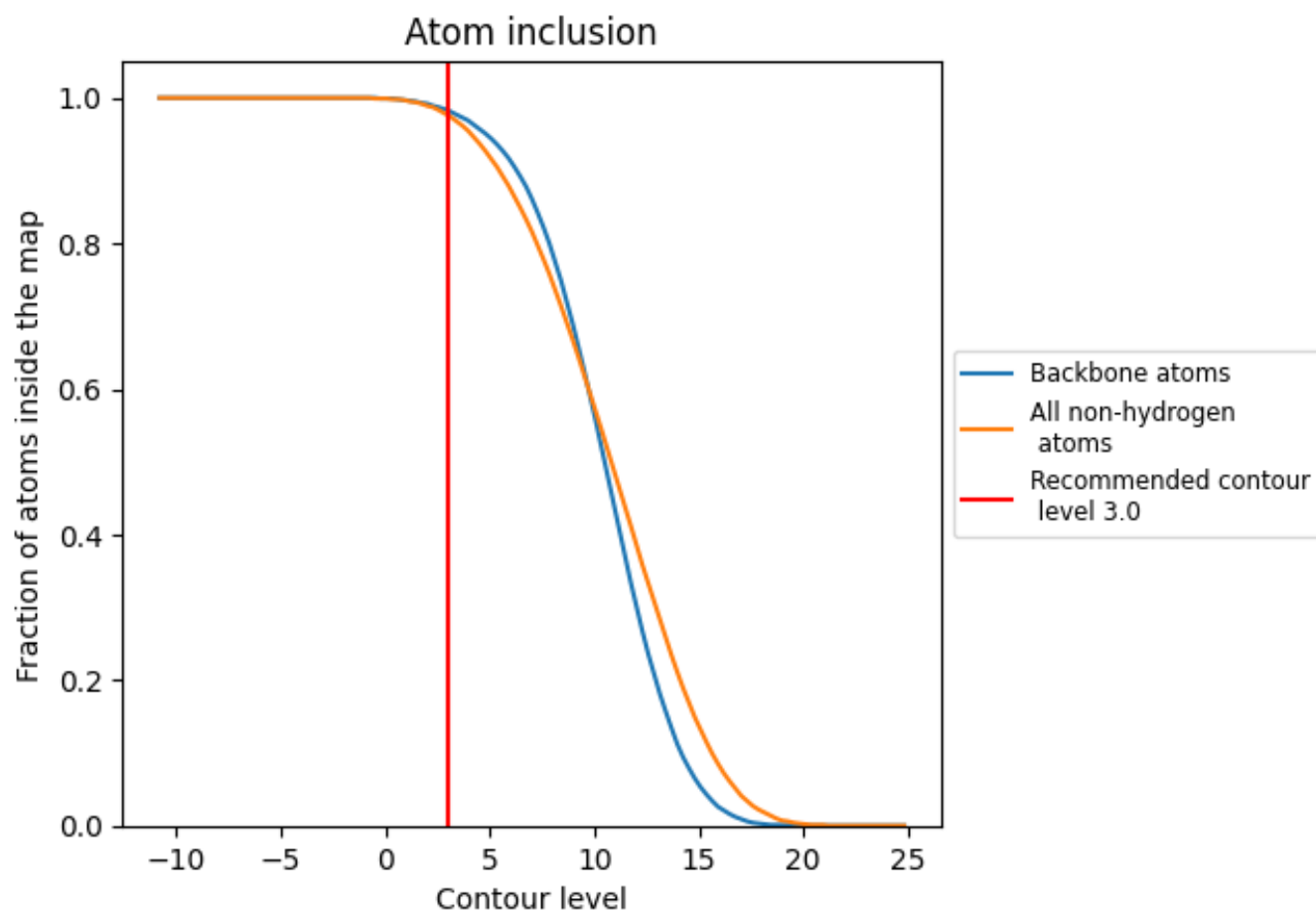
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (3.0).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 98% of all backbone atoms, 98% 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 (3.0) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9760	 0.3370
16S	 0.9980	 0.3320
23S	 0.9980	 0.3620
5S	 0.9980	 0.3300
ATRN	 0.9940	 0.3320
L02	 0.9710	 0.3920
L03	 0.9700	 0.3820
L04	 0.9680	 0.3500
L05	 0.9770	 0.2830
L06	 0.9710	 0.3240
L09	 0.4100	 0.2890
L1	 0.8880	 0.2150
L10	 0.7050	 0.1920
L11	 0.8460	 0.1940
L13	 0.9770	 0.3650
L14	 0.9310	 0.3940
L15	 0.9700	 0.3610
L16	 0.9600	 0.3710
L17	 0.9860	 0.3570
L18	 0.9940	 0.3270
L19	 0.9490	 0.3740
L20	 0.9750	 0.3470
L21	 0.9800	 0.3670
L22	 0.9430	 0.3630
L23	 0.9570	 0.3590
L24	 0.9640	 0.3390
L25	 0.9730	 0.3490
L27	 0.9710	 0.3670
L28	 0.9630	 0.3520
L29	 0.9640	 0.3020
L30	 0.9540	 0.3510
L31	 0.9680	 0.2220
L32	 0.9440	 0.3740
L33	 0.9800	 0.3490
L34	 0.9800	 0.3680



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Chain	Atom inclusion	Q-score
L35	 0.9880	 0.3820
L36	 0.9930	 0.3920
S02	 0.9310	 0.3190
S03	 0.9590	 0.3150
S04	 0.9740	 0.2870
S05	 0.9700	 0.3560
S06	 0.9370	 0.3290
S07	 0.9390	 0.2910
S08	 0.9600	 0.3370
S09	 0.9780	 0.2780
S10	 0.9440	 0.3130
S11	 0.9810	 0.3520
S12	 0.9350	 0.3450
S13	 0.9680	 0.2790
S14	 0.9790	 0.2980
S15	 0.9750	 0.3180
S16	 0.9860	 0.3290
S17	 0.9730	 0.3180
S18	 0.9770	 0.3310
S19	 0.9920	 0.3040
S20	 0.9740	 0.2690
S21	 0.9280	 0.3050
SMPB	 0.9220	 0.3130
TMRN	 0.9060	 0.2300