



wwPDB EM Validation Summary Report ⓘ

Mar 6, 2026 – 11:59 PM UTC

PDB ID : 6VZ2 / pdb_00006vz2
EMDB ID : EMD-21482
Title : Escherichia coli transcription-translation complex D1 (TTC-D1) containing mRNA with a 27 nt long spacer, NusG, and fMet-tRNAs at E-site and P-site
Authors : Molodtsov, V.; Wang, C.; Su, M.; Ebright, R.H.
Deposited on : 2020-02-27
Resolution : 10.00 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

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

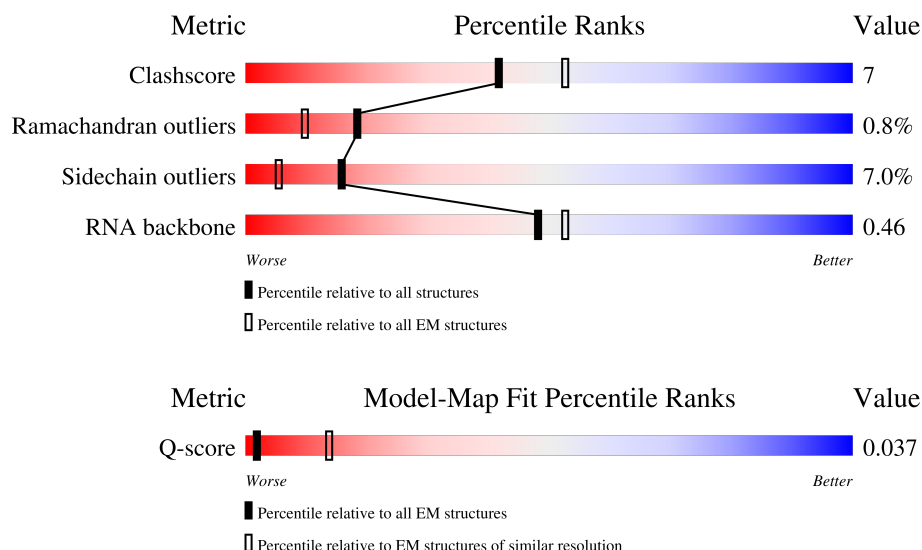
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 10.00 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	147 (9.50 - 10.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	0	103	
2	1	110	
3	2	100	

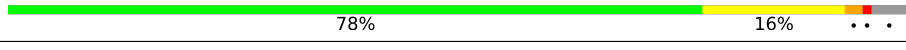
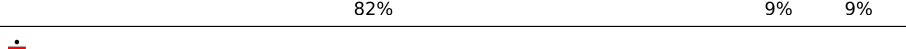
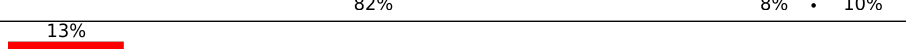
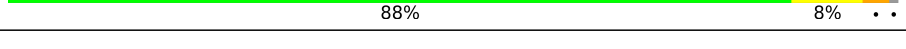
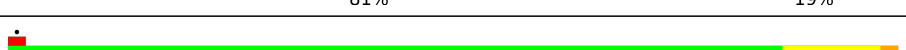
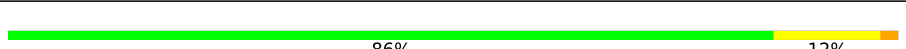
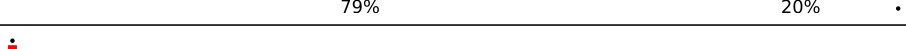
Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
4	3	104	
5	4	94	
6	5	36	
7	6	36	
8	7	44	
9	A	76	
9	B	76	
10	AA	1342	
11	AB	181	
12	AC	329	
12	AD	329	
13	AE	1407	
14	AF	91	
15	C	75	
16	D	1542	
17	E	87	
18	F	71	
19	G	241	
20	H	557	
21	I	233	
22	J	206	
23	K	167	
24	L	135	
25	M	179	
26	N	130	

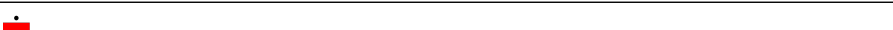
Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
27	O	130	
28	P	103	
29	Q	129	
30	R	124	
31	S	101	
32	T	89	
33	U	82	
34	V	84	
35	W	92	
36	X	118	
37	Y	3	
38	a	2904	
39	b	85	
40	c	78	
41	d	120	
42	e	62	
43	f	58	
44	g	70	
45	h	271	
46	i	56	
47	j	209	
48	k	55	
49	l	201	
50	m	46	
51	n	177	

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
52	o	64	 88% 9% .
53	p	177	 90% 8% .
54	q	38	 87% 11% .
55	r	149	 15% 88% 11% .
56	s	142	 82% 16% .
57	t	123	 80% 18% .
58	u	144	 89% 10% .
59	v	136	 91% 8% .
60	w	127	 76% 18% 6%
61	x	117	 83% 15% ..
62	y	115	 89% 10% .
63	z	118	 84% 15% .

2 Entry composition

There are 65 unique types of molecules in this entry. The entry contains 299429 atoms, of which 125494 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
1	0	103	Total	C	H	N	O	S	0	0
			1655	516	839	153	145	2		

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

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

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

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

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

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

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

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

- Molecule 6 is a DNA chain called NT DNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	5	23	Total	C	H	N	O	P	0	0
			731	225	259	87	137	23		

- 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
			847	259	305	89	167	27		

- Molecule 8 is a RNA chain called mRNA with 27 nt long spacer.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	7	16	Total	C	H	N	O	P	0	0
			516	154	169	62	115	16		

- Molecule 9 is a RNA chain called E-site and P-site tRNA (fMet).

Mol	Chain	Residues	Atoms						AltConf	Trace
9	A	76	Total	C	H	N	O	P	0	0
			2445	723	825	295	527	75		
9	B	76	Total	C	H	N	O	P	0	0
			2432	723	812	295	527	75		

- Molecule 10 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	AA	1322	Total	C	H	N	O	S	0	0
			20856	6539	10431	1817	2026	43		

- Molecule 11 is a protein called Transcription termination/antitermination protein NusG.

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

- Molecule 12 is a protein called DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	AC	230	Total	C	H	N	O	S	0	0
			3599	1112	1813	317	351	6		
12	AD	228	Total	C	H	N	O	S	0	0
			3556	1100	1789	312	349	6		

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

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

There is a discrepancy between the modelled and reference sequences:

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

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

Mol	Chain	Residues	Atoms						AltConf	Trace
14	AF	83	Total	C	H	N	O	S	0	0
			1318	399	663	123	132	1		

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

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

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

Mol	Chain	Residues	Atoms						AltConf	Trace
16	D	1523	Total	C	H	N	O	P	0	0
			49110	14575	16431	5998	10583	1523		

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- 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 RNA chain called mRNA in the ribosomal RNA entrance pore.

Mol	Chain	Residues	Atoms						AltConf	Trace
37	Y	3	Total	C	H	N	O	P	0	0
			87	27	27	6	24	3		

- Molecule 38 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
38	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 39 is a protein called 50S ribosomal protein L27.

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

- Molecule 40 is a protein called 50S ribosomal protein L28.

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

- Molecule 41 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
41	d	120	Total	C	H	N	O	P	0	0
			3869	1144	1300	468	837	120		

- Molecule 42 is a protein called 50S ribosomal protein L29.

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

- Molecule 43 is a protein called 50S ribosomal protein L30.

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

- Molecule 44 is a protein called 50S ribosomal protein L31.

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

- Molecule 45 is a protein called 50S ribosomal protein L2.

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

- Molecule 46 is a protein called 50S ribosomal protein L32.

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

- Molecule 47 is a protein called 50S ribosomal protein L3.

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

- Molecule 48 is a protein called 50S ribosomal protein L33.

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

- Molecule 49 is a protein called 50S ribosomal protein L4.

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

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

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

- Molecule 51 is a protein called 50S ribosomal protein L5.

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

- Molecule 52 is a protein called 50S ribosomal protein L35.

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

- Molecule 53 is a protein called 50S ribosomal protein L6.

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

- Molecule 54 is a protein called 50S ribosomal protein L36.

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

- Molecule 55 is a protein called 50S ribosomal protein L9.

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

- Molecule 56 is a protein called 50S ribosomal protein L13.

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

- Molecule 57 is a protein called 50S ribosomal protein L14.

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

- Molecule 58 is a protein called 50S ribosomal protein L15.

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

- Molecule 59 is a protein called 50S ribosomal protein L16.

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

- Molecule 60 is a protein called 50S ribosomal protein L17.

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

- Molecule 61 is a protein called 50S ribosomal protein L18.

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

- Molecule 62 is a protein called 50S ribosomal protein L19.

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

- Molecule 63 is a protein called 50S ribosomal protein L20.

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

- Molecule 64 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
64	AE	1	Total	Mg	0
			1	1	

- Molecule 65 is ZINC ION (CCD ID: ZN) (formula: Zn).

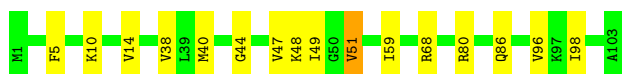
Mol	Chain	Residues	Atoms		AltConf
65	AE	2	Total	Zn	0
			2	2	

3 Residue-property plots [i](#)

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

- Molecule 1: 50S ribosomal protein L21

Chain 0: 



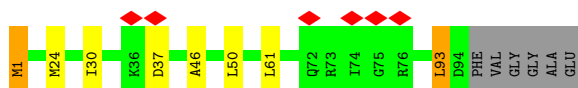
- Molecule 2: 50S ribosomal protein L22

Chain 1: 



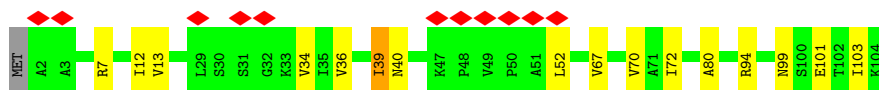
- Molecule 3: 50S ribosomal protein L23

Chain 2: 

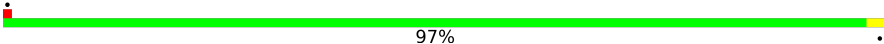


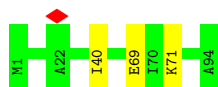
- Molecule 4: 50S ribosomal protein L24

Chain 3: 



- Molecule 5: 50S ribosomal protein L25

Chain 4: 



- Molecule 6: NT DNA

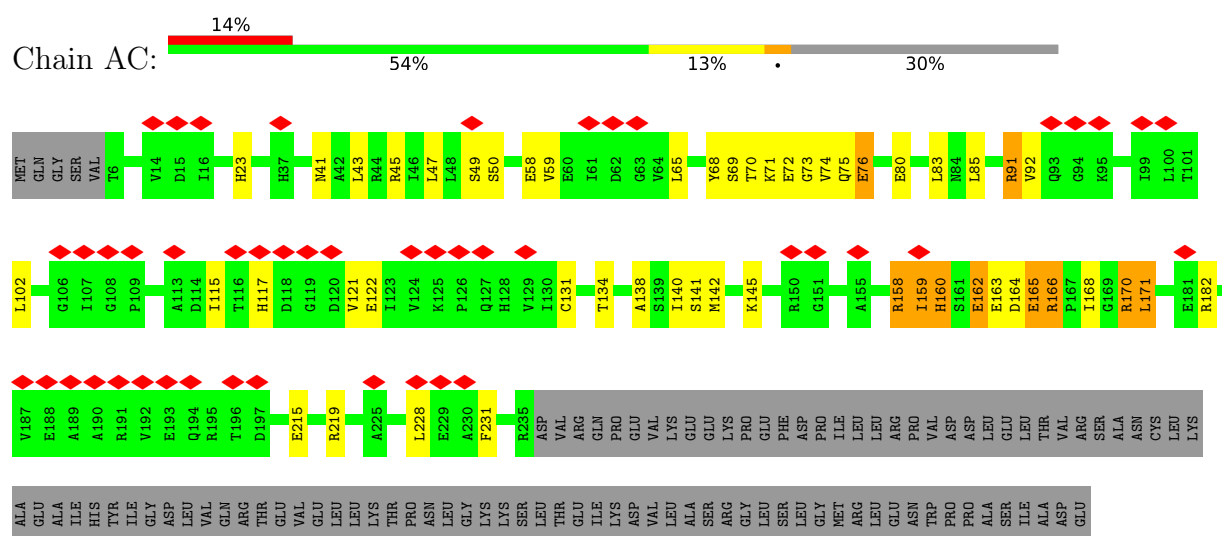
DC	DC	DG	DT	DC	DA	DT	DG	DA	T96	C97	A98	T99	A100	T101	T102	A103	DT	DT	DT	DT	T108	T109	A110	C113	C114	A115	G116	A117	G122
----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	------	------	------	------	----	----	----	----	------	------	------	------	------	------	------	------	------

C2	C3		C8	T9	G10	G11	C12		C15	C16		A21		T26	G27	A28	DT	DC	DA	DT	DG	DA	DC	DG	DG
----	----	--	----	----	-----	-----	-----	--	-----	-----	--	-----	--	-----	-----	-----	----	----	----	----	----	----	----	----	----

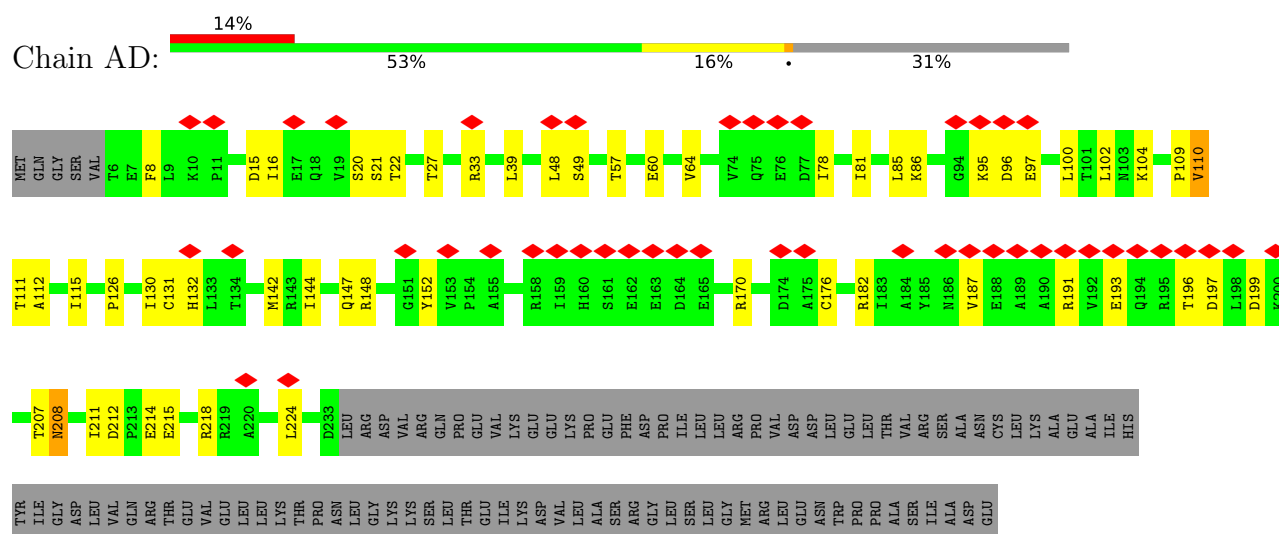
[illegible]

C61	C62	C63	C64	C65	C66	C67	C68	C69	C70	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86	C87	C88	C89	C90	C91	C92	C93	C94	C95	C96	C97	C98	C99	C100	C101	C102	C103	C104	C105	C106	C107	C108	C109	C110	C111	C112	C113	C114	C115	C116	C117	C118	C119	C120	C121	C122	C123	C124	C125	C126	C127	C128	C129	C130	C131	C132	C133	C134	C135	C136	C137	C138	C139	C140	C141	C142	C143	C144	C145	C146	C147	C148	C149	C150	C151	C152	C153	C154	C155	C156	C157	C158	C159	C160
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

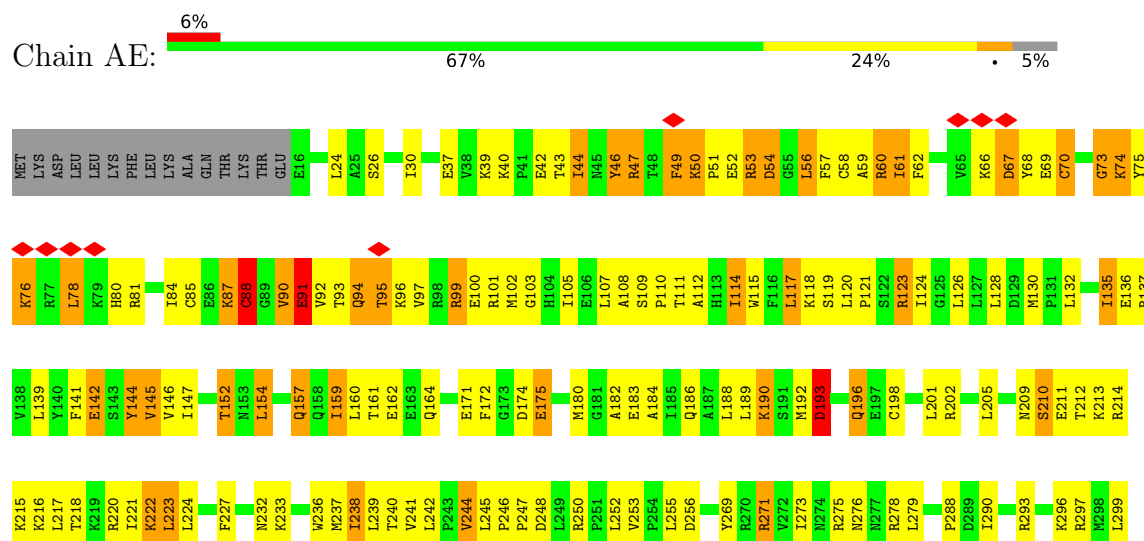
C65	C66	C67	C68	C69	C70	C71	A72	A73	C74	C75	A76	C1	C2	C3	C4	C5	C6	C7	U8	C9	C10	A11	C12	C13	A14	C15	C16	C17	C18	C19	U20	A21	C22	C23	U24	C25	C26	U27	C28	C29	C30	C31	C32	U33	C34	A37	A38	C39	G42	A43	A44	G45	G46	U47	C48	G49	U50	C51	G52	G53	U54	U55	C56	A57	A58	A59	U60	C61
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

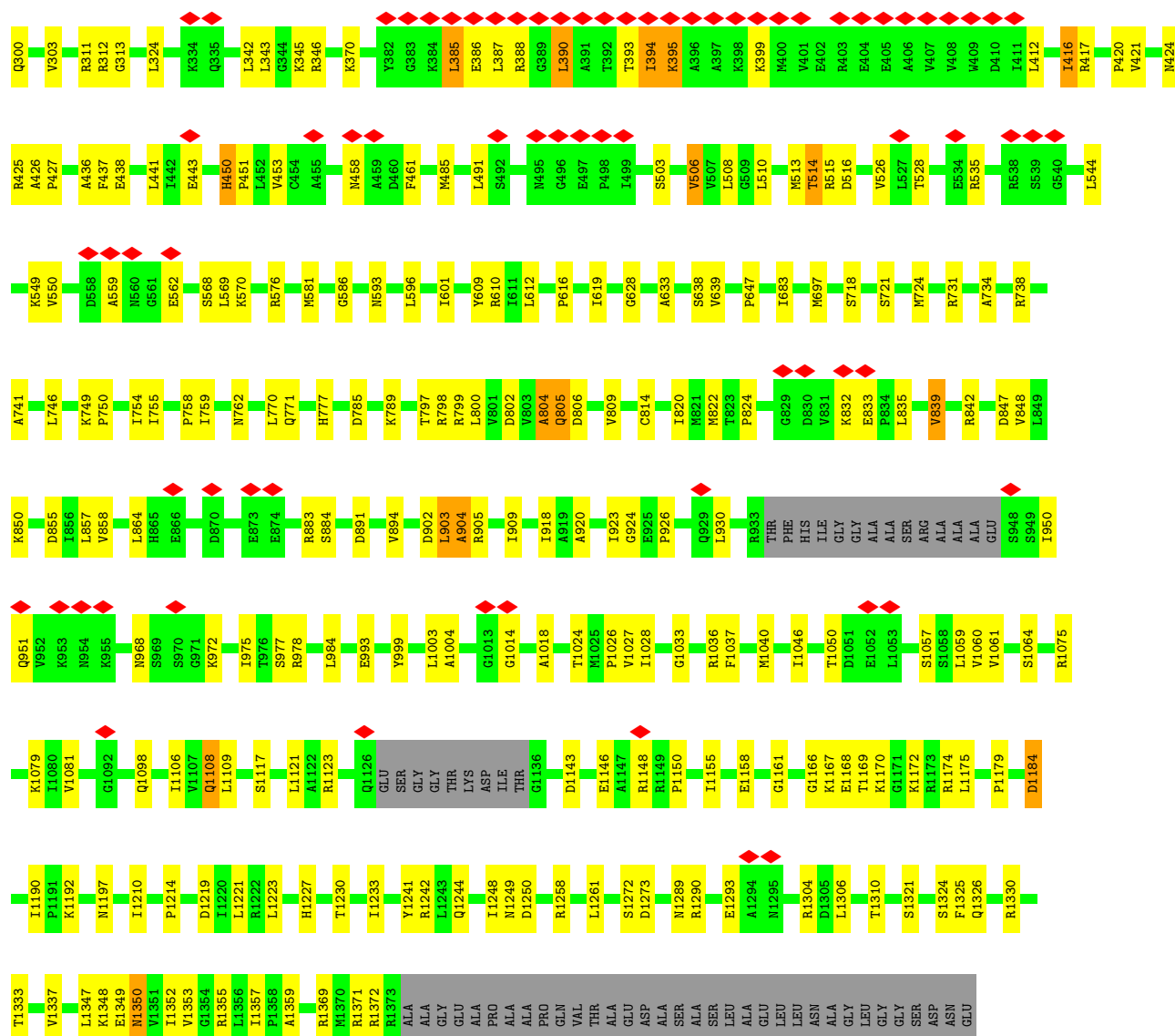


- Molecule 12: DNA-directed RNA polymerase subunit alpha

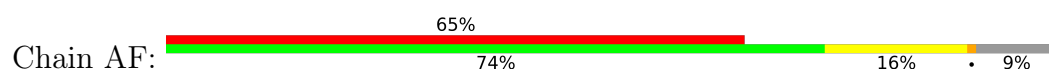


- Molecule 13: DNA-directed RNA polymerase subunit beta'

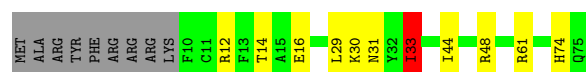


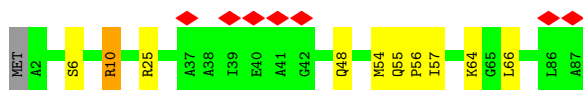


• Molecule 14: DNA-directed RNA polymerase subunit omega

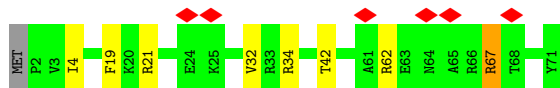
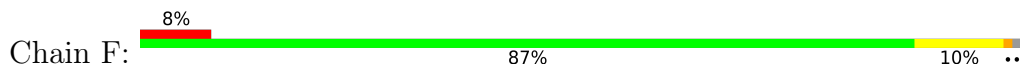


• Molecule 15: 30S ribosomal protein S18

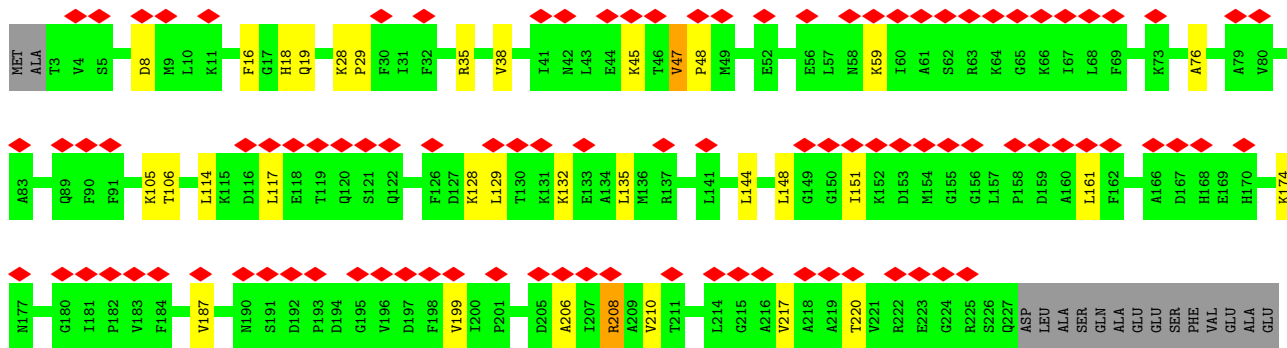
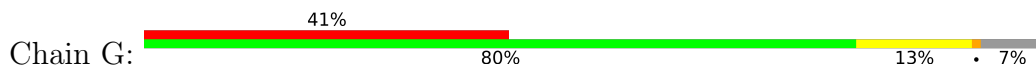




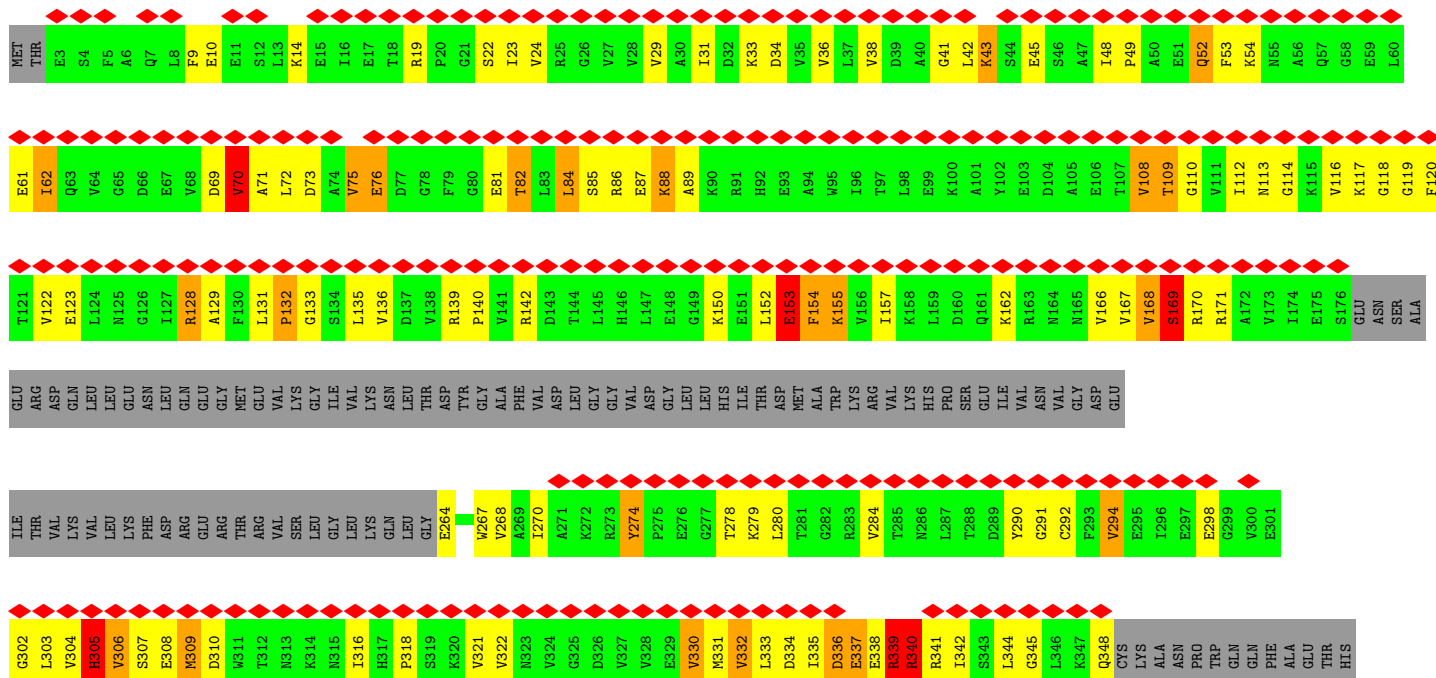
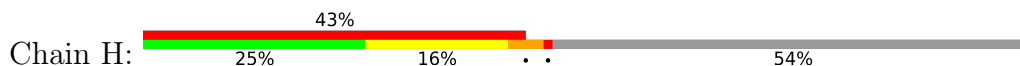
- Molecule 18: 30S ribosomal protein S21

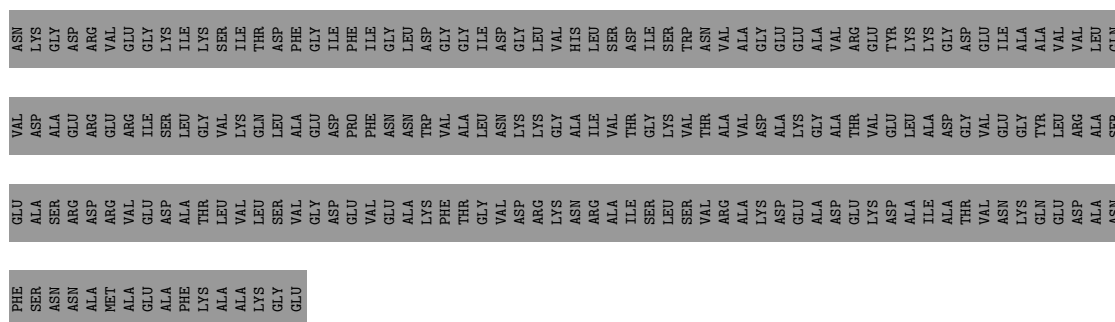


- Molecule 19: 30S ribosomal protein S2

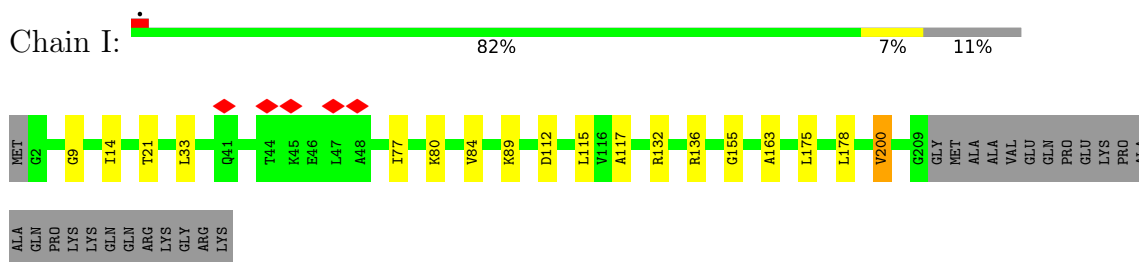


- Molecule 20: 30S ribosomal protein S1

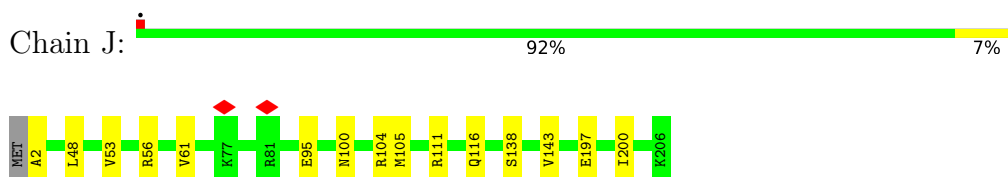




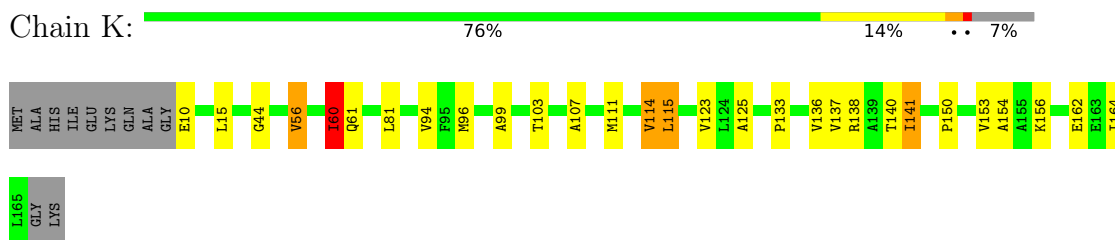
- Molecule 21: 30S ribosomal protein S3



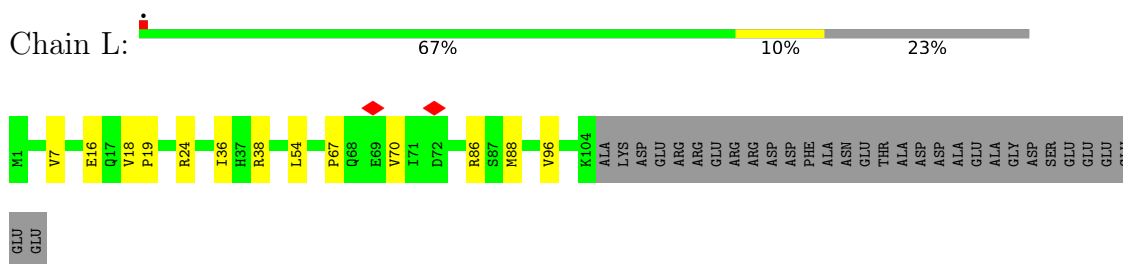
- Molecule 22: 30S ribosomal protein S4



- Molecule 23: 30S ribosomal protein S5

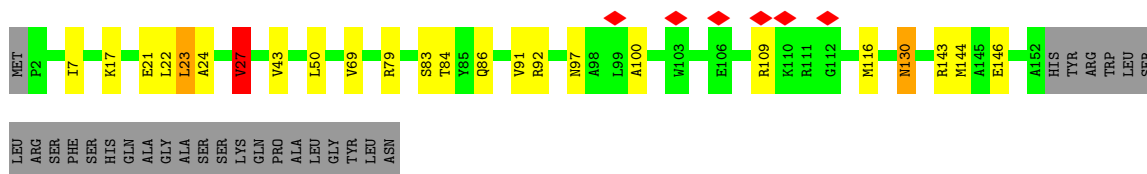


- Molecule 24: 30S ribosomal protein S6

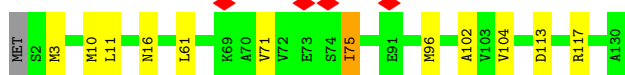


- Molecule 25: 30S ribosomal protein S7

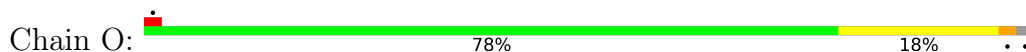




- Molecule 26: 30S ribosomal protein S8



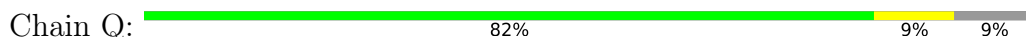
- Molecule 27: 30S ribosomal protein S9



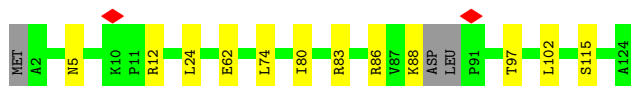
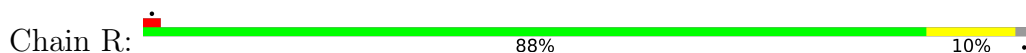
- Molecule 28: 30S ribosomal protein S10



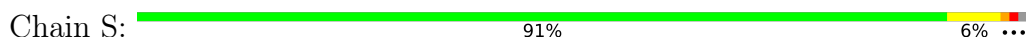
- Molecule 29: 30S ribosomal protein S11



- Molecule 30: 30S ribosomal protein S12



- Molecule 31: 30S ribosomal protein S14



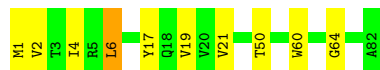
- Molecule 32: 30S ribosomal protein S15

Chain T:  79% 18% ..



- Molecule 33: 30S ribosomal protein S16

Chain U:  88% 11% .



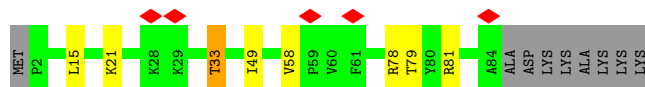
- Molecule 34: 30S ribosomal protein S17

Chain V:  87% 7% • 5%



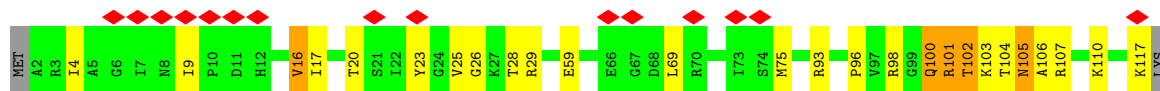
- Molecule 35: 30S ribosomal protein S19

Chain W:  5% 82% 8% • 10%



- Molecule 36: 30S ribosomal protein S13

Chain X:  13% 76% 18% • .



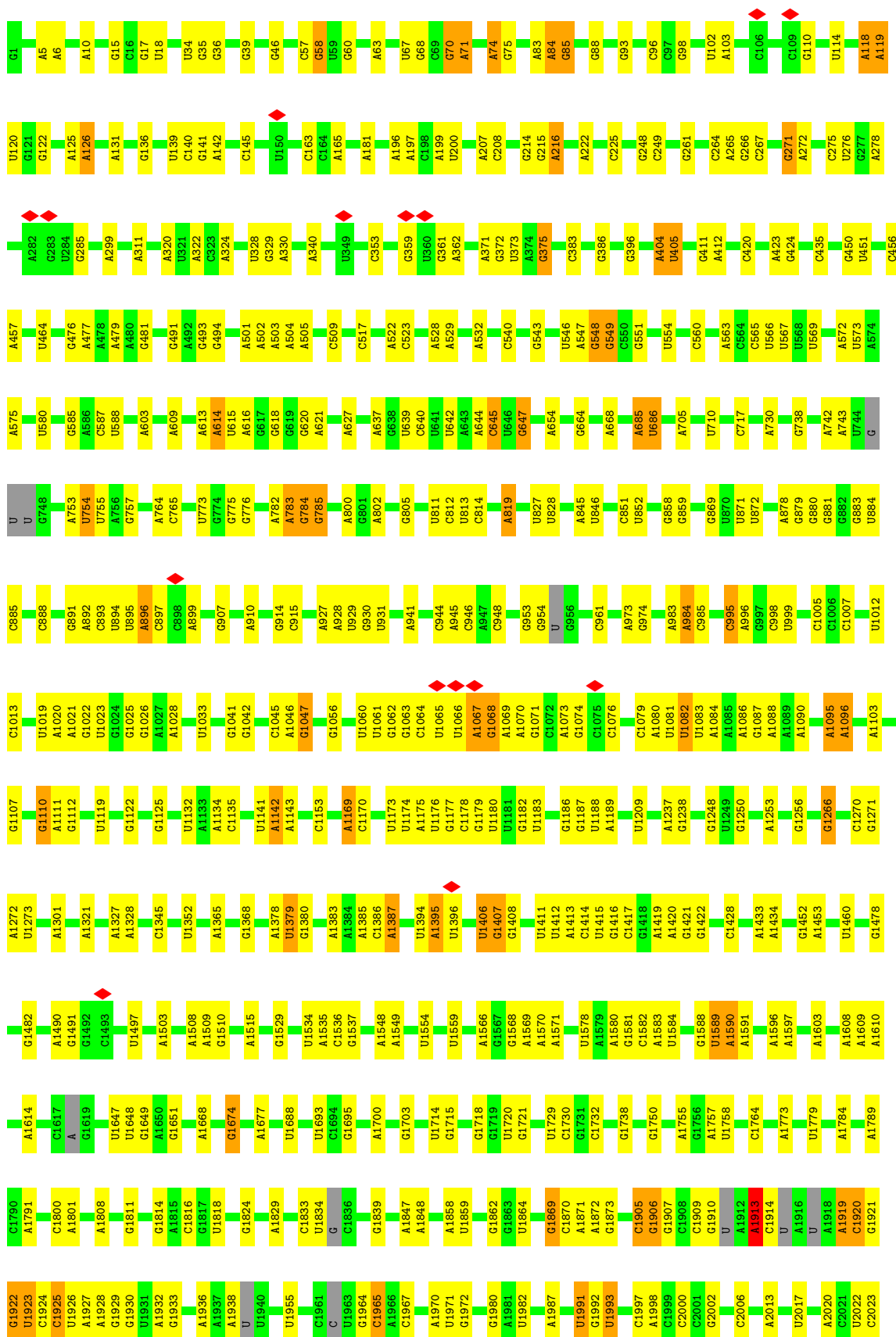
- Molecule 37: mRNA in the ribosomal RNA entrance pore

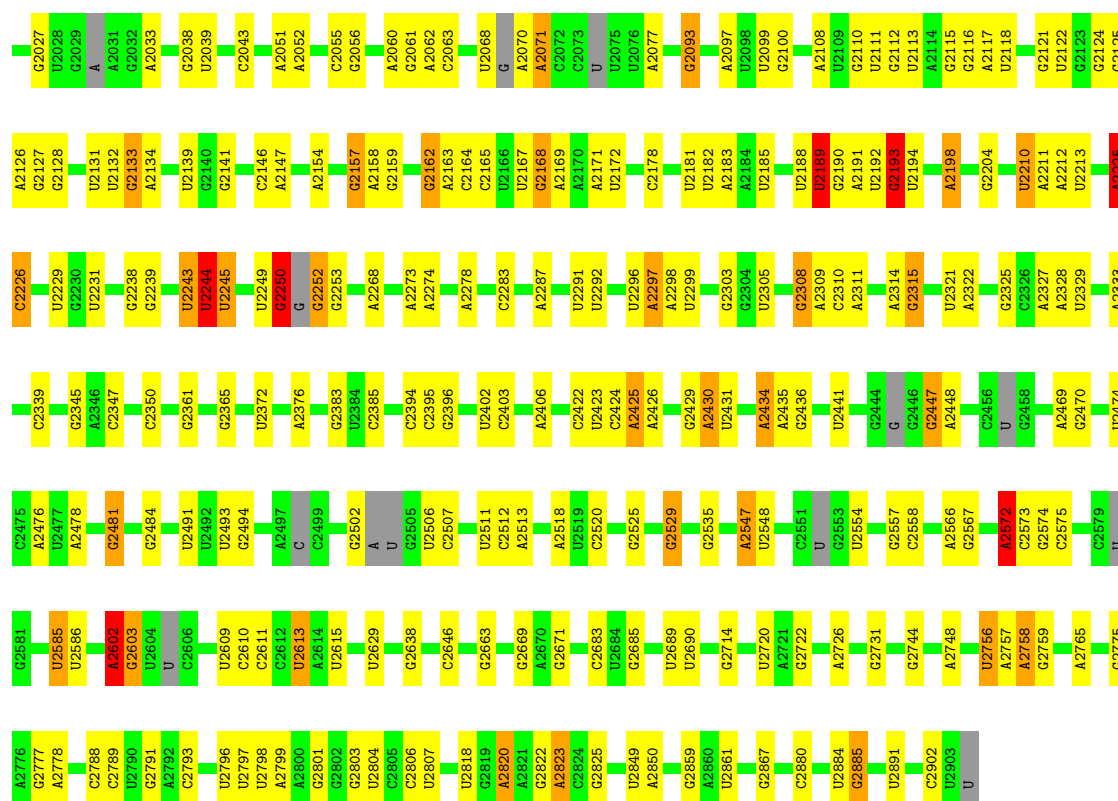
Chain Y:  33% 33% 67%



- Molecule 38: 23S rRNA

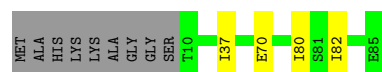
Chain a:  73% 23% • .





- Molecule 39: 50S ribosomal protein L27

Chain b: 85% 5% 11%



- Molecule 40: 50S ribosomal protein L28

Chain c: 88% 8% 4%



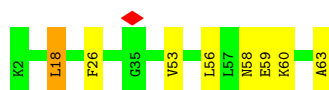
- Molecule 41: 5S rRNA

Chain d: 81% 19%



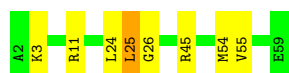
- Molecule 42: 50S ribosomal protein L29

Chain e: 87% 11% 2%



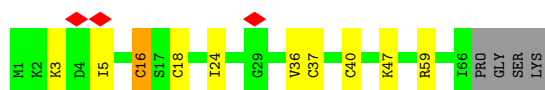
- Molecule 43: 50S ribosomal protein L30

Chain f: 86% 12% .



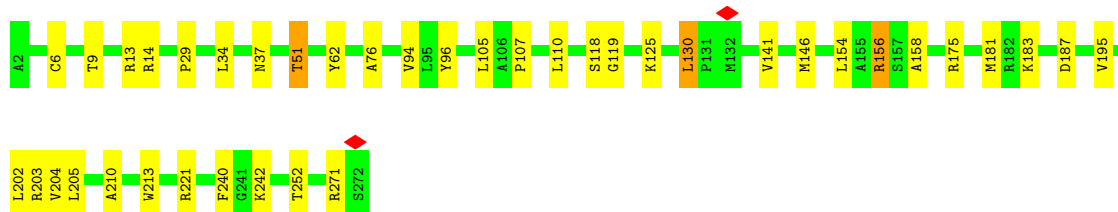
- Molecule 44: 50S ribosomal protein L31

Chain g: 80% 13% . 6%



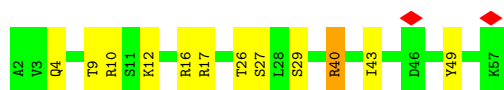
- Molecule 45: 50S ribosomal protein L2

Chain h: 85% 14% .



- Molecule 46: 50S ribosomal protein L32

Chain i: 79% 20% .



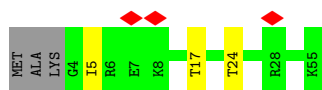
- Molecule 47: 50S ribosomal protein L3

Chain j: 88% 11%

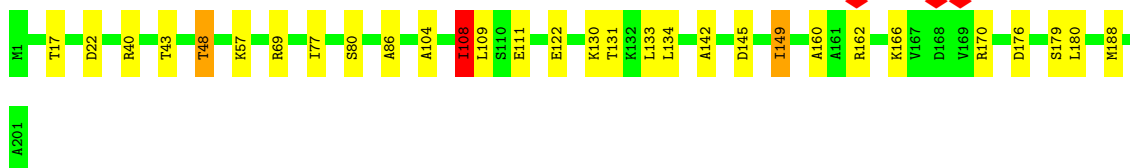
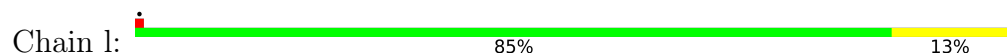


- Molecule 48: 50S ribosomal protein L33

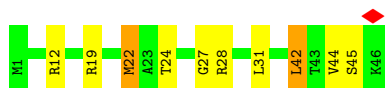
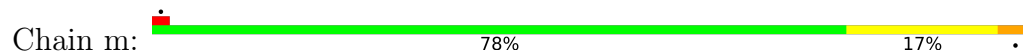
Chain k: 5% 89% 5% 5%



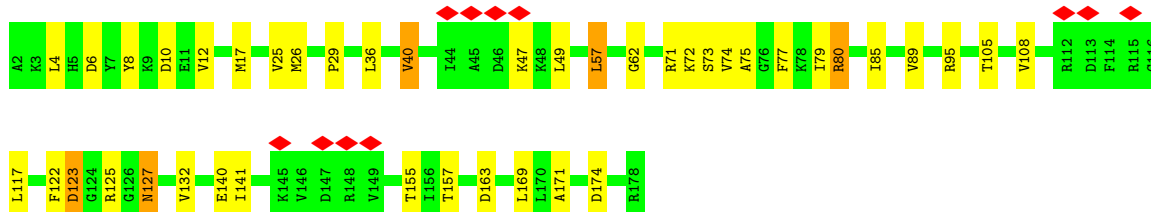
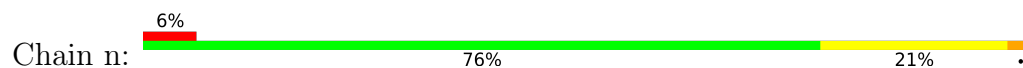
- Molecule 49: 50S ribosomal protein L4



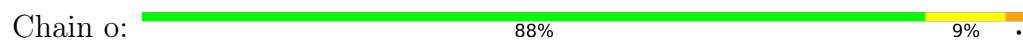
- Molecule 50: 50S ribosomal protein L34



- Molecule 51: 50S ribosomal protein L5



- Molecule 52: 50S ribosomal protein L35



- Molecule 53: 50S ribosomal protein L6



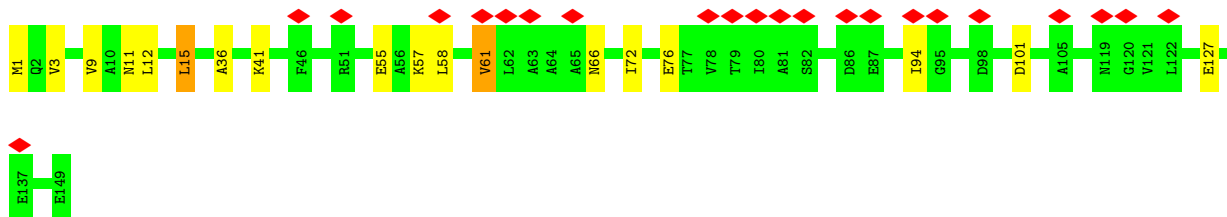
- Molecule 54: 50S ribosomal protein L36

Chain q:  87% 11% .



- Molecule 55: 50S ribosomal protein L9

Chain r:  15% 88% 11% .



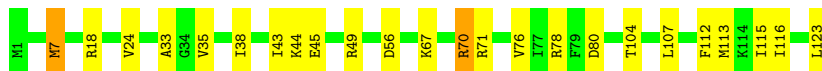
- Molecule 56: 50S ribosomal protein L13

Chain s:  82% 16% .



- Molecule 57: 50S ribosomal protein L14

Chain t:  80% 18% .

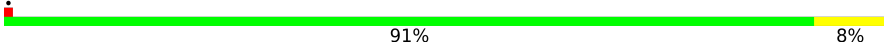


- Molecule 58: 50S ribosomal protein L15

Chain u:  89% 10% .



- Molecule 59: 50S ribosomal protein L16

Chain v:  91% 8% .



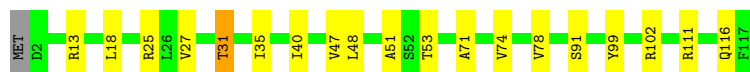
- Molecule 60: 50S ribosomal protein L17

Chain w:  76% 18% 6% .



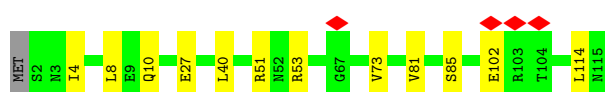
- Molecule 61: 50S ribosomal protein L18

Chain x: 83% 15% ..



- Molecule 62: 50S ribosomal protein L19

Chain y: 89% 10% .



- Molecule 63: 50S ribosomal protein L20

Chain z: 84% 15% .



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	4207	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	0.325	Depositor
Minimum map value	-0.098	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.023	Depositor
Recommended contour level	0.0342	Depositor
Map size (Å)	564.4608, 564.4608, 564.4608	wwPDB
Map dimensions	192, 192, 192	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	2.9399002, 2.9399002, 2.9399002	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	0.49	0/829	0.74	0/1107
2	1	0.67	0/864	1.08	0/1156
3	2	0.54	0/752	0.89	0/1005
4	3	0.47	0/796	0.77	0/1062
5	4	0.52	0/766	0.88	0/1025
6	5	0.63	1/528 (0.2%)	0.55	0/810
7	6	0.55	1/603 (0.2%)	0.56	0/926
8	7	0.76	4/388 (1.0%)	0.55	0/604
9	A	0.35	0/1810	0.72	3/2821 (0.1%)
9	B	0.41	0/1810	0.86	8/2821 (0.3%)
10	AA	0.68	17/10591 (0.2%)	0.95	55/14289 (0.4%)
11	AB	0.42	1/808 (0.1%)	0.70	2/1088 (0.2%)
12	AC	0.57	4/1808 (0.2%)	0.70	9/2450 (0.4%)
12	AD	0.39	0/1789	0.55	0/2425
13	AE	0.53	8/10545 (0.1%)	0.74	23/14236 (0.2%)
14	AF	0.47	0/657	0.73	0/886
15	C	0.66	0/553	1.14	1/743 (0.1%)
16	D	0.38	4/36582 (0.0%)	0.74	30/57043 (0.1%)
17	E	0.75	0/675	1.32	0/895
18	F	0.71	0/597	1.20	0/792
19	G	0.63	0/1791	1.06	1/2413 (0.0%)
20	H	0.76	4/1746 (0.2%)	1.58	34/2382 (1.4%)
21	I	0.57	0/1663	0.98	0/2241
22	J	0.61	0/1665	1.05	0/2227
23	K	0.64	0/1165	1.06	2/1568 (0.1%)
24	L	0.58	0/867	0.94	0/1171
25	M	0.68	0/1195	1.19	3/1602 (0.2%)
26	N	0.55	0/989	0.91	0/1326
27	O	0.58	0/1034	1.02	1/1375 (0.1%)
28	P	0.54	0/800	1.05	4/1082 (0.4%)
29	Q	0.55	0/893	0.91	0/1205
30	R	0.49	0/952	0.81	0/1274

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
31	S	0.64	0/817	1.11	1/1088 (0.1%)
32	T	0.68	0/722	1.21	0/964
33	U	0.57	0/659	0.99	0/884
34	V	0.45	0/657	0.73	0/881
35	W	0.51	0/680	0.83	0/915
36	X	0.66	0/909	1.21	3/1215 (0.2%)
37	Y	0.48	0/65	0.86	0/98
38	a	0.40	3/69247 (0.0%)	0.75	57/107985 (0.1%)
39	b	0.50	0/589	0.76	0/779
40	c	0.63	0/635	0.97	0/848
41	d	0.37	0/2872	0.69	0/4478
42	e	0.68	0/502	1.19	0/667
43	f	0.62	0/452	1.02	0/605
44	g	0.55	0/531	0.99	1/709 (0.1%)
45	h	0.53	0/2121	0.85	0/2852
46	i	0.52	0/450	0.93	0/599
47	j	0.59	0/1586	0.86	0/2134
48	k	0.46	0/433	0.80	0/576
49	l	0.60	0/1571	1.03	1/2113 (0.0%)
50	m	0.68	0/380	1.22	0/498
51	n	0.62	0/1434	1.18	10/1926 (0.5%)
52	o	0.63	0/513	1.10	1/676 (0.1%)
53	p	0.58	0/1333	0.89	0/1805
54	q	0.50	0/303	0.88	0/397
55	r	0.63	0/1122	0.97	1/1515 (0.1%)
56	s	0.68	0/1152	1.02	2/1551 (0.1%)
57	t	0.57	0/955	0.88	0/1279
58	u	0.54	0/1062	0.95	1/1413 (0.1%)
59	v	0.59	0/1093	0.97	0/1460
60	w	0.67	0/964	1.13	0/1289
61	x	0.61	0/902	1.09	0/1209
62	y	0.52	0/929	0.79	0/1242
63	z	0.80	0/960	1.25	0/1278
All	All	0.49	47/187111 (0.0%)	0.83	254/275978 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
9	A	0	2

Continued on next page...

Continued from previous page...

Mol	Chain	#Chirality outliers	#Planarity outliers
9	B	0	2
10	AA	0	13
13	AE	0	5
14	AF	0	1
20	H	0	3
36	X	0	1
All	All	0	27

The worst 5 of 47 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	AA	885	GLY	C-O	-16.03	1.02	1.23
10	AA	850	ILE	N-CA	-13.19	1.29	1.46
13	AE	93	THR	CA-C	12.22	1.69	1.52
20	H	169	SER	N-CA	11.78	1.61	1.46
10	AA	953	LEU	N-CA	8.71	1.57	1.46

The worst 5 of 254 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	AA	727	VAL	N-CA-C	-17.22	95.07	110.74
20	H	88	LYS	CA-C-N	16.94	143.58	120.38
20	H	88	LYS	C-N-CA	16.94	143.58	120.38
9	B	29	G	C3'-C2'-O2'	16.01	134.72	110.70
10	AA	1250	SER	CA-C-N	14.96	149.63	123.01

There are no chirality outliers.

5 of 27 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
9	A	19	G	Sidechain
9	A	7	G	Sidechain
10	AA	205	PRO	Peptide
10	AA	373	GLY	Mainchain
10	AA	594	VAL	Peptide

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

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

the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	0	816	839	839	8	0
2	1	857	922	922	14	0
3	2	746	811	811	6	0
4	3	788	844	844	10	0
5	4	753	780	780	0	0
6	5	472	259	261	22	0
7	6	542	305	306	13	0
8	7	347	169	169	18	0
9	A	1620	825	826	174	0
9	B	1620	812	827	140	0
10	AA	10425	10431	10430	350	0
11	AB	790	783	783	8	0
12	AC	1786	1813	1813	43	0
12	AD	1767	1789	1789	47	0
13	AE	10388	10612	10611	368	0
14	AF	655	663	663	14	0
15	C	544	559	560	23	0
16	D	32679	16431	16450	174	0
17	E	669	719	719	4	0
18	F	589	629	629	8	0
19	G	1760	1785	1785	46	0
20	H	1730	1454	1454	209	0
21	I	1636	1710	1710	11	0
22	J	1643	1707	1707	8	0
23	K	1152	1196	1196	21	0
24	L	848	846	846	3	0
25	M	1181	1235	1235	34	0
26	N	979	1031	1031	6	0
27	O	1022	1070	1070	12	0
28	P	790	831	831	13	0
29	Q	877	887	887	4	0
30	R	939	1001	1001	6	0
31	S	805	844	844	4	0
32	T	714	734	734	8	0
33	U	649	666	666	3	0
34	V	648	691	691	4	0
35	W	663	688	688	2	0
36	X	900	964	964	54	0
37	Y	60	27	31	2	0
38	a	61841	31077	31124	278	0
39	b	582	599	599	2	0
40	c	625	652	652	4	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
41	d	2569	1300	1301	3	0
42	e	501	531	531	5	0
43	f	448	488	488	5	0
44	g	522	520	520	11	0
45	h	2082	2154	2154	19	0
46	i	444	459	458	6	0
47	j	1565	1617	1616	15	0
48	k	426	464	464	0	0
49	l	1552	1619	1619	13	0
50	m	377	418	418	11	0
51	n	1410	1443	1444	27	0
52	o	504	572	572	4	0
53	p	1313	1358	1358	7	0
54	q	302	343	343	2	0
55	r	1111	1148	1148	5	0
56	s	1129	1162	1162	12	0
57	t	946	1023	1023	12	0
58	u	1053	1129	1129	8	0
59	v	1074	1157	1157	5	0
60	w	951	994	994	9	0
61	x	892	923	923	8	0
62	y	917	962	962	4	0
63	z	947	1020	1019	12	0
64	AE	1	0	0	0	0
65	AE	2	0	0	0	0
All	All	173935	125494	125581	2029	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 7.

The worst 5 of 2029 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)
20:H:131:LEU:CB	20:H:167:VAL:CA	1.78	1.55
15:C:12:ARG:HG3	20:H:264:GLU:CB	1.30	1.55
20:H:131:LEU:CB	20:H:167:VAL:HA	1.03	1.48
20:H:71:ALA:C	20:H:72:LEU:HD12	1.49	1.35
38:a:1839:G:H1'	38:a:1927:A:C8	1.62	1.34

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	101/103 (98%)	97 (96%)	3 (3%)	1 (1%)	12	49
2	1	108/110 (98%)	104 (96%)	4 (4%)	0	100	100
3	2	92/100 (92%)	90 (98%)	2 (2%)	0	100	100
4	3	101/104 (97%)	96 (95%)	4 (4%)	1 (1%)	12	49
5	4	92/94 (98%)	90 (98%)	2 (2%)	0	100	100
10	AA	1318/1342 (98%)	1151 (87%)	135 (10%)	32 (2%)	4	27
11	AB	94/181 (52%)	88 (94%)	6 (6%)	0	100	100
12	AC	228/329 (69%)	214 (94%)	12 (5%)	2 (1%)	14	51
12	AD	226/329 (69%)	212 (94%)	14 (6%)	0	100	100
13	AE	1329/1407 (94%)	1199 (90%)	121 (9%)	9 (1%)	18	56
14	AF	81/91 (89%)	74 (91%)	7 (9%)	0	100	100
15	C	64/75 (85%)	63 (98%)	1 (2%)	0	100	100
17	E	84/87 (97%)	83 (99%)	1 (1%)	0	100	100
18	F	68/71 (96%)	68 (100%)	0	0	100	100
19	G	223/241 (92%)	210 (94%)	13 (6%)	0	100	100
20	H	255/557 (46%)	188 (74%)	55 (22%)	12 (5%)	2	16
21	I	206/233 (88%)	196 (95%)	9 (4%)	1 (0%)	24	63
22	J	203/206 (98%)	198 (98%)	5 (2%)	0	100	100
23	K	154/167 (92%)	146 (95%)	7 (4%)	1 (1%)	21	59
24	L	102/135 (76%)	97 (95%)	4 (4%)	1 (1%)	12	49
25	M	149/179 (83%)	144 (97%)	4 (3%)	1 (1%)	18	56
26	N	127/130 (98%)	121 (95%)	5 (4%)	1 (1%)	16	54
27	O	125/130 (96%)	115 (92%)	9 (7%)	1 (1%)	16	54
28	P	97/103 (94%)	89 (92%)	7 (7%)	1 (1%)	12	49
29	Q	115/129 (89%)	104 (90%)	9 (8%)	2 (2%)	7	36

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
30	R	117/124 (94%)	116 (99%)	1 (1%)	0	100	100
31	S	98/101 (97%)	96 (98%)	2 (2%)	0	100	100
32	T	86/89 (97%)	82 (95%)	4 (5%)	0	100	100
33	U	80/82 (98%)	75 (94%)	4 (5%)	1 (1%)	9	42
34	V	78/84 (93%)	74 (95%)	4 (5%)	0	100	100
35	W	81/92 (88%)	78 (96%)	3 (4%)	0	100	100
36	X	114/118 (97%)	107 (94%)	5 (4%)	2 (2%)	6	34
39	b	74/85 (87%)	69 (93%)	5 (7%)	0	100	100
40	c	75/78 (96%)	72 (96%)	3 (4%)	0	100	100
42	e	60/62 (97%)	57 (95%)	3 (5%)	0	100	100
43	f	56/58 (97%)	53 (95%)	3 (5%)	0	100	100
44	g	64/70 (91%)	63 (98%)	1 (2%)	0	100	100
45	h	269/271 (99%)	259 (96%)	9 (3%)	1 (0%)	30	67
46	i	54/56 (96%)	51 (94%)	3 (6%)	0	100	100
47	j	207/209 (99%)	198 (96%)	9 (4%)	0	100	100
48	k	50/55 (91%)	50 (100%)	0	0	100	100
49	l	199/201 (99%)	190 (96%)	8 (4%)	1 (0%)	24	63
50	m	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
51	n	175/177 (99%)	162 (93%)	11 (6%)	2 (1%)	11	46
52	o	62/64 (97%)	59 (95%)	3 (5%)	0	100	100
53	p	173/177 (98%)	161 (93%)	12 (7%)	0	100	100
54	q	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
55	r	147/149 (99%)	136 (92%)	11 (8%)	0	100	100
56	s	140/142 (99%)	135 (96%)	5 (4%)	0	100	100
57	t	121/123 (98%)	111 (92%)	10 (8%)	0	100	100
58	u	142/144 (99%)	135 (95%)	7 (5%)	0	100	100
59	v	134/136 (98%)	129 (96%)	5 (4%)	0	100	100
60	w	117/127 (92%)	107 (92%)	10 (8%)	0	100	100
61	x	114/117 (97%)	108 (95%)	6 (5%)	0	100	100
62	y	112/115 (97%)	105 (94%)	7 (6%)	0	100	100
63	z	115/118 (98%)	110 (96%)	4 (4%)	1 (1%)	14	51

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	9136/10141 (90%)	8463 (93%)	599 (7%)	74 (1%)	18	54

5 of 74 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
10	AA	596	ASP
10	AA	890	LYS
10	AA	918	LEU
10	AA	937	ASP
10	AA	976	ARG

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	0	84/84 (100%)	76 (90%)	8 (10%)	8	25
2	1	93/93 (100%)	86 (92%)	7 (8%)	12	33
3	2	81/84 (96%)	77 (95%)	4 (5%)	22	43
4	3	84/85 (99%)	79 (94%)	5 (6%)	17	39
5	4	78/78 (100%)	75 (96%)	3 (4%)	29	50
10	AA	1140/1157 (98%)	1027 (90%)	113 (10%)	7	24
11	AB	86/158 (54%)	85 (99%)	1 (1%)	63	75
12	AC	198/286 (69%)	185 (93%)	13 (7%)	15	37
12	AD	196/286 (68%)	193 (98%)	3 (2%)	57	72
13	AE	1120/1168 (96%)	1046 (93%)	74 (7%)	15	37
14	AF	70/75 (93%)	68 (97%)	2 (3%)	37	58
15	C	57/65 (88%)	55 (96%)	2 (4%)	32	53
17	E	65/66 (98%)	61 (94%)	4 (6%)	16	38
18	F	60/61 (98%)	57 (95%)	3 (5%)	22	43
19	G	187/199 (94%)	175 (94%)	12 (6%)	16	37
20	H	137/461 (30%)	124 (90%)	13 (10%)	8	25

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
21	I	171/190 (90%)	164 (96%)	7 (4%)	27	49
22	J	172/173 (99%)	166 (96%)	6 (4%)	32	53
23	K	119/126 (94%)	111 (93%)	8 (7%)	15	36
24	L	91/116 (78%)	84 (92%)	7 (8%)	12	32
25	M	124/147 (84%)	113 (91%)	11 (9%)	9	28
26	N	104/105 (99%)	101 (97%)	3 (3%)	37	58
27	O	105/107 (98%)	99 (94%)	6 (6%)	18	40
28	P	86/90 (96%)	78 (91%)	8 (9%)	8	26
29	Q	90/99 (91%)	88 (98%)	2 (2%)	45	64
30	R	101/104 (97%)	95 (94%)	6 (6%)	18	39
31	S	83/84 (99%)	79 (95%)	4 (5%)	23	44
32	T	76/77 (99%)	65 (86%)	11 (14%)	3	13
33	U	65/65 (100%)	60 (92%)	5 (8%)	12	32
34	V	74/78 (95%)	71 (96%)	3 (4%)	27	49
35	W	72/79 (91%)	66 (92%)	6 (8%)	10	30
36	X	94/96 (98%)	87 (93%)	7 (7%)	13	33
39	b	58/63 (92%)	57 (98%)	1 (2%)	53	69
40	c	67/68 (98%)	64 (96%)	3 (4%)	24	46
42	e	54/54 (100%)	51 (94%)	3 (6%)	19	40
43	f	48/48 (100%)	43 (90%)	5 (10%)	7	22
44	g	59/62 (95%)	54 (92%)	5 (8%)	10	29
45	h	216/216 (100%)	199 (92%)	17 (8%)	11	32
46	i	47/47 (100%)	41 (87%)	6 (13%)	4	15
47	j	164/164 (100%)	156 (95%)	8 (5%)	22	43
48	k	47/49 (96%)	44 (94%)	3 (6%)	16	37
49	l	165/165 (100%)	151 (92%)	14 (8%)	10	29
50	m	38/38 (100%)	36 (95%)	2 (5%)	20	41
51	n	148/148 (100%)	130 (88%)	18 (12%)	5	17
52	o	51/51 (100%)	47 (92%)	4 (8%)	11	32
53	p	136/138 (99%)	130 (96%)	6 (4%)	25	47
54	q	34/34 (100%)	31 (91%)	3 (9%)	9	28

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
55	r	114/114 (100%)	102 (90%)	12 (10%)	6	21
56	s	116/116 (100%)	106 (91%)	10 (9%)	10	29
57	t	104/104 (100%)	97 (93%)	7 (7%)	15	36
58	u	103/103 (100%)	96 (93%)	7 (7%)	14	36
59	v	109/109 (100%)	105 (96%)	4 (4%)	30	51
60	w	99/103 (96%)	91 (92%)	8 (8%)	11	31
61	x	86/87 (99%)	80 (93%)	6 (7%)	14	35
62	y	99/100 (99%)	91 (92%)	8 (8%)	11	31
63	z	89/90 (99%)	85 (96%)	4 (4%)	24	46
All	All	7614/8413 (90%)	7083 (93%)	531 (7%)	16	35

5 of 531 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
54	q	26	ILE
55	r	127	GLU
54	q	3	VAL
62	y	10	GLN
13	AE	146	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 72 such sidechains are listed below:

Mol	Chain	Res	Type
45	h	70	ASN
63	z	44	GLN
46	i	5	GLN
55	r	18	GLN
13	AE	1238	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
16	D	1513/1542 (98%)	286 (18%)	33 (2%)
37	Y	2/3 (66%)	2 (100%)	0
38	a	2859/2904 (98%)	541 (18%)	0
41	d	119/120 (99%)	17 (14%)	0
8	7	15/44 (34%)	7 (46%)	0

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
9	A	75/76 (98%)	29 (38%)	6 (8%)
9	B	75/76 (98%)	34 (45%)	5 (6%)
All	All	4658/4765 (97%)	916 (19%)	44 (0%)

5 of 916 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
8	7	56	U
8	7	57	G
8	7	58	A
8	7	59	U
8	7	60	U

5 of 44 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
16	D	793	U
16	D	1212	U
16	D	991	U
16	D	1145	A
16	D	1214	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](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
16	D	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	D	1515:G	O3'	1517:G	P	6.72

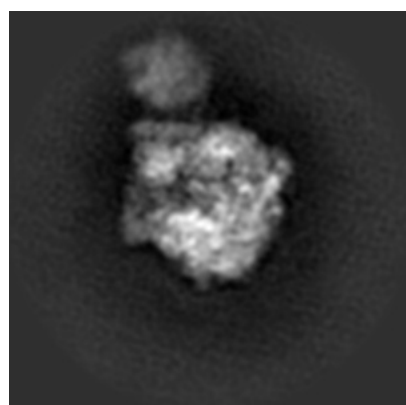
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-21482. These allow visual inspection of the internal detail of the map and identification of artifacts.

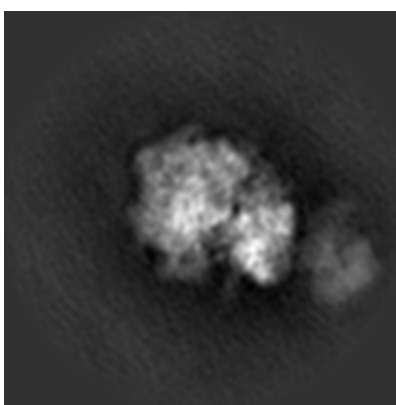
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

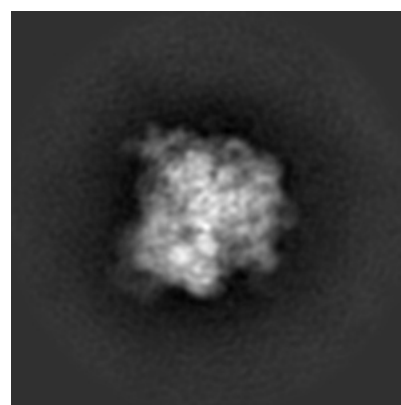
6.1.1 Primary map



X



Y

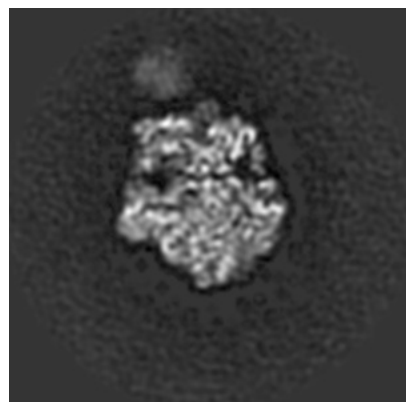


Z

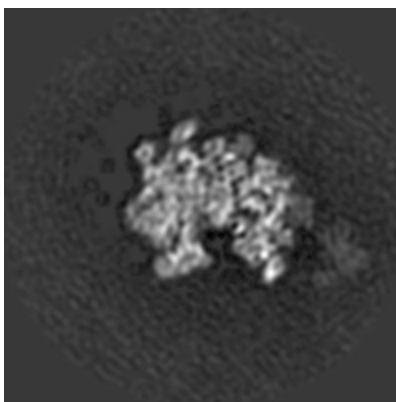
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

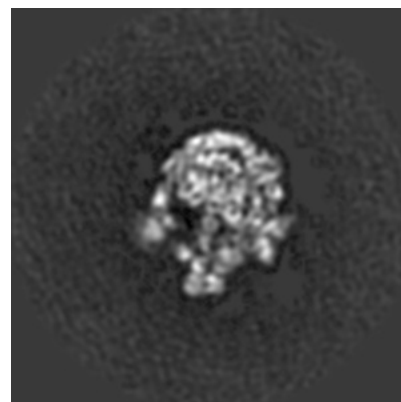
6.2.1 Primary map



X Index: 96



Y Index: 96

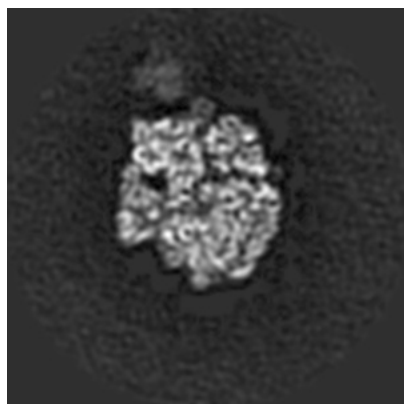


Z Index: 96

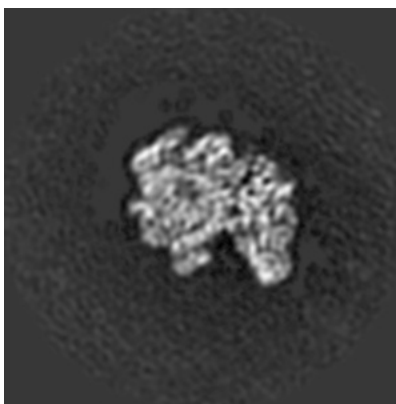
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

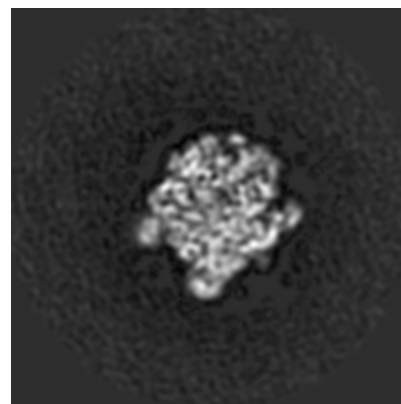
6.3.1 Primary map



X Index: 92



Y Index: 102

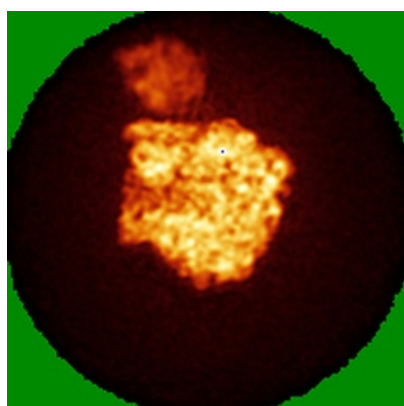


Z Index: 91

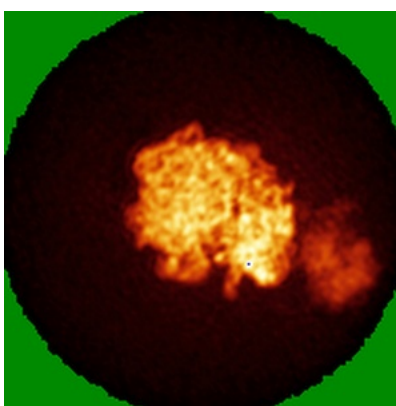
The images above show the largest variance slices of the map in three orthogonal directions.

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

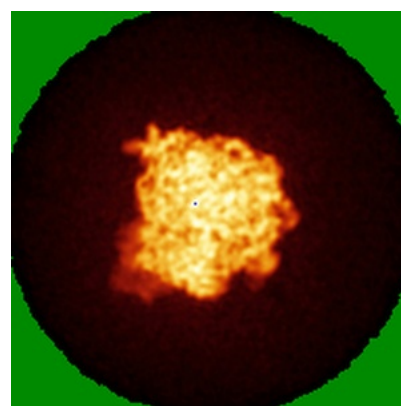
6.4.1 Primary map



X



Y



Z

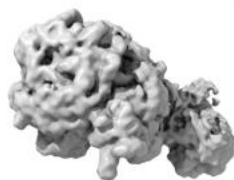
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

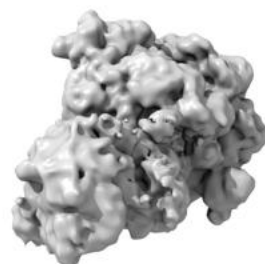
6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0342. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

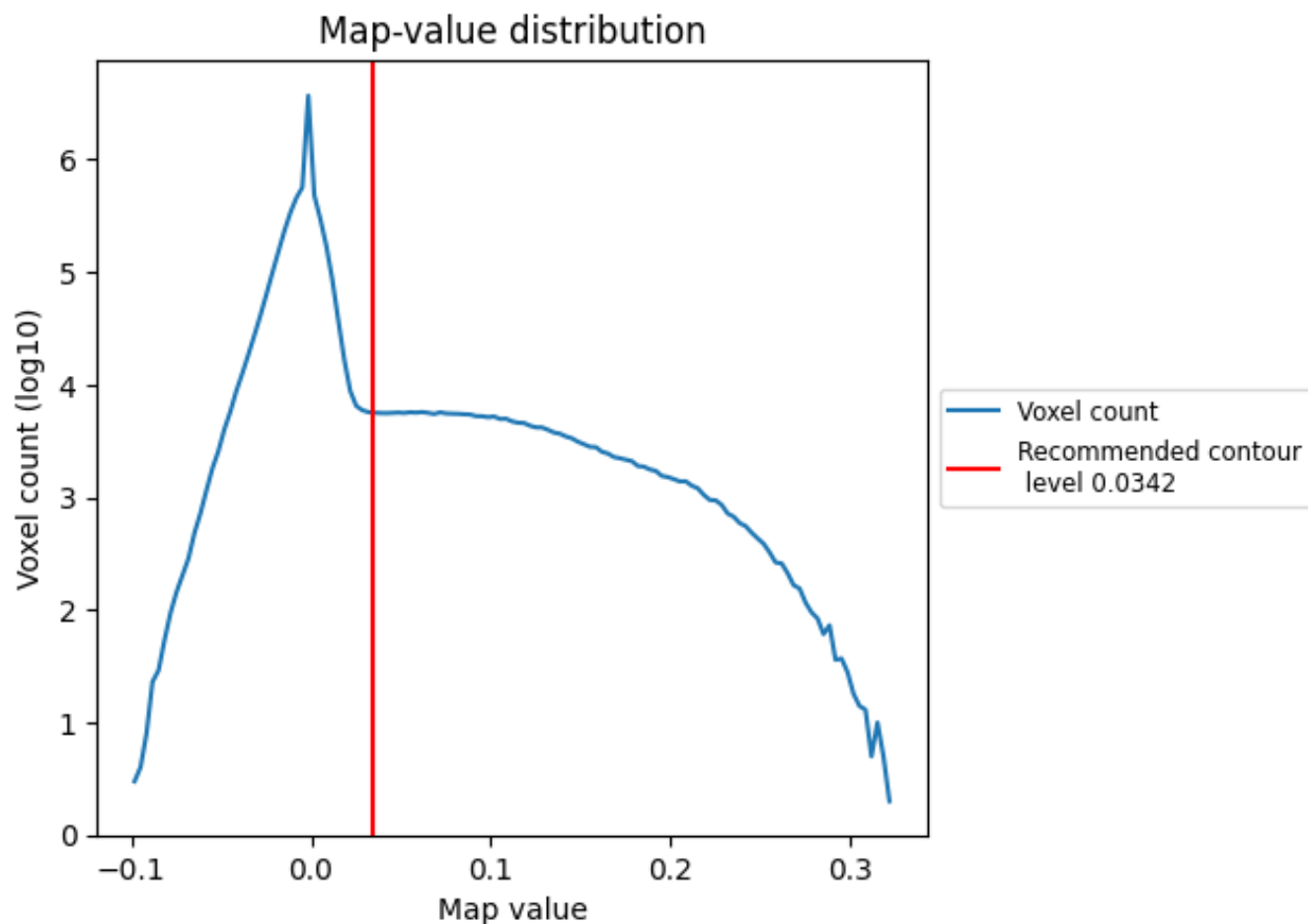
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

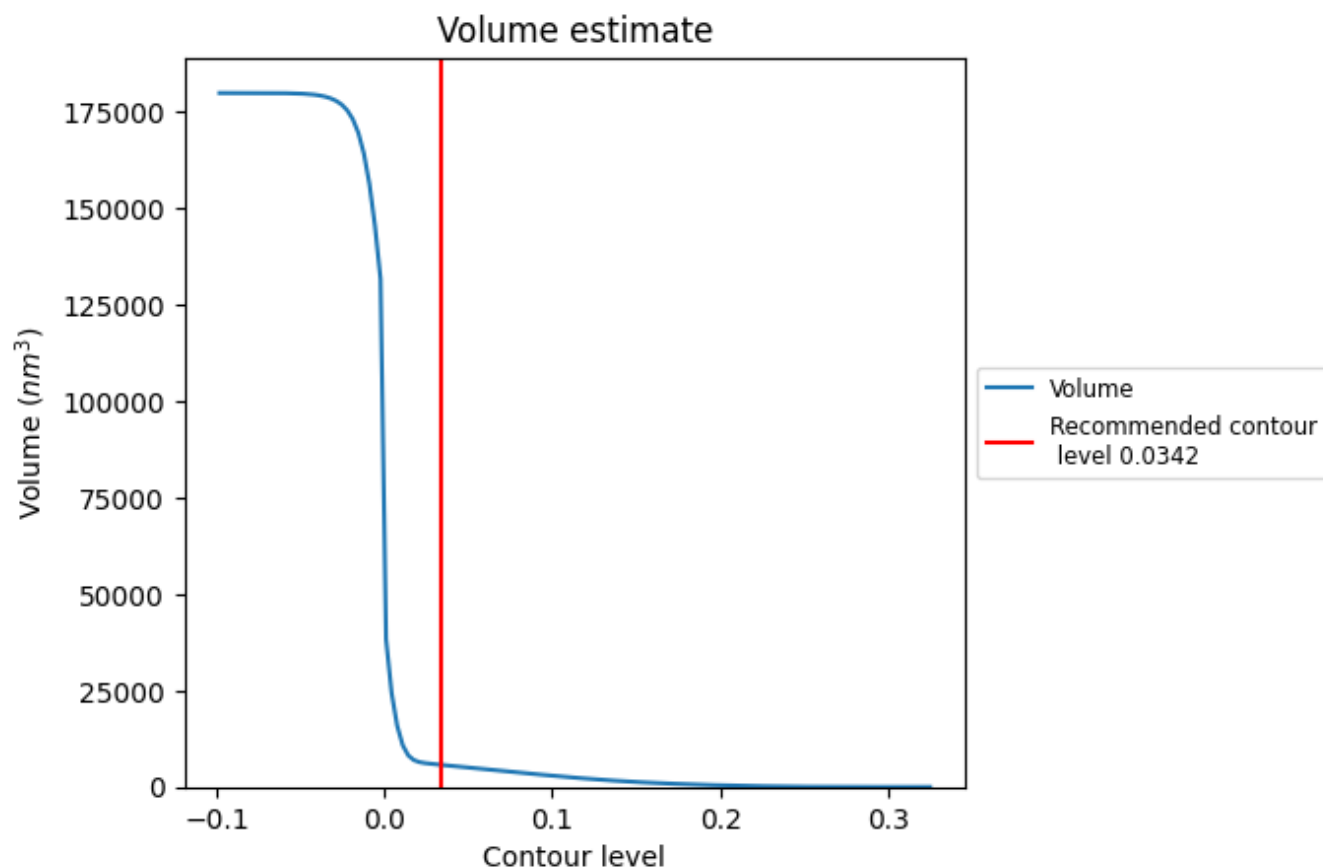
This section contains the results of statistical analysis of the map.

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.

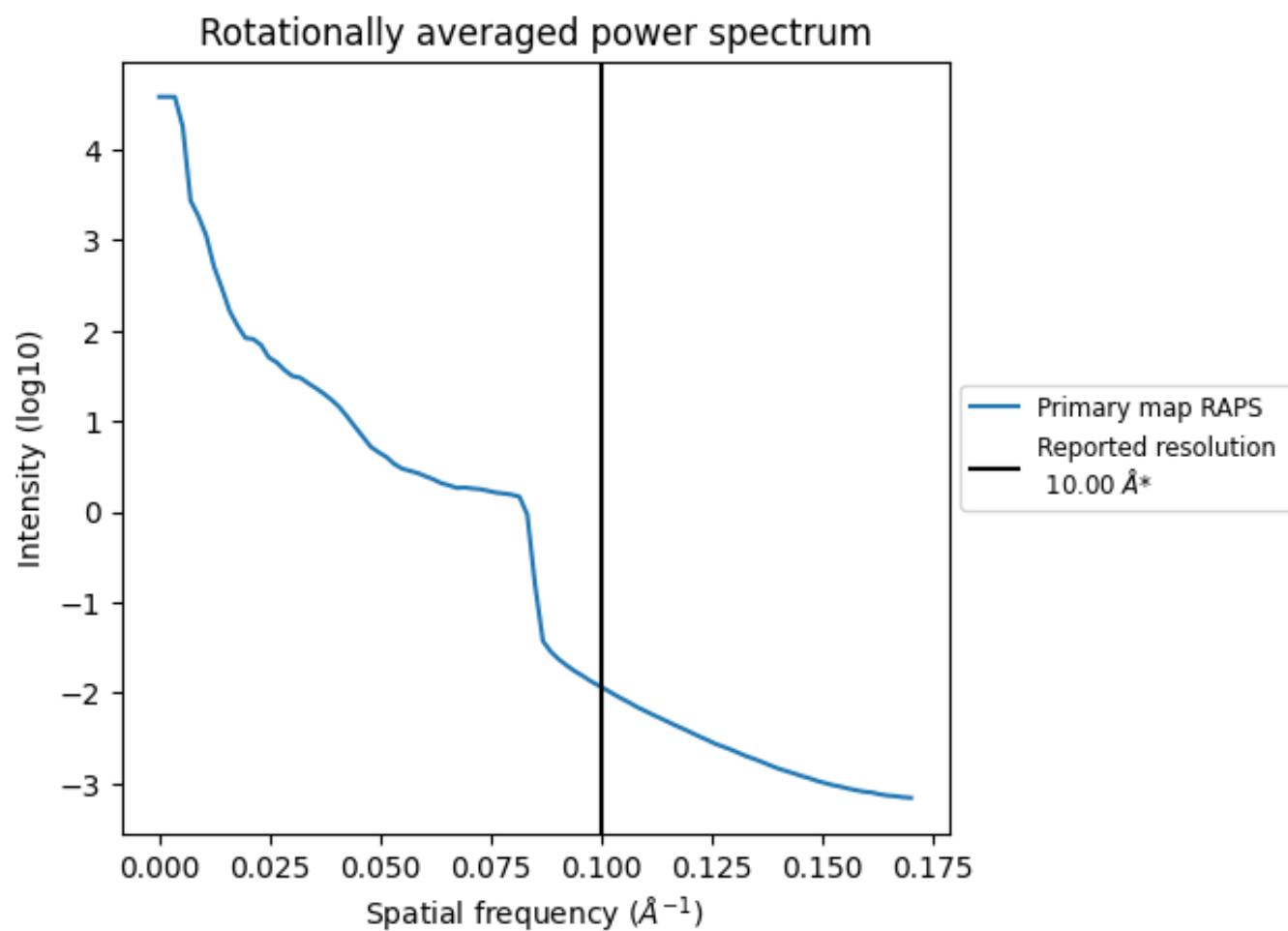
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 5708 nm^3 ; this corresponds to an approximate mass of 5157 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ



*Reported resolution corresponds to spatial frequency of 0.100 Å⁻¹

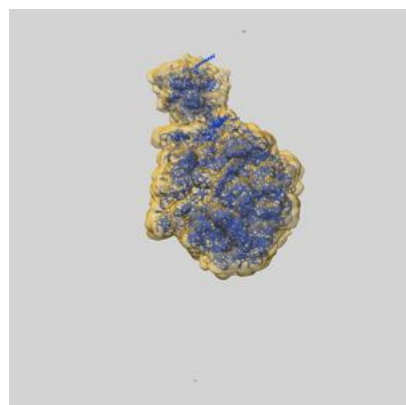
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

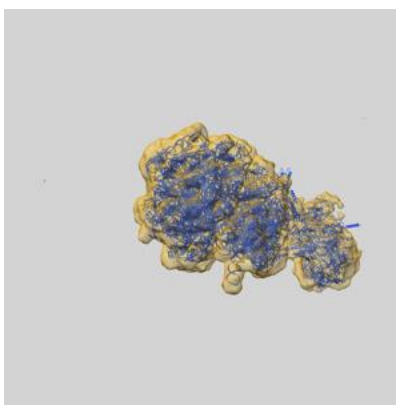
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-21482 and PDB model 6VZ2. Per-residue inclusion information can be found in section [3](#) on page [16](#).

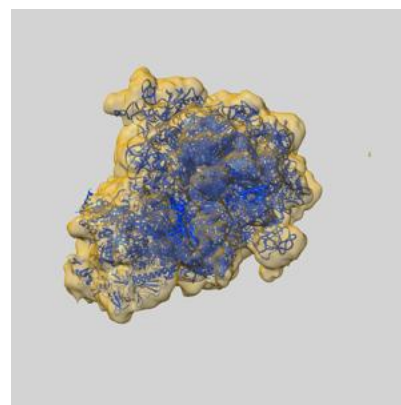
9.1 Map-model overlay [i](#)



X



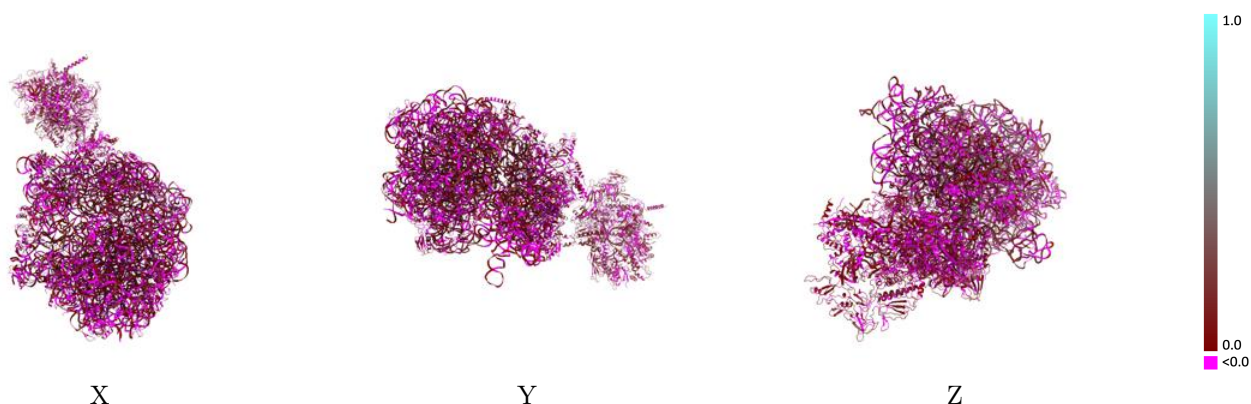
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0342 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](#)

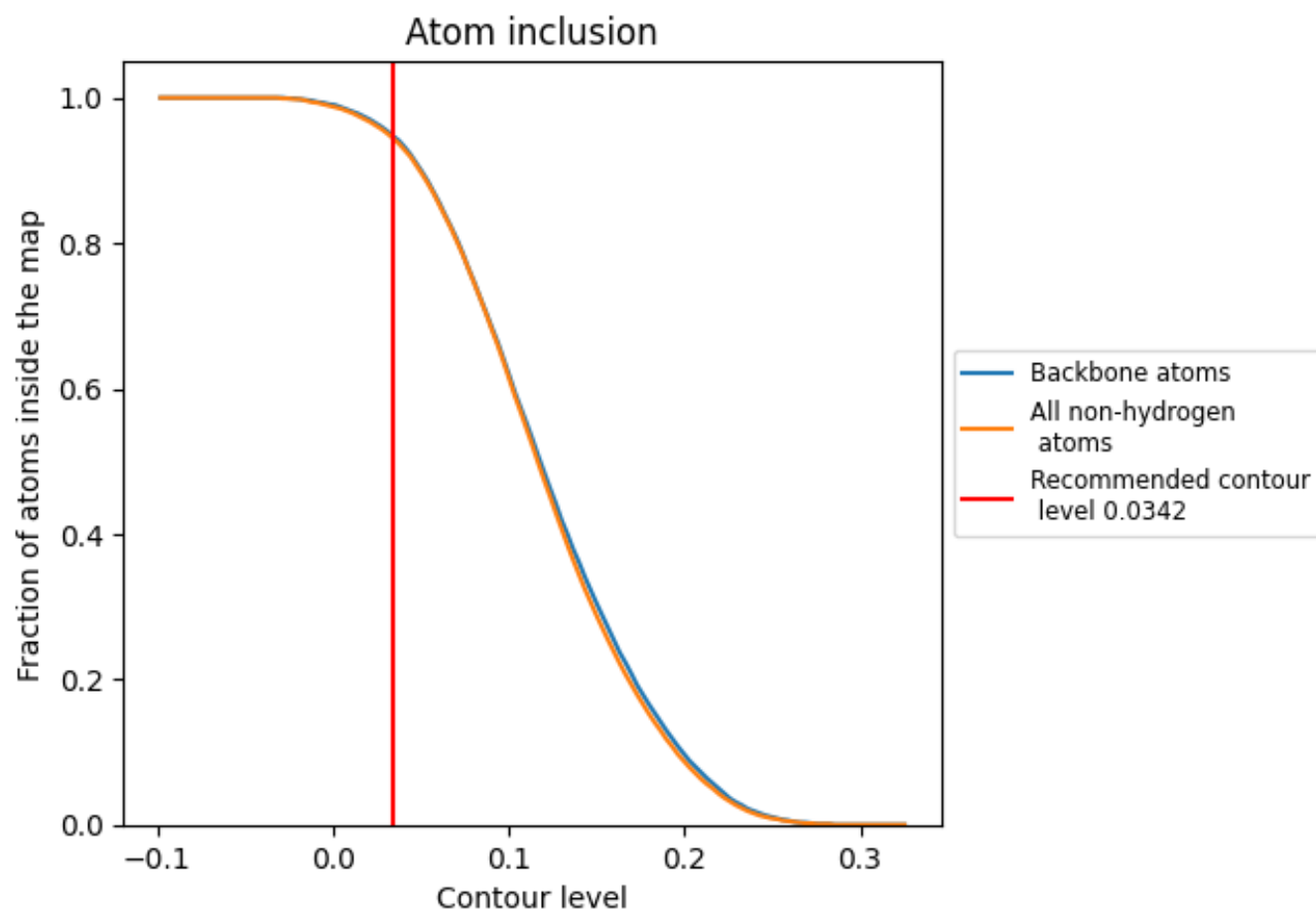


The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

This section was not generated.

9.4 Atom inclusion ⓘ



At the recommended contour level, 95% of all backbone atoms, 94% 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 (0.0342) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9440	 0.0370
0	 0.9990	 0.0150
1	 0.9980	 0.0110
2	 0.9270	 -0.0210
3	 0.8980	 -0.0120
4	 0.9840	 0.0100
5	 0.9980	 0.1100
6	 0.9950	 0.0840
7	 0.8730	 0.0430
A	 0.9110	 0.0810
AA	 0.9700	 0.0510
AB	 0.4510	 -0.0110
AC	 0.7500	 0.0400
AD	 0.7530	 0.0410
AE	 0.9220	 0.0350
AF	 0.2830	 0.0220
B	 0.8990	 0.0500
C	 1.0000	 0.0040
D	 0.9830	 0.0510
E	 0.9280	 0.0060
F	 0.8680	 0.0340
G	 0.5350	 0.0060
H	 0.0930	 -0.0270
I	 0.9590	 -0.0040
J	 0.9850	 -0.0140
K	 0.9920	 0.0340
L	 0.9540	 0.0250
M	 0.9480	 0.0090
N	 0.9520	 -0.0060
O	 0.9520	 -0.0210
P	 0.9990	 0.0210
Q	 0.9840	 0.0400
R	 0.9460	 0.0500
S	 1.0000	 -0.0090
T	 0.9830	 0.0310



Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
U	 0.9980	 0.0070
V	 0.9350	 0.0480
W	 0.9180	 0.0010
X	 0.8700	 -0.0040
Y	 0.7670	 -0.0420
a	 0.9760	 0.0490
b	 1.0000	 -0.0260
c	 0.9620	 0.0270
d	 0.9760	 0.0320
e	 0.9570	 -0.0280
f	 1.0000	 0.0130
g	 0.9510	 0.0270
h	 0.9780	 0.0270
i	 0.9510	 -0.0290
j	 0.9790	 -0.0130
k	 0.9280	 0.0100
l	 0.9680	 0.0100
m	 0.9660	 0.0030
n	 0.9120	 0.0290
o	 0.9980	 -0.0030
p	 0.9800	 0.0250
q	 1.0000	 -0.0170
r	 0.7880	 -0.0060
s	 0.9860	 -0.0070
t	 0.9920	 0.0180
u	 1.0000	 -0.0080
v	 0.9750	 0.0380
w	 1.0000	 -0.0090
x	 0.9990	 -0.0020
y	 0.9480	 -0.0210
z	 1.0000	 -0.0180