wwPDB EM Validation Summary Report

Nov 27, 2022 – 05:42 PM EST

PDB ID	:	7KHC
EMDB ID	:	EMD-21879
Title	:	Escherichia coli RNA polymerase and rrnBP1 promoter closed complex
Authors	:	Shin, Y.; Qayyum, M.Z.; Murakami, K.S.
Deposited on	:	2020-10-20
Resolution	:	4.14 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:

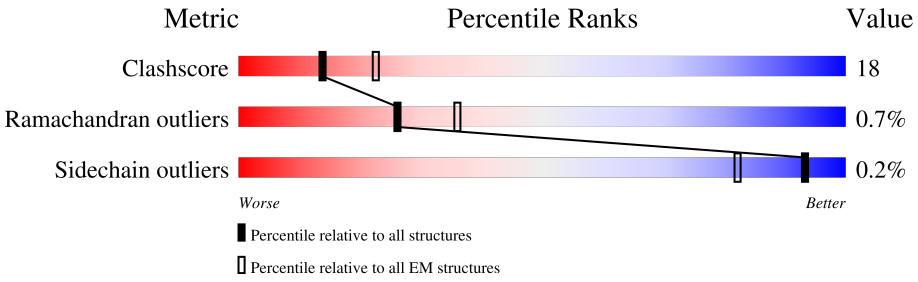
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 4.14 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.



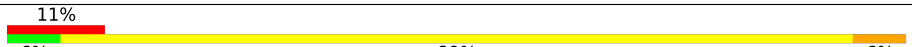
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	329	17% 61% 32% · 6%
1	B	329	22% 58% 38% ·
2	C	1342	· 66% 33% ·
3	D	1407	5% 61% 34% · 5%
4	E	91	21% 46% 36% · 16%
5	F	613	18% 37% 35% · 27%
6	X	63	21% 43% 51% 6%
7	Y	63	19% 54% 43% ·

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
8	O	18	
9	P	18	

2 Entry composition (i)

There are 13 unique types of molecules in this entry. The entry contains 33509 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 subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	309	Total	C	N	O	S	0	0
			2407	1504	424	472	7		
1	B	316	Total	C	N	O	S	0	0
			2472	1545	436	483	8		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	1340	Total	C	N	O	S	0	0
			10570	6631	1841	2055	43		

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	1342	Total	C	N	O	S	0	0
			10396	6530	1852	1965	49		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	76	Total	C	N	O	S	0	0
			605	368	115	121	1		

- Molecule 5 is a protein called RNA polymerase sigma factor RpoD.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	447	Total	C	N	O	S	0	0
			3640	2283	648	689	20		

- Molecule 6 is DNA/RNA hybrid called DNA/RNA (63-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
6	X	63	Total	C	N	O	P	0	0
			1278	613	224	378	63		

- Molecule 7 is a DNA chain called DNA (63-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
7	Y	63	Total	C	N	O	P	0	0
			1305	622	242	378	63		

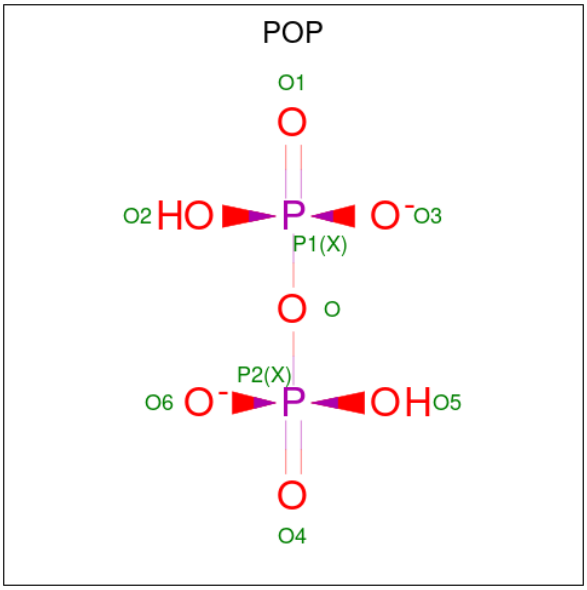
- Molecule 8 is a DNA chain called DNA (18 MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
8	O	18	Total	C	N	O	P	0	0
			370	175	71	106	18		

- Molecule 9 is a DNA chain called DNA (18 MER).

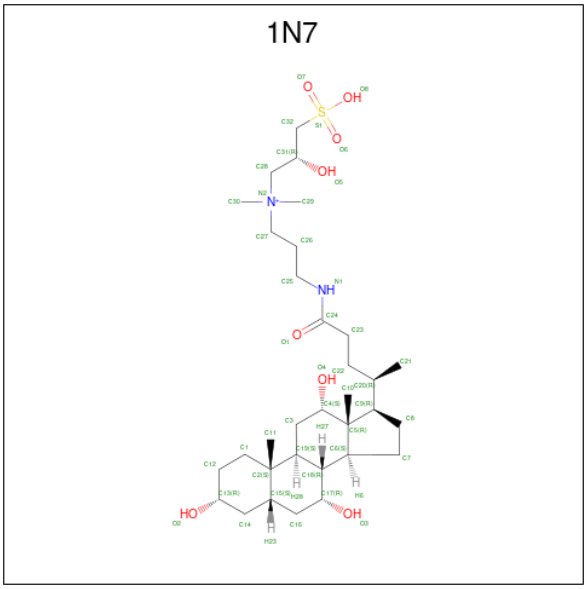
Mol	Chain	Residues	Atoms					AltConf	Trace
9	P	18	Total	C	N	O	P	0	0
			368	175	65	110	18		

- Molecule 10 is PYROPHOSPHATE 2- (three-letter code: POP) (formula: $H_2O_7P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
10	C	1	Total	O	P	0
			9	7	2	

- Molecule 11 is CHAPSO (three-letter code: 1N7) (formula: $C_{32}H_{59}N_2O_8S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
11	C	1	Total	C	N	O	S	0
			86	64	4	16	2	
11	C	1	Total	C	N	O	S	0
			86	64	4	16	2	

- Molecule 12 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
12	D	1	Total	Mg	0
			1	1	

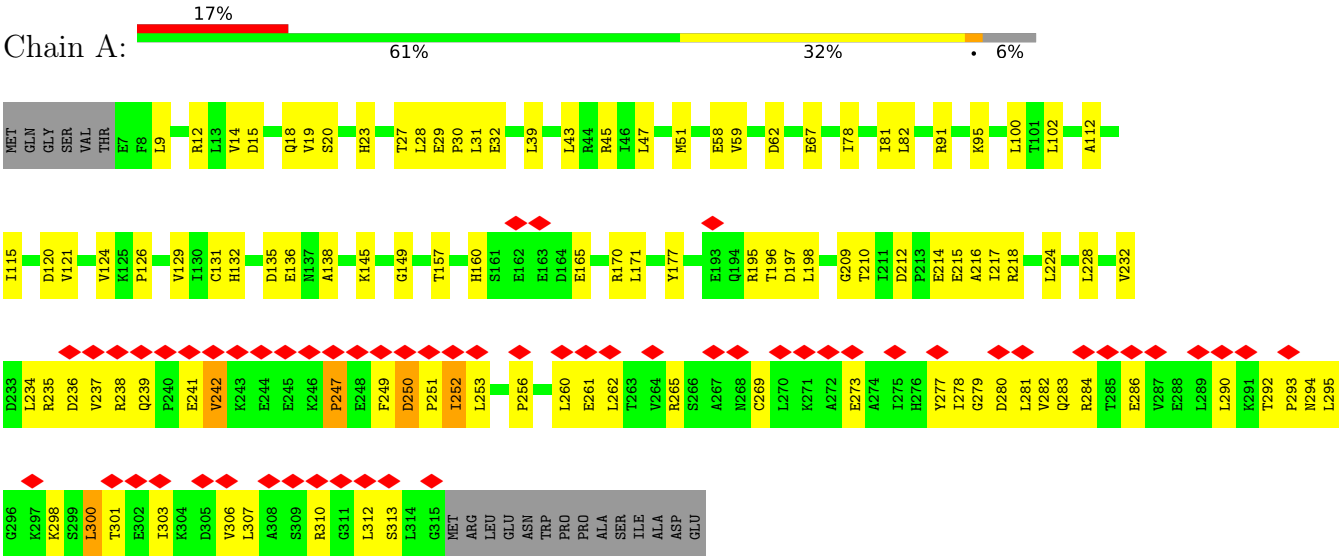
- Molecule 13 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
13	D	2	Total	Zn	0
			2	2	

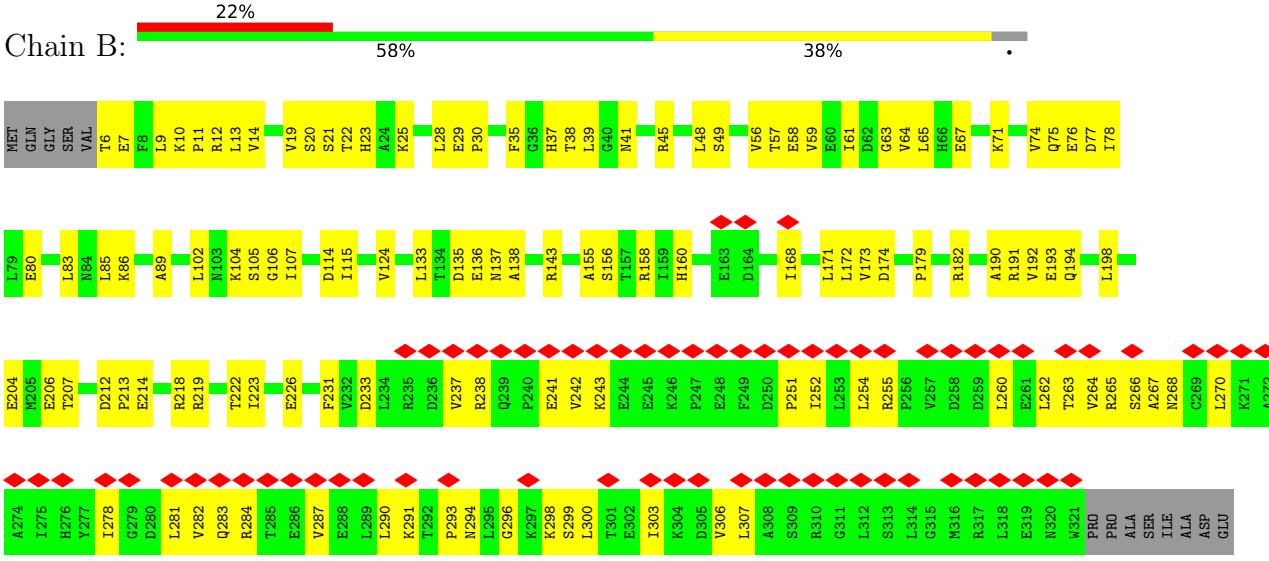
3 Residue-property plots (i)

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

• Molecule 1: DNA-directed RNA polymerase subunit alpha

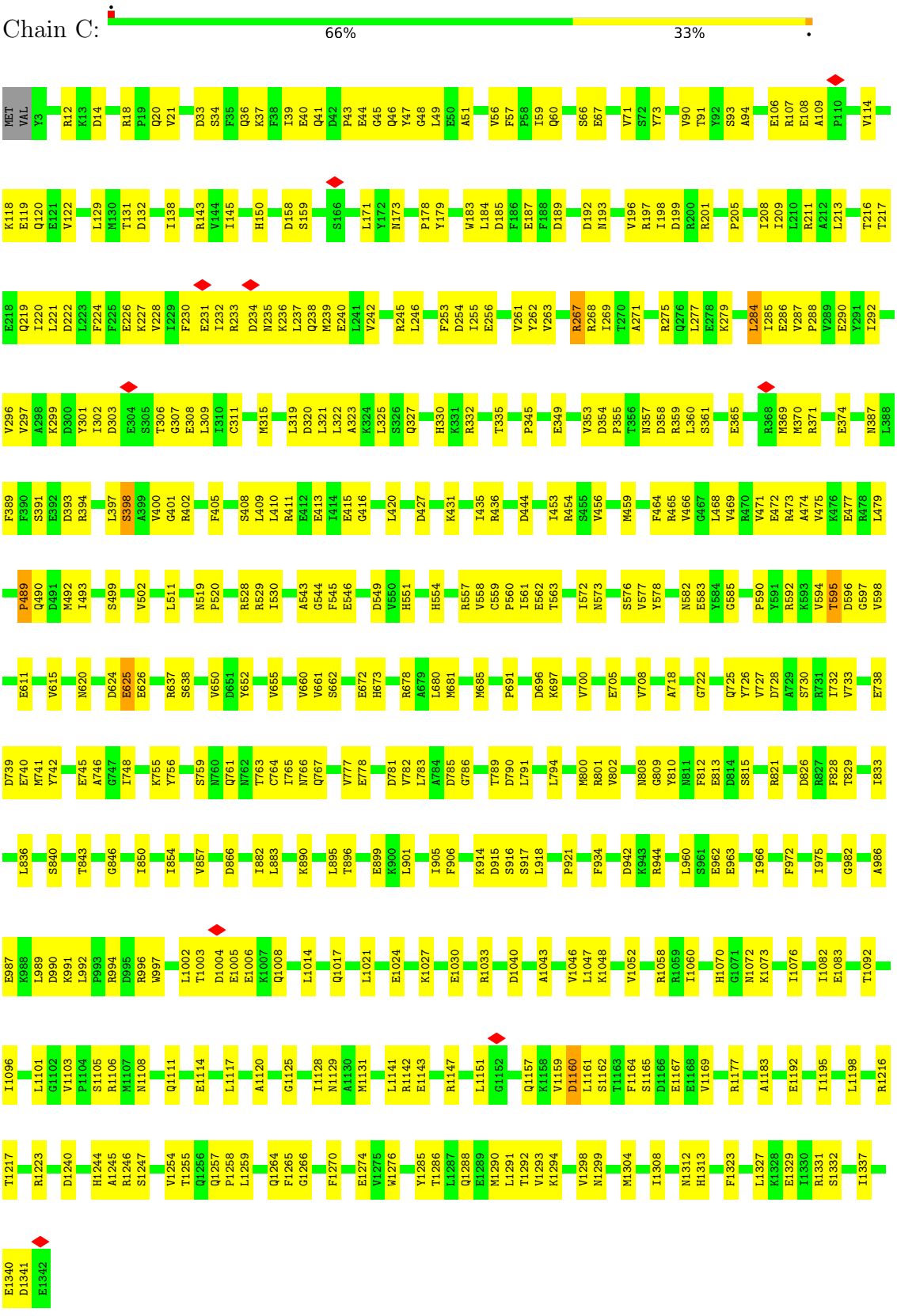


• Molecule 1: DNA-directed RNA polymerase subunit alpha



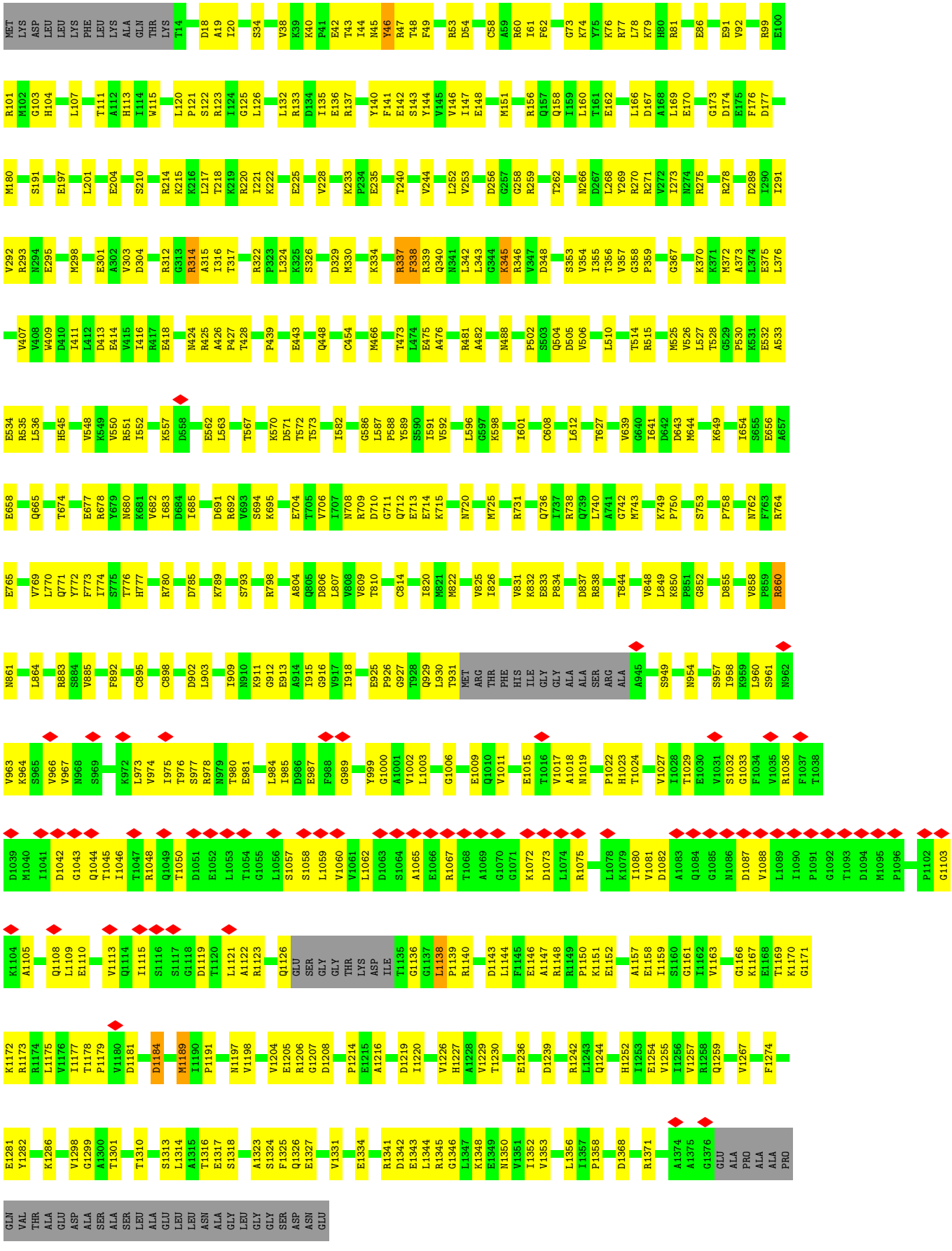
• Molecule 2: DNA-directed RNA polymerase subunit beta

Chain C:



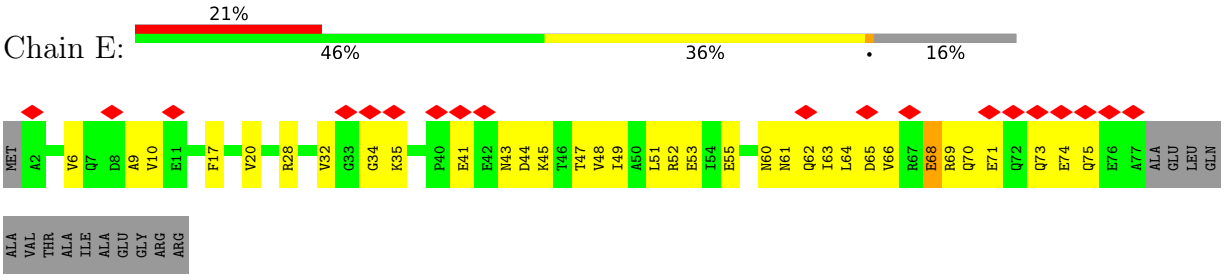
• Molecule 3: DNA-directed RNA polymerase subunit beta'

Chain D:


MET LYS ASP LEU LEU LYS PHE LEU LYS ALA GLN THR LYS
T14 D18 A19 I20 S34 V38 K39 K40 P41 E42 T43 I44 N45 Y46 R47 T48 F49 R53 D54 C58 A59 R60 I61 F62 G73 K74 Y75 K76 R77 L78 K79 H80 R81 E86 E91 V92 R99 E100
R101 M102 G103 H104 L107 T111 A112 H113 I114 W115 L120 P121 S122 R123 I124 G125 L126 L132 R133 D134 I135 E136 R137 Y140 F141 E142 S143 Y144 V145 V146 I147 E148 M151 R156 Q157 Q158 I159 L160 T161 E162 L166 D167 A168 L169 E170 G173 D174 E175 F176 D177
M180 S191 E197 L201 E204 S210 R214 K215 K216 L217 T218 K219 R220 I221 K222 E225 V228 K233 P234 E235 T240 V244 L252 V253 D256 G257 G258 R259 T262 N266 D267 L268 Y269 R270 R271 V272 I273 N274 R275 R278 D289 I290 I291
V292 R293 N294 E295 M298 E301 A302 V303 D304 R312 G313 R314 A315 I316 T317 R322 P323 L324 K325 S326 D329 M330 K334 R337 F338 R339 Q340 N341 L342 L343 G344 K345 R346 V347 D348 S353 V354 I355 T356 V357 G358 P359 G367 K370 K371 M372 A373 L374 E375 L376
V407 V408 W409 D410 I411 L412 D413 E414 V415 I416 R417 E418 N424 R425 A426 P427 T428 P439 E443 Q448 C454 M466 T473 L474 E475 A476 R481 A482 N488 P502 S503 Q504 D505 V506 L510 T514 R515 M525 V526 L527 T528 G529 P530 K531 E532 A533
E534 R535 L536 H545 V548 K549 V550 R551 I552 K557 D558 E562 L563 T567 K570 D571 T572 T573 I582 G586 L587 P588 Y589 S590 I591 V592 L596 G597 K598 I601 C608 L612 T627 V639 G640 I641 D642 D643 M644 K649 I654 S655 E656 A657
E658 Q665 T674 E677 R678 Y679 N680 K681 V682 I683 D684 I685 D691 R692 V693 S694 K695 E704 T705 V706 I707 N708 R709 D710 G711 Q712 E713 E714 K715 N720 M725 R731 Q736 I737 R738 Q739 L740 A741 G742 M743 K749 P750 S753 P758 N762 F763 R764
E765 V769 L770 Q771 Y772 F773 I774 S775 T776 H777 R780 D785 K789 S793 R798 A804 Q805 D806 L807 V808 V809 T810 C814 I820 M821 M822 V825 I826 V831 K832 E833 P834 D837 R838 T844 V848 L849 K850 P851 G852 D855 V858 P859 R860
N861 L864 R883 S884 V885 F892 C895 C898 D902 L903 I909 N910 K911 G912 E913 A914 I915 G916 V917 I918 E925 P926 G927 T928 Q929 L930 T931 MET ARG THR PHE HIS ILE GLY GLY ALA ALA SER ARG ALA A945 S949 N954 S957 I958 K959 L960 S961 N962
V963 K964 S965 V966 V967 N968 S969 K972 L973 V974 I975 T976 S977 R978 N979 T980 E981 L984 I985 D986 E987 F988 G989 Y999 G1000 A1001 V1002 L1003 G1006 E1009 Q1010 V1011 E1015 T1016 V1017 A1018 N1019 P1022 H1023 T1024 V1027 I1028 T1029 E1030 V1031 S1032 G1033 F1034 V1035 R1036 F1037 T1038
D1039 M1040 I1041 D1042 G1043 Q1044 T1045 I1046 T1047 R1048 Q1049 T1050 D1051 E1052 L1053 T1054 G1055 L1056 S1057 S1058 L1059 V1060 V1061 L1062 D1063 S1064 A1065 E1066 R1067 T1068 A1069 G1070 G1071 K1072 D1073 L1074 R1075 L1078 K1079 I1080 V1081 D1082 A1083 Q1084 G1085 N1086 D1087 V1088 L1089 I1090 P1091 G1092 T1093 D1094 M1095 P1096 P1102 G1103
K1104 A1105 Q1108 L1109 E1110 V1113 Q1114 I1115 S1116 S1117 G1118 D1119 T1120 L1121 A1122 R1123 Q1126 GLU SER GLY GLY THR LYS ASP ILE T1135 G1136 G1137 L1138 P1139 R1140 D1143 L1144 F1145 E1146 A1147 R1148 R1149 P1150 K1151 E1152 A1157 E1158 I1159 S1160 G1161 I1162 V1163 G1166 K1167 E1168 T1169 K1170 G1171
K1172 R1173 R1174 L1175 V1176 I1177 T1178 P1179 V1180 D1181 D1184 M1189 I1190 P1191 N1197 V1198 V1204 E1205 R1206 G1207 D1208 P1214 E1215 A1216 D1219 I1220 V1226 H1227 A1228 V1229 T1230 E1236 D1239 R1242 L1243 Q1244 H1252 I1253 E1254 V1255 I1256 Y1257 R1258 Q1259 V1267 F1274
E1281 Y1282 K1286 V1298 G1299 A1300 T1301 T1310 S1313 L1314 A1315 T1316 E1317 S1318 A1323 S1324 F1325 Q1326 E1327 V1331 E1334 R1341 D1342 E1343 L1344 R1345 G1346 L1347 K1348 E1349 N1350 V1351 I1352 V1353 L1356 I1357 P1358 D1368 R1371 A1374 A1375 G1376 GLU ALA PRO ALA ALA PRO
GLN VAL THR ALA GLU ASP ALA SER ALA SER LEU ALA GLU LEU LEU ASN ALA ALA GLY LEU GLY GLY SER ASP ASN GLU

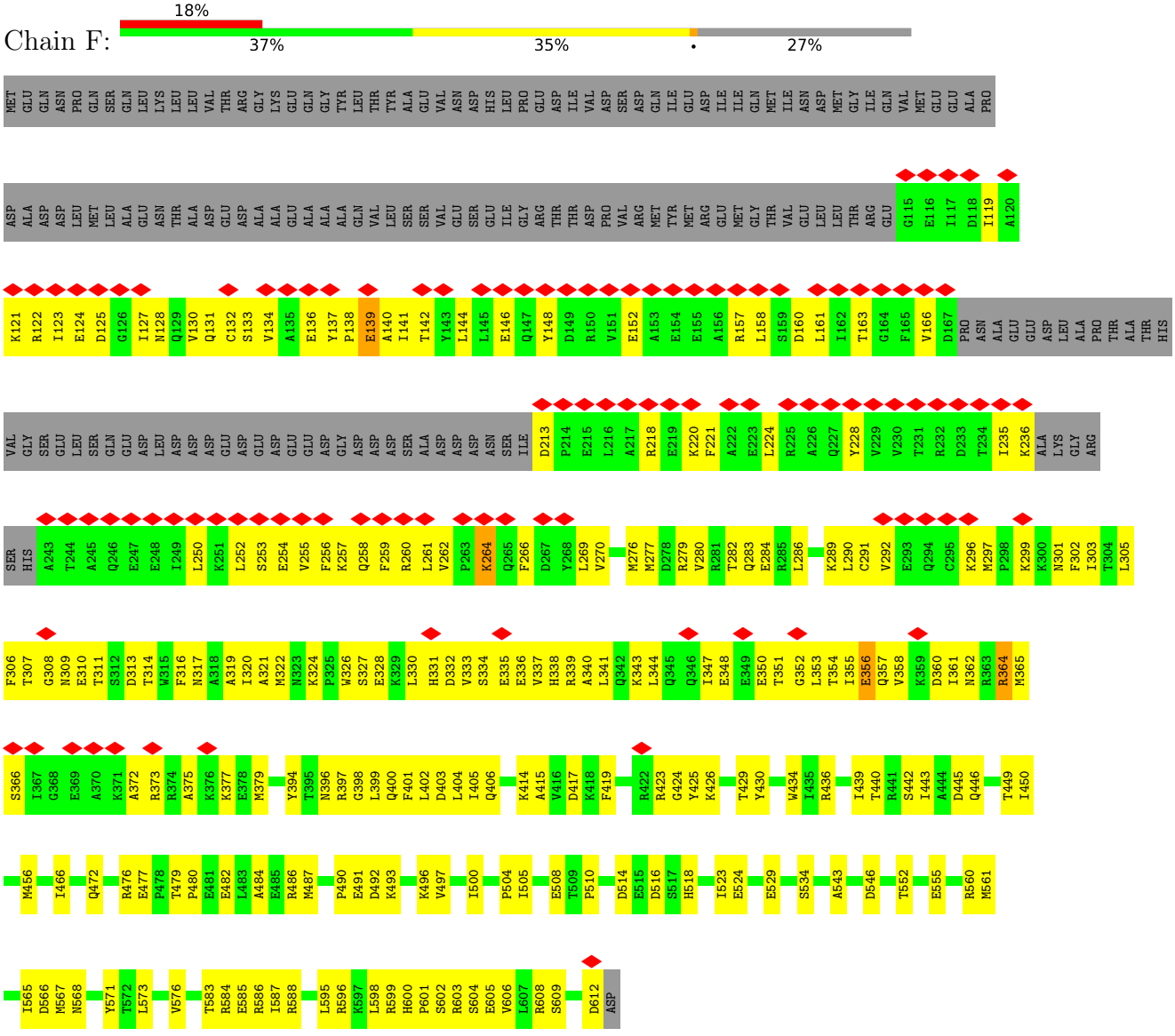
• Molecule 4: DNA-directed RNA polymerase subunit omega

Chain E:



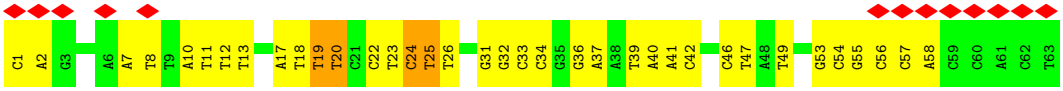
• Molecule 5: RNA polymerase sigma factor RpoD

Chain F:

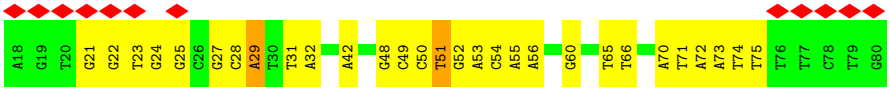


• Molecule 6: DNA/RNA (63-MER)

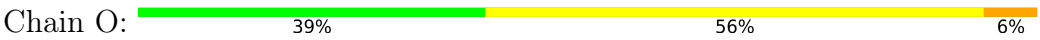
Chain X:



• Molecule 7: DNA (63-MER)



• Molecule 8: DNA (18 MER)



• Molecule 9: DNA (18 MER)

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	67187	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 ($e^-/Å^2$)	45	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.075	Depositor
Minimum map value	-0.036	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.013	Depositor
Map size (Å)	388.80002, 388.80002, 388.80002	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.08, 1.08, 1.08	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, POP, ZN, 1N7

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	0.29	0/2437	0.62	1/3301 (0.0%)
1	B	0.28	0/2504	0.63	0/3392
2	C	0.34	1/10739 (0.0%)	0.60	4/14489 (0.0%)
3	D	0.31	0/10553	0.60	1/14253 (0.0%)
4	E	0.37	1/607 (0.2%)	0.68	0/817
5	F	0.29	0/3689	0.63	0/4958
6	X	0.75	0/1430	1.17	7/2201 (0.3%)
7	Y	0.76	0/1466	1.14	3/2264 (0.1%)
8	O	0.81	0/415	1.14	1/638 (0.2%)
9	P	0.84	0/411	1.19	1/632 (0.2%)
All	All	0.39	2/34251 (0.0%)	0.70	18/46945 (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
2	C	0	3
3	D	0	1
All	All	0	4

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	489	PRO	CG-CD	-7.57	1.25	1.50
4	E	68	GLU	CG-CD	-5.59	1.43	1.51

The worst 5 of 18 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	489	PRO	N-CD-CG	-9.01	89.69	103.20
3	D	1189	MET	CB-CG-SD	7.67	135.41	112.40
6	X	24	DC	O4'-C1'-N1	7.64	113.35	108.00
7	Y	51	DT	O4'-C1'-N1	6.71	112.69	108.00
2	C	489	PRO	CA-N-CD	-6.48	102.43	111.50

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	C	198	ILE	Peptide
2	C	236	LYS	Peptide
2	C	595	THR	Peptide
3	D	1184	ASP	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	2407	0	2463	83	0
1	B	2472	0	2525	98	0
2	C	10570	0	10582	359	0
3	D	10396	0	10583	368	0
4	E	605	0	612	29	0
5	F	3640	0	3705	209	0
6	X	1278	0	713	30	0
7	Y	1305	0	713	31	0
8	O	370	0	202	10	0
9	P	368	0	204	21	0
10	C	9	0	0	1	0
11	C	86	0	116	8	0
12	D	1	0	0	0	0
13	D	2	0	0	0	0
All	All	33509	0	32418	1160	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 18.

The worst 5 of 1160 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:C:1142:ARG:NH2	2:C:1165:SER:O	1.87	1.08
3:D:1344:LEU:O	3:D:1346:GLY:N	1.97	0.97
3:D:210:SER:OG	9:P:7:DG:OP1	1.83	0.97
2:C:905:ILE:O	5:F:599:ARG:NH1	1.99	0.95
1:B:296:GLY:N	6:X:11:DT:OP1	2.00	0.93

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	307/329 (93%)	255 (83%)	47 (15%)	5 (2%)	9	44
1	B	314/329 (95%)	271 (86%)	41 (13%)	2 (1%)	25	64
2	C	1338/1342 (100%)	1227 (92%)	105 (8%)	6 (0%)	34	71
3	D	1336/1407 (95%)	1210 (91%)	115 (9%)	11 (1%)	19	59
4	E	74/91 (81%)	69 (93%)	5 (7%)	0	100	100
5	F	441/613 (72%)	397 (90%)	41 (9%)	3 (1%)	22	61
All	All	3810/4111 (93%)	3429 (90%)	354 (9%)	27 (1%)	26	61

5 of 27 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	261	GLU
3	D	338	PHE
3	D	1345	ARG
5	F	139	GLU
5	F	356	GLU

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	269/286 (94%)	268 (100%)	1 (0%)	91 94
1	B	276/286 (96%)	276 (100%)	0	100 100
2	C	1155/1157 (100%)	1153 (100%)	2 (0%)	93 96
3	D	1114/1168 (95%)	1112 (100%)	2 (0%)	93 96
4	E	65/75 (87%)	65 (100%)	0	100 100
5	F	397/540 (74%)	395 (100%)	2 (0%)	88 93
All	All	3276/3512 (93%)	3269 (100%)	7 (0%)	93 96

5 of 7 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	D	314	ARG
3	D	695	LYS
5	F	364	ARG
5	F	264	LYS
2	C	890	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
2	C	41	GLN
3	D	488	ASN
3	D	712	GLN
4	E	73	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 6 ligands modelled in this entry, 3 are monoatomic - leaving 3 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
10	POP	C	1401	-	6,8,8	0.76	0	13,13,13	1.39	1 (7%)
11	1N7	C	1403	-	45,46,46	4.03	19 (42%)	69,72,72	2.00	20 (28%)
11	1N7	C	1402	-	45,46,46	4.10	20 (44%)	69,72,72	2.43	22 (31%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
10	POP	C	1401	-	-	0/6/6/6	-
11	1N7	C	1403	-	-	6/27/92/92	0/4/4/4
11	1N7	C	1402	-	-	6/27/92/92	0/4/4/4

The worst 5 of 39 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	C	1402	1N7	C3-C4	-12.69	1.31	1.53
11	C	1403	1N7	C3-C4	-12.45	1.32	1.53
11	C	1402	1N7	C5-C9	-11.28	1.36	1.55

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	C	1403	1N7	C5-C9	-10.92	1.36	1.55
11	C	1402	1N7	C3-C19	-9.14	1.38	1.53

The worst 5 of 43 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	C	1402	1N7	C5-C6-C18	-8.07	104.43	114.74
11	C	1402	1N7	C5-C9-C20	-7.68	110.33	119.50
11	C	1403	1N7	C5-C6-C18	-6.29	106.70	114.74
11	C	1403	1N7	C6-C5-C4	-5.39	102.38	107.40
11	C	1402	1N7	C16-C17-C18	-5.33	105.79	111.48

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	C	1402	1N7	C21-C20-C9-C5
11	C	1402	1N7	C22-C20-C9-C5
11	C	1402	1N7	C22-C20-C9-C8
11	C	1402	1N7	N2-C28-C31-C32
11	C	1402	1N7	N2-C28-C31-O5

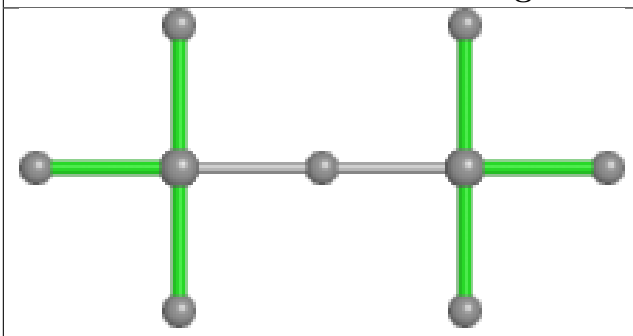
There are no ring outliers.

3 monomers are involved in 9 short contacts:

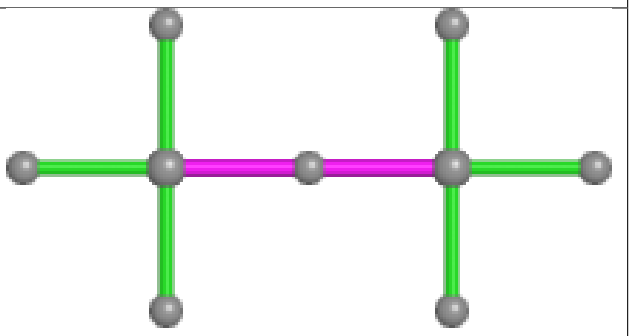
Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	C	1401	POP	1	0
11	C	1403	1N7	5	0
11	C	1402	1N7	3	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

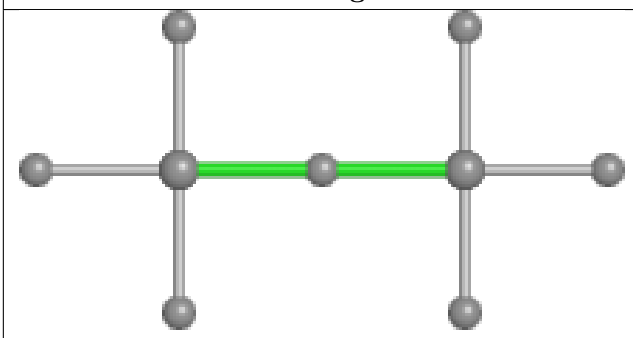
Ligand POP C 1401



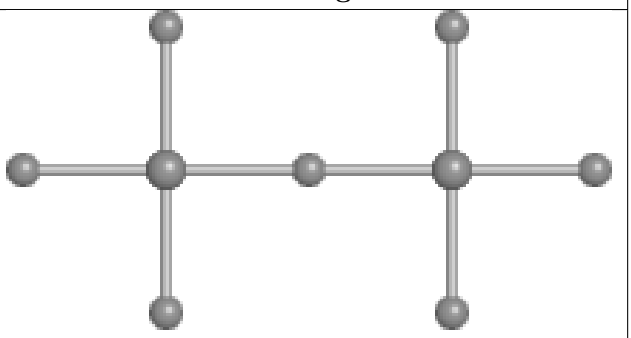
Bond lengths



Bond angles

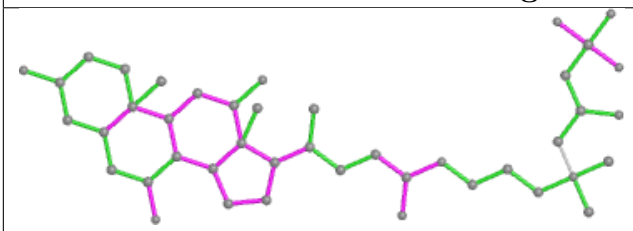


Torsions

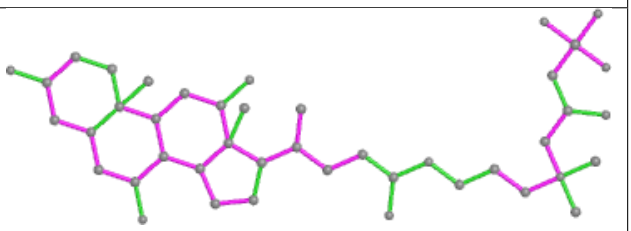


Rings

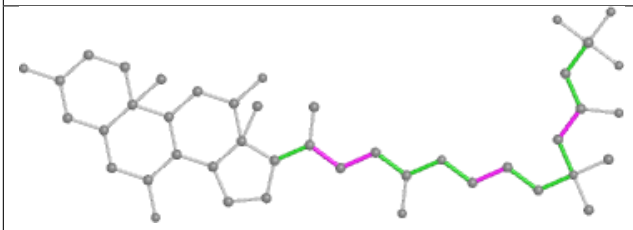
Ligand 1N7 C 1403



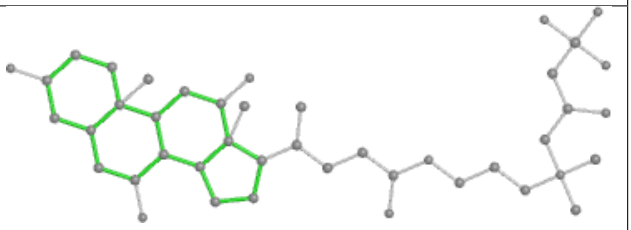
Bond lengths



Bond angles

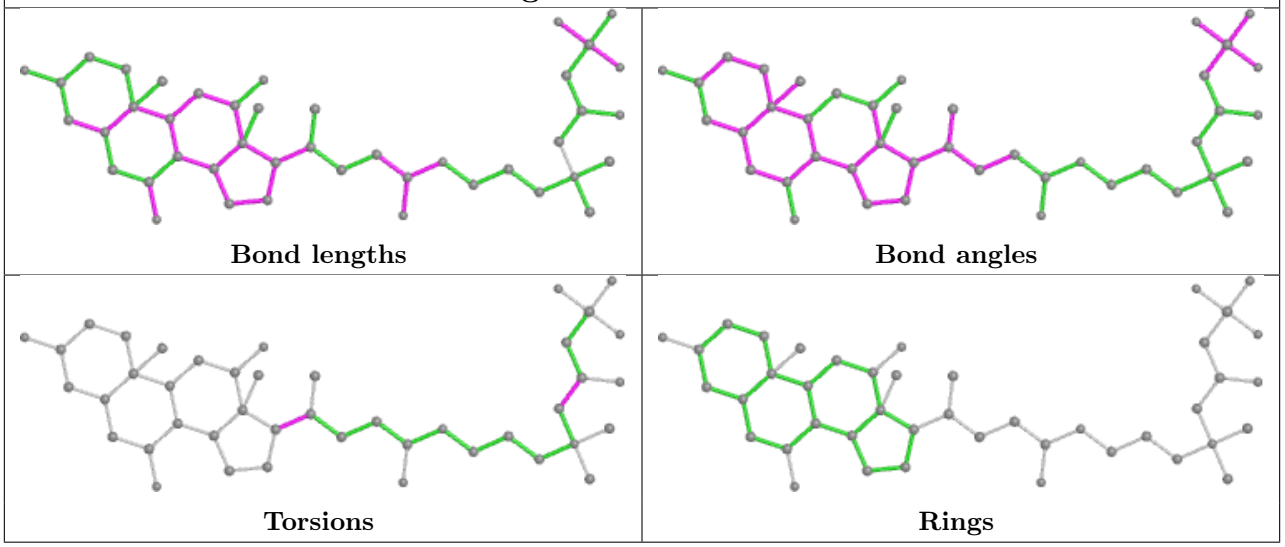


Torsions



Rings

Ligand 1N7 C 1402



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.

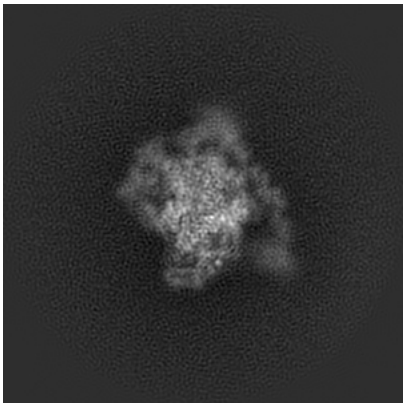
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-21879. These allow visual inspection of the internal detail of the map and identification of artifacts.

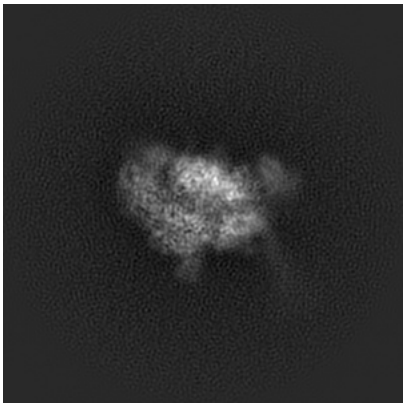
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

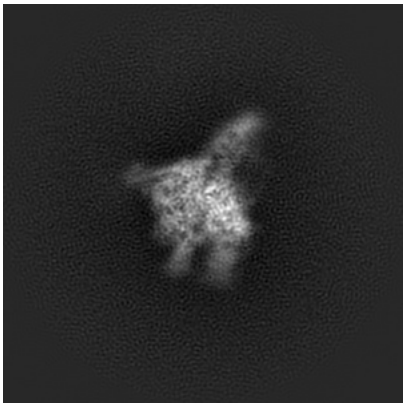
6.1.1 Primary map



X



Y

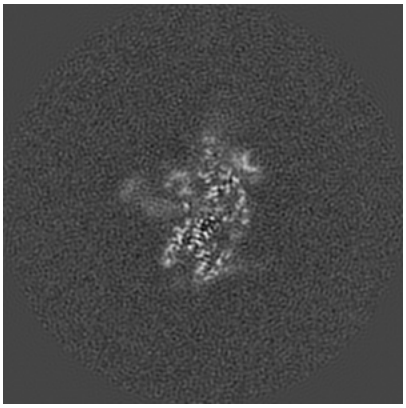


Z

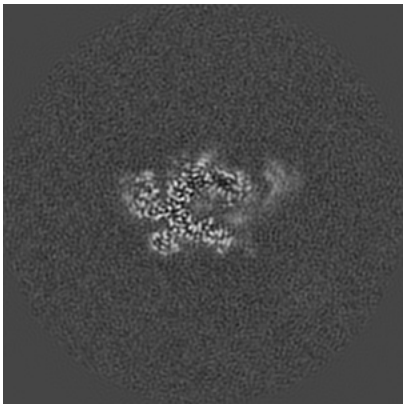
The images above show the map projected in three orthogonal directions.

6.2 Central slices

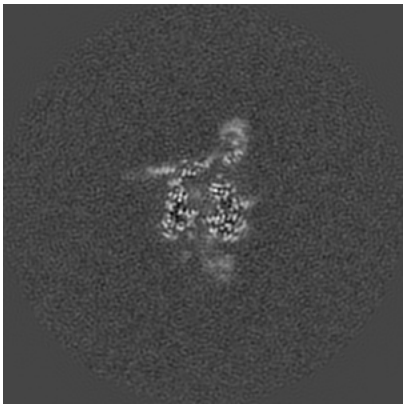
6.2.1 Primary map



X Index: 180



Y Index: 180

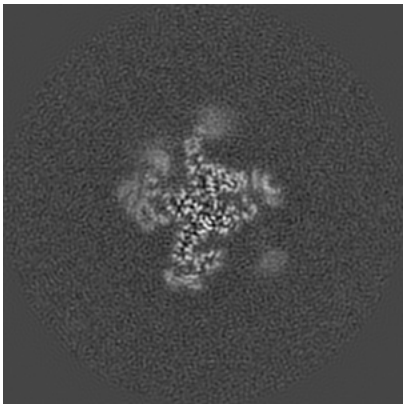


Z Index: 180

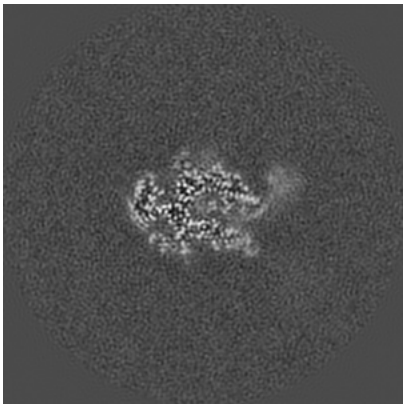
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

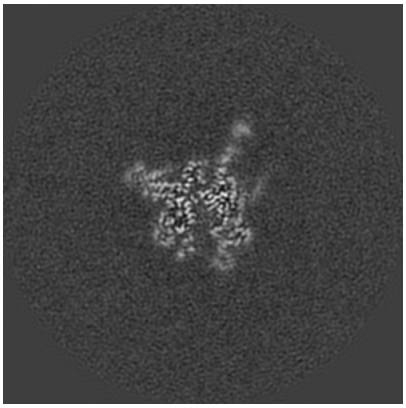
6.3.1 Primary map



X Index: 197



Y Index: 185



Z Index: 167

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

6.4 Orthogonal surface views (i)

6.4.1 Primary map

X

Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.013. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

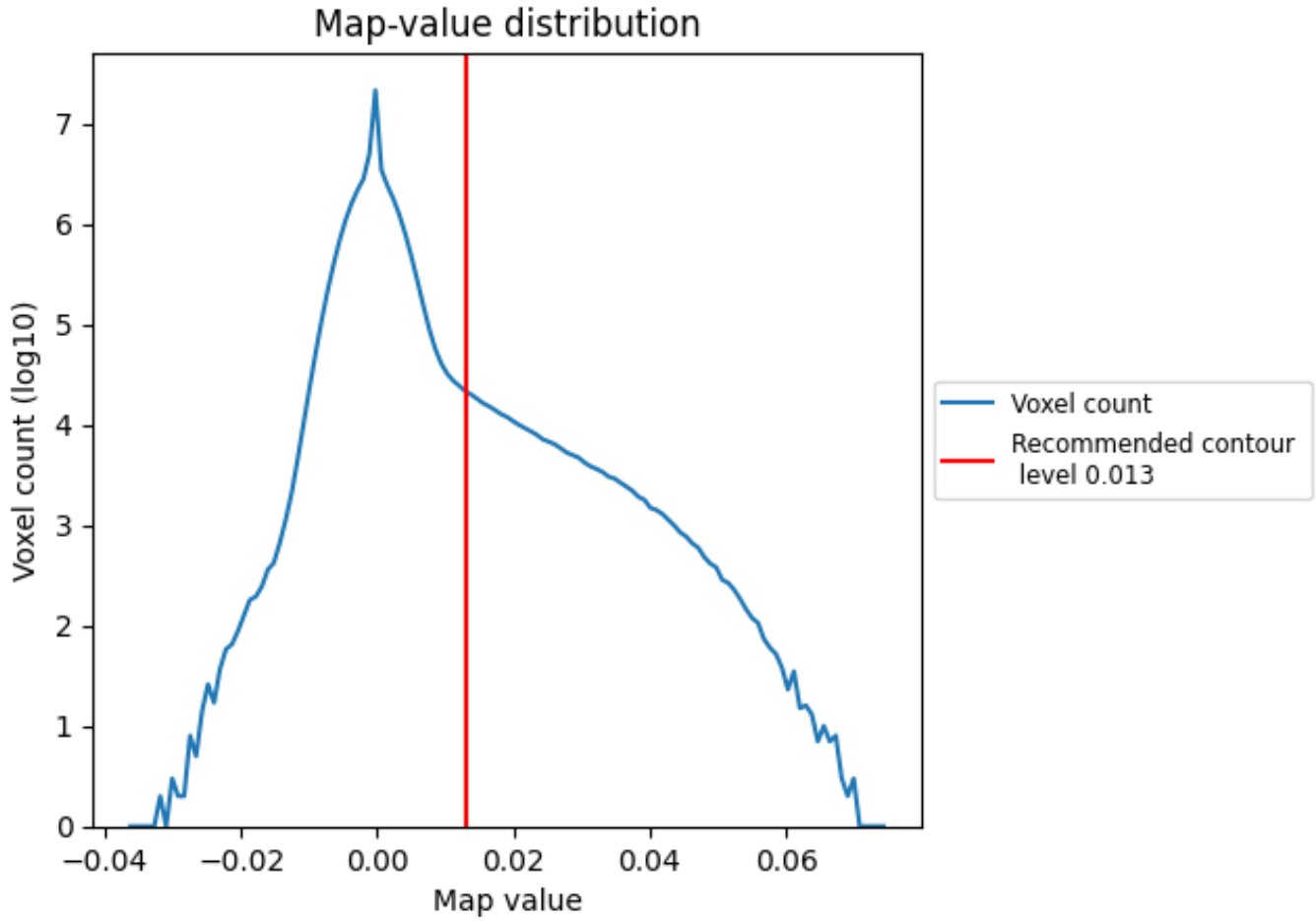
6.5 Mask visualisation (i)

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

7 Map analysis

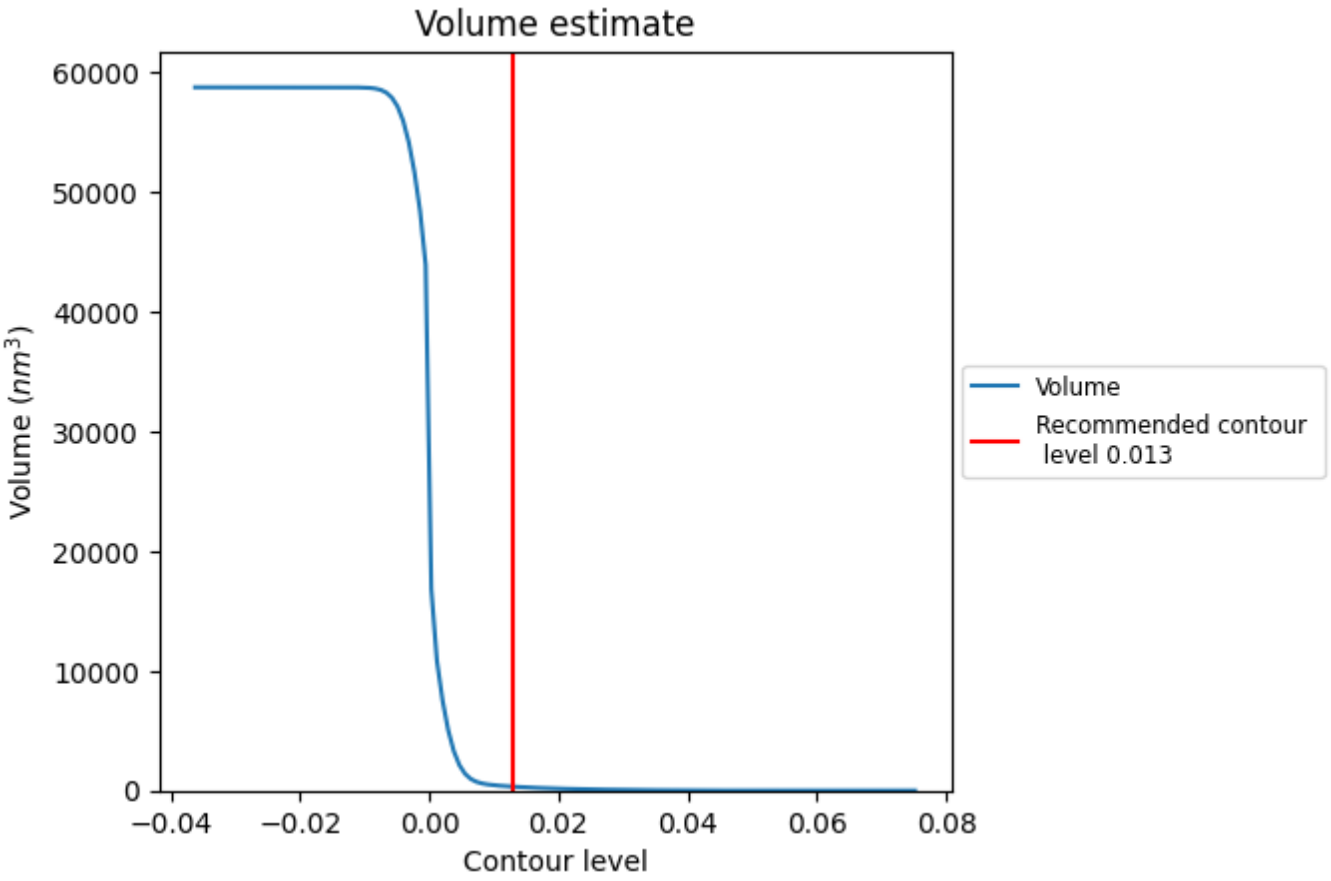
This section contains the results of statistical analysis of the map.

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.

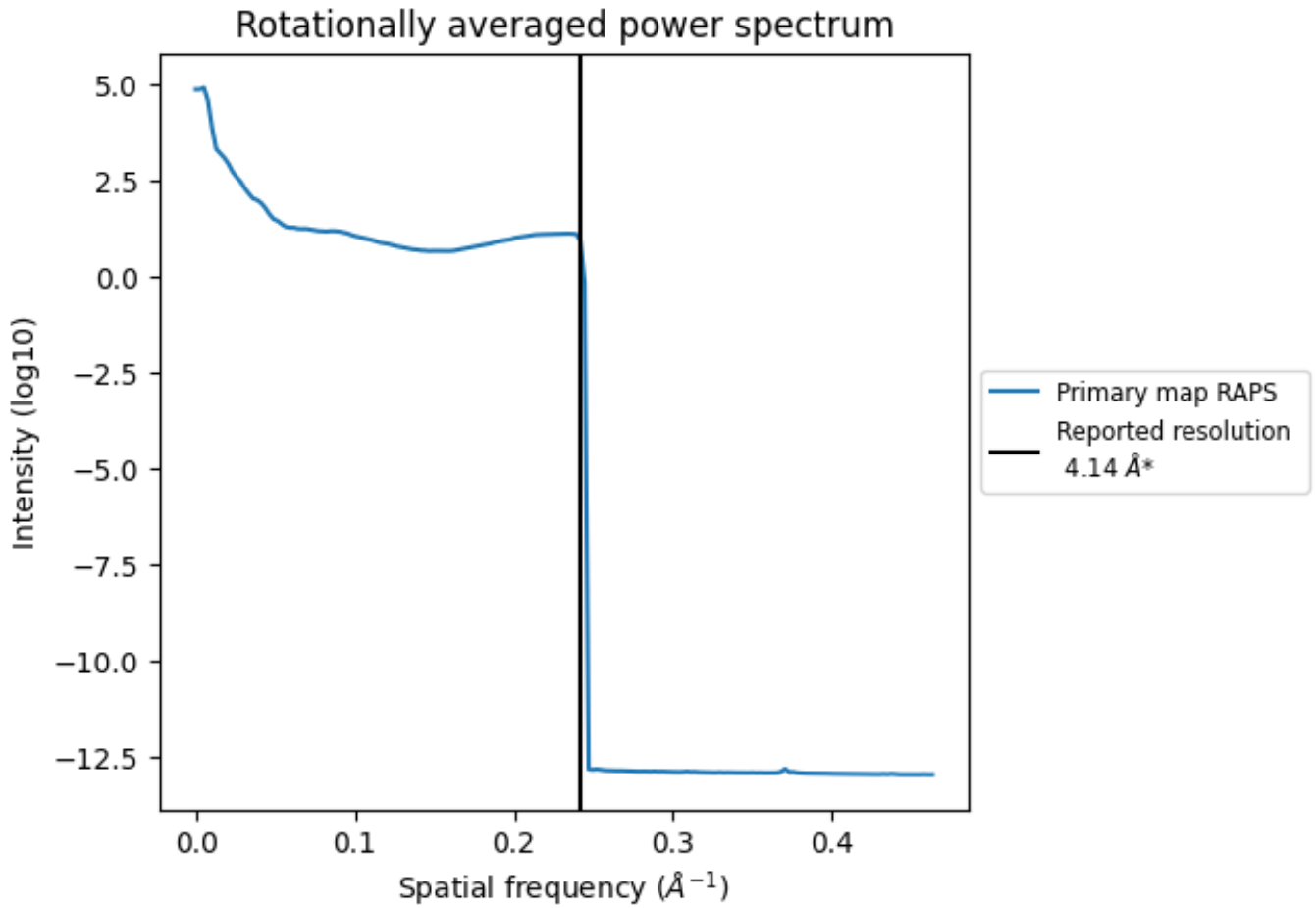
7.2 Volume estimate (i)



The volume at the recommended contour level is 327 nm^3; this corresponds to an approximate mass of 295 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 0.242 $Å^{-1}$

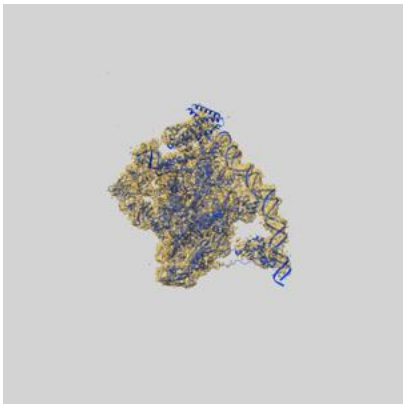
8 Fourier-Shell correlation (i)

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

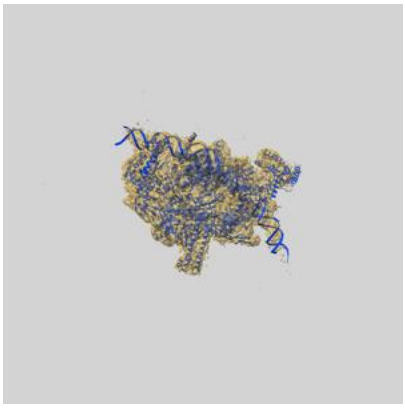
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-21879 and PDB model 7KHC. Per-residue inclusion information can be found in section 3 on page 7.

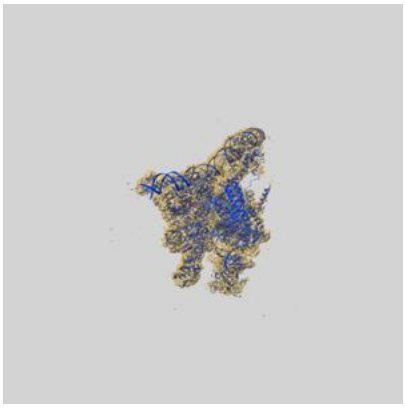
9.1 Map-model overlay



X



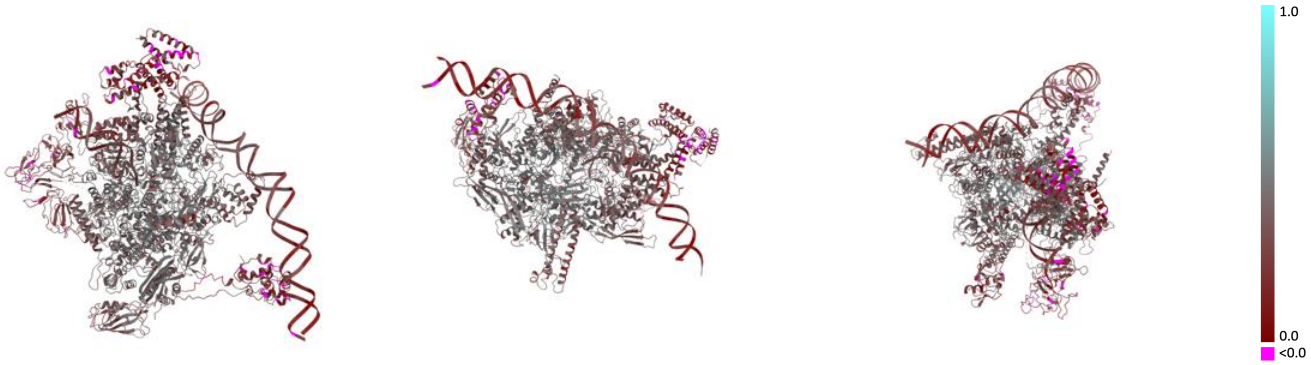
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.013 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.

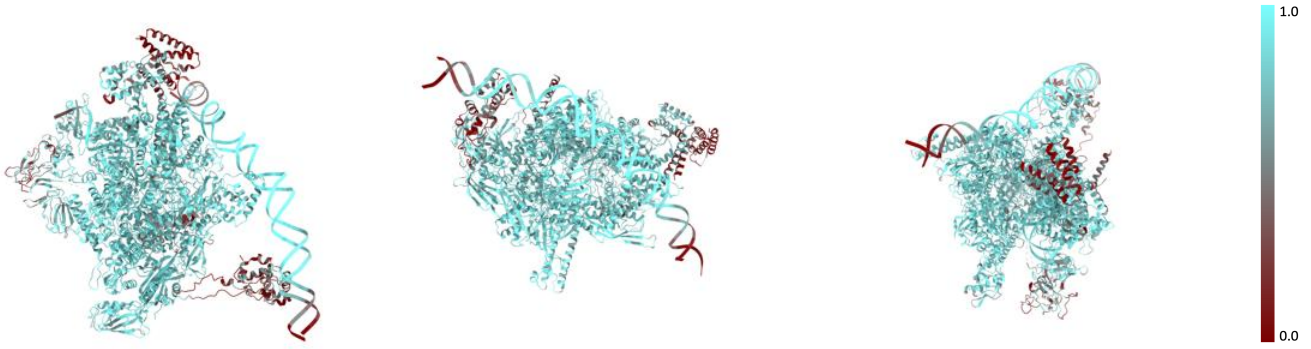
9.2 Q-score mapped to coordinate model



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.

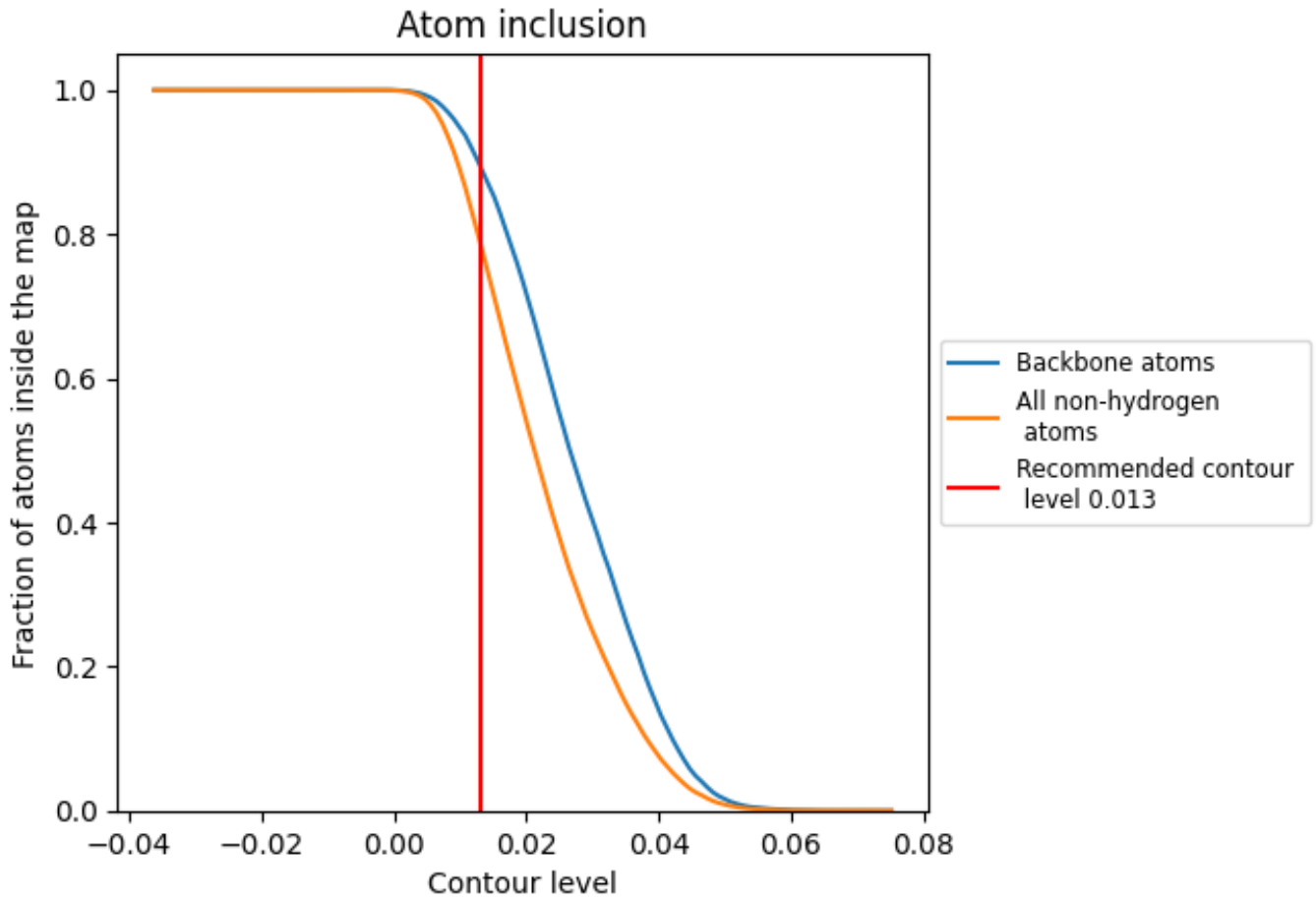
9.3 Atom inclusion mapped to coordinate model



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 (0.013).

9.4 Atom inclusion (i)



At the recommended contour level, 90% of all backbone atoms, 79% 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 (0.013) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7900	0.3570
A	0.7057	0.3580
B	0.6599	0.3310
C	0.8696	0.4070
D	0.8314	0.3870
E	0.5671	0.3720
F	0.6537	0.2600
O	0.8351	0.2130
P	0.8505	0.2720
X	0.7214	0.2050
Y	0.7341	0.2250