wwPDB EM Validation Summary Report (i)

Oct 5, 2026 – 08:21 PM EDT

PDB ID	:	12XK / pdb_000012xk
EMDB ID	:	EMD-76831
Title	:	Candida albicans Chitin synthase 1 (CaChs1) bound to UDP-GlcNAc and diynyl arylamine (DA, aka RO-09-3143)
Authors	:	Ren, Z.; Lee, S.Y.
Deposited on	:	2026-04-21
Resolution	:	2.96 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:

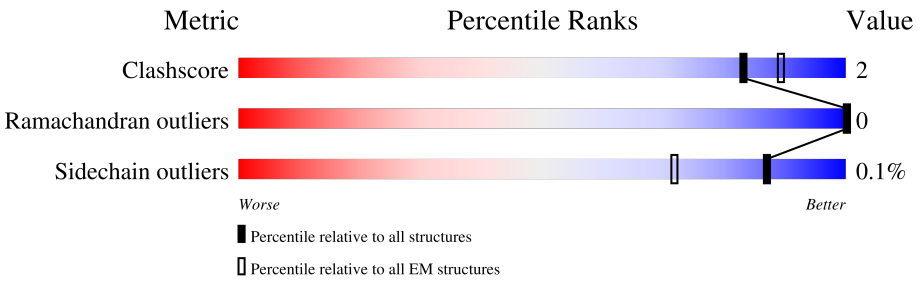
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.2
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data 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)	:	2.51

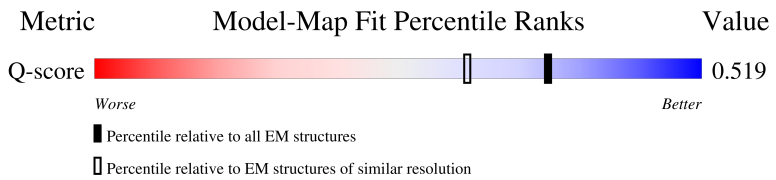
1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.96 Å.

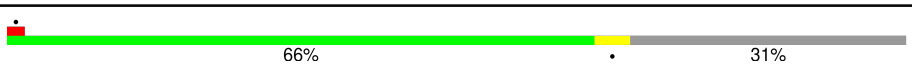
Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.





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	13155 (2.46 - 3.46)

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	1058	
1	B	1058	

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 23266 atoms, of which 11368 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 Chitin synthase.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	735	11261	3761	5480	954	1041	25	0	0
1	B	735	11280	3761	5499	955	1040	25	0	0

There are 64 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1027	SER	-	expression tag	UNP G1UA94
A	1028	ASN	-	expression tag	UNP G1UA94
A	1029	SER	-	expression tag	UNP G1UA94
A	1030	LEU	-	expression tag	UNP G1UA94
A	1031	GLU	-	expression tag	UNP G1UA94
A	1032	VAL	-	expression tag	UNP G1UA94
A	1033	LEU	-	expression tag	UNP G1UA94
A	1034	PHE	-	expression tag	UNP G1UA94
A	1035	GLN	-	expression tag	UNP G1UA94
A	1036	GLY	-	expression tag	UNP G1UA94
A	1037	PRO	-	expression tag	UNP G1UA94
A	1038	ALA	-	expression tag	UNP G1UA94
A	1039	ALA	-	expression tag	UNP G1UA94
A	1040	ASP	-	expression tag	UNP G1UA94
A	1041	TYR	-	expression tag	UNP G1UA94
A	1042	LYS	-	expression tag	UNP G1UA94
A	1043	ASP	-	expression tag	UNP G1UA94
A	1044	ASP	-	expression tag	UNP G1UA94
A	1045	ASP	-	expression tag	UNP G1UA94
A	1046	ASP	-	expression tag	UNP G1UA94
A	1047	LYS	-	expression tag	UNP G1UA94
A	1048	ALA	-	expression tag	UNP G1UA94
A	1049	HIS	-	expression tag	UNP G1UA94
A	1050	HIS	-	expression tag	UNP G1UA94
A	1051	HIS	-	expression tag	UNP G1UA94
A	1052	HIS	-	expression tag	UNP G1UA94

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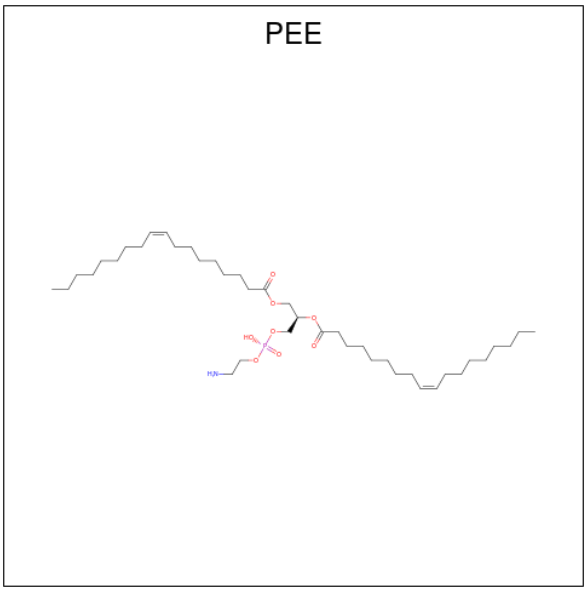
Chain	Residue	Modelled	Actual	Comment	Reference
A	1053	HIS	-	expression tag	UNP G1UA94
A	1054	HIS	-	expression tag	UNP G1UA94
A	1055	HIS	-	expression tag	UNP G1UA94
A	1056	HIS	-	expression tag	UNP G1UA94
A	1057	HIS	-	expression tag	UNP G1UA94
A	1058	HIS	-	expression tag	UNP G1UA94
B	1027	SER	-	expression tag	UNP G1UA94
B	1028	ASN	-	expression tag	UNP G1UA94
B	1029	SER	-	expression tag	UNP G1UA94
B	1030	LEU	-	expression tag	UNP G1UA94
B	1031	GLU	-	expression tag	UNP G1UA94
B	1032	VAL	-	expression tag	UNP G1UA94
B	1033	LEU	-	expression tag	UNP G1UA94
B	1034	PHE	-	expression tag	UNP G1UA94
B	1035	GLN	-	expression tag	UNP G1UA94
B	1036	GLY	-	expression tag	UNP G1UA94
B	1037	PRO	-	expression tag	UNP G1UA94
B	1038	ALA	-	expression tag	UNP G1UA94
B	1039	ALA	-	expression tag	UNP G1UA94
B	1040	ASP	-	expression tag	UNP G1UA94
B	1041	TYR	-	expression tag	UNP G1UA94
B	1042	LYS	-	expression tag	UNP G1UA94
B	1043	ASP	-	expression tag	UNP G1UA94
B	1044	ASP	-	expression tag	UNP G1UA94
B	1045	ASP	-	expression tag	UNP G1UA94
B	1046	ASP	-	expression tag	UNP G1UA94
B	1047	LYS	-	expression tag	UNP G1UA94
B	1048	ALA	-	expression tag	UNP G1UA94
B	1049	HIS	-	expression tag	UNP G1UA94
B	1050	HIS	-	expression tag	UNP G1UA94
B	1051	HIS	-	expression tag	UNP G1UA94
B	1052	HIS	-	expression tag	UNP G1UA94
B	1053	HIS	-	expression tag	UNP G1UA94
B	1054	HIS	-	expression tag	UNP G1UA94
B	1055	HIS	-	expression tag	UNP G1UA94
B	1056	HIS	-	expression tag	UNP G1UA94
B	1057	HIS	-	expression tag	UNP G1UA94
B	1058	HIS	-	expression tag	UNP G1UA94

- Molecule 2 is 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (CCD ID: PEE) (formula: $C_{41}H_{78}NO_8P$).

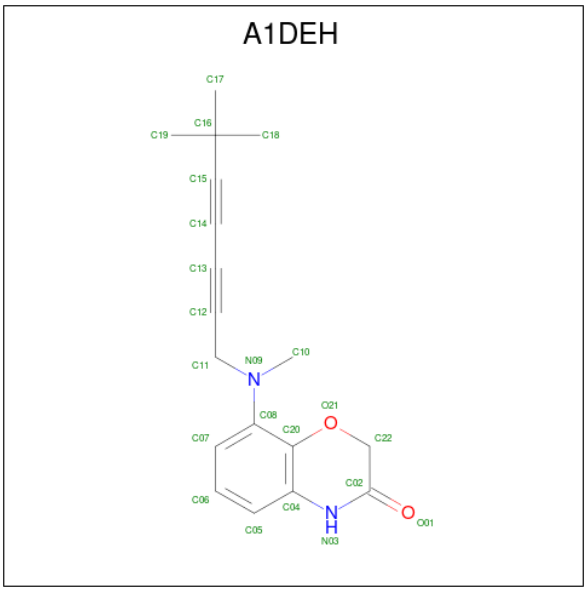


Mol	Chain	Residues	Atoms						AltConf
			Total	C	H	N	O	P	
2	A	1	59	18	31	1	8	1	0
2	A	1	128	41	77	1	8	1	0
2	B	1	68	21	37	1	8	1	0
2	B	1	128	41	77	1	8	1	0
2	B	1	128	41	77	1	8	1	0

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

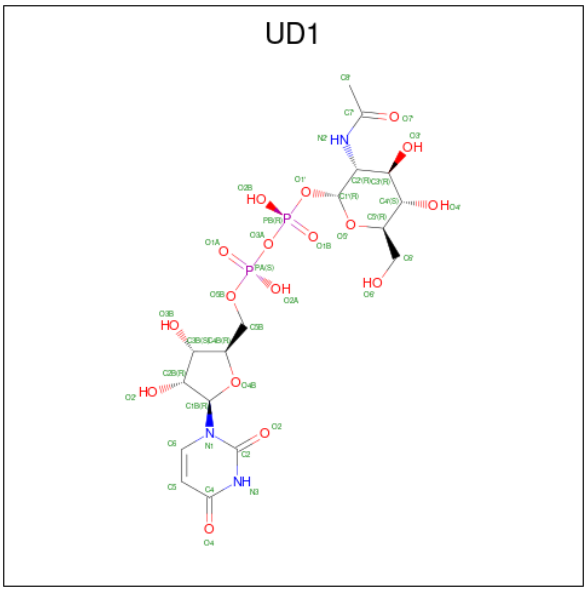
Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
3	A	1	1	1	0
3	B	1	1	1	0

- Molecule 4 is 8-[(6,6-dimethylhepta-2,4-diyn-1-yl)(methyl)amino]-2H-1,4-benzoxazin-3(4H)-one (CCD ID: A1DEH) (formula: $C_{18}H_{20}N_2O_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	H	N	O	
4	A	1	42	18	20	2	2	0
			Total	C	H	N	O	
4	B	1	42	18	20	2	2	0

- Molecule 5 is URIDINE-DIPHOSPHATE-N-ACETYLGLUCOSAMINE (CCD ID: UD1) (formula: $C_{17}H_{27}N_3O_{17}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						AltConf
			Total	C	H	N	O	P	
5	A	1	64	17	25	3	17	2	0

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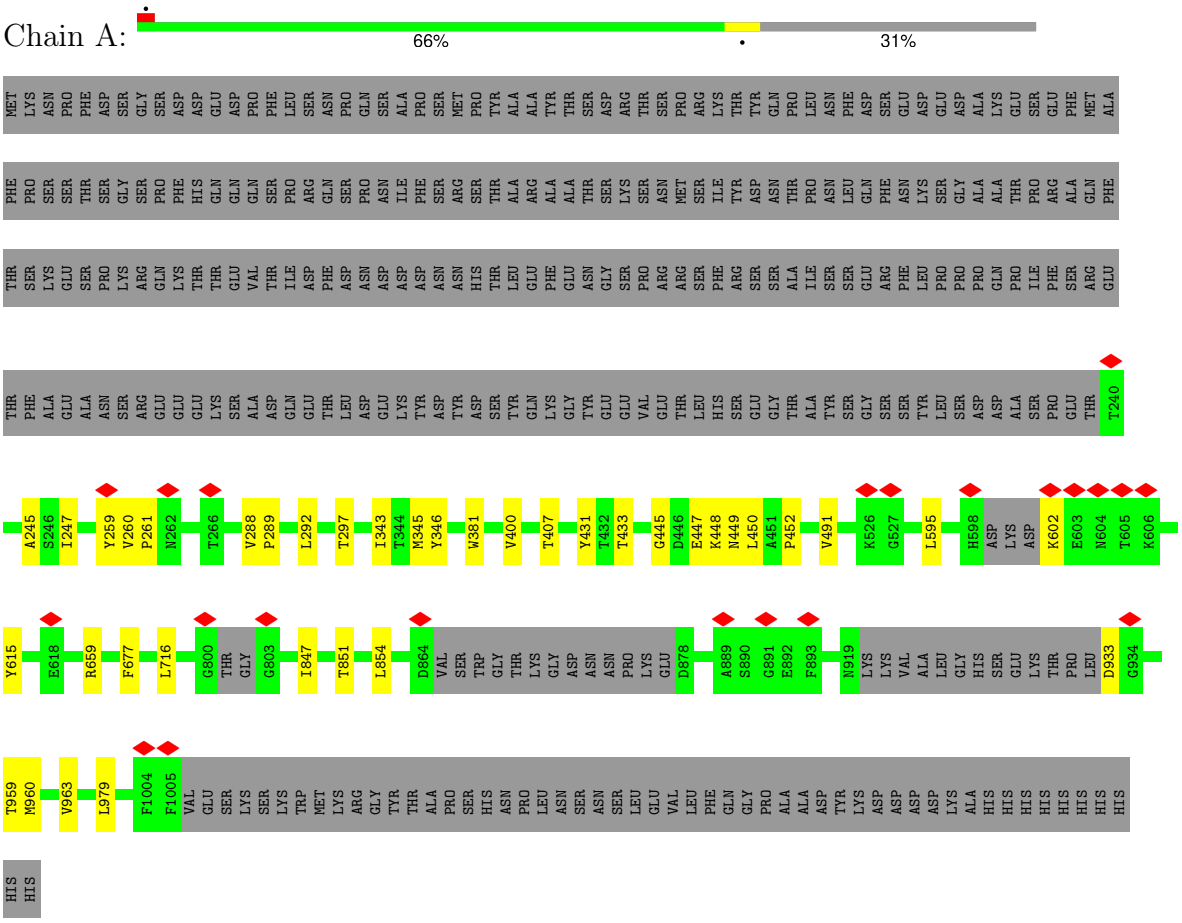
Mol	Chain	Residues	Atoms						AltConf
			Total	C	H	N	O	P	
5	B	1	64	17	25	3	17	2	0

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.

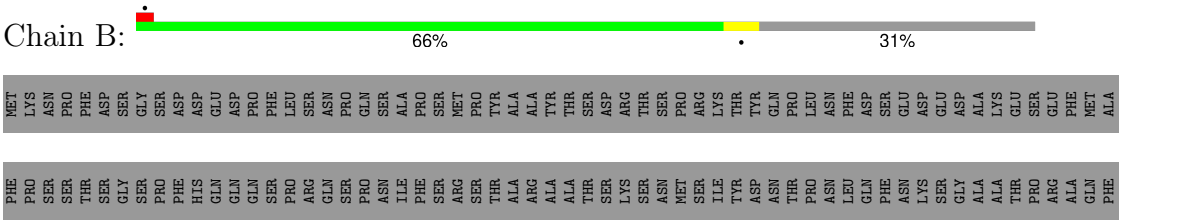
- Molecule 1: Chitin synthase

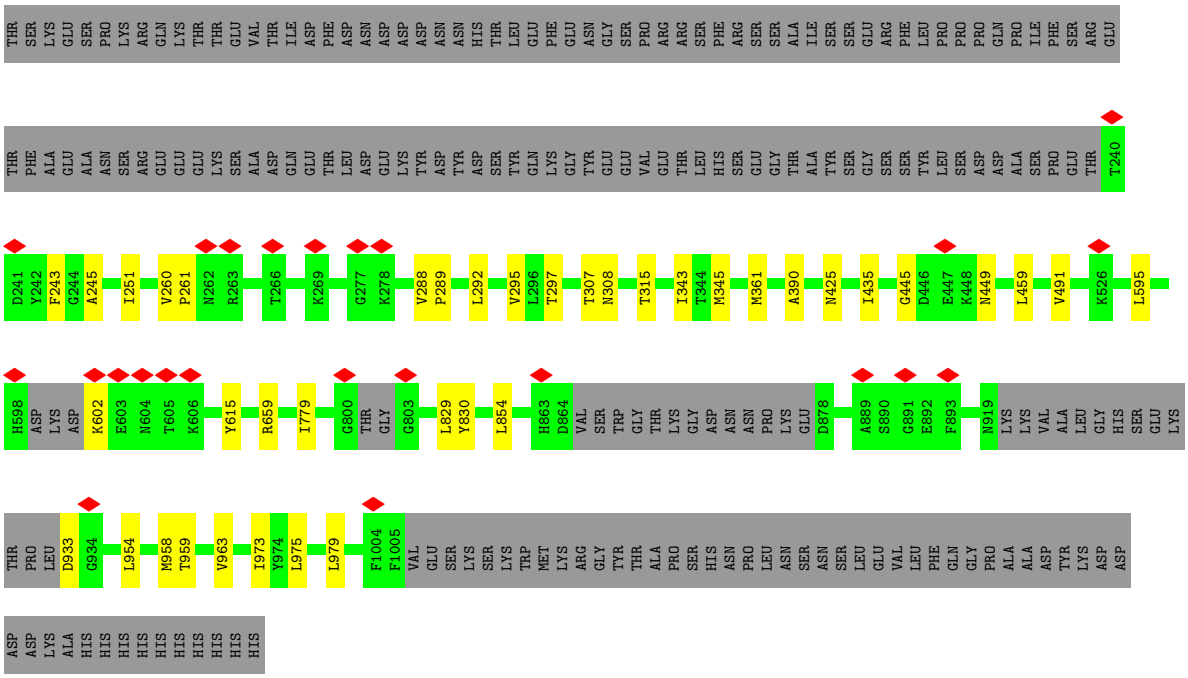
Chain A:



- Molecule 1: Chitin synthase

Chain B:




THR SER LYS GLU SER PRO LYS ARG GLN LYS THR THR GLU VAL THR ILE ASP PHE ASP ASN ASP ASP ASP ASN ASN HIS THR LEU GLU PHE GLU ASN GLY SER PRO ARG ARG SER PHE ARG SER SER ALA ILE SER SER GLU ARG PHE LEU PRO PRO PRO GLN PRO ILE PHE SER ARG GLU
THR PHE ALA GLU ALA ASN SER ARG GLU GLU GLU LYS SER ALA ASP GLN GLU THR LEU ASP GLU LYS TYR ASP TYR ASP SER TYR GLN LYS GLY TYR GLU GLU VAL GLU THR LEU HIS SER GLU GLY THR ALA TYR SER GLY SER SER TYR LEU SER ASP ASP ALA SER PRO GLU THR T240
D241 Y242 F243 G244 A245 I251 V260 P261 N262 R263 T266 K269 G277 K278 V288 P289 L292 V295 L296 T297 T307 N308 T315 I343 T344 M345 M361 A390 N425 I435 G445 D446 E447 K448 N449 L459 V491 K526 L595
H598 ASP LYS ASP K602 E603 N604 T605 K606 Y615 R659 I779 G800 THR GLY G803 L829 Y830 L854 H863 D864 VAL SER TRP GLY THR LYS GLY ASP ASN ASN PRO LYS GLU D878 A889 S890 G891 E892 F893 N919 LYS LYS VAL ALA LEU GLY HIS SER GLU LYS
THR PRO LEU D933 G934 L954 M958 T959 V963 I973 Y974 L975 L979 F1004 F1005 VAL GLU SER LYS SER LYS TRP MET LYS ARG GLY TYR THR ALA PRO SER HIS ASN PRO LEU ASN SER ASN SER LEU GLU VAL LEU PHE GLN GLY PRO ALA ALA ASP TYR LYS ASP ASP
ASP ASP LYS ALA HIS HIS HIS HIS HIS HIS HIS HIS HIS HIS

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	34493	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	TFS FALCON 4i (4k x 4k)	Depositor
Maximum map value	1.700	Depositor
Minimum map value	-1.030	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.048	Depositor
Recommended contour level	0.28	Depositor
Map size (Å)	297.6, 297.6, 297.6	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.93, 0.93, 0.93	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: PEE, A1DEH, UD1, MG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\|>5$	RMSZ	$\#\|Z\|>5$
1	A	0.13	0/5922	0.25	0/8052
1	B	0.13	0/5921	0.26	0/8048
All	All	0.13	0/11843	0.26	0/16100

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5781	5480	5632	26	0
1	B	5781	5499	5642	22	0
2	A	79	108	112	5	0
2	B	133	191	200	5	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	22	20	0	0	0
4	B	22	20	0	0	0
5	A	39	25	25	1	0
5	B	39	25	25	2	0
All	All	11898	11368	11636	56	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 2.

The worst 5 of 56 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1105:PEE:H64	2:B:1105:PEE:H28	1.45	0.98
2:A:1104:PEE:H28	2:A:1104:PEE:H64	1.56	0.88
1:A:959:THR:O	1:A:963:VAL:HG23	1.90	0.71
1:B:251:ILE:HG12	1:B:295:VAL:HG21	1.77	0.66
1:A:259:TYR:HB3	1:A:261:PRO:HD3	1.77	0.66

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	725/1058 (68%)	713 (98%)	12 (2%)	0	100	100
1	B	725/1058 (68%)	714 (98%)	11 (2%)	0	100	100
All	All	1450/2116 (68%)	1427 (98%)	23 (2%)	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	605/931 (65%)	604 (100%)	1 (0%)	87 94
1	B	605/931 (65%)	605 (100%)	0	100 100
All	All	1210/1862 (65%)	1209 (100%)	1 (0%)	87 95

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	677	PHE

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

Mol	Chain	Res	Type
1	B	463	ASN
1	B	578	HIS
1	B	962	GLN
1	B	613	ASN
1	A	578	HIS

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)

Of 11 ligands modelled in this entry, 2 are monoatomic - leaving 9 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	$\#\|Z\| > 2$
2	PEE	A	1104	-	50,50,50	1.11	2 (4%)	53,55,55	1.04	2 (3%)
2	PEE	B	1105	-	50,50,50	1.11	2 (4%)	53,55,55	1.05	2 (3%)
2	PEE	B	1101	-	30,30,50	1.27	3 (10%)	33,35,55	1.23	2 (6%)
2	PEE	A	1101	-	27,27,50	1.32	2 (7%)	30,32,55	1.26	2 (6%)
5	UD1	A	1105	3	40,41,41	0.42	0	59,62,62	0.70	1 (1%)
5	UD1	B	1106	3	40,41,41	0.42	0	59,62,62	0.65	0
4	A1DEH	B	1104	-	22,23,23	2.39	6 (27%)	26,32,32	1.31	2 (7%)
4	A1DEH	A	1103	-	22,23,23	2.41	7 (31%)	26,32,32	1.29	2 (7%)
2	PEE	B	1102	-	50,50,50	1.11	3 (6%)	53,55,55	1.06	2 (3%)

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
2	PEE	A	1104	-	-	18/54/54/54	-
2	PEE	B	1105	-	-	17/54/54/54	-
2	PEE	B	1101	-	-	13/34/34/54	-
2	PEE	A	1101	-	-	11/31/31/54	-
5	UD1	A	1105	3	-	7/26/63/63	0/3/3/3
5	UD1	B	1106	3	-	8/26/63/63	0/3/3/3
4	A1DEH	B	1104	-	-	4/12/22/22	0/2/2/2
4	A1DEH	A	1103	-	-	8/12/22/22	0/2/2/2
2	PEE	B	1102	-	-	19/54/54/54	-

The worst 5 of 25 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1104	A1DEH	C14-C13	6.97	1.52	1.37
4	A	1103	A1DEH	C14-C13	6.96	1.52	1.37
4	A	1103	A1DEH	O21-C20	4.53	1.44	1.37
4	A	1103	A1DEH	C02-N03	4.46	1.40	1.35
4	B	1104	A1DEH	C02-N03	4.40	1.40	1.35

The worst 5 of 15 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	1101	PEE	O2-C10-C11	4.72	121.68	111.48
2	A	1104	PEE	O2-C10-C11	4.33	120.84	111.48
4	B	1104	A1DEH	C04-N03-C02	-4.20	119.43	124.45
2	B	1101	PEE	O2-C10-C11	4.09	120.33	111.48
4	A	1103	A1DEH	C04-N03-C02	-3.96	119.71	124.45

There are no chirality outliers.

5 of 105 torsion outliers are listed below:

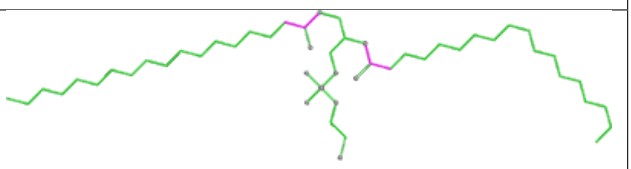
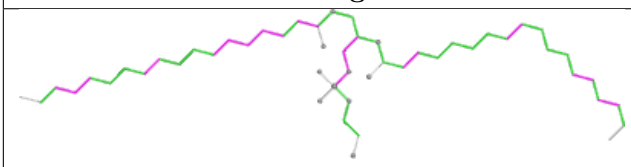
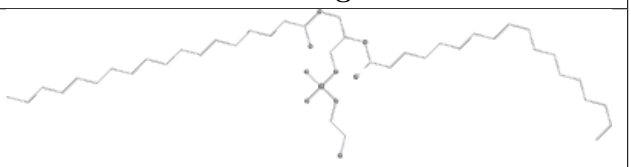
Mol	Chain	Res	Type	Atoms
2	A	1101	PEE	C11-C10-O2-C2
2	A	1101	PEE	C1-C2-O2-C10
2	A	1101	PEE	C1-O3P-P-O1P
2	B	1101	PEE	C11-C10-O2-C2
2	B	1101	PEE	C1-O3P-P-O1P

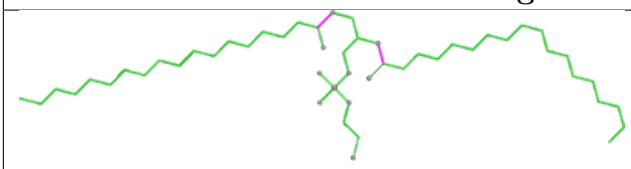
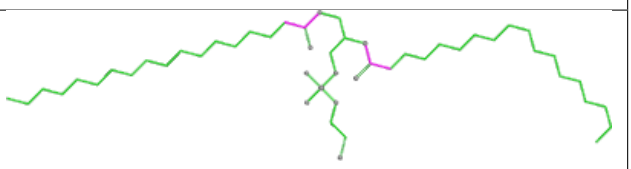
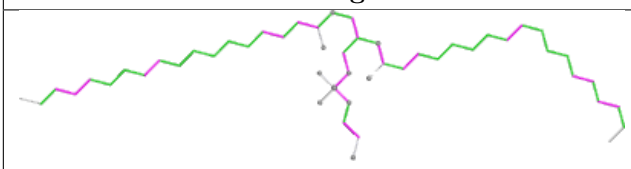
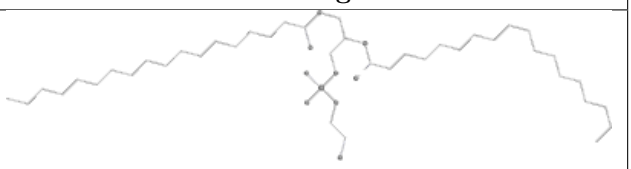
There are no ring outliers.

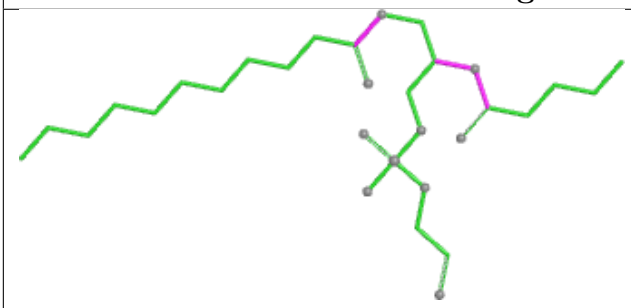
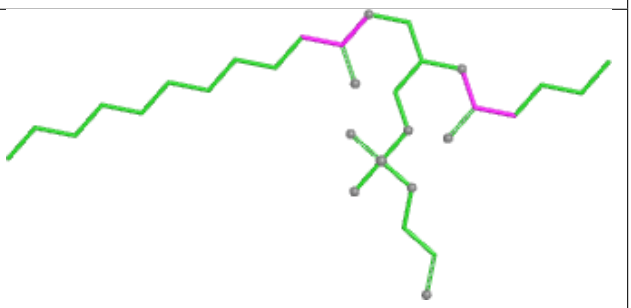
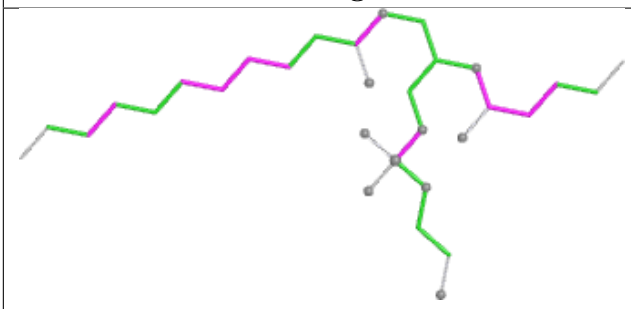
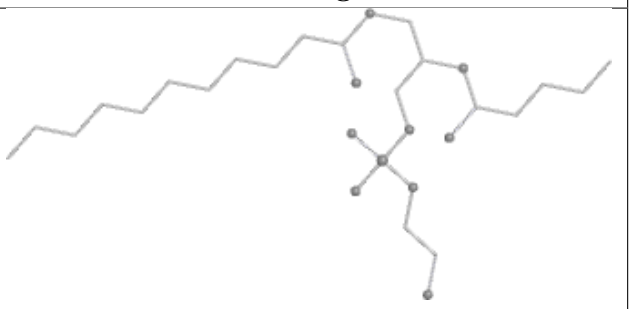
5 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1104	PEE	5	0
2	B	1105	PEE	4	0
2	B	1101	PEE	1	0
5	A	1105	UD1	1	0
5	B	1106	UD1	2	0

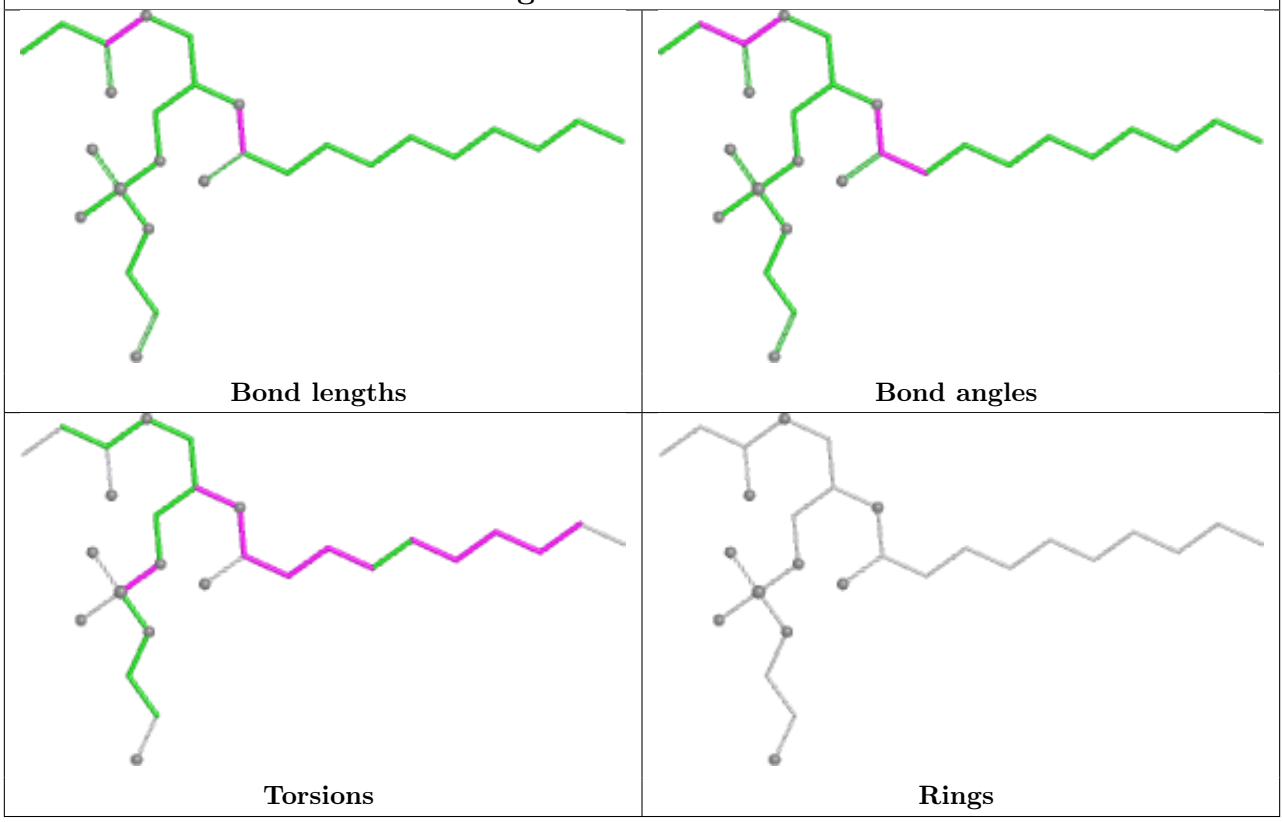
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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 PEE A 1104	
Bond lengths	 Bond angles
 Torsions	 Rings

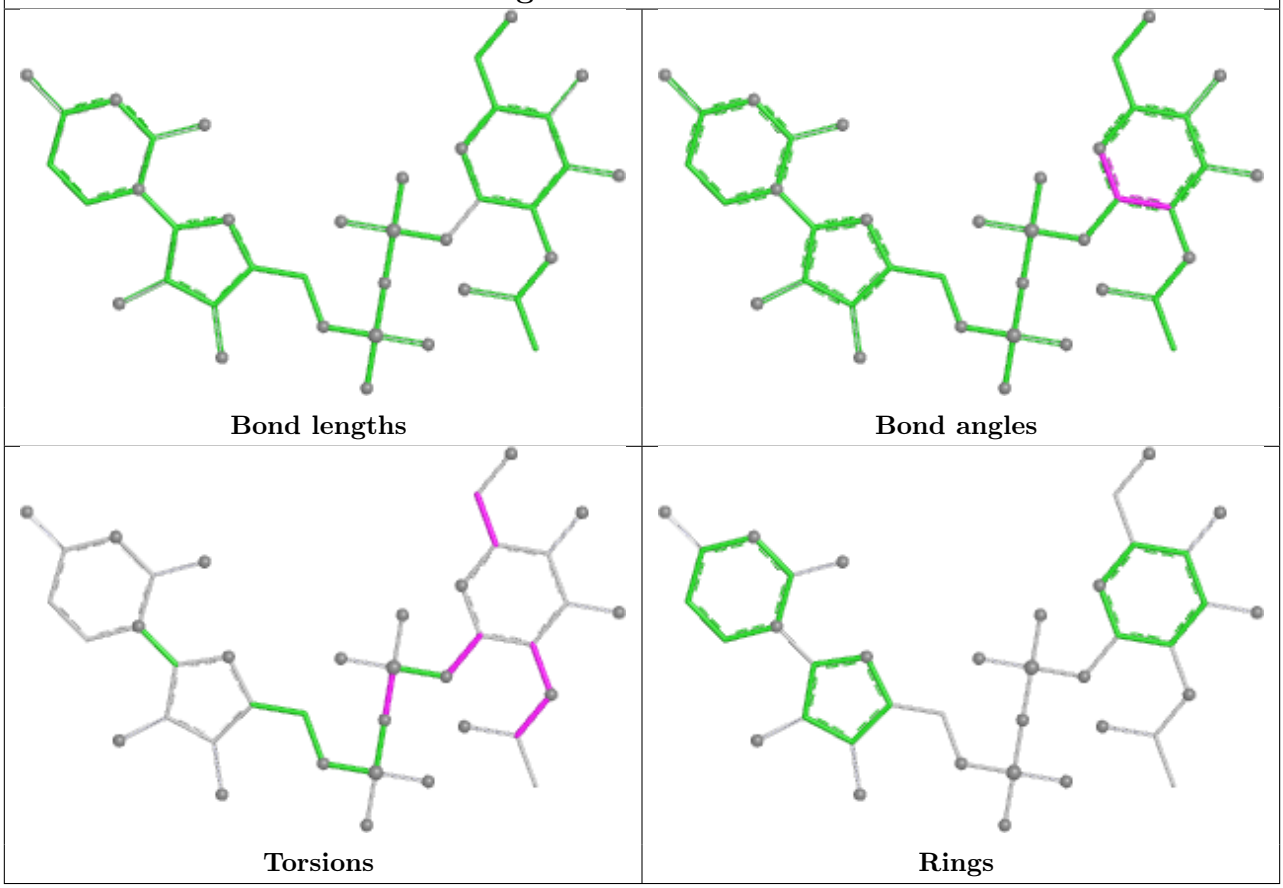
Ligand PEE B 1105	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PEE B 1101	
 Bond lengths	 Bond angles
 Torsions	 Rings

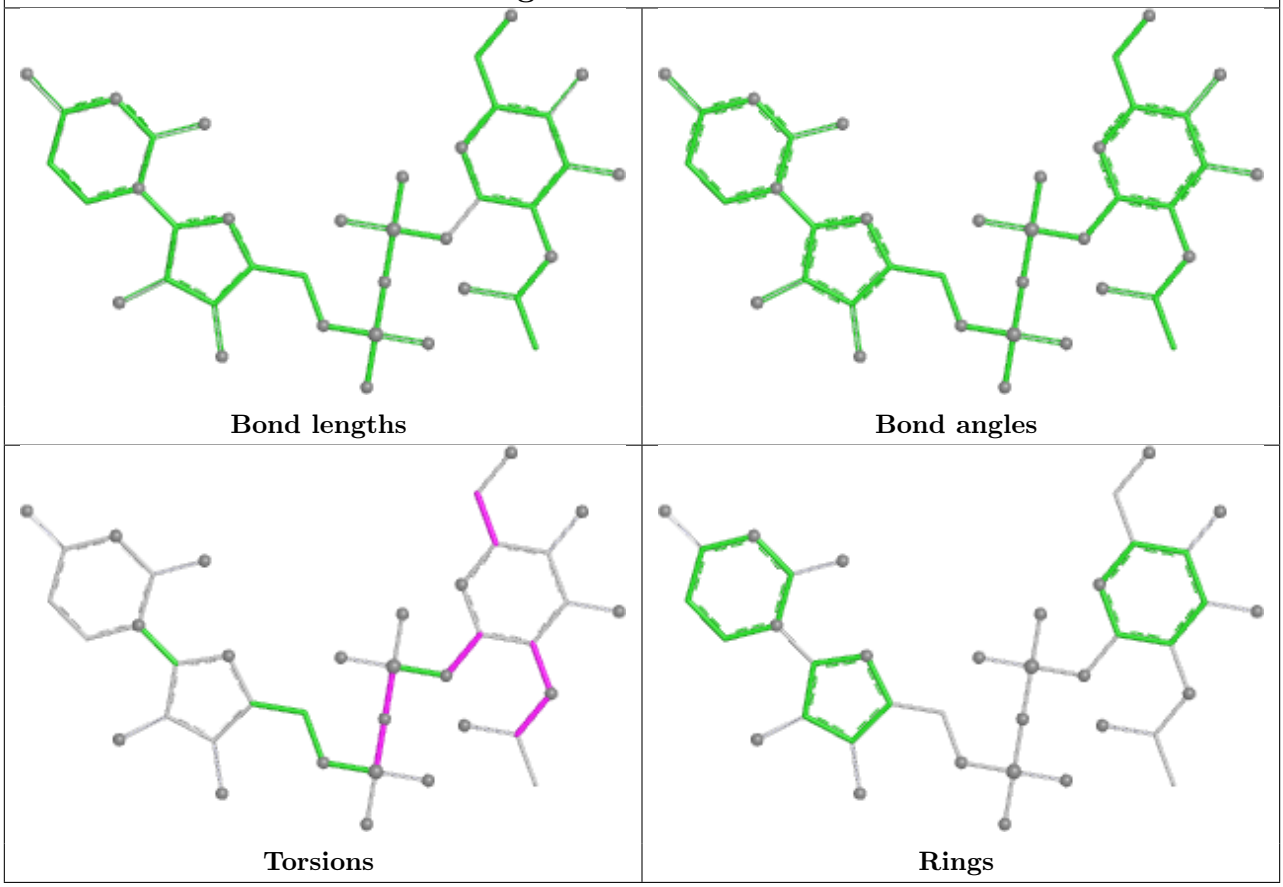
Ligand PEE A 1101



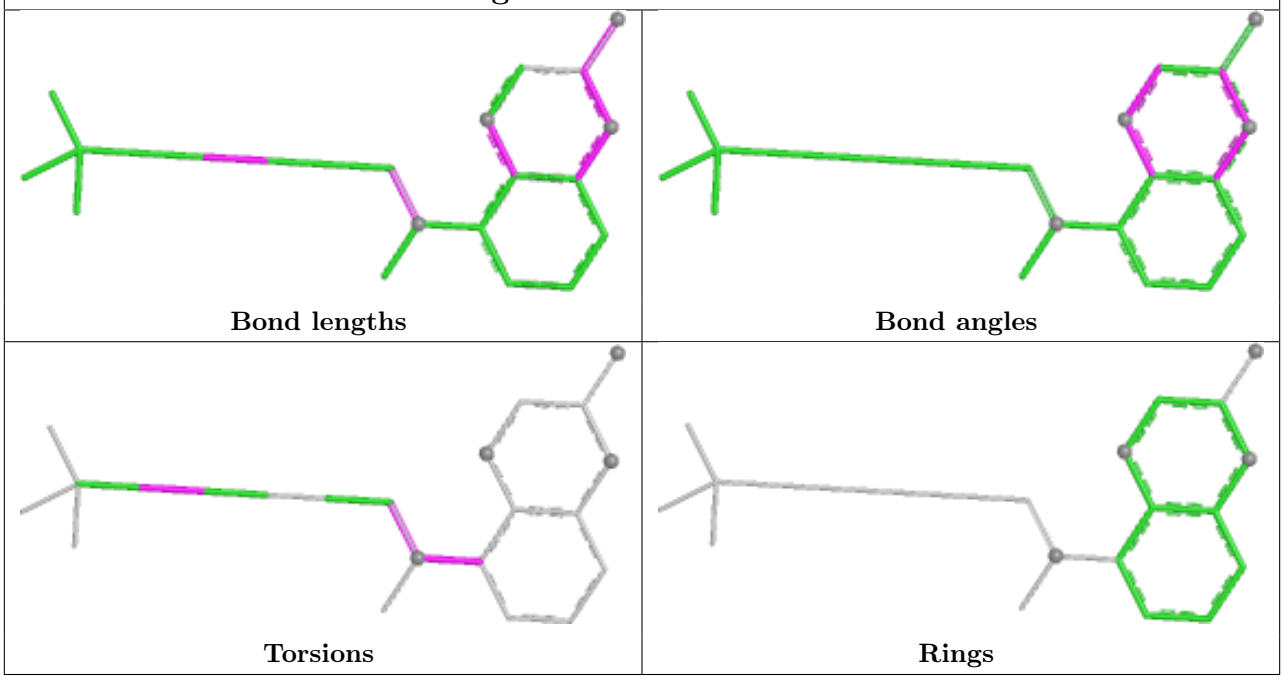
Ligand UD1 A 1105

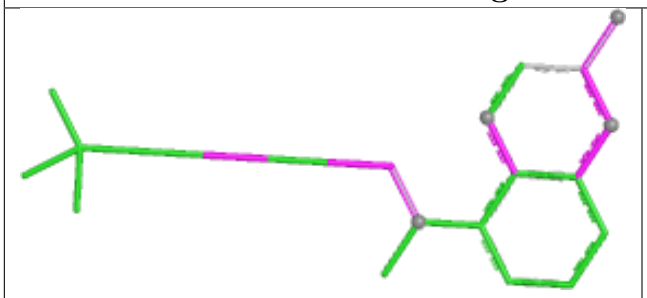
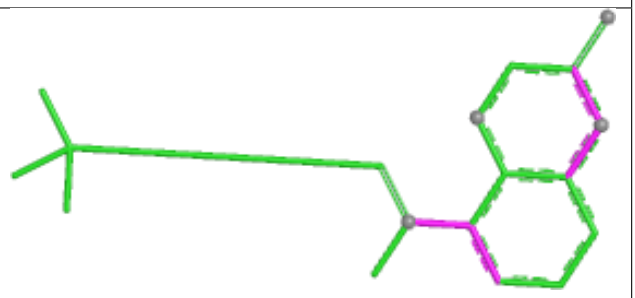
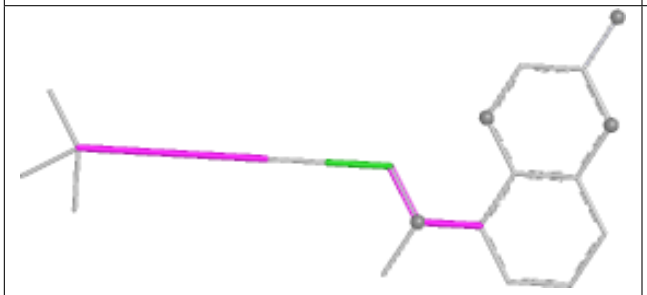
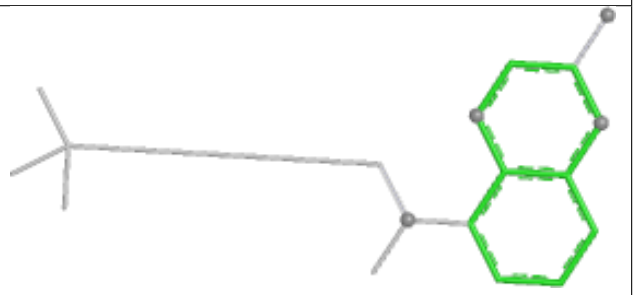


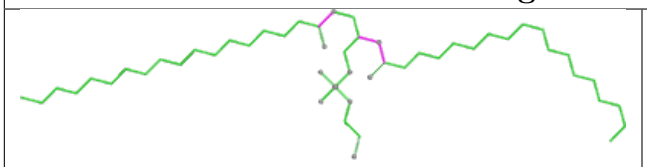
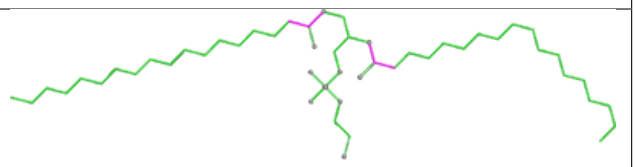
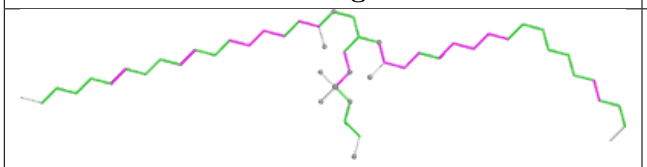
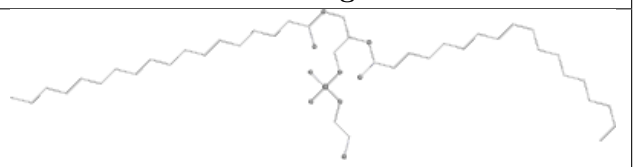
Ligand UD1 B 1106



Ligand A1DEH B 1104



Ligand A1DEH A 1103	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PEE B 1102	
 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.

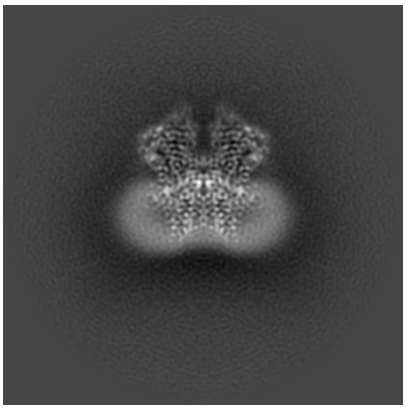
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-76831. These allow visual inspection of the internal detail of the map and identification of artifacts.

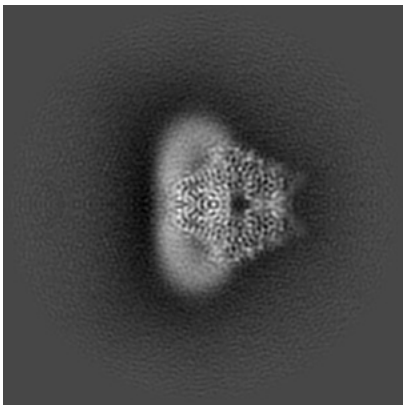
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections (i)

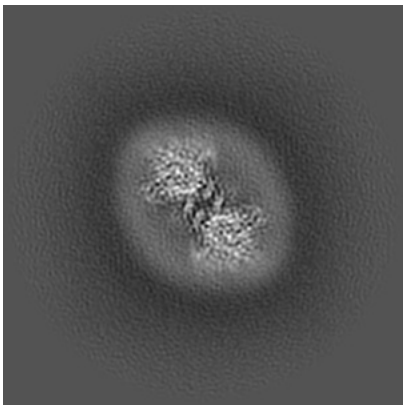
6.1.1 Primary map



X

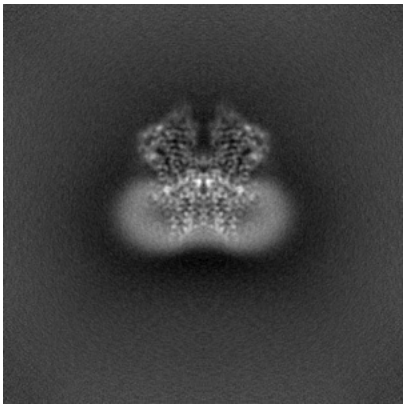


Y

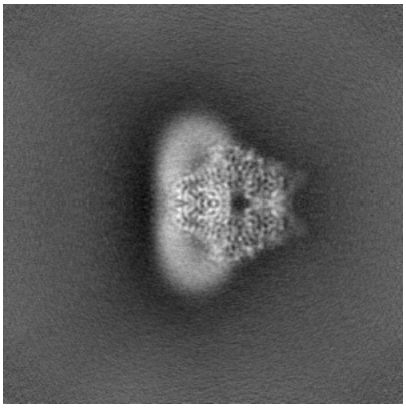


Z

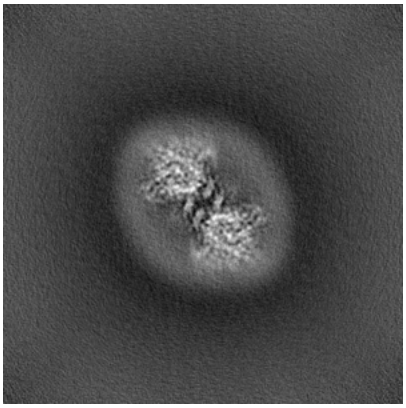
6.1.2 Raw map



X



Y

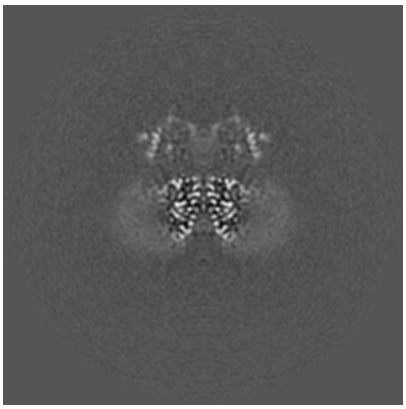


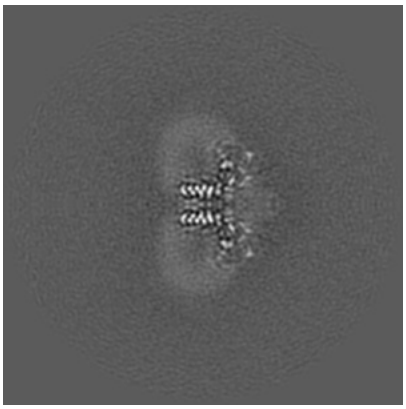
Z

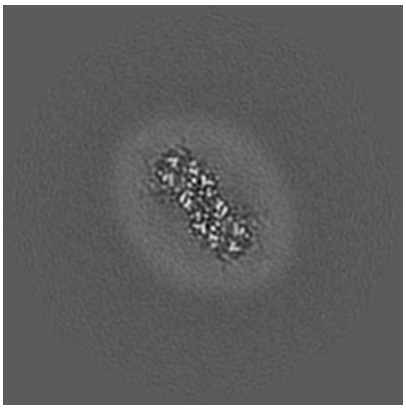
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

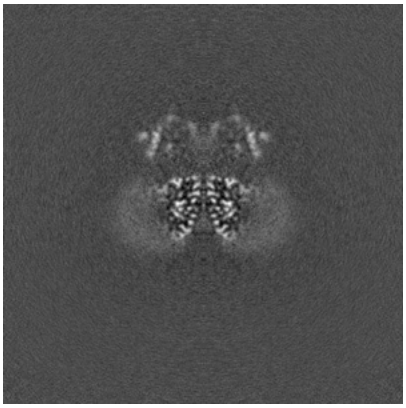
6.2.1 Primary map

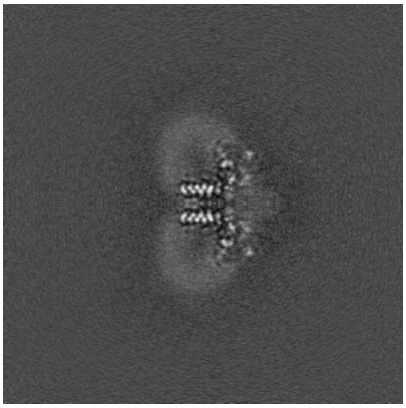

X Index: 160

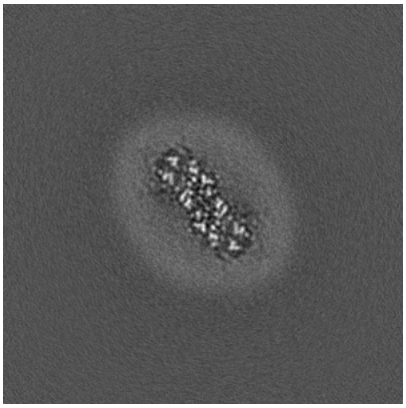

Y Index: 160


Z Index: 160

6.2.2 Raw map


X Index: 160

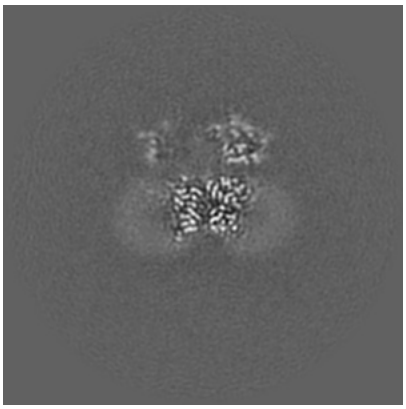

Y Index: 160

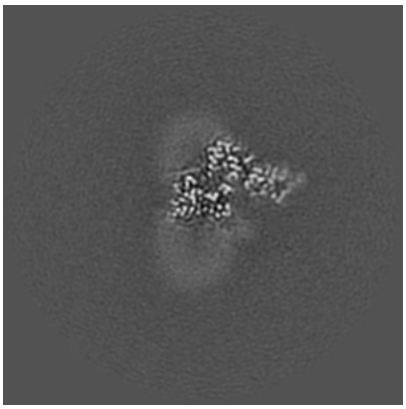

Z Index: 160

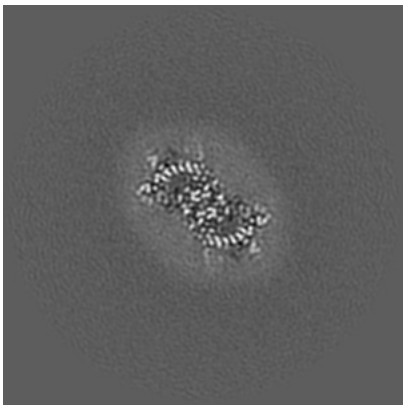
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

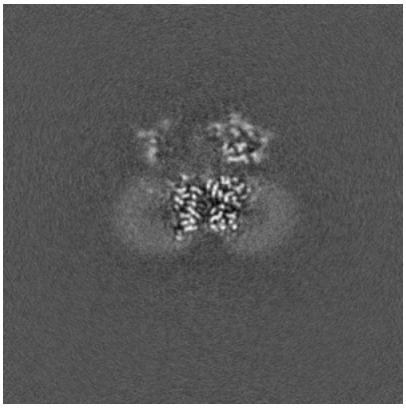
6.3.1 Primary map

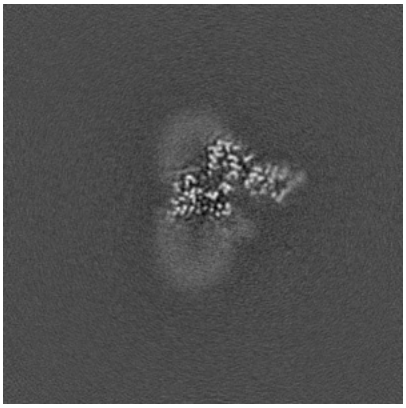

X Index: 155

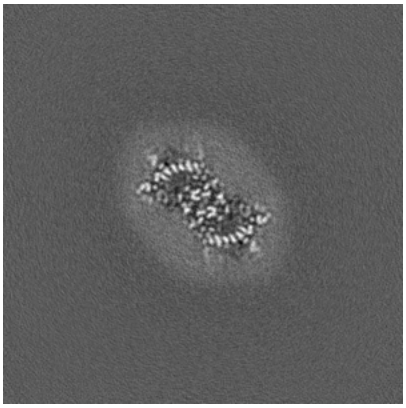

Y Index: 147


Z Index: 173

6.3.2 Raw map


X Index: 155

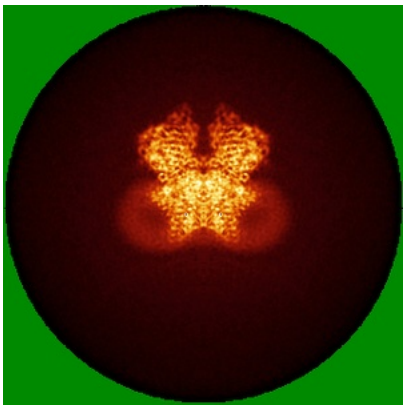

Y Index: 147

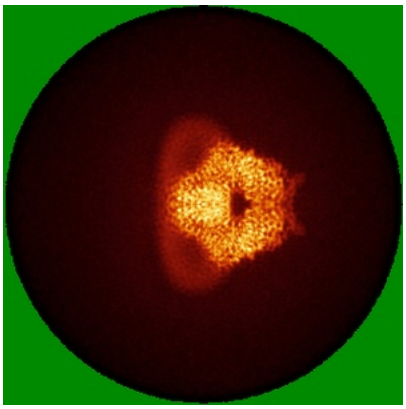

Z Index: 173

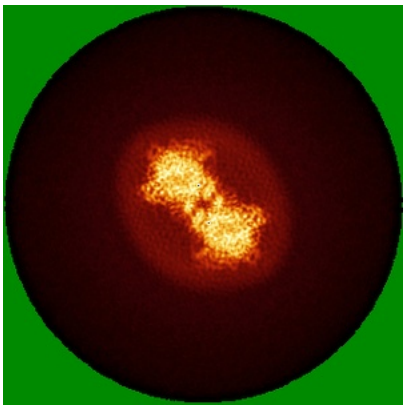
The images above show the largest variance slices of the map in three orthogonal directions.

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

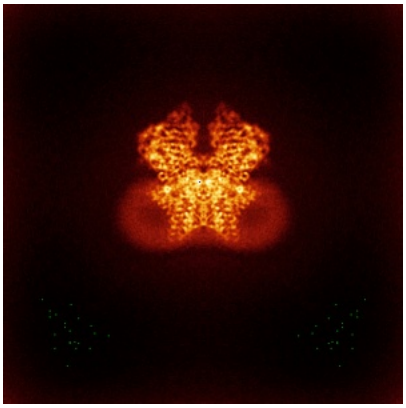
6.4.1 Primary map

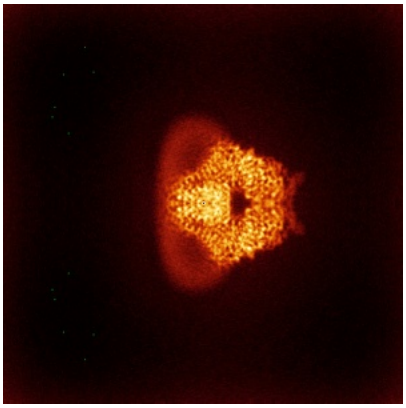

X

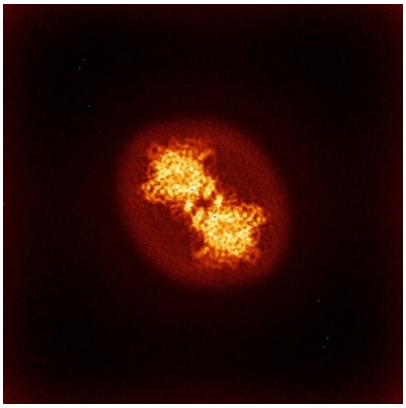

Y


Z

6.4.2 Raw map


X

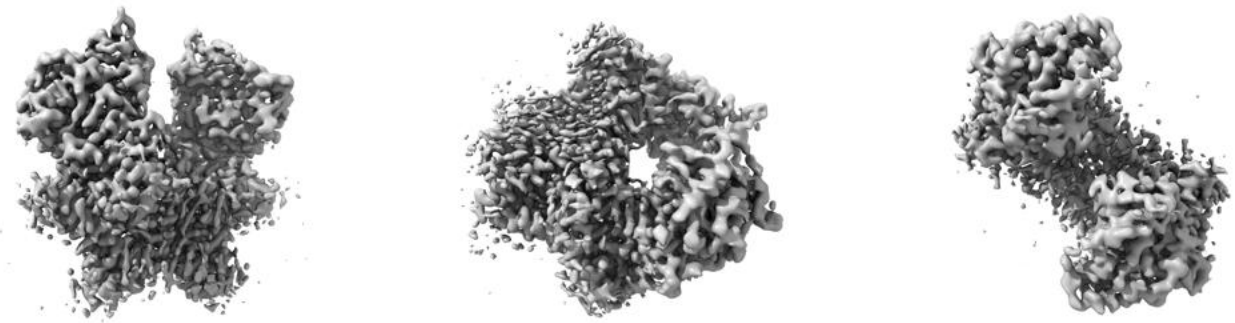

Y


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 0.28. 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.

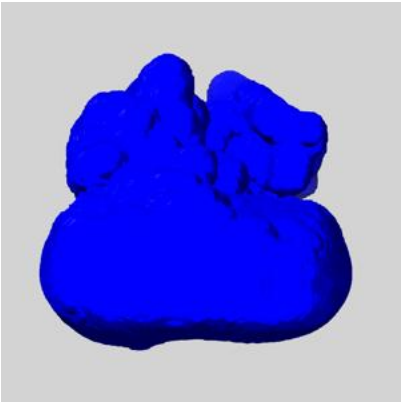
6.6 Mask visualisation (i)

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

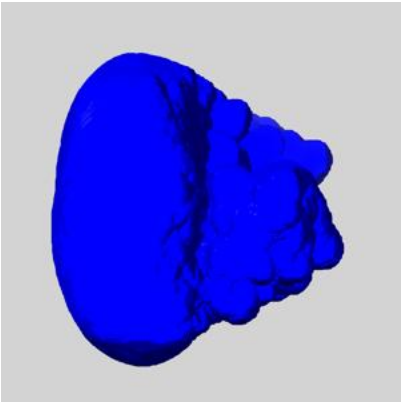
A mask typically either:

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

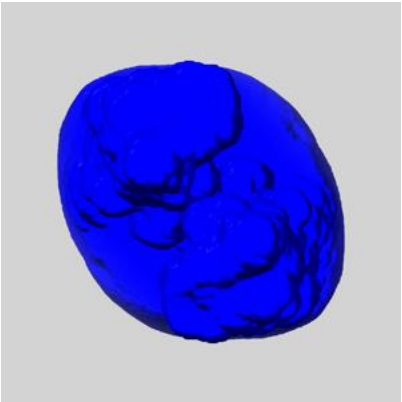
6.6.1 emd_76831_msk_1.map (i)



X



Y

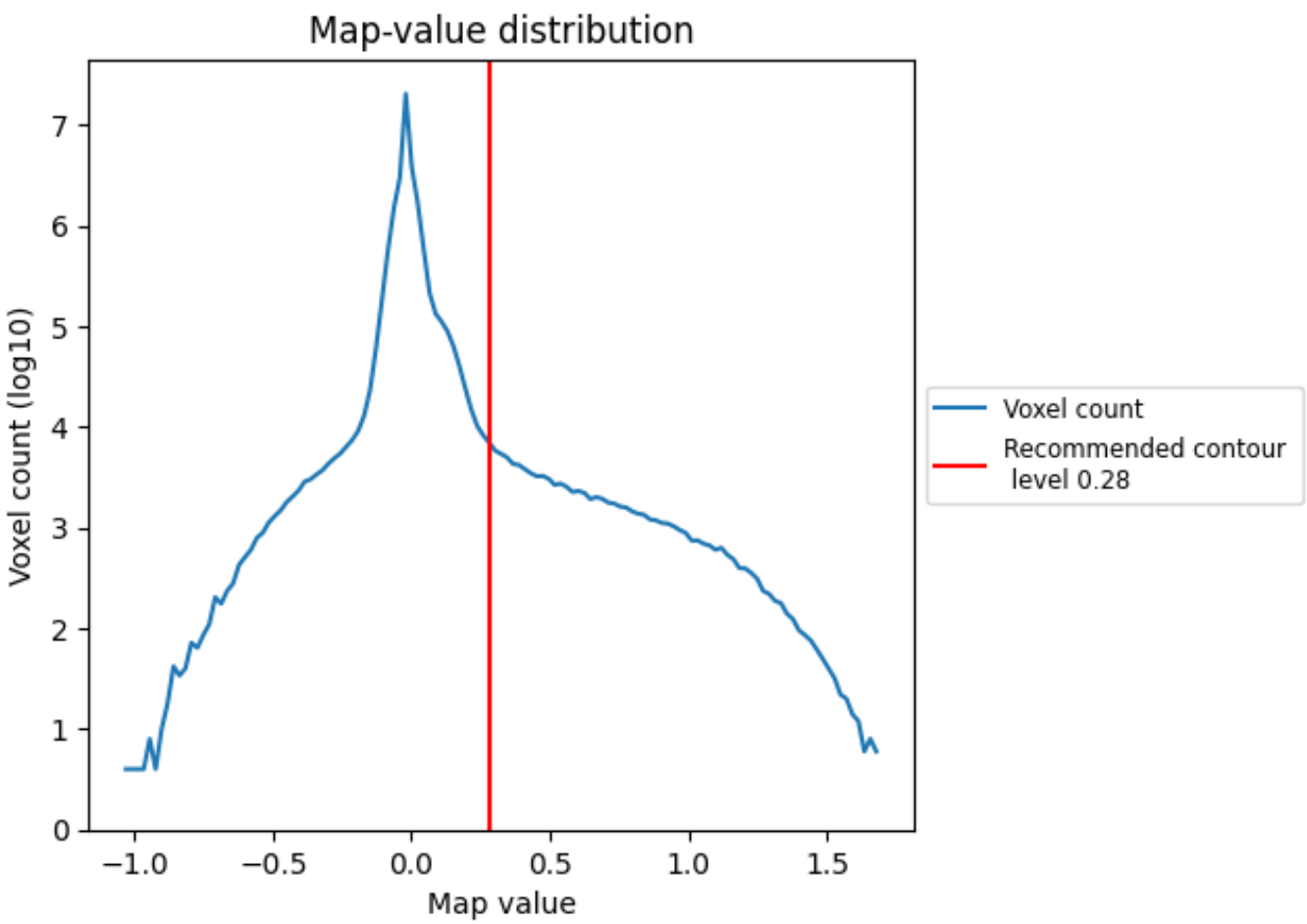


Z

7 Map analysis (i)

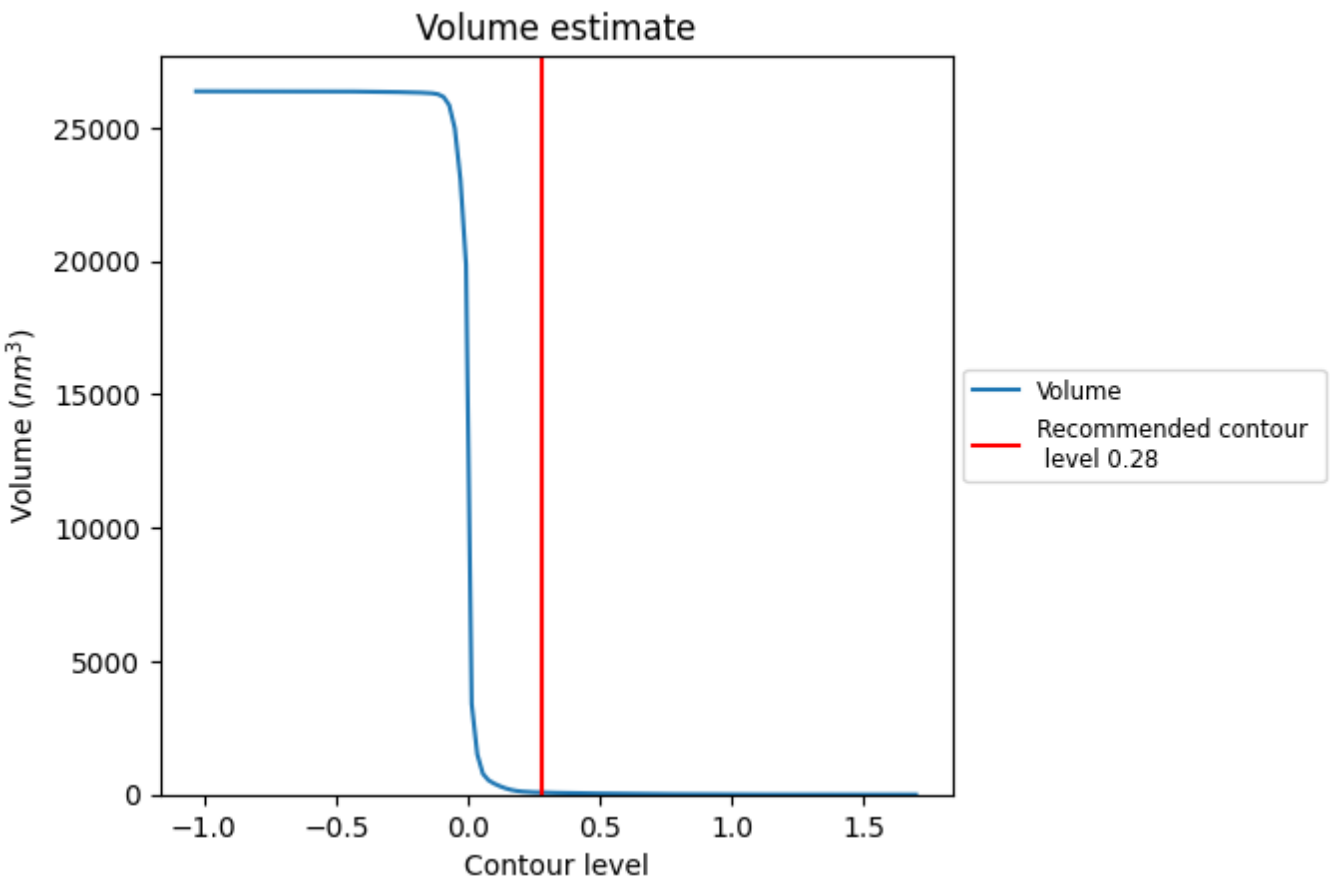
This section contains the results of statistical analysis of the map.

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.

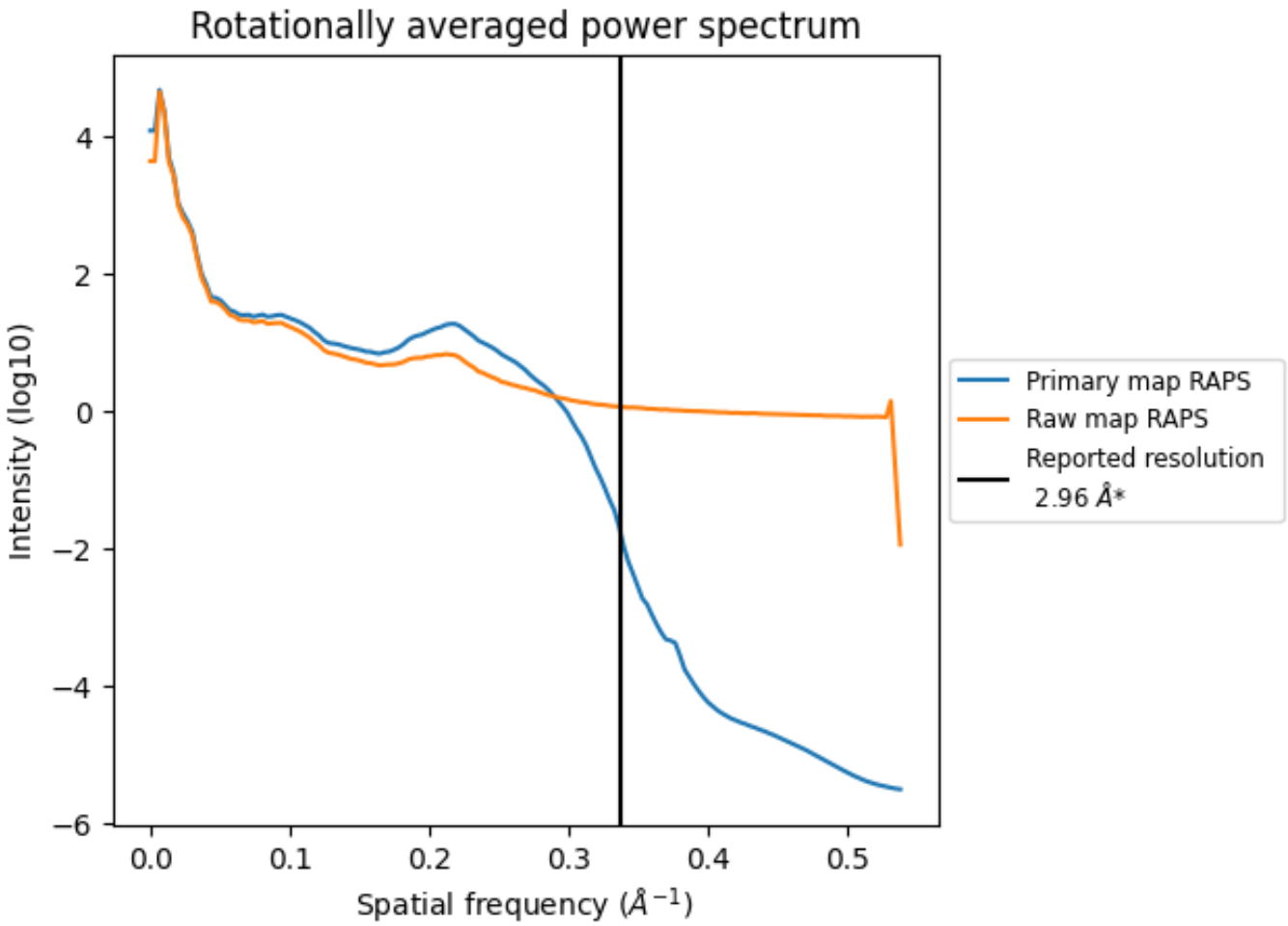
7.2 Volume estimate (i)



The volume at the recommended contour level is 77 nm^3; this corresponds to an approximate mass of 70 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)

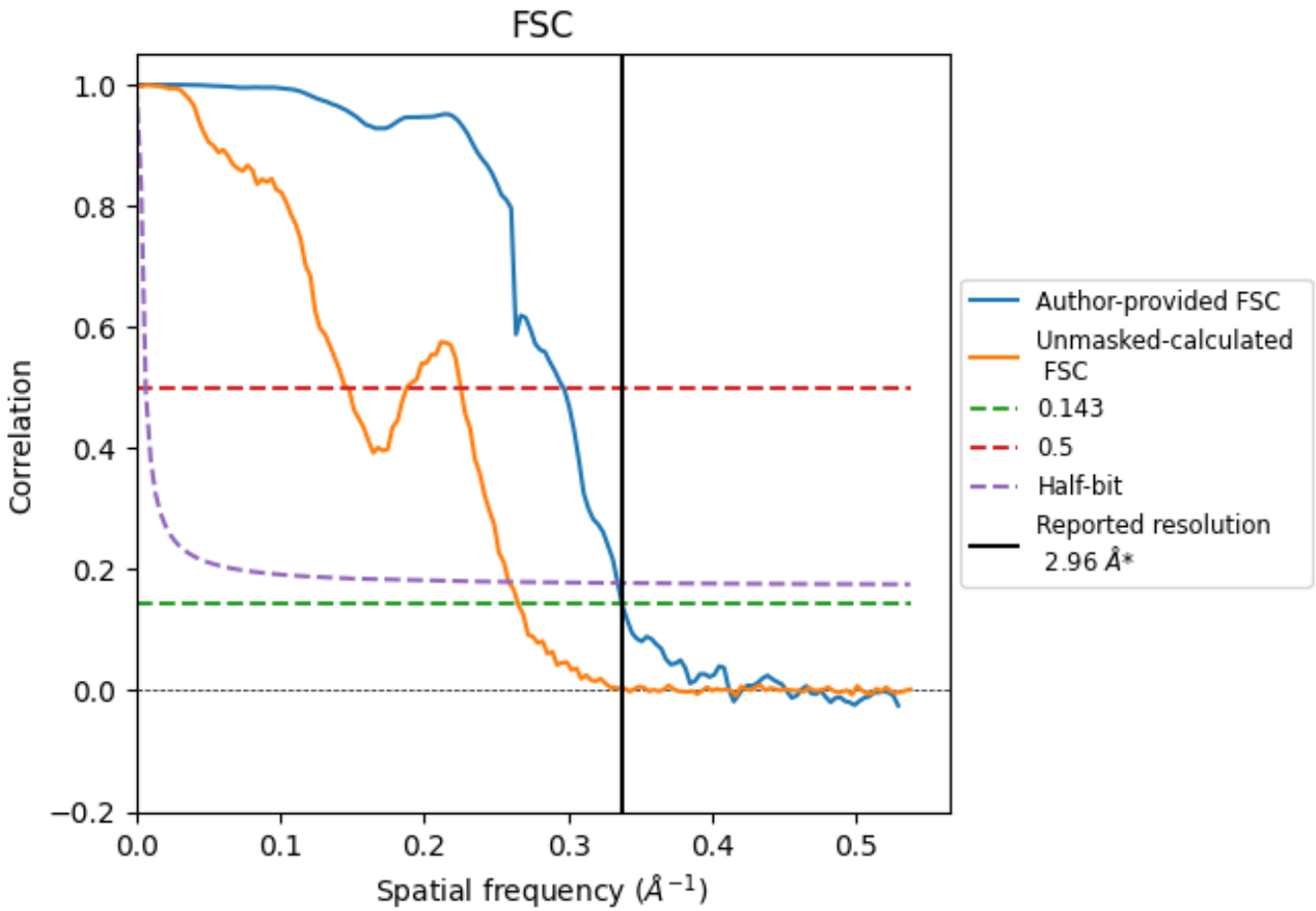


*Reported resolution corresponds to spatial frequency of 0.338 Å^{-1}

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 0.338 Å^{-1}

8.2 Resolution estimates (i)

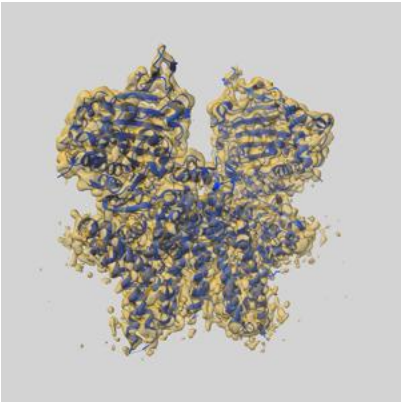
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.96	-	-
Author-provided FSC curve	2.96	3.37	2.99
Unmasked-calculated*	3.77	6.81	3.87

*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 3.77 differs from the reported value 2.96 by more than 10 %

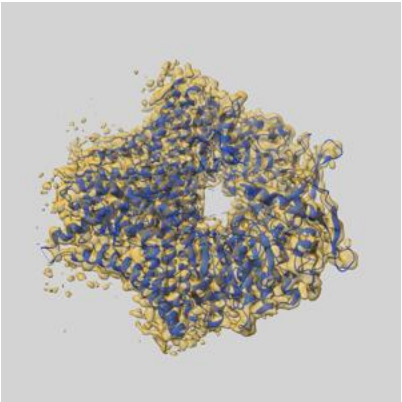
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-76831 and PDB model 12XK. Per-residue inclusion information can be found in section 3 on page 8.

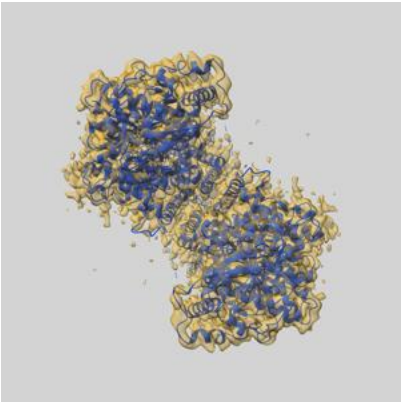
9.1 Map-model overlay (i)



X



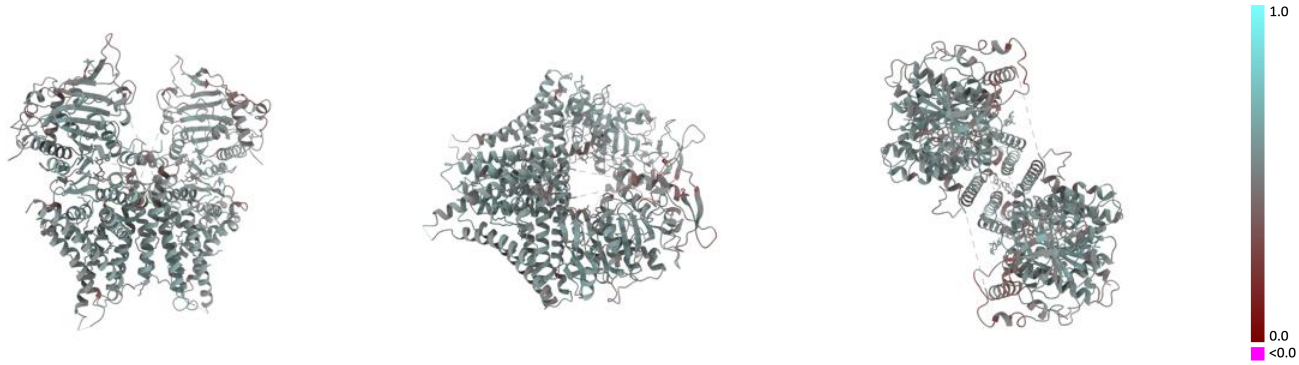
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.28 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.

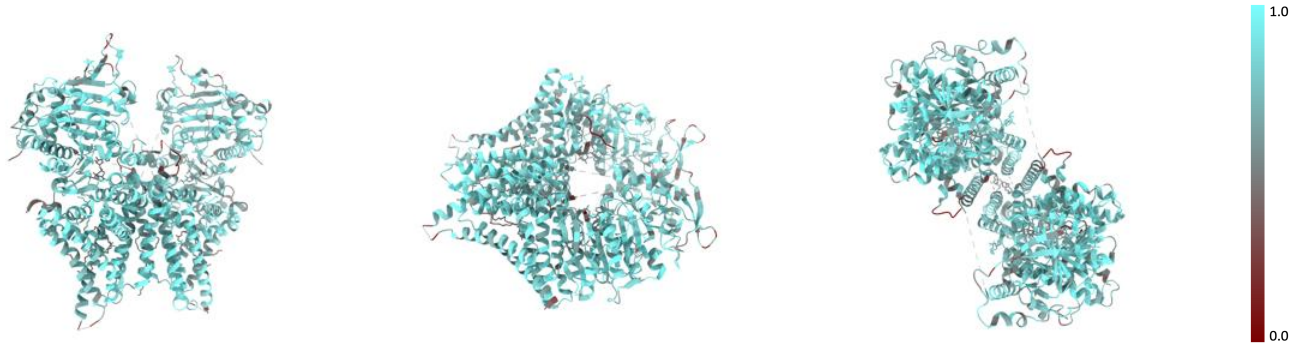
9.2 Q-score mapped to coordinate model (i)



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.

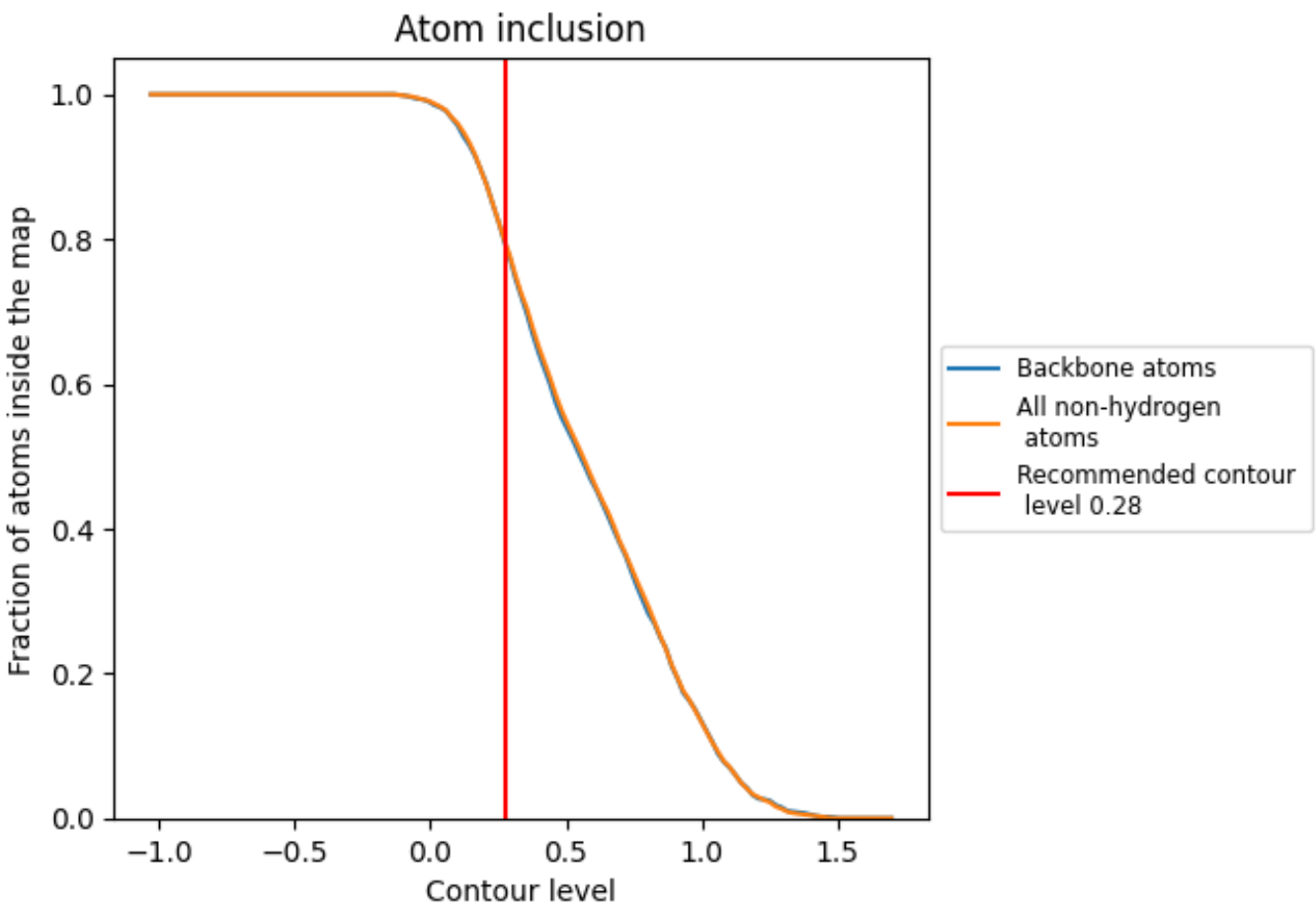
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.28).

9.4 Atom inclusion (i)



At the recommended contour level, 79% of all backbone atoms, 79% 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 (0.28) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7900	0.5190
A	0.8000	0.5190
B	0.7920	0.5190