



Full wwPDB EM Validation Report ⓘ

Mar 8, 2026 – 04:25 AM UTC

PDB ID : 6X96 / pdb_00006x96
EMDB ID : EMD-22102
Title : Cryo-EM model of HIV-1 Env BG505 SOSIP.664 in complex with rabbit monoclonal antibody 10A fragment antigen binding variable domain
Authors : Ozorowski, G.; Cottrell, C.A.; Ward, A.B.
Deposited on : 2020-06-02
Resolution : 3.40 Å(reported)
Based on initial model : 5CEZ

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ 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.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

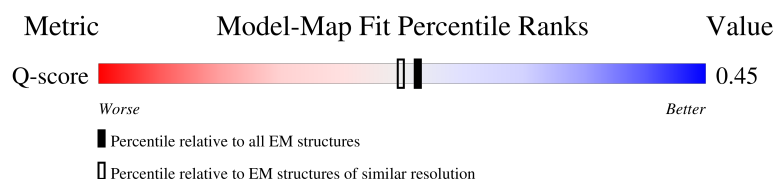
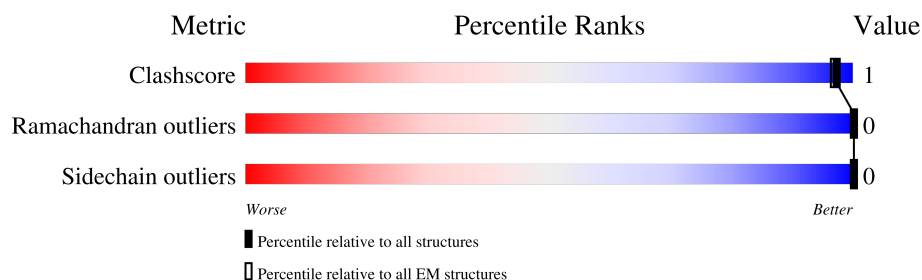
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.40 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.



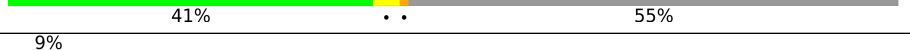
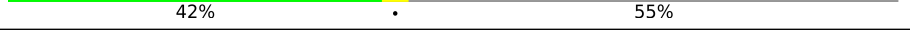
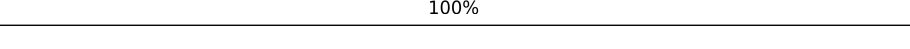
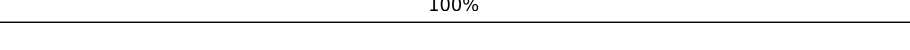
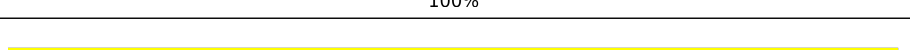
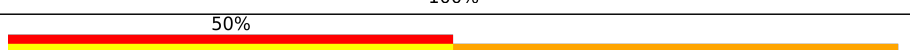
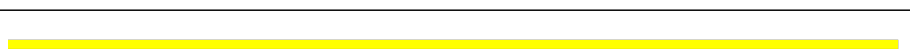
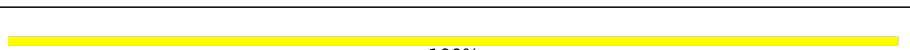
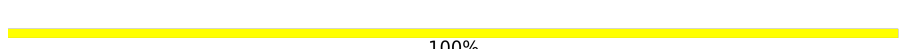
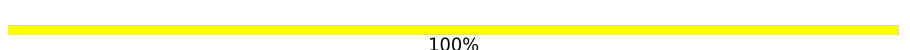
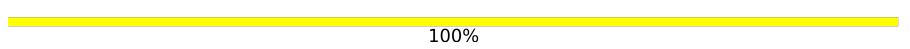
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	14717 (2.90 - 3.90)

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	A	516	
1	C	516	
1	G	516	
2	B	153	

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Mol	Chain	Length	Quality of chain
2	D	153	
2	I	153	
3	E	236	
3	H	236	
3	J	236	
4	F	242	
4	K	242	
4	L	242	
5	M	4	
5	Q	4	
5	U	4	
6	N	2	
6	O	2	
6	P	2	
6	R	2	
6	S	2	
6	T	2	
6	V	2	
6	W	2	
6	X	2	

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 18915 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 BG505 HIV-1 Env gp120.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	432	Total	C	N	O	S	0	0
			3410	2146	601	635	28		
1	C	432	Total	C	N	O	S	0	0
			3410	2146	601	635	28		
1	G	432	Total	C	N	O	S	0	0
			3410	2146	601	635	28		

There are 123 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	MET	-	expression tag	UNP Q2N0S6
A	-3	ASP	-	expression tag	UNP Q2N0S6
A	-2	ALA	-	expression tag	UNP Q2N0S6
A	-1	MET	-	expression tag	UNP Q2N0S6
A	0	LYS	-	expression tag	UNP Q2N0S6
A	1	ARG	-	expression tag	UNP Q2N0S6
A	2	GLY	-	expression tag	UNP Q2N0S6
A	3	LEU	-	expression tag	UNP Q2N0S6
A	4	CYS	-	expression tag	UNP Q2N0S6
A	5	CYS	-	expression tag	UNP Q2N0S6
A	6	VAL	-	expression tag	UNP Q2N0S6
A	7	LEU	-	expression tag	UNP Q2N0S6
A	8	LEU	-	expression tag	UNP Q2N0S6
A	9	LEU	-	expression tag	UNP Q2N0S6
A	10	CYS	-	expression tag	UNP Q2N0S6
A	11	GLY	-	expression tag	UNP Q2N0S6
A	12	ALA	-	expression tag	UNP Q2N0S6
A	13	VAL	-	expression tag	UNP Q2N0S6
A	14	PHE	-	expression tag	UNP Q2N0S6
A	15	VAL	-	expression tag	UNP Q2N0S6
A	16	SER	-	expression tag	UNP Q2N0S6
A	17	PRO	-	expression tag	UNP Q2N0S6
A	18	SER	-	expression tag	UNP Q2N0S6
A	19	GLN	-	expression tag	UNP Q2N0S6

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Chain	Residue	Modelled	Actual	Comment	Reference
A	20	GLU	-	expression tag	UNP Q2N0S6
A	21	ILE	-	expression tag	UNP Q2N0S6
A	22	HIS	-	expression tag	UNP Q2N0S6
A	23	ALA	-	expression tag	UNP Q2N0S6
A	24	ARG	-	expression tag	UNP Q2N0S6
A	25	PHE	-	expression tag	UNP Q2N0S6
A	26	ARG	-	expression tag	UNP Q2N0S6
A	27	ARG	-	expression tag	UNP Q2N0S6
A	28	GLY	-	expression tag	UNP Q2N0S6
A	29	ALA	-	expression tag	UNP Q2N0S6
A	30	ARG	-	expression tag	UNP Q2N0S6
A	332	ASN	THR	engineered mutation	UNP Q2N0S6
A	501	CYS	ALA	engineered mutation	UNP Q2N0S6
A	509	ARG	GLU	engineered mutation	UNP Q2N0S6
A	510	ARG	LYS	engineered mutation	UNP Q2N0S6
A	512	ARG	ALA	engineered mutation	UNP Q2N0S6
A	513	ARG	VAL	engineered mutation	UNP Q2N0S6
C	-4	MET	-	expression tag	UNP Q2N0S6
C	-3	ASP	-	expression tag	UNP Q2N0S6
C	-2	ALA	-	expression tag	UNP Q2N0S6
C	-1	MET	-	expression tag	UNP Q2N0S6
C	0	LYS	-	expression tag	UNP Q2N0S6
C	1	ARG	-	expression tag	UNP Q2N0S6
C	2	GLY	-	expression tag	UNP Q2N0S6
C	3	LEU	-	expression tag	UNP Q2N0S6
C	4	CYS	-	expression tag	UNP Q2N0S6
C	5	CYS	-	expression tag	UNP Q2N0S6
C	6	VAL	-	expression tag	UNP Q2N0S6
C	7	LEU	-	expression tag	UNP Q2N0S6
C	8	LEU	-	expression tag	UNP Q2N0S6
C	9	LEU	-	expression tag	UNP Q2N0S6
C	10	CYS	-	expression tag	UNP Q2N0S6
C	11	GLY	-	expression tag	UNP Q2N0S6
C	12	ALA	-	expression tag	UNP Q2N0S6
C	13	VAL	-	expression tag	UNP Q2N0S6
C	14	PHE	-	expression tag	UNP Q2N0S6
C	15	VAL	-	expression tag	UNP Q2N0S6
C	16	SER	-	expression tag	UNP Q2N0S6
C	17	PRO	-	expression tag	UNP Q2N0S6
C	18	SER	-	expression tag	UNP Q2N0S6
C	19	GLN	-	expression tag	UNP Q2N0S6
C	20	GLU	-	expression tag	UNP Q2N0S6

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Chain	Residue	Modelled	Actual	Comment	Reference
C	21	ILE	-	expression tag	UNP Q2N0S6
C	22	HIS	-	expression tag	UNP Q2N0S6
C	23	ALA	-	expression tag	UNP Q2N0S6
C	24	ARG	-	expression tag	UNP Q2N0S6
C	25	PHE	-	expression tag	UNP Q2N0S6
C	26	ARG	-	expression tag	UNP Q2N0S6
C	27	ARG	-	expression tag	UNP Q2N0S6
C	28	GLY	-	expression tag	UNP Q2N0S6
C	29	ALA	-	expression tag	UNP Q2N0S6
C	30	ARG	-	expression tag	UNP Q2N0S6
C	332	ASN	THR	engineered mutation	UNP Q2N0S6
C	501	CYS	ALA	engineered mutation	UNP Q2N0S6
C	509	ARG	GLU	engineered mutation	UNP Q2N0S6
C	510	ARG	LYS	engineered mutation	UNP Q2N0S6
C	512	ARG	ALA	engineered mutation	UNP Q2N0S6
C	513	ARG	VAL	engineered mutation	UNP Q2N0S6
G	-4	MET	-	expression tag	UNP Q2N0S6
G	-3	ASP	-	expression tag	UNP Q2N0S6
G	-2	ALA	-	expression tag	UNP Q2N0S6
G	-1	MET	-	expression tag	UNP Q2N0S6
G	0	LYS	-	expression tag	UNP Q2N0S6
G	1	ARG	-	expression tag	UNP Q2N0S6
G	2	GLY	-	expression tag	UNP Q2N0S6
G	3	LEU	-	expression tag	UNP Q2N0S6
G	4	CYS	-	expression tag	UNP Q2N0S6
G	5	CYS	-	expression tag	UNP Q2N0S6
G	6	VAL	-	expression tag	UNP Q2N0S6
G	7	LEU	-	expression tag	UNP Q2N0S6
G	8	LEU	-	expression tag	UNP Q2N0S6
G	9	LEU	-	expression tag	UNP Q2N0S6
G	10	CYS	-	expression tag	UNP Q2N0S6
G	11	GLY	-	expression tag	UNP Q2N0S6
G	12	ALA	-	expression tag	UNP Q2N0S6
G	13	VAL	-	expression tag	UNP Q2N0S6
G	14	PHE	-	expression tag	UNP Q2N0S6
G	15	VAL	-	expression tag	UNP Q2N0S6
G	16	SER	-	expression tag	UNP Q2N0S6
G	17	PRO	-	expression tag	UNP Q2N0S6
G	18	SER	-	expression tag	UNP Q2N0S6
G	19	GLN	-	expression tag	UNP Q2N0S6
G	20	GLU	-	expression tag	UNP Q2N0S6
G	21	ILE	-	expression tag	UNP Q2N0S6

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Chain	Residue	Modelled	Actual	Comment	Reference
G	22	HIS	-	expression tag	UNP Q2N0S6
G	23	ALA	-	expression tag	UNP Q2N0S6
G	24	ARG	-	expression tag	UNP Q2N0S6
G	25	PHE	-	expression tag	UNP Q2N0S6
G	26	ARG	-	expression tag	UNP Q2N0S6
G	27	ARG	-	expression tag	UNP Q2N0S6
G	28	GLY	-	expression tag	UNP Q2N0S6
G	29	ALA	-	expression tag	UNP Q2N0S6
G	30	ARG	-	expression tag	UNP Q2N0S6
G	332	ASN	THR	engineered mutation	UNP Q2N0S6
G	501	CYS	ALA	engineered mutation	UNP Q2N0S6
G	509	ARG	GLU	engineered mutation	UNP Q2N0S6
G	510	ARG	LYS	engineered mutation	UNP Q2N0S6
G	512	ARG	ALA	engineered mutation	UNP Q2N0S6
G	513	ARG	VAL	engineered mutation	UNP Q2N0S6

- Molecule 2 is a protein called BG505 HIV-1 Env gp41.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	120	Total	C	N	O	S	0	0
			958	604	166	182	6		
2	D	120	Total	C	N	O	S	0	0
			958	604	166	182	6		
2	I	120	Total	C	N	O	S	0	0
			958	604	166	182	6		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	559	PRO	ILE	engineered mutation	UNP Q2N0S6
B	605	CYS	THR	engineered mutation	UNP Q2N0S6
D	559	PRO	ILE	engineered mutation	UNP Q2N0S6
D	605	CYS	THR	engineered mutation	UNP Q2N0S6
I	559	PRO	ILE	engineered mutation	UNP Q2N0S6
I	605	CYS	THR	engineered mutation	UNP Q2N0S6

- Molecule 3 is a protein called monoclonal antibody 10A fragment antigen binding heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	H	113	Total	C	N	O	S	0	0
			838	532	138	162	6		

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Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	113	Total	C	N	O	S	0	0
			838	532	138	162	6		
3	J	113	Total	C	N	O	S	0	0
			838	532	138	162	6		

- Molecule 4 is a protein called monoclonal antibody 10A kappa chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	L	109	Total	C	N	O	S	0	0
			811	509	133	165	4		
4	F	109	Total	C	N	O	S	0	0
			811	509	133	165	4		
4	K	109	Total	C	N	O	S	0	0
			811	509	133	165	4		

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-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
5	M	4	Total	C	N	O	0	0
			50	28	2	20		
5	Q	4	Total	C	N	O	0	0
			50	28	2	20		
5	U	4	Total	C	N	O	0	0
			50	28	2	20		

- Molecule 6 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



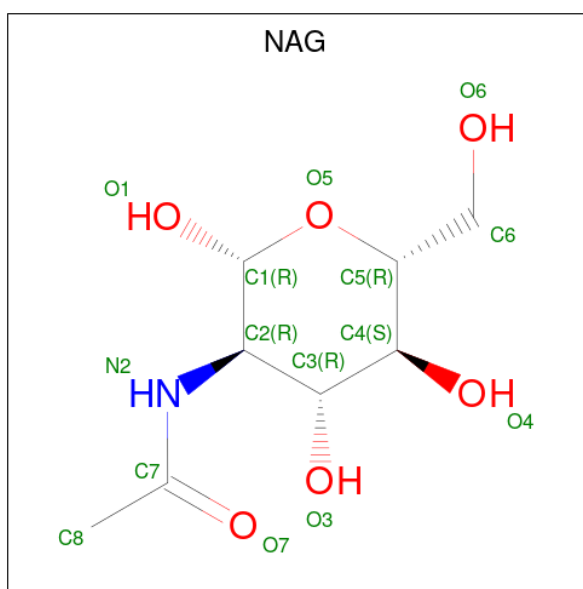
Mol	Chain	Residues	Atoms				AltConf	Trace
6	N	2	Total	C	N	O	0	0
			28	16	2	10		

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Mol	Chain	Residues	Atoms				AltConf	Trace
6	O	2	Total	C	N	O	0	0
			28	16	2	10		
6	P	2	Total	C	N	O	0	0
			28	16	2	10		
6	R	2	Total	C	N	O	0	0
			28	16	2	10		
6	S	2	Total	C	N	O	0	0
			28	16	2	10		
6	T	2	Total	C	N	O	0	0
			28	16	2	10		
6	V	2	Total	C	N	O	0	0
			28	16	2	10		
6	W	2	Total	C	N	O	0	0
			28	16	2	10		
6	X	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				AltConf
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	

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Mol	Chain	Residues	Atoms				AltConf
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	

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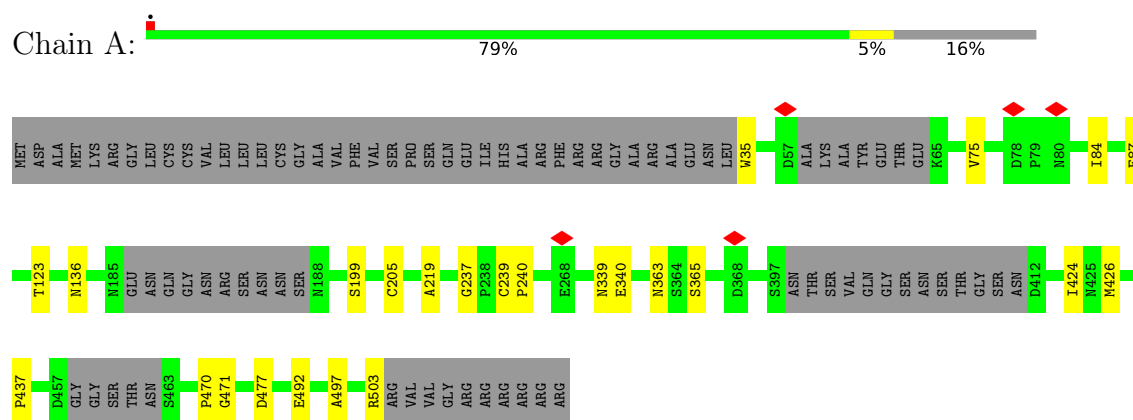
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Mol	Chain	Residues	Atoms				AltConf
7	G	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	

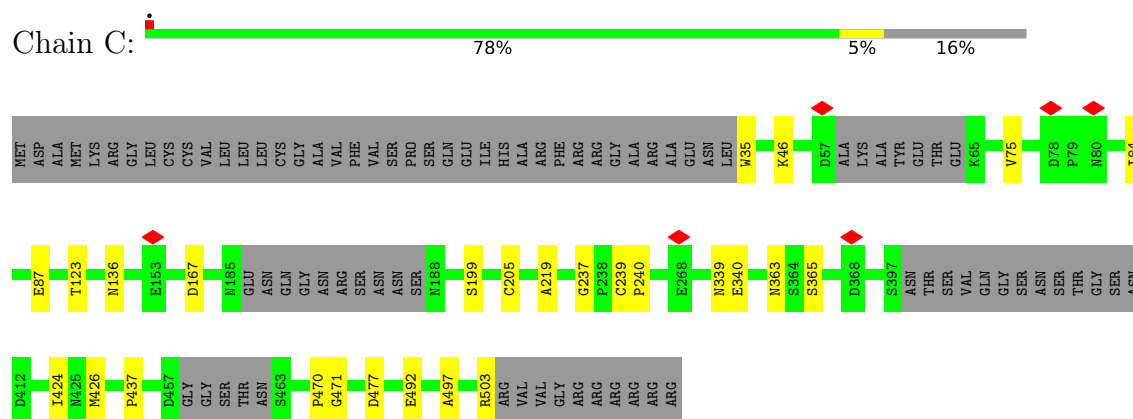
3 Residue-property plots

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.

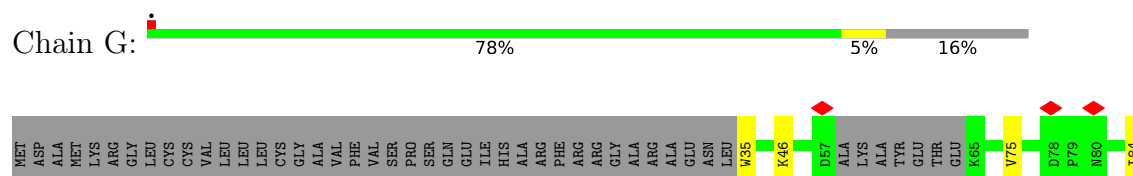
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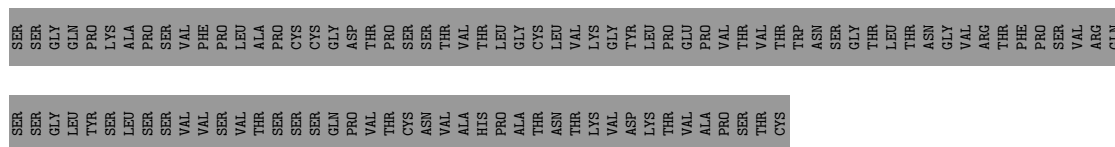


• Molecule 1: BG505 HIV-1 Env gp120

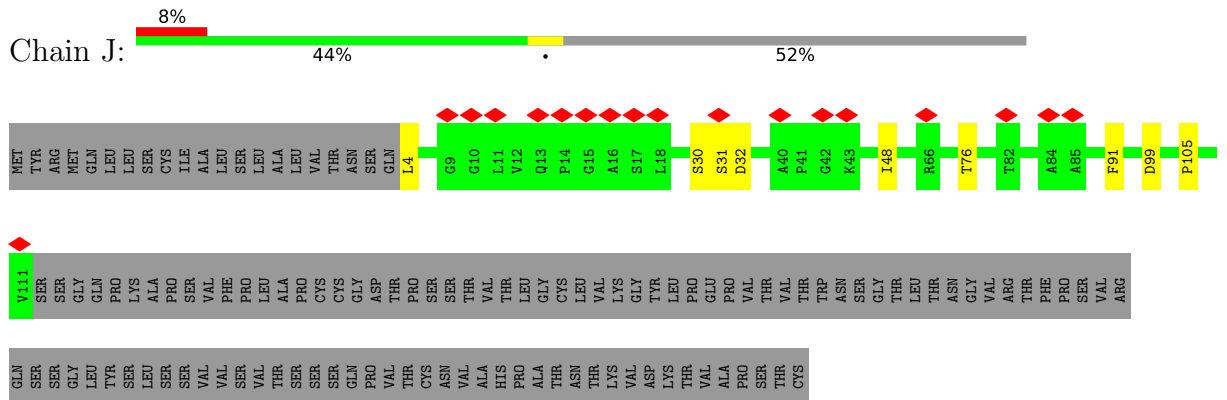


• Molecule 1: BG505 HIV-1 Env gp120

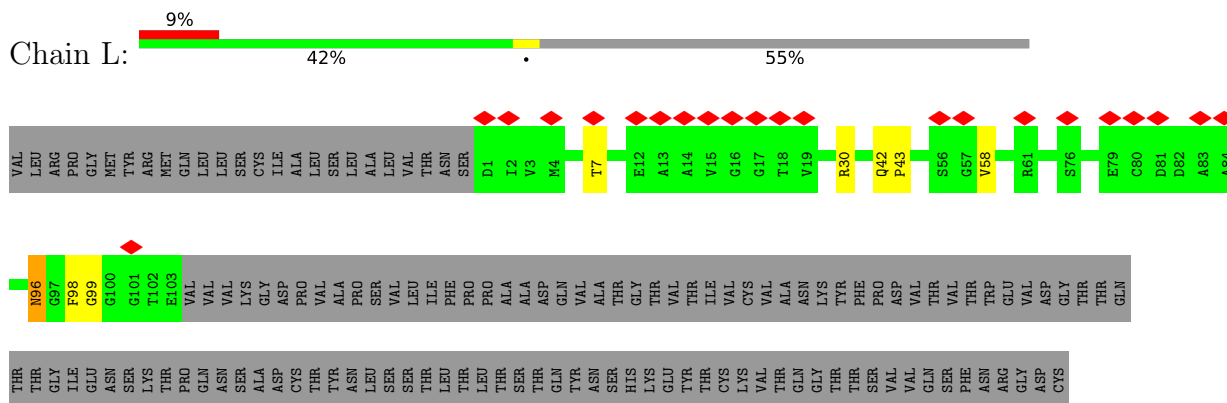




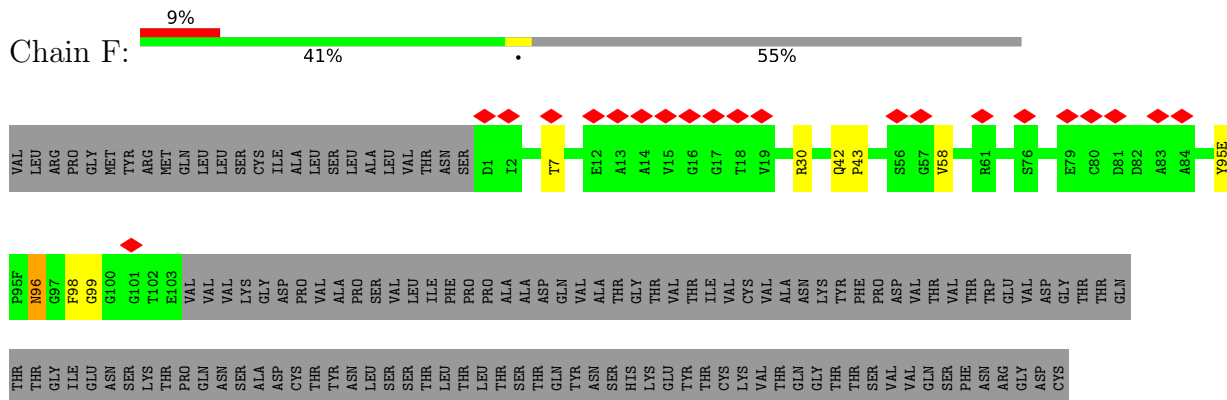
- Molecule 3: monoclonal antibody 10A fragment antigen binding heavy chain



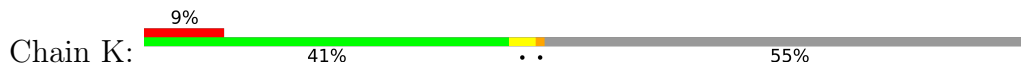
- Molecule 4: monoclonal antibody 10A kappa chain

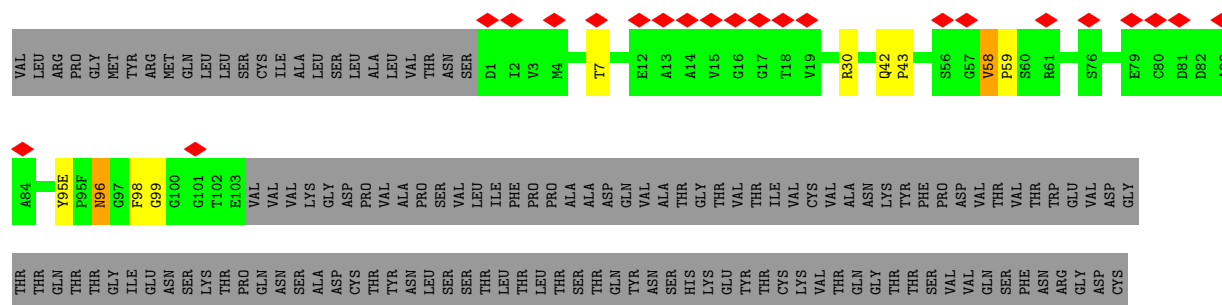


- Molecule 4: monoclonal antibody 10A kappa chain



- Molecule 4: monoclonal antibody 10A kappa chain





- Molecule 5: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain M: 100%



- Molecule 5: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Q: 100%



- Molecule 5: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain U: 100%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain N: 100%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain O: 50% 50%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain P:  100%

NAG1
NAG2

- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain R:  100%

NAG1
NAG2

- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain S:  50% 50% 50%


NAG1
NAG2

- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain T:  100%

NAG1
NAG2

- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain V:  100%

NAG1
NAG2

- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain W:  50% 50% 50%


NAG1
NAG2

- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain X:  100%

MAG1
MAG2

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C3	Depositor
Number of particles used	119493	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 ($e^-/\text{\AA}^2$)	65	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	29000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	2.580	Depositor
Minimum map value	-1.468	Depositor
Average map value	0.004	Depositor
Map value standard deviation	0.084	Depositor
Recommended contour level	0.4	Depositor
Map size (Å)	263.68, 263.68, 263.68	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.03, 1.03, 1.03	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, MAN, BMA

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	1.10	3/3481 (0.1%)	1.27	29/4724 (0.6%)
1	C	1.10	3/3481 (0.1%)	1.27	29/4724 (0.6%)
1	G	1.10	3/3481 (0.1%)	1.27	29/4724 (0.6%)
2	B	1.04	2/975 (0.2%)	1.04	2/1322 (0.2%)
2	D	1.04	2/975 (0.2%)	1.04	2/1322 (0.2%)
2	I	1.04	2/975 (0.2%)	1.04	0/1322
3	E	1.00	1/859 (0.1%)	1.24	7/1171 (0.6%)
3	H	1.00	1/859 (0.1%)	1.24	6/1171 (0.5%)
3	J	1.00	1/859 (0.1%)	1.24	7/1171 (0.6%)
4	F	0.96	0/830	1.34	11/1128 (1.0%)
4	K	0.96	0/830	1.34	11/1128 (1.0%)
4	L	0.96	0/830	1.34	9/1128 (0.8%)
All	All	1.06	18/18435 (0.1%)	1.25	142/25035 (0.6%)

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	503	ARG	NE-CZ	7.26	1.41	1.33
1	A	503	ARG	NE-CZ	7.25	1.41	1.33
1	G	503	ARG	NE-CZ	7.25	1.41	1.33
3	H	4	LEU	CB-CG	6.65	1.66	1.53
3	E	4	LEU	CB-CG	6.64	1.66	1.53
3	J	4	LEU	CB-CG	6.63	1.66	1.53
2	D	660	LEU	CB-CG	6.58	1.66	1.53
2	B	660	LEU	CB-CG	6.56	1.66	1.53
2	I	660	LEU	CB-CG	6.55	1.66	1.53
1	G	35	TRP	CZ2-CH2	6.48	1.49	1.37
1	A	35	TRP	CZ2-CH2	6.47	1.49	1.37
1	C	35	TRP	CZ2-CH2	6.45	1.49	1.37
1	A	35	TRP	CD2-CE3	6.29	1.50	1.40
1	C	35	TRP	CD2-CE3	6.28	1.50	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	G	35	TRP	CD2-CE3	6.25	1.50	1.40
2	D	568	LEU	CB-CG	5.32	1.64	1.53
2	B	568	LEU	CB-CG	5.27	1.64	1.53
2	I	568	LEU	CB-CG	5.25	1.64	1.53

All (142) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	48	ILE	CB-CA-C	-8.51	104.48	111.71
3	H	48	ILE	CB-CA-C	-8.50	104.49	111.71
3	J	48	ILE	CB-CA-C	-8.50	104.49	111.71
1	C	492	GLU	CA-C-N	8.28	128.01	119.56
1	C	492	GLU	C-N-CA	8.28	128.01	119.56
1	A	492	GLU	CA-C-N	8.25	127.98	119.56
1	A	492	GLU	C-N-CA	8.25	127.98	119.56
1	G	492	GLU	CA-C-N	8.20	127.93	119.56
1	G	492	GLU	C-N-CA	8.20	127.93	119.56
1	G	239	CYS	CA-C-N	7.25	127.88	119.47
1	G	239	CYS	C-N-CA	7.25	127.88	119.47
1	A	239	CYS	CA-C-N	7.24	127.86	119.47
1	A	239	CYS	C-N-CA	7.24	127.86	119.47
1	C	239	CYS	CA-C-N	7.21	127.84	119.47
1	C	239	CYS	C-N-CA	7.21	127.84	119.47
1	A	424	ILE	N-CA-C	6.75	117.59	107.80
1	A	205	CYS	CA-C-N	6.72	126.35	119.56
1	A	205	CYS	C-N-CA	6.72	126.35	119.56
1	C	424	ILE	N-CA-C	6.71	117.53	107.80
1	G	424	ILE	N-CA-C	6.71	117.52	107.80
1	C	205	CYS	CA-C-N	6.70	126.33	119.56
1	C	205	CYS	C-N-CA	6.70	126.33	119.56
1	G	205	CYS	CA-C-N	6.68	126.30	119.56
1	G	205	CYS	C-N-CA	6.68	126.30	119.56
1	G	136	ASN	N-CA-C	6.59	118.46	111.28
1	A	136	ASN	N-CA-C	6.56	118.43	111.28
1	C	136	ASN	N-CA-C	6.55	118.42	111.28
1	G	219	ALA	CA-C-N	6.54	126.51	120.03
1	G	219	ALA	C-N-CA	6.54	126.51	120.03
1	A	219	ALA	CA-C-N	6.52	126.49	120.03
1	A	219	ALA	C-N-CA	6.52	126.49	120.03
1	C	219	ALA	CA-C-N	6.52	126.48	120.03
1	C	219	ALA	C-N-CA	6.52	126.48	120.03
4	F	58	VAL	CA-C-N	6.20	126.17	119.78

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	F	58	VAL	C-N-CA	6.20	126.17	119.78
4	K	58	VAL	CA-C-N	6.17	126.14	119.78
4	K	58	VAL	C-N-CA	6.17	126.14	119.78
4	L	58	VAL	CA-C-N	6.17	126.13	119.78
4	L	58	VAL	C-N-CA	6.17	126.13	119.78
1	G	237	GLY	CA-C-N	6.17	126.11	119.76
1	G	237	GLY	C-N-CA	6.17	126.11	119.76
1	G	339	ASN	CA-CB-CG	6.16	118.76	112.60
1	A	339	ASN	CA-CB-CG	6.16	118.75	112.60
1	C	437	PRO	CA-C-N	6.15	126.12	119.78
1	C	437	PRO	C-N-CA	6.15	126.12	119.78
1	A	437	PRO	CA-C-N	6.14	126.11	119.78
1	A	437	PRO	C-N-CA	6.14	126.11	119.78
1	C	339	ASN	CA-CB-CG	6.14	118.74	112.60
1	A	237	GLY	CA-C-N	6.14	126.08	119.76
1	A	237	GLY	C-N-CA	6.14	126.08	119.76
4	F	43	PRO	N-CA-C	-6.14	104.01	110.58
4	L	43	PRO	N-CA-C	-6.13	104.02	110.58
4	K	43	PRO	N-CA-C	-6.13	104.02	110.58
1	C	237	GLY	CA-C-N	6.12	126.07	119.76
1	C	237	GLY	C-N-CA	6.12	126.07	119.76
1	G	437	PRO	CA-C-N	6.11	126.08	119.78
1	G	437	PRO	C-N-CA	6.11	126.08	119.78
3	H	30	SER	N-CA-C	-6.09	102.92	110.41
3	J	30	SER	N-CA-C	-6.09	102.92	110.41
3	E	30	SER	N-CA-C	-6.09	102.92	110.41
4	K	96	ASN	N-CA-C	6.08	118.61	108.20
4	F	96	ASN	N-CA-C	6.06	118.57	108.20
4	L	96	ASN	N-CA-C	6.06	118.56	108.20
1	C	426	MET	N-CA-C	6.01	117.84	111.28
1	A	426	MET	N-CA-C	6.01	117.83	111.28
1	G	426	MET	N-CA-C	5.99	117.81	111.28
4	L	99	GLY	N-CA-C	-5.88	102.12	111.18
4	K	99	GLY	N-CA-C	-5.86	102.16	111.18
4	F	99	GLY	N-CA-C	-5.85	102.17	111.18
1	G	365	SER	N-CA-C	5.79	119.60	112.54
1	C	365	SER	N-CA-C	5.78	119.59	112.54
1	A	365	SER	N-CA-C	5.76	119.57	112.54
4	L	42	GLN	CA-C-N	5.76	123.81	119.66
4	L	42	GLN	C-N-CA	5.76	123.81	119.66
3	E	31	SER	N-CA-C	5.72	117.52	111.28
4	F	42	GLN	CA-C-N	5.71	123.77	119.66

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	F	42	GLN	C-N-CA	5.71	123.77	119.66
3	J	91	PHE	CA-CB-CG	5.70	119.50	113.80
4	K	42	GLN	CA-C-N	5.70	123.76	119.66
4	K	42	GLN	C-N-CA	5.70	123.76	119.66
3	H	31	SER	N-CA-C	5.69	117.49	111.28
3	E	91	PHE	CA-CB-CG	5.69	119.49	113.80
3	J	31	SER	N-CA-C	5.69	117.48	111.28
1	A	123	THR	CA-C-N	5.68	125.36	119.56
1	A	123	THR	C-N-CA	5.68	125.36	119.56
3	H	91	PHE	CA-CB-CG	5.67	119.47	113.80
1	G	123	THR	CA-C-N	5.67	125.34	119.56
1	G	123	THR	C-N-CA	5.67	125.34	119.56
1	C	123	THR	CA-C-N	5.65	125.33	119.56
1	C	123	THR	C-N-CA	5.65	125.33	119.56
1	A	477	ASP	N-CA-C	-5.57	101.06	108.74
1	C	363	ASN	CA-CB-CG	5.56	118.16	112.60
1	A	363	ASN	CA-CB-CG	5.56	118.16	112.60
1	G	363	ASN	CA-CB-CG	5.55	118.16	112.60
1	C	477	ASP	N-CA-C	-5.55	101.08	108.74
1	G	477	ASP	N-CA-C	-5.55	101.08	108.74
3	J	105	PRO	N-CA-C	-5.55	102.39	111.21
3	H	105	PRO	N-CA-C	-5.54	102.41	111.21
3	E	105	PRO	N-CA-C	-5.52	102.44	111.21
4	L	7	THR	N-CA-C	5.46	121.88	109.81
4	K	7	THR	N-CA-C	5.44	121.83	109.81
4	F	7	THR	N-CA-C	5.43	121.81	109.81
3	E	99	ASP	CA-CB-CG	5.38	117.98	112.60
3	H	99	ASP	CA-CB-CG	5.38	117.98	112.60
3	J	99	ASP	CA-CB-CG	5.37	117.97	112.60
1	A	240	PRO	N-CA-C	5.37	121.59	113.81
1	C	75	VAL	CA-C-N	5.37	125.31	119.78
1	C	75	VAL	C-N-CA	5.37	125.31	119.78
1	C	240	PRO	N-CA-C	5.37	121.59	113.81
1	G	240	PRO	N-CA-C	5.36	121.59	113.81
1	A	75	VAL	CA-C-N	5.33	125.28	119.78
1	A	75	VAL	C-N-CA	5.33	125.28	119.78
1	G	75	VAL	CA-C-N	5.32	125.26	119.78
1	G	75	VAL	C-N-CA	5.32	125.26	119.78
1	G	437	PRO	N-CA-C	-5.27	104.94	110.58
1	C	437	PRO	N-CA-C	-5.27	104.94	110.58
1	A	437	PRO	N-CA-C	-5.26	104.95	110.58
1	A	497	ALA	CA-C-N	5.19	125.09	119.85

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	497	ALA	C-N-CA	5.19	125.09	119.85
1	C	199	SER	N-CA-C	5.18	115.38	108.38
1	A	199	SER	N-CA-C	5.17	115.36	108.38
1	G	199	SER	N-CA-C	5.17	115.36	108.38
1	C	497	ALA	CA-C-N	5.13	125.03	119.85
1	C	497	ALA	C-N-CA	5.13	125.03	119.85
1	G	497	ALA	CA-C-N	5.12	125.02	119.85
1	G	497	ALA	C-N-CA	5.12	125.02	119.85
4	F	98	PHE	CA-CB-CG	5.07	118.87	113.80
4	F	43	PRO	CA-C-N	5.06	124.97	119.76
4	F	43	PRO	C-N-CA	5.06	124.97	119.76
1	C	84	ILE	N-CA-C	5.04	114.84	107.37
4	K	98	PHE	CA-CB-CG	5.04	118.84	113.80
4	L	98	PHE	CA-CB-CG	5.04	118.84	113.80
2	B	608	VAL	CA-C-N	5.04	124.94	119.85
2	B	608	VAL	C-N-CA	5.04	124.94	119.85
1	G	84	ILE	N-CA-C	5.03	114.82	107.37
1	A	84	ILE	N-CA-C	5.03	114.81	107.37
4	K	43	PRO	CA-C-N	5.01	124.92	119.76
4	K	43	PRO	C-N-CA	5.01	124.92	119.76
2	D	608	VAL	CA-C-N	5.01	124.91	119.85
2	D	608	VAL	C-N-CA	5.01	124.91	119.85
3	E	76	THR	N-CA-C	5.00	117.06	108.90
3	J	76	THR	N-CA-C	5.00	117.05	108.90

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3410	0	3354	3	0
1	C	3410	0	3354	5	0
1	G	3410	0	3354	5	0
2	B	958	0	937	0	0
2	D	958	0	937	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	I	958	0	937	1	0
3	E	838	0	807	0	0
3	H	838	0	807	1	0
3	J	838	0	807	1	0
4	F	811	0	770	3	0
4	K	811	0	770	4	0
4	L	811	0	770	2	0
5	M	50	0	43	0	0
5	Q	50	0	43	0	0
5	U	50	0	43	0	0
6	N	28	0	25	0	0
6	O	28	0	25	1	0
6	P	28	0	25	0	0
6	R	28	0	25	0	0
6	S	28	0	25	1	0
6	T	28	0	25	0	0
6	V	28	0	25	0	0
6	W	28	0	25	1	0
6	X	28	0	25	0	0
7	A	154	0	143	1	0
7	C	154	0	143	1	0
7	G	154	0	143	0	0
All	All	18915	0	18387	24	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 1.

All (24) 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:470:PRO:O	1:A:471:GLY:C	2.55	0.49
1:C:470:PRO:O	1:C:471:GLY:C	2.55	0.48
3:J:32:ASP:OD1	3:J:32:ASP:N	2.48	0.46
3:H:32:ASP:OD1	3:H:32:ASP:N	2.48	0.46
1:G:470:PRO:O	1:G:471:GLY:C	2.55	0.45
1:C:167:ASP:N	1:C:167:ASP:OD1	2.47	0.45
1:G:46:LYS:NZ	2:I:632:ASP:OD2	2.47	0.44
4:L:96:ASN:C	4:L:96:ASN:OD1	2.61	0.43
4:K:96:ASN:OD1	4:K:96:ASN:C	2.61	0.43
1:C:46:LYS:NZ	2:D:632:ASP:OD2	2.47	0.43
4:F:96:ASN:OD1	4:F:96:ASN:C	2.61	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:K:30:ARG:O	4:K:30:ARG:CG	2.68	0.42
1:G:87:GLU:HB2	6:W:1:NAG:H82	2.01	0.42
4:K:58:VAL:HA	4:K:59:PRO:HD3	1.93	0.42
1:A:87:GLU:HB2	6:O:1:NAG:H82	2.01	0.42
1:C:87:GLU:HB2	6:S:1:NAG:H82	2.01	0.42
4:F:30:ARG:O	4:F:30:ARG:CG	2.68	0.41
4:L:30:ARG:O	4:L:30:ARG:CG	2.68	0.41
1:G:167:ASP:N	1:G:167:ASP:OD1	2.47	0.41
1:A:340:GLU:OE1	7:A:617:NAG:H81	2.21	0.41
4:K:95(E):TYR:CE1	4:K:96:ASN:HB2	2.56	0.41
4:F:95(E):TYR:CE1	4:F:96:ASN:HB2	2.56	0.41
1:G:437:PRO:HA	1:G:438:PRO:HD3	1.91	0.40
1:C:340:GLU:OE1	7:C:617:NAG:H81	2.21	0.40

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	A	422/516 (82%)	415 (98%)	7 (2%)	0	100	100
1	C	422/516 (82%)	415 (98%)	7 (2%)	0	100	100
1	G	422/516 (82%)	415 (98%)	7 (2%)	0	100	100
2	B	116/153 (76%)	114 (98%)	2 (2%)	0	100	100
2	D	116/153 (76%)	114 (98%)	2 (2%)	0	100	100
2	I	116/153 (76%)	114 (98%)	2 (2%)	0	100	100
3	E	111/236 (47%)	110 (99%)	1 (1%)	0	100	100
3	H	111/236 (47%)	110 (99%)	1 (1%)	0	100	100
3	J	111/236 (47%)	110 (99%)	1 (1%)	0	100	100
4	F	107/242 (44%)	101 (94%)	6 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	K	107/242 (44%)	101 (94%)	6 (6%)	0	100	100
4	L	107/242 (44%)	102 (95%)	5 (5%)	0	100	100
All	All	2268/3441 (66%)	2221 (98%)	47 (2%)	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	A	388/456 (85%)	388 (100%)	0	100	100
1	C	388/456 (85%)	388 (100%)	0	100	100
1	G	388/456 (85%)	388 (100%)	0	100	100
2	B	104/129 (81%)	104 (100%)	0	100	100
2	D	104/129 (81%)	104 (100%)	0	100	100
2	I	104/129 (81%)	104 (100%)	0	100	100
3	E	88/197 (45%)	88 (100%)	0	100	100
3	H	88/197 (45%)	88 (100%)	0	100	100
3	J	88/197 (45%)	88 (100%)	0	100	100
4	F	85/203 (42%)	85 (100%)	0	100	100
4	K	85/203 (42%)	85 (100%)	0	100	100
4	L	85/203 (42%)	85 (100%)	0	100	100
All	All	1995/2955 (68%)	1995 (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. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	66	HIS

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Mol	Chain	Res	Type
1	A	105	HIS
1	A	185	ASN
1	A	374	HIS
2	B	616	ASN
4	L	37	GLN
4	L	91	ASN
1	C	66	HIS
1	C	105	HIS
1	C	185	ASN
1	C	374	HIS
2	D	616	ASN
4	F	37	GLN
4	F	91	ASN
1	G	66	HIS
1	G	105	HIS
1	G	374	HIS
2	I	616	ASN
4	K	24	GLN
4	K	37	GLN
4	K	70	GLN
4	K	91	ASN

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](#)

30 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	M	1	5,1	14,14,15	2.04	4 (28%)	17,19,21	1.21	2 (11%)
5	NAG	M	2	5	14,14,15	1.92	6 (42%)	17,19,21	1.03	1 (5%)
5	BMA	M	3	5	11,11,12	0.71	0	15,15,17	0.79	1 (6%)
5	MAN	M	4	5	11,11,12	1.92	5 (45%)	15,15,17	0.67	0
6	NAG	N	1	6,1	14,14,15	2.01	5 (35%)	17,19,21	1.10	1 (5%)
6	NAG	N	2	6	14,14,15	1.96	5 (35%)	17,19,21	0.90	1 (5%)
6	NAG	O	1	6,1	14,14,15	2.15	5 (35%)	17,19,21	1.20	2 (11%)
6	NAG	O	2	6	14,14,15	2.03	6 (42%)	17,19,21	0.93	1 (5%)
6	NAG	P	1	6,1	14,14,15	2.05	6 (42%)	17,19,21	1.07	1 (5%)
6	NAG	P	2	6	14,14,15	2.00	4 (28%)	17,19,21	0.82	0
5	NAG	Q	1	5,1	14,14,15	2.04	4 (28%)	17,19,21	1.21	2 (11%)
5	NAG	Q	2	5	14,14,15	1.93	6 (42%)	17,19,21	1.03	1 (5%)
5	BMA	Q	3	5	11,11,12	0.72	0	15,15,17	0.79	1 (6%)
5	MAN	Q	4	5	11,11,12	1.91	5 (45%)	15,15,17	0.66	0
6	NAG	R	1	6,1	14,14,15	2.01	5 (35%)	17,19,21	1.11	1 (5%)
6	NAG	R	2	6	14,14,15	1.97	4 (28%)	17,19,21	0.90	1 (5%)
6	NAG	S	1	6,1	14,14,15	2.14	6 (42%)	17,19,21	1.21	2 (11%)
6	NAG	S	2	6	14,14,15	2.02	6 (42%)	17,19,21	0.93	1 (5%)
6	NAG	T	1	6,1	14,14,15	2.04	6 (42%)	17,19,21	1.07	1 (5%)
6	NAG	T	2	6	14,14,15	2.01	4 (28%)	17,19,21	0.82	0
5	NAG	U	1	5,1	14,14,15	2.04	4 (28%)	17,19,21	1.20	2 (11%)
5	NAG	U	2	5	14,14,15	1.93	6 (42%)	17,19,21	1.03	1 (5%)
5	BMA	U	3	5	11,11,12	0.72	0	15,15,17	0.79	1 (6%)
5	MAN	U	4	5	11,11,12	1.91	5 (45%)	15,15,17	0.66	0
6	NAG	V	1	6,1	14,14,15	2.00	5 (35%)	17,19,21	1.10	1 (5%)
6	NAG	V	2	6	14,14,15	1.97	5 (35%)	17,19,21	0.91	1 (5%)
6	NAG	W	1	6,1	14,14,15	2.14	6 (42%)	17,19,21	1.21	2 (11%)
6	NAG	W	2	6	14,14,15	2.03	6 (42%)	17,19,21	0.94	1 (5%)
6	NAG	X	1	6,1	14,14,15	2.05	6 (42%)	17,19,21	1.07	1 (5%)
6	NAG	X	2	6	14,14,15	2.01	5 (35%)	17,19,21	0.82	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	M	1	5,1	-	0/6/23/26	0/1/1/1
5	NAG	M	2	5	-	0/6/23/26	0/1/1/1
5	BMA	M	3	5	-	0/2/19/22	0/1/1/1
5	MAN	M	4	5	-	0/2/19/22	0/1/1/1
6	NAG	N	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	N	2	6	-	0/6/23/26	0/1/1/1
6	NAG	O	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	O	2	6	-	0/6/23/26	0/1/1/1
6	NAG	P	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	P	2	6	-	0/6/23/26	0/1/1/1
5	NAG	Q	1	5,1	-	0/6/23/26	0/1/1/1
5	NAG	Q	2	5	-	0/6/23/26	0/1/1/1
5	BMA	Q	3	5	-	0/2/19/22	0/1/1/1
5	MAN	Q	4	5	-	0/2/19/22	0/1/1/1
6	NAG	R	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	R	2	6	-	0/6/23/26	0/1/1/1
6	NAG	S	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	S	2	6	-	0/6/23/26	0/1/1/1
6	NAG	T	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	T	2	6	-	0/6/23/26	0/1/1/1
5	NAG	U	1	5,1	-	0/6/23/26	0/1/1/1
5	NAG	U	2	5	-	0/6/23/26	0/1/1/1
5	BMA	U	3	5	-	0/2/19/22	0/1/1/1
5	MAN	U	4	5	-	0/2/19/22	0/1/1/1
6	NAG	V	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	V	2	6	-	0/6/23/26	0/1/1/1
6	NAG	W	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	W	2	6	-	0/6/23/26	0/1/1/1
6	NAG	X	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	X	2	6	-	0/6/23/26	0/1/1/1

All (140) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	Q	1	NAG	C1-C2	5.31	1.59	1.52
5	U	1	NAG	C1-C2	5.30	1.59	1.52
5	M	1	NAG	C1-C2	5.29	1.59	1.52
6	O	1	NAG	C1-C2	5.20	1.59	1.52
6	S	1	NAG	C1-C2	5.17	1.59	1.52
6	W	1	NAG	C1-C2	5.15	1.59	1.52
6	P	1	NAG	C1-C2	4.98	1.59	1.52
6	X	1	NAG	C1-C2	4.95	1.59	1.52
6	N	1	NAG	C1-C2	4.95	1.59	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	R	1	NAG	C1-C2	4.94	1.59	1.52
6	T	1	NAG	C1-C2	4.91	1.59	1.52
6	V	1	NAG	C1-C2	4.89	1.59	1.52
6	O	2	NAG	C1-C2	4.71	1.58	1.52
6	W	2	NAG	C1-C2	4.69	1.58	1.52
6	T	2	NAG	C1-C2	4.68	1.58	1.52
6	R	2	NAG	C1-C2	4.67	1.58	1.52
6	X	2	NAG	C1-C2	4.67	1.58	1.52
6	S	2	NAG	C1-C2	4.66	1.58	1.52
6	V	2	NAG	C1-C2	4.64	1.58	1.52
6	P	2	NAG	C1-C2	4.62	1.58	1.52
6	N	2	NAG	C1-C2	4.62	1.58	1.52
5	M	2	NAG	C1-C2	4.25	1.58	1.52
5	U	2	NAG	C1-C2	4.23	1.58	1.52
5	Q	2	NAG	C1-C2	4.21	1.58	1.52
6	O	1	NAG	O5-C5	3.29	1.49	1.43
6	S	1	NAG	O5-C5	3.26	1.49	1.43
6	W	1	NAG	O5-C5	3.25	1.49	1.43
6	X	2	NAG	O5-C5	3.25	1.49	1.43
6	P	2	NAG	O5-C5	3.24	1.49	1.43
6	T	2	NAG	O5-C5	3.23	1.49	1.43
5	U	4	MAN	O5-C5	3.21	1.49	1.43
6	W	2	NAG	O5-C5	3.20	1.49	1.43
5	M	4	MAN	O5-C5	3.20	1.49	1.43
5	Q	4	MAN	O5-C5	3.19	1.49	1.43
6	S	2	NAG	O5-C5	3.15	1.49	1.43
6	O	2	NAG	O5-C5	3.14	1.49	1.43
5	Q	4	MAN	C2-C3	3.12	1.57	1.52
5	U	4	MAN	C2-C3	3.12	1.57	1.52
5	M	4	MAN	C2-C3	3.10	1.57	1.52
6	V	2	NAG	O5-C5	3.06	1.49	1.43
6	N	2	NAG	O5-C5	3.06	1.49	1.43
6	R	2	NAG	O5-C5	3.04	1.49	1.43
5	Q	2	NAG	O5-C5	3.02	1.49	1.43
5	U	2	NAG	O5-C5	3.01	1.49	1.43
6	N	1	NAG	O5-C5	3.00	1.49	1.43
6	R	1	NAG	O5-C5	2.99	1.49	1.43
5	M	2	NAG	O5-C5	2.96	1.49	1.43
6	V	1	NAG	O5-C5	2.93	1.49	1.43
6	X	1	NAG	O5-C5	2.92	1.49	1.43
6	T	1	NAG	O5-C5	2.92	1.49	1.43
6	P	1	NAG	O5-C5	2.91	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	M	1	NAG	O5-C5	2.67	1.48	1.43
5	Q	1	NAG	O5-C5	2.65	1.48	1.43
5	U	1	NAG	O5-C5	2.64	1.48	1.43
6	W	1	NAG	O5-C1	2.61	1.48	1.43
6	S	1	NAG	O5-C1	2.59	1.48	1.43
6	O	2	NAG	C3-C2	2.59	1.57	1.52
6	W	2	NAG	C3-C2	2.58	1.57	1.52
6	O	1	NAG	O5-C1	2.58	1.48	1.43
6	S	2	NAG	C3-C2	2.58	1.57	1.52
5	M	4	MAN	C1-C2	2.54	1.58	1.52
5	U	4	MAN	C1-C2	2.52	1.58	1.52
5	Q	4	MAN	C1-C2	2.52	1.58	1.52
6	N	2	NAG	C3-C2	2.50	1.57	1.52
6	R	2	NAG	C3-C2	2.49	1.57	1.52
6	V	2	NAG	C3-C2	2.49	1.57	1.52
6	W	1	NAG	C4-C5	2.44	1.58	1.53
6	T	2	NAG	C3-C2	2.43	1.57	1.52
6	P	2	NAG	C3-C2	2.42	1.57	1.52
6	O	1	NAG	C4-C5	2.41	1.58	1.53
6	S	1	NAG	C4-C5	2.41	1.58	1.53
6	X	2	NAG	C3-C2	2.41	1.57	1.52
6	V	1	NAG	O5-C1	2.35	1.47	1.43
6	N	1	NAG	O5-C1	2.33	1.47	1.43
5	U	1	NAG	C3-C2	2.31	1.57	1.52
6	O	2	NAG	C4-C5	2.30	1.57	1.53
5	M	4	MAN	C4-C5	2.30	1.57	1.53
6	T	1	NAG	C4-C5	2.30	1.57	1.53
6	R	1	NAG	O5-C1	2.30	1.47	1.43
6	S	2	NAG	C4-C5	2.29	1.57	1.53
5	Q	4	MAN	C4-C5	2.28	1.57	1.53
6	X	1	NAG	C4-C5	2.28	1.57	1.53
5	Q	1	NAG	C3-C2	2.28	1.57	1.52
6	R	1	NAG	C4-C5	2.27	1.57	1.53
6	W	2	NAG	C4-C5	2.27	1.57	1.53
6	V	1	NAG	C4-C5	2.27	1.57	1.53
5	M	1	NAG	C3-C2	2.25	1.57	1.52
5	U	4	MAN	C4-C5	2.24	1.57	1.53
6	P	2	NAG	C4-C5	2.24	1.57	1.53
6	P	1	NAG	C4-C5	2.23	1.57	1.53
5	Q	2	NAG	C2-N2	2.23	1.50	1.46
6	X	2	NAG	C4-C5	2.23	1.57	1.53
6	T	2	NAG	C4-C5	2.23	1.57	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	N	1	NAG	C4-C5	2.22	1.57	1.53
5	Q	2	NAG	C3-C2	2.22	1.57	1.52
6	P	1	NAG	O5-C1	2.22	1.47	1.43
5	Q	2	NAG	C4-C5	2.22	1.57	1.53
5	U	2	NAG	C3-C2	2.22	1.57	1.52
6	T	1	NAG	O5-C1	2.21	1.47	1.43
5	U	2	NAG	C2-N2	2.21	1.49	1.46
6	X	1	NAG	C3-C2	2.21	1.57	1.52
6	X	1	NAG	O5-C1	2.20	1.47	1.43
5	M	2	NAG	C2-N2	2.19	1.49	1.46
6	P	1	NAG	C3-C2	2.19	1.57	1.52
5	M	2	NAG	C4-C3	2.18	1.58	1.52
5	M	2	NAG	C4-C5	2.18	1.57	1.53
5	U	2	NAG	C4-C5	2.17	1.57	1.53
5	Q	2	NAG	C4-C3	2.17	1.58	1.52
6	T	1	NAG	C3-C2	2.17	1.57	1.52
5	U	1	NAG	O5-C1	2.16	1.47	1.43
6	R	2	NAG	C4-C5	2.16	1.57	1.53
6	N	2	NAG	C4-C5	2.16	1.57	1.53
5	U	2	NAG	C4-C3	2.16	1.57	1.52
5	M	2	NAG	C3-C2	2.15	1.57	1.52
6	V	2	NAG	C4-C5	2.15	1.57	1.53
6	W	1	NAG	C3-C2	2.14	1.57	1.52
5	Q	1	NAG	O5-C1	2.14	1.47	1.43
5	M	1	NAG	O5-C1	2.13	1.47	1.43
6	S	2	NAG	C2-N2	2.13	1.49	1.46
6	O	1	NAG	C3-C2	2.12	1.57	1.52
6	O	2	NAG	C2-N2	2.12	1.49	1.46
6	W	2	NAG	C2-N2	2.11	1.49	1.46
6	S	1	NAG	C3-C2	2.09	1.56	1.52
6	S	1	NAG	C4-C3	2.06	1.57	1.52
6	S	2	NAG	C4-C3	2.04	1.57	1.52
6	N	1	NAG	C4-C3	2.03	1.57	1.52
6	V	1	NAG	C4-C3	2.03	1.57	1.52
6	W	1	NAG	C4-C3	2.03	1.57	1.52
6	R	1	NAG	C4-C3	2.03	1.57	1.52
6	T	1	NAG	C4-C3	2.03	1.57	1.52
6	X	1	NAG	C4-C3	2.02	1.57	1.52
6	W	2	NAG	C4-C3	2.02	1.57	1.52
6	X	2	NAG	C2-N2	2.02	1.49	1.46
6	P	1	NAG	C4-C3	2.02	1.57	1.52
6	N	2	NAG	C2-N2	2.02	1.49	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	V	2	NAG	C4-C3	2.01	1.57	1.52
5	U	4	MAN	C4-C3	2.01	1.57	1.52
5	M	4	MAN	C4-C3	2.01	1.57	1.52
6	O	2	NAG	C4-C3	2.01	1.57	1.52
5	Q	4	MAN	C4-C3	2.00	1.57	1.52

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	Q	1	NAG	C8-C7-N2	2.88	120.90	116.12
5	M	1	NAG	C8-C7-N2	2.87	120.88	116.12
5	U	1	NAG	C8-C7-N2	2.87	120.88	116.12
6	W	1	NAG	O7-C7-C8	-2.87	116.95	122.05
6	S	1	NAG	O7-C7-C8	-2.85	116.97	122.05
6	O	1	NAG	O7-C7-C8	-2.84	117.00	122.05
6	W	1	NAG	C8-C7-N2	2.70	120.60	116.12
6	S	1	NAG	C8-C7-N2	2.68	120.56	116.12
6	O	1	NAG	C8-C7-N2	2.68	120.56	116.12
5	Q	2	NAG	C8-C7-N2	2.67	120.55	116.12
5	M	2	NAG	C8-C7-N2	2.67	120.55	116.12
5	U	2	NAG	C8-C7-N2	2.67	120.54	116.12
6	X	1	NAG	C8-C7-N2	2.42	120.13	116.12
6	T	1	NAG	C8-C7-N2	2.39	120.08	116.12
6	P	1	NAG	C8-C7-N2	2.39	120.08	116.12
6	W	2	NAG	C8-C7-N2	2.29	119.91	116.12
6	O	2	NAG	C8-C7-N2	2.28	119.89	116.12
6	S	2	NAG	C8-C7-N2	2.26	119.87	116.12
6	R	2	NAG	C8-C7-N2	2.24	119.84	116.12
6	V	2	NAG	C8-C7-N2	2.24	119.83	116.12
6	N	2	NAG	C8-C7-N2	2.21	119.78	116.12
5	Q	1	NAG	O7-C7-C8	-2.16	118.21	122.05
5	U	1	NAG	O7-C7-C8	-2.15	118.22	122.05
5	M	3	BMA	C2-C3-C4	-2.14	107.10	110.86
5	U	3	BMA	C2-C3-C4	-2.13	107.11	110.86
5	M	1	NAG	O7-C7-C8	-2.13	118.26	122.05
5	Q	3	BMA	C2-C3-C4	-2.12	107.12	110.86
6	R	1	NAG	C8-C7-N2	2.03	119.48	116.12
6	V	1	NAG	C8-C7-N2	2.01	119.46	116.12
6	N	1	NAG	C8-C7-N2	2.01	119.45	116.12

There are no chirality outliers.

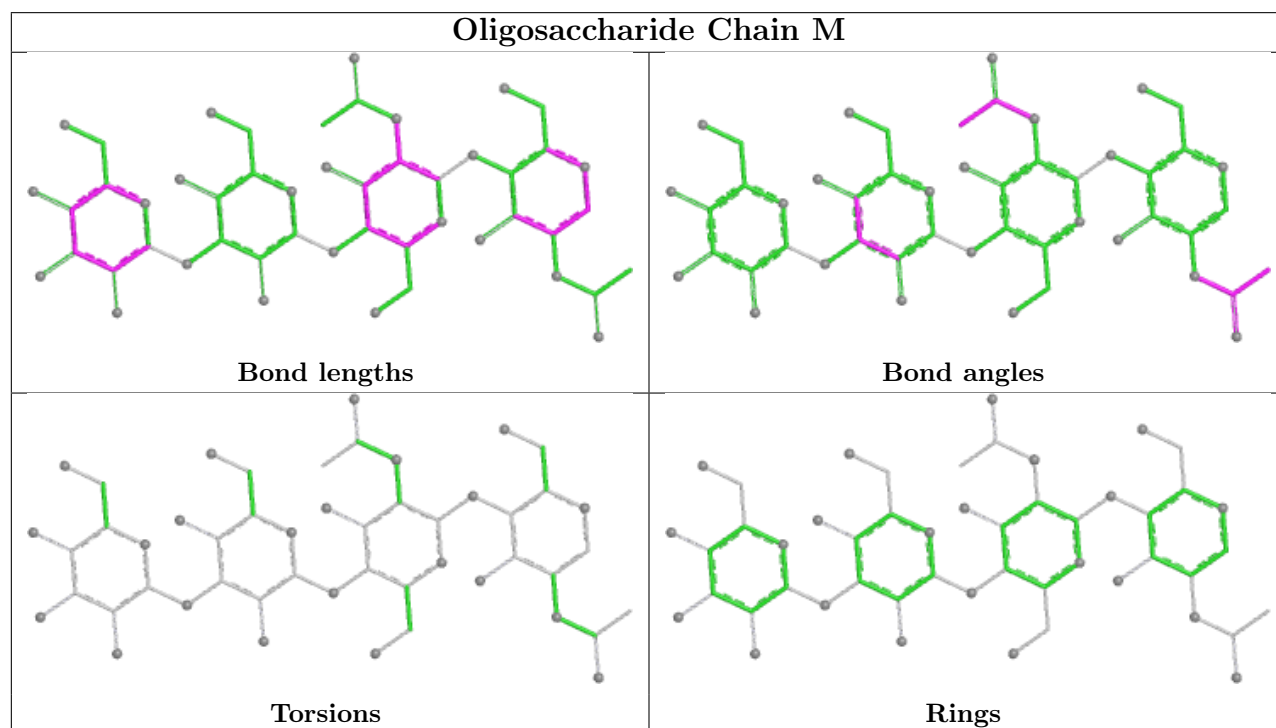
There are no torsion outliers.

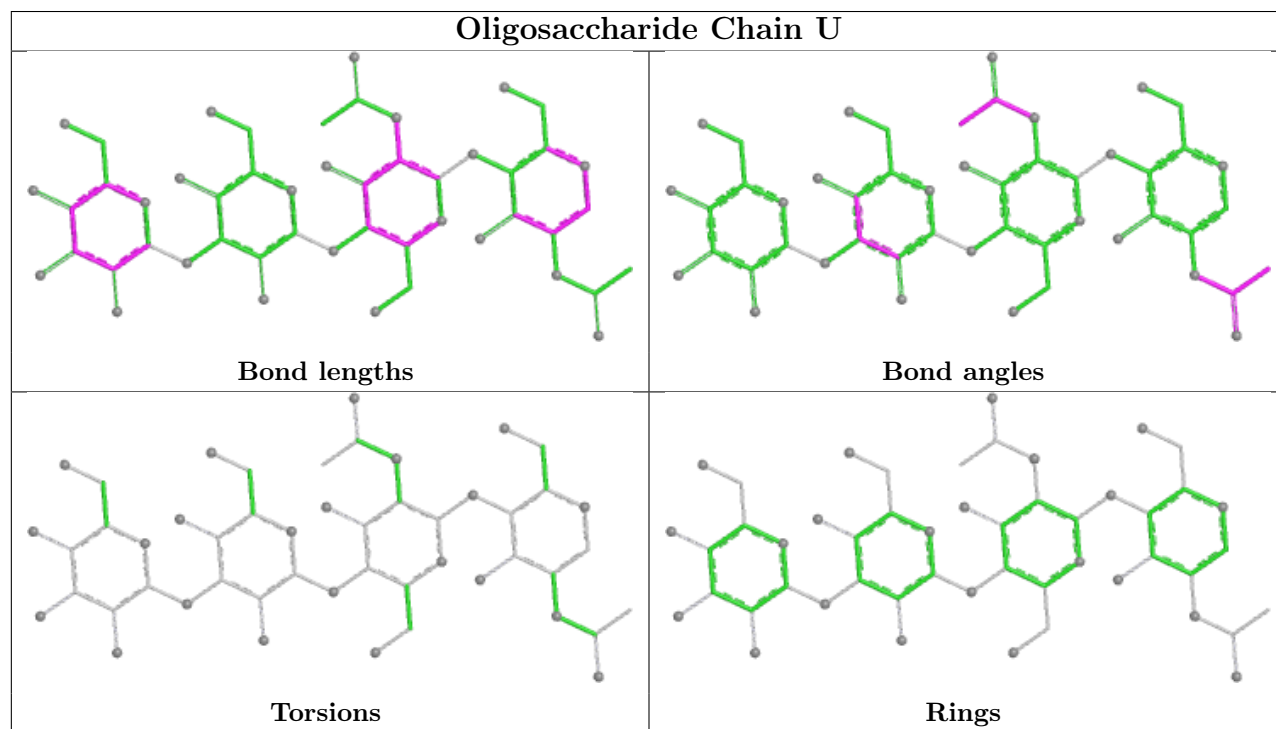
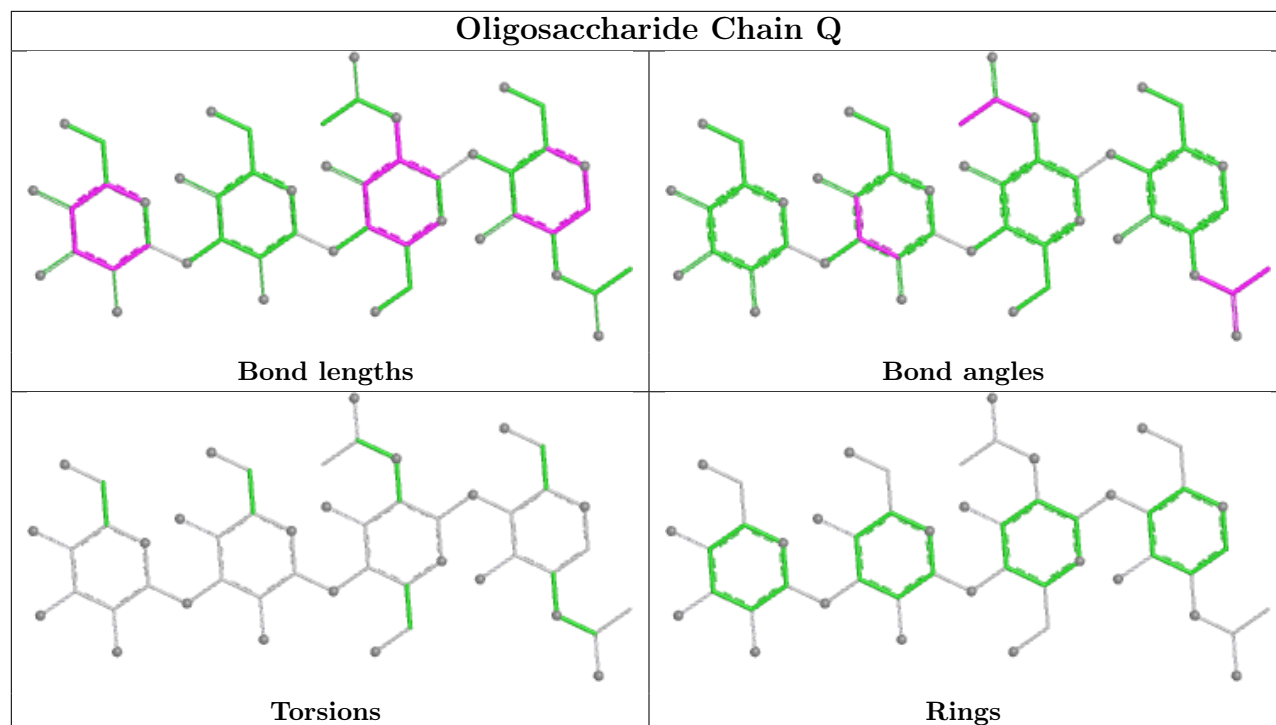
There are no ring outliers.

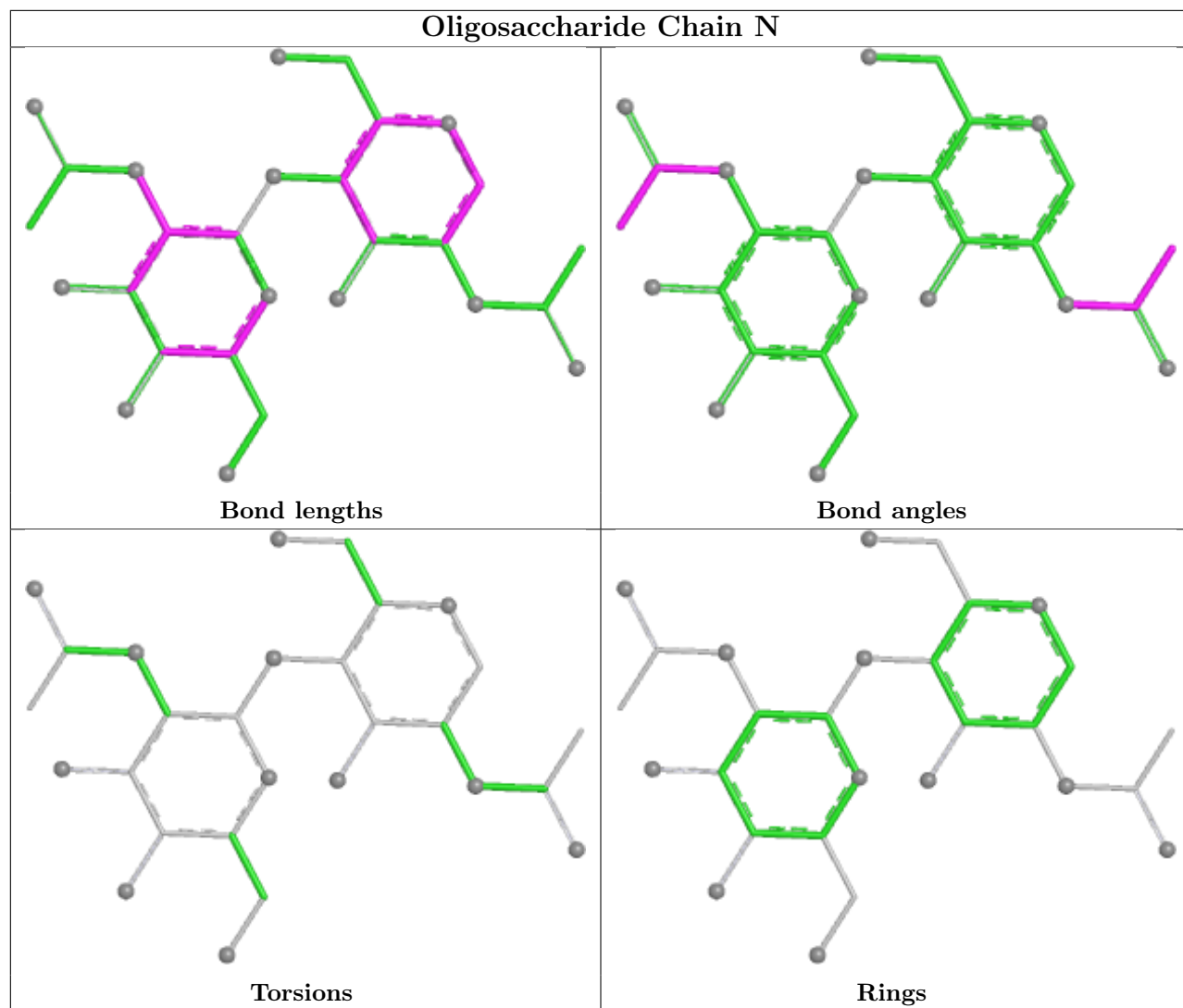
3 monomers are involved in 3 short contacts:

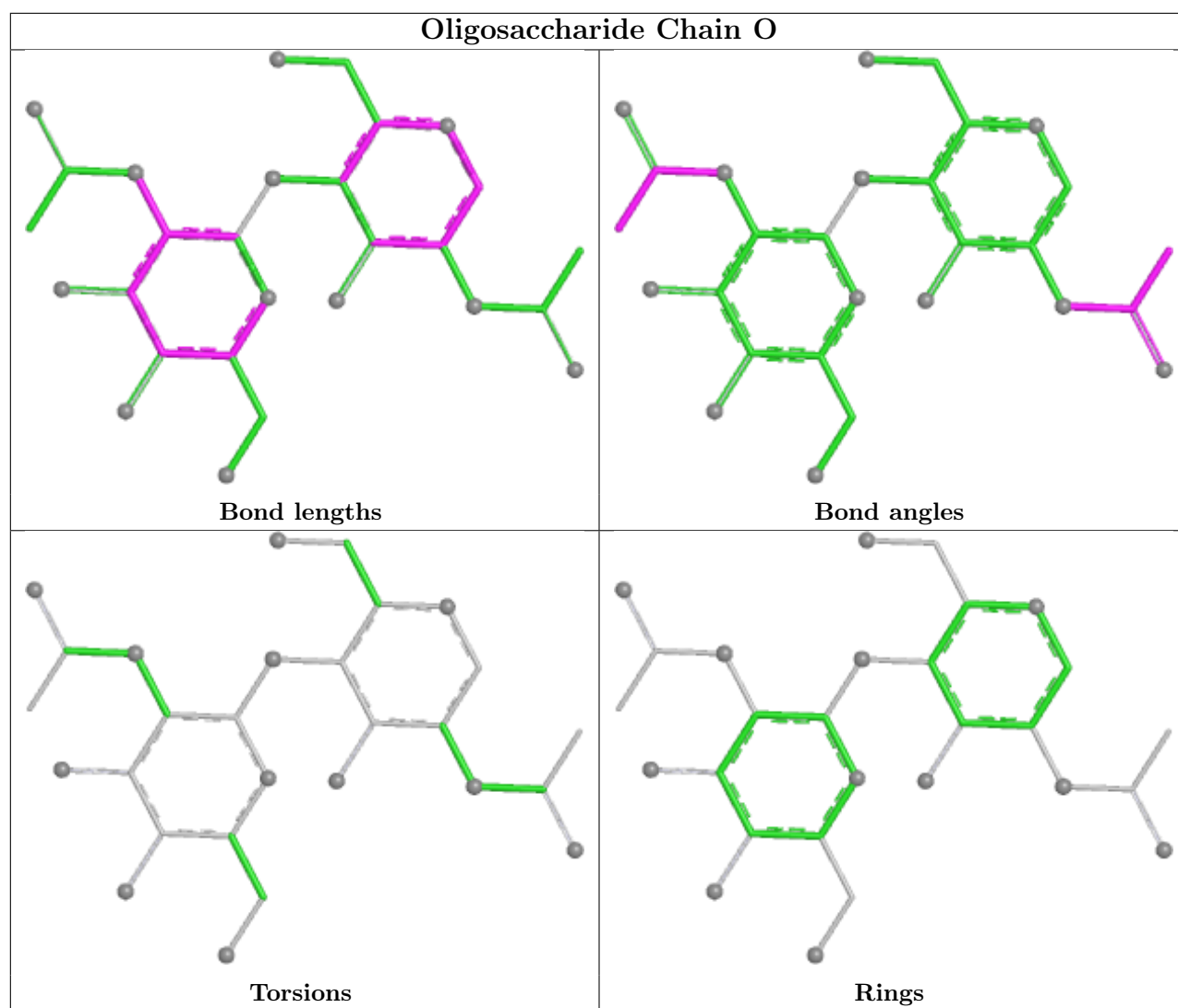
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	W	1	NAG	1	0
6	S	1	NAG	1	0
6	O	1	NAG	1	0

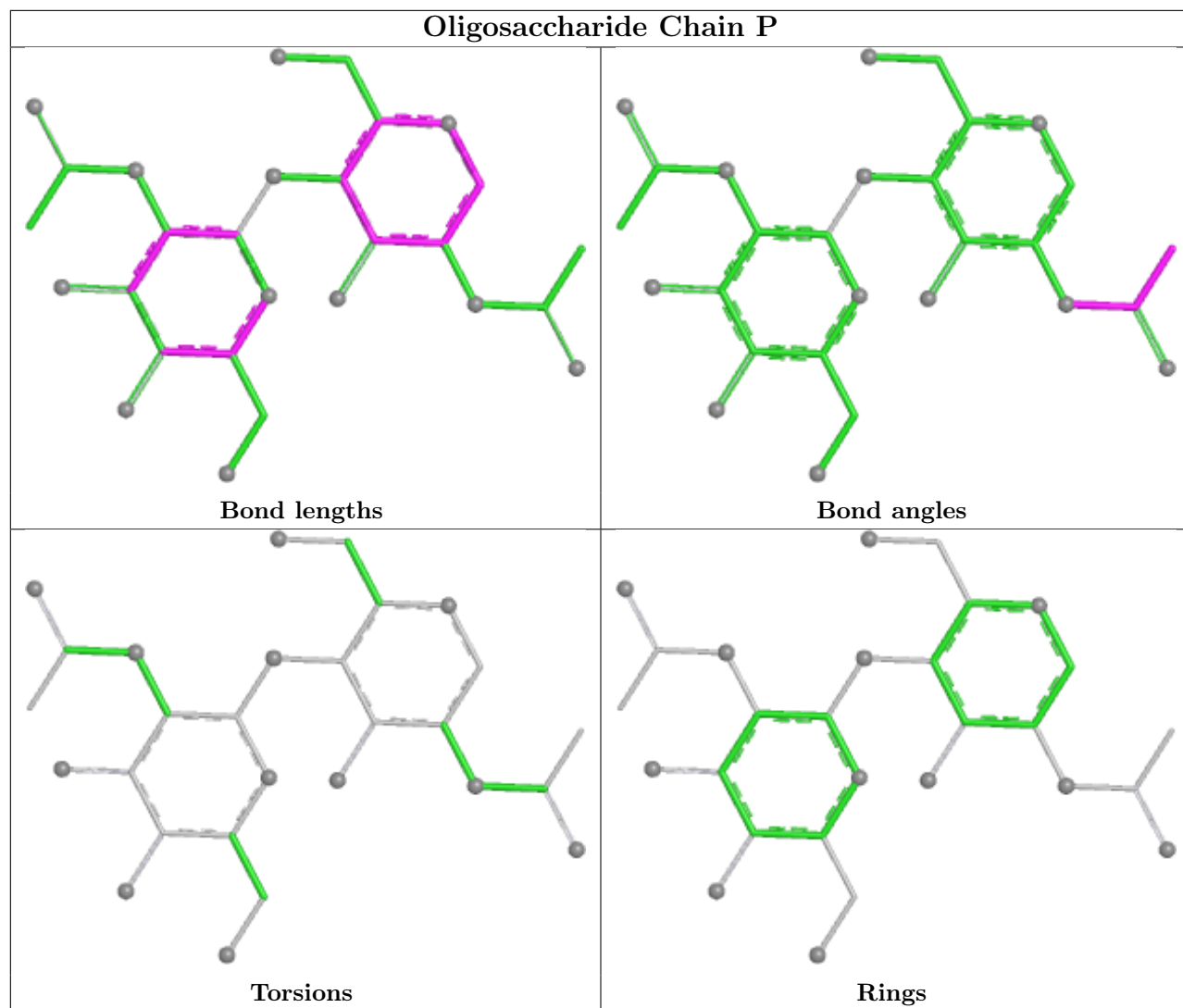
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

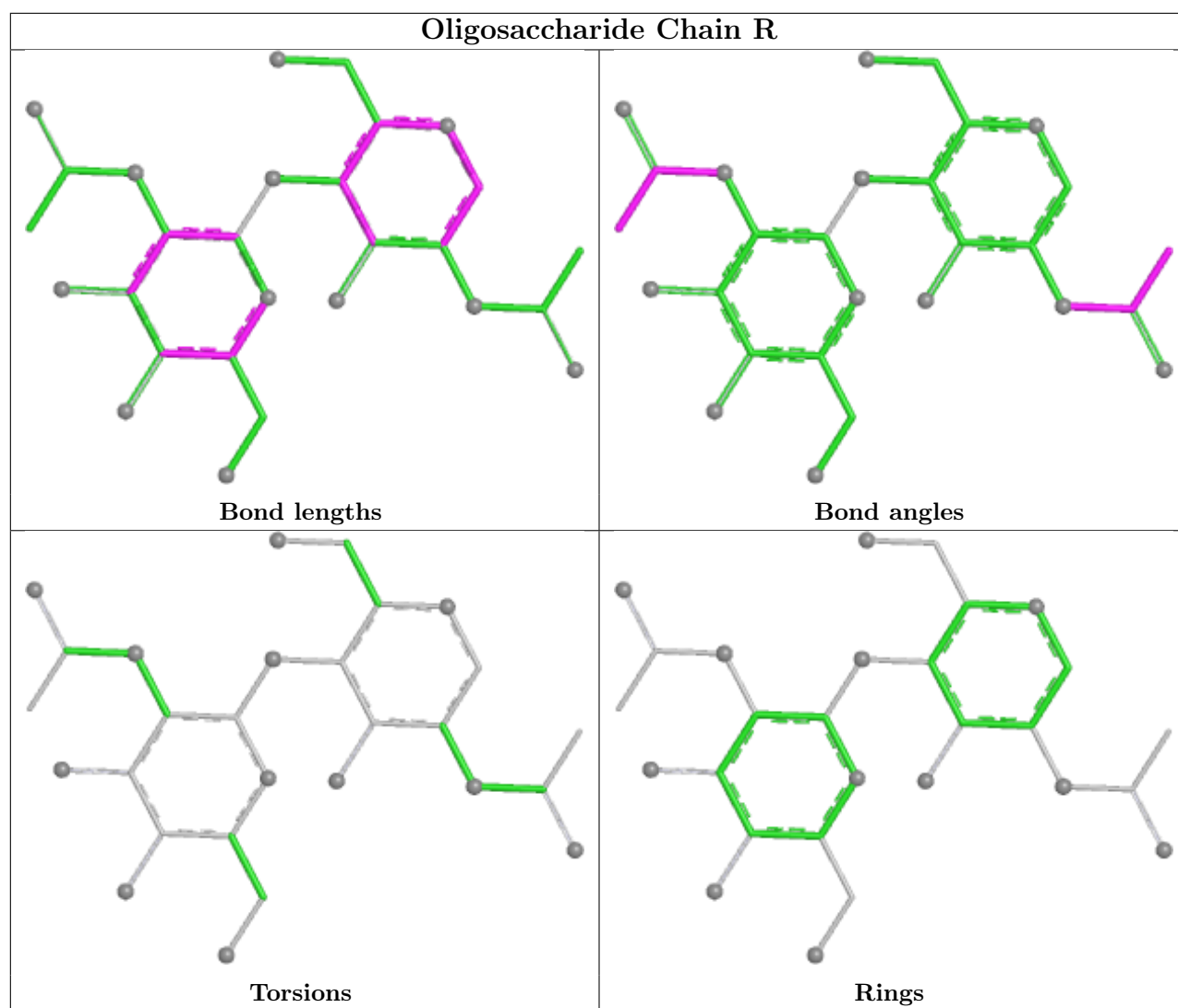


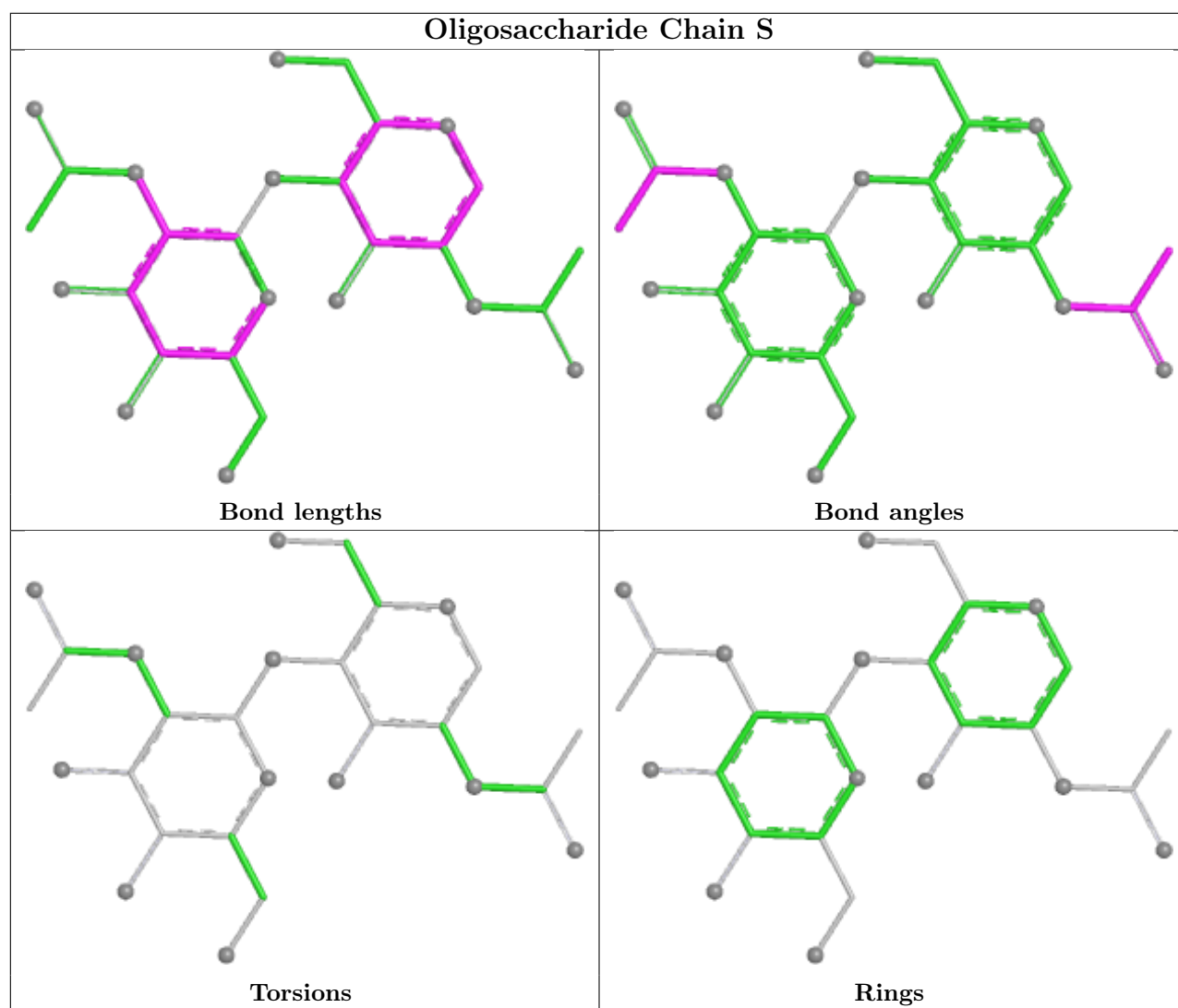


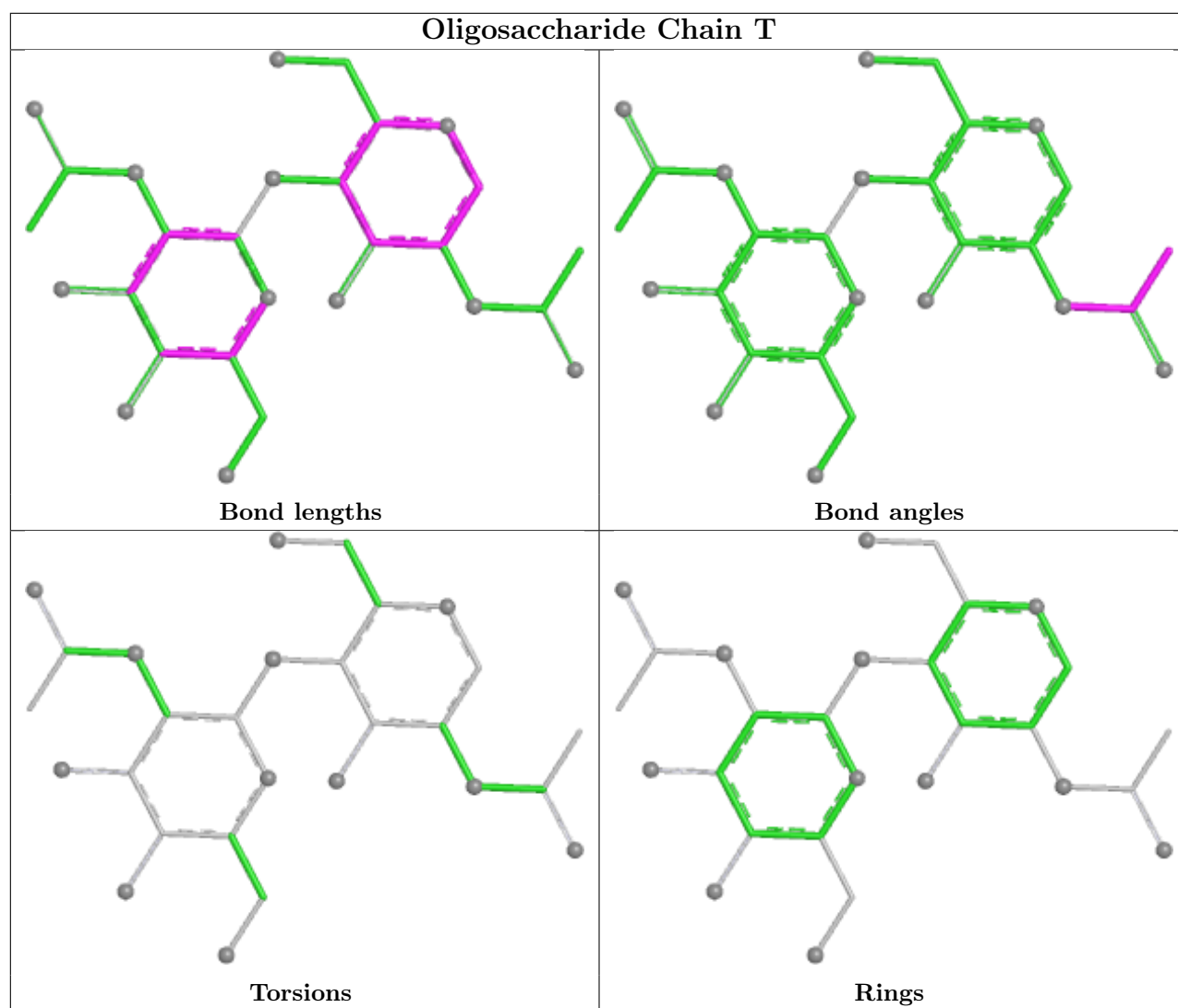


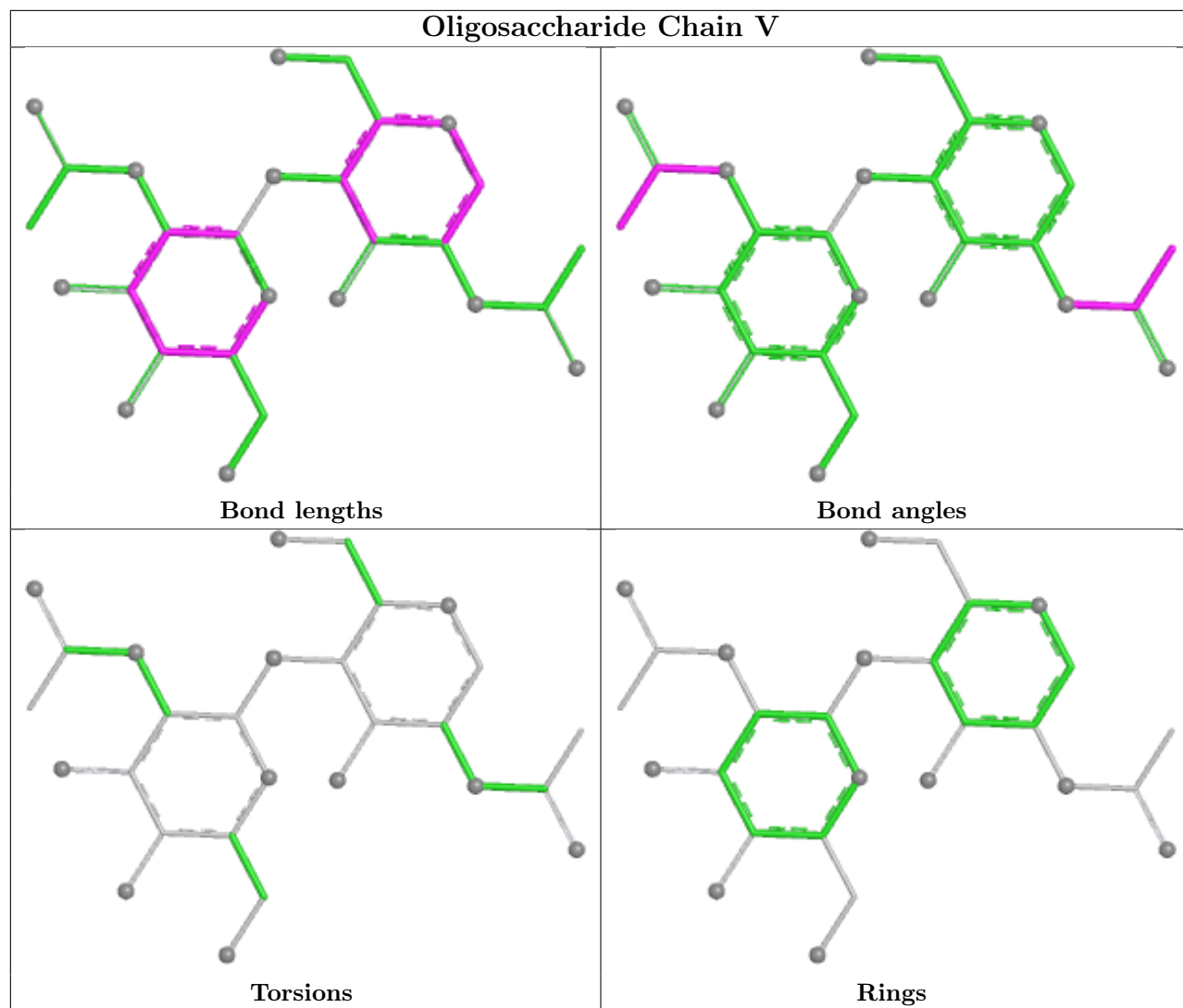


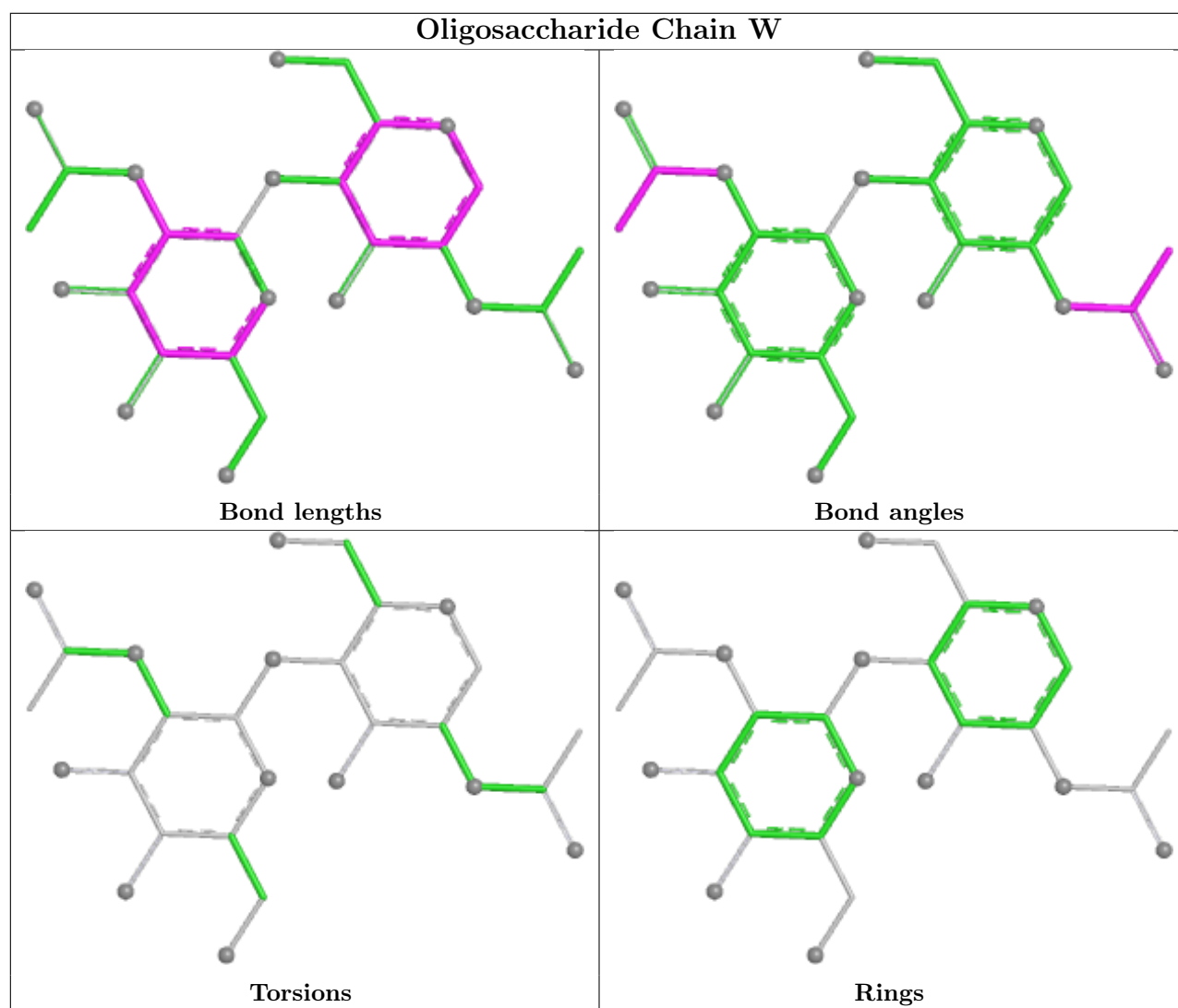


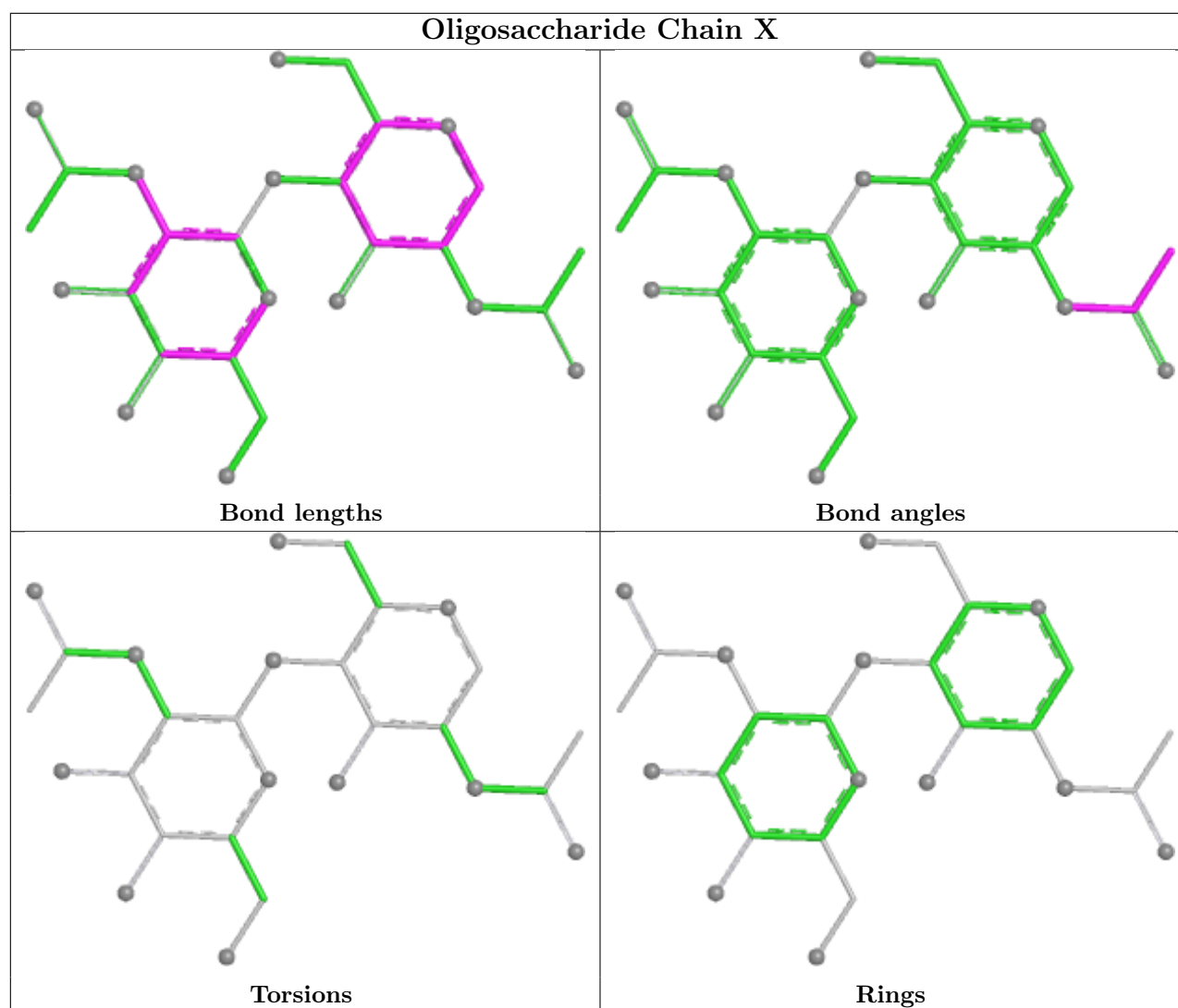












5.6 Ligand geometry [i](#)

33 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	$\# Z > 2$
7	NAG	C	614	1	14,14,15	2.14	5 (35%)	17,19,21	1.06	1 (5%)
7	NAG	C	617	1	14,14,15	2.26	5 (35%)	17,19,21	1.09	2 (11%)
7	NAG	G	603	1	14,14,15	2.17	5 (35%)	17,19,21	1.03	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	NAG	A	620	1	14,14,15	2.32	5 (35%)	17,19,21	1.18	2 (11%)
7	NAG	C	620	1	14,14,15	2.31	5 (35%)	17,19,21	1.18	2 (11%)
7	NAG	C	601	1	14,14,15	1.97	3 (21%)	17,19,21	1.07	2 (11%)
7	NAG	A	614	1	14,14,15	2.14	5 (35%)	17,19,21	1.06	1 (5%)
7	NAG	A	618	1	14,14,15	2.22	5 (35%)	17,19,21	1.01	1 (5%)
7	NAG	A	619	1	14,14,15	2.14	4 (28%)	17,19,21	1.06	1 (5%)
7	NAG	C	602	1	14,14,15	2.08	4 (28%)	17,19,21	1.05	2 (11%)
7	NAG	G	614	1	14,14,15	2.14	5 (35%)	17,19,21	1.06	1 (5%)
7	NAG	G	617	1	14,14,15	2.26	5 (35%)	17,19,21	1.08	2 (11%)
7	NAG	A	621	1	14,14,15	2.15	5 (35%)	17,19,21	0.93	1 (5%)
7	NAG	A	603	1	14,14,15	2.16	5 (35%)	17,19,21	1.03	2 (11%)
7	NAG	A	601	1	14,14,15	1.96	3 (21%)	17,19,21	1.07	2 (11%)
7	NAG	G	616	1	14,14,15	2.12	6 (42%)	17,19,21	1.04	1 (5%)
7	NAG	A	616	1	14,14,15	2.11	6 (42%)	17,19,21	1.04	1 (5%)
7	NAG	A	602	1	14,14,15	2.08	5 (35%)	17,19,21	1.05	2 (11%)
7	NAG	G	621	1	14,14,15	2.15	5 (35%)	17,19,21	0.94	1 (5%)
7	NAG	G	602	1	14,14,15	2.09	5 (35%)	17,19,21	1.05	2 (11%)
7	NAG	C	619	1	14,14,15	2.14	4 (28%)	17,19,21	1.06	1 (5%)
7	NAG	A	615	1	14,14,15	2.06	6 (42%)	17,19,21	1.06	1 (5%)
7	NAG	C	615	1	14,14,15	2.07	6 (42%)	17,19,21	1.06	1 (5%)
7	NAG	C	618	1	14,14,15	2.23	6 (42%)	17,19,21	1.02	1 (5%)
7	NAG	C	603	1	14,14,15	2.17	5 (35%)	17,19,21	1.03	1 (5%)
7	NAG	C	621	1	14,14,15	2.16	5 (35%)	17,19,21	0.93	1 (5%)
7	NAG	G	615	1	14,14,15	2.06	6 (42%)	17,19,21	1.06	1 (5%)
7	NAG	G	620	1	14,14,15	2.31	5 (35%)	17,19,21	1.17	2 (11%)
7	NAG	A	617	1	14,14,15	2.26	5 (35%)	17,19,21	1.08	2 (11%)
7	NAG	C	616	1	14,14,15	2.12	6 (42%)	17,19,21	1.03	1 (5%)
7	NAG	G	619	1	14,14,15	2.16	4 (28%)	17,19,21	1.07	1 (5%)
7	NAG	G	618	1	14,14,15	2.23	6 (42%)	17,19,21	1.01	1 (5%)
7	NAG	G	601	1	14,14,15	1.97	3 (21%)	17,19,21	1.08	2 (11%)

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	NAG	C	614	1	-	0/6/23/26	0/1/1/1
7	NAG	C	617	1	-	0/6/23/26	0/1/1/1
7	NAG	G	603	1	-	1/6/23/26	0/1/1/1
7	NAG	A	620	1	-	0/6/23/26	0/1/1/1
7	NAG	C	620	1	-	0/6/23/26	0/1/1/1
7	NAG	C	601	1	-	0/6/23/26	0/1/1/1
7	NAG	A	614	1	-	0/6/23/26	0/1/1/1
7	NAG	A	618	1	-	0/6/23/26	0/1/1/1
7	NAG	A	619	1	-	1/6/23/26	0/1/1/1
7	NAG	C	602	1	-	0/6/23/26	0/1/1/1
7	NAG	G	614	1	-	0/6/23/26	0/1/1/1
7	NAG	G	617	1	-	0/6/23/26	0/1/1/1
7	NAG	A	621	1	-	0/6/23/26	0/1/1/1
7	NAG	A	603	1	-	1/6/23/26	0/1/1/1
7	NAG	A	601	1	-	0/6/23/26	0/1/1/1
7	NAG	G	616	1	-	0/6/23/26	0/1/1/1
7	NAG	A	616	1	-	0/6/23/26	0/1/1/1
7	NAG	A	602	1	-	0/6/23/26	0/1/1/1
7	NAG	G	621	1	-	0/6/23/26	0/1/1/1
7	NAG	G	602	1	-	0/6/23/26	0/1/1/1
7	NAG	C	619	1	-	1/6/23/26	0/1/1/1
7	NAG	A	615	1	-	0/6/23/26	0/1/1/1
7	NAG	C	615	1	-	0/6/23/26	0/1/1/1
7	NAG	C	618	1	-	0/6/23/26	0/1/1/1
7	NAG	C	603	1	-	1/6/23/26	0/1/1/1
7	NAG	C	621	1	-	0/6/23/26	0/1/1/1
7	NAG	G	615	1	-	0/6/23/26	0/1/1/1
7	NAG	G	620	1	-	0/6/23/26	0/1/1/1
7	NAG	A	617	1	-	0/6/23/26	0/1/1/1
7	NAG	C	616	1	-	0/6/23/26	0/1/1/1
7	NAG	G	619	1	-	1/6/23/26	0/1/1/1
7	NAG	G	618	1	-	0/6/23/26	0/1/1/1
7	NAG	G	601	1	-	0/6/23/26	0/1/1/1

All (163) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	A	620	NAG	C1-C2	6.26	1.60	1.52
7	G	620	NAG	C1-C2	6.23	1.60	1.52
7	C	620	NAG	C1-C2	6.21	1.60	1.52
7	G	617	NAG	C1-C2	5.98	1.60	1.52
7	A	617	NAG	C1-C2	5.98	1.60	1.52
7	C	617	NAG	C1-C2	5.98	1.60	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	G	619	NAG	C1-C2	5.85	1.60	1.52
7	C	619	NAG	C1-C2	5.78	1.60	1.52
7	A	619	NAG	C1-C2	5.74	1.60	1.52
7	C	614	NAG	C1-C2	5.72	1.60	1.52
7	C	618	NAG	C1-C2	5.71	1.60	1.52
7	G	614	NAG	C1-C2	5.70	1.60	1.52
7	A	614	NAG	C1-C2	5.69	1.60	1.52
7	A	602	NAG	C1-C2	5.68	1.60	1.52
7	G	602	NAG	C1-C2	5.68	1.60	1.52
7	C	602	NAG	C1-C2	5.68	1.60	1.52
7	G	618	NAG	C1-C2	5.67	1.60	1.52
7	G	603	NAG	C1-C2	5.64	1.60	1.52
7	C	603	NAG	C1-C2	5.64	1.60	1.52
7	A	618	NAG	C1-C2	5.63	1.60	1.52
7	A	603	NAG	C1-C2	5.60	1.60	1.52
7	C	621	NAG	C1-C2	5.49	1.59	1.52
7	G	621	NAG	C1-C2	5.44	1.59	1.52
7	A	621	NAG	C1-C2	5.43	1.59	1.52
7	C	615	NAG	C1-C2	5.21	1.59	1.52
7	G	615	NAG	C1-C2	5.15	1.59	1.52
7	A	615	NAG	C1-C2	5.14	1.59	1.52
7	G	616	NAG	C1-C2	5.09	1.59	1.52
7	C	616	NAG	C1-C2	5.09	1.59	1.52
7	A	616	NAG	C1-C2	5.08	1.59	1.52
7	C	601	NAG	C1-C2	4.69	1.58	1.52
7	G	601	NAG	C1-C2	4.66	1.58	1.52
7	A	601	NAG	C1-C2	4.66	1.58	1.52
7	G	618	NAG	O5-C5	3.47	1.50	1.43
7	A	618	NAG	O5-C5	3.46	1.50	1.43
7	C	618	NAG	O5-C5	3.44	1.50	1.43
7	G	617	NAG	O5-C5	3.38	1.50	1.43
7	C	617	NAG	O5-C5	3.37	1.50	1.43
7	A	621	NAG	O5-C5	3.36	1.50	1.43
7	G	621	NAG	O5-C5	3.36	1.50	1.43
7	C	621	NAG	O5-C5	3.35	1.50	1.43
7	A	617	NAG	O5-C5	3.31	1.49	1.43
7	A	616	NAG	O5-C5	3.28	1.49	1.43
7	C	603	NAG	O5-C5	3.27	1.49	1.43
7	A	603	NAG	O5-C5	3.27	1.49	1.43
7	G	603	NAG	O5-C5	3.27	1.49	1.43
7	G	616	NAG	O5-C5	3.25	1.49	1.43
7	C	616	NAG	O5-C5	3.25	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	G	601	NAG	O5-C5	3.24	1.49	1.43
7	A	601	NAG	O5-C5	3.20	1.49	1.43
7	C	601	NAG	O5-C5	3.19	1.49	1.43
7	A	619	NAG	O5-C5	3.06	1.49	1.43
7	C	619	NAG	O5-C5	3.05	1.49	1.43
7	G	619	NAG	O5-C5	3.05	1.49	1.43
7	G	614	NAG	O5-C5	3.02	1.49	1.43
7	G	615	NAG	O5-C5	3.01	1.49	1.43
7	C	614	NAG	O5-C5	3.01	1.49	1.43
7	A	614	NAG	O5-C5	3.00	1.49	1.43
7	A	615	NAG	O5-C5	2.99	1.49	1.43
7	C	615	NAG	O5-C5	2.99	1.49	1.43
7	A	620	NAG	O5-C5	2.79	1.48	1.43
7	G	620	NAG	O5-C5	2.78	1.48	1.43
7	C	603	NAG	O5-C1	2.77	1.48	1.43
7	A	603	NAG	O5-C1	2.74	1.48	1.43
7	G	603	NAG	O5-C1	2.74	1.48	1.43
7	C	620	NAG	O5-C5	2.73	1.48	1.43
7	G	616	NAG	O5-C1	2.72	1.48	1.43
7	C	618	NAG	O5-C1	2.70	1.48	1.43
7	C	616	NAG	O5-C1	2.70	1.48	1.43
7	C	620	NAG	C2-N2	2.69	1.50	1.46
7	G	620	NAG	C2-N2	2.69	1.50	1.46
7	A	620	NAG	C2-N2	2.68	1.50	1.46
7	A	618	NAG	O5-C1	2.67	1.48	1.43
7	G	620	NAG	C3-C2	2.67	1.58	1.52
7	G	602	NAG	O5-C5	2.66	1.48	1.43
7	G	618	NAG	O5-C1	2.66	1.48	1.43
7	A	620	NAG	C3-C2	2.65	1.58	1.52
7	C	620	NAG	C3-C2	2.65	1.58	1.52
7	C	602	NAG	O5-C5	2.64	1.48	1.43
7	A	602	NAG	O5-C5	2.64	1.48	1.43
7	A	616	NAG	O5-C1	2.63	1.48	1.43
7	A	619	NAG	O5-C1	2.61	1.48	1.43
7	G	621	NAG	O5-C1	2.61	1.48	1.43
7	C	621	NAG	O5-C1	2.59	1.48	1.43
7	A	621	NAG	O5-C1	2.58	1.48	1.43
7	C	619	NAG	O5-C1	2.56	1.48	1.43
7	G	619	NAG	O5-C1	2.53	1.47	1.43
7	C	601	NAG	O5-C1	2.50	1.47	1.43
7	G	601	NAG	O5-C1	2.49	1.47	1.43
7	G	615	NAG	O5-C1	2.48	1.47	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	A	601	NAG	O5-C1	2.48	1.47	1.43
7	A	615	NAG	O5-C1	2.48	1.47	1.43
7	C	615	NAG	O5-C1	2.46	1.47	1.43
7	A	614	NAG	O5-C1	2.45	1.47	1.43
7	C	617	NAG	O5-C1	2.44	1.47	1.43
7	A	617	NAG	O5-C1	2.43	1.47	1.43
7	G	617	NAG	O5-C1	2.42	1.47	1.43
7	G	614	NAG	O5-C1	2.38	1.47	1.43
7	C	614	NAG	O5-C1	2.38	1.47	1.43
7	G	619	NAG	C3-C2	2.35	1.57	1.52
7	A	619	NAG	C3-C2	2.35	1.57	1.52
7	C	619	NAG	C3-C2	2.35	1.57	1.52
7	C	620	NAG	O5-C1	2.34	1.47	1.43
7	A	617	NAG	C3-C2	2.33	1.57	1.52
7	G	603	NAG	C3-C2	2.31	1.57	1.52
7	A	620	NAG	O5-C1	2.30	1.47	1.43
7	A	603	NAG	C3-C2	2.29	1.57	1.52
7	C	617	NAG	C3-C2	2.29	1.57	1.52
7	G	620	NAG	O5-C1	2.27	1.47	1.43
7	G	617	NAG	C3-C2	2.27	1.57	1.52
7	C	621	NAG	C3-C2	2.26	1.57	1.52
7	C	603	NAG	C3-C2	2.26	1.57	1.52
7	A	617	NAG	C4-C5	2.24	1.57	1.53
7	G	616	NAG	C3-C2	2.23	1.57	1.52
7	A	616	NAG	C3-C2	2.23	1.57	1.52
7	G	621	NAG	C3-C2	2.23	1.57	1.52
7	C	616	NAG	C3-C2	2.22	1.57	1.52
7	C	617	NAG	C4-C5	2.22	1.57	1.53
7	G	617	NAG	C4-C5	2.21	1.57	1.53
7	A	621	NAG	C3-C2	2.21	1.57	1.52
7	G	615	NAG	C2-N2	2.21	1.49	1.46
7	A	615	NAG	C2-N2	2.20	1.49	1.46
7	C	615	NAG	C2-N2	2.20	1.49	1.46
7	A	618	NAG	C3-C2	2.20	1.57	1.52
7	C	602	NAG	O5-C1	2.19	1.47	1.43
7	C	618	NAG	C3-C2	2.19	1.57	1.52
7	A	616	NAG	C4-C5	2.18	1.57	1.53
7	A	602	NAG	O5-C1	2.18	1.47	1.43
7	G	602	NAG	O5-C1	2.16	1.47	1.43
7	G	616	NAG	C4-C5	2.16	1.57	1.53
7	C	616	NAG	C4-C5	2.16	1.57	1.53
7	G	614	NAG	C3-C2	2.16	1.57	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	A	614	NAG	C3-C2	2.15	1.57	1.52
7	C	614	NAG	C3-C2	2.15	1.57	1.52
7	G	618	NAG	C3-C2	2.15	1.57	1.52
7	G	618	NAG	C4-C5	2.15	1.57	1.53
7	C	614	NAG	C4-C5	2.14	1.57	1.53
7	A	614	NAG	C4-C5	2.13	1.57	1.53
7	G	614	NAG	C4-C5	2.13	1.57	1.53
7	G	615	NAG	C3-C2	2.13	1.57	1.52
7	C	618	NAG	C4-C5	2.13	1.57	1.53
7	A	618	NAG	C4-C5	2.13	1.57	1.53
7	A	621	NAG	C4-C5	2.12	1.57	1.53
7	C	615	NAG	C3-C2	2.12	1.57	1.52
7	A	615	NAG	C3-C2	2.12	1.57	1.52
7	G	621	NAG	C4-C5	2.11	1.57	1.53
7	C	602	NAG	C4-C5	2.08	1.57	1.53
7	C	621	NAG	C4-C5	2.08	1.57	1.53
7	A	615	NAG	C4-C5	2.06	1.57	1.53
7	G	602	NAG	C4-C5	2.06	1.57	1.53
7	A	602	NAG	C4-C5	2.06	1.57	1.53
7	G	603	NAG	C4-C5	2.04	1.57	1.53
7	C	616	NAG	C2-N2	2.04	1.49	1.46
7	G	618	NAG	C2-N2	2.03	1.49	1.46
7	A	603	NAG	C4-C5	2.03	1.57	1.53
7	C	615	NAG	C4-C5	2.03	1.57	1.53
7	C	603	NAG	C4-C5	2.02	1.57	1.53
7	A	602	NAG	C3-C2	2.02	1.56	1.52
7	G	615	NAG	C4-C5	2.02	1.57	1.53
7	G	602	NAG	C3-C2	2.02	1.56	1.52
7	C	618	NAG	C2-N2	2.01	1.49	1.46
7	A	616	NAG	C2-N2	2.01	1.49	1.46
7	G	616	NAG	C2-N2	2.00	1.49	1.46

All (47) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	C	620	NAG	C8-C7-N2	3.22	121.46	116.12
7	A	620	NAG	C8-C7-N2	3.22	121.45	116.12
7	G	620	NAG	C8-C7-N2	3.20	121.43	116.12
7	G	601	NAG	C1-C2-N2	-2.65	106.26	110.43
7	A	601	NAG	C1-C2-N2	-2.64	106.27	110.43
7	C	601	NAG	C1-C2-N2	-2.64	106.28	110.43
7	C	615	NAG	C8-C7-N2	2.54	120.33	116.12

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	C	617	NAG	C8-C7-N2	2.54	120.33	116.12
7	G	615	NAG	C8-C7-N2	2.53	120.32	116.12
7	A	617	NAG	C8-C7-N2	2.53	120.31	116.12
7	G	617	NAG	C8-C7-N2	2.53	120.31	116.12
7	A	615	NAG	C8-C7-N2	2.52	120.29	116.12
7	G	617	NAG	O7-C7-C8	-2.36	117.86	122.05
7	C	617	NAG	O7-C7-C8	-2.35	117.86	122.05
7	C	614	NAG	C8-C7-N2	2.35	120.01	116.12
7	A	617	NAG	O7-C7-C8	-2.34	117.88	122.05
7	A	614	NAG	C8-C7-N2	2.34	120.00	116.12
7	C	620	NAG	O7-C7-C8	-2.34	117.89	122.05
7	A	620	NAG	O7-C7-C8	-2.33	117.90	122.05
7	G	614	NAG	C8-C7-N2	2.33	119.98	116.12
7	G	620	NAG	O7-C7-C8	-2.28	118.00	122.05
7	G	616	NAG	C8-C7-N2	2.28	119.89	116.12
7	A	616	NAG	C8-C7-N2	2.27	119.88	116.12
7	C	603	NAG	O5-C1-C2	-2.24	107.83	111.29
7	C	616	NAG	C8-C7-N2	2.24	119.83	116.12
7	G	603	NAG	O5-C1-C2	-2.22	107.86	111.29
7	C	618	NAG	C8-C7-N2	2.20	119.77	116.12
7	G	618	NAG	C8-C7-N2	2.19	119.76	116.12
7	A	603	NAG	O5-C1-C2	-2.19	107.90	111.29
7	A	618	NAG	C8-C7-N2	2.19	119.75	116.12
7	G	621	NAG	C8-C7-N2	2.16	119.71	116.12
7	G	619	NAG	C1-O5-C5	2.16	115.08	112.19
7	C	619	NAG	C1-O5-C5	2.16	115.08	112.19
7	G	601	NAG	C8-C7-N2	2.15	119.68	116.12
7	G	602	NAG	C1-O5-C5	2.15	115.06	112.19
7	A	602	NAG	C1-O5-C5	2.14	115.06	112.19
7	C	621	NAG	C8-C7-N2	2.14	119.66	116.12
7	C	602	NAG	C1-O5-C5	2.13	115.04	112.19
7	A	621	NAG	C8-C7-N2	2.12	119.64	116.12
7	A	601	NAG	C8-C7-N2	2.11	119.62	116.12
7	A	619	NAG	C1-O5-C5	2.11	115.01	112.19
7	C	601	NAG	C8-C7-N2	2.11	119.62	116.12
7	G	602	NAG	C8-C7-N2	2.10	119.60	116.12
7	A	602	NAG	C8-C7-N2	2.10	119.59	116.12
7	C	602	NAG	C8-C7-N2	2.08	119.57	116.12
7	A	603	NAG	C8-C7-N2	2.01	119.44	116.12
7	G	603	NAG	C8-C7-N2	2.00	119.44	116.12

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	A	603	NAG	O5-C5-C6-O6
7	C	603	NAG	O5-C5-C6-O6
7	G	603	NAG	O5-C5-C6-O6
7	A	619	NAG	O5-C5-C6-O6
7	C	619	NAG	O5-C5-C6-O6
7	G	619	NAG	O5-C5-C6-O6

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	C	617	NAG	1	0
7	A	617	NAG	1	0

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.

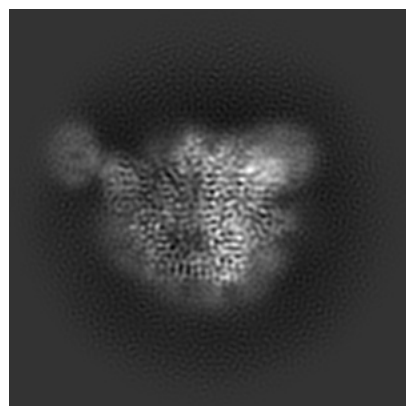
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-22102. These allow visual inspection of the internal detail of the map and identification of artifacts.

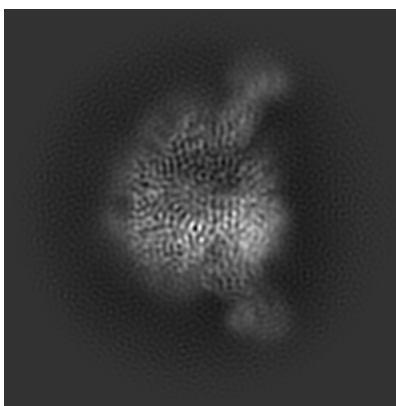
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

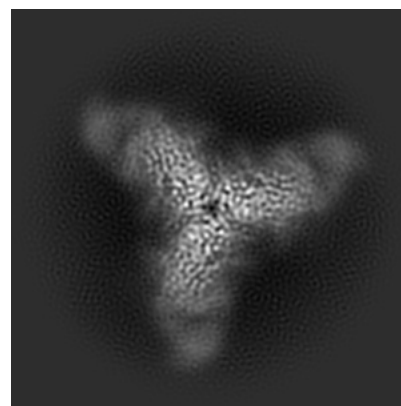
6.1.1 Primary map



X

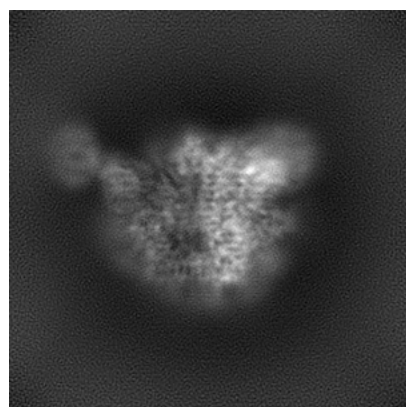


Y

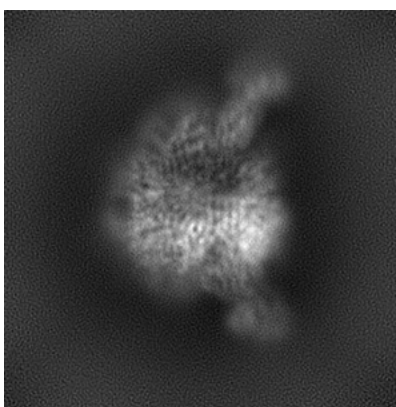


Z

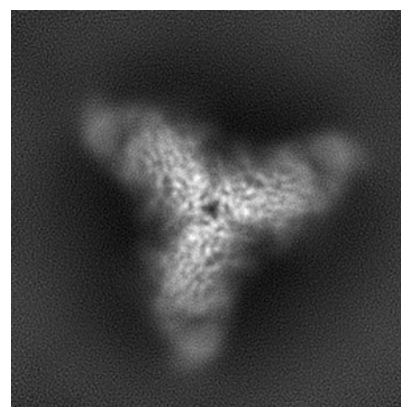
6.1.2 Raw map



X



Y

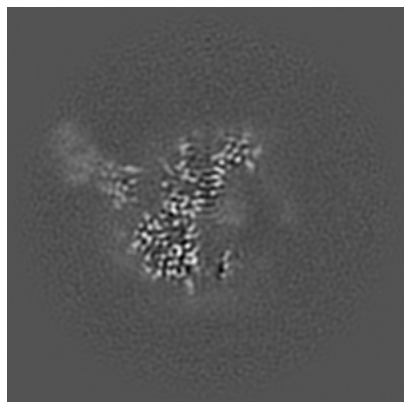


Z

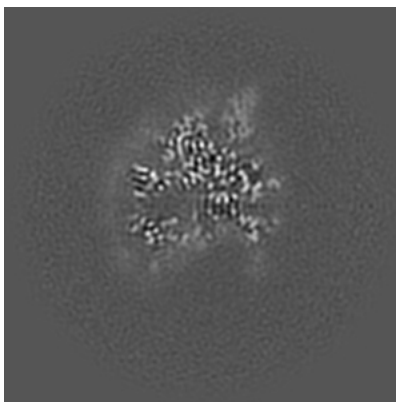
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

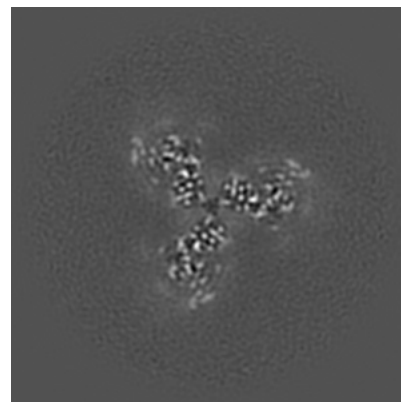
6.2.1 Primary map



X Index: 128

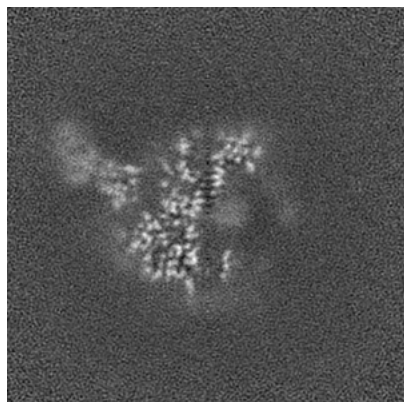


Y Index: 128

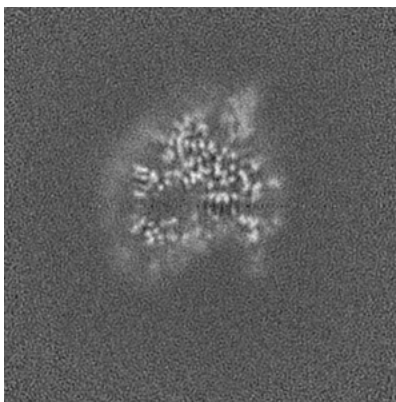


Z Index: 128

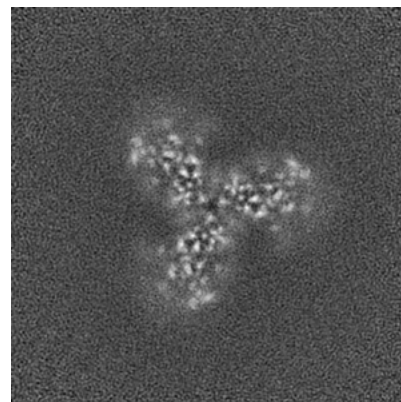
6.2.2 Raw map



X Index: 128



Y Index: 128

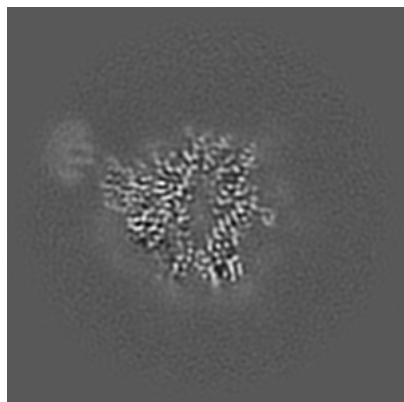


Z Index: 128

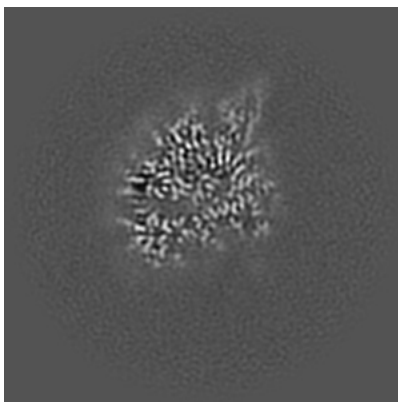
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

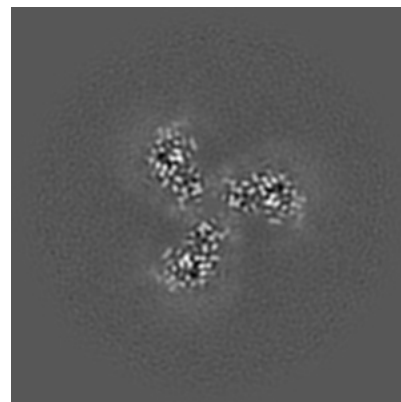
6.3.1 Primary map



X Index: 117

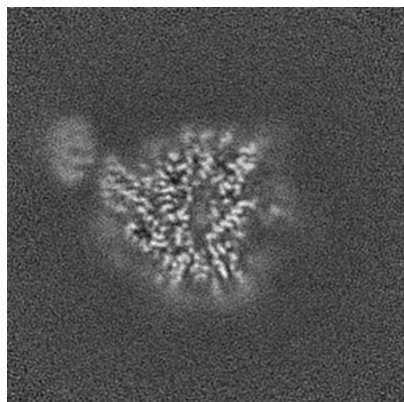


Y Index: 134

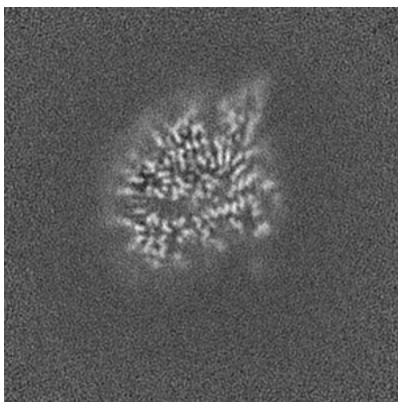


Z Index: 117

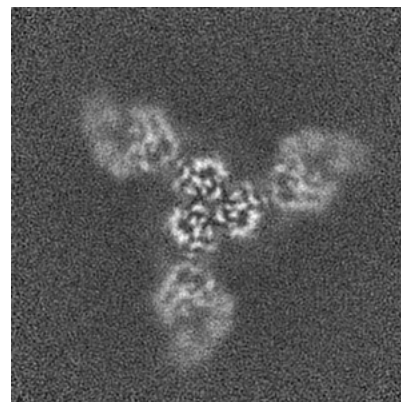
6.3.2 Raw map



X Index: 119



Y Index: 134

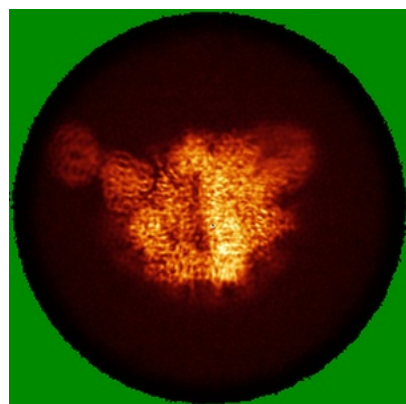


Z Index: 153

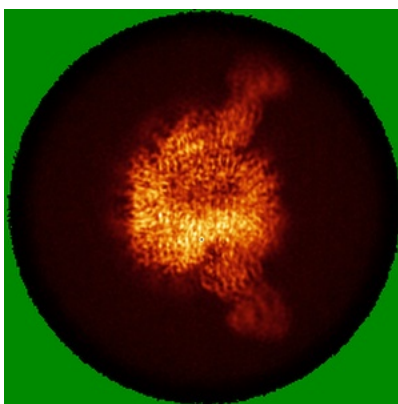
The images above show the largest variance slices of the map in three orthogonal directions.

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

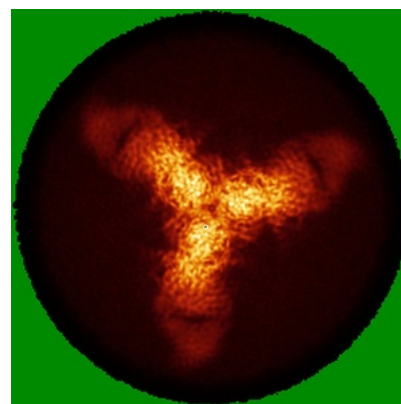
6.4.1 Primary map



X

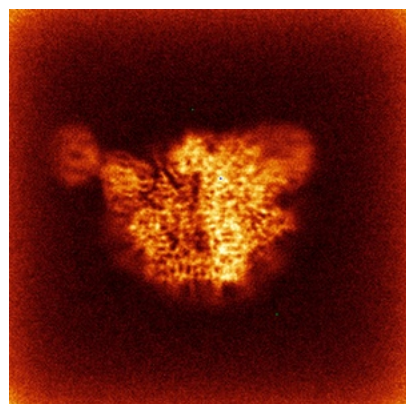


Y

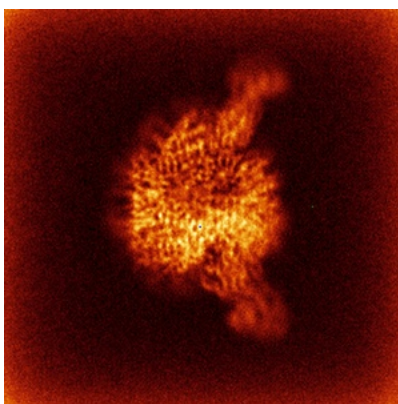


Z

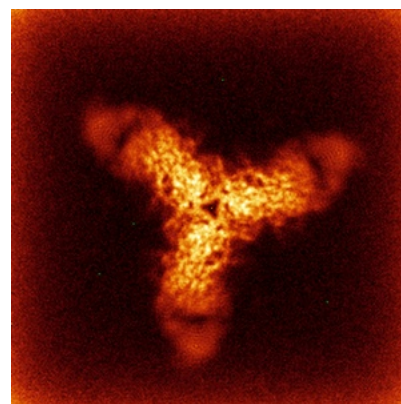
6.4.2 Raw map



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.

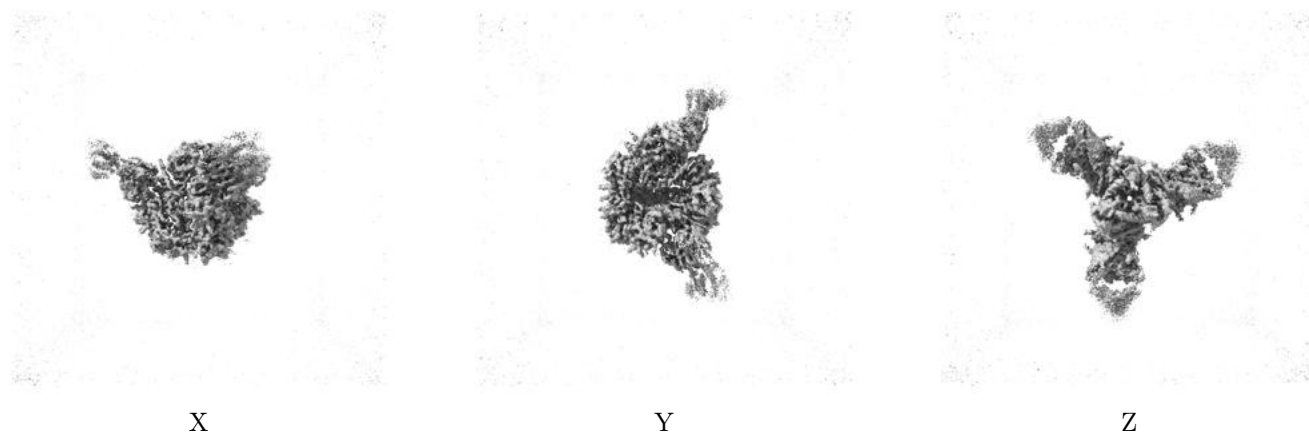
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.4. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

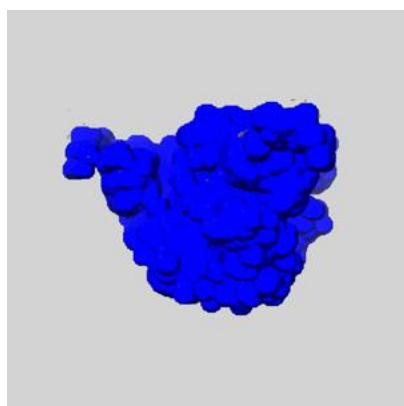
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

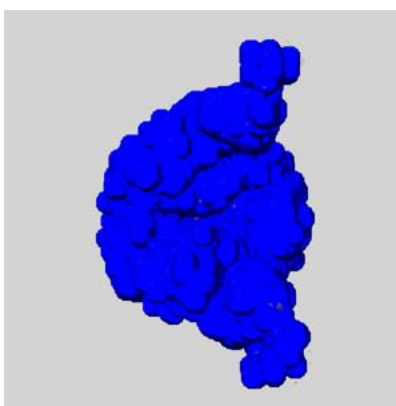
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

6.6.1 emd_22102_msk_1.map [i](#)



X



Y

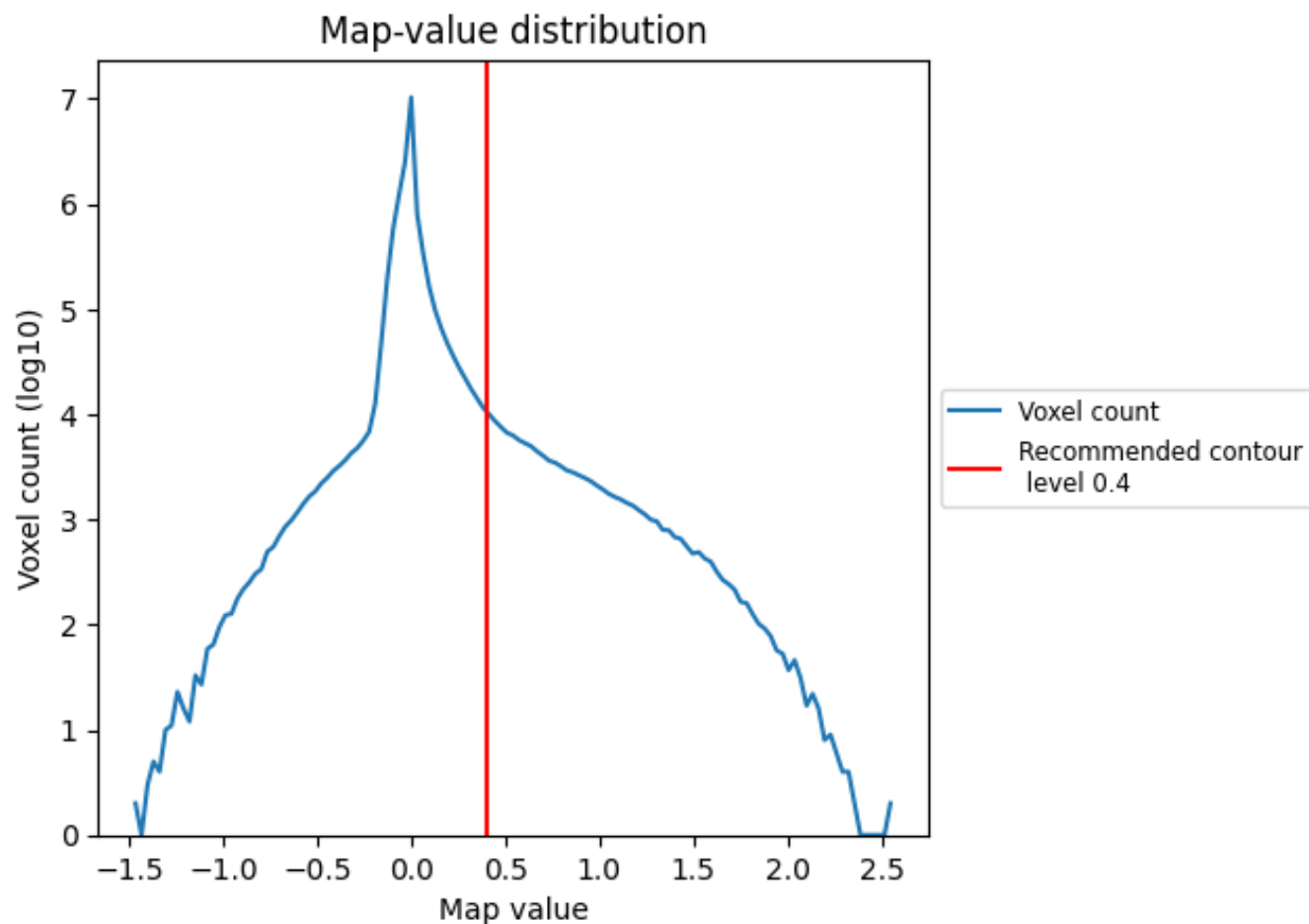


Z

7 Map analysis [i](#)

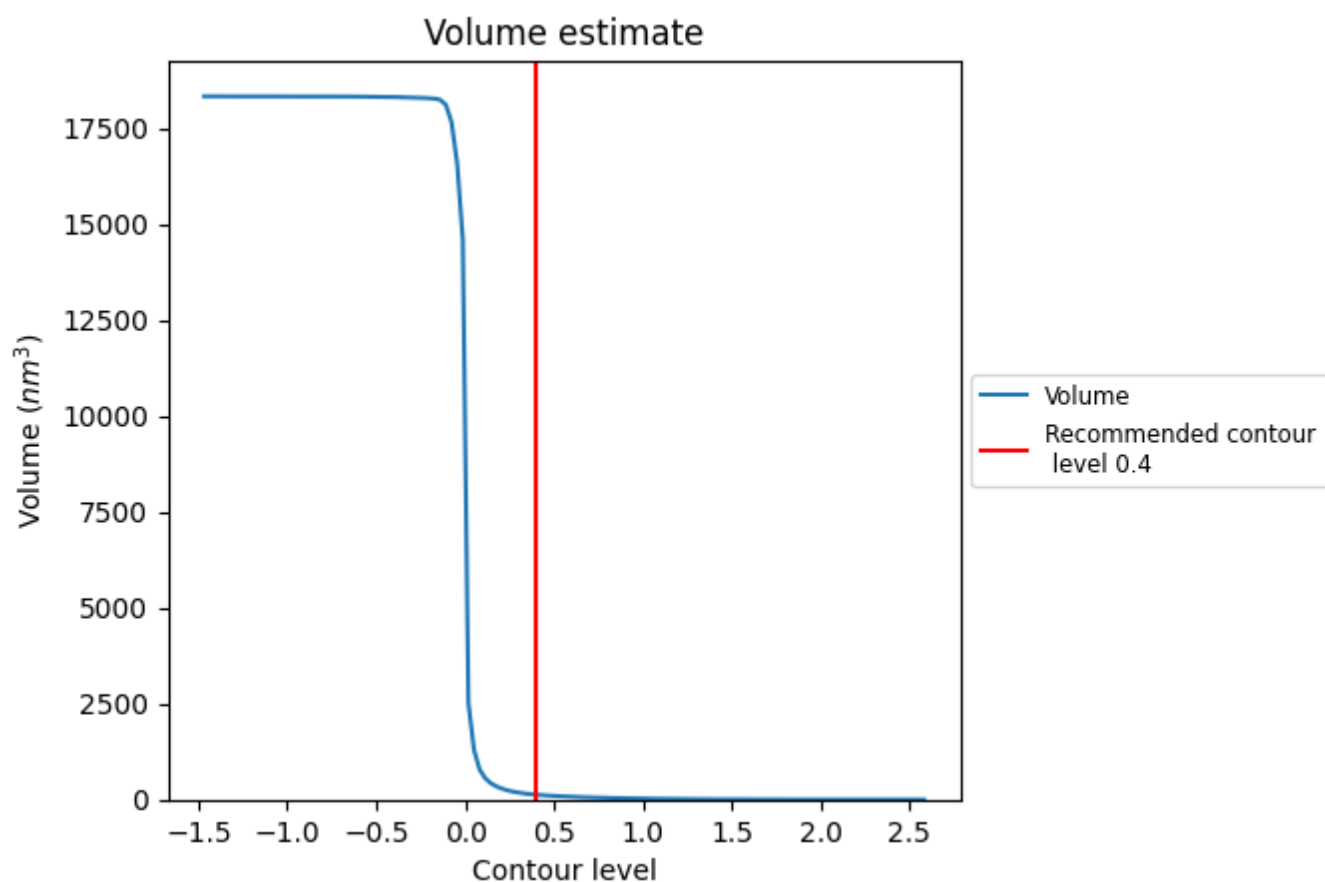
This section contains the results of statistical analysis of the map.

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.

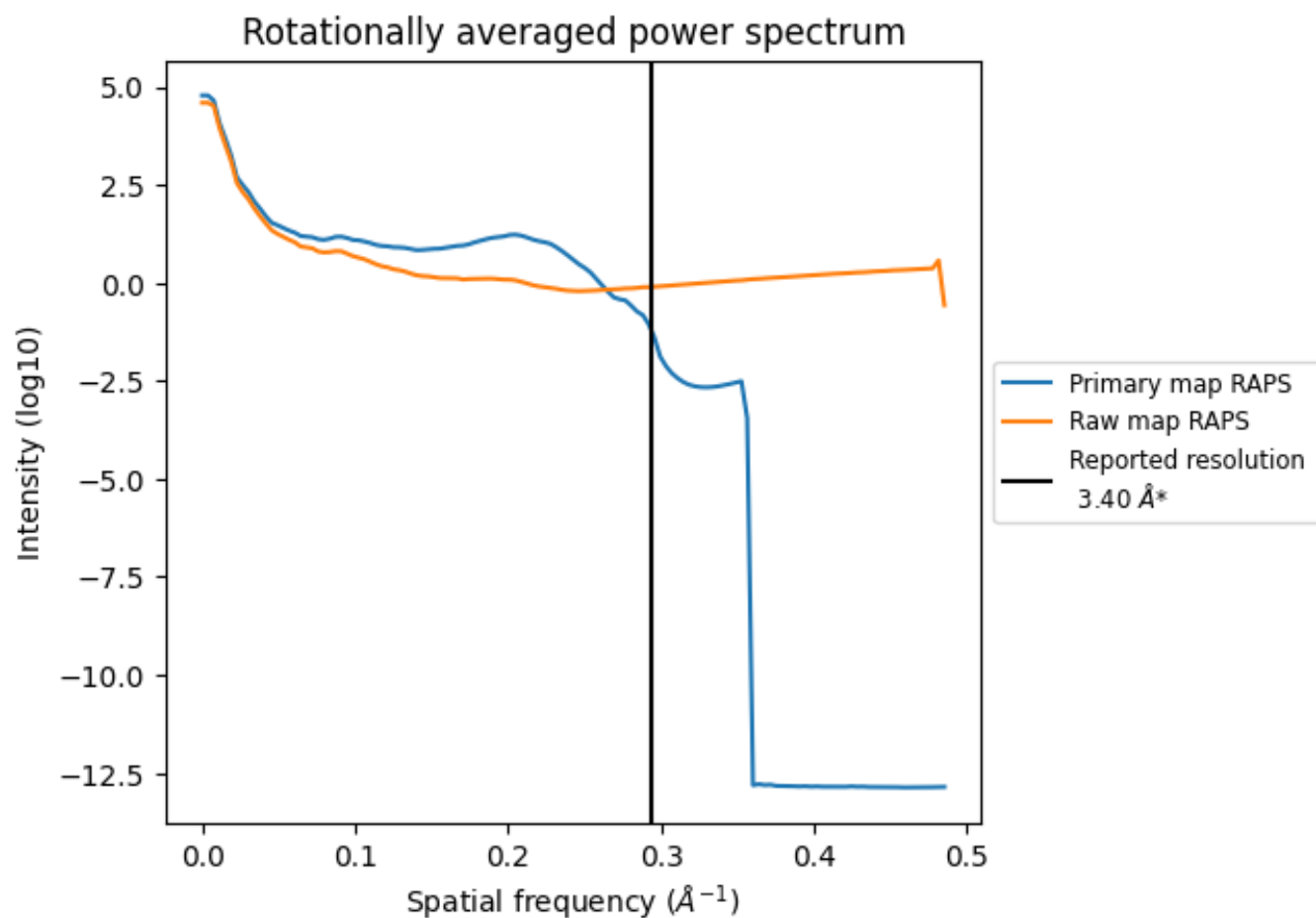
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 126 nm³; this corresponds to an approximate mass of 113 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 ⓘ

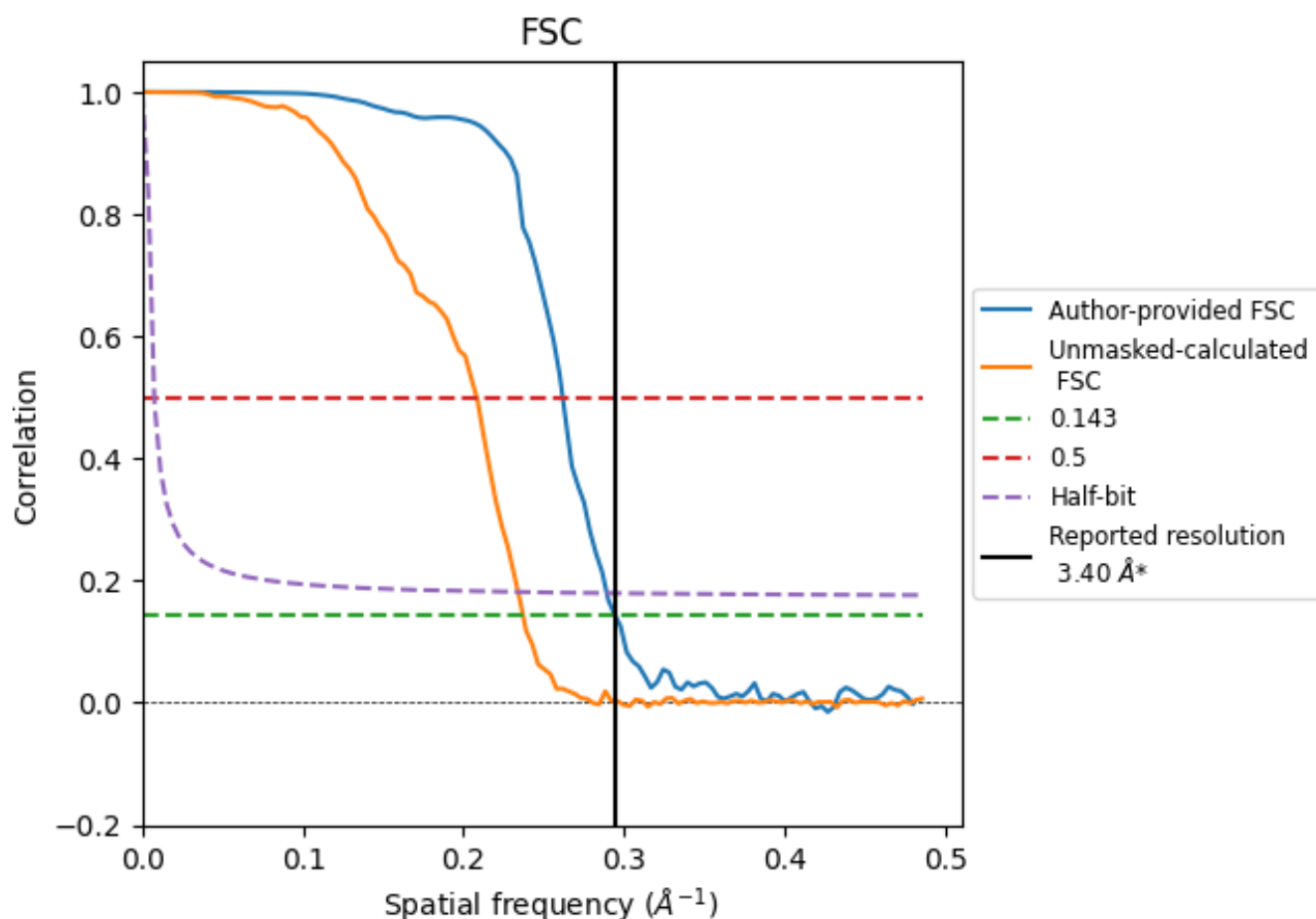


*Reported resolution corresponds to spatial frequency of 0.294 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of $0.294 \text{ \AA}^{-1}$

8.2 Resolution estimates [i](#)

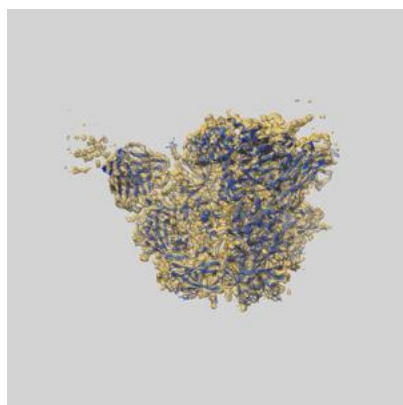
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	3.40	3.82	3.46
Unmasked-calculated*	4.22	4.80	4.27

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.22 differs from the reported value 3.4 by more than 10 %

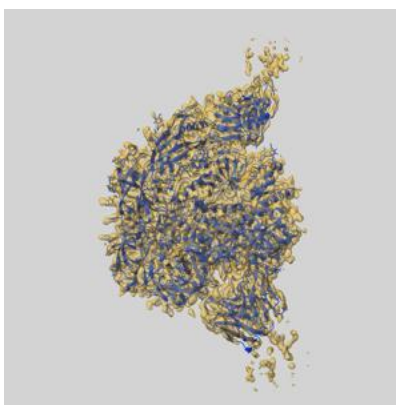
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-22102 and PDB model 6X96. Per-residue inclusion information can be found in [section 3](#) on [page 12](#).

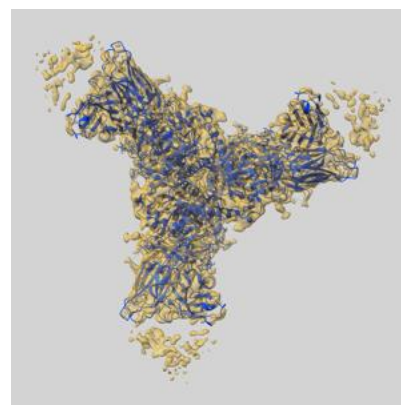
9.1 Map-model overlay [i](#)



X



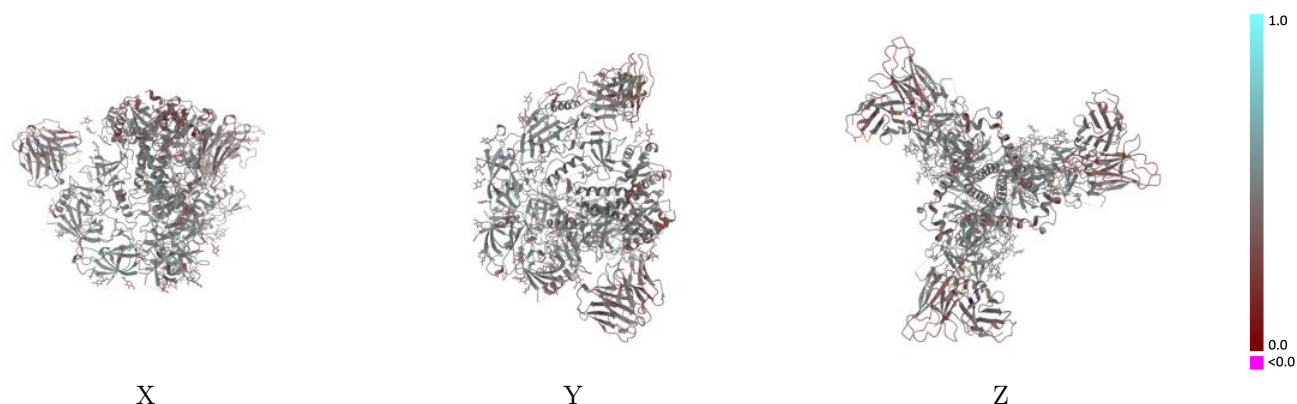
Y



Z

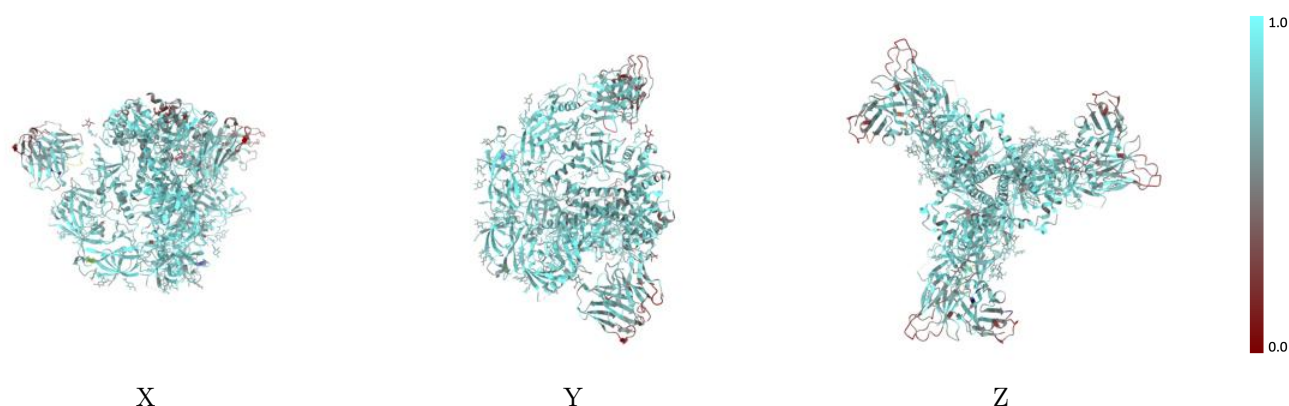
The images above show the 3D surface view of the map at the recommended contour level 0.4 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



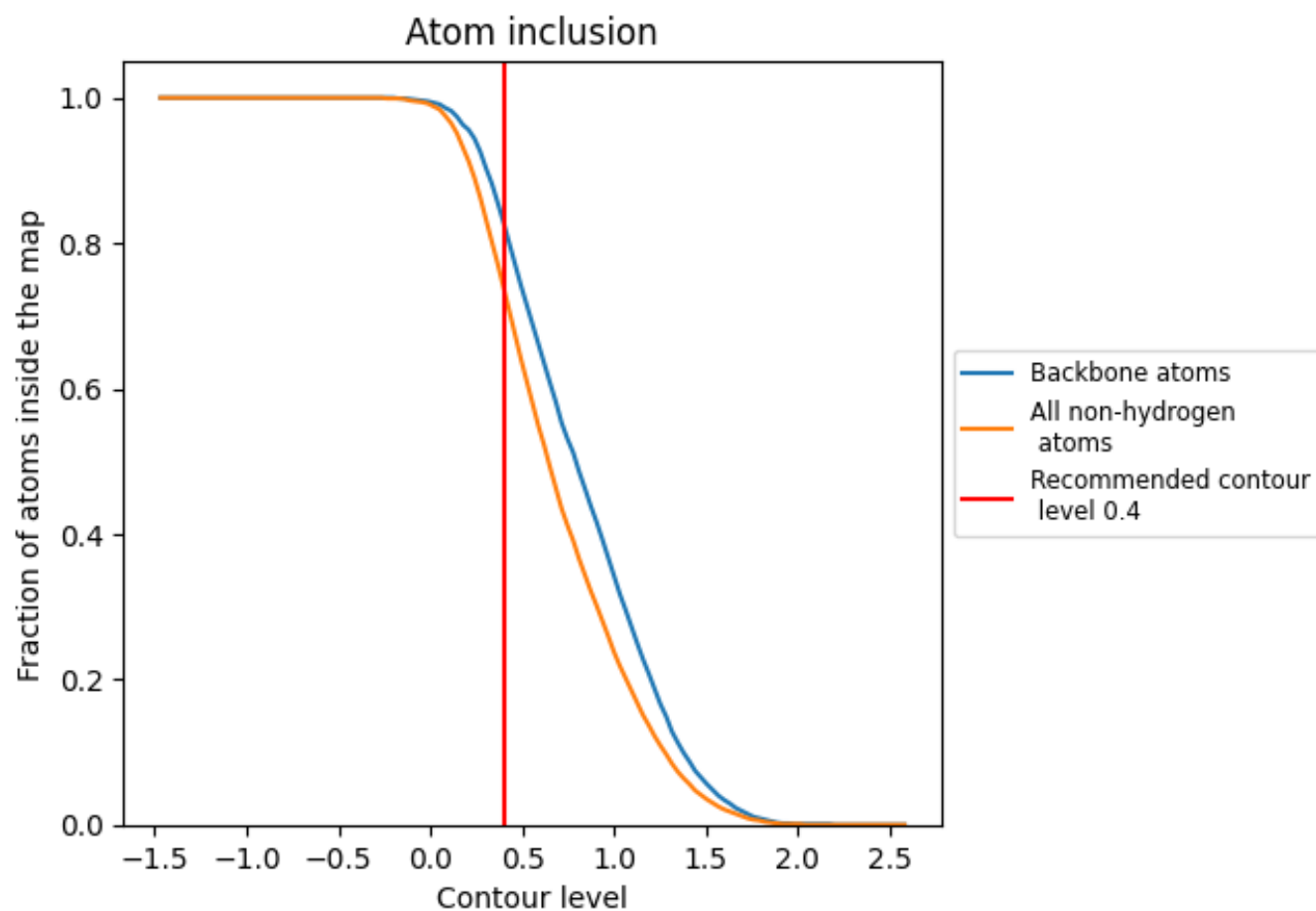
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.4).

9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 74% 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 (0.4) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7380	 0.4500
A	 0.7900	 0.4730
B	 0.7420	 0.4340
C	 0.7920	 0.4730
D	 0.7450	 0.4380
E	 0.6490	 0.4340
F	 0.6010	 0.3850
G	 0.7920	 0.4730
H	 0.6540	 0.4300
I	 0.7430	 0.4380
J	 0.6570	 0.4280
K	 0.6050	 0.3870
L	 0.6090	 0.3850
M	 0.7000	 0.4700
N	 0.6070	 0.4070
O	 0.5000	 0.3670
P	 0.6430	 0.4020
Q	 0.7000	 0.4590
R	 0.6070	 0.4200
S	 0.4640	 0.3730
T	 0.6430	 0.4130
U	 0.7000	 0.4690
V	 0.6070	 0.4110
W	 0.5000	 0.3690
X	 0.6430	 0.4090

