wwPDB EM Validation Summary Report (i)

Dec 19, 2023 – 06:40 pm GMT

PDB ID	:	8OF0
EMDB ID	:	EMD-16840
Title	:	Structure of the mammalian Pol II-SPT6-Elongin complex, Structure 1
Authors	:	Chen, Y.; Kokic, G.; Dienemann, C.; Dybkov, O.; Urlaub, H.; Cramer, P.
Deposited on	:	2023-03-13
Resolution	:	3.05 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 (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:

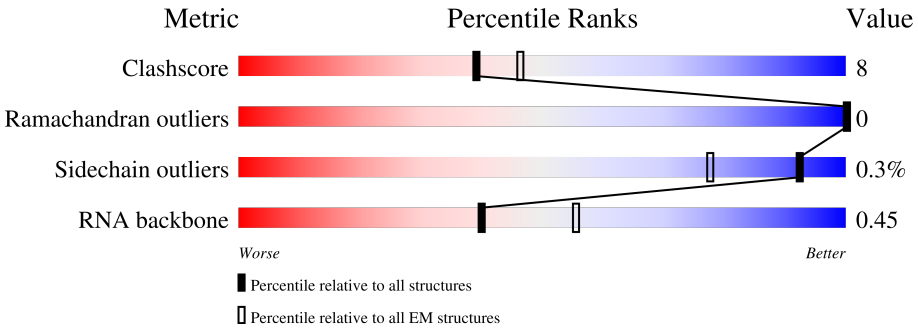
EMDB validation analysis	:	0.0.1.dev70
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.05 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 <=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	1970	59% 13% 28%
2	B	1251	74% 16% 10%
3	C	275	79% 15% 6%
4	D	184	48% 16% • 36%
5	E	210	85% 14%
6	F	127	54% 7% 39%
7	G	172	76% 24% •

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Mol	Chain	Length	Quality of chain
8	H	150	
9	I	125	
10	J	67	
11	K	117	
12	L	58	
13	N	48	
14	P	46	
15	T	48	
16	Q	118	
17	M	801	
18	O	112	
19	S	1729	

2 Entry composition (i)

There are 21 unique types of molecules in this entry. The entry contains 41700 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 II subunit RPB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1409	11159	7024	2000	2064	71	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	1131	9047	5721	1592	1670	64	0	0

- Molecule 3 is a protein called DNA-directed RNA polymerase II subunit RPB3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	258	2072	1300	356	410	6	0	0

- Molecule 4 is a protein called RNA polymerase II subunit D.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	118	967	608	167	188	4	0	0

- Molecule 5 is a protein called DNA-directed RNA polymerase II subunit E.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	209	1721	1089	300	324	8	0	0

- Molecule 6 is a protein called DNA-directed RNA polymerase II subunit F.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	78	626	401	106	114	5	0	0

- Molecule 7 is a protein called DNA-directed RNA polymerase II subunit RPB7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	171	Total	C	N	O	S	0	0
			1347	872	218	249	8		

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	148	Total	C	N	O	S	0	0
			1186	750	194	237	5		

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB9.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	116	Total	C	N	O	S	0	0
			932	577	165	179	11		

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	66	Total	C	N	O	S	0	0
			524	339	88	91	6		

- Molecule 11 is a protein called DNA-directed RNA polymerase II subunit RPB11-a.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	115	Total	C	N	O	S	0	0
			920	593	152	173	2		

- Molecule 12 is a protein called RNA polymerase II subunit K.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	44	Total	C	N	O	S	0	0
			367	228	69	64	6		

- Molecule 13 is a DNA chain called Non-template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	N	25	Total	C	N	O	P	0	0
			527	245	112	145	25		

- Molecule 14 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	P	13	Total	C	N	O	P	0	0
			280	125	54	88	13		

- Molecule 15 is a DNA chain called Template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	T	37	Total	C	N	O	P	0	0
			750	356	127	230	37		

- Molecule 16 is a protein called Elongin-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	Q	88	Total	C	N	O	S	0	0
			696	437	121	135	3		

- Molecule 17 is a protein called Elongin-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	M	140	Total	C	N	O	S	0	0
			1149	724	214	204	7		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
M	-2	SER	-	expression tag	UNP Q14241
M	-1	ASN	-	expression tag	UNP Q14241
M	0	ALA	-	expression tag	UNP Q14241

- Molecule 18 is a protein called Elongin-C.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	O	101	Total	C	N	O	S	0	0
			792	506	127	153	6		

- Molecule 19 is a protein called Transcription elongation factor SPT6.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	S	818	Total	C	N	O	S	0	0
			6629	4221	1144	1232	32		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
S	-2	SER	-	expression tag	UNP Q7KZ85
S	-1	ASN	-	expression tag	UNP Q7KZ85
S	0	ALA	-	expression tag	UNP Q7KZ85

- Molecule 20 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 21 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

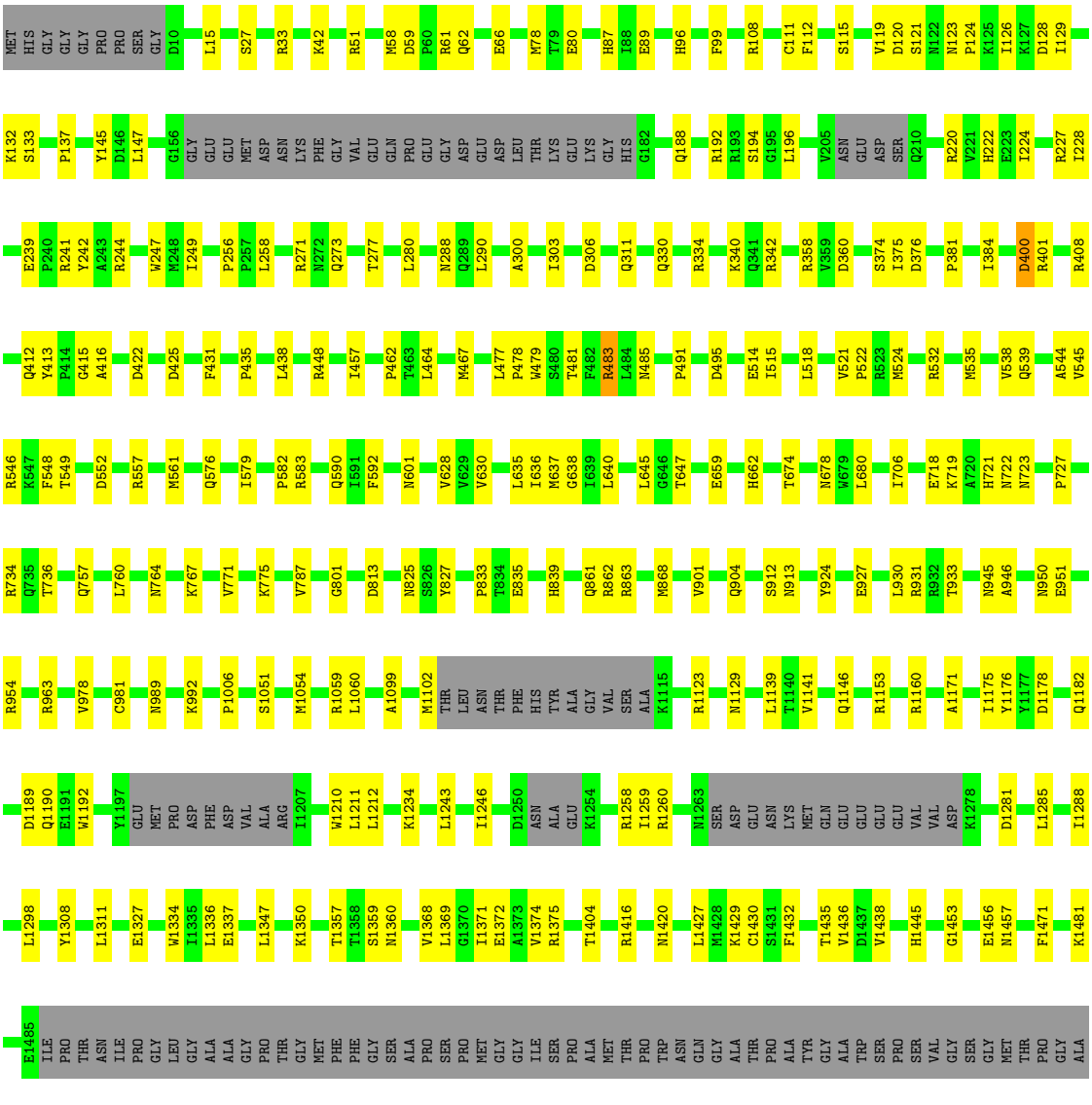
Mol	Chain	Residues	Atoms	AltConf
21	A	2	Total Zn 2 2	0
21	B	1	Total Zn 1 1	0
21	C	1	Total Zn 1 1	0
21	I	2	Total Zn 2 2	0
21	J	1	Total Zn 1 1	0
21	L	1	Total Zn 1 1	0

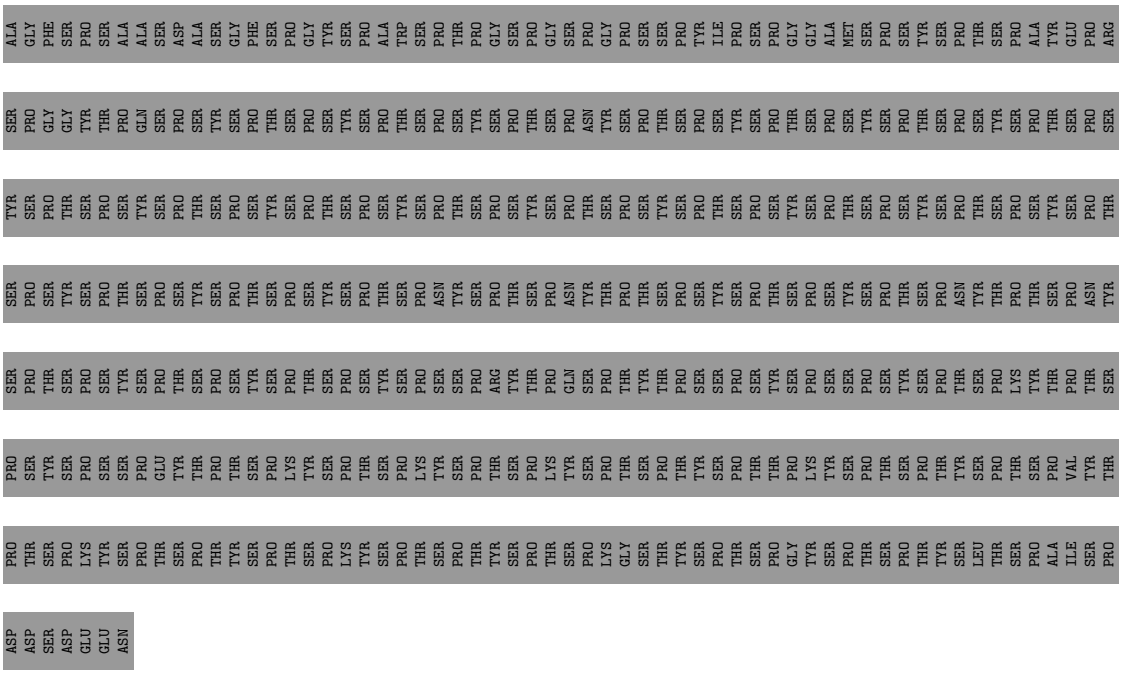
3 Residue-property plots (i)

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

- Molecule 1: DNA-directed RNA polymerase II subunit RPB1

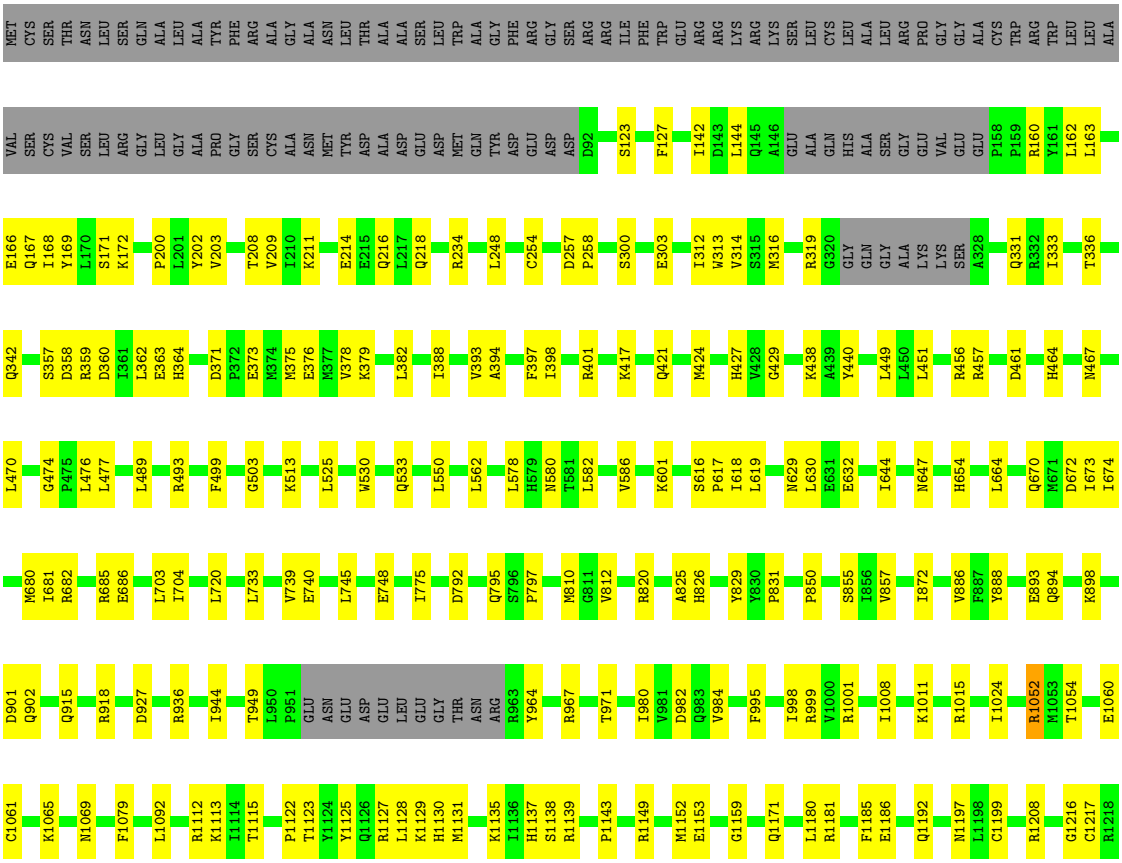
Chain A:





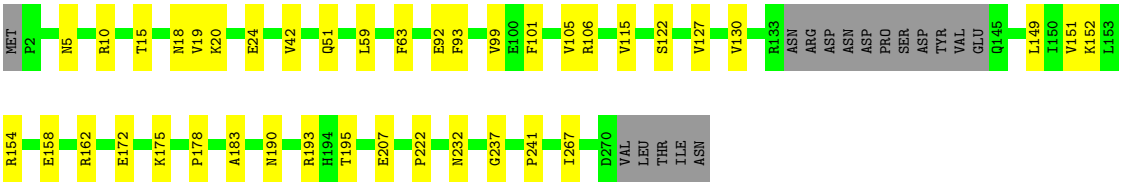
• Molecule 2: DNA-directed RNA polymerase subunit beta

Chain B:



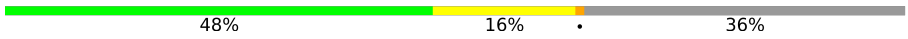
• Molecule 3: DNA-directed RNA polymerase II subunit RPB3

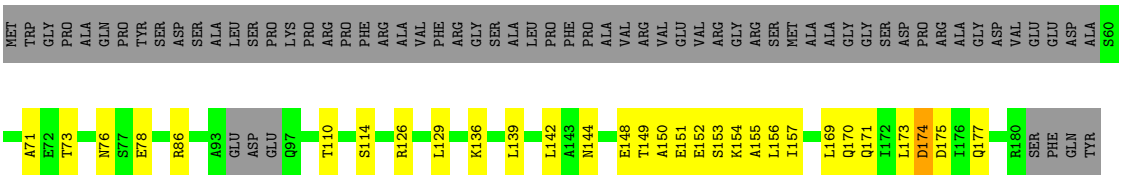
Chain C:



• Molecule 4: RNA polymerase II subunit D

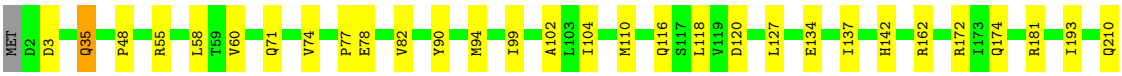
Chain D:





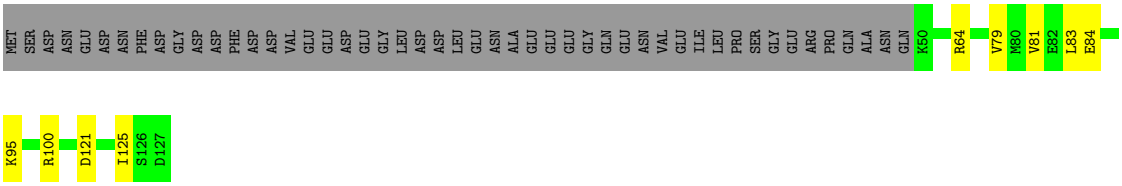
• Molecule 5: DNA-directed RNA polymerase II subunit E

Chain E:



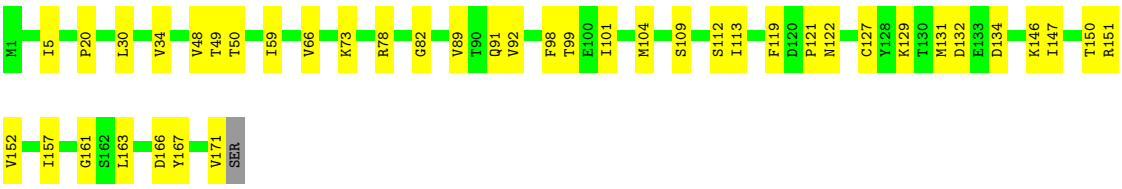
• Molecule 6: DNA-directed RNA polymerase II subunit F

Chain F:



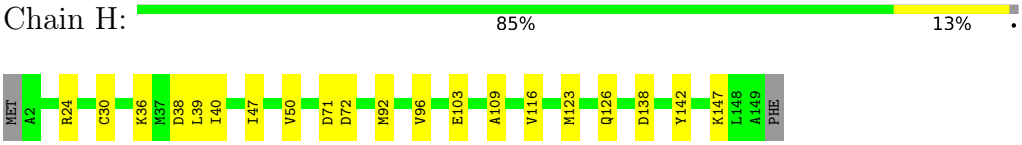
• Molecule 7: DNA-directed RNA polymerase II subunit RPB7

Chain G:



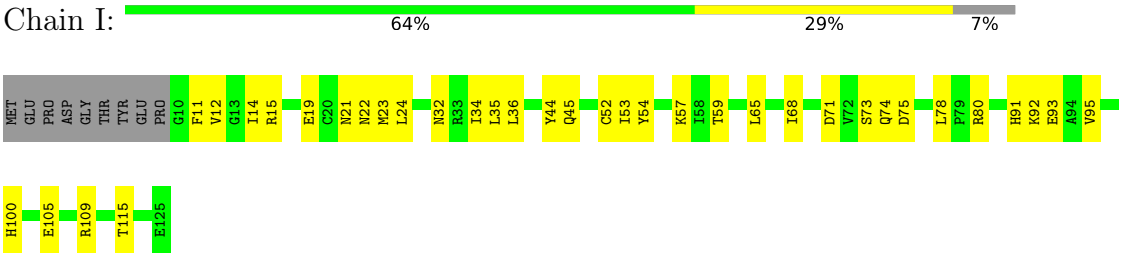
• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H:



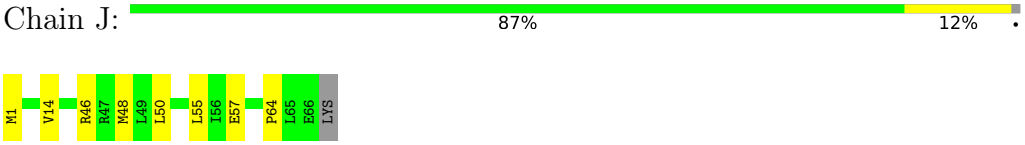
• Molecule 9: DNA-directed RNA polymerase II subunit RPB9

Chain I:



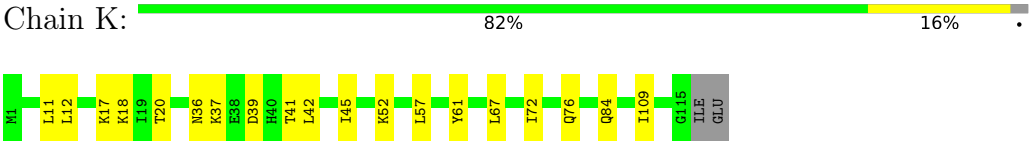
• Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5

Chain J:



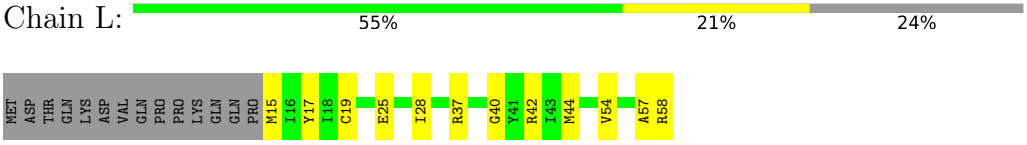
• Molecule 11: DNA-directed RNA polymerase II subunit RPB11-a

Chain K:



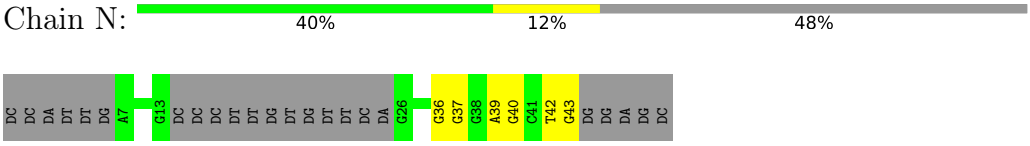
• Molecule 12: RNA polymerase II subunit K

Chain L:



• Molecule 13: Non-template DNA

Chain N:

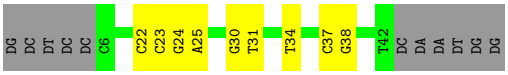


• Molecule 14: RNA

Chain P:

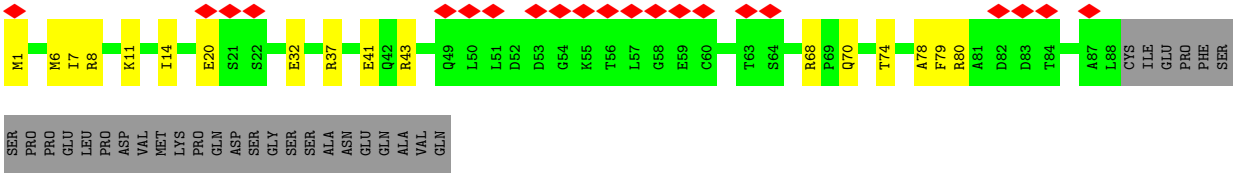
• Molecule 15: Template DNA

Chain T:



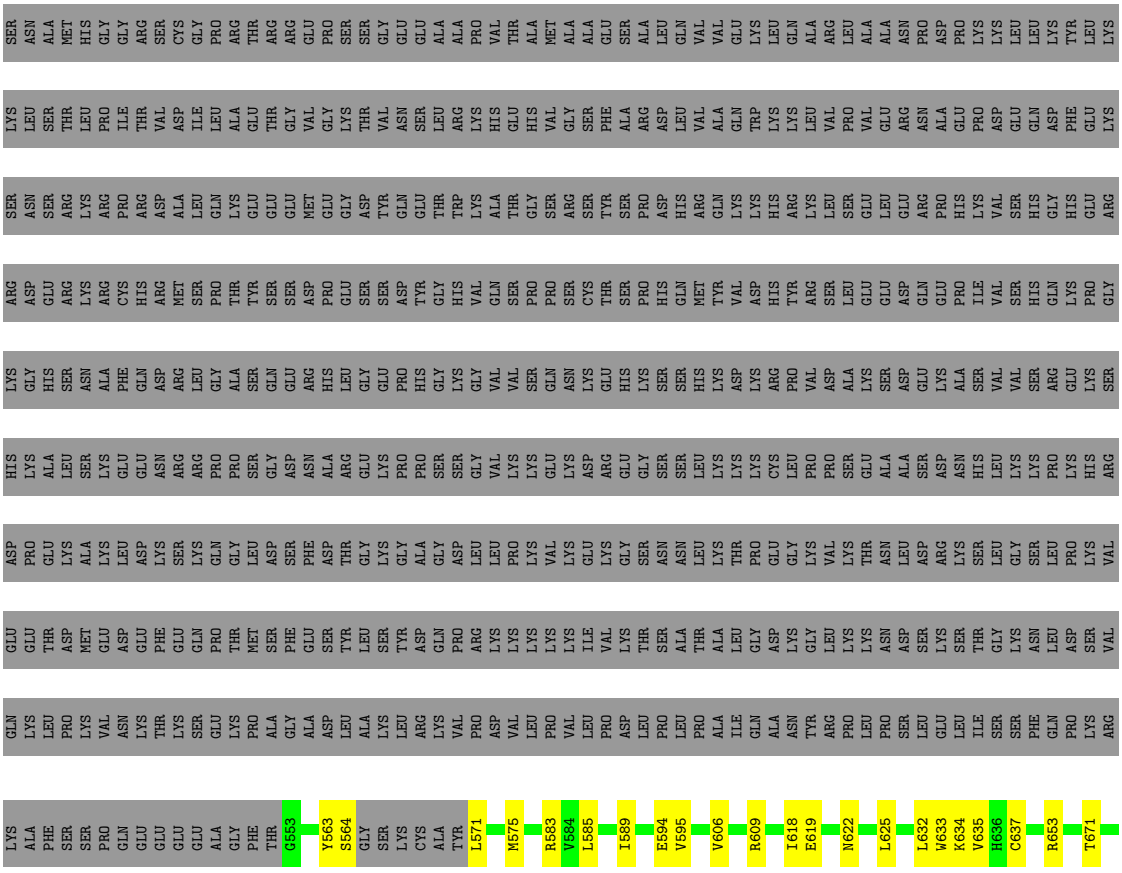
• Molecule 16: Elongin-B

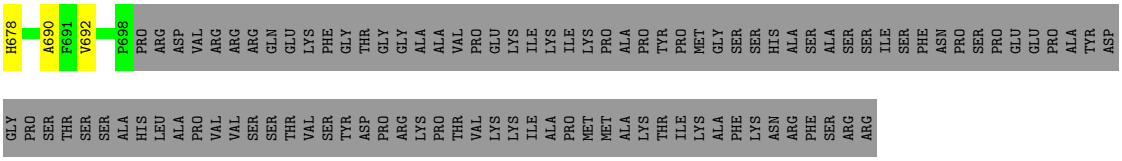
Chain Q:



• Molecule 17: Elongin-A

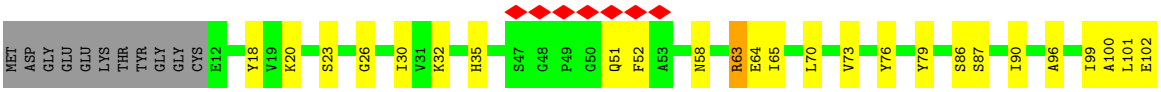
Chain M:





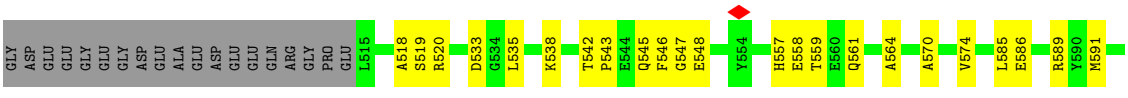
• Molecule 18: Elongin-C

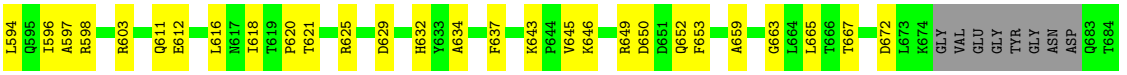
Chain O:

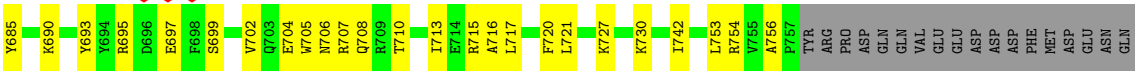


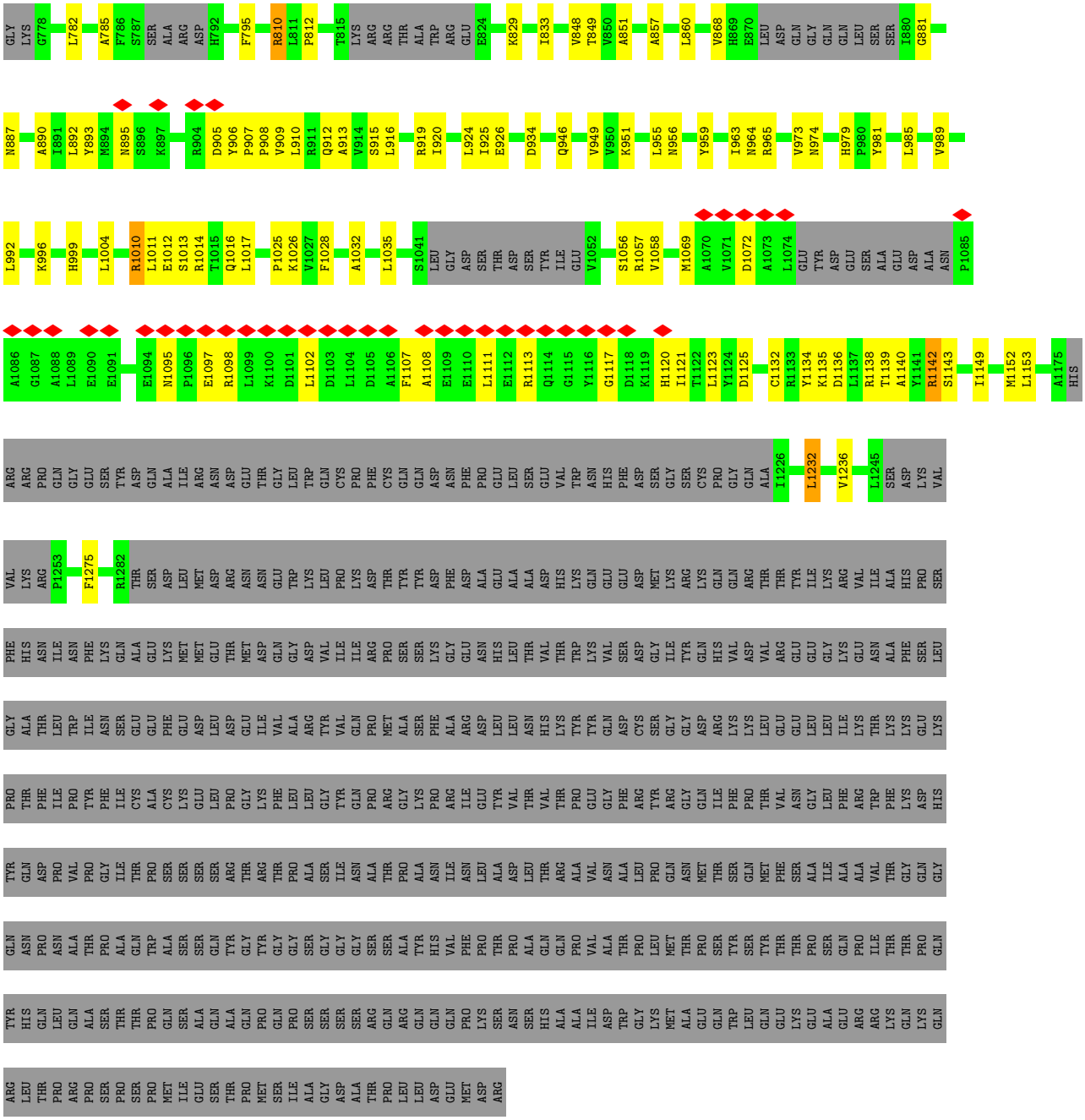
• Molecule 19: Transcription elongation factor SPT6

Chain S:








GLY LYS G778 L782 A785 F786 S787 SER ALA ARG ASP H792 F795 R810 L811 P812 T815 LYS ARG ARG THR ALA TRP ARG GLU E824 K829 I833 V848 T849 V850 A851 A857 L860 V868 H869 E870 LEU ASP GLN GLY GLN GLN LEU SER SER I880 G881
N887 A890 I891 L892 Y893 M894 N895 S896 K897 R904 D905 Y906 P907 P908 V909 L910 R911 Q912 A913 V914 S915 L916 R919 I920 L924 I925 E926 D934 Q946 V949 V950 K951 L955 N956 Y959 I963 N964 R965 V973 N974 H979 P980 Y981 L985 V989
L992 K996 H999 L1004 R1010 L1011 E1012 S1013 R1014 T1015 Q1016 L1017 P1025 K1026 V1027 F1028 A1032 L1035 S1041 LEU GLY ASP SER THR ASP SER TYR ILE GLU V1052 S1056 R1057 V1058 M1069 A1070 V1071 D1072 A1073 L1074 GLU TYR ASP GLU SER ALA GLU ASP ALA ASN P1085
A1086 G1087 A1088 L1089 E1090 E1091 E1094 N1095 P1096 E1097 R1098 L1099 K1100 D1101 L1102 D1103 L1104 D1105 A1106 F1107 A1108 E1109 E1110 L1111 E1112 R1113 Q1114 G1115 Y1116 G1117 D1118 K1119 H1120 I1121 T1122 L1123 Y1124 D1125 C1132 R1133 Y1134 K1135 D1136 L1137 R1138 T1139 A1140 Y1141 R1142 S1143 I1149 M1152 L1153 A1175 HIS
ARG ARG PRO GLN GLY GLU SER TYR ASP GLN ALA ILE ARG ASN ASP GLU THR GLY LEU TRP GLN CYS PRO PHE CYS GLN GLN ASP ASN PHE PRO GLU LEU SER GLU VAL TRP ASN HIS PHE ASP SER GLY SER CYS PRO GLY GLN ALA I1226 L1232 V1236 L1245 SER ASP LYS VAL
VAL LYS ARG P1253 F1275 R1282 THR SER ASP LEU MET ASP ARG ASN ASN GLU TRP LYS LEU PRO LYS ASP THR TYR TYR ASP PHE ASP ALA GLU ALA ALA ASP HIS LYS GLN GLU GLU ASP MET LYS ARG LYS GLN GLN ARG THR THR TYR ILE LYS ARG VAL ILE ALA HIS PRO SER
PHE HIS ASN ILE ASN PHE LYS GLN ALA GLU LYS MET MET GLU THR MET ASP GLN GLY ASP VAL ILE ILE ARG PRO SER SER LYS GLY GLU ASN HIS LEU THR VAL THR TRP LYS VAL SER ASP GLY ILE TYR GLN HIS VAL ASP VAL ARG GLU GLU GLY LYS GLU ASN ALA PHE SER LEU
GLY ALA THR LEU TRP ILE ASN SER GLU GLU PHE GLU ASP LEU ASP GLU ILE VAL ALA ARG TYR VAL GLN PRO MET ALA SER PHE ALA ARG ASP LEU LEU ASN HIS LYS TYR TYR GLN ASP CYS SER GLY GLY ASP ARG LYS LYS LEU GLU LEU LEU LEU ILE LYS THR LYS GLU LYS
PRO THR PHE ILE PRO TYR PHE ILE CYS ALA CYS LYS GLU LEU PRO GLY LYS PHE LEU LEU GLY TYR GLN PRO ARG GLY LYS PRO ARG ILE GLU TYR VAL THR VAL THR PRO GLU GLY PHE ARG TYR ARG GLY GLN ILE PRO THR VAL ASN GLY LEU PHE ARG TRP PHE LYS ASP HIS
TYR GLN ASP PRO VAL PRO GLY ILE THR PRO SER SER SER ARG THR ARG THR PRO ALA SER ILE ASN ALA THR PRO ALA ASN ILE ASN LEU ALA ASP LEU THR ARG ALA ALA VAL ASN ALA LEU PRO GLN ASN MET THR SER GLN MET PHE SER ALA ILE ALA ALA ALA VAL THR GLY GLN GLY
GLN ASN PRO ASN ALA THR PRO ALA GLN TRP ALA SER SER GLN TYR GLY TYR GLY SER SER GLY GLY GLY SER ALA TYR HIS VAL PHE PRO THR PRO GLN GLN GLN THR PRO LEU MET THR PRO SER TYR SER TYR THR THR PRO ILE SER GLN PRO ILE THR THR PRO GLN
TYR HIS GLN LEU GLN ALA SER THR THR PRO GLN SER ALA GLN ARG GLN ARG GLN GLN PRO LYS SER ASN SER HIS ALA ALA ILE ASP TRP GLY LYS MET ALA GLU GLN TRP LEU GLN GLU LYS GLU ALA GLU ARG ARG LYS GLN LYS GLN
ARG LEU THR PRO ARG PRO SER PRO SER PRO MET ILE GLU SER THR PRO MET SER ILE ALA GLY ASP ALA THR PRO LEU LEU ASP GLU MET ASP ARG

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	72087	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 ($e^-/Å^2$)	40.09	Depositor
Minimum defocus (nm)	350	Depositor
Maximum defocus (nm)	7500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.182	Depositor
Minimum map value	-0.075	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.012	Depositor
Map size (Å)	461.99997, 461.99997, 461.99997	wwPDB
Map dimensions	440, 440, 440	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.05, 1.05, 1.05	Depositor

5 Model quality

5.1 Standard geometry

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|>5$	RMSZ	#$\|Z\|>5$
1	A	0.32	0/11360	0.52	2/15328 (0.0%)
2	B	0.35	0/9227	0.52	1/12454 (0.0%)
3	C	0.36	0/2115	0.48	0/2873
4	D	0.31	0/979	0.57	1/1312 (0.1%)
5	E	0.31	0/1752	0.52	0/2366
6	F	0.34	0/636	0.57	1/859 (0.1%)
7	G	0.30	0/1378	0.55	0/1870
8	H	0.33	0/1207	0.51	0/1628
9	I	0.32	0/954	0.51	0/1293
10	J	0.36	0/533	0.51	0/719
11	K	0.34	0/939	0.50	0/1271
12	L	0.34	0/372	0.52	0/493
13	N	0.57	0/594	0.80	0/915
14	P	0.33	0/313	0.80	0/486
15	T	0.64	0/836	1.00	0/1287
16	Q	0.27	0/707	0.59	0/952
17	M	0.30	0/1172	0.54	0/1578
18	O	0.31	0/810	0.61	0/1097
19	S	0.29	0/6750	0.52	3/9096 (0.0%)
All	All	0.34	0/42634	0.55	8/57877 (0.0%)

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
18	O	0	1
All	All	0	2

There are no bond length outliers.

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	174	ASP	CB-CG-OD1	6.12	123.81	118.30
2	B	160	ARG	NE-CZ-NH1	5.87	123.24	120.30
19	S	313	LEU	CA-CB-CG	5.69	128.38	115.30
19	S	1232	LEU	CA-CB-CG	5.67	128.34	115.30
6	F	125	ILE	CG1-CB-CG2	-5.28	99.79	111.40

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	538	VAL	Peptide
18	O	90	ILE	Peptide

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	11159	0	11304	162	0
2	B	9047	0	9080	131	0
3	C	2072	0	2019	28	0
4	D	967	0	973	39	0
5	E	1721	0	1737	19	0
6	F	626	0	657	5	0
7	G	1347	0	1347	37	0
8	H	1186	0	1147	14	0
9	I	932	0	856	28	0
10	J	524	0	540	7	0
11	K	920	0	942	13	0
12	L	367	0	367	8	0
13	N	527	0	278	3	0
14	P	280	0	142	3	0
15	T	750	0	418	6	0
16	Q	696	0	694	12	0
17	M	1149	0	1127	24	0
18	O	792	0	774	20	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
19	S	6629	0	6583	160	0
20	A	1	0	0	0	0
21	A	2	0	0	0	0
21	B	1	0	0	0	0
21	C	1	0	0	0	0
21	I	2	0	0	0	0
21	J	1	0	0	0	0
21	L	1	0	0	0	0
All	All	41700	0	40985	637	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 8.

The worst 5 of 637 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)
7:G:132:ASP:O	19:S:416:LEU:HD21	1.45	1.15
4:D:148:GLU:HG2	19:S:519:SER:HB2	1.13	1.12
4:D:149:THR:OG1	4:D:152:GLU:HB2	1.62	0.99
4:D:148:GLU:CG	19:S:519:SER:HB2	1.96	0.96
7:G:134:ASP:OD1	19:S:475:ILE:HG23	1.66	0.95

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	1395/1970 (71%)	1357 (97%)	38 (3%)	0	100	100
2	B	1123/1251 (90%)	1089 (97%)	34 (3%)	0	100	100
3	C	254/275 (92%)	249 (98%)	5 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	D	114/184 (62%)	104 (91%)	10 (9%)	0	100	100
5	E	207/210 (99%)	201 (97%)	6 (3%)	0	100	100
6	F	76/127 (60%)	74 (97%)	2 (3%)	0	100	100
7	G	169/172 (98%)	157 (93%)	12 (7%)	0	100	100
8	H	146/150 (97%)	143 (98%)	3 (2%)	0	100	100
9	I	114/125 (91%)	107 (94%)	7 (6%)	0	100	100
10	J	64/67 (96%)	64 (100%)	0	0	100	100
11	K	113/117 (97%)	109 (96%)	4 (4%)	0	100	100
12	L	42/58 (72%)	41 (98%)	1 (2%)	0	100	100
16	Q	86/118 (73%)	73 (85%)	13 (15%)	0	100	100
17	M	136/801 (17%)	126 (93%)	10 (7%)	0	100	100
18	O	99/112 (88%)	92 (93%)	7 (7%)	0	100	100
19	S	792/1729 (46%)	762 (96%)	30 (4%)	0	100	100
All	All	4930/7466 (66%)	4748 (96%)	182 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1239/1749 (71%)	1237 (100%)	2 (0%)	93	97
2	B	991/1084 (91%)	990 (100%)	1 (0%)	93	97
3	C	235/252 (93%)	235 (100%)	0	100	100
4	D	109/160 (68%)	109 (100%)	0	100	100
5	E	191/192 (100%)	189 (99%)	2 (1%)	76	89
6	F	68/111 (61%)	68 (100%)	0	100	100
7	G	151/153 (99%)	149 (99%)	2 (1%)	69	86
8	H	129/131 (98%)	129 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
9	I	102/112 (91%)	102 (100%)	0	100 100
10	J	55/56 (98%)	55 (100%)	0	100 100
11	K	104/106 (98%)	104 (100%)	0	100 100
12	L	40/55 (73%)	40 (100%)	0	100 100
16	Q	75/103 (73%)	75 (100%)	0	100 100
17	M	121/706 (17%)	121 (100%)	0	100 100
18	O	88/96 (92%)	87 (99%)	1 (1%)	73 88
19	S	710/1524 (47%)	705 (99%)	5 (1%)	84 92
All	All	4408/6590 (67%)	4395 (100%)	13 (0%)	92 96

5 of 13 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
18	O	63	ARG
19	S	727	LYS
19	S	1142	ARG
19	S	1010	ARG
19	S	1113	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 11 such sidechains are listed below:

Mol	Chain	Res	Type
9	I	74	GLN
11	K	89	ASN
19	S	405	GLN
19	S	299	GLN
2	B	1126	GLN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
14	P	12/46 (26%)	2 (16%)	0

All (2) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
14	P	36	G

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Mol	Chain	Res	Type
14	P	37	G

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 9 ligands modelled in this entry, 9 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.

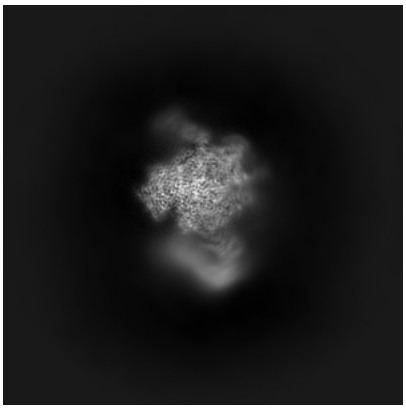
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-16840. These allow visual inspection of the internal detail of the map and identification of artifacts.

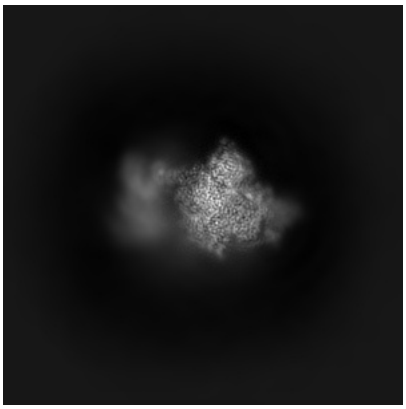
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

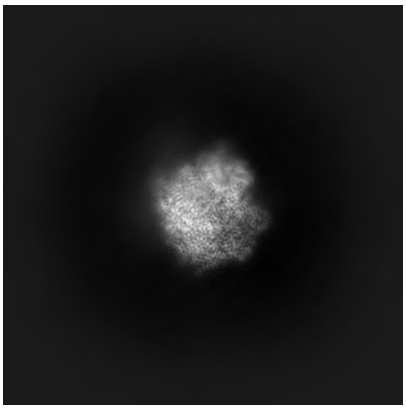
6.1.1 Primary map



X

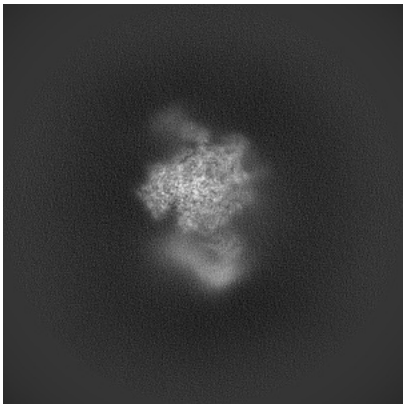


Y

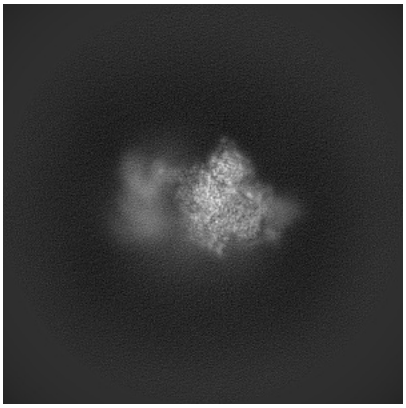


Z

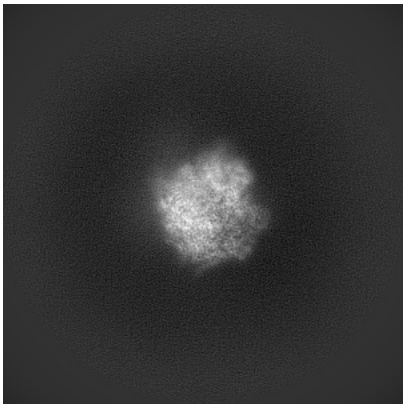
6.1.2 Raw map



X



Y

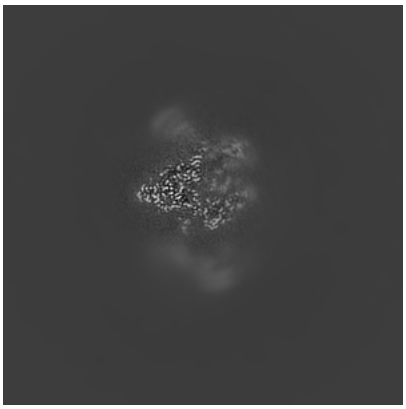


Z

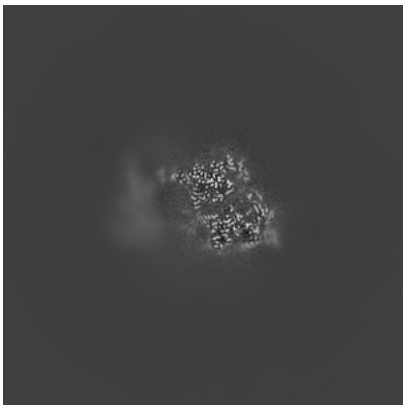
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

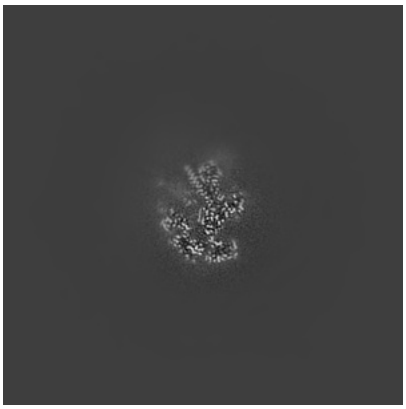
6.2.1 Primary map



X Index: 220

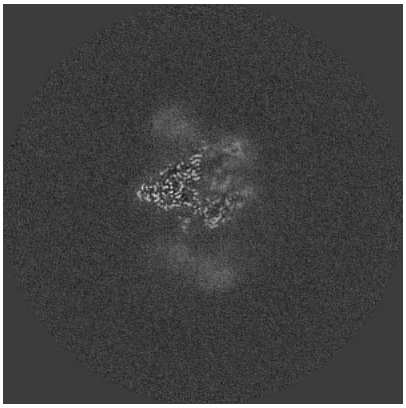


Y Index: 220

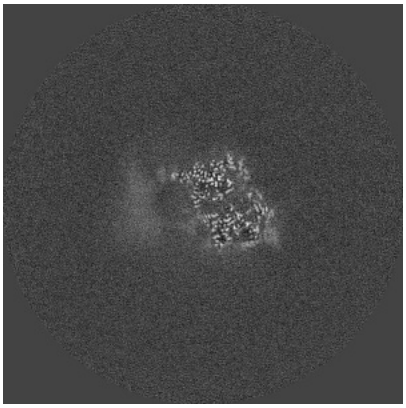


Z Index: 220

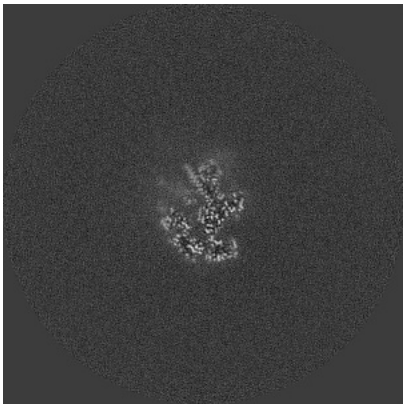
6.2.2 Raw map



X Index: 220



Y Index: 220

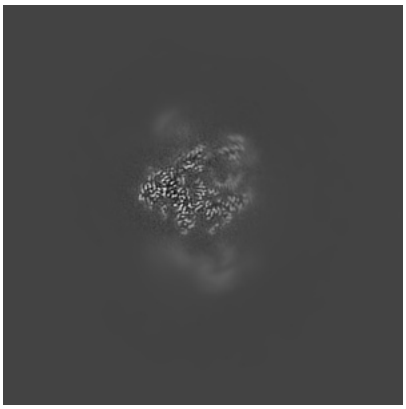


Z Index: 220

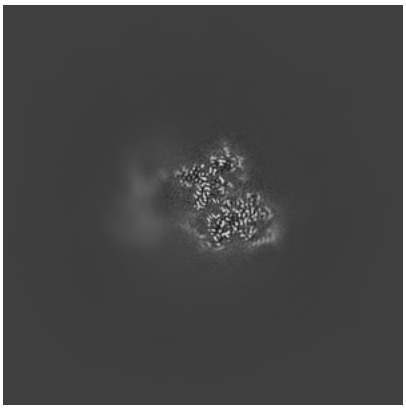
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

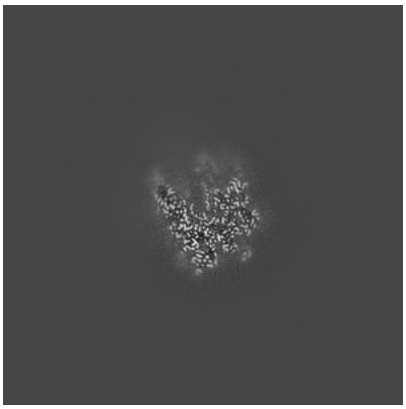
6.3.1 Primary map



X Index: 225

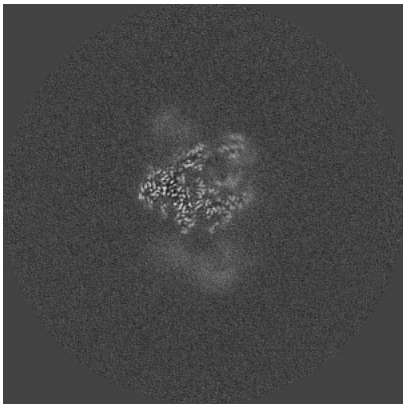


Y Index: 215

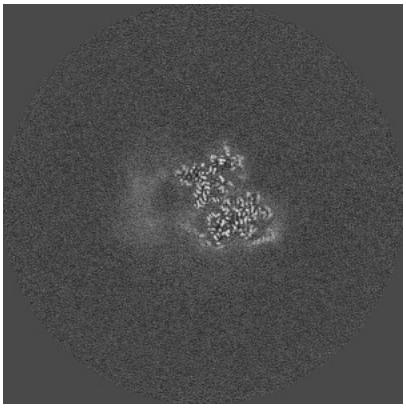


Z Index: 235

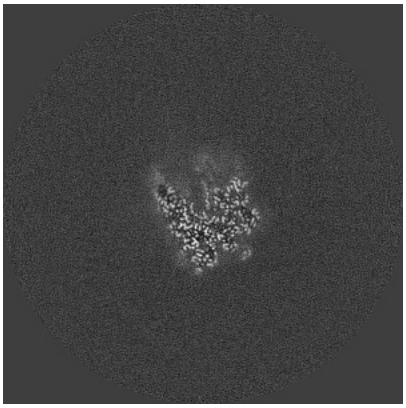
6.3.2 Raw map



X Index: 225



Y Index: 215

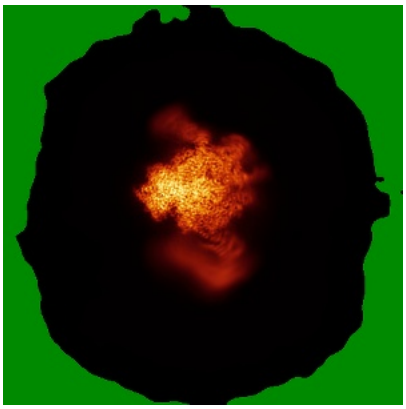


Z Index: 235

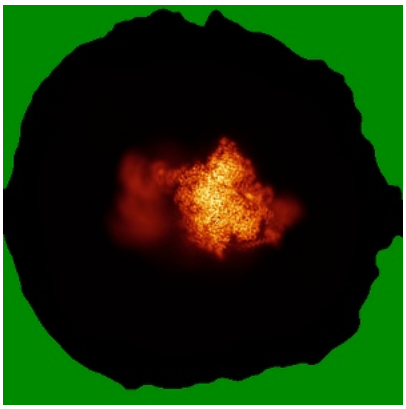
The images above show the largest variance slices of the map in three orthogonal directions.

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

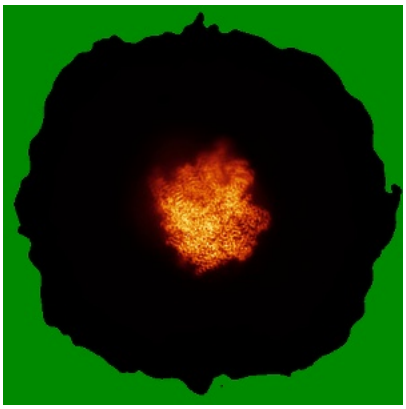
6.4.1 Primary map



X

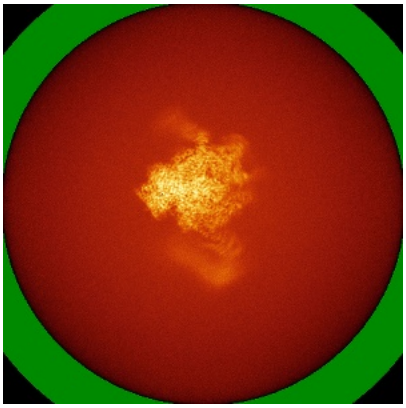


Y

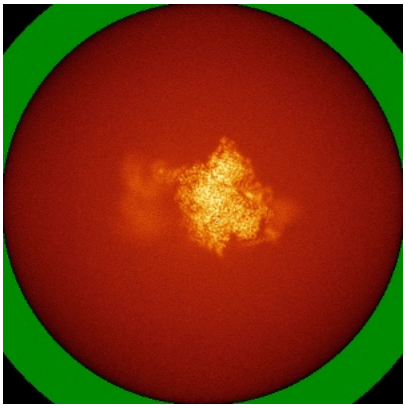


Z

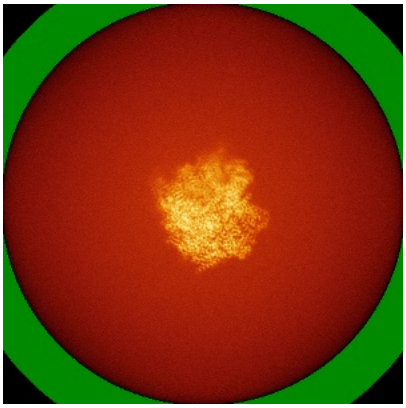
6.4.2 Raw map



X



Y

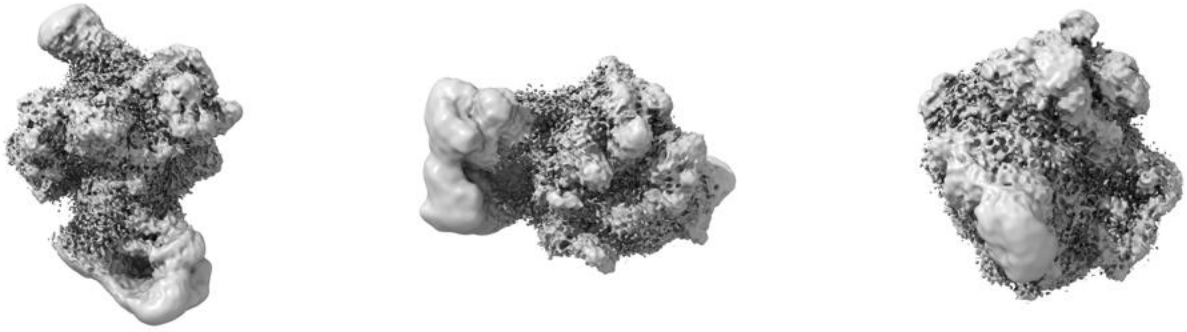


Z

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 (i)

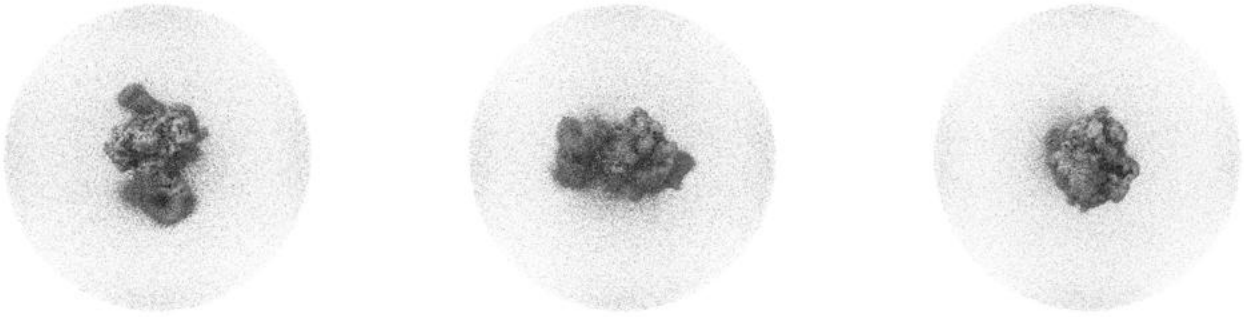
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.012. 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.

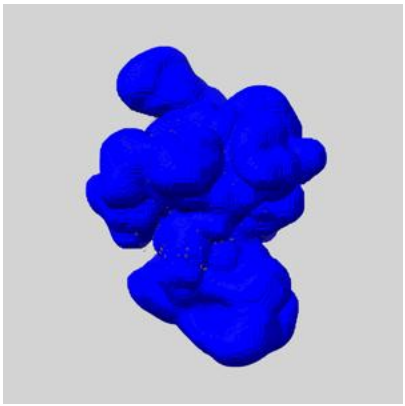
6.6 Mask visualisation

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

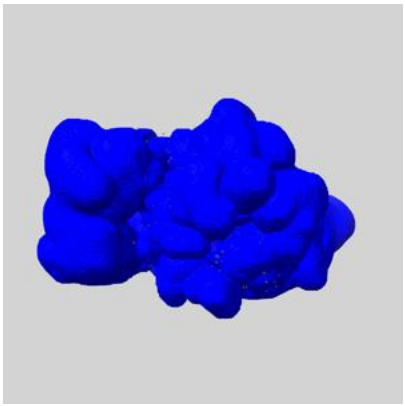
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

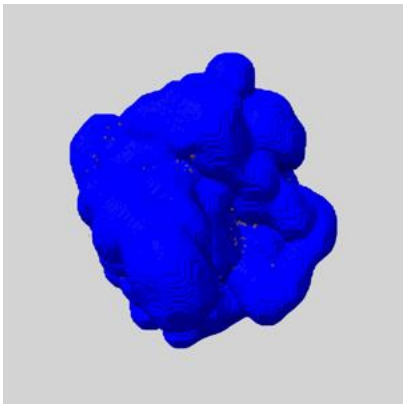
6.6.1 emd_16840_msk_1.map



X



Y

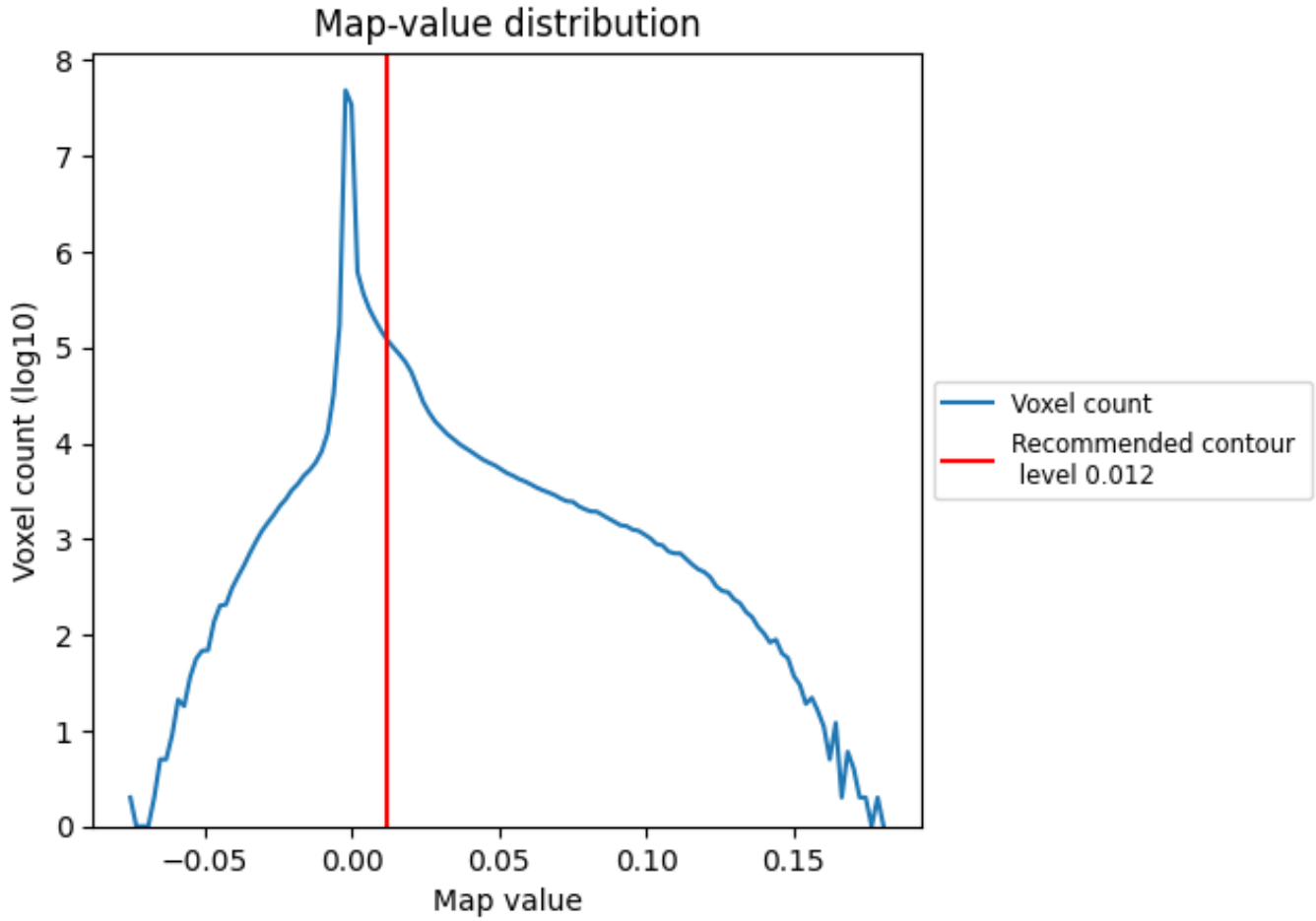


Z

7 Map analysis

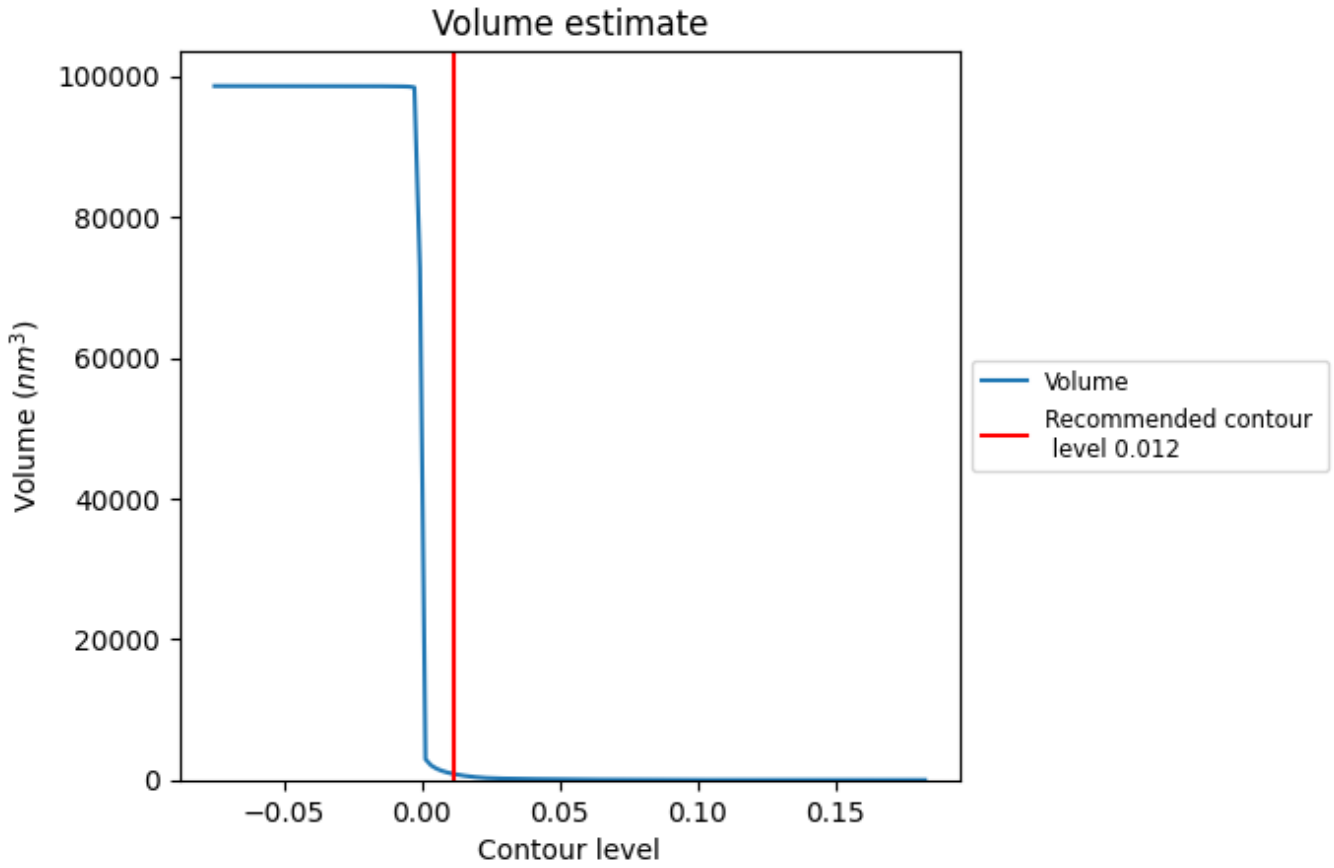
This section contains the results of statistical analysis of the map.

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.

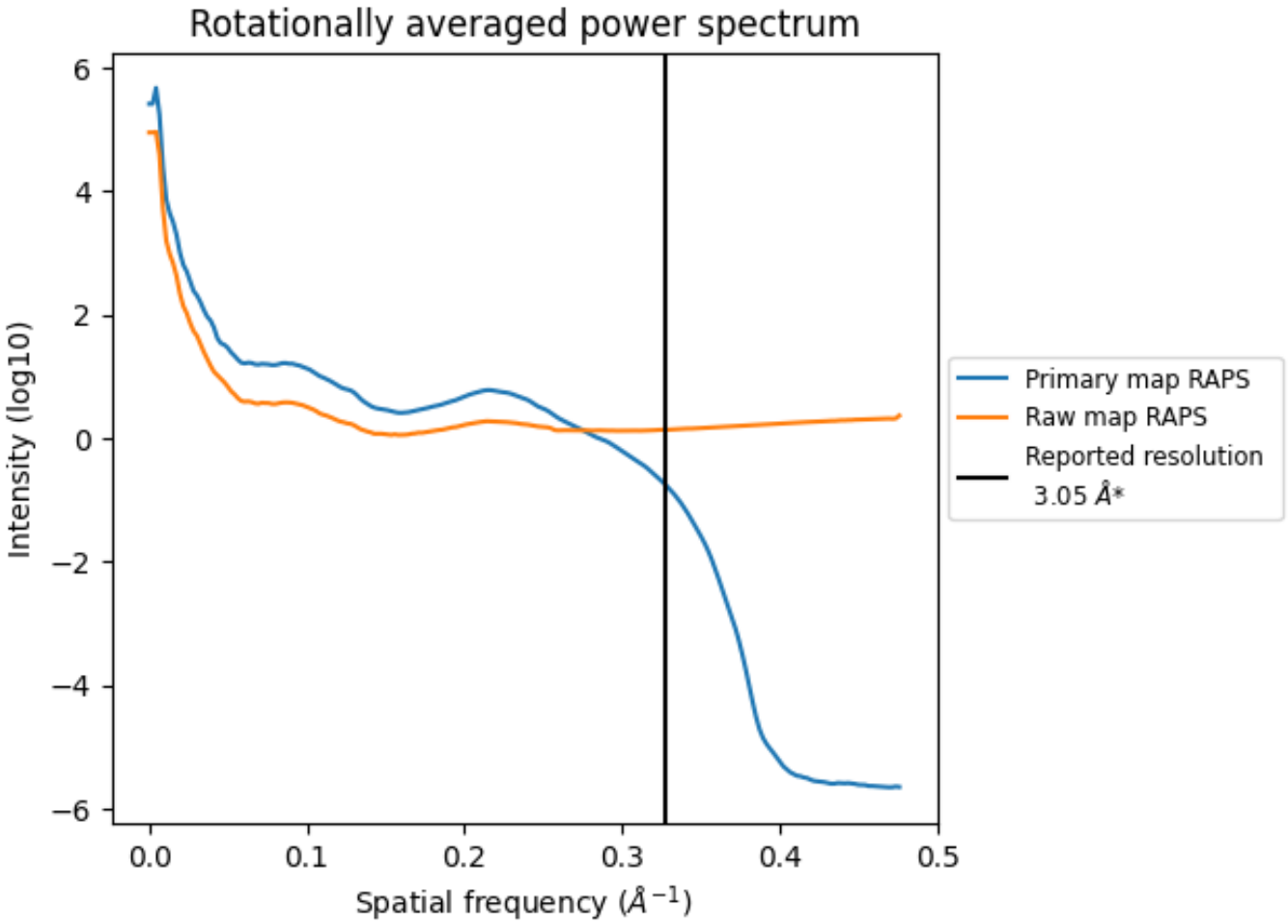
7.2 Volume estimate



The volume at the recommended contour level is 825 nm^3; this corresponds to an approximate mass of 746 kDa.

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

7.3 Rotationally averaged power spectrum (i)

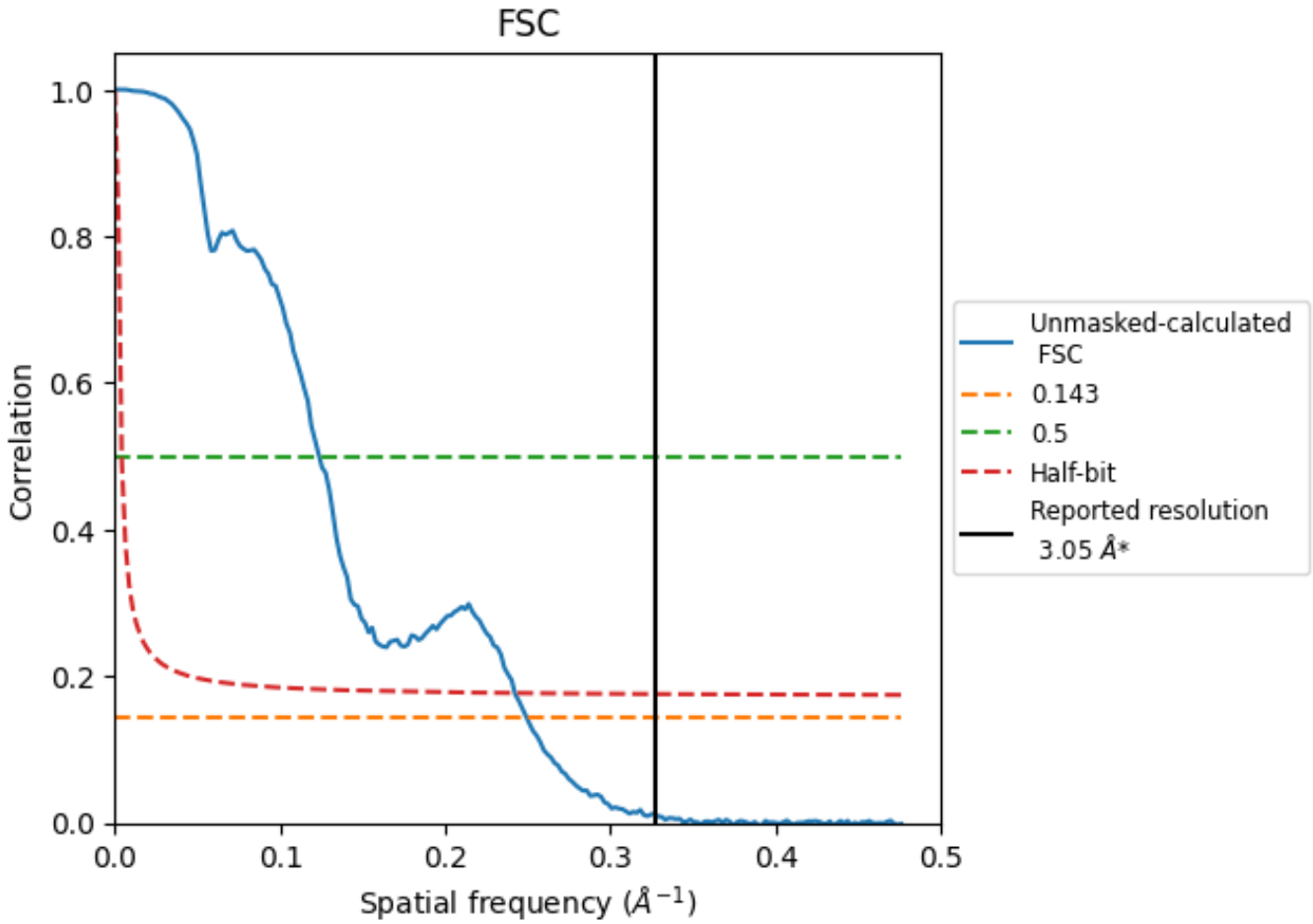


*Reported resolution corresponds to spatial frequency of 0.328 Å^{-1}

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 0.328 Å^{-1}

8.2 Resolution estimates (i)

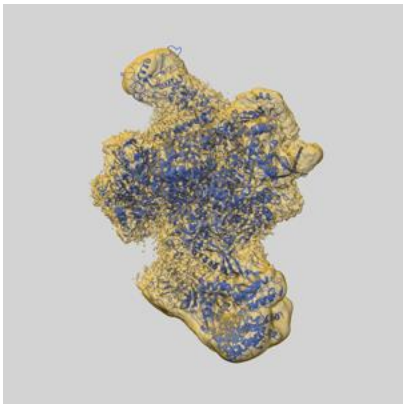
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.05	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.01	8.08	4.13

*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 4.01 differs from the reported value 3.05 by more than 10 %

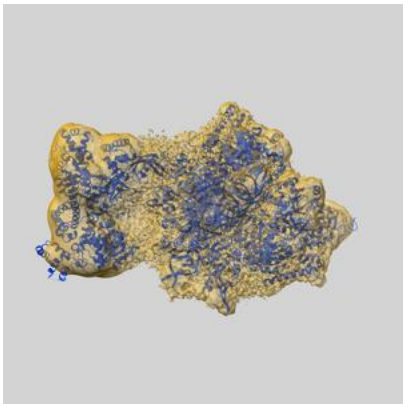
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-16840 and PDB model 8OF0. Per-residue inclusion information can be found in section 3 on page 8.

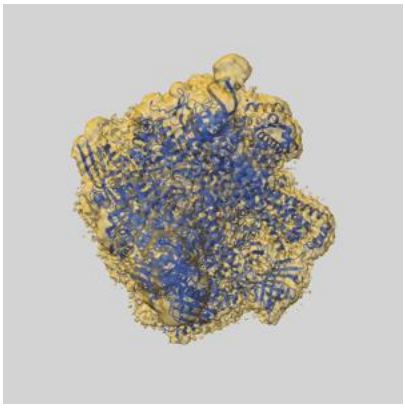
9.1 Map-model overlay



X



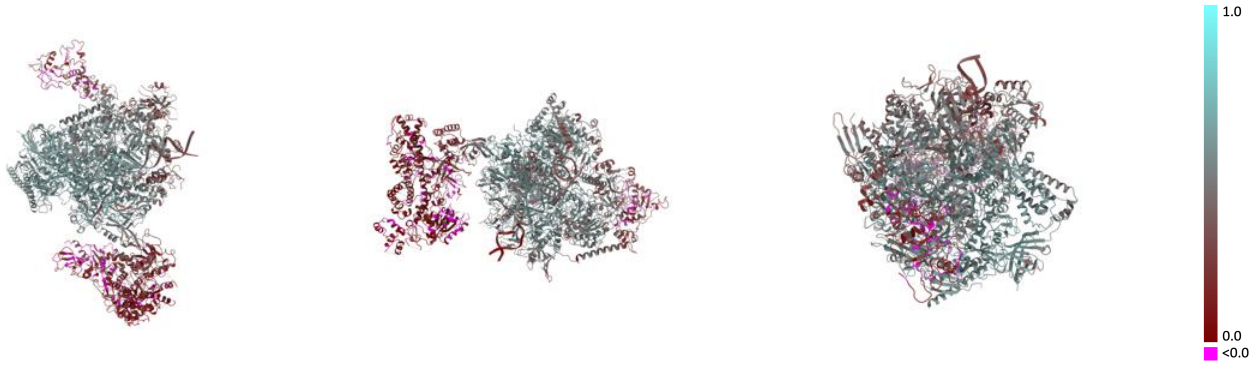
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.012 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.

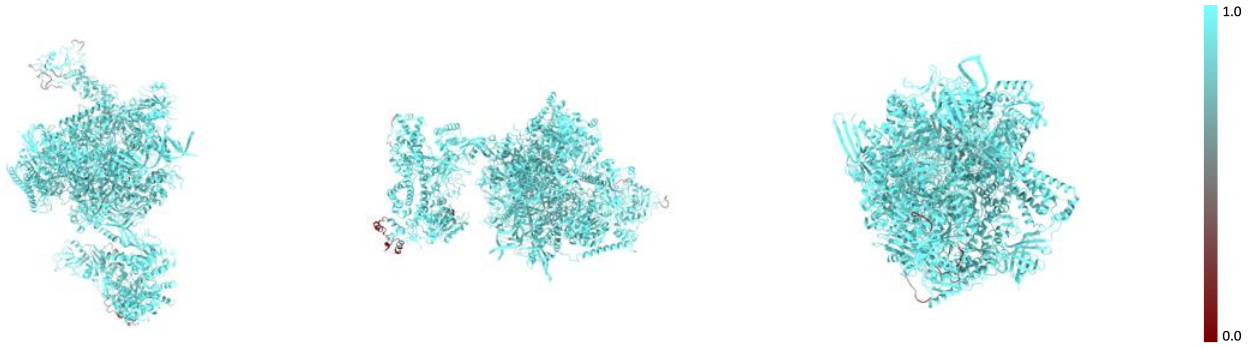
9.2 Q-score mapped to coordinate model (i)



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.

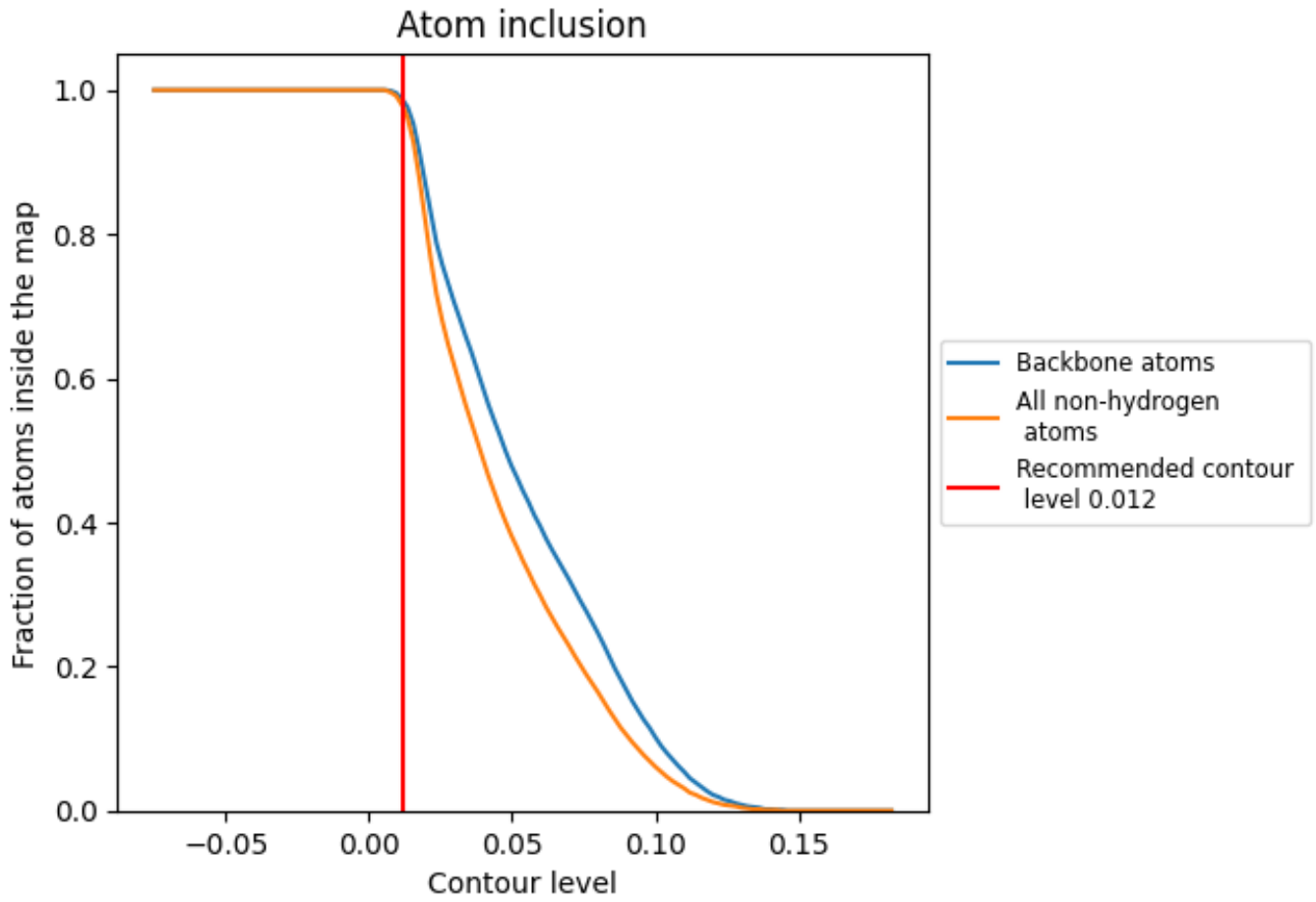
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.012).

9.4 Atom inclusion (i)



At the recommended contour level, 98% of all backbone atoms, 98% 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 (0.012) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9760	0.4220
A	0.9920	0.5290
B	0.9920	0.5440
C	0.9960	0.5730
D	0.9860	0.2450
E	0.9940	0.4810
F	0.9790	0.5600
G	0.9910	0.3130
H	0.9940	0.5520
I	0.9870	0.4350
J	0.9900	0.5750
K	0.9900	0.5690
L	0.9940	0.5160
M	0.9710	0.2890
N	0.9850	0.2930
O	0.9140	0.1280
P	0.9890	0.5160
Q	0.7460	0.1110
S	0.9340	0.0860
T	0.9870	0.3920