



# wwPDB EM Validation Summary Report ⓘ

Nov 3, 2024 – 07:32 AM EST

PDB ID : 6VU3  
EMDB ID : EMD-21386  
Title : Cryo-EM structure of Escherichia coli transcription-translation complex A (TTC-A) containing mRNA with a 12 nt long spacer  
Authors : Molodtsov, V.; Wang, C.; Su, M.; Ebright, R.  
Deposited on : 2020-02-14  
Resolution : 3.70 Å(reported)

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](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.dev113  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

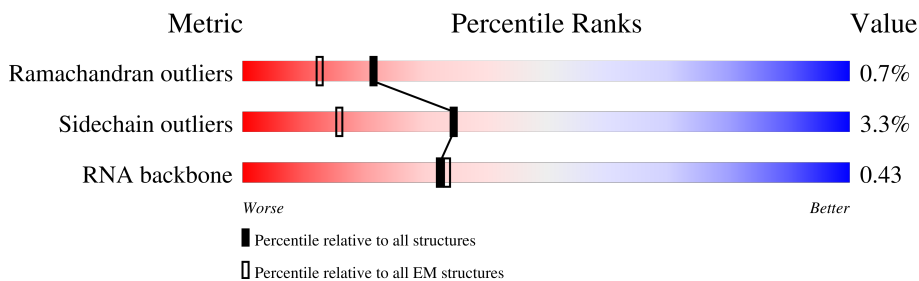
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.70 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	0	103	
2	1	110	
3	2	94	
4	3	103	
5	4	94	
6	5	36	
7	6	27	
8	7	29	
















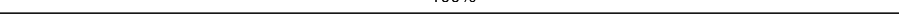
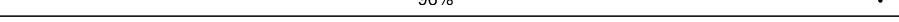
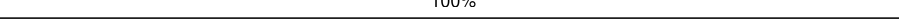
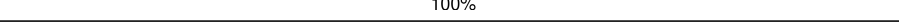
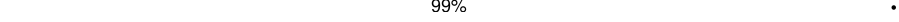

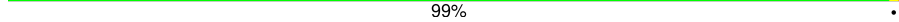
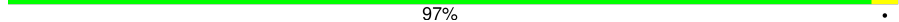
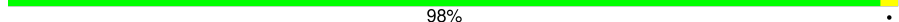
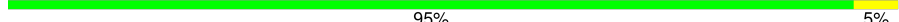
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Mol	Chain	Length	Quality of chain
9	9	148	97%
10	A	76	53% 42% 5%
10	B	76	53% 42% 5%
11	AA	1342	78% 89% 8% ..
12	AB	181	48% 53% 46%
13	AC	230	77% 92% 7%
13	AD	230	92% 98% ..
14	AE	1407	80% 89% 6% 5%
15	C	66	91% 8%
16	D	1542	76% 22% ..
17	E	86	100%
18	F	70	97%
19	G	225	98%
20	H	557	15% 41% .. 54%
21	I	208	96%
22	J	205	96%
23	K	156	99%
24	L	104	100%
25	M	151	100%
26	N	129	100%
27	O	127	98% ..
28	P	99	90% 10%
29	Q	117	100%
30	R	124	94% ..
31	S	100	96%

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Mol	Chain	Length	Quality of chain
32	T	88	 100%
33	U	82	 99%
34	V	80	 99%
35	W	83	 100%
36	X	116	 99%
37	Y	141	 99%
38	Z	30	 100%
39	a	2904	 75% 22%
40	b	76	 5% 97%
41	c	77	 100%
42	d	120	 83% 17%
43	e	62	 100%
44	f	58	 100%
45	g	66	 6% 98%
46	h	271	 100%
47	i	56	 96%
48	j	209	 100%
49	k	52	 100%
50	l	201	 99%
51	m	46	 93% 7%
52	n	177	 99%
53	o	64	 97%
54	p	175	 98%
55	q	38	 95% 5%
56	r	149	 100%

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Mol	Chain	Length	Quality of chain
57	s	142	 100%
58	t	123	 100%
59	u	144	 100%
60	v	136	 99%
61	w	119	 99%
62	x	116	 100%
63	y	114	 99%
64	z	117	 99%

## 2 Entry composition [i](#)

There are 66 unique types of molecules in this entry. The entry contains 300609 atoms, of which 124724 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 L21.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
1	0	103	1655	516	839	153	145	2	0	0

- Molecule 2 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
2	1	110	1779	532	922	166	156	3	0	0

- Molecule 3 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
3	2	94	1557	470	811	140	134	2	0	0

- Molecule 4 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
4	3	103	1632	498	844	148	142	0	0

- Molecule 5 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
5	4	94	1533	479	780	137	134	3	0	0

- Molecule 6 is a DNA chain called NT DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			P
6	5	23	732	225	260	87	137	23	0	0

- Molecule 7 is a DNA chain called T DNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	6	27	Total	C	H	N	O	P	0	0
			848	259	306	89	167	27		

- Molecule 8 is a RNA chain called mRNA with 12 nt long spacer.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	7	29	Total	C	H	N	O	P	0	0
			709	273	97	94	216	29		

- Molecule 9 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	9	148	Total	C	N	O	S	0	0
			1117	705	196	209	7		

- Molecule 10 is a RNA chain called E-site and A-site tRNA (fMet).

Mol	Chain	Residues	Atoms						AltConf	Trace
10	A	76	Total	C	H	N	O	P	0	0
			2446	723	826	295	527	75		
10	B	76	Total	C	H	N	O	P	0	0
			2433	723	813	295	527	75		

- Molecule 11 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	AA	1322	Total	C	H	N	O	S	0	0
			20851	6539	10426	1817	2026	43		

- Molecule 12 is a protein called Transcription termination/antitermination protein NusG.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	AB	98	Total	C	H	N	O	S	0	0
			1573	505	783	139	140	6		

- Molecule 13 is a protein called DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms						AltConf	Trace
13	AC	230	Total	C	H	N	O	S	0	0
			3599	1112	1813	317	351	6		

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Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
13	AD	228	3556	1100	1789	312	349	6	0	0

- Molecule 14 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
14	AE	1335	21000	6526	10612	1854	1958	50	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AE	1384	VAL	MET	conflict	UNP A0A4S1NBU2

- Molecule 15 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
15	C	66	1103	344	559	102	97	1	0	0

- Molecule 16 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			P
16	D	1524	49126	14585	16423	6003	10591	1524	0	0

- Molecule 17 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
17	E	86	1388	414	719	138	114	3	0	0

- Molecule 18 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
18	F	70	1218	366	629	125	97	1	0	0

- Molecule 19 is a protein called 30S ribosomal protein S2.



Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
19	G	225	3545	1113	1785	316	323	8	0	0

- Molecule 20 is a protein called 30S ribosomal protein S1.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
20	H	259	3184	1073	1454	305	349	3	0	0

- Molecule 21 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
21	I	208	3346	1036	1710	307	290	3	0	0

- Molecule 22 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
22	J	205	3350	1026	1707	315	298	4	0	0

- Molecule 23 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
23	K	156	2348	717	1196	217	212	6	0	0

- Molecule 24 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
24	L	104	1694	536	846	153	152	7	0	0

- Molecule 25 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
25	M	151	2416	735	1235	227	215	4	0	0

- Molecule 26 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
26	N	129	2010	616	1031	173	184	6	0	0

- Molecule 27 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
27	O	127	2092	634	1070	206	179	3	0	0

- Molecule 28 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
28	P	99	1621	495	831	151	143	1	0	0

- Molecule 29 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
29	Q	117	1764	540	887	174	160	3	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
30	R	121	1940	580	1001	194	161	4	0	0

- Molecule 31 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
31	S	100	1649	499	844	164	139	3	0	0

- Molecule 32 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
32	T	88	1448	439	734	144	130	1	0	0

- Molecule 33 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace	
33	U	82	Total	C	H	N	O	S	0	0
			1315	406	666	128	114	1		

- Molecule 34 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace	
34	V	80	Total	C	H	N	O	S	0	0
			1339	411	691	121	113	3		

- Molecule 35 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace	
35	W	83	Total	C	H	N	O	S	0	0
			1351	424	688	126	111	2		

- Molecule 36 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace	
36	X	116	Total	C	H	N	O	S	0	0
			1864	558	964	181	158	3		

- Molecule 37 is a protein called 50S ribosomal protein L11.

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

- Molecule 38 is a protein called 50S ribosomal protein L7/L12.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	Z	30	Total	C	N	O	S	0	0
			227	144	33	47	3		

- Molecule 39 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace	
39	a	2880	Total	C	H	N	O	P	0	0
			92918	27587	31077	11398	19976	2880		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	887	A	U	conflict	GB 937521852

- Molecule 40 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
40	b	76	1181	360	599	117	104	1	0	0

- Molecule 41 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
41	c	77	1277	388	652	129	106	2	0	0

- Molecule 42 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			P
42	d	120	3870	1144	1301	468	837	120	0	0

- Molecule 43 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
43	e	62	1032	308	531	98	94	1	0	0

- Molecule 44 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
44	f	58	936	281	488	87	78	2	0	0

- Molecule 45 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
45	g	66	1042	323	520	99	94	6	0	0

- Molecule 46 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
46	h	271	4236	1288	2154	423	364	7	0	0

- Molecule 47 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
47	i	56	903	269	459	94	80	1	0	0

- Molecule 48 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
48	j	209	3182	979	1617	288	294	4	0	0

- Molecule 49 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			
49	k	52	890	275	464	78	73		0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
50	l	201	3171	974	1619	283	290	5	0	0

- Molecule 51 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
51	m	46	795	228	418	90	57	2	0	0

- Molecule 52 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
52	n	177	2853	899	1443	249	256	6	0	0

- Molecule 53 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace	
53	o	64	Total	C	H	N	O	S	0	0
			1076	323	572	105	74	2		

- Molecule 54 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace	
54	p	175	Total	C	H	N	O	S	0	0
			2671	826	1358	241	244	2		

- Molecule 55 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace	
55	q	38	Total	C	H	N	O	S	0	0
			645	185	343	65	48	4		

- Molecule 56 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace	
56	r	149	Total	C	H	N	O	S	0	0
			2259	699	1148	197	214	1		

- Molecule 57 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace	
57	s	142	Total	C	H	N	O	S	0	0
			2291	714	1162	212	199	4		

- Molecule 58 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace	
58	t	123	Total	C	H	N	O	S	0	0
			1969	593	1023	181	166	6		

- Molecule 59 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace	
59	u	144	Total	C	H	N	O	S	0	0
			2182	654	1129	207	190	2		

- Molecule 60 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace	
60	v	136	Total	C	H	N	O	S	0	0
			2231	686	1157	205	177	6		

- Molecule 61 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace	
61	w	119	Total	C	H	N	O	S	0	0
			1945	588	994	195	163	5		

- Molecule 62 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace	
62	x	116	Total	C	H	N	O		0	0
			1815	552	923	178	162			

- Molecule 63 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace	
63	y	114	Total	C	H	N	O	S	0	0
			1879	574	962	179	163	1		

- Molecule 64 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace	
64	z	117	Total	C	H	N	O		0	0
			1967	604	1020	192	151			

- Molecule 65 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
65	7	1	Total	Mg	0
			1	1	

- Molecule 66 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
66	AA	2	Total	Zn	0
			2	2	

### 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 L21

Chain 0:  100%

There are no outlier residues recorded for this chain.

- Molecule 2: 50S ribosomal protein L22

Chain 1:  100%

There are no outlier residues recorded for this chain.

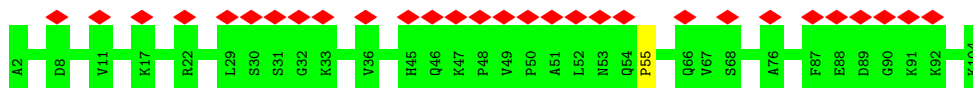
- Molecule 3: 50S ribosomal protein L23

Chain 2:  100%

There are no outlier residues recorded for this chain.

- Molecule 4: 50S ribosomal protein L24

Chain 3:  28% 99%



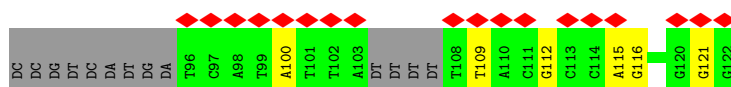
- Molecule 5: 50S ribosomal protein L25

Chain 4:  100%

There are no outlier residues recorded for this chain.

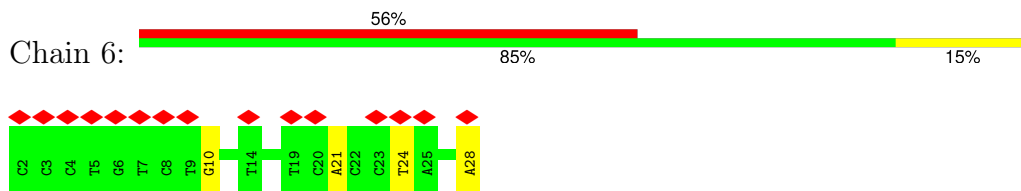
- Molecule 6: NT DNA

Chain 5:  47% 50% 17% 36%

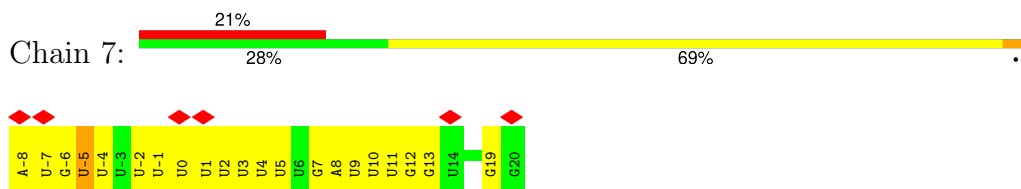




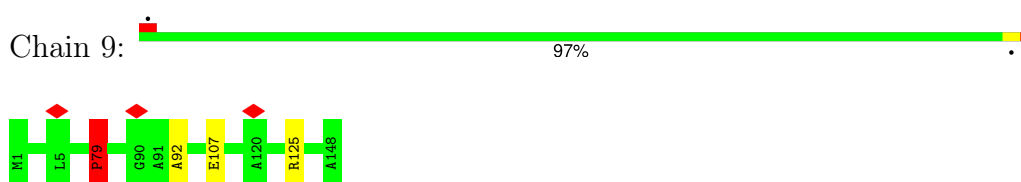
• Molecule 7: T DNA



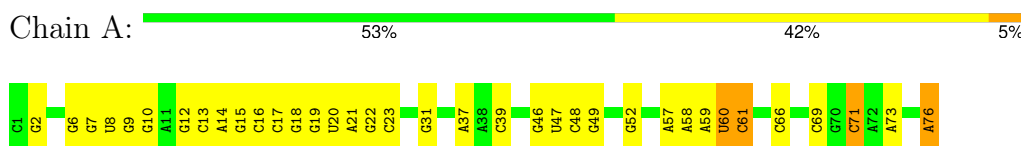
• Molecule 8: mRNA with 12 nt long spacer



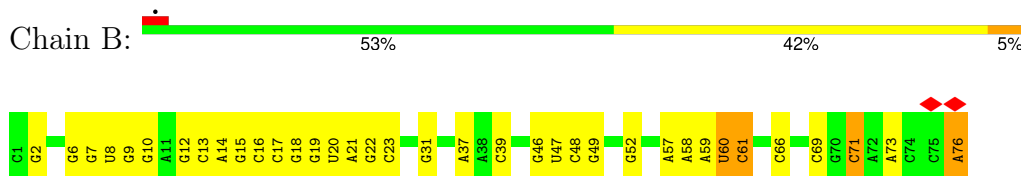
• Molecule 9: 50S ribosomal protein L10



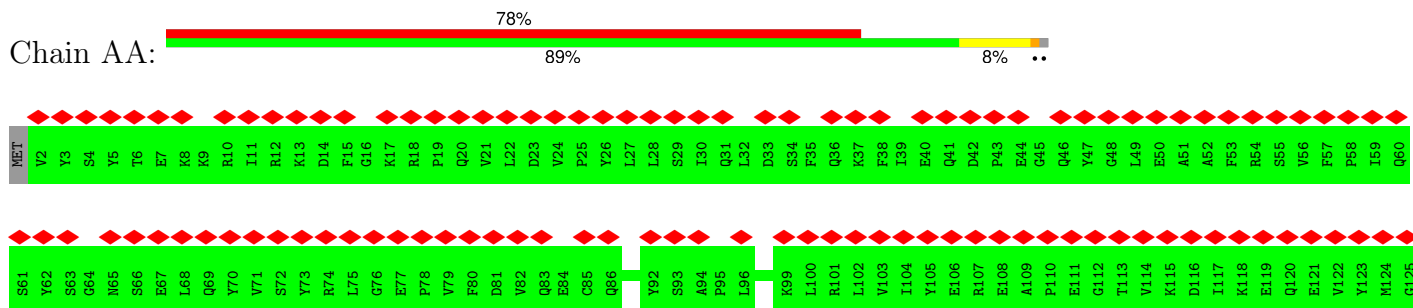
• Molecule 10: E-site and A-site tRNA (fMet)

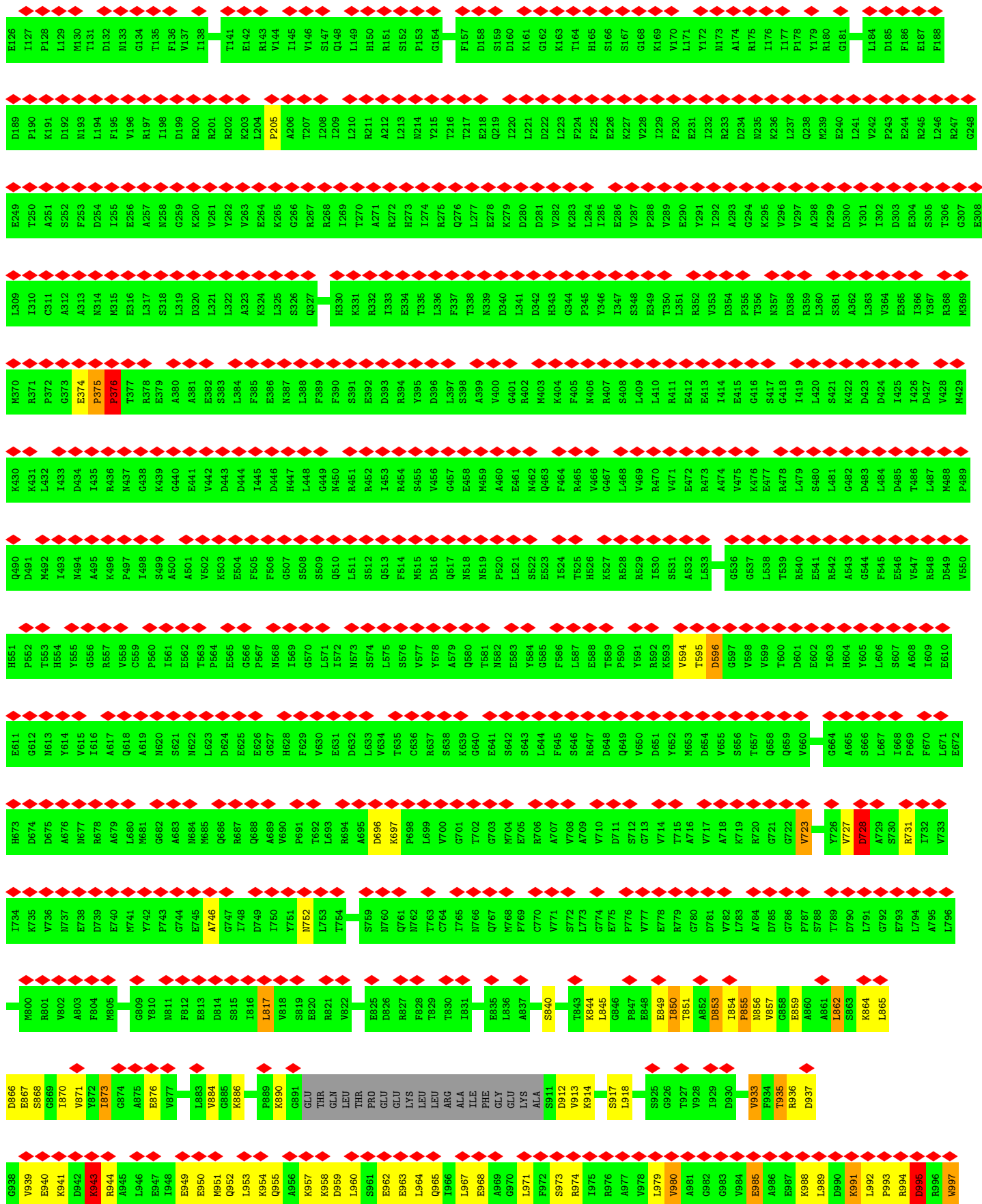


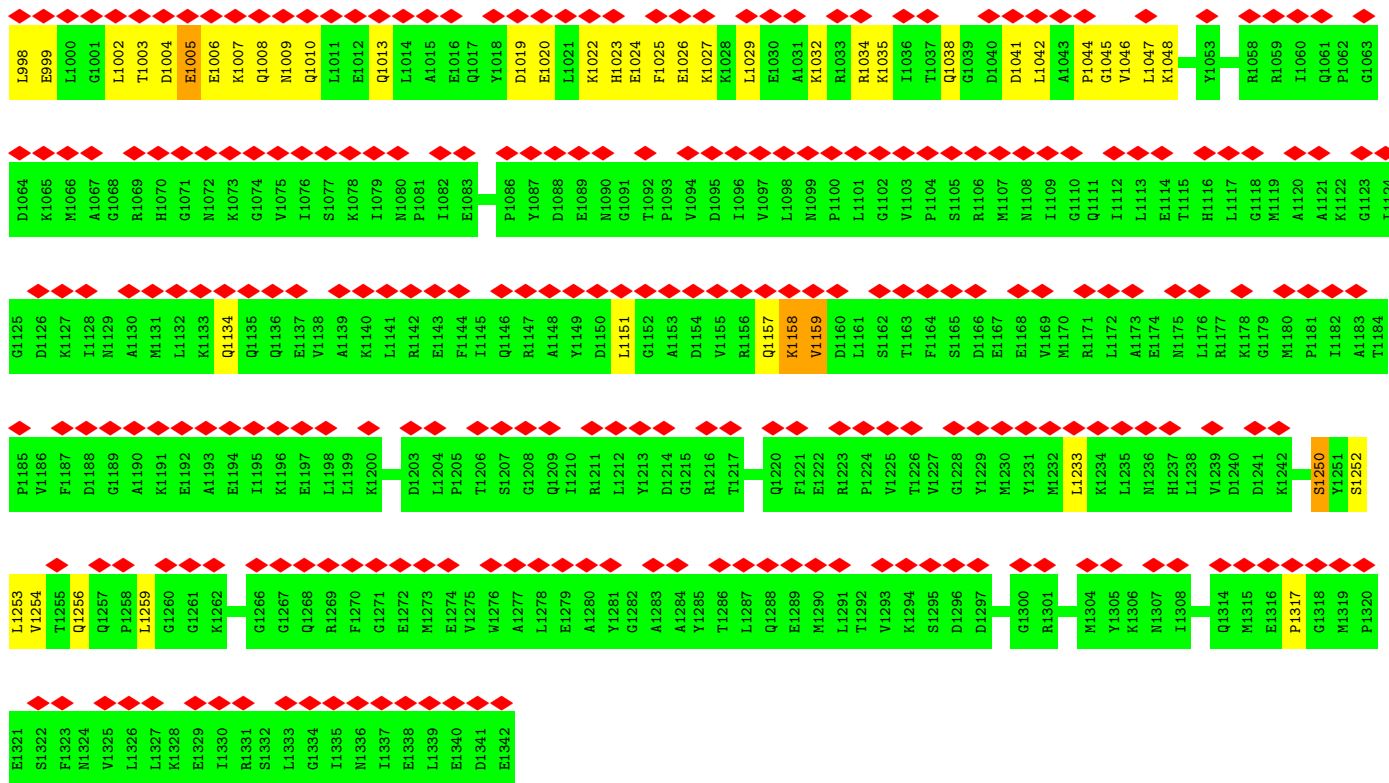
• Molecule 10: E-site and A-site tRNA (fMet)



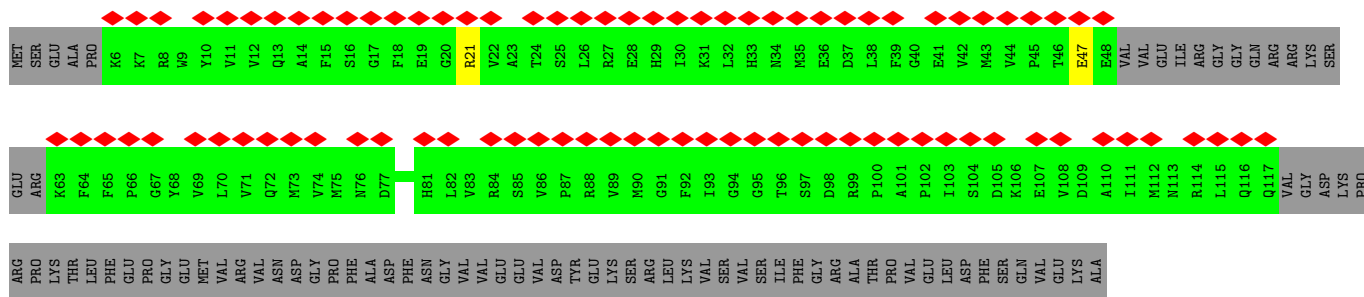
• Molecule 11: DNA-directed RNA polymerase subunit beta



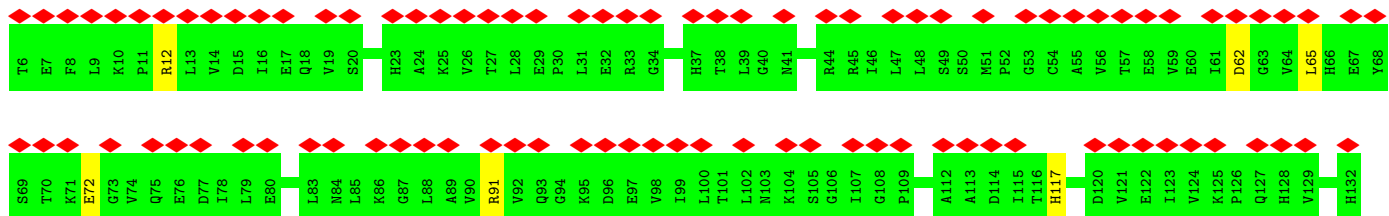
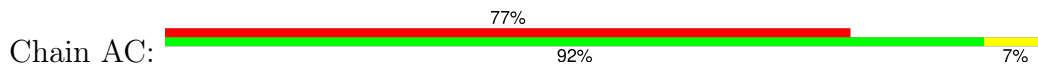


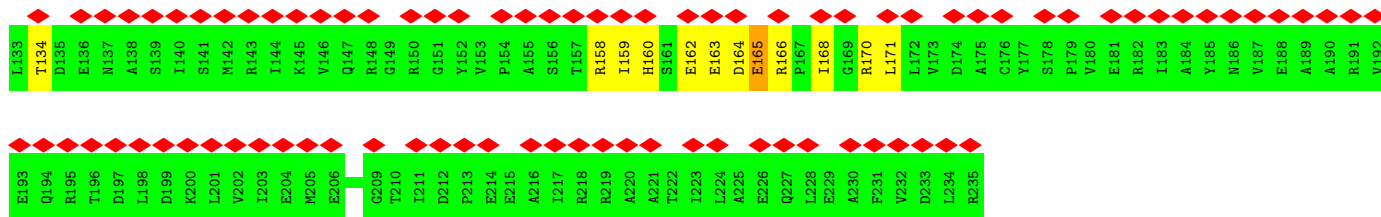


• Molecule 12: Transcription termination/antitermination protein NusG

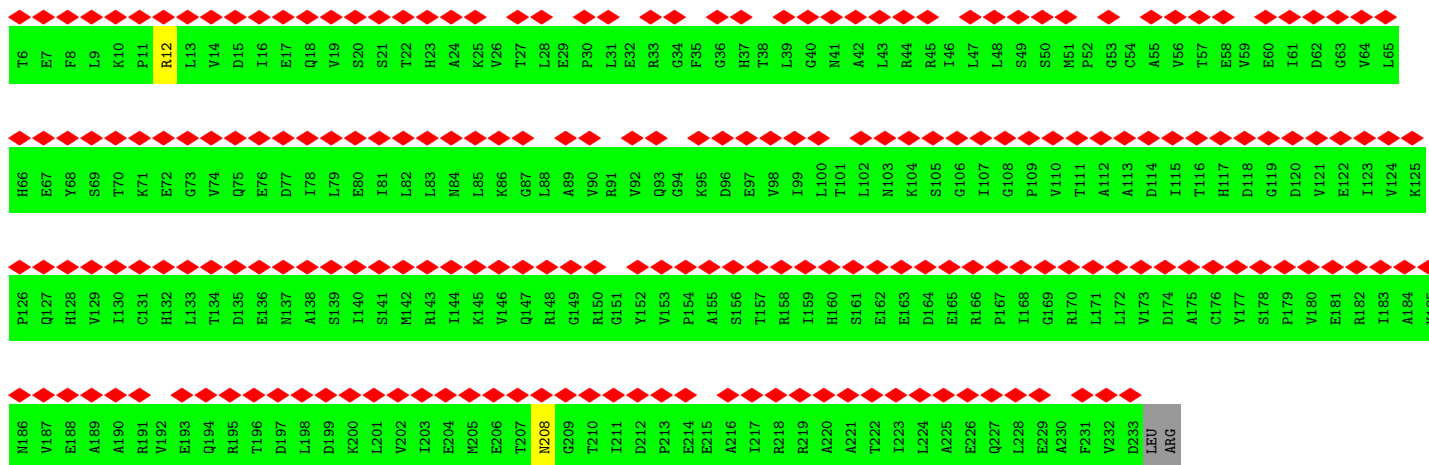


• Molecule 13: DNA-directed RNA polymerase subunit alpha

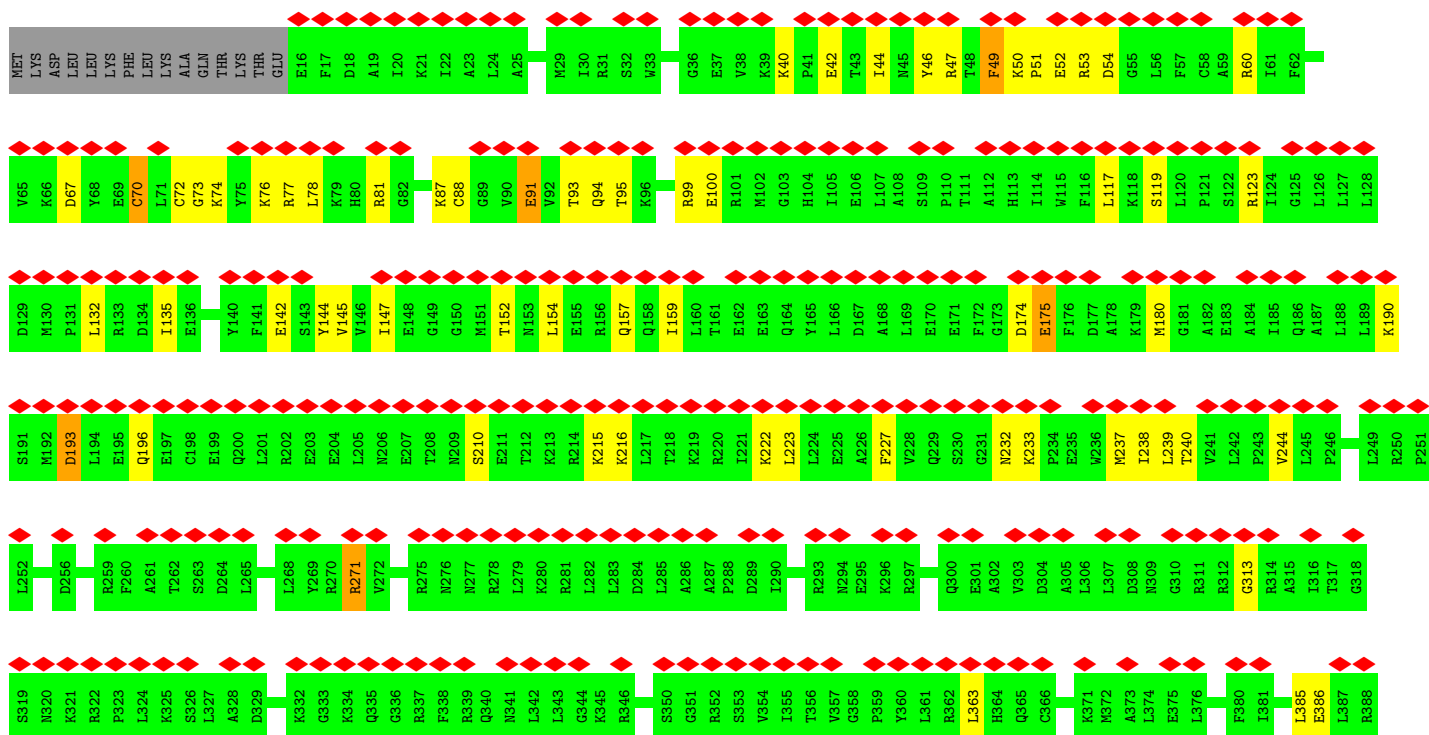




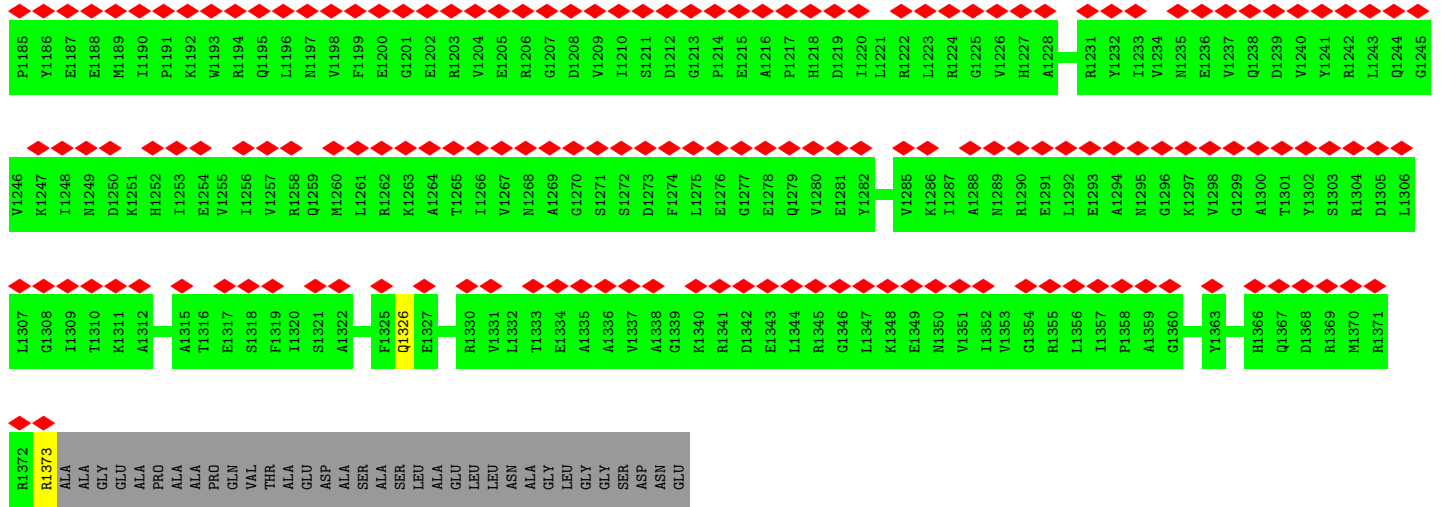
• Molecule 13: DNA-directed RNA polymerase subunit alpha



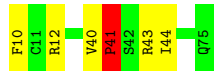
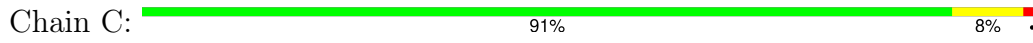
• Molecule 14: DNA-directed RNA polymerase subunit beta'



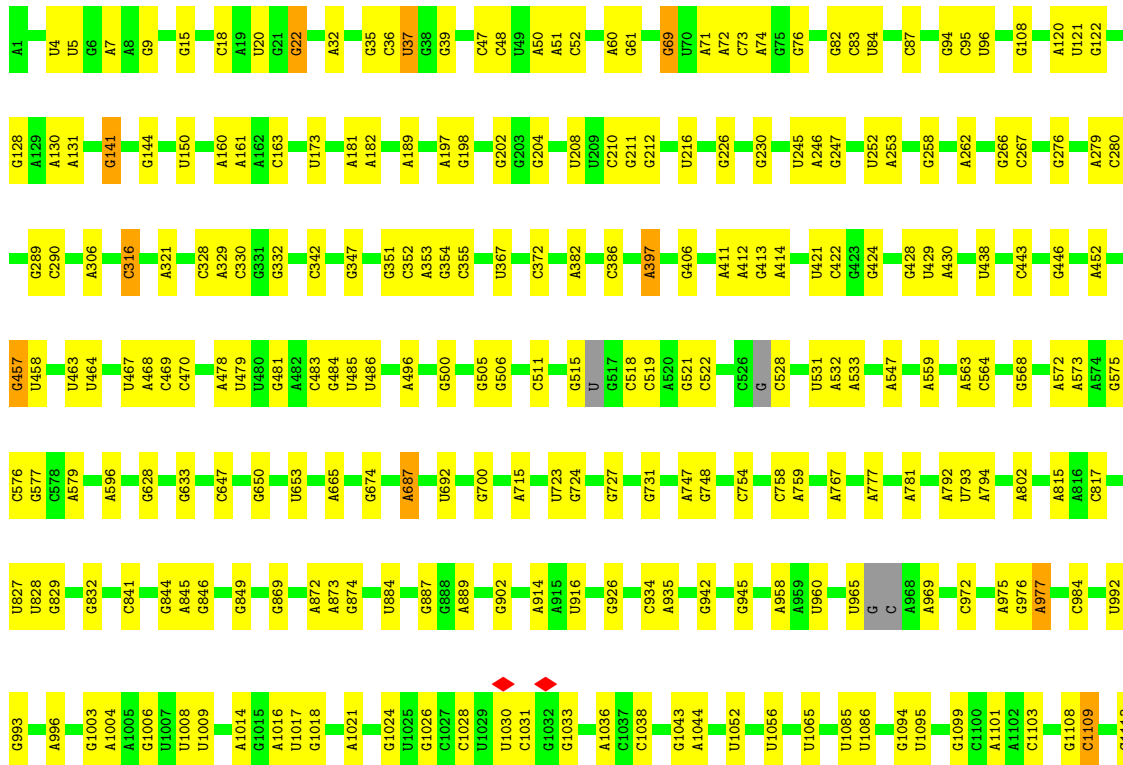
I1124	G1136	S1084	A1004	S884	P824	M762	Q702	I642	M580	N519	A459	G889
P1125	G1137	A1065	K1005	W885	W825	F763	T703	D642	M581	A520	D460	L390
Q1126	G1138	E1086	G1006	W886	W826	R764	E704	D643	M582	K521	F461	A391
GLU	SER	R1067	D1007	S887	E827	E765	T705	M644	V883	G522	D462	T392
GLY	E1088	T1088	G1008	C888	G828	G766	V706	V645	P884	E523	D463	I393
THR	E1089	E1069	E1009	D889	G829	L767	L707	I646	K885	G524	D464	I394
LYS	G1070	G1071	Q1010	T890	D830	M768	M708	P647	G886	M525	Q465	K395
ASP	V1011	V952	V1011	D891	W831	V769	R709	E648	L887	V526	M466	K398
ILE	A1012	K953	A1012	F892	R832	L770	D710	K649	P888	L527	M467	V401
THR	G1013	G893	G1013	C893	E833	Q771	G711	K650	V889	T528	V468	A406
	G1014	W894	G1014	W894	P834	V772	Q712	H651	G529	P530	H469	W409
	E1015	C895	E1015	C895	L835	F773	E713	I652	F531	K531	V470	D410
	S957	A896	S957	A896	R836	I774	E714	I653	E532	E532	L472	I411
	S958	H897	D837	H897	D837	H777	K715	I654	N593	N593	L473	I412
	K959	C898	R838	C898	R838	G778	Q716	S655	Q594	Q594	L474	L412
	L960	Y899	W839	Y899	W839	A779	V717	E556	A595	A595	E475	D413
	L961	G900	L840	G900	L840	R780	S718	A659	L596	L596	A476	I416
	N962	R901	G841	R901	G841	K781	F719	E660	Y537	Y537	Q477	R417
	V963	D902	R842	D902	R842	G782	M720	V661	R538	R538	L478	E418
	K964	L903	W843	L903	W843	L783	S721	A662	S539	S539	E479	E418
	S965	A904	T844	A904	T844	A784	I722	E663	G540	G540	A480	I416
	V966	R905	R845	R905	R845	D785	V723	I664	L541	L541	R481	V421
	V967	G906	E846	G906	E846	W786	M724	Q665	A542	A542	A482	L422
	N968	H907	D847	H907	D847	A787	A726	E666	S543	S543	L483	L423
	S969	I908	W848	I908	W848	L788	D727	F668	L544	L544	M484	M424
	S970	I909	L849	I909	L849	K789	S728	F669	H545	H545	M485	R425
	G971	N910	K850	N910	K850	T790	Q729	Q669	A546	A546	S486	A426
	K972	K911	P851	K911	P851	A791	A730	S670	R547	R547	T427	P427
	L973	G912	G852	G912	G852	M792	R731	G671	V548	V548	T428	T428
	V974	E913	T853	V974	T853	S793	G732	L672	K349	K349	L429	L429
	I975	A914	A854	I975	A854	L796	S733	A734	V550	V550	H430	H430
	S976	G916	D855	S976	D855	T797	A735	T674	R551	R551	L491	R431
	V977	N917	L856	V977	L856	R798	Q736	A675	I552	I552	S492	L432
	R978	I918	L857	R978	L857	R799	I737	G676	T553	T553	P493	G433
	N979	A919	W858	N979	W858	L800	R738	E677	Y555	Y555	A494	I434
	T980	A920	P859	T980	P859	V801	Q739	R678	E556	E556	Q435	Q435
	E981	Q921	R860	E981	R860	D802	L740	Y679	K557	K557	G496	A436
	L982	S922	H861	L982	H861	W803	A741	M680	D558	D558	P498	V440
	K983	I923	T862	K983	T862	A804	G742	K681	I499	I499	I441	L441
	L984	G924	L863	L984	L863	Q805	M743	V682	N560	N560	I442	I442
	I985	P926	L864	I985	L864	D806	R744	I683	G561	G561	E443	E443
	D986	G927	H865	D986	H865	L807	G745	D684	E562	E562	G444	G444
	E987	T928	E866	E987	E866	W808	L746	I685	L563	L563	K445	K445
	F988	Q929	Q867	F988	Q867	V809	M747	W686	V564	V564	A446	A446
	G989	Q929	W868	G989	W868	T810	A748	A687	A565	A565	I447	I447
	T991	L930	H868	T991	H868	E811	K749	A688	K566	K566	Q448	Q448
	K992	H932	D870	K992	D870	D812	P750	A689	T567	T567	L449	L449
	E993	R933	L871	E993	L871	D813	D751	M690	S568	S568	H450	H450
	S994	THR	L872	S994	L872	C814	G752	D691	Y631	Y631	P451	P451
	Y995	PHE	E874	Y995	E874	G815	S753	R692	L569	L569	L452	L452
	K996	ILE	W875	K996	W875	T816	I754	V693	G570	G570	V453	V453
	V997	GLY	S876	V997	S876	H817	I755	G694	Y511	Y511	C454	C454
	S998	GLY	W877	S998	W877	E818	E756	A696	G636	G636	A455	A455
	P999	ALA	V877	P999	V877	G819	I757	M697	A637	A637	Y457	Y457
	L1000	SER	D878	L1000	D878	I820	I758	M698	I578	I578	R458	R458
	A1001	ARG	W880	A1001	W880	M821	I760	D699	G575	G575	A456	A456
	L1003	ALA	W882	L1003	W882	T823	A761	N700	R576	R576	Y457	Y457
		ALA							A577	A577	R458	R458
		ALA							D516	D516	M458	M458
		GLU							C517	C517		
		S948							L579	L579		
	S949											
	I950											
	Q951											
	V952											
	K953											
	G954											
	E1015											
	S957											
	I958											
	K959											
	L960											
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	N968											
	S969											
	S970											
	G971											
	K972											
	L973											
	G913											
	V974											
	I975											
	S976											
	V977											
	R978											
	N979											
	T980											
	E981											
	L982											
	K983											
	L984											
	I985											
	D986											
	E987											
	F988											
	G989											
	T991											
	K992											
	E993											
	S994											
	Y995											
	K996											
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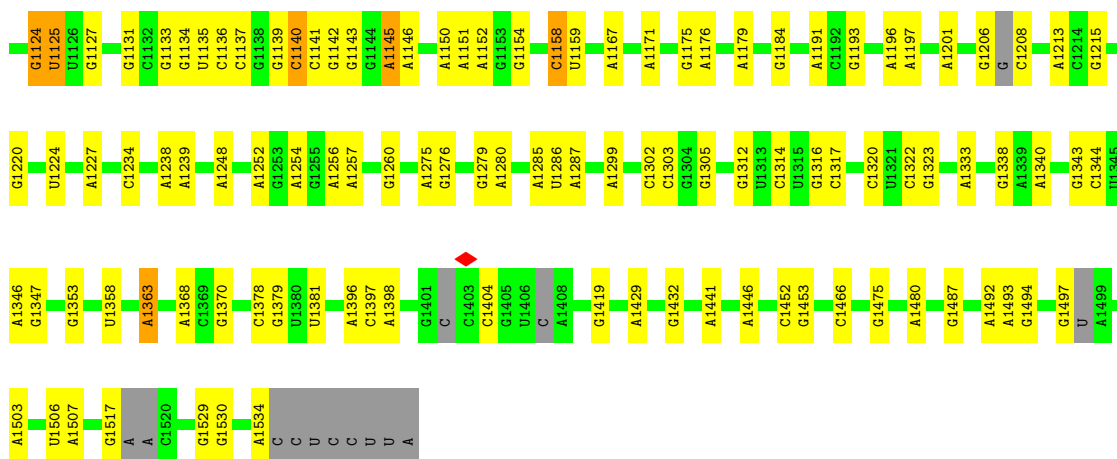


• Molecule 15: 30S ribosomal protein S18



• Molecule 16: 16S rRNA





• Molecule 17: 30S ribosomal protein S20

Chain E: 100%

There are no outlier residues recorded for this chain.

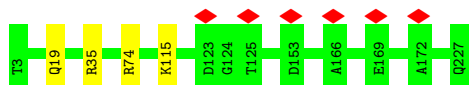
• Molecule 18: 30S ribosomal protein S21

Chain F: 97%



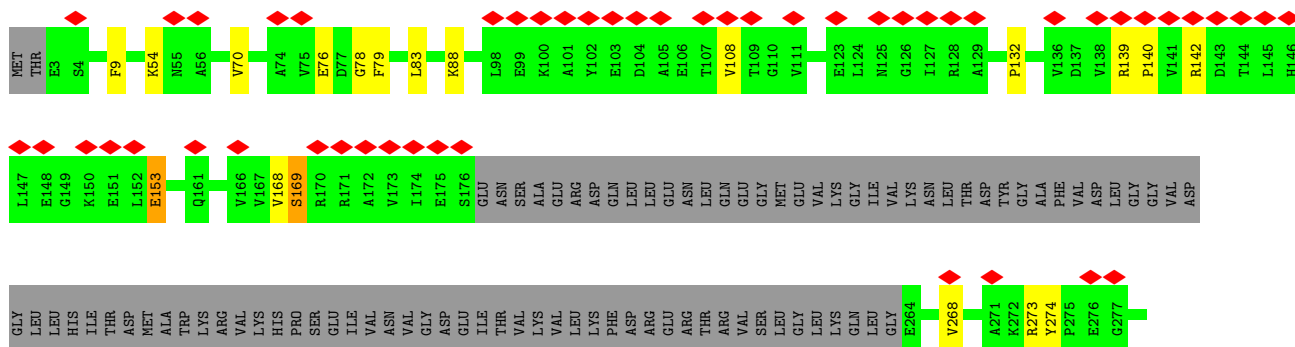
• Molecule 19: 30S ribosomal protein S2

Chain G: 98%



• Molecule 20: 30S ribosomal protein S1

Chain H: 15% 41% 54%





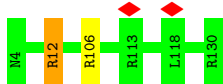


Chain N:  100%

There are no outlier residues recorded for this chain.

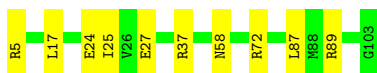
- Molecule 27: 30S ribosomal protein S9

Chain O:  98%



- Molecule 28: 30S ribosomal protein S10

Chain P:  90% 10%



- Molecule 29: 30S ribosomal protein S11

Chain Q:  100%



- Molecule 30: 30S ribosomal protein S12

Chain R:  94%



- Molecule 31: 30S ribosomal protein S14

Chain S:  96%



- Molecule 32: 30S ribosomal protein S15

Chain T:  100%

There are no outlier residues recorded for this chain.

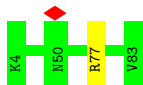
- Molecule 33: 30S ribosomal protein S16

Chain U:  99%



- Molecule 34: 30S ribosomal protein S17

Chain V: 99%



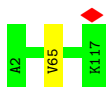
- Molecule 35: 30S ribosomal protein S19

Chain W: 100%

There are no outlier residues recorded for this chain.

- Molecule 36: 30S ribosomal protein S13

Chain X: 99%



- Molecule 37: 50S ribosomal protein L11

Chain Y: 99%



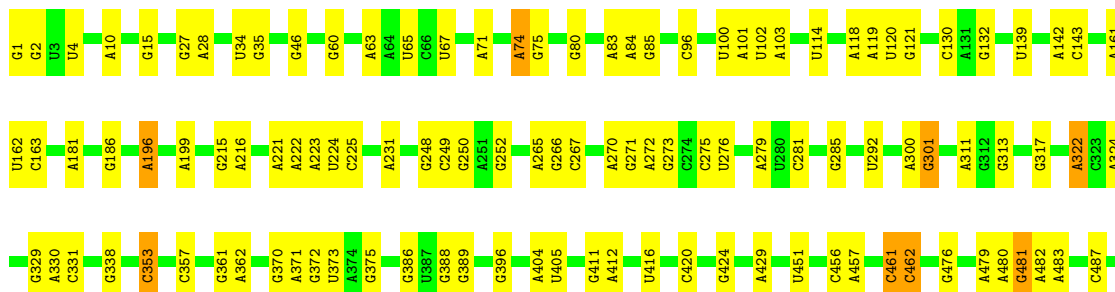
- Molecule 38: 50S ribosomal protein L7/L12

Chain Z: 100%

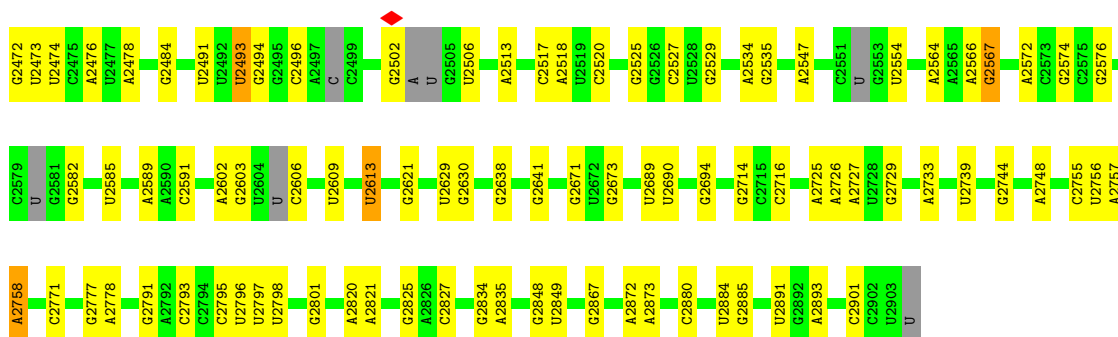
There are no outlier residues recorded for this chain.

- Molecule 39: 23S rRNA

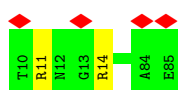
Chain a: 75% 22%



U2344	A2198	G2107	G1863	A1668	C1536	A1392	U1198	U1065	A899	G757	G491
G2345	U2203	A2108	U1864	G1674	G1537	A1395	A910	A1066	A910	A613	G498
C2346	G2204	U2109	G1869	A1713	A1549	A1395	A910	A1067	A910	A614	U499
C2350	A2211	G2110	A1871	U1714	U1554	U1406	G914	A1069	G914	A616	G500
G2357	A2212	G2112	A1872	G1715	C1557	G1407	C915	A1070	C915	A621	A501
G2361	A2225	U2113	C1881	A1722	C1564	U1409	U931	A1072	U931	A625	A505
G2372	C2226	G2115	A1889	C1726	C1566	C1414	A941	A1073	A941	A626	A508
U2373	U2229	A2117	C1893	U1729	A1566	G1416	G942	A1074	G942	A627	C509
G2374	G2230	U2118	C1906	C1730	A1569	C1417	C946	A1079	C946	A637	C510
G2375	G2238	G2120	G1907	A1738	C1573	G1418	U931	A1080	U931	A637	C517
C2380	G2239	U2122	G1910	U1738	C1574	A1419	G954	U1081	G954	A640	A522
G2383	U2243	G2124	U	A1764	C1577	A1427	G956	U1082	U	A645	C527
U2384	C2248	A2126	A1912	A1787	U1578	C1428	C961	U1083	C961	A646	A528
C2385	U2249	G2127	A1913	A1787	A1579	A1433	C961	U1084	C961	A646	A529
G2395	G2250	G2128	C1914	C1764	A1580	A1452	A973	U1085	A973	A654	C531
G2396	G	U2131	U	A1773	C1582	A1453	G974	A1086	G974	A655	A532
U2402	U2257	U2132	A1918	U1775	A1583	A1453	A983	U1087	A983	A661	G543
C2403	G2257	A2133	A1919	A1787	U1589	G1459	A984	A1088	A984	A664	U546
U2419	A2273	G2134	A1920	A1787	A1590	U1460	C992	U1101	C992	A664	A547
U2423	A2278	U2139	G1922	A1791	C1604	G1478	G993	U1107	G993	A668	G548
C2424	C2283	G2146	C1925	U1798	C1607	G1482	A996	U1111	A996	A676	G549
A2425	A2284	A2147	U1926	G1799	A1608	A1490	U999	A1111	U999	A685	G550
G2427	A2287	A2154	U1926	A1800	A1609	G1491	U1012	A1112	U1012	A685	G551
C2428	A2288	G2157	G1929	A1805	G1613	G1492	C1013	A1112	C1013	A686	C557
G2429	A2297	A2158	A1938	C1806	A1616	C1493	U1019	A1112	U1019	A687	U573
A2430	A2297	G2159	U	G1807	C1617	U1497	A1020	A1112	A1020	A687	A574
U2431	U2305	C2160	U1940	A1808	A	C1498	A1021	A1112	A1021	A687	A575
A2435	A2309	G2162	U1955	A1816	G1622	U1499	U1023	A1112	U1023	A687	A575
U2441	A2322	C2165	U1960	A1829	A1634	A1502	G1026	A1112	G1026	A687	A575
G2444	G2325	A2171	C1961	C1832	A1634	A1503	U1033	A1112	U1033	A687	A575
G2446	C2326	U2172	C	C1833	C1638	A1504	U1033	A1112	U1033	A687	A575
G2447	A2327	C2164	G1964	A1834	U1648	A1509	G1041	A1112	G1041	A687	A575
A2448	A2328	C2165	C1965	G	U1647	G1510	U1044	A1112	U1044	A687	A575
C2456	U2329	A2176	A1966	C1836	U1648	A1515	C1044	A1112	C1044	A687	A575
U	C2333	U2182	C1967	U1841	U1648	A1515	C1044	A1112	C1044	A687	A575
G2458	A2333	A2183	A1970	A1847	U1649	C1526	C1044	A1112	C1044	A687	A575
A2459	U2334	U2189	U1971	A1848	G1651	G1529	C1044	A1112	C1044	A687	A575
C2463	A2335	G2190	G1972	A1848	G1651	G1529	C1044	A1112	C1044	A687	A575
G2470	C2338	U2193	U1976	G1857	G1659	C1533	U1060	A1112	U1060	A687	A575
A2471	C2339	U2194	U1859	A1858	A1665	U1534	U1061	A1112	U1061	A687	A575
				U1859	A1665	A1535	G1062	A1112	G1062	A687	A575
							C1064	A1112	C1064	A687	A575



- Molecule 40: 50S ribosomal protein L27

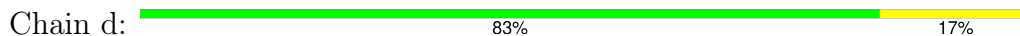


- Molecule 41: 50S ribosomal protein L28



There are no outlier residues recorded for this chain.

- Molecule 42: 5S rRNA



- Molecule 43: 50S ribosomal protein L29



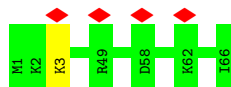
There are no outlier residues recorded for this chain.

- Molecule 44: 50S ribosomal protein L30



There are no outlier residues recorded for this chain.

- Molecule 45: 50S ribosomal protein L31



- Molecule 46: 50S ribosomal protein L2

Chain h: 100%



- Molecule 47: 50S ribosomal protein L32

Chain i: 96%



- Molecule 48: 50S ribosomal protein L3

Chain j: 100%



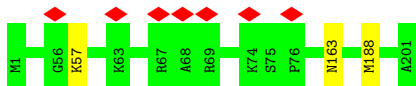
- Molecule 49: 50S ribosomal protein L33

Chain k: 100%

There are no outlier residues recorded for this chain.

- Molecule 50: 50S ribosomal protein L4

Chain l: 99%



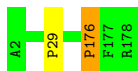
- Molecule 51: 50S ribosomal protein L34

Chain m: 93%



- Molecule 52: 50S ribosomal protein L5

Chain n: 99%



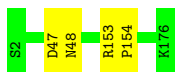
- Molecule 53: 50S ribosomal protein L35

Chain o: 97%



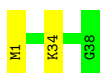
- Molecule 54: 50S ribosomal protein L6

Chain p: 98%



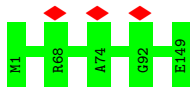
- Molecule 55: 50S ribosomal protein L36

Chain q: 95% 5%



- Molecule 56: 50S ribosomal protein L9

Chain r: 100%



- Molecule 57: 50S ribosomal protein L13

Chain s: 100%

There are no outlier residues recorded for this chain.

- Molecule 58: 50S ribosomal protein L14

Chain t: 100%

There are no outlier residues recorded for this chain.

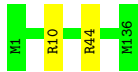
- Molecule 59: 50S ribosomal protein L15

Chain u: 100%

There are no outlier residues recorded for this chain.

- Molecule 60: 50S ribosomal protein L16

Chain v: 99%



- Molecule 61: 50S ribosomal protein L17

Chain w:  99%



- Molecule 62: 50S ribosomal protein L18

Chain x:  100%

There are no outlier residues recorded for this chain.

- Molecule 63: 50S ribosomal protein L19

Chain y:  99%



- Molecule 64: 50S ribosomal protein L20

Chain z:  99%



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	24959	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 ( $e^-/\text{\AA}^2$ )	45	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.093	Depositor
Minimum map value	-0.039	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.007	Depositor
Map size (Å)	548.05, 548.05, 548.05	wwPDB
Map dimensions	500, 500, 500	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.0961, 1.0961, 1.0961	Depositor



## 5 Model quality i

### 5.1 Standard geometry i

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	0	0.51	0/829	0.70	0/1107
2	1	0.48	0/864	0.62	0/1156
3	2	0.48	0/752	0.63	0/1005
4	3	0.46	0/796	0.65	0/1062
5	4	0.47	0/766	0.60	0/1025
6	5	1.13	6/528 (1.1%)	0.97	1/810 (0.1%)
7	6	1.11	4/603 (0.7%)	0.97	0/926
8	7	0.60	2/681 (0.3%)	0.92	3/1058 (0.3%)
9	9	0.34	0/1131	0.63	1/1524 (0.1%)
10	A	0.55	0/1810	1.28	11/2821 (0.4%)
10	B	0.55	0/1810	1.28	11/2821 (0.4%)
11	AA	0.58	2/10591 (0.0%)	0.75	15/14289 (0.1%)
12	AB	0.43	0/808	0.59	0/1088
13	AC	0.48	0/1808	0.62	1/2450 (0.0%)
13	AD	0.39	0/1789	0.56	0/2425
14	AE	0.50	3/10545 (0.0%)	0.66	4/14236 (0.0%)
15	C	0.88	3/553 (0.5%)	0.86	2/743 (0.3%)
16	D	0.69	9/36610 (0.0%)	1.21	107/57091 (0.2%)
17	E	0.50	0/675	0.64	0/895
18	F	0.53	0/597	0.63	0/792
19	G	0.47	0/1791	0.61	0/2413
20	H	0.57	1/1746 (0.1%)	1.05	13/2382 (0.5%)
21	I	0.44	0/1663	0.71	0/2241
22	J	0.48	0/1665	0.74	0/2227
23	K	0.52	0/1165	0.67	0/1568
24	L	0.54	0/867	0.70	0/1171
25	M	0.51	0/1195	0.63	0/1602
26	N	0.50	0/989	0.68	0/1326
27	O	0.59	0/1034	0.78	0/1375
28	P	0.44	0/800	0.77	0/1082
29	Q	0.47	0/893	0.65	0/1205
30	R	0.72	2/952 (0.2%)	0.80	1/1274 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
31	S	0.48	0/817	0.69	0/1088
32	T	0.47	0/722	0.62	0/964
33	U	0.58	2/659 (0.3%)	0.67	0/884
34	V	0.50	0/657	0.64	0/881
35	W	0.46	0/680	0.62	0/915
36	X	0.43	0/909	0.59	0/1215
37	Y	0.37	0/1046	0.59	2/1410 (0.1%)
38	Z	0.28	0/227	0.47	0/304
39	a	0.69	12/69247 (0.0%)	1.19	226/107985 (0.2%)
40	b	0.49	0/589	0.59	0/779
41	c	0.47	0/635	0.67	0/848
42	d	0.67	0/2872	1.10	2/4478 (0.0%)
43	e	0.44	0/502	0.59	0/667
44	f	0.43	0/452	0.66	0/605
45	g	0.44	0/531	0.62	0/709
46	h	0.61	2/2121 (0.1%)	0.76	4/2852 (0.1%)
47	i	0.65	1/450 (0.2%)	0.86	2/599 (0.3%)
48	j	0.50	0/1586	0.67	0/2134
49	k	0.51	0/433	0.60	0/576
50	l	0.47	0/1571	0.65	1/2113 (0.0%)
51	m	0.55	0/380	0.98	0/498
52	n	0.77	4/1434 (0.3%)	0.91	7/1926 (0.4%)
53	o	0.47	0/513	0.73	0/676
54	p	0.60	3/1333 (0.2%)	0.78	4/1805 (0.2%)
55	q	0.77	1/303 (0.3%)	0.84	1/397 (0.3%)
56	r	0.43	0/1122	0.60	0/1515
57	s	0.50	0/1152	0.64	0/1551
58	t	0.51	0/955	0.69	0/1279
59	u	0.50	0/1062	0.71	0/1413
60	v	0.53	0/1093	0.68	0/1460
61	w	0.51	0/964	0.69	0/1289
62	x	0.46	0/902	0.61	0/1209
63	y	0.54	0/929	0.65	0/1242
64	z	0.53	0/960	0.80	2/1278 (0.2%)
All	All	0.63	57/189114 (0.0%)	1.04	421/278734 (0.2%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
9	9	0	3

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Mol	Chain	#Chirality outliers	#Planarity outliers
11	AA	0	10
14	AE	0	5
20	H	0	1
27	O	0	1
30	R	0	1
36	X	0	1
40	b	0	1
52	n	0	1
53	o	0	1
54	p	0	1
All	All	0	26

The worst 5 of 57 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	C	41	PRO	N-CA	14.00	1.71	1.47
46	h	107	PRO	CG-CD	-14.00	1.04	1.50
30	R	42	PRO	N-CA	13.72	1.70	1.47
52	n	176	PRO	CG-CD	-13.50	1.06	1.50
52	n	29	PRO	CG-CD	-11.86	1.11	1.50

The worst 5 of 421 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	D	37	U	C5-C4-O4	34.28	146.47	125.90
39	a	1141	U	C5-C4-O4	33.53	146.02	125.90
16	D	1358	U	C5-C4-O4	31.93	145.06	125.90
16	D	37	U	N3-C4-O4	-31.78	97.16	119.40
39	a	1019	U	C5-C4-O4	31.05	144.53	125.90

There are no chirality outliers.

5 of 26 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
9	9	107	GLU	Peptide
9	9	79	PRO	Peptide
9	9	92	ALA	Peptide
11	AA	205	PRO	Peptide
11	AA	594	VAL	Peptide

## 5.2 Too-close contacts [i](#)

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

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	101/103 (98%)	89 (88%)	12 (12%)	0	100	100
2	1	108/110 (98%)	99 (92%)	9 (8%)	0	100	100
3	2	92/94 (98%)	87 (95%)	5 (5%)	0	100	100
4	3	101/103 (98%)	93 (92%)	7 (7%)	1 (1%)	13	44
5	4	92/94 (98%)	82 (89%)	10 (11%)	0	100	100
9	9	146/148 (99%)	112 (77%)	33 (23%)	1 (1%)	19	51
11	AA	1318/1342 (98%)	1149 (87%)	137 (10%)	32 (2%)	5	30
12	AB	94/181 (52%)	88 (94%)	6 (6%)	0	100	100
13	AC	228/230 (99%)	215 (94%)	11 (5%)	2 (1%)	14	47
13	AD	226/230 (98%)	212 (94%)	14 (6%)	0	100	100
14	AE	1329/1407 (94%)	1199 (90%)	121 (9%)	9 (1%)	19	51
15	C	64/66 (97%)	59 (92%)	4 (6%)	1 (2%)	8	37
17	E	84/86 (98%)	82 (98%)	2 (2%)	0	100	100
18	F	68/70 (97%)	68 (100%)	0	0	100	100
19	G	223/225 (99%)	201 (90%)	22 (10%)	0	100	100
20	H	255/557 (46%)	187 (73%)	56 (22%)	12 (5%)	2	19
21	I	206/208 (99%)	197 (96%)	8 (4%)	1 (0%)	25	57
22	J	203/205 (99%)	198 (98%)	5 (2%)	0	100	100
23	K	154/156 (99%)	140 (91%)	13 (8%)	1 (1%)	22	54
24	L	102/104 (98%)	95 (93%)	7 (7%)	0	100	100
25	M	149/151 (99%)	142 (95%)	7 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
26	N	127/129 (98%)	110 (87%)	17 (13%)	0	100	100
27	O	125/127 (98%)	111 (89%)	14 (11%)	0	100	100
28	P	97/99 (98%)	88 (91%)	8 (8%)	1 (1%)	13	44
29	Q	115/117 (98%)	104 (90%)	11 (10%)	0	100	100
30	R	117/124 (94%)	105 (90%)	11 (9%)	1 (1%)	14	47
31	S	98/100 (98%)	95 (97%)	2 (2%)	1 (1%)	13	44
32	T	86/88 (98%)	82 (95%)	4 (5%)	0	100	100
33	U	80/82 (98%)	74 (92%)	6 (8%)	0	100	100
34	V	78/80 (98%)	67 (86%)	11 (14%)	0	100	100
35	W	81/83 (98%)	75 (93%)	6 (7%)	0	100	100
36	X	114/116 (98%)	100 (88%)	14 (12%)	0	100	100
37	Y	139/141 (99%)	121 (87%)	18 (13%)	0	100	100
38	Z	28/30 (93%)	27 (96%)	1 (4%)	0	100	100
40	b	74/76 (97%)	67 (90%)	7 (10%)	0	100	100
41	c	75/77 (97%)	69 (92%)	6 (8%)	0	100	100
43	e	60/62 (97%)	58 (97%)	2 (3%)	0	100	100
44	f	56/58 (97%)	51 (91%)	5 (9%)	0	100	100
45	g	64/66 (97%)	58 (91%)	6 (9%)	0	100	100
46	h	269/271 (99%)	241 (90%)	28 (10%)	0	100	100
47	i	54/56 (96%)	49 (91%)	5 (9%)	0	100	100
48	j	207/209 (99%)	188 (91%)	19 (9%)	0	100	100
49	k	50/52 (96%)	48 (96%)	2 (4%)	0	100	100
50	l	199/201 (99%)	184 (92%)	15 (8%)	0	100	100
51	m	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
52	n	175/177 (99%)	161 (92%)	14 (8%)	0	100	100
53	o	62/64 (97%)	54 (87%)	7 (11%)	1 (2%)	8	37
54	p	173/175 (99%)	156 (90%)	16 (9%)	1 (1%)	22	54
55	q	36/38 (95%)	33 (92%)	3 (8%)	0	100	100
56	r	147/149 (99%)	136 (92%)	11 (8%)	0	100	100
57	s	140/142 (99%)	127 (91%)	13 (9%)	0	100	100
58	t	121/123 (98%)	108 (89%)	13 (11%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
59	u	142/144 (99%)	132 (93%)	10 (7%)	0	100	100
60	v	134/136 (98%)	121 (90%)	13 (10%)	0	100	100
61	w	117/119 (98%)	109 (93%)	8 (7%)	0	100	100
62	x	114/116 (98%)	110 (96%)	4 (4%)	0	100	100
63	y	112/114 (98%)	104 (93%)	8 (7%)	0	100	100
64	z	115/117 (98%)	107 (93%)	8 (7%)	0	100	100
All	All	9368/9974 (94%)	8467 (90%)	836 (9%)	65 (1%)	21	51

5 of 65 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
11	AA	596	ASP
11	AA	853	ASP
11	AA	859	GLU
11	AA	862	LEU
11	AA	873	ILE

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	0	84/84 (100%)	84 (100%)	0	100	100
2	1	93/93 (100%)	93 (100%)	0	100	100
3	2	81/81 (100%)	81 (100%)	0	100	100
4	3	84/84 (100%)	84 (100%)	0	100	100
5	4	78/78 (100%)	78 (100%)	0	100	100
9	9	112/112 (100%)	111 (99%)	1 (1%)	75	84
11	AA	1140/1157 (98%)	1039 (91%)	101 (9%)	8	31
12	AB	86/158 (54%)	84 (98%)	2 (2%)	45	64
13	AC	198/198 (100%)	182 (92%)	16 (8%)	9	34
13	AD	196/198 (99%)	194 (99%)	2 (1%)	73	82

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
14	AE	1120/1168 (96%)	1051 (94%)	69 (6%)	15	42
15	C	57/57 (100%)	53 (93%)	4 (7%)	12	39
17	E	65/65 (100%)	65 (100%)	0	100	100
18	F	60/60 (100%)	58 (97%)	2 (3%)	33	57
19	G	187/187 (100%)	183 (98%)	4 (2%)	48	67
20	H	137/461 (30%)	125 (91%)	12 (9%)	8	32
21	I	171/171 (100%)	164 (96%)	7 (4%)	26	52
22	J	172/172 (100%)	163 (95%)	9 (5%)	19	46
23	K	119/119 (100%)	118 (99%)	1 (1%)	79	85
24	L	91/91 (100%)	91 (100%)	0	100	100
25	M	124/124 (100%)	124 (100%)	0	100	100
26	N	104/104 (100%)	104 (100%)	0	100	100
27	O	105/105 (100%)	103 (98%)	2 (2%)	52	70
28	P	86/86 (100%)	77 (90%)	9 (10%)	5	25
29	Q	90/90 (100%)	90 (100%)	0	100	100
30	R	101/104 (97%)	101 (100%)	0	100	100
31	S	83/83 (100%)	80 (96%)	3 (4%)	30	55
32	T	76/76 (100%)	76 (100%)	0	100	100
33	U	65/65 (100%)	65 (100%)	0	100	100
34	V	74/74 (100%)	73 (99%)	1 (1%)	62	76
35	W	72/72 (100%)	72 (100%)	0	100	100
36	X	94/94 (100%)	94 (100%)	0	100	100
37	Y	109/109 (100%)	108 (99%)	1 (1%)	75	84
38	Z	26/26 (100%)	26 (100%)	0	100	100
40	b	58/58 (100%)	57 (98%)	1 (2%)	56	73
41	c	67/67 (100%)	67 (100%)	0	100	100
43	e	54/54 (100%)	54 (100%)	0	100	100
44	f	48/48 (100%)	48 (100%)	0	100	100
45	g	59/59 (100%)	58 (98%)	1 (2%)	56	73
46	h	216/216 (100%)	216 (100%)	0	100	100
47	i	47/47 (100%)	46 (98%)	1 (2%)	48	67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
48	j	164/164 (100%)	163 (99%)	1 (1%)	84	90
49	k	47/47 (100%)	47 (100%)	0	100	100
50	l	165/165 (100%)	163 (99%)	2 (1%)	67	79
51	m	38/38 (100%)	35 (92%)	3 (8%)	10	36
52	n	148/148 (100%)	148 (100%)	0	100	100
53	o	51/51 (100%)	51 (100%)	0	100	100
54	p	136/136 (100%)	136 (100%)	0	100	100
55	q	34/34 (100%)	34 (100%)	0	100	100
56	r	114/114 (100%)	114 (100%)	0	100	100
57	s	116/116 (100%)	116 (100%)	0	100	100
58	t	104/104 (100%)	104 (100%)	0	100	100
59	u	103/103 (100%)	103 (100%)	0	100	100
60	v	109/109 (100%)	107 (98%)	2 (2%)	54	71
61	w	99/99 (100%)	98 (99%)	1 (1%)	73	82
62	x	86/86 (100%)	86 (100%)	0	100	100
63	y	99/99 (100%)	98 (99%)	1 (1%)	73	82
64	z	89/89 (100%)	89 (100%)	0	100	100
All	All	7791/8257 (94%)	7532 (97%)	259 (3%)	35	57

5 of 259 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
27	O	106	ARG
28	P	72	ARG
11	AA	1252	SER
11	AA	1151	LEU
31	S	98	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 33 such sidechains are listed below:

Mol	Chain	Res	Type
56	r	18	GLN
60	v	13	HIS
64	z	20	GLN
41	c	34	HIS

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Mol	Chain	Res	Type
41	c	6	GLN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
10	A	75/76 (98%)	30 (40%)	8 (10%)
10	B	75/76 (98%)	30 (40%)	8 (10%)
16	D	1514/1542 (98%)	304 (20%)	10 (0%)
39	a	2859/2904 (98%)	582 (20%)	0
42	d	119/120 (99%)	19 (15%)	0
8	7	28/29 (96%)	18 (64%)	3 (10%)
All	All	4670/4747 (98%)	983 (21%)	29 (0%)

5 of 983 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
8	7	-6	G
8	7	-5	U
8	7	-4	U
8	7	-2	U
8	7	-1	U

5 of 29 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
10	B	22	G
16	D	1492	A
10	B	57	A
16	D	992	U
10	B	48	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 oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 3 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.

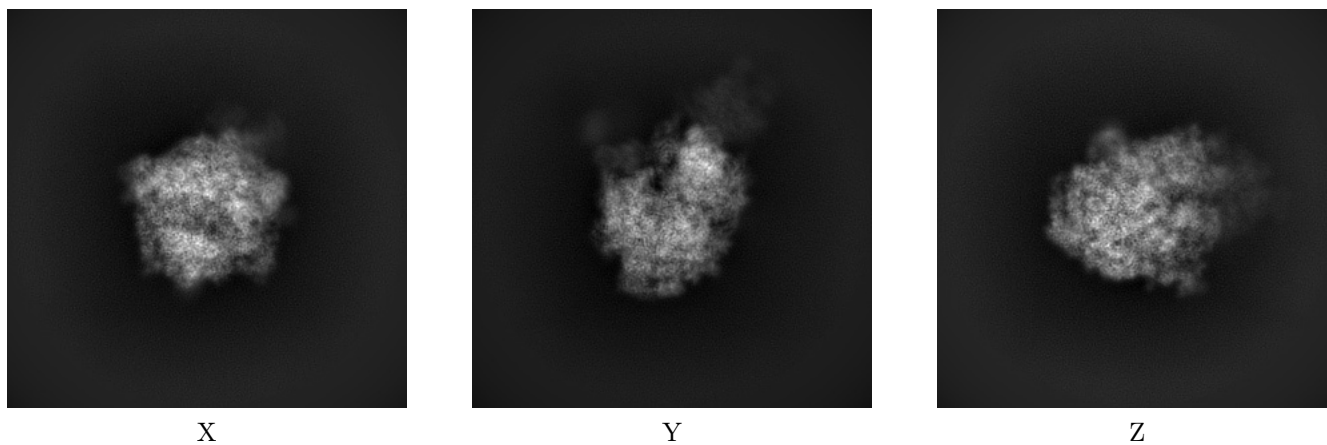
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-21386. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

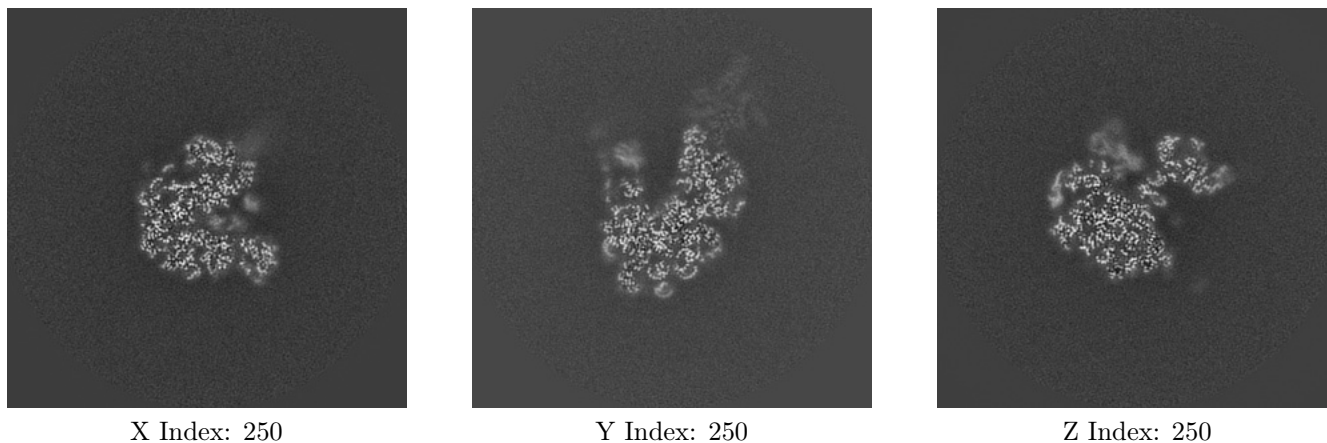
#### 6.1.1 Primary map



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

### 6.2 Central slices [i](#)

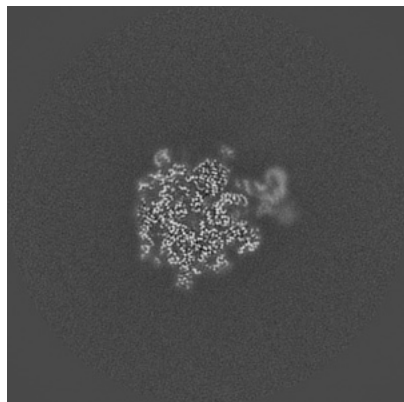
#### 6.2.1 Primary map



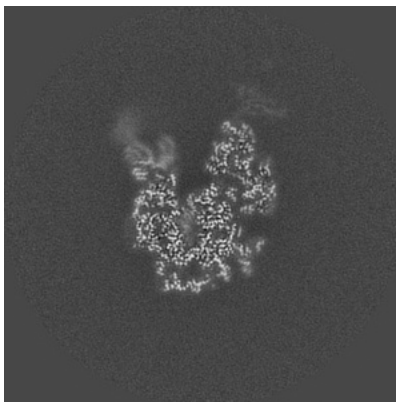
The images above show central slices of the map in three orthogonal directions.

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

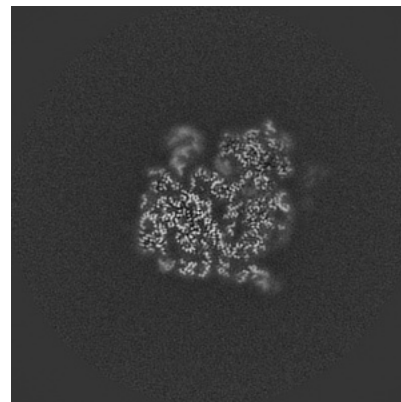
### 6.3.1 Primary map



X Index: 215



Y Index: 233

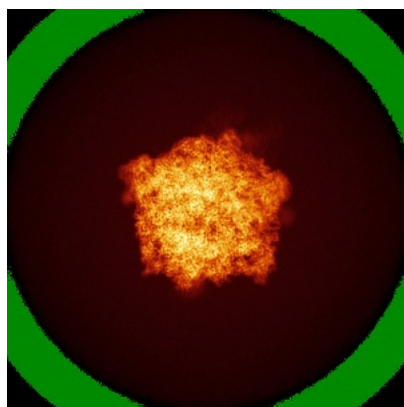


Z Index: 271

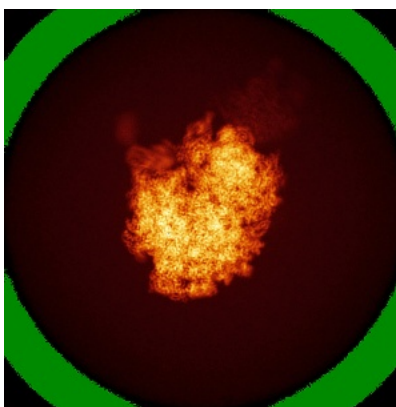
The images above show the largest variance slices of the map in three orthogonal directions.

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

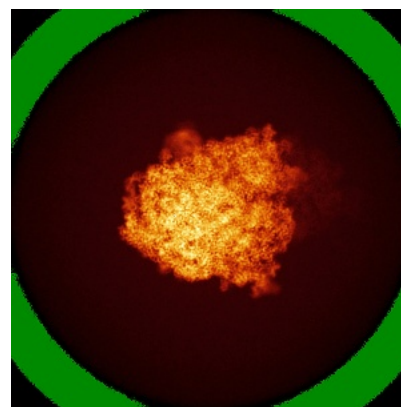
### 6.4.1 Primary map



X



Y

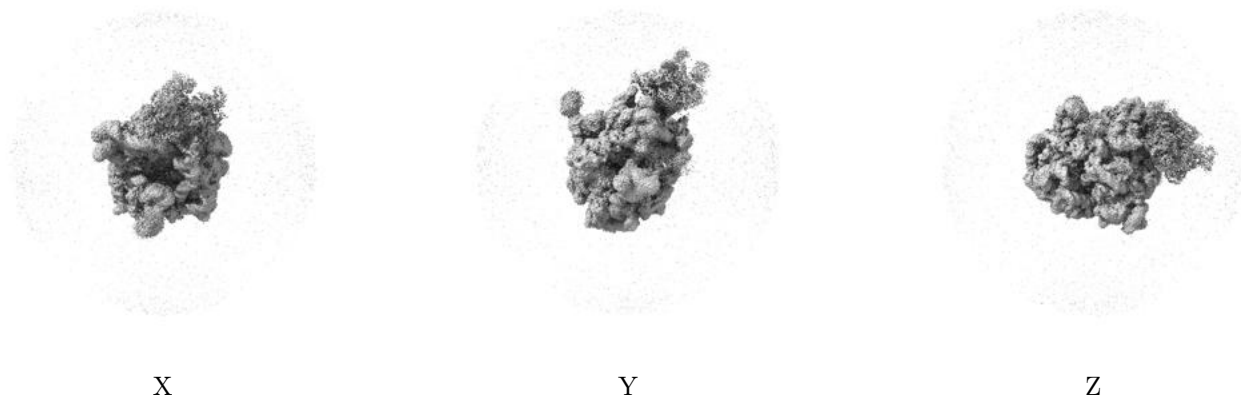


Z

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

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

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.007. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

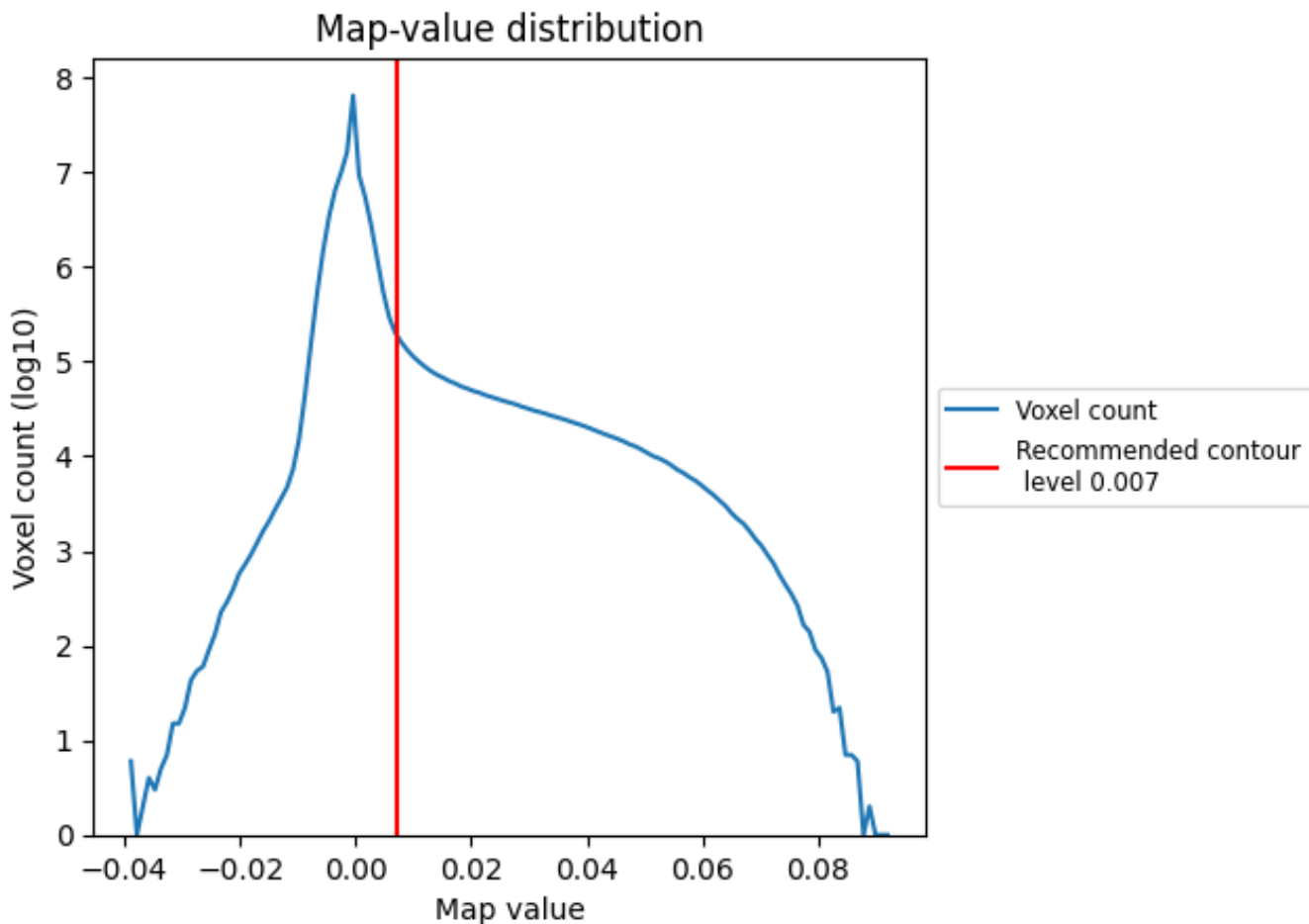
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

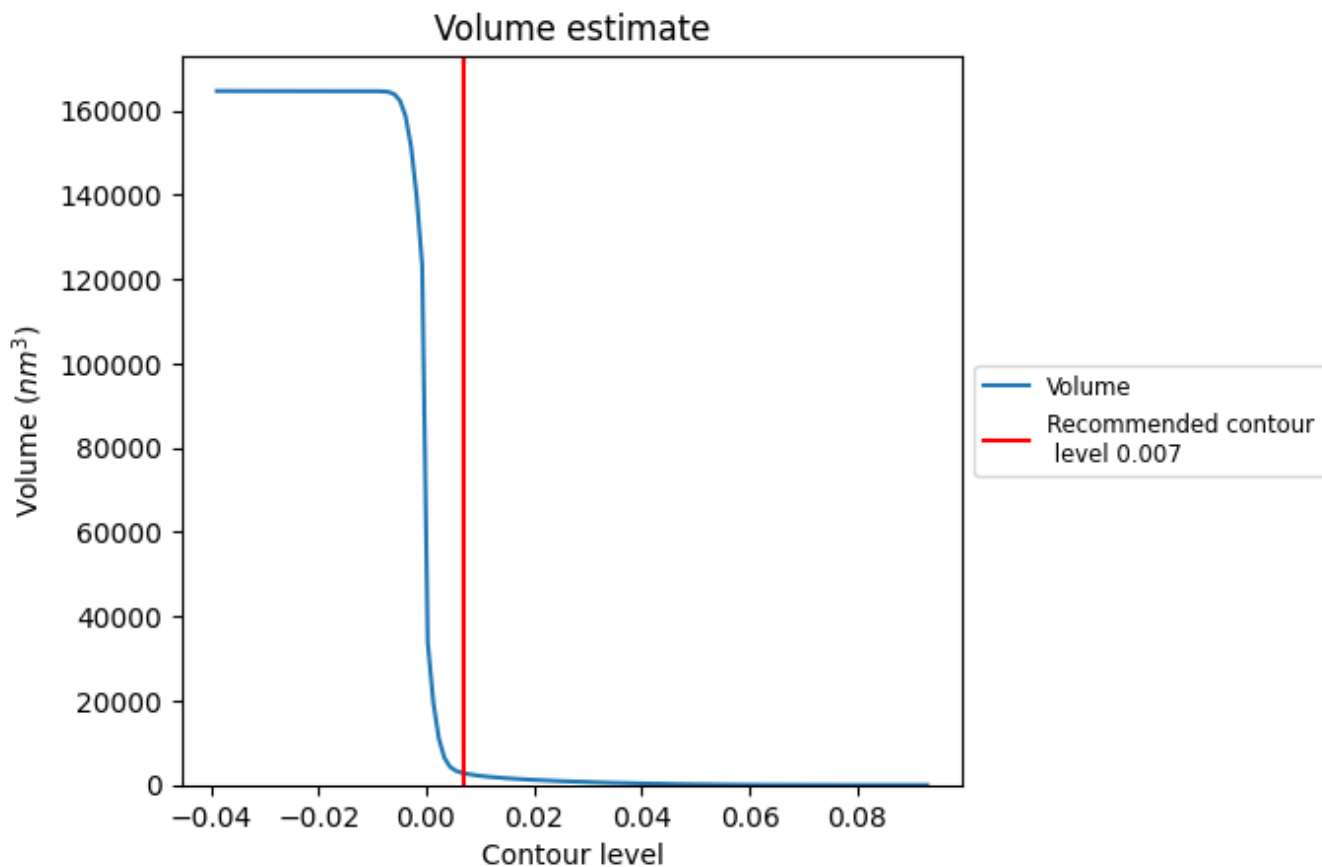
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

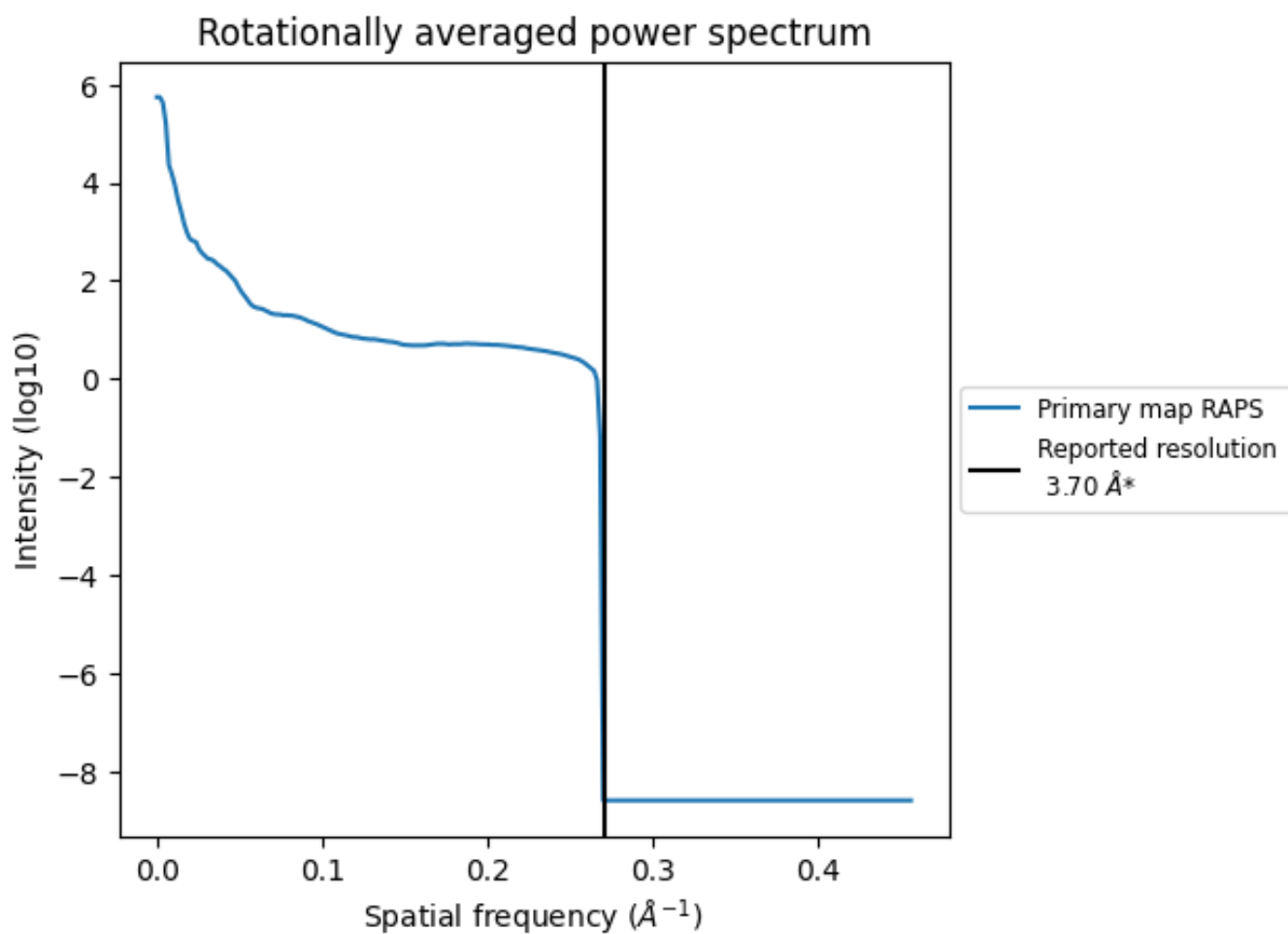
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2788  $\text{nm}^3$ ; this corresponds to an approximate mass of 2518 kDa.

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

### 7.3 Rotationally averaged power spectrum i



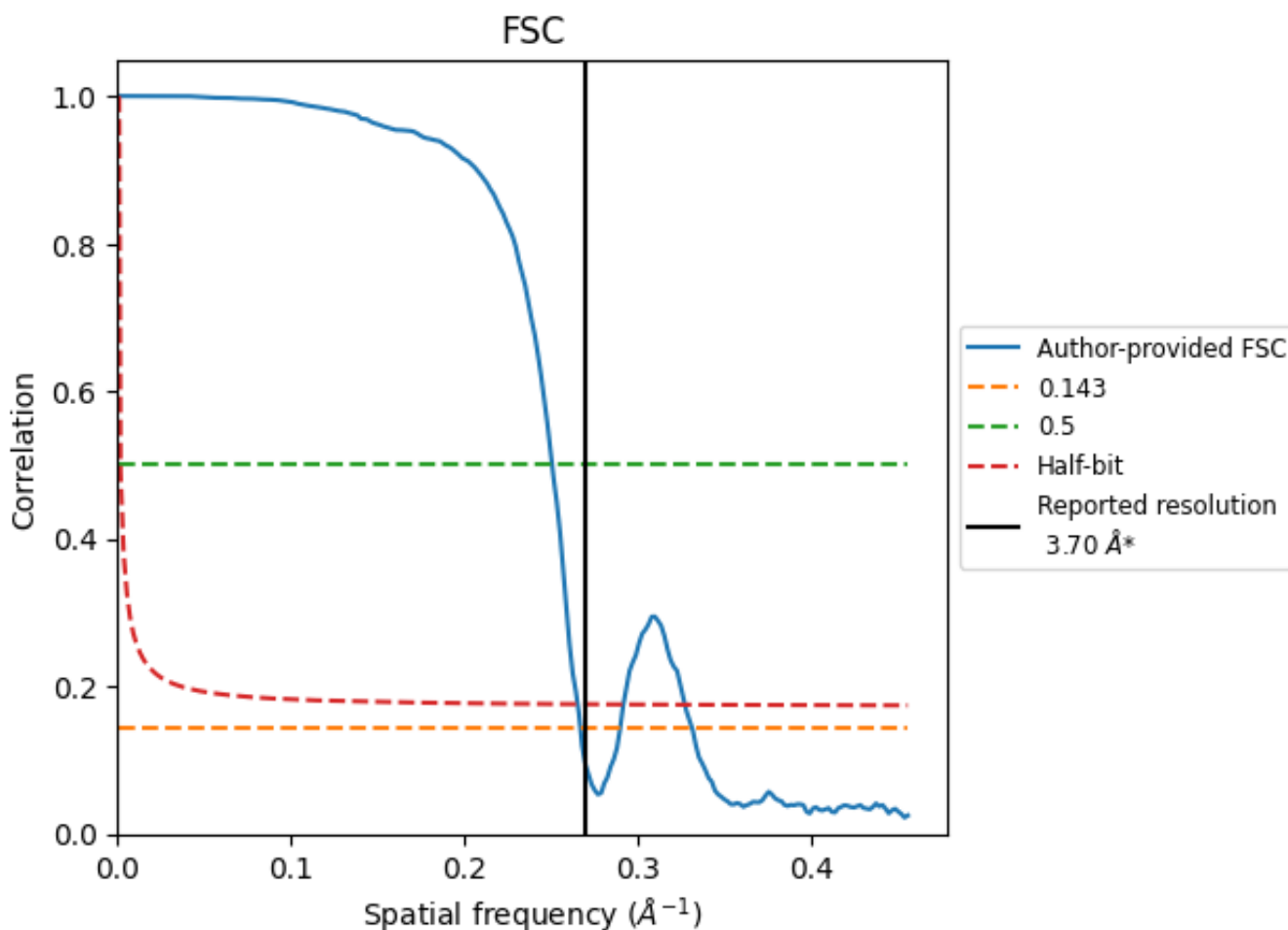
\*Reported resolution corresponds to spatial frequency of 0.270 Å<sup>-1</sup>



## 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 0.270 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

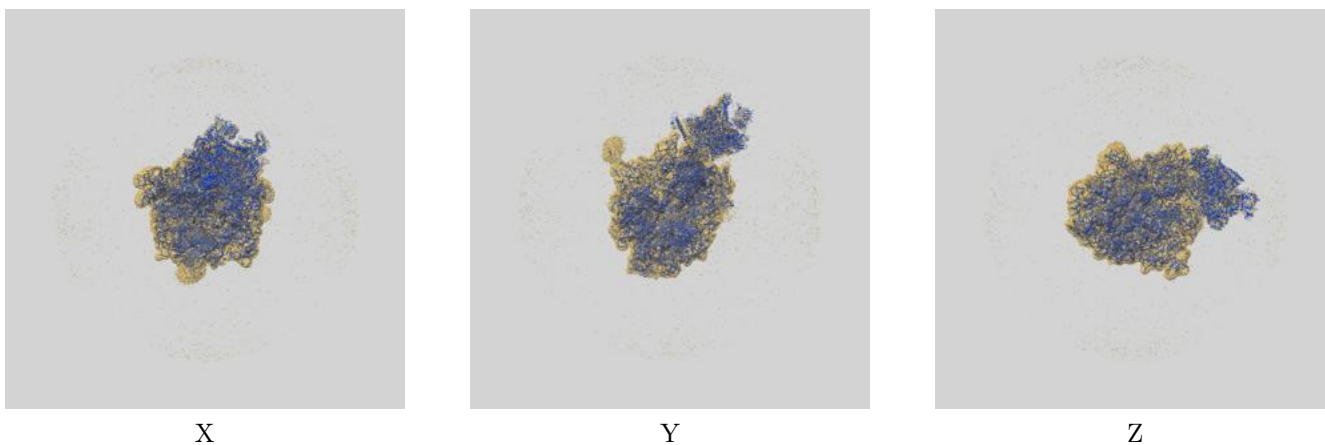
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	3.74	3.99	3.77
Unmasked-calculated*	-	-	-

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

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

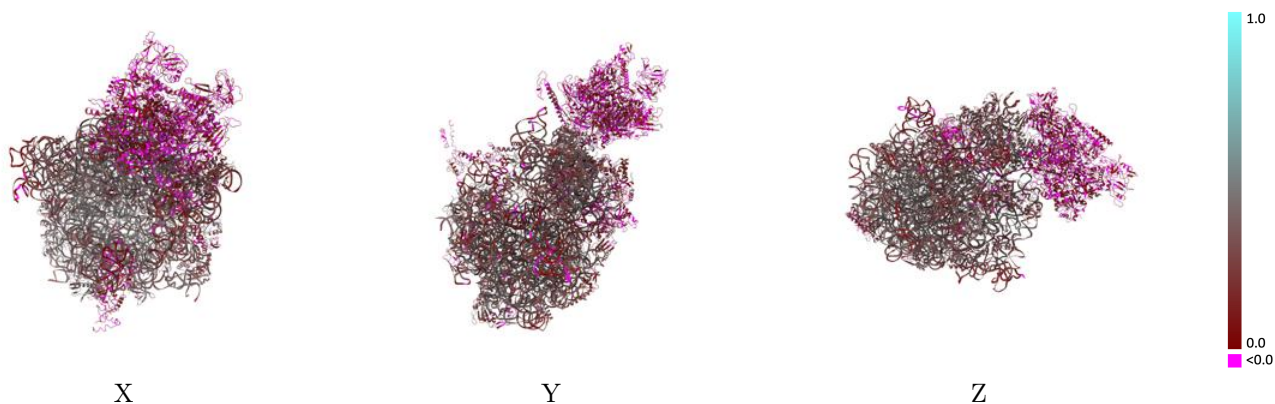
This section contains information regarding the fit between EMDB map EMD-21386 and PDB model 6VU3. Per-residue inclusion information can be found in section 3 on page 16.

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



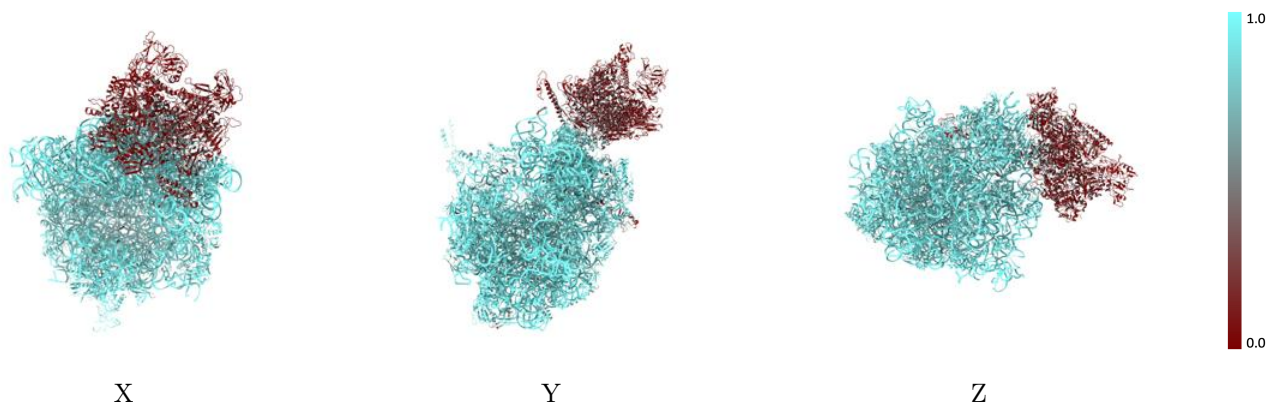
The images above show the 3D surface view of the map at the recommended contour level 0.007 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



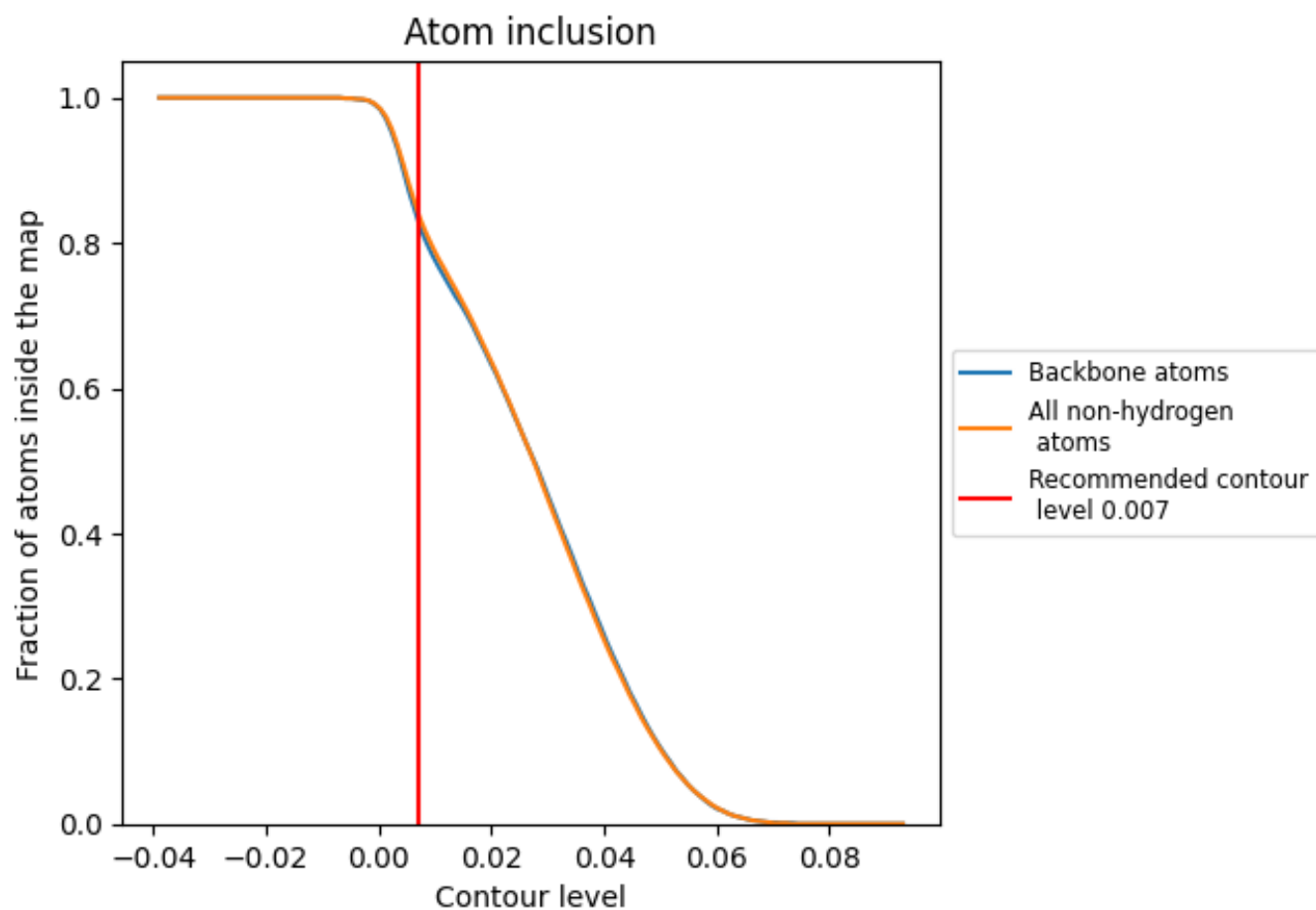
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.007).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 84% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

































































The table lists the average atom inclusion at the recommended contour level (0.007) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8420	 0.2760
0	 0.8630	 0.1500
1	 0.9110	 0.3400
2	 0.9110	 0.2660
3	 0.6280	 0.0310
4	 0.9420	 0.3370
5	 0.2100	 0.0920
6	 0.3360	 0.0790
7	 0.6430	 0.0640
9	 0.9420	 0.1200
A	 0.9890	 0.2070
AA	 0.2260	 0.0620
AB	 0.1630	 0.1010
AC	 0.2250	 0.0630
AD	 0.1360	 0.0640
AE	 0.1910	 0.0790
B	 0.9170	 0.1670
C	 0.8680	 0.1580
D	 0.9890	 0.3430
E	 0.9480	 0.3300
F	 0.8230	 0.0680
G	 0.8700	 0.1600
H	 0.6290	 0.0360
I	 0.9350	 0.3890
J	 0.9180	 0.2940
K	 0.8750	 0.1820
L	 0.9190	 0.2480
M	 0.9170	 0.2680
N	 0.8870	 0.2180
O	 0.9100	 0.1900
P	 0.9310	 0.3190
Q	 0.9030	 0.2490
R	 0.8880	 0.2860
S	 0.9110	 0.2460
T	 0.9130	 0.2380



*Continued on next page...*

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Chain	Atom inclusion	Q-score
U	 0.9280	 0.2700
V	 0.8810	 0.2100
W	 0.9460	 0.3250
X	 0.9290	 0.3180
Y	 0.8830	 0.0510
Z	 0.9210	 0.0010
a	 0.9850	 0.3450
b	 0.8550	 0.1810
c	 0.9150	 0.3260
d	 0.9950	 0.3210
e	 0.8850	 0.1590
f	 0.9130	 0.3480
g	 0.8400	 0.0960
h	 0.9530	 0.4140
i	 0.8760	 0.2890
j	 0.9270	 0.3660
k	 0.8900	 0.2720
l	 0.8740	 0.2520
m	 0.9270	 0.3560
n	 0.9300	 0.2780
o	 0.9230	 0.3850
p	 0.9530	 0.3550
q	 0.9310	 0.3900
r	 0.8750	 0.2450
s	 0.9260	 0.3160
t	 0.9250	 0.3760
u	 0.9430	 0.3710
v	 0.9300	 0.3530
w	 0.9210	 0.2700
x	 0.9270	 0.2180
y	 0.9090	 0.2750
z	 0.9060	 0.2850