wwPDB EM Validation Summary Report (i)

Nov 15, 2022 – 02:49 AM EST

PDB ID	:	6W5U
EMDB ID	:	EMD-21548
Title	:	NPC1 structure in GDN micelles at pH 5.5, conformation b
Authors	:	Yan, N.; Qian, H.W.; Wu, X.L.
Deposited on	:	2020-03-13
Resolution	:	3.90 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (1)) were used in the production of this report:

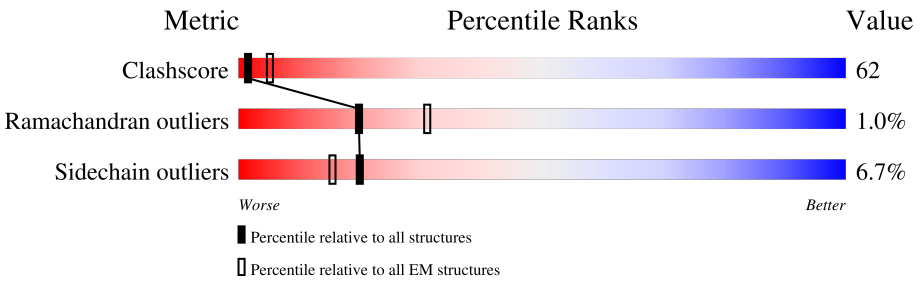
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 3.90 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	1311	15% 34% 50% 5% 10%
2	B	2	100%
2	E	2	100%
3	C	3	67% 33%
4	D	3	100% 67% 33%

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	NAG	B	2	X	-	-	-
5	NAG	A	1405	-	-	X	-
6	CLR	A	1421	-	-	X	-

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 9474 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called NPC intracellular cholesterol transporter 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1175	9158	5926	1478	1684	70	0	0

There are 33 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1279	LEU	-	expression tag	UNP O15118
A	1280	GLU	-	expression tag	UNP O15118
A	1281	GLY	-	expression tag	UNP O15118
A	1282	SER	-	expression tag	UNP O15118
A	1283	ASP	-	expression tag	UNP O15118
A	1284	GLU	-	expression tag	UNP O15118
A	1285	VAL	-	expression tag	UNP O15118
A	1286	ASP	-	expression tag	UNP O15118
A	1287	ALA	-	expression tag	UNP O15118
A	1288	GLY	-	expression tag	UNP O15118
A	1289	SER	-	expression tag	UNP O15118
A	1290	HIS	-	expression tag	UNP O15118
A	1291	HIS	-	expression tag	UNP O15118
A	1292	HIS	-	expression tag	UNP O15118
A	1293	HIS	-	expression tag	UNP O15118
A	1294	HIS	-	expression tag	UNP O15118
A	1295	HIS	-	expression tag	UNP O15118
A	1296	HIS	-	expression tag	UNP O15118
A	1297	HIS	-	expression tag	UNP O15118
A	1298	HIS	-	expression tag	UNP O15118
A	1299	HIS	-	expression tag	UNP O15118
A	1300	GLY	-	expression tag	UNP O15118
A	1301	SER	-	expression tag	UNP O15118
A	1302	VAL	-	expression tag	UNP O15118
A	1303	GLU	-	expression tag	UNP O15118
A	1304	ASP	-	expression tag	UNP O15118
A	1305	TYR	-	expression tag	UNP O15118
A	1306	LYS	-	expression tag	UNP O15118

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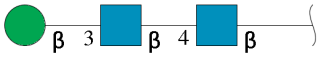
Chain	Residue	Modelled	Actual	Comment	Reference
A	1307	ASP	-	expression tag	UNP O15118
A	1308	ASP	-	expression tag	UNP O15118
A	1309	ASP	-	expression tag	UNP O15118
A	1310	ASP	-	expression tag	UNP O15118
A	1311	LYS	-	expression tag	UNP O15118

- Molecule 2 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

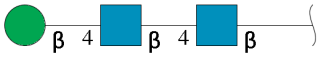
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	B	2	28	16	2	10	0	0
2	E	2	28	16	2	10	0	0

- Molecule 3 is an oligosaccharide called beta-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



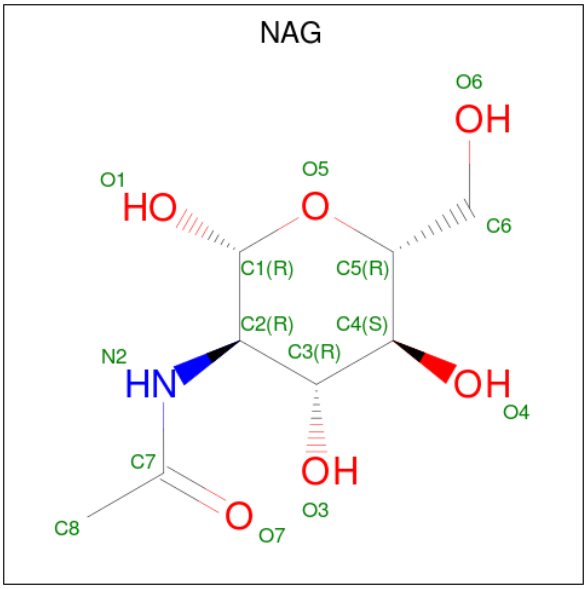
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	C	3	39	22	2	15	0	0

- Molecule 4 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



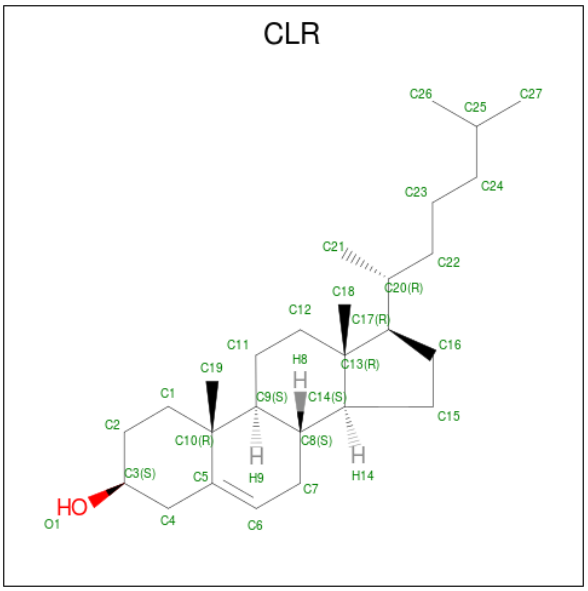
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	D	3	39	22	2	15	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	A	1	126	72	9	45	0
			Total	C	N	O	
5	A	1	126	72	9	45	0
			Total	C	N	O	
5	A	1	126	72	9	45	0
			Total	C	N	O	
5	A	1	126	72	9	45	0
			Total	C	N	O	
5	A	1	126	72	9	45	0
			Total	C	N	O	
5	A	1	126	72	9	45	0
			Total	C	N	O	
5	A	1	126	72	9	45	0
			Total	C	N	O	
5	A	1	126	72	9	45	0
			Total	C	N	O	
5	A	1	126	72	9	45	0

- Molecule 6 is CHOLESTEROL (three-letter code: CLR) (formula: $C_{27}H_{46}O$) (labeled as "Ligand of Interest" by depositor).



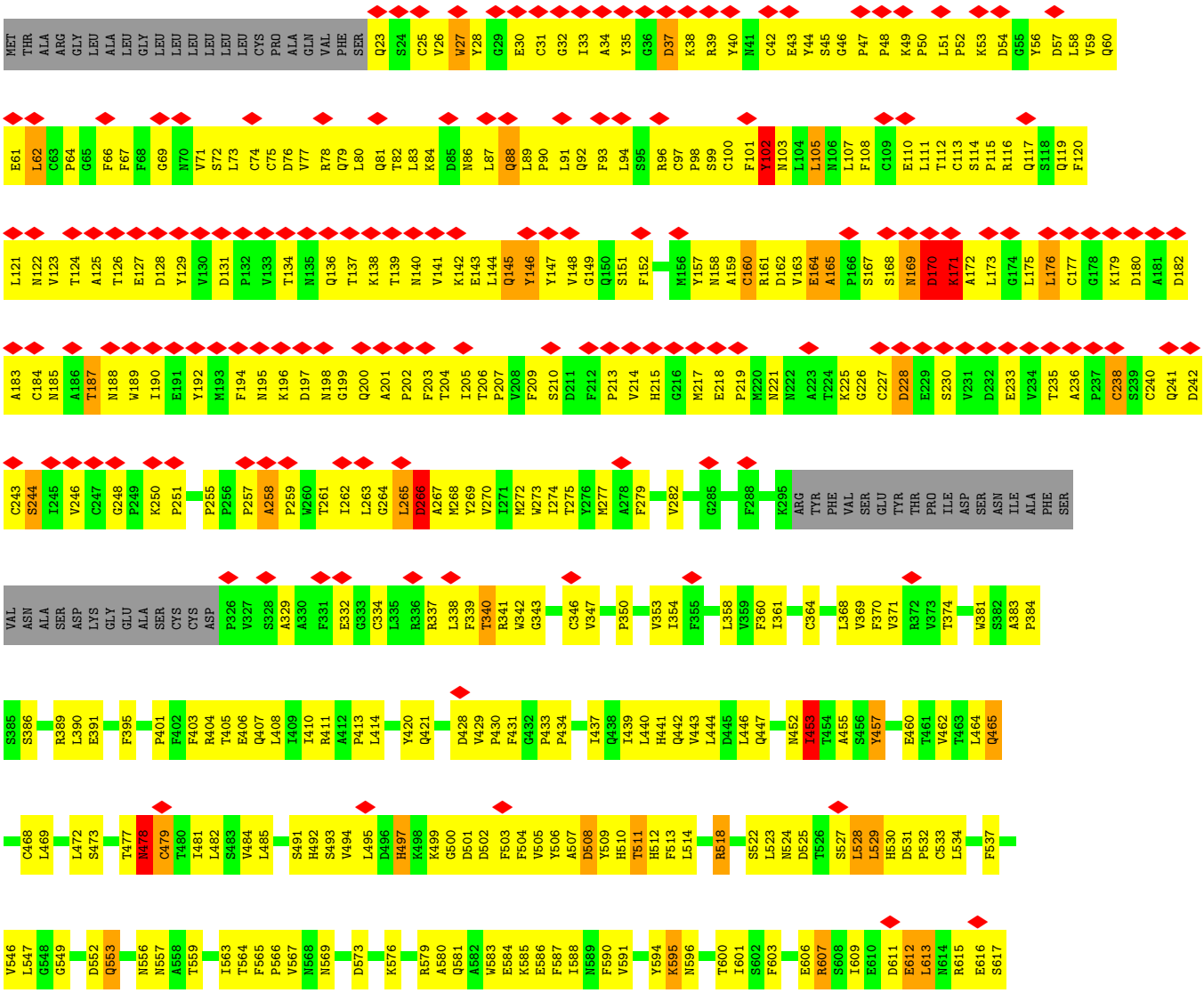
Mol	Chain	Residues	Atoms			AltConf
			Total	C	O	
6	A	1	56	54	2	0
			Total	C	O	
6	A	1	56	54	2	0

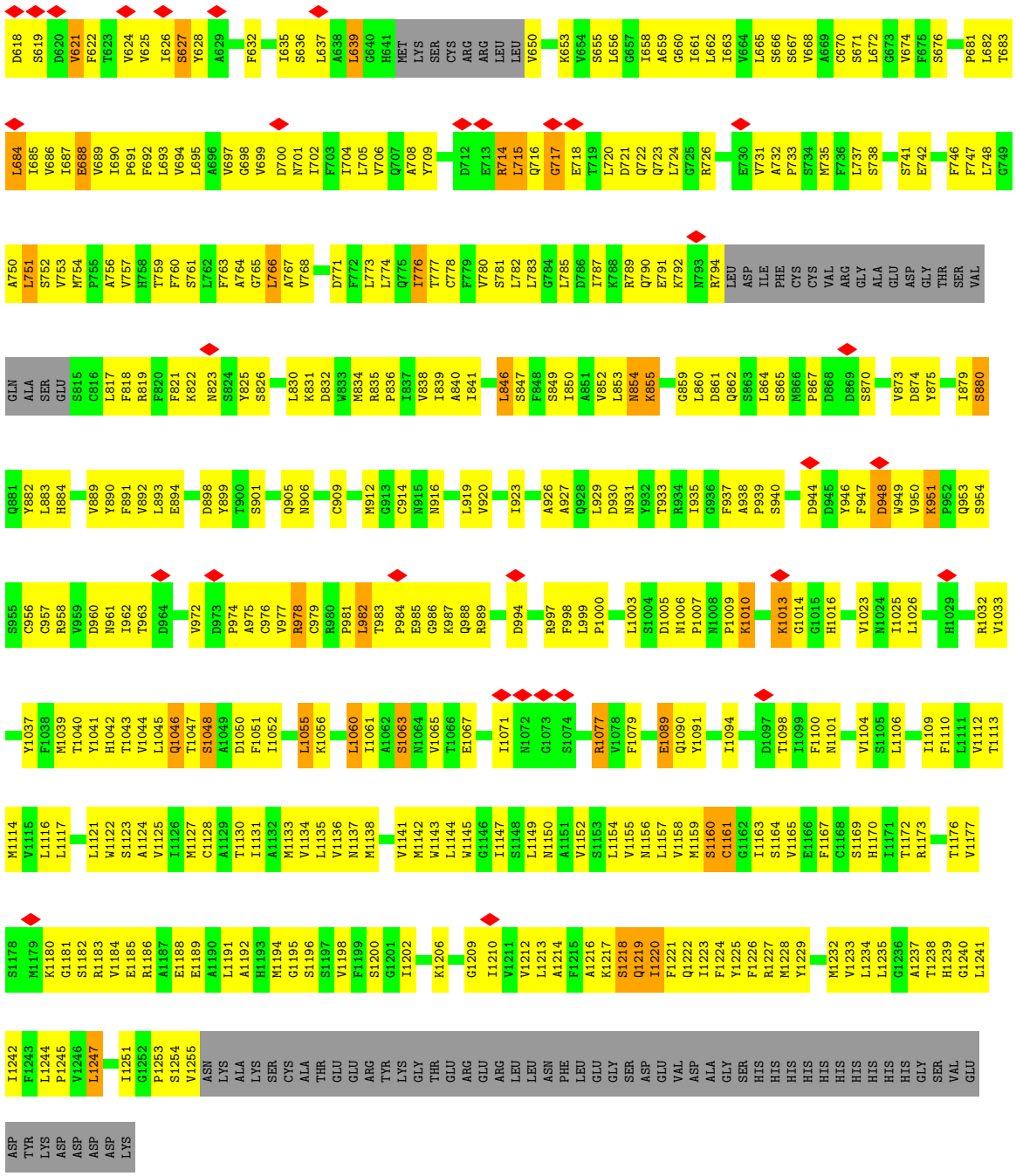
3 Residue-property plots (i)

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

- Molecule 1: NPC intracellular cholesterol transporter 1

Chain A:





• Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain B: 100%

• Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E: 100%

• Molecule 3: beta-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C: 67% 33%

• Molecule 4: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D: 100% 67% 33%

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	169487	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)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.150	Depositor
Minimum map value	-0.071	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.025	Depositor
Map size (Å)	267.36, 267.36, 267.36	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.114, 1.114, 1.114	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: NAG, BMA, CLR

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	0.56	1/9395 (0.0%)	0.74	20/12798 (0.2%)

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	1	3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	165	ALA	C-N	6.70	1.47	1.34

The worst 5 of 20 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	171	LYS	N-CA-CB	23.32	152.57	110.60
1	A	171	LYS	N-CA-C	-9.77	84.63	111.00
1	A	170	ASP	CB-CA-C	7.84	126.09	110.40
1	A	238	CYS	CA-CB-SG	7.64	127.75	114.00
1	A	1010	LYS	CB-CA-C	7.08	124.57	110.40

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	170	ASP	CA

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	478	ASN	Peptide
1	A	69	GLY	Peptide
1	A	776	ILE	Mainchain

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	9158	0	8919	1120	0
2	B	28	0	25	5	0
2	E	28	0	25	3	0
3	C	39	0	34	3	0
4	D	39	0	34	4	0
5	A	126	0	117	39	0
6	A	56	0	92	40	0
All	All	9474	0	9246	1152	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 62.

The worst 5 of 1152 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:A:111:LEU:HD12	1:A:146:TYR:CE2	1.38	1.54
1:A:524:ASN:HD22	5:A:1405:NAG:C2	1.24	1.50
1:A:524:ASN:HD22	5:A:1405:NAG:C1	1.25	1.48
1:A:524:ASN:ND2	5:A:1405:NAG:C2	1.74	1.45
1:A:62:LEU:CD1	1:A:83:LEU:HD22	1.47	1.43

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	1167/1311 (89%)	1056 (90%)	99 (8%)	12 (1%)	15 52

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	171	LYS
1	A	453	ILE
1	A	715	LEU
1	A	265	LEU
1	A	478	ASN

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	1011/1138 (89%)	943 (93%)	68 (7%)	16 46

5 of 68 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1048	SER
1	A	1063	SER
1	A	1218	SER
1	A	511	THR
1	A	508	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 24 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	596	ASN
1	A	854	ASN

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Mol	Chain	Res	Type
1	A	793	ASN
1	A	884	HIS
1	A	215	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)

10 monosaccharides 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	NAG	B	1	1,2	14,14,15	0.46	0	17,19,21	1.40	1 (5%)
2	NAG	B	2	2	14,14,15	0.32	0	17,19,21	0.79	1 (5%)
3	NAG	C	1	1,3	14,14,15	0.41	0	17,19,21	0.46	0
3	NAG	C	2	3	14,14,15	0.34	0	17,19,21	0.44	0
3	BMA	C	3	3	11,11,12	0.79	1 (9%)	15,15,17	1.04	1 (6%)
4	NAG	D	1	1,4	14,14,15	0.36	0	17,19,21	0.70	0
4	NAG	D	2	4	14,14,15	0.29	0	17,19,21	1.30	2 (11%)
4	BMA	D	3	4	11,11,12	0.23	0	15,15,17	0.75	0
2	NAG	E	1	1,2	14,14,15	0.57	0	17,19,21	0.54	0
2	NAG	E	2	2	14,14,15	0.35	0	17,19,21	0.41	0

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	NAG	B	1	1,2	-	6/6/23/26	0/1/1/1
2	NAG	B	2	2	1/1/5/7	5/6/23/26	0/1/1/1
3	NAG	C	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	C	2	3	-	2/6/23/26	0/1/1/1
3	BMA	C	3	3	-	2/2/19/22	0/1/1/1
4	NAG	D	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	D	2	4	-	2/6/23/26	0/1/1/1
4	BMA	D	3	4	-	2/2/19/22	0/1/1/1
2	NAG	E	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	E	2	2	-	3/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	3	BMA	O5-C1	-2.30	1.40	1.43

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1	NAG	C4-C3-C2	4.31	117.33	111.02
4	D	2	NAG	C1-O5-C5	3.77	117.30	112.19
4	D	2	NAG	O5-C5-C6	2.77	111.55	107.20
3	C	3	BMA	O2-C2-C3	-2.33	105.46	110.14
2	B	2	NAG	O5-C5-C6	2.33	110.86	107.20

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	B	2	NAG	C1

5 of 30 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	2	NAG	C8-C7-N2-C2
2	B	2	NAG	O7-C7-N2-C2
4	D	1	NAG	C8-C7-N2-C2
4	D	1	NAG	O7-C7-N2-C2
2	E	2	NAG	C4-C5-C6-O6

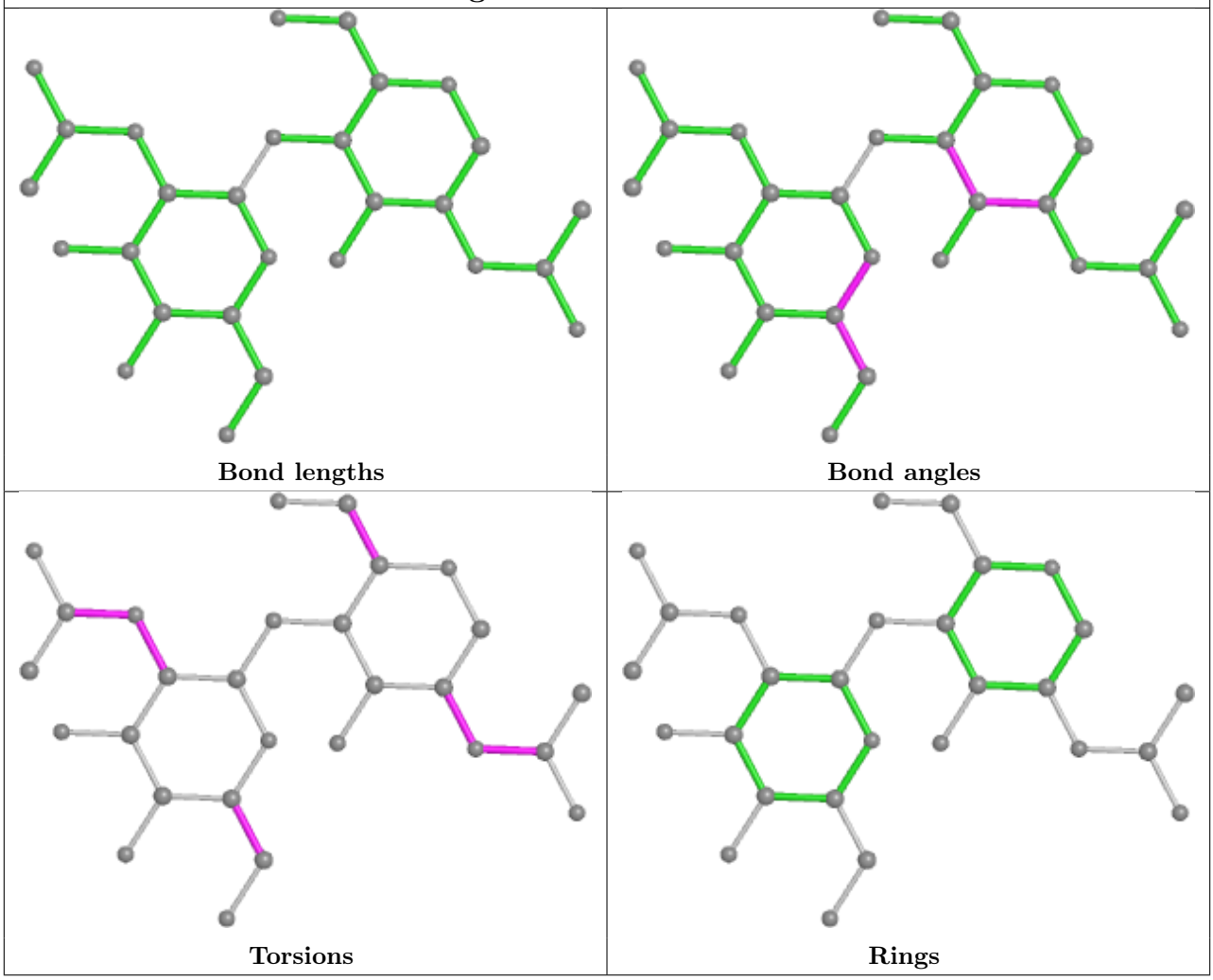
There are no ring outliers.

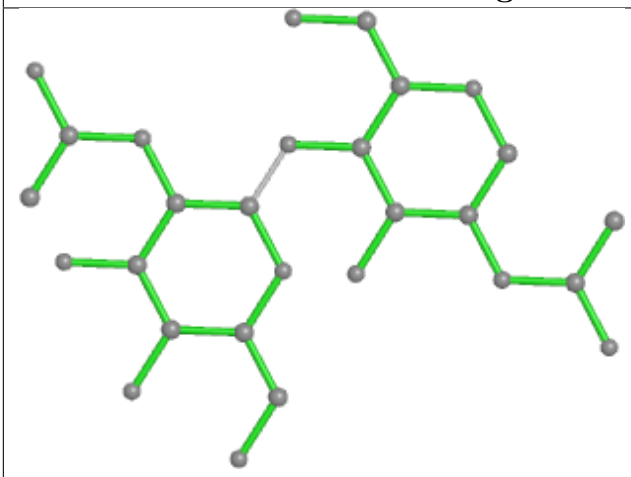
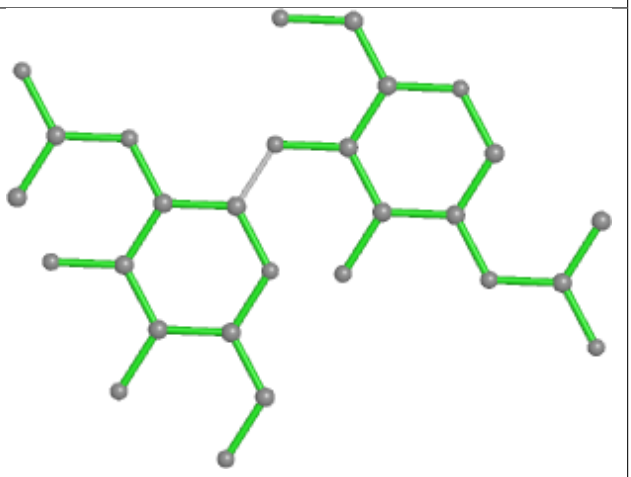
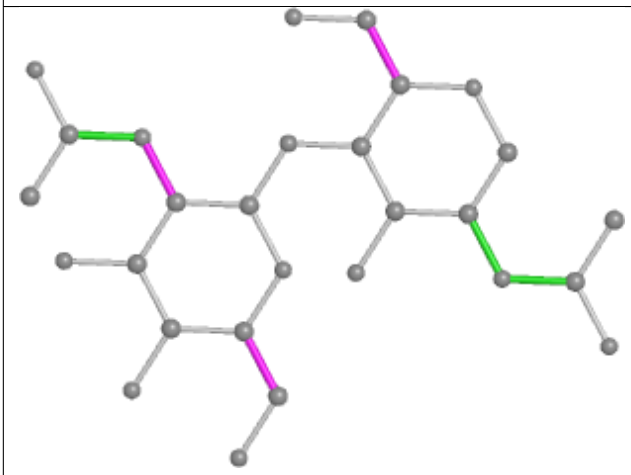
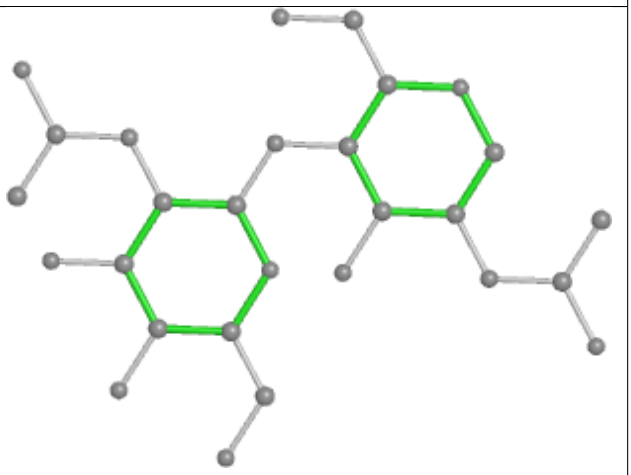
10 monomers are involved in 15 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	1	NAG	3	0
3	C	1	NAG	1	0
4	D	2	NAG	2	0
4	D	3	BMA	1	0
2	B	2	NAG	2	0
3	C	3	BMA	1	0
4	D	1	NAG	2	0
2	E	2	NAG	3	0
3	C	2	NAG	2	0
2	B	1	NAG	4	0

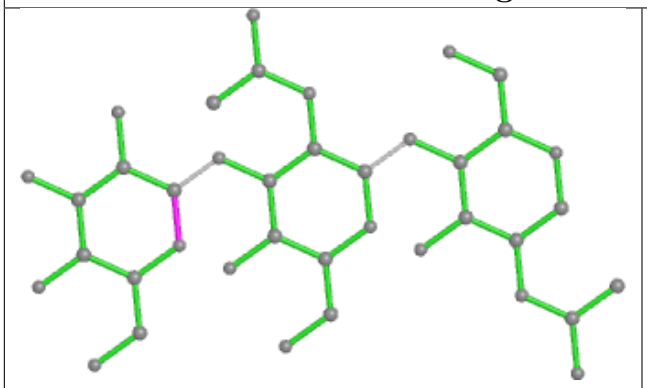
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

Oligosaccharide Chain B

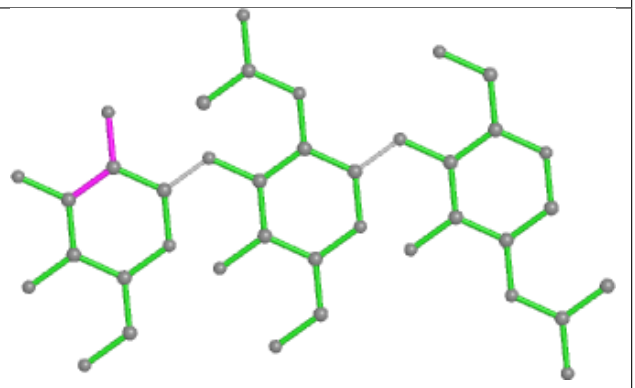


Oligosaccharide Chain E	
 Bond lengths	 Bond angles
 Torsions	 Rings

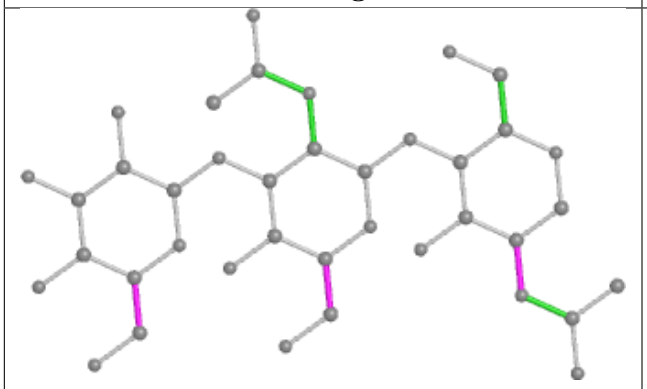
Oligosaccharide Chain C



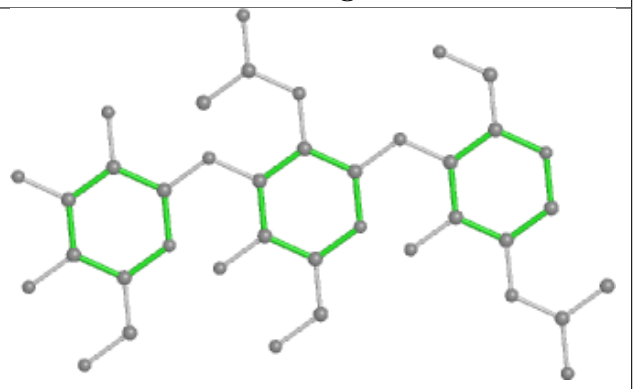
Bond lengths



Bond angles

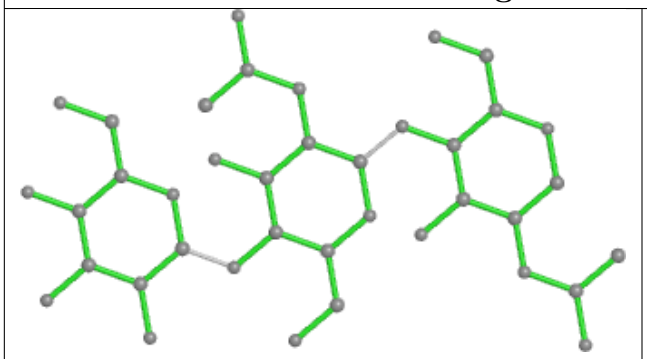


Torsions

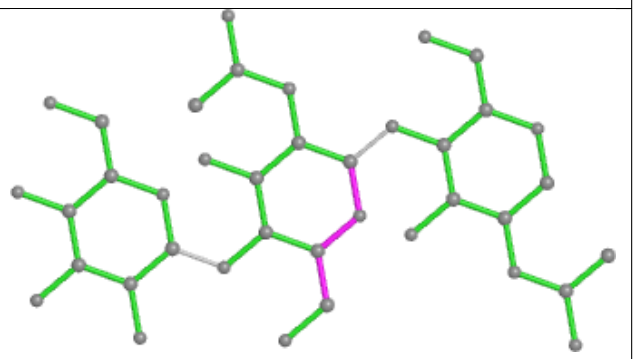


Rings

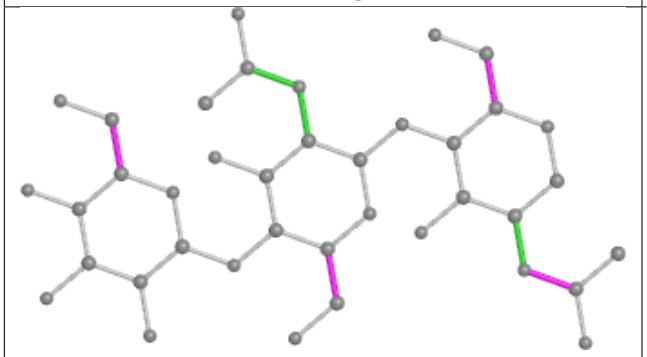
Oligosaccharide Chain D



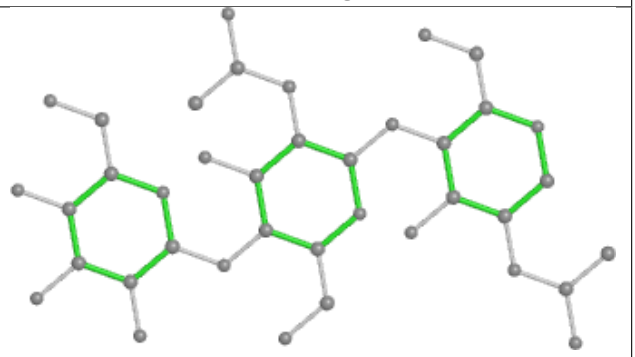
Bond lengths



Bond angles



Torsions



Rings

5.6 Ligand geometry (i)

11 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	$\#\|Z\| > 2$
5	NAG	A	1402	-	14,14,15	0.29	0	17,19,21	0.62	0
6	CLR	A	1421	-	31,31,31	0.94	2 (6%)	48,48,48	1.42	7 (14%)
5	NAG	A	1401	1	14,14,15	0.36	0	17,19,21	0.63	0
5	NAG	A	1405	-	14,14,15	0.44	0	17,19,21	0.92	2 (11%)
5	NAG	A	1409	1	14,14,15	0.16	0	17,19,21	0.51	0
6	CLR	A	1420	-	31,31,31	1.12	3 (9%)	48,48,48	1.90	14 (29%)
5	NAG	A	1415	1	14,14,15	0.23	0	17,19,21	0.42	0
5	NAG	A	1414	1	14,14,15	0.28	0	17,19,21	0.48	0
5	NAG	A	1416	1	14,14,15	0.22	0	17,19,21	0.61	0
5	NAG	A	1419	1	14,14,15	0.43	0	17,19,21	0.75	1 (5%)
5	NAG	A	1410	1	14,14,15	0.57	0	17,19,21	1.06	1 (5%)

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
5	NAG	A	1402	-	-	4/6/23/26	0/1/1/1
6	CLR	A	1421	-	-	5/10/68/68	0/4/4/4
5	NAG	A	1401	1	-	3/6/23/26	0/1/1/1
5	NAG	A	1405	-	-	3/6/23/26	0/1/1/1
5	NAG	A	1409	1	-	4/6/23/26	0/1/1/1
6	CLR	A	1420	-	-	5/10/68/68	0/4/4/4
5	NAG	A	1415	1	-	4/6/23/26	0/1/1/1
5	NAG	A	1414	1	-	4/6/23/26	0/1/1/1
5	NAG	A	1416	1	-	4/6/23/26	0/1/1/1
5	NAG	A	1419	1	-	3/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	A	1410	1	-	2/6/23/26	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1420	CLR	C18-C13	-2.58	1.49	1.54
6	A	1420	CLR	C13-C14	-2.49	1.50	1.55
6	A	1421	CLR	C10-C9	-2.36	1.52	1.56
6	A	1421	CLR	C13-C14	-2.21	1.50	1.55
6	A	1420	CLR	C19-C10	-2.01	1.51	1.54

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

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	A	1420	CLR	C21-C20-C17	-4.86	105.48	112.92
6	A	1420	CLR	C7-C8-C9	-4.82	103.87	109.71
5	A	1410	NAG	C1-O5-C5	4.05	117.67	112.19
6	A	1420	CLR	C14-C8-C9	3.92	114.35	109.09
6	A	1420	CLR	C12-C13-C17	3.63	122.01	116.57

There are no chirality outliers.

5 of 41 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1405	NAG	C3-C2-N2-C7
5	A	1410	NAG	C3-C2-N2-C7
5	A	1414	NAG	C3-C2-N2-C7
5	A	1416	NAG	O5-C5-C6-O6
5	A	1414	NAG	C4-C5-C6-O6

There are no ring outliers.

10 monomers are involved in 79 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1402	NAG	2	0
6	A	1421	CLR	31	0
5	A	1401	NAG	4	0
5	A	1405	NAG	18	0
5	A	1409	NAG	5	0
6	A	1420	CLR	9	0
5	A	1415	NAG	1	0

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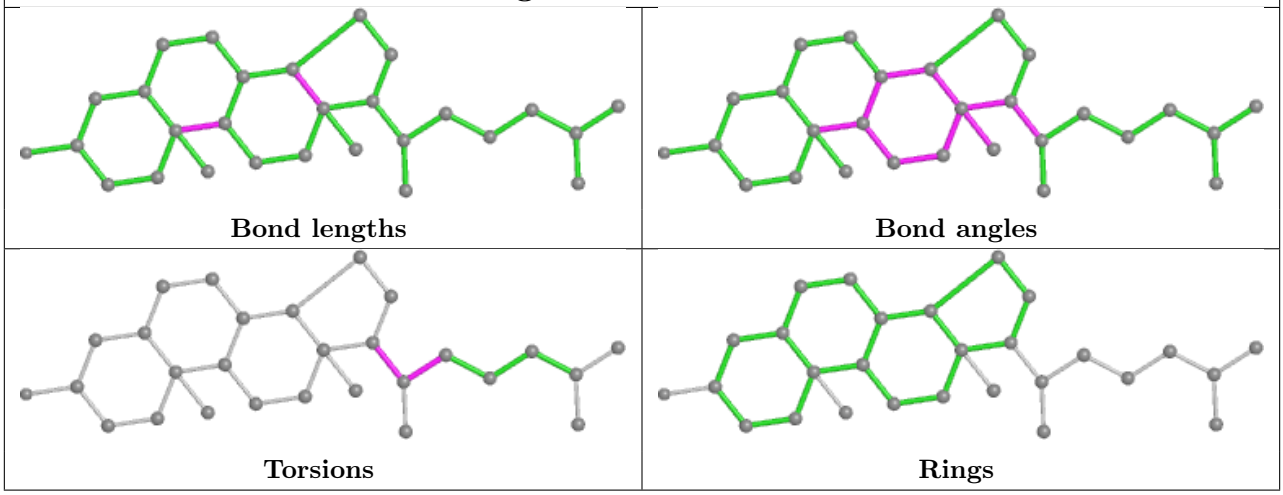
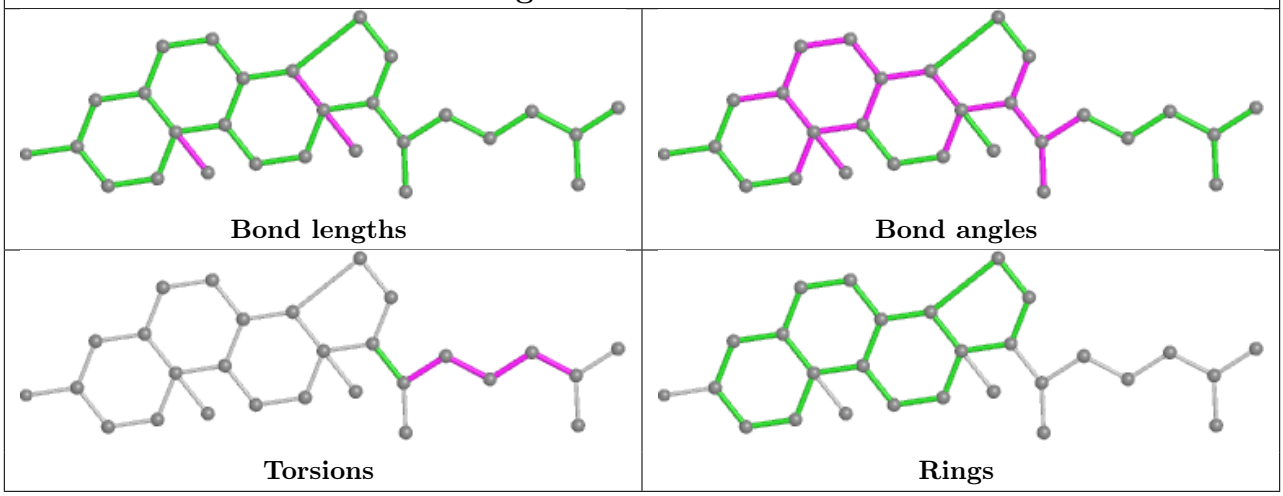
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1414	NAG	4	0
5	A	1419	NAG	3	0
5	A	1410	NAG	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand CLR A 1421



Ligand CLR A 1420



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.

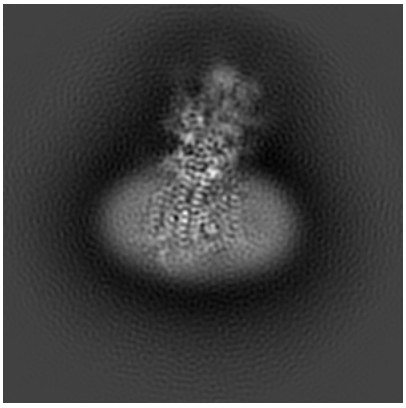
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-21548. These allow visual inspection of the internal detail of the map and identification of artifacts.

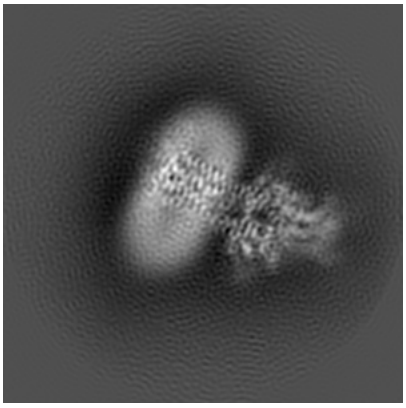
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections (i)

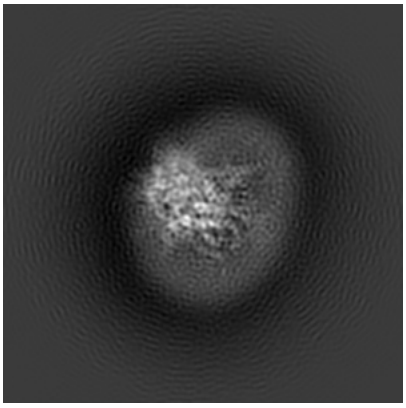
6.1.1 Primary map



X



Y

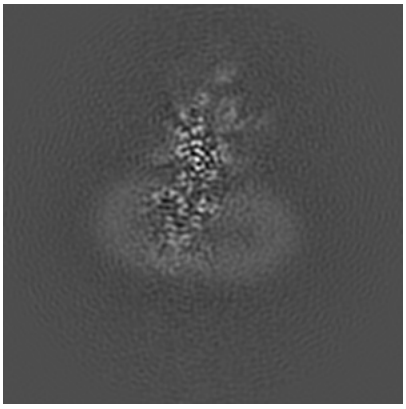


Z

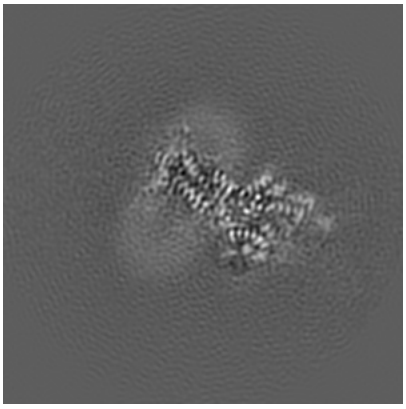
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

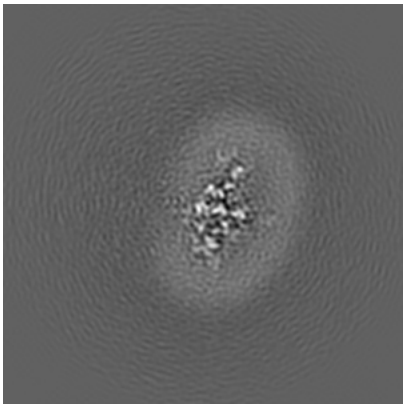
6.2.1 Primary map



X Index: 120



Y Index: 120

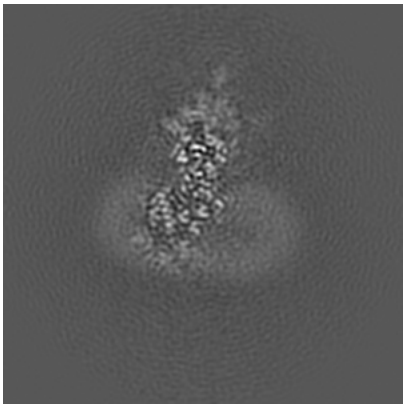


Z Index: 120

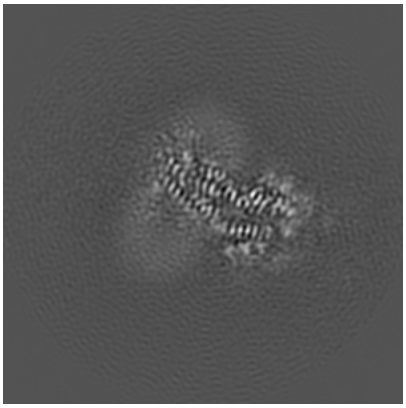
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

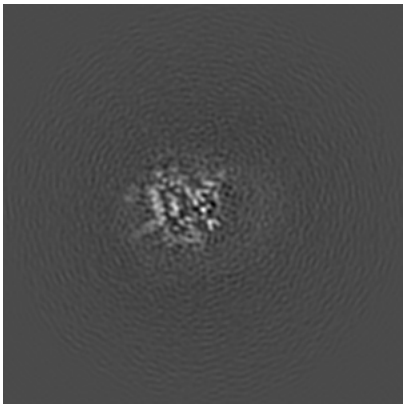
6.3.1 Primary map



X Index: 124



Y Index: 117

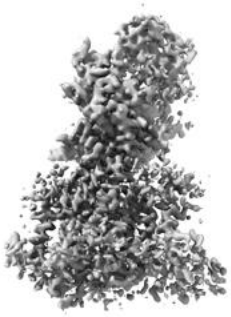


Z Index: 146

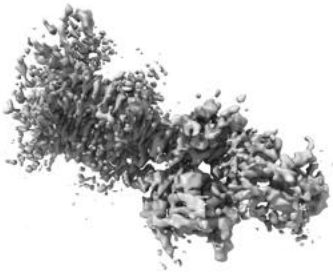
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views (i)

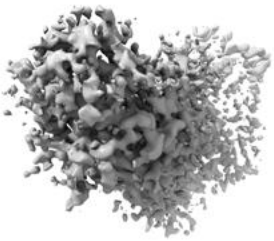
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.025. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

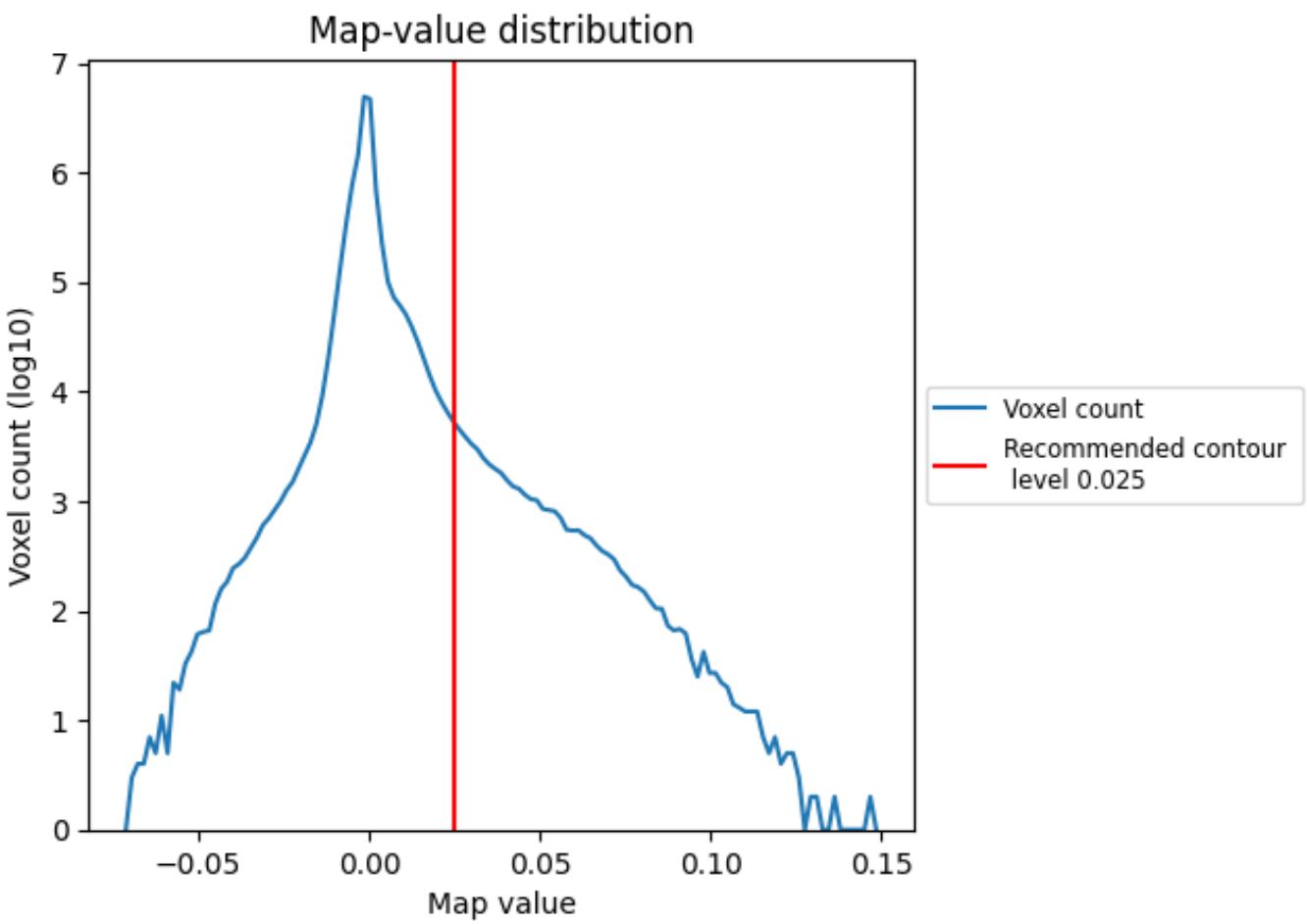
6.5 Mask visualisation (i)

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

7 Map analysis (i)

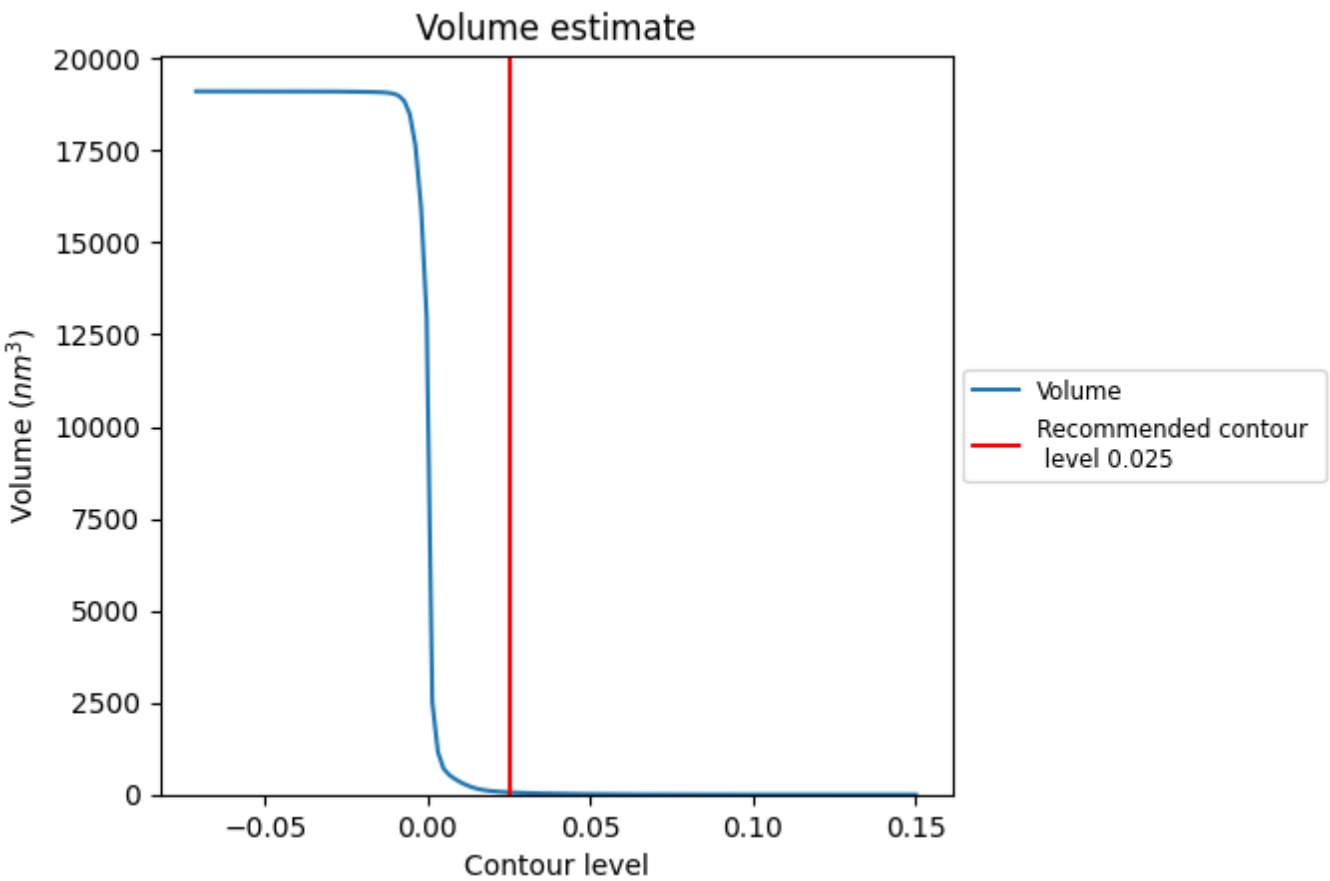
This section contains the results of statistical analysis of the map.

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.

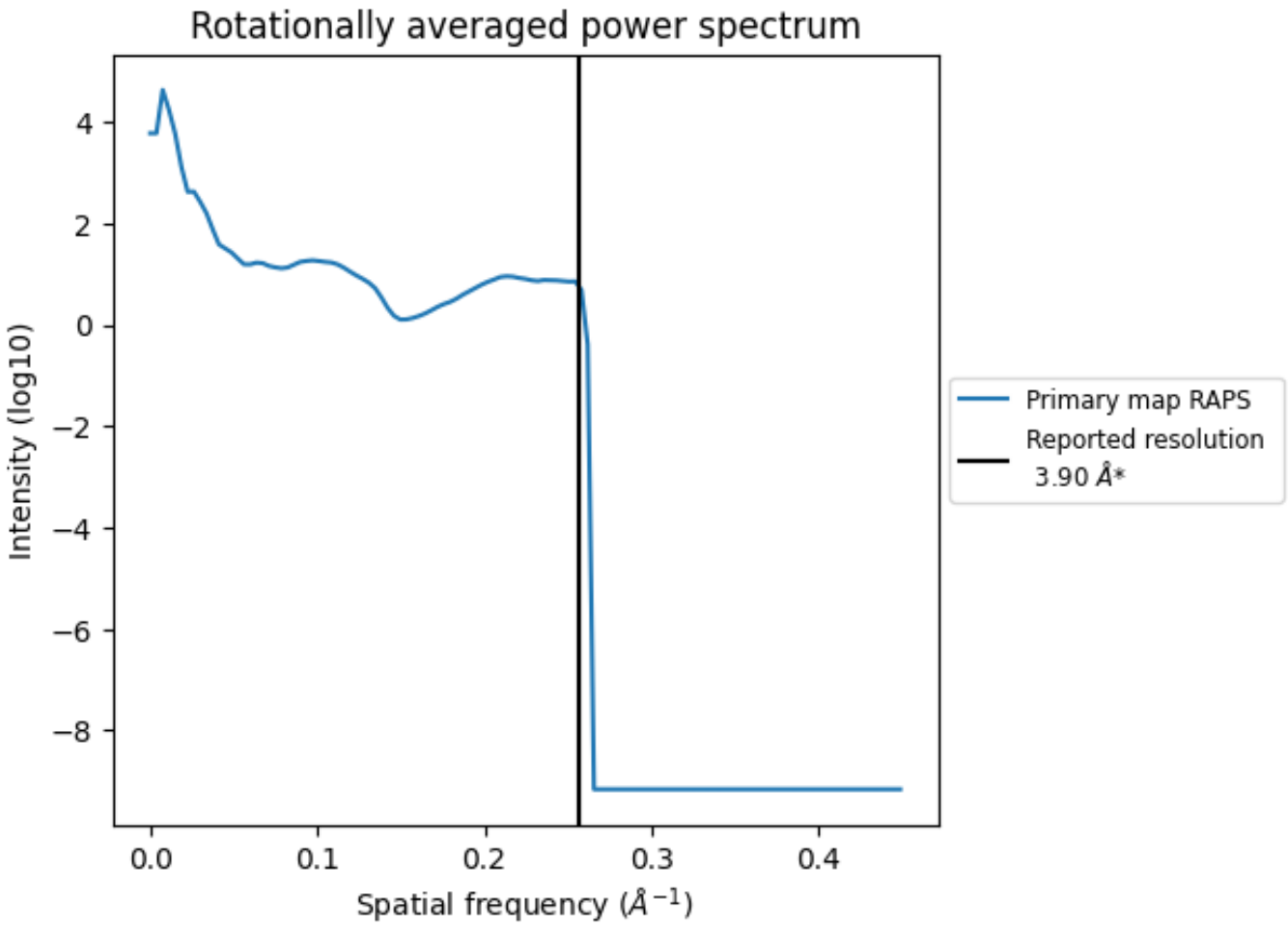
7.2 Volume estimate (i)



The volume at the recommended contour level is 61 nm^3; this corresponds to an approximate mass of 55 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 0.256 Å^{-1}

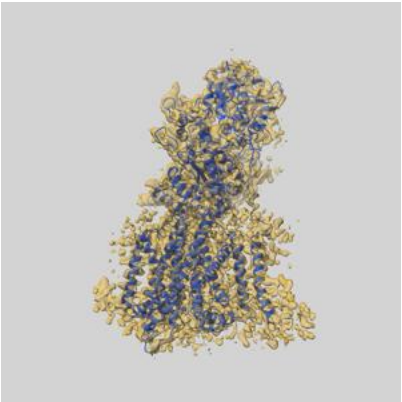
8 Fourier-Shell correlation (i)

This section was not generated. No FSC curve or half-maps provided.

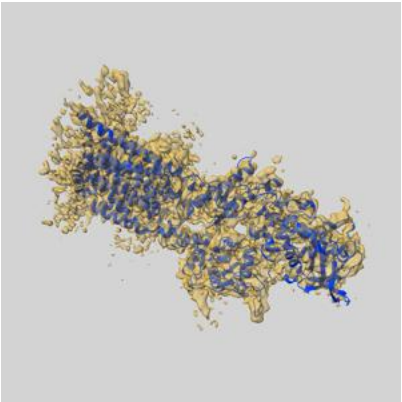
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-21548 and PDB model 6W5U. Per-residue inclusion information can be found in section 3 on page 8.

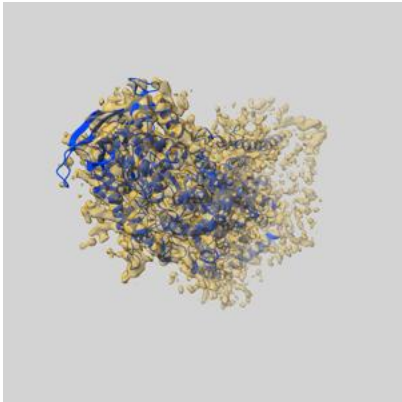
9.1 Map-model overlay (i)



X



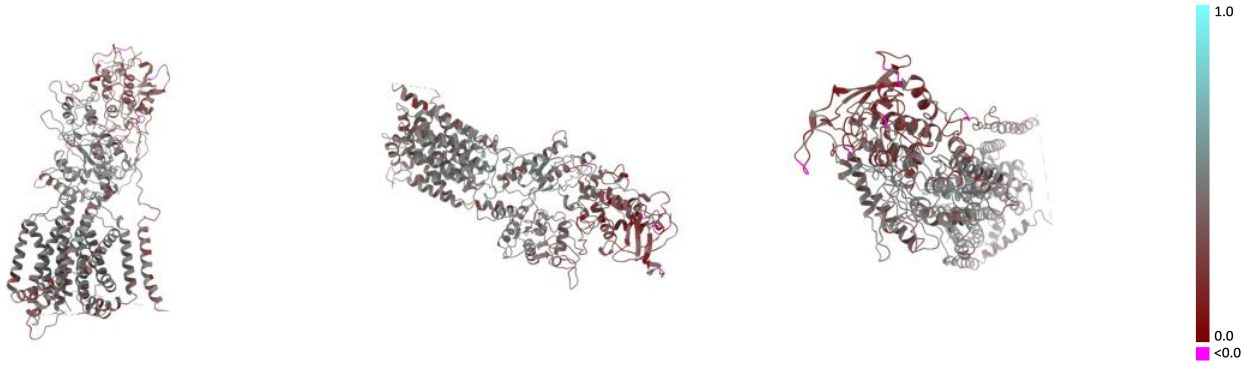
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.025 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.

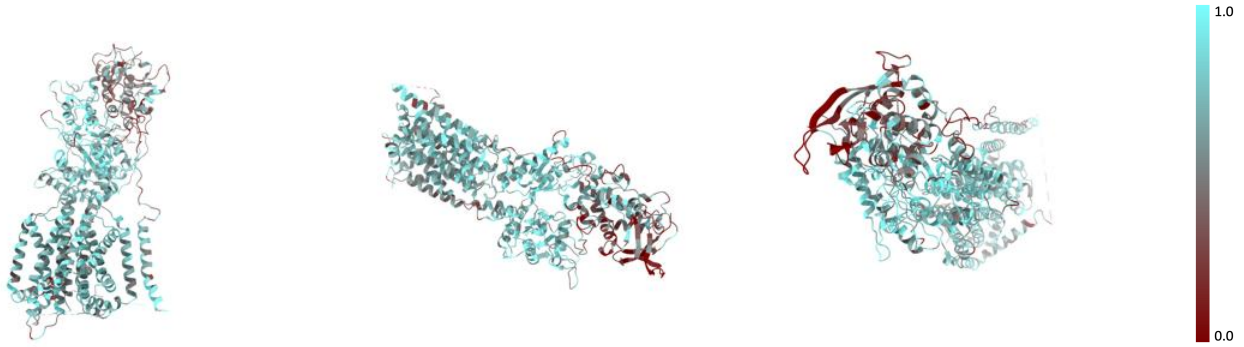
9.2 Q-score mapped to coordinate model (i)



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.

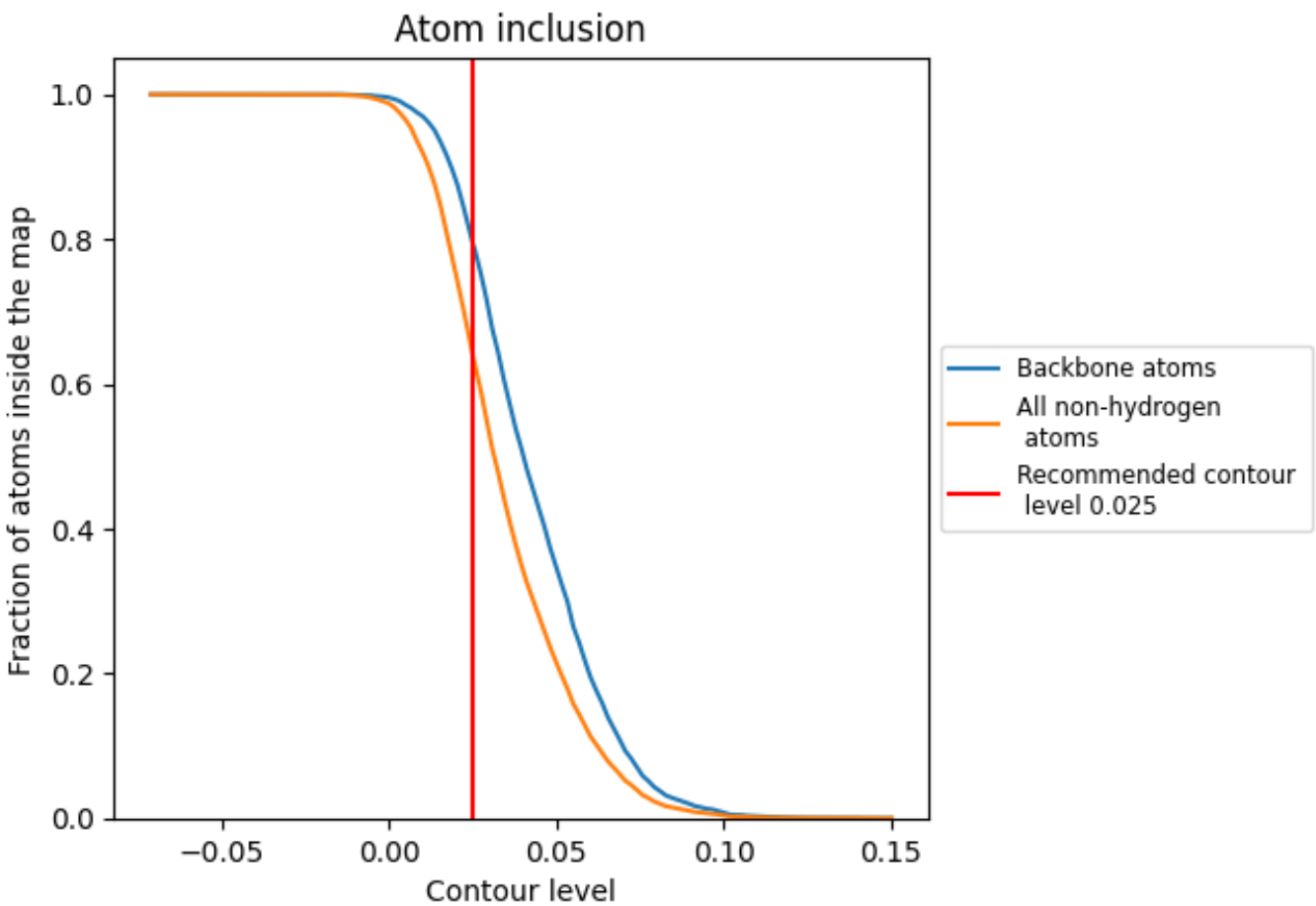
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.025).

9.4 Atom inclusion (i)



At the recommended contour level, 79% of all backbone atoms, 64% 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 (0.025) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6392	0.4050
A	0.6400	0.4050
B	0.7143	0.3330
C	0.8974	0.5280
D	0.1282	0.3240
E	0.6786	0.4440