



wwPDB EM Validation Summary Report ⓘ

Jun 19, 2026 – 02:27 am BST

PDB ID : 6YSS / pdb_00006yss
EMDB ID : EMD-10906
Title : Structure of the P+9 ArfB-ribosome complex in the post-hydrolysis state
Authors : Chan, K.-H.; Petrychenko, V.; Mueller, C.; Maracci, C.; Holtkamp, W.; Wilson, D.N.; Fischer, N.; Rodnina, M.V.
Deposited on : 2020-04-23
Resolution : 2.60 Å (reported)
Based on initial models : 4V95, 4RB7, 5AFI, 5O2R

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:

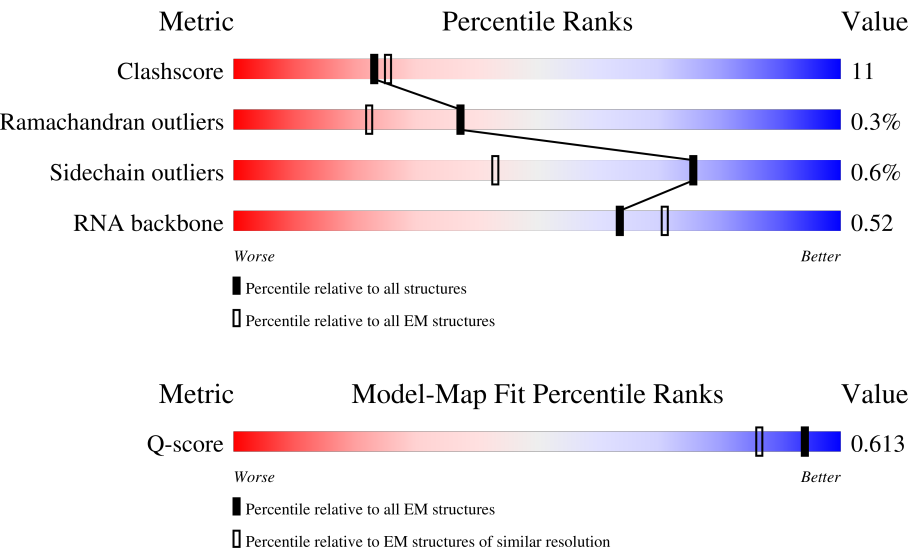
EMDB validation analysis : 0.0.1.dev132
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal 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 2.60 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.



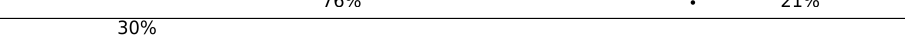
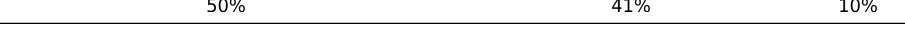
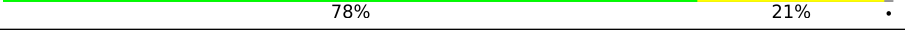
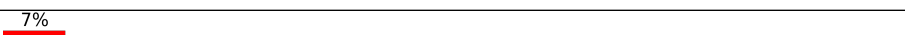
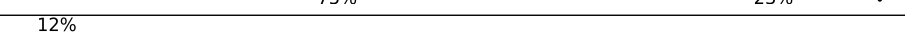
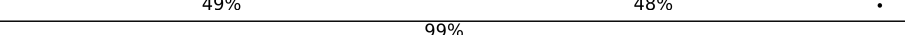
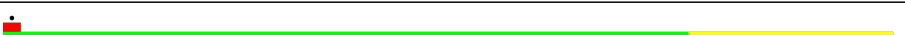
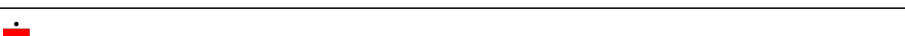
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	8728 (2.10 - 3.10)

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	0	57	
2	1	55	
3	2	46	

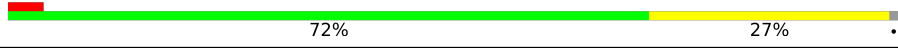
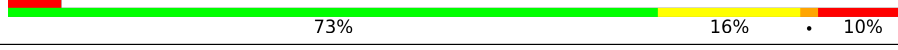
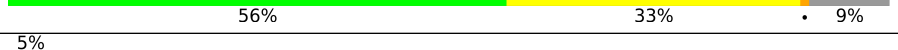
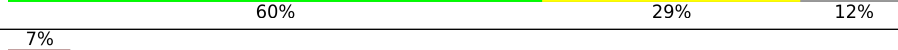
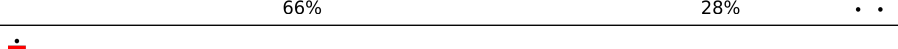
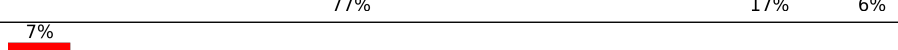
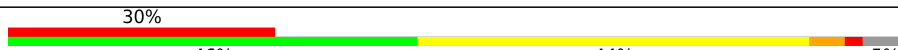
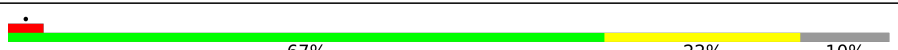
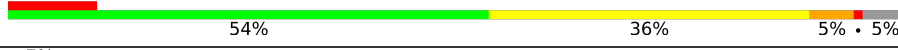
Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
4	3	65	
5	4	38	
6	5	165	
7	6	70	
8	A	2903	
9	B	120	
10	C	273	
11	D	209	
12	E	201	
13	F	179	
14	G	177	
15	H	149	
16	I	142	
17	J	142	
18	K	123	
19	L	144	
20	M	136	
21	N	127	
22	O	117	
23	P	115	
24	Q	118	
25	R	103	
26	S	110	
27	T	100	
28	U	104	

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
29	V	94	
30	W	85	
31	X	78	
32	Y	63	
33	Z	59	
34	a	1542	
35	b	240	
36	c	233	
37	d	206	
38	e	167	
39	f	135	
40	g	179	
41	h	130	
42	i	130	
43	j	103	
44	k	129	
45	l	124	
46	m	118	
47	n	102	
48	o	89	
49	p	82	
50	q	84	
51	r	75	
52	s	92	
53	t	87	

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
54	u	71	28% 56% 25% 7% 8%
55	v	14	14% 71% 29%
56	w	76	5% 57% 33% 7%
57	x	15	7% 33% 13% 53%
58	y	140	8% 73% 25%

2 Entry composition

There are 61 unique types of molecules in this entry. The entry contains 147046 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 L32.

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

- Molecule 2 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
2	1	50	Total	C	N	O	0	0
			409	263	75	71		

- Molecule 3 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	2	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 4 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	3	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 5 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	4	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 6 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms				AltConf	Trace
6	5	131	Total	C	N	O	0	0
			647	385	131	131		

- Molecule 7 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	6	66	Total	C	N	O	S	0	0
			522	323	99	94	6		

- Molecule 8 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	A	2903	Total	C	N	O	P	0	0
			62336	27815	11468	20150	2903		

- Molecule 9 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	B	120	Total	C	N	O	P	0	0
			2570	1144	468	838	120		

- Molecule 10 is a protein called 50S ribosomal protein L2.

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

- Molecule 11 is a protein called 50S ribosomal protein L3.

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

- Molecule 12 is a protein called 50S ribosomal protein L4.

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

- Molecule 13 is a protein called 50S ribosomal protein L5.

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

- Molecule 14 is a protein called 50S ribosomal protein L6.

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

- Molecule 15 is a protein called 50S ribosomal protein L9.

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

- Molecule 16 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	I	141	Total	C	N	O	S	0	0
			693	411	141	141			

- Molecule 17 is a protein called 50S ribosomal protein L13.

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

- Molecule 18 is a protein called 50S ribosomal protein L14.

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

- Molecule 19 is a protein called 50S ribosomal protein L15.

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

- Molecule 20 is a protein called 50S ribosomal protein L16.

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

- Molecule 21 is a protein called 50S ribosomal protein L17.

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

- Molecule 22 is a protein called 50S ribosomal protein L18.

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

- Molecule 23 is a protein called 50S ribosomal protein L19.

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

- Molecule 24 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Q	117	Total	C	N	O		0	0
			947	604	192	151			

- Molecule 25 is a protein called 50S ribosomal protein L21.

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

- Molecule 26 is a protein called 50S ribosomal protein L22.

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

- Molecule 27 is a protein called 50S ribosomal protein L23.

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

- Molecule 28 is a protein called 50S ribosomal protein L24.

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

- Molecule 29 is a protein called 50S ribosomal protein L25.

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

- Molecule 30 is a protein called 50S ribosomal protein L27.

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

- Molecule 31 is a protein called 50S ribosomal protein L28.

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

- Molecule 32 is a protein called 50S ribosomal protein L29.

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

- Molecule 33 is a protein called 50S ribosomal protein L30.

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

- Molecule 34 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	a	1540	Total	C	N	O	P	0	0
			33050	14748	6057	10705	1540		

- Molecule 35 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	b	218	Total	C	N	O	S	0	0
			1704	1081	305	311	7		

- Molecule 36 is a protein called 30S ribosomal protein S3.

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

- Molecule 37 is a protein called 30S ribosomal protein S4.

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

- Molecule 38 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	e	157	Total	C	N	O	S	0	0
			1141	709	218	208	6		

- Molecule 39 is a protein called 30S ribosomal protein S6.

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

- Molecule 40 is a protein called 30S ribosomal protein S7.

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

- Molecule 41 is a protein called 30S ribosomal protein S8.

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

- Molecule 42 is a protein called 30S ribosomal protein S9.

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

- Molecule 43 is a protein called 30S ribosomal protein S10.

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

- Molecule 44 is a protein called 30S ribosomal protein S11.

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

- Molecule 45 is a protein called 30S ribosomal protein S12.

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

- Molecule 46 is a protein called 30S ribosomal protein S13.

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

- Molecule 47 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	n	101	Total	C	N	O	S	0	0
			799	498	165	133	3		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
n	36	ALA	-	insertion	UNP I2X5X6

- Molecule 48 is a protein called 30S ribosomal protein S15.

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

- Molecule 49 is a protein called 30S ribosomal protein S16.

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

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

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

- Molecule 51 is a protein called 30S ribosomal protein S18.

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

- Molecule 52 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	s	82	Total	C	N	O	S	0	0
			658	421	125	110	2		

- Molecule 53 is a protein called 30S ribosomal protein S20.

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

- Molecule 54 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	u	65	Total	C	N	O	S	0	0
			506	313	105	87	1		

- Molecule 55 is a protein called Api137.

Mol	Chain	Residues	Atoms				AltConf	Trace
55	v	14	Total	C	N	O	0	0
			121	80	25	16		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
v	10	ARG	GLN	conflict	UNP Q8WSY8

- Molecule 56 is a RNA chain called P-site tRNAPhe.

Mol	Chain	Residues	Atoms						AltConf	Trace
56	w	76	Total	C	N	O	P	S	0	0
			1631	731	291	531	76	2		

- Molecule 57 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	x	7	Total	C	N	O	P	0	0
			147	66	24	50	7		

- Molecule 58 is a protein called Alternative stalled-ribosome rescue factor B.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	y	139	Total	C	N	O	S	0	0
			1078	666	215	195	2		

- Molecule 59 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
59	0	1	Total	Mg	0
			1	1	
59	A	269	Total	Mg	0
			269	269	
59	B	7	Total	Mg	0
			7	7	
59	C	3	Total	Mg	0
			3	3	
59	D	1	Total	Mg	0
			1	1	
59	M	1	Total	Mg	0
			1	1	
59	O	1	Total	Mg	0
			1	1	

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms		AltConf
59	P	1	Total 1	Mg 1	0
59	W	1	Total 1	Mg 1	0
59	a	95	Total 95	Mg 95	0
59	m	1	Total 1	Mg 1	0
59	n	1	Total 1	Mg 1	0
59	w	4	Total 4	Mg 4	0
59	y	1	Total 1	Mg 1	0

- Molecule 60 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
60	4	1	Total 1	Zn 1	0
60	6	1	Total 1	Zn 1	0

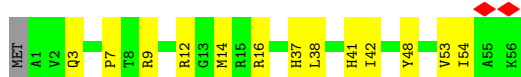
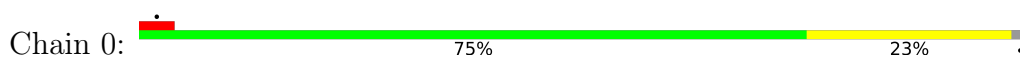
- Molecule 61 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		AltConf
61	A	1	Total 1	Na 1	0
61	V	1	Total 1	Na 1	0

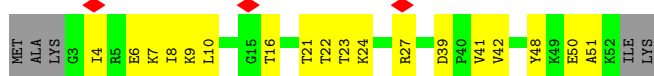
3 Residue-property plots [i](#)

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.

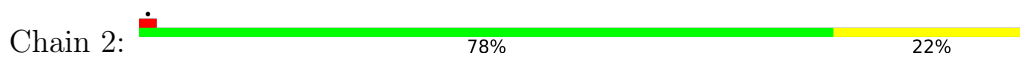
- Molecule 1: 50S ribosomal protein L32



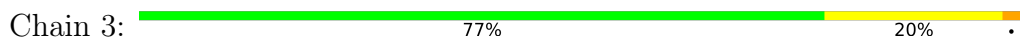
- Molecule 2: 50S ribosomal protein L33



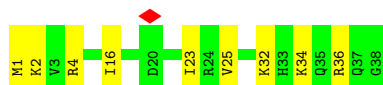
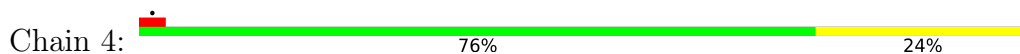
- Molecule 3: 50S ribosomal protein L34



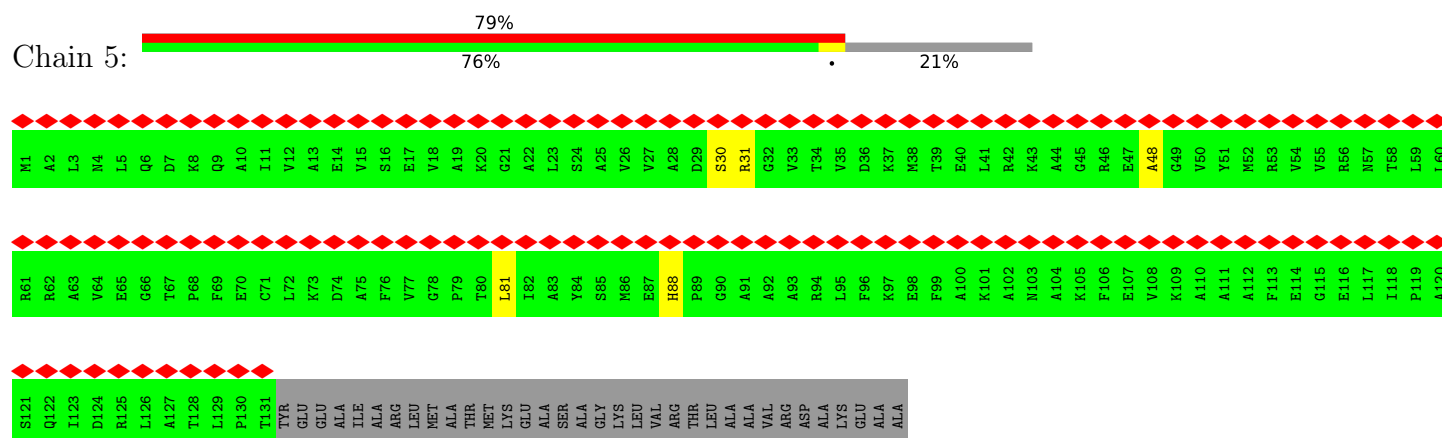
- Molecule 4: 50S ribosomal protein L35



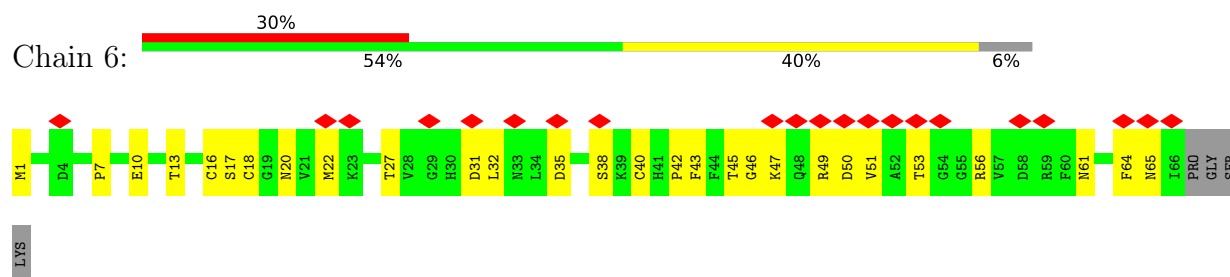
- Molecule 5: 50S ribosomal protein L36



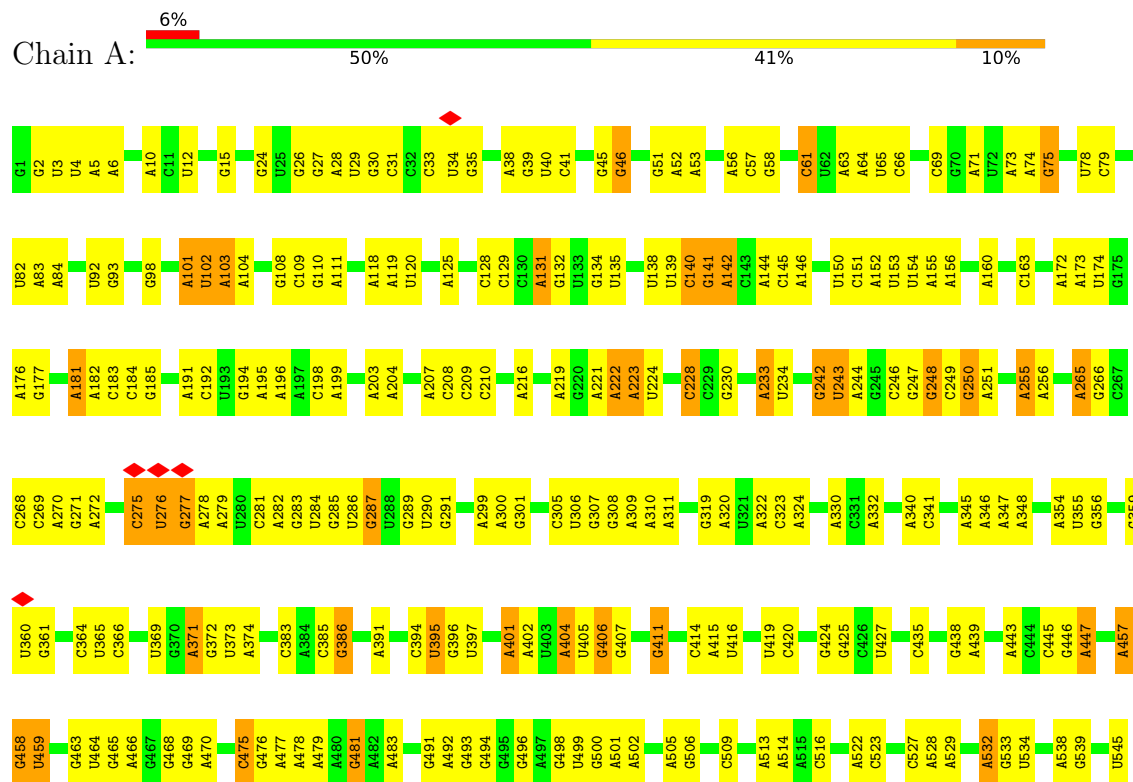
- Molecule 6: 50S ribosomal protein L10

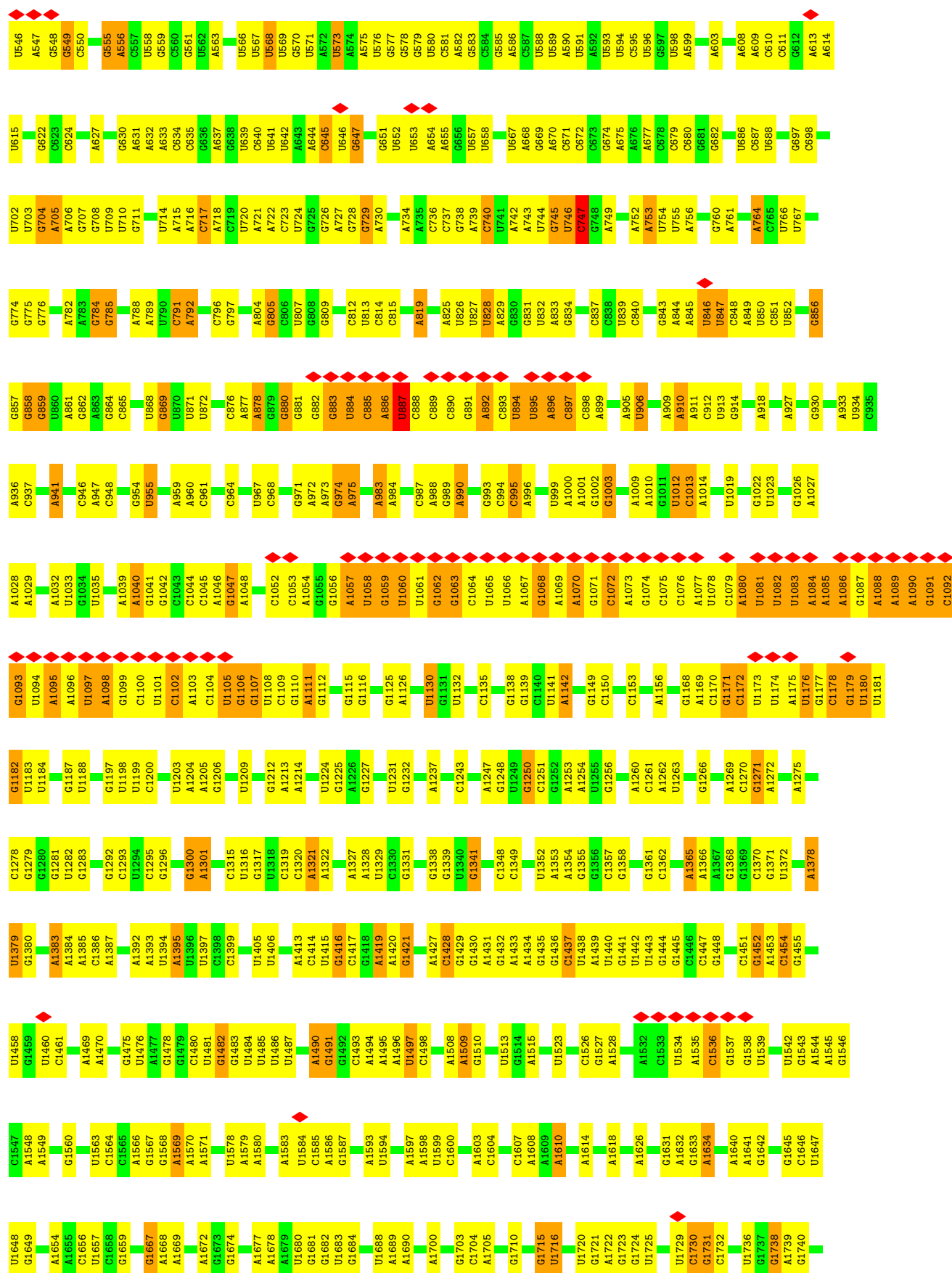


- Molecule 7: 50S ribosomal protein L31



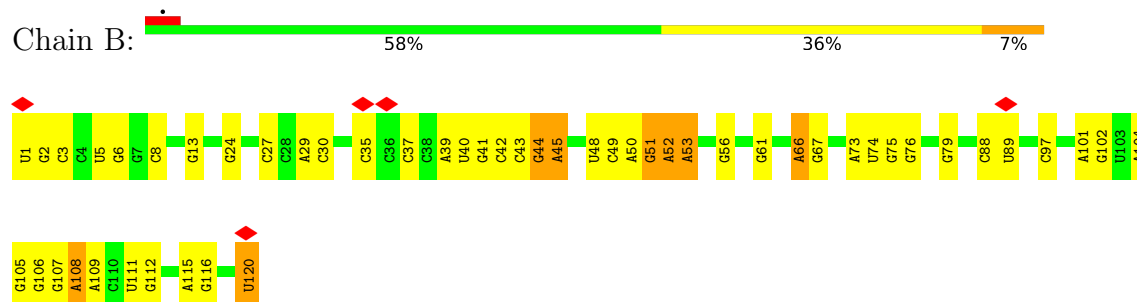
- Molecule 8: 23S ribosomal RNA



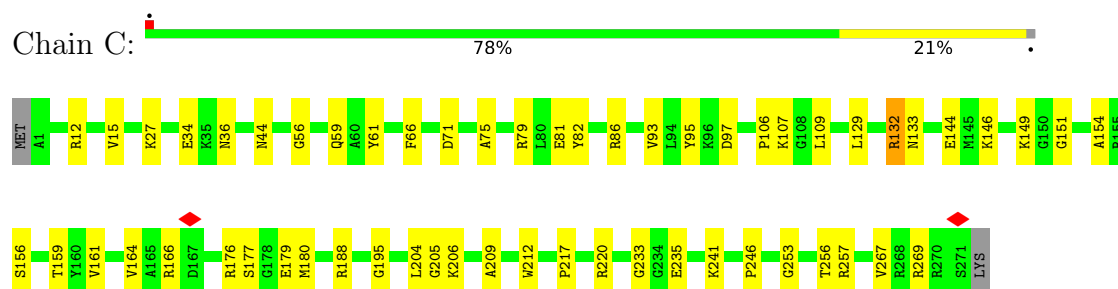


A2873	U2783	C2681	G2581	G2487	G2396	C2310	G2228	G2152	A2088	A2019	U1923	G1828	A1744
A2879	U2784	A2682	G2582	G2488	U2402	A2311	U2229	C2153	G2093	C2021	C1924	A1829	A1745
C2880	U2785	U2684	U2583	G2490	A2406	C2312	G2230	A2154		G2022	G1925	G1830	U1746
U2884	C2789	U2685	U2585	G2495	A2407	A2314	U2232	U2155	C2096	C2023	U1926	C1831	C1748
G2885	U2790	U2686	U2586	G2496	A2407		U2233	G2156	C2097	G2024	A1927	U1834	G1763
A2886	G2791	U2689	G2497	C2498		G2319	G2234	G2157	U2098	C2025	A1928	G1835	A1754
	C2794	U2690	C2499	G2499	G2410	U2321	G2237	A2158	U2099	U2026	G1929		
	C2795	U2691	G2500	A2411	A2412	U2322	G2238	G2159	A2101	G2029	G1930	C1838	C1764
	U2796	U2692	G2501	A2412		G2323	G2239	G2160	G2102	A2031	A1931	C1839	
	U2797	G2702	U2502	U2419	U2420	U2324	U2240	C2161	C2103	G2032	G1932	G1842	U1769
	U2798	G2703	G2503	U2423	U2424	G2325	U2241	C2162	C2104	G2033	G1933	C1843	G1770
	A2799	U2705	U2504	U2425	U2426	C2326	G2242	A2163	U2105	A2034	G1934	C1844	C1771
	A2800	G2706	U2514	U2426	U2426	A2327	U2243	A2164	G2106	G2035	A1936		A1772
	G2801	U2707	U2515	A2426	U2426	U2328	U2244	C2165	G2107	C2036	A1937	G1847	A1773
	G2802	G2709	U2516	A2426	U2426	U2329	U2245	U2166	A2108	A2037	A1938	A1848	
	G2803		C2517	G2429		G2330	U2246	U2167	U2109	G2038	U1939		G1776
	U2804	G2714	G2518	G2429		A2336	G2248	U2168	G2110	U2039	U1943	A1853	U1779
	C2715	C2716	U2519	A2435	A2436	A2340	U2249	G2169	G2111	G2040	U1946	A1854	
	C2717	G2718	G2520	A2436		U2343	G2250	A2170	U2112	A2041	U1957	U1855	U1782
	G2719	U2720	U2521	A2436			G2251	A2171	G2113	A2042	C1957	G1857	A1784
	A2810	G2721	U2522	A2439		C2347	U2262	A2172	A2114	C2043	G1954	A1858	A1785
	G2811	G2722	G2525	U2441	U2442		A2266	A2173	G2115	G2044	U1955		A1786
	C2812	C2723	G2529	U2442	U2443	C2350	A2267	A2174	G2116	G2045	U1956	G1869	C1790
	G2813	U2724	U2537	G2444	G2445	G2351	A2268	C2175	G2117	C2046	C1957	G1870	G1792
	A2795	A2796	C2538	G2445	G2446	A2358	U2271	C2176	A2118	A2059	C1967	A1871	C1793
	A2726	U2727	U2545	G2446	G2447	C2359	U2272	A2177	A2119	C2055	C1965	C1874	A1794
	U2728	G2729	U2546	G2447	U2448	G2360	A2273	C2178	G2120	G2056	C1966	G1875	U1796
	G2732		U2548	U2449	U2449	G2361	A2274	C2179	G2121	A2060	C1967	A1876	G1797
	A2733		U2552	C2452		C2364	G2275	U2180	G2122	G2061	A1968	G1884	U1798
	A2740	A2741	G2553	G2455	G2456	G2365	G2280	U2181	G2123	A2062	A1970	C1885	G1799
	A2744	G2744	U2554	G2456	U2457		C2283	U2182	G2124	C2063	U1971	A1889	C1800
	G2747	U2748	G2555	G2457	C2463	C2374	A2284	A2183	G2125	C2064	G1972	A1802	A1801
	U2845	U2846	U2556	G2462	G2463	A2377	A2287	A2184	A2126	C2065	G1975	A1890	A1803
	U2847	G2749	A2564	G2463		A2378	A2288	U2185	G2127	C2066	G1976	U1898	G1807
	U2849	G2751	G2565	U2473	A2468		U2291	G2186	G2128	G2069	U1982	A1899	A1808
	G2852	C2755	A2566	U2474	A2469	G2382	U2292	U2187	C2129	A2070	U1991	A1900	A1809
	C2853	A2765	G2567	U2475	A2470	G2383	G2293	U2188	U2130	A2071	G1992	C1902	A1810
	G2857	A2766	U2568	U2476	U2477	U2384	A2297	U2189	U2131	C2072	U1993	G1905	G1811
	C2858	C2773	G2569	U2477	U2478	C2385	A2298	A2191	G2132	C2073	G1997	G1906	U1812
	A2860	G2777	A2572	U2478	U2479	U2386	A2299	U2192	G2133	U2074	A1998	G1907	G1814
	U2861	U2778	C2573	U2479	U2480	U2387	A2300	U2193	A2134	U2075	C1999		A1815
	G2867	A2868	U2577	U2480	U2481	A2388	U2305	A2198	G2136	C2078	C2000	U1911	C1816
			G2578	C2480	U2481	A2389	G2308	U2202	U2137	A2080	G2012	U1912	G1817
			U2580	U2481	U2481	C2393	G2309	G2203	G2138	A2082	A2013	A1913	U1818
						C2395	G2395	G2204	U2139	U2086	A2015	3TD1915	A1916
								A2205	G2140	G2087		U1917	G1826
								C2206	G2141			A1918	U1827
								A2211	A2142				
								C2215	G2143				
								G2216	G2144				
								A2225	C2145				
									C2146				
									A2147				
									G2148				
									U2149				
									C2150				
									U2151				

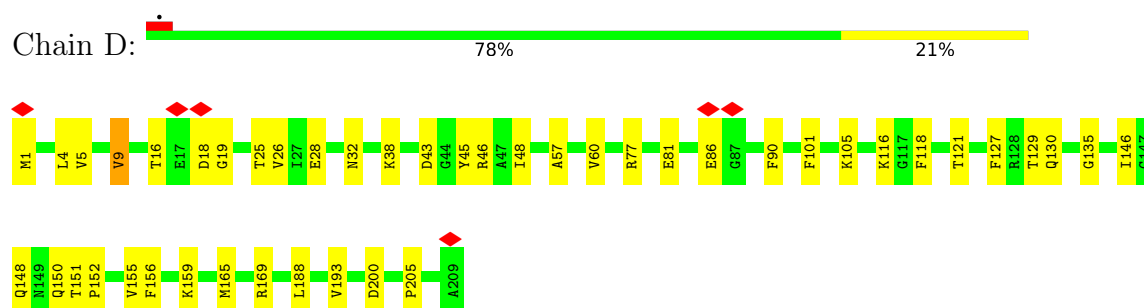
- Molecule 9: 5S ribosomal RNA



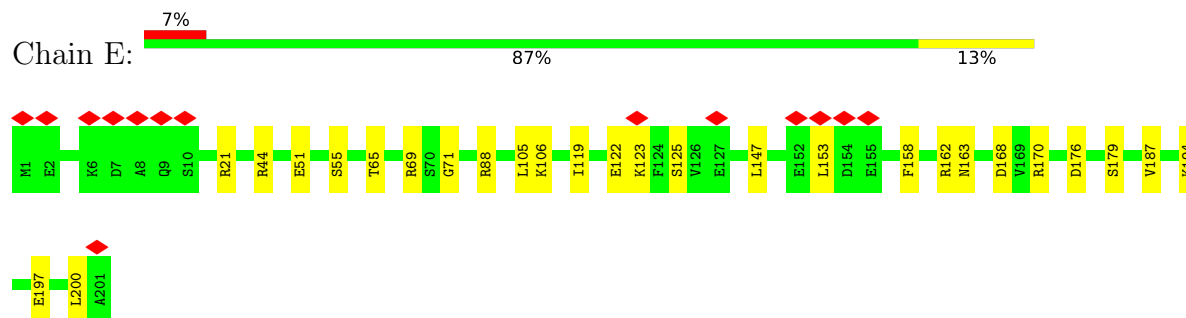
- Molecule 10: 50S ribosomal protein L2



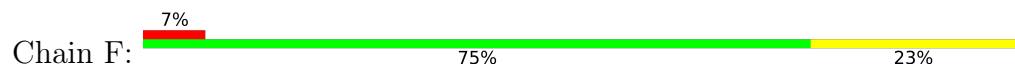
- Molecule 11: 50S ribosomal protein L3

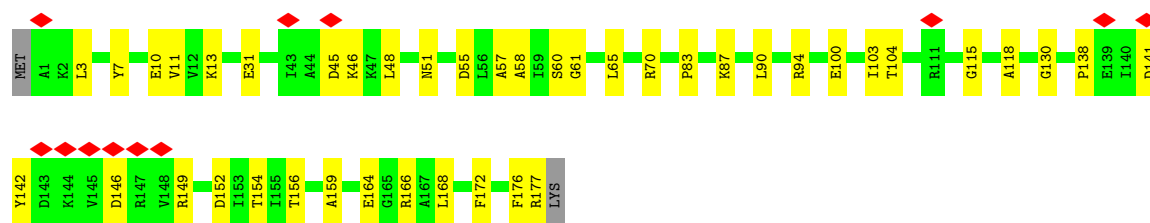


- Molecule 12: 50S ribosomal protein L4

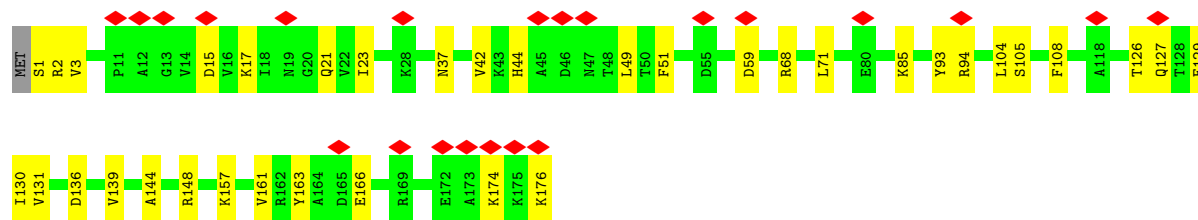
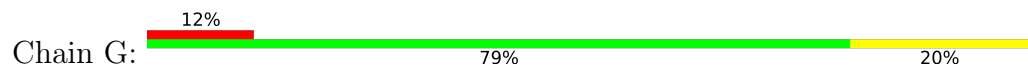


- Molecule 13: 50S ribosomal protein L5

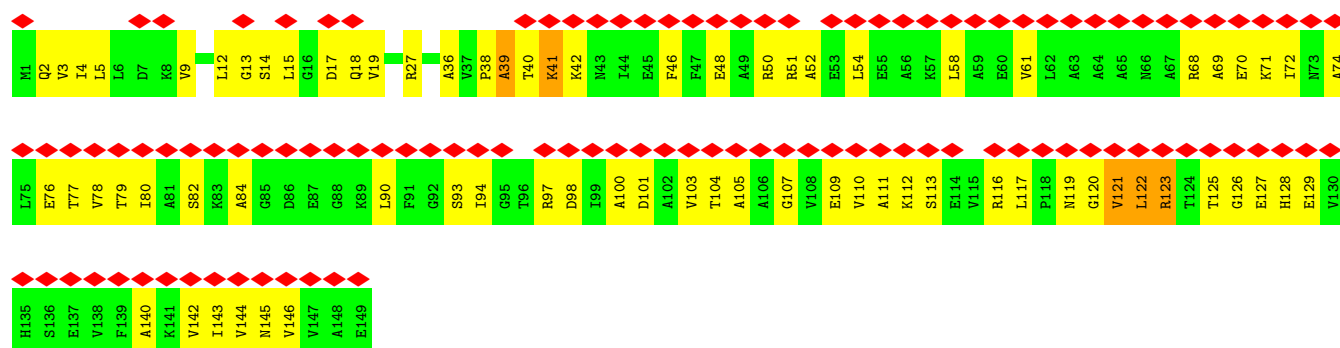
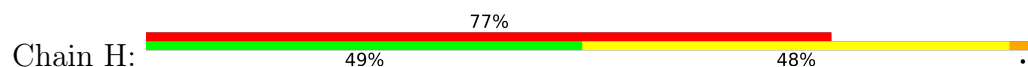




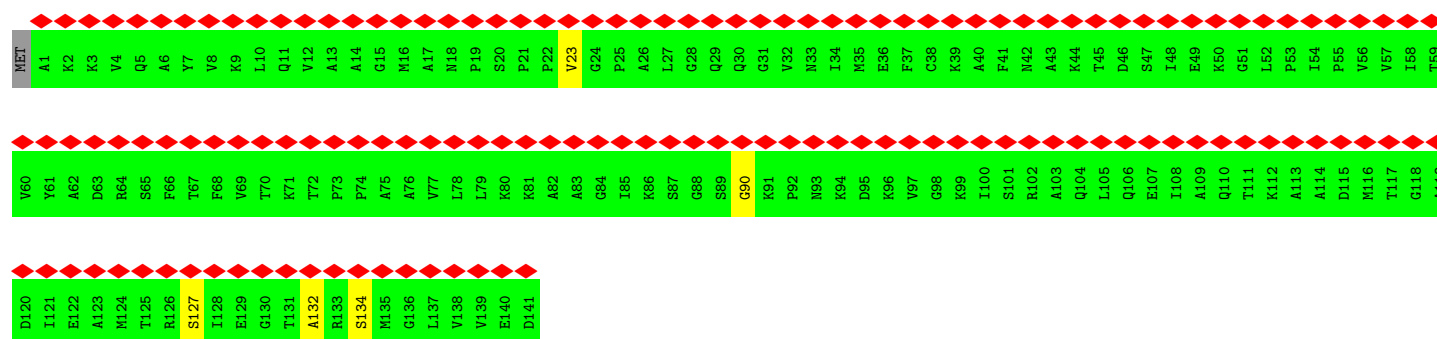
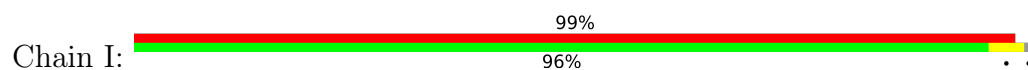
- Molecule 14: 50S ribosomal protein L6



- Molecule 15: 50S ribosomal protein L9

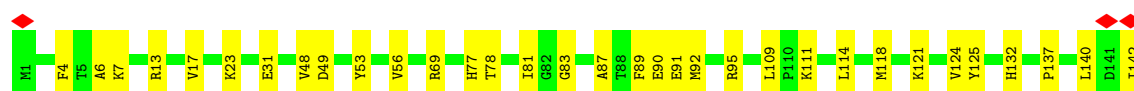


- Molecule 16: 50S ribosomal protein L11



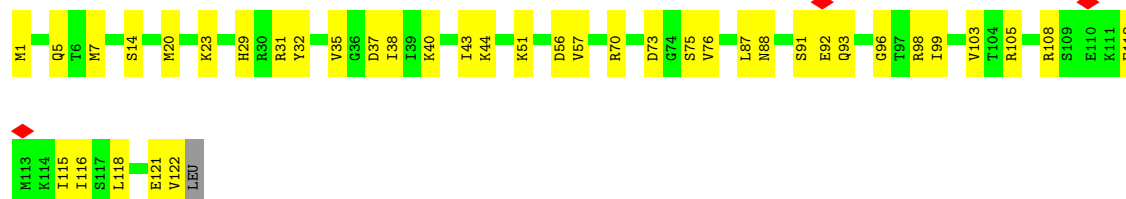
- Molecule 17: 50S ribosomal protein L13

Chain J:  77% 23%



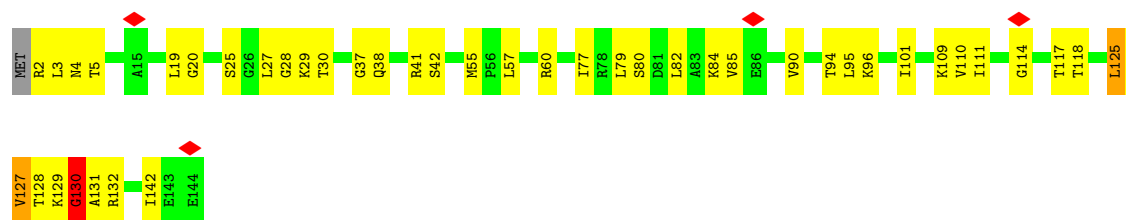
- Molecule 18: 50S ribosomal protein L14

Chain K:  67% 32%



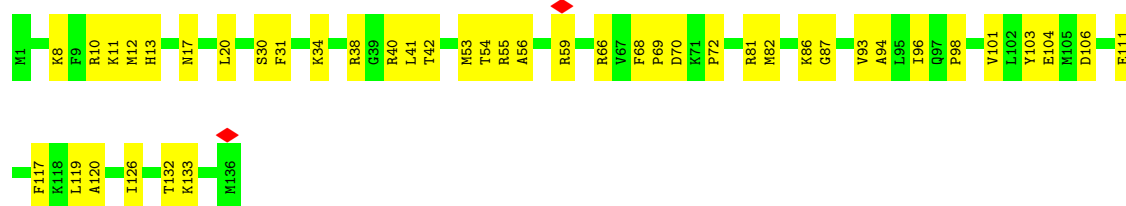
- Molecule 19: 50S ribosomal protein L15

Chain L:  69% 28%



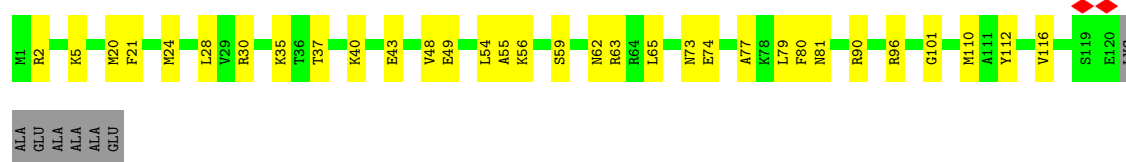
- Molecule 20: 50S ribosomal protein L16

Chain M:  68% 32%



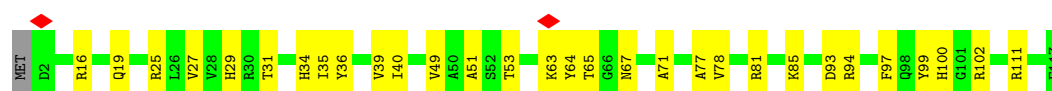
- Molecule 21: 50S ribosomal protein L17

Chain N:  69% 25% 6%



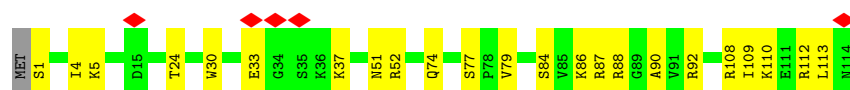
- Molecule 22: 50S ribosomal protein L18

Chain O:  74% 26%



- Molecule 23: 50S ribosomal protein L19

Chain P:  79% 20%



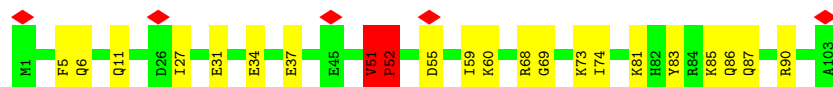
- Molecule 24: 50S ribosomal protein L20

Chain Q:  82% 17%



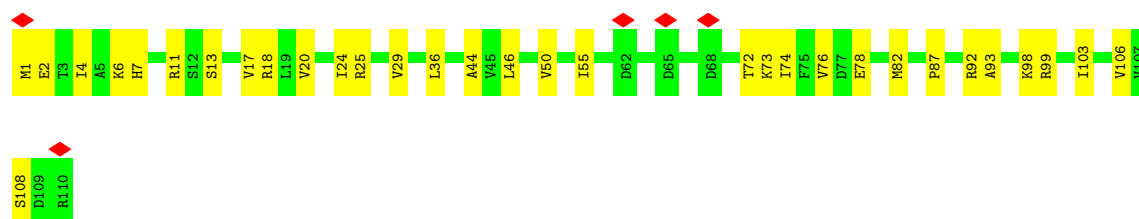
- Molecule 25: 50S ribosomal protein L21

Chain R:  5% 79% 19%



- Molecule 26: 50S ribosomal protein L22

Chain S:  5% 71% 29%



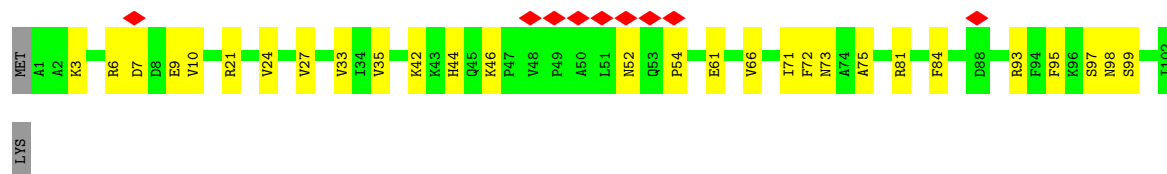
- Molecule 27: 50S ribosomal protein L23

Chain T:  6% 82% 11% 7%

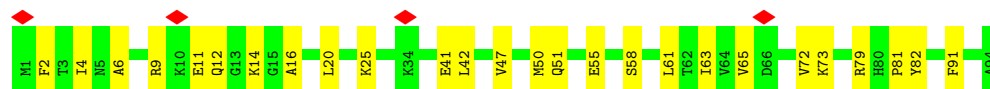


- Molecule 28: 50S ribosomal protein L24

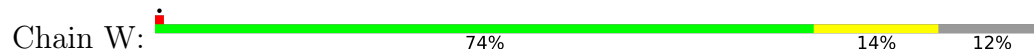
Chain U:  9% 71% 27%



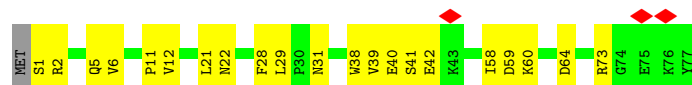
- Molecule 29: 50S ribosomal protein L25



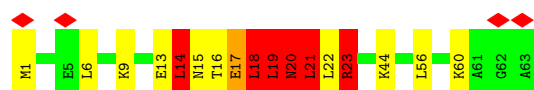
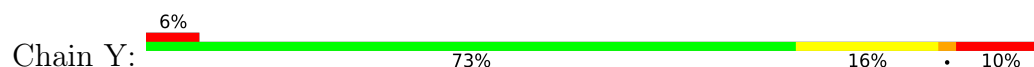
- Molecule 30: 50S ribosomal protein L27



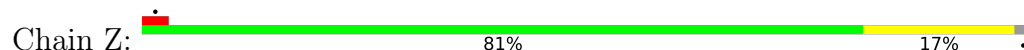
- Molecule 31: 50S ribosomal protein L28



- Molecule 32: 50S ribosomal protein L29



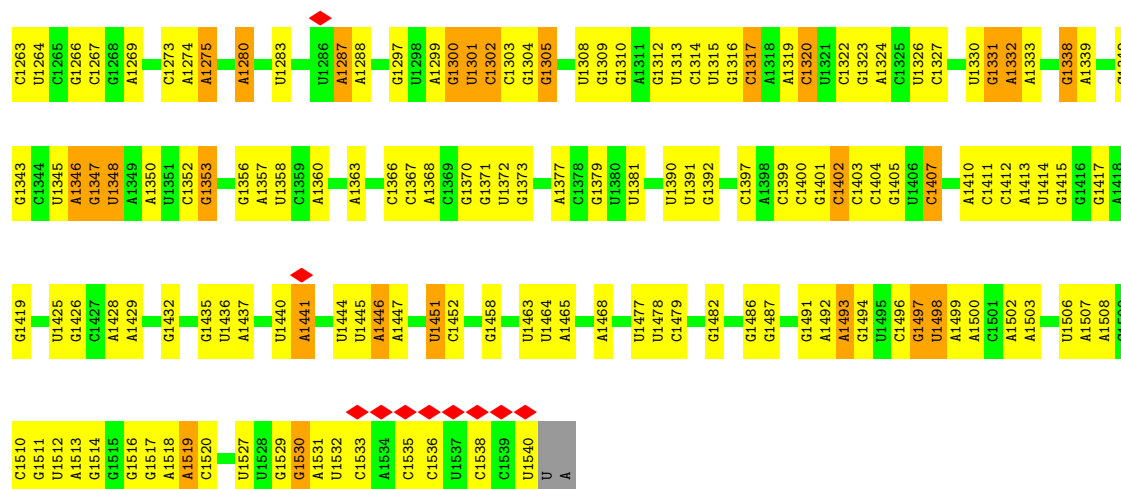
- Molecule 33: 50S ribosomal protein L30



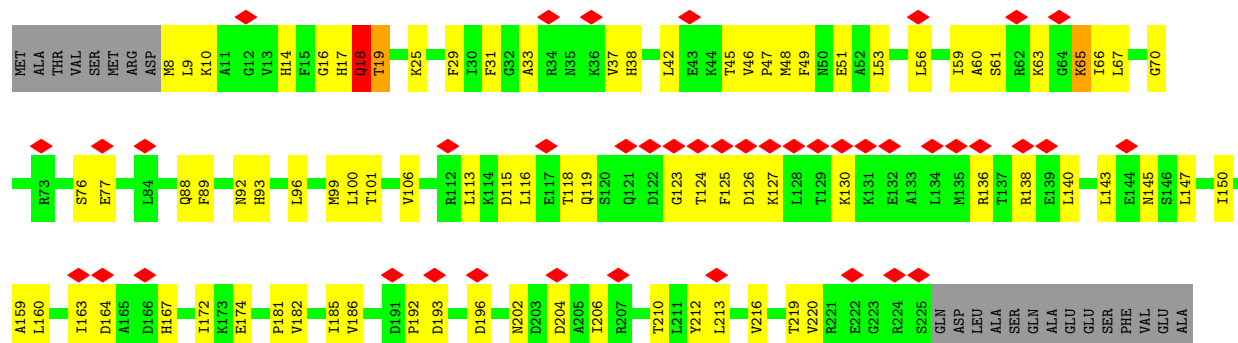
- Molecule 34: 16S ribosomal RNA



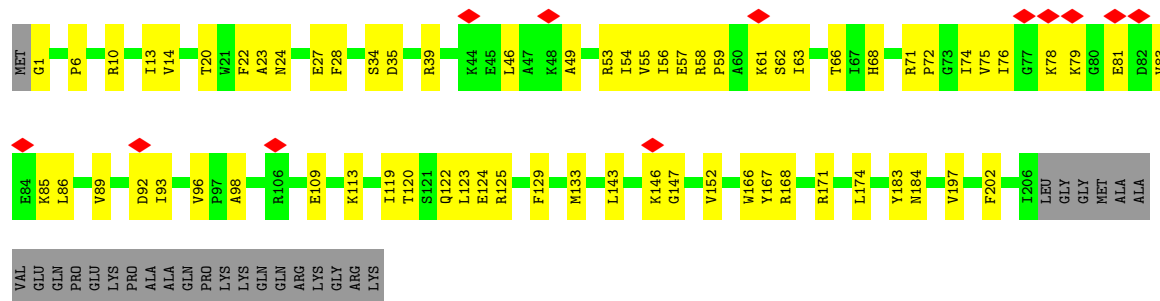




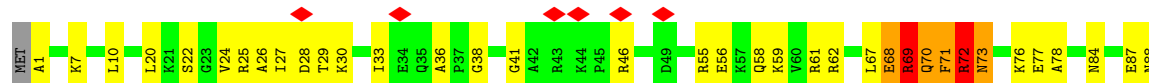
• Molecule 35: 30S ribosomal protein S2

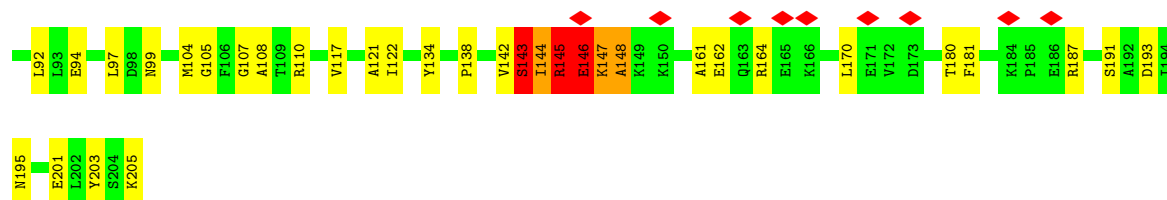


• Molecule 36: 30S ribosomal protein S3

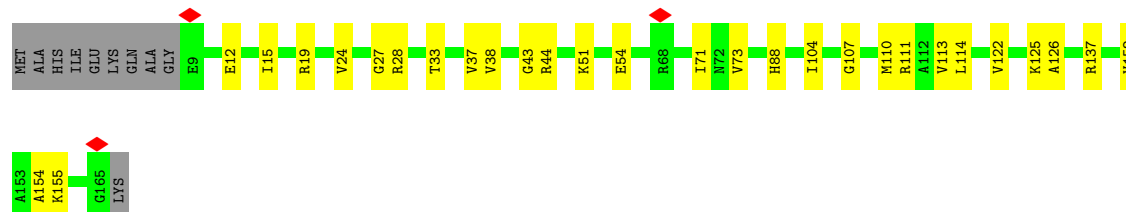
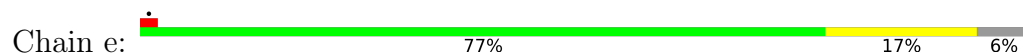


• Molecule 37: 30S ribosomal protein S4

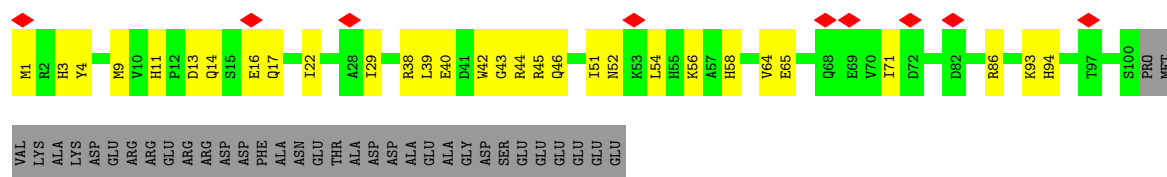




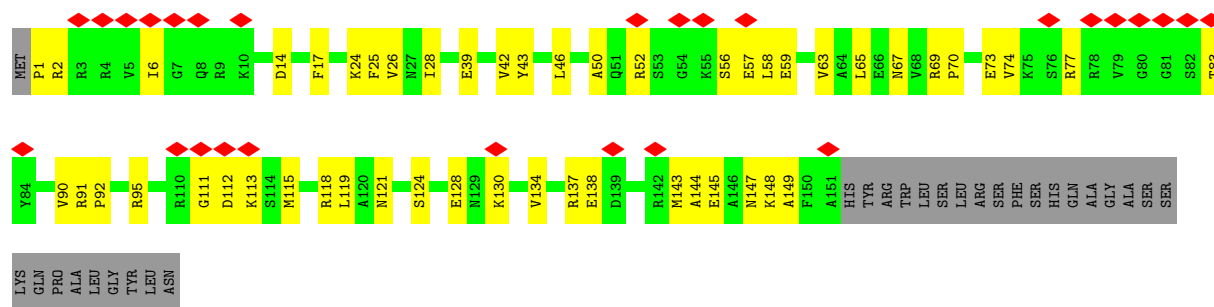
- Molecule 38: 30S ribosomal protein S5



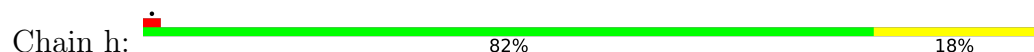
- Molecule 39: 30S ribosomal protein S6



- Molecule 40: 30S ribosomal protein S7

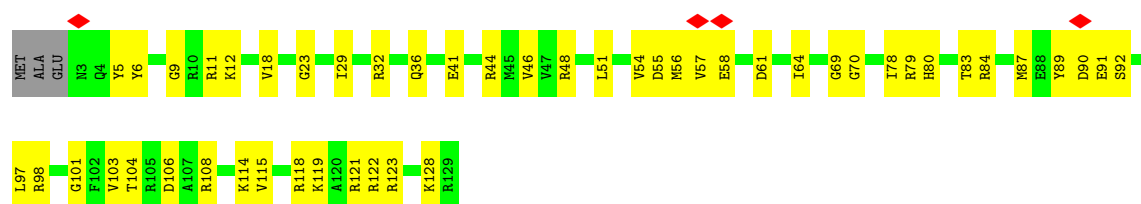


- Molecule 41: 30S ribosomal protein S8



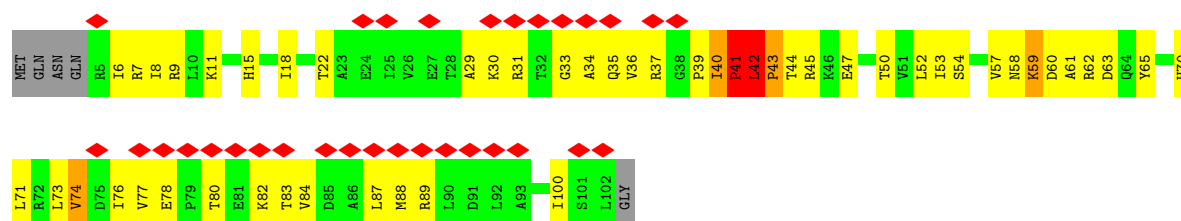
- Molecule 42: 30S ribosomal protein S9

Chain i: 



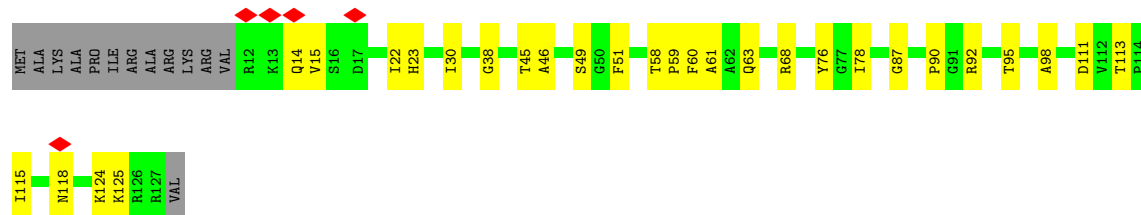
- Molecule 43: 30S ribosomal protein S10

Chain j: 



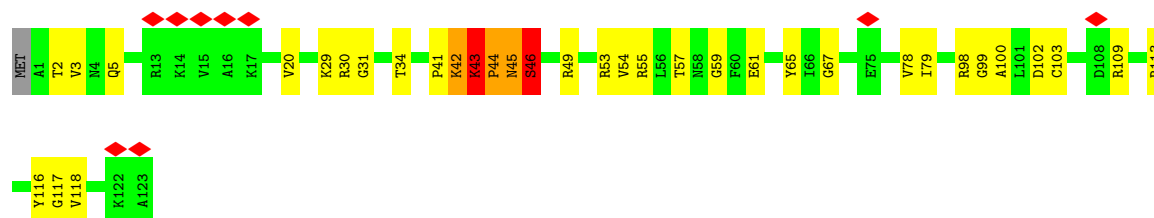
- Molecule 44: 30S ribosomal protein S11

Chain k: 



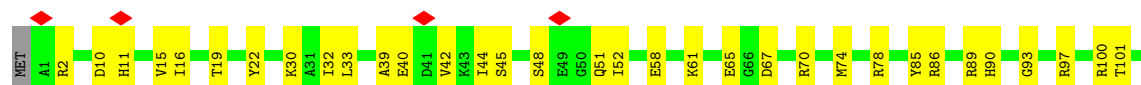
- Molecule 45: 30S ribosomal protein S12

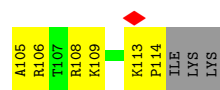
Chain l: 



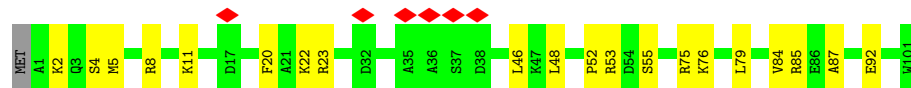
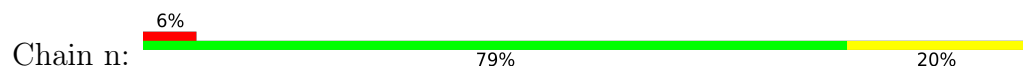
- Molecule 46: 30S ribosomal protein S13

Chain m: 

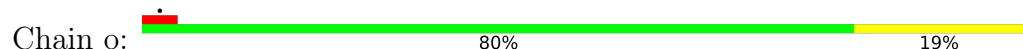




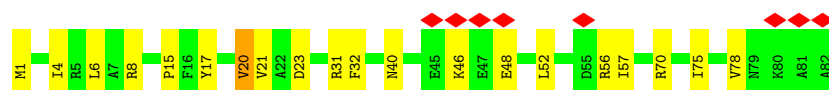
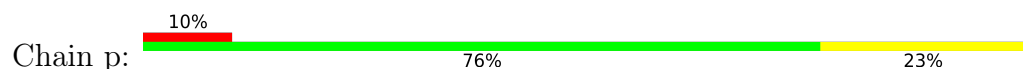
- Molecule 47: 30S ribosomal protein S14



- Molecule 48: 30S ribosomal protein S15



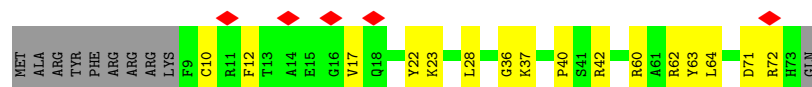
- Molecule 49: 30S ribosomal protein S16



- Molecule 50: 30S ribosomal protein S17



- Molecule 51: 30S ribosomal protein S18

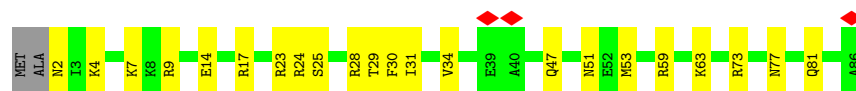


- Molecule 52: 30S ribosomal protein S19

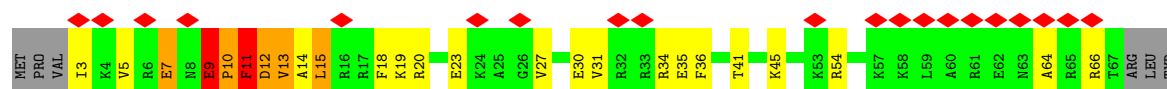




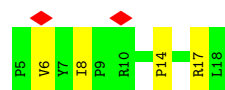
- Molecule 53: 30S ribosomal protein S20



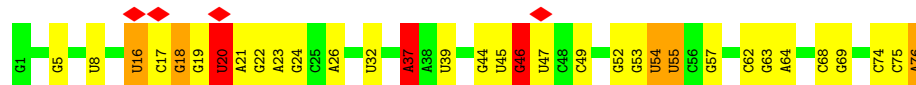
- Molecule 54: 30S ribosomal protein S21



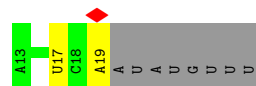
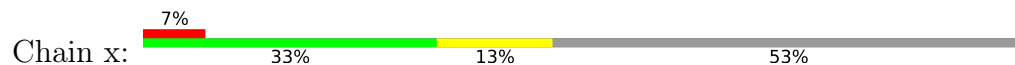
- Molecule 55: Api137



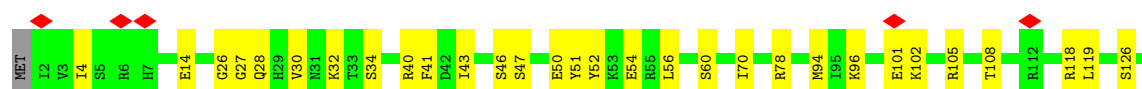
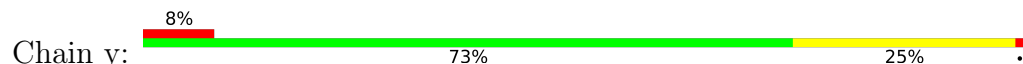
- Molecule 56: P-site tRNA^{Phe}



- Molecule 57: mRNA



- Molecule 58: Alternative stalled-ribosome rescue factor B





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	282252	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	200	Depositor
Maximum defocus (nm)	2.5	Depositor
Magnification	59000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	23.880	Depositor
Minimum map value	-9.666	Depositor
Average map value	0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	3	Depositor
Map size (Å)	334.08, 334.08, 334.08	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.6525, 0.6525, 0.6525	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 5MC, MA6, MG, NA, G7M, UR3, 2MG, ZN, 4OC, 4SU, 3TD, OMC, MIA, 6MZ, 1MG, 5MU, 2MA, OMU, PSU, OMG

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	0	0.35	0/450	0.48	0/599
2	1	0.31	0/416	0.40	0/554
3	2	0.37	0/380	0.42	0/498
4	3	0.34	0/513	0.46	0/676
5	4	0.38	0/303	0.51	0/397
6	5	0.14	0/646	0.43	0/898
7	6	0.21	0/531	0.43	0/709
8	A	0.41	4/69263 (0.0%)	0.34	0/108050
9	B	0.34	1/2873 (0.0%)	0.31	0/4478
10	C	0.38	0/2121	0.49	1/2852 (0.0%)
11	D	0.35	0/1586	0.43	0/2134
12	E	0.31	0/1571	0.40	0/2113
13	F	0.26	0/1434	0.42	0/1926
14	G	0.25	0/1343	0.40	0/1816
15	H	0.73	6/1122 (0.5%)	0.69	3/1515 (0.2%)
16	I	0.15	0/692	0.40	0/960
17	J	0.34	0/1152	0.38	0/1551
18	K	0.36	0/947	0.43	0/1268
19	L	2.06	14/1054 (1.3%)	0.88	6/1403 (0.4%)
20	M	0.34	0/1093	0.44	0/1460
21	N	0.36	0/973	0.49	0/1301
22	O	0.28	0/902	0.46	0/1209
23	P	0.34	0/929	0.40	0/1242
24	Q	0.37	0/960	0.40	0/1278
25	R	0.38	0/829	1.38	6/1107 (0.5%)
26	S	0.34	0/864	0.44	0/1156
27	T	0.29	0/744	0.40	0/994
28	U	0.29	0/787	0.41	0/1051
29	V	0.29	0/766	0.37	0/1025
30	W	0.35	0/582	0.38	0/769
31	X	0.36	0/635	0.39	0/848

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	Y	2.63	35/510 (6.9%)	1.40	17/677 (2.5%)
33	Z	0.30	0/453	0.38	0/605
34	a	0.36	1/36725 (0.0%)	0.37	4/57285 (0.0%)
35	b	0.69	7/1735 (0.4%)	0.68	4/2338 (0.2%)
36	c	0.28	0/1651	0.40	0/2225
37	d	1.19	25/1665 (1.5%)	0.86	14/2227 (0.6%)
38	e	0.30	0/1154	0.42	0/1554
39	f	0.27	0/835	0.47	0/1128
40	g	0.24	0/1195	0.40	0/1602
41	h	0.29	0/989	0.37	0/1326
42	i	0.27	0/1034	0.47	0/1375
43	j	1.66	31/796 (3.9%)	0.99	7/1077 (0.6%)
44	k	0.27	0/885	0.44	0/1195
45	l	1.31	17/969 (1.8%)	0.92	5/1300 (0.4%)
46	m	0.27	0/892	0.49	0/1193
47	n	0.27	0/811	0.41	0/1081
48	o	0.27	0/722	0.38	0/964
49	p	0.31	0/659	0.44	0/884
50	q	1.54	18/657 (2.7%)	0.92	5/881 (0.6%)
51	r	0.30	0/544	0.46	0/731
52	s	0.26	0/675	0.43	0/908
53	t	0.28	0/671	0.39	0/888
54	u	1.20	9/512 (1.8%)	1.21	8/683 (1.2%)
55	v	0.33	0/128	0.60	1/175 (0.6%)
56	w	0.60	6/1650 (0.4%)	0.33	0/2569
57	x	0.31	0/163	0.31	0/251
58	y	0.31	0/1090	0.59	4/1461 (0.3%)
All	All	0.49	174/158231 (0.1%)	0.42	85/236420 (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
19	L	0	1
37	d	0	1
58	y	0	1
All	All	0	3

The worst 5 of 174 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
19	L	130	GLY	C-O	-33.07	0.79	1.23
19	L	129	LYS	C-O	-29.46	0.89	1.24
19	L	126	ARG	C-O	-24.52	0.93	1.24
19	L	129	LYS	CA-C	-19.32	1.26	1.52
19	L	126	ARG	CA-C	-17.63	1.31	1.52

The worst 5 of 85 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
34	a	89	U	O3'-P-O5'	36.78	159.17	104.00
25	R	51	VAL	CA-C-N	27.44	154.14	119.84
25	R	51	VAL	C-N-CA	27.44	154.14	119.84
45	l	45	ASN	N-CA-C	18.33	131.34	111.36
34	a	89	U	OP1-P-O3'	-17.47	55.59	108.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
19	L	130	GLY	Mainchain
37	d	143	SER	Mainchain
58	y	136	ARG	Mainchain

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	0	444	0	461	11	0
2	1	409	0	440	15	0
3	2	377	0	418	8	0
4	3	504	0	574	16	0
5	4	302	0	340	8	0
6	5	647	0	336	4	0
7	6	522	0	521	27	0
8	A	62336	0	31365	1043	0
9	B	2570	0	1300	34	0
10	C	2082	0	2157	47	0
11	D	1565	0	1616	34	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
12	E	1552	0	1618	21	0
13	F	1410	0	1447	32	0
14	G	1323	0	1374	26	0
15	H	1111	0	1148	64	0
16	I	693	0	347	5	0
17	J	1129	0	1162	26	0
18	K	938	0	1012	32	0
19	L	1045	0	1116	33	0
20	M	1074	0	1157	45	0
21	N	960	0	1000	21	0
22	O	892	0	923	21	0
23	P	917	0	965	18	0
24	Q	947	0	1022	18	0
25	R	816	0	839	16	0
26	S	857	0	922	26	0
27	T	738	0	807	9	0
28	U	779	0	834	21	0
29	V	753	0	780	19	0
30	W	575	0	592	9	0
31	X	625	0	655	17	0
32	Y	509	0	543	11	0
33	Z	449	0	491	6	0
34	a	33050	0	16653	617	0
35	b	1704	0	1732	62	0
36	c	1624	0	1699	41	0
37	d	1643	0	1710	63	0
38	e	1141	0	1170	21	0
39	f	817	0	808	21	0
40	g	1181	0	1240	35	0
41	h	979	0	1034	17	0
42	i	1022	0	1070	41	0
43	j	786	0	828	44	0
44	k	869	0	878	23	0
45	l	955	0	1019	31	0
46	m	883	0	944	30	0
47	n	799	0	841	18	0
48	o	714	0	737	10	0
49	p	649	0	666	15	0
50	q	648	0	691	37	0
51	r	535	0	552	14	0
52	s	658	0	685	22	0
53	t	665	0	714	22	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
54	u	506	0	502	22	0
55	v	121	0	128	3	0
56	w	1631	0	837	27	0
57	x	147	0	75	1	0
58	y	1078	0	1134	36	0
59	0	1	0	0	0	0
59	A	269	0	0	0	0
59	B	7	0	0	0	0
59	C	3	0	0	0	0
59	D	1	0	0	0	0
59	M	1	0	0	1	0
59	O	1	0	0	0	0
59	P	1	0	0	0	0
59	W	1	0	0	0	0
59	a	95	0	0	0	0
59	m	1	0	0	0	0
59	n	1	0	0	0	0
59	w	4	0	0	0	0
59	y	1	0	0	0	0
60	4	1	0	0	0	0
60	6	1	0	0	0	0
61	A	1	0	0	0	0
61	V	1	0	0	0	0
All	All	147046	0	98629	2663	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 11.

The worst 5 of 2663 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)
45:l:43:LYS:HB3	45:l:44:PRO:CD	1.53	1.39
45:l:43:LYS:CB	45:l:44:PRO:CD	1.97	1.38
19:L:130:GLY:O	19:L:130:GLY:CA	1.69	1.38
37:d:46:ARG:NH2	58:y:137:SER:O	1.60	1.32
34:a:89:U:O2'	34:a:90:C:C6	1.81	1.32

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	0	54/57 (95%)	53 (98%)	1 (2%)	0	100	100
2	1	48/55 (87%)	45 (94%)	3 (6%)	0	100	100
3	2	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
4	3	62/65 (95%)	59 (95%)	3 (5%)	0	100	100
5	4	36/38 (95%)	33 (92%)	3 (8%)	0	100	100
6	5	129/165 (78%)	103 (80%)	26 (20%)	0	100	100
7	6	64/70 (91%)	51 (80%)	13 (20%)	0	100	100
10	C	269/273 (98%)	254 (94%)	15 (6%)	0	100	100
11	D	207/209 (99%)	194 (94%)	13 (6%)	0	100	100
12	E	199/201 (99%)	194 (98%)	5 (2%)	0	100	100
13	F	175/179 (98%)	163 (93%)	12 (7%)	0	100	100
14	G	174/177 (98%)	160 (92%)	14 (8%)	0	100	100
15	H	147/149 (99%)	116 (79%)	31 (21%)	0	100	100
16	I	139/142 (98%)	121 (87%)	18 (13%)	0	100	100
17	J	140/142 (99%)	139 (99%)	1 (1%)	0	100	100
18	K	120/123 (98%)	109 (91%)	11 (9%)	0	100	100
19	L	141/144 (98%)	126 (89%)	15 (11%)	0	100	100
20	M	134/136 (98%)	130 (97%)	3 (2%)	1 (1%)	18	38
21	N	118/127 (93%)	108 (92%)	10 (8%)	0	100	100
22	O	114/117 (97%)	110 (96%)	4 (4%)	0	100	100
23	P	112/115 (97%)	105 (94%)	7 (6%)	0	100	100
24	Q	115/118 (98%)	113 (98%)	2 (2%)	0	100	100
25	R	101/103 (98%)	96 (95%)	4 (4%)	1 (1%)	12	28
26	S	108/110 (98%)	102 (94%)	6 (6%)	0	100	100
27	T	91/100 (91%)	82 (90%)	9 (10%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
28	U	100/104 (96%)	91 (91%)	9 (9%)	0	100	100
29	V	92/94 (98%)	91 (99%)	1 (1%)	0	100	100
30	W	73/85 (86%)	69 (94%)	4 (6%)	0	100	100
31	X	75/78 (96%)	74 (99%)	1 (1%)	0	100	100
32	Y	61/63 (97%)	59 (97%)	0	2 (3%)	3	5
33	Z	56/59 (95%)	55 (98%)	1 (2%)	0	100	100
35	b	216/240 (90%)	198 (92%)	18 (8%)	0	100	100
36	c	204/233 (88%)	196 (96%)	8 (4%)	0	100	100
37	d	203/206 (98%)	176 (87%)	23 (11%)	4 (2%)	6	12
38	e	155/167 (93%)	139 (90%)	16 (10%)	0	100	100
39	f	98/135 (73%)	90 (92%)	8 (8%)	0	100	100
40	g	149/179 (83%)	141 (95%)	8 (5%)	0	100	100
41	h	127/130 (98%)	116 (91%)	11 (9%)	0	100	100
42	i	125/130 (96%)	108 (86%)	17 (14%)	0	100	100
43	j	96/103 (93%)	81 (84%)	12 (12%)	3 (3%)	3	5
44	k	114/129 (88%)	102 (90%)	12 (10%)	0	100	100
45	l	121/124 (98%)	112 (93%)	8 (7%)	1 (1%)	16	34
46	m	112/118 (95%)	102 (91%)	10 (9%)	0	100	100
47	n	99/102 (97%)	90 (91%)	9 (9%)	0	100	100
48	o	86/89 (97%)	82 (95%)	4 (5%)	0	100	100
49	p	80/82 (98%)	69 (86%)	11 (14%)	0	100	100
50	q	78/84 (93%)	69 (88%)	9 (12%)	0	100	100
51	r	63/75 (84%)	55 (87%)	8 (13%)	0	100	100
52	s	80/92 (87%)	74 (92%)	6 (8%)	0	100	100
53	t	83/87 (95%)	80 (96%)	3 (4%)	0	100	100
54	u	63/71 (89%)	52 (82%)	8 (13%)	3 (5%)	2	2
55	v	12/14 (86%)	9 (75%)	3 (25%)	0	100	100
58	y	137/140 (98%)	129 (94%)	6 (4%)	2 (2%)	8	18
All	All	5999/6374 (94%)	5518 (92%)	464 (8%)	17 (0%)	37	58

5 of 17 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
20	M	70	ASP
25	R	52	PRO
32	Y	18	LEU
37	d	143	SER
45	l	43	LYS

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	
1	0	47/48 (98%)	47 (100%)	0	100	100
2	1	45/49 (92%)	45 (100%)	0	100	100
3	2	38/38 (100%)	38 (100%)	0	100	100
4	3	51/52 (98%)	47 (92%)	4 (8%)	11	26
5	4	34/34 (100%)	34 (100%)	0	100	100
7	6	59/62 (95%)	59 (100%)	0	100	100
10	C	216/218 (99%)	216 (100%)	0	100	100
11	D	164/164 (100%)	163 (99%)	1 (1%)	78	91
12	E	165/165 (100%)	165 (100%)	0	100	100
13	F	148/150 (99%)	148 (100%)	0	100	100
14	G	137/138 (99%)	137 (100%)	0	100	100
15	H	114/114 (100%)	111 (97%)	3 (3%)	40	68
17	J	116/116 (100%)	116 (100%)	0	100	100
18	K	103/104 (99%)	103 (100%)	0	100	100
19	L	102/103 (99%)	101 (99%)	1 (1%)	68	86
20	M	109/109 (100%)	109 (100%)	0	100	100
21	N	100/103 (97%)	100 (100%)	0	100	100
22	O	86/87 (99%)	86 (100%)	0	100	100
23	P	99/100 (99%)	99 (100%)	0	100	100
24	Q	89/90 (99%)	89 (100%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
25	R	84/84 (100%)	82 (98%)	2 (2%)	43	70
26	S	93/93 (100%)	93 (100%)	0	100	100
27	T	80/84 (95%)	80 (100%)	0	100	100
28	U	83/85 (98%)	83 (100%)	0	100	100
29	V	78/78 (100%)	78 (100%)	0	100	100
30	W	57/63 (90%)	57 (100%)	0	100	100
31	X	67/68 (98%)	67 (100%)	0	100	100
32	Y	55/55 (100%)	50 (91%)	5 (9%)	9	19
33	Z	48/49 (98%)	48 (100%)	0	100	100
35	b	180/198 (91%)	178 (99%)	2 (1%)	65	84
36	c	170/190 (90%)	170 (100%)	0	100	100
37	d	172/173 (99%)	167 (97%)	5 (3%)	37	65
38	e	114/126 (90%)	114 (100%)	0	100	100
39	f	87/116 (75%)	87 (100%)	0	100	100
40	g	124/147 (84%)	124 (100%)	0	100	100
41	h	104/105 (99%)	104 (100%)	0	100	100
42	i	105/107 (98%)	105 (100%)	0	100	100
43	j	86/90 (96%)	84 (98%)	2 (2%)	44	71
44	k	89/99 (90%)	89 (100%)	0	100	100
45	l	103/104 (99%)	101 (98%)	2 (2%)	50	75
46	m	92/96 (96%)	92 (100%)	0	100	100
47	n	79/84 (94%)	79 (100%)	0	100	100
48	o	76/77 (99%)	76 (100%)	0	100	100
49	p	65/65 (100%)	64 (98%)	1 (2%)	57	80
50	q	74/78 (95%)	73 (99%)	1 (1%)	59	81
51	r	56/65 (86%)	56 (100%)	0	100	100
52	s	72/79 (91%)	72 (100%)	0	100	100
53	t	65/66 (98%)	65 (100%)	0	100	100
54	u	46/61 (75%)	45 (98%)	1 (2%)	45	72
55	v	14/14 (100%)	14 (100%)	0	100	100
58	y	112/115 (97%)	112 (100%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	4752/4958 (96%)	4722 (99%)	30 (1%)	76 91

5 of 30 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
32	Y	21	LEU
49	p	20	VAL
35	b	65	LYS
54	u	13	VAL
43	j	74	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 67 such sidechains are listed below:

Mol	Chain	Res	Type
45	l	111	GLN
47	n	60	GLN
53	t	51	ASN
18	K	88	ASN
18	K	9	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
34	a	1539/1542 (99%)	253 (16%)	0
56	w	75/76 (98%)	11 (14%)	0
57	x	6/15 (40%)	1 (16%)	0
8	A	2902/2903 (99%)	515 (17%)	35 (1%)
9	B	119/120 (99%)	15 (12%)	3 (2%)
All	All	4641/4656 (99%)	795 (17%)	38 (0%)

5 of 795 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
8	A	10	A
8	A	15	G
8	A	34	U
8	A	35	G
8	A	46	G

5 of 38 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
8	A	2405	G
9	B	44	G
8	A	2406	A
8	A	2728	U
9	B	66	A

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

41 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
8	2MA	A	2503	8,59	22,25,26	3.77	8 (36%)	33,37,40	2.14	10 (30%)
8	OMC	A	2498	8,59	19,22,23	2.82	8 (42%)	26,31,34	0.86	0
8	PSU	A	955	8	18,21,22	1.07	1 (5%)	22,30,33	1.89	4 (18%)
34	5MC	a	967	34	18,22,23	3.43	7 (38%)	26,32,35	1.00	2 (7%)
8	6MZ	A	1618	8	22,25,26	2.31	7 (31%)	30,36,39	2.42	10 (33%)
34	UR3	a	1498	34	19,22,23	2.70	6 (31%)	26,32,35	1.54	3 (11%)
8	PSU	A	1917	8	18,21,22	1.05	1 (5%)	22,30,33	1.79	4 (18%)
56	4SU	w	8	56	18,21,22	3.67	8 (44%)	26,30,33	2.26	5 (19%)
8	6MZ	A	2030	8	22,25,26	2.30	8 (36%)	30,36,39	2.53	12 (40%)
8	G7M	A	2069	8	23,26,27	3.34	10 (43%)	35,39,42	1.64	6 (17%)
8	PSU	A	2580	8	18,21,22	1.13	3 (16%)	22,30,33	1.97	6 (27%)
56	MIA	w	37	56	28,31,32	2.59	7 (25%)	40,44,47	2.86	16 (40%)
8	3TD	A	1915	8	18,22,23	4.46	7 (38%)	22,32,35	1.83	4 (18%)
8	OMG	A	2251	56,8,59	23,26,27	2.33	8 (34%)	33,38,41	2.62	10 (30%)
34	2MG	a	1516	34	23,26,27	2.70	9 (39%)	32,38,41	2.28	12 (37%)
8	5MC	A	1962	8	18,22,23	3.37	7 (38%)	26,32,35	1.08	2 (7%)
8	PSU	A	2504	8	18,21,22	1.09	1 (5%)	22,30,33	1.76	4 (18%)
34	G7M	a	527	34	23,26,27	3.39	10 (43%)	35,39,42	1.61	6 (17%)
8	2MG	A	2445	8	23,26,27	2.65	8 (34%)	32,38,41	2.23	10 (31%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
56	PSU	w	55	56	18,21,22	1.02	1 (5%)	22,30,33	2.09	5 (22%)
34	PSU	a	516	34,59	18,21,22	0.96	1 (5%)	22,30,33	1.73	5 (22%)
8	5MU	A	1939	8	19,22,23	4.69	7 (36%)	28,32,35	3.78	9 (32%)
56	PSU	w	39	56	18,21,22	1.04	1 (5%)	22,30,33	1.75	2 (9%)
34	2MG	a	966	34	23,26,27	2.71	7 (30%)	32,38,41	2.31	8 (25%)
34	MA6	a	1518	34	23,26,27	1.61	2 (8%)	34,38,41	3.15	11 (32%)
8	5MC	A	747	8	18,22,23	3.35	7 (38%)	26,32,35	1.24	2 (7%)
8	PSU	A	2457	8	18,21,22	1.08	1 (5%)	22,30,33	2.02	6 (27%)
34	2MG	a	1207	34	23,26,27	2.71	9 (39%)	32,38,41	2.14	11 (34%)
34	MA6	a	1519	34	23,26,27	1.59	2 (8%)	34,38,41	3.23	11 (32%)
8	PSU	A	746	8,59	18,21,22	1.04	1 (5%)	22,30,33	1.76	3 (13%)
8	PSU	A	1911	8	18,21,22	1.05	1 (5%)	22,30,33	1.90	5 (22%)
8	PSU	A	2604	8	18,21,22	1.04	1 (5%)	22,30,33	1.98	5 (22%)
34	4OC	a	1402	34	20,23,24	3.06	8 (40%)	26,32,35	0.94	1 (3%)
8	1MG	A	745	8	22,26,27	2.57	7 (31%)	33,39,42	1.63	6 (18%)
34	5MC	a	1407	34	18,22,23	3.35	7 (38%)	26,32,35	1.07	2 (7%)
56	5MU	w	54	56	19,22,23	4.76	7 (36%)	28,32,35	3.74	9 (32%)
8	OMU	A	2552	8,59	19,22,23	2.88	7 (36%)	26,31,34	1.97	6 (23%)
8	2MG	A	1835	8	23,26,27	2.67	8 (34%)	32,38,41	2.23	9 (28%)
56	PSU	w	32	56	18,21,22	1.07	1 (5%)	22,30,33	1.71	3 (13%)
56	G7M	w	46	56	23,26,27	2.26	7 (30%)	35,39,42	3.16	10 (28%)
8	PSU	A	2605	8	18,21,22	1.04	1 (5%)	22,30,33	1.88	4 (18%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	2MA	A	2503	8,59	-	2/7/25/26	0/3/3/3
8	OMC	A	2498	8,59	-	0/9/27/28	0/2/2/2
8	PSU	A	955	8	-	0/7/25/26	0/2/2/2
34	5MC	a	967	34	-	0/7/25/26	0/2/2/2
8	6MZ	A	1618	8	-	0/9/27/28	0/3/3/3
34	UR3	a	1498	34	-	2/7/25/26	0/2/2/2
8	PSU	A	1917	8	-	0/7/25/26	0/2/2/2
56	4SU	w	8	56	-	0/7/25/26	0/2/2/2

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	6MZ	A	2030	8	-	2/9/27/28	0/3/3/3
8	G7M	A	2069	8	-	1/7/25/26	0/3/3/3
8	PSU	A	2580	8	-	0/7/25/26	0/2/2/2
56	MIA	w	37	56	-	8/15/33/34	0/3/3/3
8	3TD	A	1915	8	-	3/7/25/26	0/2/2/2
8	OMG	A	2251	56,8,59	-	1/9/27/28	0/3/3/3
34	2MG	a	1516	34	-	0/9/27/28	0/3/3/3
8	5MC	A	1962	8	-	0/7/25/26	0/2/2/2
8	PSU	A	2504	8	-	2/7/25/26	0/2/2/2
34	G7M	a	527	34	-	1/7/25/26	0/3/3/3
8	2MG	A	2445	8	-	2/9/27/28	0/3/3/3
56	PSU	w	55	56	-	0/7/25/26	0/2/2/2
34	PSU	a	516	34,59	-	0/7/25/26	0/2/2/2
8	5MU	A	1939	8	-	2/7/25/26	0/2/2/2
56	PSU	w	39	56	-	3/7/25/26	0/2/2/2
34	2MG	a	966	34	-	2/9/27/28	0/3/3/3
34	MA6	a	1518	34	-	1/11/29/30	0/3/3/3
8	5MC	A	747	8	-	0/7/25/26	0/2/2/2
8	PSU	A	2457	8	-	0/7/25/26	0/2/2/2
34	2MG	a	1207	34	-	0/9/27/28	0/3/3/3
34	MA6	a	1519	34	-	1/11/29/30	0/3/3/3
8	PSU	A	746	8,59	-	1/7/25/26	0/2/2/2
8	PSU	A	1911	8	-	0/7/25/26	0/2/2/2
8	PSU	A	2604	8	-	0/7/25/26	0/2/2/2
34	4OC	a	1402	34	-	1/9/29/30	0/2/2/2
8	1MG	A	745	8	-	0/7/25/26	0/3/3/3
34	5MC	a	1407	34	-	0/7/25/26	0/2/2/2
56	5MU	w	54	56	-	0/7/25/26	0/2/2/2
8	OMU	A	2552	8,59	-	2/9/27/28	0/2/2/2
8	2MG	A	1835	8	-	2/9/27/28	0/3/3/3
56	PSU	w	32	56	-	3/7/25/26	0/2/2/2
56	G7M	w	46	56	-	3/7/25/26	0/3/3/3
8	PSU	A	2605	8	-	0/7/25/26	0/2/2/2

The worst 5 of 218 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	A	1915	3TD	C6-C5	14.22	1.51	1.35
8	A	2503	2MA	C4-N3	11.60	1.49	1.34
56	w	54	5MU	C2-N1	10.85	1.55	1.38

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
56	w	54	5MU	C6-N1	10.23	1.55	1.38
8	A	1939	5MU	C6-N1	10.06	1.55	1.38

The worst 5 of 259 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
34	a	1519	MA6	N1-C6-N6	-12.91	102.97	117.08
56	w	54	5MU	C5-C4-N3	12.67	126.12	115.31
8	A	1939	5MU	C5-C4-N3	12.46	125.94	115.31
34	a	1518	MA6	N1-C6-N6	-12.17	103.78	117.08
8	A	1939	5MU	C5-C6-N1	-10.78	112.25	123.34

There are no chirality outliers.

5 of 45 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	A	1915	3TD	C2'-C1'-C5-C4
8	A	1915	3TD	O4'-C1'-C5-C4
8	A	1915	3TD	O4'-C1'-C5-C6
8	A	1939	5MU	O4'-C4'-C5'-O5'
8	A	2251	OMG	C1'-C2'-O2'-CM2

There are no ring outliers.

21 monomers are involved in 32 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	A	2498	OMC	1	0
8	A	955	PSU	1	0
34	a	967	5MC	1	0
34	a	1498	UR3	2	0
8	A	2030	6MZ	3	0
56	w	37	MIA	1	0
8	A	1915	3TD	4	0
8	A	2251	OMG	1	0
8	A	1962	5MC	1	0
34	a	527	G7M	1	0
56	w	55	PSU	2	0
34	a	516	PSU	3	0
8	A	1939	5MU	1	0
34	a	966	2MG	1	0
8	A	747	5MC	2	0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Clashes	Symm-Clashes
34	a	1402	4OC	2	0
8	A	745	1MG	1	0
34	a	1407	5MC	1	0
56	w	54	5MU	2	0
8	A	2552	OMU	1	0
56	w	46	G7M	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 391 ligands modelled in this entry, 391 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

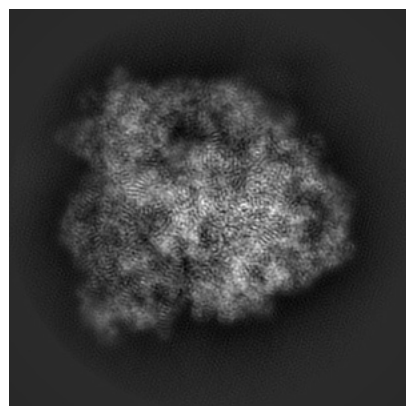
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-10906. These allow visual inspection of the internal detail of the map and identification of artifacts.

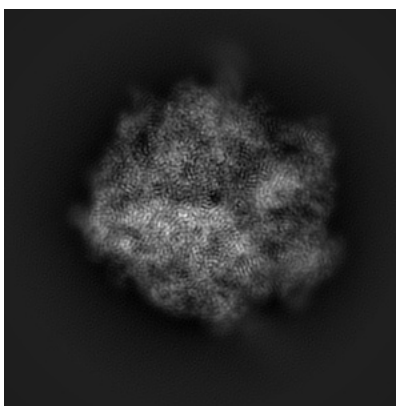
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

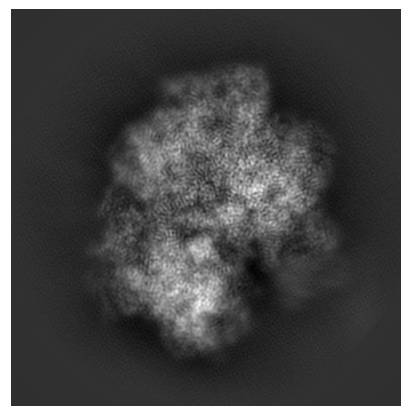
6.1.1 Primary map



X

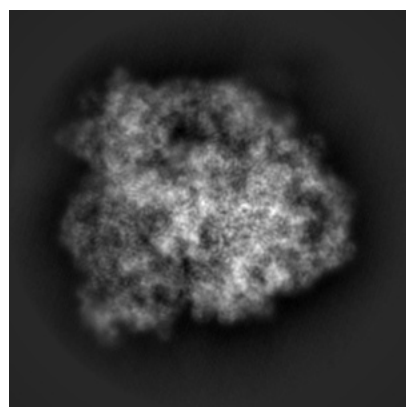


Y

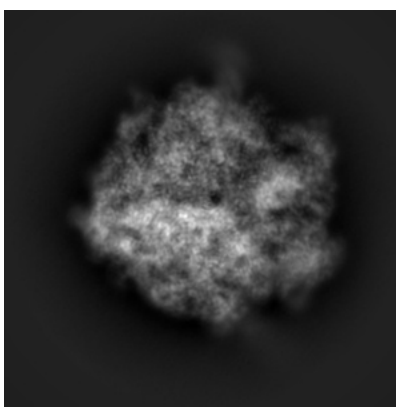


Z

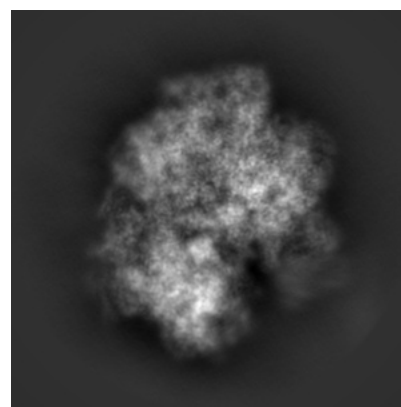
6.1.2 Raw map



X



Y

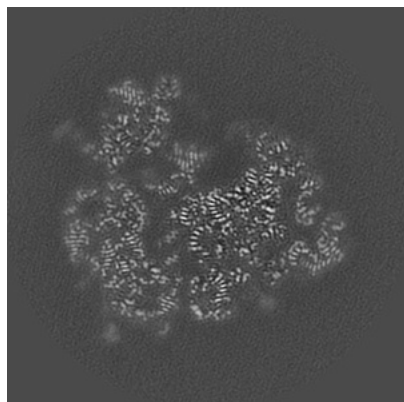


Z

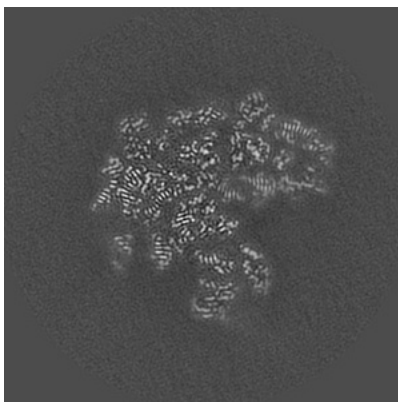
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

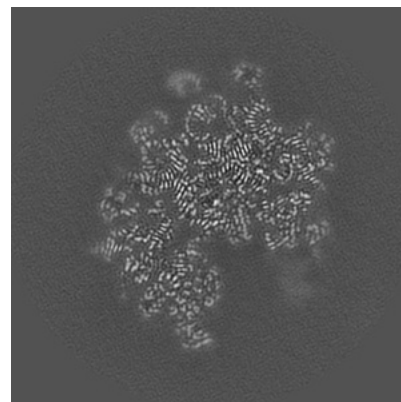
6.2.1 Primary map



X Index: 256

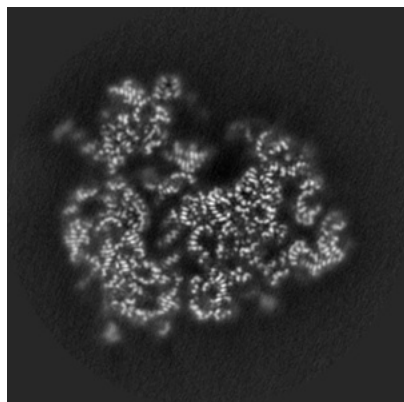


Y Index: 256

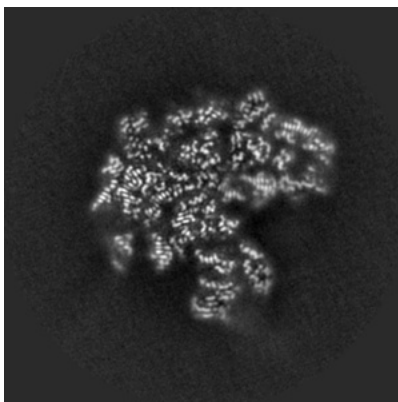


Z Index: 256

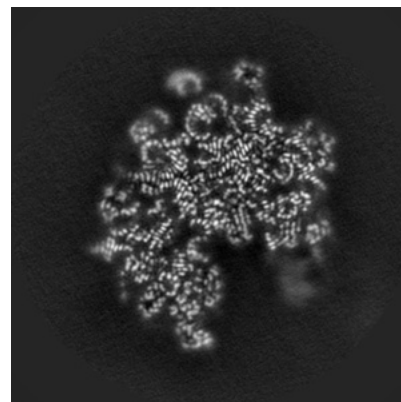
6.2.2 Raw map



X Index: 144



Y Index: 144

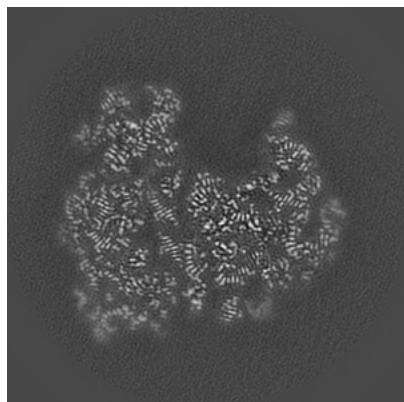


Z Index: 144

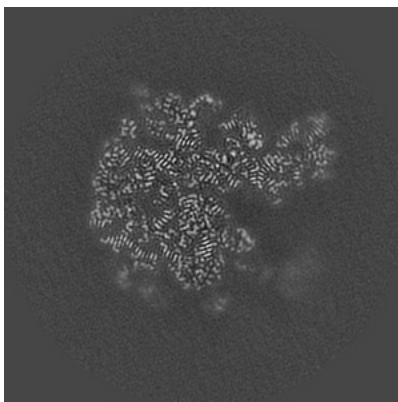
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

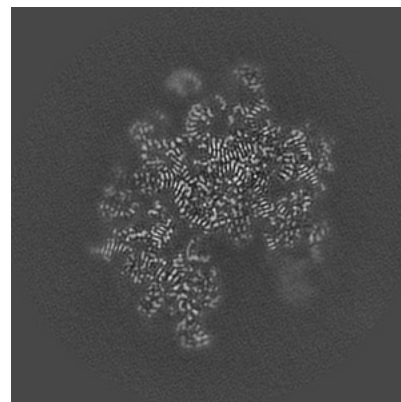
6.3.1 Primary map



X Index: 236

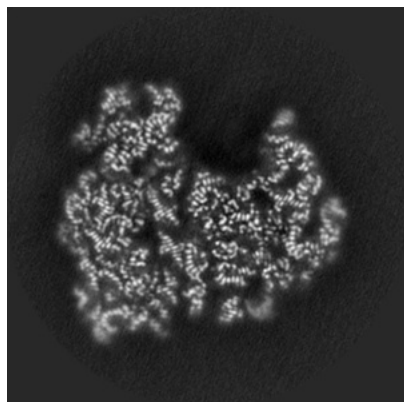


Y Index: 284

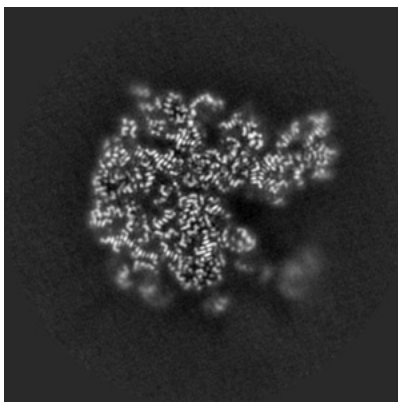


Z Index: 258

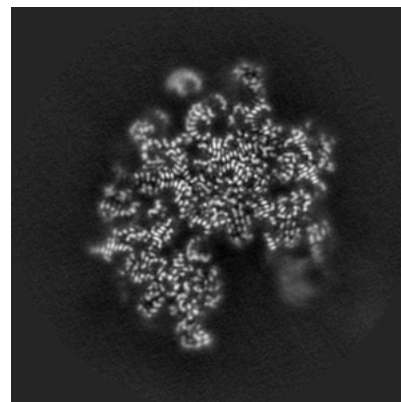
6.3.2 Raw map



X Index: 133



Y Index: 160

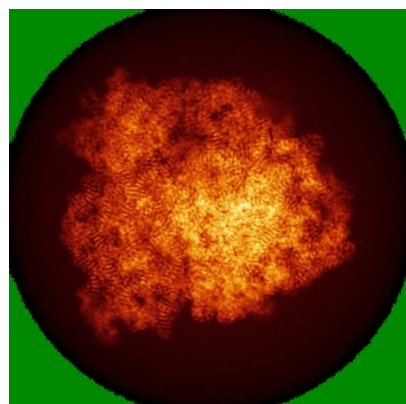


Z Index: 145

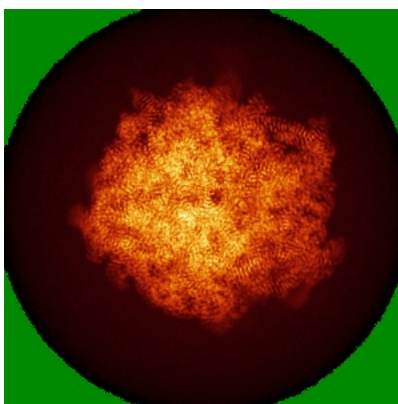
The images above show the largest variance slices of the map in three orthogonal directions.

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

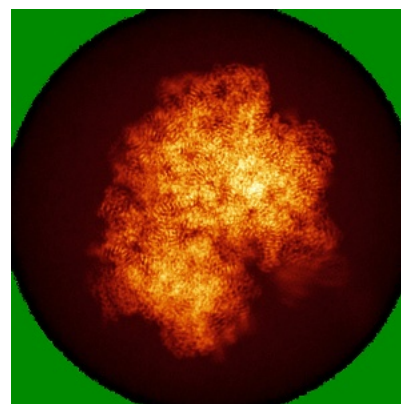
6.4.1 Primary map



X

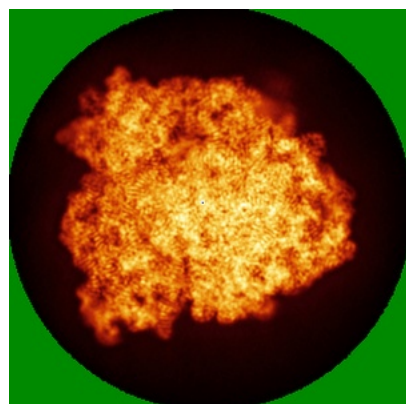


Y

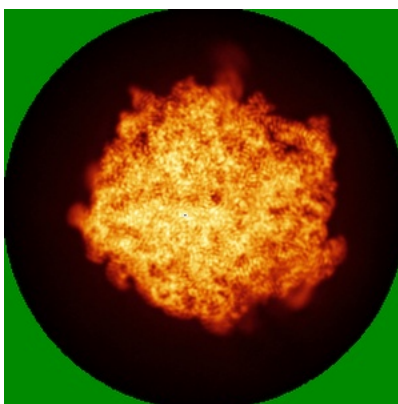


Z

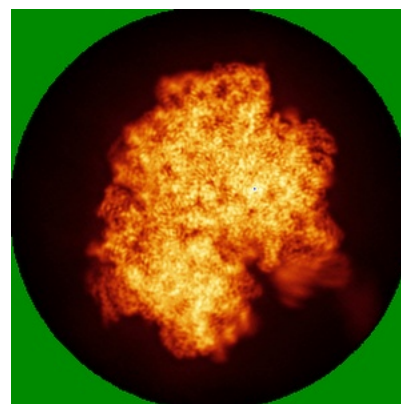
6.4.2 Raw map



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](#)

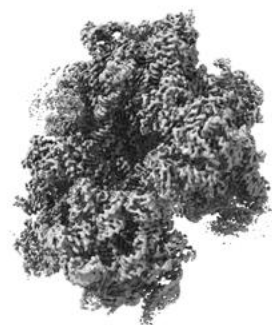
6.5.1 Primary map



X



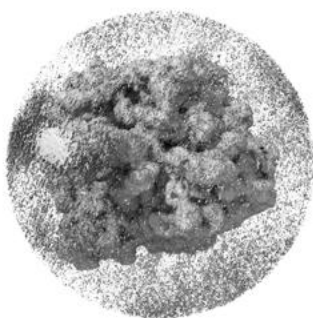
Y



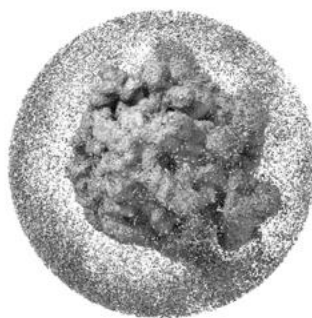
Z

The images above show the 3D surface view of the map at the recommended contour level 3.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

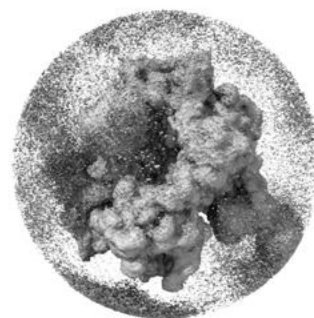
6.5.2 Raw map



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.

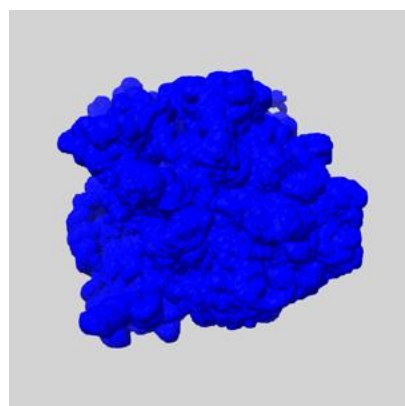
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

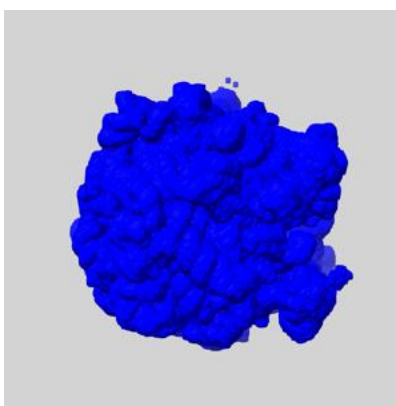
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

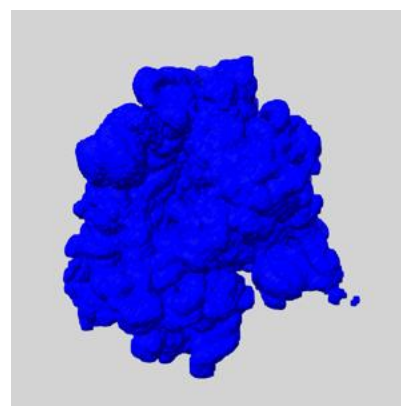
6.6.1 emd_10906_msk_1.map [i](#)



X



Y

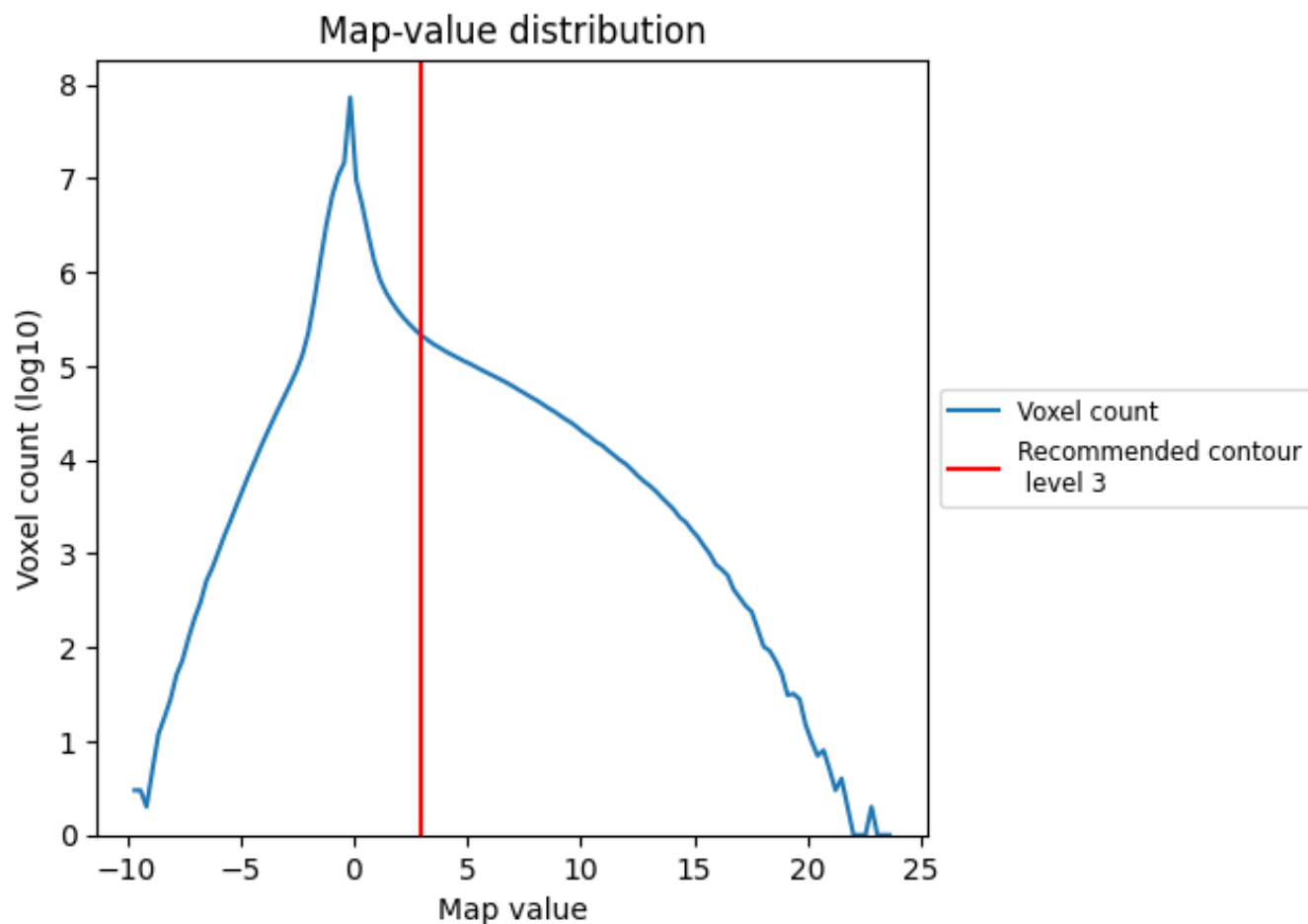


Z

7 Map analysis [i](#)

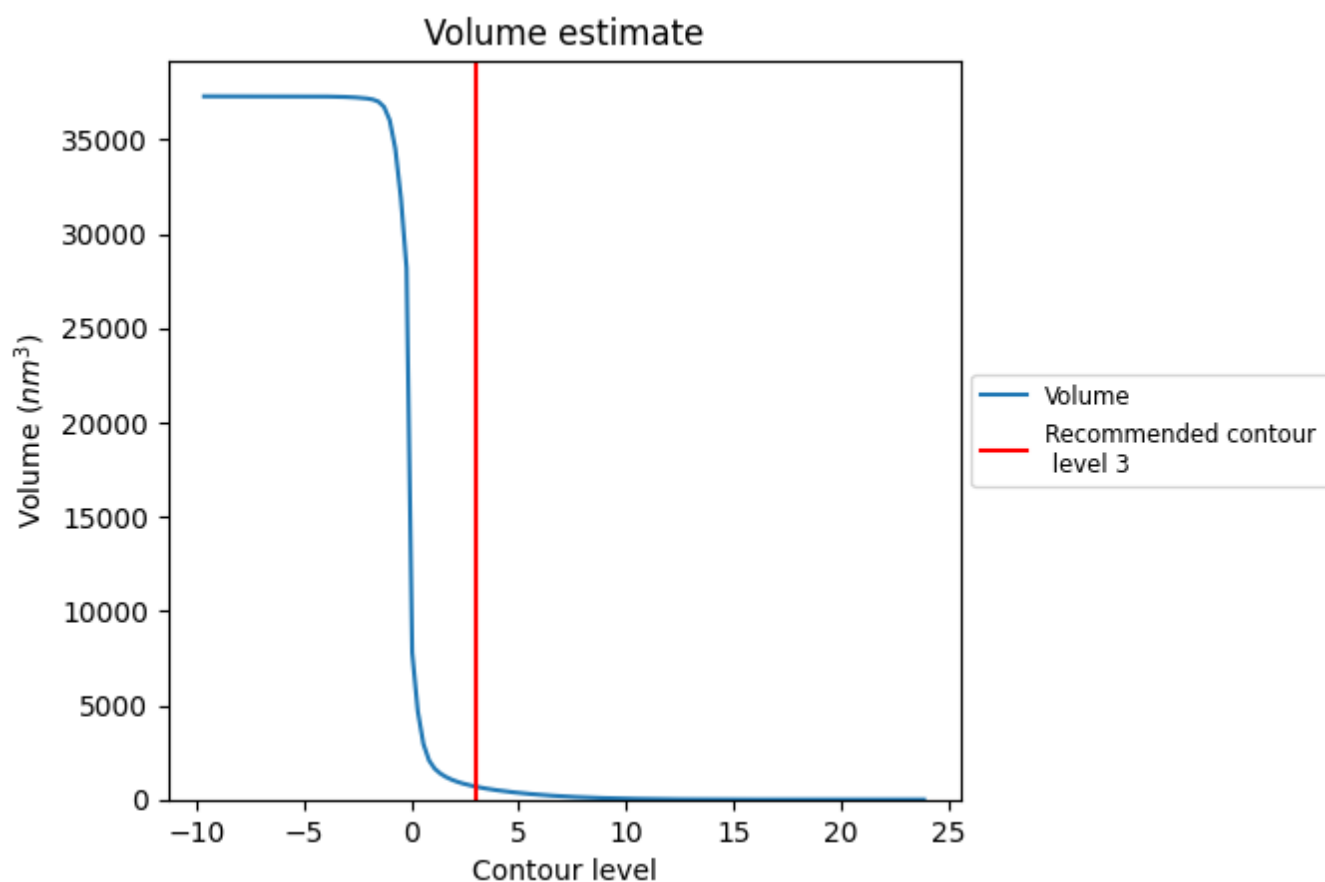
This section contains the results of statistical analysis of the map.

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.

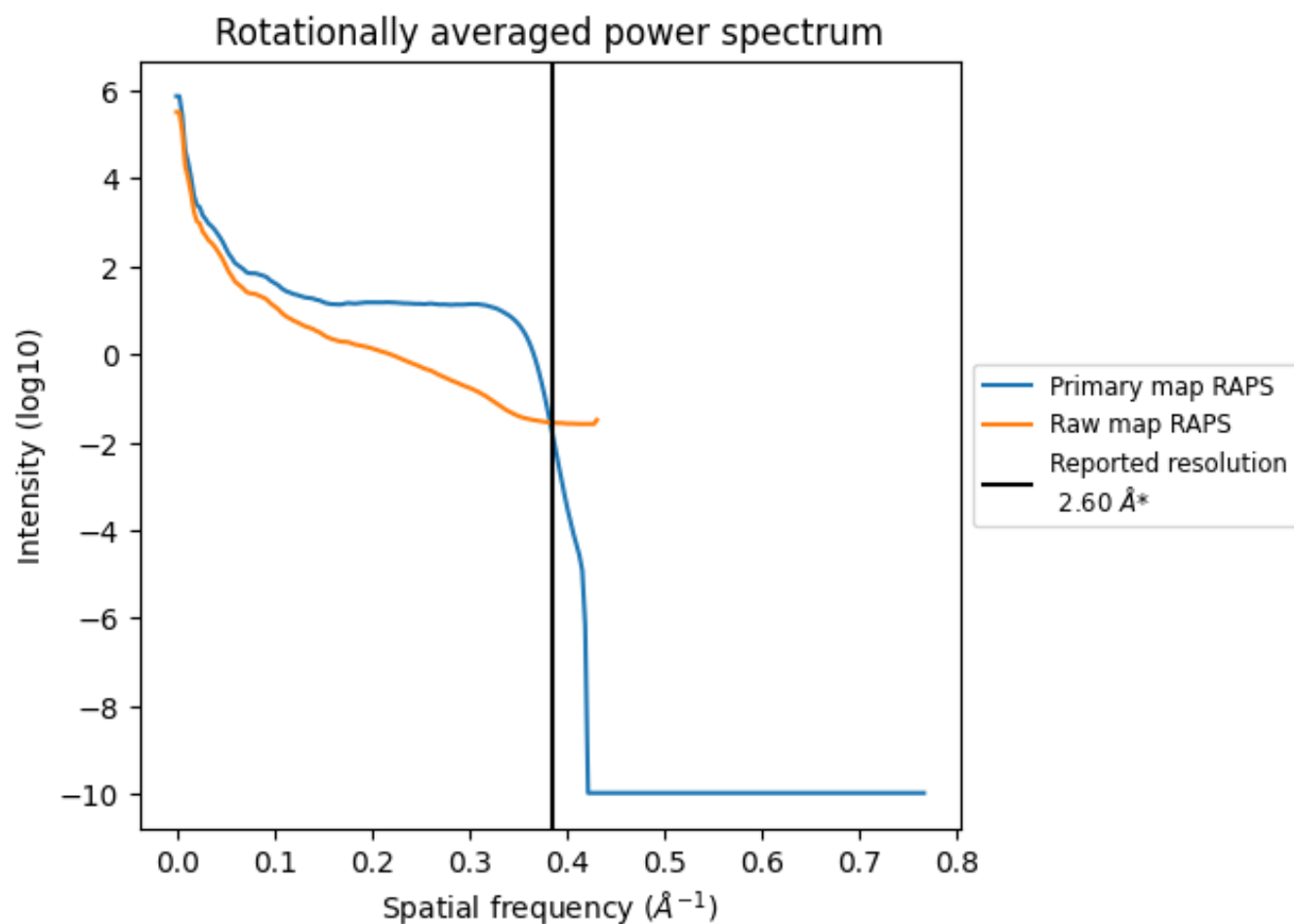
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 684 nm³; this corresponds to an approximate mass of 618 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 ⓘ

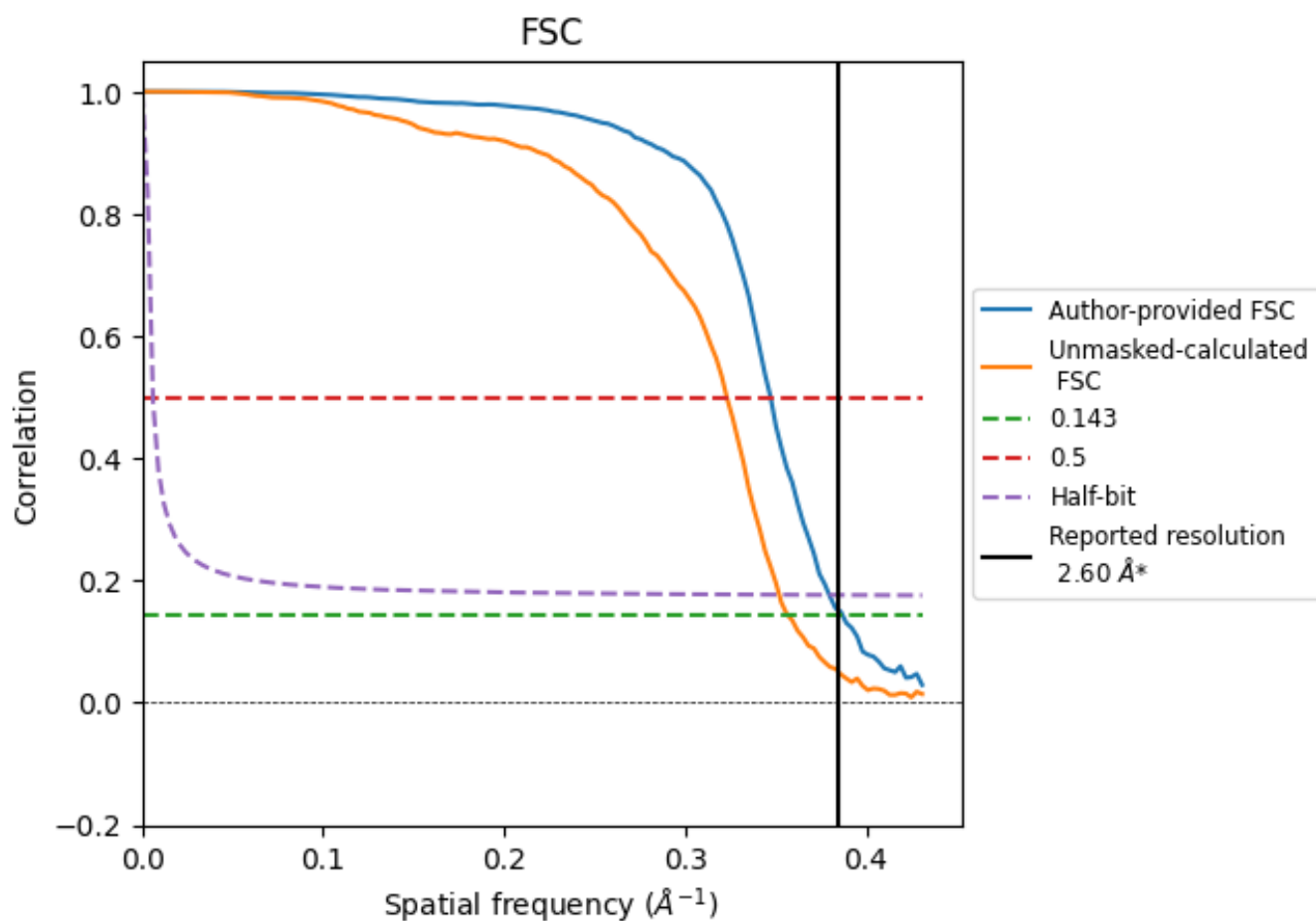


*Reported resolution corresponds to spatial frequency of 0.385 Å⁻¹

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 0.385 Å⁻¹

8.2 Resolution estimates [i](#)

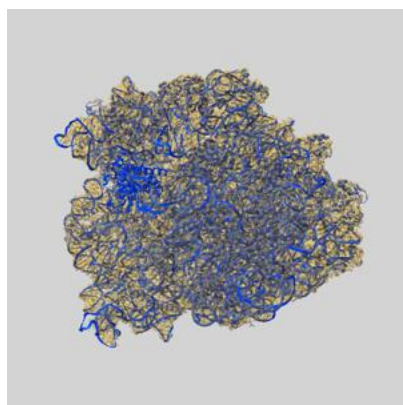
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.60	-	-
Author-provided FSC curve	2.58	2.88	2.63
Unmasked-calculated*	2.80	3.10	2.84

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

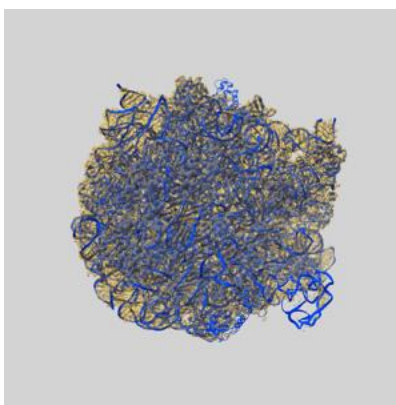
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-10906 and PDB model 6YSS. Per-residue inclusion information can be found in section [3](#) on page [16](#).

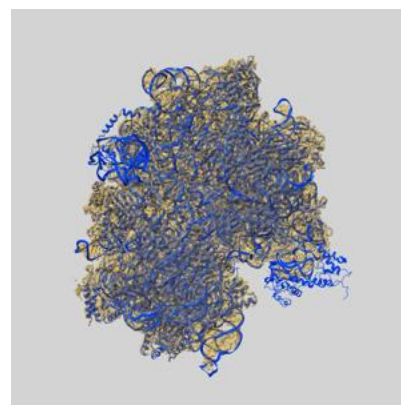
9.1 Map-model overlay [i](#)



X



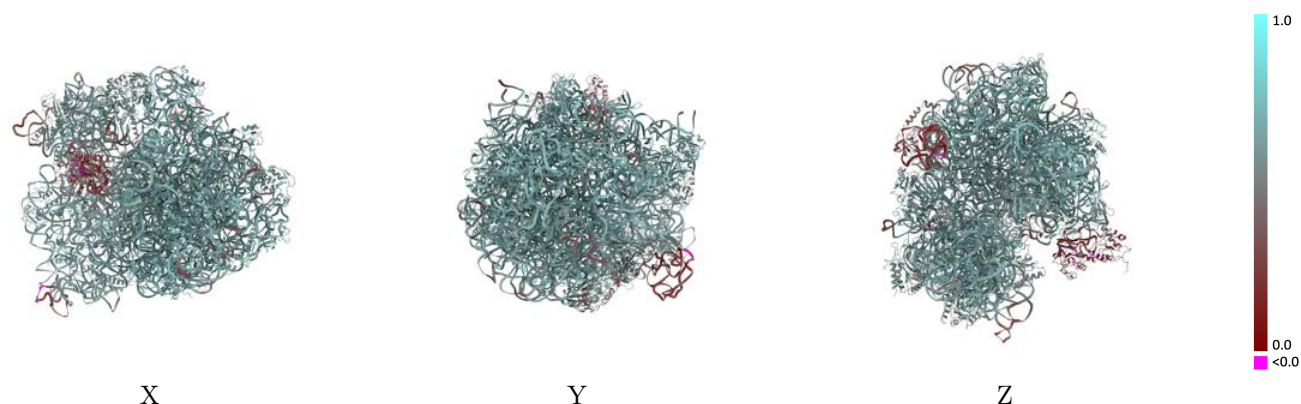
Y



Z

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](#)



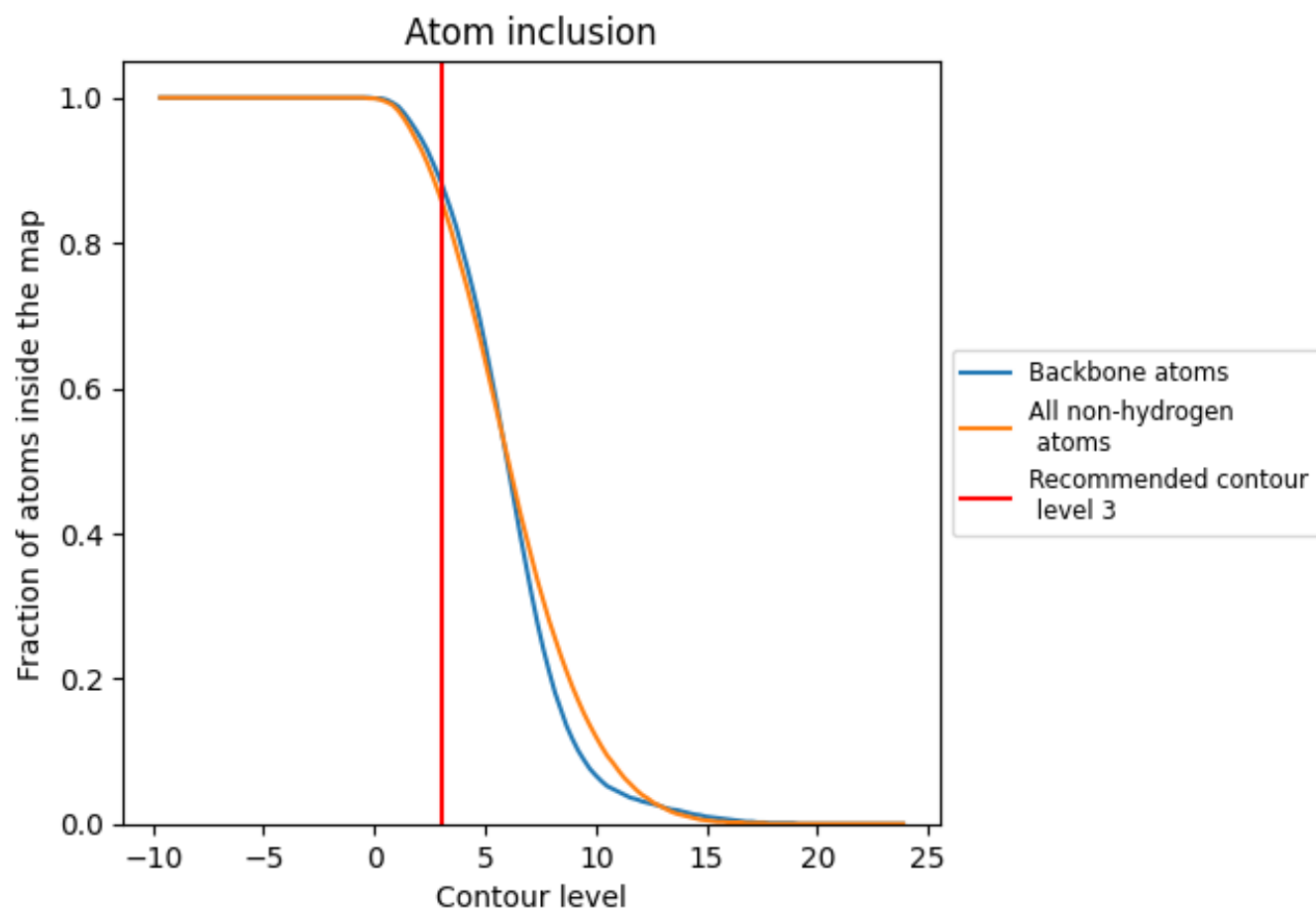
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.4 Atom inclusion [i](#)



At the recommended contour level, 88% of all backbone atoms, 86% 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) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8610	 0.6130
0	 0.8420	 0.6350
1	 0.7760	 0.6330
2	 0.9130	 0.6610
3	 0.9100	 0.6550
4	 0.8800	 0.6260
5	 0.0220	 0.2620
6	 0.5180	 0.5170
A	 0.9070	 0.6190
B	 0.9310	 0.6300
C	 0.8950	 0.6580
D	 0.8910	 0.6470
E	 0.7850	 0.6180
F	 0.7310	 0.5890
G	 0.6900	 0.5820
H	 0.2110	 0.4620
I	 0.0060	 0.2640
J	 0.8910	 0.6480
K	 0.8410	 0.6460
L	 0.8460	 0.6360
M	 0.8500	 0.6430
N	 0.9130	 0.6540
O	 0.8330	 0.6150
P	 0.8370	 0.6420
Q	 0.9340	 0.6620
R	 0.8420	 0.6260
S	 0.8490	 0.6390
T	 0.7890	 0.6100
U	 0.7720	 0.6000
V	 0.8170	 0.6300
W	 0.8960	 0.6530
X	 0.8500	 0.6390
Y	 0.7430	 0.6000
Z	 0.8490	 0.6390
a	 0.9190	 0.6190



Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
b	 0.5960	 0.5570
c	 0.7590	 0.6080
d	 0.7600	 0.6060
e	 0.8450	 0.6310
f	 0.7190	 0.5820
g	 0.6260	 0.5560
h	 0.8240	 0.6350
i	 0.7650	 0.5890
j	 0.5820	 0.5460
k	 0.7880	 0.6050
l	 0.8260	 0.6250
m	 0.7570	 0.6050
n	 0.7880	 0.6060
o	 0.7960	 0.6080
p	 0.7860	 0.6000
q	 0.7550	 0.6090
r	 0.7880	 0.6090
s	 0.7730	 0.5960
t	 0.8000	 0.6050
u	 0.5590	 0.5610
v	 0.7810	 0.6420
w	 0.8450	 0.6010
x	 0.8160	 0.5840
y	 0.7540	 0.6170