



## wwPDB EM Validation Summary Report ⓘ

Nov 27, 2022 – 01:11 AM EST

PDB ID : 5KPW  
EMDB ID : EMD-8281  
Title : Structure of RelA bound to ribosome in presence of A/R tRNA (Structure III)  
Authors : Loveland, A.B.; Bah, E.; Madireddy, R.; Zhang, Y.; Brilot, A.F.; Grigorieff, N.; Korostelev, A.A.  
Deposited on : 2016-07-05  
Resolution : 3.90 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](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

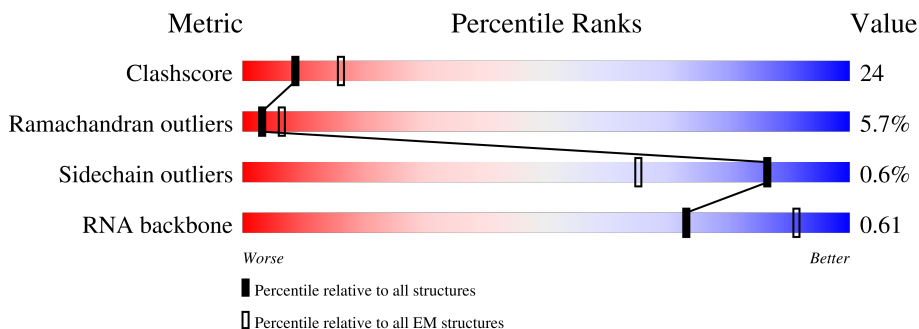
EMDB validation analysis : 0.0.1.dev43  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP)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

# 1 Overall quality at a glance i

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

The reported resolution of this entry is 3.90 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.



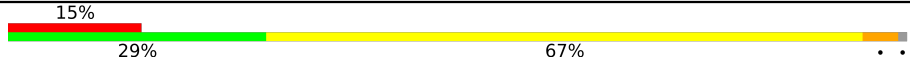


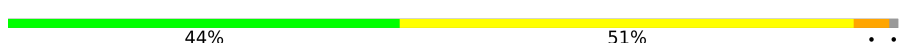

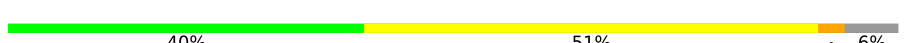


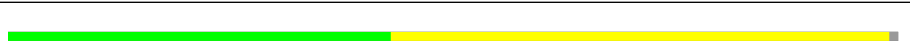
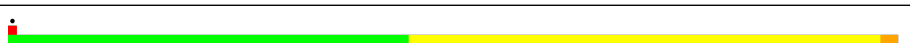
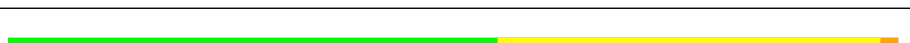
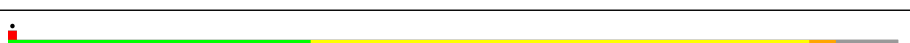

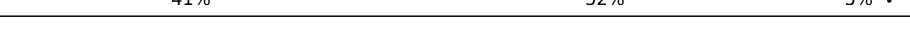
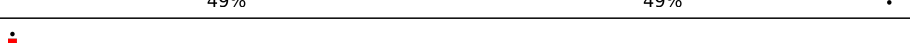
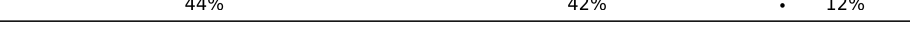
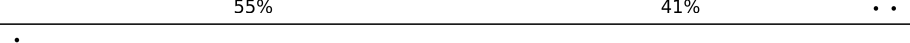
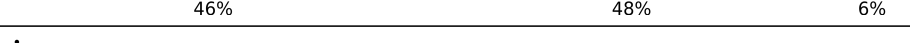
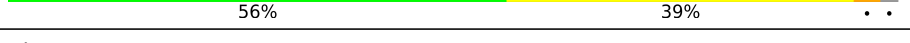

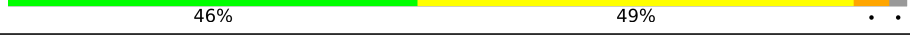




Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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  $\geq 3$ , 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	A	273	58% (green), 40% (yellow), 2% (orange), 2% (red), 0% (grey)
2	B	209	46% (green), 50% (yellow), 4% (orange), 0% (red), 0% (grey)
3	C	201	48% (green), 49% (yellow), 3% (orange), 0% (red), 0% (grey)
4	D	179	41% (green), 54% (yellow), 5% (orange), 0% (red), 0% (grey)
5	E	177	50% (green), 48% (yellow), 2% (orange), 0% (red), 0% (grey)
6	F	149	17% (red), 40% (green), 54% (yellow), 5% (orange), 0% (grey)
7	G	165	18% (red), 17% (green), 52% (yellow), 10% (orange), 21% (grey)


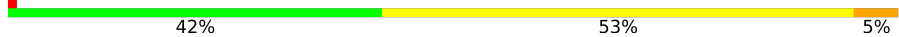

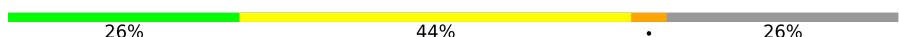


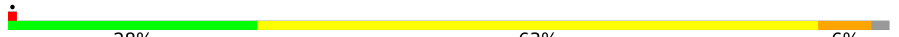
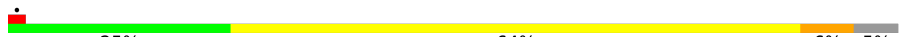
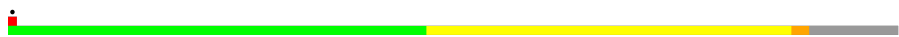

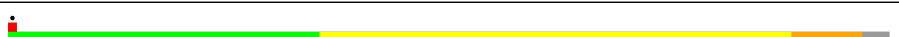
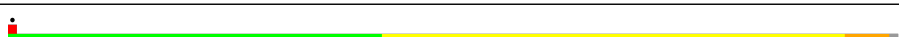

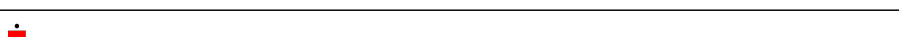
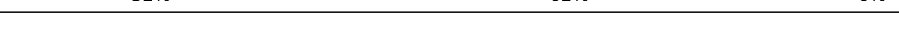
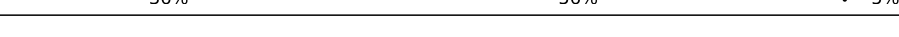



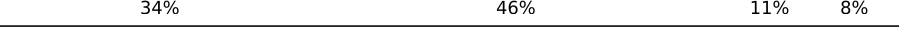


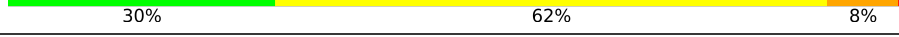

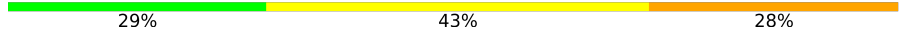
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Mol	Chain	Length	Quality of chain
8	H	142	
9	I	142	
10	J	123	
11	K	144	
12	L	136	
13	M	127	
14	N	117	
15	O	115	
16	P	118	
17	Q	103	
18	R	110	
19	S	100	
20	T	104	
21	U	94	
22	V	85	
23	W	78	
24	X	63	
25	Y	59	
26	Z	70	
27	1	57	
28	2	55	
29	3	46	
30	4	65	
31	5	38	
32	6	241	

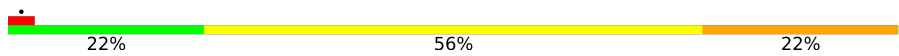

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Mol	Chain	Length	Quality of chain
33	7	233	 35% 50% 12%
34	8	206	 42% 53% 5%
35	9	167	 40% 47% 7% 6%
36	10	135	 26% 44% 26%
37	11	179	 32% 50% 16%
38	12	130	 52% 46% 2% 2%
39	13	130	 28% 63% 6% 3%
40	14	103	 25% 64% 6% 5%
41	15	129	 47% 41% 10%
42	16	124	 44% 50% 6% 2%
43	17	118	 35% 53% 8% 2%
44	18	101	 42% 52% 5% 1%
45	19	89	 63% 34% 2% 1%
46	20	82	 32% 62% 6%
47	21	84	 36% 56% 5% 1%
48	22	75	 41% 36% 9% 13%
49	23	92	 34% 49% 14%
50	24	87	 51% 46% 2% 1%
51	25	71	 34% 46% 11% 8%
52	26	1539	 38% 55% 7%
53	27	2903	 40% 52% 8%
54	28	120	 30% 62% 8% 2%
55	29	20	 45% 45% 10%
56	30	76	 29% 43% 28%
57	31	77	 52% 47% 1%

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Mol	Chain	Length	Quality of chain
58	32	77	 <p>22% 56% 22%</p>
59	33	750	 <p>48% 38% 45% 6% 10%</p>

## 2 Entry composition [i](#)

There are 59 unique types of molecules in this entry. The entry contains 154603 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	A	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	B	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	C	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	D	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	E	176	1323	832	243	246	2	0	0

- Molecule 6 is a protein called 50S ribosomal protein L9.

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

- Molecule 7 is a protein called 50S ribosomal protein L10.

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

- Molecule 8 is a protein called 50S ribosomal protein L11.

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

- Molecule 9 is a protein called 50S ribosomal protein L13.

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

- Molecule 10 is a protein called 50S ribosomal protein L14.

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

- Molecule 11 is a protein called 50S ribosomal protein L15.

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

- Molecule 12 is a protein called 50S ribosomal protein L16.

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

- Molecule 13 is a protein called 50S ribosomal protein L17.

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

- Molecule 14 is a protein called 50S ribosomal protein L18.

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

- Molecule 15 is a protein called 50S ribosomal protein L19.

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

- Molecule 16 is a protein called 50S ribosomal protein L20.

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

- Molecule 17 is a protein called 50S ribosomal protein L21.

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

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

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

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

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

- Molecule 20 is a protein called 50S ribosomal protein L24.

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

- Molecule 21 is a protein called 50S ribosomal protein L25.



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

- Molecule 22 is a protein called 50S ribosomal protein L27.

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

- Molecule 23 is a protein called 50S ribosomal protein L28.

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

- Molecule 24 is a protein called 50S ribosomal protein L29.

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

- Molecule 25 is a protein called 50S ribosomal protein L30.

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

- Molecule 26 is a protein called 50S ribosomal protein L31.

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

- Molecule 27 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	1	56	Total	C	N	O	S	0	0
			444	269	94	80	1		

- Molecule 28 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	2	50	Total	C	N	O	0	0
			409	263	75	71		

- Molecule 29 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	3	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 30 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	4	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 31 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	5	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 32 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	6	218	Total	C	N	O	S	0	0
			1704	1081	305	311	7		

- Molecule 33 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	7	206	Total	C	N	O	S	0	0
			1624	1028	305	288	3		

- Molecule 34 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	8	205	Total	C	N	O	S	0	0
			1643	1026	315	298	4		

- Molecule 35 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	9	157	1156	719	218	213	6	0	0

- Molecule 36 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	10	100	817	515	148	148	6	0	0

- Molecule 37 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	11	151	1181	735	227	215	4	0	0

- Molecule 38 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	12	129	979	616	173	184	6	0	0

- Molecule 39 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	13	127	1022	634	206	179	3	0	0

- Molecule 40 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	14	98	786	493	150	142	1	0	0

- Molecule 41 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	15	116	869	535	173	158	3	0	0

- Molecule 42 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	16	123	955	590	196	165	4	0	0

- Molecule 43 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	17	114	883	546	178	156	3	0	0

- Molecule 44 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	18	100	805	499	164	139	3	0	0

- Molecule 45 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	19	88	714	439	144	130	1	0	0

- Molecule 46 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	20	82	649	406	128	114	1	0	0

- Molecule 47 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	21	80	648	411	121	113	3	0	0

- Molecule 48 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	22	65	535	339	100	95	1	0	0

- Molecule 49 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	23	79	Total	C	N	O	S	0	0
			637	408	120	107	2		

- Molecule 50 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	24	85	Total	C	N	O	S	0	0
			665	411	137	114	3		

- Molecule 51 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	25	65	Total	C	N	O	S	0	0
			544	335	117	91	1		

- Molecule 52 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	26	1539	Total	C	N	O	P	0	0
			33016	14725	6052	10700	1539		

- Molecule 53 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	27	2903	Total	C	N	O	P	0	0
			62322	27801	11468	20150	2903		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
27	747	C	U	conflict	GB 802133627
27	1847	G	A	conflict	GB 802133627

- Molecule 54 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	28	120	Total	C	N	O	P	0	0
			2572	1145	471	836	120		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
28	120	A	-	conflict	GB 1028475309

- Molecule 55 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
55	29	20	432	195	86	132	19	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
56	30	76	1623	723	290	534	76	0	0

- Molecule 57 is a RNA chain called P-site tRNAfMet.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
57	31	77	1644	732	297	538	77	0	0

- Molecule 58 is a RNA chain called E-site tRNAfMet.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
58	32	77	1643	732	297	537	77	0	0

- Molecule 59 is a protein called GTP pyrophosphokinase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	33	675	4911	3070	904	915	22	0	0

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
33	-5	MET	-	expression tag	UNP P0AG20
33	-4	HIS	-	expression tag	UNP P0AG20
33	-3	HIS	-	expression tag	UNP P0AG20
33	-2	HIS	-	expression tag	UNP P0AG20
33	-1	HIS	-	expression tag	UNP P0AG20
33	0	HIS	-	expression tag	UNP P0AG20
33	1	HIS	-	expression tag	UNP P0AG20

### 3 Residue-property plots

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

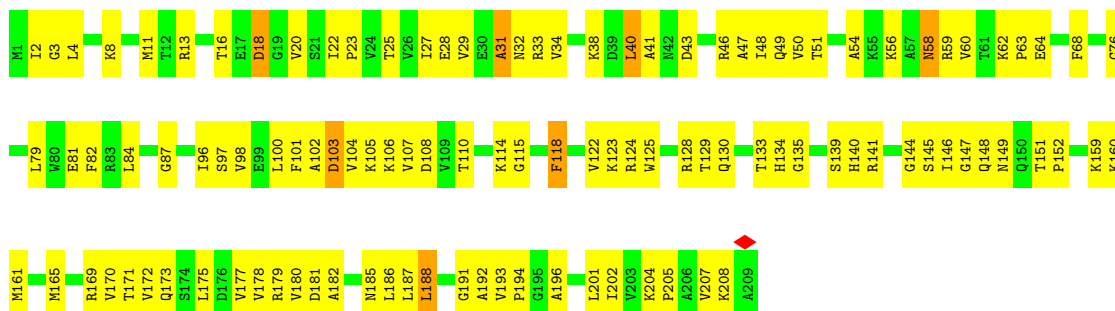
- Molecule 1: 50S ribosomal protein L2

Chain A: 



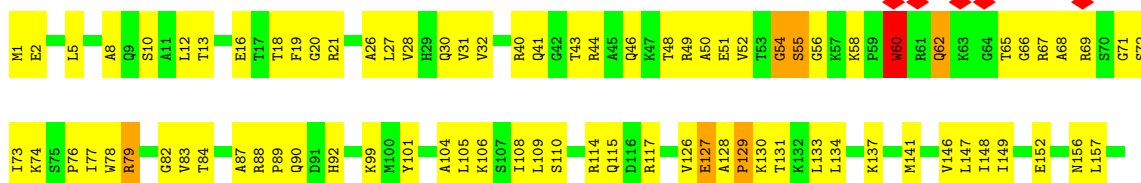
- Molecule 2: 50S ribosomal protein L3

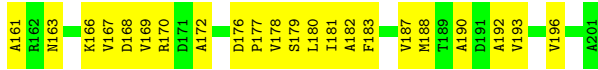
Chain B: 



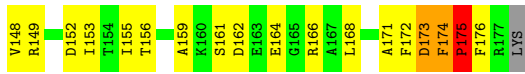
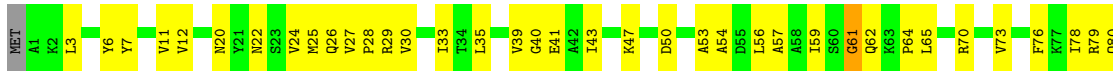
- Molecule 3: 50S ribosomal protein L4

Chain C: 

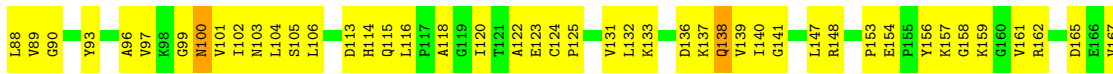
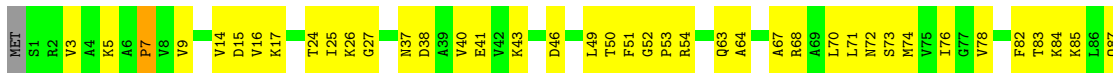
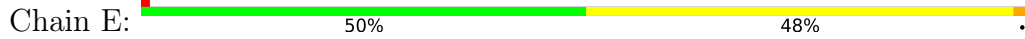




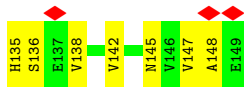
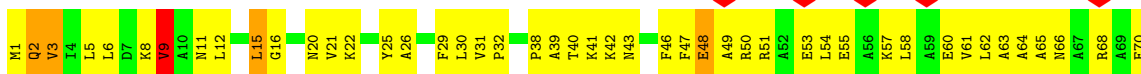
• Molecule 4: 50S ribosomal protein L5



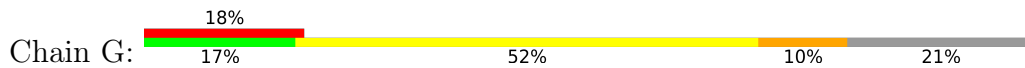
• Molecule 5: 50S ribosomal protein L6



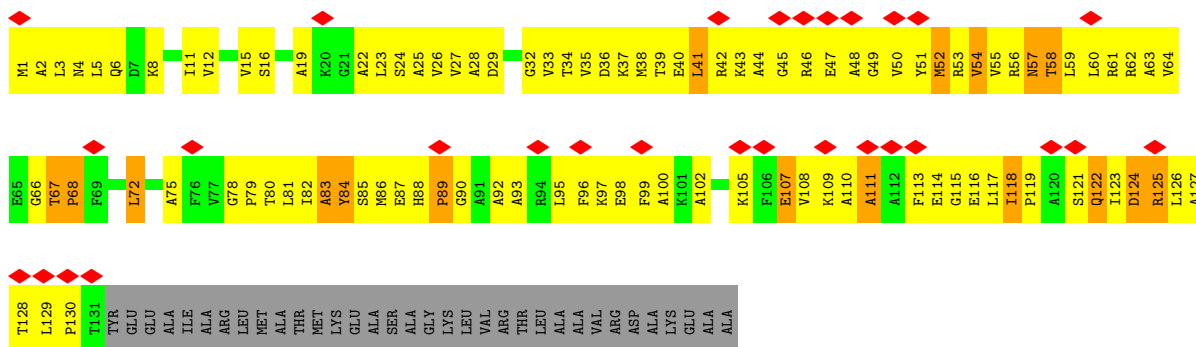
• Molecule 6: 50S ribosomal protein L9



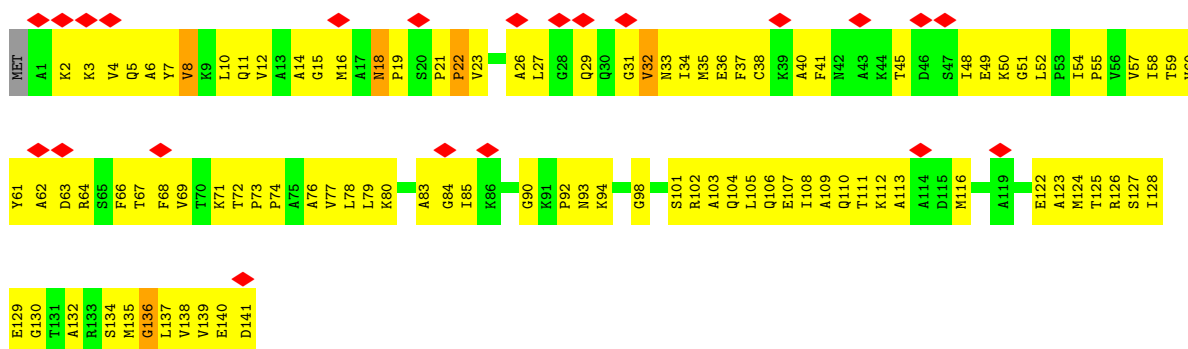
• Molecule 7: 50S ribosomal protein L10



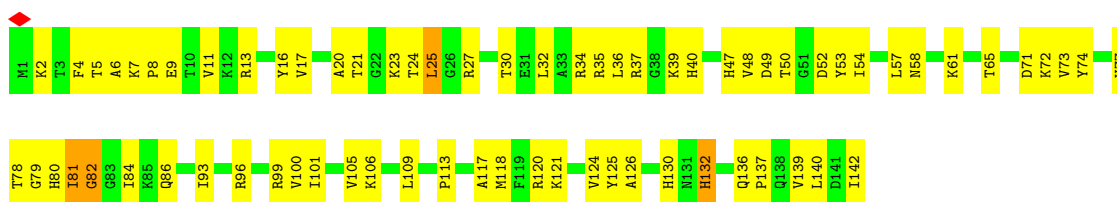




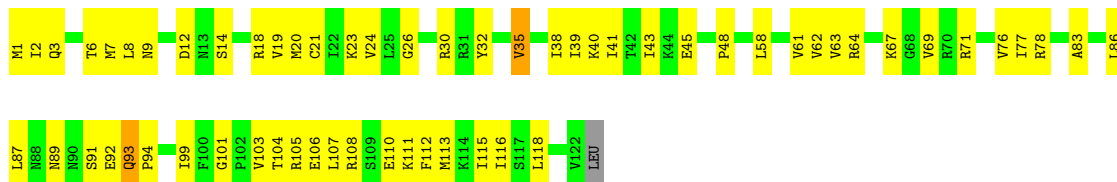
• Molecule 8: 50S ribosomal protein L11



• Molecule 9: 50S ribosomal protein L13

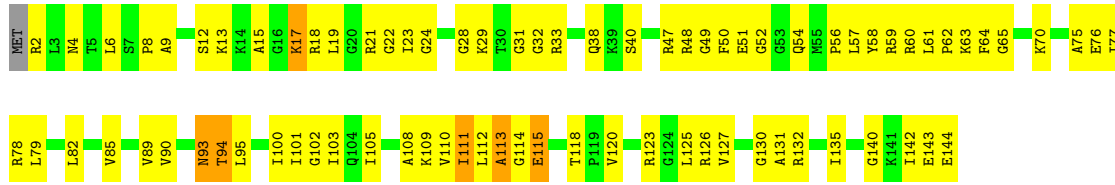


• Molecule 10: 50S ribosomal protein L14

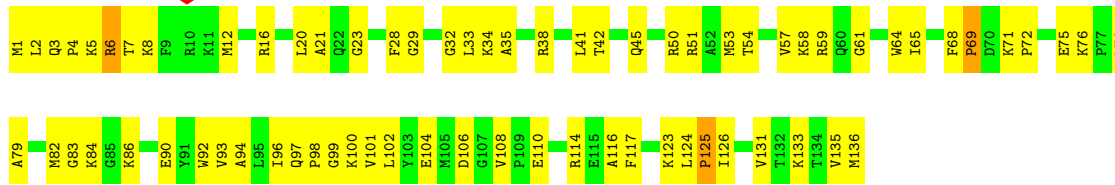


• Molecule 11: 50S ribosomal protein L15

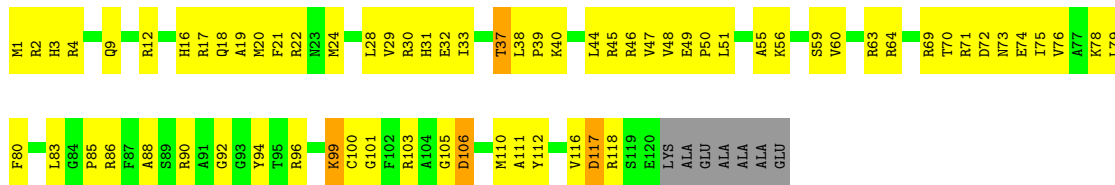




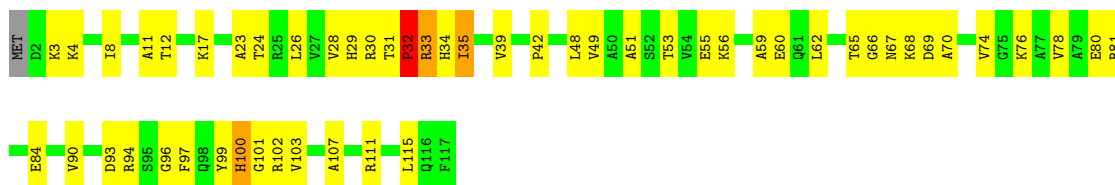
• Molecule 12: 50S ribosomal protein L16



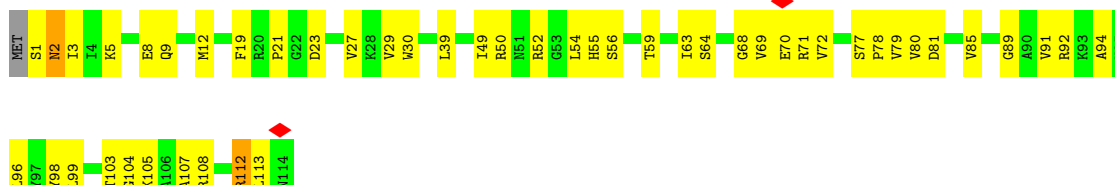
• Molecule 13: 50S ribosomal protein L17



• Molecule 14: 50S ribosomal protein L18

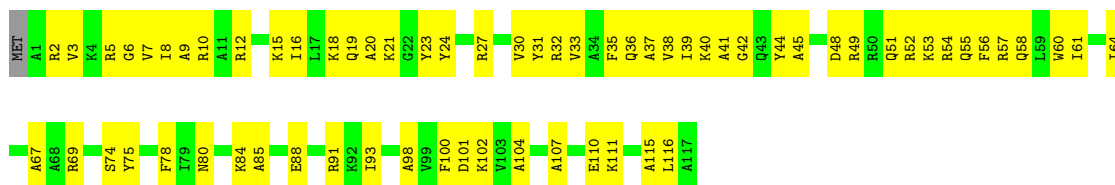


• Molecule 15: 50S ribosomal protein L19



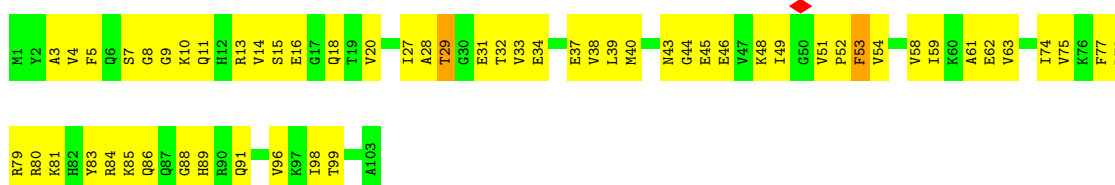
• Molecule 16: 50S ribosomal protein L20

Chain P:  43% 56%



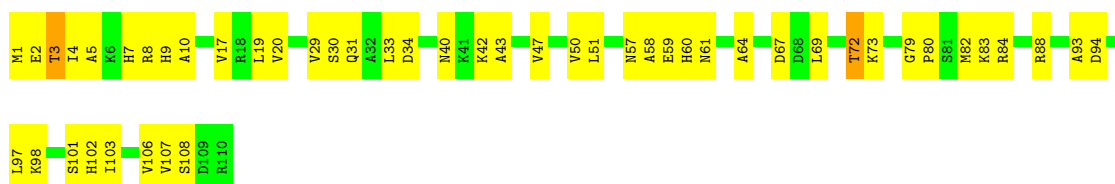
• Molecule 17: 50S ribosomal protein L21

Chain Q:  45% 53%



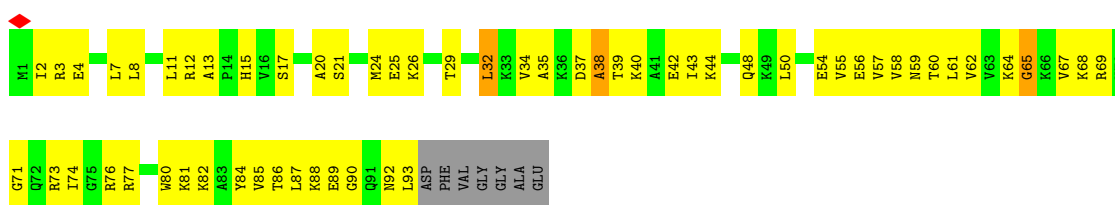
• Molecule 18: 50S ribosomal protein L22

Chain R:  55% 43%



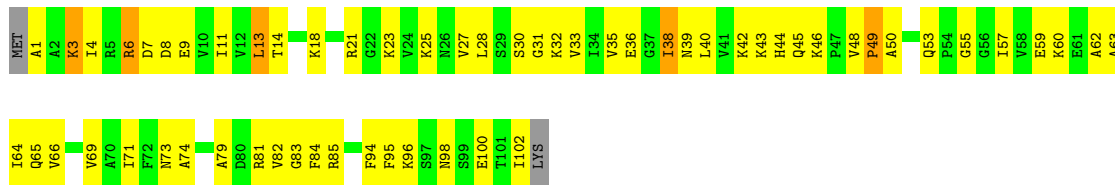
• Molecule 19: 50S ribosomal protein L23

Chain S:  34% 56% 7%

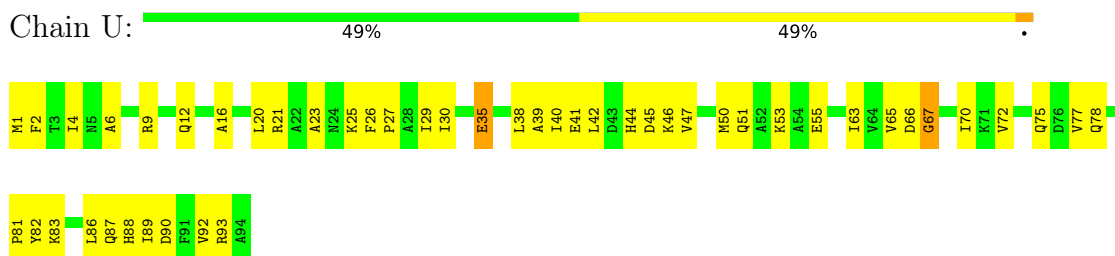


• Molecule 20: 50S ribosomal protein L24

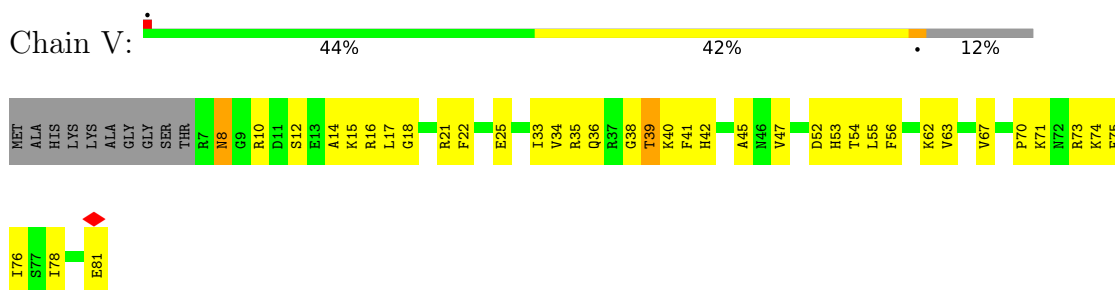
Chain T:  41% 52% 5%



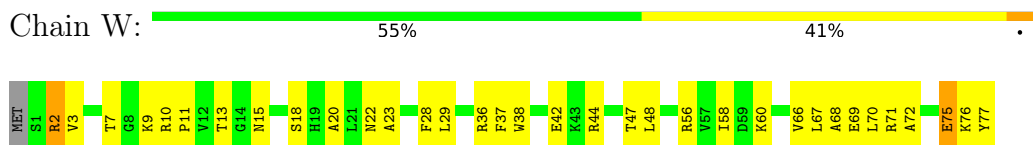
• Molecule 21: 50S ribosomal protein L25



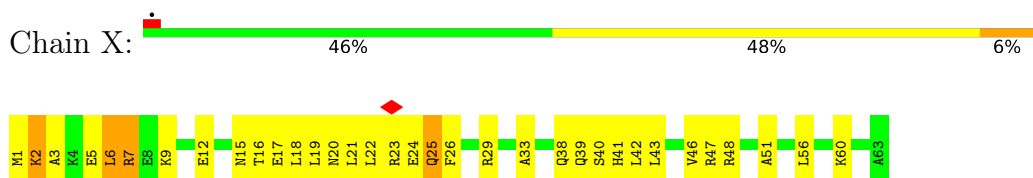
• Molecule 22: 50S ribosomal protein L27



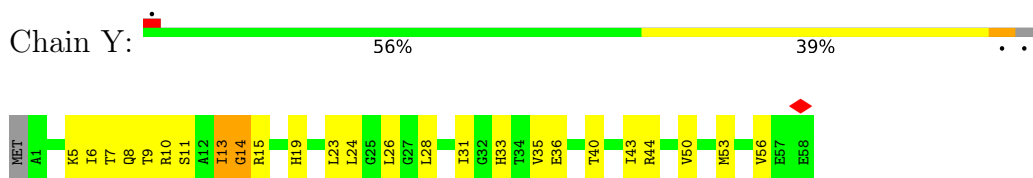
• Molecule 23: 50S ribosomal protein L28



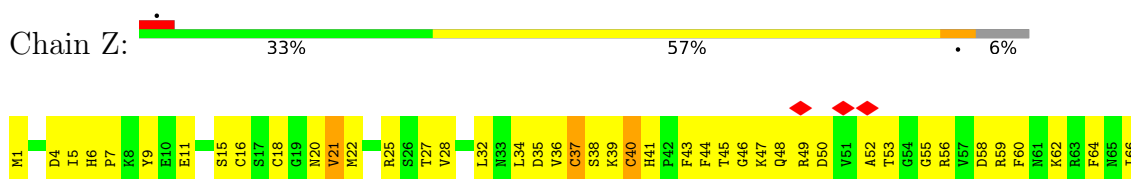
• Molecule 24: 50S ribosomal protein L29



• Molecule 25: 50S ribosomal protein L30



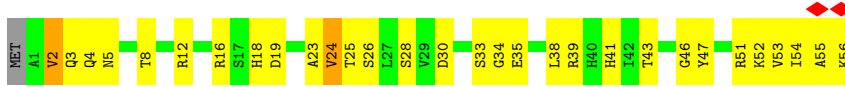
• Molecule 26: 50S ribosomal protein L31



PRO  
GLY  
SER  
LYS

- Molecule 27: 50S ribosomal protein L32

Chain 1:  46% 49%



- Molecule 28: 50S ribosomal protein L33

Chain 2:  51% 38% 9%



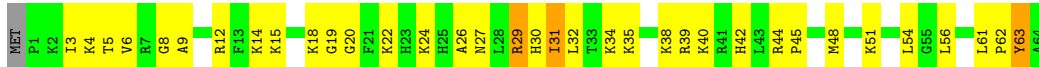
- Molecule 29: 50S ribosomal protein L34

Chain 3:  39% 59%



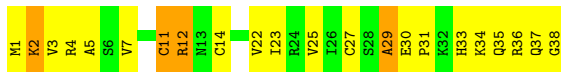
- Molecule 30: 50S ribosomal protein L35

Chain 4:  45% 49% 5%



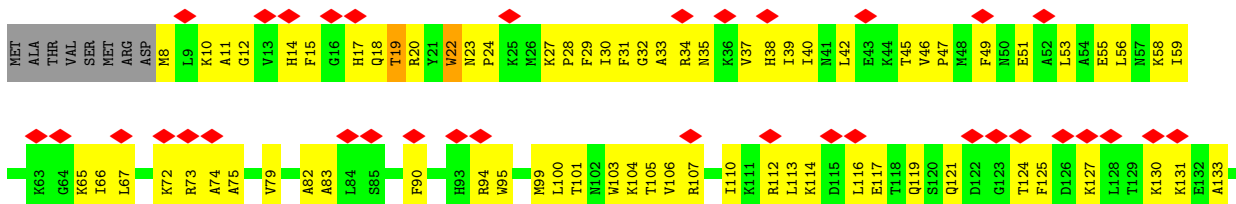
- Molecule 31: 50S ribosomal protein L36

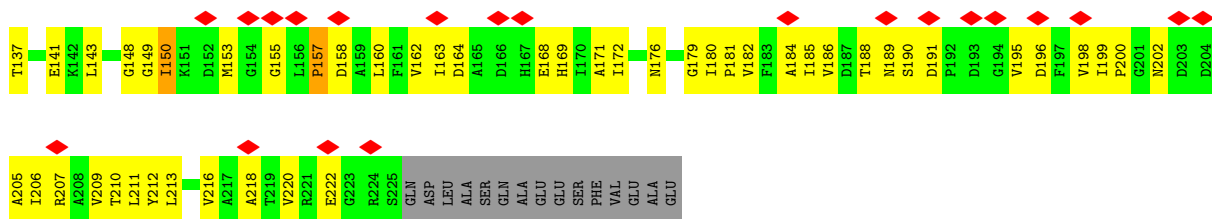
Chain 5:  42% 47% 11%



- Molecule 32: 30S ribosomal protein S2

Chain 6:  23% 41% 48% 10%

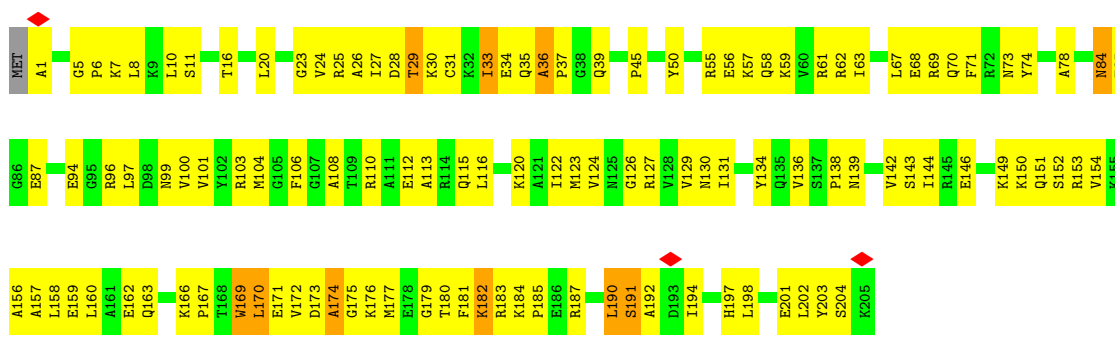




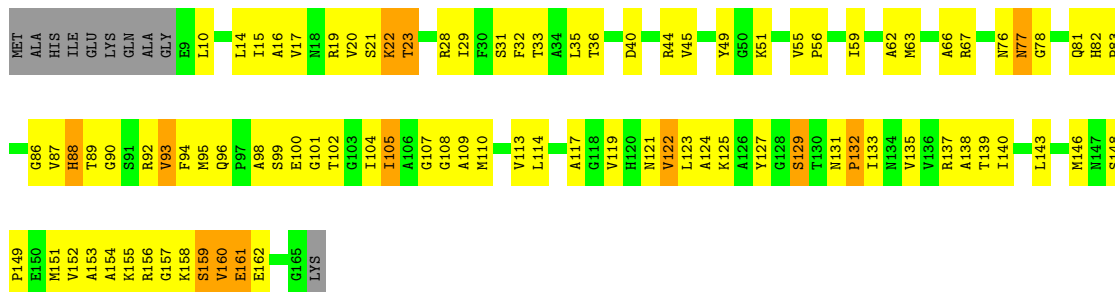
• Molecule 33: 30S ribosomal protein S3



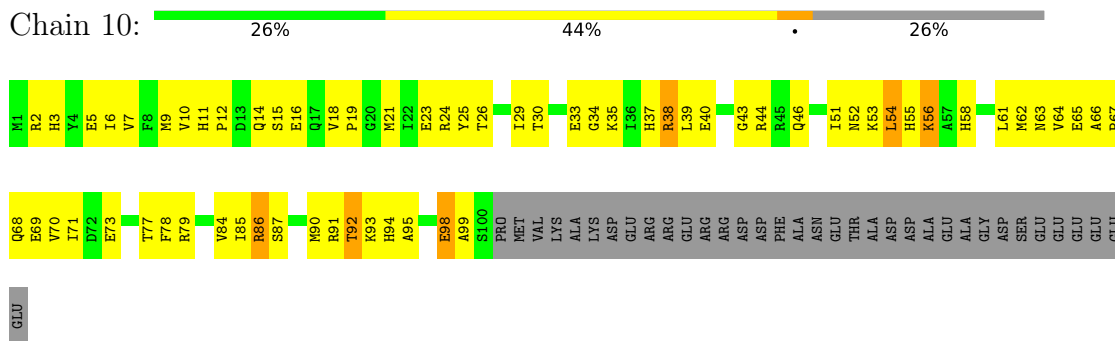
• Molecule 34: 30S ribosomal protein S4



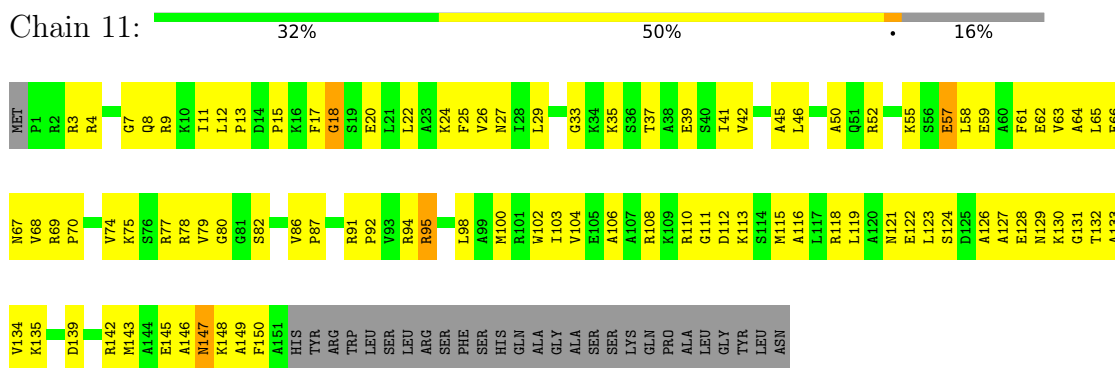
• Molecule 35: 30S ribosomal protein S5



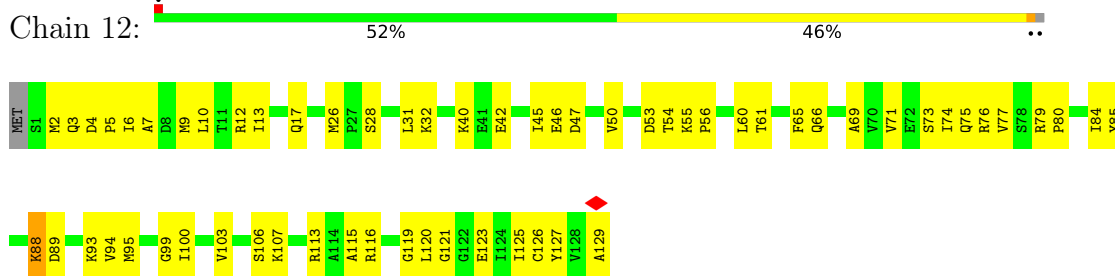
• Molecule 36: 30S ribosomal protein S6



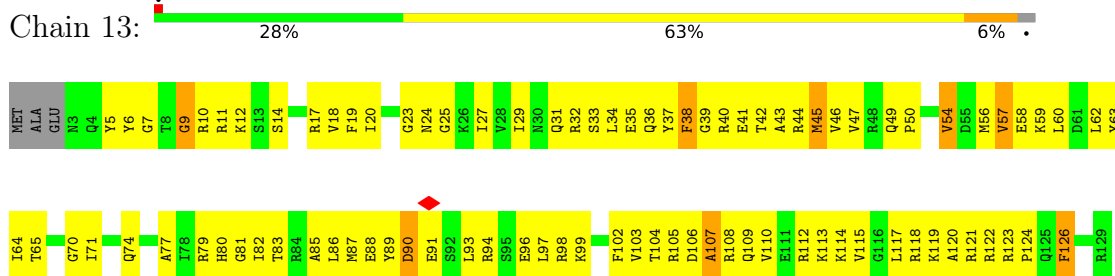
• Molecule 37: 30S ribosomal protein S7



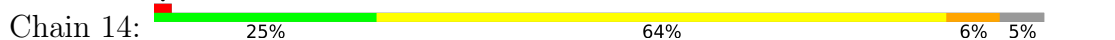
• Molecule 38: 30S ribosomal protein S8

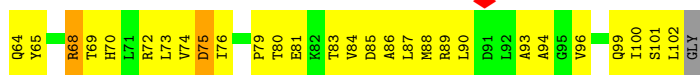
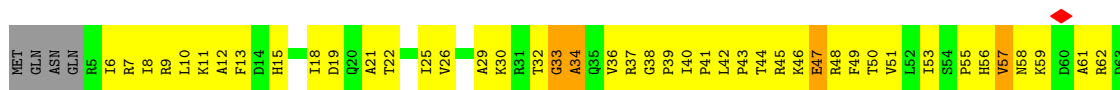


• Molecule 39: 30S ribosomal protein S9

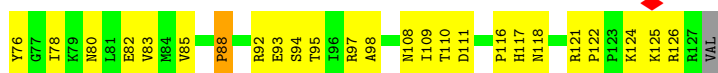


• Molecule 40: 30S ribosomal protein S10

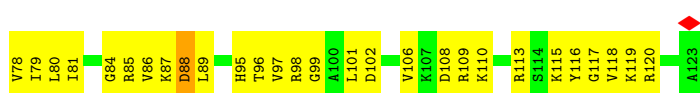
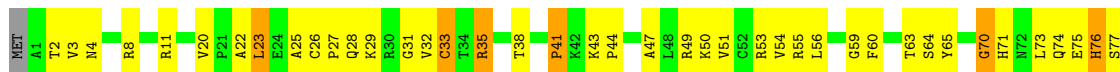




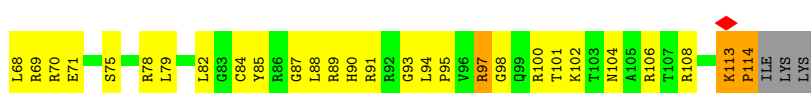
• Molecule 41: 30S ribosomal protein S11



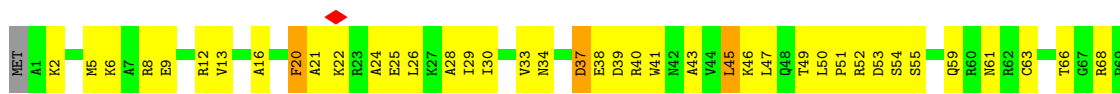
• Molecule 42: 30S ribosomal protein S12



• Molecule 43: 30S ribosomal protein S13



• Molecule 44: 30S ribosomal protein S14

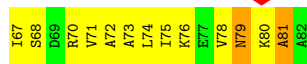
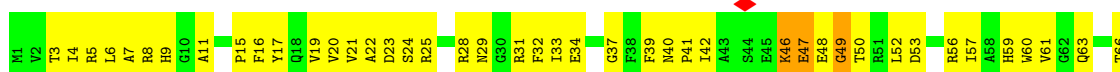




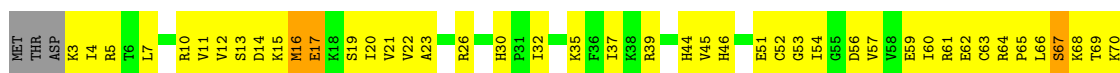
• Molecule 45: 30S ribosomal protein S15



• Molecule 46: 30S ribosomal protein S16



• Molecule 47: 30S ribosomal protein S17



• Molecule 48: 30S ribosomal protein S18

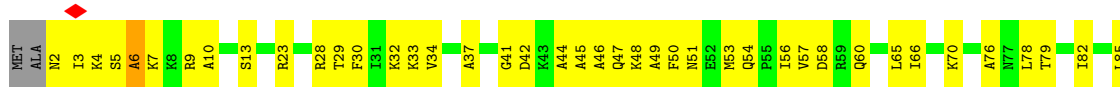


• Molecule 49: 30S ribosomal protein S19



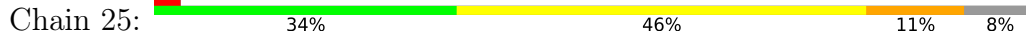
• Molecule 50: 30S ribosomal protein S20



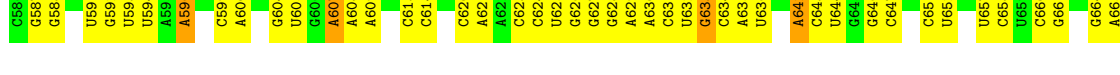
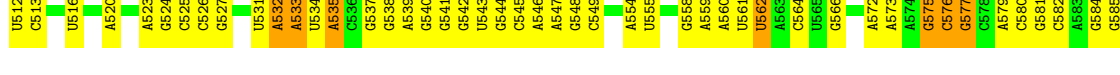
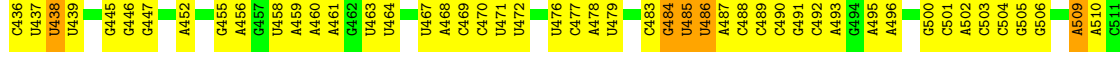
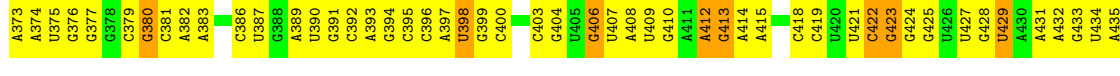
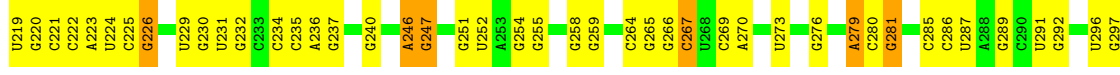
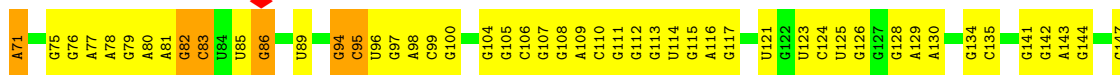
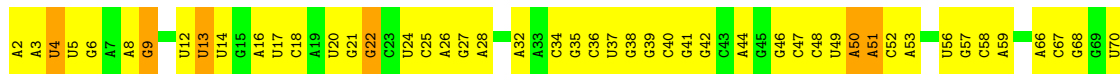
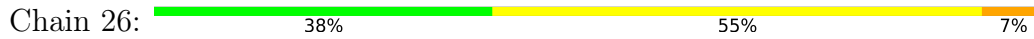


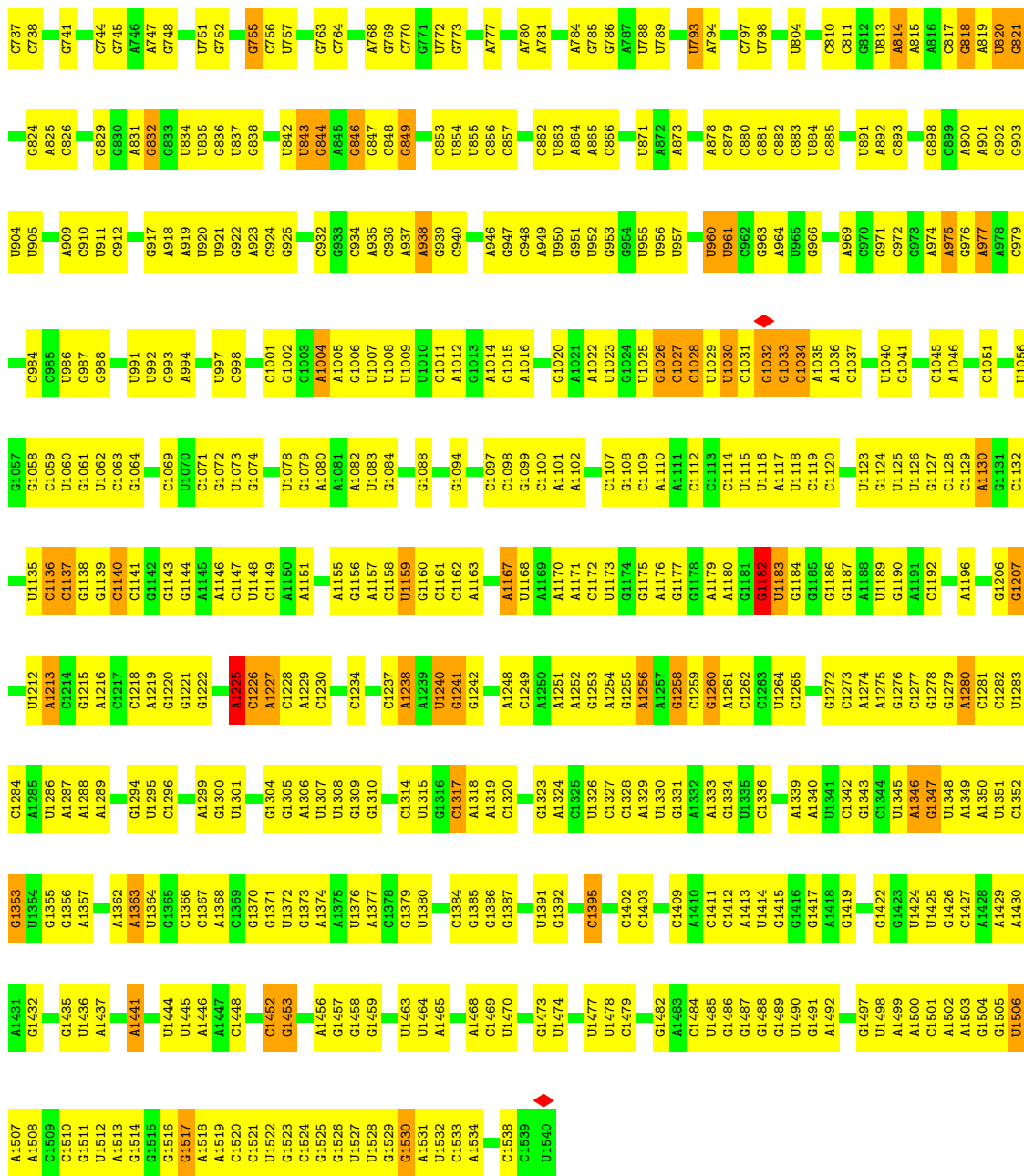
A86

• Molecule 51: 30S ribosomal protein S21

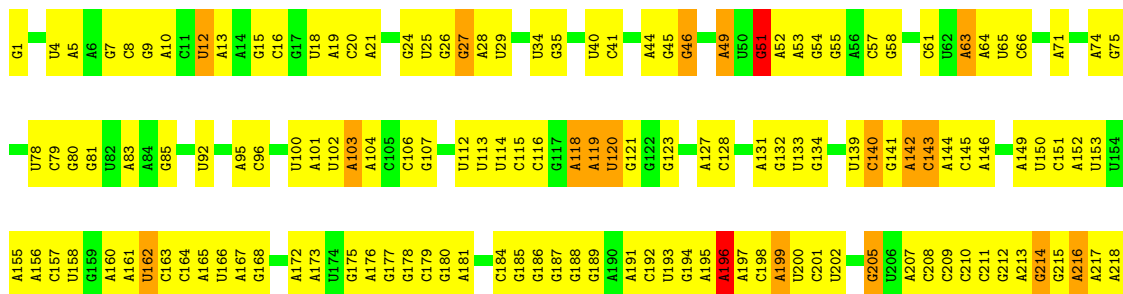


• Molecule 52: 16S ribosomal RNA



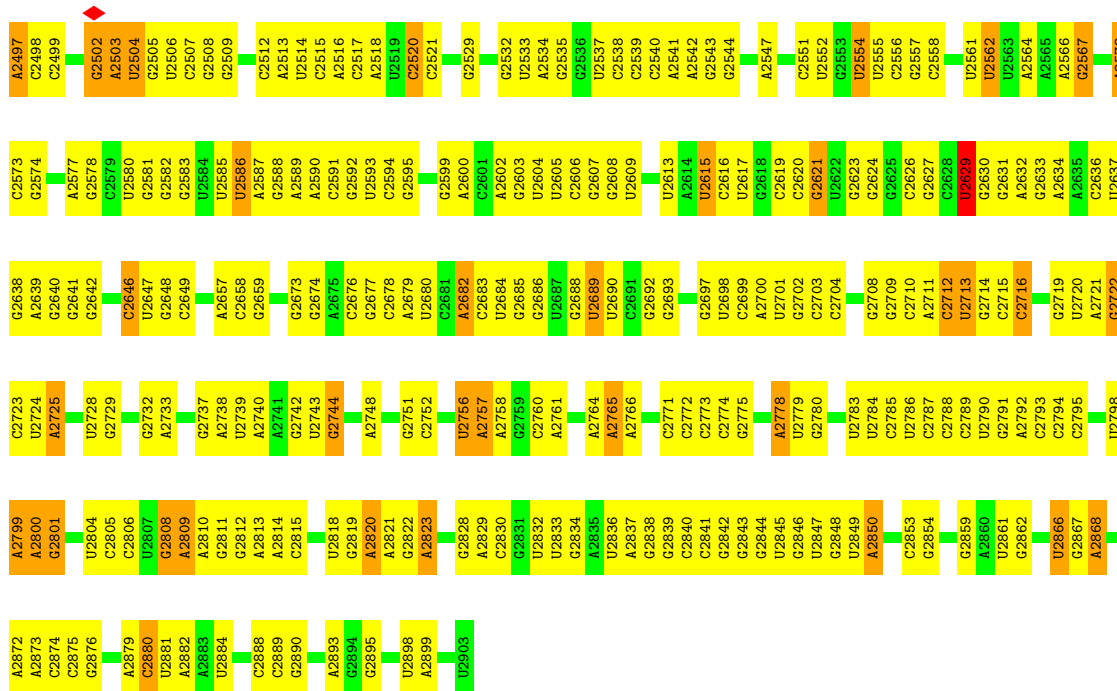


● Molecule 53: 23S ribosomal RNA

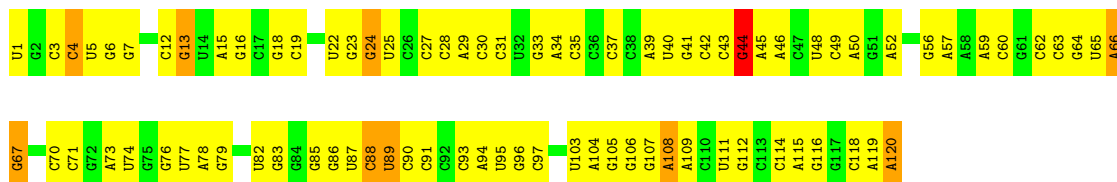


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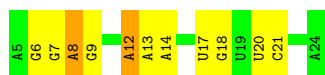
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C2424	U2197	C2283	G2353	A1395
A2425	A2198	A2284	C2354	U1396
G2428	C2199	C2285	G2355	C1399
U2429	U2132	G2286	U2356	U1400
A2430	G2133	A2287	G2357	A1403
G2435	A2134	G2288	A2358	C1404
A2439	A2135	G2289	C2359	U1405
C2440	G2136	U2290	G2360	U1406
U2441	U2137	U2291	G2361	A1494
C2442	G2138	G2292	C2362	A1495
U2443	U2139	U2293	G2363	U1411
C2444	G2140	G2294	C2364	U1412
G2447	A2211	A2295	G2365	G1416
A2448	C2215	A2296	A2366	C1417
U2449	G2216	C2297	C2367	G1418
A2450	U2220	A2298	G2368	A1419
A2453	G2221	U2299	A2369	A1502
G2454	C2222	G2300	G2370	A1503
C2455	A2147	C2301	U2371	A1504
U2456	U2149	U2302	G2372	A1505
G2457	C2150	U2305	C2373	U1506
A2459	U2151	G2308	C2374	C1507
U2460	C2152	A2309	C2380	A1508
C2462	C2153	G2309	C2381	A1431
G2463	A2154	C2310	G2382	G1432
A2464	U2155	A2311	U2383	A1509
G2465	C2156	U2312	G2384	G1433
C2466	G2157	C2313	U2385	U1511
G2472	A2158	A2314	A2388	A1434
A2475	G2159	G2315	U2389	G1435
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A2478	C2163	G2318	G2391	G1436
U2479	A2163	U2319	A2392	A1515
C2480	C2164	G2320	U2393	U1438
G2481	U2165	U2321	C2394	A1439
A2482	U2166	A2322	U2401	U1440
C2483	U2167	G2323	U2402	G1441
G2488	G2168	U2324	C2403	U1442
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C2490	C2170	C2326	A2405	G1444
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G2494	U2175	U2334	G2410	G1448
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C2496	G2177	A2267	U2412	U1454
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A2051	U2189	A2348	G2345	G1540
U2022	U2190	A2349	U2346	U1542
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G2027	A2114	A2284	C2331	G1547
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A2030	U2116	A2176	A2266	G1549
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C2036	U2121	U2182	A2274	C1547
U2037	G2122	U2183	A2275	A1548
C2038	U2123	U2184	A2276	U1549
U2039	U2124	U2185	U2277	G1542
G2040	U2125	U2186	A2278	U1542
C2041	U2126	U2187	U2279	U1542
U2042	U2127	U2188	A2280	G1542
C2043	U2128	U2189	U2281	C1536
G2044	U2129	U2190	U2282	U1539
U2045	U2130	U2191	U2283	G1540
C2046	U2131	U2192	U2284	U1542
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G2066	U2149	U2210	U2302	U1542
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C2068	U2151	U2212	U2304	U1544
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A2070	U2153	U2214	U2306	G1546
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G2072	U2155	U2216	U2308	U1549
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U2077	U2160	U2221	U2313	G1534
U2078	U2161	U2222	U2314	G1535
U2079	U2162	U2223	U2315	G1536
A2080	U2163	U2224	U2316	G1537
U2081	U2164	U2225	U2317	G1538
G2082	U2165	U2226	U2318	G1539
A2088	U2166	U2227	U2319	G1540
G2093	U2167	U2228	U2320	G1541
A2094	U2168	U2229	U2321	G1542
U2095	U2169	U2230	U2322	G1543
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A2097	U2171	U2232	U2324	G1545
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G2104	U2175	U2236	U2328	G1549
C2105	U2176	U2237	U2329	G1549
U2106	U2177	U2238	U2330	G1549
G2107	U2178	U2239	U2331	G1549
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A2113	U2182	U2245	U2337	G1549
G2115	U2183	U2246	U2338	G1549
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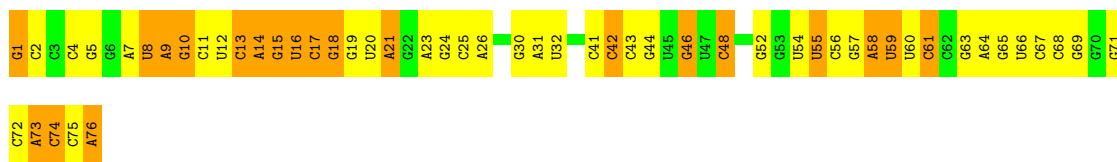
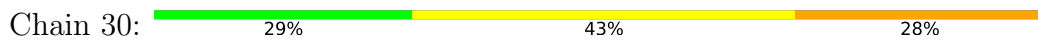
• Molecule 54: 5S ribosomal RNA



• Molecule 55: mRNA

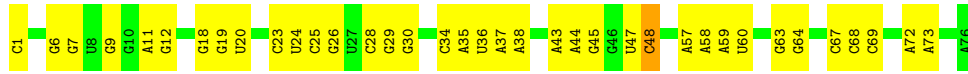


• Molecule 56: A-site tRNAPhe

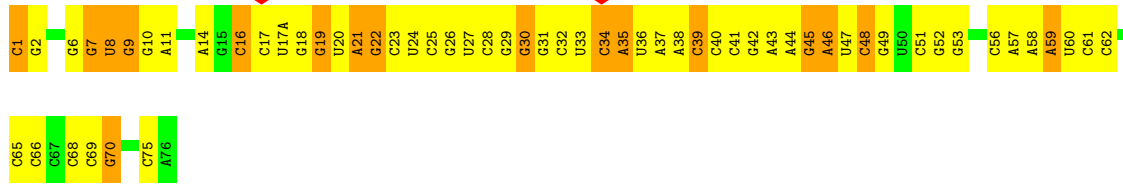


• Molecule 57: P-site tRNAMet

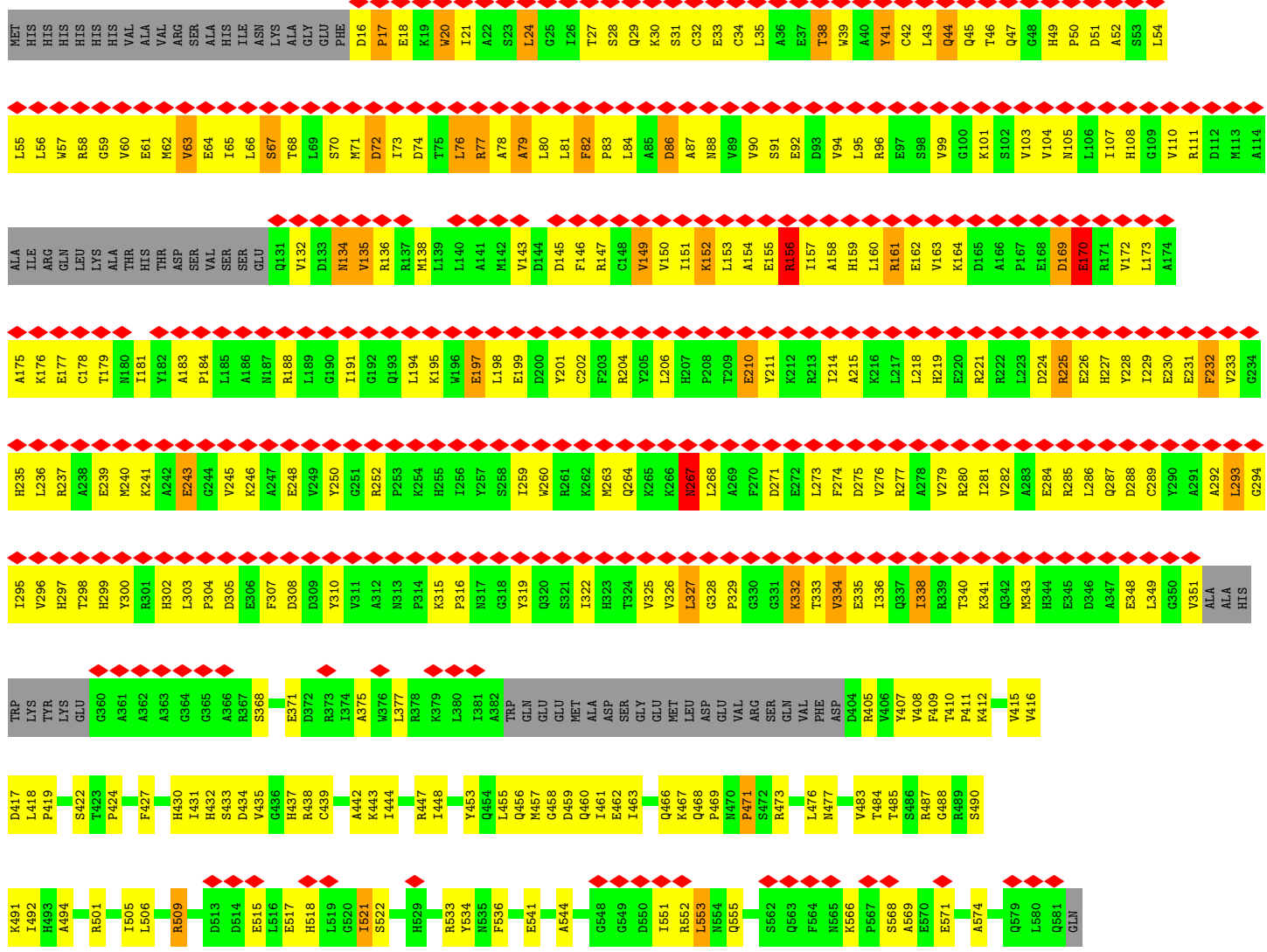


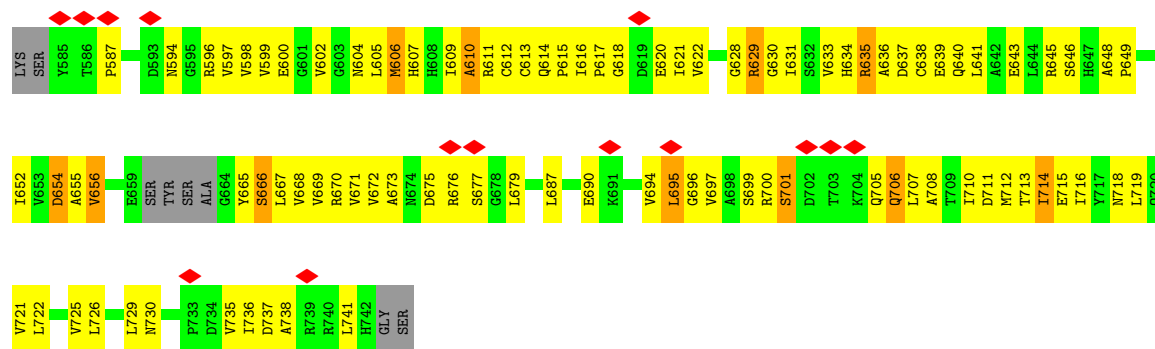


• Molecule 58: E-site tRNA<sup>fMet</sup>



• Molecule 59: GTP pyrophosphokinase







## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	77862	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	1.6	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	30488	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.469	Depositor
Minimum map value	-0.137	Depositor
Average map value	-0.006	Depositor
Map value standard deviation	0.041	Depositor
Recommended contour level	0.1	Depositor
Map size (Å)	393.6, 393.6, 393.6	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.82, 0.82, 0.82	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	A	0.29	0/2121	0.64	0/2852
2	B	0.33	0/1586	0.62	0/2134
3	C	0.34	0/1571	0.62	0/2113
4	D	0.34	0/1434	0.58	0/1926
5	E	0.30	0/1343	0.62	0/1816
6	F	0.36	0/1122	0.68	0/1515
7	G	0.41	0/1001	0.74	1/1350 (0.1%)
8	H	0.38	0/1046	0.72	1/1410 (0.1%)
9	I	0.30	0/1152	0.61	0/1551
10	J	0.30	0/947	0.63	0/1268
11	K	0.30	0/1054	0.66	0/1403
12	L	0.33	0/1093	0.59	0/1460
13	M	0.32	0/973	0.63	0/1301
14	N	0.28	0/902	0.57	0/1209
15	O	0.32	0/929	0.61	0/1242
16	P	0.32	0/960	0.56	0/1278
17	Q	0.35	0/829	0.67	1/1107 (0.1%)
18	R	0.27	0/864	0.65	0/1156
19	S	0.30	0/744	0.61	0/994
20	T	0.35	0/787	0.69	0/1051
21	U	0.32	0/766	0.58	0/1025
22	V	0.34	0/582	0.60	0/769
23	W	0.34	0/635	0.63	0/848
24	X	0.31	0/510	0.59	0/677
25	Y	0.30	0/453	0.55	0/605
26	Z	0.37	0/531	0.91	3/709 (0.4%)
27	1	0.28	0/450	0.56	0/599
28	2	0.32	0/416	0.57	0/554
29	3	0.35	0/380	0.58	0/498
30	4	0.32	0/513	0.61	0/676
31	5	0.29	0/303	0.63	0/397
32	6	0.37	0/1735	0.60	0/2338
33	7	0.32	0/1651	0.60	0/2225
34	8	0.32	0/1665	0.60	0/2227

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
35	9	0.31	0/1169	0.70	1/1573 (0.1%)
36	10	0.34	0/835	0.64	0/1128
37	11	0.29	0/1195	0.60	0/1602
38	12	0.31	0/989	0.60	0/1326
39	13	0.33	0/1034	0.66	0/1375
40	14	0.31	0/796	0.62	0/1077
41	15	0.33	0/885	0.68	0/1195
42	16	0.33	0/969	0.73	0/1300
43	17	0.28	0/892	0.63	0/1193
44	18	0.40	0/817	0.58	0/1088
45	19	0.28	0/722	0.55	0/964
46	20	0.35	0/659	0.64	1/884 (0.1%)
47	21	0.33	0/657	0.66	0/881
48	22	0.34	0/544	0.67	0/731
49	23	0.33	0/652	0.62	0/877
50	24	0.29	0/671	0.55	0/888
51	25	0.38	0/550	0.73	0/728
52	26	0.38	1/36967 (0.0%)	0.70	5/57666 (0.0%)
53	27	0.39	1/69801 (0.0%)	0.70	5/108894 (0.0%)
54	28	0.36	1/2876 (0.0%)	0.70	1/4483 (0.0%)
55	29	0.84	0/486	0.70	0/757
56	30	0.50	1/1813 (0.1%)	0.74	0/2823
57	31	0.37	1/1836 (0.1%)	0.68	0/2859
58	32	0.80	2/1835 (0.1%)	0.74	1/2857 (0.0%)
59	33	0.66	6/4985 (0.1%)	1.08	38/6770 (0.6%)
All	All	0.39	13/167683 (0.0%)	0.70	58/250202 (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
52	26	0	9
53	27	0	22
56	30	0	1
59	33	0	2
All	All	0	34

The worst 5 of 13 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
59	33	156	ARG	CZ-NH2	-10.64	1.19	1.33
59	33	152	LYS	CD-CE	-7.75	1.31	1.51
59	33	17	PRO	CA-CB	-7.24	1.39	1.53
52	26	2	A	OP3-P	-7.10	1.52	1.61
58	32	1	C	OP3-P	-7.09	1.52	1.61

The worst 5 of 58 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
59	33	156	ARG	NE-CZ-NH1	19.60	130.10	120.30
59	33	156	ARG	NH1-CZ-NH2	-13.76	104.26	119.40
59	33	17	PRO	N-CA-CB	-11.19	89.87	103.30
59	33	17	PRO	CA-CB-CG	10.30	124.37	104.80
59	33	63	VAL	CG1-CB-CG2	-9.24	96.11	110.90

There are no chirality outliers.

5 of 34 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
52	26	159	G	Sidechain
52	26	380	G	Sidechain
52	26	820	U	Sidechain
52	26	898	G	Sidechain
52	26	938	A	Sidechain

## 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	A	2082	0	2157	111	0
2	B	1565	0	1616	100	0
3	C	1552	0	1619	102	0
4	D	1410	0	1447	120	0
5	E	1323	0	1374	77	0
6	F	1111	0	1148	93	0
7	G	988	0	1025	135	0
8	H	1032	0	1088	109	0
9	I	1129	0	1162	65	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
10	J	938	0	1012	64	0
11	K	1045	0	1117	88	0
12	L	1074	0	1157	62	0
13	M	960	0	1000	65	0
14	N	892	0	923	51	0
15	O	917	0	965	61	0
16	P	947	0	1022	72	0
17	Q	816	0	839	54	0
18	R	857	0	922	45	0
19	S	738	0	807	51	0
20	T	779	0	834	55	0
21	U	753	0	780	37	0
22	V	575	0	592	31	0
23	W	625	0	655	32	0
24	X	509	0	543	40	0
25	Y	449	0	491	25	0
26	Z	522	0	521	41	0
27	1	444	0	461	36	0
28	2	409	0	440	17	0
29	3	377	0	418	35	0
30	4	504	0	574	32	0
31	5	302	0	343	28	0
32	6	1704	0	1732	100	0
33	7	1624	0	1699	126	0
34	8	1643	0	1710	136	0
35	9	1156	0	1199	80	0
36	10	817	0	808	68	0
37	11	1181	0	1240	65	0
38	12	979	0	1034	59	0
39	13	1022	0	1070	118	0
40	14	786	0	828	83	0
41	15	869	0	878	65	0
42	16	955	0	1019	65	0
43	17	883	0	944	85	0
44	18	805	0	847	62	0
45	19	714	0	737	26	0
46	20	649	0	666	62	0
47	21	648	0	691	50	0
48	22	535	0	552	40	0
49	23	637	0	665	52	0
50	24	665	0	714	42	0
51	25	544	0	579	72	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
52	26	33016	0	16617	892	0
53	27	62322	0	31345	1639	0
54	28	2572	0	1302	90	0
55	29	432	0	218	13	0
56	30	1623	0	821	66	0
57	31	1644	0	836	26	0
58	32	1643	0	836	76	0
59	33	4911	0	4550	616	0
All	All	154603	0	105189	6144	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 24.

The worst 5 of 6144 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)
52:26:484:G:H4'	52:26:485:U:H5'	1.23	1.18
59:33:17:PRO:HB3	59:33:39:TRP:NE1	1.57	1.18
51:25:20:ARG:HH22	52:26:1538:C:H1'	1.05	1.13
59:33:65:ILE:HG21	59:33:157:ILE:HD11	1.31	1.11
59:33:188:ARG:HH12	59:33:377:LEU:HA	1.08	1.11

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	A	269/273 (98%)	226 (84%)	34 (13%)	9 (3%)	4	31
2	B	207/209 (99%)	165 (80%)	29 (14%)	13 (6%)	1	19
3	C	199/201 (99%)	164 (82%)	23 (12%)	12 (6%)	1	20

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	D	175/179 (98%)	140 (80%)	27 (15%)	8 (5%)	2	25
5	E	174/177 (98%)	145 (83%)	22 (13%)	7 (4%)	3	27
6	F	147/149 (99%)	119 (81%)	16 (11%)	12 (8%)	1	14
7	G	129/165 (78%)	92 (71%)	17 (13%)	20 (16%)	0	3
8	H	139/142 (98%)	106 (76%)	27 (19%)	6 (4%)	2	26
9	I	140/142 (99%)	127 (91%)	7 (5%)	6 (4%)	2	26
10	J	120/123 (98%)	101 (84%)	14 (12%)	5 (4%)	3	26
11	K	141/144 (98%)	116 (82%)	16 (11%)	9 (6%)	1	19
12	L	134/136 (98%)	110 (82%)	20 (15%)	4 (3%)	4	33
13	M	118/127 (93%)	99 (84%)	14 (12%)	5 (4%)	3	26
14	N	114/117 (97%)	92 (81%)	16 (14%)	6 (5%)	2	22
15	O	112/115 (97%)	88 (79%)	20 (18%)	4 (4%)	3	29
16	P	115/118 (98%)	108 (94%)	5 (4%)	2 (2%)	9	43
17	Q	101/103 (98%)	82 (81%)	16 (16%)	3 (3%)	4	33
18	R	108/110 (98%)	85 (79%)	19 (18%)	4 (4%)	3	29
19	S	91/100 (91%)	73 (80%)	13 (14%)	5 (6%)	2	22
20	T	100/104 (96%)	80 (80%)	13 (13%)	7 (7%)	1	17
21	U	92/94 (98%)	76 (83%)	13 (14%)	3 (3%)	4	31
22	V	73/85 (86%)	64 (88%)	7 (10%)	2 (3%)	5	35
23	W	75/78 (96%)	67 (89%)	6 (8%)	2 (3%)	5	35
24	X	61/63 (97%)	52 (85%)	5 (8%)	4 (7%)	1	19
25	Y	56/59 (95%)	50 (89%)	4 (7%)	2 (4%)	3	29
26	Z	64/70 (91%)	50 (78%)	9 (14%)	5 (8%)	1	15
27	1	54/57 (95%)	42 (78%)	6 (11%)	6 (11%)	0	8
28	2	48/55 (87%)	41 (85%)	6 (12%)	1 (2%)	7	39
29	3	44/46 (96%)	35 (80%)	7 (16%)	2 (4%)	2	25
30	4	62/65 (95%)	51 (82%)	6 (10%)	5 (8%)	1	14
31	5	36/38 (95%)	26 (72%)	6 (17%)	4 (11%)	0	8
32	6	216/241 (90%)	177 (82%)	31 (14%)	8 (4%)	3	29
33	7	204/233 (88%)	172 (84%)	26 (13%)	6 (3%)	4	33
34	8	203/206 (98%)	158 (78%)	30 (15%)	15 (7%)	1	16

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
35	9	155/167 (93%)	116 (75%)	25 (16%)	14 (9%)	1	13
36	10	98/135 (73%)	76 (78%)	15 (15%)	7 (7%)	1	17
37	11	149/179 (83%)	123 (83%)	17 (11%)	9 (6%)	1	20
38	12	127/130 (98%)	112 (88%)	13 (10%)	2 (2%)	9	44
39	13	125/130 (96%)	98 (78%)	17 (14%)	10 (8%)	1	15
40	14	96/103 (93%)	77 (80%)	11 (12%)	8 (8%)	1	14
41	15	114/129 (88%)	92 (81%)	18 (16%)	4 (4%)	3	30
42	16	121/124 (98%)	98 (81%)	11 (9%)	12 (10%)	0	10
43	17	112/118 (95%)	90 (80%)	11 (10%)	11 (10%)	0	10
44	18	98/101 (97%)	71 (72%)	20 (20%)	7 (7%)	1	17
45	19	86/89 (97%)	73 (85%)	8 (9%)	5 (6%)	1	21
46	20	80/82 (98%)	64 (80%)	12 (15%)	4 (5%)	2	23
47	21	78/84 (93%)	53 (68%)	19 (24%)	6 (8%)	1	16
48	22	63/75 (84%)	48 (76%)	9 (14%)	6 (10%)	0	11
49	23	77/92 (84%)	60 (78%)	13 (17%)	4 (5%)	2	23
50	24	83/87 (95%)	75 (90%)	5 (6%)	3 (4%)	3	29
51	25	63/71 (89%)	44 (70%)	9 (14%)	10 (16%)	0	3
59	33	663/750 (88%)	550 (83%)	78 (12%)	35 (5%)	2	22
All	All	6509/6970 (93%)	5299 (81%)	841 (13%)	369 (6%)	3	21

5 of 369 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	18	ASP
2	B	181	ASP
2	B	188	LEU
3	C	55	SER
3	C	127	GLU

### 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	A	216/218 (99%)	215 (100%)	1 (0%)	88	93
2	B	164/164 (100%)	163 (99%)	1 (1%)	86	91
3	C	165/165 (100%)	164 (99%)	1 (1%)	86	91
4	D	148/150 (99%)	146 (99%)	2 (1%)	67	81
5	E	137/138 (99%)	136 (99%)	1 (1%)	84	90
6	F	114/114 (100%)	113 (99%)	1 (1%)	78	87
7	G	100/123 (81%)	99 (99%)	1 (1%)	76	86
8	H	109/110 (99%)	109 (100%)	0	100	100
9	I	116/116 (100%)	116 (100%)	0	100	100
10	J	103/104 (99%)	103 (100%)	0	100	100
11	K	102/103 (99%)	102 (100%)	0	100	100
12	L	109/109 (100%)	109 (100%)	0	100	100
13	M	100/103 (97%)	99 (99%)	1 (1%)	76	86
14	N	86/87 (99%)	84 (98%)	2 (2%)	50	71
15	O	99/100 (99%)	99 (100%)	0	100	100
16	P	89/90 (99%)	89 (100%)	0	100	100
17	Q	84/84 (100%)	84 (100%)	0	100	100
18	R	93/93 (100%)	93 (100%)	0	100	100
19	S	80/84 (95%)	79 (99%)	1 (1%)	69	82
20	T	83/85 (98%)	82 (99%)	1 (1%)	71	83
21	U	78/78 (100%)	78 (100%)	0	100	100
22	V	57/63 (90%)	57 (100%)	0	100	100
23	W	67/68 (98%)	67 (100%)	0	100	100
24	X	55/55 (100%)	55 (100%)	0	100	100
25	Y	48/49 (98%)	48 (100%)	0	100	100
26	Z	59/62 (95%)	58 (98%)	1 (2%)	60	78
27	1	47/48 (98%)	47 (100%)	0	100	100
28	2	45/49 (92%)	45 (100%)	0	100	100
29	3	38/38 (100%)	38 (100%)	0	100	100
30	4	51/52 (98%)	51 (100%)	0	100	100
31	5	34/34 (100%)	34 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
32	6	180/199 (90%)	179 (99%)	1 (1%)	86	91
33	7	170/190 (90%)	168 (99%)	2 (1%)	71	83
34	8	172/173 (99%)	171 (99%)	1 (1%)	86	91
35	9	119/126 (94%)	117 (98%)	2 (2%)	60	78
36	10	87/116 (75%)	86 (99%)	1 (1%)	73	84
37	11	124/147 (84%)	124 (100%)	0	100	100
38	12	104/105 (99%)	104 (100%)	0	100	100
39	13	105/107 (98%)	103 (98%)	2 (2%)	57	75
40	14	86/90 (96%)	86 (100%)	0	100	100
41	15	89/99 (90%)	89 (100%)	0	100	100
42	16	103/104 (99%)	103 (100%)	0	100	100
43	17	92/96 (96%)	91 (99%)	1 (1%)	73	84
44	18	83/84 (99%)	81 (98%)	2 (2%)	49	69
45	19	76/77 (99%)	76 (100%)	0	100	100
46	20	65/65 (100%)	65 (100%)	0	100	100
47	21	74/78 (95%)	74 (100%)	0	100	100
48	22	56/65 (86%)	55 (98%)	1 (2%)	59	77
49	23	70/79 (89%)	70 (100%)	0	100	100
50	24	65/66 (98%)	65 (100%)	0	100	100
51	25	55/61 (90%)	55 (100%)	0	100	100
59	33	452/635 (71%)	449 (99%)	3 (1%)	84	90
All	All	5303/5698 (93%)	5273 (99%)	30 (1%)	86	91

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

Mol	Chain	Res	Type
32	6	22	TRP
59	33	267	ASN
34	8	170	LEU
59	33	714	ILE
44	18	45	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 94 such sidechains are listed below:

Mol	Chain	Res	Type
36	10	37	HIS
46	20	9	HIS
37	11	121	ASN
39	13	109	GLN
46	20	79	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
52	26	1538/1539 (99%)	178 (11%)	5 (0%)
53	27	2902/2903 (99%)	379 (13%)	17 (0%)
54	28	119/120 (99%)	15 (12%)	1 (0%)
55	29	19/20 (95%)	3 (15%)	0
56	30	75/76 (98%)	22 (29%)	1 (1%)
57	31	76/77 (98%)	5 (6%)	0
58	32	76/77 (98%)	16 (21%)	0
All	All	4805/4812 (99%)	618 (12%)	24 (0%)

5 of 618 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
52	26	4	U
52	26	9	G
52	26	13	U
52	26	22	G
52	26	32	A

5 of 24 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
53	27	1730	C
53	27	2296	U
53	27	2286	G
53	27	2326	C
53	27	421	C

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

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 [i](#)

There are no chain breaks in this entry.

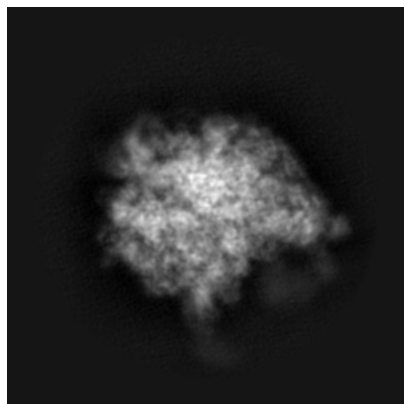
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-8281. These allow visual inspection of the internal detail of the map and identification of artifacts.

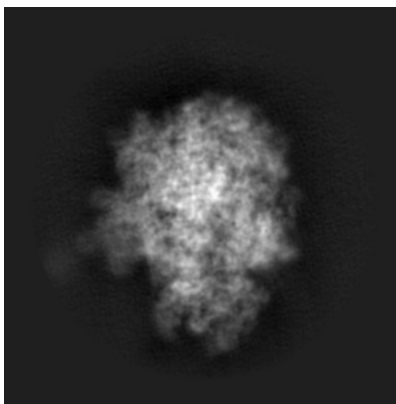
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

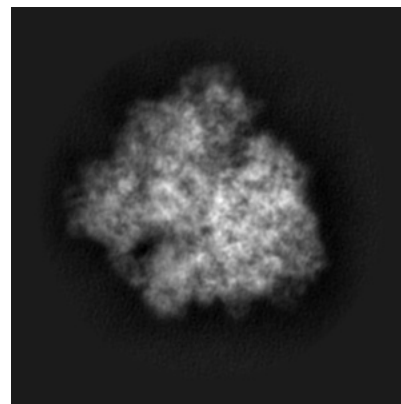
#### 6.1.1 Primary map



X

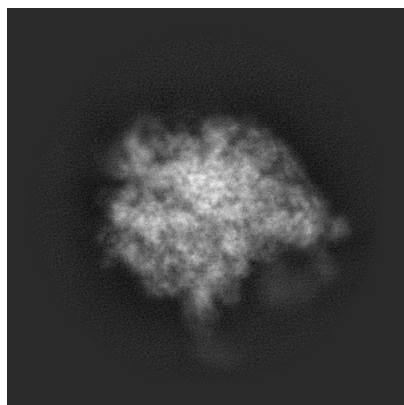


Y

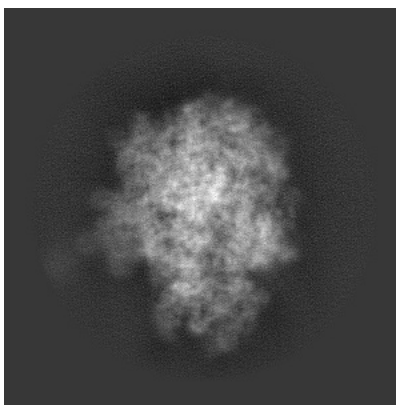


Z

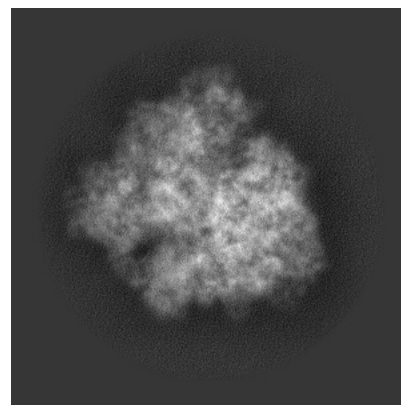
#### 6.1.2 Raw map



X



Y

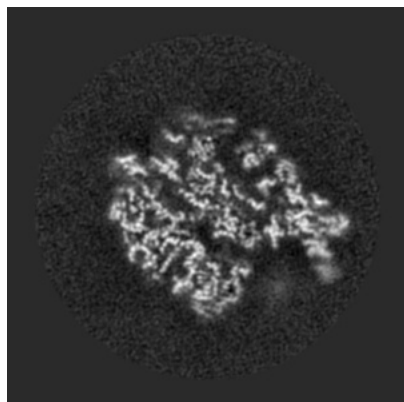


Z

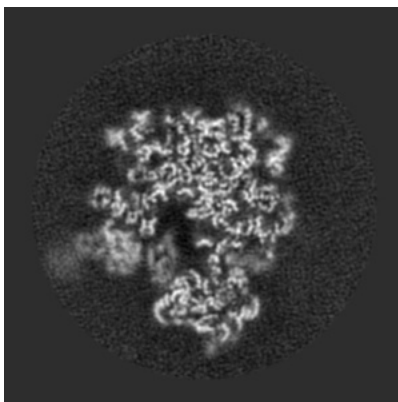
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

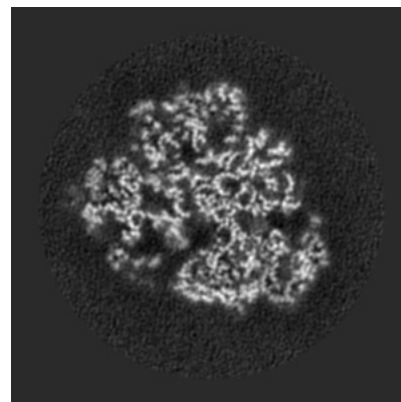
### 6.2.1 Primary map



X Index: 240

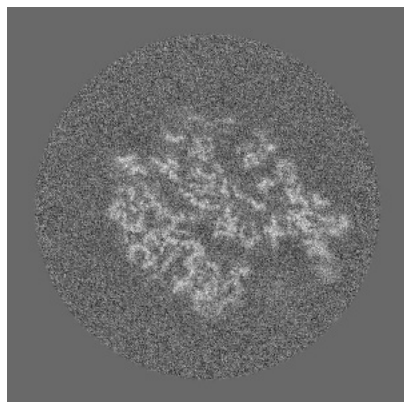


Y Index: 240

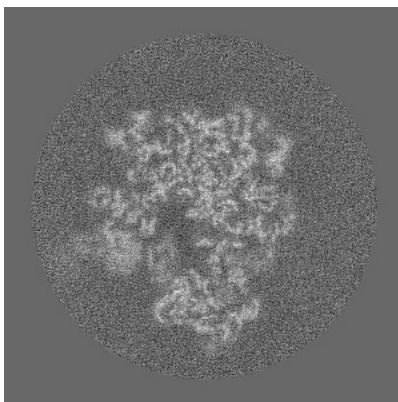


Z Index: 240

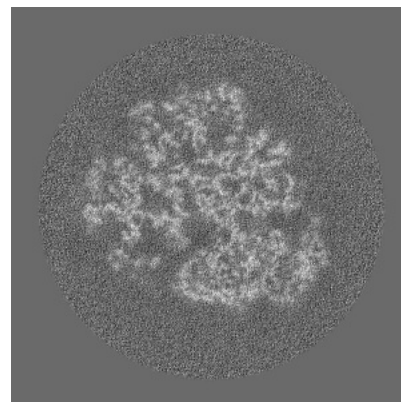
### 6.2.2 Raw map



X Index: 240



Y Index: 240

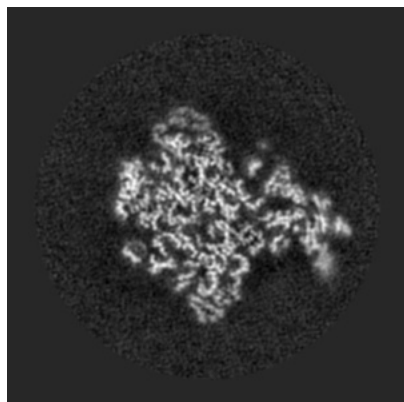


Z Index: 240

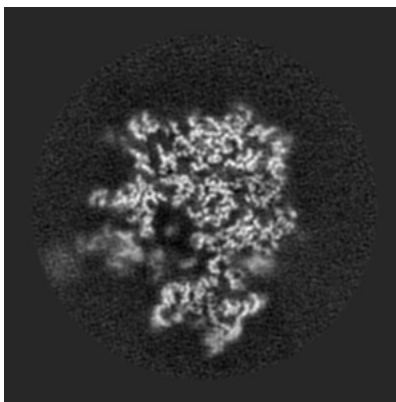
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

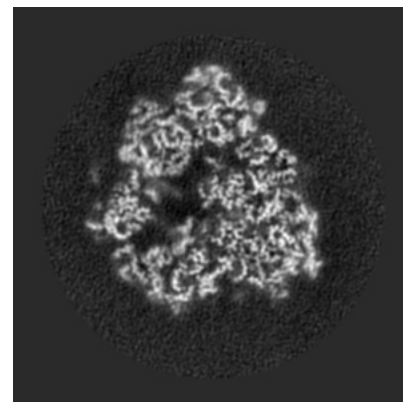
### 6.3.1 Primary map



X Index: 249

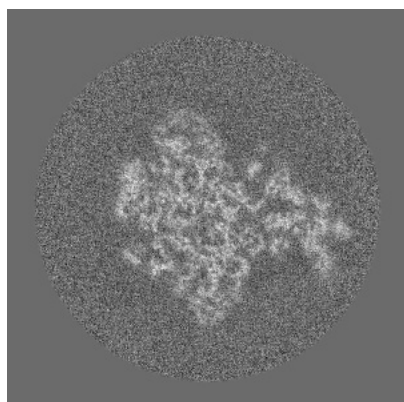


Y Index: 247

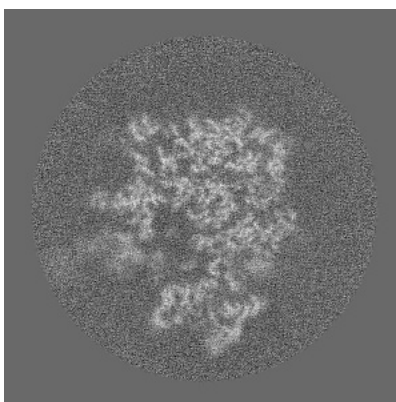


Z Index: 220

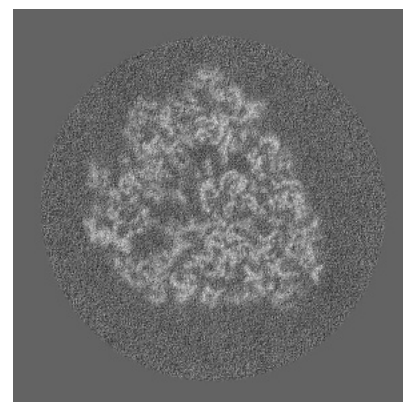
### 6.3.2 Raw map



X Index: 249



Y Index: 247



Z Index: 227

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

## 6.4 Orthogonal surface views [i](#)

### 6.4.1 Primary map



X



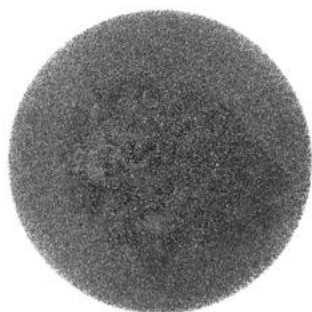
Y



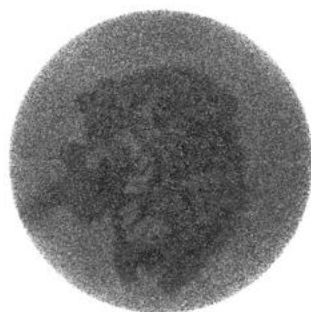
Z

The images above show the 3D surface view of the map at the recommended contour level 0.1. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

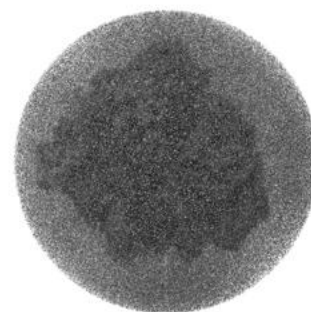
### 6.4.2 Raw map



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.

## 6.5 Mask visualisation [i](#)

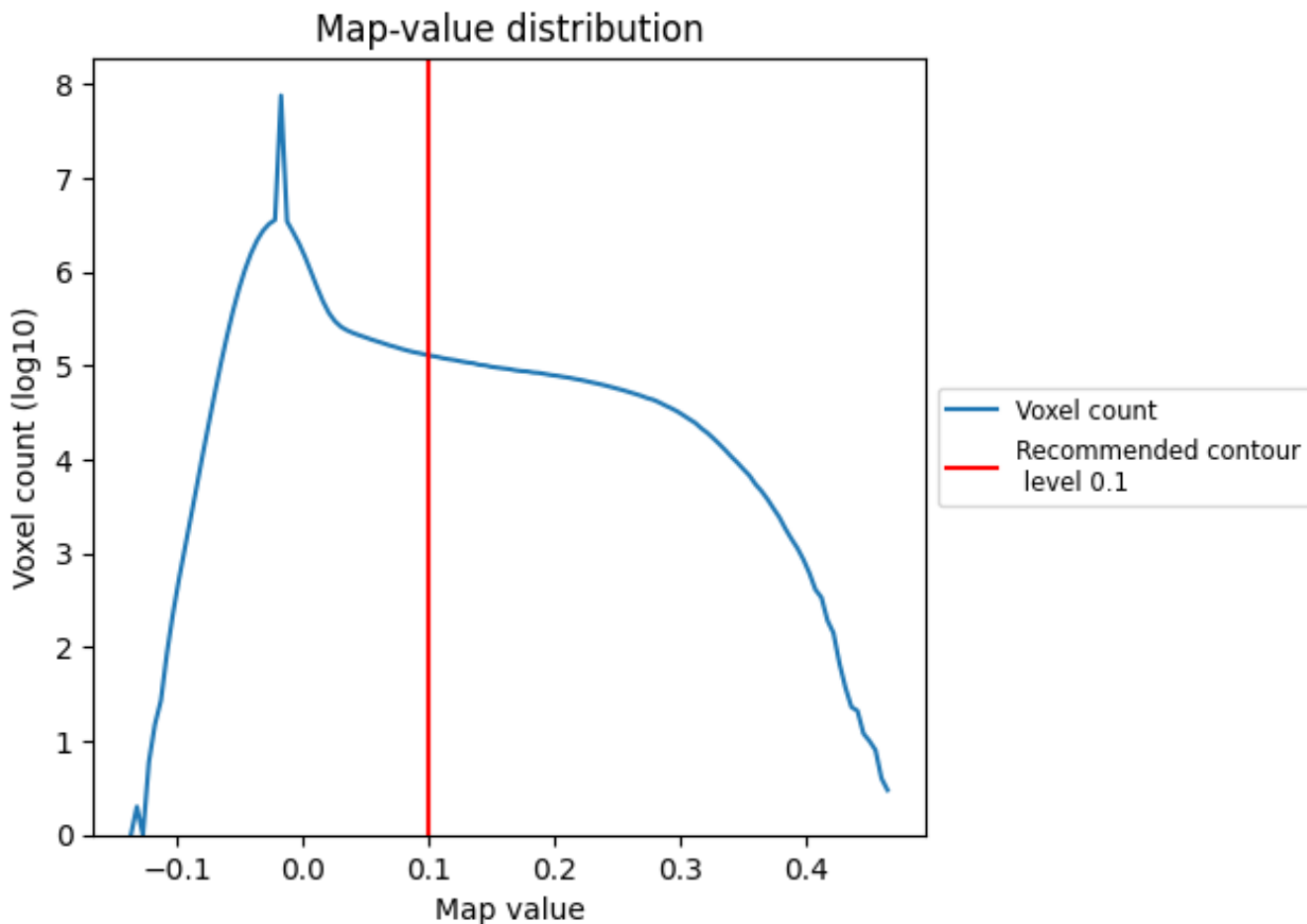
This section was not generated. No masks/segmentation were deposited.



## 7 Map analysis [i](#)

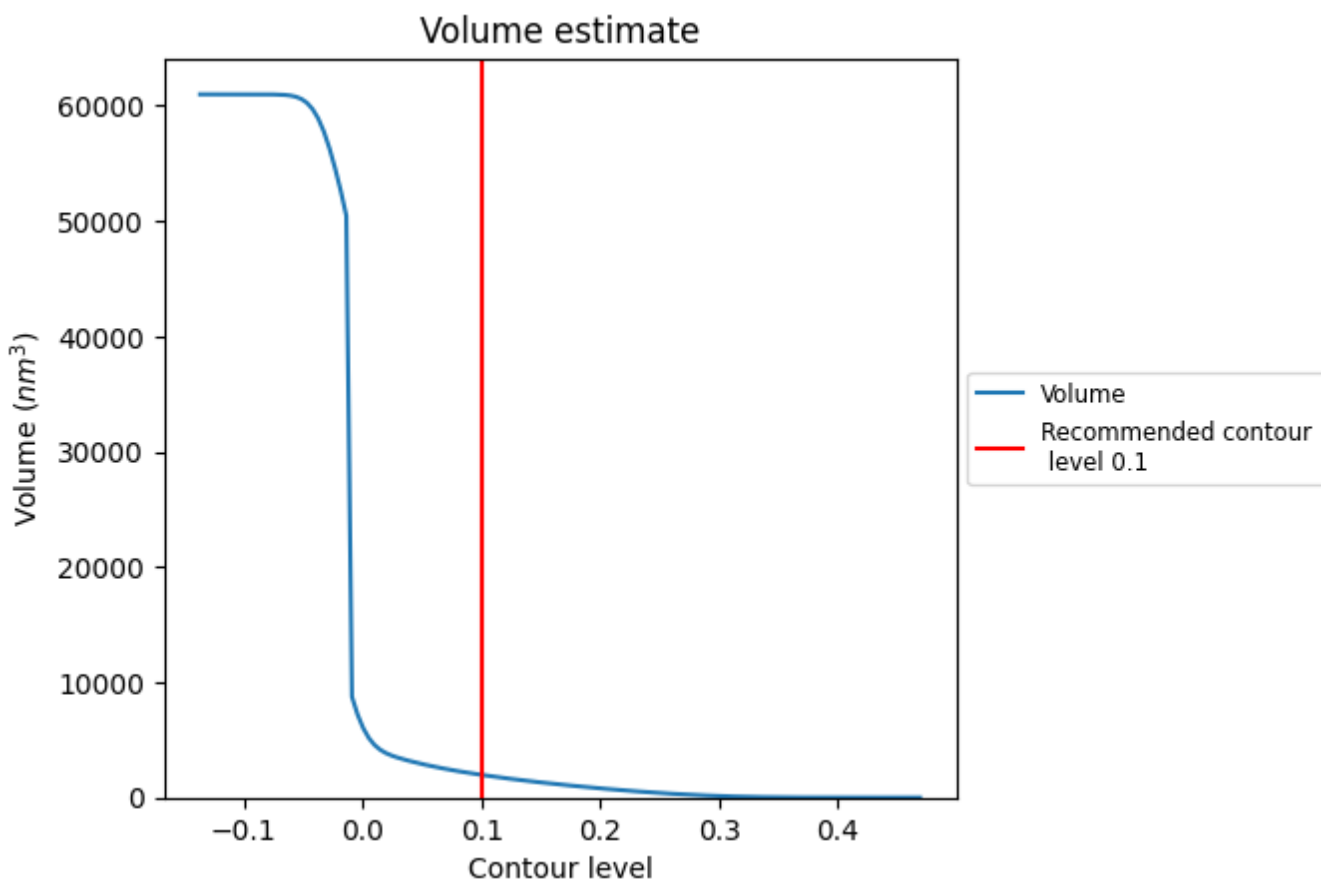
This section contains the results of statistical analysis of the map.

### 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.

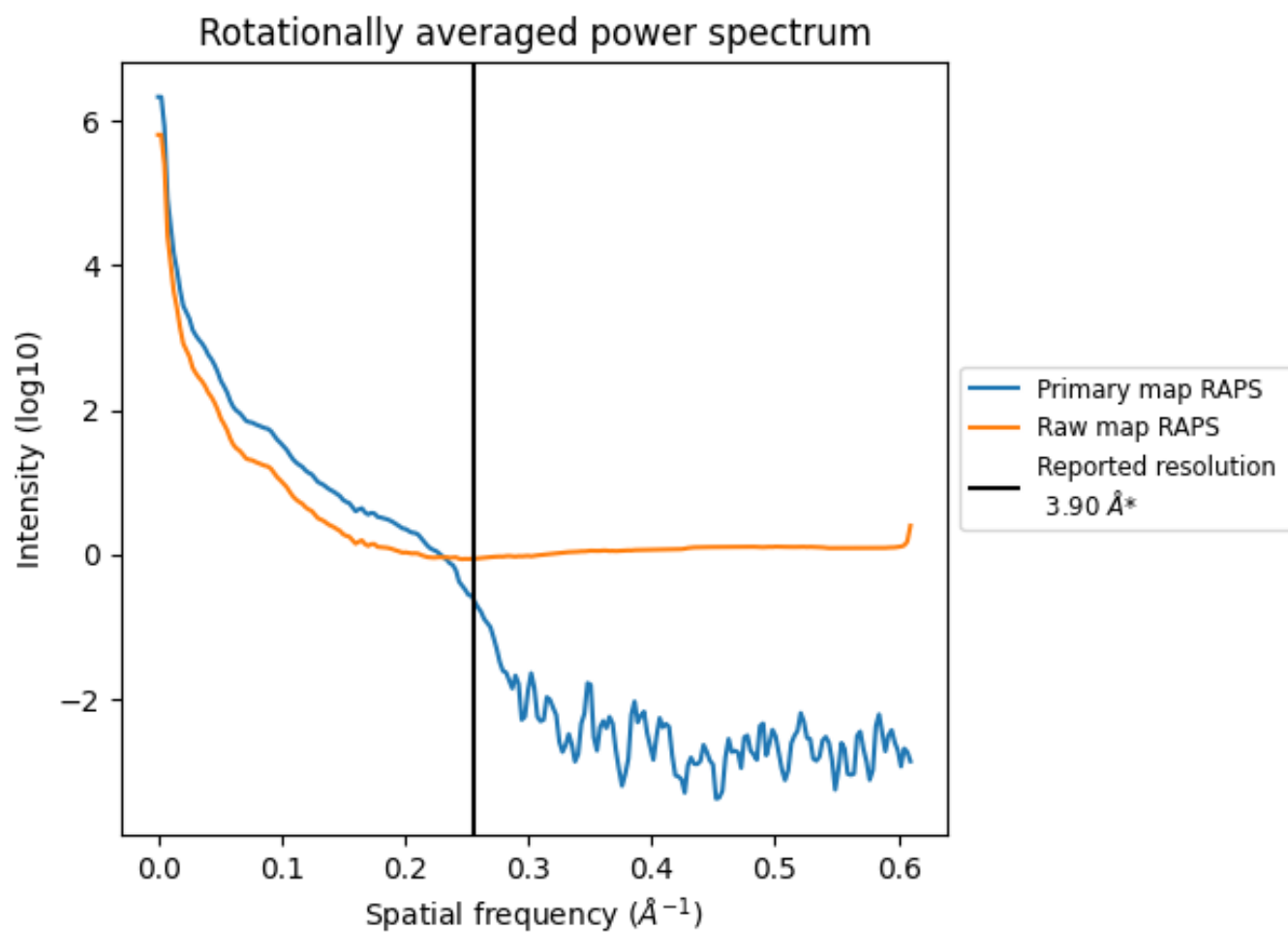
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1970 nm<sup>3</sup>; this corresponds to an approximate mass of 1779 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

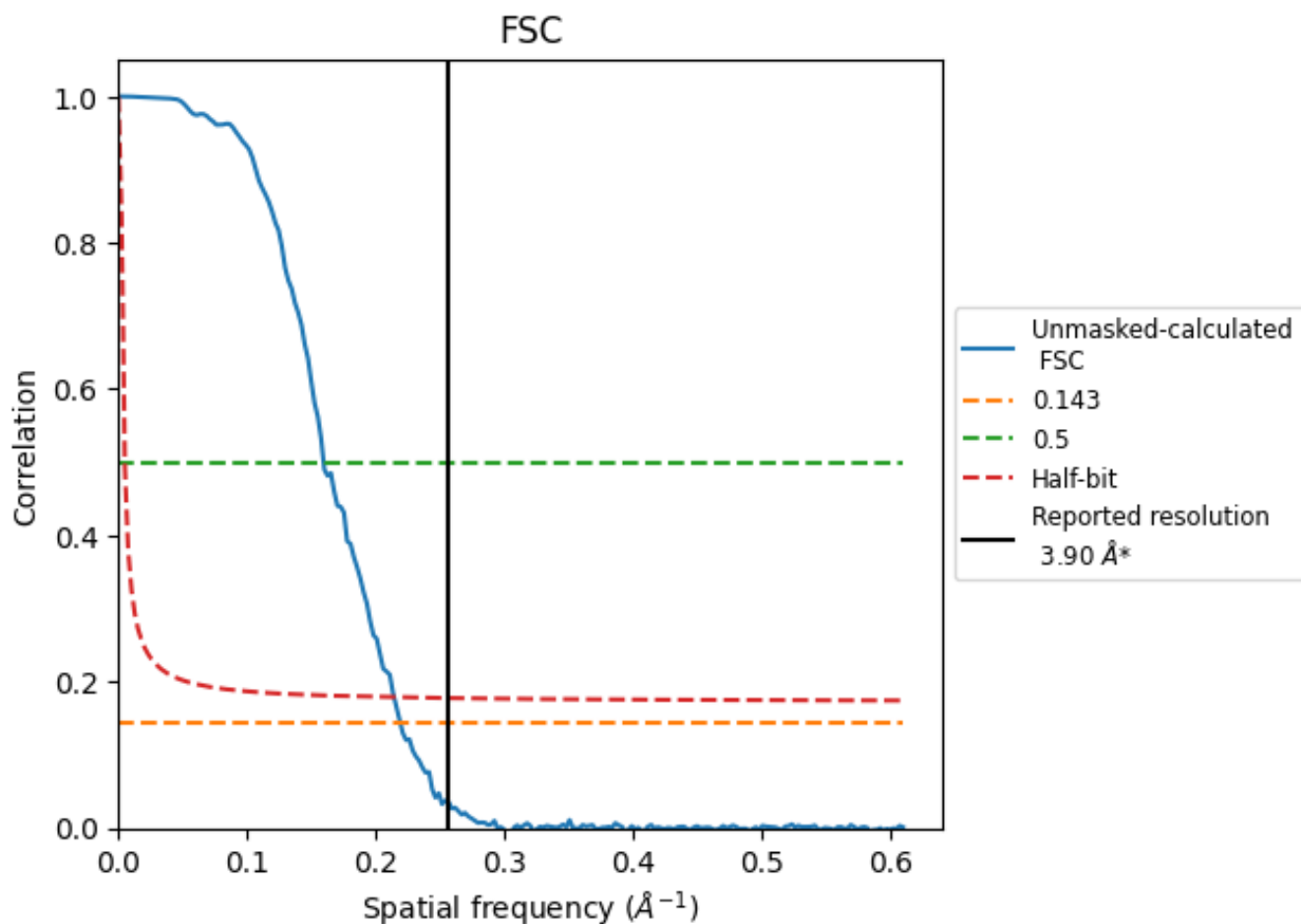


\*Reported resolution corresponds to spatial frequency of 0.256 Å<sup>-1</sup>

## 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 0.256 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

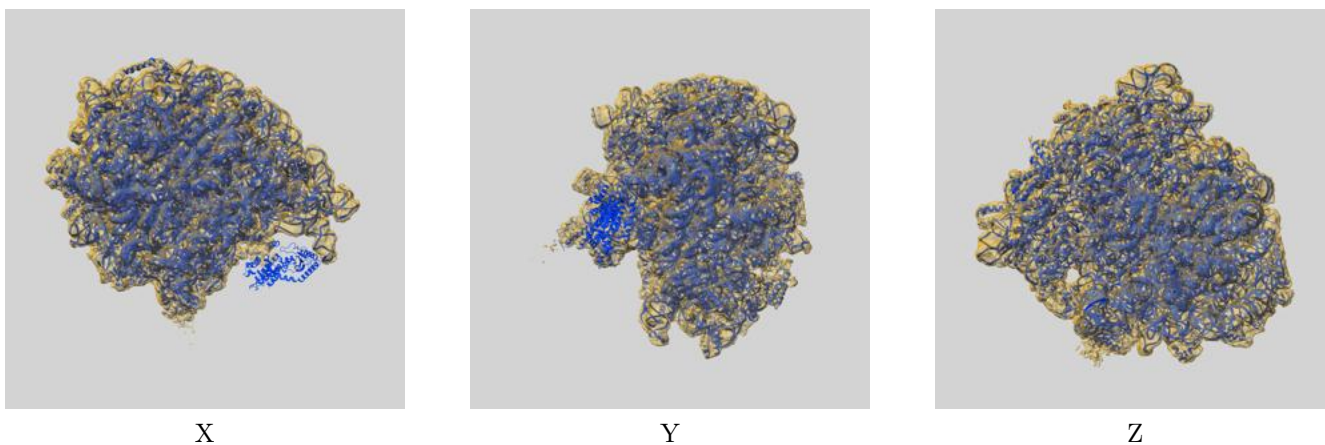
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.90	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.57	6.27	4.67

\*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 4.57 differs from the reported value 3.9 by more than 10 %

## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-8281 and PDB model 5KPW. Per-residue inclusion information can be found in section 3 on page 15.

### 9.1 Map-model overlay [i](#)

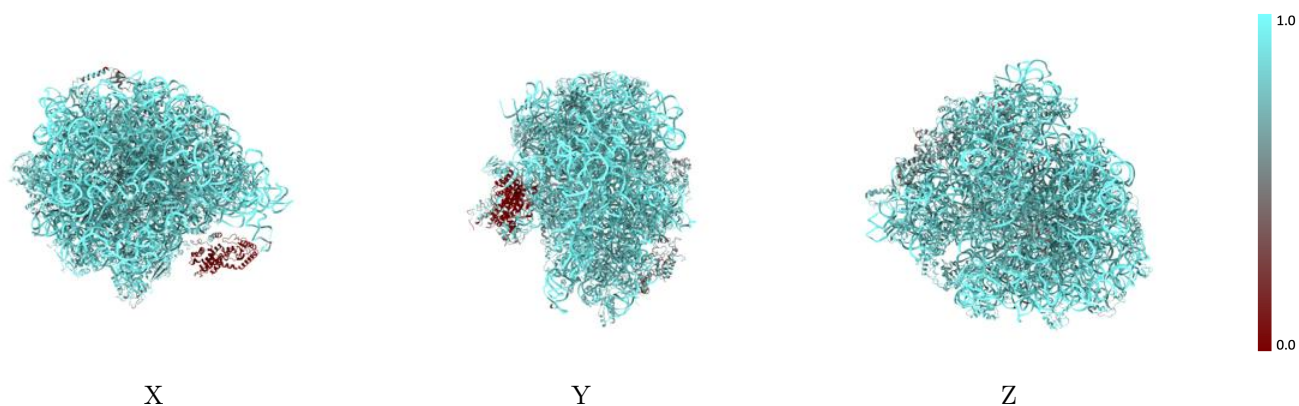


The images above show the 3D surface view of the map at the recommended contour level 0.1 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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

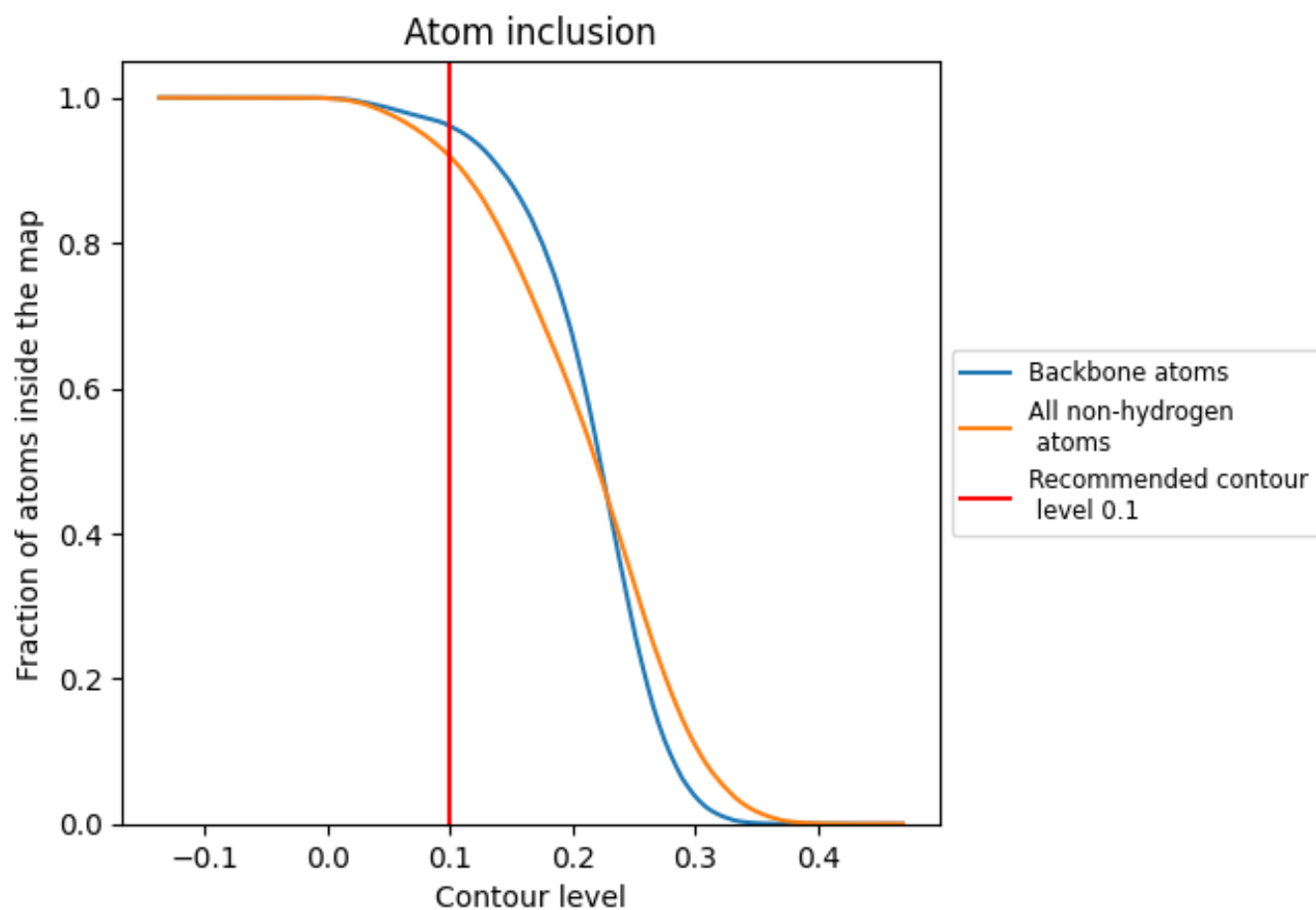
This section was not generated.

## 9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.1).

## 9.4 Atom inclusion [i](#)






































At the recommended contour level, 96% of all backbone atoms, 92% of all non-hydrogen atoms, are inside the map.



## 9.5 Map-model fit summary [i](#)


























The table lists the average atom inclusion at the recommended contour level (0.1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion
All	 0.9187
1	 0.8435
10	 0.8518
11	 0.8531
12	 0.8479
13	 0.8631
14	 0.7740
15	 0.8746
16	 0.7991
17	 0.8684
18	 0.8463
19	 0.8754
2	 0.7781
20	 0.8628
21	 0.8434
22	 0.8852
23	 0.8551
24	 0.8508
25	 0.7660
26	 0.9887
27	 0.9906
28	 0.9911
29	 0.9190
3	 0.8563
30	 0.9532
31	 0.9635
32	 0.9026
33	 0.3879
4	 0.8208
5	 0.8390
6	 0.5301
7	 0.8093
8	 0.8176
9	 0.8633
A	 0.8621



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Chain	Atom inclusion
B	 0.8368
C	 0.7895
D	 0.8471
E	 0.8743
F	 0.6542
G	 0.6508
H	 0.7016
I	 0.8518
J	 0.7788
K	 0.8602
L	 0.8129
M	 0.8829
N	 0.8876
O	 0.8367
P	 0.8623
Q	 0.8595
R	 0.8062
S	 0.8504
T	 0.8579
U	 0.8469
V	 0.8301
W	 0.8586
X	 0.8290
Y	 0.8467
Z	 0.8532