WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

May 4, 2024 – 12:40 PM EDT

PDB ID	:	8T3L
EMDB ID	:	EMD-41005
Title	:	TRPV1 in nanodisc bound with 2 LPA molecules in neighboring monomers
Authors	:	Arnold, W.R.; Julius, D.; Cheng, Y.
Deposited on	:	2023-06-07
Resolution	:	3.60 Å(reported)

This is a Full wwPDB EM Validation 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.dev92
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)	:	2.36.2

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.60 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
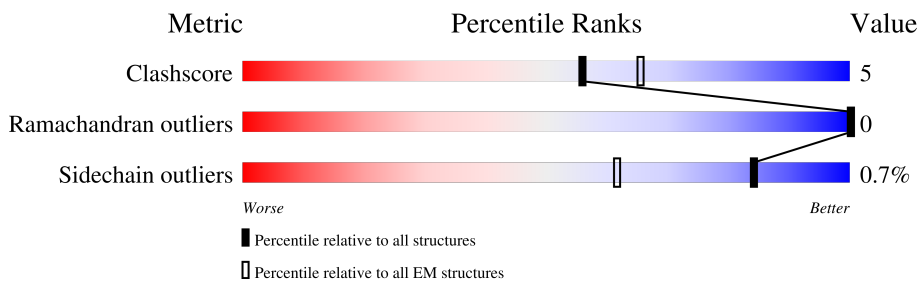
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	637	42% 5% 52%
1	B	637	38% 8% 54%
1	C	637	40% 6% 54%
1	D	637	43% 5% 52%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	8IJ	A	801	X	-	-	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	NKN	C	801	X	-	-	-

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 20296 atoms, of which 10230 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 Transient receptor potential cation channel subfamily V member 1.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	303	Total	C	H	N	O	S	0	0
			5059	1674	2548	385	434	18		
1	D	305	Total	C	H	N	O	S	0	0
			5078	1680	2555	387	438	18		
1	B	294	Total	C	H	N	O	S	0	0
			4899	1626	2461	373	421	18		
1	C	295	Total	C	H	N	O	S	0	0
			4944	1639	2492	377	420	16		

There are 112 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	105	GLY	-	expression tag	UNP O35433
A	106	ALA	-	expression tag	UNP O35433
A	107	MET	-	expression tag	UNP O35433
A	108	GLY	-	expression tag	UNP O35433
A	109	SER	-	expression tag	UNP O35433
A	?	-	ASN	deletion	UNP O35433
A	?	-	ASN	deletion	UNP O35433
A	?	-	SER	deletion	UNP O35433
A	?	-	LEU	deletion	UNP O35433
A	?	-	PRO	deletion	UNP O35433
A	?	-	MET	deletion	UNP O35433
A	?	-	GLU	deletion	UNP O35433
A	?	-	SER	deletion	UNP O35433
A	?	-	THR	deletion	UNP O35433
A	?	-	PRO	deletion	UNP O35433
A	?	-	HIS	deletion	UNP O35433
A	?	-	LYS	deletion	UNP O35433
A	?	-	CYS	deletion	UNP O35433
A	?	-	ARG	deletion	UNP O35433
A	?	-	GLY	deletion	UNP O35433
A	?	-	SER	deletion	UNP O35433

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	ALA	deletion	UNP O35433
A	?	-	CYS	deletion	UNP O35433
A	?	-	LYS	deletion	UNP O35433
A	?	-	PRO	deletion	UNP O35433
A	?	-	GLY	deletion	UNP O35433
A	?	-	ASN	deletion	UNP O35433
A	?	-	SER	deletion	UNP O35433
D	105	GLY	-	expression tag	UNP O35433
D	106	ALA	-	expression tag	UNP O35433
D	107	MET	-	expression tag	UNP O35433
D	108	GLY	-	expression tag	UNP O35433
D	109	SER	-	expression tag	UNP O35433
D	?	-	ASN	deletion	UNP O35433
D	?	-	ASN	deletion	UNP O35433
D	?	-	SER	deletion	UNP O35433
D	?	-	LEU	deletion	UNP O35433
D	?	-	PRO	deletion	UNP O35433
D	?	-	MET	deletion	UNP O35433
D	?	-	GLU	deletion	UNP O35433
D	?	-	SER	deletion	UNP O35433
D	?	-	THR	deletion	UNP O35433
D	?	-	PRO	deletion	UNP O35433
D	?	-	HIS	deletion	UNP O35433
D	?	-	LYS	deletion	UNP O35433
D	?	-	CYS	deletion	UNP O35433
D	?	-	ARG	deletion	UNP O35433
D	?	-	GLY	deletion	UNP O35433
D	?	-	SER	deletion	UNP O35433
D	?	-	ALA	deletion	UNP O35433
D	?	-	CYS	deletion	UNP O35433
D	?	-	LYS	deletion	UNP O35433
D	?	-	PRO	deletion	UNP O35433
D	?	-	GLY	deletion	UNP O35433
D	?	-	ASN	deletion	UNP O35433
D	?	-	SER	deletion	UNP O35433
B	105	GLY	-	expression tag	UNP O35433
B	106	ALA	-	expression tag	UNP O35433
B	107	MET	-	expression tag	UNP O35433
B	108	GLY	-	expression tag	UNP O35433
B	109	SER	-	expression tag	UNP O35433
B	?	-	ASN	deletion	UNP O35433
B	?	-	ASN	deletion	UNP O35433

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	?	-	SER	deletion	UNP O35433
B	?	-	LEU	deletion	UNP O35433
B	?	-	PRO	deletion	UNP O35433
B	?	-	MET	deletion	UNP O35433
B	?	-	GLU	deletion	UNP O35433
B	?	-	SER	deletion	UNP O35433
B	?	-	THR	deletion	UNP O35433
B	?	-	PRO	deletion	UNP O35433
B	?	-	HIS	deletion	UNP O35433
B	?	-	LYS	deletion	UNP O35433
B	?	-	CYS	deletion	UNP O35433
B	?	-	ARG	deletion	UNP O35433
B	?	-	GLY	deletion	UNP O35433
B	?	-	SER	deletion	UNP O35433
B	?	-	ALA	deletion	UNP O35433
B	?	-	CYS	deletion	UNP O35433
B	?	-	LYS	deletion	UNP O35433
B	?	-	PRO	deletion	UNP O35433
B	?	-	GLY	deletion	UNP O35433
B	?	-	ASN	deletion	UNP O35433
B	?	-	SER	deletion	UNP O35433
C	105	GLY	-	expression tag	UNP O35433
C	106	ALA	-	expression tag	UNP O35433
C	107	MET	-	expression tag	UNP O35433
C	108	GLY	-	expression tag	UNP O35433
C	109	SER	-	expression tag	UNP O35433
C	?	-	ASN	deletion	UNP O35433
C	?	-	ASN	deletion	UNP O35433
C	?	-	SER	deletion	UNP O35433
C	?	-	LEU	deletion	UNP O35433
C	?	-	PRO	deletion	UNP O35433
C	?	-	MET	deletion	UNP O35433
C	?	-	GLU	deletion	UNP O35433
C	?	-	SER	deletion	UNP O35433
C	?	-	THR	deletion	UNP O35433
C	?	-	PRO	deletion	UNP O35433
C	?	-	HIS	deletion	UNP O35433
C	?	-	LYS	deletion	UNP O35433
C	?	-	CYS	deletion	UNP O35433
C	?	-	ARG	deletion	UNP O35433
C	?	-	GLY	deletion	UNP O35433
C	?	-	SER	deletion	UNP O35433

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	?	-	ALA	deletion	UNP O35433
C	?	-	CYS	deletion	UNP O35433
C	?	-	LYS	deletion	UNP O35433
C	?	-	PRO	deletion	UNP O35433
C	?	-	GLY	deletion	UNP O35433
C	?	-	ASN	deletion	UNP O35433
C	?	-	SER	deletion	UNP O35433

- Molecule 2 is (2R)-3-{[(R)-hydroxy{[(1S,2R,3R,4S,5S,6R)-2,3,4,5,6-pentahydroxycyclohex yl]oxy}phosphoryl]oxy}propane-1,2-diyl dioctadecanoate (three-letter code: 8IJ) (formula: $C_{45}H_{87}O_{13}P$) (labeled as "Ligand of Interest" by depositor).

8IJ
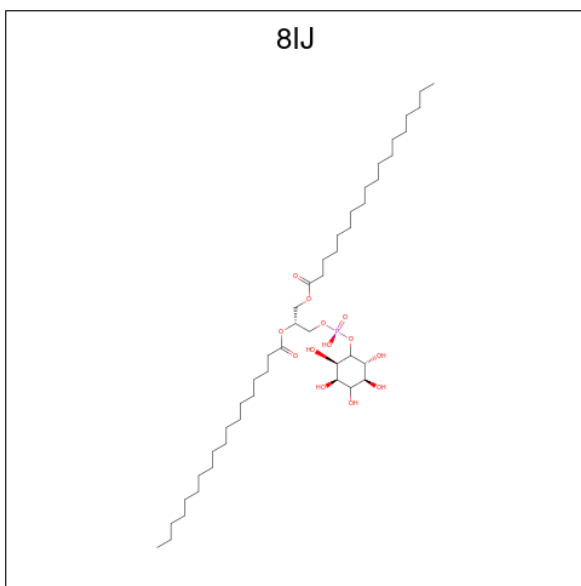
Mol	Chain	Residues	Atoms					AltConf
2	A	1	Total	C	H	O	P	0
			101	31	56	13	1	
2	D	1	Total	C	H	O	P	0
			101	31	56	13	1	

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

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

- Molecule 4 is (2R)-2-hydroxy-3-(phosphonooxy)propyl tetradecanoate (three-letter code: NKN) (formula: $C_{17}H_{35}O_7P$) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms					AltConf
4	B	1	Total	C	H	O	P	0
			56	17	31	7	1	
4	C	1	Total	C	H	O	P	0
			56	17	31	7	1	

3 Residue-property plots ⓘ

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: Transient receptor potential cation channel subfamily V member 1

• Molecule 1: Transient receptor potential cation channel subfamily V member 1

• Molecule 1: Transient receptor potential cation channel subfamily V member 1

Chain B:

38%   8%   54%
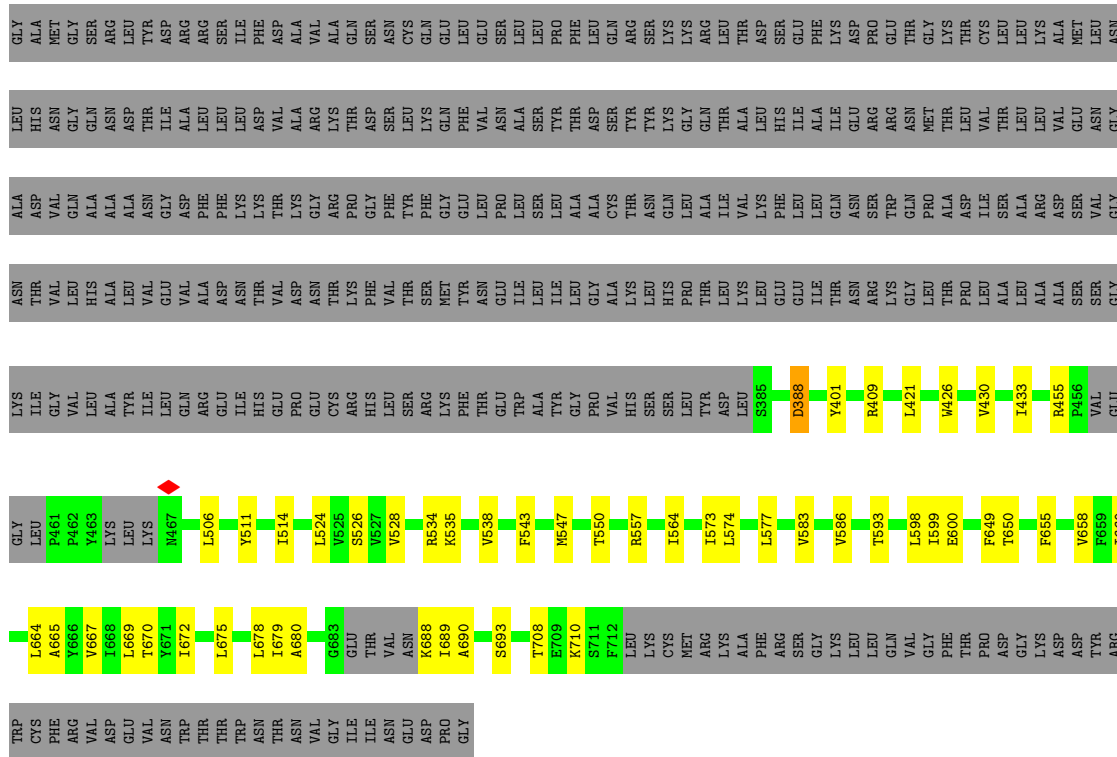
• Molecule 1: Transient receptor potential cation channel subfamily V member 1

Chain C:

40%   6%   54%

LYS ILE GLY VAL LEU ALA TYR ILE LEU GLN ARG GLU ILE HIS GLU PRO GLU CYS ARG HIS LEU SER ARG LYS PHE THR GLU TRP ALA TYR GLY PRO VAL HIS SER SER LEU TYR ASP LEU SER CYS ILE ASP THR CYS GLU K392 V395 I399 S403 T406 R409 V415

E416 P417 L421 K425 W426 V430 K431 R432 C442 I446 T449 V457 GLU GLY LEU P461 K464 L465 V475 S502 L503 L506 I514 F543 Q561 M562 M568 I573 L577 V583 F638 T641 N652 A657 I661 I668

Y671 I672 L675 N676 M677 L678 I679 A680 L681 T685 F712 LEU LYS CYS MET ARG LYS ALA PHE ARG SER GLY LYS LEU LEU GLN VAL GLY PHE THR PRO ASP GLY LYS ASP ASP TYR ARG TRP CYS PHE ARG VAL ASP GLU VAL ASN TRP THR THR TRP ASN THR ASN VAL GLY GLY

ILE ILE ASN GLU ASP PRO GLY

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	7916	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	45.8	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.083	Depositor
Minimum map value	-0.057	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.003	Depositor
Map size (Å)	320.63998, 320.63998, 320.63998	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.835, 0.835, 0.835	Depositor

5   Model quality ⓘ

5.1   Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: NA, 8IJ, NKN

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	0.33	0/2573	0.50	0/3477
1	B	0.34	0/2498	0.51	0/3372
1	C	0.31	0/2514	0.47	0/3396
1	D	0.31	0/2586	0.49	0/3496
All	All	0.32	0/10171	0.49	0/13741

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	3
1	D	0	1
All	All	0	5

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	409	ARG	Sidechain
1	B	409	ARG	Sidechain
1	B	455	ARG	Sidechain
1	B	557	ARG	Sidechain
1	D	474	ARG	Sidechain

5.2 Too-close contacts ⓘ

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	2511	2548	2546	25	0
1	B	2438	2461	2458	36	0
1	C	2452	2492	2491	39	0
1	D	2523	2555	2554	29	0
2	A	45	56	0	1	0
2	D	45	56	0	1	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	B	25	31	33	0	0
4	C	25	31	33	2	0
All	All	10066	10230	10115	104	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 5.

All (104) 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:B:593:THR:HG21	1:C:449:THR:HG23	1.61	0.81
1:B:598:LEU:HD11	1:B:658:VAL:HG13	1.65	0.78
1:D:577:LEU:HD13	1:C:672:ILE:HG12	1.67	0.77
1:B:679:ILE:HD11	1:C:681:LEU:HG	1.73	0.70
1:D:679:ILE:HD13	1:C:675:LEU:CD1	2.22	0.69
1:B:658:VAL:HG23	1:C:543:PHE:CE2	2.28	0.69
1:B:655:PHE:O	1:B:658:VAL:HG12	1.93	0.68
1:C:671:TYR:O	1:C:675:LEU:HD23	1.93	0.68
1:C:681:LEU:O	1:C:685:THR:HG22	1.93	0.68
1:B:672:ILE:HD11	1:C:577:LEU:HD13	1.77	0.66
1:B:665:ALA:O	1:B:669:LEU:HD23	1.96	0.66
1:D:686:VAL:HG11	1:C:680:ALA:HA	1.78	0.65
1:C:415:VAL:HG12	1:C:417:PRO:HD2	1.79	0.64
1:B:593:THR:CG2	1:C:449:THR:HG23	2.28	0.64
1:D:570:GLU:OE2	1:D:574:LEU:HD11	1.99	0.62
1:C:506:LEU:O	1:C:514:ILE:HD11	1.98	0.62
1:D:599:ILE:HD11	1:D:650:THR:HG21	1.83	0.61

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:677:MET:O	1:D:681:LEU:HD23	2.01	0.59
1:C:543:PHE:CE1	4:C:801:NKN:HAT	2.37	0.58
1:D:514:ILE:O	1:D:518:VAL:HG23	2.04	0.57
1:B:524:LEU:O	1:B:528:VAL:HG23	2.05	0.57
1:B:388:ASP:HB3	1:B:421:LEU:HD11	1.89	0.54
1:D:686:VAL:HG21	1:C:679:ILE:HG22	1.90	0.54
1:A:395:VAL:O	1:A:399:ILE:HG22	2.09	0.53
1:D:577:LEU:HD22	1:C:672:ILE:HD11	1.90	0.52
1:A:388:ASP:HA	1:A:396:LEU:HD12	1.91	0.52
1:A:658:VAL:HG23	1:B:543:PHE:CZ	2.44	0.52
1:B:675:LEU:HG	1:C:681:LEU:HD11	1.91	0.51
1:B:506:LEU:O	1:B:514:ILE:HD11	2.10	0.51
1:B:535:LYS:O	1:B:538:VAL:HG12	2.11	0.51
1:A:415:VAL:HG12	1:A:417:PRO:HD2	1.92	0.50
1:B:672:ILE:HG21	1:C:573:ILE:HD11	1.93	0.50
1:D:463:TYR:HH	1:D:537:TYR:HH	1.58	0.50
1:A:396:LEU:HD21	1:A:418:LEU:HD11	1.94	0.49
1:B:658:VAL:HG23	1:C:543:PHE:CZ	2.48	0.49
1:C:395:VAL:O	1:C:399:ILE:HG22	2.13	0.48
1:B:667:VAL:O	1:B:670:THR:HG22	2.14	0.47
1:C:638:PHE:O	1:C:641:THR:HG22	2.15	0.47
1:D:577:LEU:CD2	1:C:672:ILE:HD11	2.45	0.47
1:A:552:MET:HE3	1:D:586:VAL:HG13	1.98	0.46
1:A:673:LEU:HD22	1:B:573:ILE:HD11	1.98	0.46
1:D:679:ILE:HD13	1:C:675:LEU:HD11	1.97	0.46
1:B:534:ARG:HE	1:B:534:ARG:HA	1.81	0.46
1:A:384:LEU:HD22	1:A:387:ILE:HG21	1.98	0.46
1:D:655:PHE:O	1:D:658:VAL:HG12	2.16	0.46
2:D:801:8IJ:O7	2:D:801:8IJ:O13	2.34	0.46
1:B:433:ILE:HG21	1:B:708:THR:HG23	1.98	0.46
1:A:677:MET:O	1:A:681:LEU:HD13	2.16	0.45
1:A:665:ALA:O	1:A:669:LEU:HD23	2.17	0.45
1:A:399:ILE:HG23	1:A:400:ALA:N	2.30	0.45
1:A:573:ILE:HG13	1:D:673:LEU:HD11	1.98	0.45
1:D:599:ILE:CD1	1:D:650:THR:HG21	2.46	0.45
1:A:396:LEU:CD2	1:A:418:LEU:HD11	2.47	0.45
1:B:660:ILE:O	1:B:664:LEU:HD13	2.15	0.45
1:A:538:VAL:O	1:A:542:VAL:HG13	2.17	0.45
1:A:573:ILE:CG1	1:D:673:LEU:HD11	2.48	0.44
1:B:649:PHE:CD1	1:B:650:THR:HG22	2.52	0.44
1:B:680:ALA:HB2	1:C:568:MET:SD	2.57	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:534:ARG:HA	1:B:534:ARG:NE	2.33	0.44
1:B:649:PHE:CE1	1:B:650:THR:HG22	2.52	0.44
1:C:502:SER:HA	1:C:503:LEU:HD12	2.00	0.44
1:D:577:LEU:HD22	1:C:672:ILE:CD1	2.48	0.44
1:B:511:TYR:CE1	1:B:574:LEU:HD13	2.52	0.44
1:D:421:LEU:C	1:D:421:LEU:HD23	2.38	0.44
1:B:547:MET:HA	1:B:550:THR:HG22	1.98	0.44
1:C:543:PHE:CZ	4:C:801:NKN:HAT	2.53	0.44
1:A:552:MET:CE	1:D:586:VAL:HG13	2.47	0.43
1:A:567:VAL:HG11	1:A:693:SER:HA	1.99	0.43
1:D:569:ILE:CG2	1:D:573:ILE:HD11	2.48	0.43
1:B:583:VAL:O	1:B:586:VAL:HG12	2.17	0.43
1:C:403:SER:O	1:C:406:THR:HG22	2.18	0.43
1:A:683:GLY:O	1:A:686:VAL:HG12	2.19	0.43
1:D:399:ILE:HD11	1:D:412:MET:HB2	2.00	0.43
1:A:387:ILE:O	1:A:396:LEU:HG	2.20	0.42
1:B:598:LEU:HD11	1:B:658:VAL:CG1	2.40	0.42
1:B:689:ILE:O	1:B:690:ALA:HB3	2.20	0.42
1:D:535:LYS:O	1:D:538:VAL:HG12	2.19	0.42
1:B:678:LEU:HD23	1:B:678:LEU:HA	1.93	0.42
1:D:565:TYR:CE2	1:C:583:VAL:HG21	2.55	0.42
1:D:577:LEU:HD13	1:C:672:ILE:CG1	2.44	0.42
1:A:535:LYS:O	1:A:538:VAL:HG22	2.20	0.42
1:D:421:LEU:HD21	1:D:425:LYS:HD2	2.02	0.42
1:C:561:GLN:HG2	1:C:562:MET:N	2.34	0.42
1:B:564:ILE:HG23	1:B:693:SER:OG	2.20	0.41
1:C:657:ALA:O	1:C:661:ILE:HG12	2.21	0.41
1:D:519:GLN:OE1	1:D:548:GLY:HA2	2.20	0.41
1:C:426:TRP:HA	1:C:430:VAL:HB	2.02	0.41
1:C:442:CYS:O	1:C:446:ILE:HG12	2.20	0.41
1:B:675:LEU:HG	1:C:681:LEU:CD1	2.50	0.41
1:C:677:MET:O	1:C:681:LEU:HD22	2.20	0.41
1:C:465:LEU:HD12	1:C:475:VAL:HG21	2.03	0.41
1:A:638:PHE:O	1:A:641:THR:HG22	2.21	0.41
1:D:572:MET:HE1	1:D:682:MET:HB3	2.02	0.41
1:A:590:GLY:O	1:A:593:THR:OG1	2.29	0.41
1:A:655:PHE:O	1:A:658:VAL:HG12	2.20	0.41
1:C:406:THR:HG22	1:C:409:ARG:HE	1.86	0.41
1:C:668:ILE:O	1:C:672:ILE:HG13	2.21	0.41
1:C:421:LEU:CD2	1:C:425:LYS:HE2	2.51	0.40
1:A:449:THR:HG23	1:D:593:THR:HG21	2.03	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:426:TRP:HA	1:B:430:VAL:HB	2.02	0.40
1:A:511:TYR:O	1:A:514:ILE:HG22	2.22	0.40
2:A:801:8IJ:O13	2:A:801:8IJ:O7	2.39	0.40
1:B:401:TYR:HE2	1:B:710:LYS:HZ1	1.68	0.40
1:B:599:ILE:HG22	1:B:600:GLU:N	2.37	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	299/637 (47%)	280 (94%)	19 (6%)	0	100	100
1	B	286/637 (45%)	264 (92%)	22 (8%)	0	100	100
1	C	291/637 (46%)	268 (92%)	23 (8%)	0	100	100
1	D	303/637 (48%)	281 (93%)	22 (7%)	0	100	100
All	All	1179/2548 (46%)	1093 (93%)	86 (7%)	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	277/562 (49%)	276 (100%)	1 (0%)	91	97

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	268/562 (48%)	264 (98%)	4 (2%)	65	84
1	C	269/562 (48%)	266 (99%)	3 (1%)	73	88
1	D	278/562 (50%)	278 (100%)	0	100	100
All	All	1092/2248 (49%)	1084 (99%)	8 (1%)	84	93

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	476	THR
1	B	388	ASP
1	B	526	SER
1	B	577	LEU
1	B	688	LYS
1	C	432	ARG
1	C	652	ASN
1	C	679	ILE

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

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6   Ligand geometry ⓘ

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 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	8IJ	A	801	-	45,45,59	1.05	5 (11%)	55,57,71	3.67	5 (9%)
4	NKN	C	801	-	24,24,24	1.13	4 (16%)	27,28,28	1.33	4 (14%)
2	8IJ	D	801	-	45,45,59	1.03	4 (8%)	55,57,71	1.11	3 (5%)
4	NKN	B	801	-	24,24,24	1.13	4 (16%)	27,28,28	1.37	4 (14%)

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	8IJ	A	801	-	1/1/10/10	23/40/64/78	0/1/1/1
4	NKN	C	801	-	1/1/3/3	12/24/24/24	-
2	8IJ	D	801	-	-	22/40/64/78	0/1/1/1
4	NKN	B	801	-	-	12/24/24/24	-

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	801	8IJ	O40-C18	-2.47	1.40	1.46
2	D	801	8IJ	O20-C21	2.45	1.40	1.33
4	C	801	NKN	OAJ-CAK	2.41	1.40	1.33
2	A	801	8IJ	O20-C19	-2.40	1.39	1.45
2	D	801	8IJ	O40-C18	-2.36	1.40	1.46
4	B	801	NKN	OAJ-CAK	2.34	1.40	1.33
4	C	801	NKN	PAC-OAB	-2.24	1.46	1.54
4	B	801	NKN	PAC-OAA	-2.24	1.46	1.54
4	B	801	NKN	OAJ-CAI	-2.23	1.40	1.45
4	B	801	NKN	PAC-OAB	-2.21	1.46	1.54
2	A	801	8IJ	O20-C21	2.21	1.39	1.33
4	C	801	NKN	PAC-OAA	-2.19	1.46	1.54
2	A	801	8IJ	O40-C41	2.19	1.40	1.34
2	D	801	8IJ	O40-C41	2.16	1.40	1.34
4	C	801	NKN	OAJ-CAI	-2.08	1.40	1.45
2	D	801	8IJ	O20-C19	-2.04	1.40	1.45
2	A	801	8IJ	P2-O3	-2.03	1.45	1.55

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	801	8IJ	O20-C21-O22	-18.22	77.61	123.59
2	A	801	8IJ	O20-C21-C23	15.49	160.53	111.91
2	A	801	8IJ	O22-C21-C23	-10.46	82.92	123.73
2	D	801	8IJ	O40-C41-C43	4.49	121.19	111.50
2	A	801	8IJ	O40-C41-C43	4.21	120.57	111.50
4	B	801	NKN	OAB-PAC-OAF	3.00	114.73	106.73
4	C	801	NKN	OAF-PAC-OAD	2.89	114.57	106.47
4	B	801	NKN	OAJ-CAK-CAL	2.74	120.51	111.91
4	C	801	NKN	OAA-PAC-OAF	2.72	113.96	106.73
4	C	801	NKN	OAB-PAC-OAF	2.70	113.91	106.73
4	B	801	NKN	OAF-PAC-OAD	2.66	113.95	106.47
4	B	801	NKN	OAA-PAC-OAF	2.64	113.75	106.73
4	C	801	NKN	OAJ-CAK-CAL	2.57	119.98	111.91
2	D	801	8IJ	O3-P2-O1	-2.39	100.42	112.24
2	A	801	8IJ	O3-P2-O1	-2.37	100.55	112.24
2	D	801	8IJ	O20-C21-C23	2.28	119.05	111.91

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	801	8IJ	C18
4	C	801	NKN	CAH

All (69) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	801	8IJ	O16-C17-C18-O40
2	A	801	8IJ	C43-C41-O40-C18
2	A	801	8IJ	C5-O4-P2-O1
2	A	801	8IJ	C5-O4-P2-O3
2	A	801	8IJ	C17-O16-P2-O1
2	D	801	8IJ	C43-C41-O40-C18
2	D	801	8IJ	C5-O4-P2-O3
2	D	801	8IJ	C17-O16-P2-O1
2	D	801	8IJ	C17-O16-P2-O3
2	D	801	8IJ	C17-O16-P2-O4
2	A	801	8IJ	O22-C21-O20-C19
4	B	801	NKN	OAE-CAK-OAJ-CAI
4	C	801	NKN	OAE-CAK-OAJ-CAI
2	D	801	8IJ	O42-C41-O40-C18
4	B	801	NKN	CAL-CAK-OAJ-CAI

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
4	C	801	NKN	CAL-CAK-OAJ-CAI
2	A	801	8IJ	O42-C41-O40-C18
4	C	801	NKN	OAY-CAH-CAI-OAJ
4	C	801	NKN	CAH-CAI-OAJ-CAK
2	D	801	8IJ	C49-C50-C51-C52
2	A	801	8IJ	C41-C43-C44-C45
2	D	801	8IJ	C41-C43-C44-C45
4	B	801	NKN	OAY-CAH-CAI-OAJ
2	D	801	8IJ	C5-O4-P2-O16
2	A	801	8IJ	C48-C49-C50-C51
2	D	801	8IJ	C23-C21-O20-C19
4	C	801	NKN	CAP-CAQ-CAR-CAS
2	D	801	8IJ	C45-C46-C47-C48
4	C	801	NKN	CAK-CAL-CAM-CAN
4	B	801	NKN	CAP-CAQ-CAR-CAS
2	A	801	8IJ	C23-C21-O20-C19
2	D	801	8IJ	O22-C21-O20-C19
2	A	801	8IJ	C24-C25-C26-C27
2	A	801	8IJ	C21-C23-C24-C25
2	A	801	8IJ	C46-C47-C48-C49
2	A	801	8IJ	C5-O4-P2-O16
2	A	801	8IJ	C23-C24-C25-C26
2	D	801	8IJ	C17-C18-O40-C41
4	C	801	NKN	CAS-CAT-CAU-CAV
4	B	801	NKN	CAM-CAN-CAO-CAP
2	D	801	8IJ	C44-C45-C46-C47
2	D	801	8IJ	O40-C18-C19-O20
2	D	801	8IJ	C5-O4-P2-O1
2	A	801	8IJ	C17-O16-P2-O4
4	B	801	NKN	CAH-CAG-OAF-PAC
4	B	801	NKN	CAR-CAS-CAT-CAU
4	C	801	NKN	CAL-CAM-CAN-CAO
2	A	801	8IJ	O16-C17-C18-C19
4	B	801	NKN	CAN-CAO-CAP-CAQ
4	C	801	NKN	CAM-CAN-CAO-CAP
2	D	801	8IJ	C23-C24-C25-C26
2	D	801	8IJ	C43-C44-C45-C46
2	D	801	8IJ	C24-C25-C26-C27
4	C	801	NKN	CAG-CAH-CAI-OAJ
4	B	801	NKN	CAQ-CAR-CAS-CAT
2	D	801	8IJ	C48-C49-C50-C51
2	D	801	8IJ	C17-C18-C19-O20

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
2	A	801	8IJ	C45-C46-C47-C48
2	A	801	8IJ	C44-C45-C46-C47
4	C	801	NKN	CAO-CAP-CAQ-CAR
2	A	801	8IJ	O20-C21-C23-C24
4	B	801	NKN	CAU-CAV-CAW-CAX
2	D	801	8IJ	C51-C52-C53-C54
2	A	801	8IJ	O40-C41-C43-C44
4	B	801	NKN	CAG-CAH-CAI-OAJ
4	B	801	NKN	CAS-CAT-CAU-CAV
2	A	801	8IJ	O22-C21-C23-C24
2	A	801	8IJ	O42-C41-C43-C44
4	C	801	NKN	CAN-CAO-CAP-CAQ

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	801	8IJ	1	0
4	C	801	NKN	2	0
2	D	801	8IJ	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 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 8IJ A 801

Bond lengths

Bond angles

Torsions

Rings

Ligand NKN C 801

Bond lengths

Bond angles

Torsions

Rings

Ligand 8IJ D 801

Bond lengths

Bond angles

Torsions

Rings

Ligand NKN B 801

Bond lengths

Bond angles

Torsions

Rings
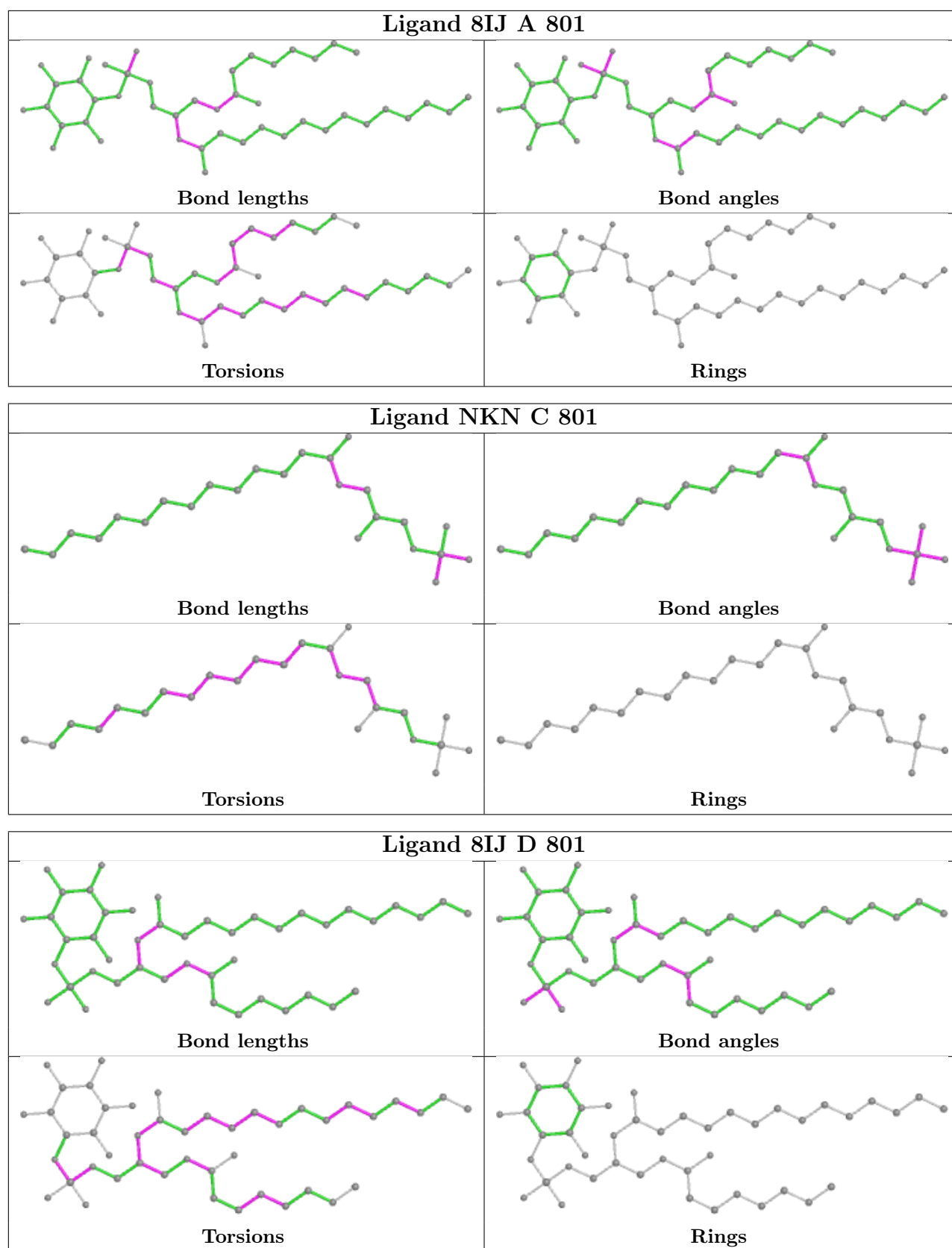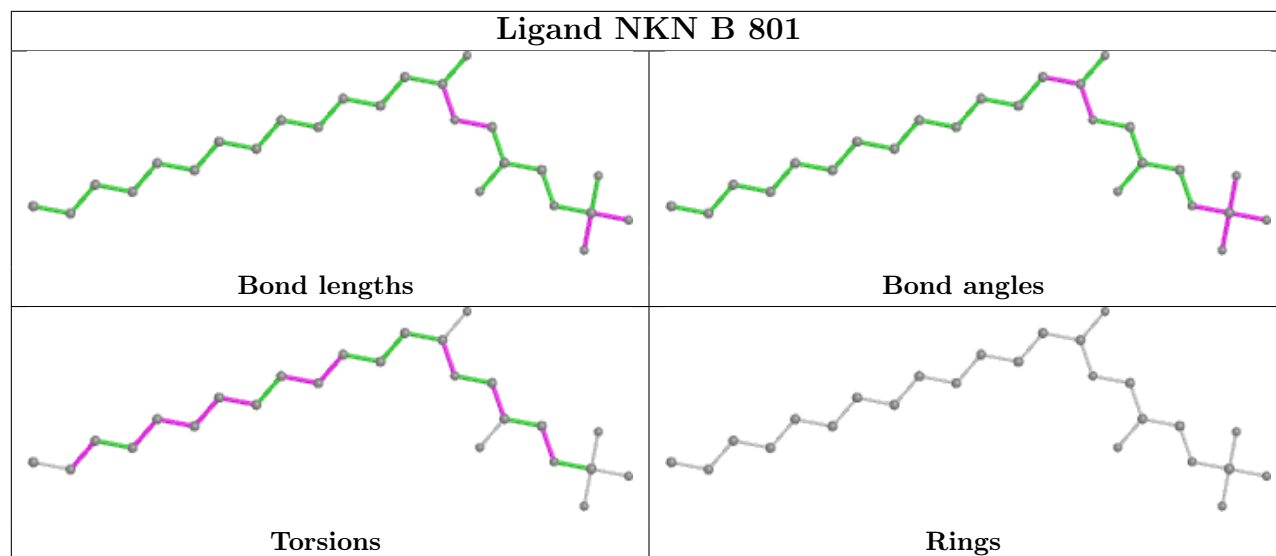
5.7　Other polymers ⓘ

There are no such residues in this entry.

5.8　Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-41005. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections ⓘ

6.1.1 Primary map

X   Y   Z

6.1.2 Raw map

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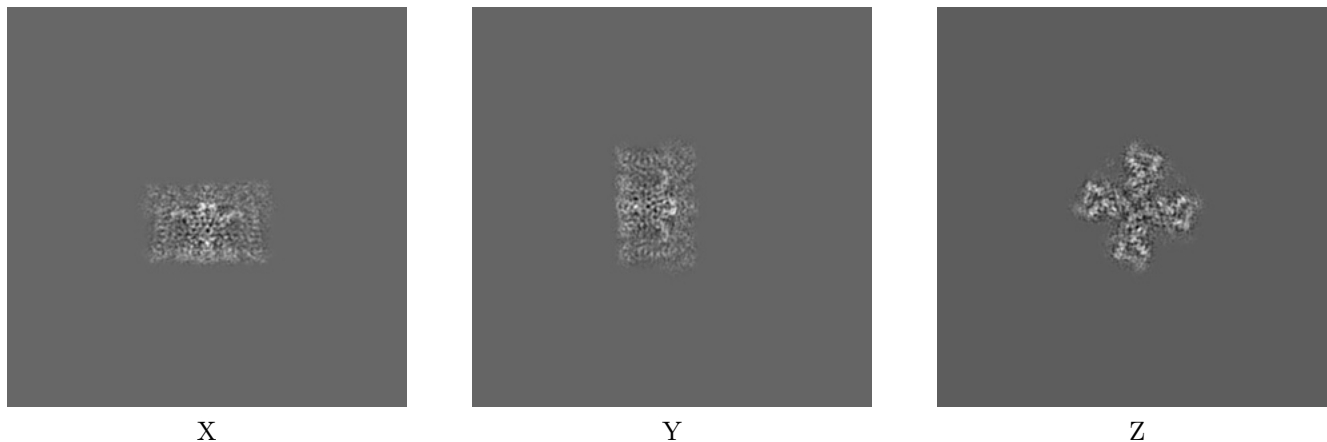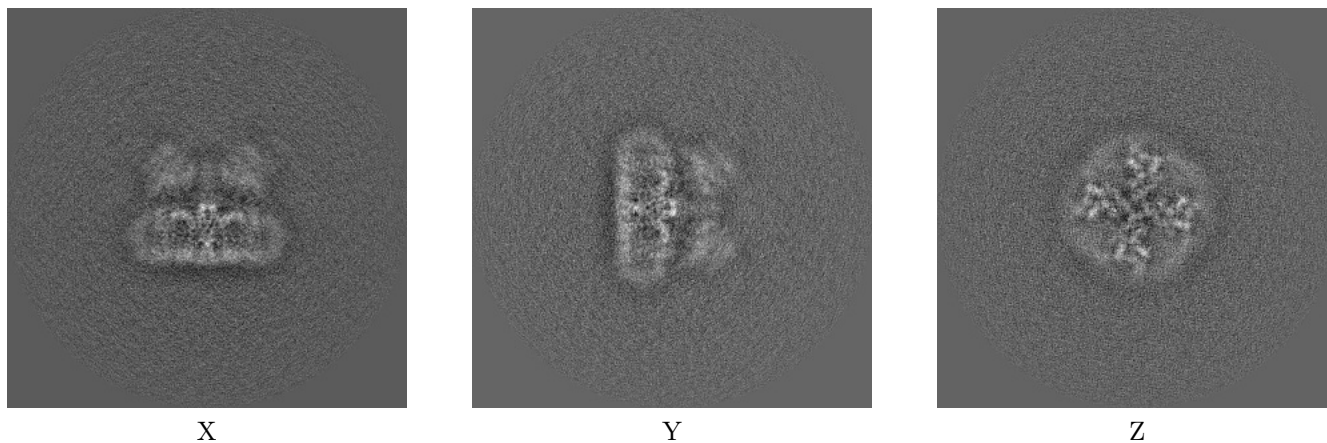
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

6.2.1 Primary map
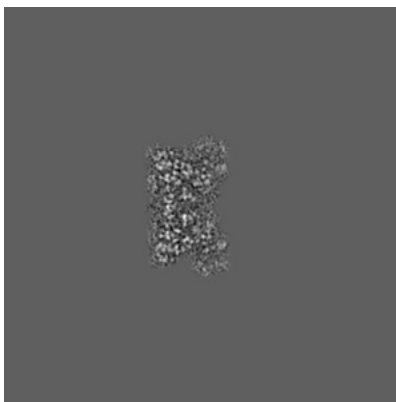
| X Index: 192 | Y Index: 192 | Z Index: 192 |

6.2.2 Raw map
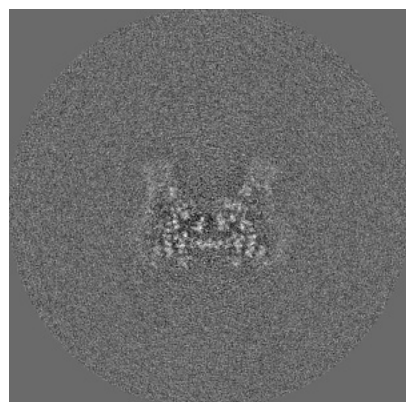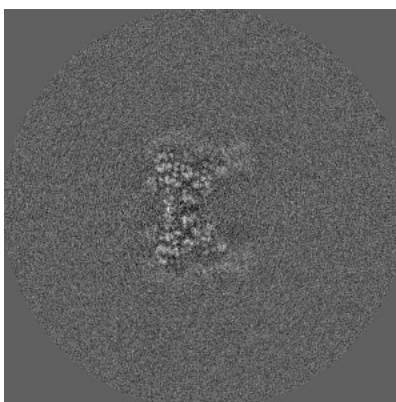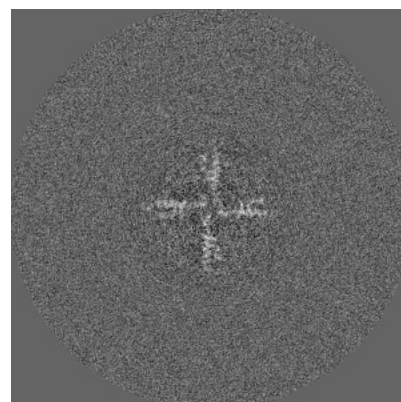
| X Index: 192 | Y Index: 192 | Z Index: 192 |

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

6.3　Largest variance slices ⓘ

6.3.1　Primary map
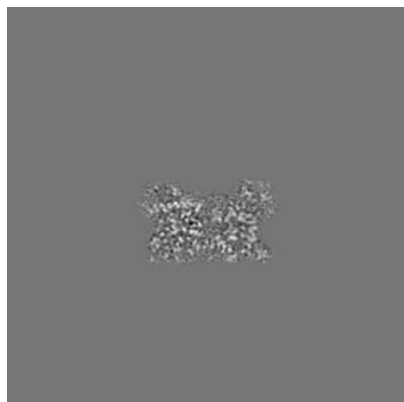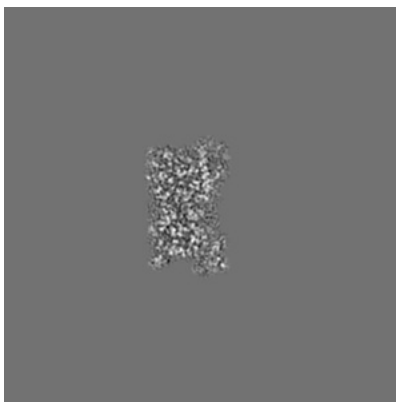
| X Index: 189 | Y Index: 189 | Z Index: 173 |
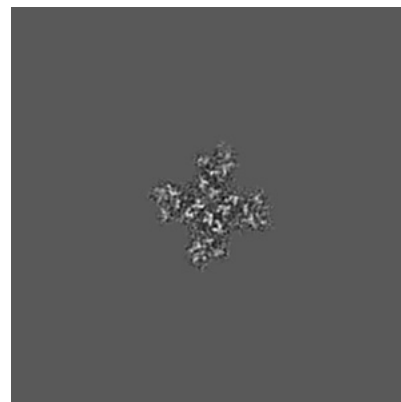
6.3.2　Raw map
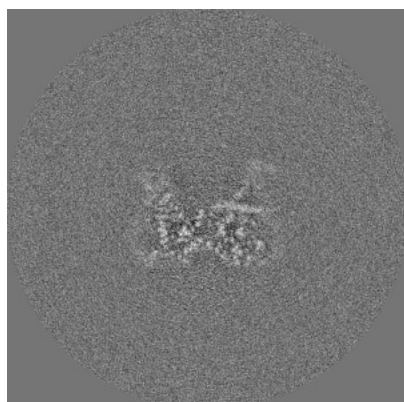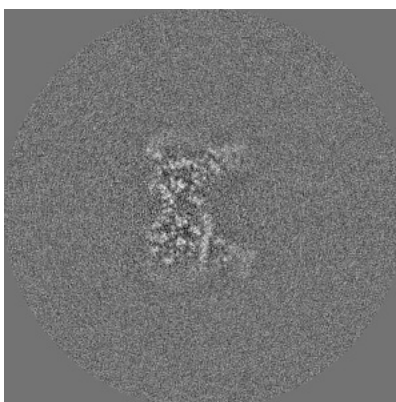
| X Index: 196 | Y Index: 196 | Z Index: 173 |
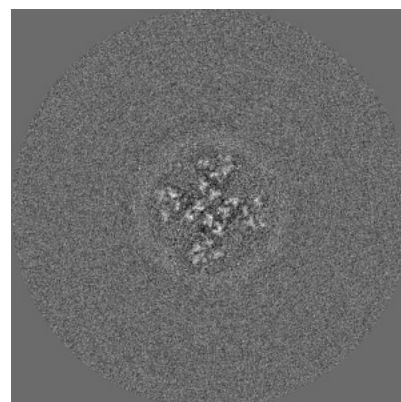
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
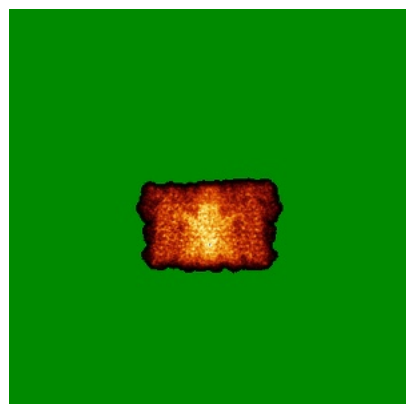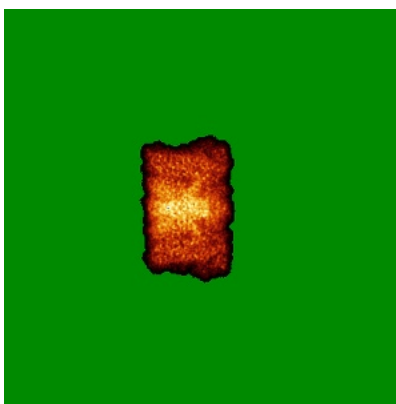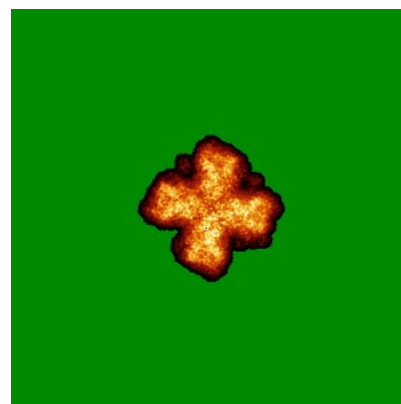
X   Y   Z

6.4.2 Raw map

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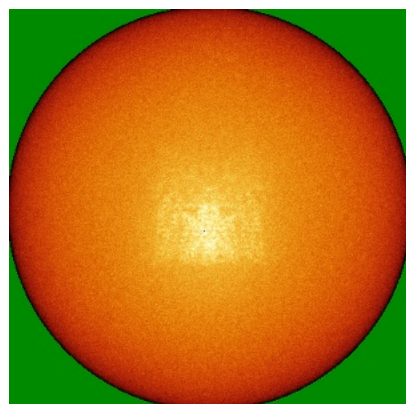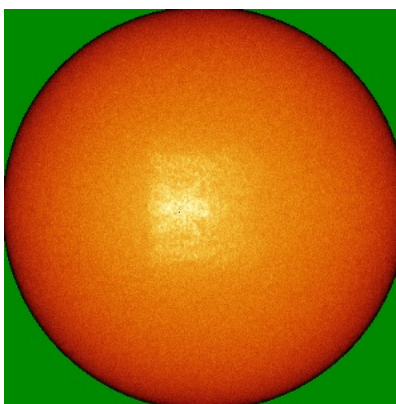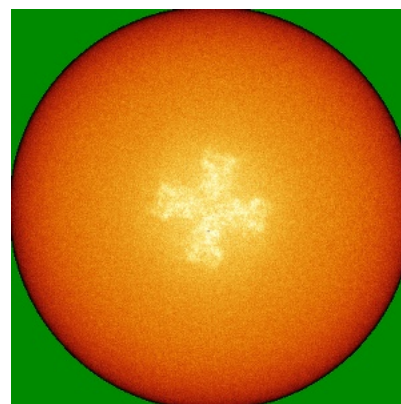
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z
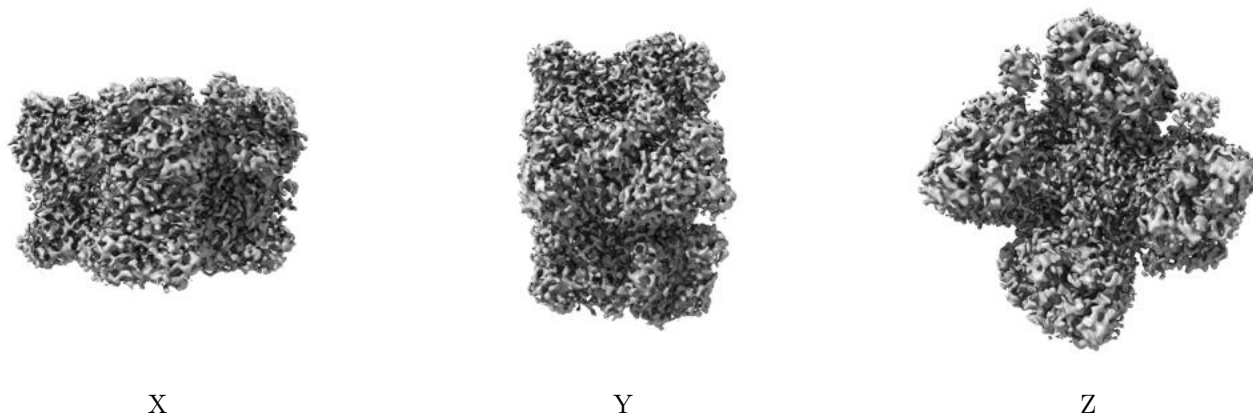
The images above show the 3D surface view of the map at the recommended contour level 0.003. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X Y Z
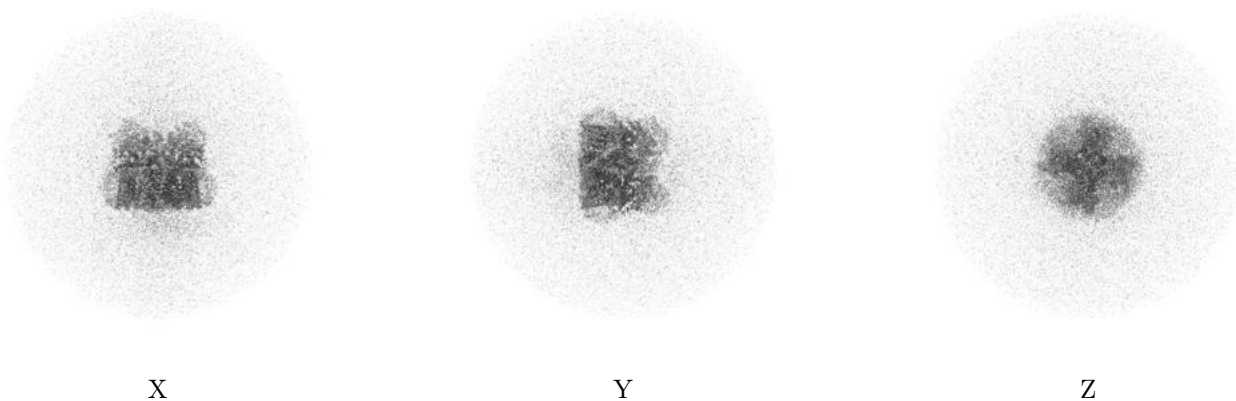
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation (i)

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

7 Map analysis ⓘ

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

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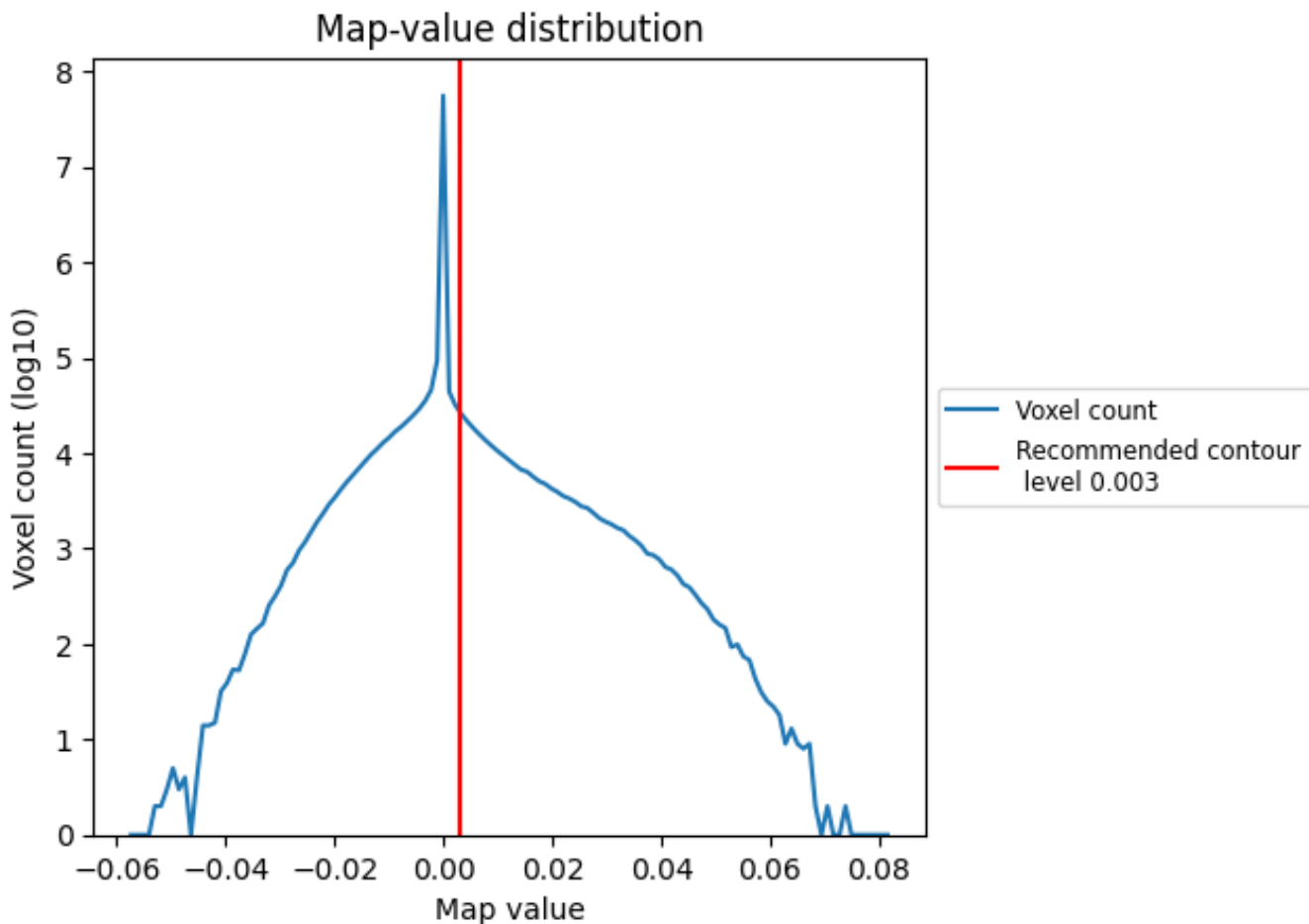
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
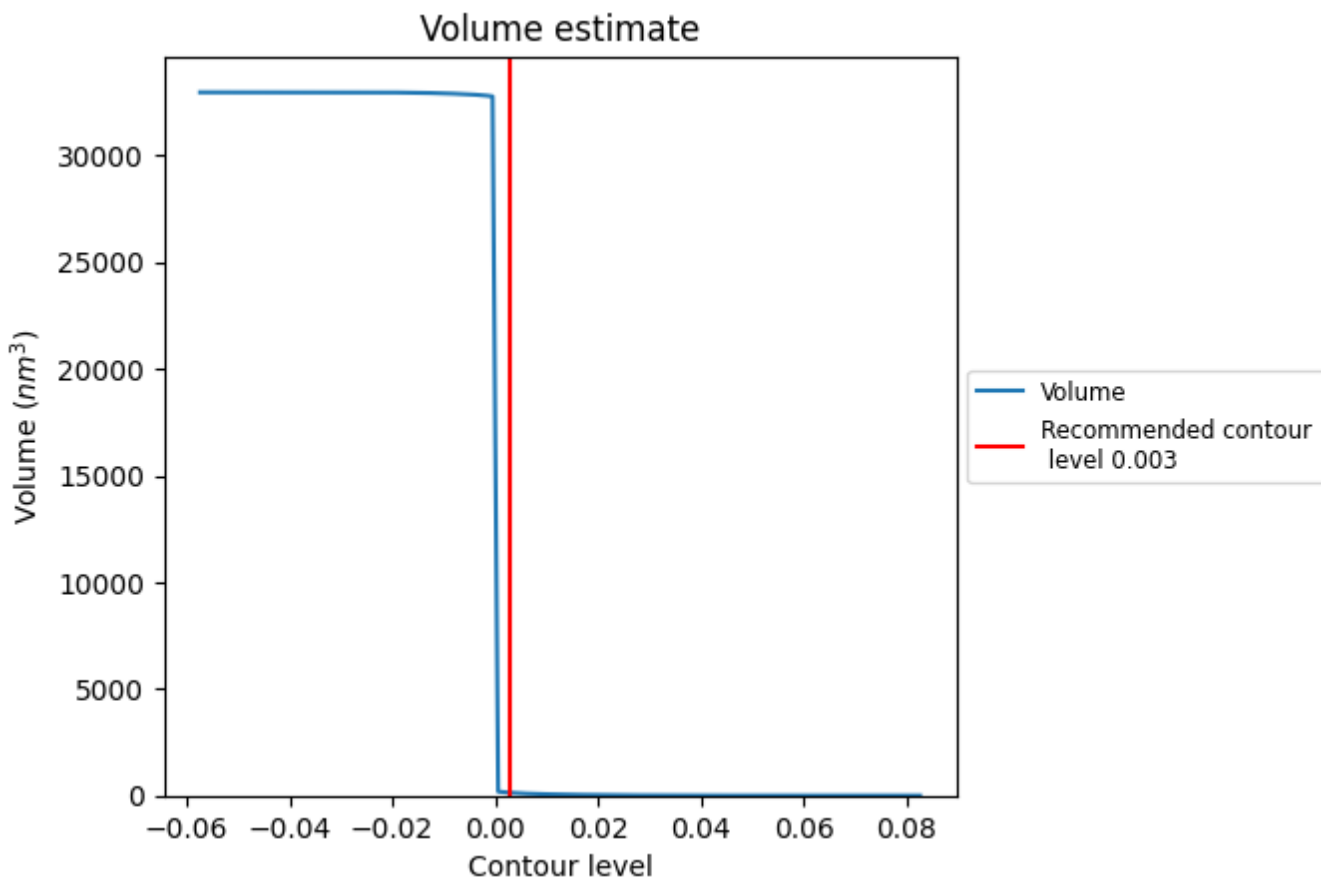
The volume at the recommended contour level is 131 nm^3; this corresponds to an approximate mass of 118 kDa.

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)
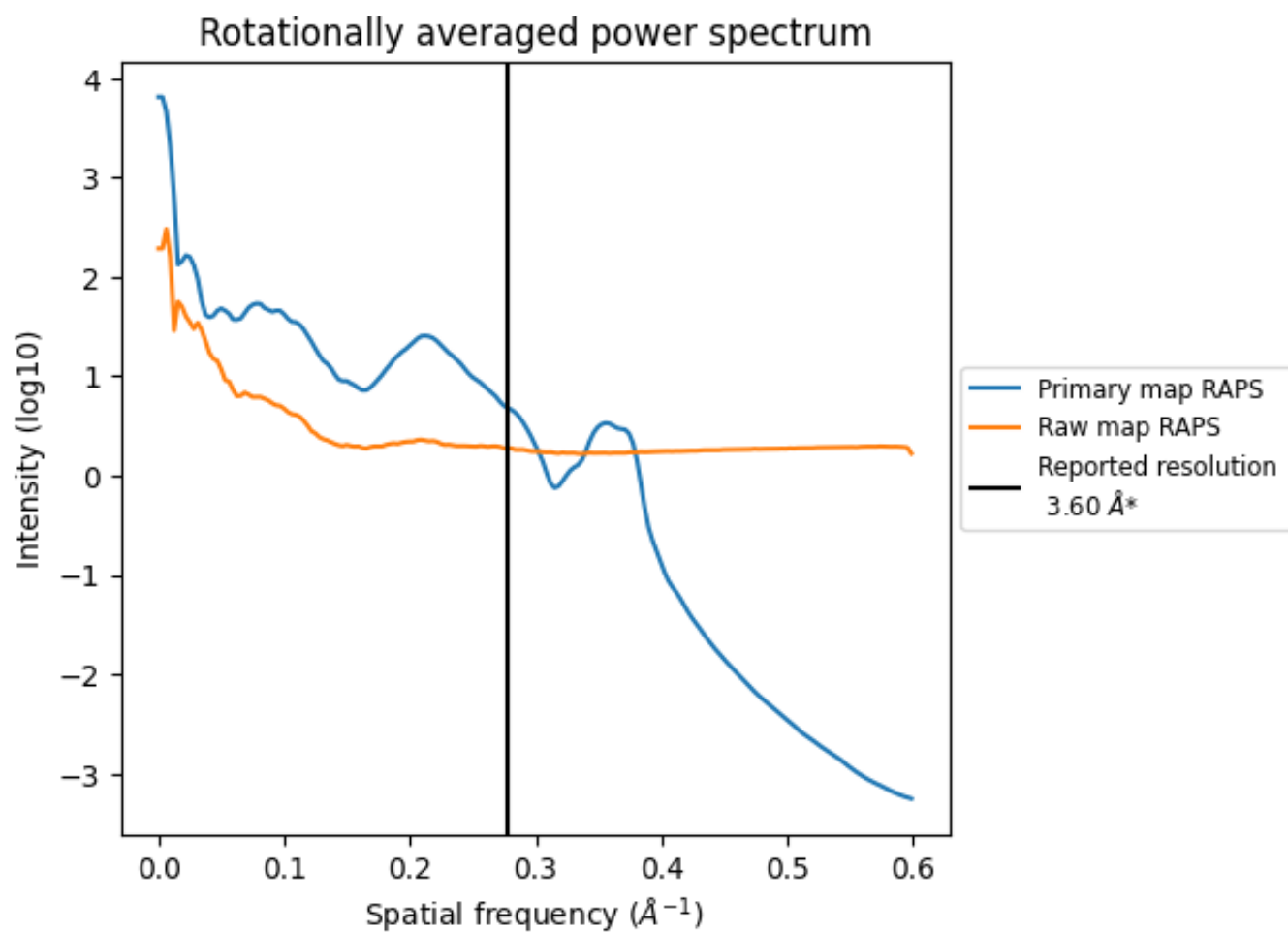
*Reported resolution corresponds to spatial frequency of 0.278 Å^{-1}

8 Fourier-Shell correlation ⓘ

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC ⓘ
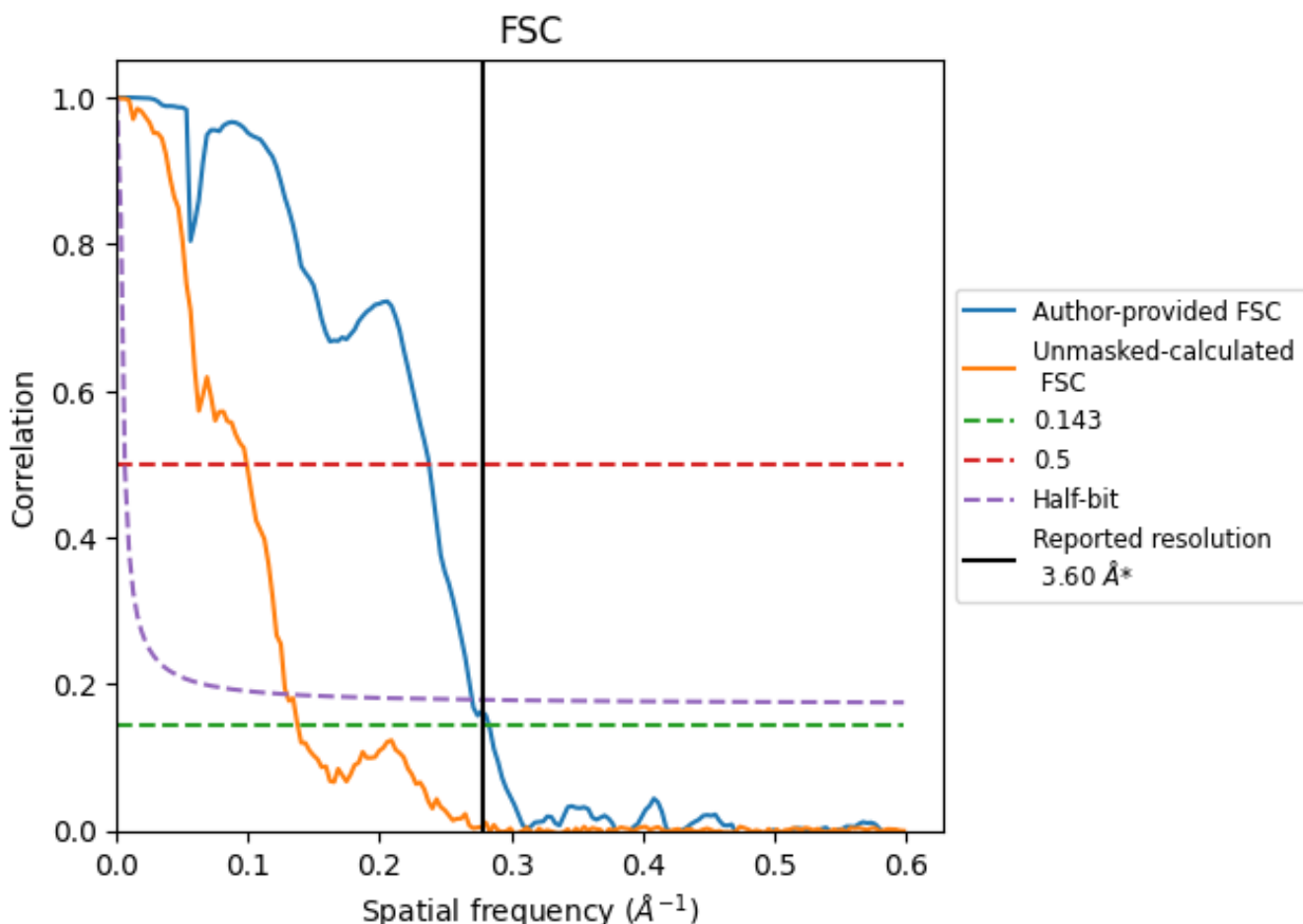
*Reported resolution corresponds to spatial frequency of 0.278 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	3.53	4.21	3.70
Unmasked-calculated*	7.26	10.12	7.73

*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 7.26 differs from the reported value 3.6 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-41005 and PDB model 8T3L. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay ⓘ

X   Y   Z
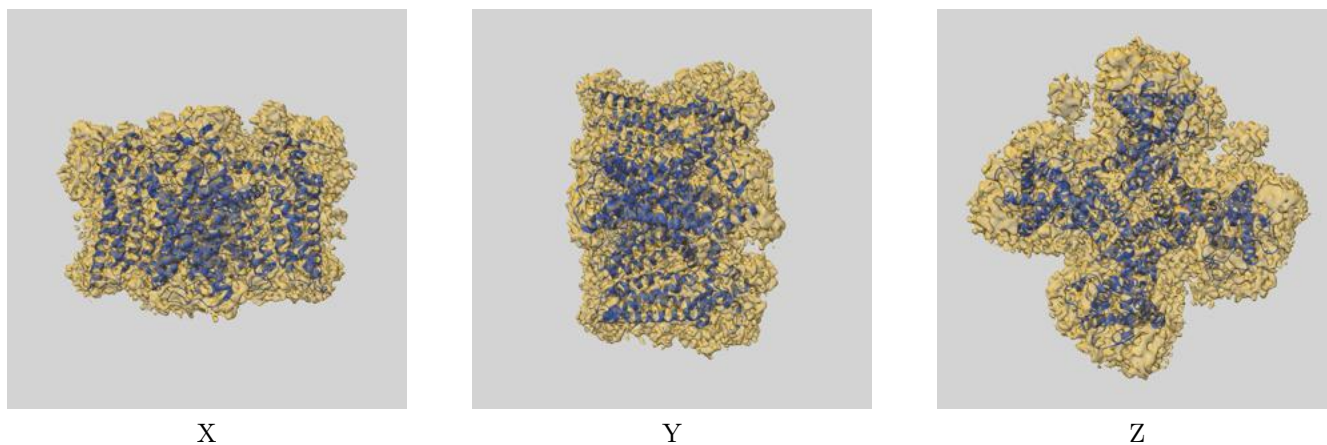
The images above show the 3D surface view of the map at the recommended contour level 0.003 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

X Y Z
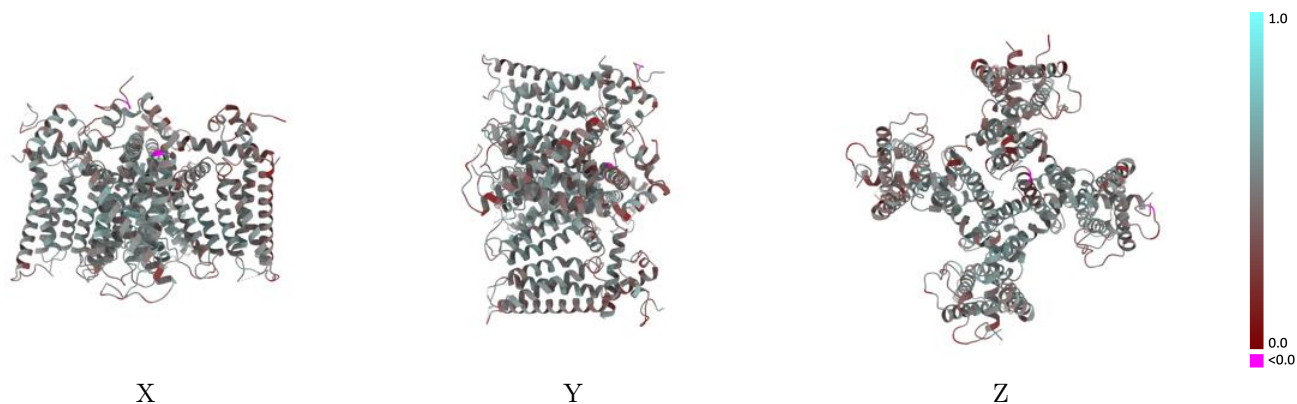
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model ⓘ

X Y Z
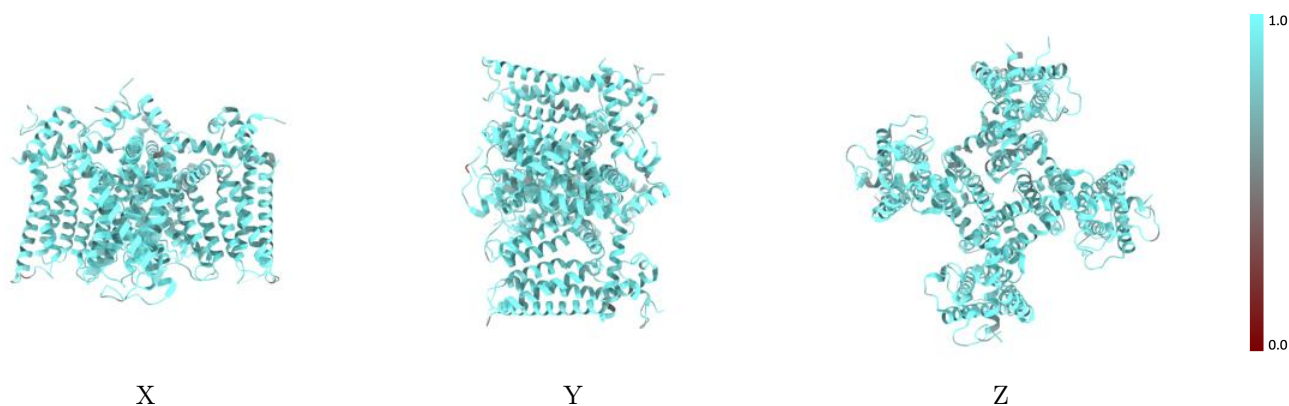
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.003).

9.4   Atom inclusion ⓘ
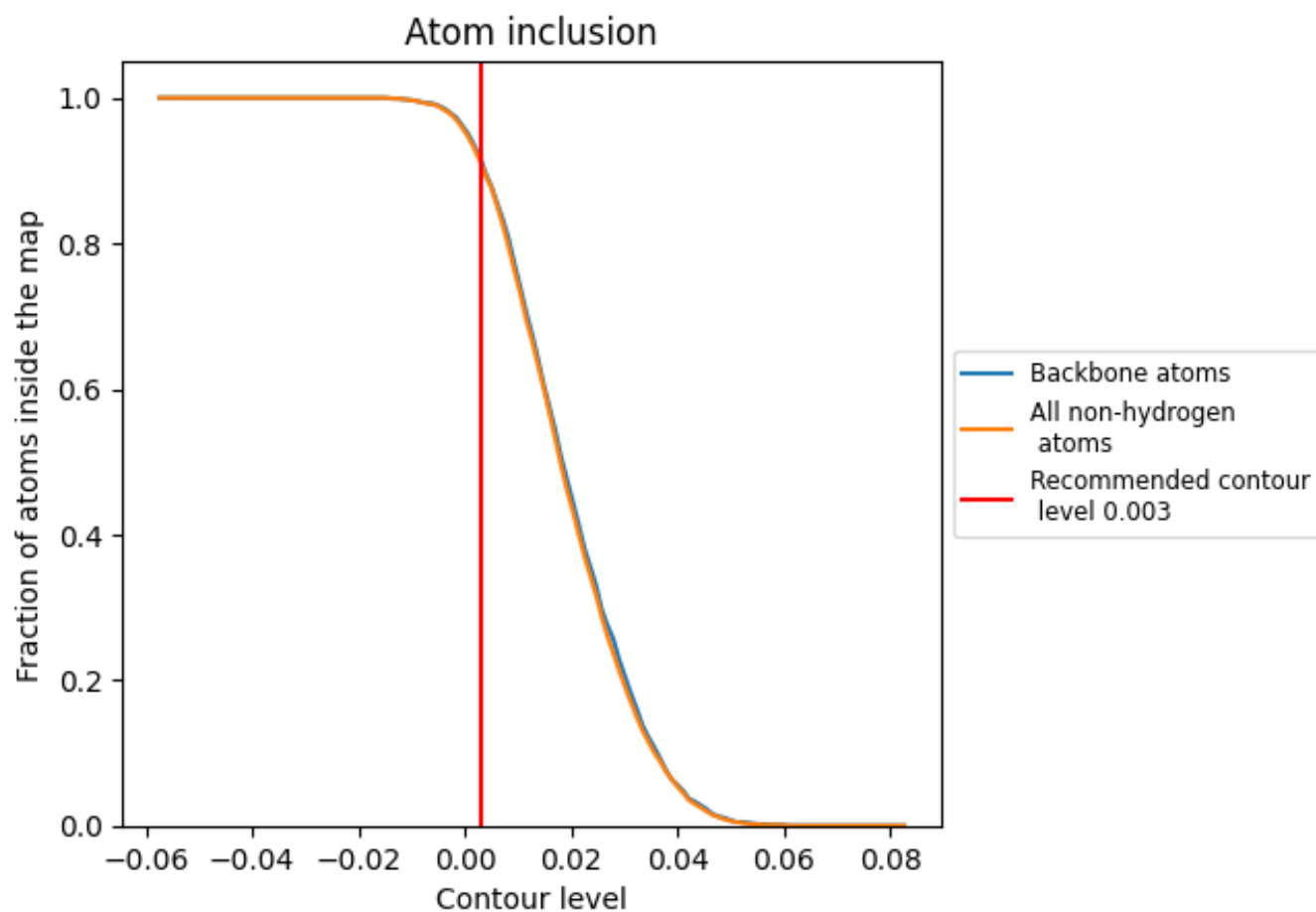
At the recommended contour level, 92% of all backbone atoms, 91% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.003) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9110	0.4700
A	0.9280	0.4900
B	0.9070	0.4590
C	0.9050	0.4420
D	0.9220	0.4860

1.0

0.0

<0.0