wwPDB EM Validation Summary Report (i)

Jul 23, 2026 – 06:06 PM JST

PDB ID	:	9UKA / pdb_00009uka
EMDB ID	:	EMD-64232
Title	:	CryoEM structure of Brucella melitensis CobN-CobS-CobT holoenzyme with AMPPNP (conformation 3)
Authors	:	Zhou, Y.L.; Chen, X.; Liu, L.
Deposited on	:	2025-04-17
Resolution	:	4.24 Å(reported)

The following versions of software and data (see references (i)) were used in the production of this report:

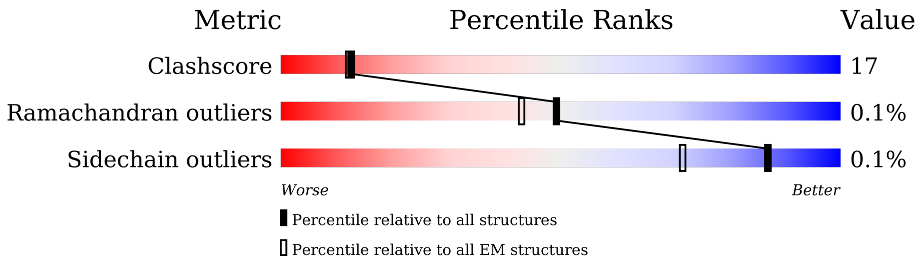
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.50

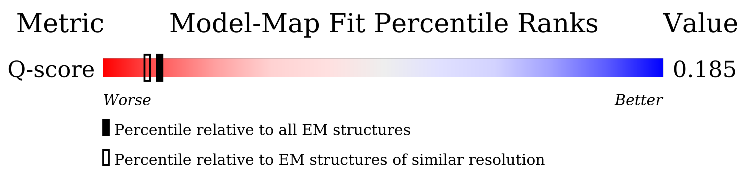
1 Overall quality at a glance (i)

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

The reported resolution of this entry is 4.24 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	4688 (3.74 - 4.74)

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	328	• 57% 37% 7%
1	B	328	• 65% 29% 6%
1	C	328	• 61% 31% 8%
1	D	328	• 65% 31% •

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Mol	Chain	Length	Quality of chain
1	E	328	• 68% 31% •
1	F	328	6% 61% 37% ••
2	G	637	• 31% 18% 51%
2	a	637	• 22% 10% 68%
3	N	1263	12% 44% 26% 30%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 25825 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 Cobaltochelatase subunit CobS.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	306	2421	1538	423	450	10	0	0
1	B	309	2449	1553	429	457	10	0	0
1	C	302	2397	1520	421	446	10	0	0
1	D	316	2503	1584	439	470	10	0	0
1	E	324	2555	1617	448	480	10	0	0
1	F	324	2555	1617	448	480	10	0	0

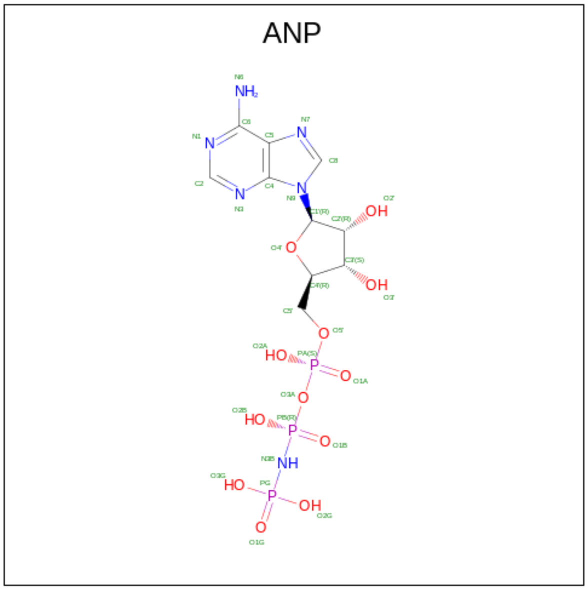
- Molecule 2 is a protein called Cobaltochelatase subunit CobT.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	G	310	2474	1541	456	467	10	0	0
2	a	204	1562	959	295	300	8	0	0

- Molecule 3 is a protein called Cobaltochelatase subunit CobN.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	N	887	6816	4295	1221	1277	23	0	0

- Molecule 4 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (CCD ID: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$) (labeled as "Ligand of Interest" by depositor).



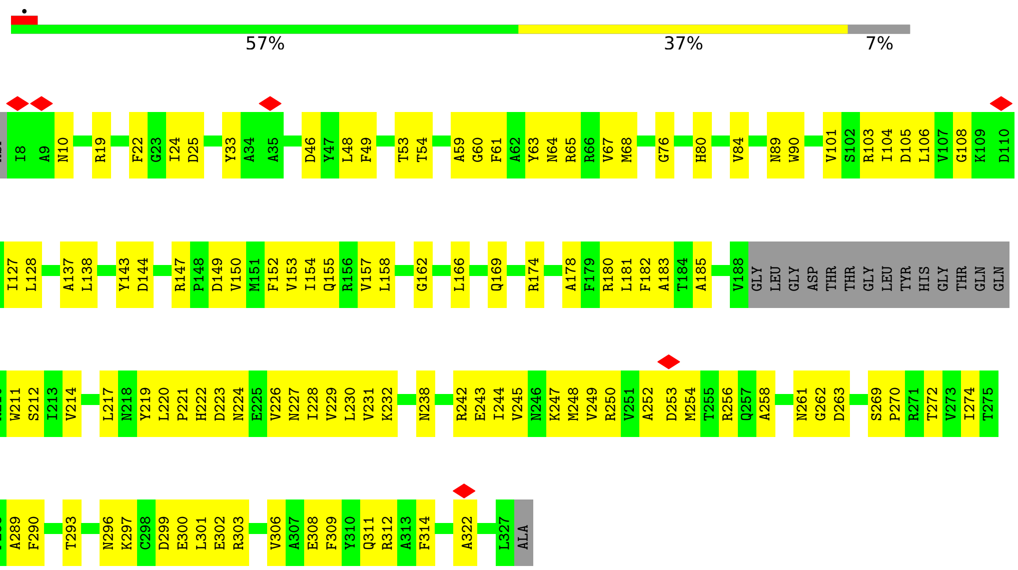
Mol	Chain	Residues	Atoms					AltConf
4	D	1	Total 31	C 10	N 6	O 12	P 3	0
4	E	1	Total 31	C 10	N 6	O 12	P 3	0
4	F	1	Total 31	C 10	N 6	O 12	P 3	0

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.

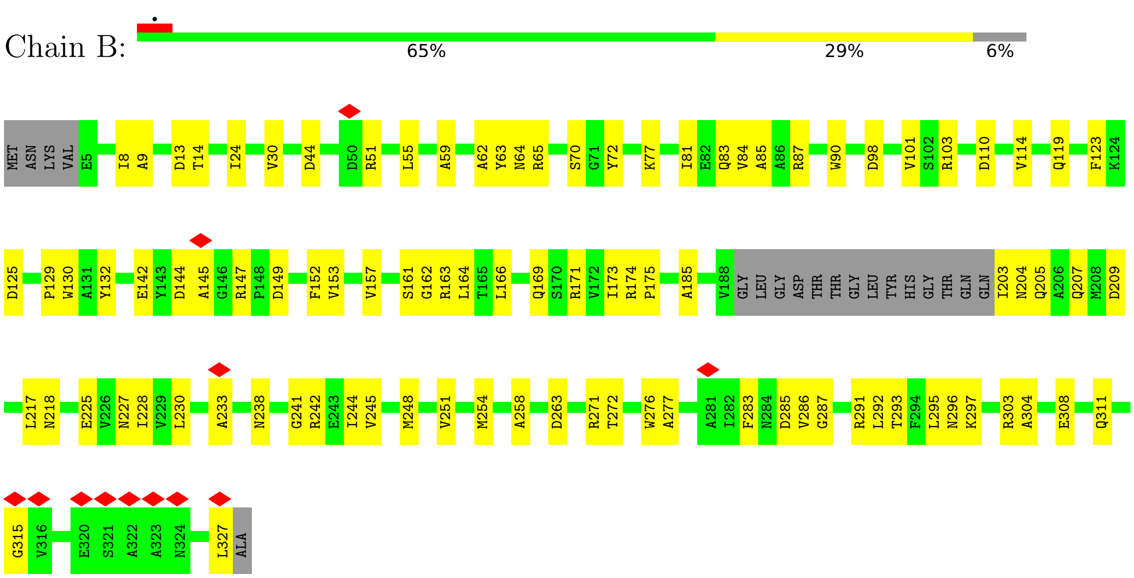
- Molecule 1: Cobaltochelatase subunit CobS

Chain A:

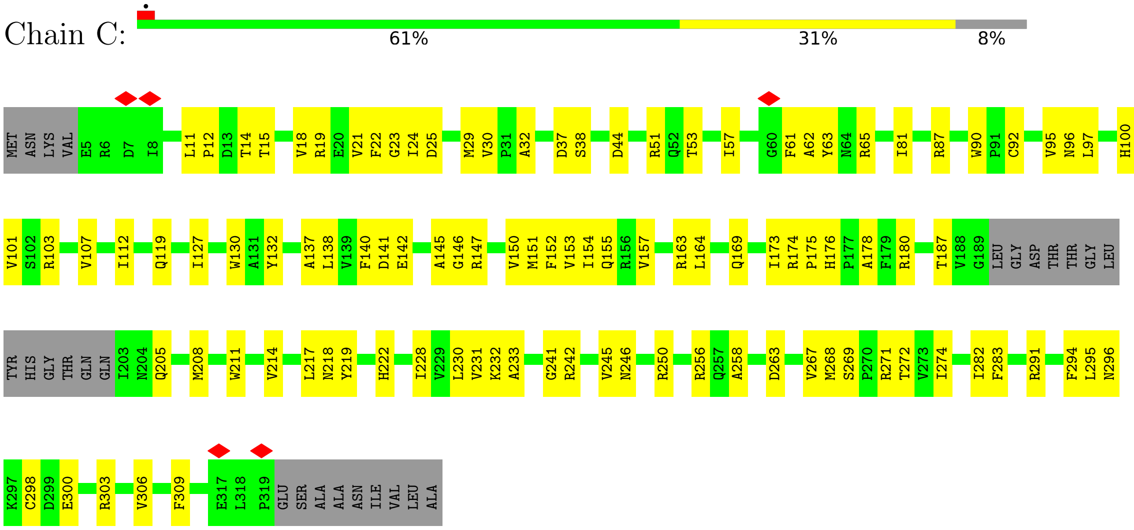


- Molecule 1: Cobaltochelatase subunit CobS

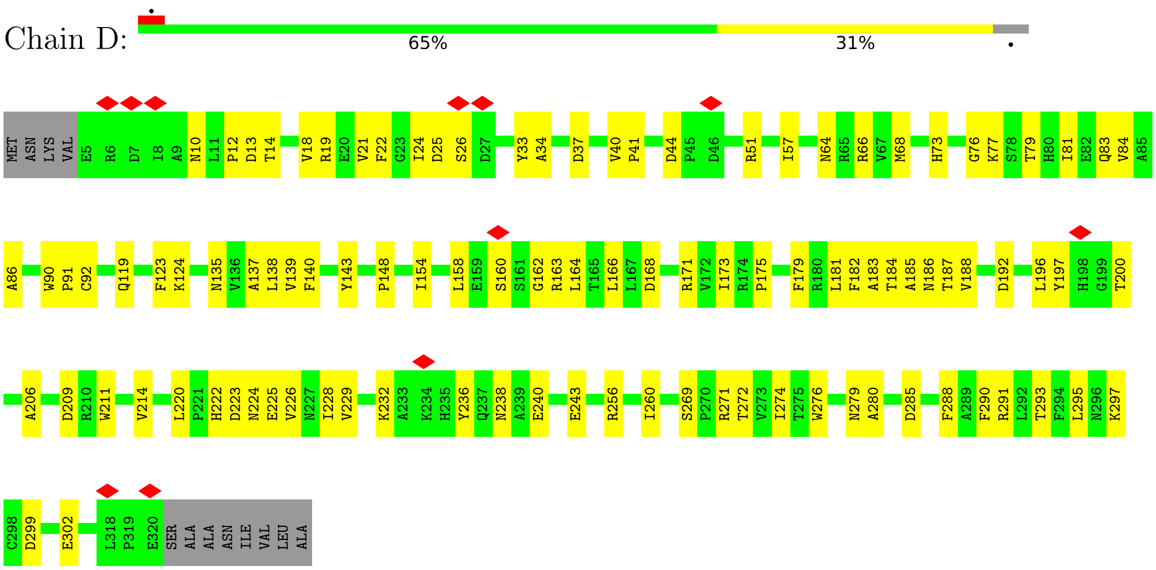
Chain B:



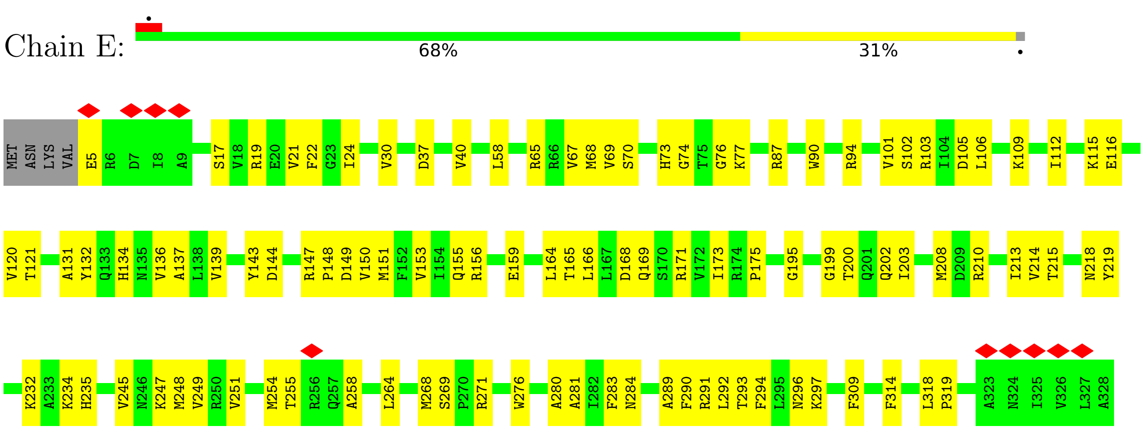
- Molecule 1: Cobaltochelatase subunit CobS



- Molecule 1: Cobaltochelatase subunit CobS

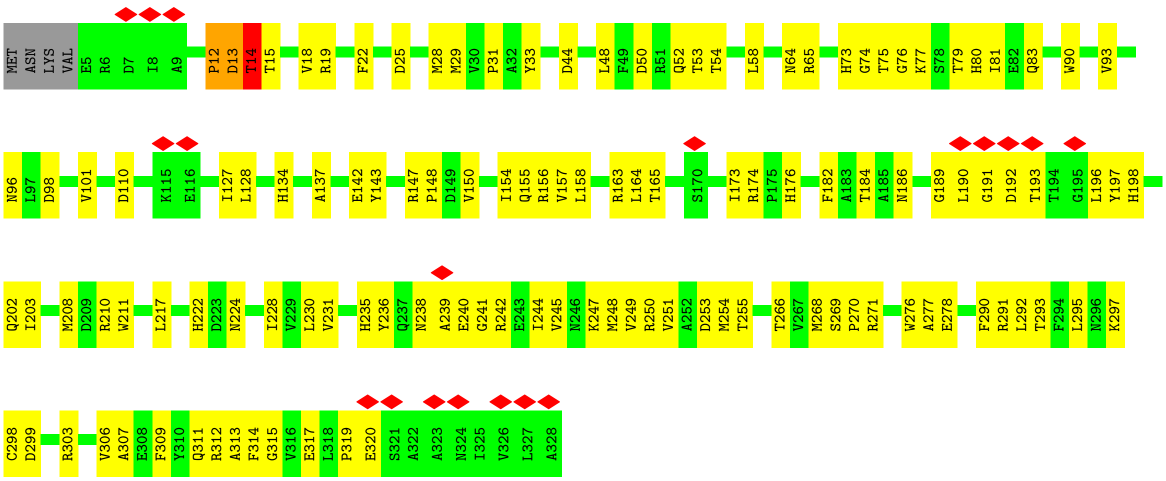


- Molecule 1: Cobaltochelatase subunit CobS



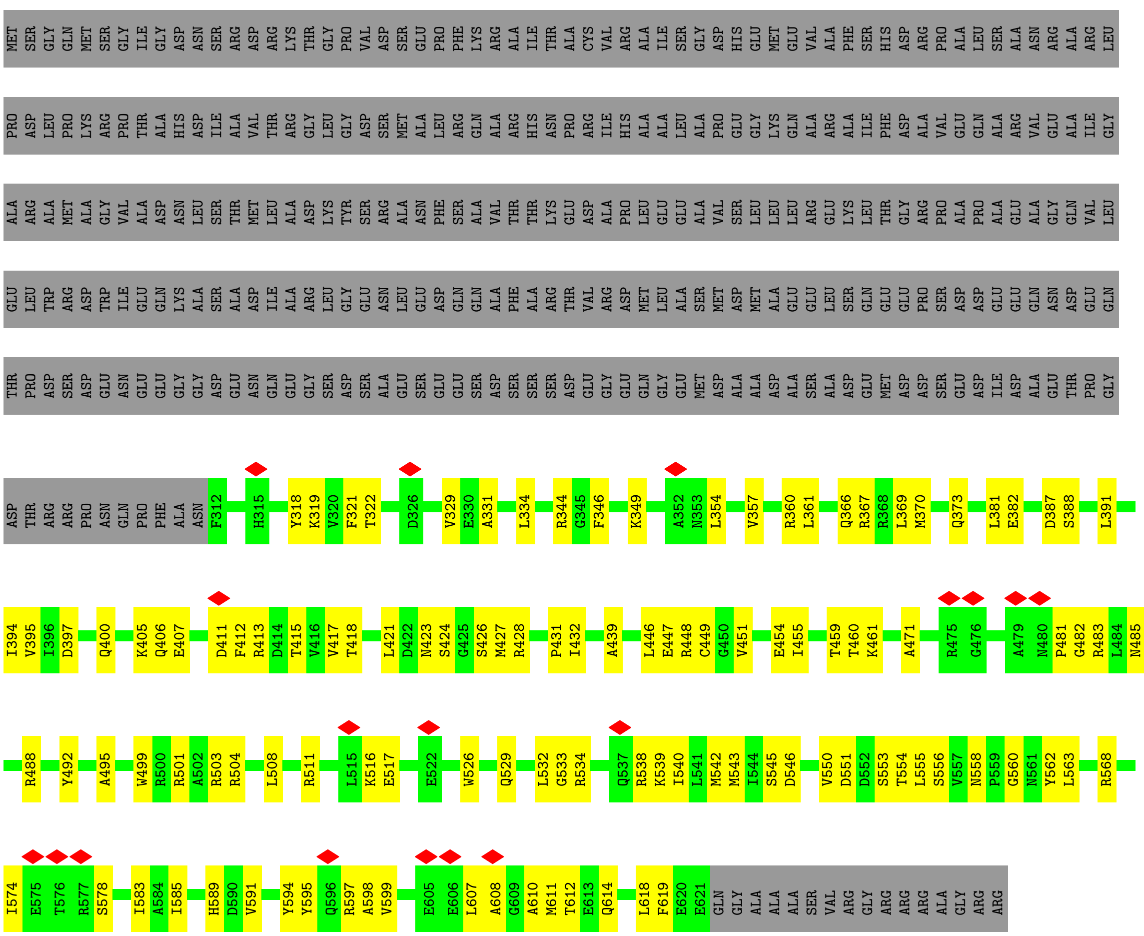
- Molecule 1: Cobaltochelatase subunit CobS

Chain F:

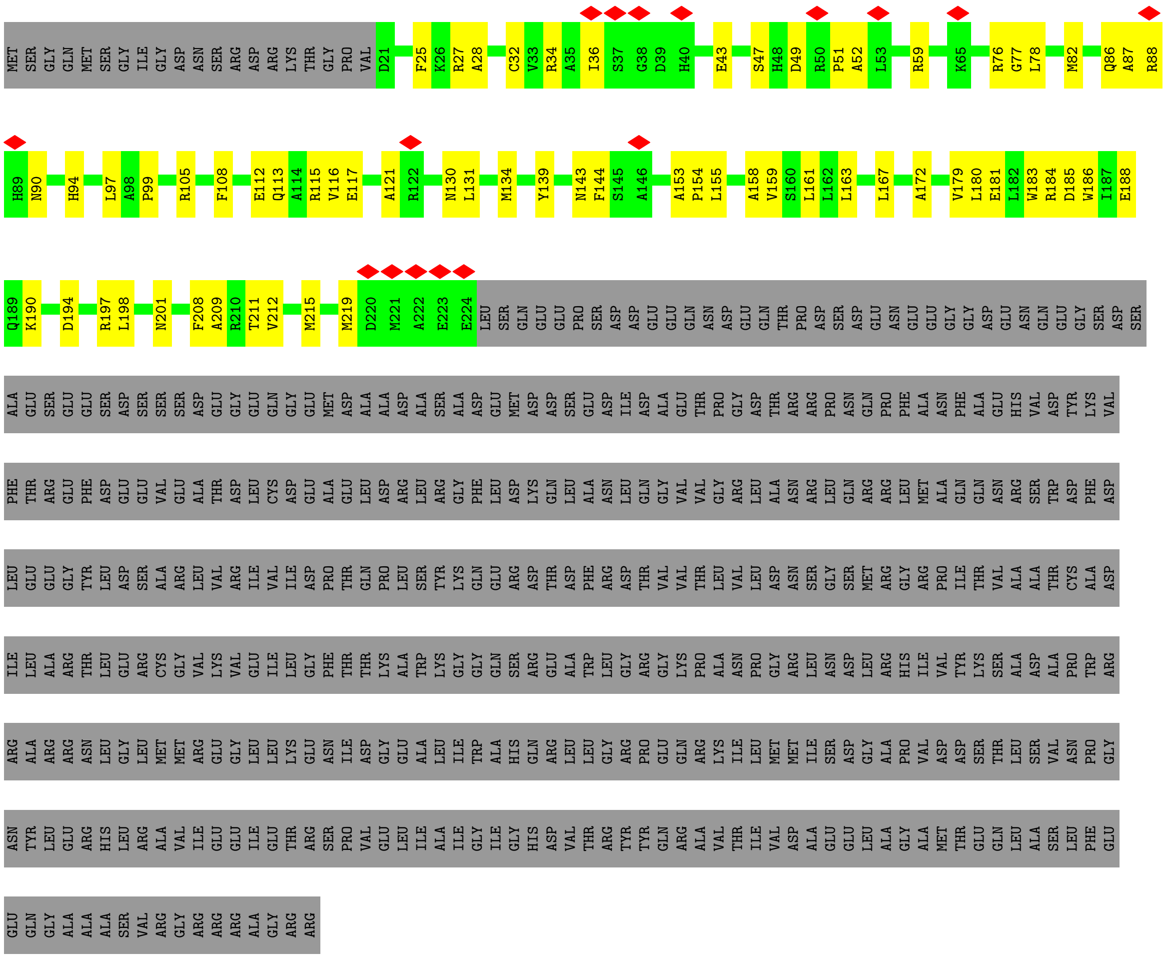
- Molecule 2: Cobaltochelatase subunit CobT

Chain G:

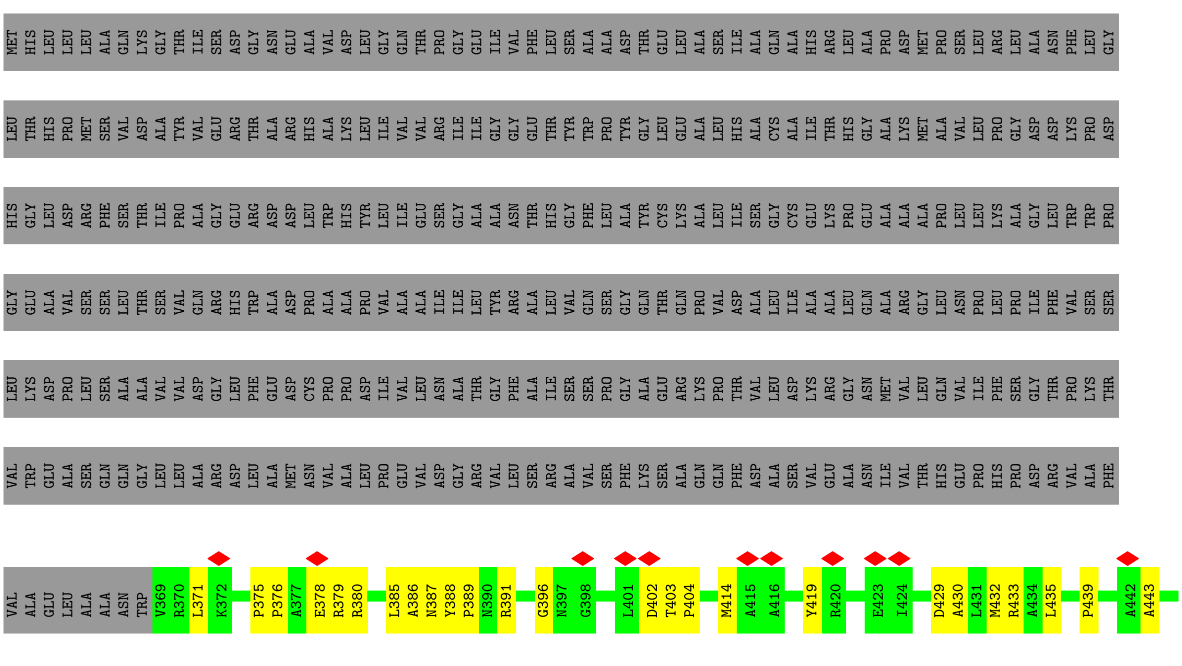
- Molecule 2: Cobaltochelatase subunit CobT

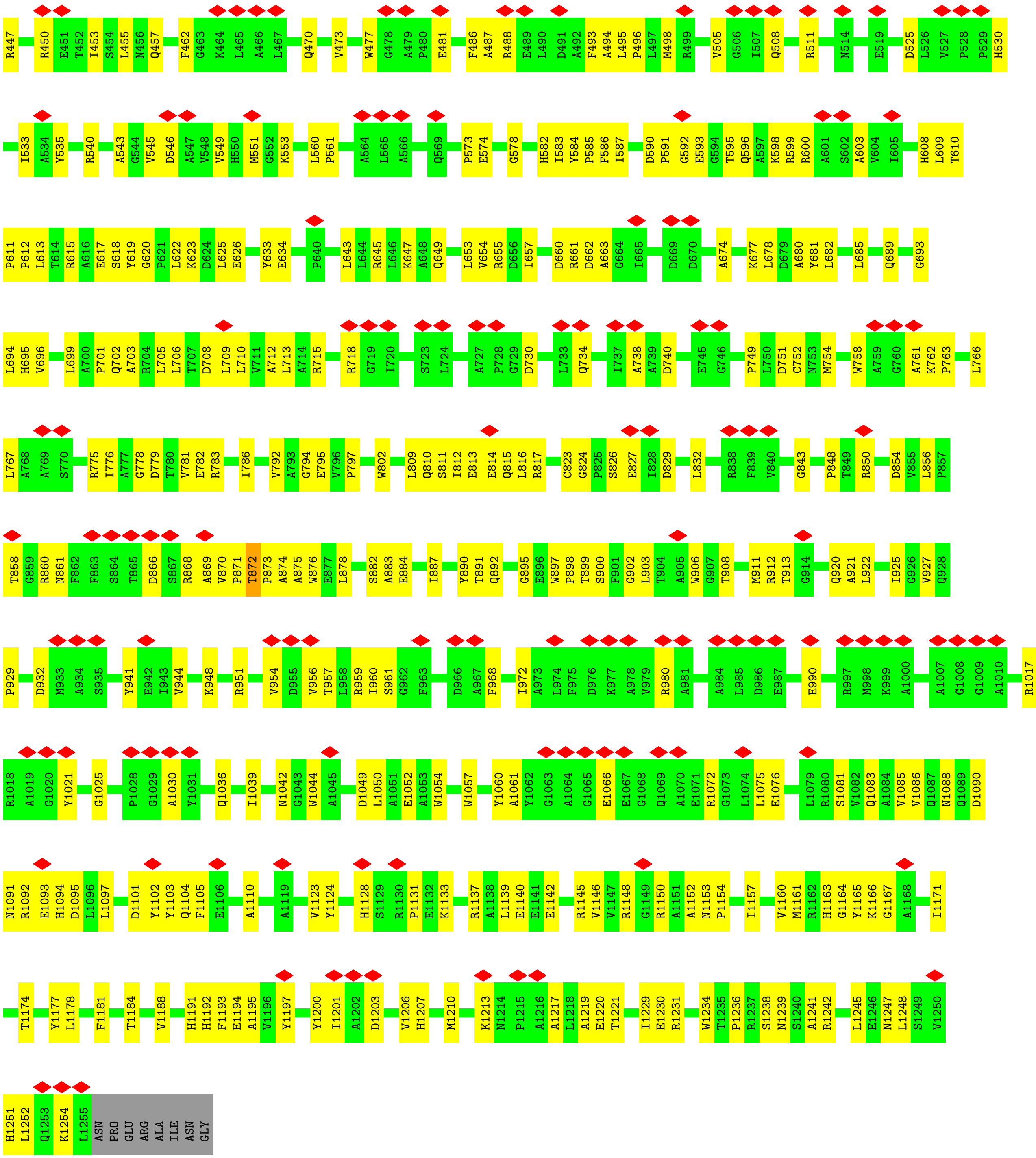
Chain a:

• Molecule 3: Cobaltochelatase subunit CobN

Chain N:




R447 R450 E451 T452 I453 S454 L455 N456 Q457 F462 G463 K464 L465 A466 L467 Q470 V473 W477 G478 A479 P480 E481 F486 A487 R488 E489 L490 D491 A492 F493 A494 L495 P496 L497 M498 R499 V505 G506 I507 Q508 R511 N514 E519 D525 L526 V527 P528 P529 H530
I533 A534 Y535 R540 A543 G544 V545 D546 A547 V548 V549 H550 M551 G552 K553 L560 P561 A564 L565 A566 Q569 P573 E574 G578 H582 I583 Y584 P585 F586 I587 D590 P591 G592 E593 G594 T595 Q596 A597 K598 R599 R600 A601 S602 A603 V604 I605 H608 L609 T610
P611 P612 L613 T614 R615 A616 E617 S618 Y619 G620 P621 L622 K623 D624 L625 E626 Y633 E634 P640 L643 L644 R645 L646 K647 A648 Q649 L653 V654 R655 D656 I657 D660 R661 D662 A663 G664 I665 D669 D670 A674 K677 L678 D679 A680 Y681 L682 L685 Q689 G693
L694 H695 V696 L699 A700 P701 Q702 A703 R704 L705 L706 T707 D708 L709 L710 V711 A712 L713 A714 R715 R718 G719 I720 S723 L724 A727 P728 G729 D730 L733 Q734 I737 A738 A739 D740 E745 G746 P749 L750 D751 C752 N753 M754 W758 A759 G760 A761 K762 P763 L766
L767 A768 A769 S770 R775 I776 A777 G778 D779 T780 V781 E782 R783 I786 V792 A793 G794 E795 V796 P797 W802 L809 Q810 S811 I812 E813 E814 Q815 L816 R817 C823 G824 P825 S826 E827 I828 D829 L832 R838 F839 V840 G843 P848 T849 R850 D854 V855 L856 P857
T858 G859 R860 N861 F862 F863 S864 T865 D866 S867 R868 A869 V870 P871 T872 P873 A874 A875 W876 E877 L878 S882 A883 E884 I887 Y890 T891 Q892 G895 E896 W897 P898 T899 S900 F901 G902 L903 T904 A905 W906 G907 T908 M911 R912 T913 G914 Q920 A921 L922 I925 G926 V927 Q928
P929 D932 M933 A934 S935 Y941 E942 I943 V944 K948 R951 V954 D955 V956 T957 L958 R959 I960 S961 G962 F963 D966 A967 F968 I972 A973 L974 F975 D976 K977 A978 V979 R980 A981 A984 L985 D986 E987 E990 R997 M998 K999 A1000 A1007 G1008 G1009 A1010 R1017
R1018 A1019 G1020 Y1021 G1025 P1028 G1029 A1030 Y1031 Q1036 I1039 N1042 G1043 W1044 A1045 D1049 L1050 A1051 E1052 A1053 W1054 W1057 Y1060 A1061 Y1062 G1063 A1064 G1065 E1066 E1067 G1068 Q1069 A1070 E1071 R1072 G1073 L1074 L1075 E1076 L1079 R1080 S1081 V1082 Q1083 A1084 V1085 V1086 Q1087 N1088 Q1089 D1090
N1091 R1092 E1093 H1094 D1095 L1096 L1097 D1101 Y1102 Y1103 Q1104 F1105 E1106 A1110 A1119 V1123 Y1124 H1128 S1129 R1130 P1131 E1132 K1133 R1137 A1138 L1139 E1140 E1141 E1142 R1145 V1146 V1147 R1148 G1149 R1150 A1151 A1152 N1153 P1154 I1157 V1160 M1161 R1162 H1163 G1164 Y1165 K1166 G1167 A1168 I1171
T1174 Y1177 L1178 F1181 T1184 V1188 H1191 H1192 F1193 E1194 A1195 V1196 Y1197 Y1200 I1201 A1202 D1203 V1206 H1207 M1210 K1213 N1214 P1215 A1216 A1217 L1218 A1219 E1220 T1221 I1229 E1230 R1231 W1234 T1235 P1236 R1237 S1238 N1239 S1240 A1241 R1242 L1245 E1246 N1247 L1248 S1249 V1250
H1251 L1252 Q1253 K1254 L1255 ASN PRO GLU ARG ALA ILE ASN GLY

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	31908	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{Å}^2$)	50	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	2.111	Depositor
Minimum map value	-0.002	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.039	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	293.16, 293.16, 293.16	wwPDB
Map dimensions	420, 420, 420	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.698, 0.698, 0.698	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: ANP

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	0.11	0/2471	0.34	0/3363
1	B	0.11	0/2499	0.30	0/3400
1	C	0.11	0/2447	0.32	0/3328
1	D	0.16	0/2556	0.36	0/3478
1	E	0.15	0/2608	0.38	0/3550
1	F	0.18	0/2608	0.41	1/3550 (0.0%)
2	G	0.13	0/2513	0.30	0/3395
2	a	0.09	0/1586	0.27	0/2144
3	N	0.16	0/6974	0.35	0/9485
All	All	0.14	0/26262	0.34	1/35693 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	13	ASP	CA-CB-CG	5.44	118.04	112.60

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2421	0	2391	100	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	2449	0	2414	72	0
1	C	2397	0	2359	85	0
1	D	2503	0	2454	74	0
1	E	2555	0	2511	88	0
1	F	2555	0	2511	85	0
2	G	2474	0	2470	92	0
2	a	1562	0	1549	50	0
3	N	6816	0	6694	265	0
4	D	31	0	13	7	0
4	E	31	0	13	6	0
4	F	31	0	13	4	0
All	All	25825	0	25392	862	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 17.

The worst 5 of 862 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:76:GLY:HA3	4:D:401:ANP:H8	1.48	0.93
2:G:597:ARG:HH21	2:G:618:LEU:HD11	1.35	0.90
1:D:79:THR:HG22	1:D:83:GLN:HE22	1.38	0.87
1:B:24:ILE:HA	1:B:51:ARG:HH12	1.42	0.85
1:E:67:VAL:HG12	1:E:213:ILE:HB	1.59	0.85

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	302/328 (92%)	275 (91%)	27 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	305/328 (93%)	285 (93%)	20 (7%)	0	100	100
1	C	298/328 (91%)	272 (91%)	26 (9%)	0	100	100
1	D	314/328 (96%)	296 (94%)	18 (6%)	0	100	100
1	E	322/328 (98%)	292 (91%)	30 (9%)	0	100	100
1	F	322/328 (98%)	303 (94%)	17 (5%)	2 (1%)	21	58
2	G	308/637 (48%)	289 (94%)	19 (6%)	0	100	100
2	a	202/637 (32%)	192 (95%)	10 (5%)	0	100	100
3	N	885/1263 (70%)	829 (94%)	56 (6%)	0	100	100
All	All	3258/4505 (72%)	3033 (93%)	223 (7%)	2 (0%)	49	82

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	14	THR
1	F	12	PRO

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	261/278 (94%)	261 (100%)	0	100	100
1	B	264/278 (95%)	264 (100%)	0	100	100
1	C	258/278 (93%)	258 (100%)	0	100	100
1	D	269/278 (97%)	269 (100%)	0	100	100
1	E	274/278 (99%)	274 (100%)	0	100	100
1	F	274/278 (99%)	273 (100%)	1 (0%)	84	82
2	G	261/517 (50%)	261 (100%)	0	100	100
2	a	157/517 (30%)	157 (100%)	0	100	100
3	N	684/978 (70%)	681 (100%)	3 (0%)	84	82
All	All	2702/3680 (73%)	2698 (100%)	4 (0%)	87	88

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	14	THR
3	N	792	VAL
3	N	868	ARG
3	N	872	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 32 such sidechains are listed below:

Mol	Chain	Res	Type
3	N	1069	GLN
3	N	1091	ASN
1	D	64	ASN
1	C	133	GLN
3	N	1239	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

3 ligands are modelled in this entry.

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	#$\|Z\|>2$
4	ANP	E	401	-	32,33,33	0.91	4 (12%)	44,52,52	0.88	1 (2%)
4	ANP	D	401	-	32,33,33	0.93	4 (12%)	44,52,52	0.93	1 (2%)
4	ANP	F	401	-	32,33,33	0.91	4 (12%)	44,52,52	0.83	1 (2%)

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
4	ANP	E	401	-	-	7/18/38/38	0/3/3/3
4	ANP	D	401	-	-	5/18/38/38	0/3/3/3
4	ANP	F	401	-	-	3/18/38/38	0/3/3/3

The worst 5 of 12 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	401	ANP	PG-N3B	2.44	1.69	1.63
4	D	401	ANP	PG-O1G	2.43	1.50	1.46
4	E	401	ANP	PG-O1G	2.42	1.50	1.46
4	D	401	ANP	PB-O3A	-2.36	1.56	1.59
4	F	401	ANP	PG-N3B	2.36	1.69	1.63

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	401	ANP	PB-O3A-PA	-4.53	116.67	132.62
4	E	401	ANP	PB-O3A-PA	-4.21	117.78	132.62
4	F	401	ANP	PB-O3A-PA	-3.87	118.98	132.62

There are no chirality outliers.

5 of 15 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	D	401	ANP	PG-N3B-PB-O1B
4	D	401	ANP	PA-O3A-PB-O1B
4	D	401	ANP	PA-O3A-PB-O2B
4	E	401	ANP	PG-N3B-PB-O1B
4	E	401	ANP	PG-N3B-PB-O3A

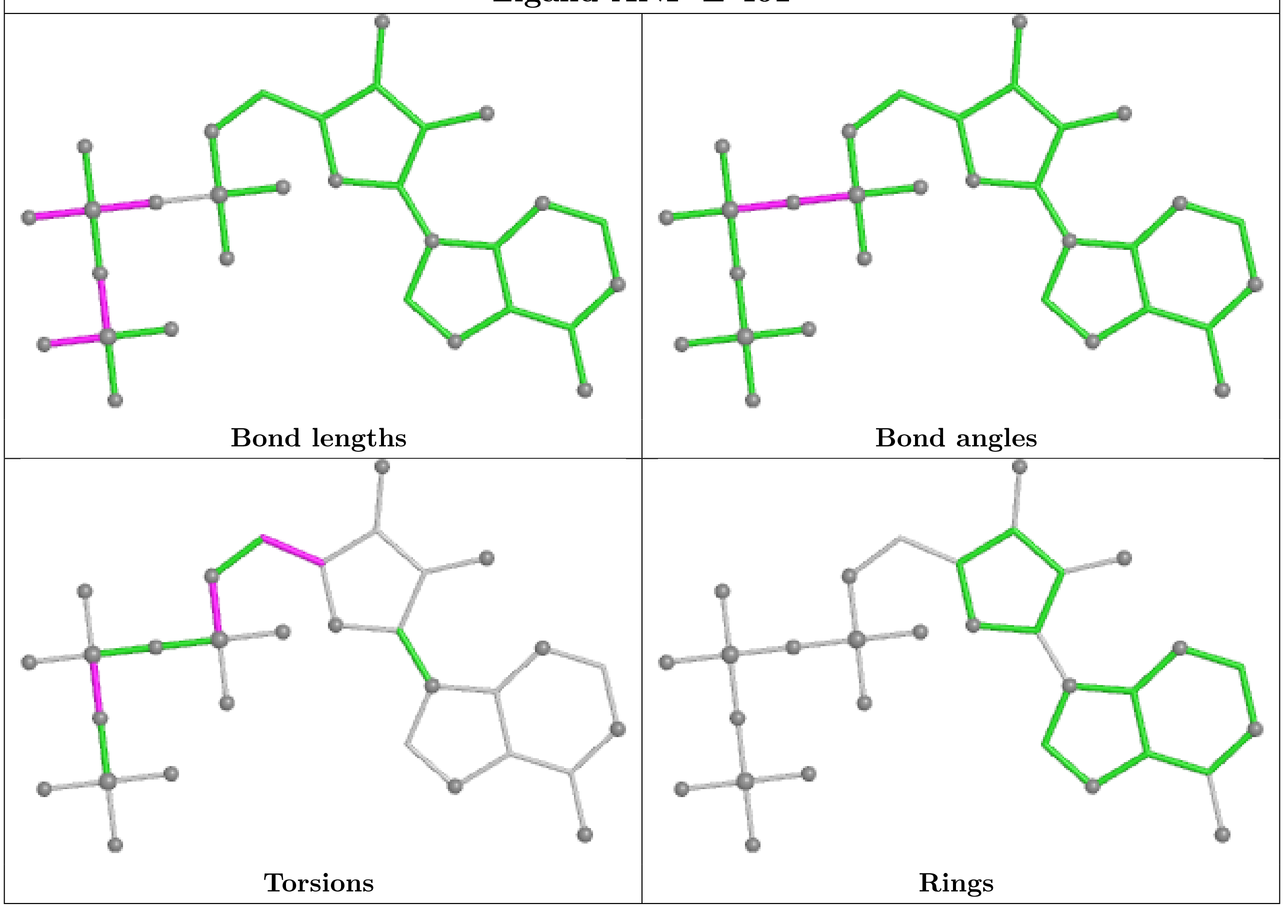
There are no ring outliers.

3 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	401	ANP	6	0
4	D	401	ANP	7	0
4	F	401	ANP	4	0

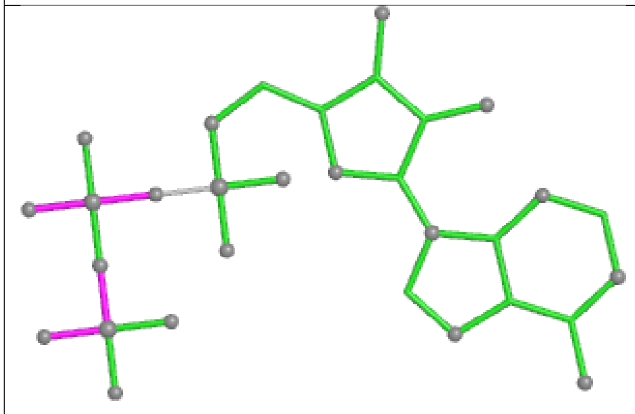
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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 ANP E 401

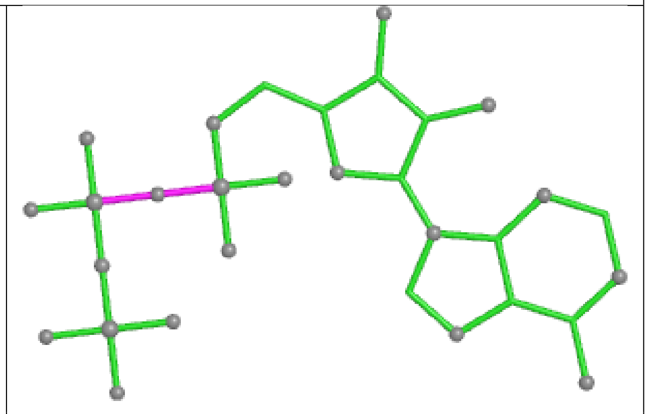


Bond lengths | Bond angles | Torsions | Rings

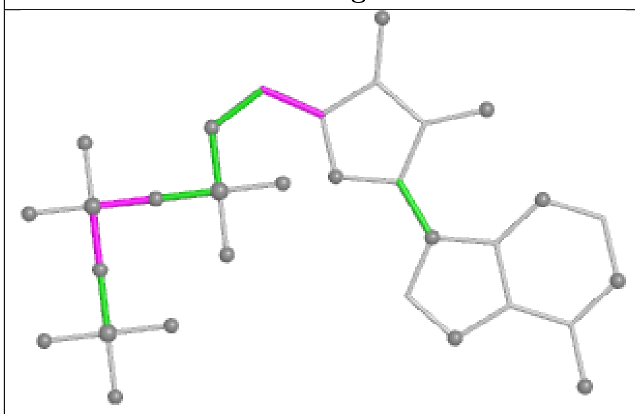
Ligand ANP D 401



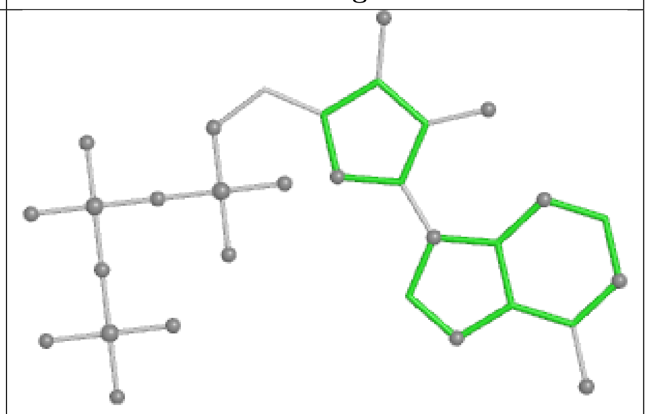
Bond lengths



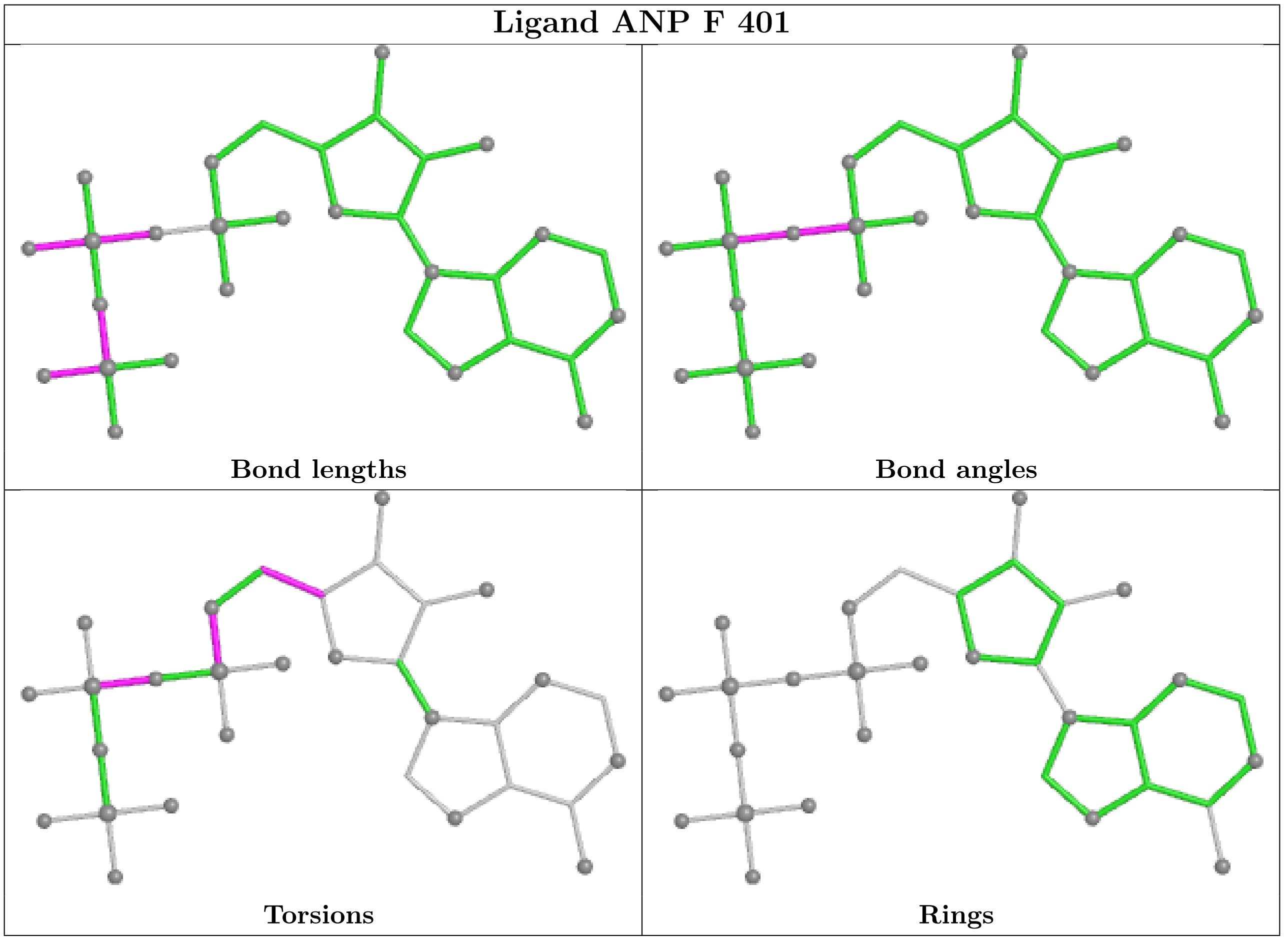
Bond angles



Torsions



Rings



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

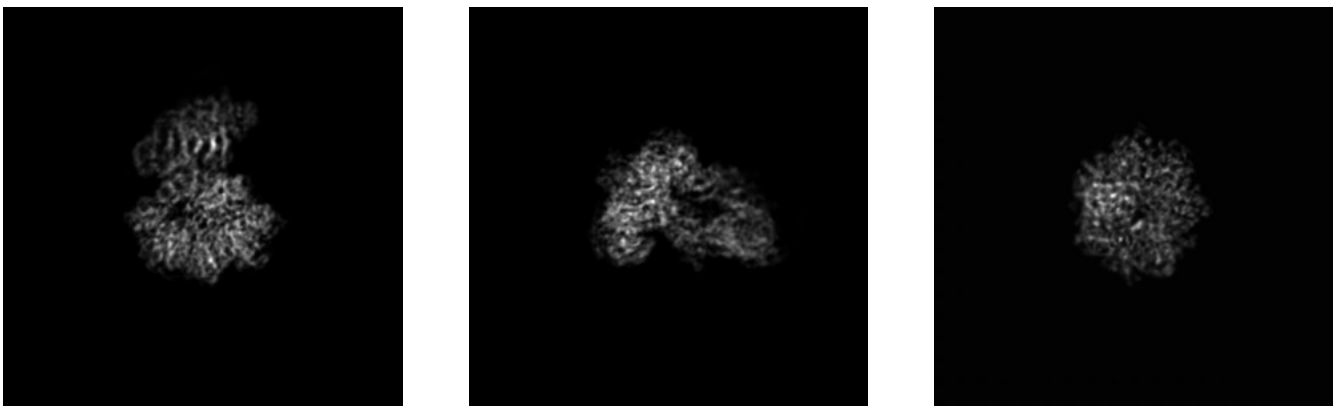
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-64232. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

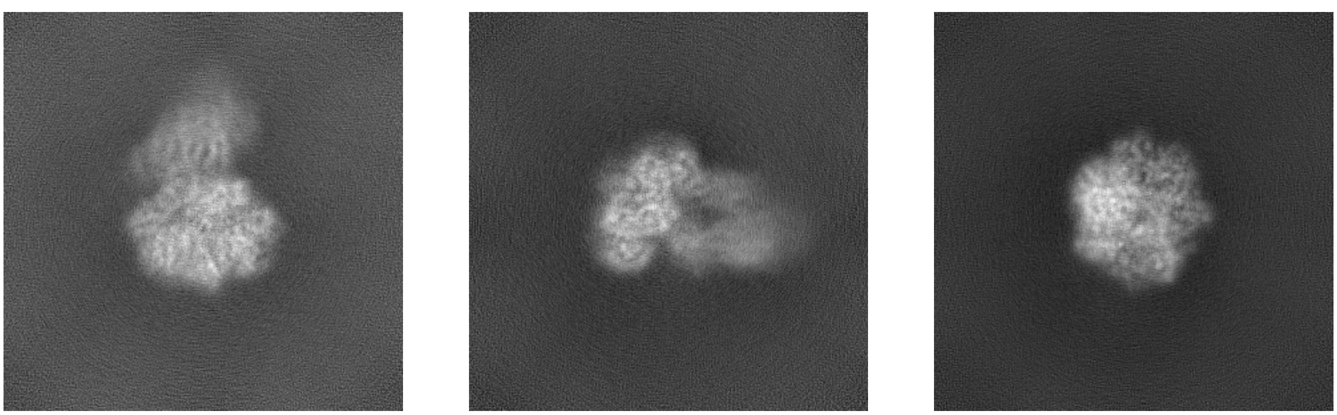
6.1 Orthogonal projections (i)

6.1.1 Primary map



X Y Z

6.1.2 Raw map



X Y Z

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

6.2 Central slices (i)

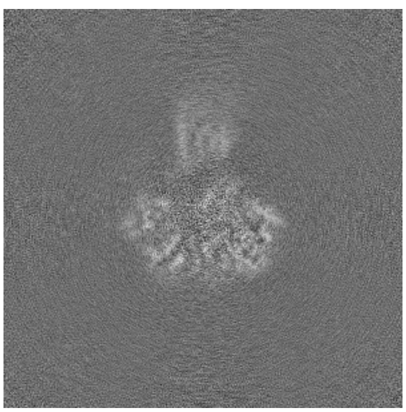
6.2.1 Primary map

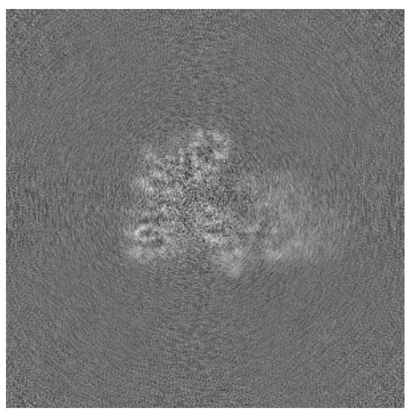

X Index: 210

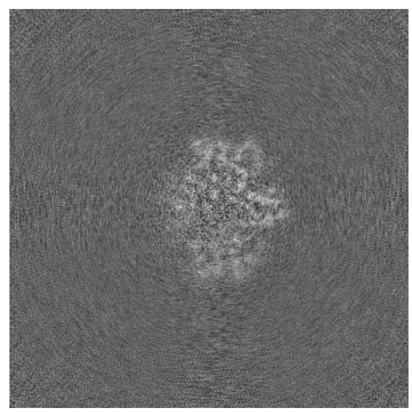

Y Index: 210


Z Index: 210

6.2.2 Raw map


X Index: 210


Y Index: 210


Z Index: 210

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

6.3 Largest variance slices (i)

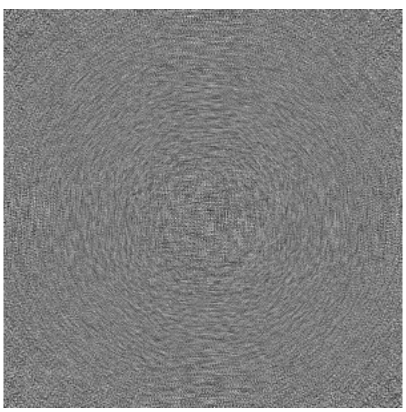
6.3.1 Primary map

X Index: 196

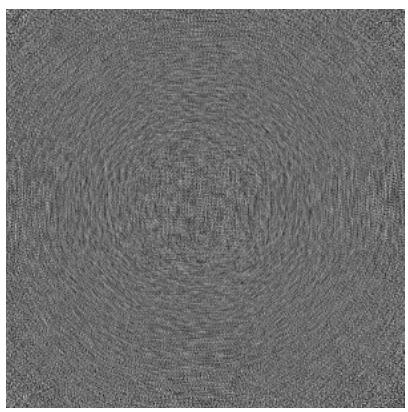
Y Index: 220

Z Index: 193

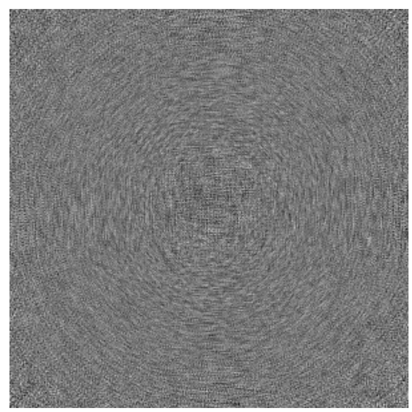
6.3.2 Raw map



X Index: 0



Y Index: 0

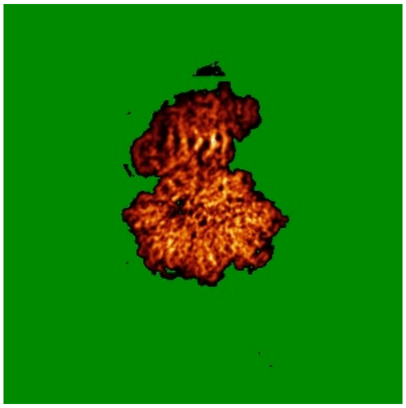


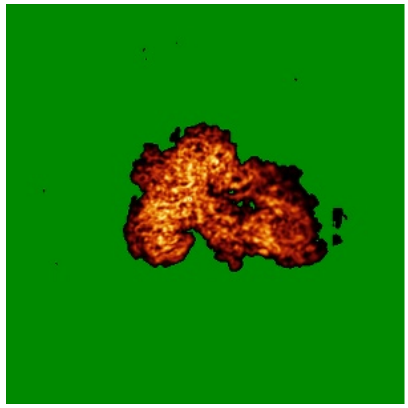
Z Index: 0

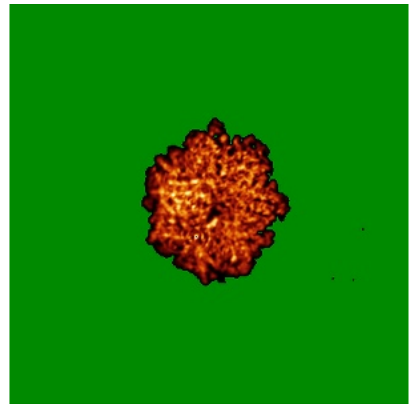
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color)

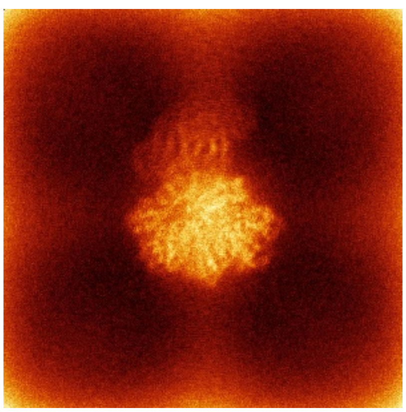
6.4.1 Primary map

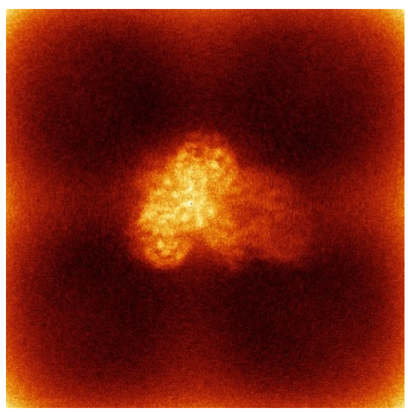

X

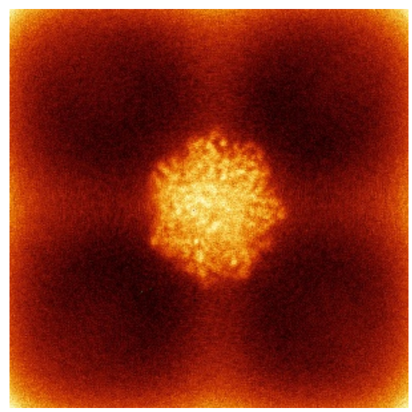

Y


Z

6.4.2 Raw map


X

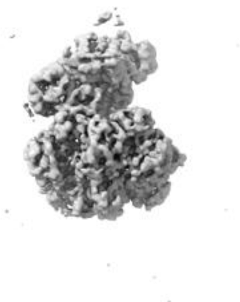

Y


Z

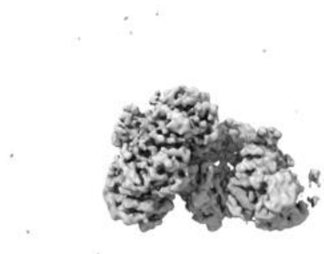
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

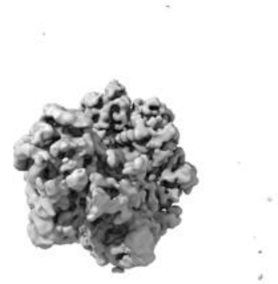
6.5.1 Primary map



X



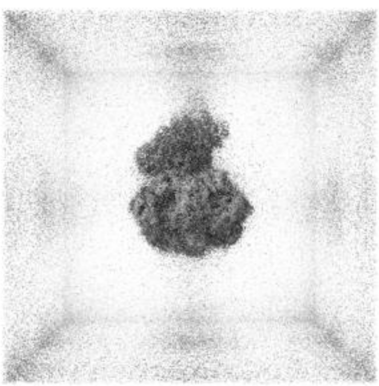
Y



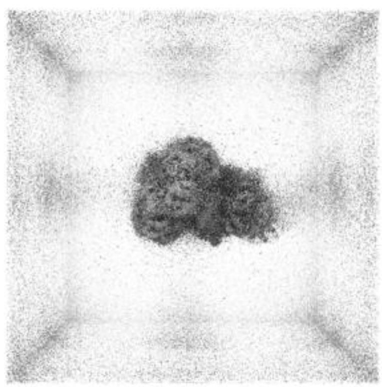
Z

The images above show the 3D surface view of the map at the recommended contour level 0.01. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

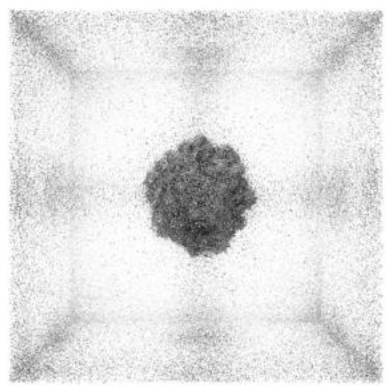
6.5.2 Raw map



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.

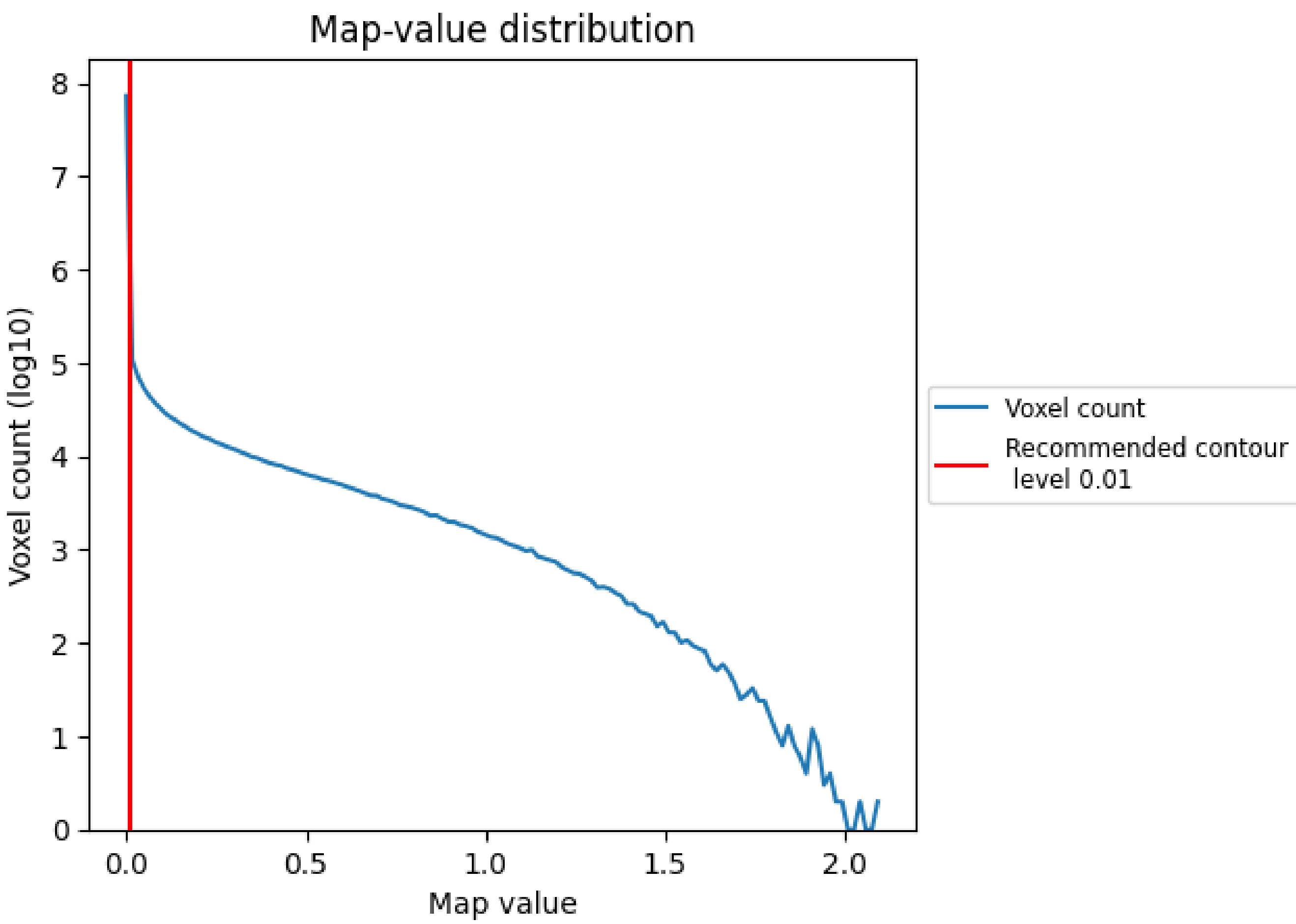
6.6 Mask visualisation (i)

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

7 Map analysis (i)

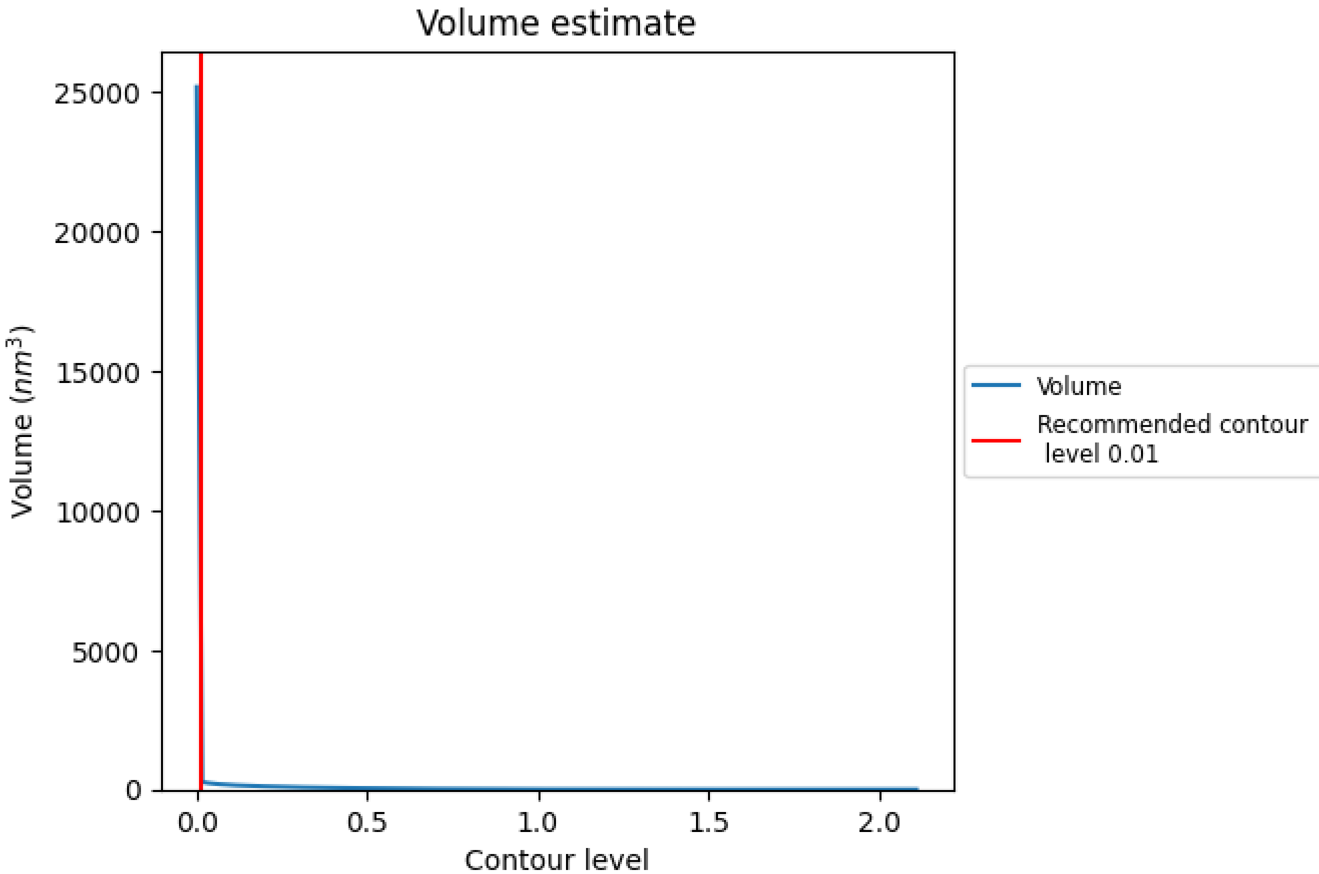
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution (i)



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

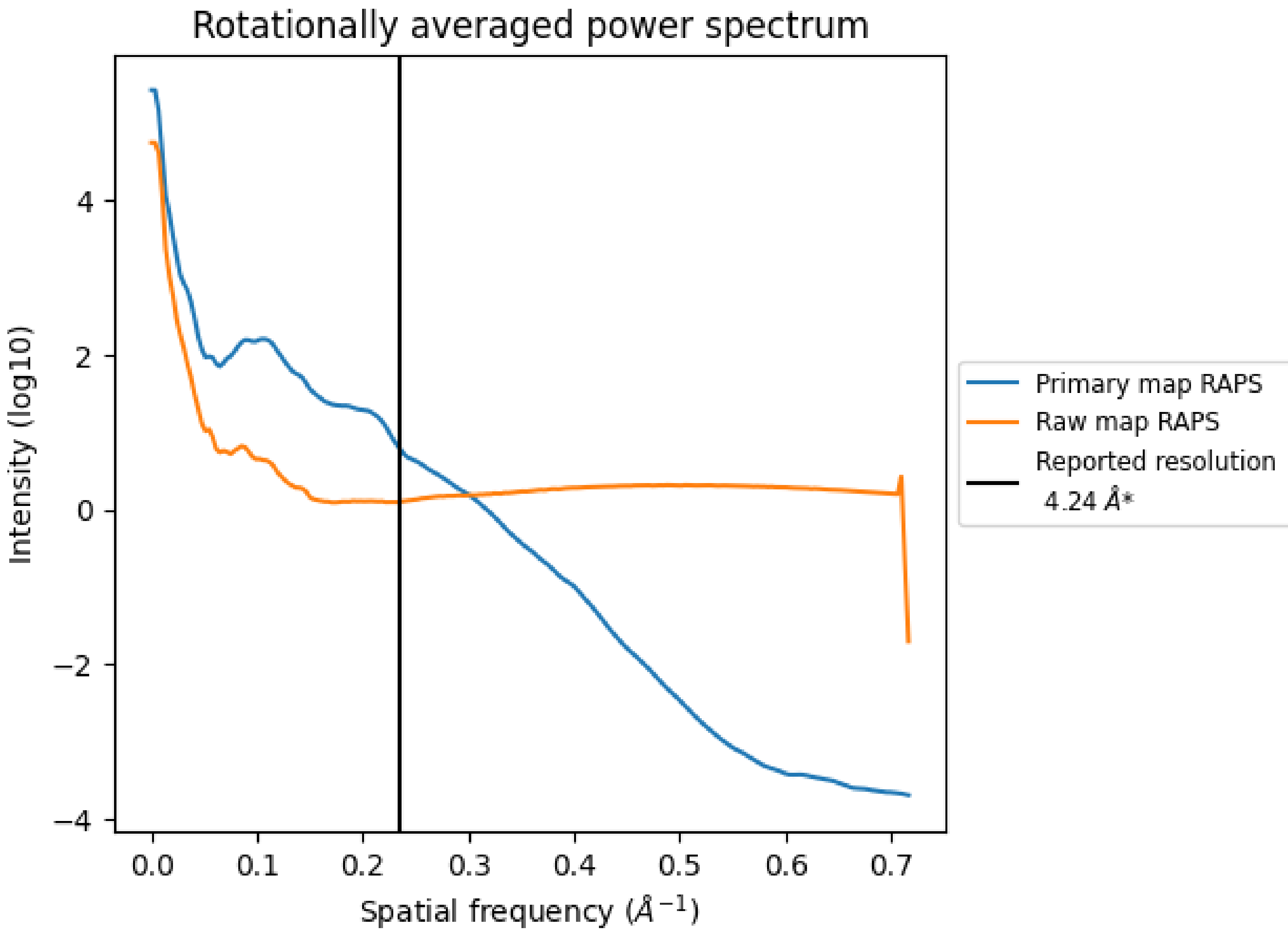
7.2 Volume estimate (i)



The volume at the recommended contour level is 7479 nm^3; this corresponds to an approximate mass of 6756 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)

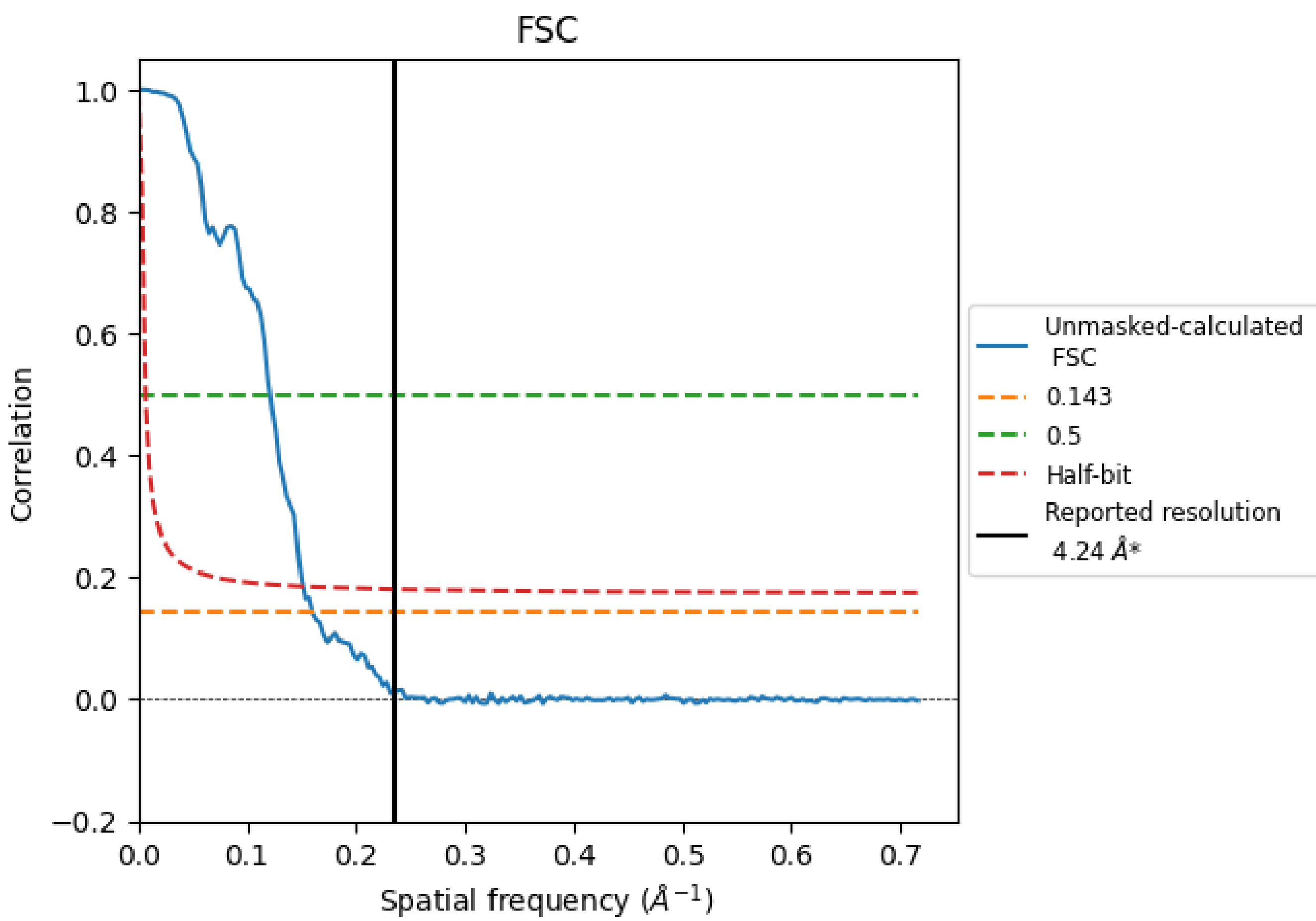


*Reported resolution corresponds to spatial frequency of 0.236 Å^{-1}

8 Fourier-Shell correlation (i)

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 (i)



*Reported resolution corresponds to spatial frequency of 0.236 $Å^{-1}$

8.2 Resolution estimates (i)

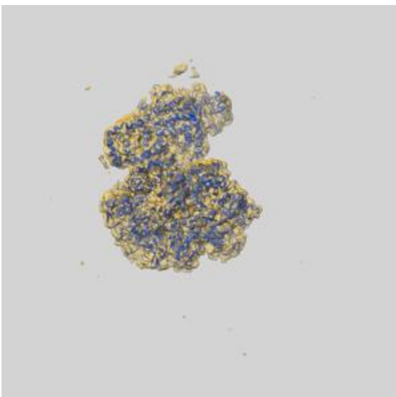
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.24	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	6.25	8.26	6.61

*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 6.25 differs from the reported value 4.24 by more than 10 %

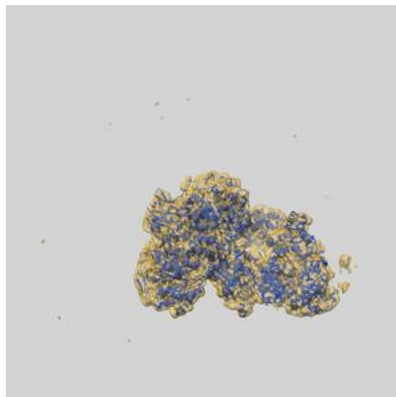
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-64232 and PDB model 9UKA. Per-residue inclusion information can be found in section 3 on page 6.

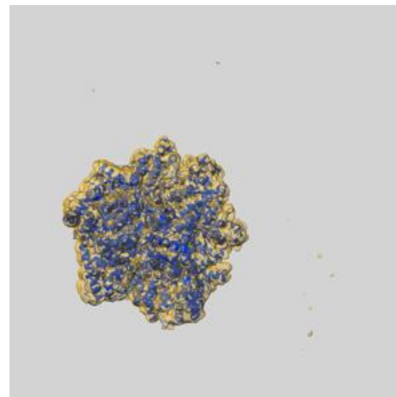
9.1 Map-model overlay (i)



X



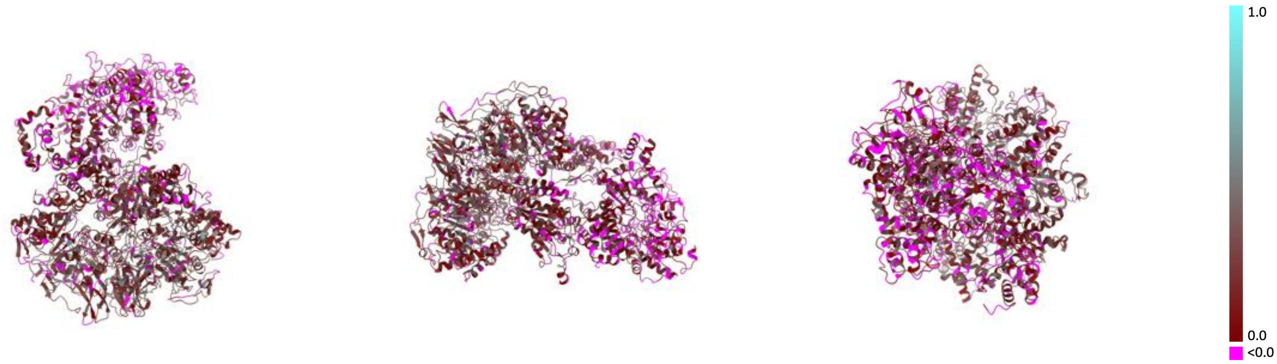
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.01 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.

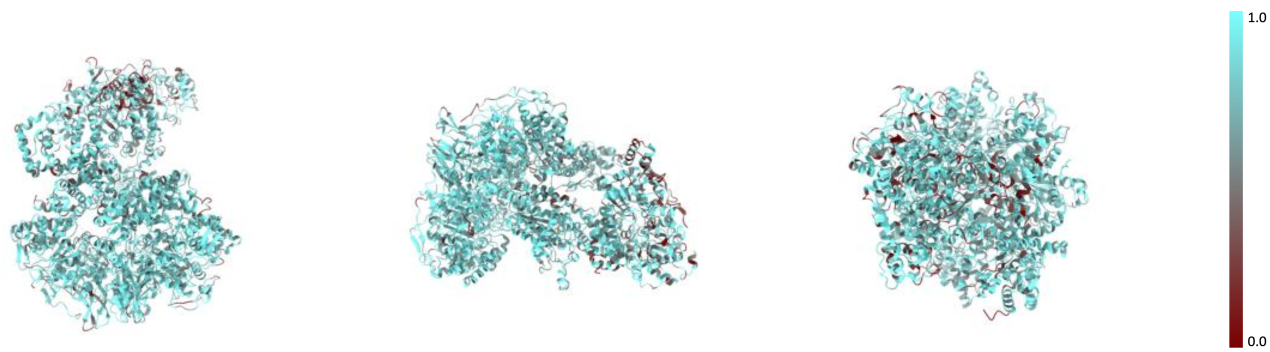
9.2 Q-score mapped to coordinate model (i)



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.

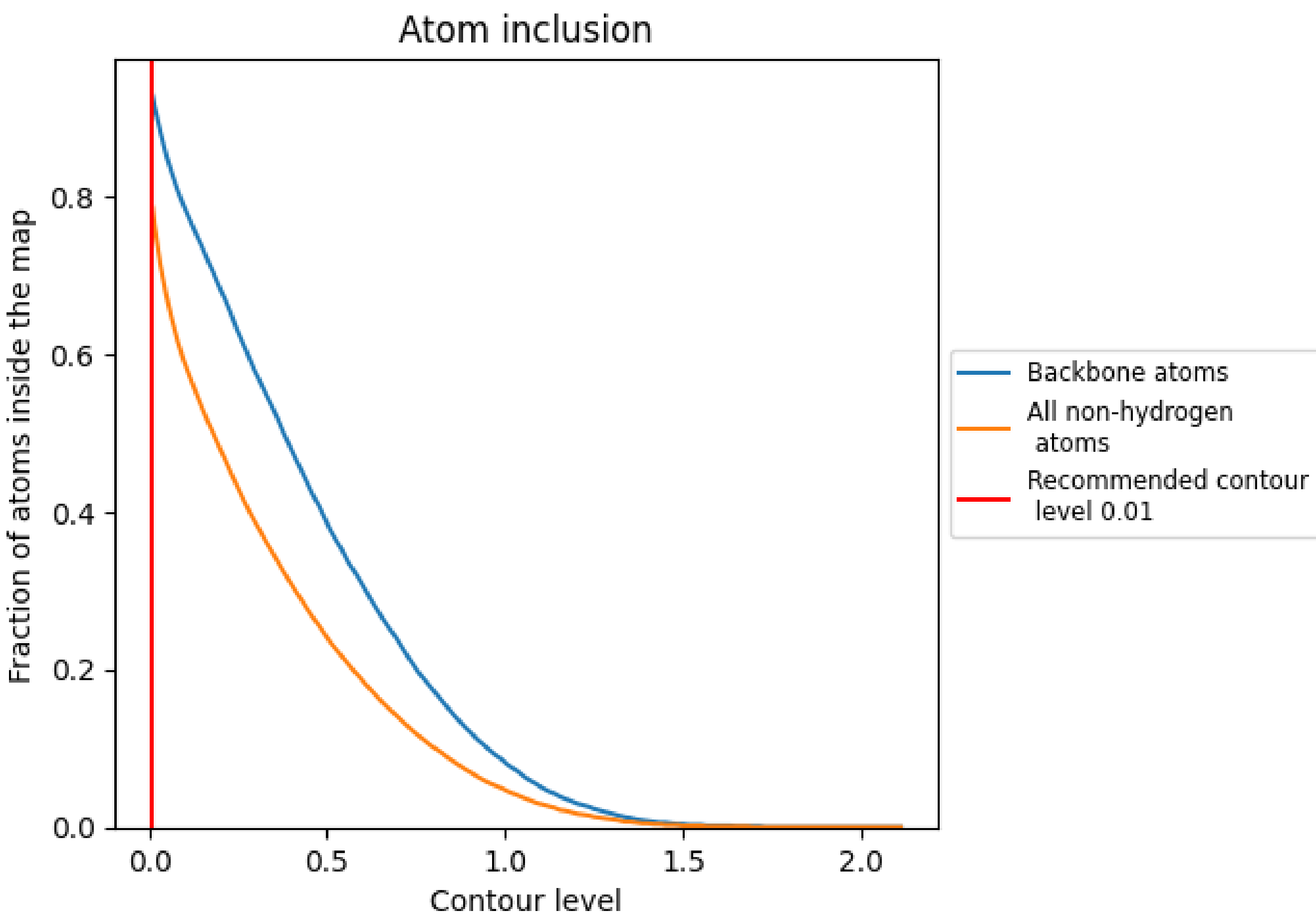
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.01).

9.4 Atom inclusion (i)



At the recommended contour level, 93% of all backbone atoms, 78% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7850	0.1850
A	0.8080	0.2110
B	0.8080	0.2240
C	0.8340	0.2370
D	0.8190	0.2440
E	0.8370	0.2620
F	0.8060	0.2350
G	0.7820	0.1750
N	0.7160	0.0940
a	0.7600	0.1190