wwPDB EM Validation Summary Report (i)

May 20, 2025 – 03:06 AM EDT

PDB ID	:	9B28 / pdb_00009b28
EMDB ID	:	EMD-44100
Title	:	Cryo-EM structure of the mouse TRPM3 alpha 2 channel in complex with primidone
Authors	:	Yin, Y.; Park, C.G.; Feng, S.; Zhang, F.; Guan, Z.; Sharma, K.; Borgnia, M.J.; Im, W.; Lee, S.-Y.
Deposited on	:	2024-03-14
Resolution	:	3.24 Å(reported)
Based on initial model	:	6BPQ

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 (1)) were used in the production of this report:

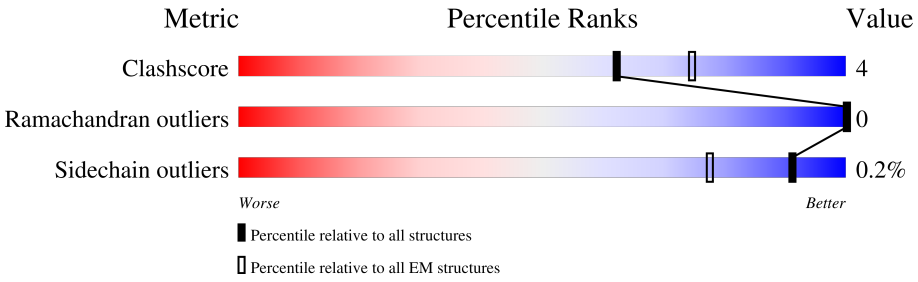
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0rc1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

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 3.24 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	1739	49% 5% 47%
1	B	1739	49% · 47%
1	C	1739	49% · 47%
1	D	1739	49% · 47%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 50704 atoms, of which 23832 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 M, member 3.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	925	Total	C	H	N	O	S	0	0
			12392	4264	5797	1127	1163	41		
1	C	925	Total	C	H	N	O	S	0	0
			12392	4264	5797	1127	1163	41		
1	B	925	Total	C	H	N	O	S	0	0
			12392	4264	5797	1127	1163	41		
1	D	925	Total	C	H	N	O	S	0	0
			12392	4264	5797	1127	1163	41		

There are 120 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1710	SER	-	expression tag	UNP Q5F4S7
A	1711	ASN	-	expression tag	UNP Q5F4S7
A	1712	SER	-	expression tag	UNP Q5F4S7
A	1713	LEU	-	expression tag	UNP Q5F4S7
A	1714	GLU	-	expression tag	UNP Q5F4S7
A	1715	VAL	-	expression tag	UNP Q5F4S7
A	1716	LEU	-	expression tag	UNP Q5F4S7
A	1717	PHE	-	expression tag	UNP Q5F4S7
A	1718	GLN	-	expression tag	UNP Q5F4S7
A	1719	GLY	-	expression tag	UNP Q5F4S7
A	1720	PRO	-	expression tag	UNP Q5F4S7
A	1721	ASP	-	expression tag	UNP Q5F4S7
A	1722	TYR	-	expression tag	UNP Q5F4S7
A	1723	LYS	-	expression tag	UNP Q5F4S7
A	1724	ASP	-	expression tag	UNP Q5F4S7
A	1725	ASP	-	expression tag	UNP Q5F4S7
A	1726	ASP	-	expression tag	UNP Q5F4S7
A	1727	ASP	-	expression tag	UNP Q5F4S7
A	1728	LYS	-	expression tag	UNP Q5F4S7
A	1729	ALA	-	expression tag	UNP Q5F4S7
A	1730	HIS	-	expression tag	UNP Q5F4S7

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1731	HIS	-	expression tag	UNP Q5F4S7
A	1732	HIS	-	expression tag	UNP Q5F4S7
A	1733	HIS	-	expression tag	UNP Q5F4S7
A	1734	HIS	-	expression tag	UNP Q5F4S7
A	1735	HIS	-	expression tag	UNP Q5F4S7
A	1736	HIS	-	expression tag	UNP Q5F4S7
A	1737	HIS	-	expression tag	UNP Q5F4S7
A	1738	HIS	-	expression tag	UNP Q5F4S7
A	1739	HIS	-	expression tag	UNP Q5F4S7
C	1710	SER	-	expression tag	UNP Q5F4S7
C	1711	ASN	-	expression tag	UNP Q5F4S7
C	1712	SER	-	expression tag	UNP Q5F4S7
C	1713	LEU	-	expression tag	UNP Q5F4S7
C	1714	GLU	-	expression tag	UNP Q5F4S7
C	1715	VAL	-	expression tag	UNP Q5F4S7
C	1716	LEU	-	expression tag	UNP Q5F4S7
C	1717	PHE	-	expression tag	UNP Q5F4S7
C	1718	GLN	-	expression tag	UNP Q5F4S7
C	1719	GLY	-	expression tag	UNP Q5F4S7
C	1720	PRO	-	expression tag	UNP Q5F4S7
C	1721	ASP	-	expression tag	UNP Q5F4S7
C	1722	TYR	-	expression tag	UNP Q5F4S7
C	1723	LYS	-	expression tag	UNP Q5F4S7
C	1724	ASP	-	expression tag	UNP Q5F4S7
C	1725	ASP	-	expression tag	UNP Q5F4S7
C	1726	ASP	-	expression tag	UNP Q5F4S7
C	1727	ASP	-	expression tag	UNP Q5F4S7
C	1728	LYS	-	expression tag	UNP Q5F4S7
C	1729	ALA	-	expression tag	UNP Q5F4S7
C	1730	HIS	-	expression tag	UNP Q5F4S7
C	1731	HIS	-	expression tag	UNP Q5F4S7
C	1732	HIS	-	expression tag	UNP Q5F4S7
C	1733	HIS	-	expression tag	UNP Q5F4S7
C	1734	HIS	-	expression tag	UNP Q5F4S7
C	1735	HIS	-	expression tag	UNP Q5F4S7
C	1736	HIS	-	expression tag	UNP Q5F4S7
C	1737	HIS	-	expression tag	UNP Q5F4S7
C	1738	HIS	-	expression tag	UNP Q5F4S7
C	1739	HIS	-	expression tag	UNP Q5F4S7
B	1710	SER	-	expression tag	UNP Q5F4S7
B	1711	ASN	-	expression tag	UNP Q5F4S7
B	1712	SER	-	expression tag	UNP Q5F4S7

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1713	LEU	-	expression tag	UNP Q5F4S7
B	1714	GLU	-	expression tag	UNP Q5F4S7
B	1715	VAL	-	expression tag	UNP Q5F4S7
B	1716	LEU	-	expression tag	UNP Q5F4S7
B	1717	PHE	-	expression tag	UNP Q5F4S7
B	1718	GLN	-	expression tag	UNP Q5F4S7
B	1719	GLY	-	expression tag	UNP Q5F4S7
B	1720	PRO	-	expression tag	UNP Q5F4S7
B	1721	ASP	-	expression tag	UNP Q5F4S7
B	1722	TYR	-	expression tag	UNP Q5F4S7
B	1723	LYS	-	expression tag	UNP Q5F4S7
B	1724	ASP	-	expression tag	UNP Q5F4S7
B	1725	ASP	-	expression tag	UNP Q5F4S7
B	1726	ASP	-	expression tag	UNP Q5F4S7
B	1727	ASP	-	expression tag	UNP Q5F4S7
B	1728	LYS	-	expression tag	UNP Q5F4S7
B	1729	ALA	-	expression tag	UNP Q5F4S7
B	1730	HIS	-	expression tag	UNP Q5F4S7
B	1731	HIS	-	expression tag	UNP Q5F4S7
B	1732	HIS	-	expression tag	UNP Q5F4S7
B	1733	HIS	-	expression tag	UNP Q5F4S7
B	1734	HIS	-	expression tag	UNP Q5F4S7
B	1735	HIS	-	expression tag	UNP Q5F4S7
B	1736	HIS	-	expression tag	UNP Q5F4S7
B	1737	HIS	-	expression tag	UNP Q5F4S7
B	1738	HIS	-	expression tag	UNP Q5F4S7
B	1739	HIS	-	expression tag	UNP Q5F4S7
D	1710	SER	-	expression tag	UNP Q5F4S7
D	1711	ASN	-	expression tag	UNP Q5F4S7
D	1712	SER	-	expression tag	UNP Q5F4S7
D	1713	LEU	-	expression tag	UNP Q5F4S7
D	1714	GLU	-	expression tag	UNP Q5F4S7
D	1715	VAL	-	expression tag	UNP Q5F4S7
D	1716	LEU	-	expression tag	UNP Q5F4S7
D	1717	PHE	-	expression tag	UNP Q5F4S7
D	1718	GLN	-	expression tag	UNP Q5F4S7
D	1719	GLY	-	expression tag	UNP Q5F4S7
D	1720	PRO	-	expression tag	UNP Q5F4S7
D	1721	ASP	-	expression tag	UNP Q5F4S7
D	1722	TYR	-	expression tag	UNP Q5F4S7
D	1723	LYS	-	expression tag	UNP Q5F4S7
D	1724	ASP	-	expression tag	UNP Q5F4S7

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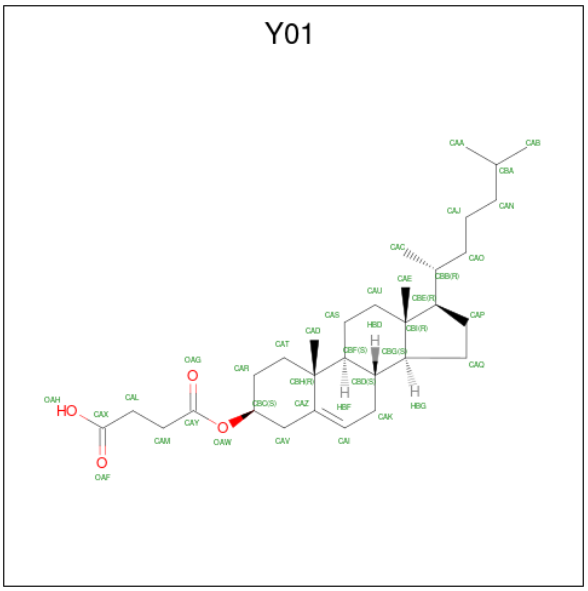
Chain	Residue	Modelled	Actual	Comment	Reference
D	1725	ASP	-	expression tag	UNP Q5F4S7
D	1726	ASP	-	expression tag	UNP Q5F4S7
D	1727	ASP	-	expression tag	UNP Q5F4S7
D	1728	LYS	-	expression tag	UNP Q5F4S7
D	1729	ALA	-	expression tag	UNP Q5F4S7
D	1730	HIS	-	expression tag	UNP Q5F4S7
D	1731	HIS	-	expression tag	UNP Q5F4S7
D	1732	HIS	-	expression tag	UNP Q5F4S7
D	1733	HIS	-	expression tag	UNP Q5F4S7
D	1734	HIS	-	expression tag	UNP Q5F4S7
D	1735	HIS	-	expression tag	UNP Q5F4S7
D	1736	HIS	-	expression tag	UNP Q5F4S7
D	1737	HIS	-	expression tag	UNP Q5F4S7
D	1738	HIS	-	expression tag	UNP Q5F4S7
D	1739	HIS	-	expression tag	UNP Q5F4S7

- Molecule 2 is CHOLESTEROL HEMISUCCINATE (CCD ID: Y01) (formula: $C_{31}H_{50}O_4$).



Mol	Chain	Residues	Atoms	AltConf
2	A	1	Total C H O 84 31 49 4	0
2	A	1	Total C H O 84 31 49 4	0
2	C	1	Total C H O 84 31 49 4	0
2	C	1	Total C H O 84 31 49 4	0

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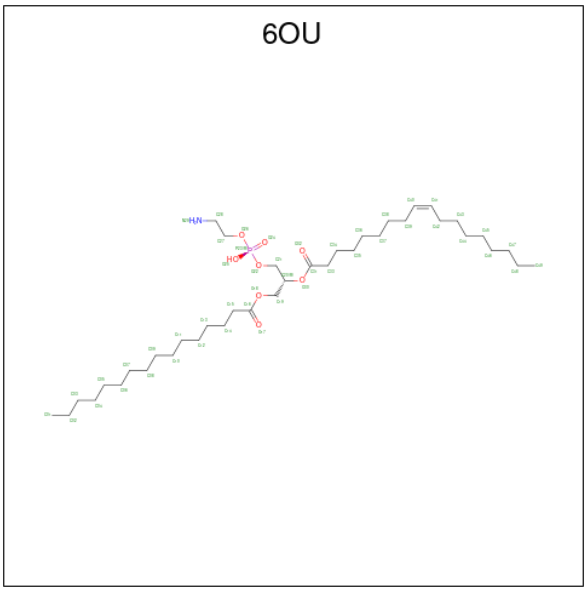
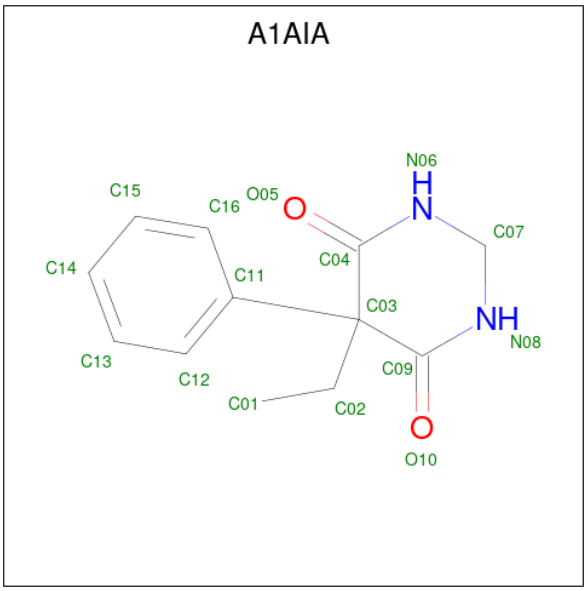
Mol	Chain	Residues	Atoms				AltConf
2	B	1	Total	C	H	O	0
			84	31	49	4	
2	B	1	Total	C	H	O	0
			84	31	49	4	
2	D	1	Total	C	H	O	0
			84	31	49	4	
2	D	1	Total	C	H	O	0
			84	31	49	4	

- Molecule 3 is [(2 {R})-1-[2-azanylethoxy(oxidanyl)phosphoryl]oxy-3-hexadecanoyloxy-propan-2-yl] ({Z})-octadec-9-enoate (CCD ID: 6OU) (formula: $C_{39}H_{76}NO_8P$).



Mol	Chain	Residues	Atoms						AltConf
3	A	1	Total	C	H	N	O	P	0
			86	27	49	1	8	1	
3	C	1	Total	C	H	N	O	P	0
			86	27	49	1	8	1	
3	B	1	Total	C	H	N	O	P	0
			86	27	49	1	8	1	
3	D	1	Total	C	H	N	O	P	0
			86	27	49	1	8	1	

- Molecule 4 is primidone (CCD ID: A1AIA) (formula: $C_{12}H_{14}N_2O_2$).



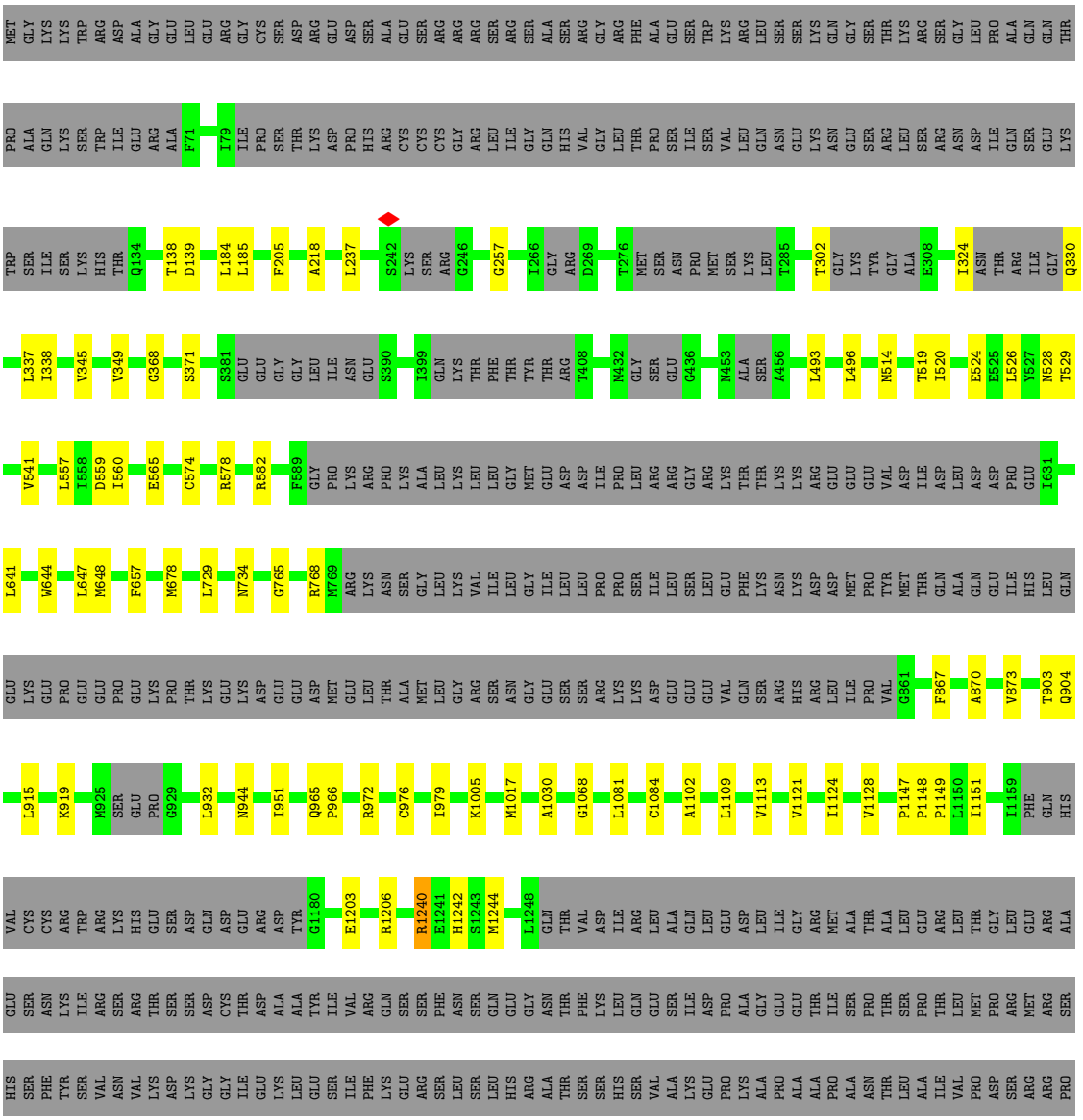
Mol	Chain	Residues	Atoms					AltConf
4	A	1	Total	C	H	N	O	0
			30	12	14	2	2	
4	C	1	Total	C	H	N	O	0
			30	12	14	2	2	
4	B	1	Total	C	H	N	O	0
			30	12	14	2	2	
4	D	1	Total	C	H	N	O	0
			30	12	14	2	2	

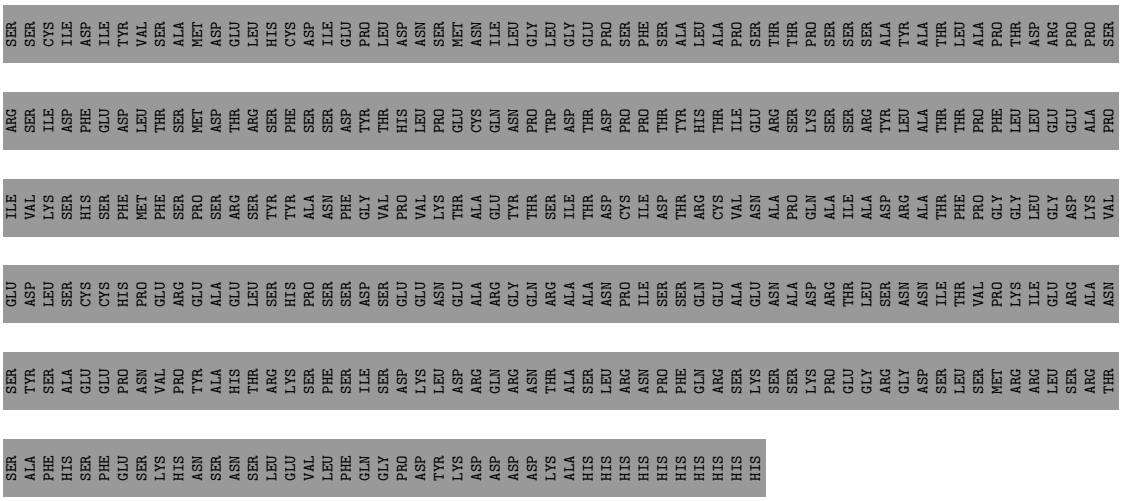
3 Residue-property plots (i)

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

- Molecule 1: Transient receptor potential cation channel, subfamily M, member 3

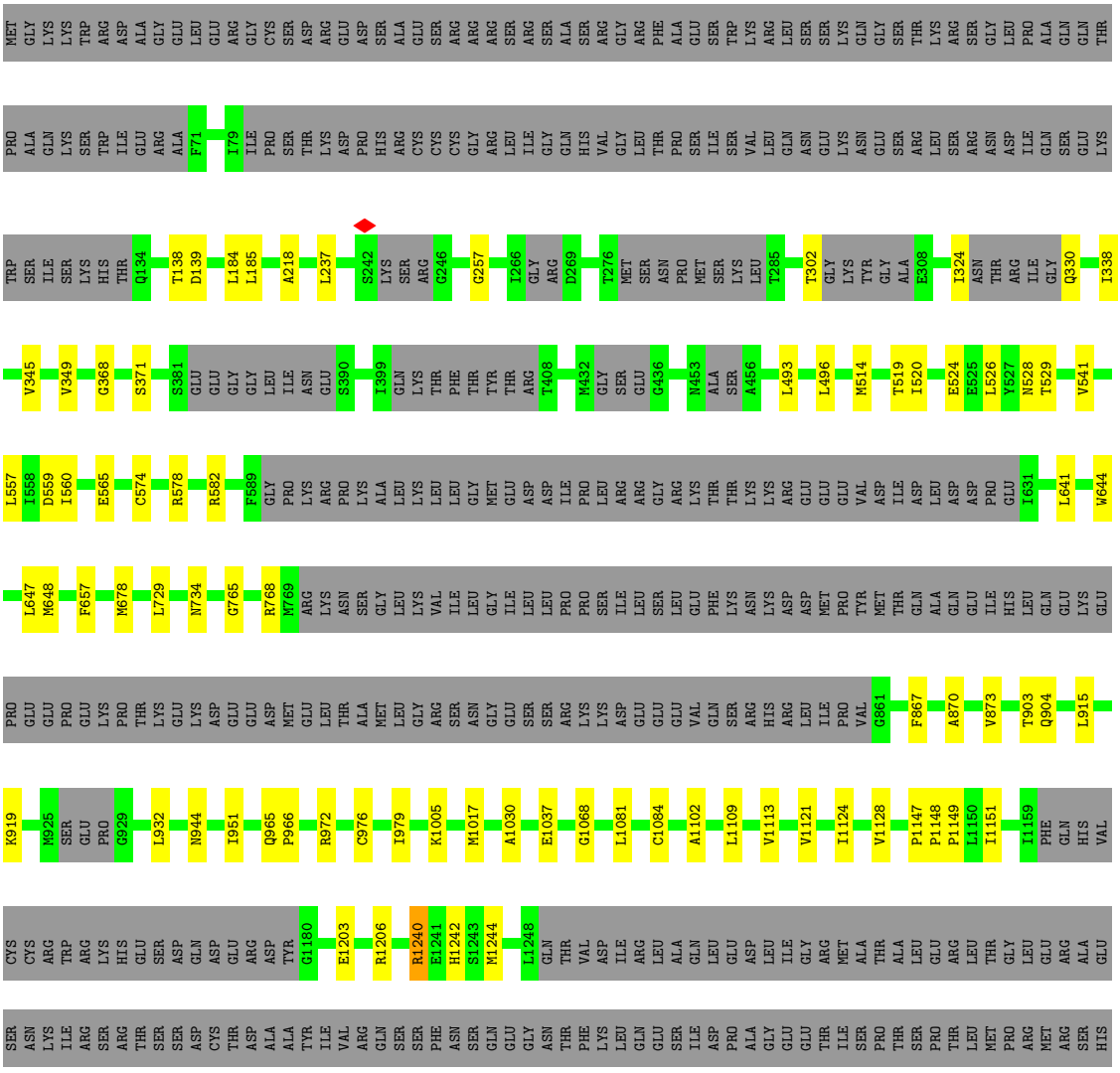
Chain A:

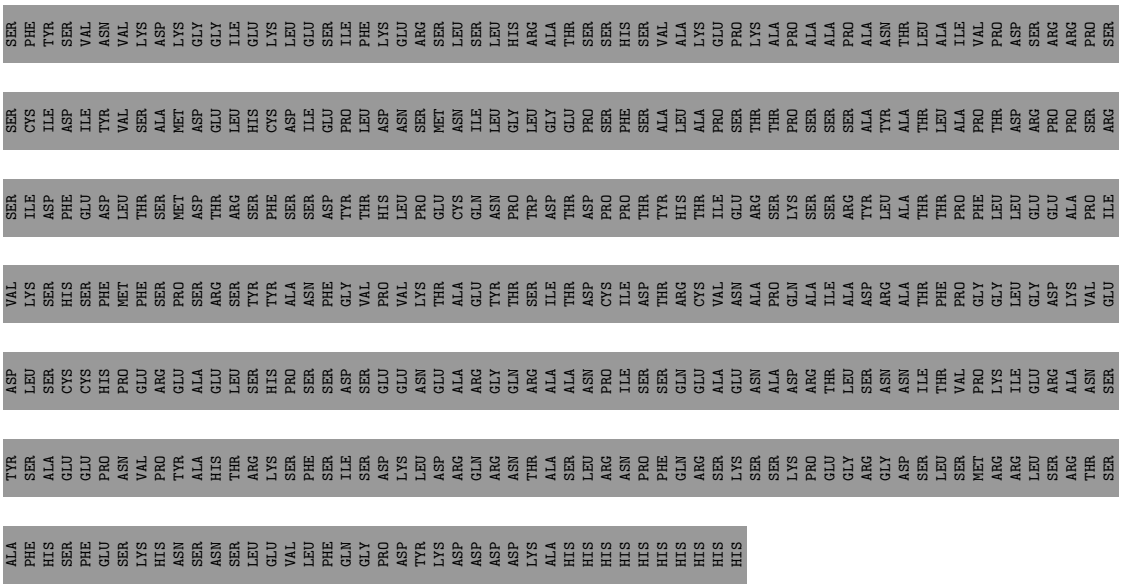




• Molecule 1: Transient receptor potential cation channel, subfamily M, member 3

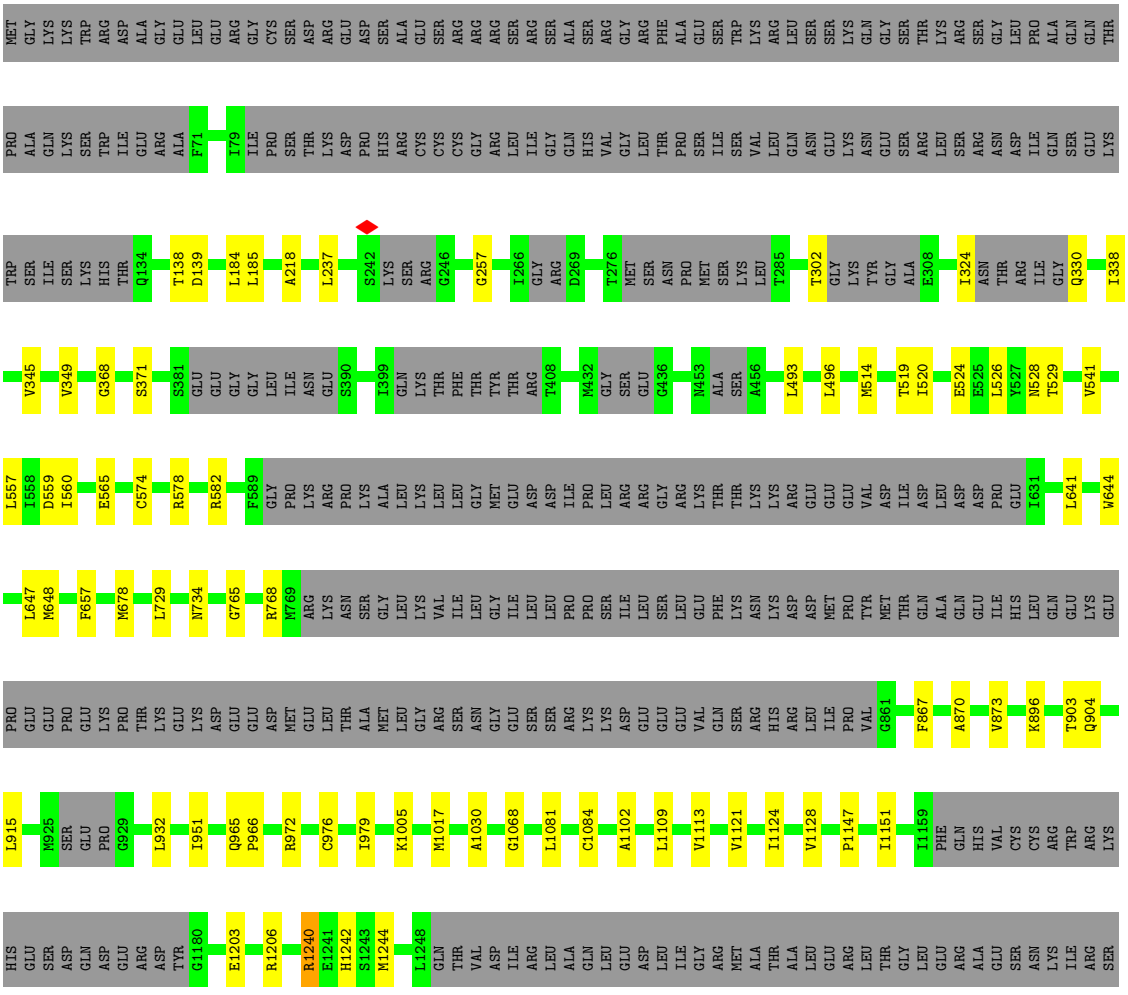
Chain C:

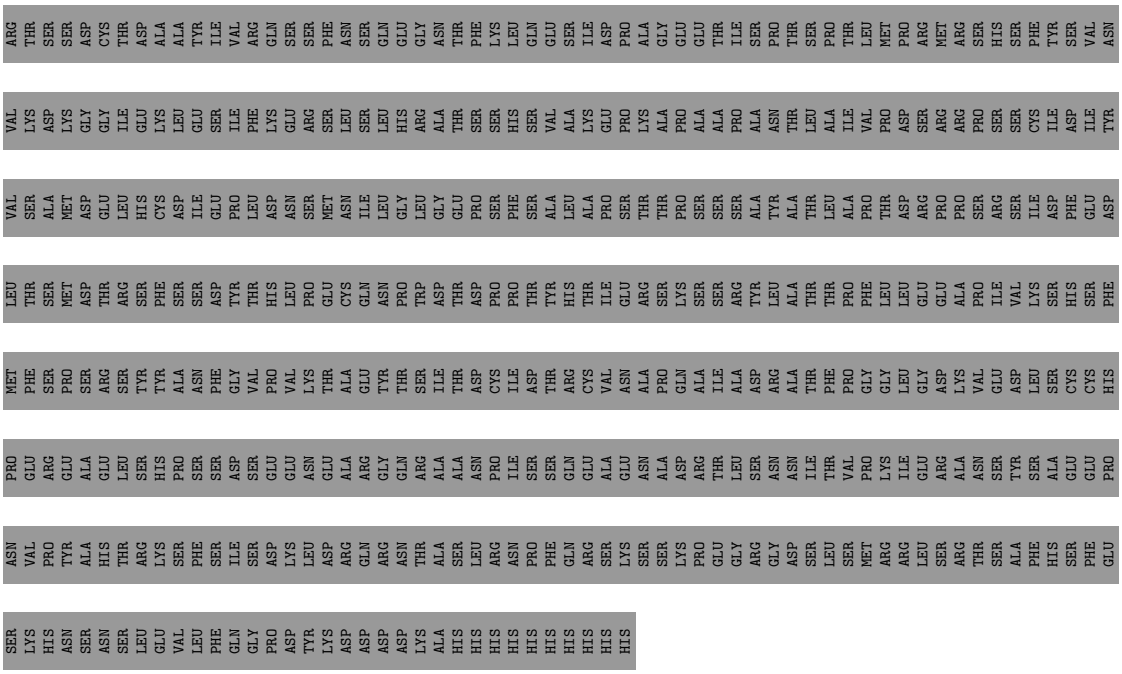




• Molecule 1: Transient receptor potential cation channel, subfamily M, member 3

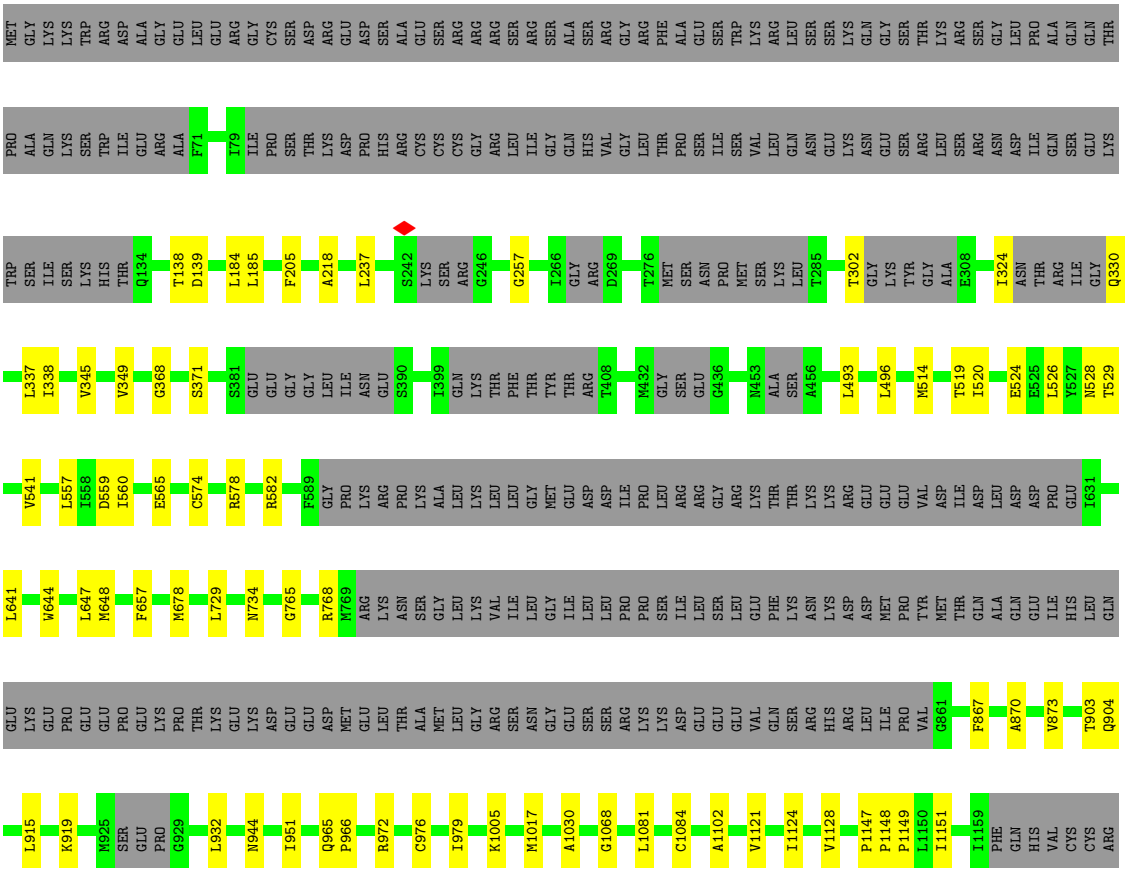
Chain B:

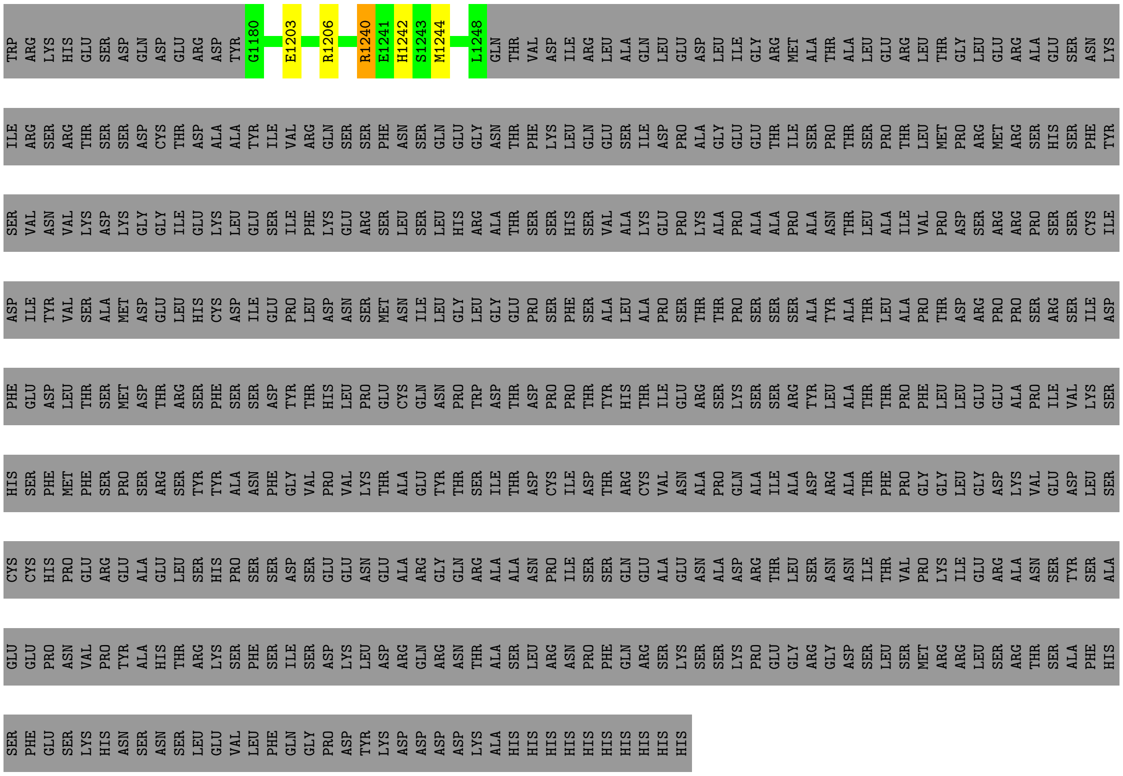




• Molecule 1: Transient receptor potential cation channel, subfamily M, member 3

Chain D:




TRP ARG LYS HIS GLU SER ASP GLN ASP GLU ARG ASP TYR G1180 E1203 R1206 R1240 E1241 H1242 S1243 M1244 L1248 GLN THR VAL ASP ILE ARG LEU ALA GLN LEU GLU ASP LEU ILE GLY ARG MET ALA THR ALA LEU GLU ARG LEU THR GLY LEU GLU ARG ALA GLU SER ASN LYS
ILE ARG SER ARG THR SER SER ASP CYS THR ASP ALA ALA TYR ILE VAL ARG GLN SER SER PHE ASN SER GLN GLU GLY ASN THR PHE LYS LEU GLN GLU SER ILE ASP PRO ALA GLY GLU GLU THR ILE SER PRO THR SER PRO THR LEU MET PRO ARG MET ARG SER HIS SER PHE TYR
SER VAL ASN VAL LYS ASP LYS GLY GLY ILE GLU LYS LEU GLU SER ILE PHE LYS GLU ARG SER LEU SER LEU HIS ARG ALA THR SER SER HIS SER VAL ALA LYS GLU PRO LYS ALA PRO ALA ALA PRO ALA ASN THR LEU ALA ILE VAL PRO ASP SER ARG ARG PRO SER SER CYS ILE
ASP ILE TYR VAL SER ALA MET ASP GLU LEU HIS CYS ASP ILE GLU PRO LEU ASP ASN SER MET ASN ILE LEU GLY LEU GLY GLU PRO SER PHE SER ALA LEU ALA PRO SER THR THR PRO SER SER SER ALA TYR ALA THR LEU ALA PRO THR ASP ARG PRO PRO SER ARG SER ILE ASP
PHE GLU ASP LEU THR SER MET ASP THR ARG SER PHE SER SER ASP TYR THR HIS LEU PRO GLU CYS GLN ASN PRO TRP ASP THR ASP PRO PRO THR TYR HIS THR ILE GLU ARG SER LYS SER SER ARG TYR LEU ALA THR THR PRO PHE LEU LEU GLU GLU ALA PRO ILE VAL LYS SER
HIS SER PHE MET PHE SER PRO SER ARG SER TYR TYR ALA ASN PHE GLY VAL PRO VAL LYS THR ALA GLU TYR THR SER ILE THR ASP CYS ILE ASP THR ARG CYS VAL ASN ALA PRO GLN ALA ILE ALA ASP ARG ALA THR PHE PRO GLY GLY LEU GLY ASP LYS VAL GLU ASP LEU SER
CYS CYS HIS PRO GLU ARG GLU ALA GLU LEU SER HIS PRO SER SER ASP SER GLU GLU ASN GLU ALA ARG GLY GLN ARG ALA ALA ASN PRO ILE SER SER GLN GLU ALA GLU ASN ALA ASP ARG THR LEU SER ASN ASN ILE THR VAL PRO LYS ILE GLU ARG ALA ASN SER TYR SER ALA
GLU GLU PRO ASN VAL PRO TYR ALA HIS THR ARG LYS SER PHE SER ILE SER ASP LYS LEU ASP ARG GLN ARG ASN THR ALA SER LEU ARG ASN PRO PHE GLN ARG SER LYS SER SER LYS PRO GLU GLY ARG GLY ASP SER LEU SER MET ARG ARG LEU SER ARG THR SER ALA PHE HIS
SER PHE GLU SER LYS HIS ASN SER ASN SER LEU GLU VAL LEU PHE GLN GLY PRO ASP TYR LYS 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, C4	Depositor
Number of particles used	104425	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1250	Depositor
Maximum defocus (nm)	2750	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	1.724	Depositor
Minimum map value	-0.892	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.042	Depositor
Recommended contour level	0.1	Depositor
Map size (Å)	358.4, 358.4, 358.4	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.12, 1.12, 1.12	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 6OU, Y01, A1AIA

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	0/6731	0.25	0/9178
1	B	0.13	0/6731	0.25	0/9178
1	C	0.13	0/6731	0.25	0/9178
1	D	0.13	0/6731	0.25	0/9178
All	All	0.13	0/26924	0.25	0/36712

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

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	6595	5797	5852	55	0
1	B	6595	5797	5852	53	0
1	C	6595	5797	5852	54	0
1	D	6595	5797	5852	53	0
2	A	70	98	98	2	0
2	B	70	98	98	2	0
2	C	70	98	98	2	0
2	D	70	98	98	3	0
3	A	37	49	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	37	49	0	0	0
3	C	37	49	0	0	0
3	D	37	49	0	0	0
4	A	16	14	0	0	0
4	B	16	14	0	0	0
4	C	16	14	0	0	0
4	D	16	14	0	0	0
All	All	26872	23832	23800	207	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 4.

The worst 5 of 207 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:867:PHE:O	1:D:873:VAL:HG21	1.91	0.71
1:A:867:PHE:O	1:A:873:VAL:HG21	1.91	0.71
1:C:867:PHE:O	1:C:873:VAL:HG21	1.91	0.71
1:B:867:PHE:O	1:B:873:VAL:HG21	1.91	0.69
1:A:904:GLN:N	1:A:904:GLN:OE1	2.26	0.69

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	895/1739 (52%)	869 (97%)	26 (3%)	0	100	100
1	B	895/1739 (52%)	869 (97%)	26 (3%)	0	100	100
1	C	895/1739 (52%)	869 (97%)	26 (3%)	0	100	100
1	D	895/1739 (52%)	869 (97%)	26 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	3580/6956 (52%)	3476 (97%)	104 (3%)	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	563/1545 (36%)	562 (100%)	1 (0%)	92 96
1	B	563/1545 (36%)	562 (100%)	1 (0%)	92 96
1	C	563/1545 (36%)	562 (100%)	1 (0%)	92 96
1	D	563/1545 (36%)	562 (100%)	1 (0%)	92 96
All	All	2252/6180 (36%)	2248 (100%)	4 (0%)	91 96

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

Mol	Chain	Res	Type
1	A	1240	ARG
1	C	1240	ARG
1	B	1240	ARG
1	D	1240	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	633	HIS
1	A	746	HIS
1	C	633	HIS
1	B	633	HIS
1	D	633	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)

16 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	$\#\|Z\| > 2$
2	Y01	B	2002	-	38,38,38	1.10	3 (7%)	57,57,57	2.31	14 (24%)
3	6OU	A	2004	-	36,36,48	1.03	4 (11%)	39,41,53	0.97	2 (5%)
3	6OU	B	2004	-	36,36,48	1.03	4 (11%)	39,41,53	0.97	2 (5%)
4	A1AIA	C	2101	-	17,17,17	5.73	9 (52%)	24,24,24	1.00	1 (4%)
3	6OU	C	2004	-	36,36,48	1.04	4 (11%)	39,41,53	0.97	2 (5%)
4	A1AIA	D	2101	-	17,17,17	5.73	9 (52%)	24,24,24	1.00	1 (4%)
4	A1AIA	B	2101	-	17,17,17	5.73	9 (52%)	24,24,24	1.00	1 (4%)
2	Y01	D	2002	-	38,38,38	1.10	3 (7%)	57,57,57	2.31	14 (24%)
3	6OU	D	2004	-	36,36,48	1.03	4 (11%)	39,41,53	0.97	2 (5%)
2	Y01	C	2201	-	38,38,38	1.14	3 (7%)	57,57,57	2.48	18 (31%)
2	Y01	B	2201	-	38,38,38	1.13	3 (7%)	57,57,57	2.48	18 (31%)
2	Y01	A	2002	-	38,38,38	1.10	3 (7%)	57,57,57	2.31	14 (24%)
2	Y01	C	2002	-	38,38,38	1.10	3 (7%)	57,57,57	2.32	13 (22%)
2	Y01	D	2201	-	38,38,38	1.13	3 (7%)	57,57,57	2.48	18 (31%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	A1AIA	A	2101	-	17,17,17	5.73	9 (52%)	24,24,24	0.99	0
2	Y01	A	2201	-	38,38,38	1.14	3 (7%)	57,57,57	2.48	17 (29%)

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	Y01	B	2002	-	-	7/19/77/77	0/4/4/4
3	6OU	A	2004	-	-	20/40/40/52	-
3	6OU	B	2004	-	-	20/40/40/52	-
4	A1AIA	C	2101	-	-	1/9/27/27	0/2/2/2
3	6OU	C	2004	-	-	20/40/40/52	-
4	A1AIA	D	2101	-	-	1/9/27/27	0/2/2/2
4	A1AIA	B	2101	-	-	1/9/27/27	0/2/2/2
2	Y01	D	2002	-	-	7/19/77/77	0/4/4/4
3	6OU	D	2004	-	-	20/40/40/52	-
2	Y01	C	2201	-	-	15/19/77/77	0/4/4/4
2	Y01	B	2201	-	-	15/19/77/77	0/4/4/4
2	Y01	A	2002	-	-	7/19/77/77	0/4/4/4
2	Y01	C	2002	-	-	7/19/77/77	0/4/4/4
2	Y01	D	2201	-	-	15/19/77/77	0/4/4/4
4	A1AIA	A	2101	-	-	1/9/27/27	0/2/2/2
2	Y01	A	2201	-	-	15/19/77/77	0/4/4/4

The worst 5 of 76 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	2101	A1AIA	C04-N06	16.16	1.45	1.33
4	D	2101	A1AIA	C04-N06	16.16	1.45	1.33
4	A	2101	A1AIA	C04-N06	16.05	1.45	1.33
4	C	2101	A1AIA	C04-N06	16.05	1.45	1.33
4	A	2101	A1AIA	C09-N08	15.45	1.45	1.33

The worst 5 of 137 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	2002	Y01	CAT-CBH-CBF	-9.55	96.09	108.74

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	2002	Y01	CAT-CBH-CBF	-9.54	96.12	108.74
2	B	2002	Y01	CAT-CBH-CBF	-9.54	96.12	108.74
2	D	2002	Y01	CAT-CBH-CBF	-9.54	96.12	108.74
2	A	2201	Y01	CAT-CBH-CBF	-8.28	97.78	108.74

There are no chirality outliers.

5 of 172 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	2004	6OU	C21-O22-P23-O24
3	A	2004	6OU	C21-O22-P23-O26
3	A	2004	6OU	O26-C27-C28-N29
3	A	2004	6OU	O32-C31-O30-C20
3	C	2004	6OU	C21-O22-P23-O24

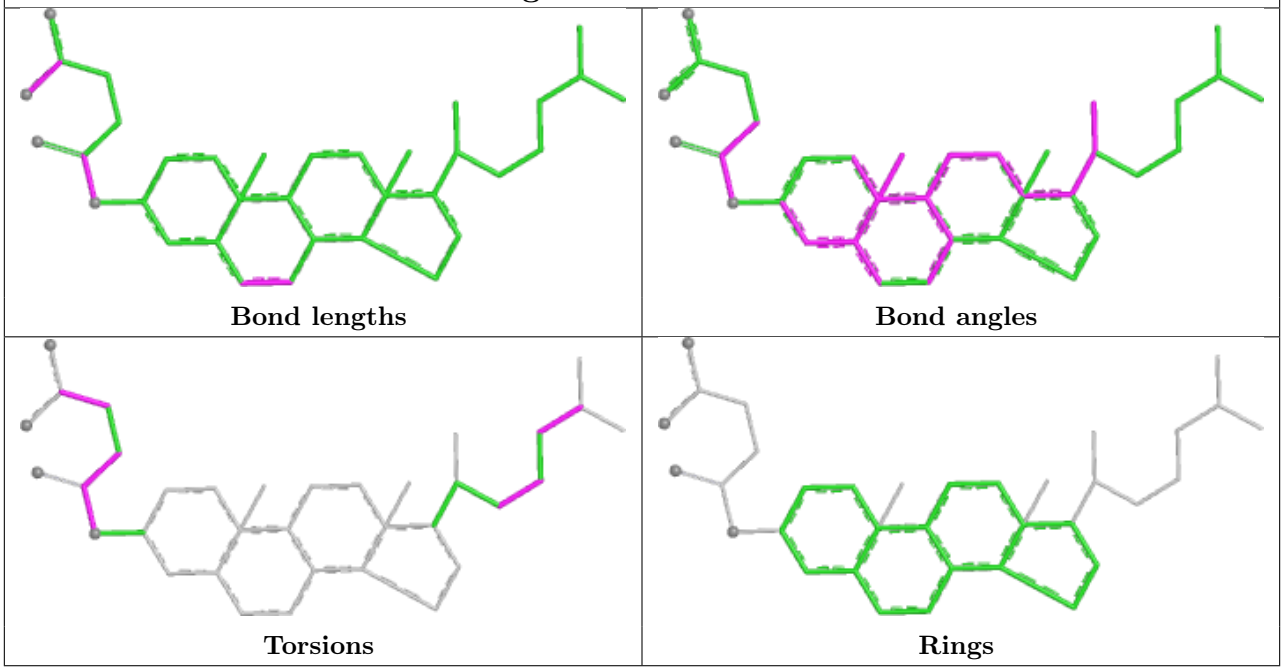
There are no ring outliers.

8 monomers are involved in 9 short contacts:

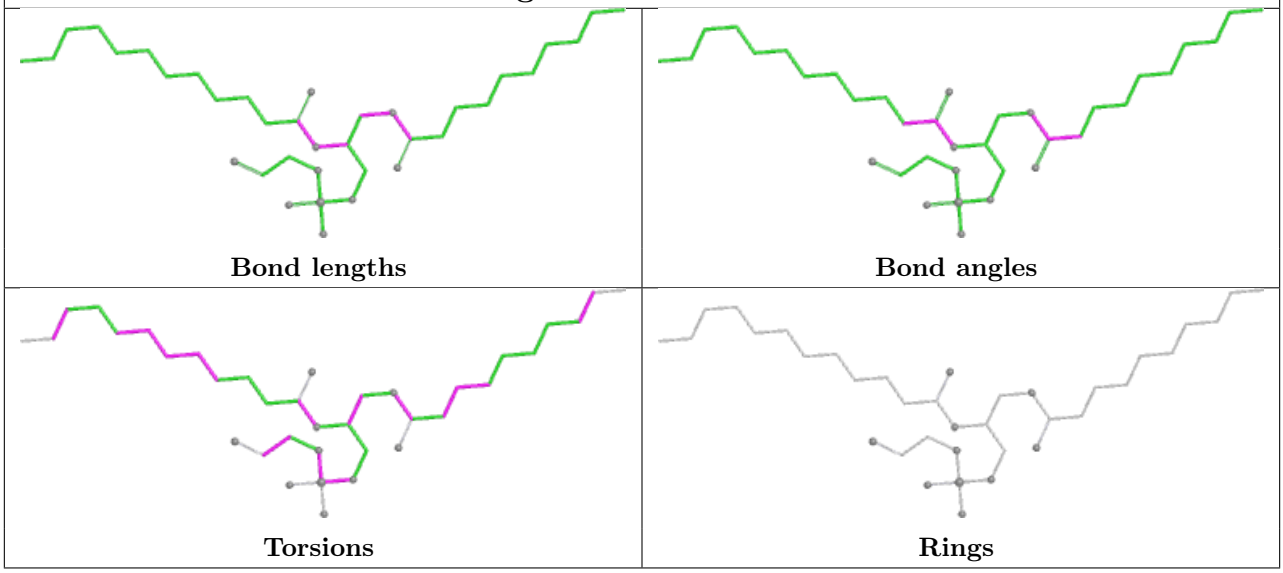
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	2002	Y01	1	0
2	D	2002	Y01	1	0
2	C	2201	Y01	1	0
2	B	2201	Y01	1	0
2	A	2002	Y01	1	0
2	C	2002	Y01	1	0
2	D	2201	Y01	2	0
2	A	2201	Y01	1	0

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.

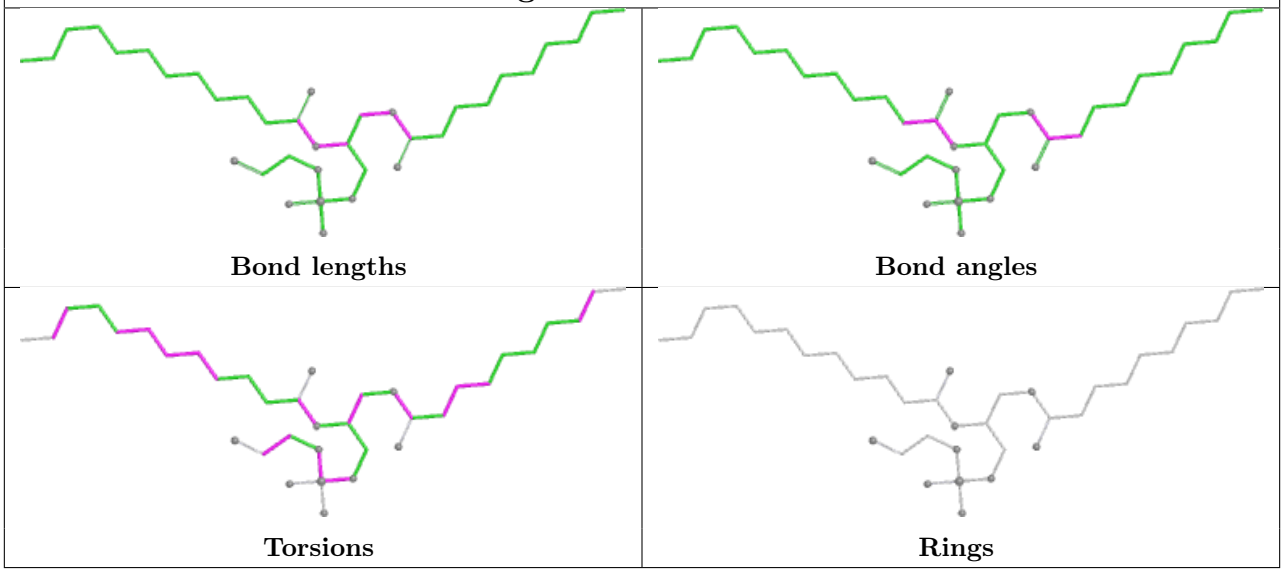
Ligand Y01 B 2002



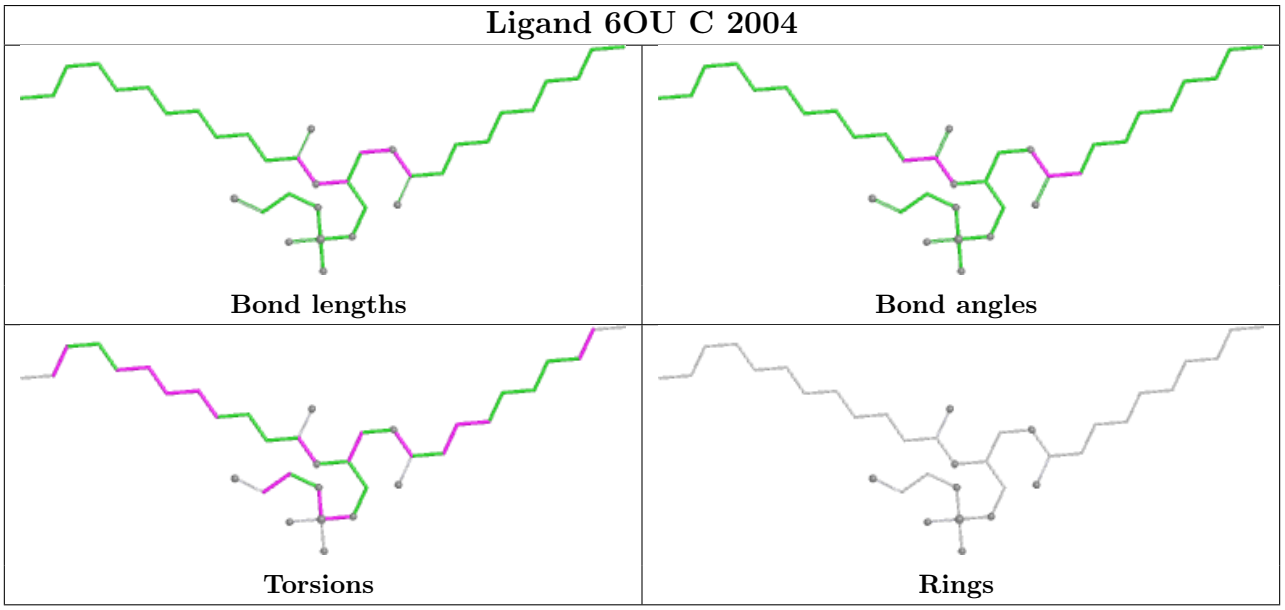
Ligand 6OU A 2004



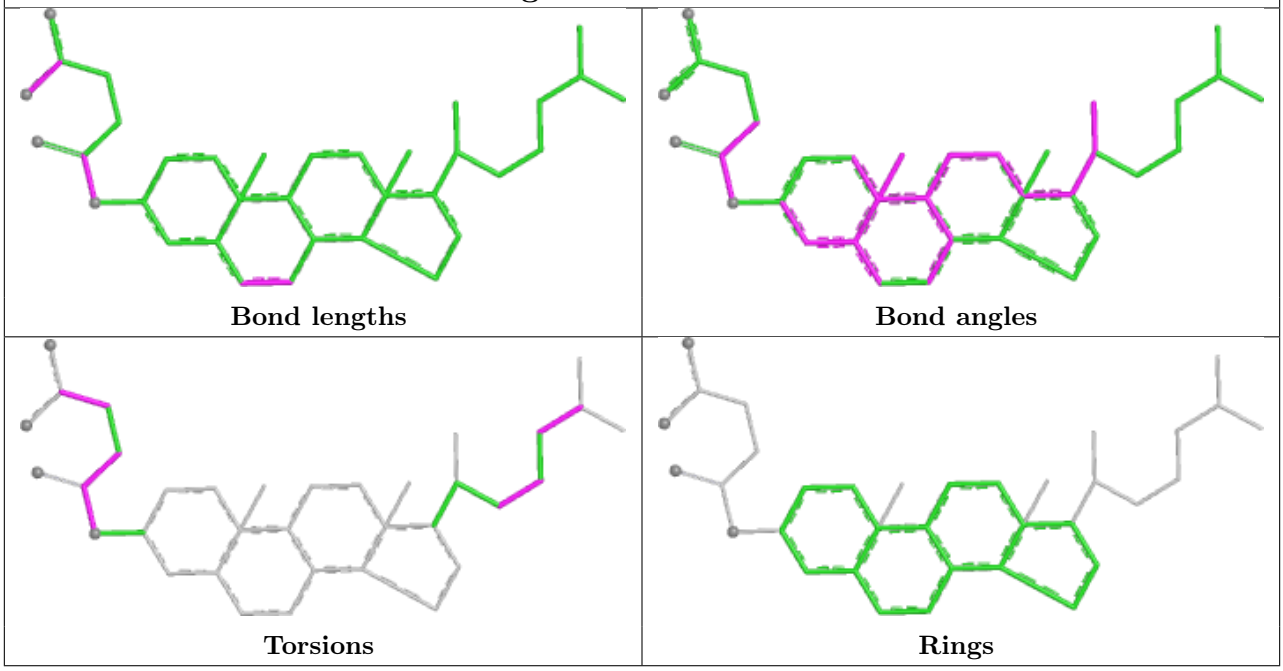
Ligand 6OU B 2004



Ligand 6OU C 2004



Ligand Y01 D 2002



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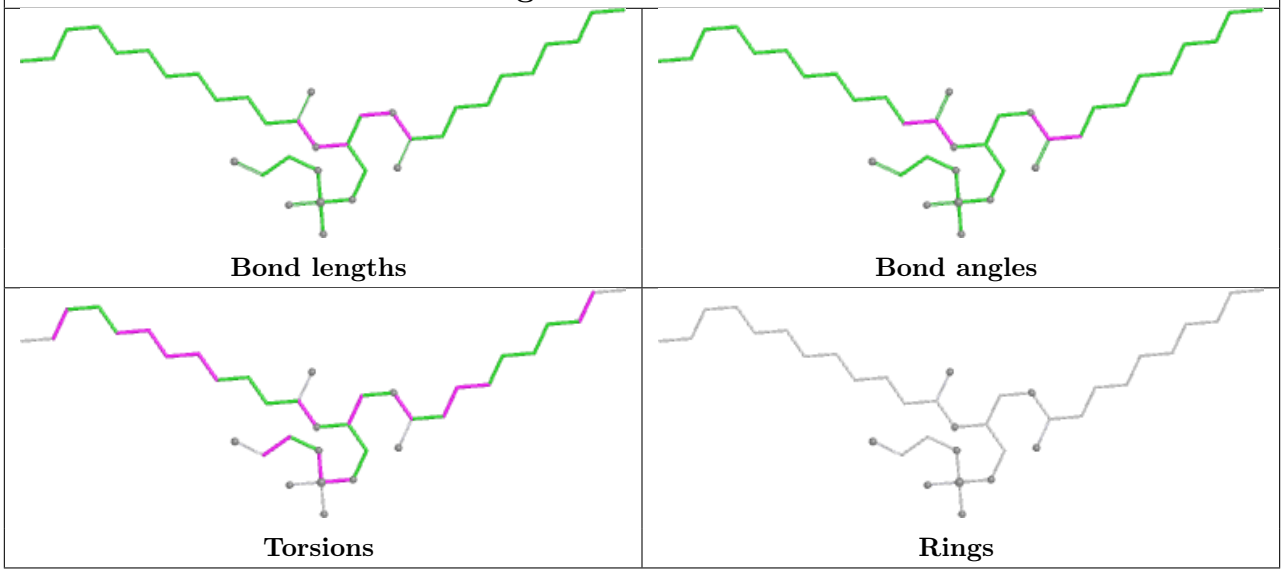
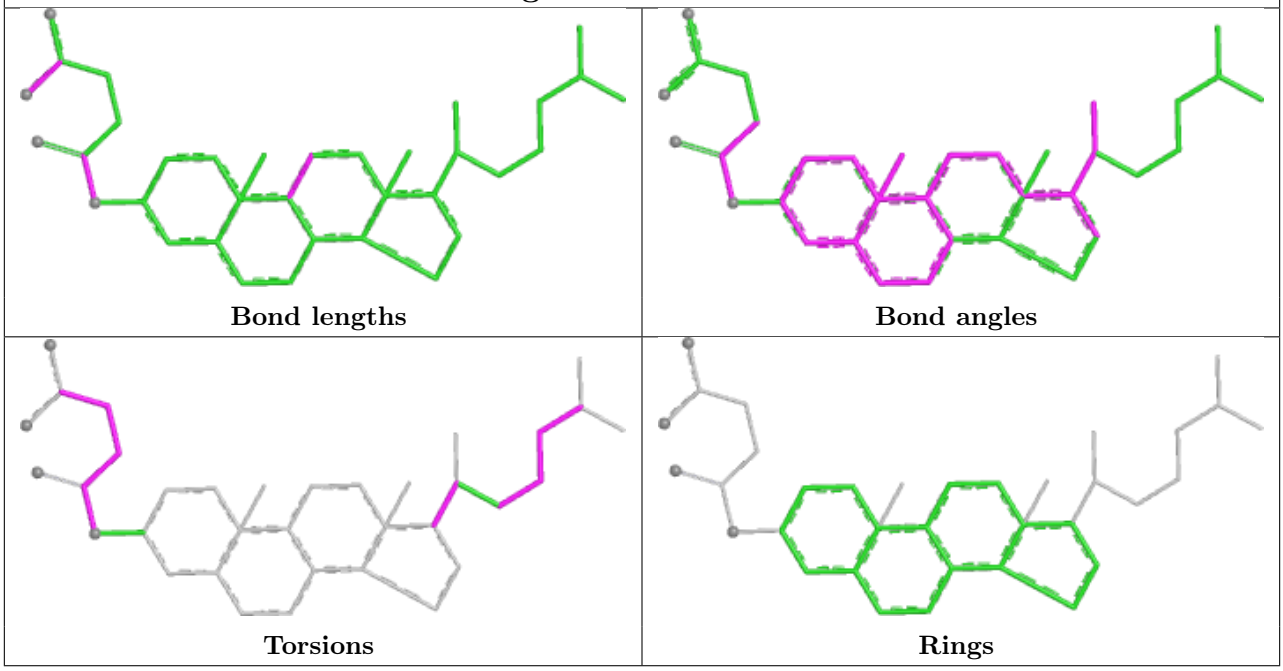


Ligand Y01 C 2201



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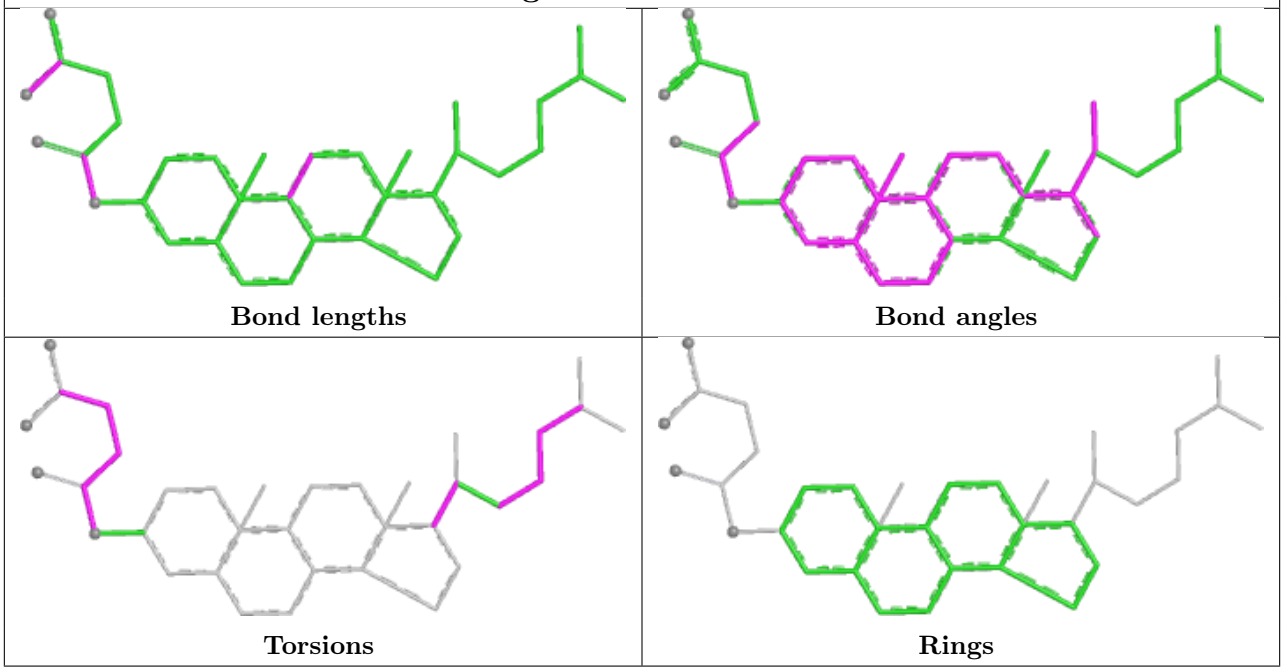
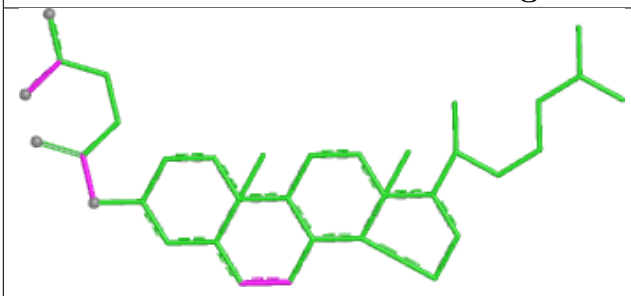
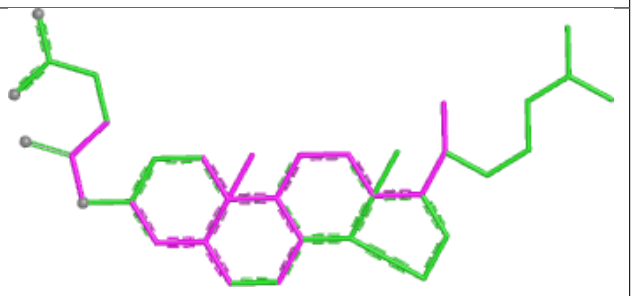


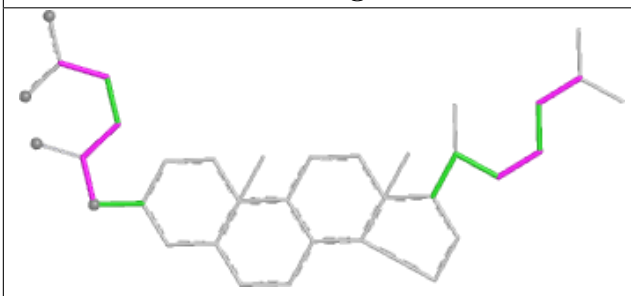
Ligand Y01 A 2002



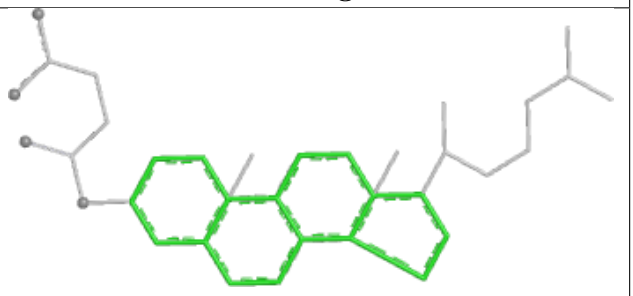
Bond lengths



Bond angles

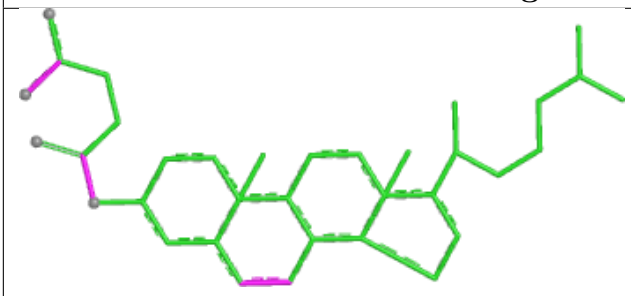


Torsions

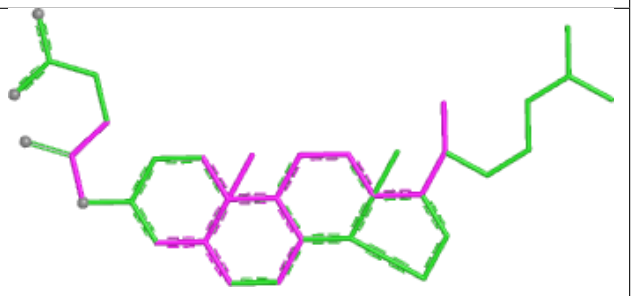


Rings

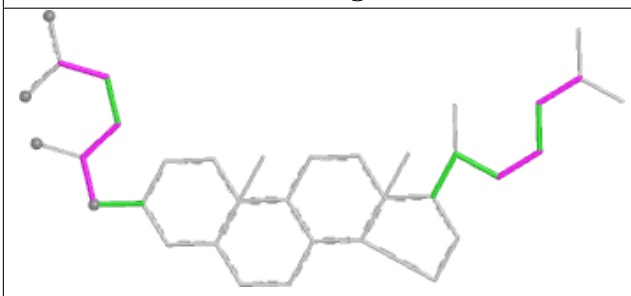
Ligand Y01 C 2002



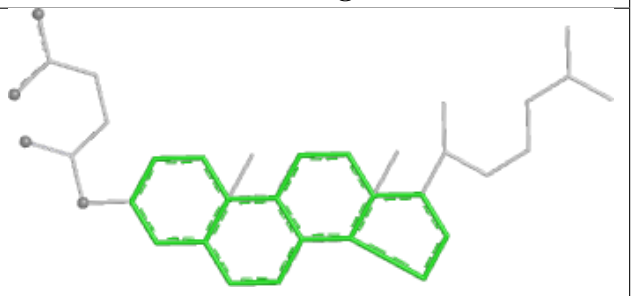
Bond lengths



Bond angles

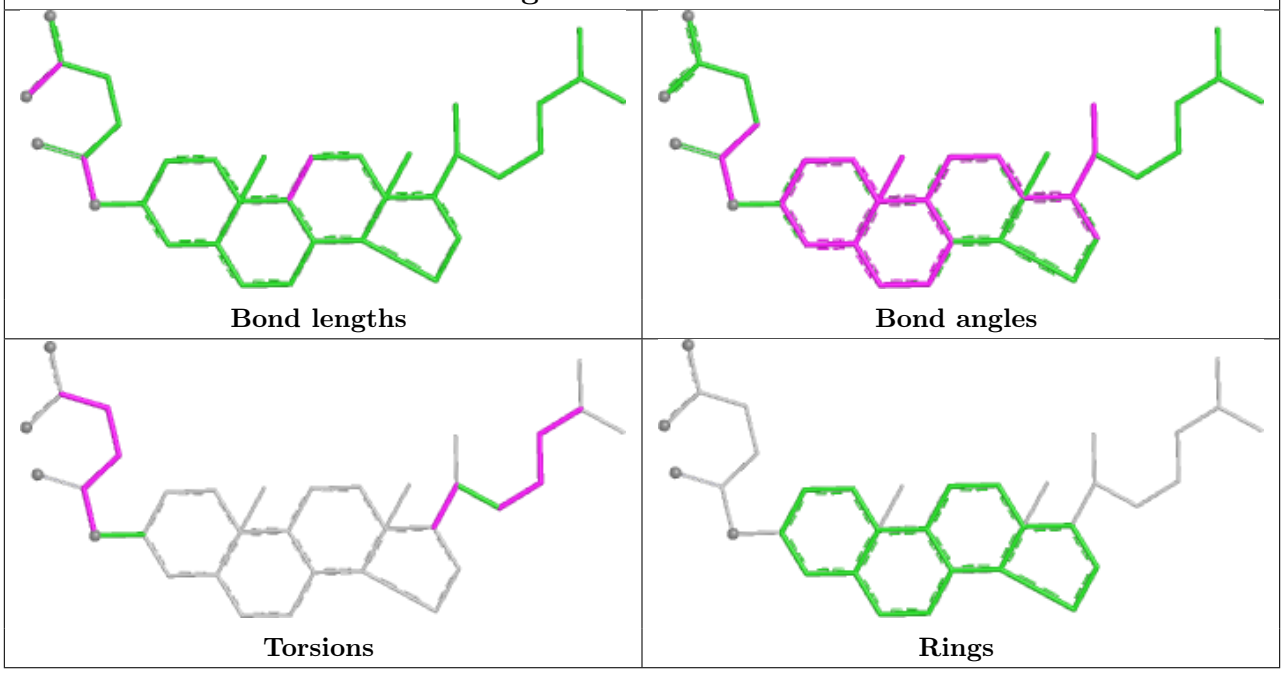


Torsions

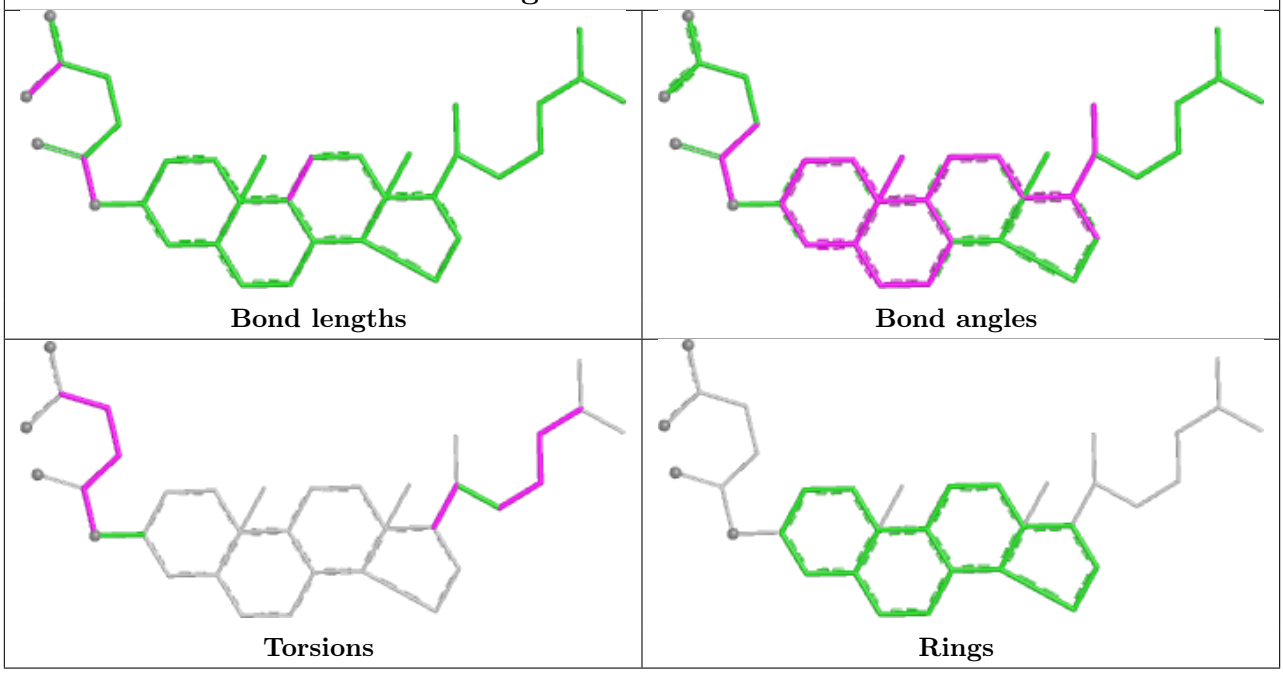


Rings

Ligand Y01 D 2201



Ligand Y01 A 2201



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

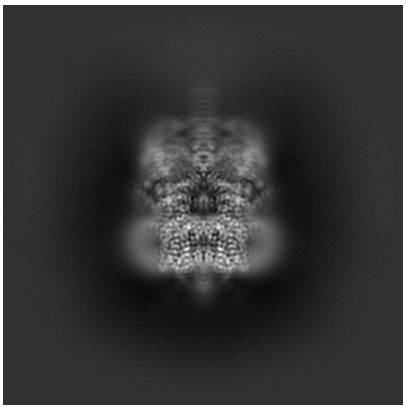
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-44100. These allow visual inspection of the internal detail of the map and identification of artifacts.

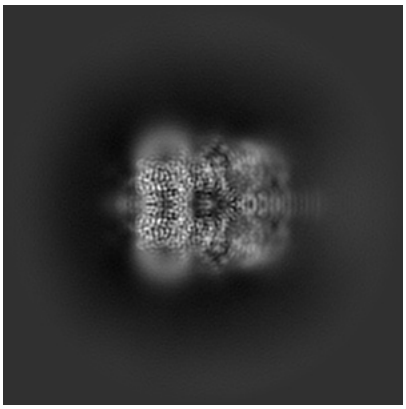
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

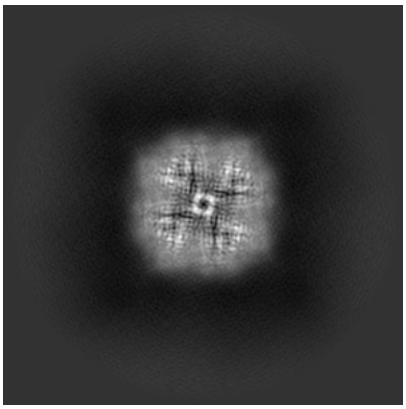
6.1.1 Primary map



X

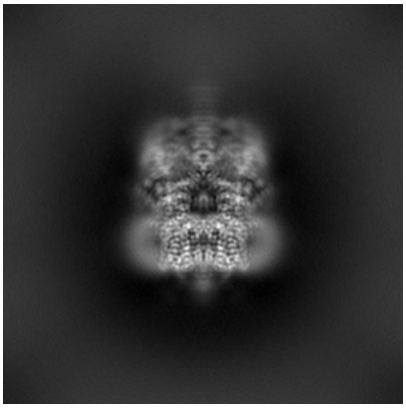


Y

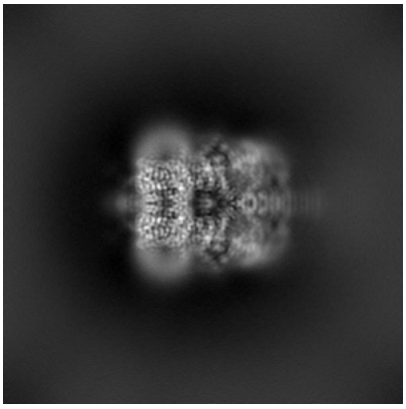


Z

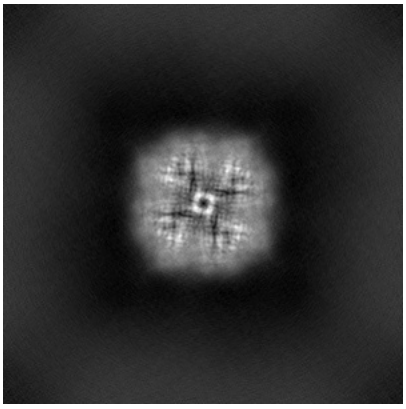
6.1.2 Raw map



X



Y

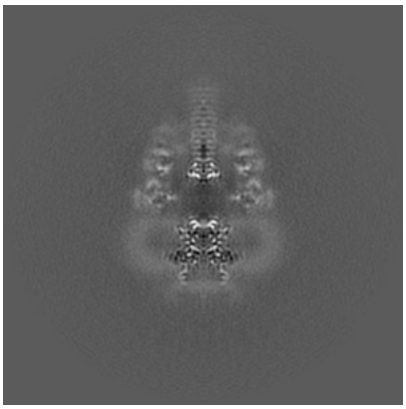


Z

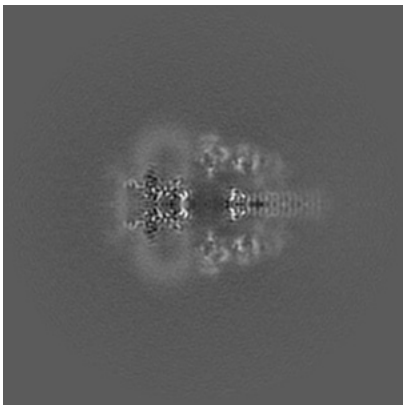
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

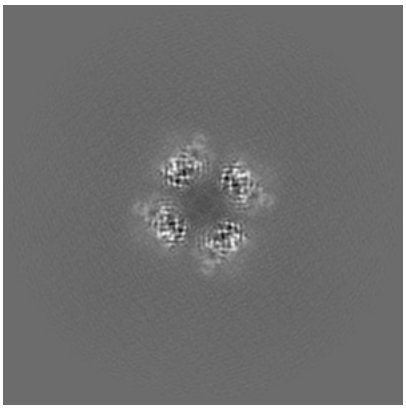
6.2.1 Primary map



X Index: 160



Y Index: 160



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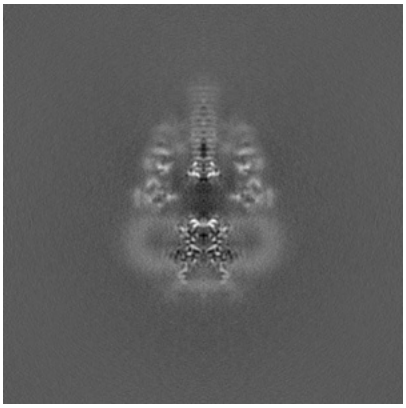
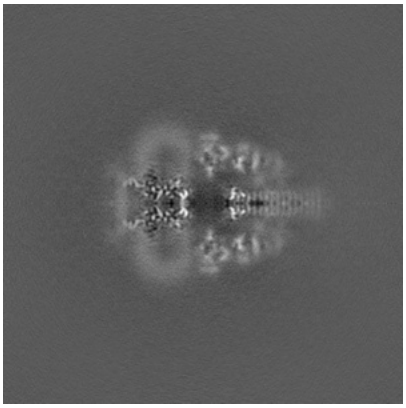
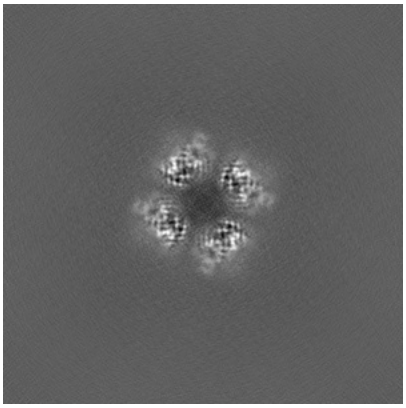
6.2.2 Raw map



X Index: 160



Y Index: 160

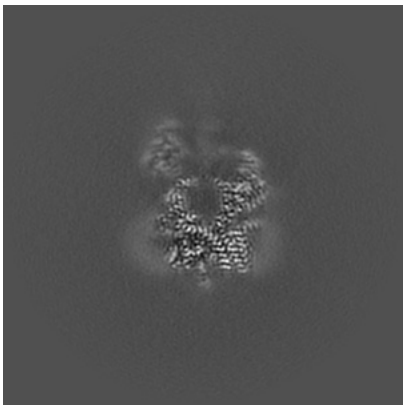


Z Index: 160

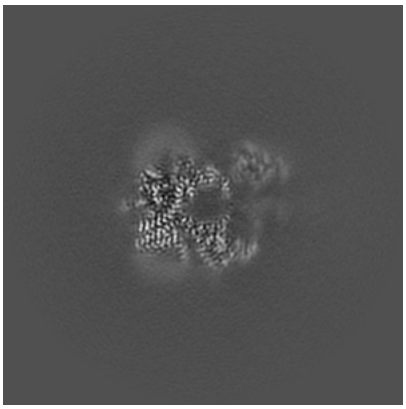
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

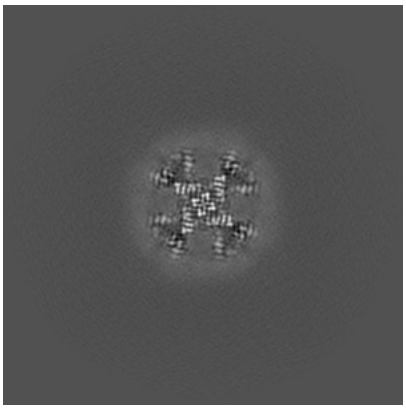
6.3.1 Primary map



X Index: 146

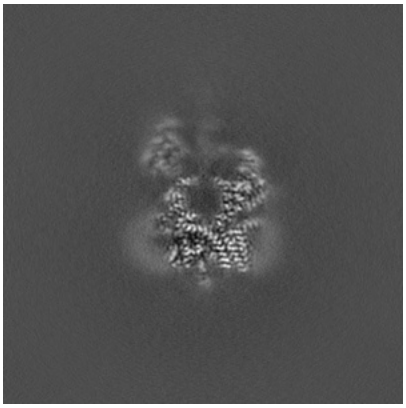


Y Index: 146

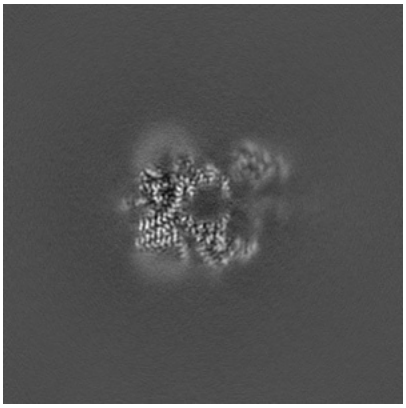


Z Index: 142

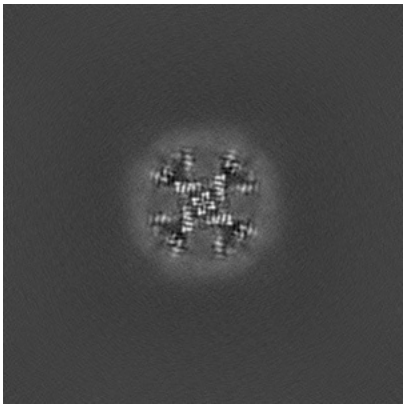
6.3.2 Raw map



X Index: 146



Y Index: 146

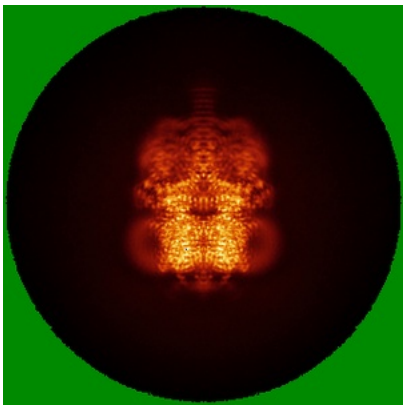


Z Index: 142

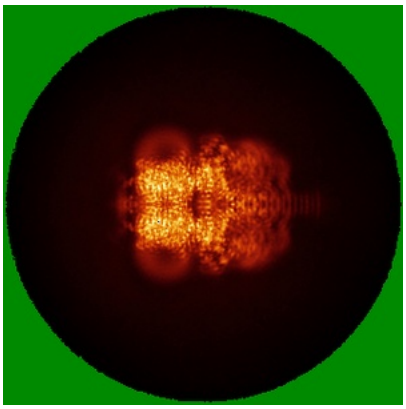
The images above show the largest variance slices of the map in three orthogonal directions.

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

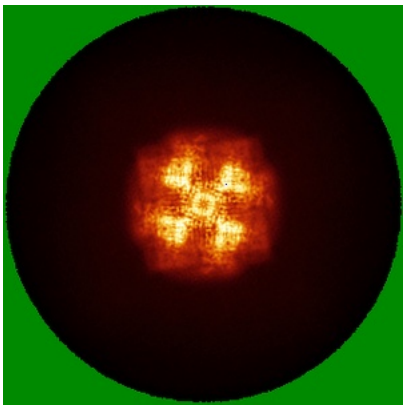
6.4.1 Primary map



X

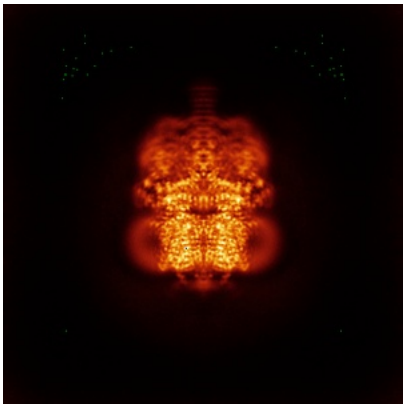


Y

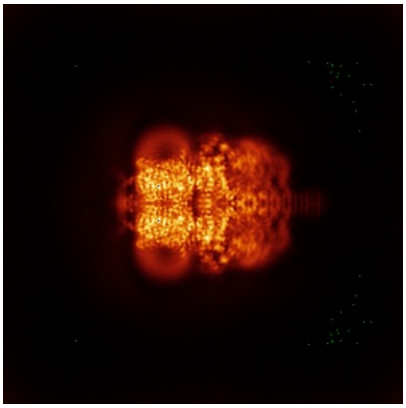


Z

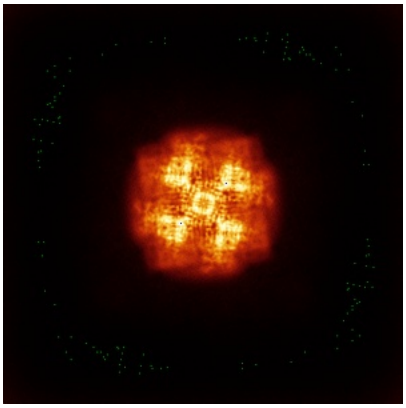
6.4.2 Raw map



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 0.1. 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.

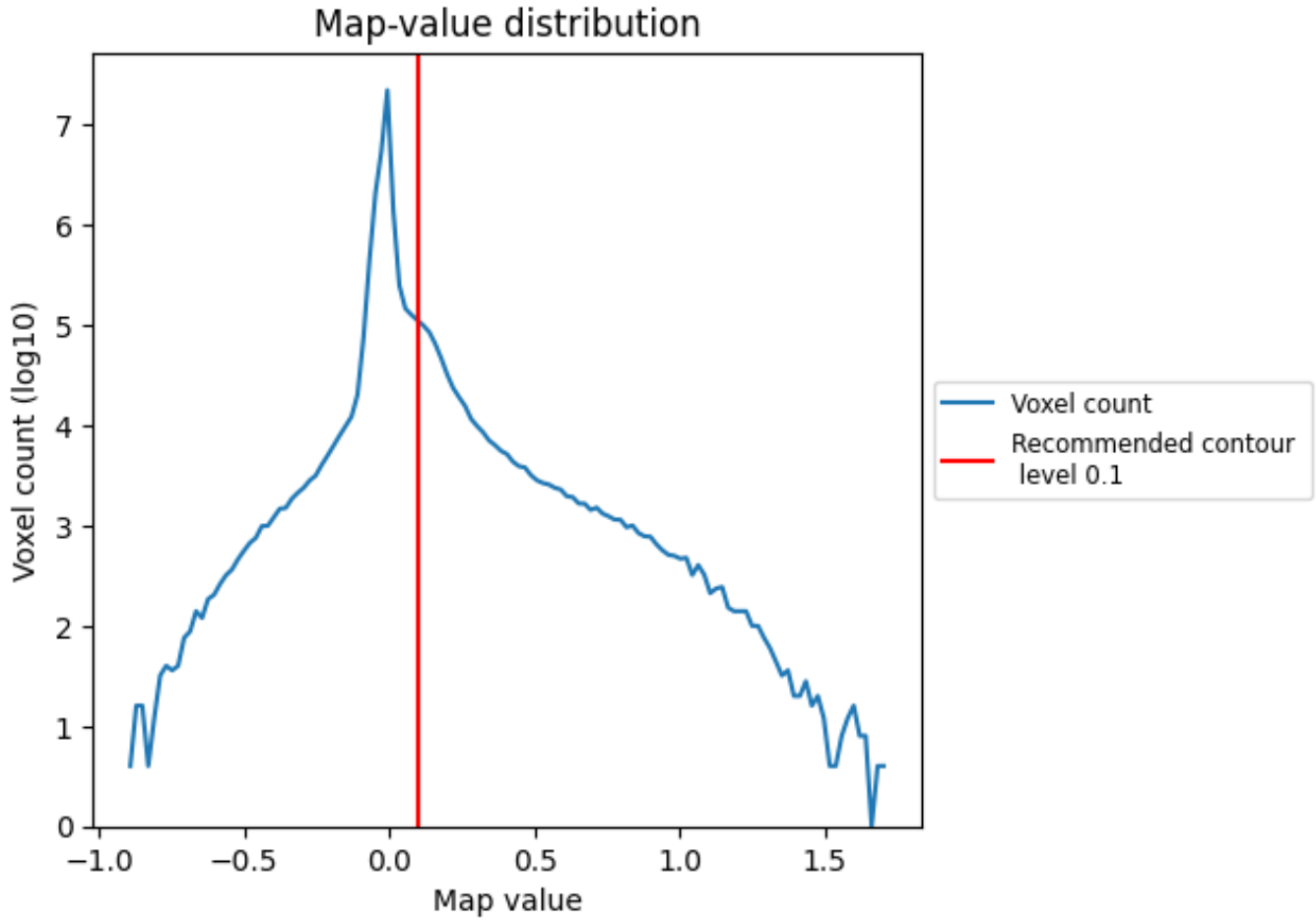
6.6 Mask visualisation (i)

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

7 Map analysis

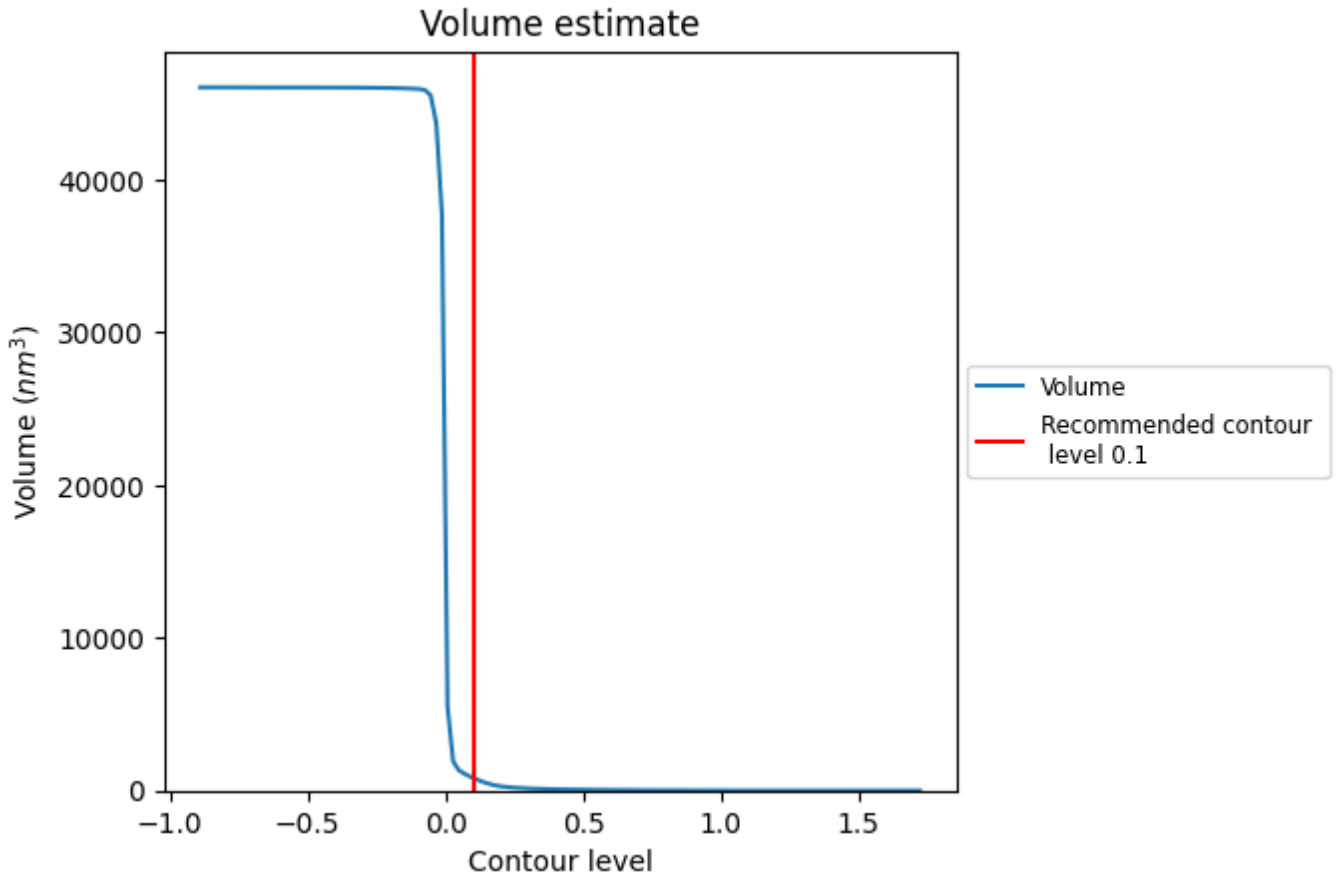
This section contains the results of statistical analysis of the map.

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.

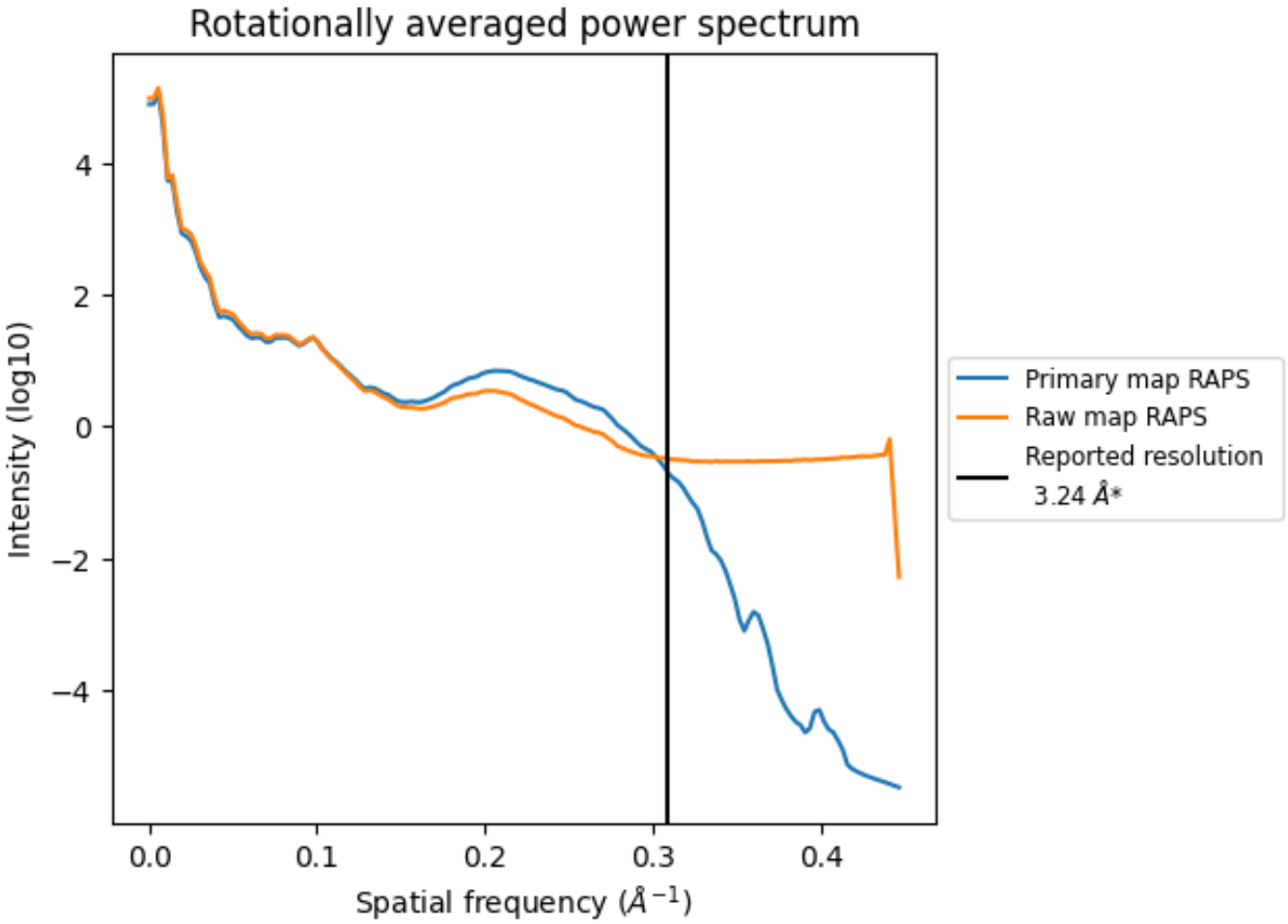
7.2 Volume estimate (i)



The volume at the recommended contour level is 834 nm^3; this corresponds to an approximate mass of 753 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)

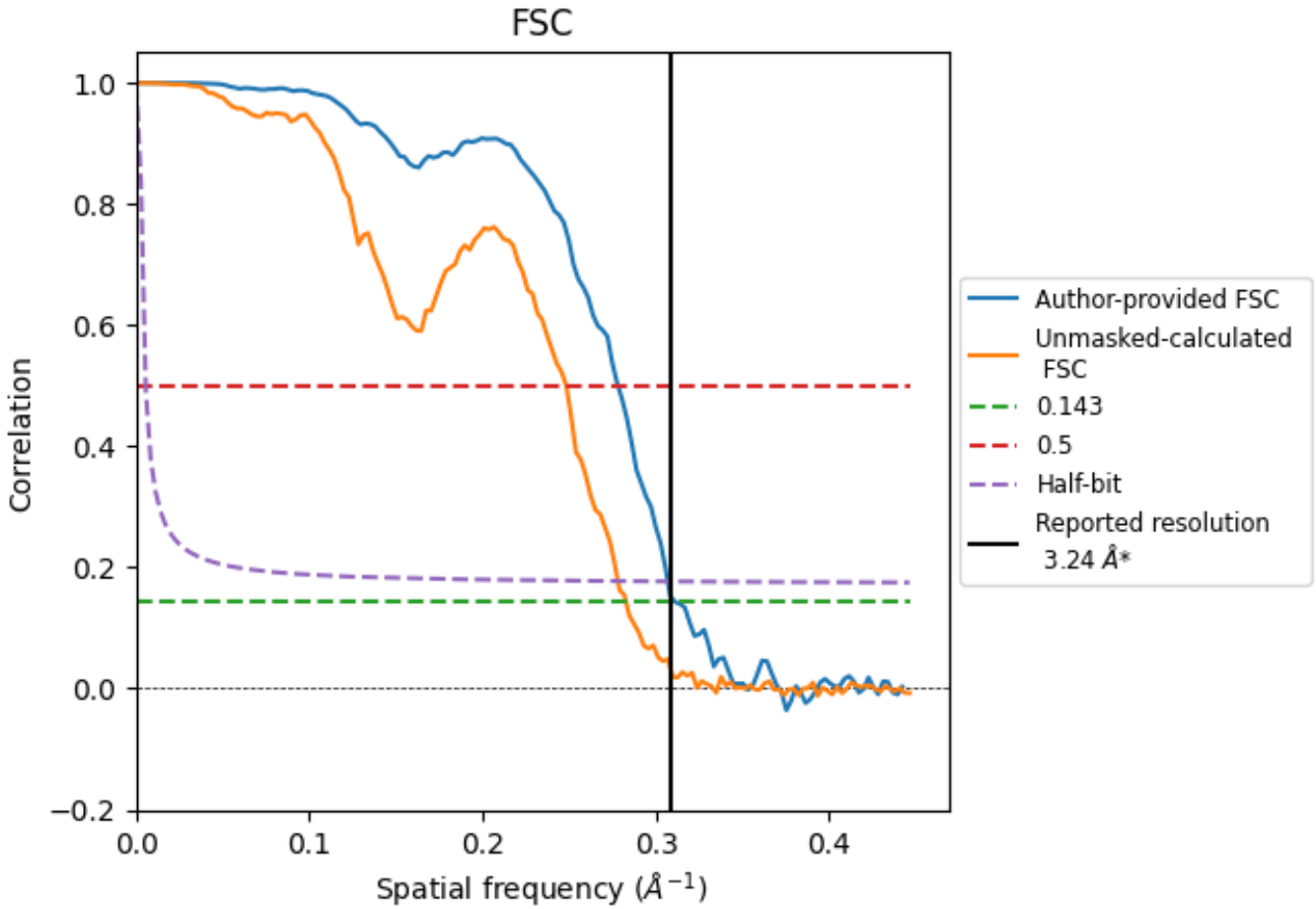


*Reported resolution corresponds to spatial frequency of 0.309 Å^{-1}

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 0.309 Å^{-1}

8.2 Resolution estimates (i)

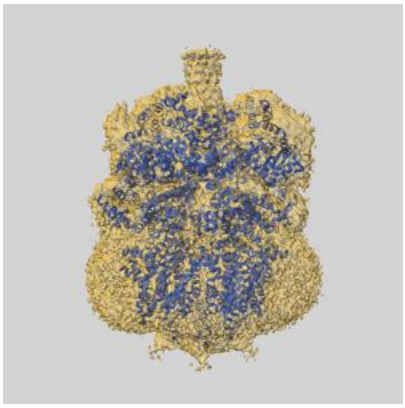
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.24	-	-
Author-provided FSC curve	3.21	3.60	3.26
Unmasked-calculated*	3.54	4.03	3.60

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

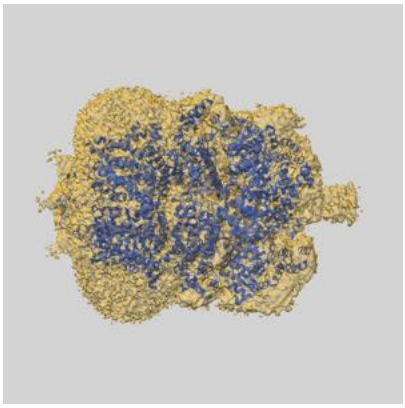
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-44100 and PDB model 9B28. Per-residue inclusion information can be found in section 3 on page 9.

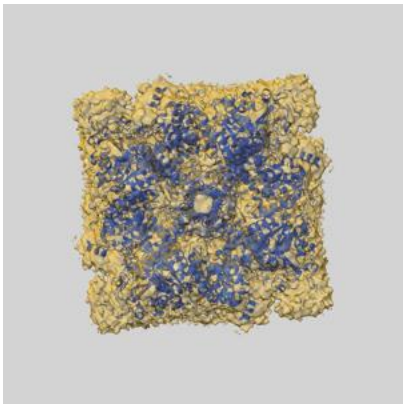
9.1 Map-model overlay



X



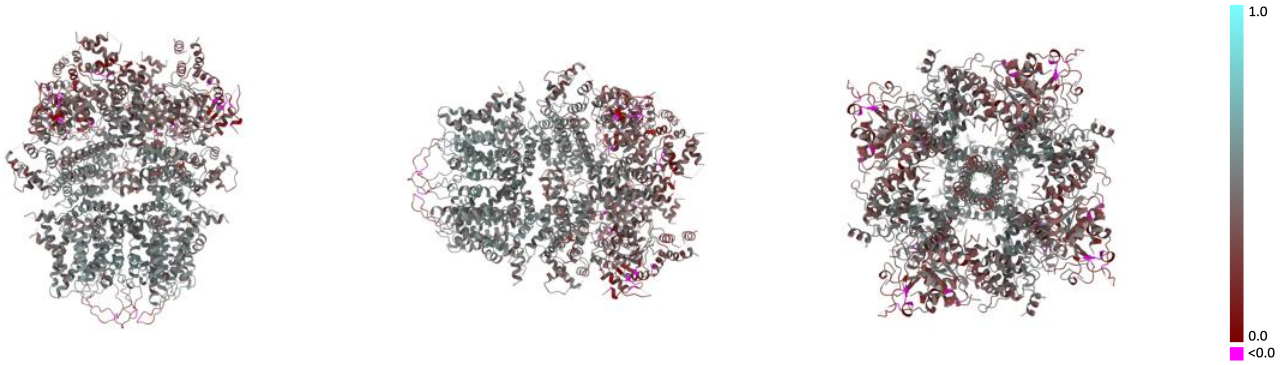
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.1 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.

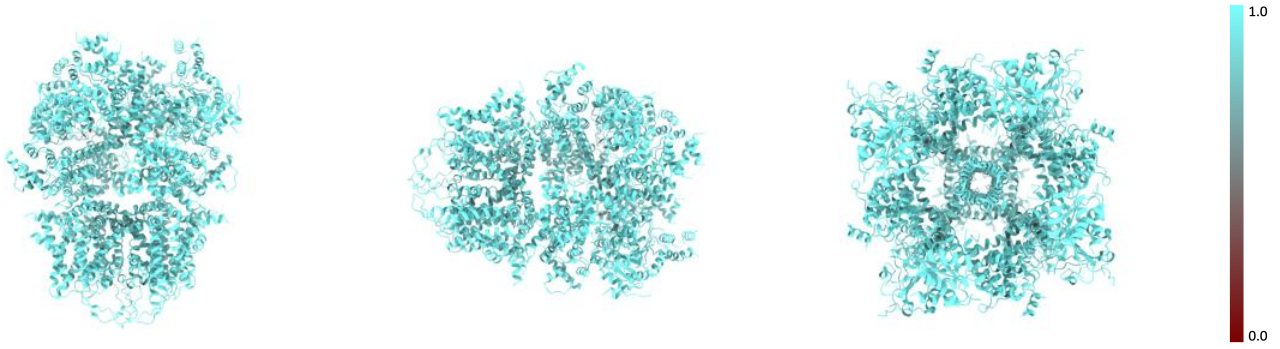
9.2 Q-score mapped to coordinate model (i)



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.

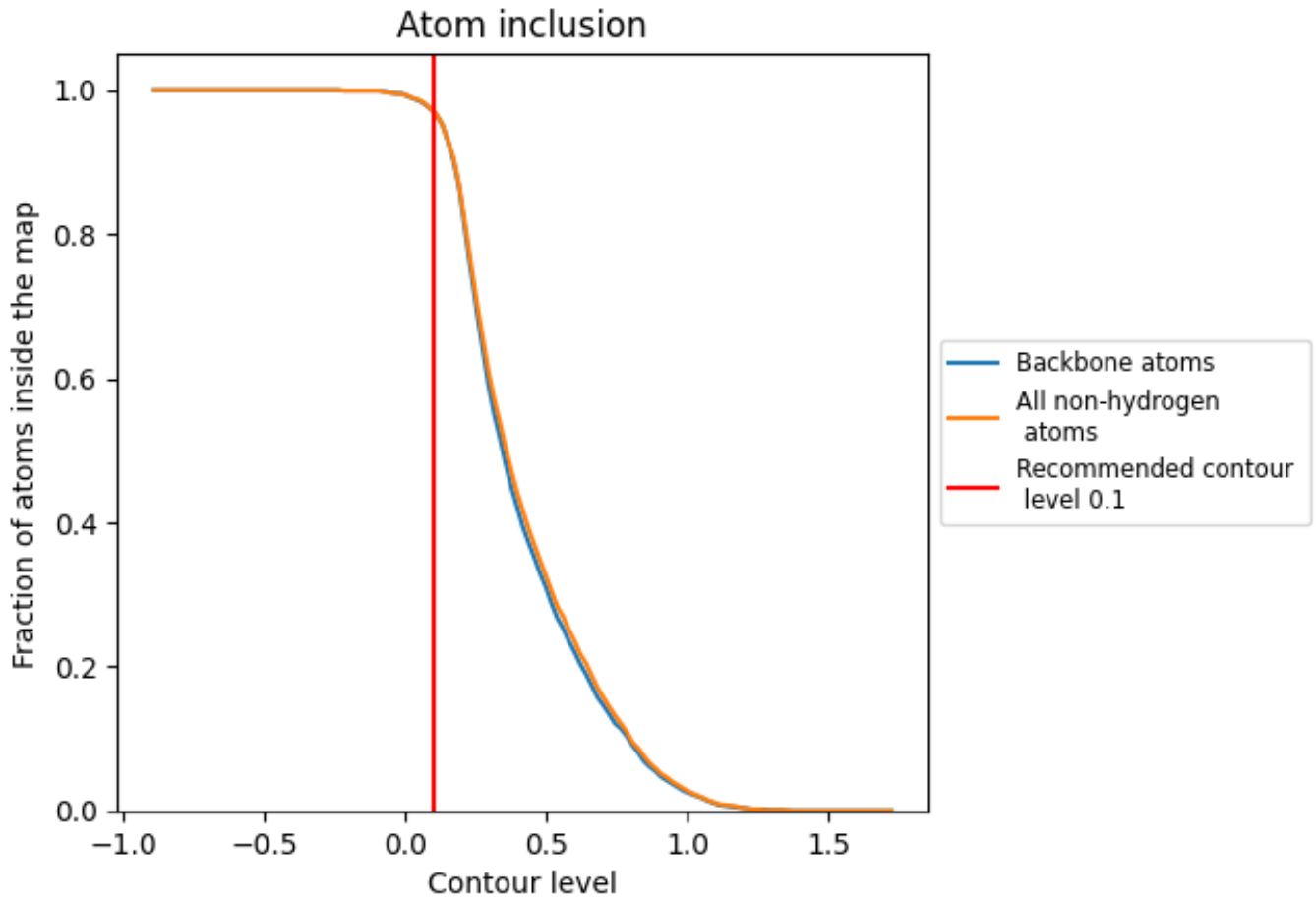
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.1).

9.4 Atom inclusion (i)



At the recommended contour level, 97% of all backbone atoms, 97% 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 (0.1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9700	0.4380
A	0.9710	0.4380
B	0.9700	0.4380
C	0.9700	0.4380
D	0.9700	0.4370