



wwPDB EM Validation Summary Report ⓘ

Nov 22, 2022 – 09:06 PM JST

PDB ID : 7VBC
EMDB ID : EMD-31878
Title : Back track state of human RNA Polymerase I Elongation Complex
Authors : Zhao, D.; Liu, W.; Chen, K.; Yang, H.; Xu, Y.
Deposited on : 2021-08-31
Resolution : 3.01 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.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

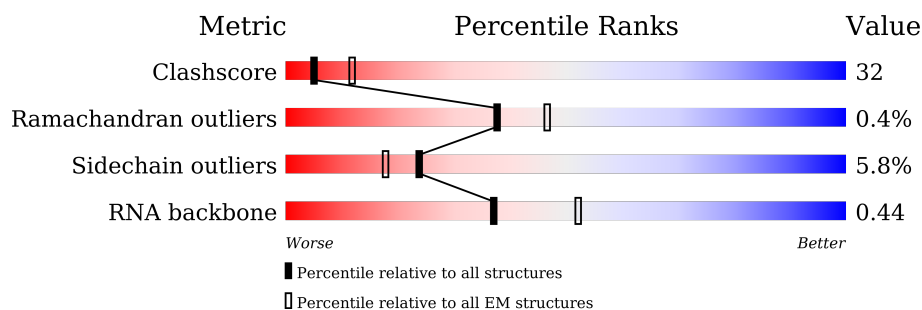
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.01 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	1719	
2	B	1135	
3	C	346	
4	E	210	
5	F	127	
6	H	150	
7	J	67	

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Mol	Chain	Length	Quality of chain
8	K	133	
9	L	58	
10	N	510	
11	G	338	
12	M	419	
13	I	126	
14	R	6	
15	T	20	
16	U	14	

2 Entry composition

There are 18 unique types of molecules in this entry. The entry contains 33414 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called DNA-directed RNA polymerase I subunit RPA1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1477	Total	C	N	O	S	0	0
			11775	7488	2067	2142	78		

- Molecule 2 is a protein called DNA-directed RNA polymerase I subunit RPA2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	1123	Total	C	N	O	S	0	0
			8912	5710	1517	1614	71		

- Molecule 3 is a protein called DNA-directed RNA polymerases I and III subunit RPAC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	337	Total	C	N	O	S	0	0
			2697	1701	480	505	11		

- Molecule 4 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	199	Total	C	N	O	S	0	0
			1641	1042	286	305	8		

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	76	Total	C	N	O	S	0	0
			610	392	103	110	5		

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	H	146	Total	C	N	O	S	0	0
			1176	744	192	235	5		

- Molecule 7 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	J	64	Total	C	N	O	S	0	0
			507	328	86	87	6		

- Molecule 8 is a protein called DNA-directed RNA polymerases I and III subunit RPAC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	K	108	Total	C	N	O	S	0	0
			863	535	156	165	7		

- Molecule 9 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC4.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	L	45	Total	C	N	O	S	0	0
			379	236	73	64	6		

- Molecule 10 is a protein called DNA-directed RNA polymerase I subunit RPA34.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	N	151	Total	C	N	O	S	0	0
			1105	698	198	204	5		

- Molecule 11 is a protein called DNA-directed RNA polymerase I subunit RPA43.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	G	157	Total	C	N	O	S	0	0
			1229	775	215	232	7		

- Molecule 12 is a protein called DNA-directed RNA polymerase I subunit RPA49.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	M	110	Total	C	N	O	S	0	0
			867	539	159	163	6		

- Molecule 13 is a protein called DNA-directed RNA polymerase I subunit RPA12.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	I	107	Total	C	N	O	S	0	0
			822	501	148	162	11		

- Molecule 14 is a RNA chain called RNA (5'-R(P*UP*GP*CP*UP*GP*A)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
14	R	6	Total	C	N	O	P	0	0
			128	57	22	43	6		

- Molecule 15 is a DNA chain called DNA (5'-D(P*AP*GP*GP*AP*CP*AP*GP*CP*GP*TP*GP*TP*CP*AP*GP*CP*AP*AP*TP*A)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
15	T	20	Total	C	N	O	P	0	0
			415	196	83	116	20		

- Molecule 16 is a DNA chain called DNA (5'-D(*GP*TP*AP*CP*TP*GP*TP*CP*CP*TP*CP*TP*GP*G)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
16	U	14	Total	C	N	O	P	0	0
			282	136	47	86	13		

- Molecule 17 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
17	A	2	Total	Zn	0
			2	2	
17	B	1	Total	Zn	0
			1	1	
17	J	1	Total	Zn	0
			1	1	
17	L	1	Total	Zn	0
			1	1	

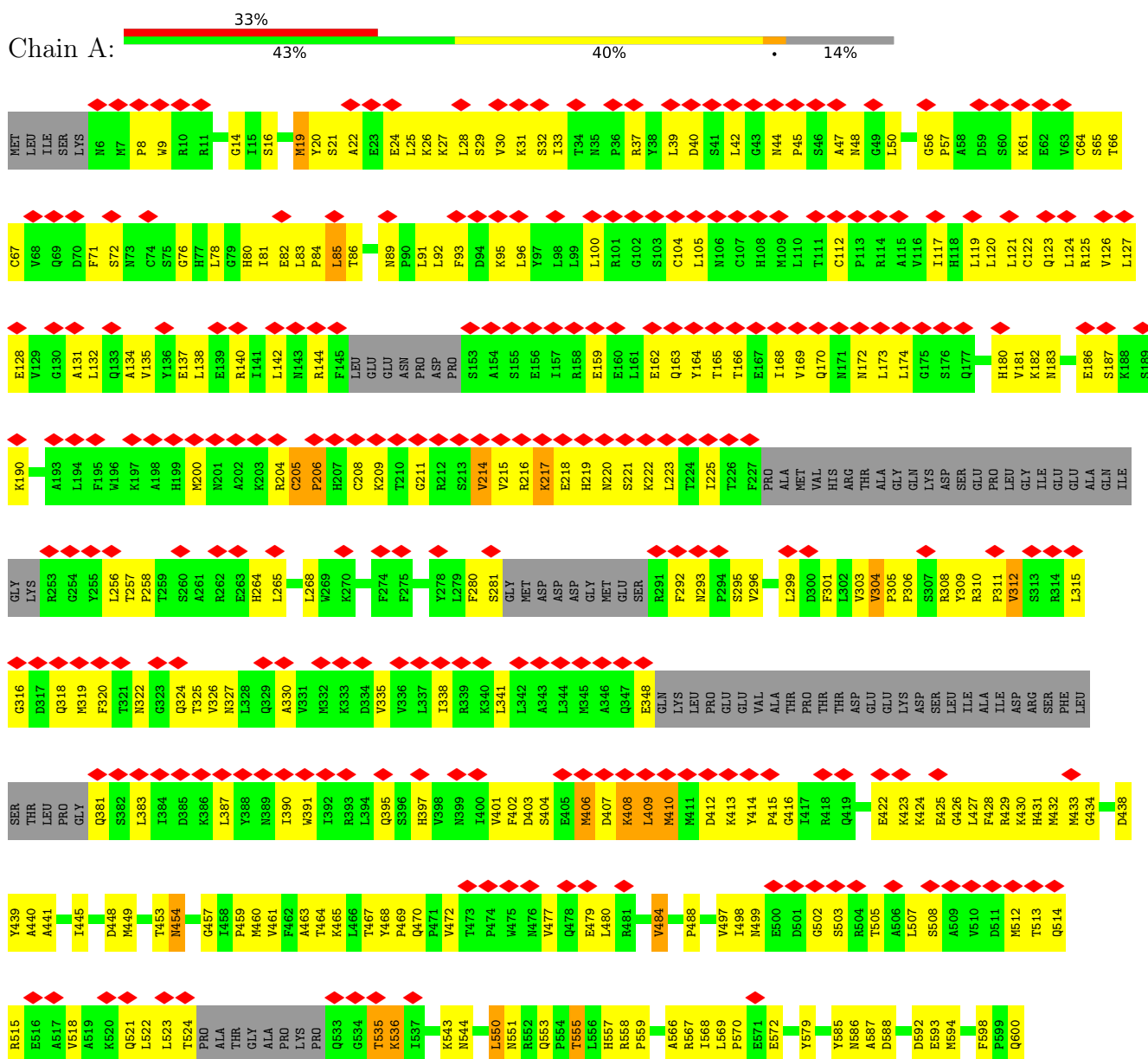
- Molecule 18 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
18	A	1	Total	Mg	0
			1	1	

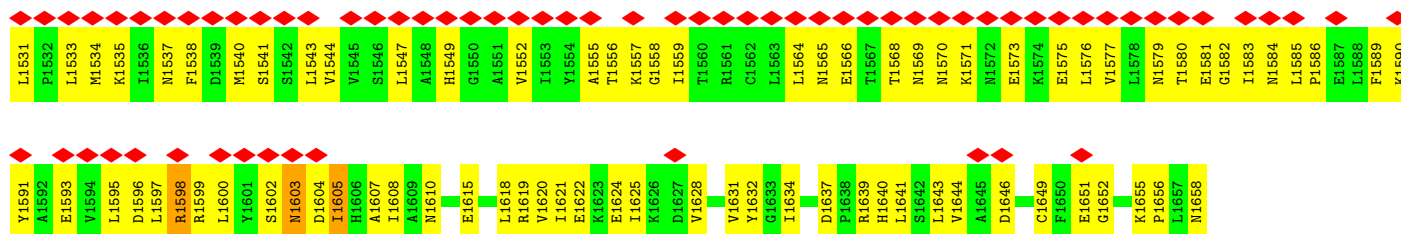
3 Residue-property plots

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.

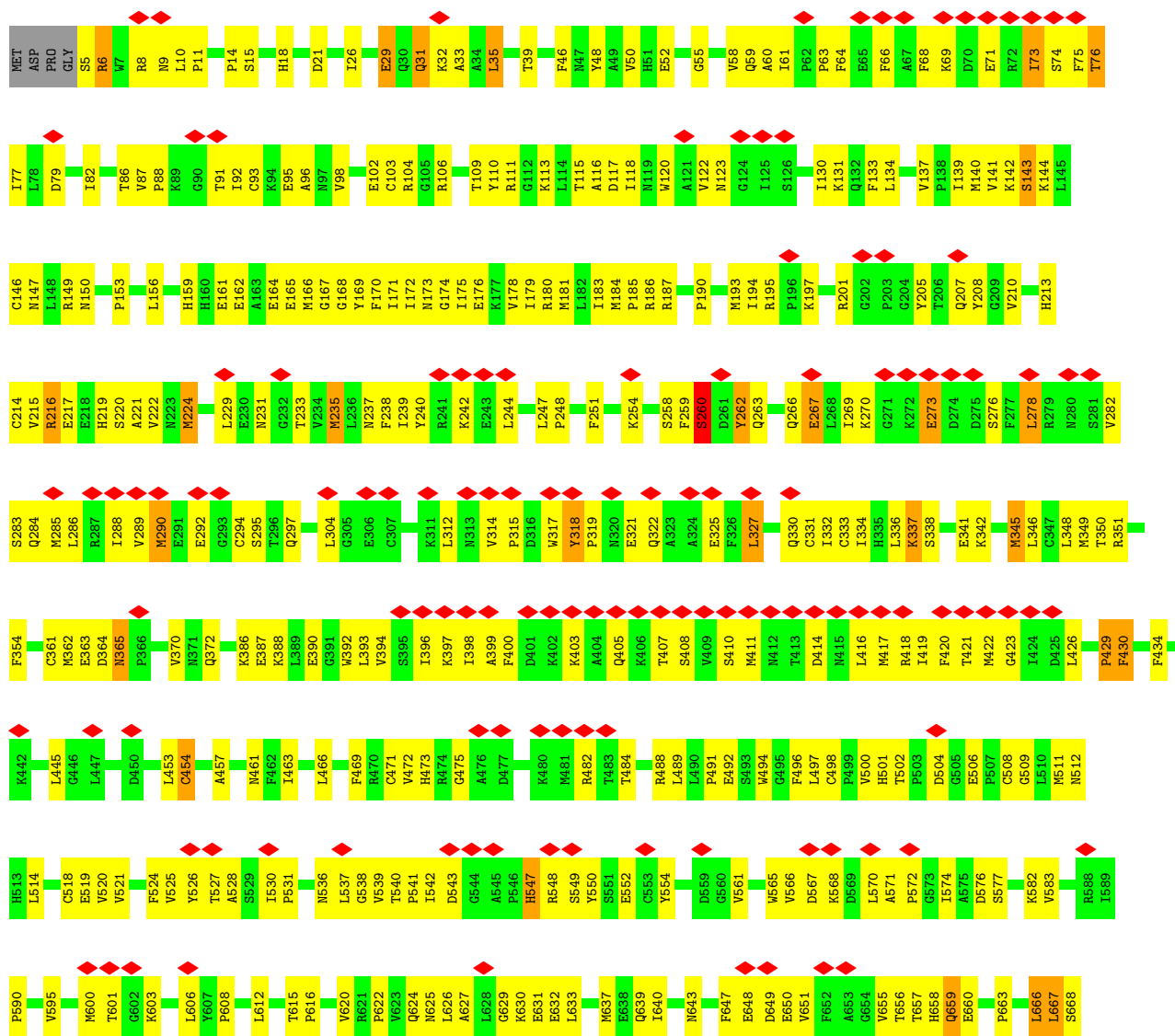
- Molecule 1: DNA-directed RNA polymerase I subunit RPA1

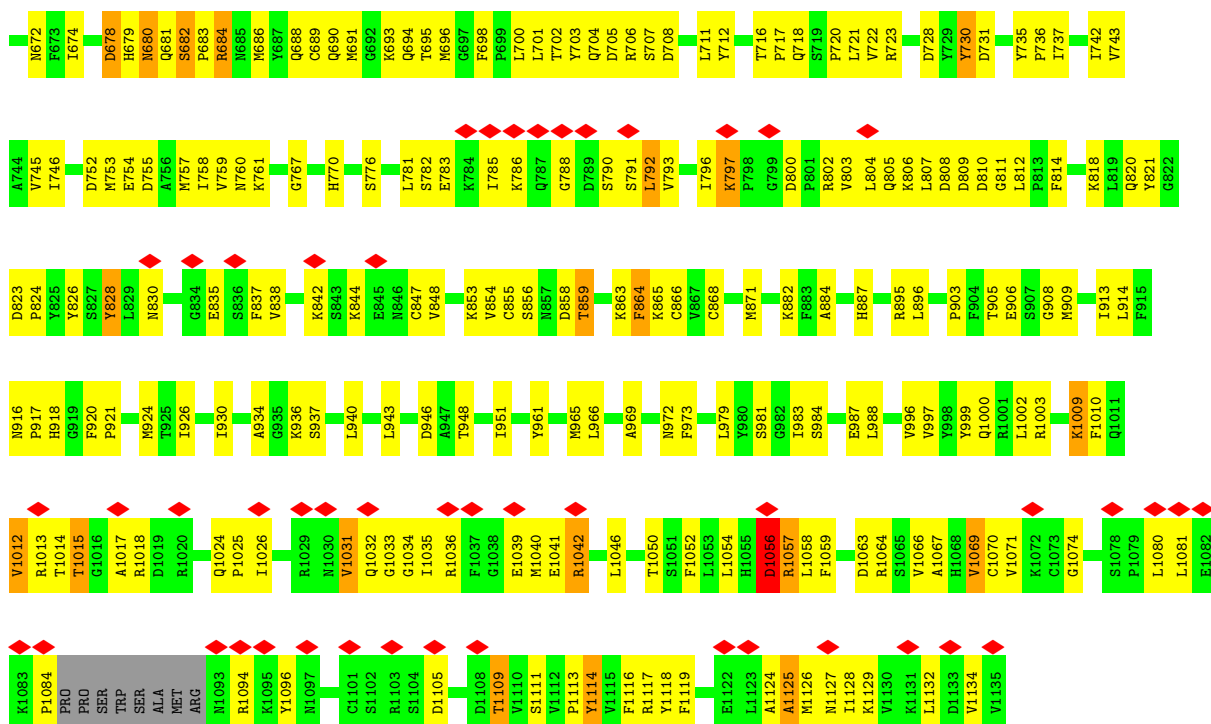




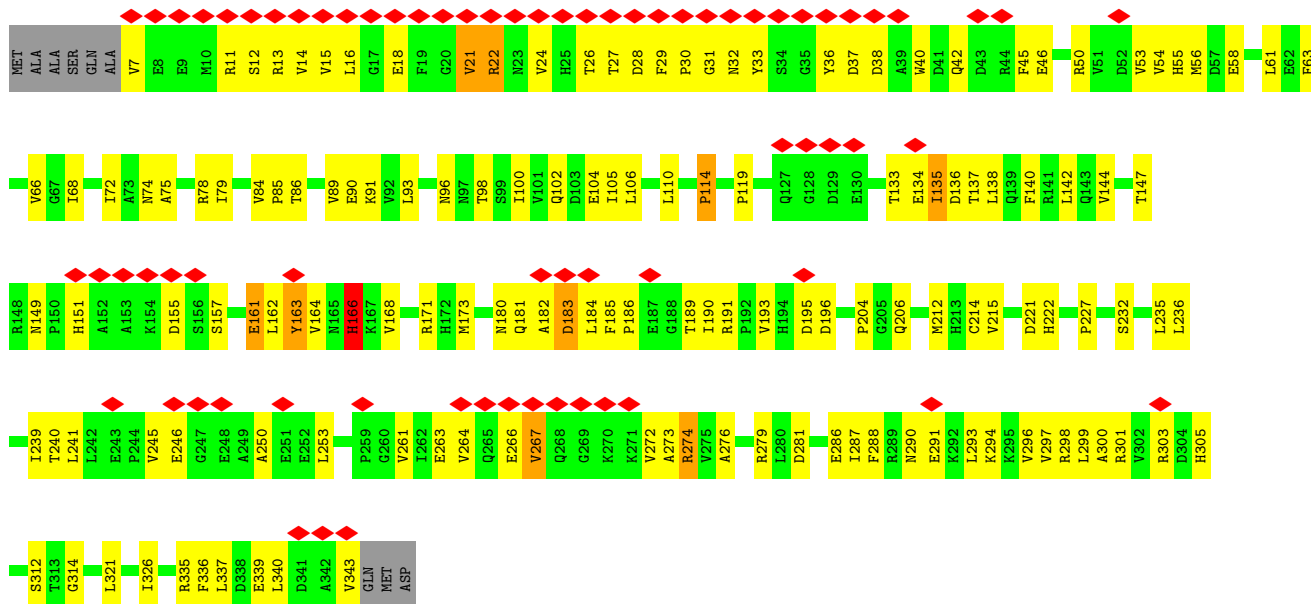


• Molecule 2: DNA-directed RNA polymerase I subunit RPA2

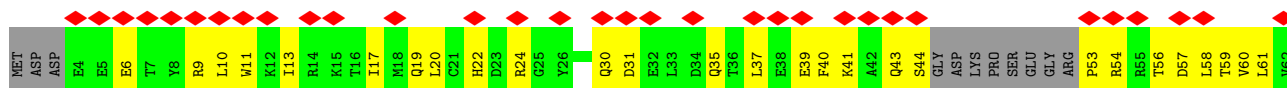




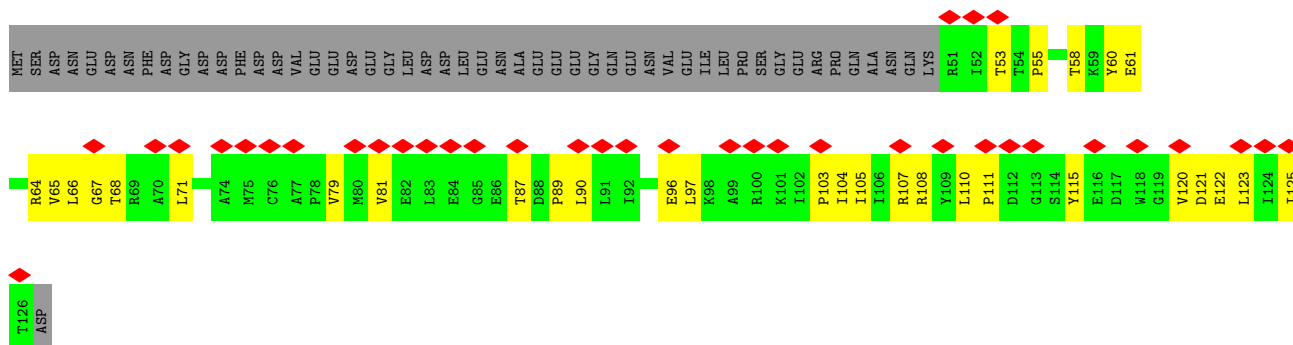
• Molecule 3: DNA-directed RNA polymerases I and III subunit RPAC1



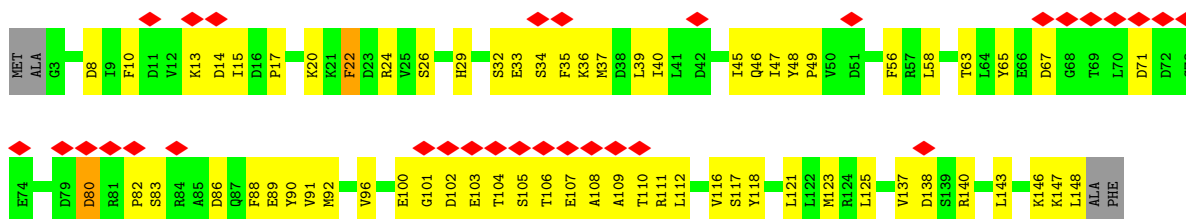
• Molecule 4: DNA-directed RNA polymerases I, II, and III subunit RPABC1



- Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC2



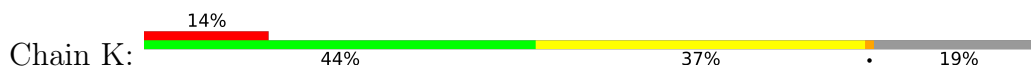
- Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC3



- Molecule 7: DNA-directed RNA polymerases I, II, and III subunit RPABC5



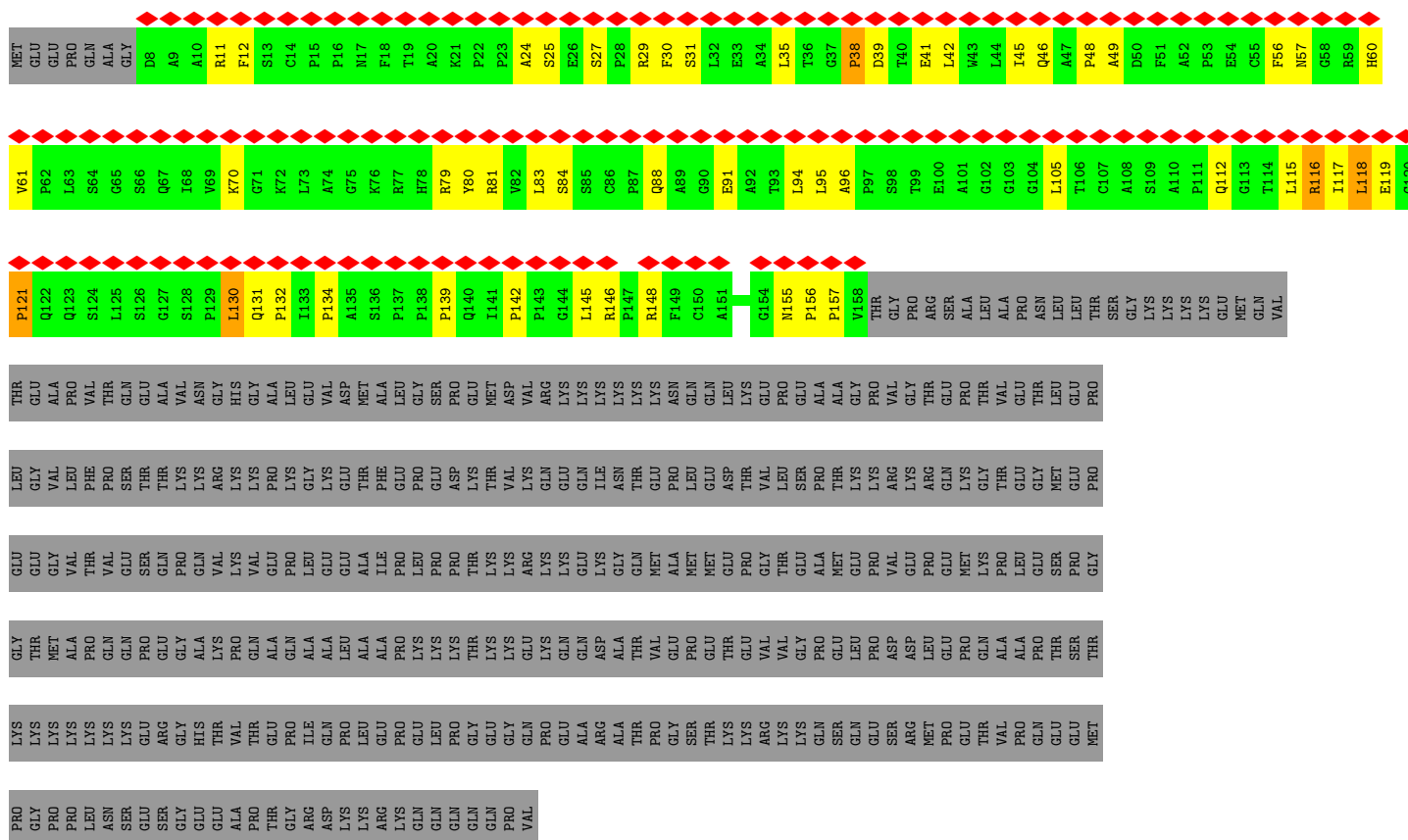
- Molecule 8: DNA-directed RNA polymerases I and III subunit RPAC2



- Molecule 9: DNA-directed RNA polymerases I, II, and III subunit RPABC4

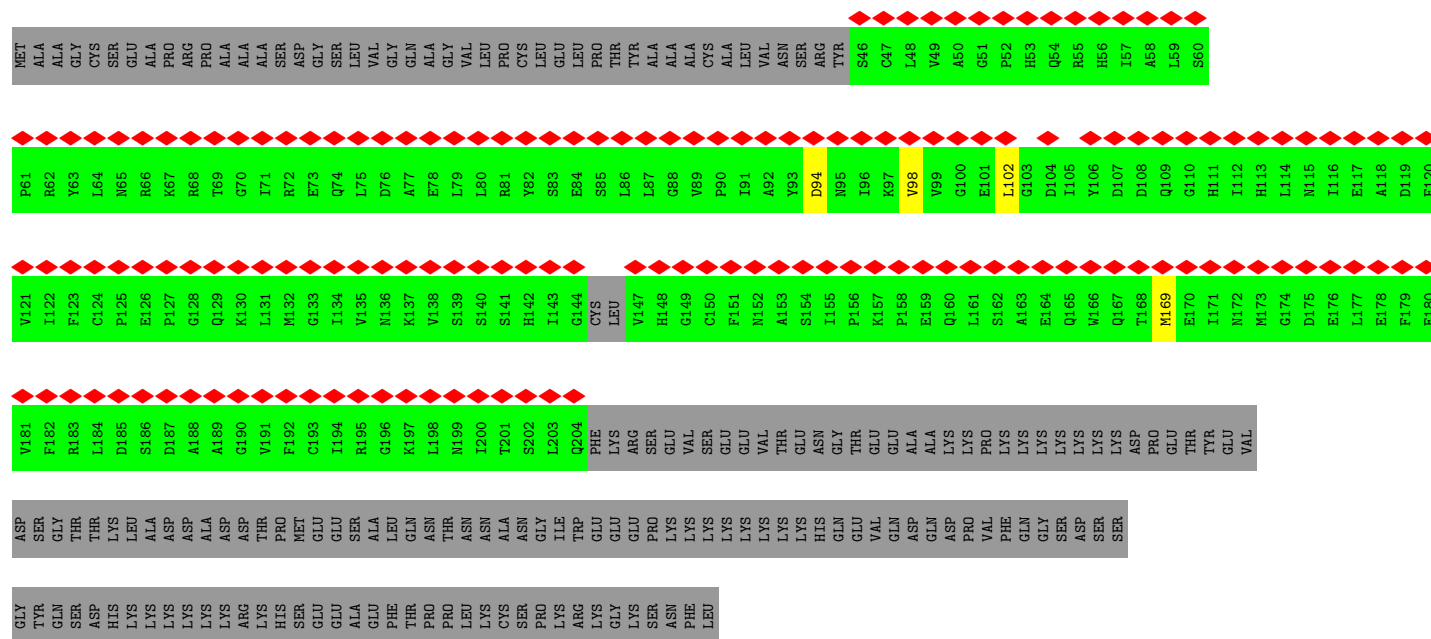


- Molecule 10: DNA-directed RNA polymerase I subunit RPA34

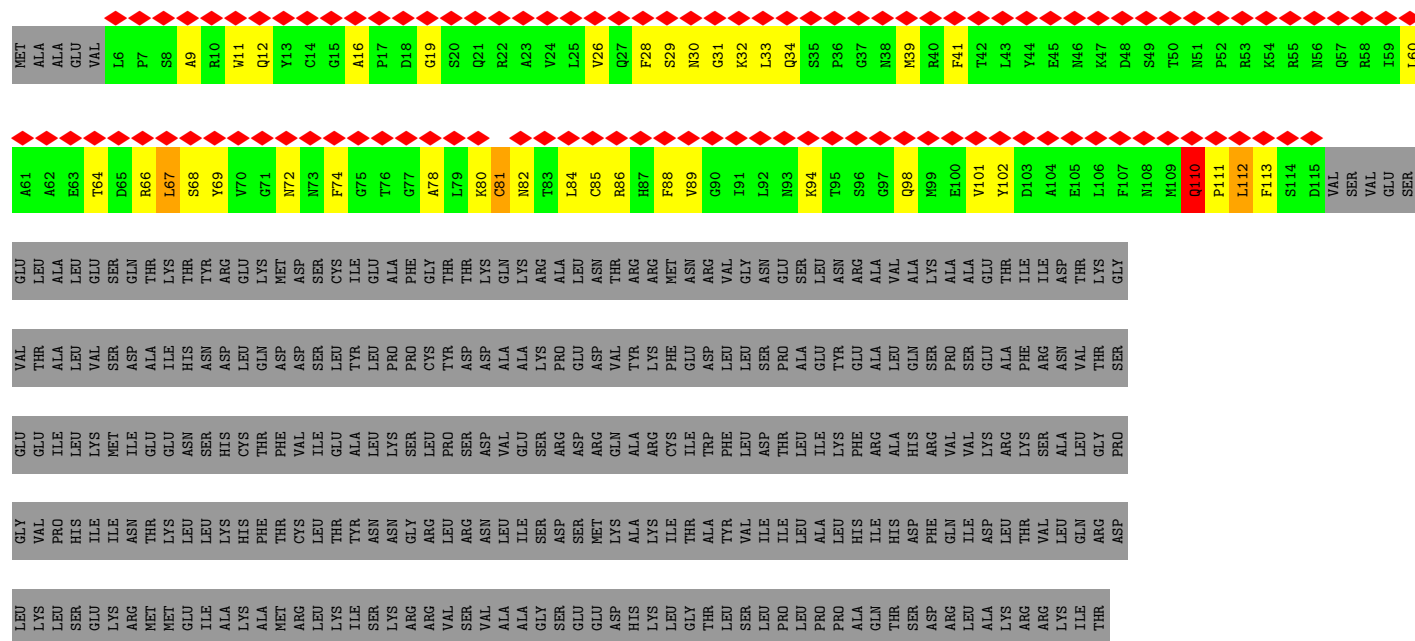


- Molecule 11: DNA-directed RNA polymerase I subunit RPA43

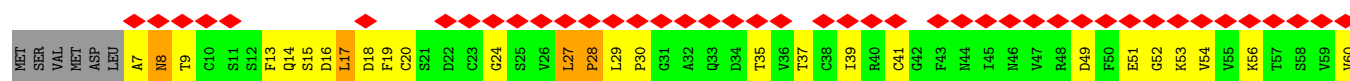


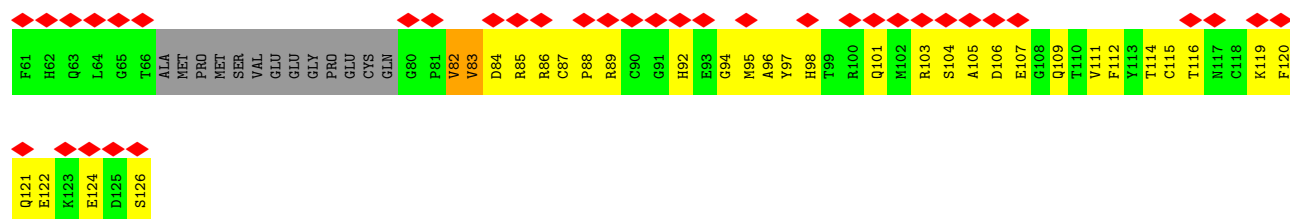


• Molecule 12: DNA-directed RNA polymerase I subunit RPA49

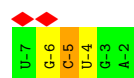


• Molecule 13: DNA-directed RNA polymerase I subunit RPA12





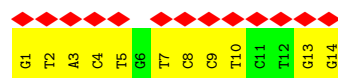
- Molecule 14: RNA (5'-R(P*UP*GP*CP*UP*GP*A)-3')



- Molecule 15: DNA (5'-D(P*AP*GP*GP*AP*CP*AP*GP*CP*GP*TP*GP*TP*CP*AP*GP*CP*AP*AP*TP*A)-3')



- Molecule 16: DNA (5'-D(*GP*TP*AP*CP*TP*GP*TP*CP*CP*TP*CP*TP*GP*G)-3')



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	152653	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	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	3.977	Depositor
Minimum map value	-2.344	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.112	Depositor
Recommended contour level	0.575	Depositor
Map size (\AA)	337.28, 337.28, 337.28	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.054, 1.054, 1.054	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	A	0.48	1/12014 (0.0%)	0.70	6/16219 (0.0%)
2	B	0.54	4/9127 (0.0%)	0.80	10/12350 (0.1%)
3	C	0.50	0/2751	0.79	3/3729 (0.1%)
4	E	0.32	0/1669	0.49	0/2254
5	F	0.32	0/620	0.48	0/839
6	H	0.38	0/1197	0.60	1/1614 (0.1%)
7	J	0.46	0/516	0.80	1/696 (0.1%)
8	K	0.34	0/878	0.61	0/1182
9	L	0.33	0/385	0.55	0/511
10	N	0.76	2/1140 (0.2%)	0.87	2/1560 (0.1%)
11	G	0.33	0/1252	0.55	0/1691
12	M	0.69	0/884	0.79	2/1192 (0.2%)
13	I	0.44	0/836	0.70	1/1126 (0.1%)
14	R	0.71	0/142	0.86	0/219
15	T	0.81	0/467	0.89	1/719 (0.1%)
16	U	0.67	0/314	1.07	0/483
All	All	0.50	7/34192 (0.0%)	0.73	27/46384 (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
1	A	0	1
2	B	0	4
All	All	0	5

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	N	57	ASN	C-N	6.47	1.44	1.33
10	N	38	PRO	N-CD	5.76	1.55	1.47
2	B	143	SER	CA-CB	-5.64	1.44	1.52
2	B	283	SER	CA-CB	-5.45	1.44	1.52
1	A	674	SER	CA-CB	-5.37	1.44	1.52

The worst 5 of 27 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	J	10	CYS	CB-CA-C	-9.88	90.65	110.40
10	N	121	PRO	CA-N-CD	-8.63	99.42	111.50
1	A	875	GLU	C-N-CA	-7.54	102.85	121.70
15	T	-6	DA	O4'-C4'-C3'	-6.10	102.06	104.50
2	B	1040	MET	O-C-N	-6.07	112.99	122.70

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	721	PRO	Mainchain
2	B	1056	ASP	Mainchain
2	B	1057	ARG	Mainchain
2	B	1058	LEU	Mainchain
2	B	684	ARG	Mainchain

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	11775	0	11912	949	0
2	B	8912	0	8896	748	0
3	C	2697	0	2676	162	0
4	E	1641	0	1671	133	0
5	F	610	0	642	55	0
6	H	1176	0	1137	66	0
7	J	507	0	523	26	0
8	K	863	0	850	60	0
9	L	379	0	387	25	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
10	N	1105	0	1098	89	0
11	G	1229	0	1212	0	0
12	M	867	0	844	150	0
13	I	822	0	774	169	0
14	R	128	0	64	2	0
15	T	415	0	224	39	0
16	U	282	0	161	12	0
17	A	2	0	0	0	0
17	B	1	0	0	0	0
17	J	1	0	0	0	0
17	L	1	0	0	0	0
18	A	1	0	0	0	0
All	All	33414	0	33071	2071	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 32.

The worst 5 of 2071 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)
1:A:972:ARG:NH2	2:B:509:GLY:HA2	1.17	1.46
12:M:33:LEU:HD22	12:M:39:MET:CE	1.47	1.44
10:N:142:PRO:CG	10:N:145:LEU:HD21	1.50	1.42
1:A:975:LEU:CD2	13:I:104:SER:HA	1.49	1.41
10:N:142:PRO:HG2	10:N:145:LEU:CD2	1.54	1.35

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1459/1719 (85%)	1310 (90%)	141 (10%)	8 (0%)	29	66
2	B	1119/1135 (99%)	1017 (91%)	99 (9%)	3 (0%)	41	75
3	C	335/346 (97%)	312 (93%)	23 (7%)	0	100	100
4	E	195/210 (93%)	185 (95%)	10 (5%)	0	100	100
5	F	74/127 (58%)	70 (95%)	4 (5%)	0	100	100
6	H	144/150 (96%)	130 (90%)	14 (10%)	0	100	100
7	J	62/67 (92%)	59 (95%)	3 (5%)	0	100	100
8	K	106/133 (80%)	96 (91%)	9 (8%)	1 (1%)	17	53
9	L	43/58 (74%)	37 (86%)	6 (14%)	0	100	100
10	N	149/510 (29%)	134 (90%)	13 (9%)	2 (1%)	12	43
11	G	153/338 (45%)	138 (90%)	14 (9%)	1 (1%)	22	59
12	M	108/419 (26%)	107 (99%)	1 (1%)	0	100	100
13	I	103/126 (82%)	68 (66%)	32 (31%)	3 (3%)	4	23
All	All	4050/5338 (76%)	3663 (90%)	369 (9%)	18 (0%)	38	71

5 of 18 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	214	VAL
1	A	1605	ILE
2	B	1125	ALA
10	N	156	PRO
13	I	28	PRO

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	A	1298/1503 (86%)	1215 (94%)	83 (6%)	17	49
2	B	982/992 (99%)	902 (92%)	80 (8%)	11	38
3	C	296/302 (98%)	275 (93%)	21 (7%)	14	44

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	E	183/192 (95%)	181 (99%)	2 (1%)	73	90
5	F	66/111 (60%)	66 (100%)	0	100	100
6	H	129/131 (98%)	126 (98%)	3 (2%)	50	79
7	J	53/56 (95%)	50 (94%)	3 (6%)	20	54
8	K	96/119 (81%)	94 (98%)	2 (2%)	53	81
9	L	42/55 (76%)	41 (98%)	1 (2%)	49	79
10	N	119/427 (28%)	114 (96%)	5 (4%)	30	65
11	G	135/288 (47%)	132 (98%)	3 (2%)	52	80
12	M	94/366 (26%)	90 (96%)	4 (4%)	29	64
13	I	94/111 (85%)	92 (98%)	2 (2%)	53	81
All	All	3587/4653 (77%)	3378 (94%)	209 (6%)	24	53

5 of 209 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	338	SER
2	B	828	TYR
10	N	130	LEU
2	B	365	ASN
2	B	547	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 82 such sidechains are listed below:

Mol	Chain	Res	Type
2	B	734	ASN
3	C	305	HIS
2	B	887	HIS
3	C	102	GLN
7	J	61	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
14	R	5/6 (83%)	2 (40%)	0

All (2) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
14	R	-6	G
14	R	-5	C

There are no RNA pucker outliers to report.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 6 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.

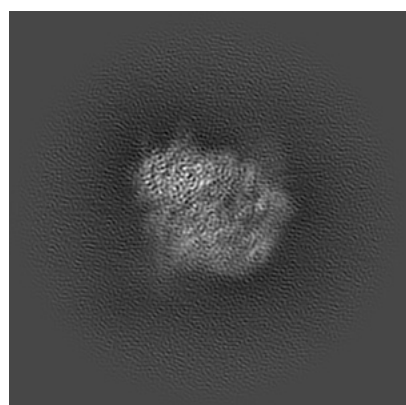
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-31878. These allow visual inspection of the internal detail of the map and identification of artifacts.

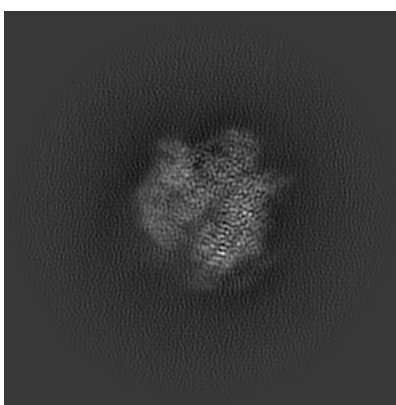
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

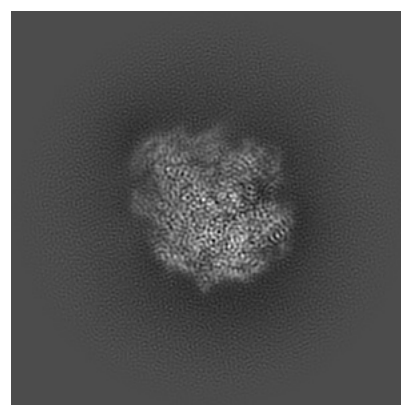
6.1.1 Primary map



X



Y

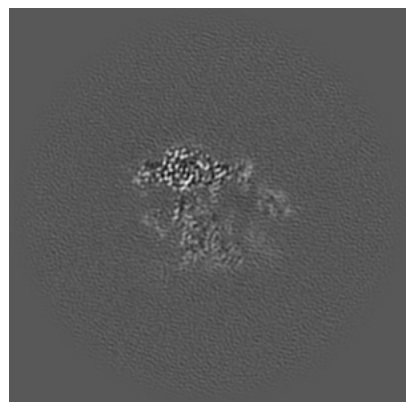


Z

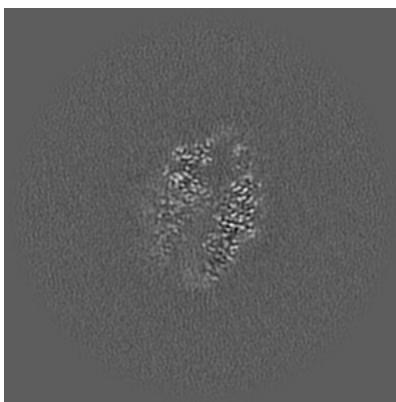
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

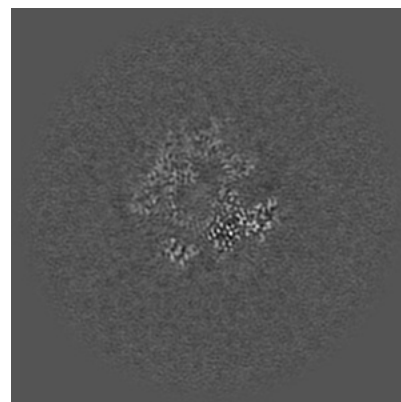
6.2.1 Primary map



X Index: 160



Y Index: 160

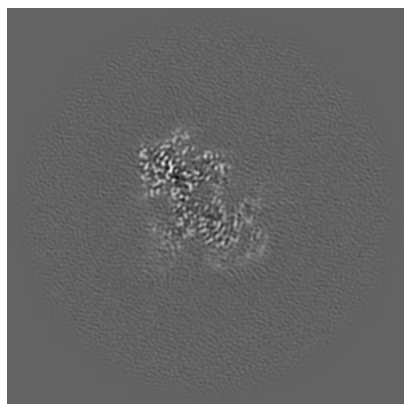


Z Index: 160

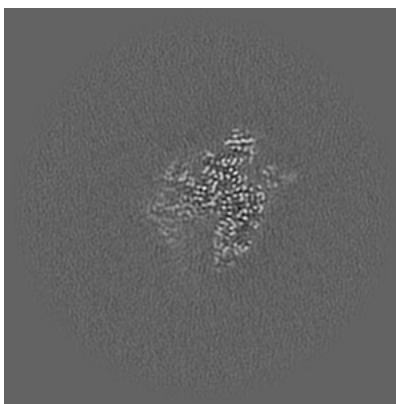
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

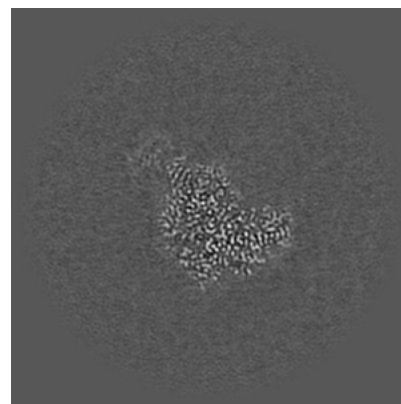
6.3.1 Primary map



X Index: 179



Y Index: 139



Z Index: 185

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

6.4 Orthogonal surface views [i](#)

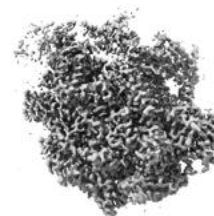
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.575. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

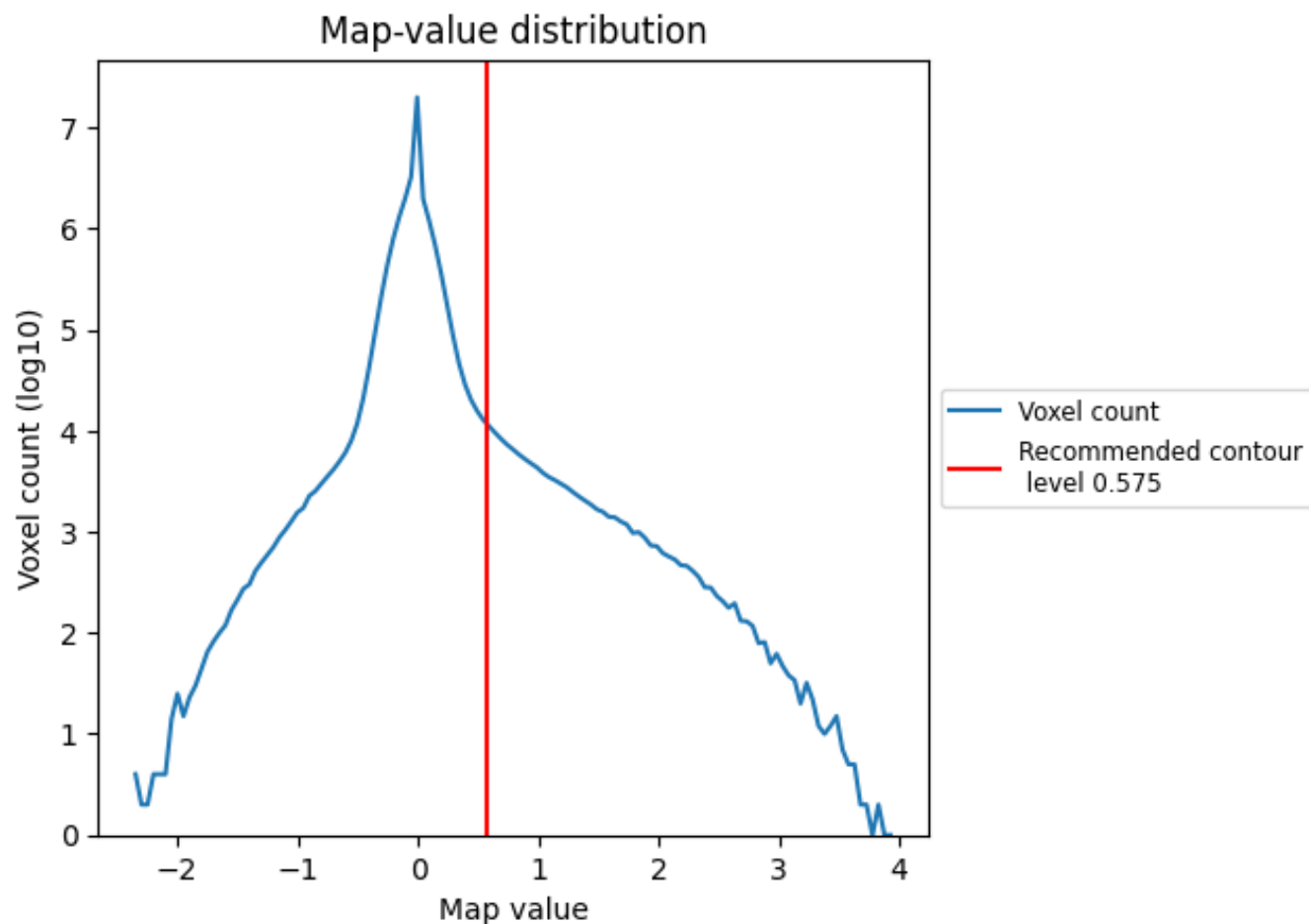
6.5 Mask visualisation

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

7 Map analysis [i](#)

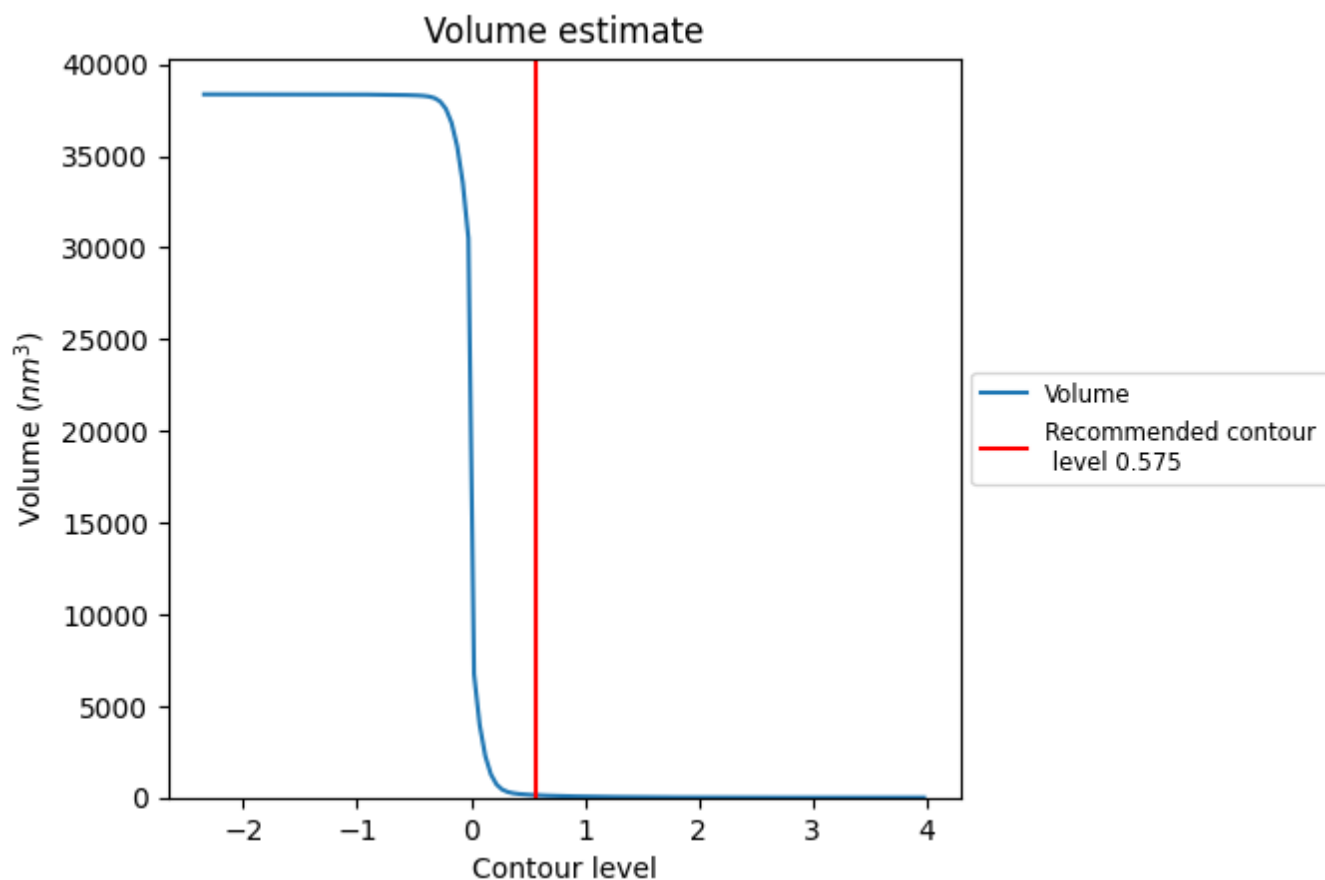
This section contains the results of statistical analysis of the map.

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.

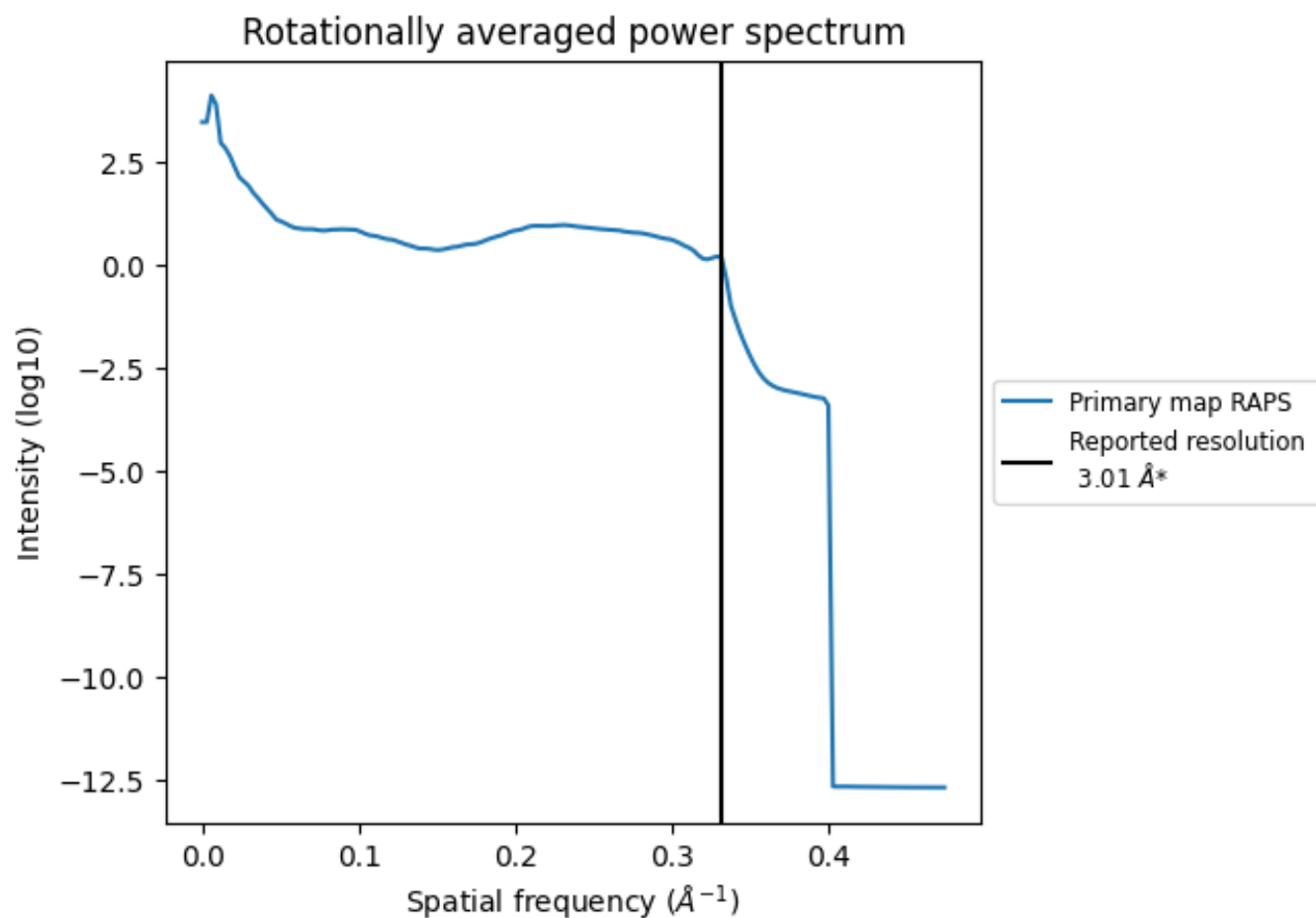
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 129 nm³; this corresponds to an approximate mass of 117 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 0.332 Å⁻¹

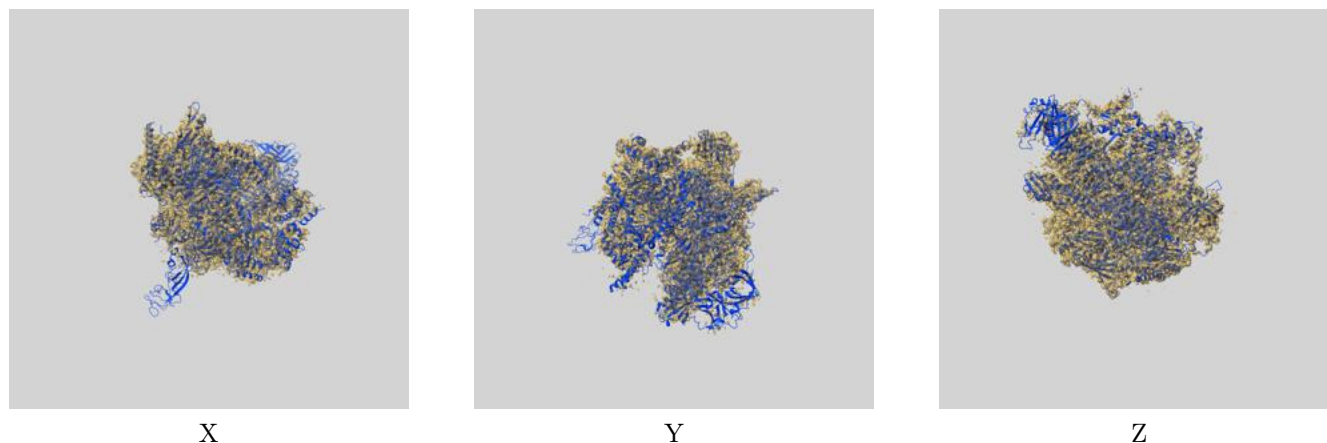
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

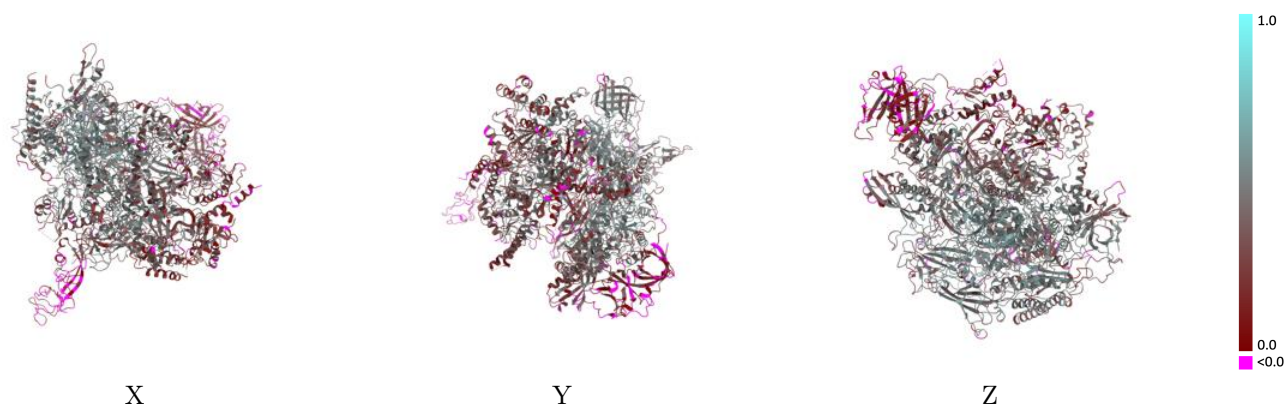
This section contains information regarding the fit between EMDB map EMD-31878 and PDB model 7VBC. Per-residue inclusion information can be found in [section 3](#) on [page 7](#).

9.1 Map-model overlay [i](#)



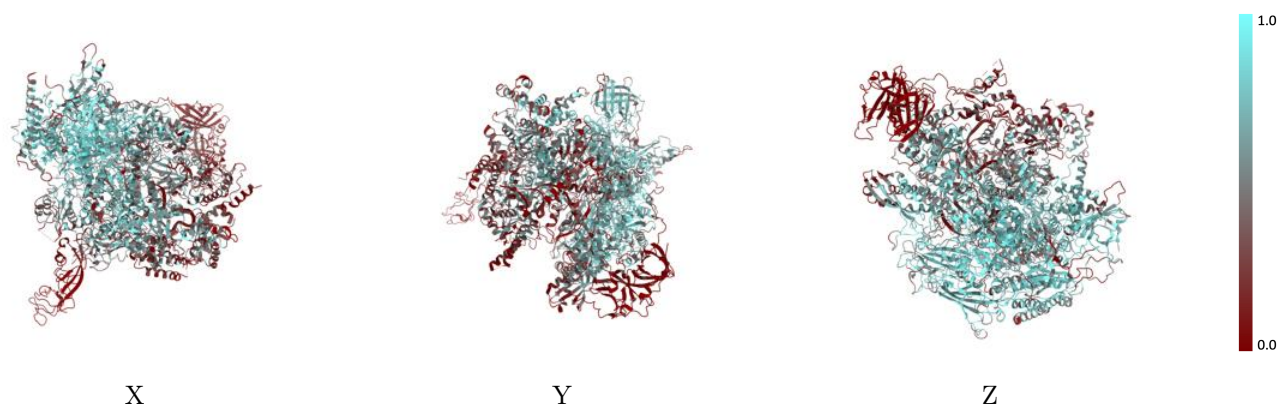
The images above show the 3D surface view of the map at the recommended contour level 0.575 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



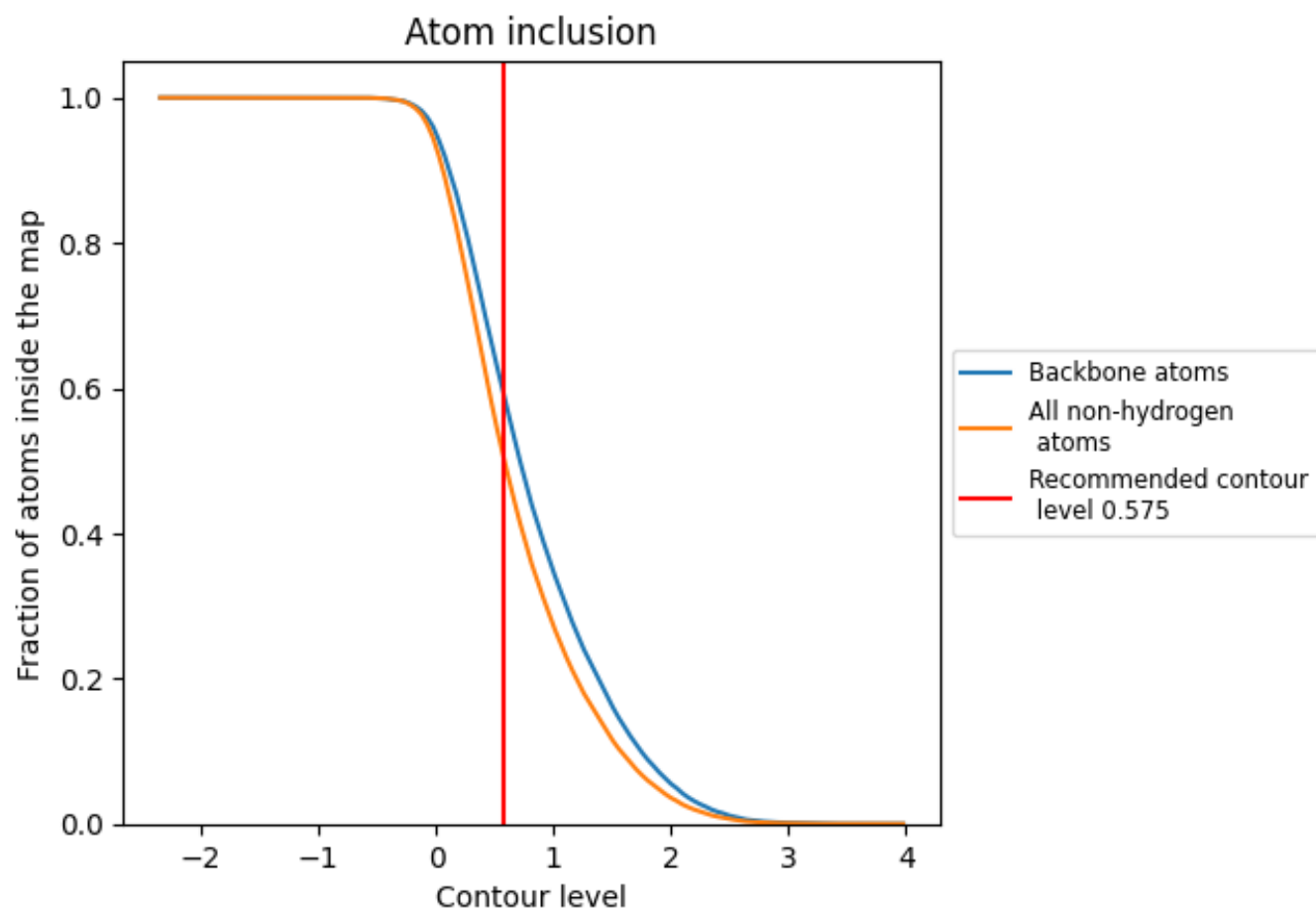
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.575).



































9.4 Atom inclusion [i](#)



At the recommended contour level, 59% of all backbone atoms, 51% 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 (0.575) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.5061	 0.3730
A	 0.5017	 0.3710
B	 0.6555	 0.4570
C	 0.6221	 0.4270
E	 0.4238	 0.2760
F	 0.4382	 0.3070
G	 0.0257	 0.0550
H	 0.6327	 0.4230
I	 0.2494	 0.3950
J	 0.8364	 0.5340
K	 0.6631	 0.4370
L	 0.6970	 0.4290
M	 0.0485	 0.1320
N	 0.0332	 0.0980
R	 0.4219	 0.5210
T	 0.2819	 0.3820
U	 0.1170	 0.3040

