WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

May 19, 2024 – 12:25 pm BST

PDB ID	:	8P0J
EMDB ID	:	EMD-17334
Title	:	Cryo EM map and model of the vaccinia RNA polymerase intermediate pre-initiation open promoter complex
Authors	:	Grimm, C.; Jungwirth, S.; Fischer, U.
Deposited on	:	2023-05-10
Resolution	:	2.39 Å(reported)

This is a Full wwPDB EM Validation 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 (i) 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 (i)) were used in the production of this report:

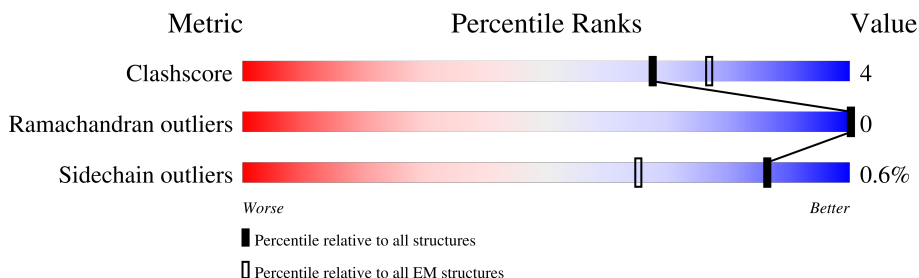|		
EMDB validation analysis	:	0.0.1.dev92
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 2.39 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	Percentile Ranks	Value
Clashscore		4
Ramachandran outliers		0
Sidechain outliers		0.6%

Worse   *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures

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

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 <=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	1286	91% 8% •
2	B	1164	89% 11% •
3	C	305	90% 9%
4	E	185	88% 11% •
5	F	164	61% • 37%
6	G	161	25% 84% 11% 5%
7	H	382	6% 89% 11%
8	J	63	79% 16% • •

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Mol	Chain	Length	Quality of chain
9	L	287	53% · 85% 14%
10	N	70	29% 27% 44%
11	O	844	5% 89% 11%
12	S	259	8% 40% 5% 55%
13	T	70	40% 11% 49%
14	I	288	87% 9% ·

2 Entity composition ⓘ

There are 17 unique types of molecules in this entry. The entry contains 86467 atoms, of which 42799 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 147 kDa polypeptide.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	1277	20617	6593	10357	1690	1931	46	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	258	THR	SER	variant	UNP P20504
A	489	GLU	LYS	variant	UNP P20504
A	1015	LYS	ARG	variant	UNP P20504

- Molecule 2 is a protein called DNA-directed RNA polymerase 133 kDa polypeptide.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
2	B	1155	18659	5934	9340	1595	1741	49	2	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	6	ASN	ASP	variant	UNP P68694
B	343	PHE	TYR	variant	UNP P68694

- Molecule 3 is a protein called DNA-directed RNA polymerase 35 kDa subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
3	C	304	4947	1608	2463	399	464	13	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	236	ASN	ASP	variant	UNP P21087

- Molecule 4 is a protein called DNA-directed RNA polymerase 22 kDa subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	E	184	Total 3041	C 966	H 1546	N 248	O 276	S 5	0	0

- Molecule 5 is a protein called DNA-directed RNA polymerase 19 kDa subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	F	104	Total 1736	C 551	H 877	N 151	O 154	S 3	0	0

- Molecule 6 is a protein called DNA-directed RNA polymerase 18 kDa subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	G	153	Total 2370	C 753	H 1178	N 198	O 235	S 6	0	0

- Molecule 7 is a protein called Intermediate transcription factor 3 large subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	H	382	Total 6298	C 2004	H 3164	N 522	O 590	S 18	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	58	PRO	HIS	variant	UNP P20998

- Molecule 8 is a protein called DNA-directed RNA polymerase 7 kDa subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	J	61	Total 1017	C 310	H 527	N 88	O 88	S 4	0	0

- Molecule 9 is a protein called mRNA-capping enzyme regulatory subunit OPG124.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	L	284	Total 4678	C 1492	H 2358	N 385	O 430	S 13	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	235	ASN	ASP	variant	UNP P20980

- Molecule 10 is a DNA chain called Non-template DNA oligomer.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	N	39	Total 1236	C 383	H 442	N 142	O 230	P 39	0	0

- Molecule 11 is a protein called mRNA-capping enzyme catalytic subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	O	844	Total 13715	C 4399	H 6884	N 1123	O 1290	S 19	0	0

There are 2 discrepancies between the modelled and reference sequences:

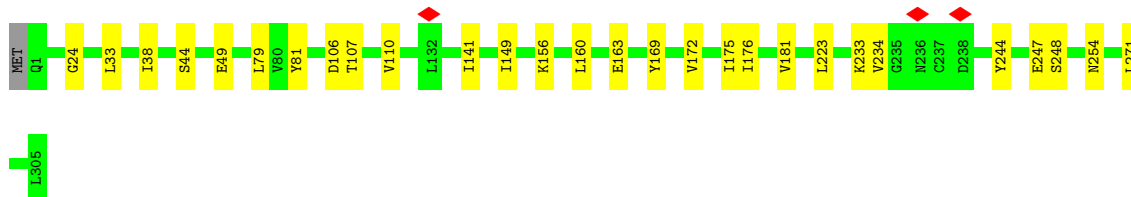| Chain	Residue	Modelled	Actual	Comment	Reference
O	8	PHE	SER	variant	UNP P20979
O	202	THR	LYS	variant	UNP P20979

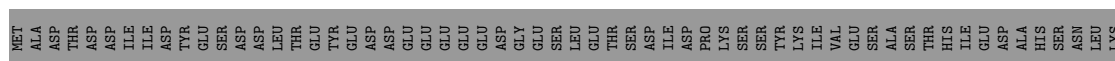- Molecule 12 is a protein called DNA-directed RNA polymerase 30 kDa polypeptide.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	S	116	Total 1916	C 609	H 961	N 155	O 187	S 4	0	0

- Molecule 13 is a DNA chain called Template DNA oligomer.

Mol	Chain	Residues	Atoms						AltConf	Trace
13	T	36	Total 1161	C 360	H 409	N 141	O 215	P 36	0	0

- Molecule 14 is a protein called Intermediate transcription factor 3 small subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
14	I	276	Total 4563	C 1469	H 2293	N 370	O 424	S 7	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
I	247	LYS	GLU	variant	UNP P20986

- Molecule 15 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 16 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

- Molecule 17 is water.

Mol	Chain	Residues	Atoms		AltConf
17	A	161	Total 161	O 161	0
17	B	165	Total 165	O 165	0
17	C	42	Total 42	O 42	0
17	E	18	Total 18	O 18	0
17	F	17	Total 17	O 17	0
17	G	18	Total 18	O 18	0
17	H	1	Total 1	O 1	0
17	J	6	Total 6	O 6	0
17	L	7	Total 7	O 7	0
17	N	2	Total 2	O 2	0
17	O	42	Total 42	O 42	0
17	S	24	Total 24	O 24	0
17	T	2	Total 2	O 2	0

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Mol	Chain	Residues	Atoms		AltConf
17	I	3	Total O 3 3		0

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.

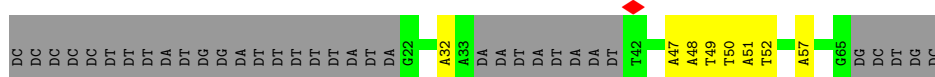- Molecule 1: DNA-directed RNA polymerase 147 kDa polypeptide

Chain A:
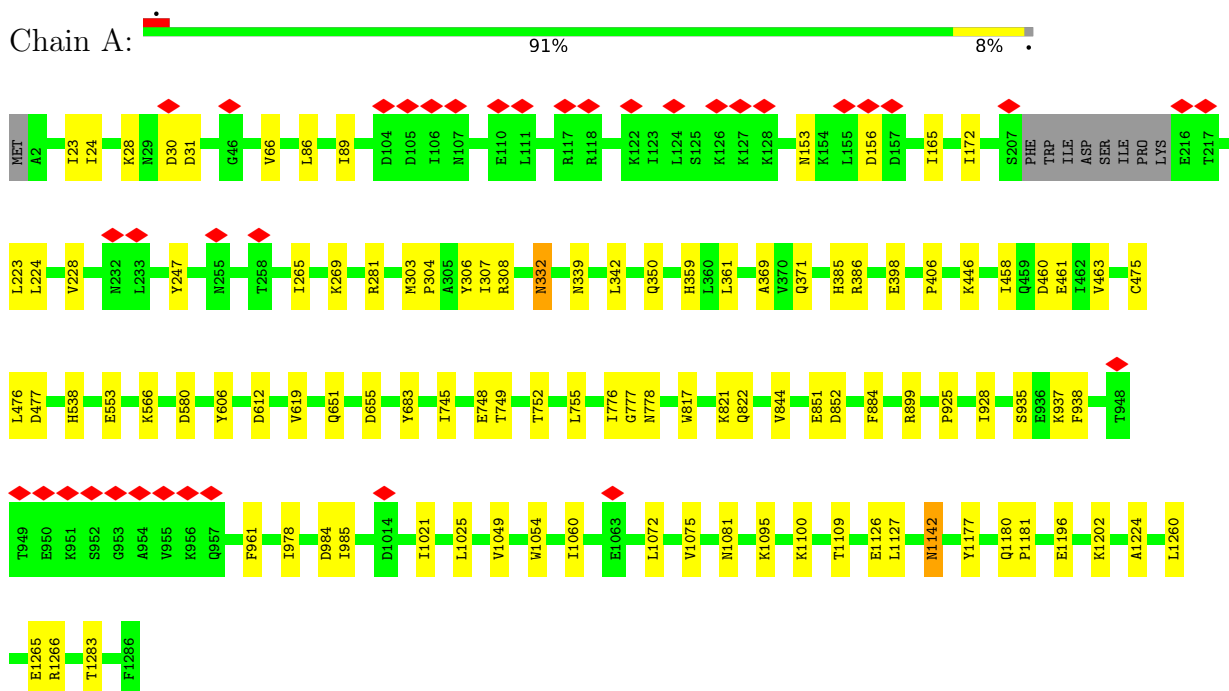
- Molecule 2: DNA-directed RNA polymerase 133 kDa polypeptide

Chain B:

R767 A775 E781 L784 K790 E791 R792 D793 R794 S795 N796 A797 R826 E829 D830 D831 R834 D835 N836 D848 R853 D863 R868 V869 L870 R875 T887 S888 D898 E899 Y938 S939 A940 N958 E959 T960 S976 K988 R1017

A1026 T1027 V1028 R1029 K1046 R1047 G1048 I1051 R1058 D1059 A1063 M1131 V1136 K1139 L1140 D1141 F1162 LEU VAL
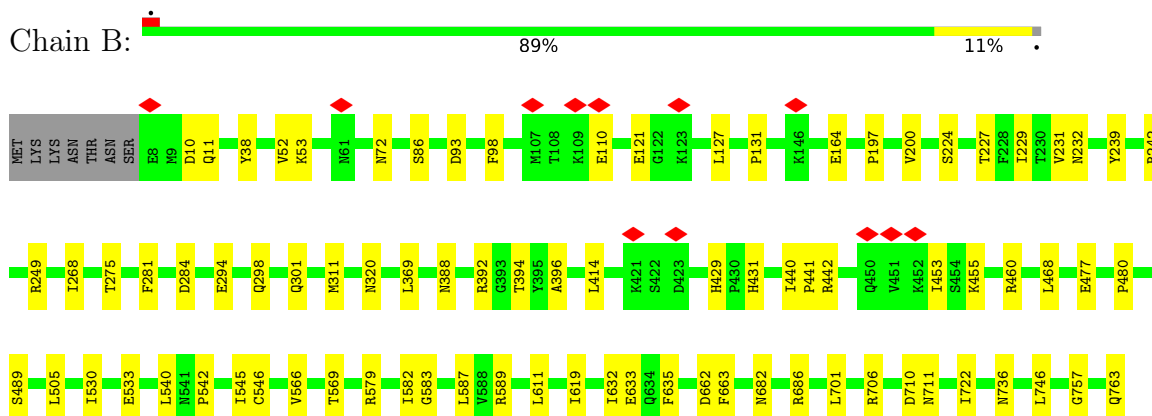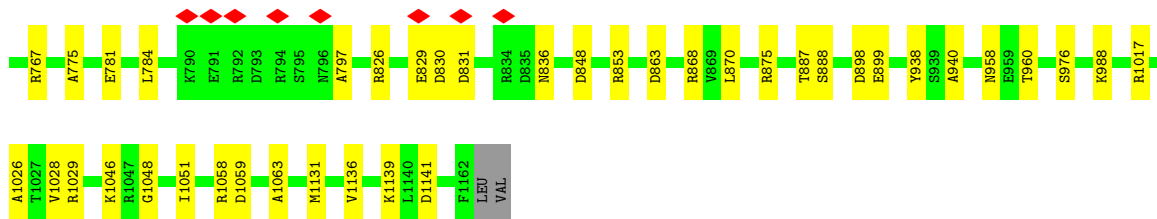
- Molecule 3: DNA-directed RNA polymerase 35 kDa subunit

Chain C: 90% 9%

MET Q1 G24 L33 I38 S44 E49 L79 V80 Y81 D106 T107 V110 L132 I141 I149 K156 L160 E163 Y169 V172 I175 I176 V181 L223 K233 V234 G235 N236 C237 D238 Y244 E247 S248 N254 L271

L305
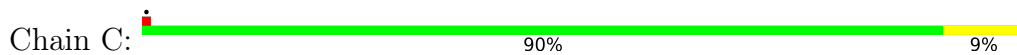
- Molecule 4: DNA-directed RNA polymerase 22 kDa subunit

Chain E: 88% 11%

M1 N5 L9 L13 T46 M57 D75 D76 D77 Y78 G91 L100 I106 S107 R115 L116 Q129 R138 K150 I151 L152 R163 N167 T171 E174 A184 ASP
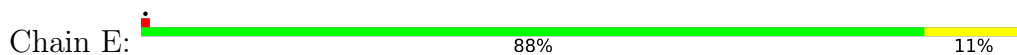
- Molecule 5: DNA-directed RNA polymerase 19 kDa subunit

Chain F: 61% 37%

MET ALA ASP THR ASP ASP ILE ILE ASP TYR GLU SER ASP ASP LEU THR GLU TYR GLU ASP ASP GLU GLU GLU GLU GLU GLY GLU SER LEU GLU THR SER ASP ILE ASP PRO LYS SER SER TYR LYS ILE VAL GLU SER ALA SER THR HIS ILE GLU ASP ALA HIS SER ASN LEU LYS

H61 K70 N112 E135 R163 Y164

- Molecule 6: DNA-directed RNA polymerase 18 kDa subunit

Chain G: 25% 84% 11% 5%

MET S2 R28 N29 A30 T34 Y35 K47 I50 I84 V85 R86 L89 N90 I91 E92 D93 E94 S95 N96 V97 G102 L108 S109 R110 D111 S112 G113 T114 V115 S116 F117 SER ASP SER LYS TYR C123 F124 F125 R126 N127 G128 N129 A130 Y131 D132 N133 G134 S135 E136

E143 Q146 G147 I148 E149 A156 N157 I158 V159 ASP SER
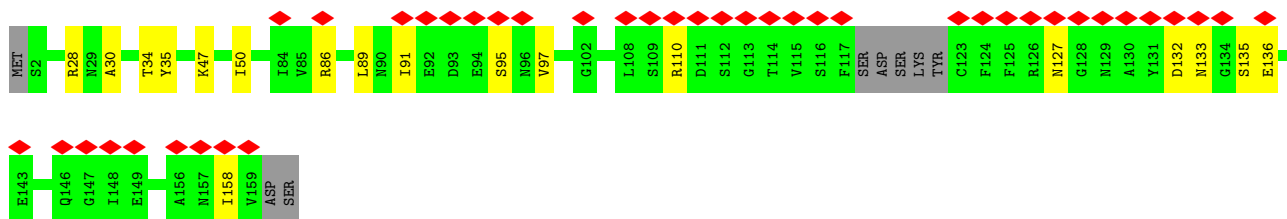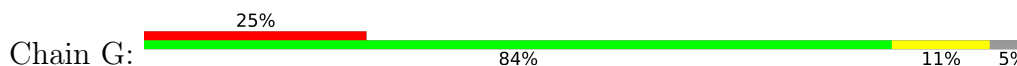
- Molecule 7: Intermediate transcription factor 3 large subunit

Chain H: 6% 89% 11%
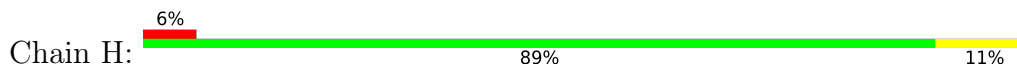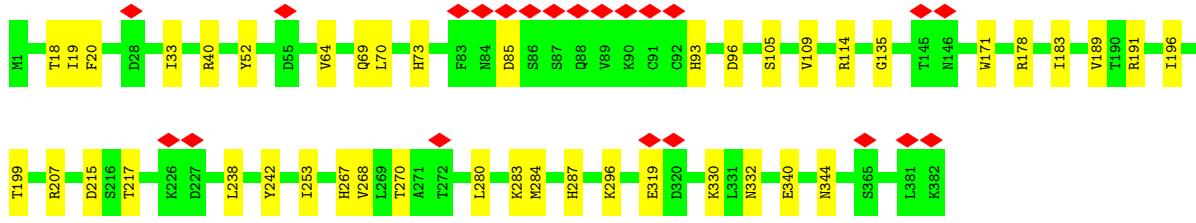
• Molecule 8: DNA-directed RNA polymerase 7 kDa subunit

Chain J:
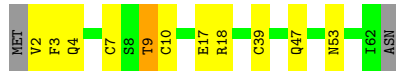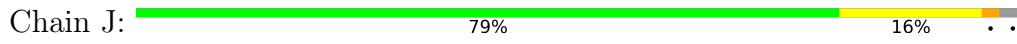
• Molecule 9: mRNA-capping enzyme regulatory subunit OPG124

Chain L:
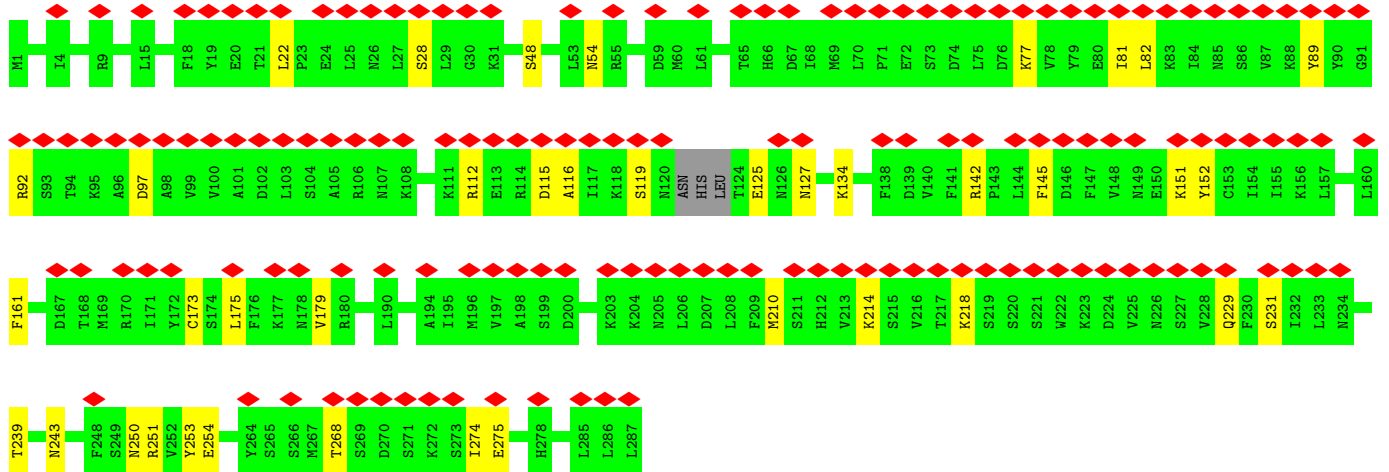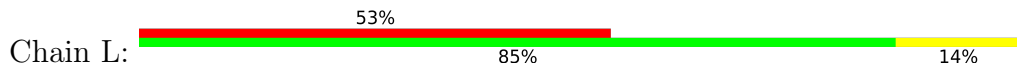
• Molecule 10: Non-template DNA oligomer
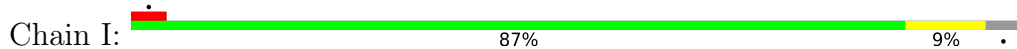
Chain N:
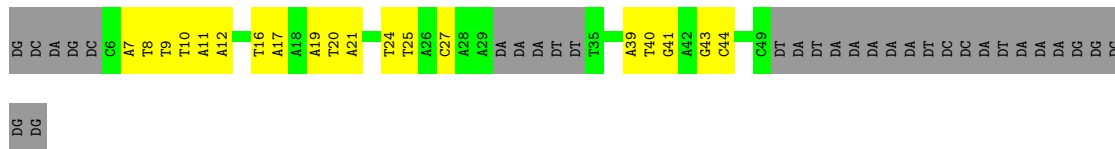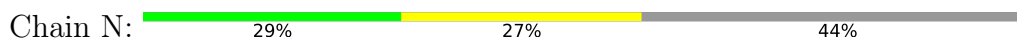
• Molecule 11: mRNA-capping enzyme catalytic subunit

Chain O:

S296 E297 V298 V299 V300 F301 L317 I318 V321 N322 A323 I324 N325 E330 V334 K337 L338 V339 K351 F356 T357 E361 V362 Y381 S382 K383 D400 Q401 T402 E419 V424 L446 M454 L484 L490 I494 Y507 G508 N509 I513

H517 L518 R519 F529 N530 E531 D532 K533 L534 S535 D536 V537 G538 H539 Q540 Y541 A542 N543 N544 D545 K546 F547 R548 L549 N550 P551 E552 V553 S554 R560 Y571 L575 L576 I577 S578 D587 D588 K607 I613 I626 I640 Y649 I650 Q651 R655 S656 D657

D676 W677 Q678 T692 L697 T701 T711 M712 D713 D722 I727 N731 D746 I766 D784 N785 T804 M805 E806 D807 R808 K823 C824 E825 G826 E830 Y835 R844

• Molecule 12: DNA-directed RNA polymerase 30 kDa polypeptide

Chain S:

8%

40% 5% 55%

MET GLU ASN VAL TYR ILE SER SER TYR SER SER ASN GLU GLN GLN THR SER MET ALA VAL ALA ALA THR ASP ILE ARG GLU LEU LEU SER GLN TYR VAL ASP ALA N36 L37 E38 D39 E42 T59 E65 N90 N97 L98 E99 T102 L103 C104 D105 K108 G109 T110

S111 E114 F117 L121 K130 D137 K140 D141 V142 S143 Y144 N145 D146 N149 V150 L151 ASP GLU LYS TYR ASN THR PRO CYS PRO ASN CYS LYS SER ARG ASN THR THR PRO MET MET ILE GLN THR ARG ALA ALA ASP GLU PRO LEU VAL ARG HIS ALA CYS ARG

ASP CYS LYS GLN HIS PHE LYS PRO PRO LYS PHE ARG ALA PHE ARG ASN LEU ASN VAL THR THR GLN SER ILE HIS GLU ASN LYS GLU ILE THR GLU ILE LEU PRO ASP ASN ASN PRO SER PRO PRO GLU SER PRO GLU PRO ALA SER PRO ILE ASP ASP GLY LEU LEU ILE ARG ALA ALA THR PHE

ASP ARG ASN ASP GLU PRO GLU ASP GLU

• Molecule 13: Template DNA oligomer

Chain T:

40% 11% 49%

DC DC DC DC DC DT DT DT DA DT DG DG DA DT DT DT DT DA DT DA G22 A32 A33 DA DA DT DA DT DA DA DT T42 A47 A48 T49 T50 A51 T52 A57 G65 DG DC DT DG DC
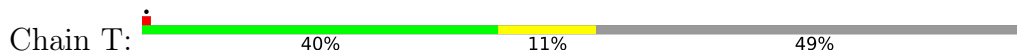
• Molecule 14: Intermediate transcription factor 3 small subunit

Chain I:

87% 9%

M1 T24 K29 E30 ASN SER GLY PHE ILE SER ARG ARG ARG LEU PHE A43 H44 L55 E69 V77 V83 I91 I114 F118 P119 E120 K127 K128 F129 K130 S133 Q145 F146 E155 R166 D167 E168 H169 N197 D201 I222

V231 I232 E233 N234 D235 F260 I275 D281 T288
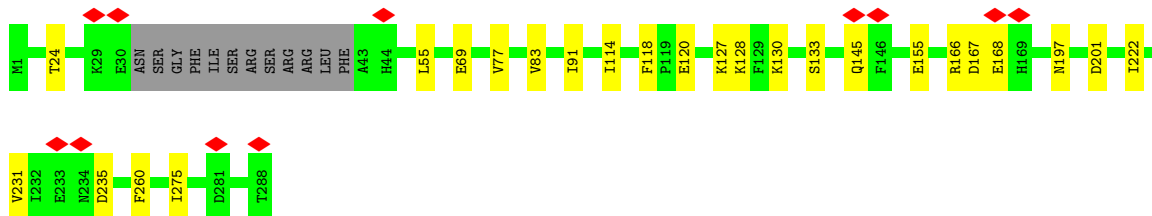
4   Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1421158	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 $(e^-/\text{Å}^2)$	70	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	4.295	Depositor
Minimum map value	-1.708	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.110	Depositor
Recommended contour level	0.733	Depositor
Map size (Å)	408.38403, 408.38403, 408.38403	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.0635, 1.0635, 1.0635	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: ZN, MG

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	0.25	0/10462	0.44	0/14135
2	B	0.25	0/9525	0.48	0/12866
3	C	0.26	0/2540	0.46	0/3440
4	E	0.25	0/1522	0.49	0/2069
5	F	0.23	0/874	0.47	0/1173
6	G	0.24	0/1209	0.48	0/1639
7	H	0.24	0/3189	0.44	0/4288
8	J	0.24	0/494	0.47	0/663
9	L	0.24	0/2365	0.45	0/3189
10	N	0.51	0/889	0.94	0/1365
11	O	0.25	0/6973	0.46	0/9433
12	S	0.24	0/970	0.44	0/1298
13	T	0.49	0/845	0.93	0/1303
14	I	0.24	0/2315	0.43	0/3123
All	All	0.26	0/44172	0.49	0/59984

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	10260	10357	10377	70	0
2	B	9319	9340	9359	84	0
3	C	2484	2463	2473	21	0
4	E	1495	1546	1548	13	0
5	F	859	877	881	3	0
6	G	1192	1178	1181	11	0
7	H	3134	3164	3176	25	0
8	J	490	527	528	8	0
9	L	2320	2358	2363	25	0
10	N	794	442	444	14	0
11	O	6831	6884	6899	60	0
12	S	955	961	961	9	0
13	T	752	409	411	8	0
14	I	2270	2293	2299	16	0
15	A	1	0	0	0	0
16	A	2	0	0	0	0
16	B	1	0	0	0	0
16	J	1	0	0	0	0
17	A	161	0	0	7	0
17	B	165	0	0	14	0
17	C	42	0	0	0	0
17	E	18	0	0	1	0
17	F	17	0	0	1	0
17	G	18	0	0	0	0
17	H	1	0	0	0	0
17	I	3	0	0	0	0
17	J	6	0	0	1	0
17	L	7	0	0	0	0
17	N	2	0	0	0	0
17	O	42	0	0	2	0
17	S	24	0	0	1	0
17	T	2	0	0	0	0
All	All	43668	42799	42900	339	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 4.

All (339) 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)
2:B:239:TYR:O	2:B:242:ARG:NH1	2.07	0.88
11:O:519:ARG:O	11:O:541:TYR:OH	1.94	0.85

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:745:ILE:O	1:A:749:THR:OG1	1.96	0.83
13:T:50:DT:OP1	14:I:128:LYS:NZ	2.12	0.81
2:B:1058:ARG:NH2	2:B:1059:ASP:OD1	2.17	0.78
11:O:292:ARG:NH2	11:O:337:LYS:O	2.18	0.76
11:O:49:THR:HG21	11:O:191:LEU:HD22	1.69	0.75
11:O:317:LEU:HD13	11:O:334:VAL:HG21	1.69	0.75
1:A:937:LYS:NZ	1:A:1177:TYR:OH	2.22	0.73
2:B:455:LYS:O	2:B:460:ARG:NH1	2.22	0.73
11:O:357:THR:N	11:O:361:GLU:OE2	2.21	0.73
7:H:283:LYS:O	7:H:287:HIS:ND1	2.23	0.72
1:A:1142:ASN:ND2	4:E:107:SER:O	2.23	0.71
2:B:633:GLU:OE1	17:B:1301:HOH:O	2.08	0.71
11:O:77:ARG:NH1	11:O:105:GLU:OE2	2.24	0.70
1:A:446:LYS:O	17:A:1402:HOH:O	2.09	0.70
1:A:303:MET:O	1:A:308:ARG:NH1	2.23	0.70
1:A:1109:THR:O	17:A:1401:HOH:O	2.09	0.70
11:O:251:ASP:OD1	11:O:381:TYR:OH	2.07	0.70
11:O:253:GLU:OE1	11:O:253:GLU:N	2.25	0.70
11:O:52:ASN:ND2	11:O:219:ILE:O	2.24	0.69
2:B:830:ASP:OD1	2:B:831:ASP:N	2.25	0.69
1:A:281:ARG:O	17:A:1404:HOH:O	2.10	0.69
1:A:580:ASP:OD1	17:A:1403:HOH:O	2.09	0.69
14:I:155:GLU:N	14:I:155:GLU:OE1	2.25	0.69
2:B:853:ARG:NH2	17:B:1314:HOH:O	2.25	0.69
2:B:736:ASN:OD1	17:B:1302:HOH:O	2.10	0.68
2:B:746:LEU:O	17:B:1303:HOH:O	2.10	0.68
3:C:172:VAL:O	3:C:176:ILE:N	2.27	0.68
2:B:301:GLN:N	2:B:301:GLN:OE1	2.28	0.67
2:B:164:GLU:OE2	17:B:1304:HOH:O	2.11	0.67
2:B:682:ASN:O	17:B:1306:HOH:O	2.12	0.67
4:E:129:GLN:O	5:F:70:LYS:NZ	2.26	0.67
1:A:538:HIS:ND1	17:A:1409:HOH:O	2.26	0.67
2:B:757:GLY:O	17:B:1305:HOH:O	2.11	0.67
9:L:250:ASN:OD1	9:L:251:ARG:N	2.28	0.66
4:E:174:GLU:OE2	17:E:201:HOH:O	2.12	0.66
9:L:48:SER:OG	11:O:808:ARG:NH2	2.27	0.66
2:B:958:ASN:ND2	2:B:960:THR:O	2.28	0.66
5:F:135:GLU:OE1	17:F:201:HOH:O	2.11	0.66
6:G:47:LYS:NZ	11:O:33:GLU:OE2	2.29	0.66
11:O:513:ILE:O	11:O:517:HIS:ND1	2.25	0.66
2:B:200:VAL:O	17:B:1307:HOH:O	2.12	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:242:ARG:NH2	2:B:284:ASP:OD2	2.29	0.66
2:B:294:GLU:OE2	2:B:298:GLN:NE2	2.28	0.65
2:B:848:ASP:OD1	2:B:1046:LYS:NZ	2.31	0.64
12:S:59:THR:O	17:S:301:HOH:O	2.13	0.64
1:A:1075:VAL:O	1:A:1081:ASN:ND2	2.30	0.64
7:H:267:HIS:O	7:H:270:THR:OG1	2.14	0.64
11:O:454:ASN:O	17:O:901:HOH:O	2.15	0.64
1:A:844:VAL:O	17:A:1405:HOH:O	2.15	0.63
14:I:231:VAL:O	14:I:235:ASP:N	2.32	0.63
9:L:89:TYR:O	9:L:142:ARG:NH1	2.31	0.63
1:A:1100:LYS:NZ	12:S:65:GLU:O	2.32	0.62
1:A:822:GLN:NE2	4:E:167:ASN:OD1	2.33	0.62
7:H:96:ASP:OD1	7:H:178:ARG:NH2	2.33	0.62
1:A:269:LYS:NZ	13:T:32:DA:OP1	2.32	0.62
6:G:127:ASN:O	6:G:127:ASN:ND2	2.33	0.62
11:O:697:LEU:O	11:O:701:THR:OG1	2.13	0.61
14:I:167:ASP:OD1	14:I:168:GLU:N	2.33	0.61
12:S:99:GLU:OE1	12:S:99:GLU:N	2.32	0.61
7:H:196:ILE:O	7:H:199:THR:OG1	2.17	0.61
1:A:28:LYS:NZ	10:N:27:DC:OP2	2.34	0.60
2:B:887:THR:O	2:B:888:SER:OG	2.10	0.60
1:A:553:GLU:N	1:A:553:GLU:OE1	2.34	0.60
9:L:28:SER:N	9:L:231:SER:O	2.34	0.60
13:T:51:DA:H2"	13:T:52:DT:H72	1.83	0.60
6:G:30:ALA:O	6:G:34:THR:HG22	2.02	0.59
2:B:431:HIS:HB3	2:B:701:LEU:HD21	1.83	0.59
3:C:247:GLU:O	3:C:248:SER:OG	2.19	0.59
1:A:461:GLU:OE2	1:A:566:LYS:NZ	2.36	0.58
3:C:33:LEU:HD12	3:C:181:VAL:HG12	1.85	0.58
1:A:66:VAL:HG11	1:A:228:VAL:HG22	1.85	0.58
9:L:115:ASP:OD1	9:L:116:ALA:N	2.34	0.58
14:I:127:LYS:O	14:I:130:LYS:NZ	2.35	0.58
9:L:119:SER:O	14:I:145:GLN:NE2	2.37	0.57
6:G:86:ARG:NH1	6:G:136:GLU:OE1	2.38	0.57
11:O:578:SER:OG	17:O:902:HOH:O	2.17	0.57
7:H:340:GLU:OE2	7:H:344:ASN:ND2	2.36	0.57
8:J:17:GLU:OE1	8:J:17:GLU:N	2.37	0.57
1:A:153:ASN:ND2	1:A:156:ASP:OD1	2.38	0.56
2:B:38:TYR:OH	2:B:131:PRO:O	2.18	0.56
11:O:640:ILE:HD11	14:I:83:VAL:HG22	1.86	0.56
3:C:163:GLU:OE1	3:C:163:GLU:N	2.36	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:268:VAL:HG21	7:H:284:MET:SD	2.45	0.56
1:A:369:ALA:O	1:A:371:GLN:NE2	2.39	0.56
2:B:542:PRO:HA	2:B:545:ILE:HD13	1.88	0.56
11:O:66:PHE:CD2	11:O:143:LEU:HD22	2.41	0.56
2:B:121:GLU:N	2:B:121:GLU:OE1	2.38	0.55
3:C:141:ILE:HD12	3:C:160:LEU:HD11	1.88	0.55
7:H:215:ASP:OD2	7:H:217:THR:OG1	2.23	0.55
9:L:275:GLU:N	9:L:275:GLU:OE1	2.39	0.55
2:B:587:LEU:HD12	2:B:632:ILE:HD12	1.87	0.55
2:B:763:GLN:OE1	2:B:763:GLN:N	2.39	0.55
2:B:505:LEU:HD21	2:B:566:VAL:HG22	1.89	0.55
6:G:28:ARG:HG2	6:G:50:ILE:HD12	1.88	0.55
6:G:95:SER:OG	6:G:110:ARG:NH1	2.40	0.55
1:A:1054:TRP:NE1	12:S:90:ASN:O	2.39	0.55
7:H:93:HIS:O	7:H:178:ARG:NH1	2.40	0.55
2:B:93:ASP:OD1	17:B:1308:HOH:O	2.17	0.54
11:O:301:PHE:HB2	11:O:318:ILE:HD11	1.90	0.54
11:O:713:ASP:N	11:O:835:TYR:O	2.37	0.54
2:B:736:ASN:O	17:B:1310:HOH:O	2.19	0.54
11:O:298:VAL:HG13	11:O:317:LEU:HD11	1.88	0.54
1:A:1196:GLU:OE2	1:A:1202:LYS:N	2.40	0.54
9:L:161:PHE:N	9:L:253:TYR:OH	2.41	0.53
2:B:569:THR:OG1	17:B:1311:HOH:O	2.19	0.53
2:B:797:ALA:O	17:B:1309:HOH:O	2.18	0.53
6:G:89:LEU:N	6:G:135:SER:O	2.40	0.53
9:L:77:LYS:O	9:L:81:ILE:HG22	2.09	0.53
11:O:179:ALA:O	11:O:185:SER:OG	2.21	0.53
2:B:781:GLU:OE1	2:B:781:GLU:N	2.42	0.53
11:O:419:GLU:OE1	11:O:419:GLU:N	2.39	0.53
3:C:169:TYR:HA	3:C:172:VAL:HG22	1.90	0.53
6:G:132:ASP:OD1	6:G:133:ASN:N	2.41	0.53
11:O:49:THR:HG23	11:O:219:ILE:HG23	1.91	0.53
4:E:91:GLY:O	4:E:150:LYS:NZ	2.41	0.52
14:I:91:ILE:HD12	14:I:91:ILE:H	1.74	0.52
1:A:619:VAL:HG21	1:A:1025:LEU:HD12	1.90	0.52
2:B:686:ARG:NH2	2:B:888:SER:O	2.41	0.52
11:O:274:GLY:HA2	11:O:290:VAL:HG23	1.92	0.52
6:G:34:THR:HG23	6:G:35:TYR:CD2	2.45	0.52
1:A:223:LEU:HD13	1:A:247:TYR:HA	1.92	0.52
1:A:778:ASN:OD1	4:E:138:ARG:NH2	2.41	0.52
4:E:115:ARG:NH2	4:E:152:LEU:O	2.38	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:77:ASP:OD1	4:E:78:TYR:N	2.43	0.52
11:O:66:PHE:HD2	11:O:143:LEU:HD22	1.74	0.52
2:B:442:ARG:NH2	2:B:489:SER:O	2.43	0.52
1:A:1283:THR:HG21	11:O:218:HIS:ND1	2.25	0.51
3:C:38:ILE:HG13	3:C:172:VAL:HG21	1.92	0.51
2:B:579:ARG:NE	2:B:633:GLU:OE2	2.41	0.51
2:B:1029:ARG:NH1	2:B:1048:GLY:O	2.44	0.51
3:C:49:GLU:OE1	3:C:49:GLU:N	2.41	0.51
7:H:135:GLY:N	10:N:24:DT:OP1	2.44	0.51
11:O:292:ARG:NH1	11:O:339:VAL:O	2.43	0.51
2:B:898:ASP:OD1	2:B:899:GLU:N	2.44	0.51
2:B:489:SER:OG	2:B:589:ARG:NH1	2.44	0.51
11:O:676:ASP:OD1	11:O:678:GLN:NE2	2.42	0.51
11:O:587:ASP:OD1	11:O:588:ASP:N	2.44	0.50
2:B:388:ASN:ND2	2:B:396:ALA:O	2.44	0.50
1:A:359:HIS:HB3	1:A:361:LEU:HD13	1.93	0.50
11:O:484:LEU:HG	11:O:490:LEU:HD11	1.93	0.50
2:B:468:LEU:HD23	2:B:635:PHE:CZ	2.47	0.50
1:A:460:ASP:N	1:A:460:ASP:OD1	2.45	0.49
1:A:978:ILE:N	1:A:978:ILE:HD12	2.27	0.49
3:C:24:GLY:HA3	3:C:223:LEU:HD21	1.94	0.49
10:N:9:DT:H2'	10:N:10:DT:H72	1.93	0.49
11:O:806:GLU:OE2	11:O:808:ARG:NE	2.39	0.49
2:B:110:GLU:OE1	2:B:110:GLU:N	2.44	0.48
5:F:112:ASN:ND2	5:F:163:ARG:O	2.45	0.48
7:H:105:SER:O	7:H:109:VAL:HG23	2.13	0.48
9:L:81:ILE:HG23	9:L:82:LEU:HD22	1.96	0.48
3:C:172:VAL:O	3:C:175:ILE:N	2.46	0.48
2:B:224:SER:OG	2:B:227:THR:OG1	2.31	0.48
7:H:109:VAL:HG22	7:H:183:ILE:HD12	1.95	0.48
6:G:158:ILE:HD12	6:G:158:ILE:H	1.79	0.48
2:B:52:VAL:HG23	2:B:53:LYS:H	1.78	0.48
1:A:1060:ILE:N	1:A:1060:ILE:HD12	2.28	0.48
9:L:54:ASN:ND2	9:L:125:GLU:O	2.47	0.48
9:L:92:ARG:NH2	9:L:145:PHE:O	2.43	0.48
1:A:776:ILE:HG23	1:A:777:GLY:H	1.79	0.47
11:O:830:GLU:OE1	11:O:830:GLU:N	2.41	0.47
8:J:9:THR:O	8:J:10:CYS:SG	2.72	0.47
13:T:48:DA:H2'	13:T:49:DT:H72	1.96	0.47
3:C:110:VAL:HG23	3:C:110:VAL:O	2.15	0.47
1:A:1224:ALA:HB2	2:B:1136:VAL:HG13	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:O:519:ARG:NH1	11:O:547:PHE:O	2.39	0.47
2:B:533:GLU:OE2	2:B:583:GLY:N	2.46	0.47
1:A:651:GLN:NE2	1:A:655:ASP:OD2	2.48	0.47
3:C:81:TYR:CE1	3:C:160:LEU:HD21	2.49	0.47
2:B:388:ASN:O	2:B:392:ARG:N	2.45	0.47
7:H:330:LYS:O	7:H:332:ASN:ND2	2.47	0.47
1:A:332:ASN:OD1	1:A:350:GLN:NE2	2.43	0.47
7:H:268:VAL:HG22	7:H:280:LEU:HB3	1.96	0.47
14:I:114:ILE:O	14:I:118:PHE:N	2.40	0.47
2:B:460:ARG:NH2	2:B:480:PRO:O	2.48	0.47
2:B:722:ILE:HG21	2:B:938:TYR:CZ	2.50	0.47
3:C:106:ASP:OD1	3:C:107:THR:N	2.48	0.46
11:O:299:VAL:HG12	11:O:318:ILE:HD12	1.96	0.46
11:O:552:GLU:OE1	11:O:554:SER:N	2.49	0.46
14:I:130:LYS:HZ3	14:I:133:SER:HG	1.61	0.46
11:O:640:ILE:O	11:O:640:ILE:HG22	2.16	0.46
1:A:984:ASP:OD1	1:A:985:ILE:N	2.49	0.46
1:A:86:LEU:HD21	1:A:165:ILE:HG23	1.98	0.46
3:C:254:ASN:HA	3:C:271:LEU:O	2.15	0.46
11:O:270:VAL:HG12	11:O:298:VAL:O	2.16	0.46
11:O:143:LEU:N	11:O:143:LEU:HD23	2.30	0.46
10:N:20:DT:H2"	10:N:21:DA:C8	2.51	0.46
13:T:48:DA:O4'	13:T:48:DA:OP2	2.34	0.46
1:A:755:LEU:HD23	1:A:961:PHE:CE1	2.51	0.46
1:A:460:ASP:O	1:A:463:VAL:HG22	2.16	0.45
2:B:229:ILE:HG23	2:B:311:MET:SD	2.56	0.45
2:B:197:PRO:O	17:B:1307:HOH:O	2.21	0.45
3:C:149:ILE:HD12	3:C:149:ILE:N	2.32	0.45
12:S:109:GLY:O	12:S:110:THR:OG1	2.31	0.45
9:L:214:LYS:O	9:L:218:LYS:N	2.44	0.45
2:B:505:LEU:HD23	2:B:582:ILE:HB	1.98	0.45
11:O:53:VAL:O	11:O:57:SER:N	2.50	0.45
11:O:655:ARG:O	11:O:692:THR:HG21	2.16	0.45
2:B:784:LEU:HD13	2:B:784:LEU:O	2.16	0.45
2:B:86:SER:O	2:B:868:ARG:NH2	2.50	0.45
12:S:117:PHE:CE2	12:S:121:LEU:HD11	2.52	0.45
9:L:134:LYS:O	9:L:229:GLN:NE2	2.45	0.45
11:O:356:PHE:CG	11:O:362:VAL:HG12	2.52	0.45
1:A:477:ASP:OD2	17:A:1406:HOH:O	2.21	0.45
8:J:53:ASN:O	17:J:201:HOH:O	2.20	0.45
11:O:244:LYS:O	11:O:247:ILE:HG22	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:O:402:THR:OG1	11:O:507:TYR:O	2.30	0.44
11:O:727:ILE:HD12	11:O:727:ILE:N	2.31	0.44
1:A:925:PRO:HB2	1:A:928:ILE:HG22	1.98	0.44
7:H:33:ILE:HG12	7:H:253:ILE:HD11	1.99	0.44
11:O:76:ILE:HD12	11:O:76:ILE:N	2.32	0.44
7:H:70:LEU:HD11	7:H:189:VAL:HG13	1.99	0.44
13:T:47:DA:H1'	13:T:48:DA:OP2	2.18	0.44
2:B:875:ARG:O	2:B:1017:ARG:NH1	2.49	0.44
1:A:884:PHE:CD1	4:E:171:THR:HG23	2.52	0.44
14:I:55:LEU:HD22	14:I:77:VAL:HG21	2.00	0.44
1:A:475:CYS:SG	1:A:476:LEU:N	2.90	0.44
2:B:72:ASN:ND2	2:B:72:ASN:O	2.49	0.44
2:B:706:ARG:NH1	3:C:44:SER:O	2.47	0.44
2:B:767:ARG:O	8:J:4:GLN:NE2	2.51	0.44
7:H:238:LEU:HD21	7:H:242:TYR:CZ	2.53	0.44
10:N:43:DG:H2"	10:N:44:DC:C6	2.52	0.44
12:S:142:VAL:HG23	12:S:144:TYR:CE2	2.52	0.44
2:B:545:ILE:HG22	2:B:546:CYS:N	2.31	0.44
10:N:24:DT:H2'	10:N:25:DT:H72	1.99	0.44
1:A:851:GLU:OE1	1:A:899:ARG:NE	2.48	0.44
11:O:784:ASP:OD1	11:O:785:ASN:N	2.51	0.44
2:B:1051:ILE:N	2:B:1051:ILE:HD12	2.33	0.43
2:B:1139:LYS:NZ	2:B:1141:ASP:OD2	2.50	0.43
1:A:30:ASP:OD1	1:A:31:ASP:N	2.51	0.43
2:B:775:ALA:HB1	2:B:870:LEU:HD11	2.00	0.43
2:B:863:ASP:OD1	2:B:863:ASP:N	2.51	0.43
3:C:141:ILE:CD1	3:C:160:LEU:HD11	2.48	0.43
11:O:400:ASP:N	11:O:509:ASN:OD1	2.47	0.43
1:A:398:GLU:OE1	1:A:398:GLU:N	2.42	0.43
3:C:234:VAL:HG12	3:C:234:VAL:O	2.18	0.43
11:O:424:VAL:HG23	11:O:446:LEU:HD11	2.01	0.43
11:O:626:ILE:HD11	11:O:651:GLN:HA	2.01	0.43
7:H:207:ARG:NH2	13:T:57:DA:OP1	2.50	0.43
1:A:224:LEU:O	1:A:228:VAL:HG23	2.18	0.43
2:B:940:ALA:O	2:B:976:SER:OG	2.37	0.43
4:E:5:ASN:HB2	4:E:100:LEU:HB3	2.01	0.43
4:E:116:LEU:HD11	4:E:163:ARG:NH2	2.34	0.43
7:H:85:ASP:O	7:H:114:ARG:NH1	2.52	0.43
9:L:274:ILE:N	9:L:274:ILE:HD12	2.33	0.43
8:J:2:VAL:HG12	8:J:2:VAL:O	2.19	0.43
9:L:210:MET:O	9:L:214:LYS:HG2	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:N:11:DA:H2'	10:N:12:DA:C8	2.54	0.43
2:B:52:VAL:HG23	2:B:53:LYS:N	2.33	0.43
2:B:98:PHE:CZ	2:B:127:LEU:HD23	2.54	0.43
3:C:233:LYS:O	3:C:244:TYR:N	2.51	0.43
7:H:40:ARG:NH2	7:H:52:TYR:OH	2.52	0.43
9:L:239:THR:O	9:L:243:ASN:ND2	2.52	0.43
1:A:23:ILE:N	1:A:23:ILE:HD12	2.34	0.43
2:B:826:ARG:NE	14:I:24:THR:OG1	2.47	0.43
9:L:22:LEU:HD21	9:L:175:LEU:HD12	2.01	0.43
1:A:265:ILE:HD11	2:B:1131:MET:HE3	2.01	0.43
1:A:978:ILE:HD13	1:A:1127:LEU:HB2	2.00	0.42
1:A:1021:ILE:N	1:A:1021:ILE:HD12	2.34	0.42
2:B:611:LEU:CD1	2:B:619:ILE:HD11	2.49	0.42
3:C:79:LEU:C	3:C:79:LEU:HD23	2.39	0.42
11:O:10:THR:HG22	11:O:228:ILE:HG12	2.01	0.42
14:I:222:ILE:HG21	14:I:275:ILE:HD13	2.01	0.42
1:A:306:TYR:CE2	2:B:1028:VAL:HG13	2.55	0.42
10:N:8:DT:O4'	10:N:8:DT:OP2	2.38	0.42
11:O:711:THR:OG1	11:O:766:ILE:HD11	2.20	0.42
2:B:710:ASP:OD1	2:B:711:ASN:N	2.51	0.42
11:O:48:ILE:HD11	11:O:494:ILE:HD13	2.01	0.42
11:O:577:ILE:HD11	11:O:607:LYS:HB3	2.02	0.42
2:B:477:GLU:N	2:B:477:GLU:OE1	2.53	0.42
10:N:16:DT:H2"	10:N:17:DA:N7	2.35	0.42
10:N:40:DT:H2"	10:N:41:DG:O4'	2.19	0.42
4:E:9:LEU:O	4:E:13:LEU:HG	2.20	0.42
11:O:142:ARG:C	11:O:143:LEU:HD23	2.40	0.42
1:A:1180:GLN:OE1	1:A:1180:GLN:N	2.49	0.42
7:H:319:GLU:OE1	7:H:319:GLU:N	2.43	0.42
8:J:7:CYS:SG	8:J:9:THR:O	2.78	0.42
9:L:97:ASP:O	9:L:151:LYS:N	2.52	0.42
11:O:571:TYR:CE2	11:O:575:LEU:HD11	2.55	0.42
12:S:102:THR:HG22	12:S:102:THR:O	2.20	0.42
1:A:1126:GLU:O	1:A:1127:LEU:HD12	2.20	0.42
2:B:988:LYS:O	17:B:1312:HOH:O	2.21	0.42
7:H:268:VAL:HA	7:H:280:LEU:HD13	2.01	0.42
11:O:298:VAL:CG1	11:O:317:LEU:HD11	2.50	0.42
11:O:330:GLU:O	11:O:334:VAL:HG23	2.20	0.42
9:L:173:CYS:HA	9:L:179:VAL:HG21	2.02	0.42
1:A:304:PRO:HD2	1:A:307:ILE:HD12	2.01	0.41
9:L:81:ILE:HG23	9:L:82:LEU:CD2	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:L:112:ARG:O	9:L:127:ASN:ND2	2.50	0.41
1:A:306:TYR:CZ	2:B:1026:ALA:HB1	2.55	0.41
10:N:9:DT:C2'	10:N:10:DT:H72	2.50	0.41
14:I:197:ASN:O	14:I:201:ASP:N	2.52	0.41
2:B:369:LEU:HD12	2:B:414:LEU:HD22	2.03	0.41
2:B:440:ILE:HB	2:B:441:PRO:HD3	2.01	0.41
2:B:662:ASP:OD1	2:B:663:PHE:N	2.52	0.41
1:A:852:ASP:OD1	1:A:852:ASP:N	2.53	0.41
3:C:110:VAL:HG22	3:C:156:LYS:HB3	2.01	0.41
7:H:69:GLN:O	7:H:191:ARG:NE	2.53	0.41
1:A:776:ILE:HG23	1:A:777:GLY:N	2.35	0.41
1:A:1265:GLU:OE1	1:A:1266:ARG:N	2.53	0.41
6:G:91:ILE:HG12	6:G:97:VAL:HG13	2.01	0.41
1:A:386:ARG:HD3	2:B:1063:ALA:HB1	2.03	0.41
2:B:231:VAL:HG22	2:B:232:ASN:N	2.36	0.41
2:B:453:ILE:HD11	10:N:39:DA:C2	2.56	0.41
13:T:48:DA:C2'	13:T:49:DT:H72	2.51	0.41
14:I:69:GLU:OE2	14:I:166:ARG:NH2	2.51	0.41
1:A:406:PRO:HB3	1:A:458:ILE:HD11	2.02	0.41
7:H:64:VAL:HG13	7:H:73:HIS:CE1	2.56	0.41
8:J:18:ARG:NH2	8:J:47:GLN:OE1	2.50	0.41
1:A:89:ILE:HG21	1:A:172:ILE:HD11	2.02	0.41
1:A:817:TRP:O	1:A:821:LYS:N	2.53	0.41
1:A:935:SER:HA	1:A:938:PHE:CE2	2.56	0.41
1:A:1266:ARG:NE	1:A:1266:ARG:O	2.54	0.41
2:B:394:THR:O	2:B:394:THR:HG22	2.20	0.41
10:N:7:DA:H1'	10:N:8:DT:OP2	2.20	0.41
10:N:19:DA:H2"	10:N:20:DT:C6	2.56	0.41
11:O:149:ILE:HD12	11:O:149:ILE:N	2.36	0.41
1:A:24:ILE:HB	1:A:66:VAL:HG12	2.02	0.41
1:A:1180:GLN:HB2	1:A:1181:PRO:HD3	2.02	0.41
2:B:10:ASP:OD1	2:B:11:GLN:N	2.54	0.41
7:H:171:TRP:NE1	14:I:120:GLU:OE2	2.49	0.41
9:L:268:THR:HG22	9:L:268:THR:O	2.20	0.41
11:O:804:THR:O	11:O:804:THR:HG22	2.21	0.41
2:B:249:ARG:NH1	2:B:268:ILE:HG21	2.36	0.40
2:B:829:GLU:OE2	2:B:836:ASN:ND2	2.54	0.40
1:A:156:ASP:OD1	1:A:156:ASP:N	2.54	0.40
2:B:275:THR:HG23	2:B:281:PHE:CD2	2.56	0.40
9:L:251:ARG:O	9:L:254:GLU:HG2	2.21	0.40
11:O:110:VAL:HG23	11:O:111:THR:HG22	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:265:ILE:HD11	2:B:1131:MET:CE	2.51	0.40
1:A:748:GLU:O	1:A:752:THR:HG23	2.21	0.40
2:B:530:ILE:HD11	2:B:540:LEU:HB2	2.03	0.40
1:A:1049:VAL:HG22	1:A:1049:VAL:O	2.21	0.40
12:S:143:SER:O	12:S:144:TYR:HB2	2.22	0.40
4:E:1:MET:SD	4:E:46:THR:OG1	2.80	0.40
7:H:18:THR:HG23	7:H:19:ILE:N	2.36	0.40
8:J:9:THR:HG23	8:J:39:CYS:HB2	2.04	0.40
9:L:82:LEU:HD12	9:L:152:TYR:CZ	2.56	0.40

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	A	1273/1286 (99%)	1233 (97%)	40 (3%)	0	100	100
2	B	1155/1164 (99%)	1110 (96%)	45 (4%)	0	100	100
3	C	302/305 (99%)	288 (95%)	14 (5%)	0	100	100
4	E	182/185 (98%)	172 (94%)	10 (6%)	0	100	100
5	F	102/164 (62%)	99 (97%)	3 (3%)	0	100	100
6	G	149/161 (92%)	141 (95%)	8 (5%)	0	100	100
7	H	380/382 (100%)	372 (98%)	8 (2%)	0	100	100
8	J	59/63 (94%)	55 (93%)	4 (7%)	0	100	100
9	L	280/287 (98%)	270 (96%)	10 (4%)	0	100	100
11	O	842/844 (100%)	821 (98%)	21 (2%)	0	100	100
12	S	114/259 (44%)	109 (96%)	5 (4%)	0	100	100
14	I	272/288 (94%)	261 (96%)	11 (4%)	0	100	100
All	All	5110/5388 (95%)	4931 (96%)	179 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	1148/1157 (99%)	1137 (99%)	11 (1%)	76	88
2	B	1057/1064 (99%)	1055 (100%)	2 (0%)	93	97
3	C	286/287 (100%)	286 (100%)	0	100	100
4	E	174/175 (99%)	173 (99%)	1 (1%)	86	94
5	F	95/151 (63%)	95 (100%)	0	100	100
6	G	136/144 (94%)	136 (100%)	0	100	100
7	H	363/363 (100%)	361 (99%)	2 (1%)	86	94
8	J	60/62 (97%)	58 (97%)	2 (3%)	38	57
9	L	269/272 (99%)	269 (100%)	0	100	100
11	O	774/774 (100%)	766 (99%)	8 (1%)	76	88
12	S	108/240 (45%)	108 (100%)	0	100	100
14	I	257/268 (96%)	256 (100%)	1 (0%)	91	96
All	All	4727/4957 (95%)	4700 (99%)	27 (1%)	86	94

All (27) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	332	ASN
1	A	339	ASN
1	A	342	LEU
1	A	385	HIS
1	A	606	TYR
1	A	612	ASP
1	A	683	TYR
1	A	1072	LEU
1	A	1095	LYS
1	A	1142	ASN
1	A	1260	LEU

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Mol	Chain	Res	Type
2	B	320	ASN
2	B	429	HIS
4	E	106	ILE
7	H	20	PHE
7	H	296	LYS
8	J	3	PHE
8	J	9	THR
11	O	281	HIS
11	O	351	LYS
11	O	362	VAL
11	O	613	ILE
11	O	649	TYR
11	O	677	TRP
11	O	805	MET
11	O	808	ARG
14	I	260	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	159	ASN
6	G	127	ASN
9	L	279	GLN
11	O	21	ASN
11	O	35	ASN
11	O	147	ASN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 5 ligands modelled in this entry, 5 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 ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-17334. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections (i)

6.1.1 Primary map
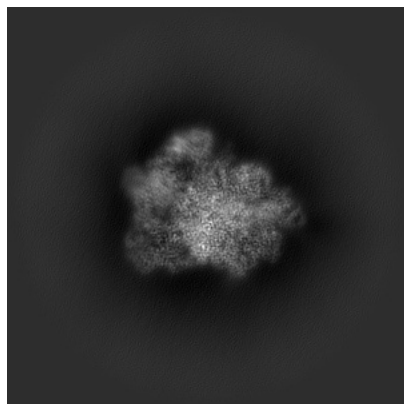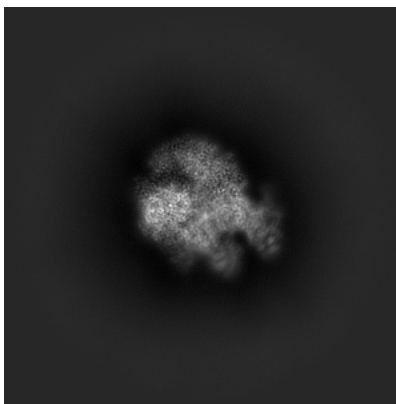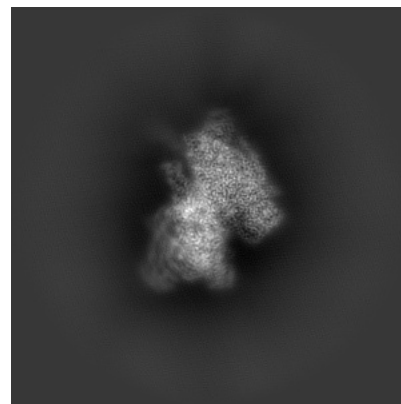
| X | Y | Z |

6.1.2 Raw map

| X | Y | Z |
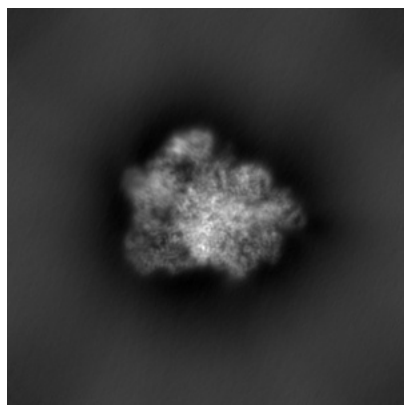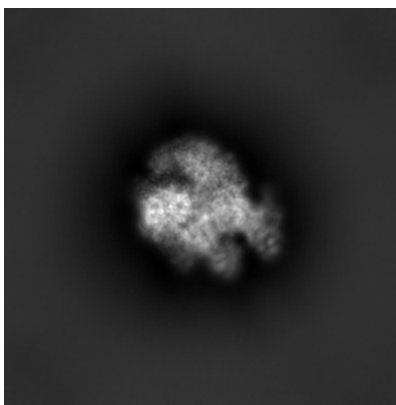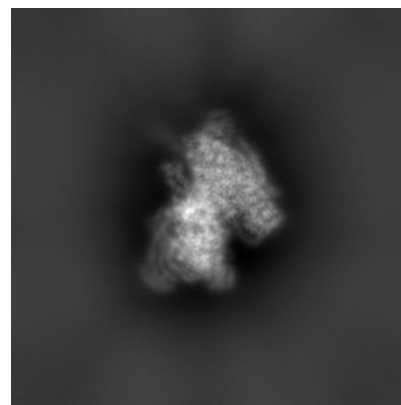
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

6.2.1 Primary map
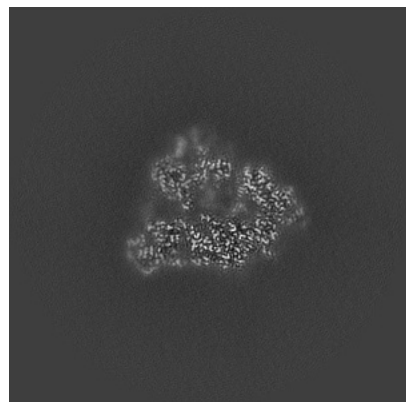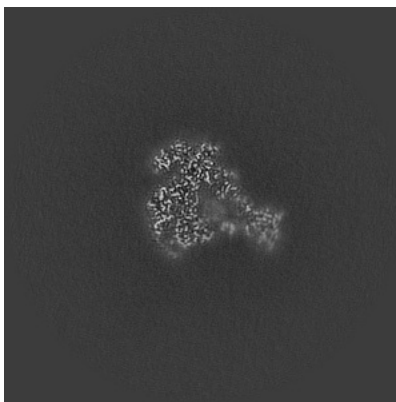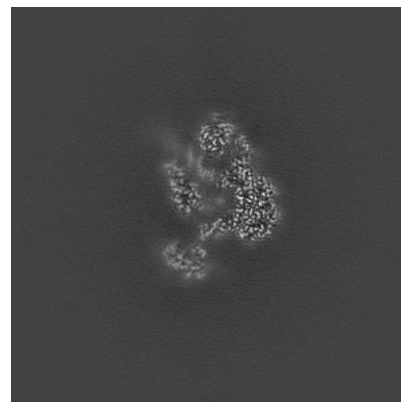
| X Index: 192 | Y Index: 192 | Z Index: 192 |

6.2.2 Raw map
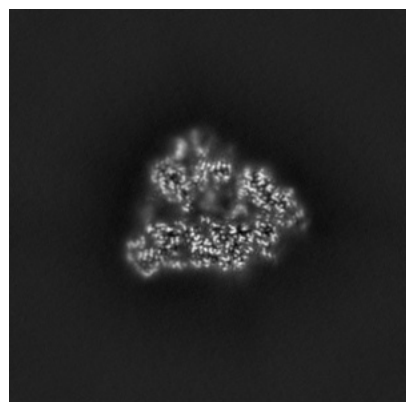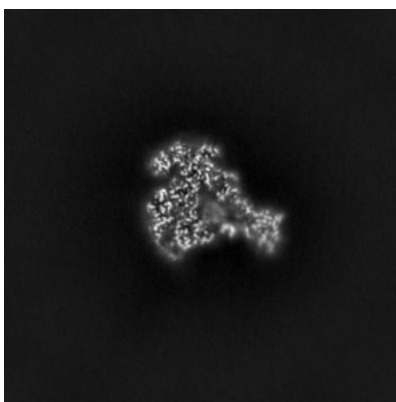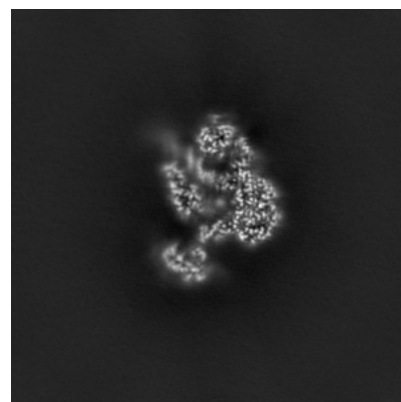
| X Index: 192 | Y Index: 192 | Z Index: 192 |

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
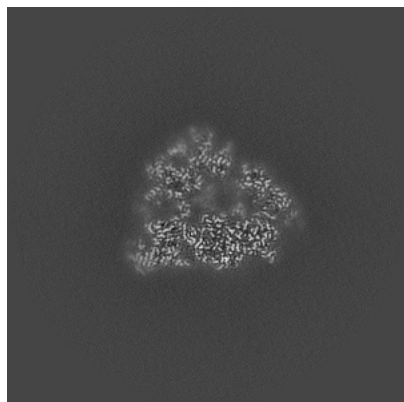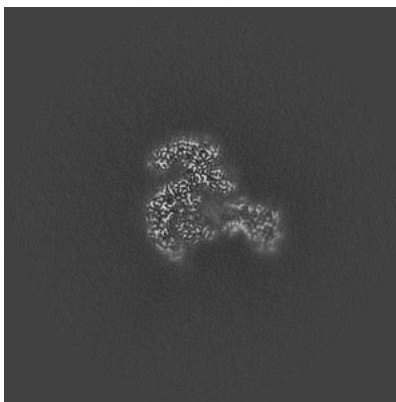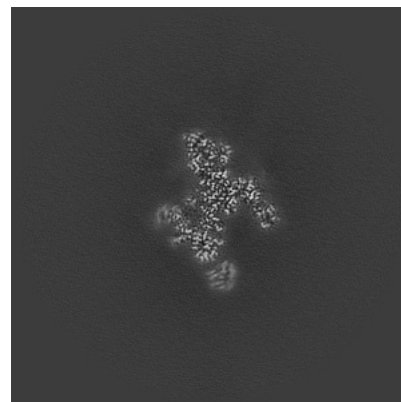
| X Index: 188 | Y Index: 188 | Z Index: 160 |

6.3.2 Raw map
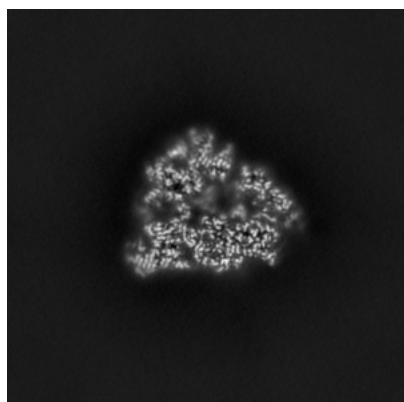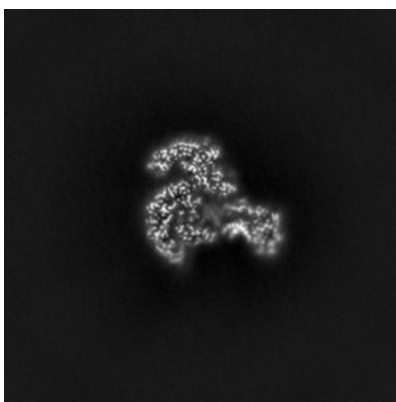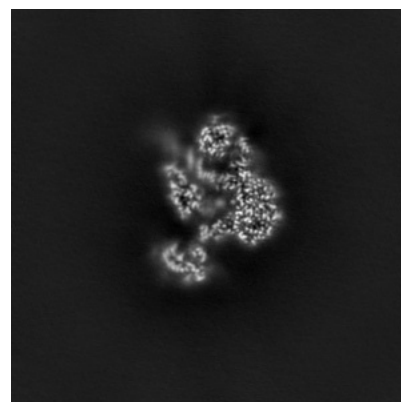
| X Index: 188 | Y Index: 188 | Z Index: 193 |

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

6.4 Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1 Primary map
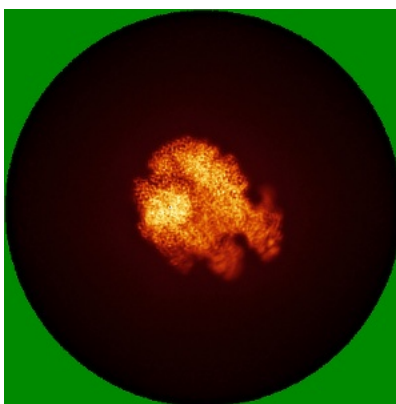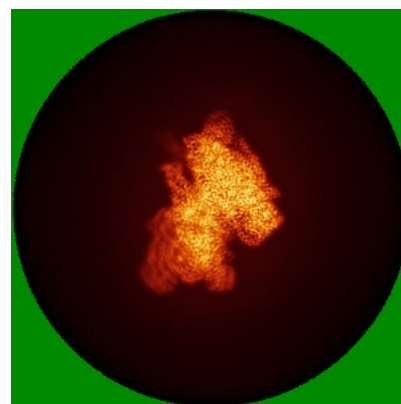
| X | Y | Z |

6.4.2 Raw map

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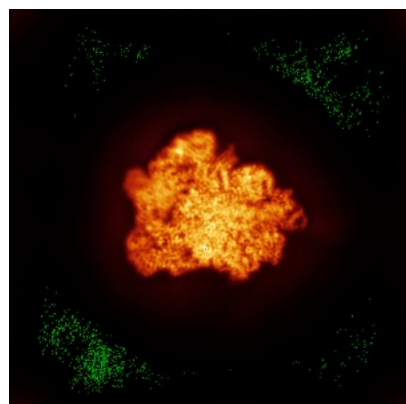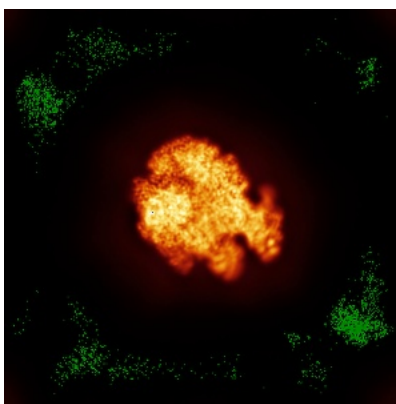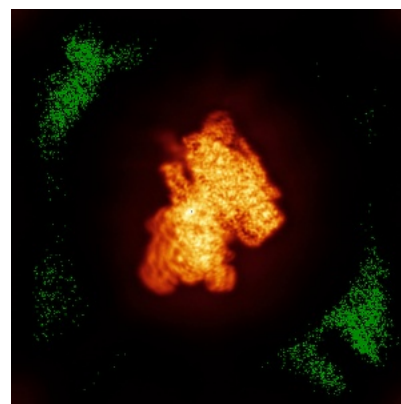
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

X	Y	Z
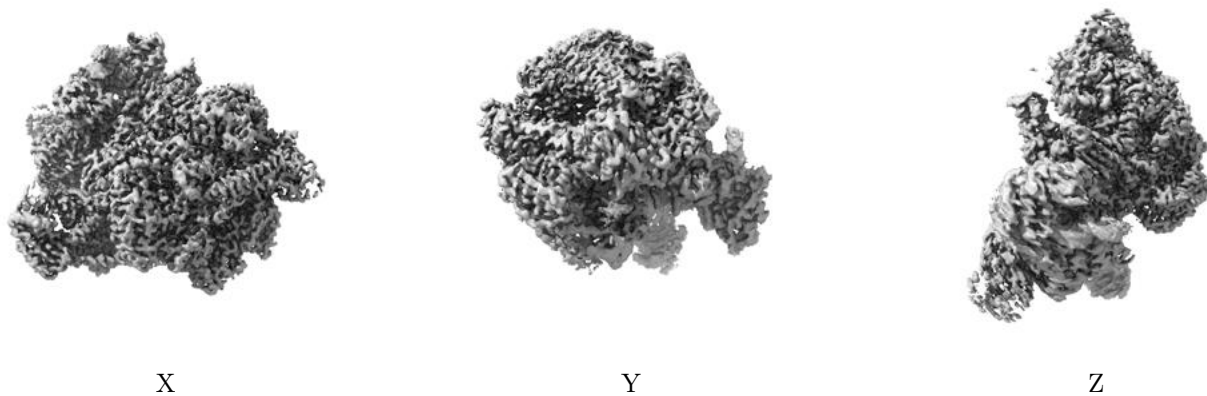
The images above show the 3D surface view of the map at the recommended contour level 0.733. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X	Y	Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation ⓘ

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

7 Map analysis ⓘ

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

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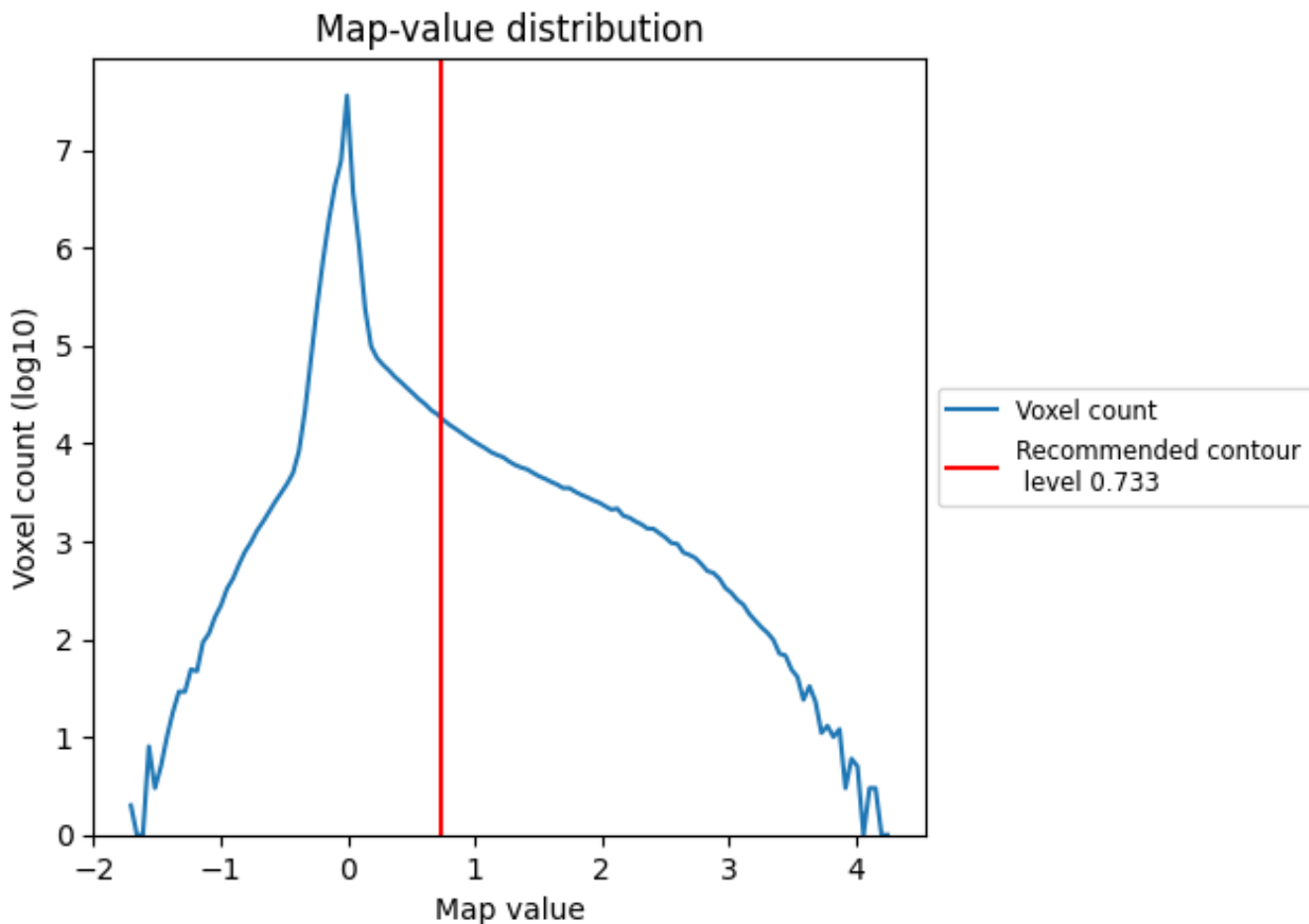
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate (i)
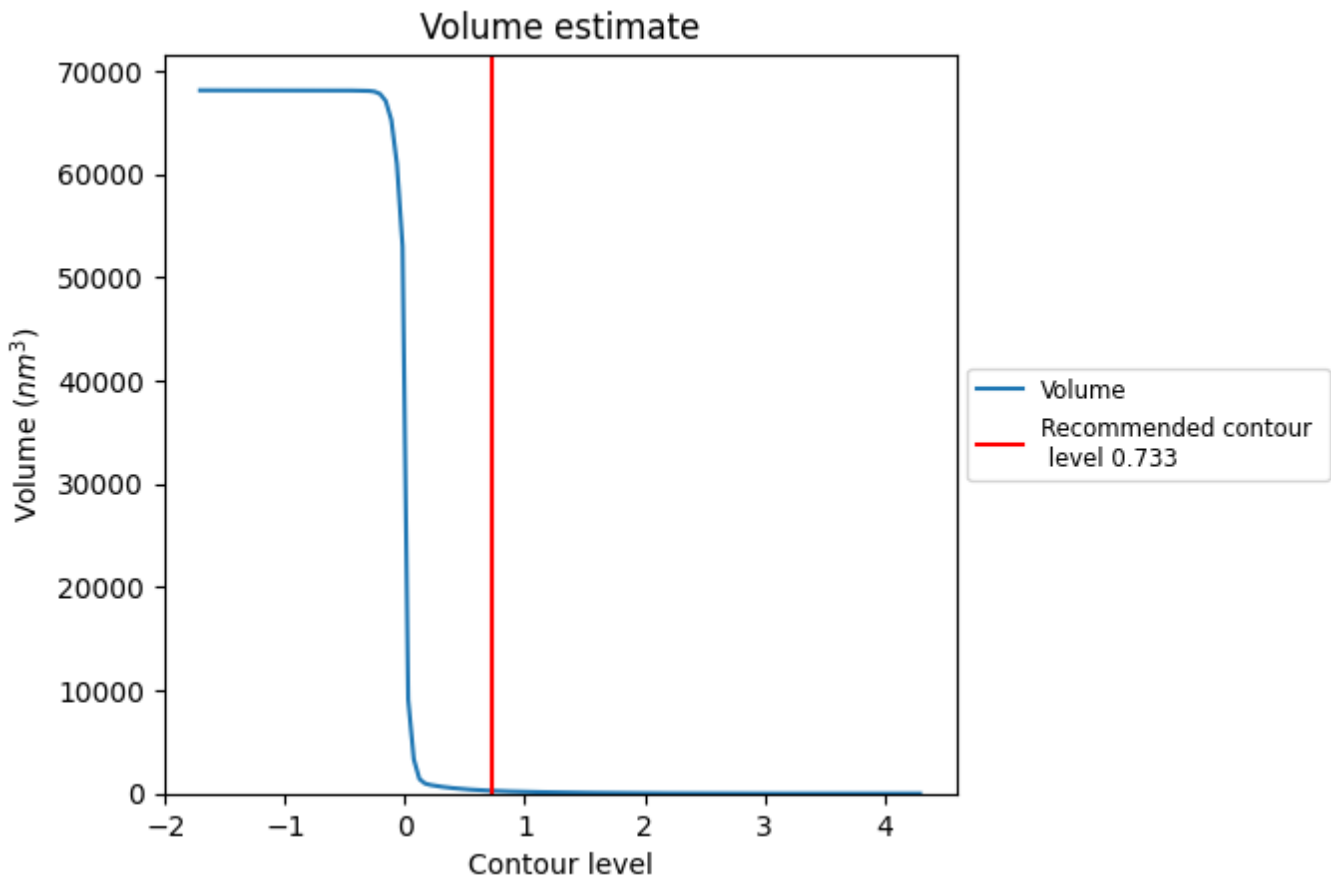
The volume at the recommended contour level is 269 nm^3; this corresponds to an approximate mass of 243 kDa.

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 ⓘ
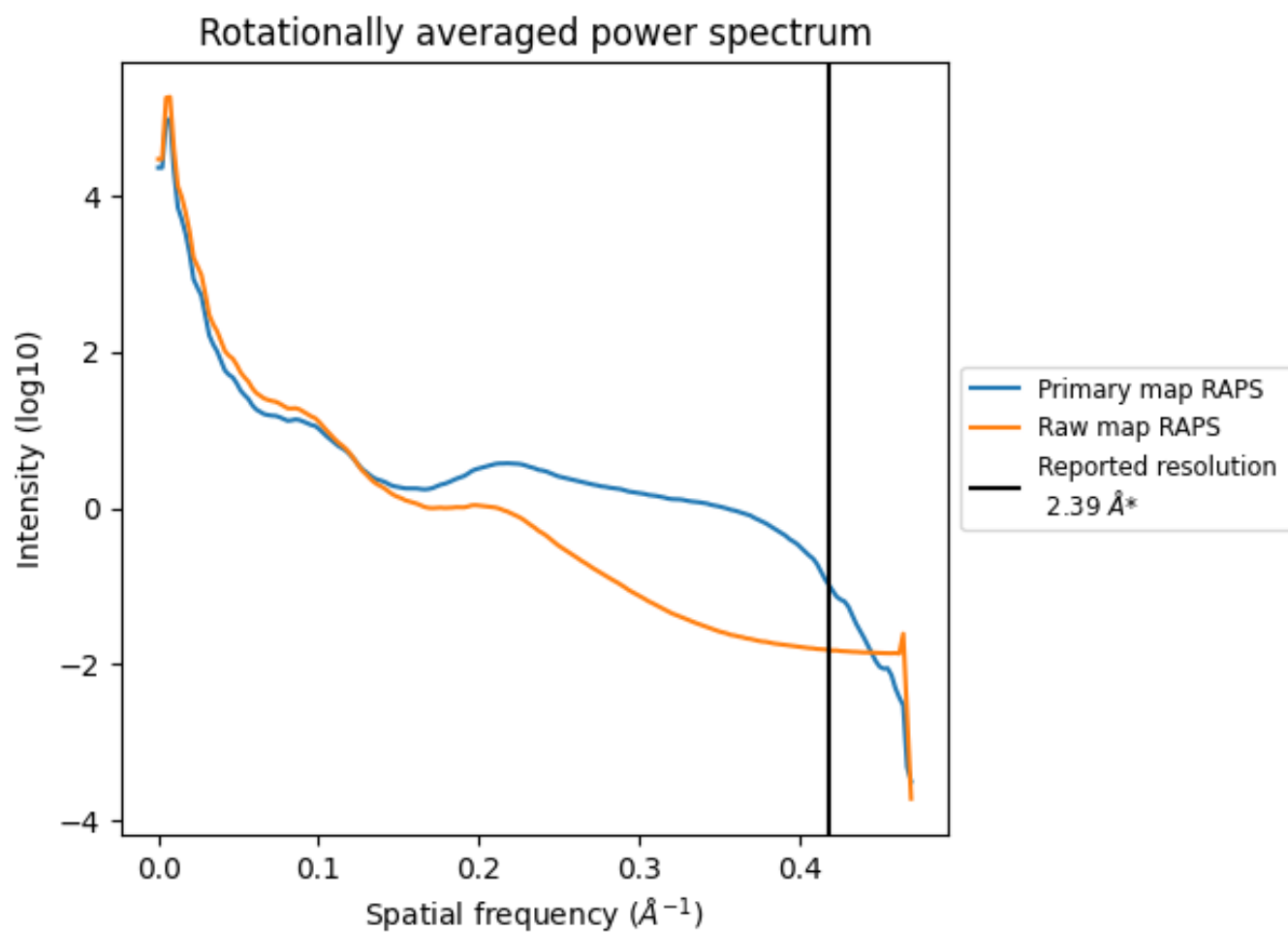
*Reported resolution corresponds to spatial frequency of 0.418 Å^{-1}

8 Fourier-Shell correlation ⓘ

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 ⓘ
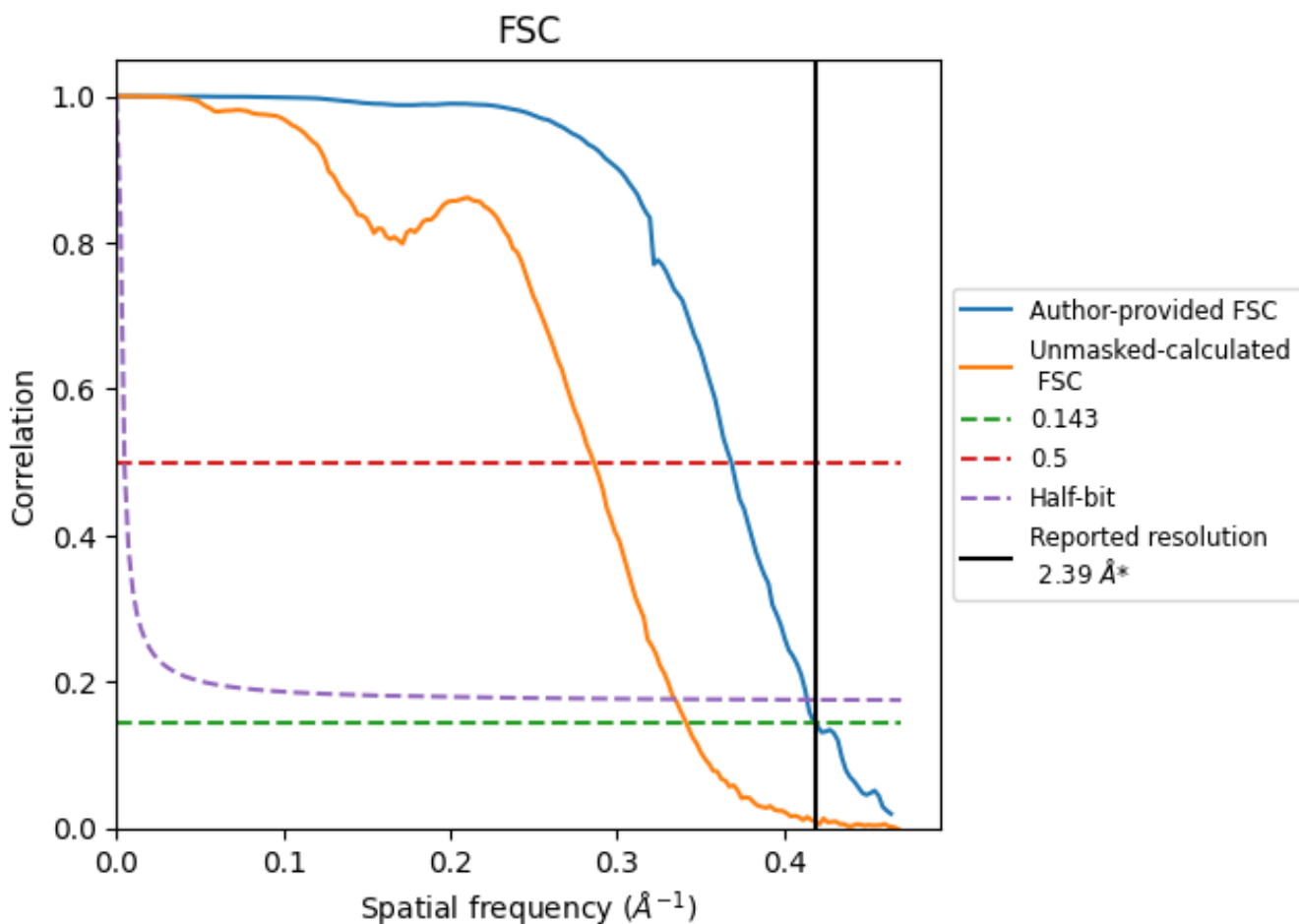
*Reported resolution corresponds to spatial frequency of 0.418 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.39	-	-
Author-provided FSC curve	2.39	2.71	2.42
Unmasked-calculated*	2.93	3.50	2.99

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 2.93 differs from the reported value 2.39 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-17334 and PDB model 8P0J. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay ⓘ

X

Y

Z
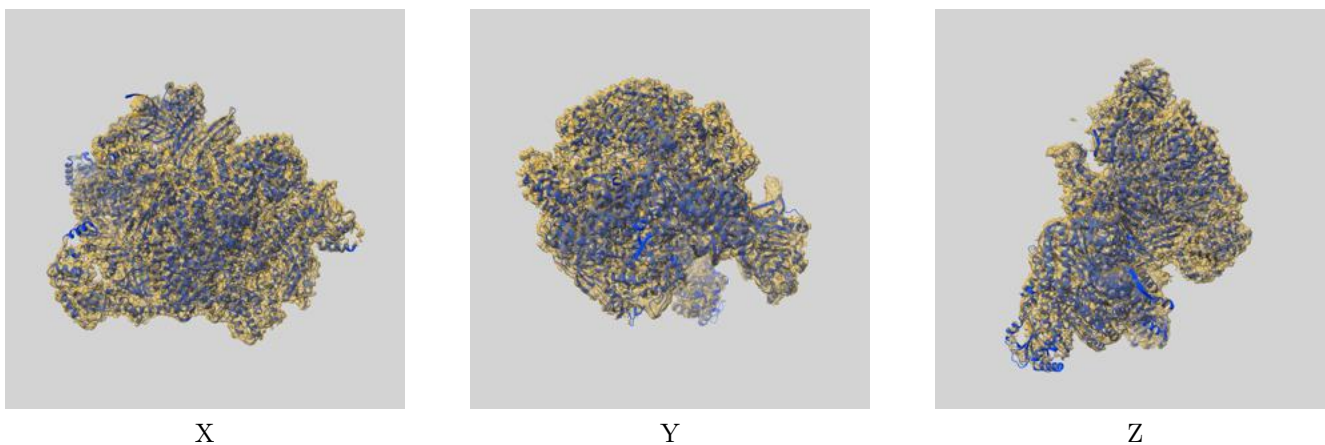
The images above show the 3D surface view of the map at the recommended contour level 0.733 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model ⓘ

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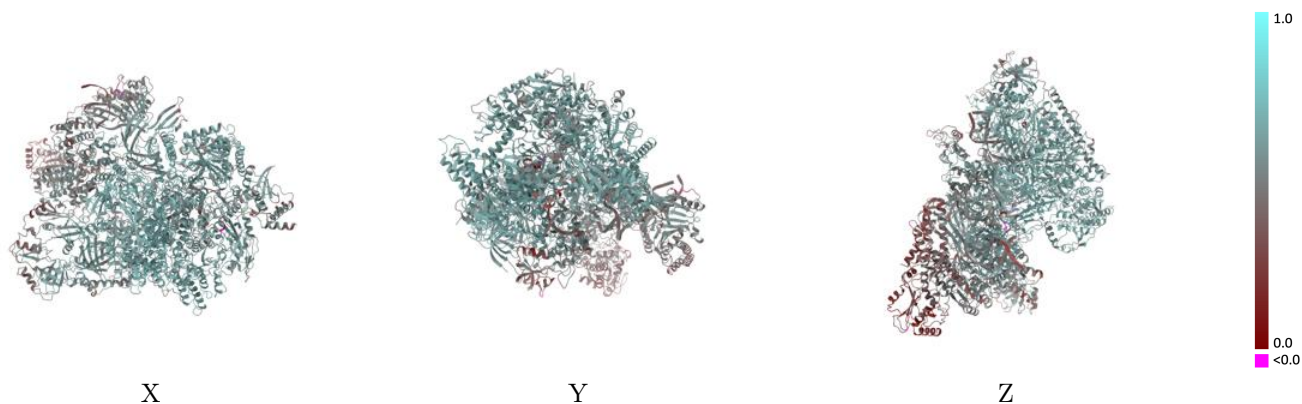
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

X	Y	Z
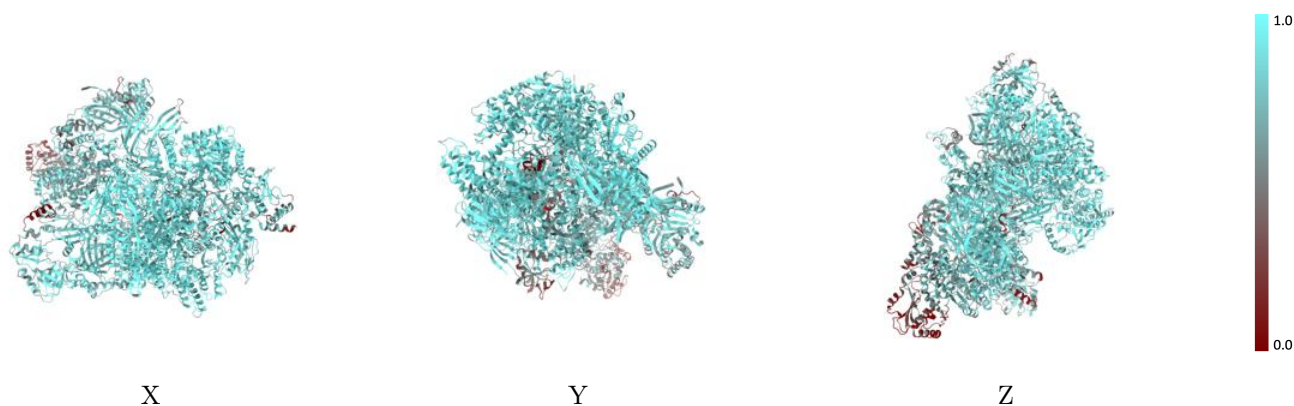
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.733).

9.4 Atom inclusion ⓘ
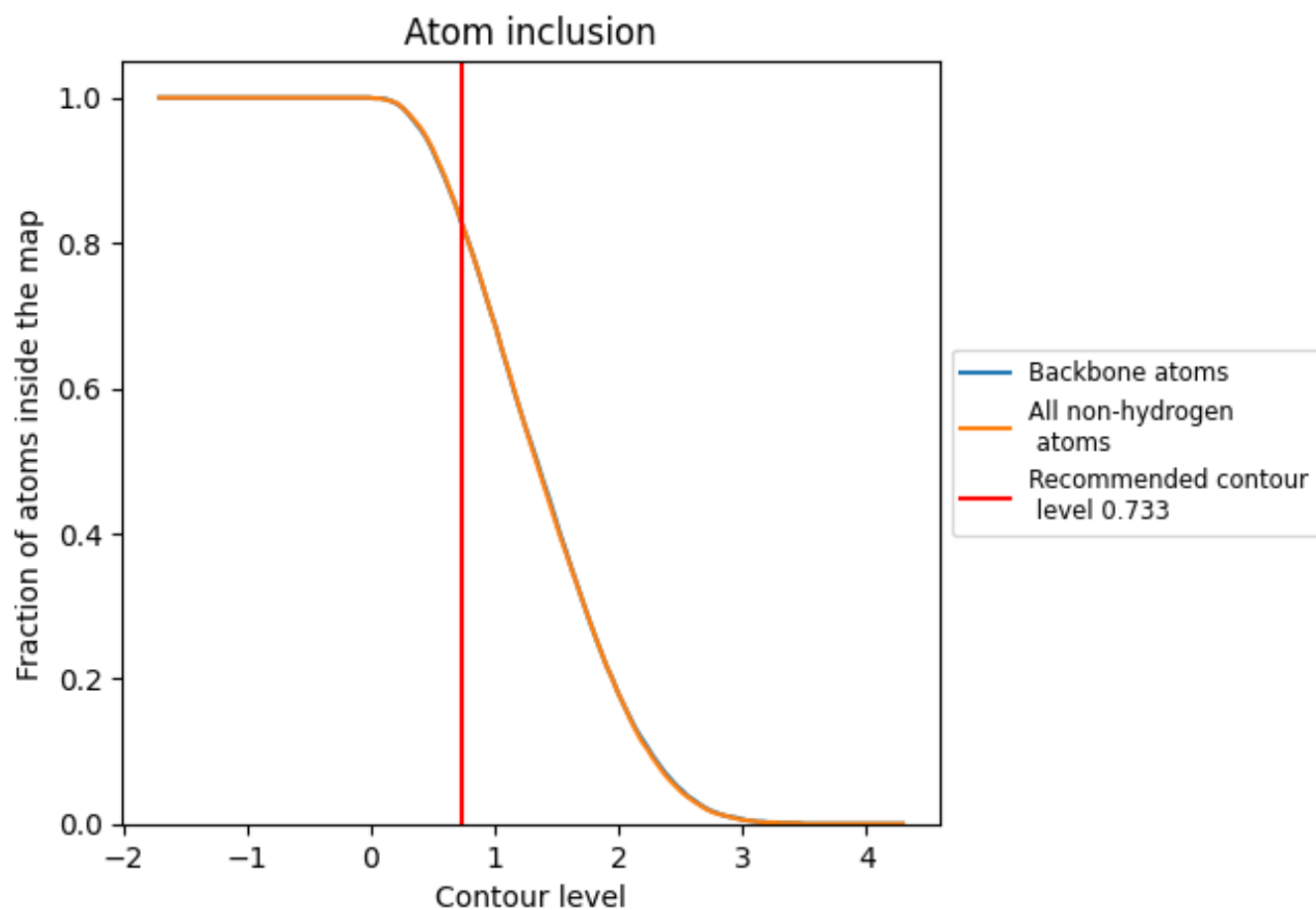
At the recommended contour level, 83% of all backbone atoms, 83% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.733) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8280	0.5580
A	0.8860	0.6050
B	0.9090	0.6160
C	0.9180	0.6140
E	0.9140	0.6080
F	0.9290	0.6530
G	0.6650	0.4810
H	0.7580	0.4690
I	0.8040	0.5460
J	0.9480	0.6220
L	0.4020	0.3010
N	0.8290	0.4540
O	0.8100	0.5350
S	0.6680	0.5100
T	0.8380	0.4620

1.0

0.0
<0.0