



## Full wwPDB EM Validation Report ⓘ

Mar 6, 2024 – 04:47 PM EST

PDB ID : 8TZ7  
EMDB ID : EMD-41736  
Title : Cryo-EM structure of bovine concentrative nucleoside transporter 3 in complex with Molnupiravir, condition 1, INT1-INT1-INT1 conformation  
Authors : Wright, N.J.; Lee, S.-Y.  
Deposited on : 2023-08-26  
Resolution : 3.00 Å(reported)  
Based on initial model : 3TIJ

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto: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 ⓘ 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 ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev70  
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 : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

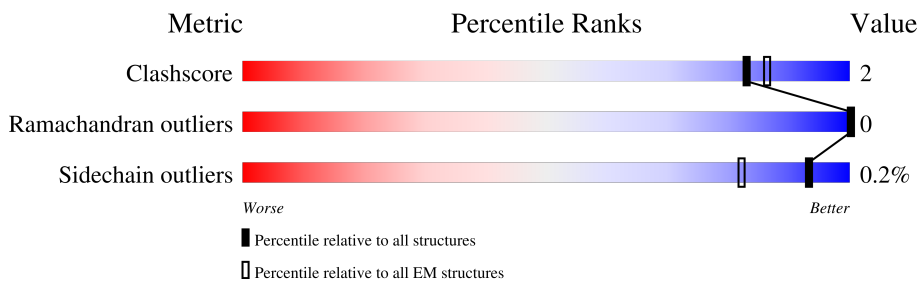
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.00 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  $\geq 3$ , 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  $\leq 5\%$ . 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	715	
1	B	715	
1	C	715	

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 24615 atoms, of which 12276 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 Sodium/nucleoside cotransporter.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
1	A	533	8076	2688	4023	638	698	29	0	0
1	B	533	8076	2688	4023	638	698	29	0	0
1	C	533	8076	2688	4023	638	698	29	0	0

There are 54 discrepancies between the modelled and reference sequences:

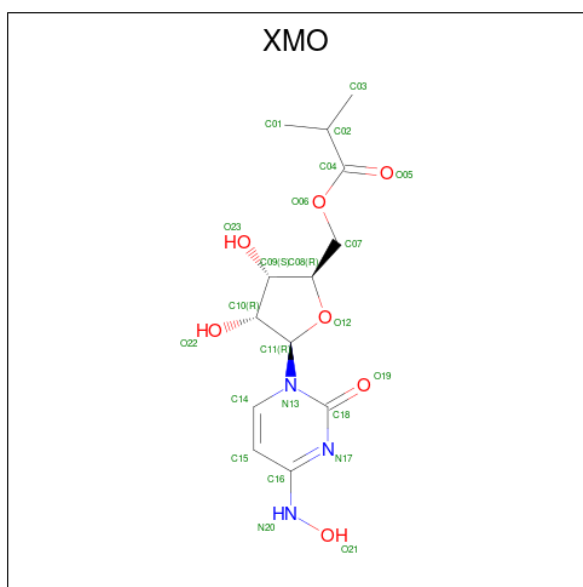
Chain	Residue	Modelled	Actual	Comment	Reference
A	-14	MET	-	initiating methionine	UNP F1MGR1
A	-13	ASP	-	expression tag	UNP F1MGR1
A	-12	TYR	-	expression tag	UNP F1MGR1
A	-11	LYS	-	expression tag	UNP F1MGR1
A	-10	ASP	-	expression tag	UNP F1MGR1
A	-9	ASP	-	expression tag	UNP F1MGR1
A	-8	ASP	-	expression tag	UNP F1MGR1
A	-7	ASP	-	expression tag	UNP F1MGR1
A	-6	LYS	-	expression tag	UNP F1MGR1
A	-5	LEU	-	expression tag	UNP F1MGR1
A	-4	GLU	-	expression tag	UNP F1MGR1
A	-3	ALA	-	expression tag	UNP F1MGR1
A	-2	THR	-	expression tag	UNP F1MGR1
A	-1	MET	-	expression tag	UNP F1MGR1
A	0	ALA	-	expression tag	UNP F1MGR1
A	698	SER	-	expression tag	UNP F1MGR1
A	699	ASN	-	expression tag	UNP F1MGR1
A	700	SER	-	expression tag	UNP F1MGR1
B	-14	MET	-	initiating methionine	UNP F1MGR1
B	-13	ASP	-	expression tag	UNP F1MGR1
B	-12	TYR	-	expression tag	UNP F1MGR1
B	-11	LYS	-	expression tag	UNP F1MGR1
B	-10	ASP	-	expression tag	UNP F1MGR1
B	-9	ASP	-	expression tag	UNP F1MGR1

*Continued on next page...*

*Continued from previous page...*

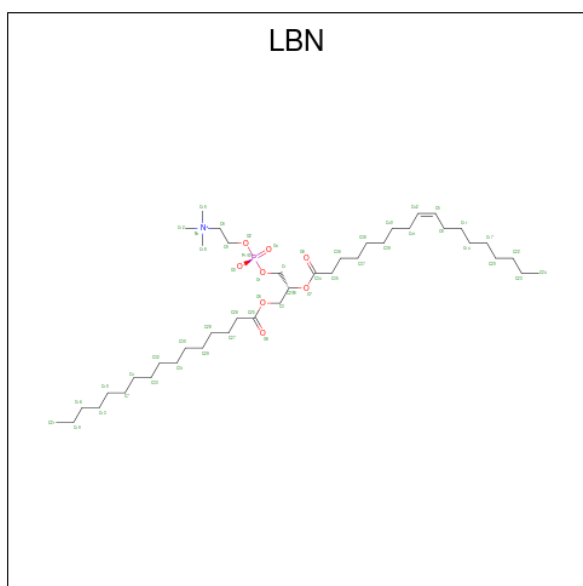
Chain	Residue	Modelled	Actual	Comment	Reference
B	-8	ASP	-	expression tag	UNP F1MGR1
B	-7	ASP	-	expression tag	UNP F1MGR1
B	-6	LYS	-	expression tag	UNP F1MGR1
B	-5	LEU	-	expression tag	UNP F1MGR1
B	-4	GLU	-	expression tag	UNP F1MGR1
B	-3	ALA	-	expression tag	UNP F1MGR1
B	-2	THR	-	expression tag	UNP F1MGR1
B	-1	MET	-	expression tag	UNP F1MGR1
B	0	ALA	-	expression tag	UNP F1MGR1
B	698	SER	-	expression tag	UNP F1MGR1
B	699	ASN	-	expression tag	UNP F1MGR1
B	700	SER	-	expression tag	UNP F1MGR1
C	-14	MET	-	initiating methionine	UNP F1MGR1
C	-13	ASP	-	expression tag	UNP F1MGR1
C	-12	TYR	-	expression tag	UNP F1MGR1
C	-11	LYS	-	expression tag	UNP F1MGR1
C	-10	ASP	-	expression tag	UNP F1MGR1
C	-9	ASP	-	expression tag	UNP F1MGR1
C	-8	ASP	-	expression tag	UNP F1MGR1
C	-7	ASP	-	expression tag	UNP F1MGR1
C	-6	LYS	-	expression tag	UNP F1MGR1
C	-5	LEU	-	expression tag	UNP F1MGR1
C	-4	GLU	-	expression tag	UNP F1MGR1
C	-3	ALA	-	expression tag	UNP F1MGR1
C	-2	THR	-	expression tag	UNP F1MGR1
C	-1	MET	-	expression tag	UNP F1MGR1
C	0	ALA	-	expression tag	UNP F1MGR1
C	698	SER	-	expression tag	UNP F1MGR1
C	699	ASN	-	expression tag	UNP F1MGR1
C	700	SER	-	expression tag	UNP F1MGR1

- Molecule 2 is N-hydroxy-5'-O-(2-methylpropanoyl)cytidine (three-letter code: XMO) (formula: C<sub>13</sub>H<sub>19</sub>N<sub>3</sub>O<sub>7</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf	
			Total	C	H	N		O
2	A	1	42	13	19	3	7	0
2	B	1	42	13	19	3	7	0
2	C	1	42	13	19	3	7	0

- Molecule 3 is 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (three-letter code: LBN) (formula:  $C_{42}H_{82}NO_8P$ ).



<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>					<b>AltConf</b>
3	A	1	Total 87	C 28	H 50	O 8	P 1	0
3	B	1	Total 87	C 28	H 50	O 8	P 1	0
3	C	1	Total 87	C 28	H 50	O 8	P 1	0



SER CYS CYS GLN LEU LEU SER SER ALA LEU VAL VAL LYS GLY PRO PRO GLY GLY VAL VAL ILE PRO THR THR GLY ASN HIS LEU LEU TYR SER LEU LYS CYS ASN LEU LEU ASN THR PRO THR ASN CYS SER TRP ILE PRO PRO ASN VAL LEU SER ASN SER

• Molecule 1: Sodium/nucleoside cotransporter

Chain C:



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

ASN ARG VAL GLN ASN ARG GLU HIS ASN GLY GLN VAL VAL HIS ILE THR ILE GLY GLN ASP LEU ARG LYS ASP ASP LEU THR HIS ARG LYS GLY CYS LEU E90 R91 M92 C93 G94 R95 M96 S97 D98 F99 C100 R101 E102 H103 K104 T105

T106 L107 W112 G118 H132 W180 M154 R163 F164 L165 S166 P167 Q168 R170 L171 L172 D173 S174 L195 V196 T199 A200 K201 L202 L213 R233 P234 L248 R251 T252 D260 K284 L270 S273 D274 A275 V280 F289 K293

W316 K320 F344 A403 P404 L407 K411 G433 I450 V468 K520 F523 V527 Q531 F546 D548 G549 V550 L610 F622 VAL ASP ILE ASN CYS HIS HIS ILE LEU GLU ASN ALA PHE ASN SER GLY LEU VAL ARG ASN THR THR ASN VAL

VAL SER CYS GLY LEU SER SER ALA VAL VAL LYS GLY PRO PRO GLU VAL ILE PRO THR THR ASN HIS SER LEU TYR SER LEU LYS ASN CYS ASN LEU ASN THR THR PRO THR LEU LEU ASN THR THR PHE GLN ASN VAL ASN SER SER



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C3	Depositor
Number of particles used	127798	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	60	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	3.376	Depositor
Minimum map value	-2.327	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.083	Depositor
Recommended contour level	0.3	Depositor
Map size ( $\text{\AA}$ )	276.48, 276.48, 276.48	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.08, 1.08, 1.08	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: LBN, XMO

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	0.27	0/4164	0.44	0/5672
1	B	0.27	0/4164	0.44	0/5672
1	C	0.26	0/4164	0.44	0/5672
All	All	0.27	0/12492	0.44	0/17016

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	4053	4023	4023	18	0
1	B	4053	4023	4023	21	0
1	C	4053	4023	4023	22	0
2	A	23	19	0	1	0
2	B	23	19	0	1	0
2	C	23	19	0	1	0
3	A	37	50	0	0	0
3	B	37	50	0	0	0
3	C	37	50	0	0	0
All	All	12339	12276	12069	58	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.

All (58) 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:A:801:XMO:O12	2:A:801:XMO:C11	1.68	1.24
2:C:801:XMO:C11	2:C:801:XMO:O12	1.68	1.22
2:B:801:XMO:C11	2:B:801:XMO:O12	1.68	1.16
1:B:458:VAL:HG21	1:C:450:ILE:HG12	1.88	0.55
1:A:446:ALA:HB1	1:C:458:VAL:HG12	1.89	0.53
1:C:316:TRP:O	1:C:320:LYS:HG2	2.11	0.51
1:B:316:TRP:O	1:B:320:LYS:HG2	2.11	0.51
1:A:316:TRP:O	1:A:320:LYS:HG2	2.11	0.50
1:A:450:ILE:HG12	1:C:458:VAL:HG21	1.94	0.50
1:A:270:LEU:O	1:A:273:SER:OG	2.17	0.49
1:C:289:PHE:O	1:C:293:LYS:HB2	2.14	0.48
1:B:289:PHE:O	1:B:293:LYS:HB2	2.14	0.48
1:A:289:PHE:O	1:A:293:LYS:HB2	2.14	0.47
1:C:202:LEU:HD11	1:C:251:ARG:HH22	1.79	0.47
1:C:270:LEU:O	1:C:273:SER:OG	2.17	0.47
1:A:248:LEU:O	1:A:252:THR:OG1	2.22	0.47
1:B:202:LEU:HD11	1:B:251:ARG:HH22	1.79	0.47
1:C:213:LEU:HD12	1:C:610:LEU:HD22	1.97	0.47
1:B:213:LEU:HD12	1:B:610:LEU:HD22	1.97	0.47
1:C:546:PHE:HB3	1:C:548:ASP:O	2.15	0.46
1:A:202:LEU:HD11	1:A:251:ARG:HH22	1.79	0.46
1:A:213:LEU:HD12	1:A:610:LEU:HD22	1.97	0.46
1:A:546:PHE:HB3	1:A:548:ASP:O	2.15	0.46
1:B:546:PHE:HB3	1:B:548:ASP:O	2.15	0.46
1:C:195:LEU:O	1:C:199:THR:OG1	2.31	0.45
1:C:150:TRP:O	1:C:154:MET:HG2	2.17	0.45
1:B:195:LEU:O	1:B:199:THR:OG1	2.31	0.44
1:A:458:VAL:HG21	1:B:450:ILE:HG12	2.00	0.44
1:B:248:LEU:O	1:B:252:THR:OG1	2.21	0.44
1:A:150:TRP:O	1:A:154:MET:HG2	2.17	0.44
1:B:150:TRP:O	1:B:154:MET:HG2	2.17	0.43
1:C:233:ARG:HB3	1:C:234:PRO:HD3	2.01	0.43
1:A:233:ARG:HB3	1:A:234:PRO:HD3	2.01	0.43
1:A:407:LEU:O	1:A:411:LYS:HG2	2.19	0.43
1:C:403:ALA:HB3	1:C:404:PRO:HD3	2.01	0.42
1:A:403:ALA:HB3	1:A:404:PRO:HD3	2.01	0.42
1:B:407:LEU:O	1:B:411:LYS:HG2	2.19	0.42

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:233:ARG:HB3	1:B:234:PRO:HD3	2.01	0.42
1:C:407:LEU:O	1:C:411:LYS:HG2	2.19	0.42
1:B:403:ALA:HB3	1:B:404:PRO:HD3	2.01	0.42
1:B:548:ASP:C	1:B:550:VAL:H	2.23	0.41
1:C:196:VAL:O	1:C:200:ALA:HB3	2.20	0.41
1:A:548:ASP:C	1:A:550:VAL:H	2.23	0.41
1:B:506:ASP:OD1	1:B:506:ASP:N	2.53	0.41
1:A:446:ALA:O	1:C:458:VAL:HG11	2.21	0.41
1:B:461:ILE:HG13	1:C:280:VAL:HG21	2.02	0.41
1:B:260:ASP:O	1:B:264:LYS:HG2	2.21	0.41
1:C:248:LEU:O	1:C:252:THR:OG1	2.21	0.41
1:A:196:VAL:O	1:A:200:ALA:HB3	2.20	0.41
1:C:548:ASP:C	1:C:550:VAL:H	2.23	0.41
1:B:196:VAL:O	1:B:200:ALA:HB3	2.21	0.41
1:A:520:LYS:O	1:A:523:PHE:O	2.40	0.40
1:C:520:LYS:O	1:C:523:PHE:O	2.40	0.40
1:B:527:VAL:O	1:B:531:GLN:HG2	2.21	0.40
1:B:575:LEU:HD11	1:B:597:ALA:HB1	2.03	0.40
1:C:260:ASP:O	1:C:264:LYS:HG2	2.21	0.40
1:C:527:VAL:O	1:C:531:GLN:HG2	2.21	0.40
1:B:409:ILE:HD11	1:B:610:LEU:HD11	2.03	0.40

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	531/715 (74%)	523 (98%)	8 (2%)	0	100	100
1	B	531/715 (74%)	523 (98%)	8 (2%)	0	100	100
1	C	531/715 (74%)	523 (98%)	8 (2%)	0	100	100
All	All	1593/2145 (74%)	1569 (98%)	24 (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	416/608 (68%)	415 (100%)	1 (0%)	93	98
1	B	416/608 (68%)	415 (100%)	1 (0%)	93	98
1	C	416/608 (68%)	415 (100%)	1 (0%)	93	98
All	All	1248/1824 (68%)	1245 (100%)	3 (0%)	93	98

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	344	PHE
1	B	344	PHE
1	C	344	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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

6 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
3	LBN	A	802	-	36,36,51	1.36	4 (11%)	40,41,59	0.97	2 (5%)
3	LBN	C	802	-	36,36,51	1.36	4 (11%)	40,41,59	0.97	2 (5%)
2	XMO	C	801	-	24,24,24	4.66	14 (58%)	31,34,34	1.05	2 (6%)
3	LBN	B	802	-	36,36,51	1.36	4 (11%)	40,41,59	0.97	2 (5%)
2	XMO	A	801	-	24,24,24	4.66	14 (58%)	31,34,34	1.04	2 (6%)
2	XMO	B	801	-	24,24,24	4.67	14 (58%)	31,34,34	1.04	2 (6%)

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
3	LBN	A	802	-	-	10/38/38/55	-
3	LBN	C	802	-	-	10/38/38/55	-
2	XMO	C	801	-	-	0/13/31/31	0/2/2/2
3	LBN	B	802	-	-	11/38/38/55	-
2	XMO	A	801	-	-	0/13/31/31	0/2/2/2
2	XMO	B	801	-	-	0/13/31/31	0/2/2/2

All (54) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	801	XMO	O12-C11	11.27	1.68	1.42
2	A	801	XMO	O12-C11	11.24	1.68	1.42
2	C	801	XMO	O12-C11	11.23	1.68	1.42
2	B	801	XMO	C10-C11	-7.49	1.29	1.53
2	A	801	XMO	C10-C11	-7.48	1.29	1.53
2	C	801	XMO	C10-C11	-7.48	1.29	1.53

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	801	XMO	O06-C04	7.33	1.48	1.33
2	B	801	XMO	O06-C04	7.30	1.48	1.33
2	A	801	XMO	O06-C04	7.26	1.48	1.33
2	A	801	XMO	C16-N17	7.08	1.45	1.32
2	C	801	XMO	C16-N17	7.08	1.45	1.32
2	B	801	XMO	C16-N17	7.05	1.45	1.32
2	C	801	XMO	C18-N17	6.86	1.50	1.36
2	A	801	XMO	C18-N17	6.82	1.50	1.36
2	B	801	XMO	C18-N17	6.82	1.50	1.36
2	B	801	XMO	C14-C15	6.23	1.49	1.35
2	C	801	XMO	C14-C15	6.21	1.49	1.35
2	A	801	XMO	C14-C15	6.19	1.49	1.35
2	B	801	XMO	O12-C08	-5.94	1.31	1.45
2	A	801	XMO	O12-C08	-5.93	1.31	1.45
2	C	801	XMO	O12-C08	-5.91	1.31	1.45
3	C	802	LBN	P1-O4	4.51	1.65	1.50
2	A	801	XMO	C15-C16	4.51	1.50	1.40
3	B	802	LBN	P1-O4	4.49	1.65	1.50
2	C	801	XMO	C15-C16	4.49	1.50	1.40
3	A	802	LBN	P1-O4	4.49	1.65	1.50
2	A	801	XMO	O23-C09	-4.46	1.32	1.43
2	C	801	XMO	O23-C09	-4.45	1.32	1.43
2	B	801	XMO	C15-C16	4.45	1.50	1.40
2	B	801	XMO	O23-C09	-4.43	1.32	1.43
2	B	801	XMO	C18-N13	4.30	1.49	1.40
2	A	801	XMO	C18-N13	4.29	1.49	1.40
2	C	801	XMO	C18-N13	4.28	1.49	1.40
2	B	801	XMO	C16-N20	3.74	1.44	1.35
2	A	801	XMO	C16-N20	3.73	1.44	1.35
2	C	801	XMO	C16-N20	3.68	1.44	1.35
2	B	801	XMO	O19-C18	-3.66	1.16	1.23
2	A	801	XMO	O19-C18	-3.63	1.17	1.23
2	C	801	XMO	O19-C18	-3.63	1.17	1.23
2	B	801	XMO	C14-N13	3.46	1.46	1.38
2	A	801	XMO	C14-N13	3.43	1.46	1.38
2	C	801	XMO	C14-N13	3.43	1.46	1.38
3	C	802	LBN	O7-C34	3.18	1.43	1.34
3	A	802	LBN	O7-C34	3.16	1.43	1.34
3	B	802	LBN	O7-C34	3.16	1.43	1.34
3	A	802	LBN	O5-C25	2.70	1.41	1.33
3	C	802	LBN	O5-C25	2.70	1.41	1.33
3	B	802	LBN	O5-C25	2.68	1.41	1.33

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	801	XMO	C09-C10	2.47	1.60	1.53
2	C	801	XMO	C09-C10	2.43	1.60	1.53
2	B	801	XMO	C09-C10	2.42	1.60	1.53
3	A	802	LBN	P1-O1	2.21	1.67	1.60
3	B	802	LBN	P1-O1	2.18	1.67	1.60
3	C	802	LBN	P1-O1	2.18	1.67	1.60

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	802	LBN	O7-C34-C35	3.63	119.33	111.50
3	A	802	LBN	O7-C34-C35	3.63	119.31	111.50
3	C	802	LBN	O7-C34-C35	3.61	119.28	111.50
3	C	802	LBN	O5-C25-C26	2.56	119.94	111.91
3	A	802	LBN	O5-C25-C26	2.55	119.92	111.91
3	B	802	LBN	O5-C25-C26	2.55	119.91	111.91
2	B	801	XMO	C09-C10-C11	2.52	106.20	101.43
2	A	801	XMO	C09-C10-C11	2.49	106.15	101.43
2	C	801	XMO	C09-C10-C11	2.49	106.15	101.43
2	C	801	XMO	C14-C15-C16	2.27	119.73	116.96
2	B	801	XMO	C14-C15-C16	2.25	119.72	116.96
2	A	801	XMO	C14-C15-C16	2.23	119.69	116.96

There are no chirality outliers.

All (31) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	802	LBN	O8-C34-O7-C2
3	B	802	LBN	O8-C34-O7-C2
3	C	802	LBN	O8-C34-O7-C2
3	A	802	LBN	C35-C34-O7-C2
3	B	802	LBN	C35-C34-O7-C2
3	C	802	LBN	C35-C34-O7-C2
3	A	802	LBN	C26-C25-O5-C3
3	B	802	LBN	C26-C25-O5-C3
3	C	802	LBN	C26-C25-O5-C3
3	A	802	LBN	O6-C25-O5-C3
3	B	802	LBN	O6-C25-O5-C3
3	C	802	LBN	O6-C25-O5-C3
3	A	802	LBN	C11-C14-C17-C20
3	A	802	LBN	C14-C11-C8-C5
3	B	802	LBN	C14-C11-C8-C5

*Continued on next page...*



*Continued from previous page...*

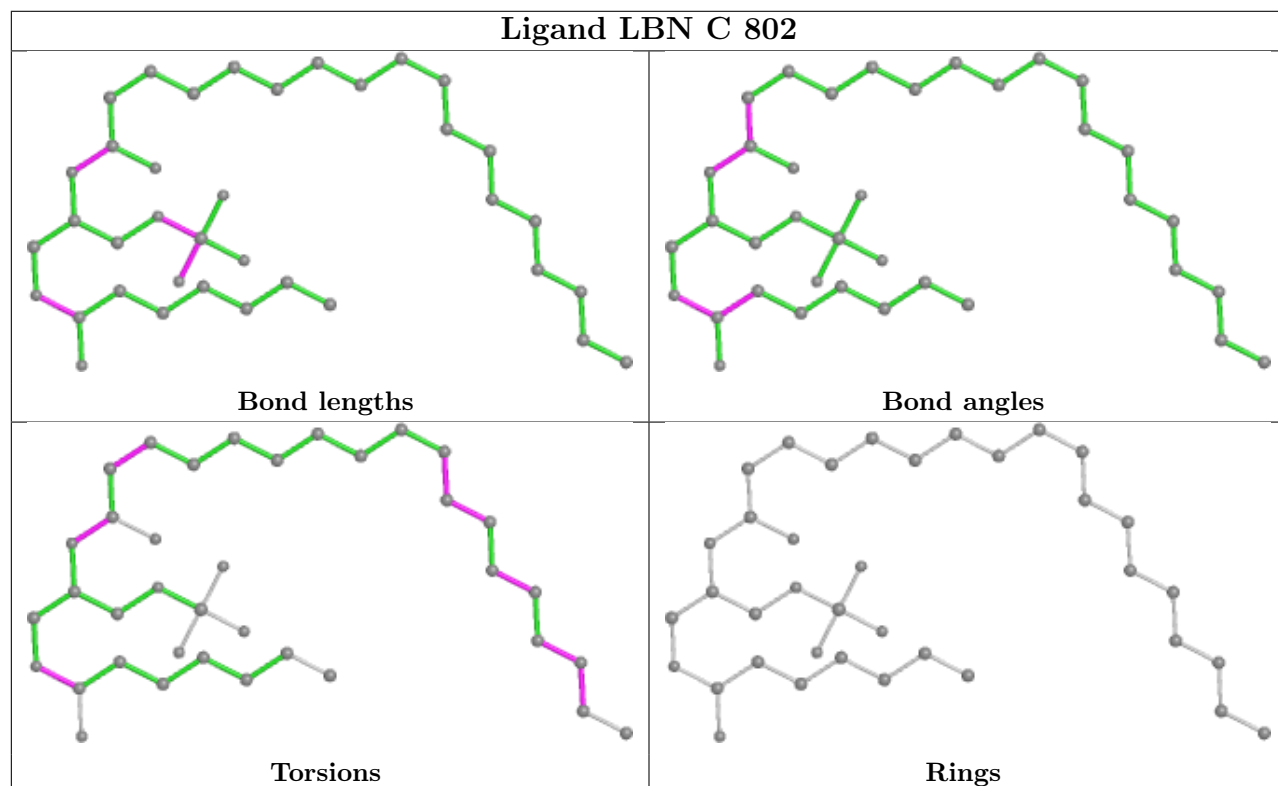
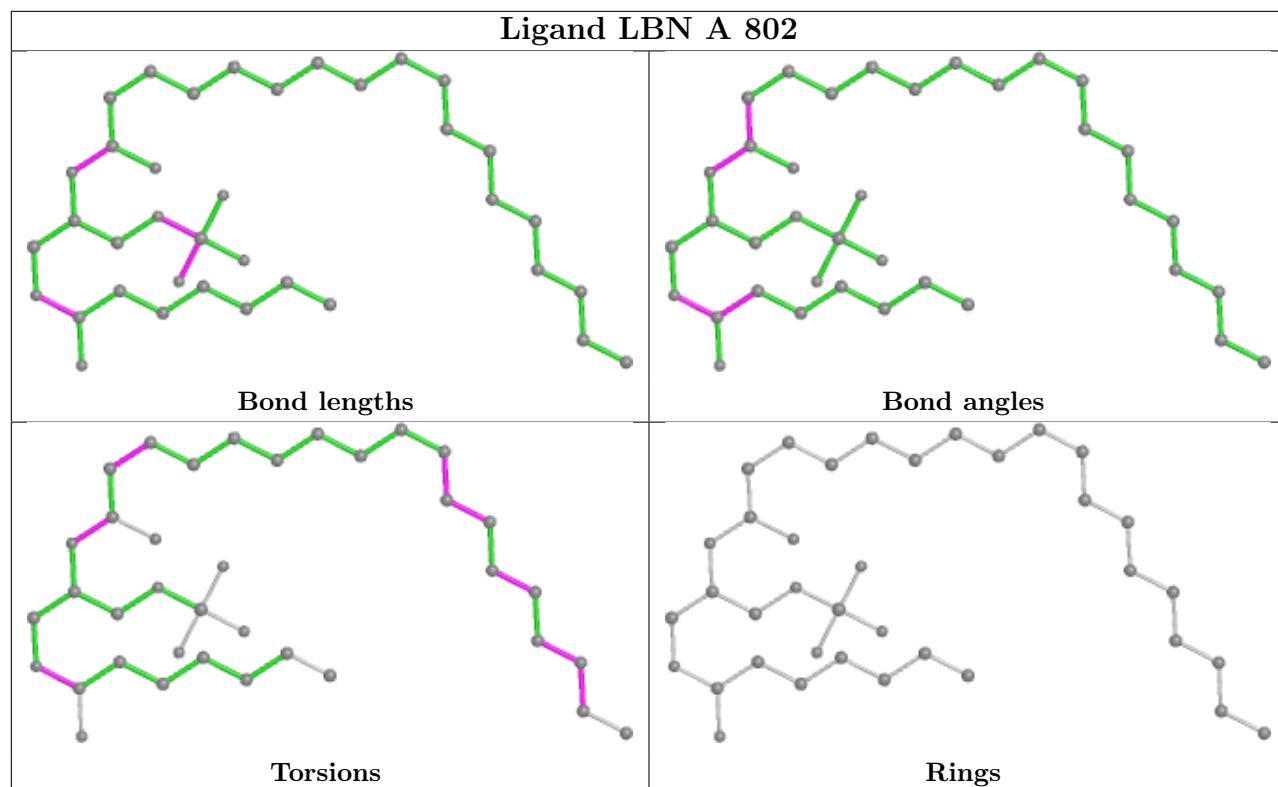
Mol	Chain	Res	Type	Atoms
3	C	802	LBN	C14-C11-C8-C5
3	B	802	LBN	C11-C14-C17-C20
3	C	802	LBN	C11-C14-C17-C20
3	A	802	LBN	C34-C35-C36-C37
3	B	802	LBN	C34-C35-C36-C37
3	C	802	LBN	C34-C35-C36-C37
3	A	802	LBN	C20-C22-C23-C24
3	B	802	LBN	C20-C22-C23-C24
3	C	802	LBN	C20-C22-C23-C24
3	B	802	LBN	C17-C20-C22-C23
3	C	802	LBN	C17-C20-C22-C23
3	A	802	LBN	C17-C20-C22-C23
3	A	802	LBN	C42-C5-C8-C11
3	B	802	LBN	C42-C5-C8-C11
3	C	802	LBN	C42-C5-C8-C11
3	B	802	LBN	C27-C28-C29-C30

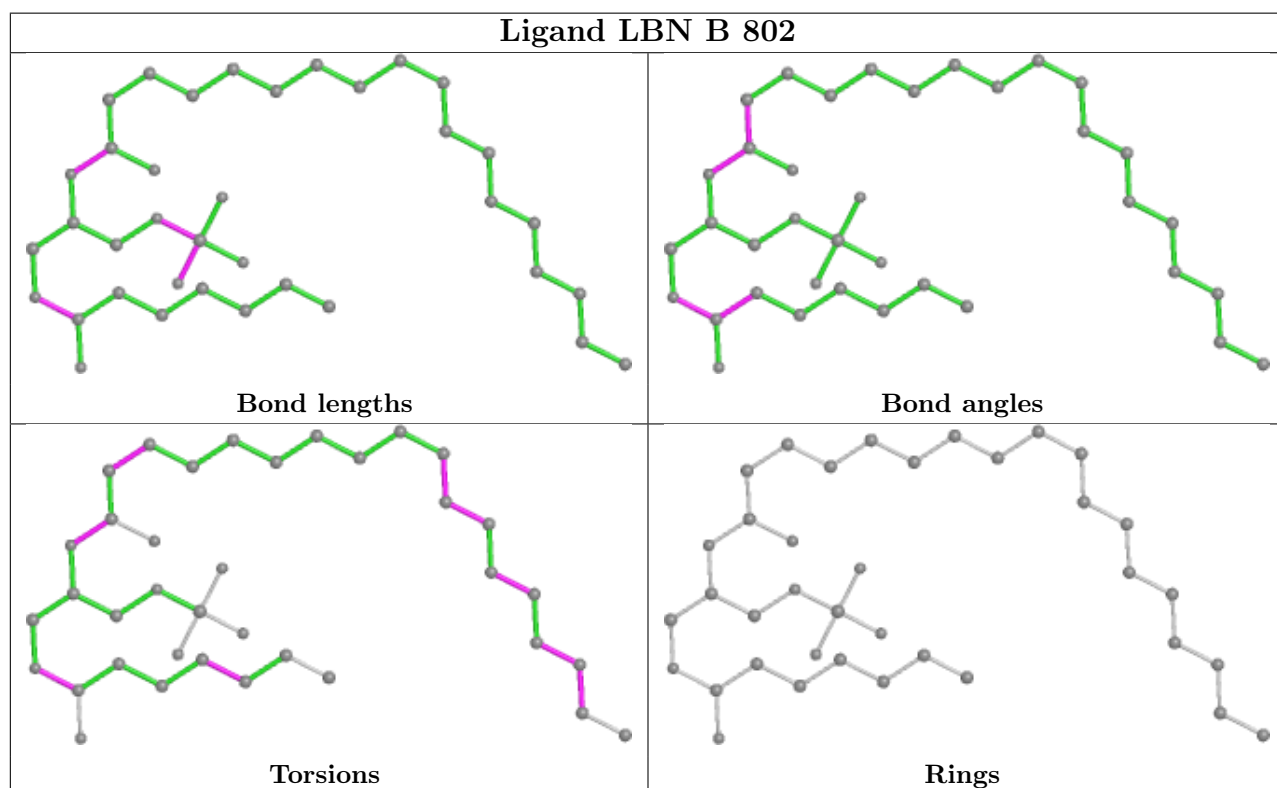
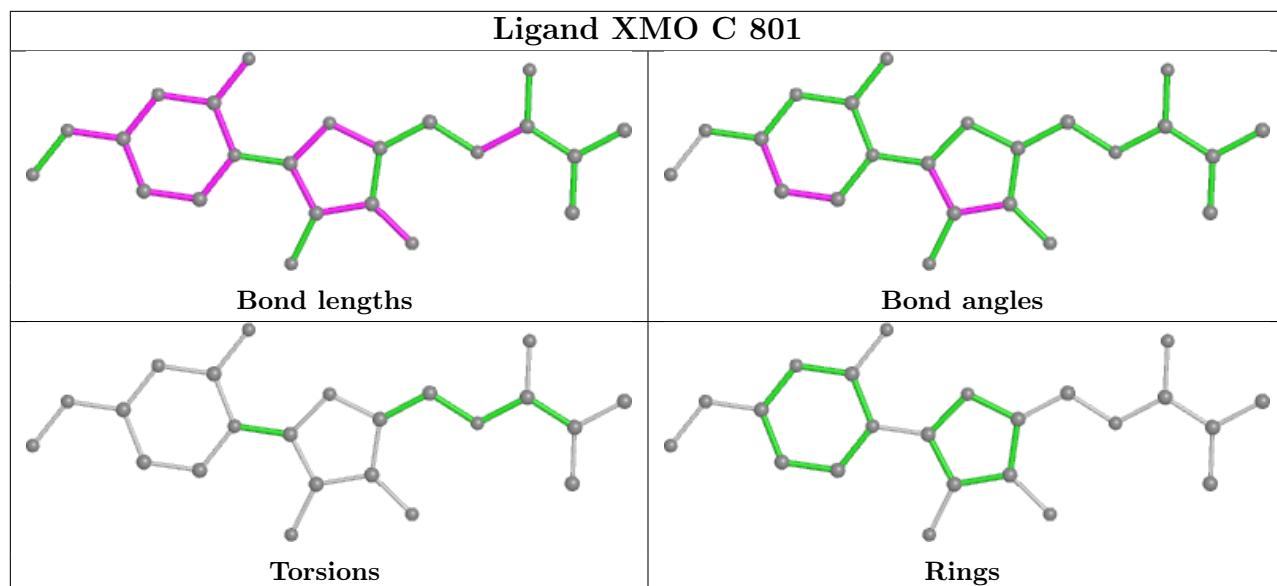
There are no ring outliers.

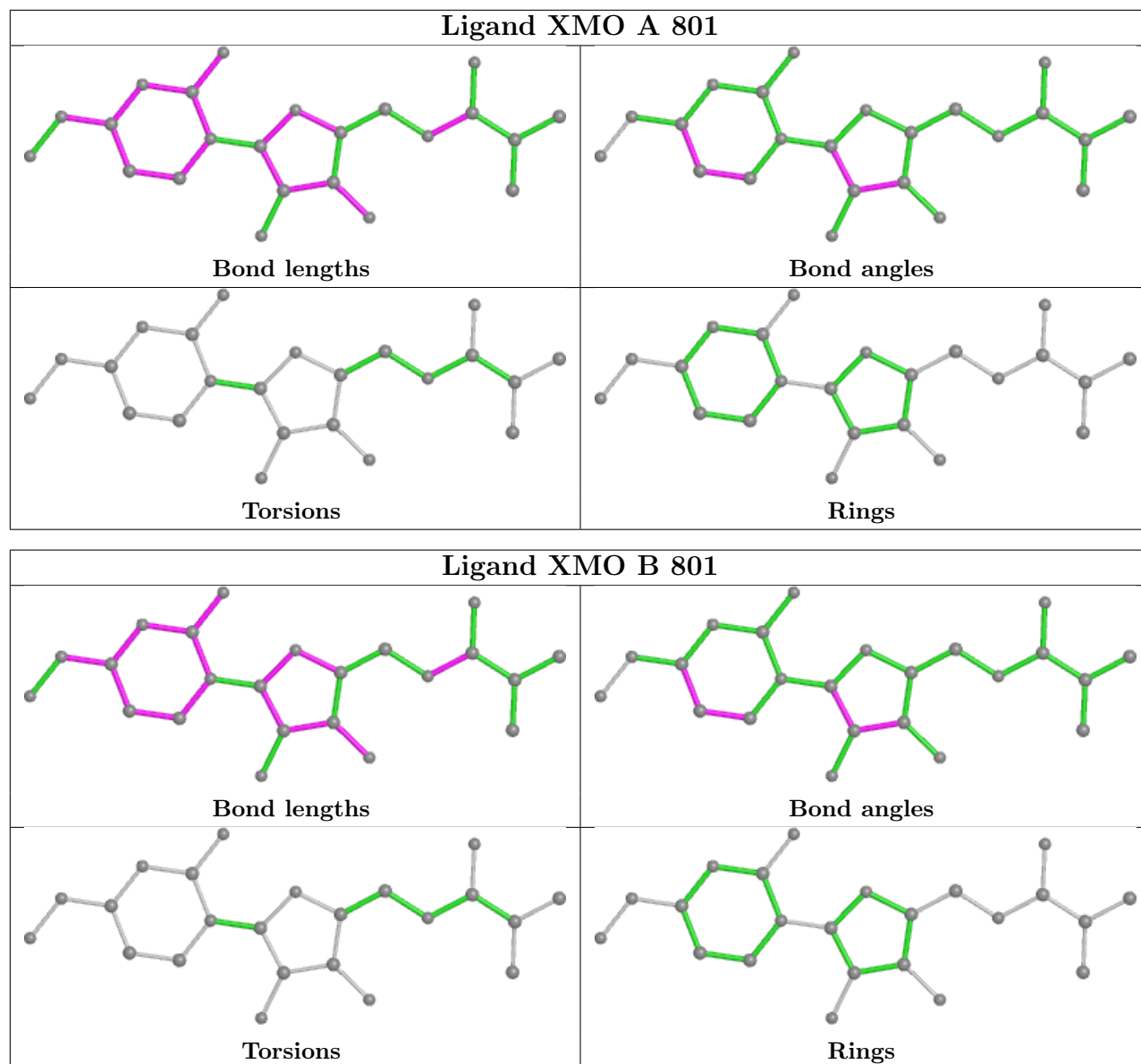
3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	801	XMO	1	0
2	A	801	XMO	1	0
2	B	801	XMO	1	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 than 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.







## 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.

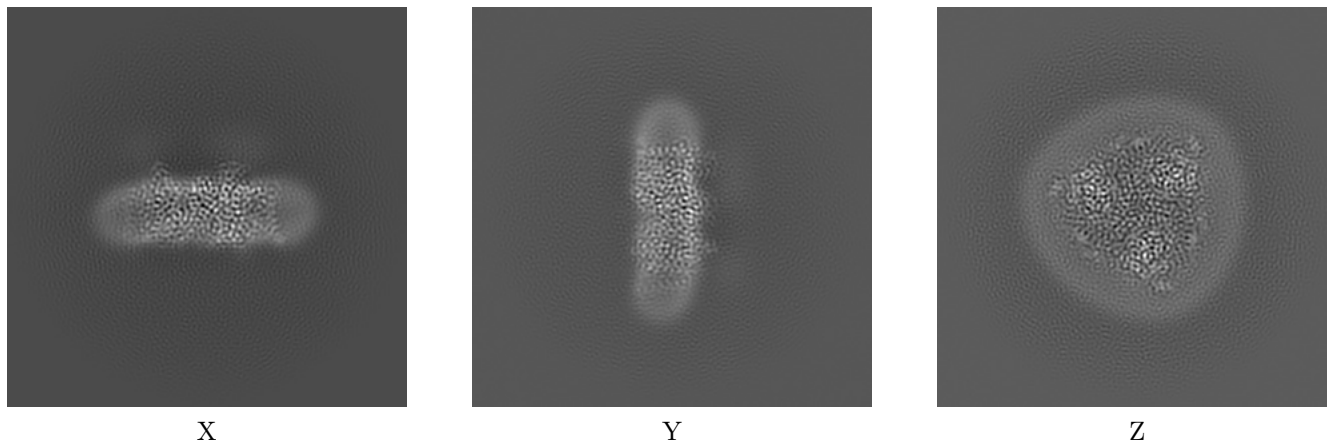
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-41736. These allow visual inspection of the internal detail of the map and identification of artifacts.

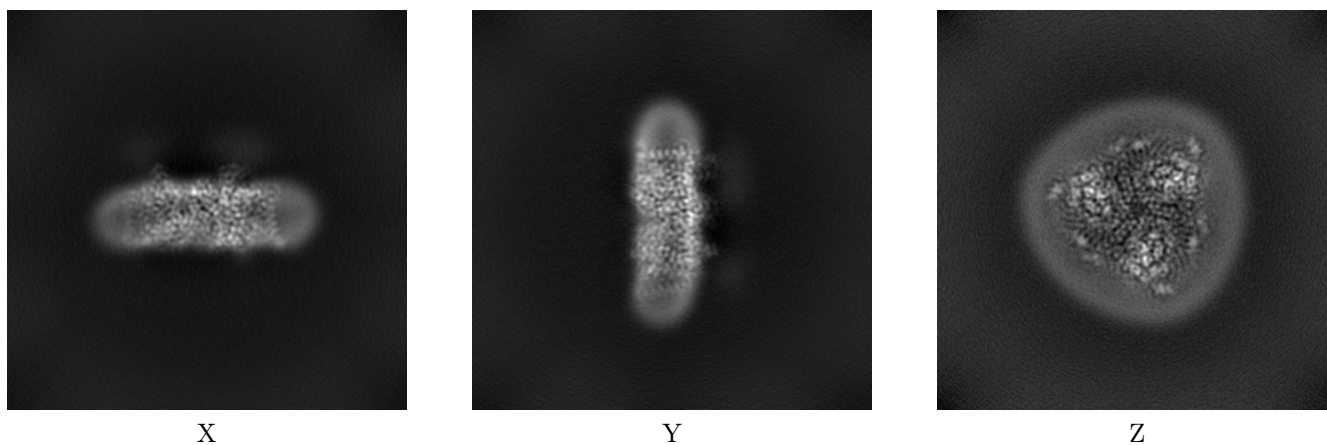
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

#### 6.1.1 Primary map



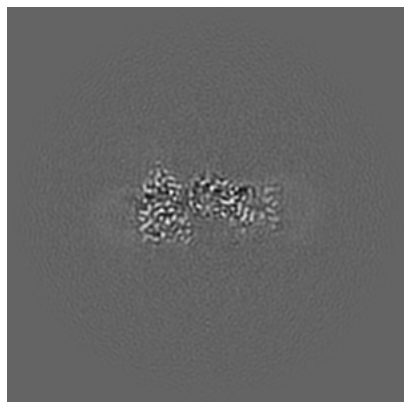
#### 6.1.2 Raw map



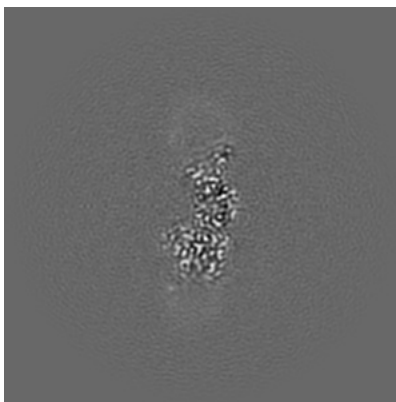
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

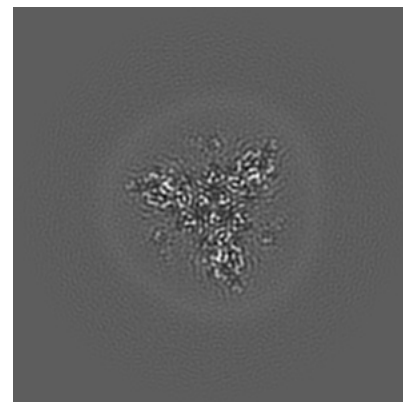
### 6.2.1 Primary map



X Index: 128

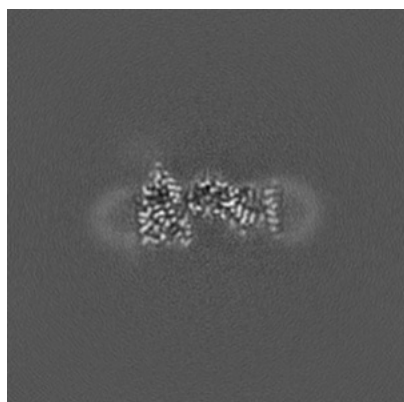


Y Index: 128

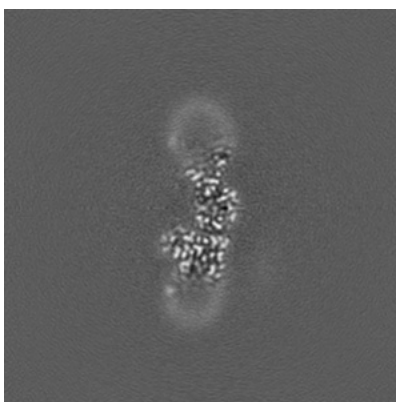


Z Index: 128

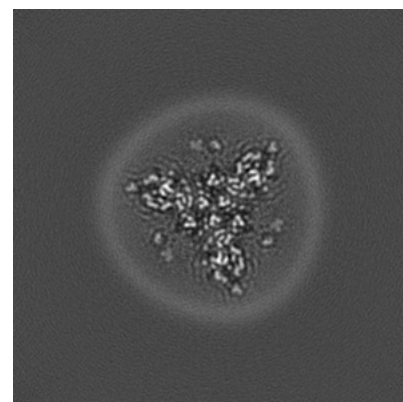
### 6.2.2 Raw map



X Index: 128



Y Index: 128

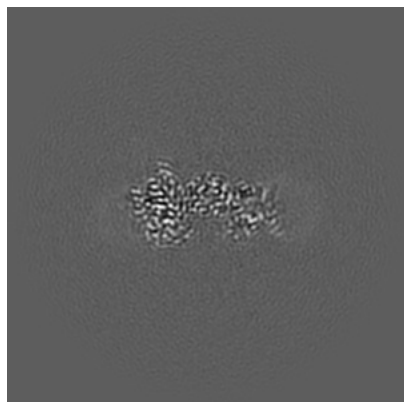


Z Index: 128

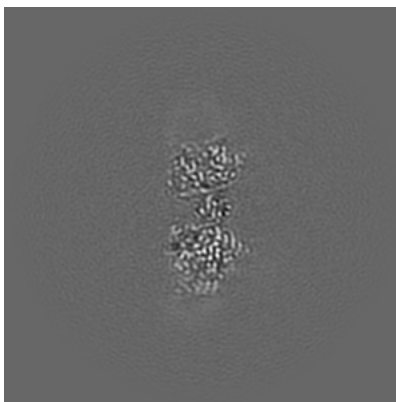
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

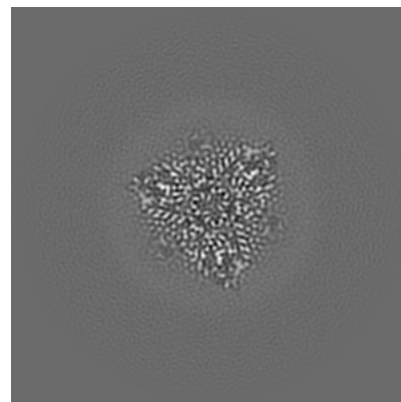
### 6.3.1 Primary map



X Index: 132

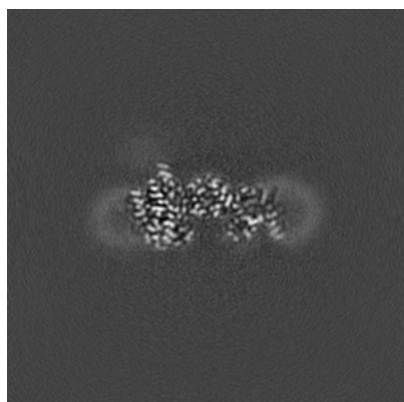


Y Index: 140

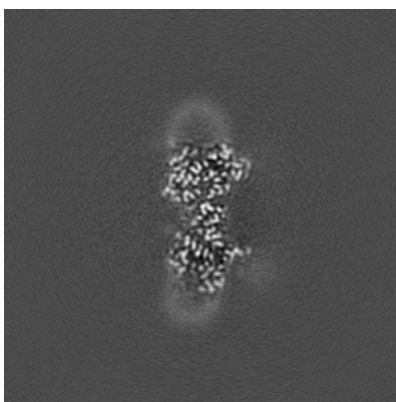


Z Index: 136

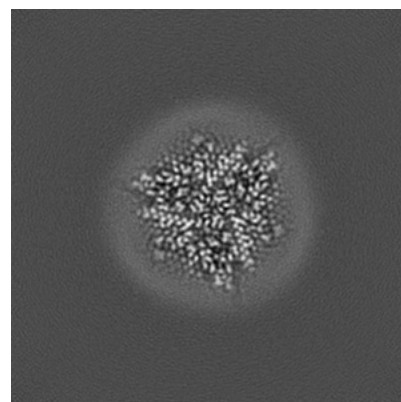
### 6.3.2 Raw map



X Index: 132



Y Index: 144

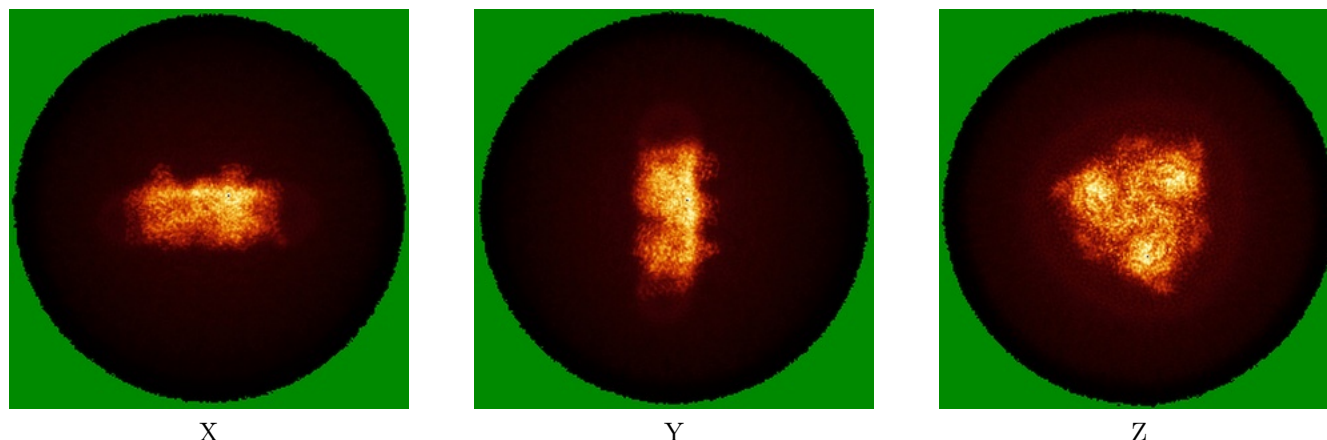


Z Index: 138

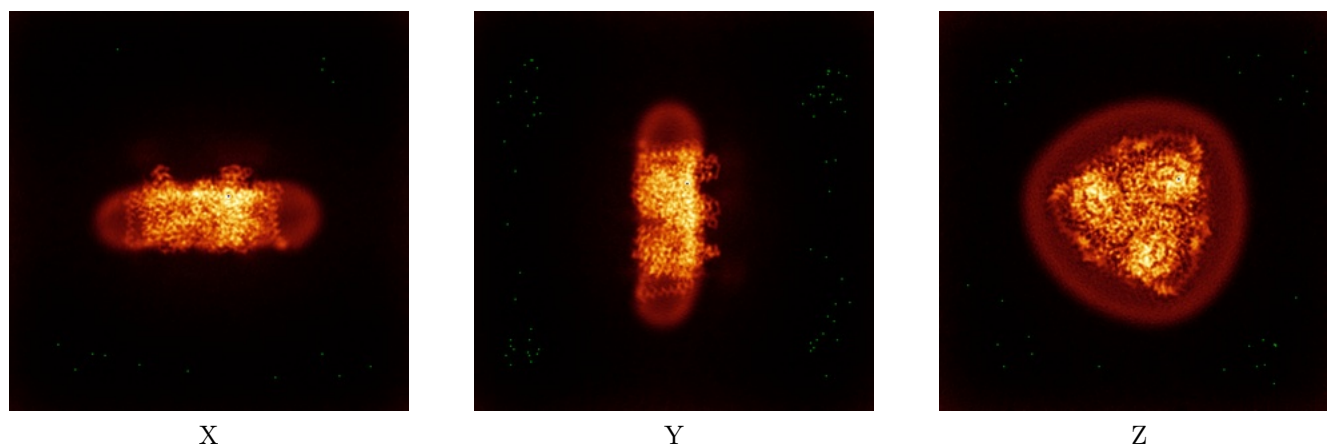
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

### 6.4.1 Primary map



### 6.4.2 Raw map

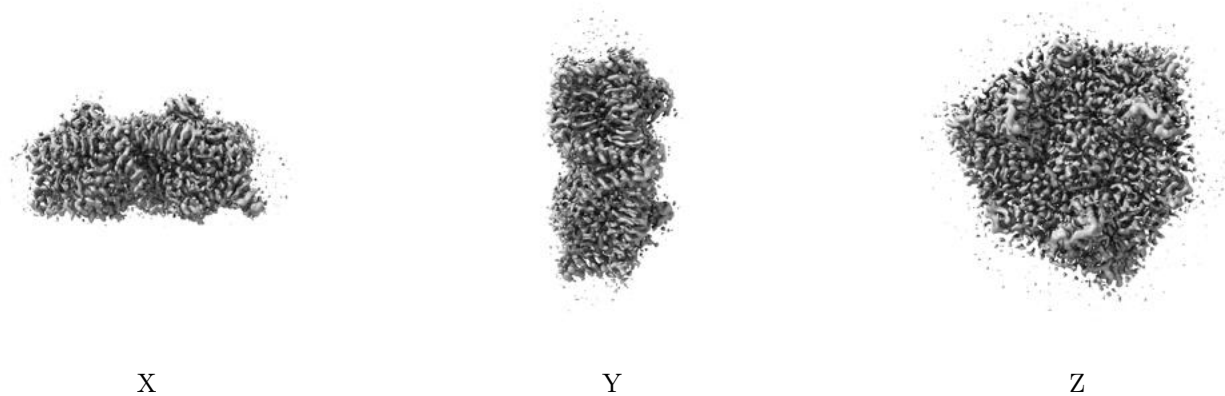


The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.



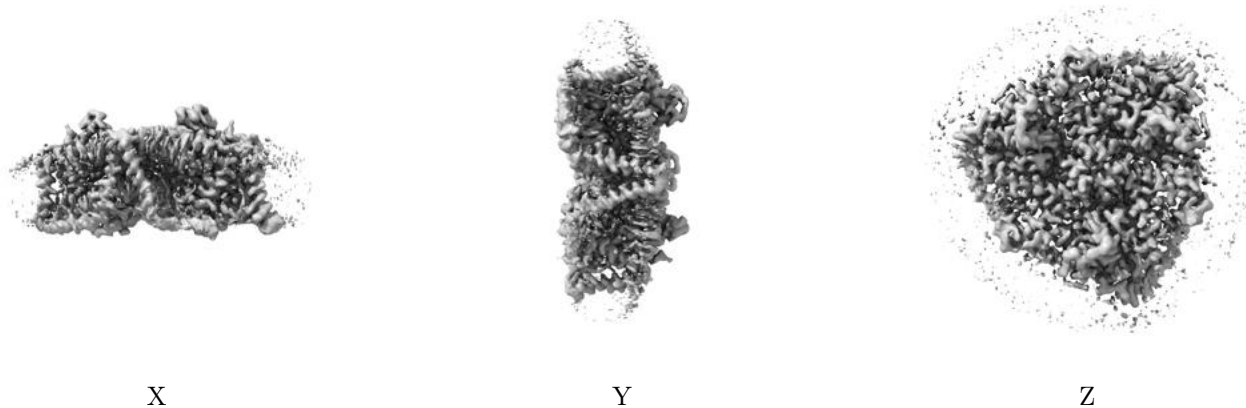
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.3. 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



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.

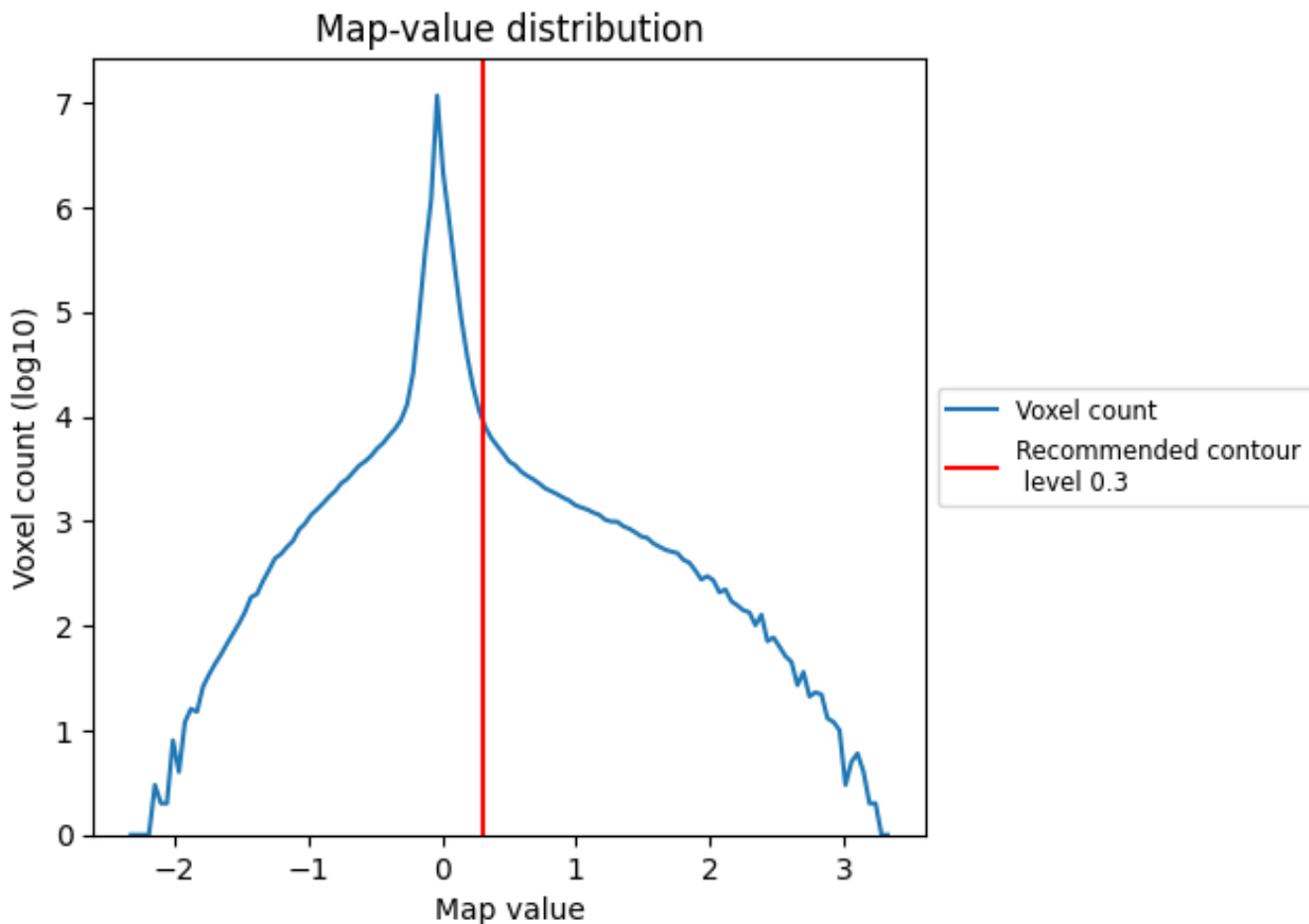
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

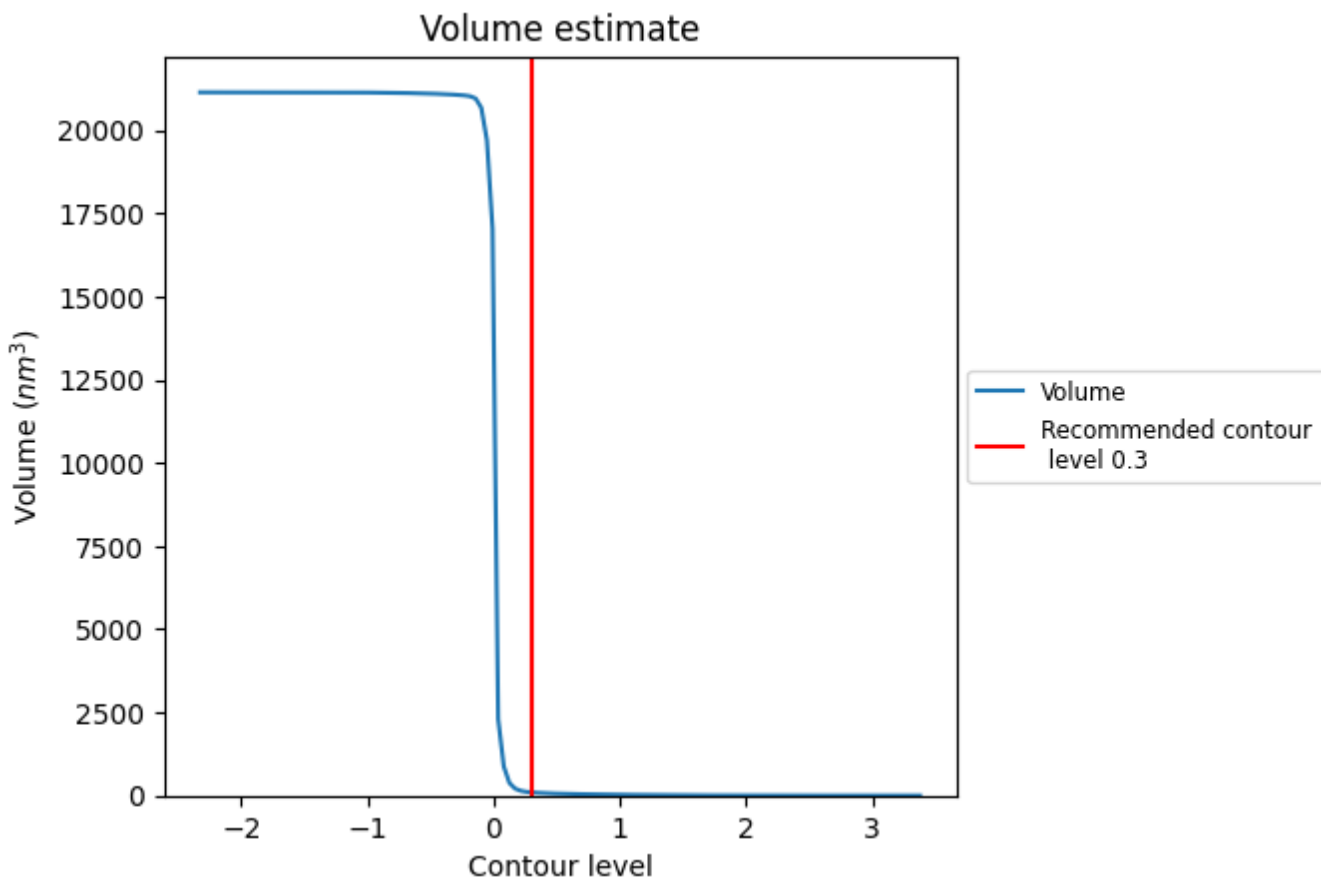
This section contains the results of statistical analysis of the map.

### 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.

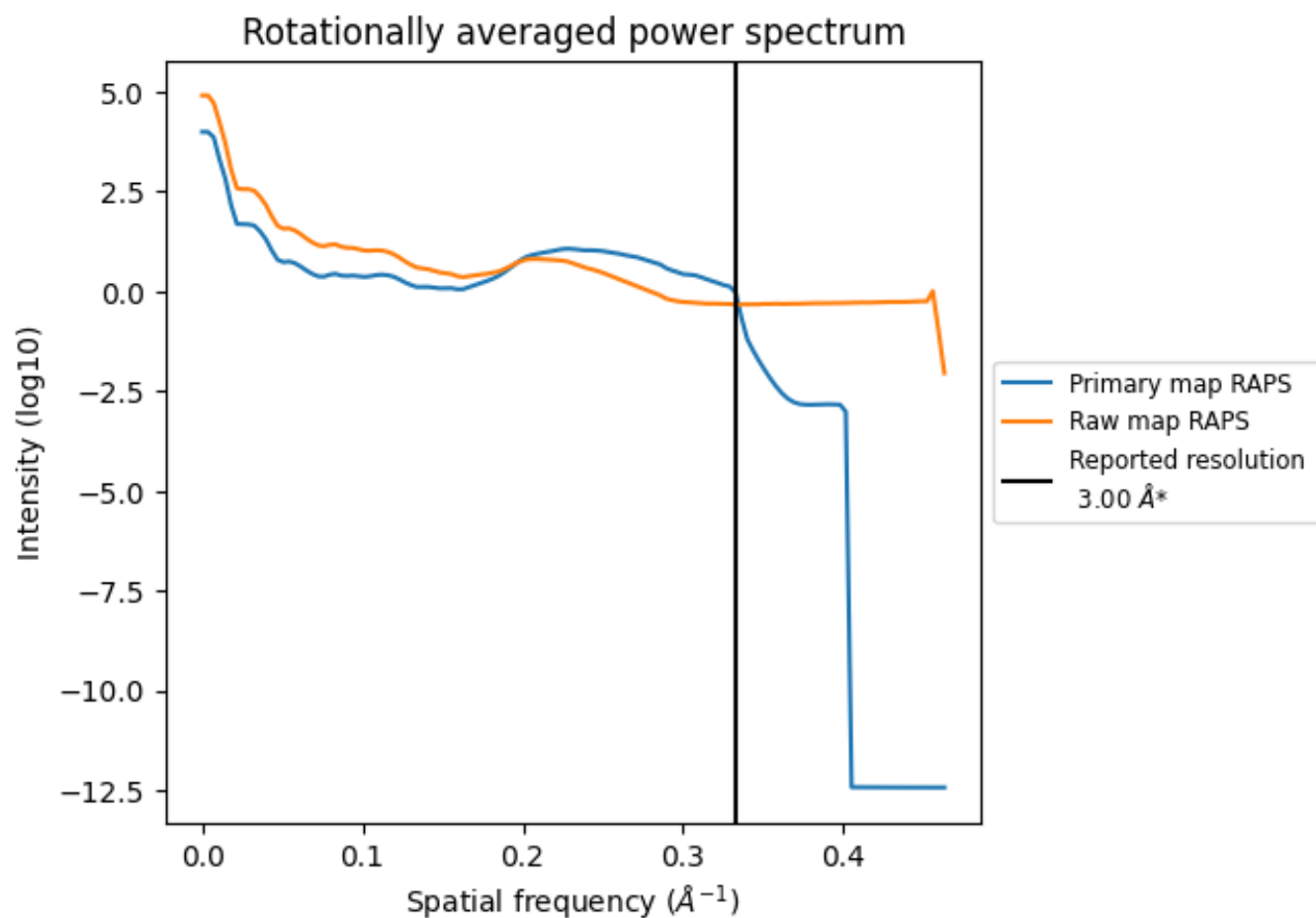
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 95 nm<sup>3</sup>; this corresponds to an approximate mass of 86 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

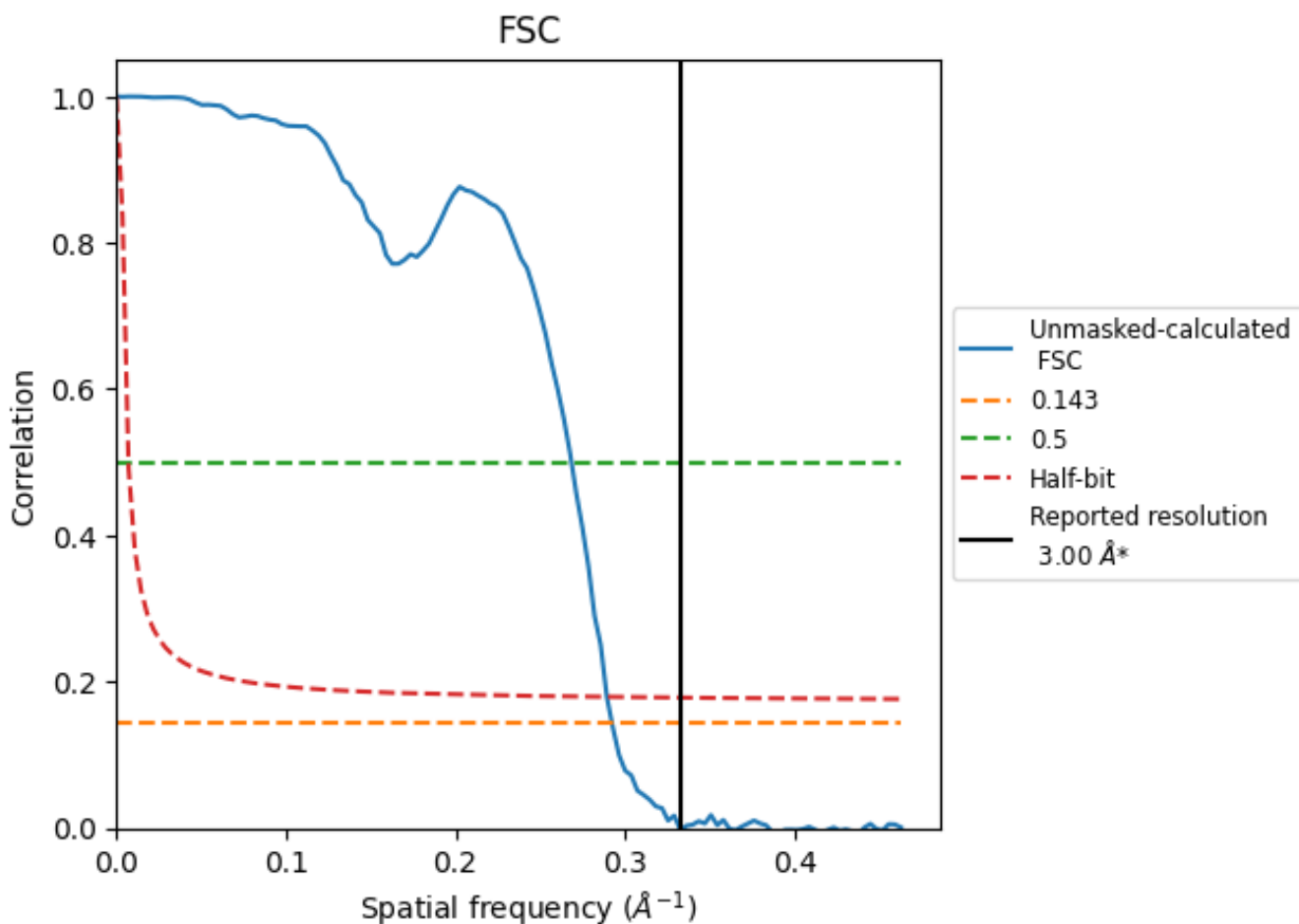


\*Reported resolution corresponds to spatial frequency of  $0.333 \text{ \AA}^{-1}$

## 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 0.333  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

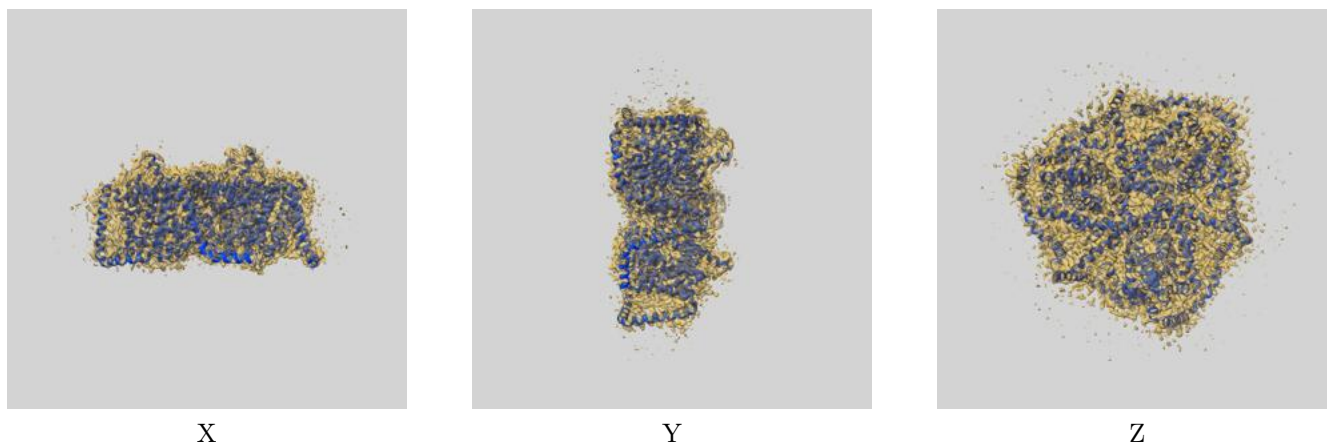
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.00	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.42	3.73	3.46

\*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 3.42 differs from the reported value 3.0 by more than 10 %

## 9 Map-model fit [i](#)

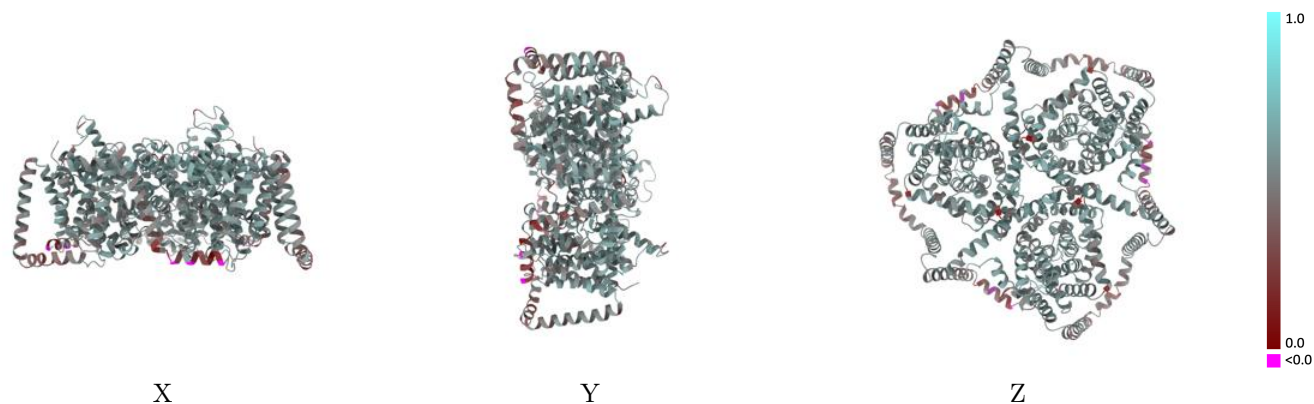
This section contains information regarding the fit between EMDB map EMD-41736 and PDB model 8TZ7. Per-residue inclusion information can be found in section 3 on page 7.

### 9.1 Map-model overlay [i](#)



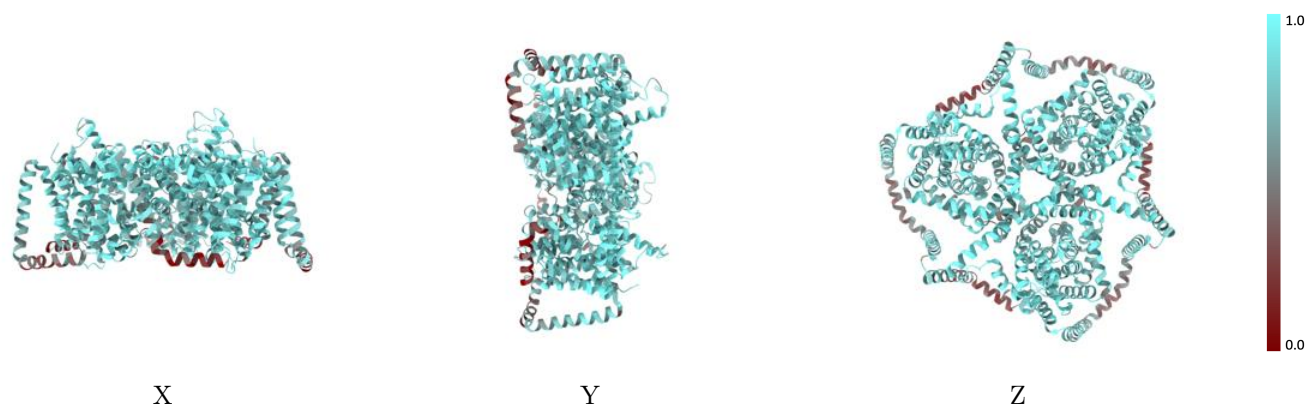
The images above show the 3D surface view of the map at the recommended contour level 0.3 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to 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.

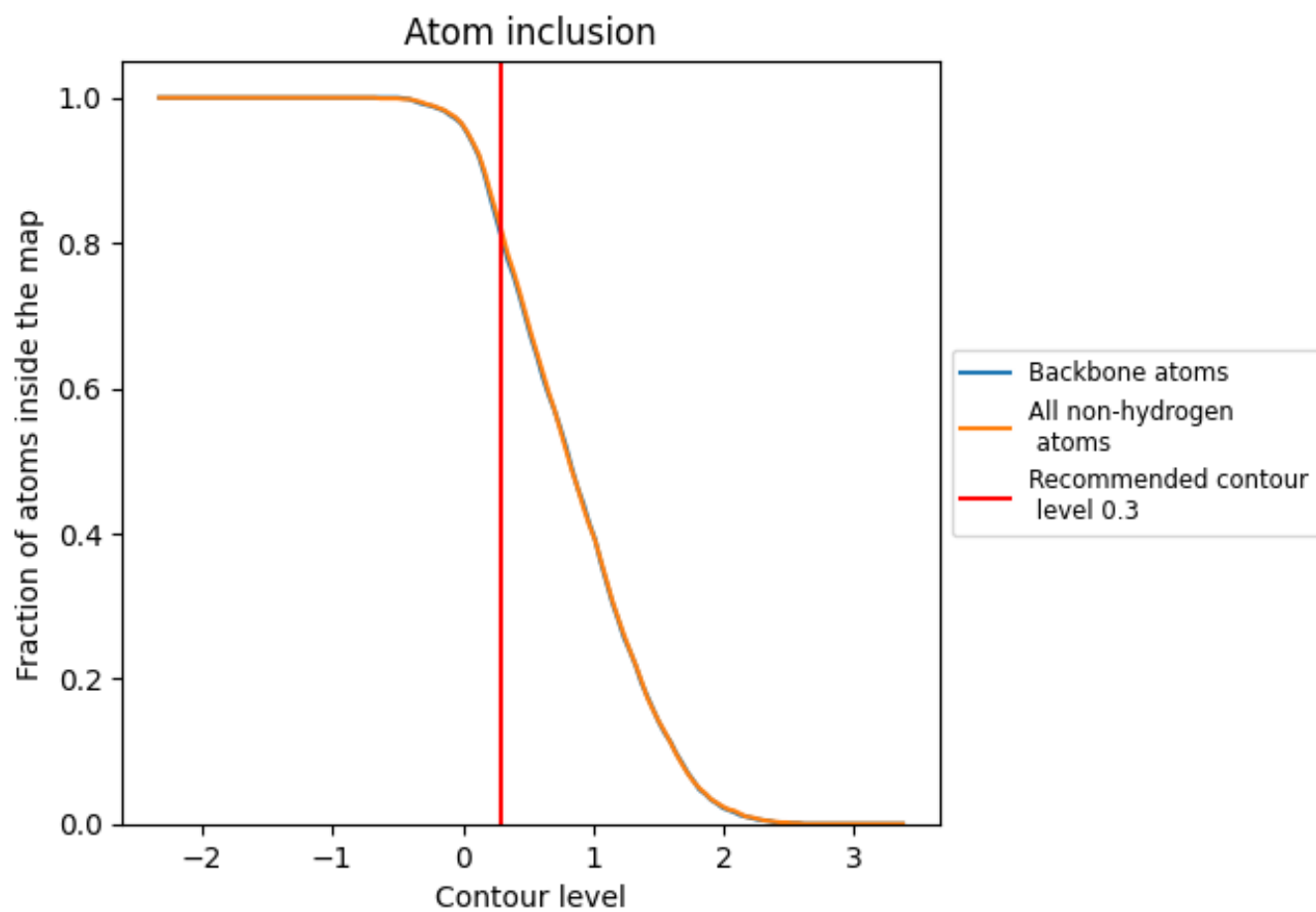
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.3).











## 9.4 Atom inclusion [i](#)



At the recommended contour level, 80% of all backbone atoms, 82% 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 (0.3) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8150	 0.5300
A	 0.8210	 0.5320
B	 0.8220	 0.5310
C	 0.8170	 0.5270

