W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

wwPDB EM Validation Summary Report (i)

Dec 10, 2022 – 10:38 am GMT

PDB ID	:	5G5L
EMDB ID	:	EMD-3439
Title	:	RNA polymerase I-Rrn3 complex at 4.8 A resolution
Authors	:	Engel, C.; Plitzko, J.; Cramer, P.
Deposited on	:	2016-05-26
Resolution	:	4.80 Å(reported)
Based on initial model	:	4C2M

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 (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:

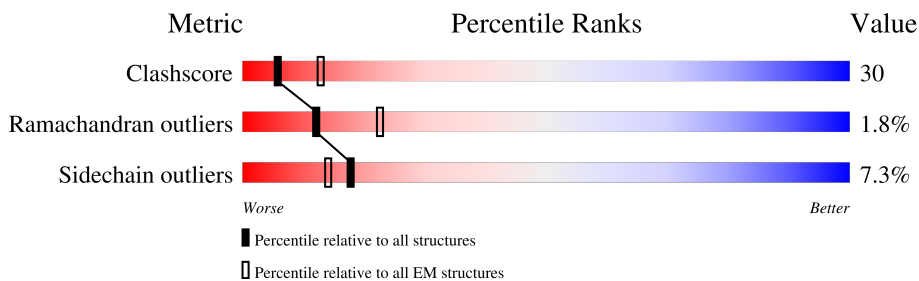|		
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	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 4.80 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		30
Ramachandran outliers		1.8%
Sidechain outliers		7.3%

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	1664	8% / 63% 23% · 11%
2	B	1203	9% / 69% 24% · ·
3	C	335	6% / 61% 26% · · 9%
4	D	137	· / 23% 18% ·· 58%
5	E	215	· / 77% 18% · ·
6	F	155	· / 53% 10% · 35%
7	G	326	7% / 39% 17% · 41%
8	H	146	· / 72% 16% · 10%

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Mol	Chain	Length	Quality of chain
9	I	125	22% 54% 30% 14%
10	J	70	79% 17%
11	K	142	6% 51% 19% 29%
12	L	70	6% 29% 27% 6% 39%
13	M	415	8% 17% 8% 75%
14	N	233	24% 47% 15% 38%
15	O	627	22% 25% 40% 8% 26%

2   Entry composition ⓘ

There are 16 unique types of molecules in this entry. The entry contains 37349 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 RPA190.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1480	Total	C	N	O	S	0	0
			11686	7384	2030	2211	61		

- Molecule 2 is a protein called DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA135.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	1174	Total	C	N	O	S	0	0
			9327	5899	1635	1743	50		

- Molecule 3 is a protein called DNA-DIRECTED RNA POLYMERASES I AND III SUBUNIT RPAC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	305	Total	C	N	O	S	0	0
			2423	1539	416	460	8		

- Molecule 4 is a protein called DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA14.

Mol	Chain	Residues	Atoms				AltConf	Trace
4	D	58	Total	C	N	O	0	0
			459	289	78	92		

- Molecule 5 is a protein called DNA-DIRECTED RNA POLYMERASES I, II, AND III SUBUNIT RPABC 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	212	Total	C	N	O	S	0	0
			1735	1102	306	316	11		

- Molecule 6 is a protein called DNA-DIRECTED RNA POLYMERASES I, II, AND III SUBUNIT RPABC 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	100	Total 823	C 522	N 144	O 154	S 3	0	0

- Molecule 7 is a protein called DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA43.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	193	Total 1520	C 982	N 259	O 274	S 5	0	0

- Molecule 8 is a protein called DNA-DIRECTED RNA POLYMERASES I, II, AND III SUB-UNIT RPABC 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	131	Total 1052	C 664	N 176	O 208	S 4	0	0

- Molecule 9 is a protein called DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA12.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	107	Total 820	C 511	N 138	O 162	S 9	0	0

- Molecule 10 is a protein called DNA-DIRECTED RNA POLYMERASES I, II, AND III SUBUNIT RPABC 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	69	Total 569	C 362	N 101	O 100	S 6	0	0

- Molecule 11 is a protein called DNA-DIRECTED RNA POLYMERASES I AND III SUB-UNIT RPAC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	101	Total 793	C 496	N 130	O 162	S 5	0	0

- Molecule 12 is a protein called DNA-DIRECTED RNA POLYMERASES I, II, AND III SUBUNIT RPABC 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	43	Total 340	C 211	N 66	O 59	S 4	0	0

- Molecule 13 is a protein called DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA49.

Mol	Chain	Residues	Atoms				AltConf	Trace
13	M	105	Total 833	C 528	N 138	O 167	0	0

- Molecule 14 is a protein called DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA34.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	145	Total 1151	C 735	N 188	O 224	S 4	0	0

- Molecule 15 is a protein called RNA POLYMERASE I-SPECIFIC TRANSCRIPTION INITIATION FACTOR RRN3.

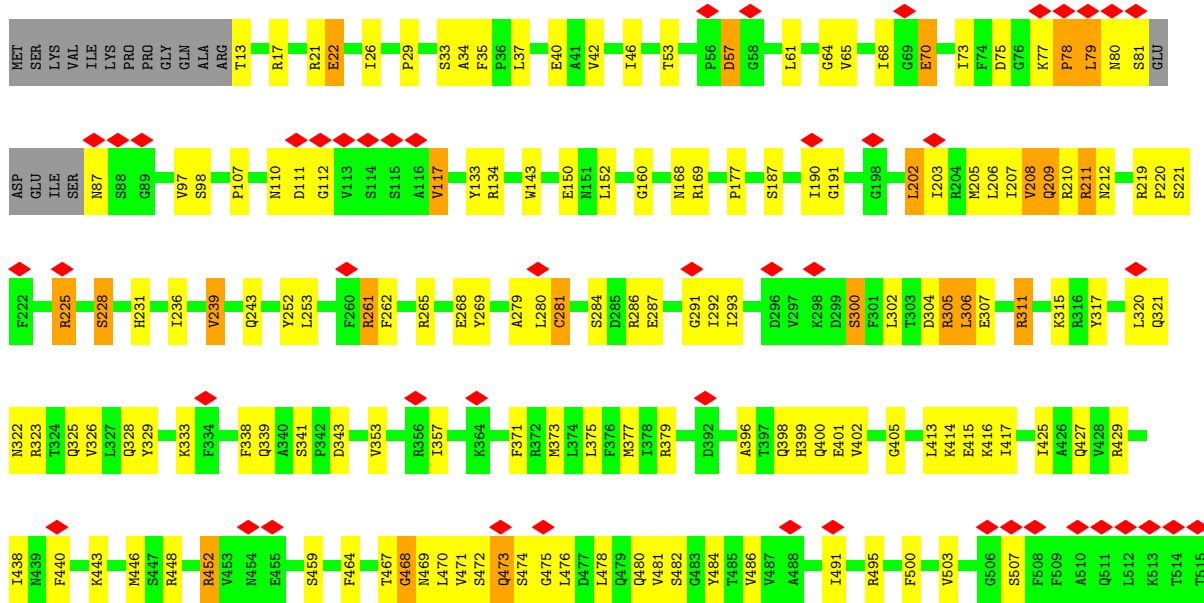| Mol	Chain	Residues	Atoms					AltConf	Trace
15	O	463	Total 3811	C 2473	N 623	O 694	S 21	0	0

- 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	I	2	Total 2	Zn 2	0
16	J	1	Total 1	Zn 1	0
16	L	1	Total 1	Zn 1	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.
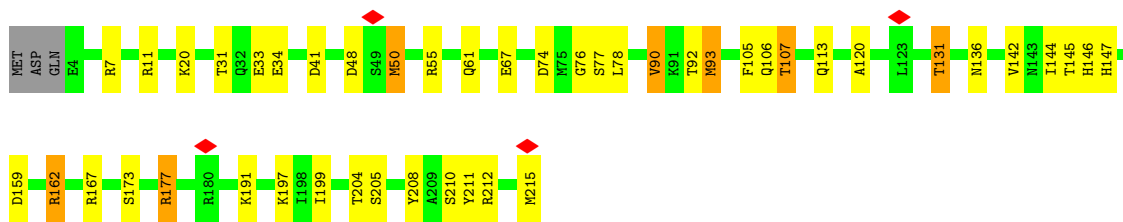
• Molecule 1: DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA190

• Molecule 2: DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA135

Chain B:
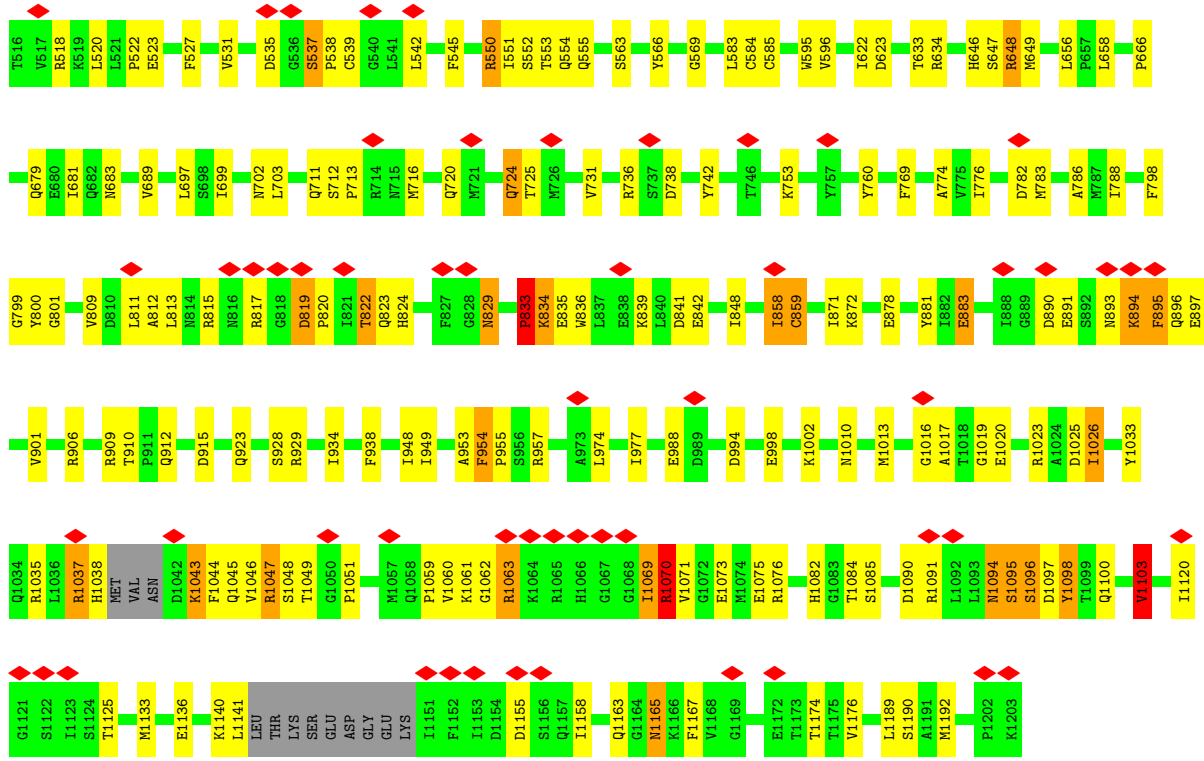
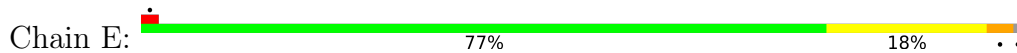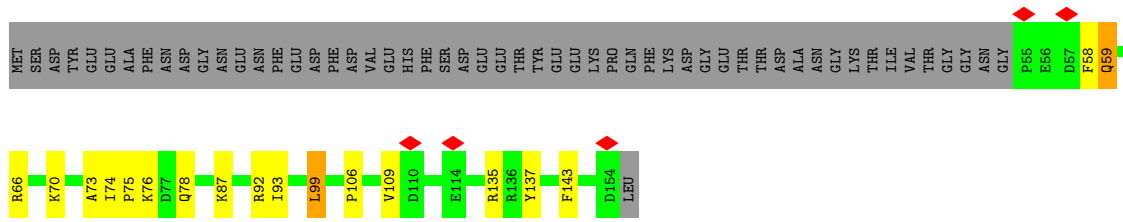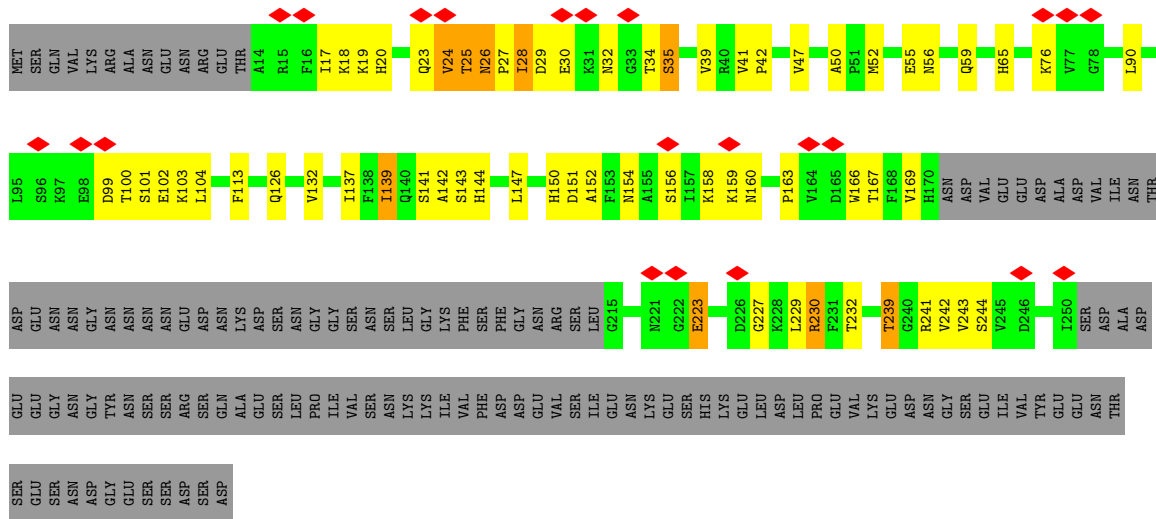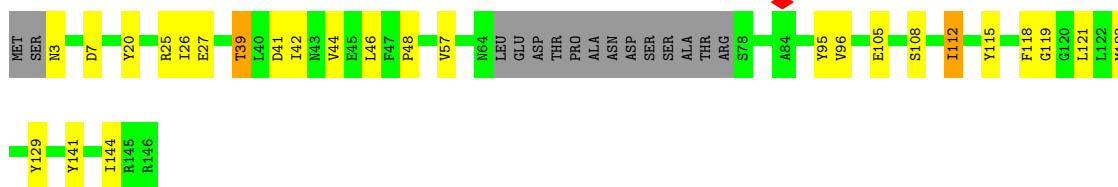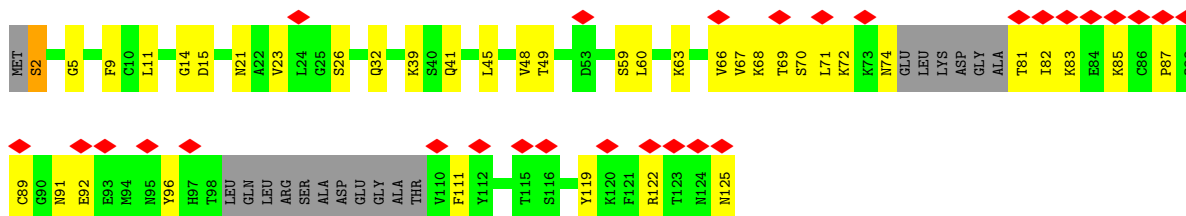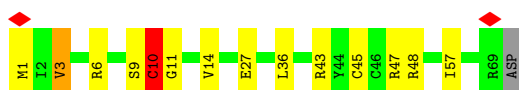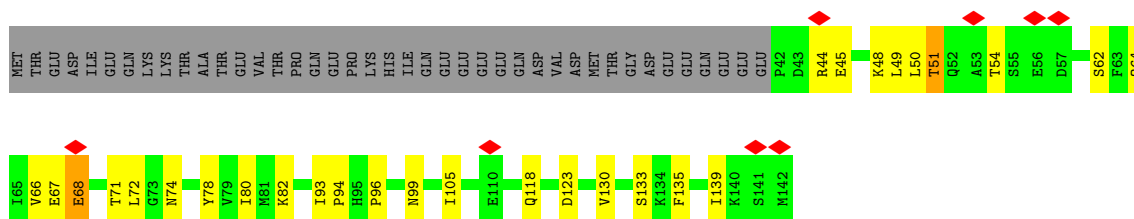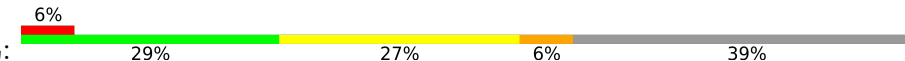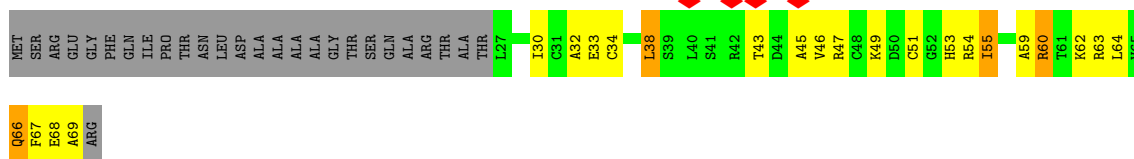• Molecule 3: DNA-DIRECTED RNA POLYMERASES I AND III SUBUNIT RPAC1

Chain C:

6%

61%   26%   9%
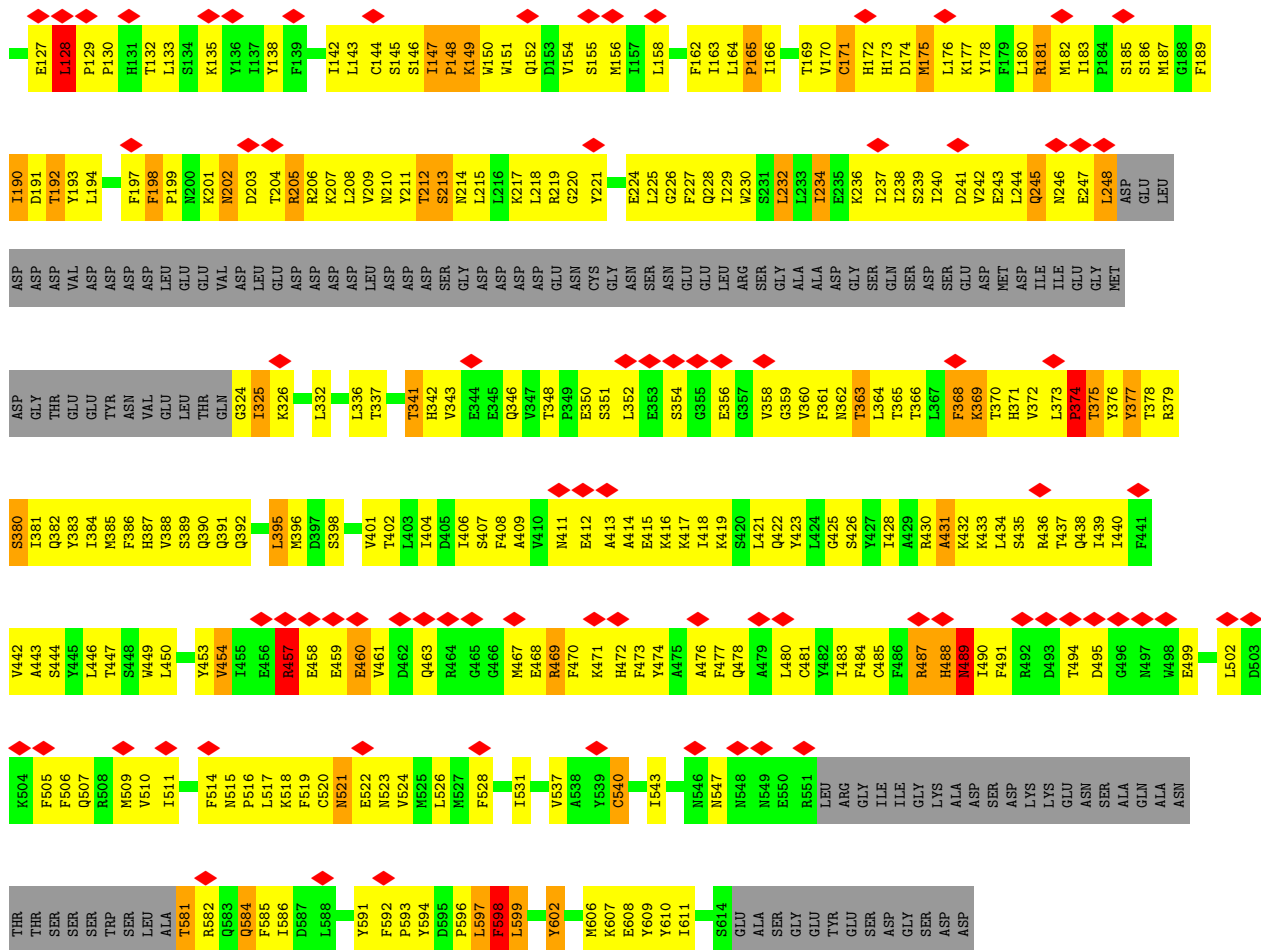

• Molecule 4: DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA14

Chain D:

23%   18%   58%

ALA ASN THR SER LEU ASN ILE ASP **T80** N81 L82 I86 K90 R91 I92 Q93 R94 D95 F96 K97 G98 **L99** **P100** PRO ALA GLN ASP PHE SER ALA ALA PRO ILE GLN VAL SER THR THR GLU LYS LYS GLU THR SER ILE GLY VAL SER ALA THR GLY GLY LYS LYS THR THR PHE ALA

ASP GLU

• Molecule 5: DNA-DIRECTED RNA POLYMERASES I, II, AND III SUBUNIT RPABC 1

Chain E:

77% 18%

MET ASP GLN E4 R7 R11 K20 T31 Q32 E33 E34 D41 D48 S49 M50 R55 Q61 E67 D74 M75 G76 S77 L78 V90 K91 T92 M93 F105 Q106 T107 Q113 A120 L123 T131 N136 V142 N143 I144 T145 H146 H147

D159 R162 R167 S173 R177 R180 K191 K197 I198 I199 T204 S205 Y208 A209 S210 Y211 R212 M215

• Molecule 6: DNA-DIRECTED RNA POLYMERASES I, II, AND III SUBUNIT RPABC 2

Chain F:

53% 10% 35%

MET SER ASP TYR GLU GLU ALA PHE ASN ASP GLY ASN GLU ASN PHE GLU ASP PHE ASP VAL GLU HIS PHE SER GLU ASP GLU GLU THR TYR GLU GLU LYS PRO GLN PHE LYS ASP GLY GLU THR THR ASP ALA ASN GLY LYS THR ILE VAL THR GLY GLY ASN GLY **P55** **E56** **D57** **F58** **Q59**

R66 K70 A73 I74 P75 K76 D77 Q78 K87 R92 I93 L99 P106 V109 D110 E114 R135 R136 Y137 F143 D154 LEU

• Molecule 7: DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA43

Chain G:

7% 39% 17% 41%

MET SER GLN VAL LYS ARG ALA ASN GLU ASN GLU ARG GLU THR A14 R15 F16 I17 K18 K19 H20 Q23 V24 T25 N26 P27 I28 D29 E30 K31 N32 G33 T34 S35 V39 R40 V41 P42 V47 A50 P51 M52 E55 N56 Q59 H65 K76 V77 G78 L90 P94

L95 S96 K97 E98 D99 T100 S101 E102 K103 L104 F113 Q126 V132 I137 F138 I139 Q140 S141 A142 S143 H144 L147 H150 D151 A152 F153 N154 A155 S156 I157 K158 K159 N160 P163 V164 D165 W166 T167 F168 V169 H170 ASN ASP VAL GLU GLU ASP ALA ASP VAL ILE ASN THR

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

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

SER GLU SER ASN GLY GLU SER SER ASP

• Molecule 8: DNA-DIRECTED RNA POLYMERASES I, II, AND III SUBUNIT RPABC 3

Chain H:

72%   16%   10%

MET SER N3 D7 Y20 R25 I26 E27 T39 L40 D41 I42 N43 V44 E45 L46 F47 P48 V57 N64 LEU GLU ASP THR PRO ALA ASN ASP SER ALA THR S78 A84 Y95 V96 E105 S108 I112 Y115 F118 G119 G120 L121 L122 M123

Y129 Y141 I144 R145 R146

• Molecule 9: DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA12

Chain I:

22%

54%   30%   14%

MET S2 G5 F9 C10 L11 G14 D15 N21 A22 V23 L24 G25 S26 Q32 K39 S40 Q41 L45 V48 T49 D53 S59 L60 K63 V66 V67 K68 T69 S70 L71 K72 K73 N74 GLU LEU LYS ASP GLY ALA T81 I82 K83 E84 K85 C86 P87 Q88

C89 G90 N91 E92 E93 M94 N95 Y96 H97 T98 LEU GLN LEU ARG SER ALA ASP GLU GLY ALA THR V110 F111 Y112 T115 S116 Y119 K120 F121 R122 T123 N124 N125

• Molecule 10: DNA-DIRECTED RNA POLYMERASES I, II, AND III SUBUNIT RPABC 5

Chain J:

79%   17%

M1 I2 V3 R6 S9 C10 G11 V14 E27 L36 R43 Y44 C45 C46 R47 R48 I57 R69 ASP

• Molecule 11: DNA-DIRECTED RNA POLYMERASES I AND III SUBUNIT RPAC2

Chain K:

6%

51%   19%   29%

MET THR GLU ASP ILE GLU GLN LYS LYS THR ALA THR GLU VAL THR PRO GLN GLU PRO LYS HIS ILE GLN GLU GLU GLU GLU GLN GLN ASP VAL ASP MET THR GLY ASP GLU GLU GLN GLU GLU GLU P42 D43 R44 E45 K48 L49 L50 T51 Q52 A53 T54 S55 E56 D57 S62 F63 Q64

I65 V66 E67 E68 T71 L72 G73 N74 Y78 V79 I80 M81 K82 I93 P94 H95 P96 N99 I105 E110 Q118 D123 V130 S133 K134 F135 I139 K140 S141 M142

• Molecule 12: DNA-DIRECTED RNA POLYMERASES I, II, AND III SUBUNIT RPABC 4

Chain L:

6%

29%   27%   6%   39%

MET SER ARG GLU GLY PHE GLN ILE PRO THR ASN LEU ASP ALA ALA ALA ALA GLY THR SER GLN ALA ARG THR ALA THR L27 I30 C31 A32 E33 C34 L38 S39 L40 S41 R42 T43 D44 A45 V46 R47 C48 K49 D50 C51 G52 H53 R54 I55 A59 R60 T61 K62 R63 L64 V65

Q66 F67 E68 A69 ARG

• Molecule 13: DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA49

Chain M:

8%

17%   8%   •   75%

[residue sequence diagram for Chain M]

• Molecule 14: DNA-DIRECTED RNA POLYMERASE I SUBUNIT RPA34

Chain N:

24%

47%   15%   38%

[residue sequence diagram for Chain N]

• Molecule 15: RNA POLYMERASE I-SPECIFIC TRANSCRIPTION INITIATION FACTOR RRN3

Chain O:

22%

25%   40%   8%   •   26%

[residue sequence diagram for Chain O]

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	63445	Depositor
Resolution determination method	Not provided	
CTF correction method	RELION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	40	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	3600	Depositor
Magnification	37037	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.079	Depositor
Minimum map value	-0.034	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.023	Depositor
Map size (Å)	324.0, 324.0, 324.0	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.35, 1.35, 1.35	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

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	0/11900	0.72	22/16073 (0.1%)
2	B	0.49	1/9533 (0.0%)	0.77	25/12884 (0.2%)
3	C	0.43	0/2475	0.68	5/3354 (0.1%)
4	D	0.40	0/465	0.59	0/630
5	E	0.40	0/1771	0.66	3/2383 (0.1%)
6	F	0.45	0/838	0.58	0/1129
7	G	0.39	0/1558	0.60	3/2120 (0.1%)
8	H	0.42	0/1070	0.61	0/1449
9	I	0.42	0/831	0.57	0/1117
10	J	0.57	1/578 (0.2%)	0.59	0/775
11	K	0.46	0/804	0.79	3/1083 (0.3%)
12	L	0.38	0/342	0.55	0/454
13	M	0.42	0/849	0.56	1/1140 (0.1%)
14	N	0.40	0/1172	0.54	0/1580
15	O	0.38	1/3897 (0.0%)	0.58	3/5268 (0.1%)
All	All	0.45	3/38083 (0.0%)	0.69	65/51439 (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
15	O	0	5
All	All	0	6

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	J	10	CYS	CB-SG	7.64	1.95	1.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	O	198	PHE	C-N	-7.16	1.20	1.34
2	B	859	CYS	CB-SG	-6.12	1.71	1.82

The worst 5 of 65 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1023	ARG	NE-CZ-NH2	-13.90	113.35	120.30
2	B	452	ARG	NE-CZ-NH2	-13.35	113.63	120.30
1	A	397	ARG	NE-CZ-NH1	13.22	126.91	120.30
1	A	329	ARG	NE-CZ-NH2	-13.12	113.74	120.30
2	B	448	ARG	NE-CZ-NH2	-12.97	113.81	120.30

There are no chirality outliers.

5 of 6 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1343	ASP	Peptide
15	O	374	PRO	Peptide
15	O	375	THR	Peptide
15	O	411	ASN	Peptide
15	O	598	PHE	Peptide

5.2   Too-close contacts   ⓘ

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	11686	0	11770	682	0
2	B	9327	0	9214	482	0
3	C	2423	0	2409	283	0
4	D	459	0	461	103	0
5	E	1735	0	1764	40	0
6	F	823	0	840	64	0
7	G	1520	0	1529	164	0
8	H	1052	0	1021	15	0
9	I	820	0	805	71	0
10	J	569	0	585	6	0
11	K	793	0	790	36	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
12	L	340	0	361	47	0
13	M	833	0	826	32	0
14	N	1151	0	1169	44	0
15	O	3811	0	3800	757	0
16	A	2	0	0	0	0
16	B	1	0	0	0	0
16	I	2	0	0	0	0
16	J	1	0	0	0	0
16	L	1	0	0	0	0
All	All	37349	0	37344	2258	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 30.

The worst 5 of 2258 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)
15:O:162:PHE:CB	15:O:214:ASN:CB	1.76	1.62
3:C:75:VAL:HG11	3:C:221:PRO:CG	1.33	1.52
1:A:478:TYR:HA	2:B:1048:SER:CA	1.42	1.50
1:A:436:ALA:CB	1:A:443:ALA:HB2	1.43	1.46
1:A:83:VAL:HG21	1:A:427:PHE:CZ	1.50	1.46

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	1464/1664 (88%)	1370 (94%)	82 (6%)	12 (1%)	19	59
2	B	1166/1203 (97%)	1086 (93%)	56 (5%)	24 (2%)	7	38

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	C	303/335 (90%)	278 (92%)	18 (6%)	7 (2%)	6	36
4	D	54/137 (39%)	50 (93%)	2 (4%)	2 (4%)	3	27
5	E	210/215 (98%)	197 (94%)	11 (5%)	2 (1%)	15	53
6	F	98/155 (63%)	94 (96%)	4 (4%)	0	100	100
7	G	189/326 (58%)	171 (90%)	13 (7%)	5 (3%)	5	34
8	H	127/146 (87%)	121 (95%)	6 (5%)	0	100	100
9	I	101/125 (81%)	89 (88%)	9 (9%)	3 (3%)	4	31
10	J	67/70 (96%)	63 (94%)	4 (6%)	0	100	100
11	K	99/142 (70%)	92 (93%)	7 (7%)	0	100	100
12	L	41/70 (59%)	32 (78%)	6 (15%)	3 (7%)	1	16
13	M	103/415 (25%)	93 (90%)	8 (8%)	2 (2%)	8	40
14	N	139/233 (60%)	123 (88%)	13 (9%)	3 (2%)	6	37
15	O	457/627 (73%)	400 (88%)	38 (8%)	19 (4%)	3	25
All	All	4618/5863 (79%)	4259 (92%)	277 (6%)	82 (2%)	12	41

5 of 82 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1606	SER
2	B	111	ASP
2	B	117	VAL
2	B	895	PHE
2	B	1069	ILE

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	1307/1465 (89%)	1221 (93%)	86 (7%)	16	43
2	B	1027/1053 (98%)	956 (93%)	71 (7%)	15	42
3	C	269/296 (91%)	249 (93%)	20 (7%)	13	40

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	D	55/116 (47%)	49 (89%)	6 (11%)	6	25
5	E	194/197 (98%)	180 (93%)	14 (7%)	14	41
6	F	90/137 (66%)	86 (96%)	4 (4%)	28	54
7	G	170/291 (58%)	158 (93%)	12 (7%)	14	41
8	H	115/128 (90%)	111 (96%)	4 (4%)	36	60
9	I	97/110 (88%)	91 (94%)	6 (6%)	18	45
10	J	64/65 (98%)	57 (89%)	7 (11%)	6	25
11	K	91/130 (70%)	84 (92%)	7 (8%)	13	39
12	L	38/57 (67%)	34 (90%)	4 (10%)	7	26
13	M	95/371 (26%)	85 (90%)	10 (10%)	7	26
14	N	135/220 (61%)	129 (96%)	6 (4%)	28	54
15	O	427/576 (74%)	378 (88%)	49 (12%)	5	23
All	All	4174/5212 (80%)	3868 (93%)	306 (7%)	18	40

5 of 306 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
11	K	51	THR
15	O	350	GLU
12	L	55	ILE
15	O	78	VAL
15	O	526	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 37 such sidechains are listed below:

Mol	Chain	Res	Type
15	O	362	ASN
15	O	547	ASN
15	O	371	HIS
15	O	497	ASN
6	F	59	GLN

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 7 ligands modelled in this entry, 7 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 ⓘ

This section contains visualisations of the EMDB entry EMD-3439. 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 ⓘ

6.1.1   Primary map

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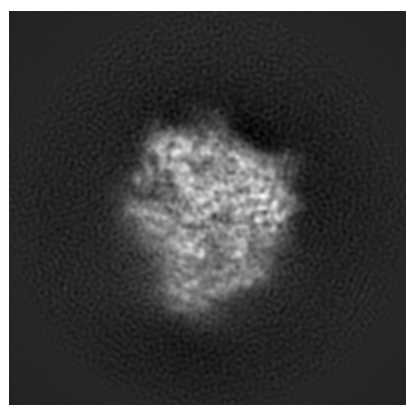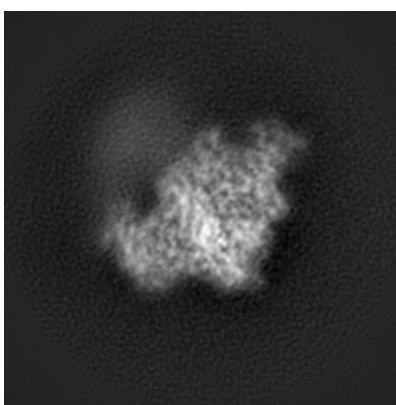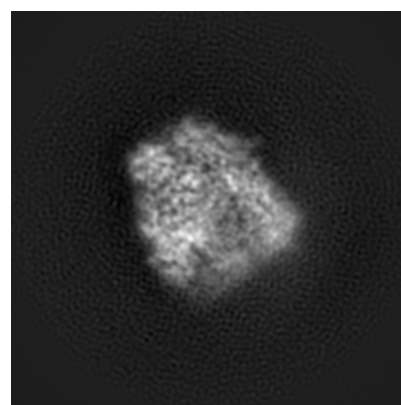
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
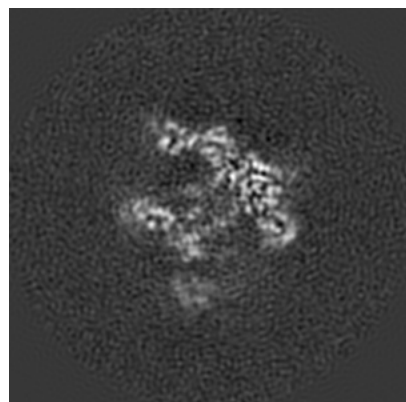
6.2.1   Primary map
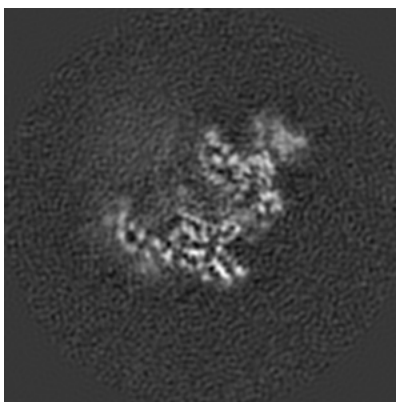
X Index: 120   Y Index: 120   Z Index: 120
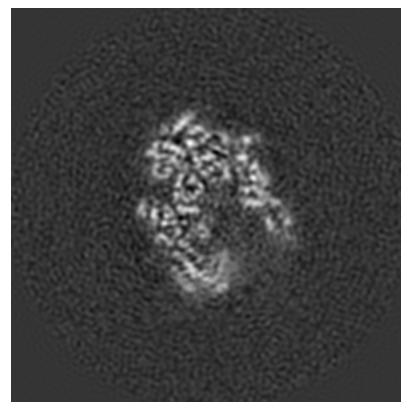
The images above show central slices of the map in three orthogonal directions.

6.3   Largest variance slices ⓘ
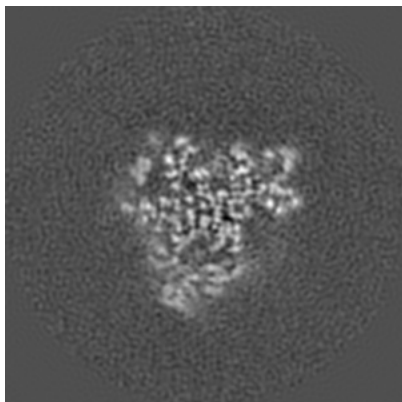
6.3.1   Primary map
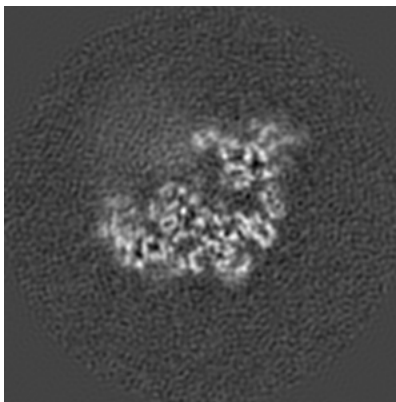
| X Index: 106 | Y Index: 106 | Z Index: 121 |
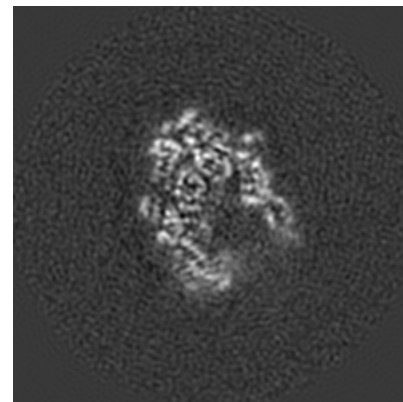
The images above show the largest variance slices of the map in three orthogonal directions.

6.4   Orthogonal surface views ⓘ
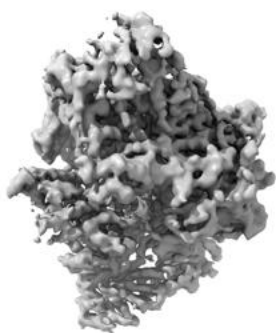
6.4.1   Primary map

| X | Y | Z |
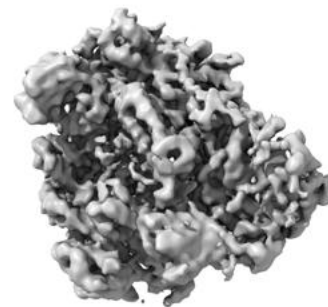
The images above show the 3D surface view of the map at the recommended contour level 0.023. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5 Mask visualisation (i)

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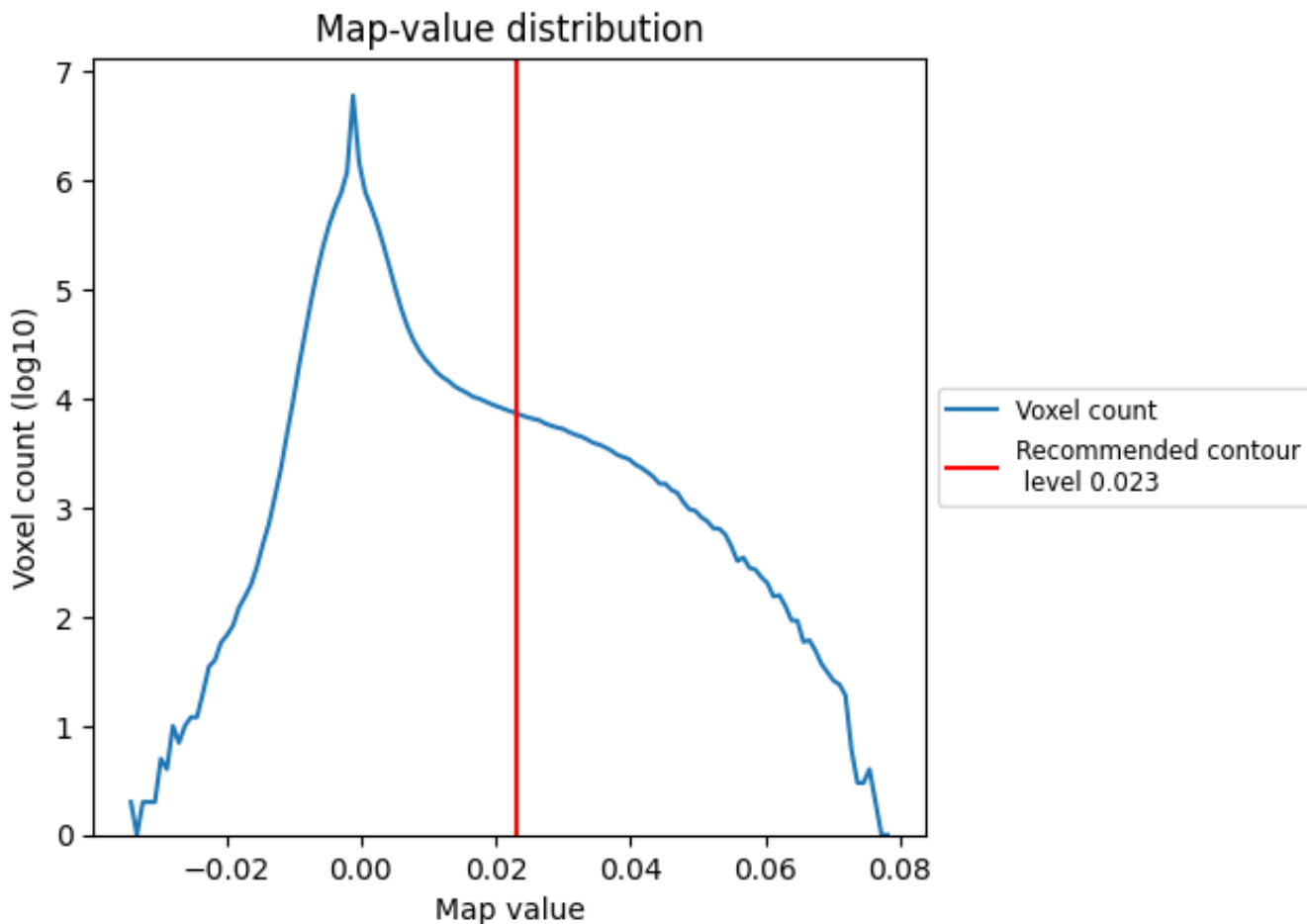
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2   Volume estimate (i)
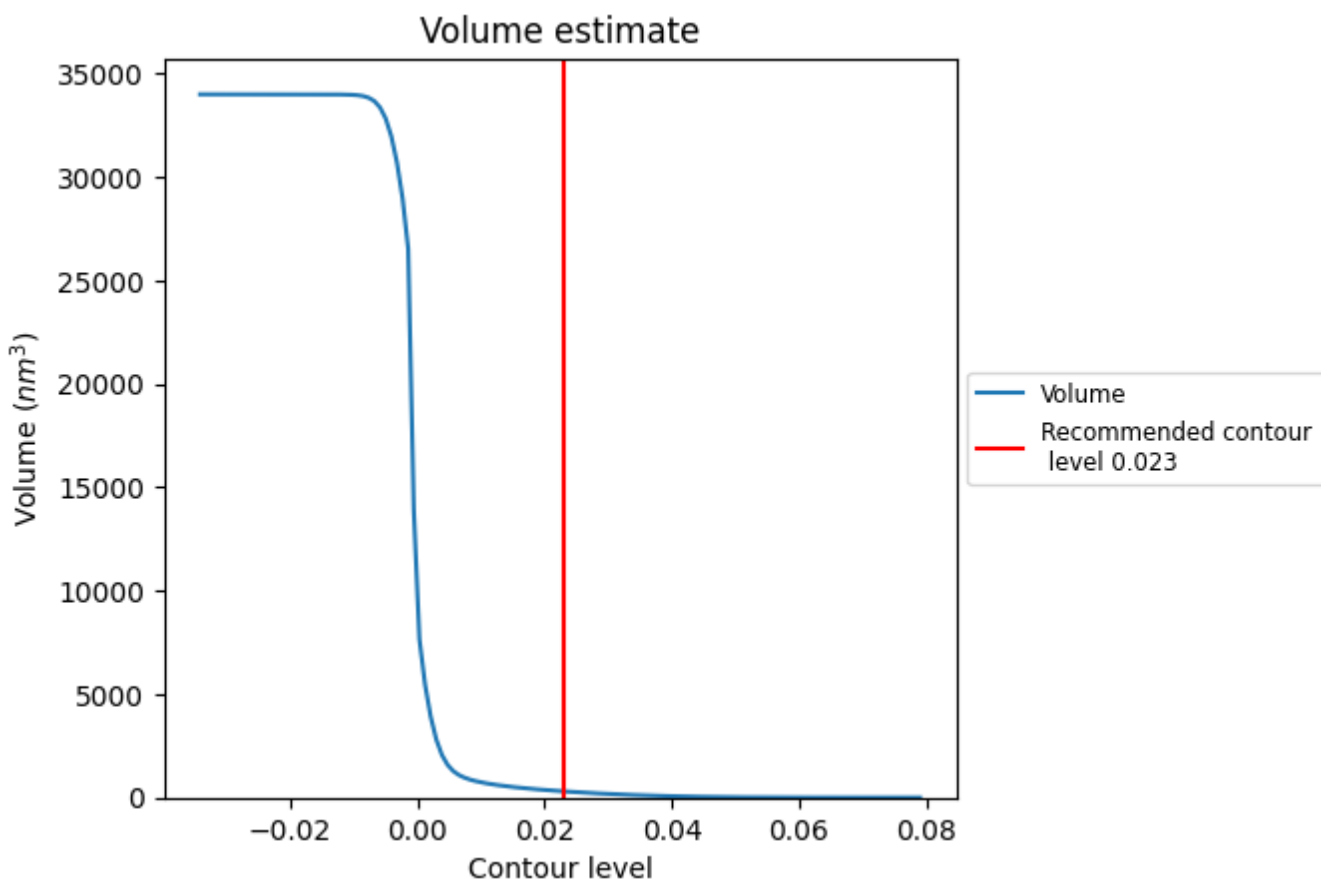
Volume estimate

The volume at the recommended contour level is 300 nm^3; this corresponds to an approximate mass of 271 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 ⓘ
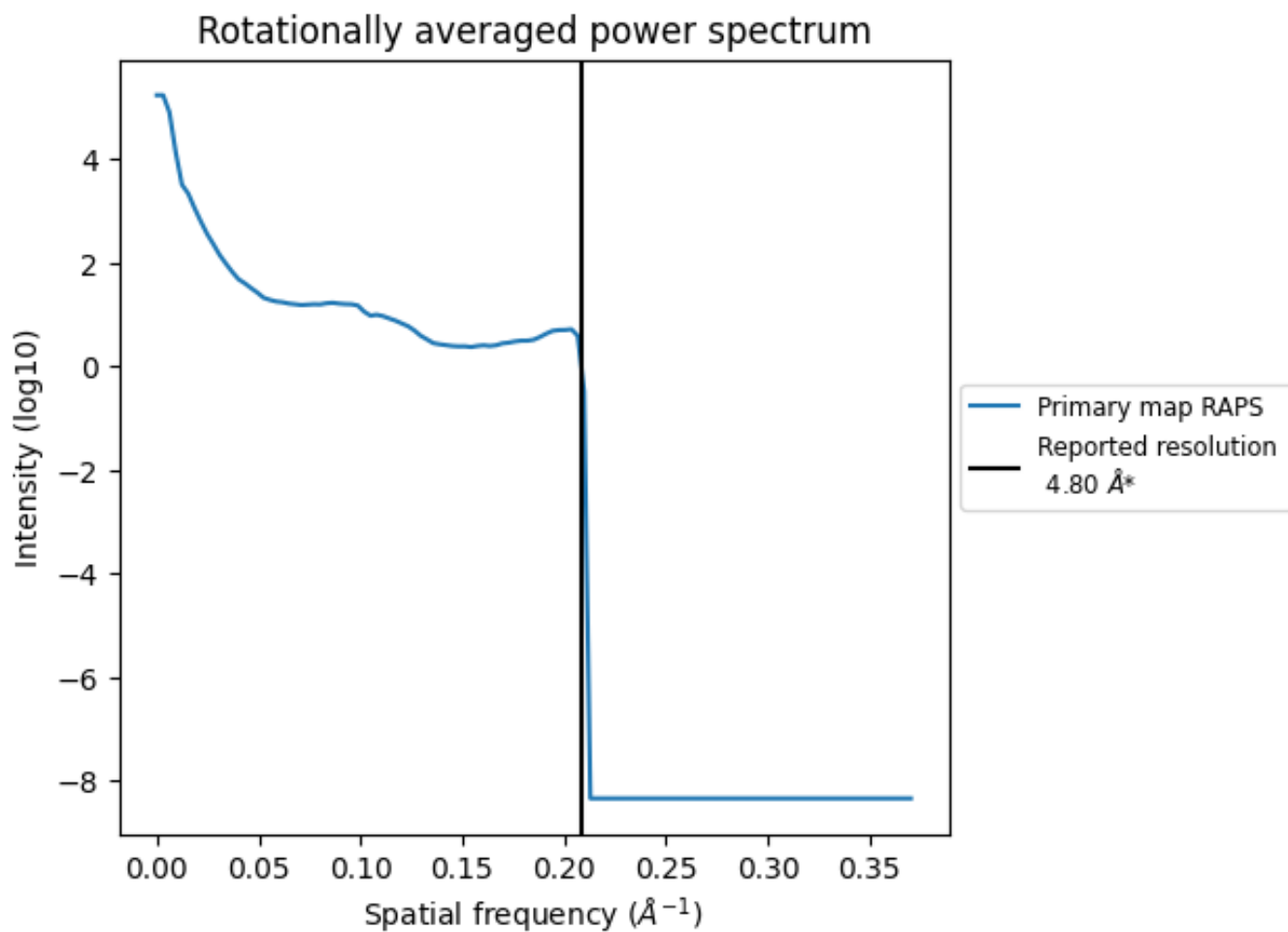
*Reported resolution corresponds to spatial frequency of 0.208 Å^{-1}

8 Fourier-Shell correlation (i)

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

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-3439 and PDB model 5G5L. Per-residue inclusion information can be found in section 3 on page 7.

9.1   Map-model overlay ⓘ

X   Y   Z
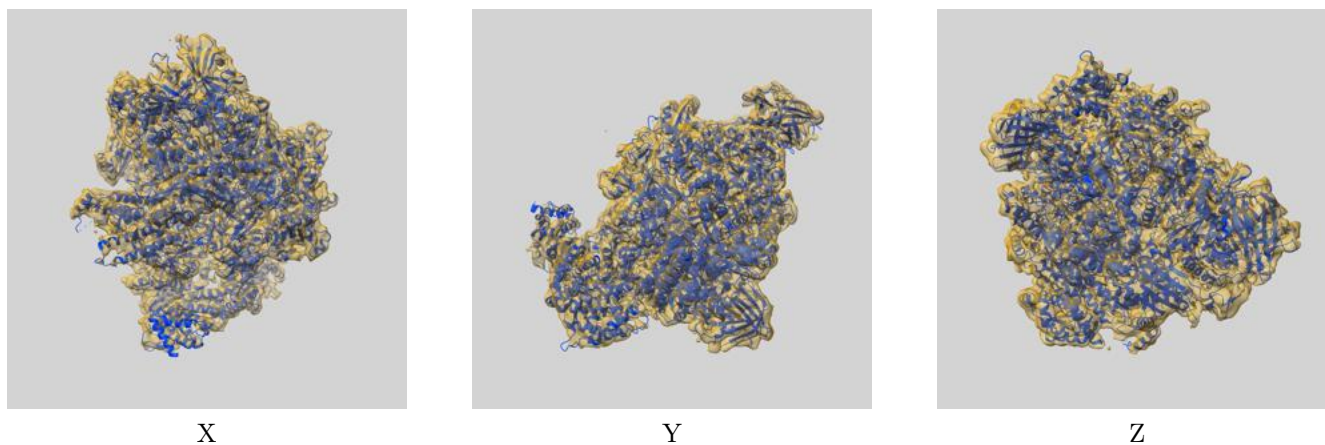
The images above show the 3D surface view of the map at the recommended contour level 0.023 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model ⓘ

X   Y   Z
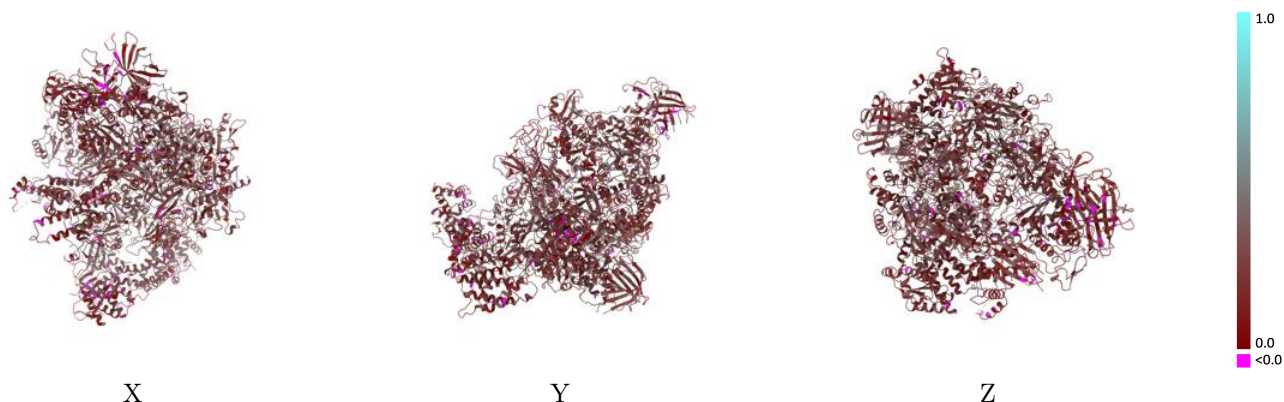
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
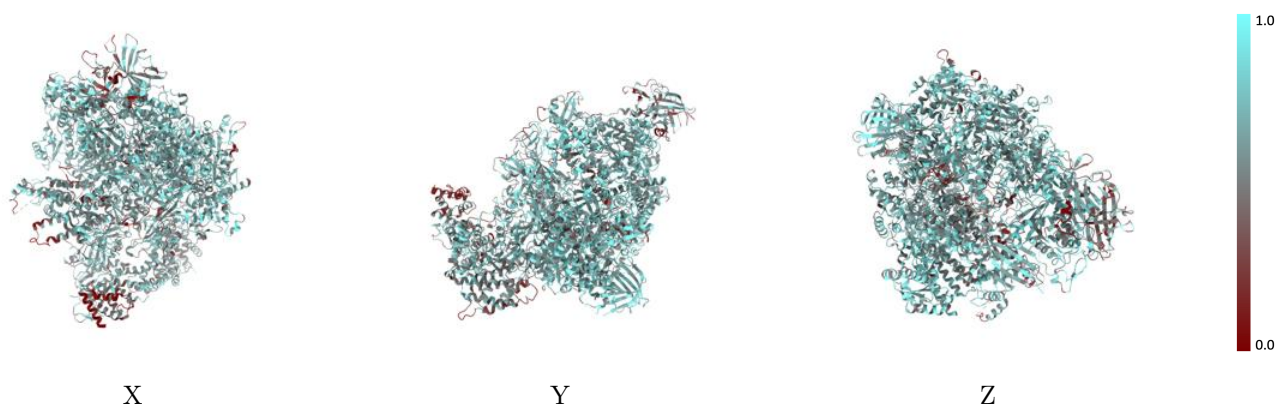
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.023).

9.4   Atom inclusion ⓘ
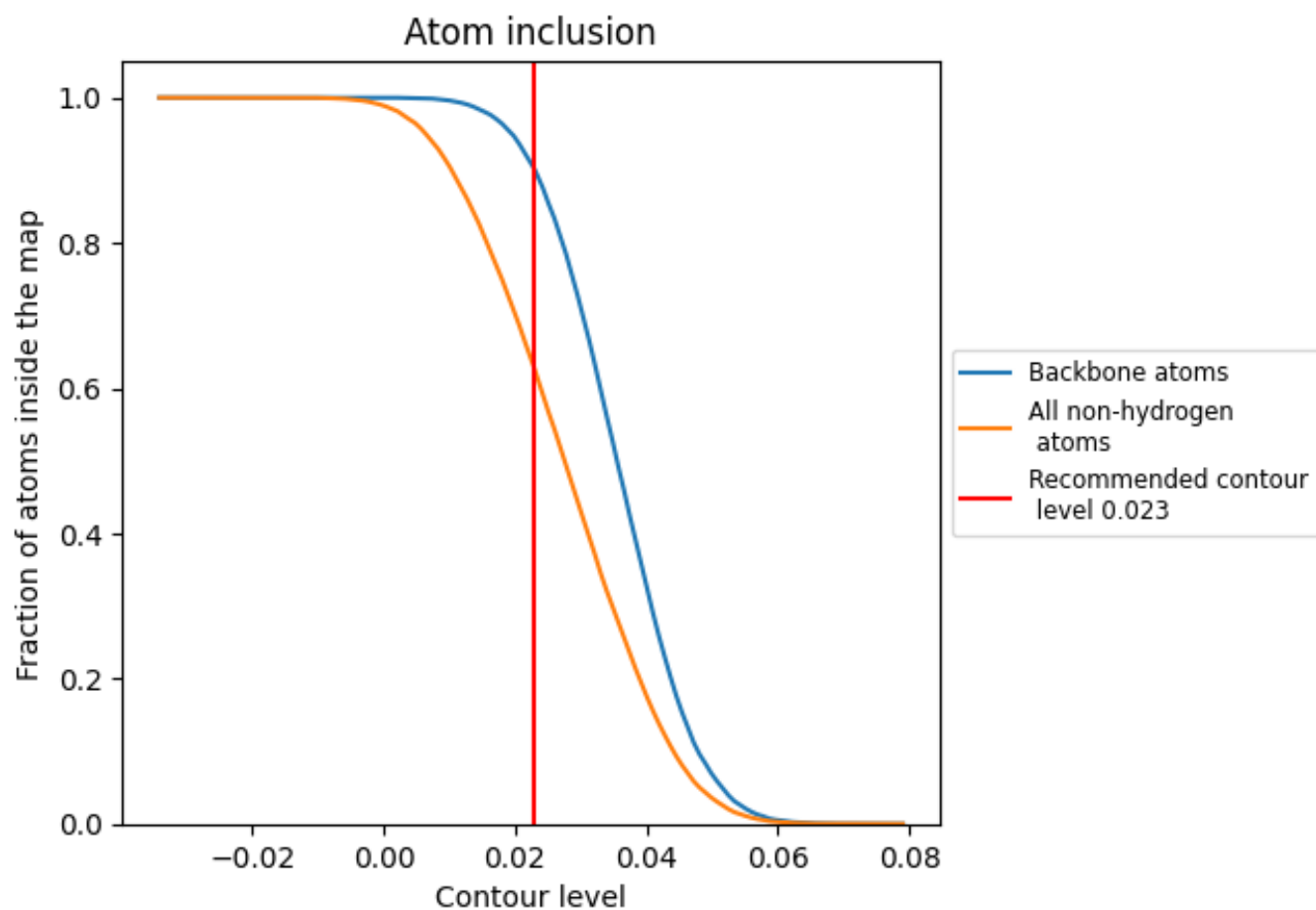
At the recommended contour level, 90% of all backbone atoms, 63% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.023) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6252	0.2290
A	0.6393	0.2330
B	0.6486	0.2420
C	0.6936	0.2360
D	0.6022	0.2160
E	0.7098	0.2390
F	0.6604	0.2600
G	0.6352	0.2230
H	0.7135	0.2510
I	0.5270	0.2350
J	0.6793	0.2400
K	0.6620	0.2310
L	0.6727	0.2440
M	0.4988	0.1990
N	0.4506	0.1930
O	0.4924	0.1840

1.0

0.0
<0.0