



wwPDB EM Validation Summary Report ⓘ

May 11, 2024 – 12:24 PM EDT

PDB ID : 9AVL
EMDB ID : EMD-43908
Title : Structure of human calcium-sensing receptor in complex with Gi3 protein in nanodiscs
Authors : Zuo, H.; Park, J.; Frangaj, A.; Ye, J.; Lu, G.; Manning, J.J.; Asher, W.B.; Lu, Z.; Hu, G.; Wang, L.; Mendez, J.; Eng, E.; Zhang, Z.; Lin, X.; Grasucci, R.; Hendrickson, W.A.; Clarke, O.B.; Javitch, J.A.; Conigrave, A.D.; Fan, Q.R.
Deposited on : 2024-03-04
Resolution : 3.80 Å(reported)
Based on initial models : 7S8M, 7SIL

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 ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.1.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

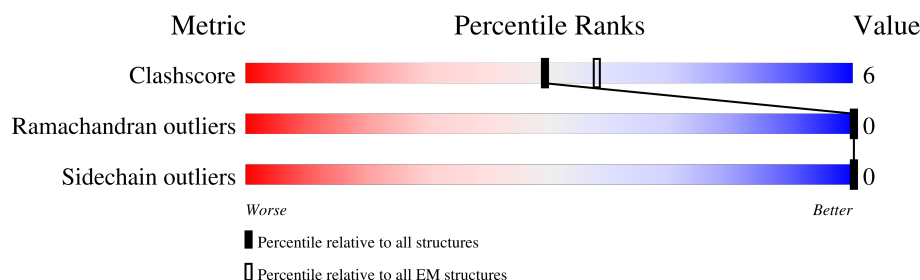
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY






The reported resolution of this entry is 3.80 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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	Q	911	
1	R	911	
2	A	354	
3	B	348	
4	G	71	
5	C	2	
5	D	2	

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Mol	Chain	Length	Quality of chain	
5	E	2	<div><div></div></div>	50%
5	F	2	<div><div></div></div>	50%

2 Entry composition

There are 12 unique types of molecules in this entry. The entry contains 18143 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 Isoform 1 of Extracellular calcium-sensing receptor.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	Q	803	Total	C	N	O	S	0	0
			6390	4150	1039	1165	36		
1	R	824	Total	C	N	O	S	0	0
			6561	4261	1073	1190	37		

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Q	12	ASP	-	insertion	UNP P41180
Q	13	TYR	-	insertion	UNP P41180
Q	14	LYS	-	insertion	UNP P41180
Q	15	ASP	-	insertion	UNP P41180
Q	16	ASP	-	insertion	UNP P41180
Q	17	ASP	-	insertion	UNP P41180
Q	18	ASP	-	insertion	UNP P41180
Q	19	LYS	-	insertion	UNP P41180
R	12	ASP	-	insertion	UNP P41180
R	13	TYR	-	insertion	UNP P41180
R	14	LYS	-	insertion	UNP P41180
R	15	ASP	-	insertion	UNP P41180
R	16	ASP	-	insertion	UNP P41180
R	17	ASP	-	insertion	UNP P41180
R	18	ASP	-	insertion	UNP P41180
R	19	LYS	-	insertion	UNP P41180

- Molecule 2 is a protein called Guanine nucleotide-binding protein G(i) subunit alpha-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A	225	Total	C	N	O	S	0	0
			1822	1157	301	351	13		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	47	ASN	SER	engineered mutation	UNP P08754
A	203	ALA	GLY	engineered mutation	UNP P08754
A	245	ALA	GLU	engineered mutation	UNP P08754
A	326	SER	ALA	engineered mutation	UNP P08754

- Molecule 3 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	B	338	Total	C	N	O	S	0	0
			2599	1608	467	503	21		

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-7	MET	-	initiating methionine	UNP P62879
B	-6	ASP	-	expression tag	UNP P62879
B	-5	TYR	-	expression tag	UNP P62879
B	-4	LYS	-	expression tag	UNP P62879
B	-3	ASP	-	expression tag	UNP P62879
B	-2	ASP	-	expression tag	UNP P62879
B	-1	ASP	-	expression tag	UNP P62879
B	0	ASP	-	expression tag	UNP P62879
B	1	LYS	-	expression tag	UNP P62879

- Molecule 4 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	55	Total	C	N	O	S	0	0
			427	268	75	81	3		

- Molecule 5 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



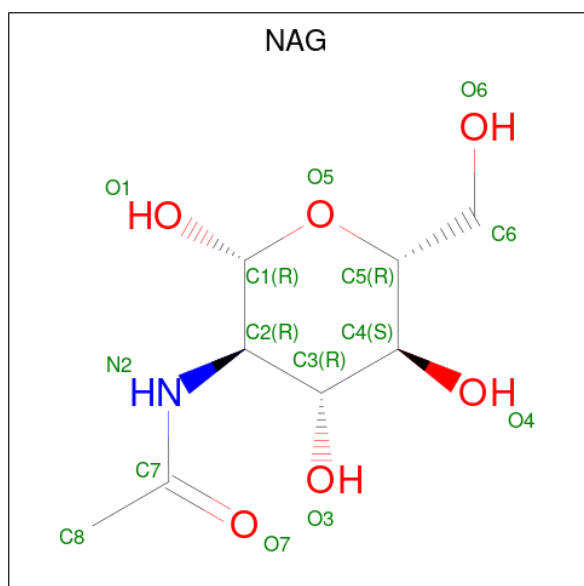
Mol	Chain	Residues	Atoms				AltConf	Trace
5	C	2	Total	C	N	O	0	0
			28	16	2	10		

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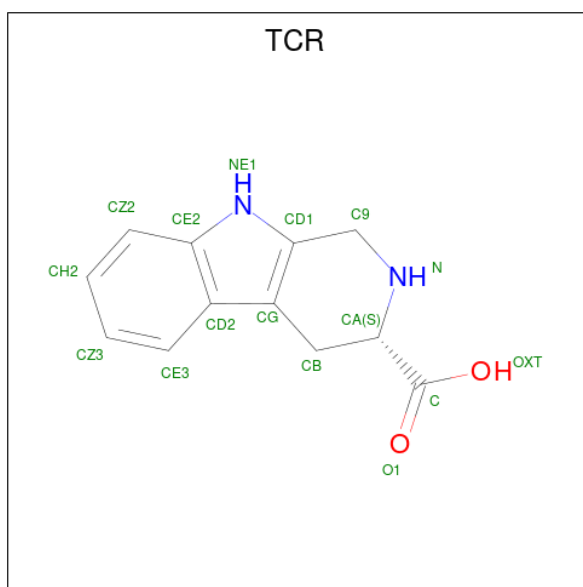
Mol	Chain	Residues	Atoms				AltConf	Trace
5	D	2	Total	C	N	O	0	0
			28	16	2	10		
5	E	2	Total	C	N	O	0	0
			28	16	2	10		
5	F	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



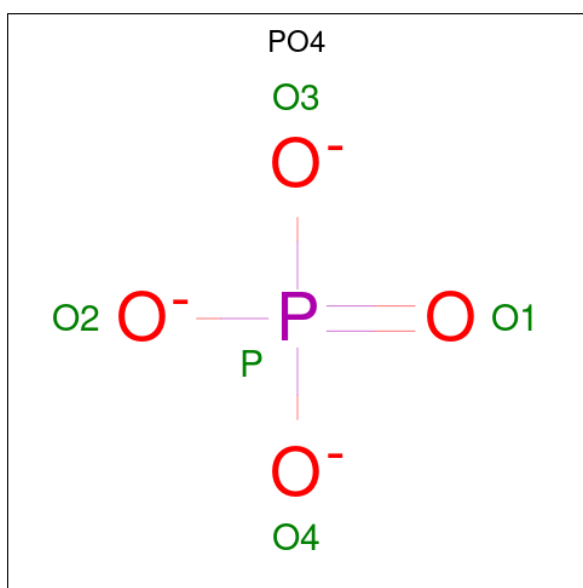
Mol	Chain	Residues	Atoms				AltConf
6	Q	1	Total	C	N	O	0
			14	8	1	5	
6	R	1	Total	C	N	O	0
			14	8	1	5	
6	R	1	Total	C	N	O	0
			14	8	1	5	
6	R	1	Total	C	N	O	0
			14	8	1	5	

- Molecule 7 is CYCLOMETHYLTRYPTOPHAN (three-letter code: TCR) (formula: $C_{12}H_{12}N_2O_2$).



Mol	Chain	Residues	Atoms				AltConf
7	Q	1	Total	C	N	O	0
			16	12	2	2	
7	R	1	Total	C	N	O	0
			16	12	2	2	

- Molecule 8 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).

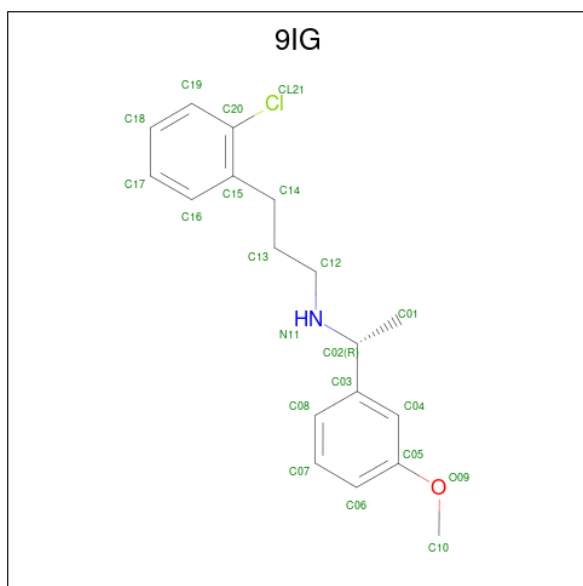


Mol	Chain	Residues	Atoms			AltConf
8	Q	1	Total	O	P	0
			5	4	1	
8	R	1	Total	O	P	0
			5	4	1	

- Molecule 9 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
9	Q	3	Total	Ca	0
			3	3	
9	R	3	Total	Ca	0
			3	3	

- Molecule 10 is 3-(2-chlorophenyl)-N-[(1R)-1-(3-methoxyphenyl)ethyl]propan-1-amine (three-letter code: 9IG) (formula: C₁₈H₂₂ClNO).



Mol	Chain	Residues	Atoms					AltConf
10	Q	1	Total	C	Cl	N	O	0
			21	18	1	1	1	
10	R	1	Total	C	Cl	N	O	0
			21	18	1	1	1	

- Molecule 11 is CHOLESTEROL HEMISUCCINATE (three-letter code: Y01) (formula: C₃₁H₅₀O₄).



Mol	Chain	Residues	Atoms			AltConf
11	Q	1	Total	C	O	0
			35	31	4	

- Molecule 12 is (19R,22S,25R)-22,25,26-trihydroxy-16,22-dioxo-17,21,23-trioxa-22λ⁵-phosphahexacosan-19-yl (9Z)-octadec-9-enoate (three-letter code: A1AF7) (formula: C₄₀H₇₇O₁₀P).

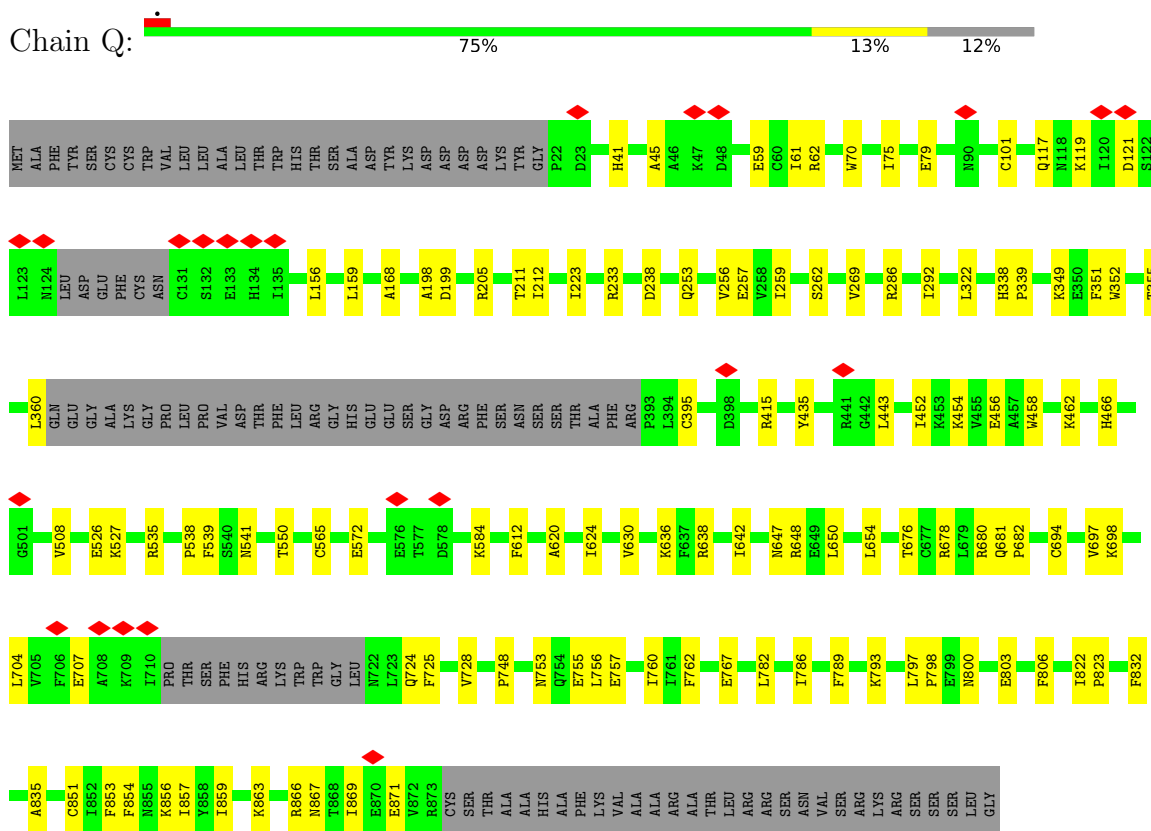


Mol	Chain	Residues	Atoms				AltConf
12	R	1	Total 51	C 40	O 10	P 1	0

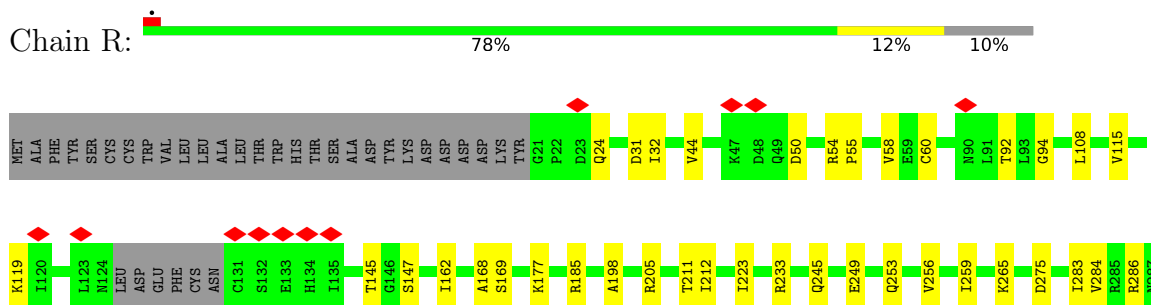
3 Residue-property plots

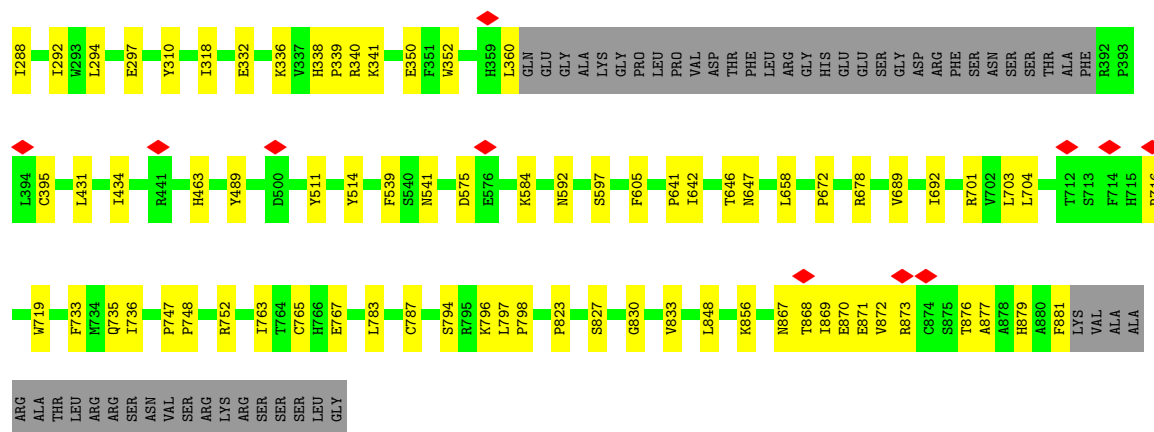
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Isoform 1 of Extracellular calcium-sensing receptor

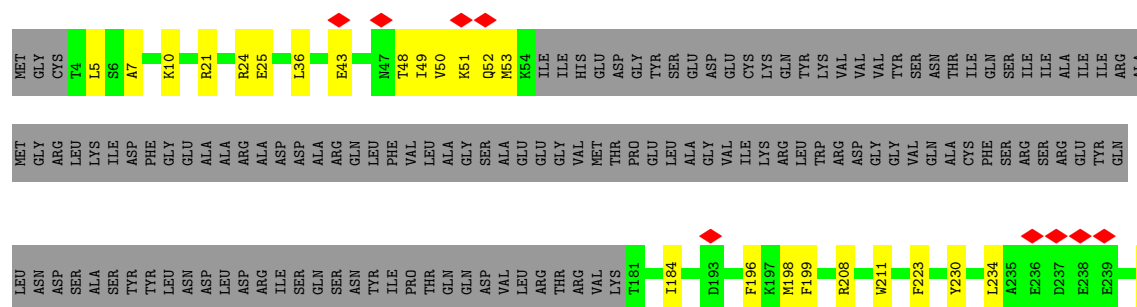


- Molecule 1: Isoform 1 of Extracellular calcium-sensing receptor

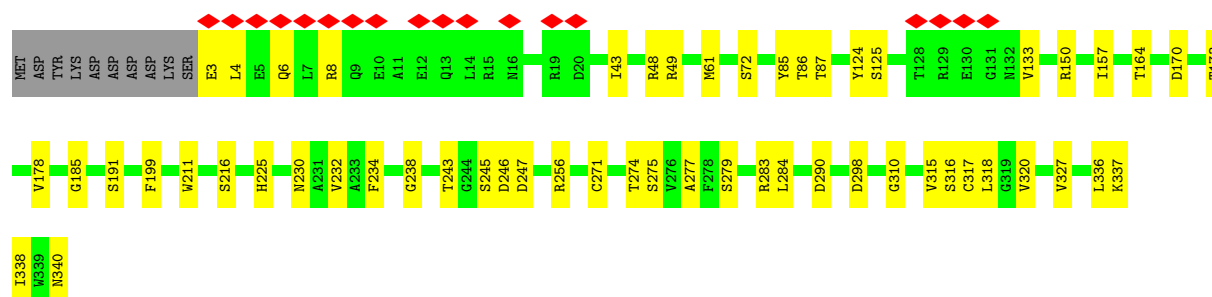
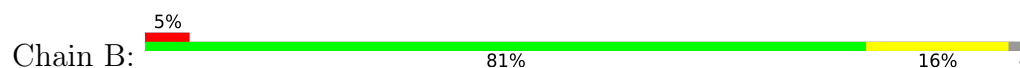




• Molecule 2: Guanine nucleotide-binding protein G(i) subunit alpha-3

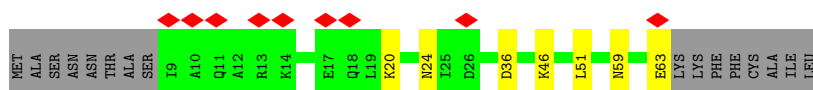


• Molecule 3: Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2



• Molecule 4: Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2





- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C:  100%



- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:  50%  50%



- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:  50%  50%



- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain F:  50%  50%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	55985	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 ($e^-/\text{\AA}^2$)	70.14	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	4.324	Depositor
Minimum map value	0.000	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.041	Depositor
Recommended contour level	0.3	Depositor
Map size (Å)	432.128, 432.128, 432.128	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.844, 0.844, 0.844	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: A1AF7, NAG, TCR, CA, Y01, PO4, 9IG

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	Q	0.28	0/6550	0.47	0/8883
1	R	0.28	0/6731	0.46	0/9133
2	A	0.28	0/1852	0.48	0/2486
3	B	0.28	0/2648	0.56	0/3585
4	G	0.26	0/433	0.45	0/584
All	All	0.28	0/18214	0.48	0/24671

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	Q	6390	0	6294	81	0
1	R	6561	0	6449	79	0
2	A	1822	0	1809	27	0
3	B	2599	0	2507	35	0
4	G	427	0	437	7	0
5	C	28	0	25	0	0
5	D	28	0	25	1	0
5	E	28	0	25	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	F	28	0	25	1	0
6	Q	14	0	13	0	0
6	R	42	0	39	0	0
7	Q	16	0	11	1	0
7	R	16	0	11	3	0
8	Q	5	0	0	1	0
8	R	5	0	0	0	0
9	Q	3	0	0	0	0
9	R	3	0	0	0	0
10	Q	21	0	0	0	0
10	R	21	0	0	0	0
11	Q	35	0	49	1	0
12	R	51	0	0	0	0
All	All	18143	0	17719	218	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 6.

The worst 5 of 218 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)
3:B:284:LEU:HD11	4:G:51:LEU:HD13	1.56	0.87
1:Q:832:PHE:O	1:Q:835:ALA:HB3	1.83	0.79
2:A:184:ILE:HD11	2:A:199:PHE:HB3	1.65	0.77
1:Q:866:ARG:HE	1:Q:871:GLU:HG2	1.52	0.74
1:R:249:GLU:O	1:R:253:GLN:NE2	2.22	0.72

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	Q	795/911 (87%)	770 (97%)	25 (3%)	0	100	100
1	R	818/911 (90%)	801 (98%)	17 (2%)	0	100	100
2	A	221/354 (62%)	210 (95%)	11 (5%)	0	100	100
3	B	336/348 (97%)	326 (97%)	10 (3%)	0	100	100
4	G	53/71 (75%)	53 (100%)	0	0	100	100
All	All	2223/2595 (86%)	2160 (97%)	63 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	Q	700/790 (89%)	700 (100%)	0	100	100
1	R	716/790 (91%)	716 (100%)	0	100	100
2	A	201/310 (65%)	201 (100%)	0	100	100
3	B	279/289 (96%)	279 (100%)	0	100	100
4	G	45/58 (78%)	45 (100%)	0	100	100
All	All	1941/2237 (87%)	1941 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 8 such sidechains are listed below:

Mol	Chain	Res	Type
4	G	59	ASN
3	B	340	ASN
1	R	735	GLN
1	R	647	ASN
3	B	110	ASN

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 ⓘ

8 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
5	NAG	C	1	5,1	14,14,15	0.23	0	17,19,21	0.50	0
5	NAG	C	2	5	14,14,15	0.22	0	17,19,21	0.40	0
5	NAG	D	1	5,1	14,14,15	0.35	0	17,19,21	0.45	0
5	NAG	D	2	5	14,14,15	0.24	0	17,19,21	0.47	0
5	NAG	E	1	5,1	14,14,15	0.17	0	17,19,21	0.45	0
5	NAG	E	2	5	14,14,15	0.21	0	17,19,21	0.41	0
5	NAG	F	1	5,1	14,14,15	0.31	0	17,19,21	0.48	0
5	NAG	F	2	5	14,14,15	0.20	0	17,19,21	0.40	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
5	NAG	C	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	C	2	5	-	2/6/23/26	0/1/1/1
5	NAG	D	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	D	2	5	-	2/6/23/26	0/1/1/1
5	NAG	E	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	E	2	5	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	F	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	F	2	5	-	4/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 18 torsion outliers are listed below:

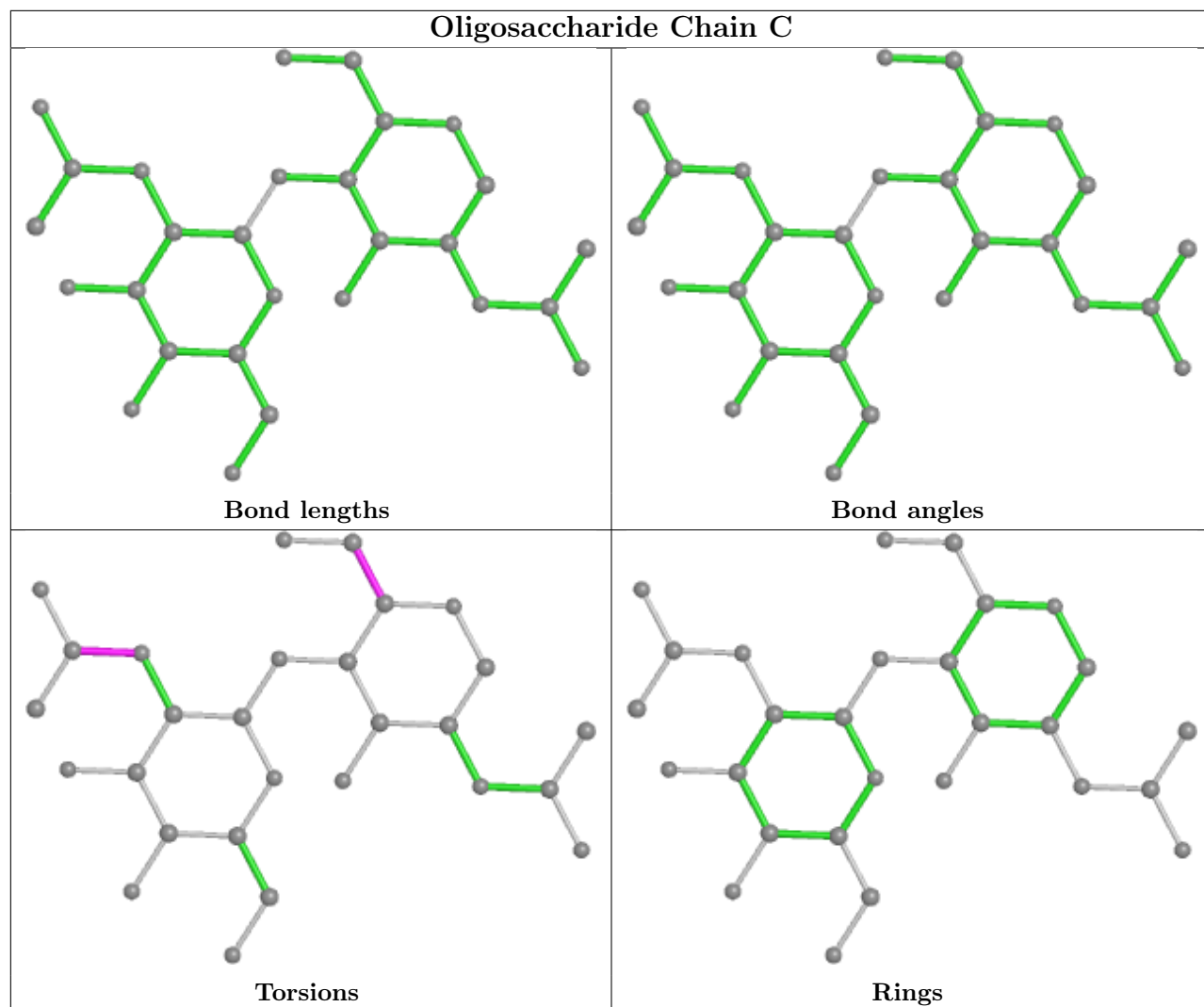
Mol	Chain	Res	Type	Atoms
5	F	2	NAG	C4-C5-C6-O6
5	F	1	NAG	O5-C5-C6-O6
5	F	2	NAG	O5-C5-C6-O6
5	F	1	NAG	C4-C5-C6-O6
5	C	2	NAG	C8-C7-N2-C2

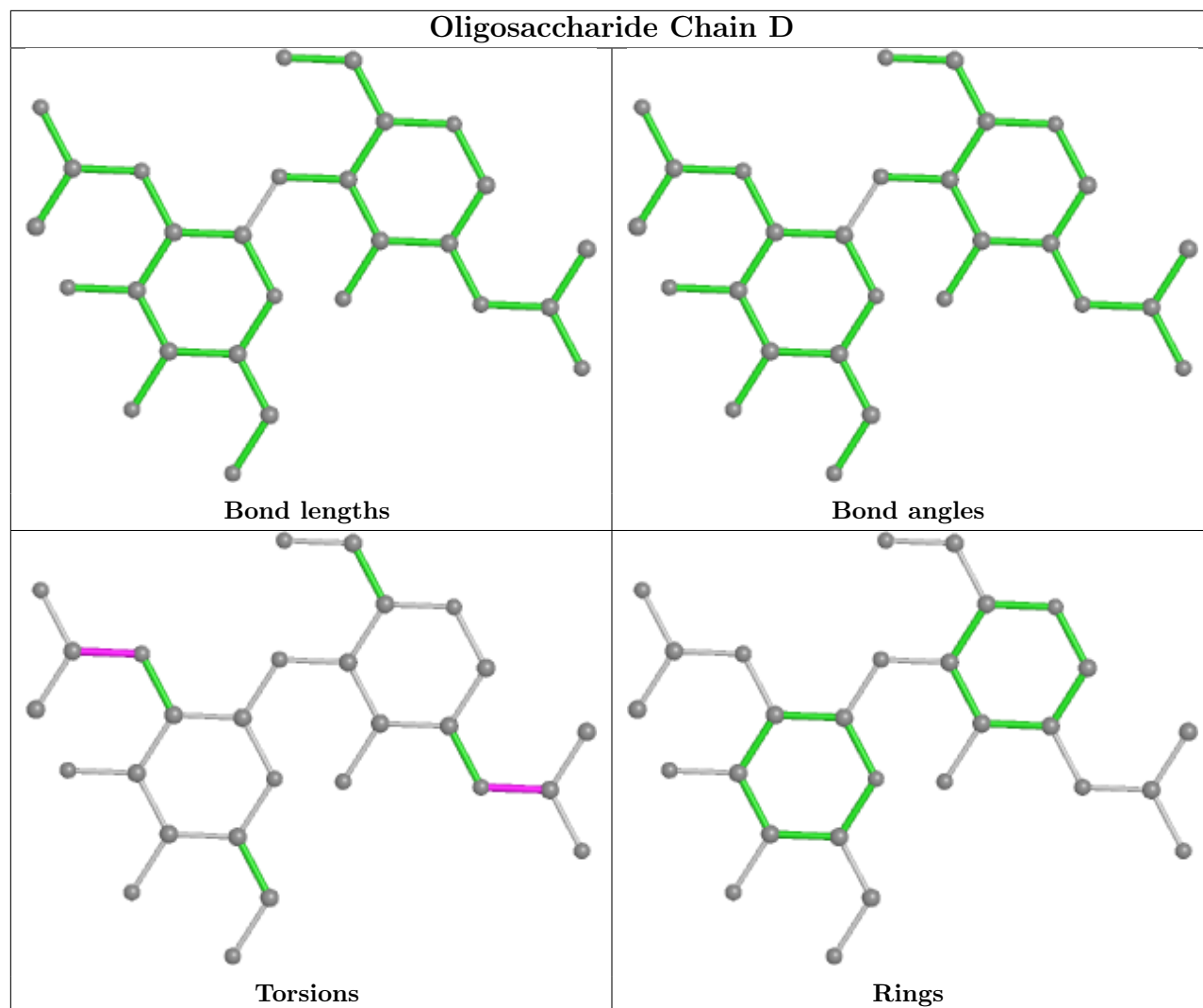
There are no ring outliers.

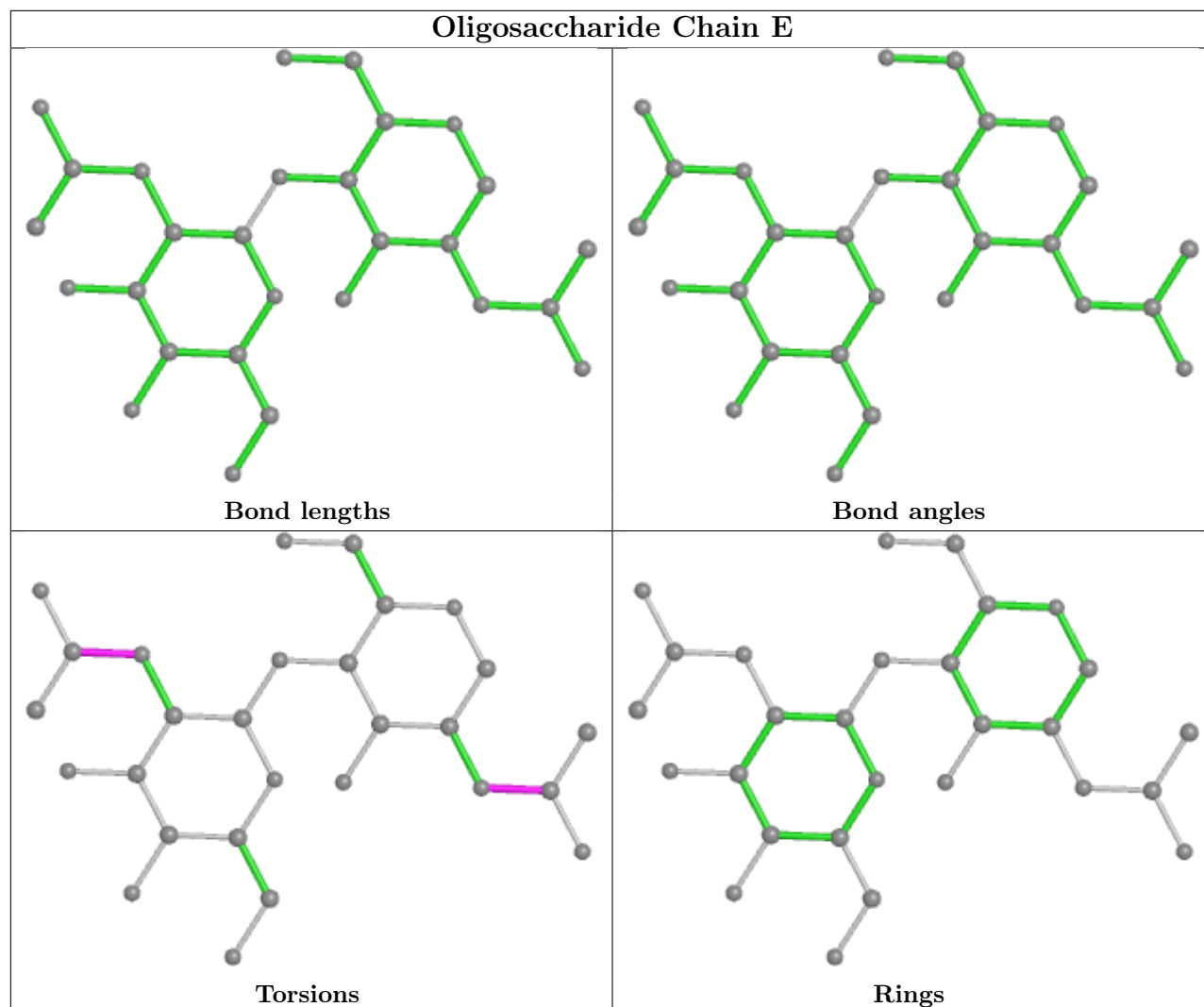
3 monomers are involved in 3 short contacts:

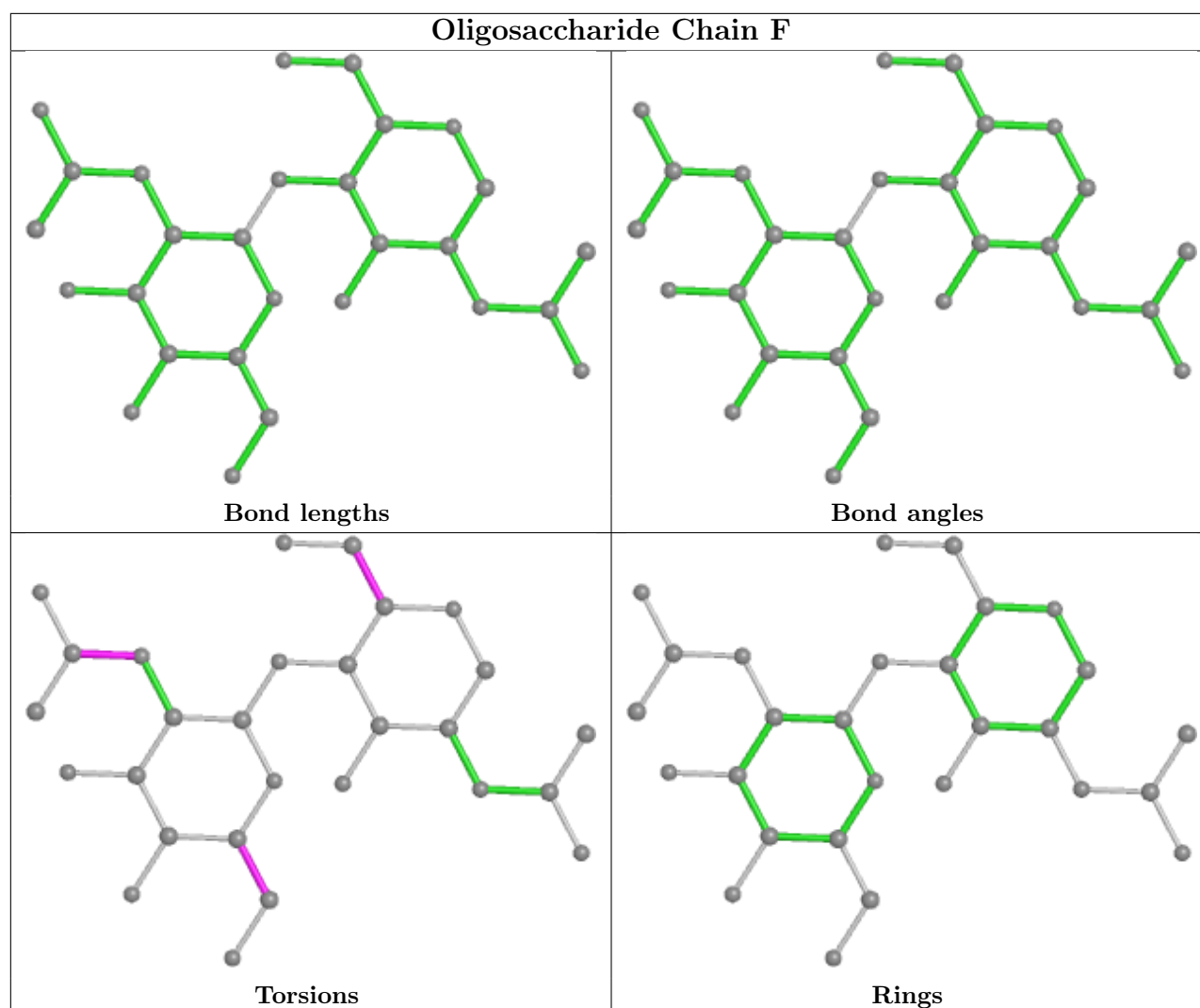
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	F	1	NAG	1	0
5	D	1	NAG	1	0
5	E	1	NAG	1	0

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









5.6 Ligand geometry [i](#)

Of 18 ligands modelled in this entry, 6 are monoatomic - leaving 12 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	$\# Z > 2$
8	PO4	R	1005	-	4,4,4	1.06	0	6,6,6	0.43	0
8	PO4	Q	1003	-	4,4,4	1.02	0	6,6,6	0.43	0
7	TCR	Q	1002	-	16,18,18	1.85	2 (12%)	16,26,26	1.25	2 (12%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
11	Y01	Q	1008	-	38,38,38	1.29	3 (7%)	57,57,57	2.20	14 (24%)
10	9IG	R	1009	-	22,22,22	0.75	0	26,28,28	1.06	2 (7%)
12	A1AF7	R	1010	-	50,50,50	0.87	4 (8%)	53,56,56	0.80	1 (1%)
10	9IG	Q	1007	-	22,22,22	0.73	0	26,28,28	1.06	2 (7%)
6	NAG	R	1003	1	14,14,15	0.31	0	17,19,21	0.48	0
6	NAG	R	1002	1	14,14,15	0.17	0	17,19,21	0.40	0
7	TCR	R	1004	-	16,18,18	1.87	2 (12%)	16,26,26	1.17	2 (12%)
6	NAG	Q	1001	1	14,14,15	0.22	0	17,19,21	0.43	0
6	NAG	R	1001	1	14,14,15	0.20	0	17,19,21	0.42	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
7	TCR	Q	1002	-	-	1/4/13/13	0/3/3/3
11	Y01	Q	1008	-	-	15/19/77/77	0/4/4/4
10	9IG	R	1009	-	-	6/13/13/13	0/2/2/2
12	A1AF7	R	1010	-	-	33/55/55/55	-
10	9IG	Q	1007	-	-	3/13/13/13	0/2/2/2
6	NAG	R	1003	1	-	1/6/23/26	0/1/1/1
6	NAG	R	1002	1	-	2/6/23/26	0/1/1/1
7	TCR	R	1004	-	-	0/4/13/13	0/3/3/3
6	NAG	Q	1001	1	-	2/6/23/26	0/1/1/1
6	NAG	R	1001	1	-	0/6/23/26	0/1/1/1

The worst 5 of 11 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	Q	1002	TCR	CB-CG	-5.79	1.44	1.51
7	R	1004	TCR	CB-CG	-5.50	1.44	1.51
11	Q	1008	Y01	CAK-CAI	-4.17	1.41	1.50
7	R	1004	TCR	C9-N	3.23	1.51	1.46
7	Q	1002	TCR	C9-N	2.94	1.50	1.46

The worst 5 of 23 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	Q	1008	Y01	CAV-CAZ-CBH	8.49	127.70	116.42

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	Q	1008	Y01	CAV-CAZ-CAI	-5.46	112.74	120.61
11	Q	1008	Y01	OAW-CAY-CAM	5.32	122.96	111.50
11	Q	1008	Y01	OAW-CAY-OAG	-5.03	111.54	123.70
11	Q	1008	Y01	OAW-CBC-CAV	-3.41	101.15	108.12

There are no chirality outliers.

5 of 63 torsion outliers are listed below:

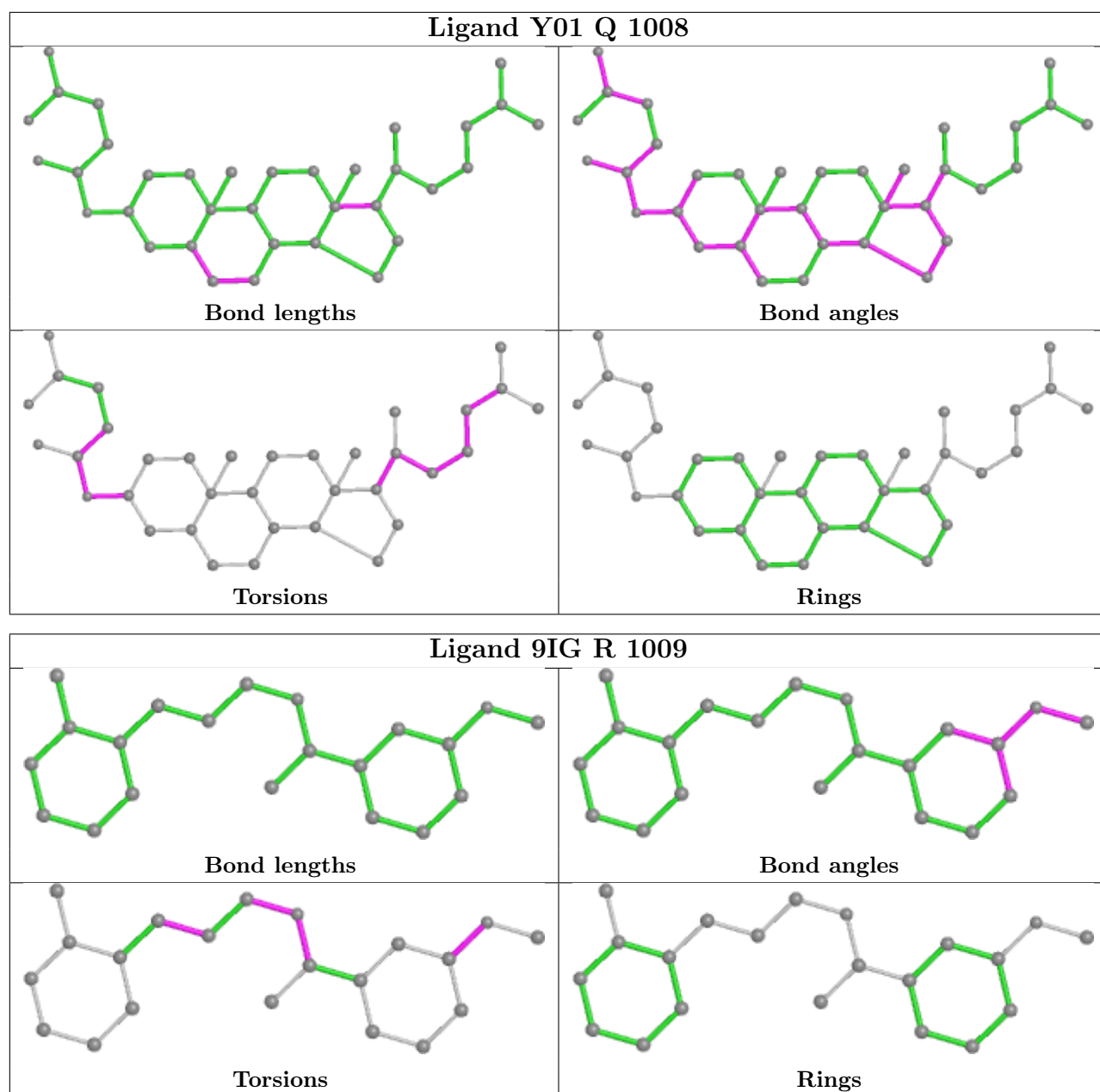
Mol	Chain	Res	Type	Atoms
10	R	1009	9IG	C01-C02-N11-C12
10	R	1009	9IG	C03-C02-N11-C12
11	Q	1008	Y01	CAR-CBC-OAW-CAY
11	Q	1008	Y01	OAG-CAY-OAW-CBC
11	Q	1008	Y01	CAM-CAY-OAW-CBC

There are no ring outliers.

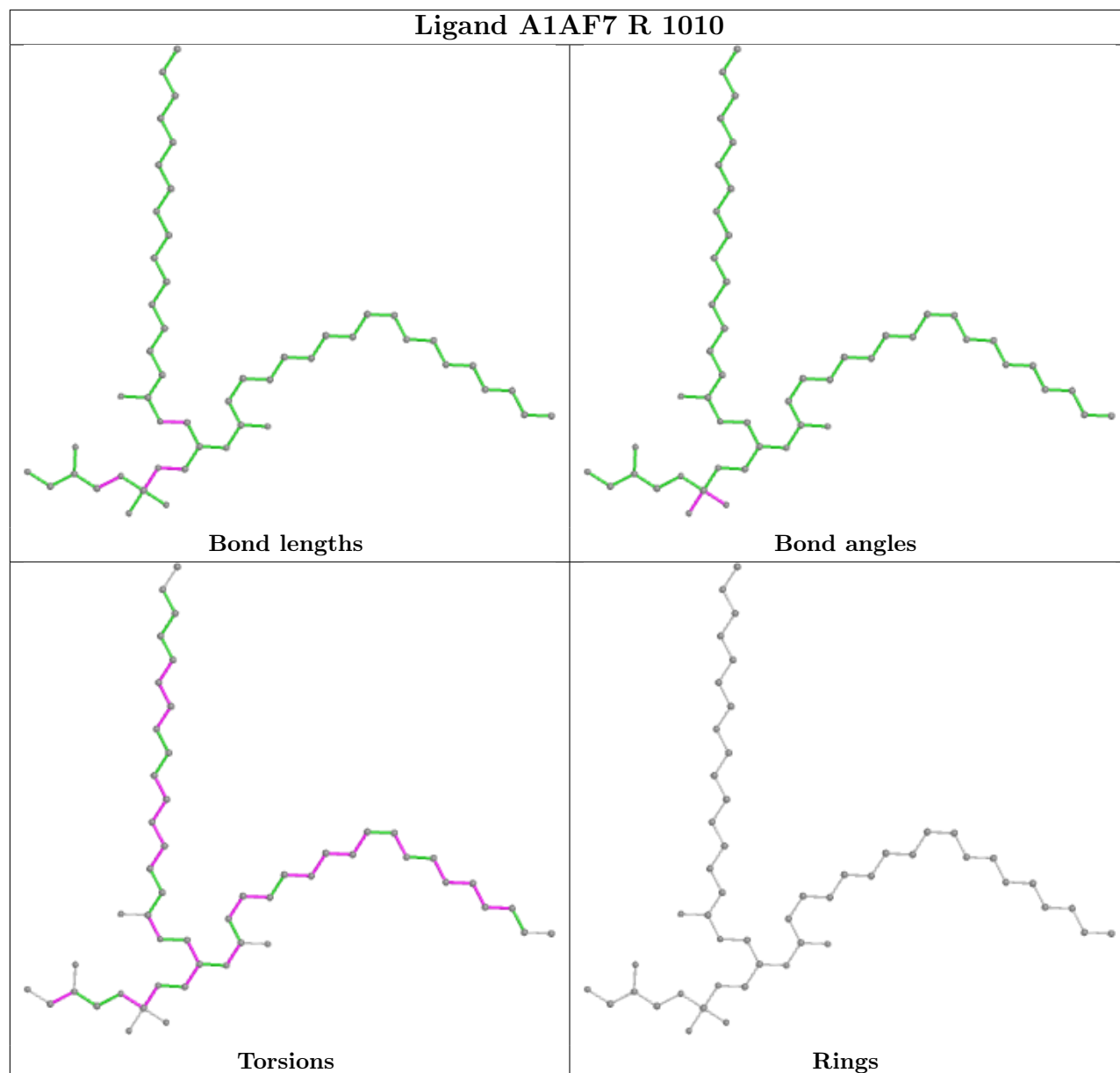
4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	Q	1003	PO4	1	0
7	Q	1002	TCR	1	0
11	Q	1008	Y01	1	0
7	R	1004	TCR	3	0

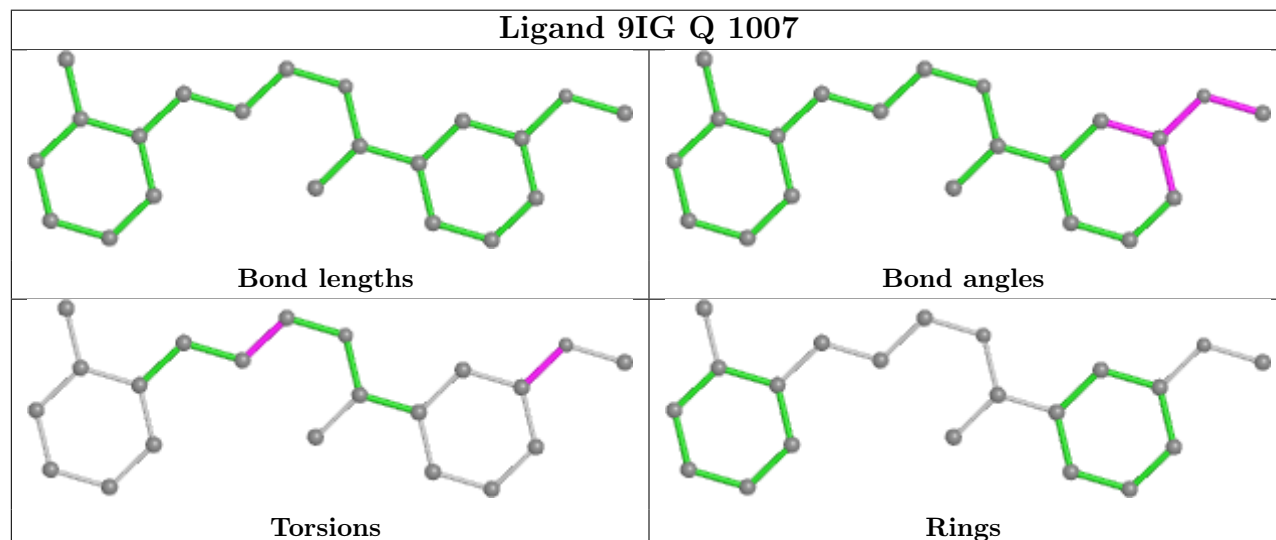
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



Ligand A1AF7 R 1010



Ligand 9IG Q 1007



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.

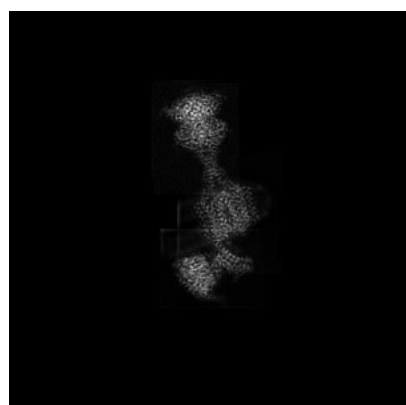
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-43908. These allow visual inspection of the internal detail of the map and identification of artifacts.

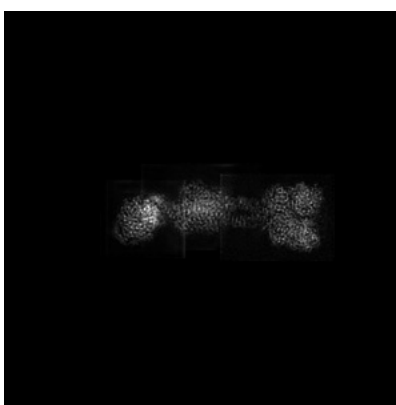
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

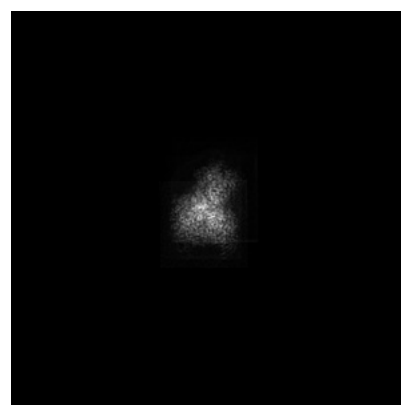
6.1.1 Primary map



X



Y

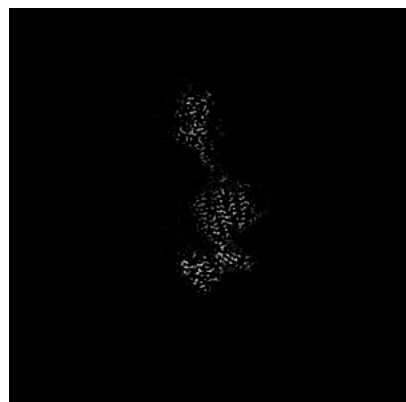


Z

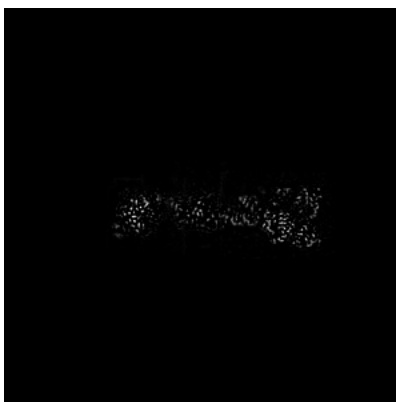
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

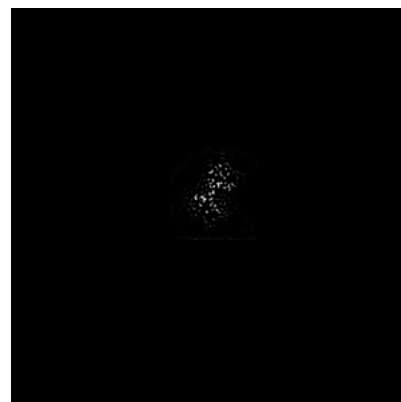
6.2.1 Primary map



X Index: 256



Y Index: 256

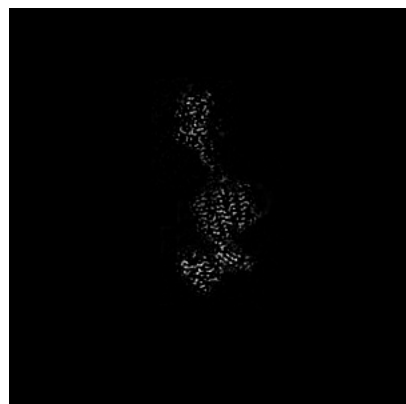


Z Index: 256

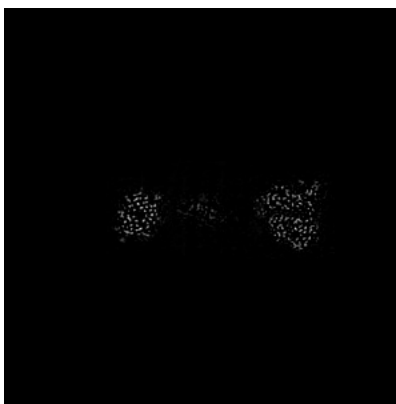
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

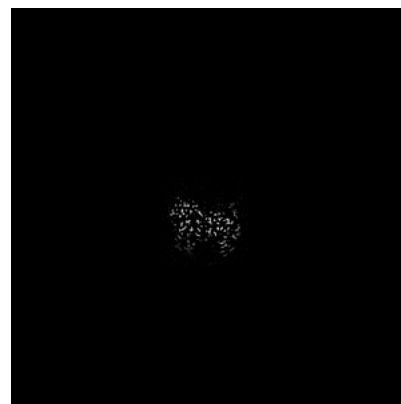
6.3.1 Primary map



X Index: 256



Y Index: 244

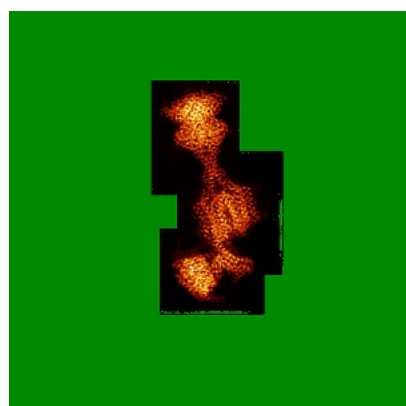


Z Index: 383

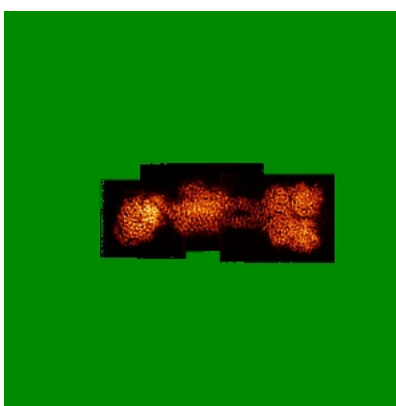
The images above show the largest variance slices of the map in three orthogonal directions.

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

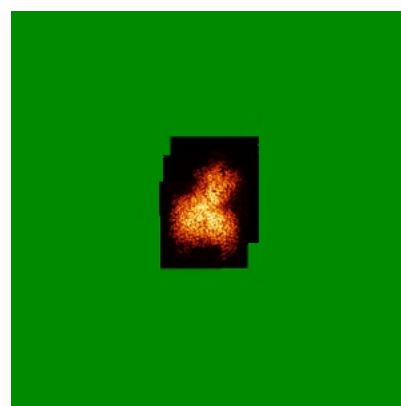
6.4.1 Primary map



X



Y

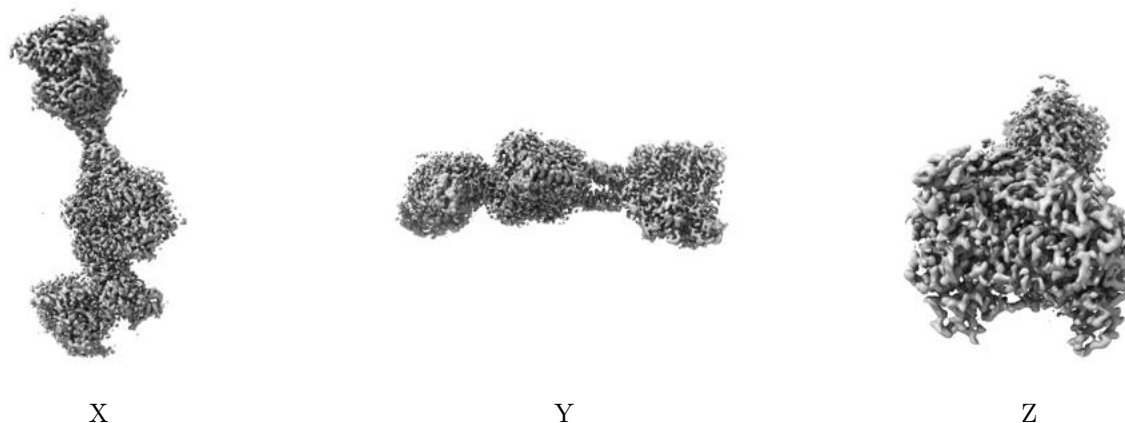


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.3. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

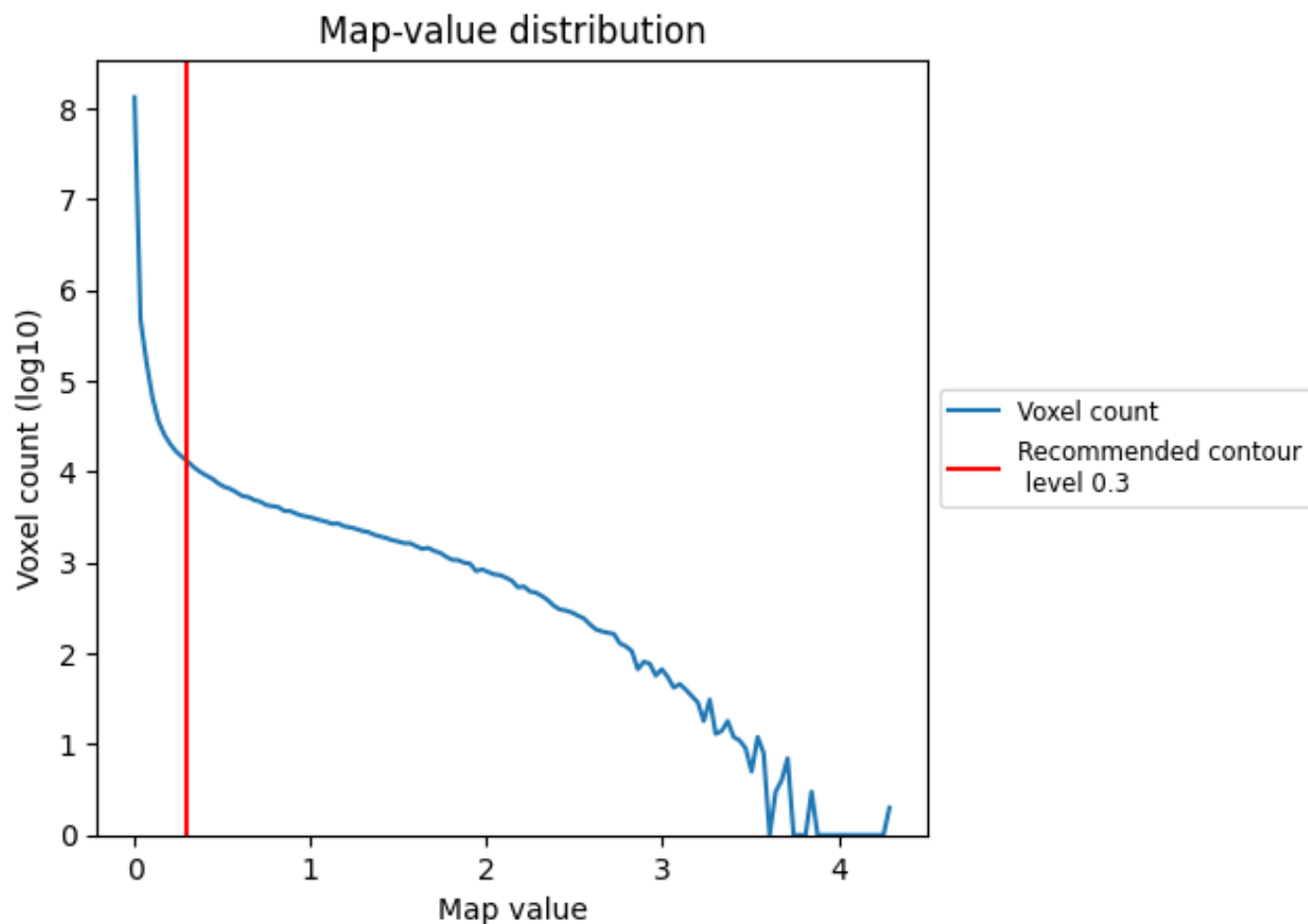
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

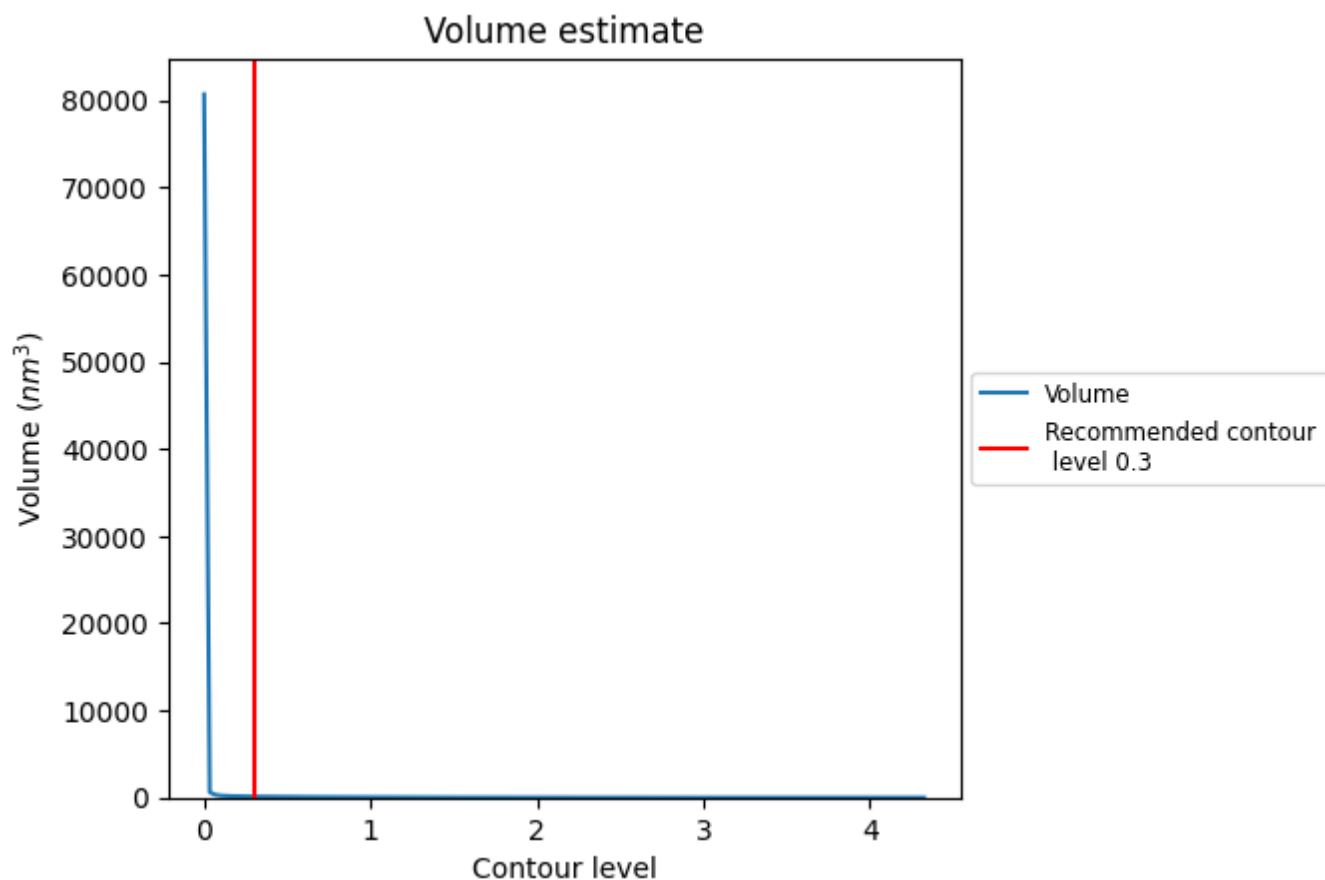
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

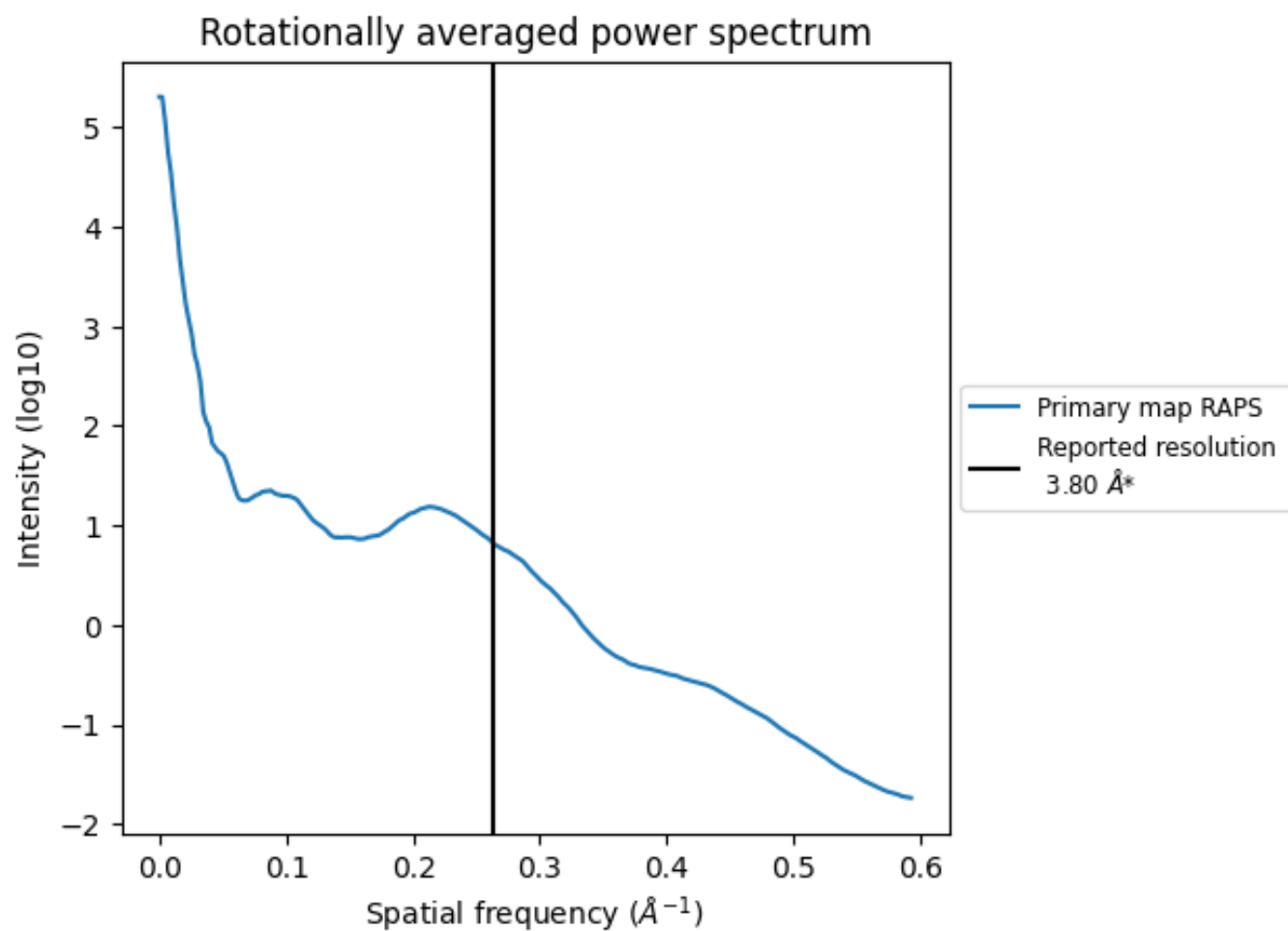
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 116 nm³; this corresponds to an approximate mass of 105 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 ⓘ



*Reported resolution corresponds to spatial frequency of 0.263 Å⁻¹

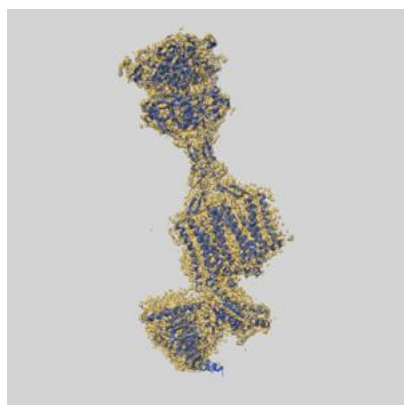
8 Fourier-Shell correlation

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

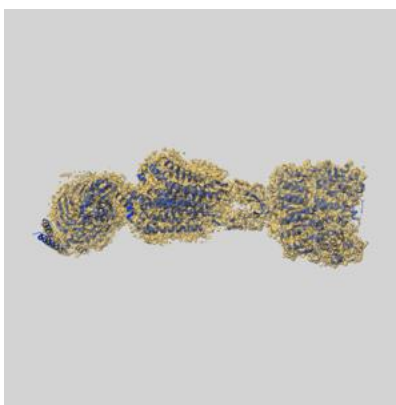
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-43908 and PDB model 9AVL. Per-residue inclusion information can be found in [section 3](#) on [page 10](#).

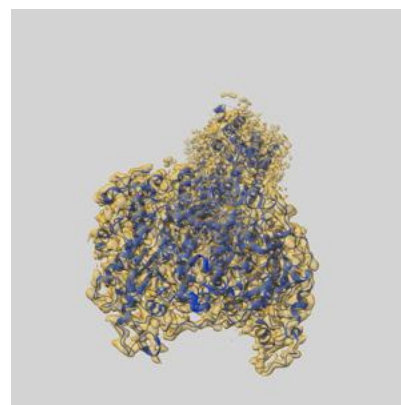
9.1 Map-model overlay [i](#)



X



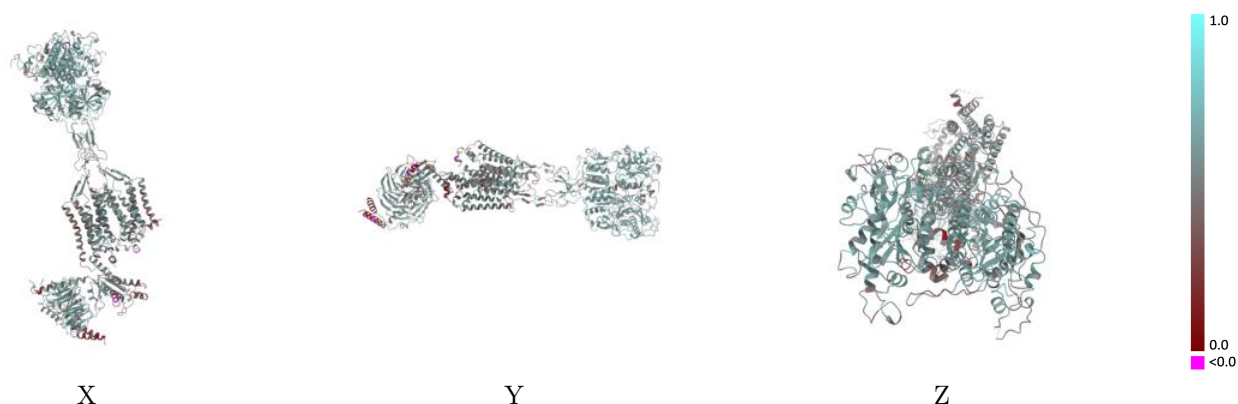
Y



Z

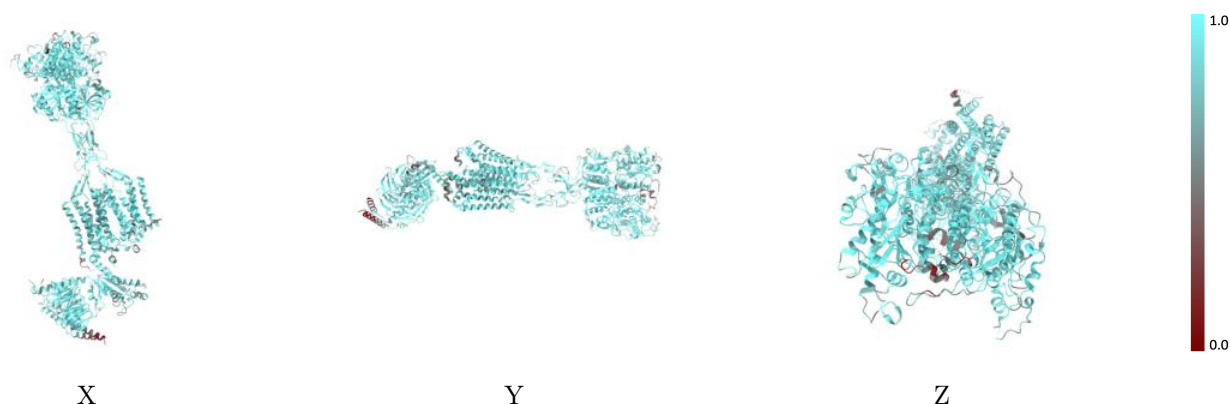
The images above show the 3D surface view of the map at the recommended contour level 0.3 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



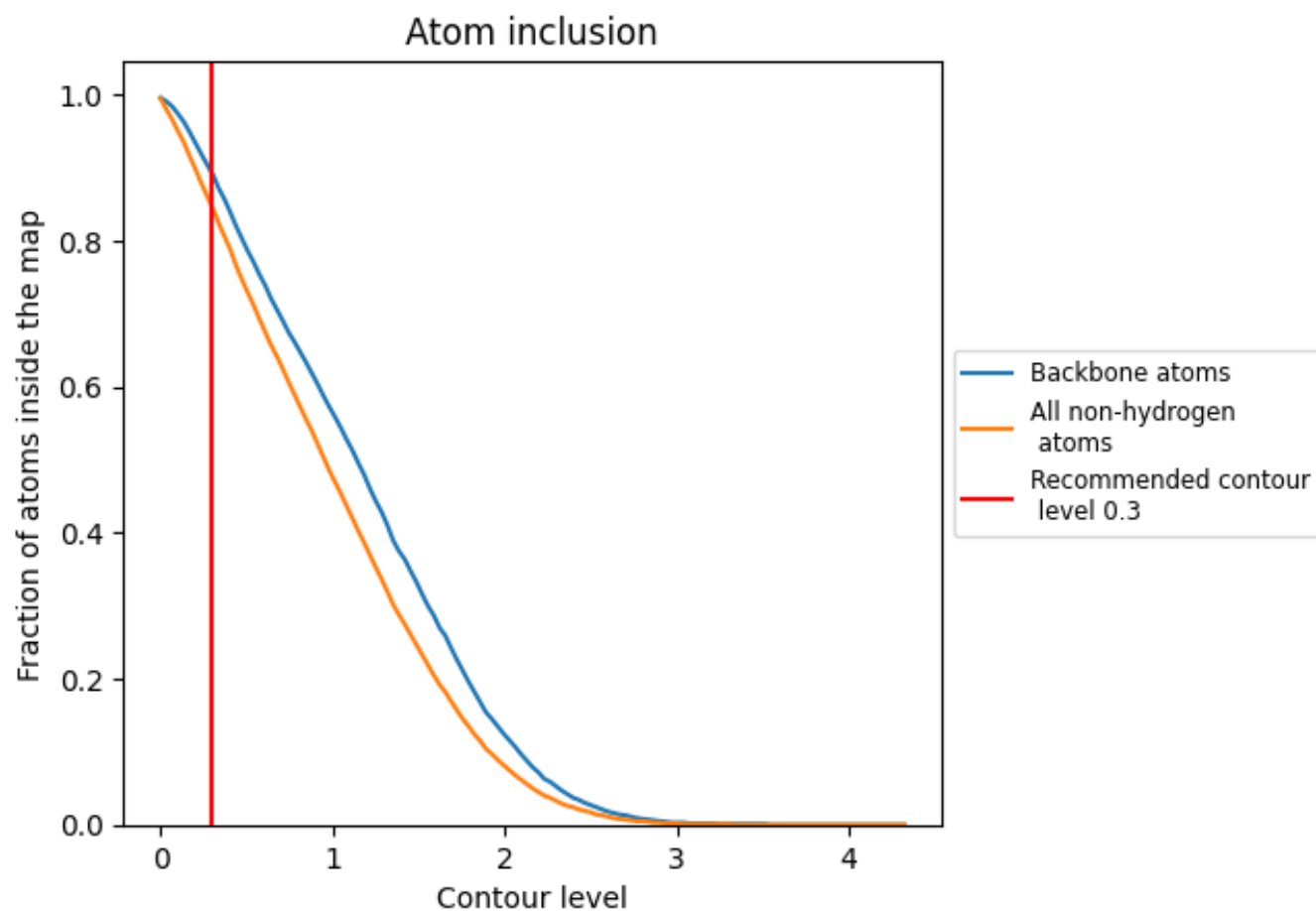
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.3).

9.4 Atom inclusion ⓘ



At the recommended contour level, 89% of all backbone atoms, 85% 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 (0.3) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.8460	<div></div> 0.5320
A	<div></div> 0.8080	<div></div> 0.4710
B	<div></div> 0.8800	<div></div> 0.5380
C	<div></div> 0.7500	<div></div> 0.5020
D	<div></div> 0.7500	<div></div> 0.5220
E	<div></div> 0.6070	<div></div> 0.4580
F	<div></div> 0.6790	<div></div> 0.4430
G	<div></div> 0.6710	<div></div> 0.3990
Q	<div></div> 0.8490	<div></div> 0.5410
R	<div></div> 0.8530	<div></div> 0.5470

1.0

0.0

<0.0