



Full wwPDB EM Validation Report ⓘ

Jul 23, 2025 – 05:13 PM EDT

PDB ID : 9DO2 / pdb_00009do2
EMDB ID : EMD-47071
Title : #1664 Fab in complex with NG2 COBRA hemagglutinin
Authors : Nagashima, K.; Mousa, J.
Deposited on : 2024-09-18
Resolution : 3.45 Å(reported)

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ 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.dev118
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0rc1
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

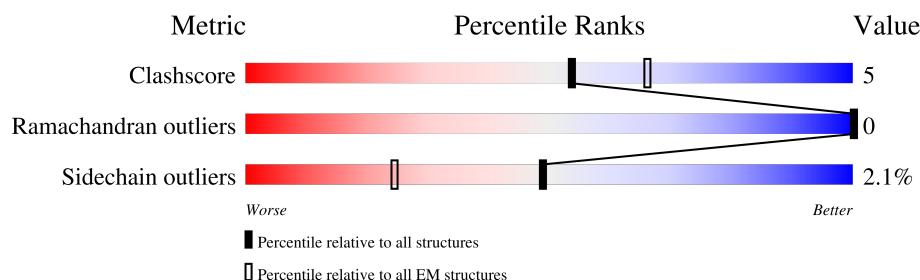
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.45 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	H	127	<div> <div>22%</div> <div>83%</div> <div>16%</div> <div>.</div> </div>
2	L	110	<div> <div>20%</div> <div>84%</div> <div>14%</div> <div>.</div> </div>
3	A	573	<div> <div>45%</div> <div>7%</div> <div>47%</div> </div>
3	B	573	<div> <div>46%</div> <div>6%</div> <div>47%</div> </div>
3	C	573	<div> <div>38%</div> <div>9%</div> <div>53%</div> </div>
4	D	2	<div> <div>50%</div> <div>50%</div> <div>50%</div> </div>
4	E	2	<div> <div>50%</div> <div>50%</div> <div>50%</div> </div>
4	G	2	<div> <div>50%</div> <div>50%</div> </div>

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Mol	Chain	Length	Quality of chain
4	I	2	<div>50%</div>
4	J	2	<div>50%</div>
4	K	2	<div>50%</div>
4	N	2	<div>100%</div>
4	O	2	<div>50%</div>
4	P	2	<div>50%</div>
4	Q	2	<div>50%</div>
4	S	2	<div>50%</div>
4	T	2	<div>50%</div>
5	F	3	<div>33%</div>
5	M	3	<div>33%</div>
6	R	7	<div>14%</div>

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 9327 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 Fab-1664 heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	H	126	Total	C	N	O	S	0	0
			963	608	156	193	6		

- Molecule 2 is a protein called Fab-1664 light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	L	107	Total	C	N	O	S	0	0
			797	491	137	166	3		

- Molecule 3 is a protein called Hemagglutinin.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	A	303	Total	C	N	O	S	0	0
			2408	1517	418	463	10		
3	B	303	Total	C	N	O	S	0	0
			2408	1517	418	463	10		
3	C	270	Total	C	N	O	S	0	0
			2142	1350	369	413	10		

There are 162 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	142	GLY	ARG	conflict	UNP A0A2P1ADT1
A	144	SER	LYS	conflict	UNP A0A2P1ADT1
A	311	GLN	HIS	conflict	UNP A0A2P1ADT1
A	507	GLY	-	expression tag	UNP A0A2P1ADT1
A	508	TYR	-	expression tag	UNP A0A2P1ADT1
A	509	ILE	-	expression tag	UNP A0A2P1ADT1
A	510	PRO	-	expression tag	UNP A0A2P1ADT1
A	511	GLU	-	expression tag	UNP A0A2P1ADT1
A	512	ALA	-	expression tag	UNP A0A2P1ADT1
A	513	PRO	-	expression tag	UNP A0A2P1ADT1
A	514	ARG	-	expression tag	UNP A0A2P1ADT1

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Chain	Residue	Modelled	Actual	Comment	Reference
A	515	ASP	-	expression tag	UNP A0A2P1ADT1
A	516	GLY	-	expression tag	UNP A0A2P1ADT1
A	517	GLN	-	expression tag	UNP A0A2P1ADT1
A	518	ALA	-	expression tag	UNP A0A2P1ADT1
A	519	TYR	-	expression tag	UNP A0A2P1ADT1
A	520	VAL	-	expression tag	UNP A0A2P1ADT1
A	521	ARG	-	expression tag	UNP A0A2P1ADT1
A	522	LYS	-	expression tag	UNP A0A2P1ADT1
A	523	ASP	-	expression tag	UNP A0A2P1ADT1
A	524	GLY	-	expression tag	UNP A0A2P1ADT1
A	525	GLU	-	expression tag	UNP A0A2P1ADT1
A	526	TRP	-	expression tag	UNP A0A2P1ADT1
A	527	VAL	-	expression tag	UNP A0A2P1ADT1
A	528	LEU	-	expression tag	UNP A0A2P1ADT1
A	529	LEU	-	expression tag	UNP A0A2P1ADT1
A	530	SER	-	expression tag	UNP A0A2P1ADT1
A	531	THR	-	expression tag	UNP A0A2P1ADT1
A	532	PHE	-	expression tag	UNP A0A2P1ADT1
A	533	LEU	-	expression tag	UNP A0A2P1ADT1
A	534	GLY	-	expression tag	UNP A0A2P1ADT1
A	535	SER	-	expression tag	UNP A0A2P1ADT1
A	536	GLY	-	expression tag	UNP A0A2P1ADT1
A	537	LEU	-	expression tag	UNP A0A2P1ADT1
A	538	ASN	-	expression tag	UNP A0A2P1ADT1
A	539	ASP	-	expression tag	UNP A0A2P1ADT1
A	540	ILE	-	expression tag	UNP A0A2P1ADT1
A	541	PHE	-	expression tag	UNP A0A2P1ADT1
A	542	GLU	-	expression tag	UNP A0A2P1ADT1
A	543	ALA	-	expression tag	UNP A0A2P1ADT1
A	544	GLN	-	expression tag	UNP A0A2P1ADT1
A	545	LYS	-	expression tag	UNP A0A2P1ADT1
A	546	ILE	-	expression tag	UNP A0A2P1ADT1
A	547	GLU	-	expression tag	UNP A0A2P1ADT1
A	548	TRP	-	expression tag	UNP A0A2P1ADT1
A	549	HIS	-	expression tag	UNP A0A2P1ADT1
A	550	GLU	-	expression tag	UNP A0A2P1ADT1
A	551	GLY	-	expression tag	UNP A0A2P1ADT1
A	552	HIS	-	expression tag	UNP A0A2P1ADT1
A	553	HIS	-	expression tag	UNP A0A2P1ADT1
A	554	HIS	-	expression tag	UNP A0A2P1ADT1
A	555	HIS	-	expression tag	UNP A0A2P1ADT1
A	556	HIS	-	expression tag	UNP A0A2P1ADT1

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Chain	Residue	Modelled	Actual	Comment	Reference
A	557	HIS	-	expression tag	UNP A0A2P1ADT1
B	142	GLY	ARG	conflict	UNP A0A2P1ADT1
B	144	SER	LYS	conflict	UNP A0A2P1ADT1
B	311	GLN	HIS	conflict	UNP A0A2P1ADT1
B	507	GLY	-	expression tag	UNP A0A2P1ADT1
B	508	TYR	-	expression tag	UNP A0A2P1ADT1
B	509	ILE	-	expression tag	UNP A0A2P1ADT1
B	510	PRO	-	expression tag	UNP A0A2P1ADT1
B	511	GLU	-	expression tag	UNP A0A2P1ADT1
B	512	ALA	-	expression tag	UNP A0A2P1ADT1
B	513	PRO	-	expression tag	UNP A0A2P1ADT1
B	514	ARG	-	expression tag	UNP A0A2P1ADT1
B	515	ASP	-	expression tag	UNP A0A2P1ADT1
B	516	GLY	-	expression tag	UNP A0A2P1ADT1
B	517	GLN	-	expression tag	UNP A0A2P1ADT1
B	518	ALA	-	expression tag	UNP A0A2P1ADT1
B	519	TYR	-	expression tag	UNP A0A2P1ADT1
B	520	VAL	-	expression tag	UNP A0A2P1ADT1
B	521	ARG	-	expression tag	UNP A0A2P1ADT1
B	522	LYS	-	expression tag	UNP A0A2P1ADT1
B	523	ASP	-	expression tag	UNP A0A2P1ADT1
B	524	GLY	-	expression tag	UNP A0A2P1ADT1
B	525	GLU	-	expression tag	UNP A0A2P1ADT1
B	526	TRP	-	expression tag	UNP A0A2P1ADT1
B	527	VAL	-	expression tag	UNP A0A2P1ADT1
B	528	LEU	-	expression tag	UNP A0A2P1ADT1
B	529	LEU	-	expression tag	UNP A0A2P1ADT1
B	530	SER	-	expression tag	UNP A0A2P1ADT1
B	531	THR	-	expression tag	UNP A0A2P1ADT1
B	532	PHE	-	expression tag	UNP A0A2P1ADT1
B	533	LEU	-	expression tag	UNP A0A2P1ADT1
B	534	GLY	-	expression tag	UNP A0A2P1ADT1
B	535	SER	-	expression tag	UNP A0A2P1ADT1
B	536	GLY	-	expression tag	UNP A0A2P1ADT1
B	537	LEU	-	expression tag	UNP A0A2P1ADT1
B	538	ASN	-	expression tag	UNP A0A2P1ADT1
B	539	ASP	-	expression tag	UNP A0A2P1ADT1
B	540	ILE	-	expression tag	UNP A0A2P1ADT1
B	541	PHE	-	expression tag	UNP A0A2P1ADT1
B	542	GLU	-	expression tag	UNP A0A2P1ADT1
B	543	ALA	-	expression tag	UNP A0A2P1ADT1
B	544	GLN	-	expression tag	UNP A0A2P1ADT1

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Chain	Residue	Modelled	Actual	Comment	Reference
B	545	LYS	-	expression tag	UNP A0A2P1ADT1
B	546	ILE	-	expression tag	UNP A0A2P1ADT1
B	547	GLU	-	expression tag	UNP A0A2P1ADT1
B	548	TRP	-	expression tag	UNP A0A2P1ADT1
B	549	HIS	-	expression tag	UNP A0A2P1ADT1
B	550	GLU	-	expression tag	UNP A0A2P1ADT1
B	551	GLY	-	expression tag	UNP A0A2P1ADT1
B	552	HIS	-	expression tag	UNP A0A2P1ADT1
B	553	HIS	-	expression tag	UNP A0A2P1ADT1
B	554	HIS	-	expression tag	UNP A0A2P1ADT1
B	555	HIS	-	expression tag	UNP A0A2P1ADT1
B	556	HIS	-	expression tag	UNP A0A2P1ADT1
B	557	HIS	-	expression tag	UNP A0A2P1ADT1
C	142	GLY	ARG	conflict	UNP A0A2P1ADT1
C	144	SER	LYS	conflict	UNP A0A2P1ADT1
C	311	GLN	HIS	conflict	UNP A0A2P1ADT1
C	507	GLY	-	expression tag	UNP A0A2P1ADT1
C	508	TYR	-	expression tag	UNP A0A2P1ADT1
C	509	ILE	-	expression tag	UNP A0A2P1ADT1
C	510	PRO	-	expression tag	UNP A0A2P1ADT1
C	511	GLU	-	expression tag	UNP A0A2P1ADT1
C	512	ALA	-	expression tag	UNP A0A2P1ADT1
C	513	PRO	-	expression tag	UNP A0A2P1ADT1
C	514	ARG	-	expression tag	UNP A0A2P1ADT1
C	515	ASP	-	expression tag	UNP A0A2P1ADT1
C	516	GLY	-	expression tag	UNP A0A2P1ADT1
C	517	GLN	-	expression tag	UNP A0A2P1ADT1
C	518	ALA	-	expression tag	UNP A0A2P1ADT1
C	519	TYR	-	expression tag	UNP A0A2P1ADT1
C	520	VAL	-	expression tag	UNP A0A2P1ADT1
C	521	ARG	-	expression tag	UNP A0A2P1ADT1
C	522	LYS	-	expression tag	UNP A0A2P1ADT1
C	523	ASP	-	expression tag	UNP A0A2P1ADT1
C	524	GLY	-	expression tag	UNP A0A2P1ADT1
C	525	GLU	-	expression tag	UNP A0A2P1ADT1
C	526	TRP	-	expression tag	UNP A0A2P1ADT1
C	527	VAL	-	expression tag	UNP A0A2P1ADT1
C	528	LEU	-	expression tag	UNP A0A2P1ADT1
C	529	LEU	-	expression tag	UNP A0A2P1ADT1
C	530	SER	-	expression tag	UNP A0A2P1ADT1
C	531	THR	-	expression tag	UNP A0A2P1ADT1
C	532	PHE	-	expression tag	UNP A0A2P1ADT1

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Chain	Residue	Modelled	Actual	Comment	Reference
C	533	LEU	-	expression tag	UNP A0A2P1ADT1
C	534	GLY	-	expression tag	UNP A0A2P1ADT1
C	535	SER	-	expression tag	UNP A0A2P1ADT1
C	536	GLY	-	expression tag	UNP A0A2P1ADT1
C	537	LEU	-	expression tag	UNP A0A2P1ADT1
C	538	ASN	-	expression tag	UNP A0A2P1ADT1
C	539	ASP	-	expression tag	UNP A0A2P1ADT1
C	540	ILE	-	expression tag	UNP A0A2P1ADT1
C	541	PHE	-	expression tag	UNP A0A2P1ADT1
C	542	GLU	-	expression tag	UNP A0A2P1ADT1
C	543	ALA	-	expression tag	UNP A0A2P1ADT1
C	544	GLN	-	expression tag	UNP A0A2P1ADT1
C	545	LYS	-	expression tag	UNP A0A2P1ADT1
C	546	ILE	-	expression tag	UNP A0A2P1ADT1
C	547	GLU	-	expression tag	UNP A0A2P1ADT1
C	548	TRP	-	expression tag	UNP A0A2P1ADT1
C	549	HIS	-	expression tag	UNP A0A2P1ADT1
C	550	GLU	-	expression tag	UNP A0A2P1ADT1
C	551	GLY	-	expression tag	UNP A0A2P1ADT1
C	552	HIS	-	expression tag	UNP A0A2P1ADT1
C	553	HIS	-	expression tag	UNP A0A2P1ADT1
C	554	HIS	-	expression tag	UNP A0A2P1ADT1
C	555	HIS	-	expression tag	UNP A0A2P1ADT1
C	556	HIS	-	expression tag	UNP A0A2P1ADT1
C	557	HIS	-	expression tag	UNP A0A2P1ADT1

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



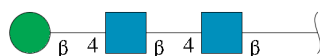
Mol	Chain	Residues	Atoms				AltConf	Trace
4	D	2	Total	C	N	O	0	0
			28	16	2	10		
4	E	2	Total	C	N	O	0	0
			28	16	2	10		
4	G	2	Total	C	N	O	0	0
			28	16	2	10		
4	I	2	Total	C	N	O	0	0
			28	16	2	10		

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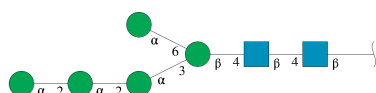
Mol	Chain	Residues	Atoms				AltConf	Trace
4	J	2	Total	C	N	O	0	0
			28	16	2	10		
4	K	2	Total	C	N	O	0	0
			28	16	2	10		
4	N	2	Total	C	N	O	0	0
			28	16	2	10		
4	O	2	Total	C	N	O	0	0
			28	16	2	10		
4	P	2	Total	C	N	O	0	0
			28	16	2	10		
4	Q	2	Total	C	N	O	0	0
			28	16	2	10		
4	S	2	Total	C	N	O	0	0
			28	16	2	10		
4	T	2	Total	C	N	O	0	0
			28	16	2	10		

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



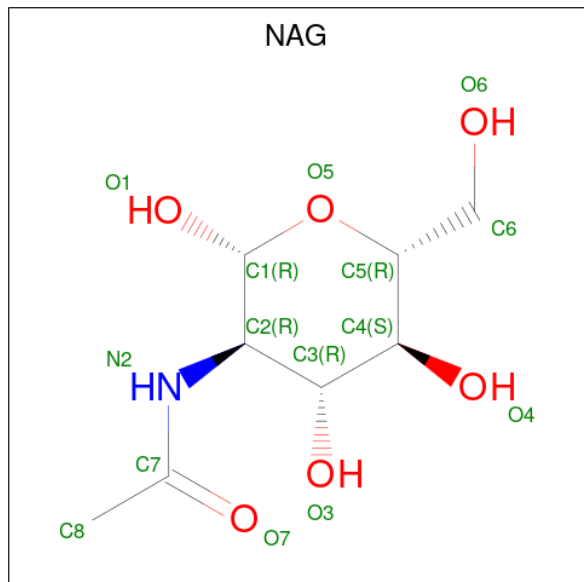
Mol	Chain	Residues	Atoms				AltConf	Trace
5	F	3	Total	C	N	O	0	0
			39	22	2	15		
5	M	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 6 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

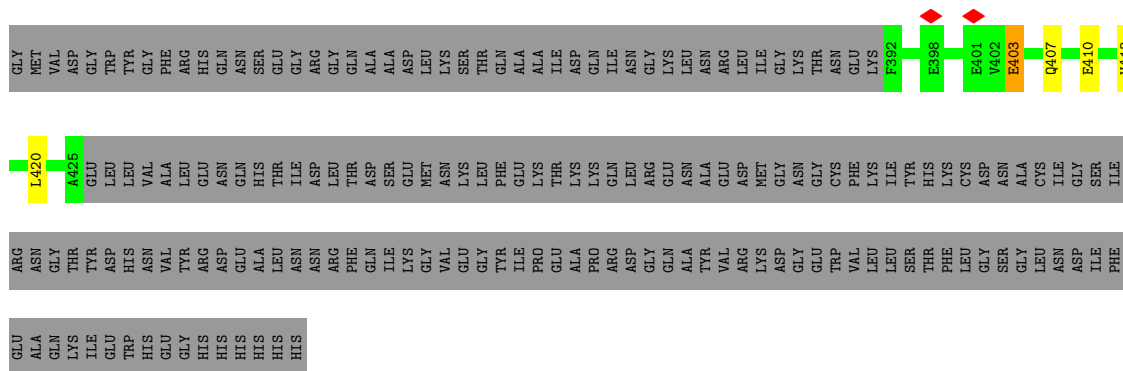


Mol	Chain	Residues	Atoms				AltConf	Trace
6	R	7	Total	C	N	O	0	0
			83	46	2	35		

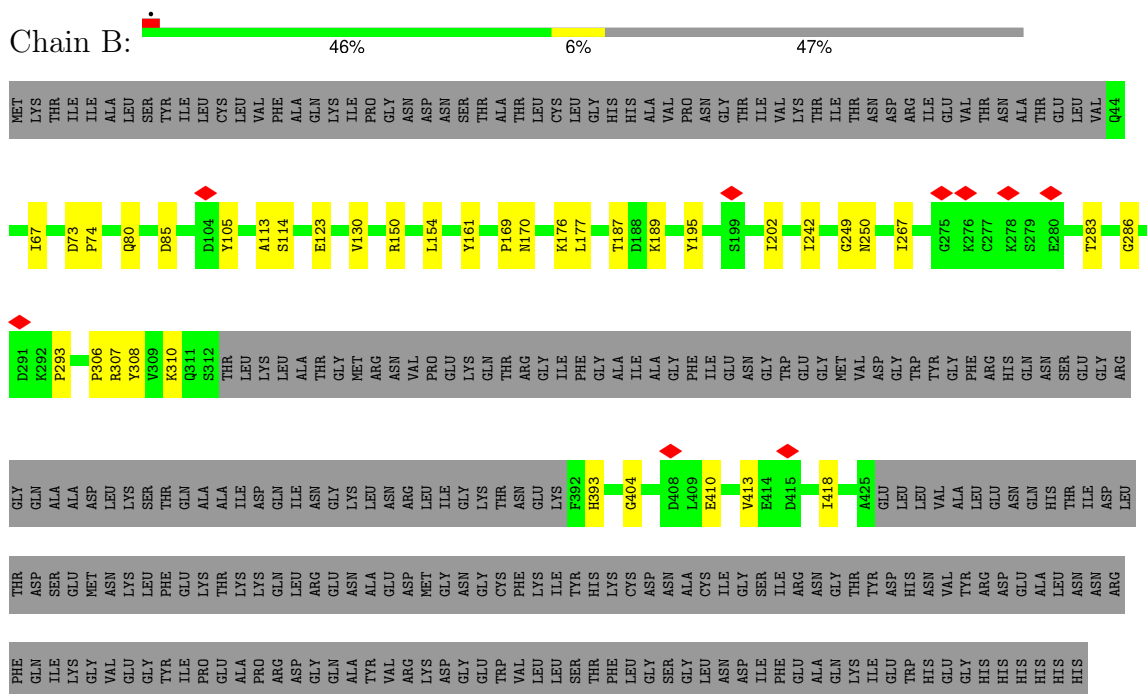
- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).



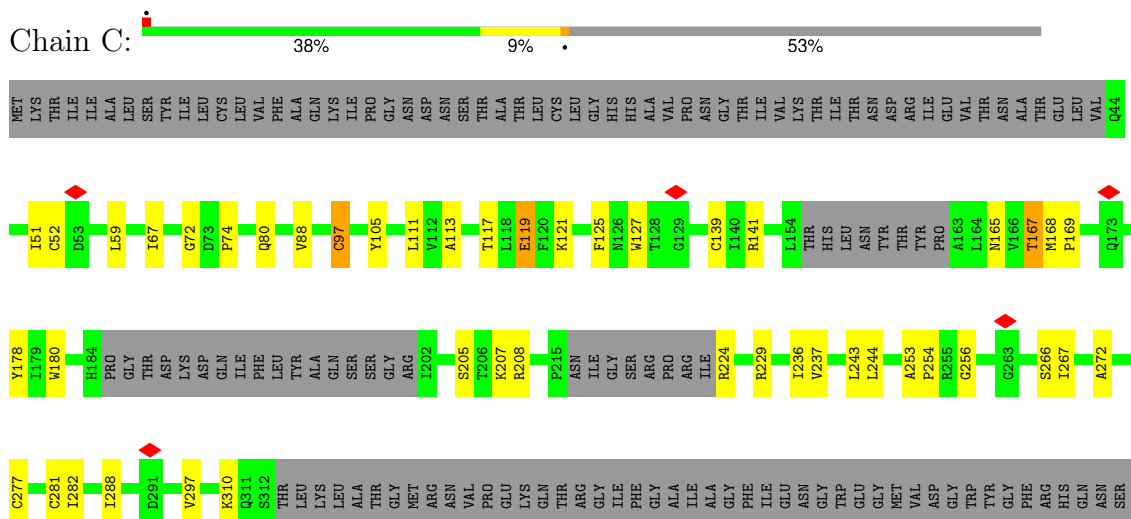
Mol	Chain	Residues	Atoms				AltConf
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	B	1	Total	C	N	O	0
			14	8	1	5	
7	B	1	Total	C	N	O	0
			14	8	1	5	
7	B	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	

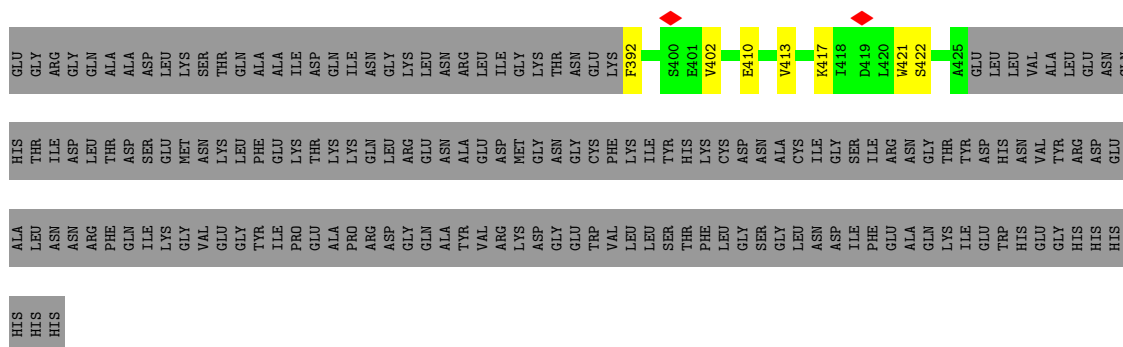


- Molecule 3: Hemagglutinin



- Molecule 3: Hemagglutinin





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



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



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

Chain S: 



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

Chain T: 



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

Chain F: 




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

Chain M: 



- Molecule 6: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain R: 



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	110663	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	57.00	Depositor
Minimum defocus (nm)	900	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	1.167	Depositor
Minimum map value	-0.838	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.018	Depositor
Recommended contour level	0.15	Depositor
Map size (\AA)	403.96802, 403.96802, 403.96802	wwPDB
Map dimensions	768, 768, 768	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.526, 0.526, 0.526	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	H	0.12	0/985	0.30	0/1339
2	L	0.11	0/814	0.32	0/1103
3	A	0.12	0/2466	0.31	0/3344
3	B	0.11	0/2466	0.30	0/3344
3	C	0.13	0/2189	0.33	0/2962
All	All	0.12	0/8920	0.31	0/12092

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	H	963	0	917	14	0
2	L	797	0	749	10	0
3	A	2408	0	2324	26	0
3	B	2408	0	2324	17	0
3	C	2142	0	2065	29	0
4	D	28	0	25	0	0
4	E	28	0	25	0	0
4	G	28	0	25	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	I	28	0	25	0	0
4	J	28	0	25	0	0
4	K	28	0	25	0	0
4	N	28	0	25	0	0
4	O	28	0	25	0	0
4	P	28	0	25	0	0
4	Q	28	0	25	0	0
4	S	28	0	25	0	0
4	T	28	0	25	1	0
5	F	39	0	34	0	0
5	M	39	0	34	0	0
6	R	83	0	70	1	0
7	A	42	0	39	0	0
7	B	42	0	39	0	0
7	C	28	0	26	0	0
All	All	9327	0	8921	91	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

All (91) 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:A:220:ARG:HE	3:A:229:ARG:HG2	1.44	0.81
3:A:107:SER:HB2	3:B:404:GLY:HA3	1.64	0.79
2:L:38:ILE:HG12	2:L:57:GLY:HA2	1.72	0.72
2:L:107:TRP:HD1	2:L:108:ASP:H	1.41	0.67
3:A:86:LEU:HD11	3:A:268:MET:HB2	1.77	0.67
3:C:51:ILE:HG12	3:C:282:ILE:HD11	1.78	0.66
2:L:41:TRP:HB2	2:L:54:MET:HB3	1.77	0.65
3:C:167:THR:HG22	3:C:244:LEU:HD13	1.79	0.64
3:A:283:THR:HG22	3:A:285:ASN:H	1.61	0.64
3:C:117:THR:HG22	3:C:119:GLU:H	1.62	0.64
1:H:110:ARG:HE	1:H:112(D):SER:HB3	1.61	0.64
2:L:107:TRP:CD1	2:L:108:ASP:H	2.16	0.63
3:A:74:PRO:HB3	3:A:141:ARG:HB2	1.81	0.62
3:A:167:THR:HG22	3:A:169:PRO:HD3	1.80	0.61
3:C:67:ILE:HG13	3:C:105:TYR:HE1	1.66	0.61
3:A:237:VAL:HG13	3:A:241:ASP:HB3	1.86	0.57
3:C:97:CYS:HB2	3:C:139:CYS:HA	1.85	0.57
1:H:36:ASP:HA	1:H:59:ASP:HB2	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:67:ILE:HD12	3:A:70:LEU:HD23	1.90	0.54
1:H:99:THR:HG23	1:H:125:THR:HA	1.90	0.54
3:C:168:MET:HE3	3:C:169:PRO:HD2	1.90	0.53
3:C:125:PHE:HZ	3:C:178:TYR:HE2	1.57	0.52
3:C:180:TRP:HB3	3:C:254:PRO:HD3	1.92	0.52
1:H:99:THR:HA	1:H:124:VAL:O	2.10	0.52
3:C:310:LYS:H	3:C:422:SER:HB2	1.76	0.51
3:C:237:VAL:HG11	3:C:243:LEU:HB2	1.92	0.51
3:A:88:VAL:HA	3:A:268:MET:HB3	1.93	0.50
3:A:84:TRP:HZ3	3:A:118:LEU:HG	1.77	0.49
3:A:292:LYS:HG2	3:A:293:PRO:HD2	1.94	0.49
2:L:21:LEU:HD21	2:L:124:LEU:HD21	1.93	0.49
2:L:24:THR:HG23	2:L:86:ASP:HB3	1.93	0.49
3:A:220:ARG:HG3	3:C:205:SER:HB2	1.94	0.49
3:A:288:ILE:HD11	3:A:297:VAL:HG11	1.95	0.48
3:B:114:SER:HB2	3:B:393:HIS:CE1	2.48	0.48
1:H:78:ILE:HG12	1:H:89:LEU:HD13	1.96	0.48
3:B:80:GLN:HE21	3:B:150:ARG:HH22	1.63	0.47
3:A:288:ILE:HG13	3:A:297:VAL:HG21	1.97	0.47
3:C:410:GLU:HA	3:C:413:VAL:HG12	1.96	0.46
2:L:79:SER:HB2	2:L:88:TYR:HB2	1.97	0.46
3:A:413:VAL:HG12	3:C:413:VAL:HG21	1.97	0.46
3:A:195:TYR:CZ	3:A:250:ASN:HA	2.51	0.46
3:B:310:LYS:HE3	3:B:418:ILE:HG21	1.97	0.46
1:H:53:MET:HE1	1:H:102:TYR:HE2	1.81	0.46
3:B:73:ASP:OD1	3:B:74:PRO:HD2	2.16	0.46
3:B:195:TYR:CZ	3:B:250:ASN:HA	2.52	0.45
1:H:53:MET:HE1	1:H:102:TYR:CE2	2.52	0.45
3:B:293:PRO:C	3:B:306:PRO:HB3	2.41	0.45
3:C:165:ASN:OD1	3:C:244:LEU:HD11	2.16	0.45
1:H:2:VAL:HG23	1:H:27:GLY:HA3	1.99	0.45
2:L:107:TRP:HB3	2:L:115:LYS:O	2.16	0.45
3:A:407:GLN:HA	3:A:410:GLU:HG2	1.97	0.45
3:C:297:VAL:HG13	4:T:1:NAG:H82	1.99	0.44
1:H:29:THR:HG22	6:R:4:MAN:H61	1.98	0.44
1:H:110:ARG:NE	1:H:112(D):SER:HB3	2.32	0.44
3:B:130:VAL:HG21	3:B:154:LEU:HD23	1.99	0.44
1:H:113:PHE:CD2	2:L:108:ASP:HB2	2.53	0.44
3:B:67:ILE:HG13	3:B:105:TYR:CE1	2.53	0.44
3:C:67:ILE:HG13	3:C:105:TYR:CE1	2.51	0.43
3:B:113:ALA:HB1	3:B:267:ILE:HB	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:72:GLY:HA2	3:C:80:GLN:HE22	1.83	0.43
3:B:161:TYR:CE1	3:B:249:GLY:HA2	2.53	0.43
3:B:308:TYR:HE1	3:B:310:LYS:HD3	1.84	0.43
3:A:123:GLU:HB2	3:A:256:GLY:HA2	2.02	0.42
3:A:70:LEU:HD22	3:A:112:VAL:HG21	2.00	0.42
3:C:121:LYS:O	3:C:256:GLY:HA3	2.20	0.42
3:A:111:LEU:HD11	3:A:236:ILE:HD11	2.02	0.42
3:A:403:GLU:HG2	3:A:407:GLN:HE21	1.85	0.42
3:C:127:TRP:CZ2	3:C:253:ALA:HB1	2.54	0.42
3:C:266:SER:HB2	3:C:392:PHE:O	2.19	0.42
3:A:267:ILE:HD12	3:A:267:ILE:HA	1.94	0.42
3:B:170:ASN:CG	3:B:176:LYS:HD2	2.44	0.42
3:B:410:GLU:HA	3:B:413:VAL:HG22	2.02	0.42
3:C:281:CYS:HB2	3:C:288:ILE:O	2.20	0.42
3:C:59:LEU:O	3:C:88:VAL:HG22	2.20	0.41
3:C:417:LYS:HG3	3:C:421:TRP:HD1	1.85	0.41
1:H:44:GLN:O	1:H:100:ALA:HB1	2.20	0.41
3:C:51:ILE:HG13	3:C:272:ALA:HB3	2.01	0.41
3:A:268:MET:HE1	3:A:284:PRO:HD3	2.02	0.41
1:H:118:TRP:CD1	2:L:50:PRO:HB2	2.55	0.41
3:B:187:THR:HG22	3:B:189:LYS:H	1.86	0.41
3:B:283:THR:HB	3:B:286:GLY:O	2.20	0.41
3:C:111:LEU:HD11	3:C:236:ILE:HD11	2.02	0.41
3:C:121:LYS:HA	3:C:121:LYS:HD2	1.92	0.41
3:A:201:ARG:NH2	4:G:1:NAG:H83	2.36	0.41
3:C:113:ALA:HB1	3:C:267:ILE:HB	2.02	0.40
3:A:237:VAL:HG21	3:A:243:LEU:HB2	2.02	0.40
3:C:207:LYS:HB3	3:C:208:ARG:NH1	2.35	0.40
1:H:6:GLN:HG2	1:H:23:CYS:SG	2.61	0.40
3:B:169:PRO:HB3	3:B:242:ILE:HG12	2.04	0.40
3:C:74:PRO:HB3	3:C:141:ARG:HB2	2.04	0.40
3:A:177:LEU:HD11	3:A:234:TRP:HB2	2.02	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	H	124/127 (98%)	112 (90%)	12 (10%)	0	100	100
2	L	105/110 (96%)	101 (96%)	4 (4%)	0	100	100
3	A	299/573 (52%)	293 (98%)	6 (2%)	0	100	100
3	B	299/573 (52%)	290 (97%)	9 (3%)	0	100	100
3	C	260/573 (45%)	252 (97%)	8 (3%)	0	100	100
All	All	1087/1956 (56%)	1048 (96%)	39 (4%)	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	H	103/104 (99%)	103 (100%)	0	100	100
2	L	87/90 (97%)	86 (99%)	1 (1%)	70	83
3	A	271/496 (55%)	265 (98%)	6 (2%)	47	71
3	B	271/496 (55%)	266 (98%)	5 (2%)	54	75
3	C	242/496 (49%)	234 (97%)	8 (3%)	33	62
All	All	974/1682 (58%)	954 (98%)	20 (2%)	49	72

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	L	53	LEU
3	A	88	VAL
3	A	140	ILE
3	A	214	ILE
3	A	223	ILE
3	A	403	GLU

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Mol	Chain	Res	Type
3	A	420	LEU
3	B	85	ASP
3	B	123	GLU
3	B	177	LEU
3	B	202	ILE
3	B	307	ARG
3	C	52	CYS
3	C	97	CYS
3	C	119	GLU
3	C	167	THR
3	C	224	ARG
3	C	229	ARG
3	C	277	CYS
3	C	402	VAL

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

Mol	Chain	Res	Type
3	A	394	GLN
3	A	407	GLN
3	B	394	GLN
3	C	56	HIS
3	C	171	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](#)

37 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	$\# Z > 2$
4	NAG	D	1	4,3	14,14,15	0.74	0	17,19,21	1.02	1 (5%)
4	NAG	D	2	4	14,14,15	0.70	0	17,19,21	0.79	0
4	NAG	E	1	4,3	14,14,15	0.70	0	17,19,21	0.92	1 (5%)
4	NAG	E	2	4	14,14,15	0.71	0	17,19,21	0.82	0
5	NAG	F	1	3,5	14,14,15	0.67	0	17,19,21	1.27	1 (5%)
5	NAG	F	2	5	14,14,15	0.79	0	17,19,21	1.48	3 (17%)
5	BMA	F	3	5	11,11,12	0.93	0	15,15,17	2.98	7 (46%)
4	NAG	G	1	4,3	14,14,15	0.69	0	17,19,21	0.91	1 (5%)
4	NAG	G	2	4	14,14,15	0.73	0	17,19,21	0.92	1 (5%)
4	NAG	I	1	4,3	14,14,15	0.73	0	17,19,21	0.91	1 (5%)
4	NAG	I	2	4	14,14,15	0.72	0	17,19,21	0.83	0
4	NAG	J	1	4,3	14,14,15	0.76	0	17,19,21	0.90	1 (5%)
4	NAG	J	2	4	14,14,15	0.71	0	17,19,21	0.76	0
4	NAG	K	1	4,3	14,14,15	0.69	0	17,19,21	0.82	0
4	NAG	K	2	4	14,14,15	0.72	0	17,19,21	0.84	0
5	NAG	M	1	3,5	14,14,15	0.67	0	17,19,21	1.06	2 (11%)
5	NAG	M	2	5	14,14,15	0.72	0	17,19,21	0.92	0
5	BMA	M	3	5	11,11,12	0.94	0	15,15,17	2.87	7 (46%)
4	NAG	N	1	4,3	14,14,15	0.71	0	17,19,21	0.80	0
4	NAG	N	2	4	14,14,15	0.73	0	17,19,21	0.84	0
4	NAG	O	1	4,3	14,14,15	0.74	0	17,19,21	0.81	0
4	NAG	O	2	4	14,14,15	0.70	0	17,19,21	0.82	0
4	NAG	P	1	4,3	14,14,15	0.75	0	17,19,21	1.03	2 (11%)
4	NAG	P	2	4	14,14,15	0.70	0	17,19,21	0.81	0
4	NAG	Q	1	4,3	14,14,15	0.75	0	17,19,21	0.93	1 (5%)
4	NAG	Q	2	4	14,14,15	0.71	0	17,19,21	0.78	0
6	NAG	R	1	3,6	14,14,15	0.70	0	17,19,21	1.03	1 (5%)
6	NAG	R	2	6	14,14,15	0.77	0	17,19,21	1.01	2 (11%)
6	BMA	R	3	6	11,11,12	0.84	0	15,15,17	2.69	6 (40%)
6	MAN	R	4	6	11,11,12	0.63	0	15,15,17	1.82	1 (6%)
6	MAN	R	5	6	11,11,12	0.61	0	15,15,17	1.63	1 (6%)
6	MAN	R	6	6	11,11,12	0.70	0	15,15,17	1.27	1 (6%)
6	MAN	R	7	6	11,11,12	0.71	0	15,15,17	1.20	1 (6%)
4	NAG	S	1	4,3	14,14,15	0.83	0	17,19,21	0.94	1 (5%)
4	NAG	S	2	4	14,14,15	0.73	0	17,19,21	0.89	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	NAG	T	1	4,3	14,14,15	0.73	0	17,19,21	0.89	1 (5%)
4	NAG	T	2	4	14,14,15	0.74	0	17,19,21	0.88	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
4	NAG	D	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	D	2	4	-	0/6/23/26	0/1/1/1
4	NAG	E	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	E	2	4	-	0/6/23/26	0/1/1/1
5	NAG	F	1	3,5	-	0/6/23/26	0/1/1/1
5	NAG	F	2	5	-	4/6/23/26	0/1/1/1
5	BMA	F	3	5	-	1/2/19/22	0/1/1/1
4	NAG	G	1	4,3	-	1/6/23/26	0/1/1/1
4	NAG	G	2	4	-	0/6/23/26	0/1/1/1
4	NAG	I	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	I	2	4	-	0/6/23/26	0/1/1/1
4	NAG	J	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	J	2	4	-	0/6/23/26	0/1/1/1
4	NAG	K	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	K	2	4	-	0/6/23/26	0/1/1/1
5	NAG	M	1	3,5	-	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	-	2/2/19/22	0/1/1/1
4	NAG	N	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	N	2	4	-	0/6/23/26	0/1/1/1
4	NAG	O	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	O	2	4	-	0/6/23/26	0/1/1/1
4	NAG	P	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	P	2	4	-	0/6/23/26	0/1/1/1
4	NAG	Q	1	4,3	-	1/6/23/26	0/1/1/1
4	NAG	Q	2	4	-	0/6/23/26	0/1/1/1
6	NAG	R	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	R	2	6	-	0/6/23/26	0/1/1/1
6	BMA	R	3	6	-	2/2/19/22	0/1/1/1
6	MAN	R	4	6	-	2/2/19/22	0/1/1/1
6	MAN	R	5	6	-	2/2/19/22	0/1/1/1
6	MAN	R	6	6	-	0/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	MAN	R	7	6	-	0/2/19/22	0/1/1/1
4	NAG	S	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	S	2	4	-	0/6/23/26	0/1/1/1
4	NAG	T	1	4,3	-	0/6/23/26	0/1/1/1
4	NAG	T	2	4	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (44) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	R	3	BMA	C1-O5-C5	8.42	123.47	112.19
5	F	3	BMA	C1-O5-C5	8.34	123.36	112.19
5	M	3	BMA	C1-O5-C5	8.05	122.97	112.19
6	R	4	MAN	C1-O5-C5	6.09	120.35	112.19
6	R	5	MAN	C1-O5-C5	4.54	118.27	112.19
5	F	3	BMA	C3-C4-C5	4.27	117.98	110.23
5	M	3	BMA	C3-C4-C5	4.13	117.73	110.23
6	R	6	MAN	C1-O5-C5	4.01	117.57	112.19
5	F	2	NAG	C2-N2-C7	3.88	128.10	122.90
5	F	1	NAG	O5-C1-C2	-3.79	105.43	111.29
6	R	7	MAN	C1-O5-C5	3.40	116.74	112.19
5	M	3	BMA	C2-C3-C4	3.20	116.48	110.86
5	F	2	NAG	C1-C2-N2	-3.01	105.69	110.43
5	F	3	BMA	C2-C3-C4	2.90	115.97	110.86
5	F	3	BMA	O5-C5-C4	2.90	117.87	110.83
5	F	3	BMA	C1-C2-C3	2.88	113.83	109.64
6	R	3	BMA	C3-C4-C5	2.79	115.30	110.23
4	S	1	NAG	O5-C1-C2	-2.74	107.05	111.29
5	M	3	BMA	C1-C2-C3	2.74	113.63	109.64
5	M	1	NAG	O5-C1-C2	-2.70	107.11	111.29
6	R	3	BMA	O4-C4-C3	-2.60	104.24	110.38
6	R	3	BMA	C2-C3-C4	2.58	115.39	110.86
5	F	3	BMA	O3-C3-C2	-2.58	104.80	110.05
6	R	1	NAG	O5-C1-C2	-2.52	107.39	111.29
4	G	1	NAG	O5-C1-C2	-2.51	107.41	111.29
5	M	3	BMA	O5-C5-C4	2.51	116.93	110.83
4	Q	1	NAG	O5-C1-C2	-2.49	107.43	111.29
5	M	3	BMA	O3-C3-C2	-2.49	104.97	110.05
4	P	1	NAG	O4-C4-C3	-2.36	104.81	110.38
4	D	1	NAG	O4-C4-C3	-2.34	104.86	110.38
5	M	3	BMA	O4-C4-C3	-2.34	104.86	110.38
4	T	1	NAG	O5-C1-C2	-2.30	107.73	111.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	I	1	NAG	O5-C1-C2	-2.29	107.74	111.29
6	R	3	BMA	O5-C5-C4	2.26	116.31	110.83
5	F	3	BMA	O4-C4-C3	-2.24	105.09	110.38
6	R	2	NAG	O5-C1-C2	-2.22	107.86	111.29
4	G	2	NAG	C1-O5-C5	2.14	115.06	112.19
4	P	1	NAG	O5-C1-C2	-2.14	107.98	111.29
5	F	2	NAG	O4-C4-C3	-2.13	105.36	110.38
4	J	1	NAG	O4-C4-C3	-2.12	105.39	110.38
4	E	1	NAG	O5-C1-C2	-2.10	108.05	111.29
6	R	3	BMA	O3-C3-C2	-2.09	105.78	110.05
6	R	2	NAG	C2-N2-C7	2.08	125.69	122.90
5	M	1	NAG	O4-C4-C3	-2.00	105.66	110.38

There are no chirality outliers.

All (15) torsion outliers are listed below:

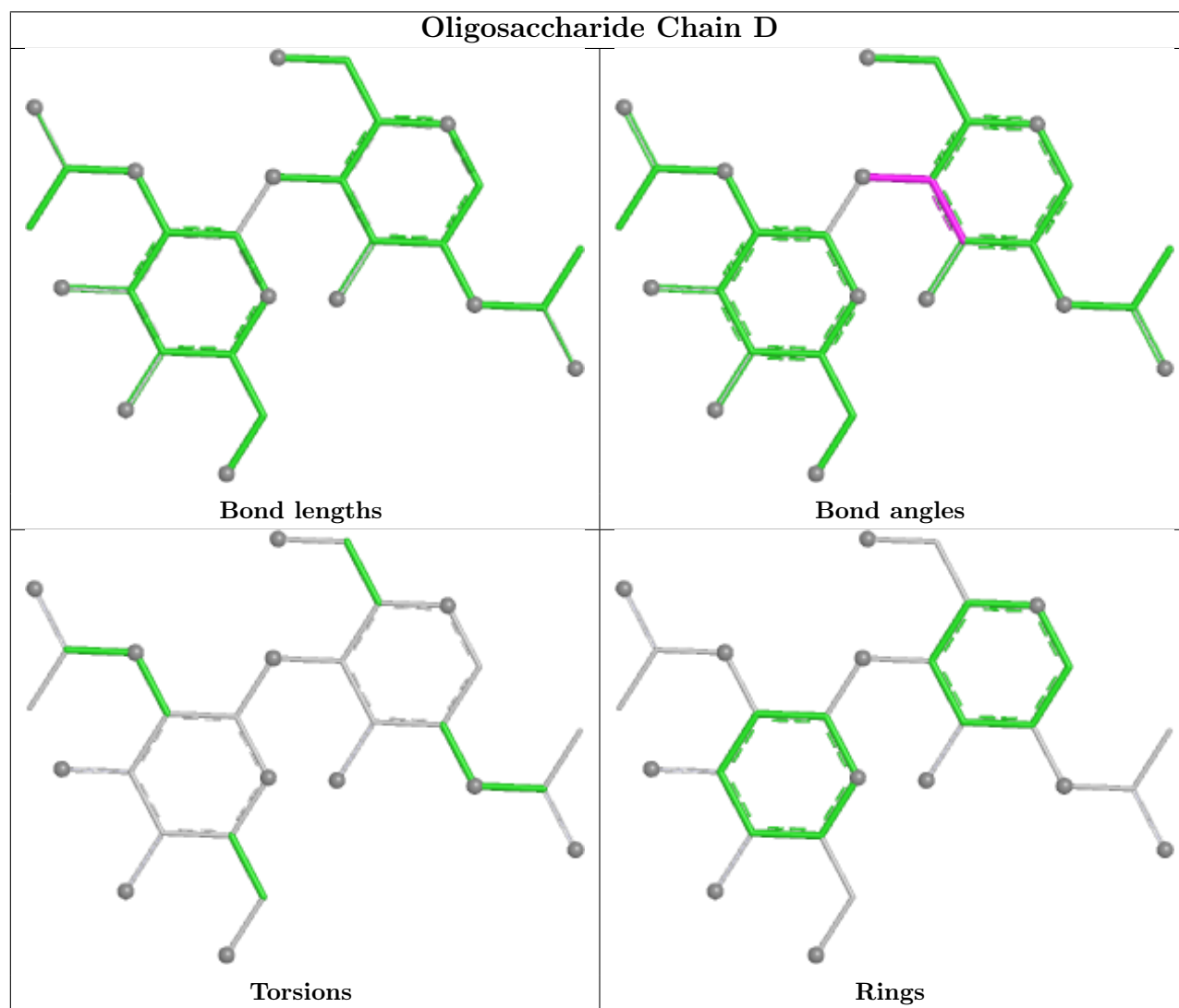
Mol	Chain	Res	Type	Atoms
5	M	3	BMA	O5-C5-C6-O6
6	R	4	MAN	O5-C5-C6-O6
5	F	3	BMA	O5-C5-C6-O6
5	F	2	NAG	C8-C7-N2-C2
5	F	2	NAG	O7-C7-N2-C2
5	F	2	NAG	O5-C5-C6-O6
6	R	3	BMA	O5-C5-C6-O6
6	R	4	MAN	C4-C5-C6-O6
6	R	5	MAN	C4-C5-C6-O6
6	R	5	MAN	O5-C5-C6-O6
4	G	1	NAG	O5-C5-C6-O6
6	R	3	BMA	C4-C5-C6-O6
5	M	3	BMA	C4-C5-C6-O6
4	Q	1	NAG	O5-C5-C6-O6
5	F	2	NAG	C4-C5-C6-O6

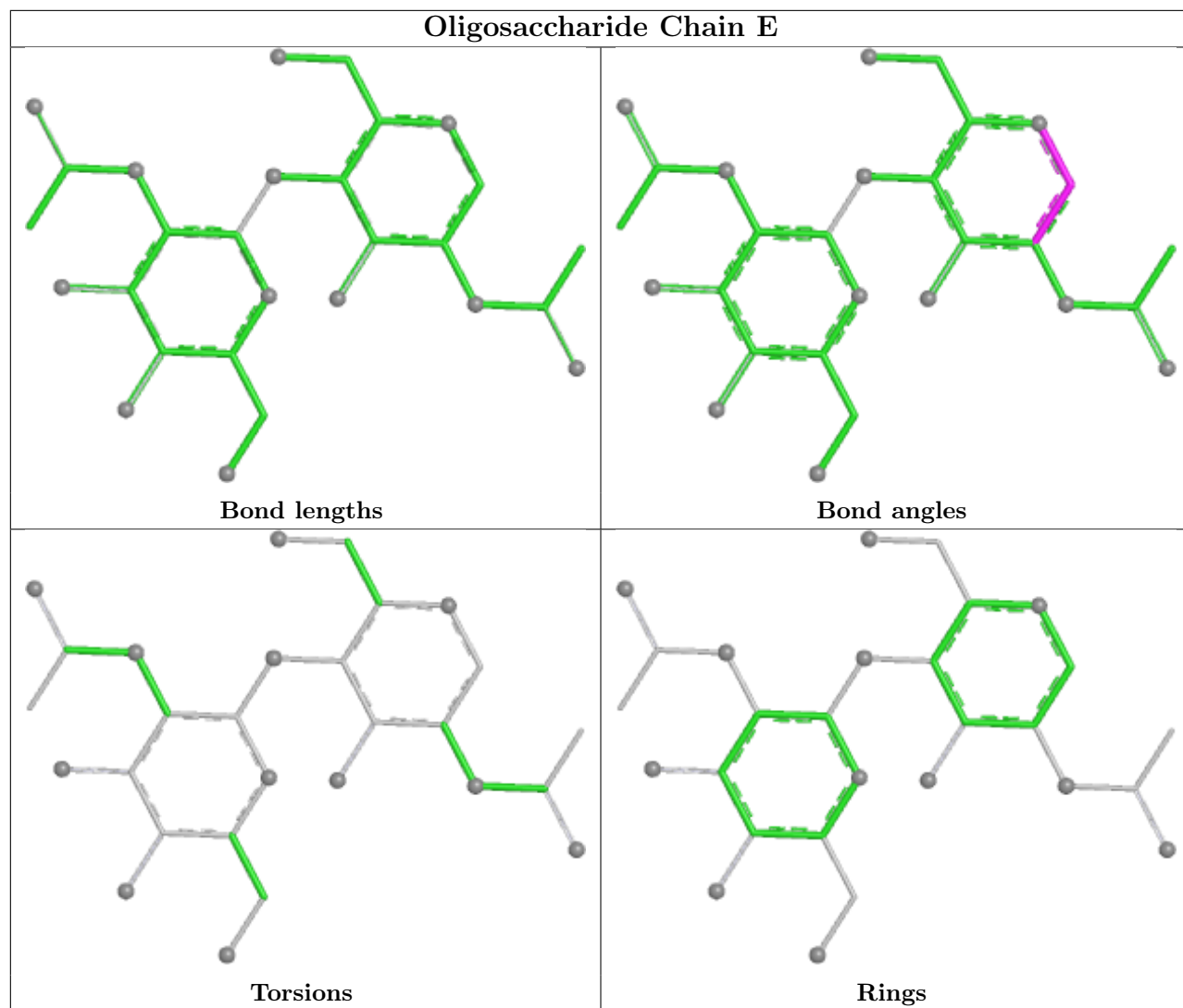
There are no ring outliers.

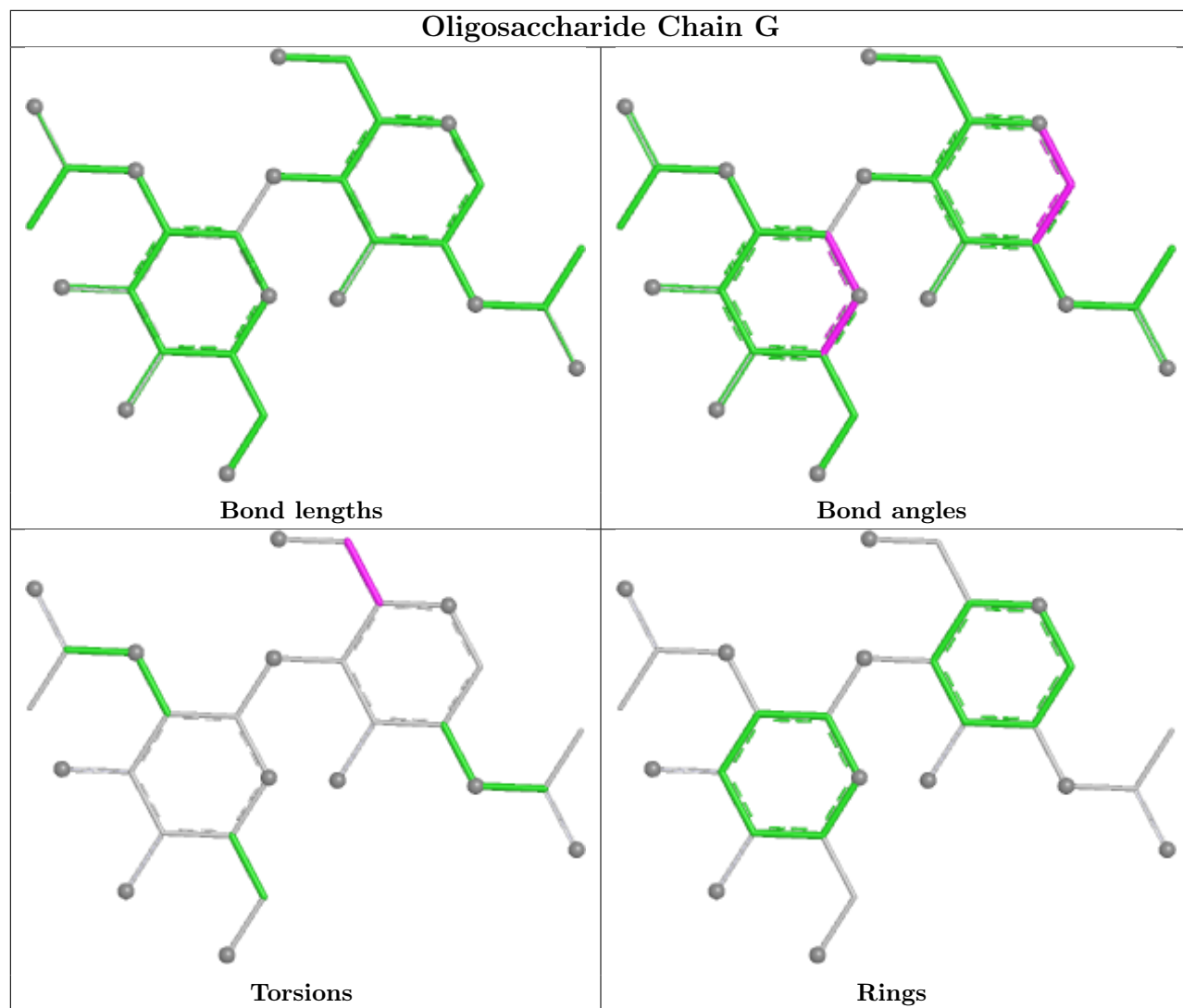
3 monomers are involved in 3 short contacts:

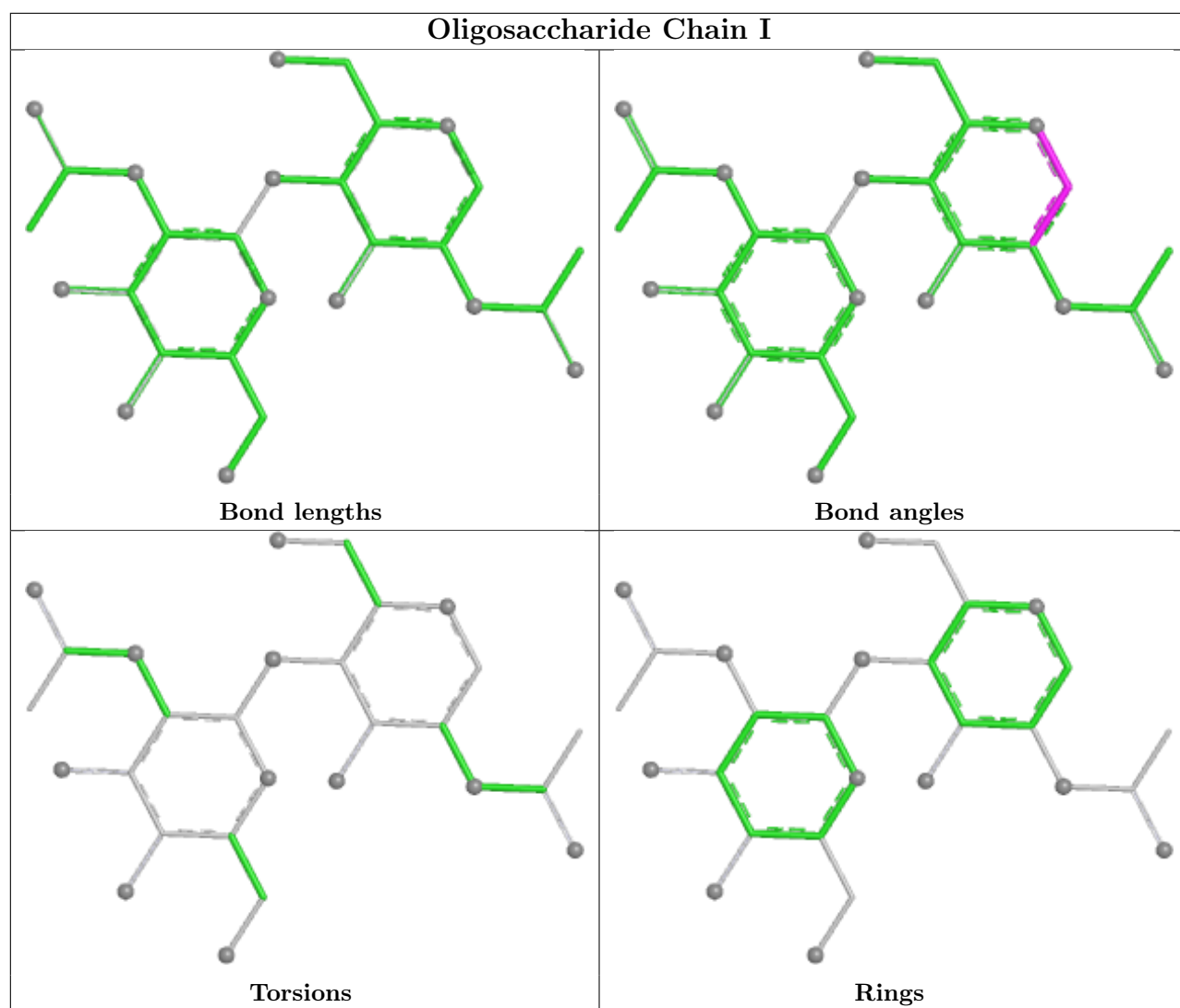
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	T	1	NAG	1	0
6	R	4	MAN	1	0
4	G	1	NAG	1	0

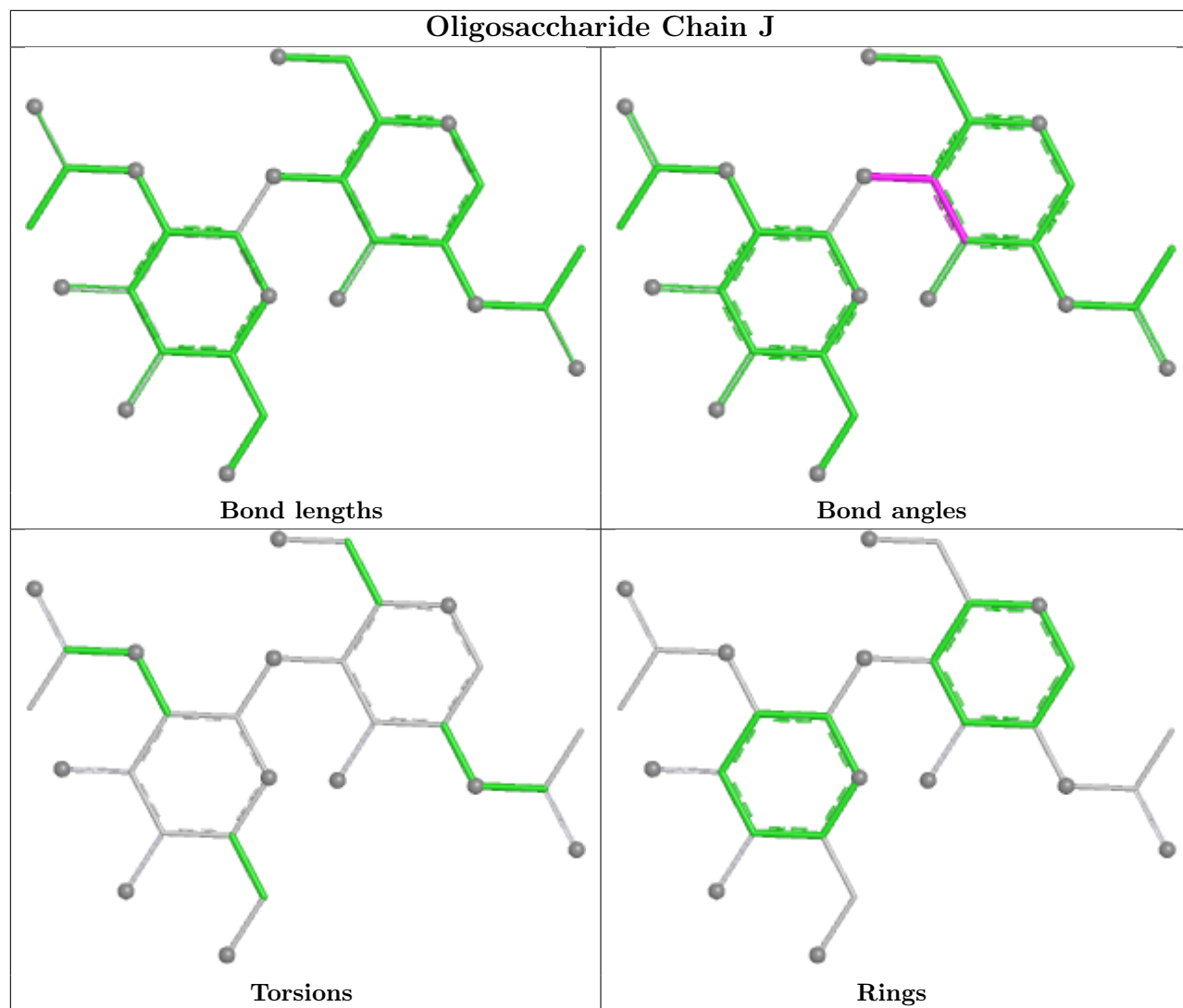
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

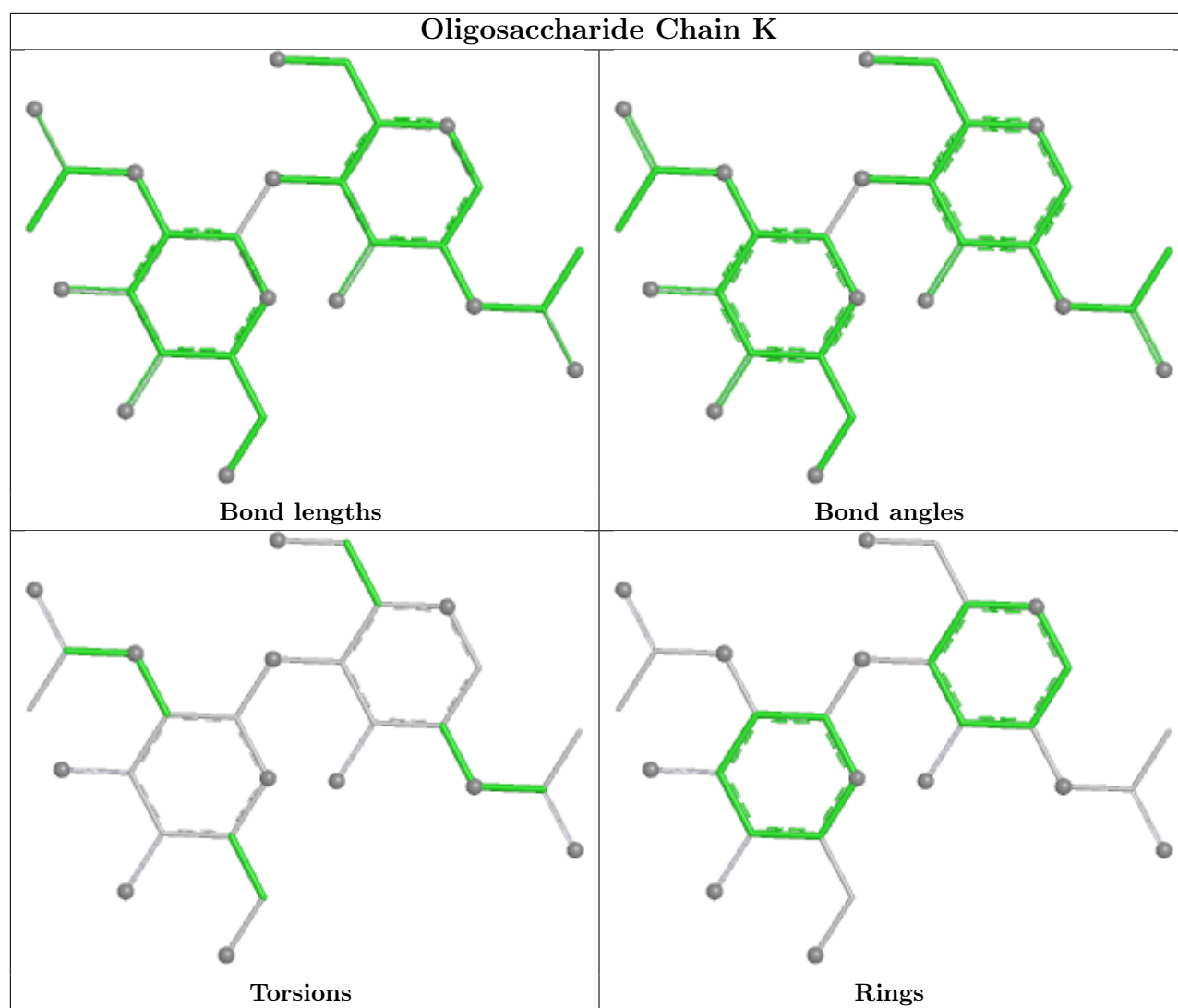


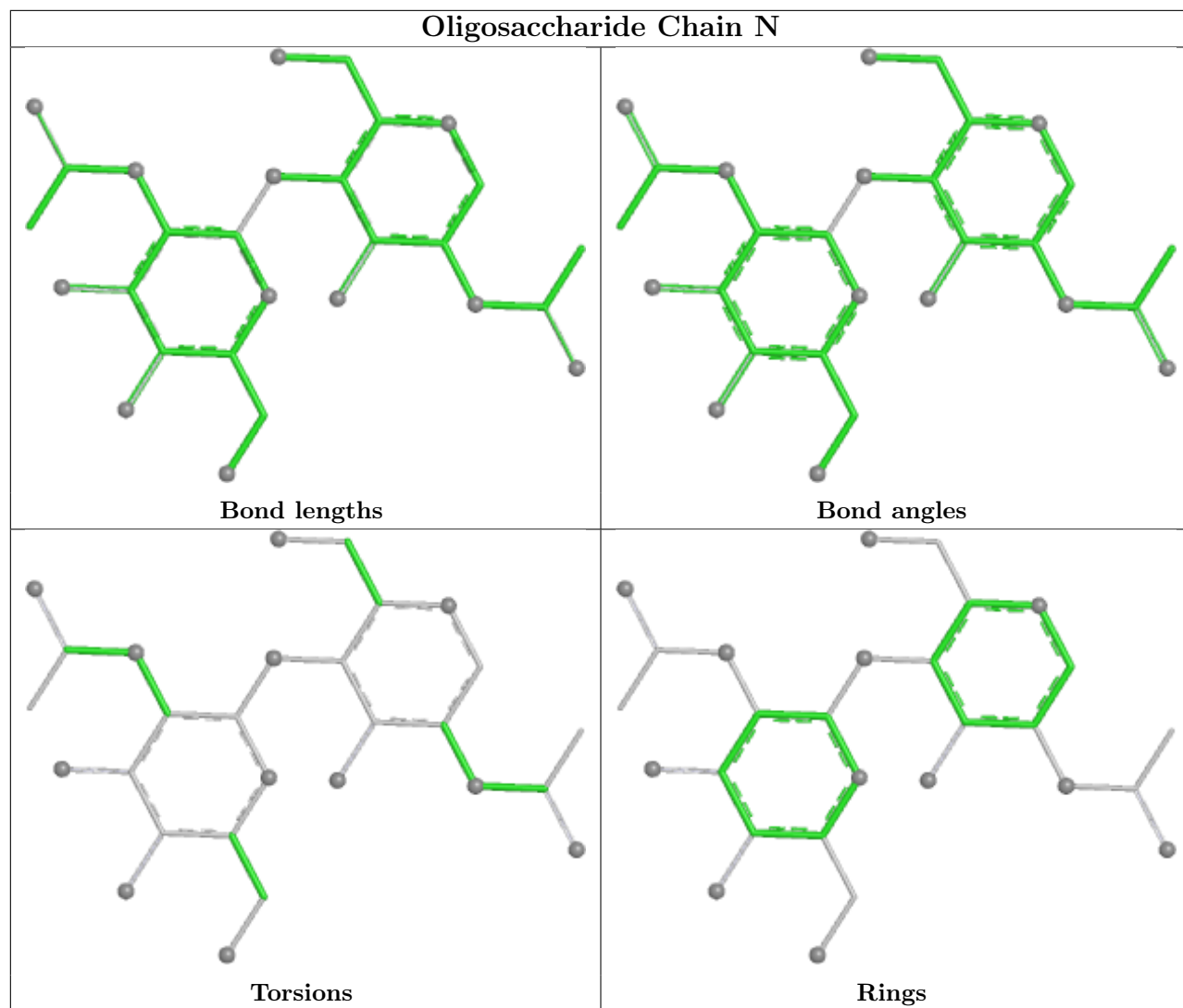


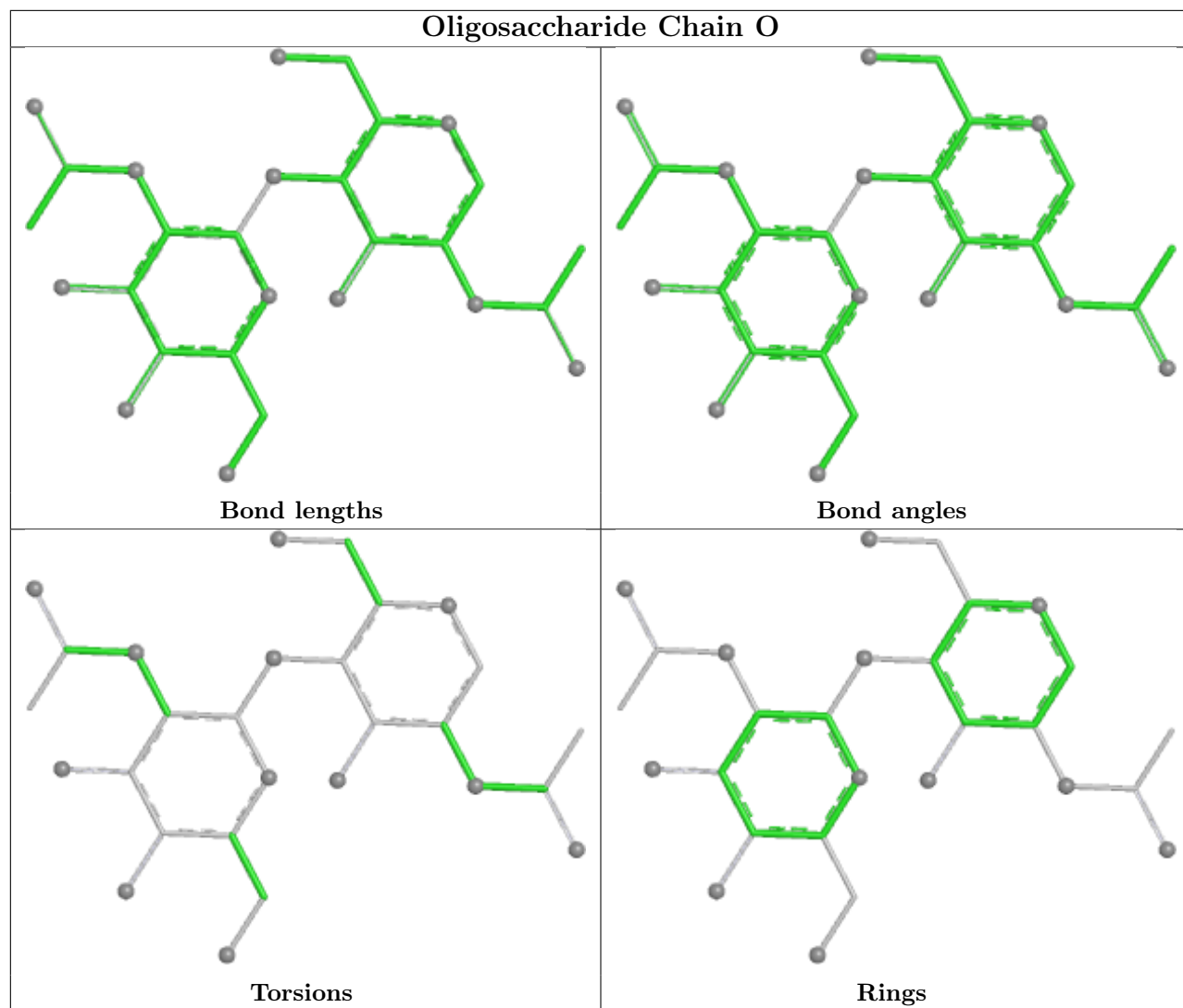


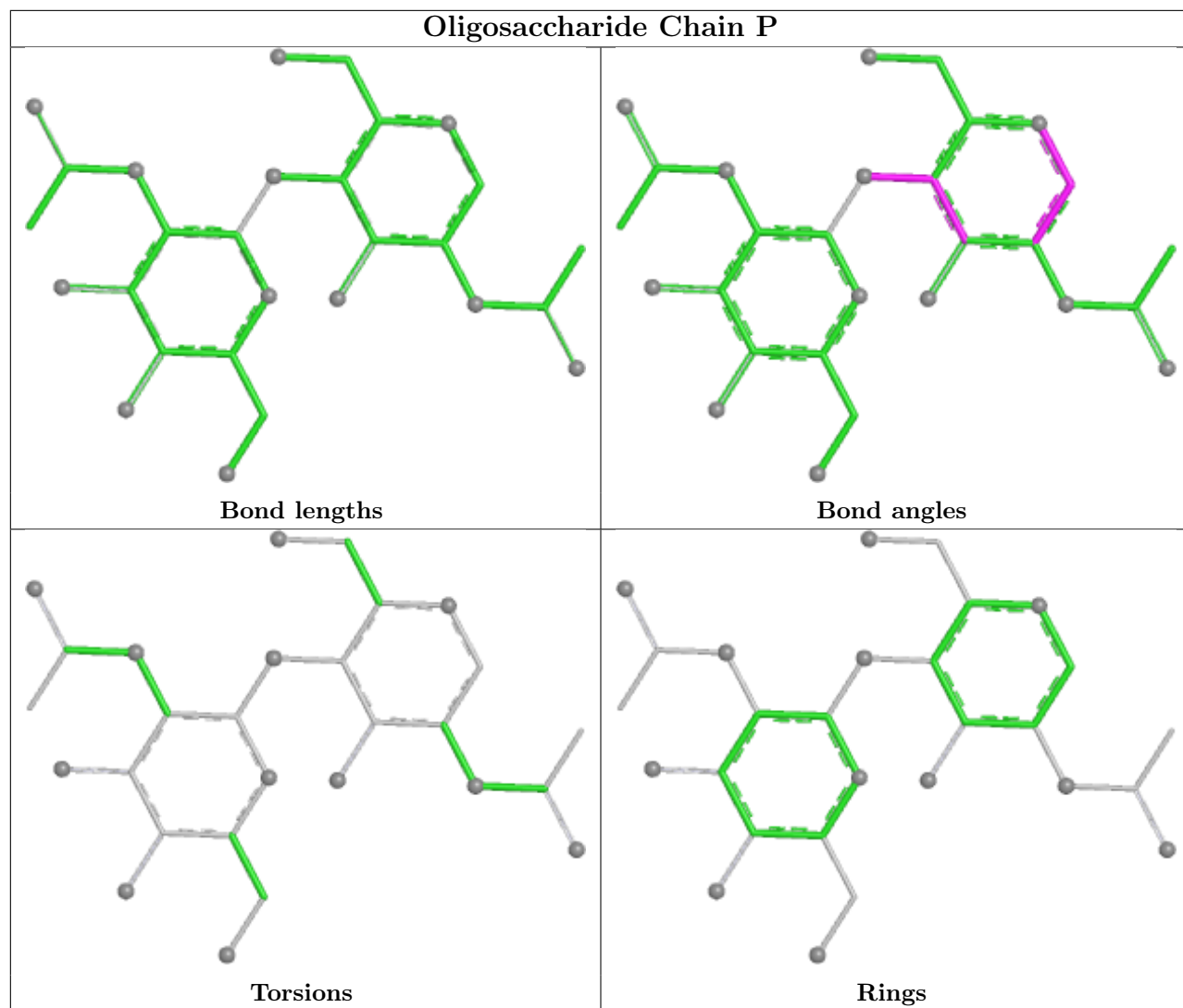


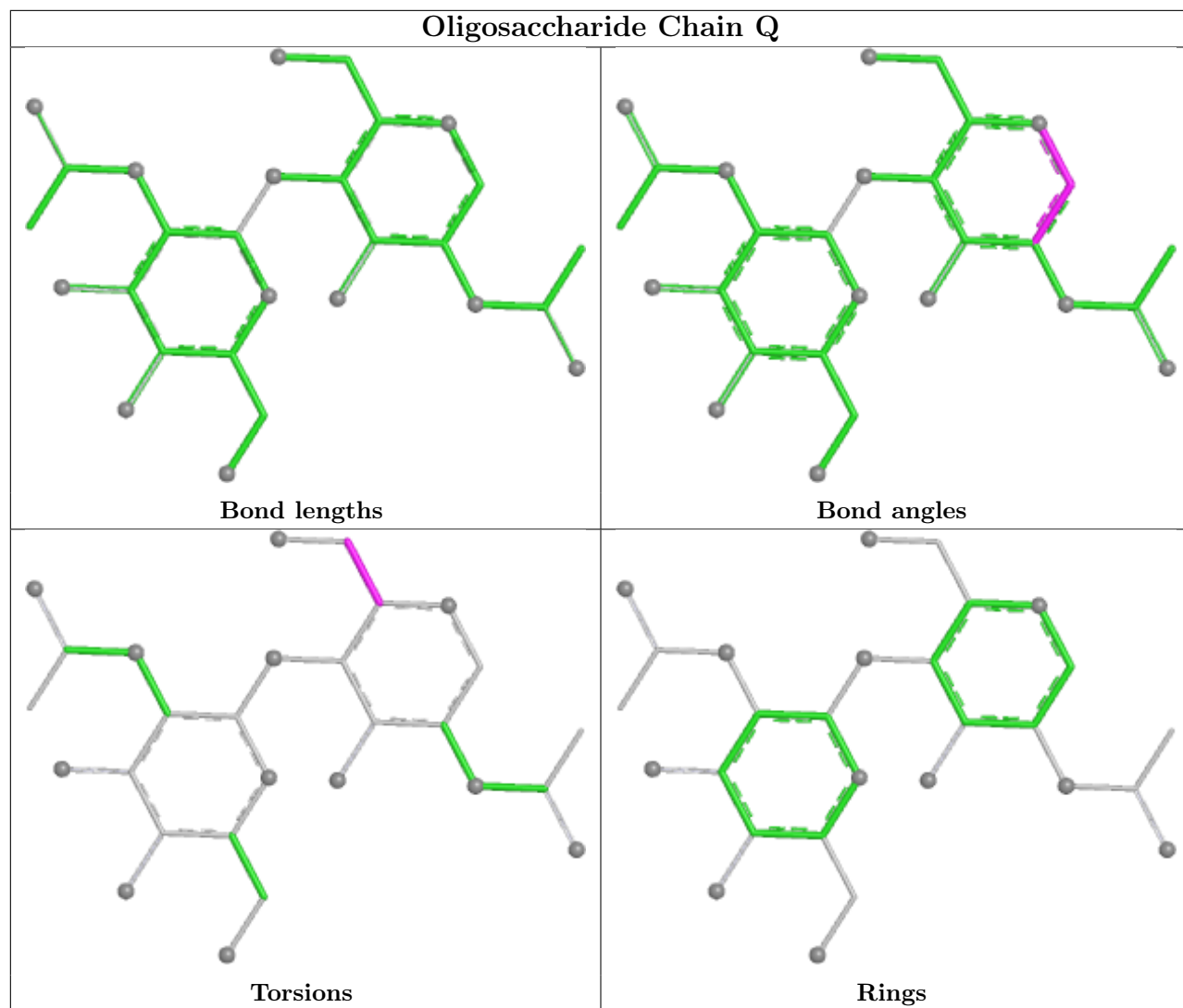


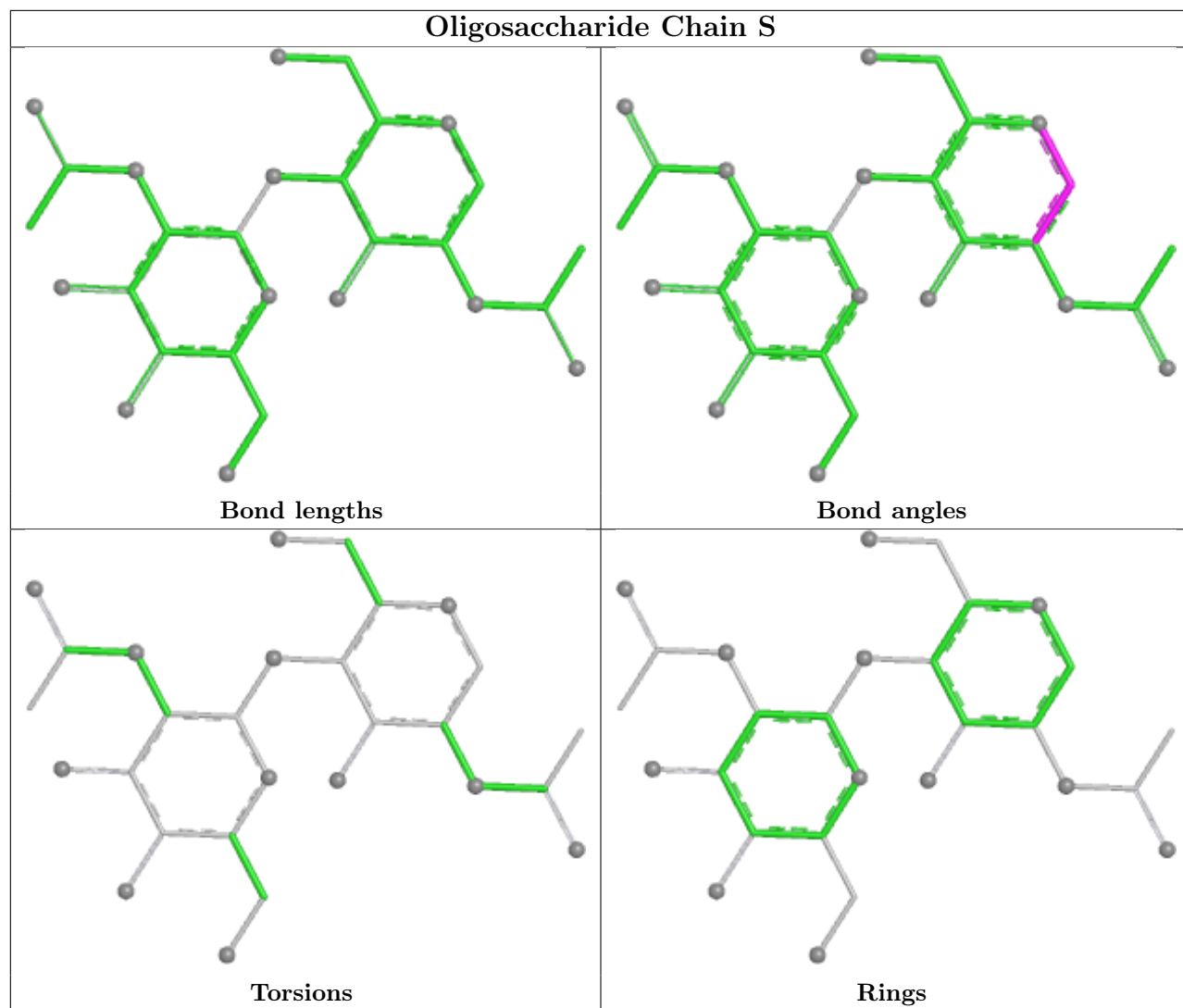


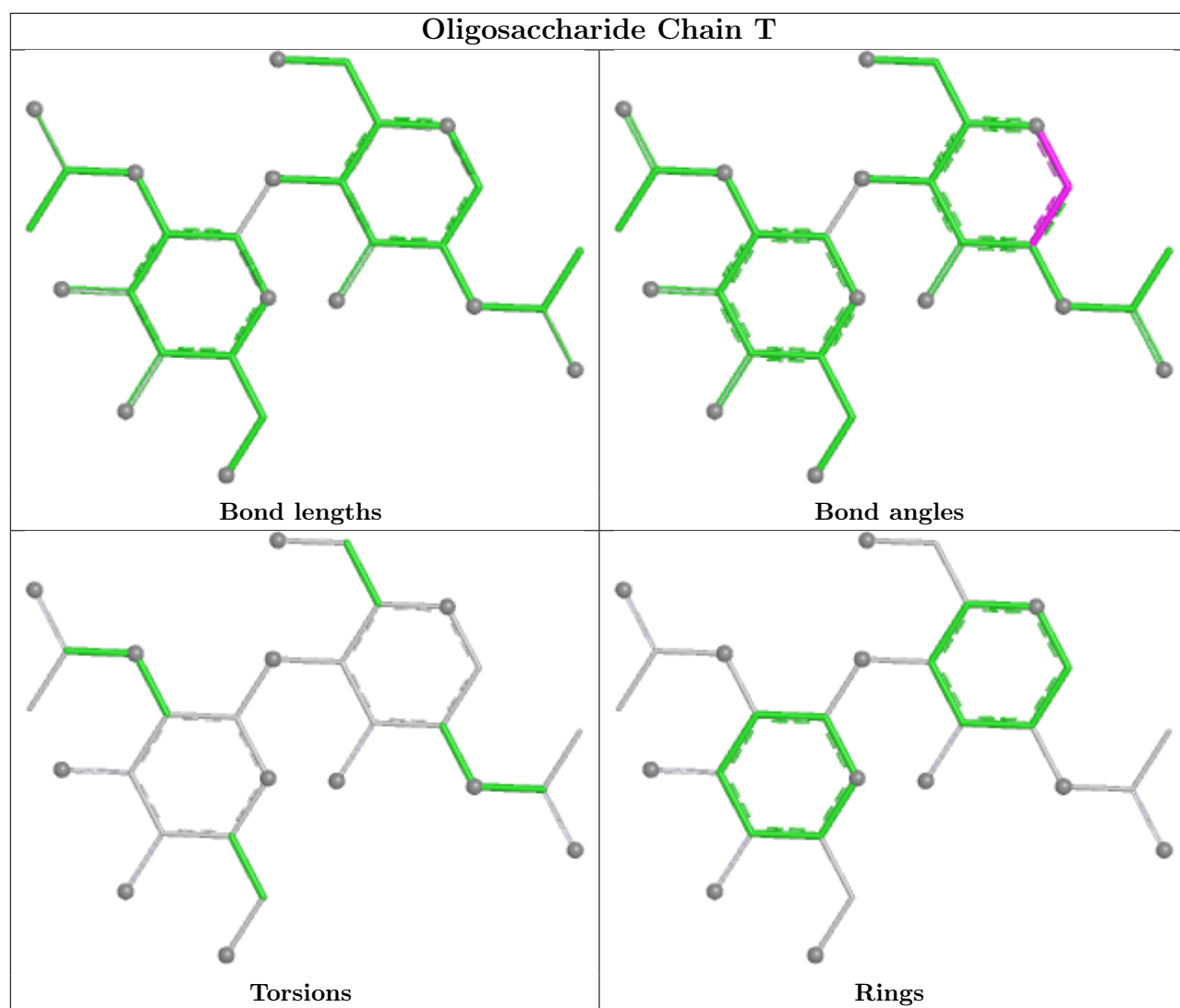


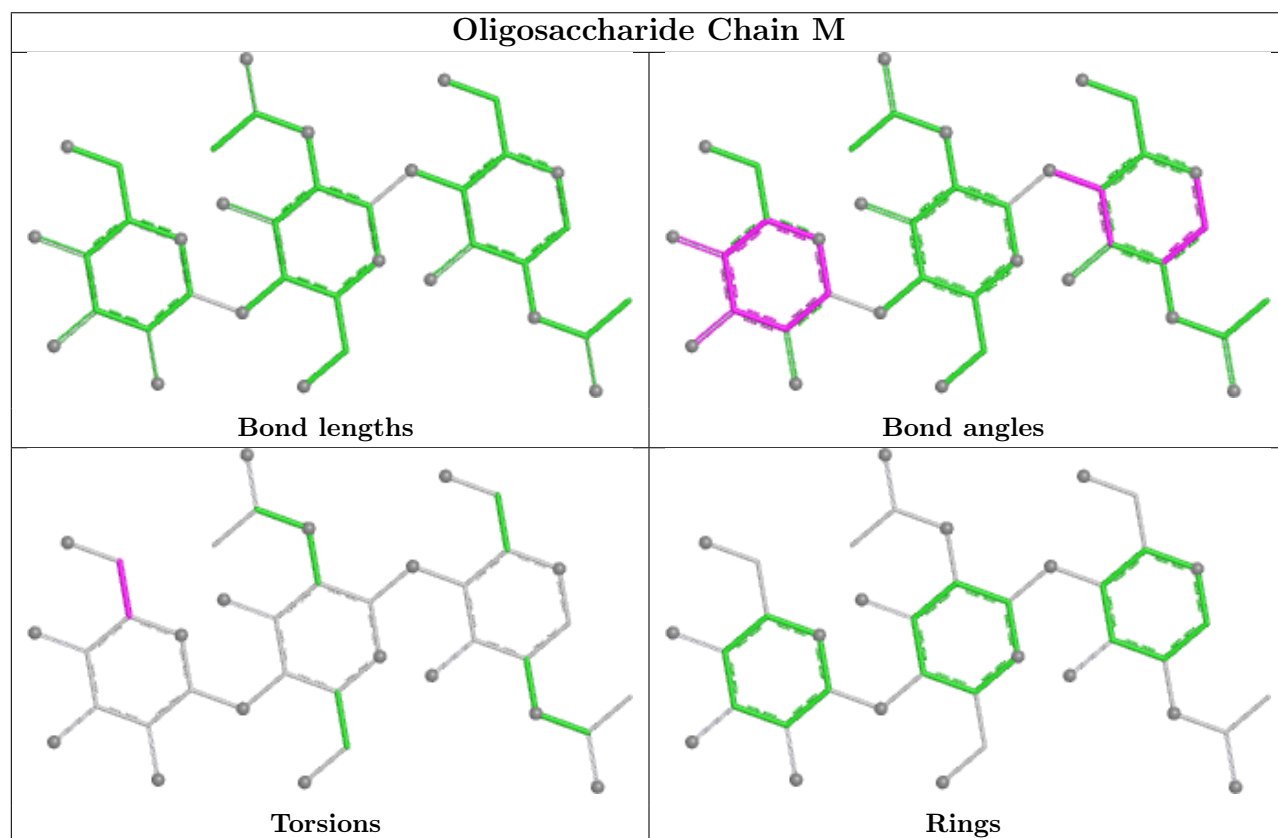
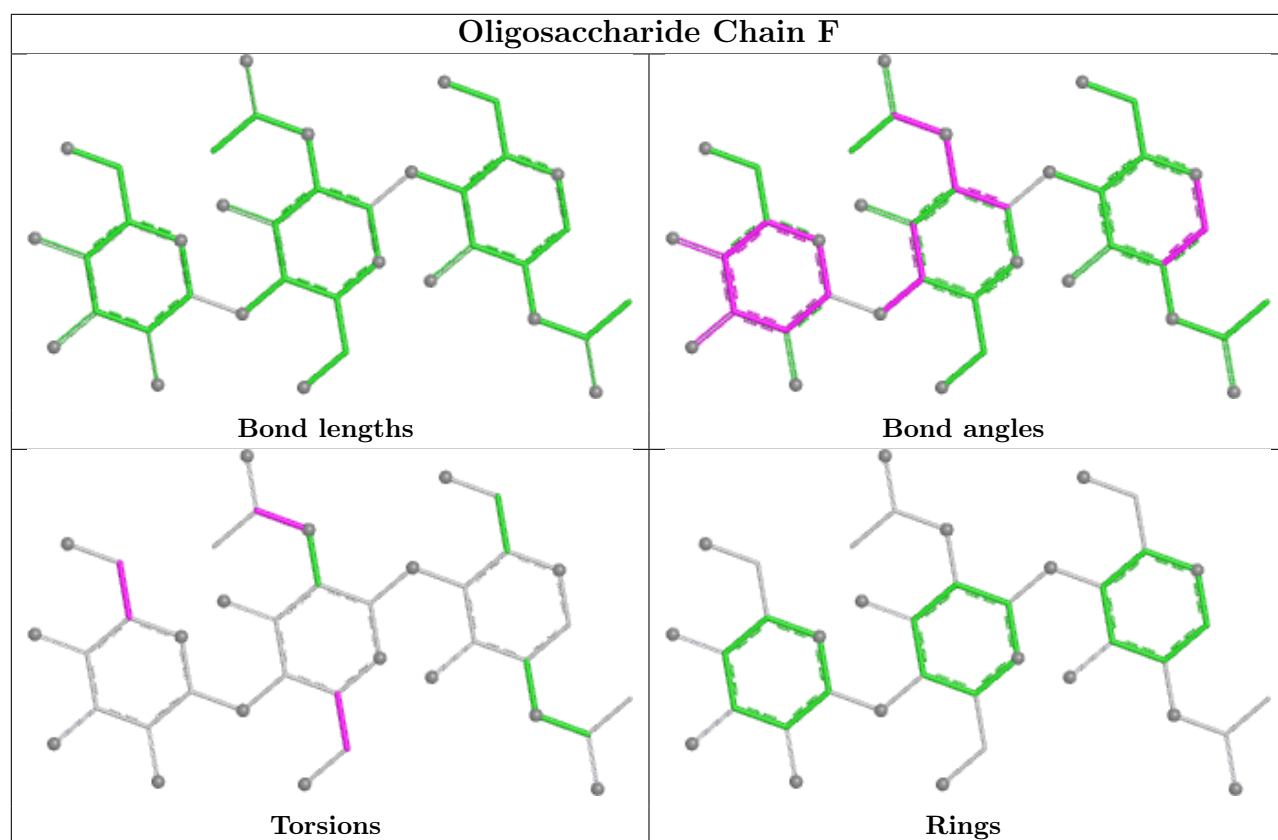


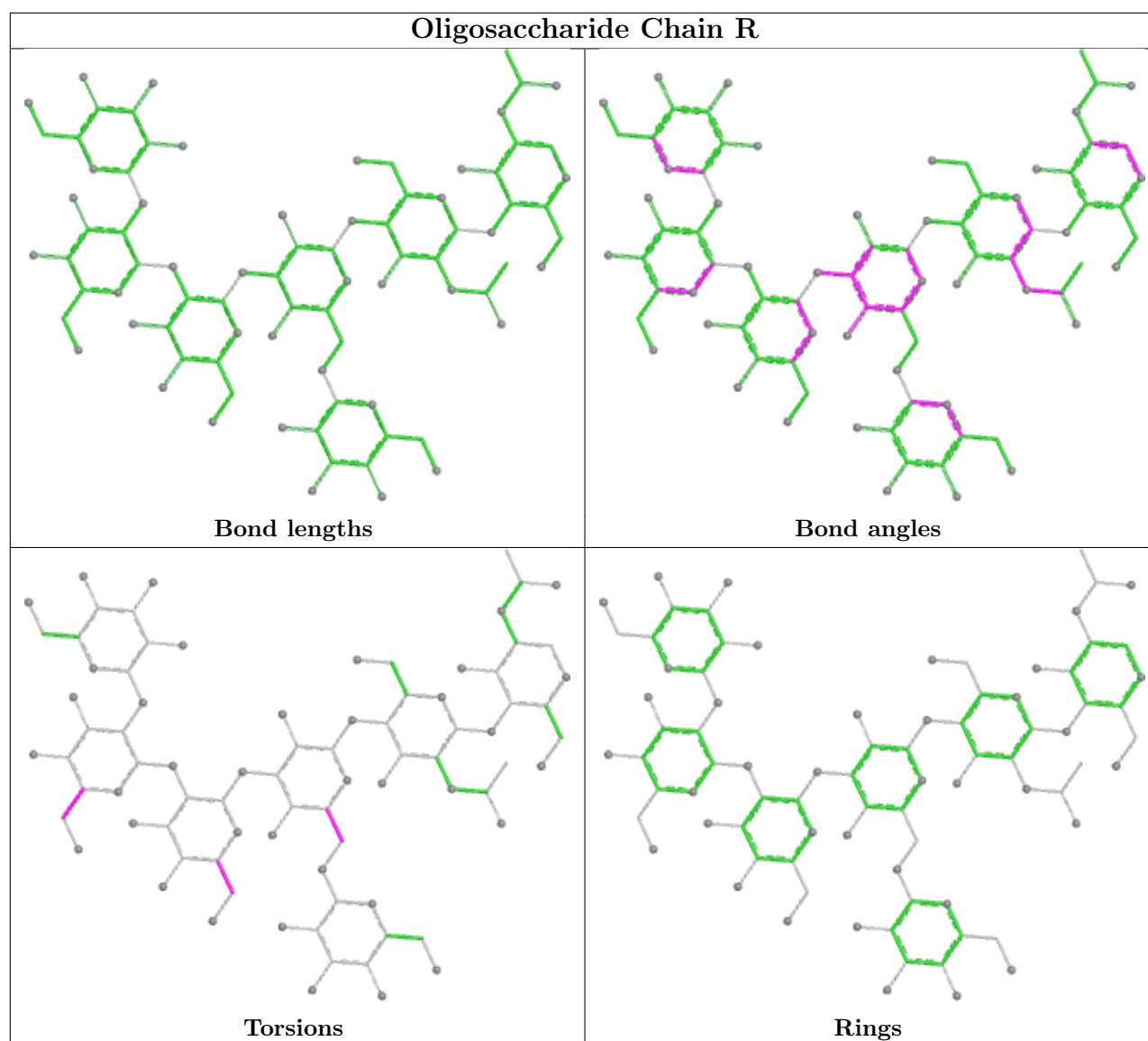












5.6 Ligand geometry [i](#)

8 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	B	602	3	14,14,15	0.71	0	17,19,21	0.85	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	NAG	C	602	3	14,14,15	0.71	0	17,19,21	0.90	1 (5%)
7	NAG	B	601	3	14,14,15	0.71	0	17,19,21	0.81	0
7	NAG	B	603	3	14,14,15	0.69	0	17,19,21	0.77	0
7	NAG	A	603	3	14,14,15	0.73	0	17,19,21	0.86	0
7	NAG	C	601	3	14,14,15	0.71	0	17,19,21	0.80	0
7	NAG	A	601	3	14,14,15	0.72	0	17,19,21	0.80	0
7	NAG	A	602	3	14,14,15	0.71	0	17,19,21	0.95	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	NAG	B	602	3	-	0/6/23/26	0/1/1/1
7	NAG	C	602	3	-	0/6/23/26	0/1/1/1
7	NAG	B	601	3	-	0/6/23/26	0/1/1/1
7	NAG	B	603	3	-	0/6/23/26	0/1/1/1
7	NAG	A	603	3	-	0/6/23/26	0/1/1/1
7	NAG	C	601	3	-	0/6/23/26	0/1/1/1
7	NAG	A	601	3	-	0/6/23/26	0/1/1/1
7	NAG	A	602	3	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	A	602	NAG	C1-O5-C5	2.24	115.19	112.19
7	B	602	NAG	C1-O5-C5	2.14	115.05	112.19
7	C	602	NAG	C1-O5-C5	2.09	114.98	112.19

There are no chirality outliers.

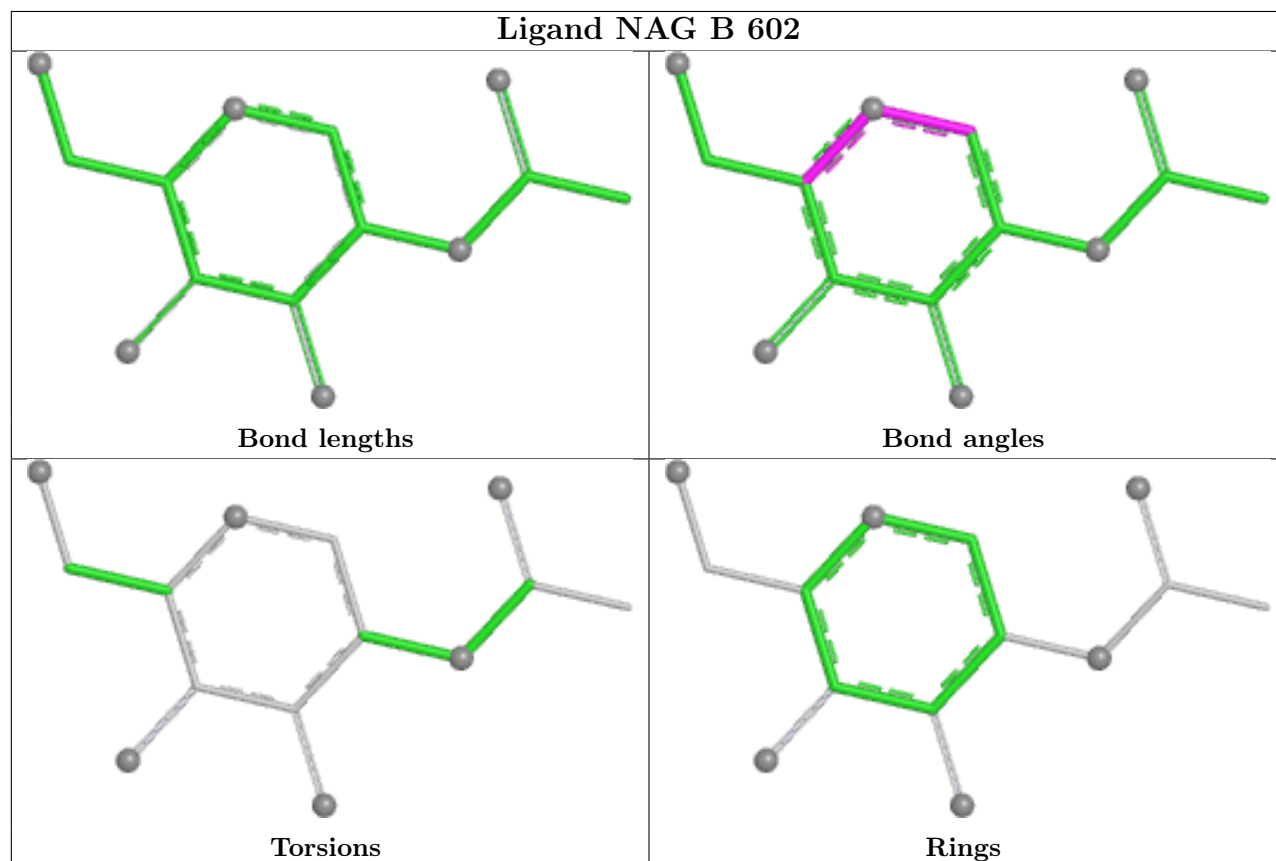
There are no torsion outliers.

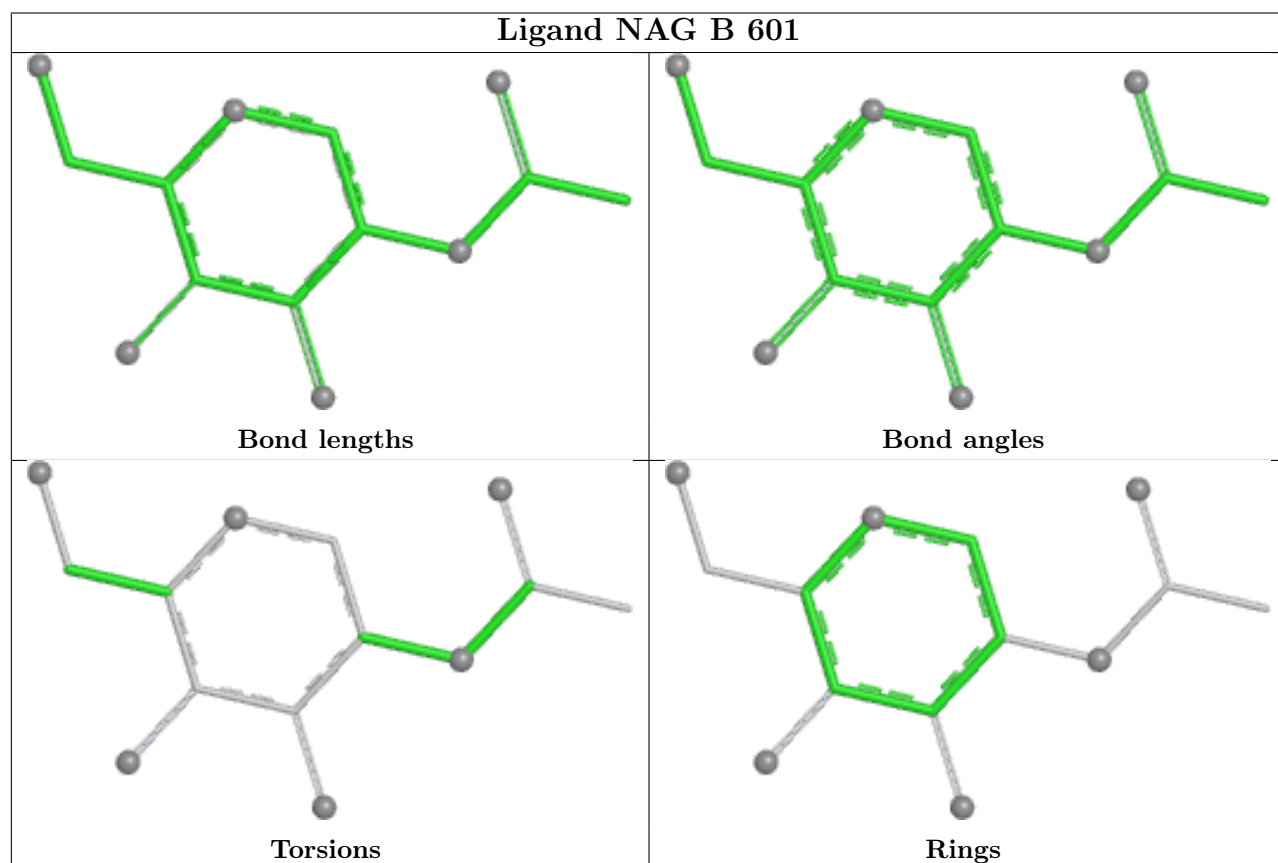
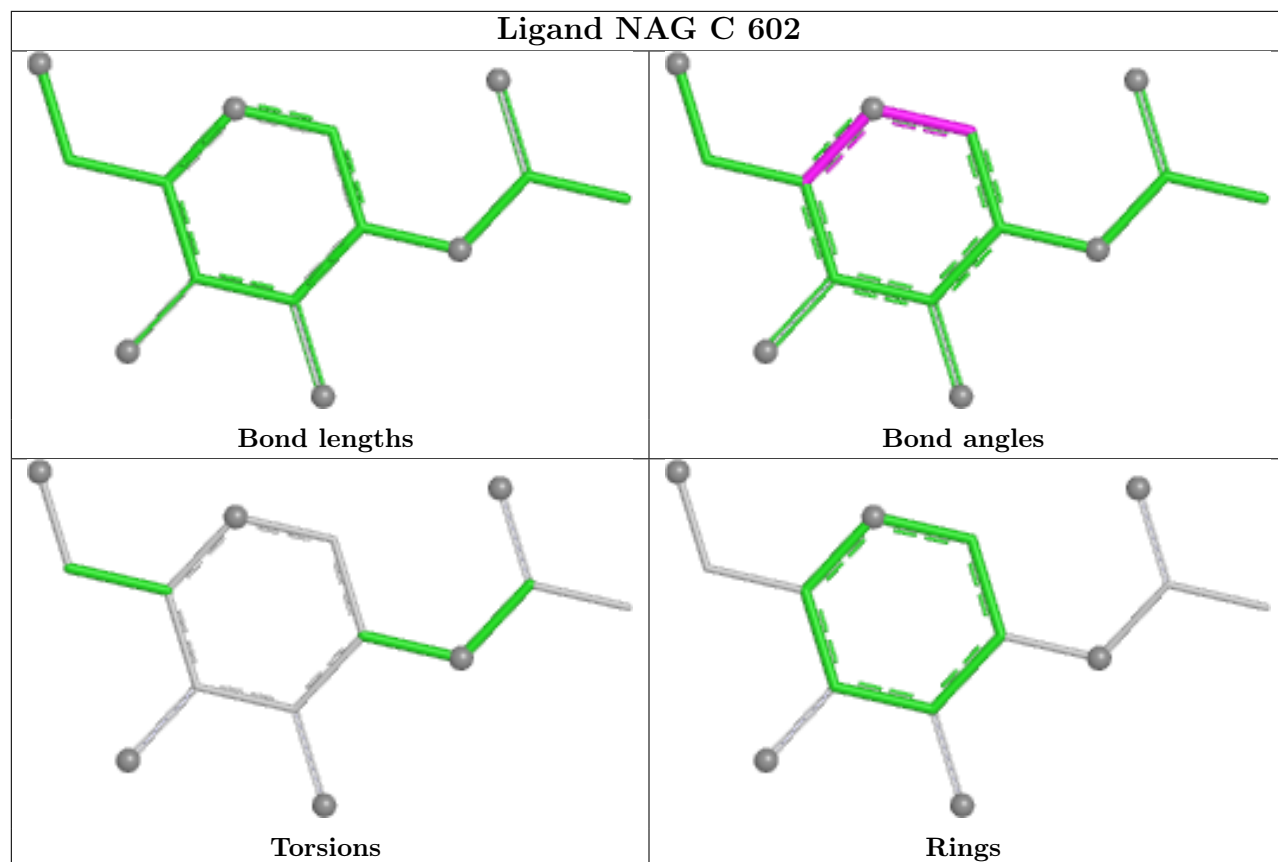
There are no ring outliers.

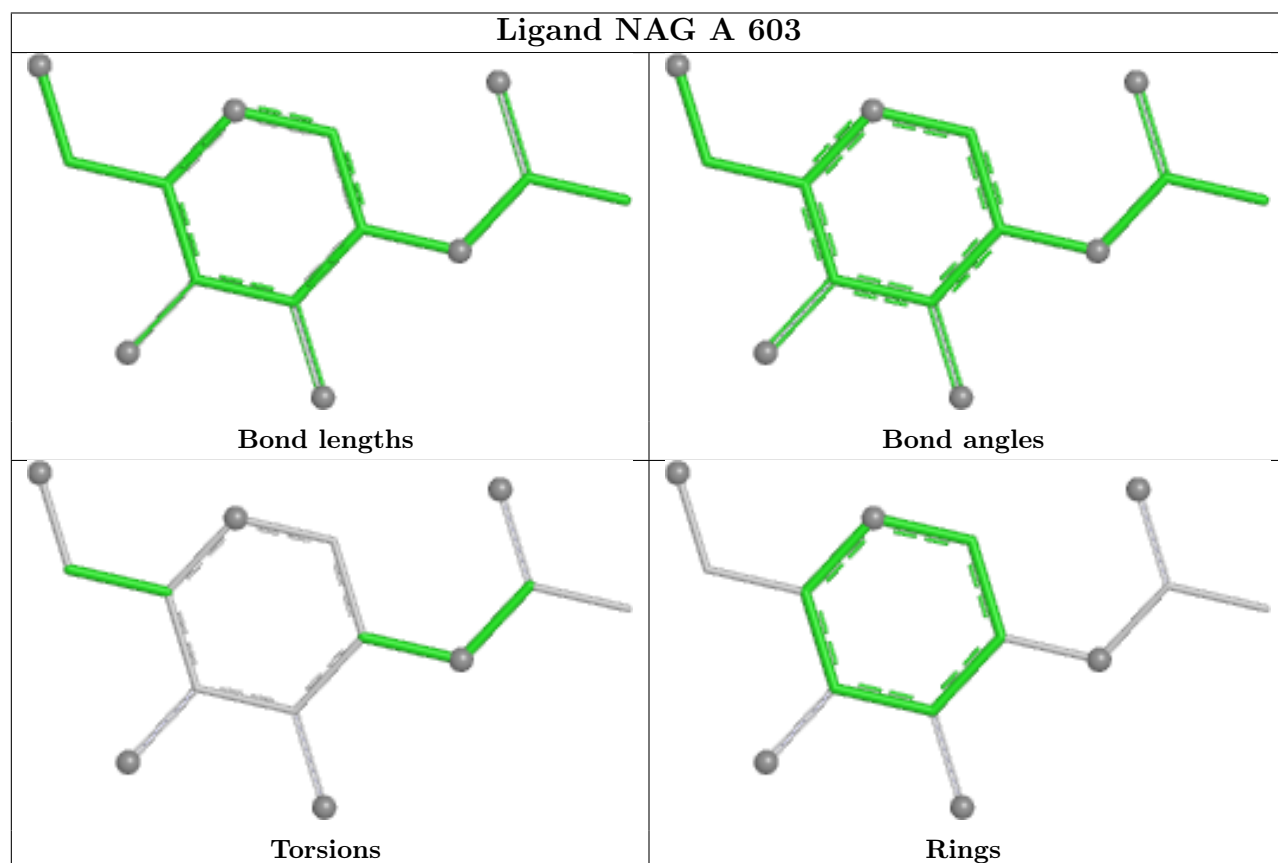
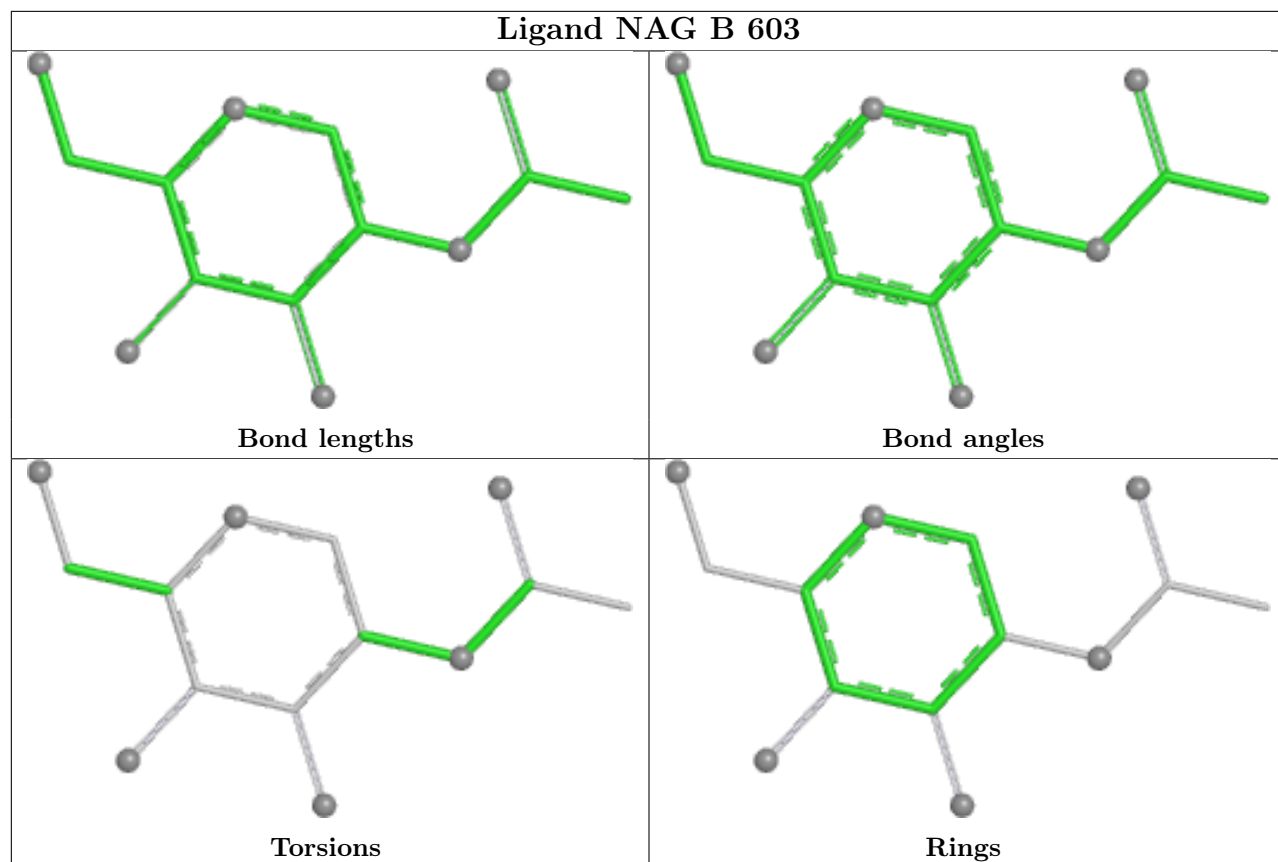
No monomer is involved in short contacts.

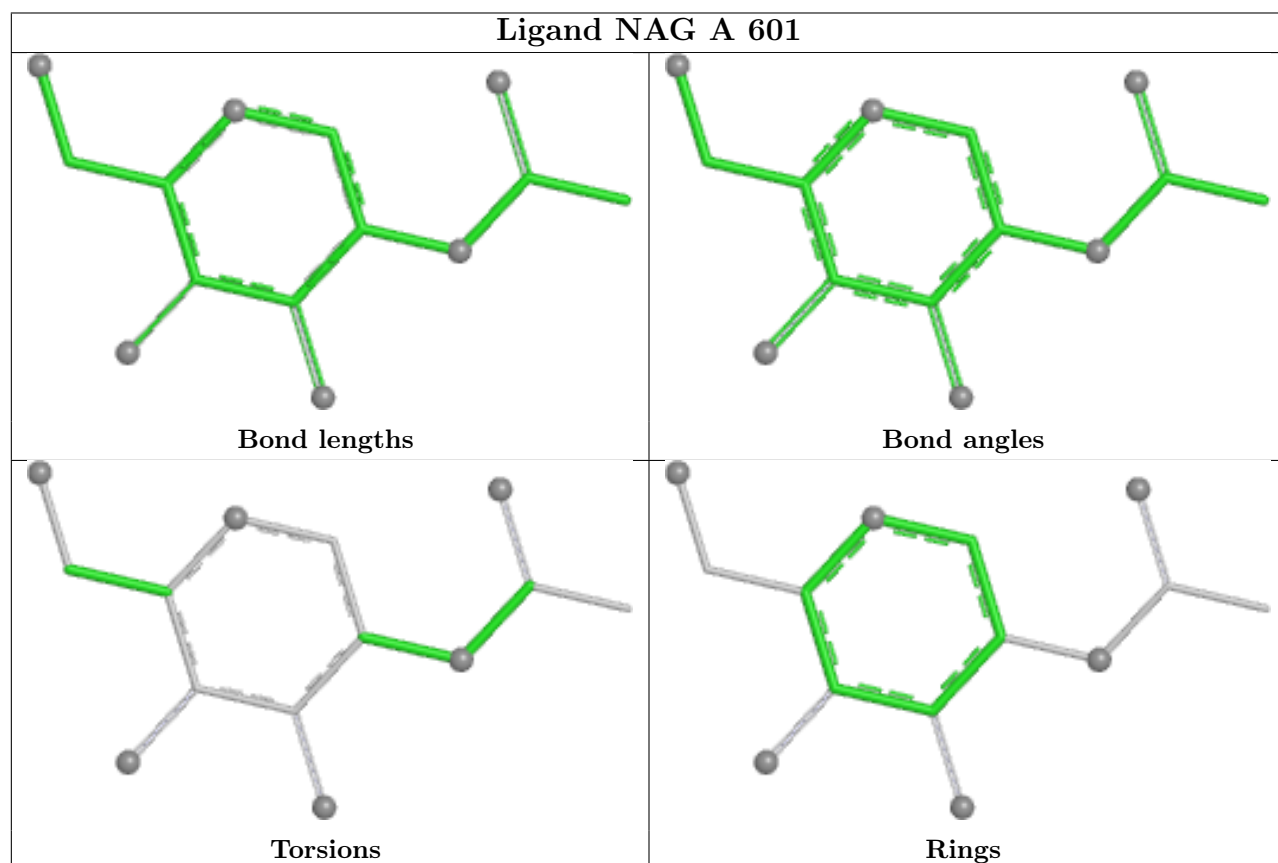
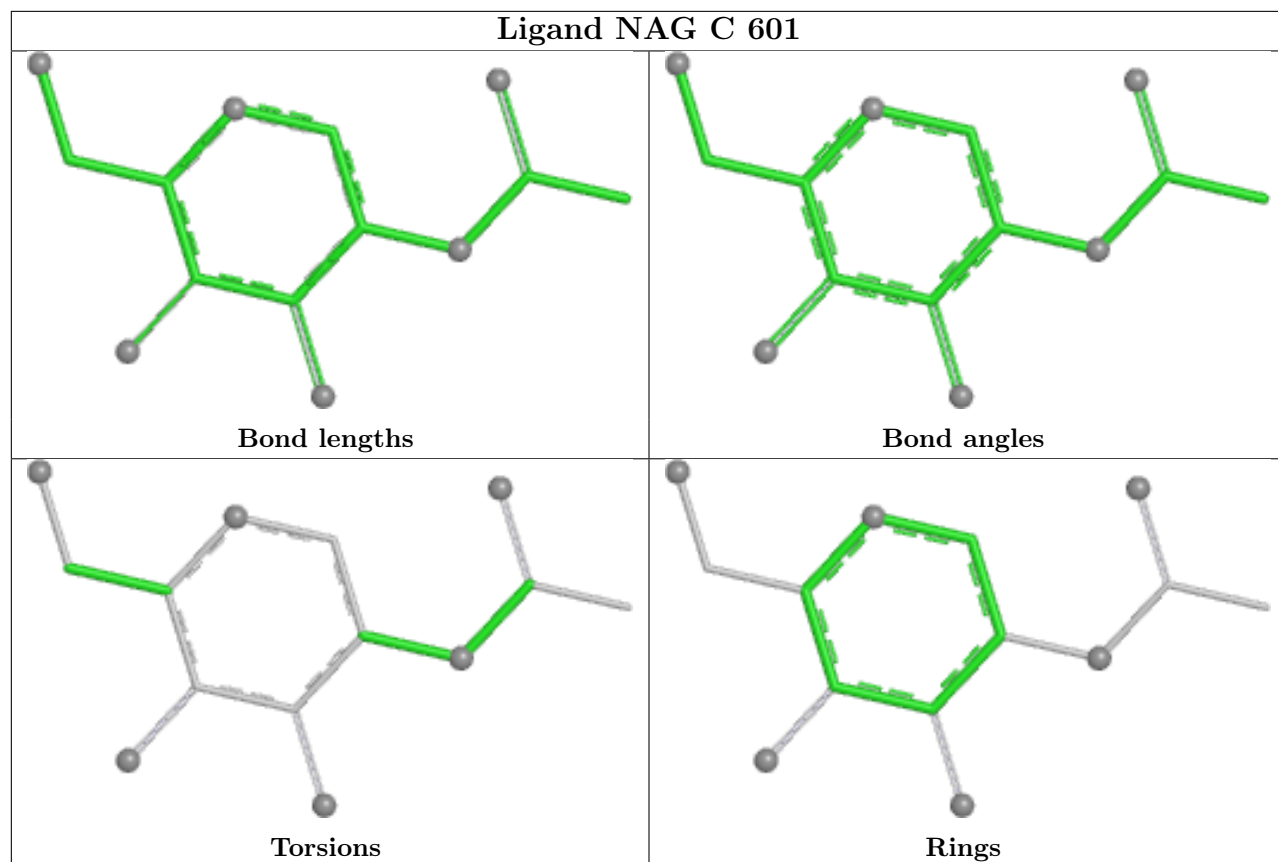
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

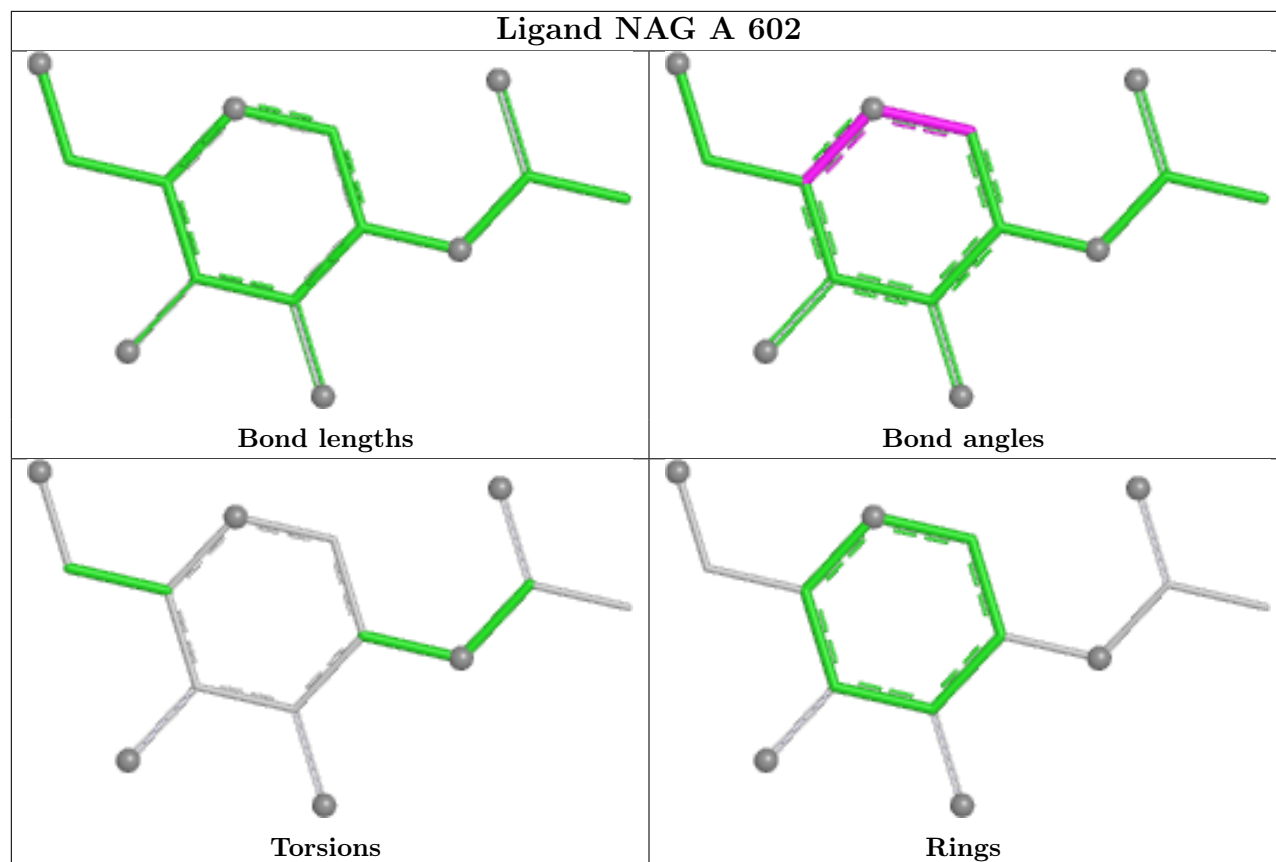
Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD 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.











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.

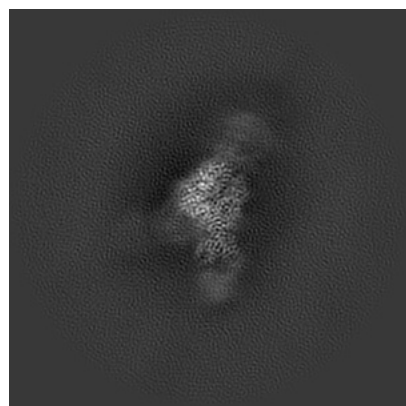
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-47071. These allow visual inspection of the internal detail of the map and identification of artifacts.

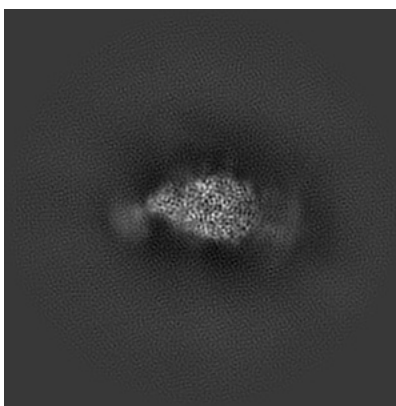
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

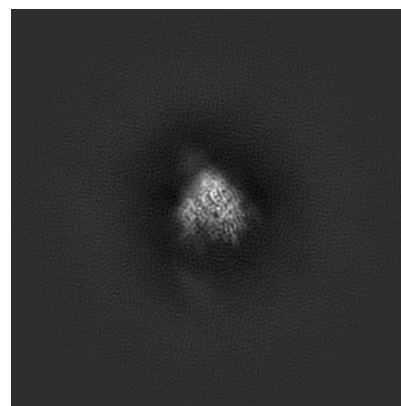
6.1.1 Primary map



X

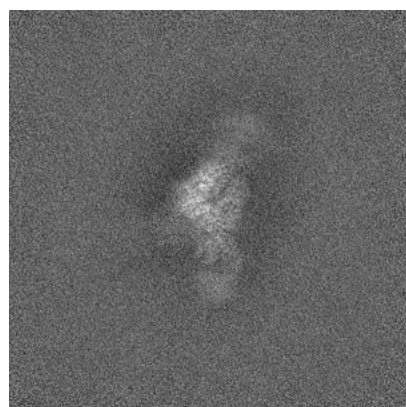


Y

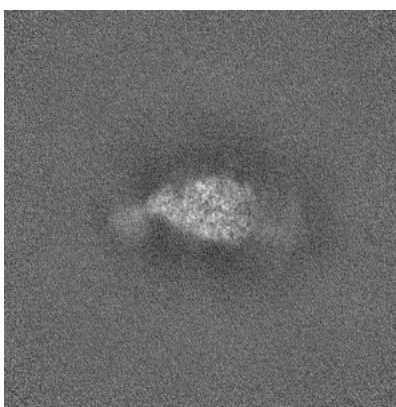


Z

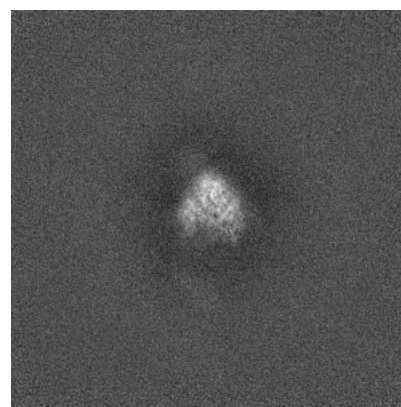
6.1.2 Raw map



X



Y

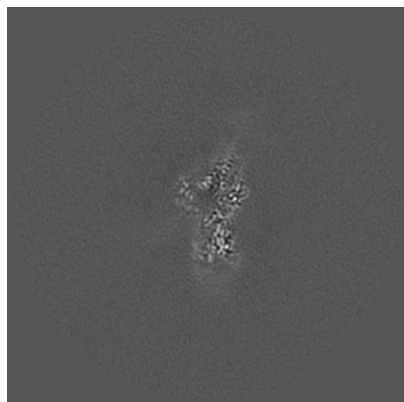


Z

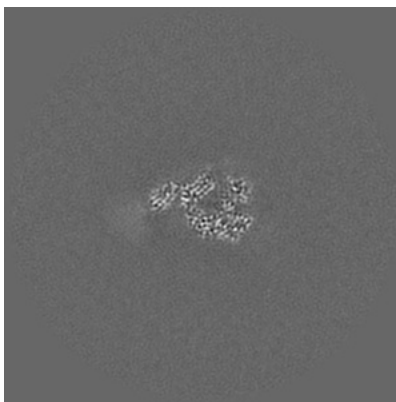
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

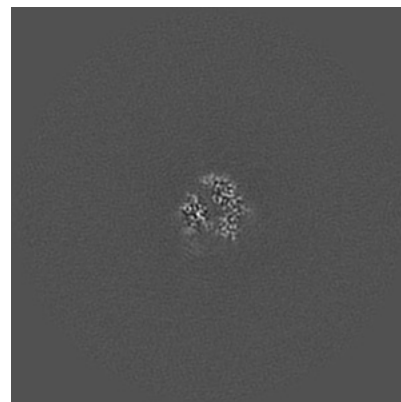
6.2.1 Primary map



X Index: 384

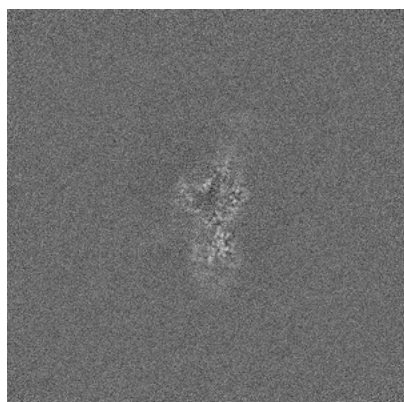


Y Index: 384

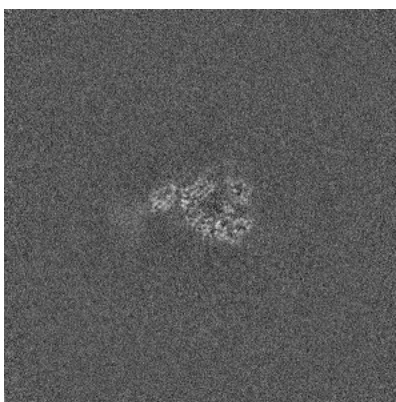


Z Index: 384

6.2.2 Raw map



X Index: 384



Y Index: 384

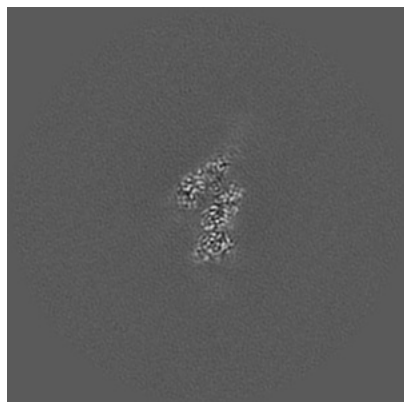


Z Index: 384

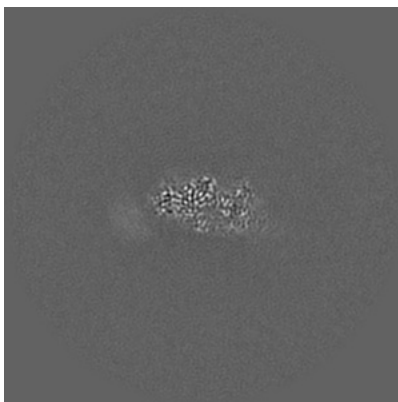
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

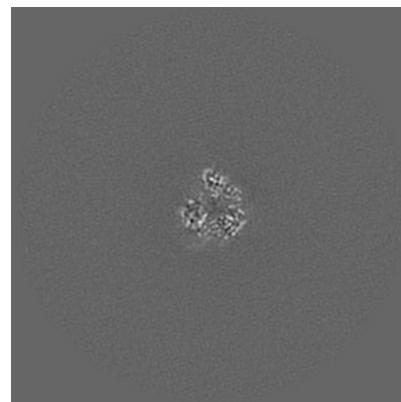
6.3.1 Primary map



X Index: 401

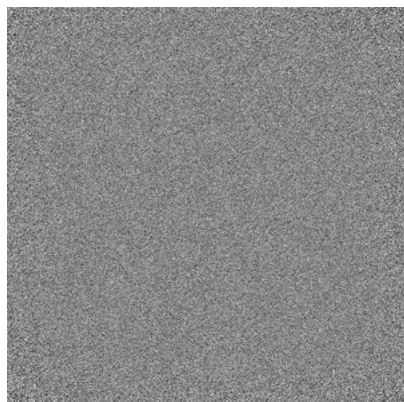


Y Index: 402

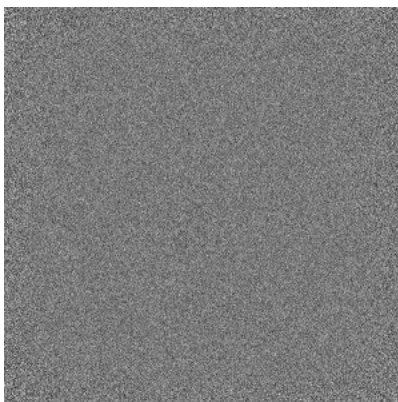


Z Index: 400

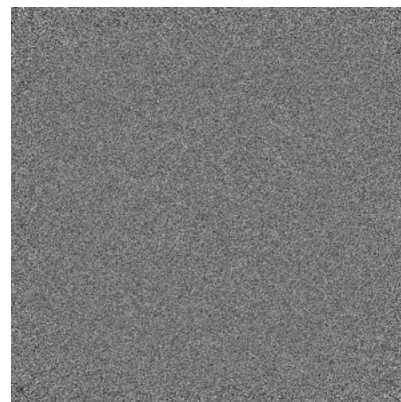
6.3.2 Raw map



X Index: 0



Y Index: 0

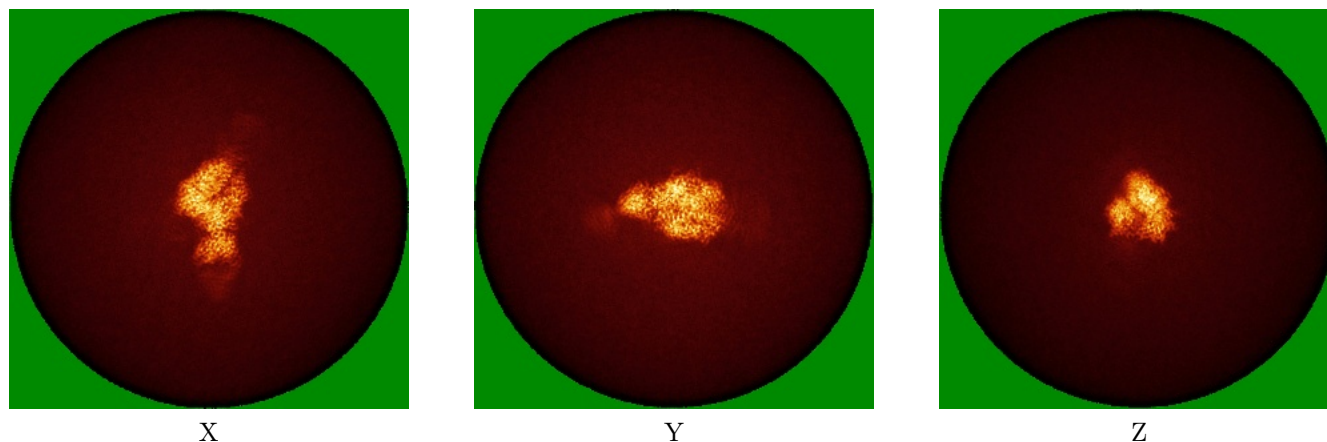


Z Index: 767

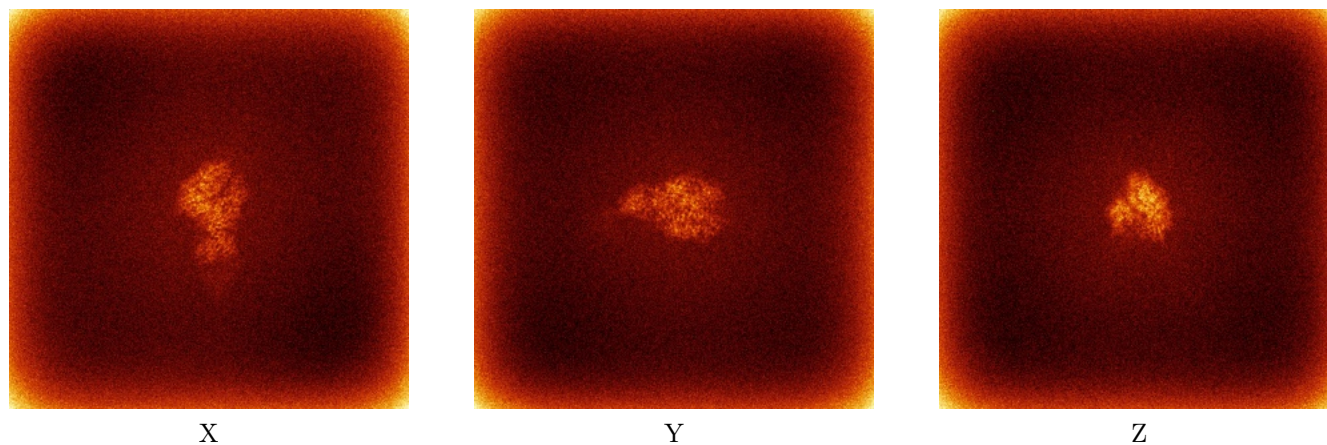
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



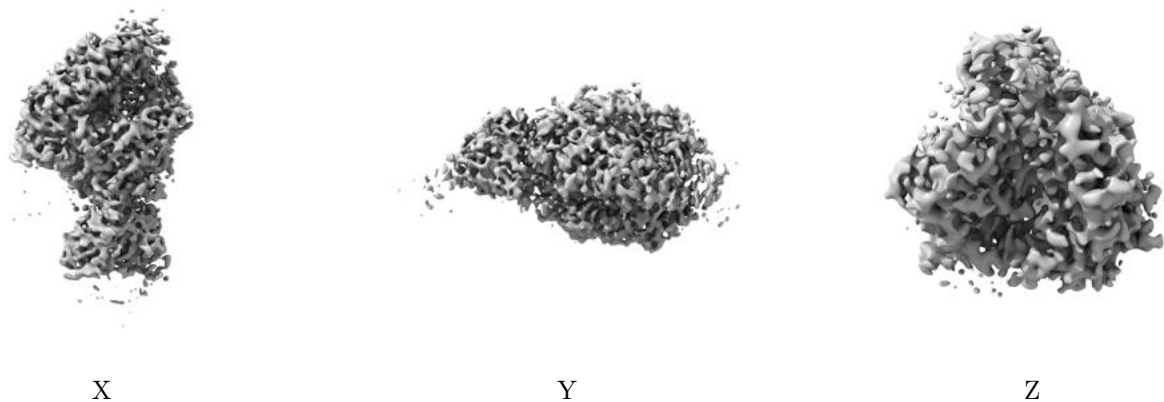
6.4.2 Raw map



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.

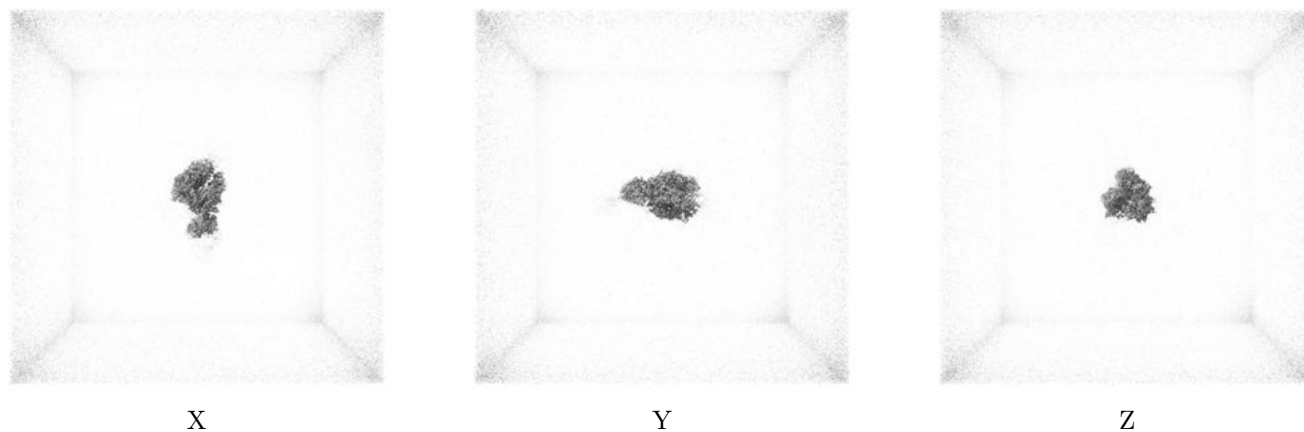
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.15. 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.

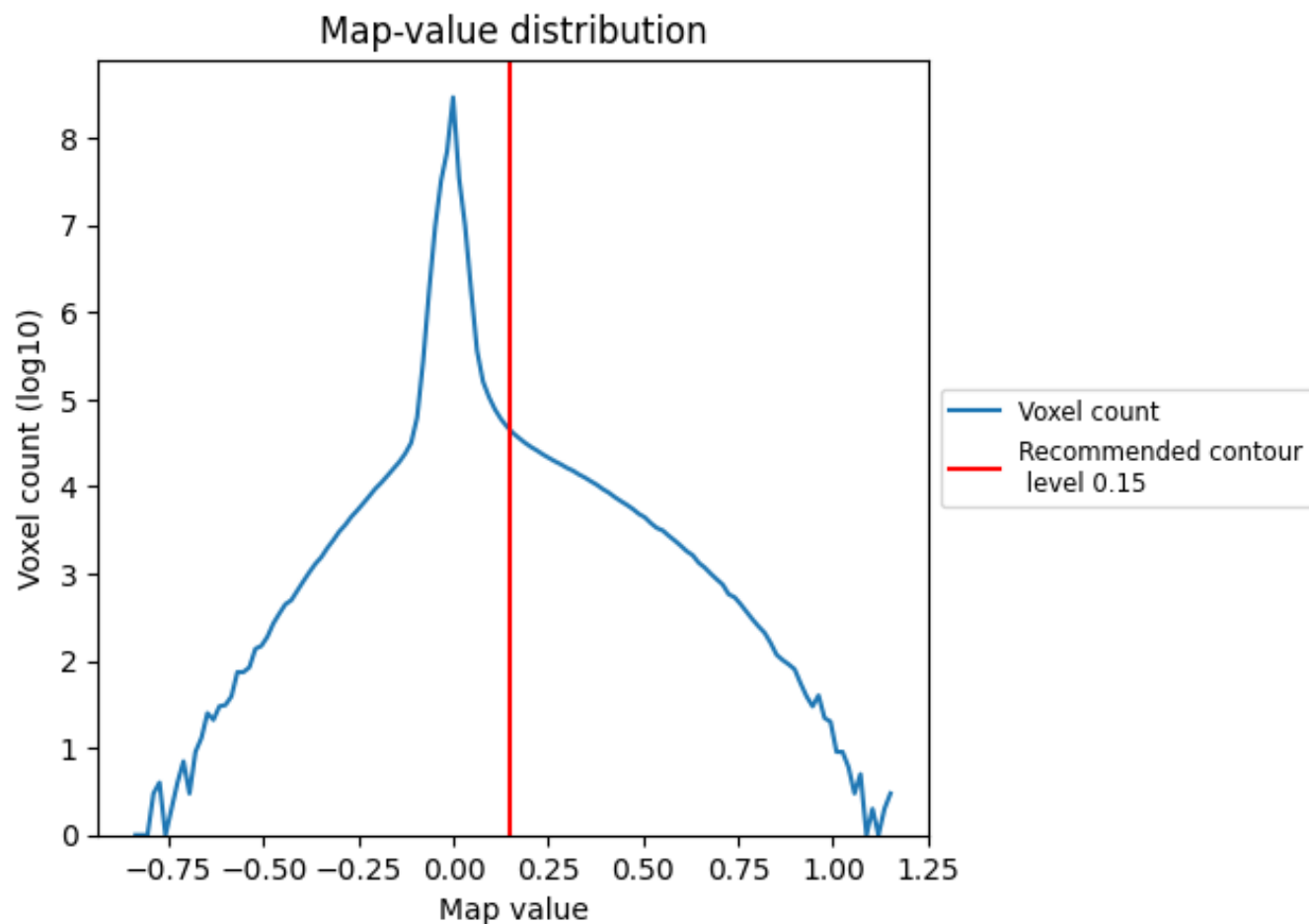
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

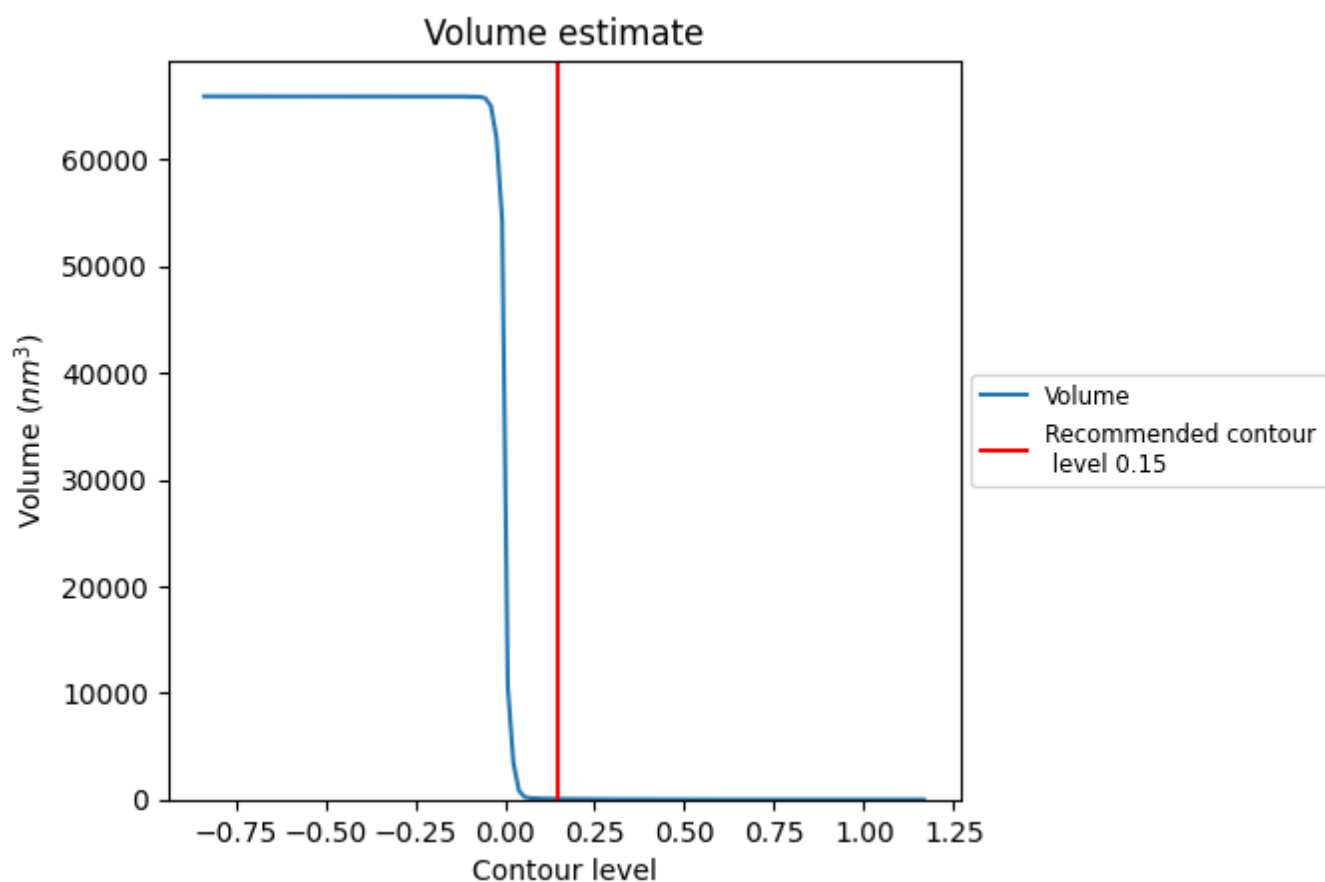
This section contains the results of statistical analysis of the map.

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.

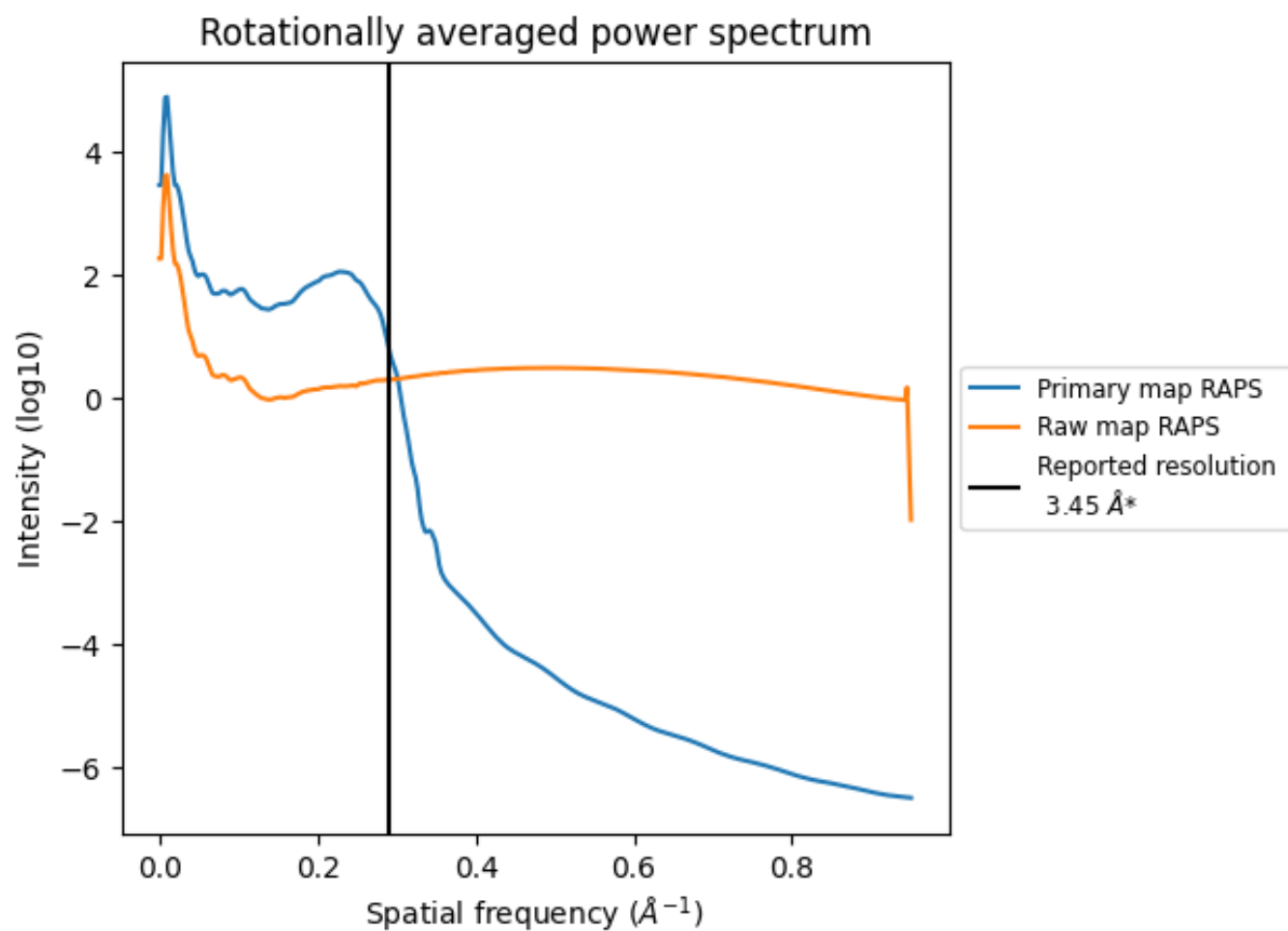
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 62 nm³; this corresponds to an approximate mass of 56 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 ⓘ

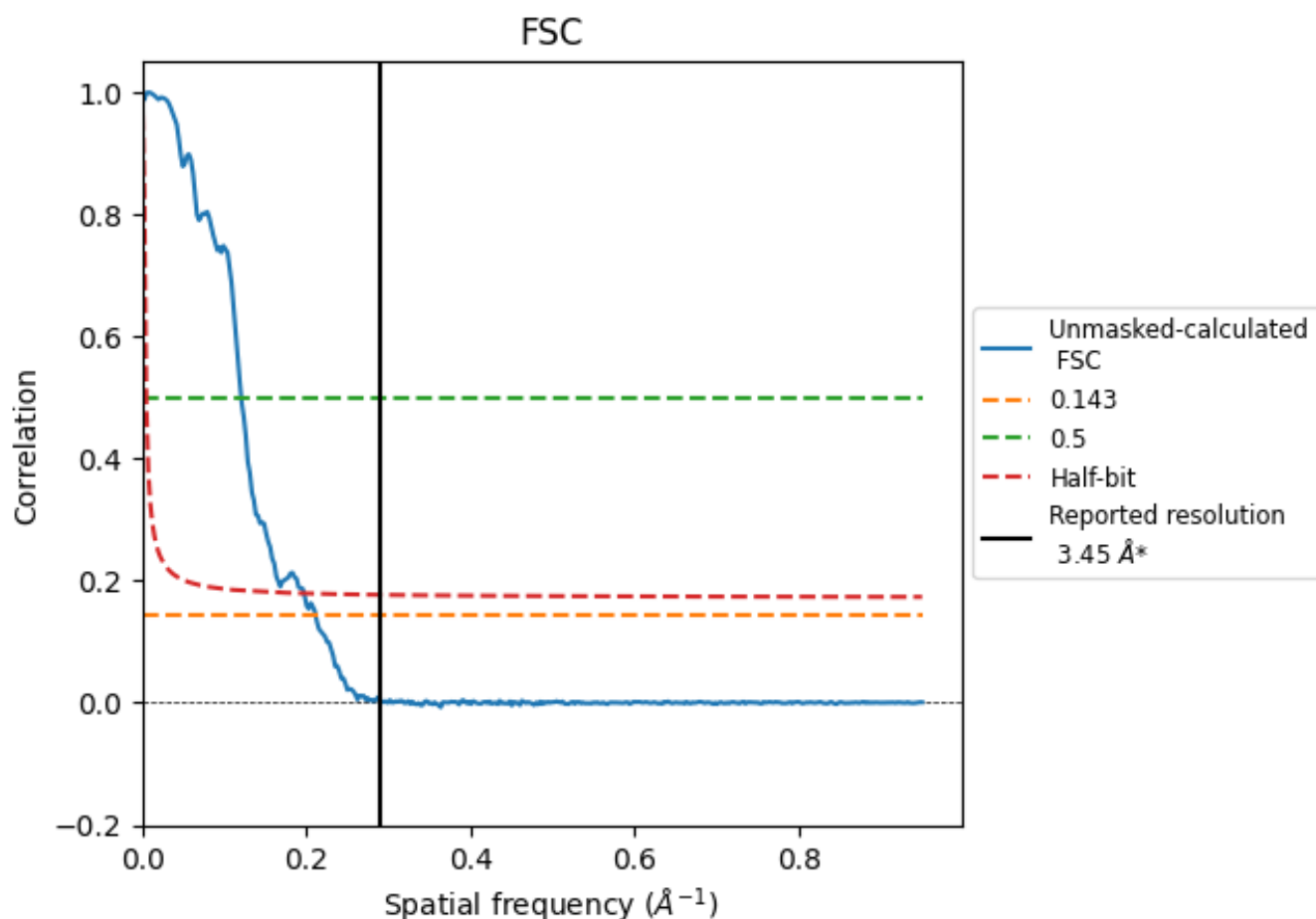


*Reported resolution corresponds to spatial frequency of 0.290 Å⁻¹

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 0.290 Å⁻¹

8.2 Resolution estimates [i](#)

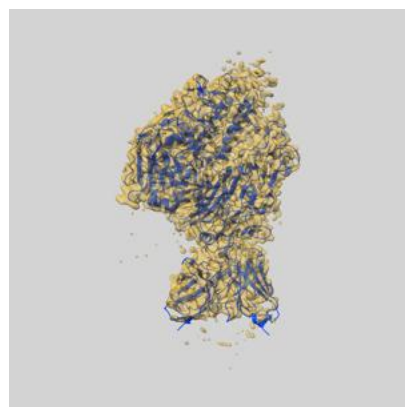
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.45	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.73	8.29	5.07

*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 4.73 differs from the reported value 3.45 by more than 10 %

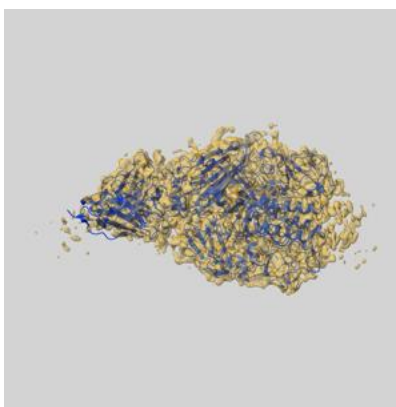
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-47071 and PDB model 9DO2. Per-residue inclusion information can be found in section 3 on page 11.

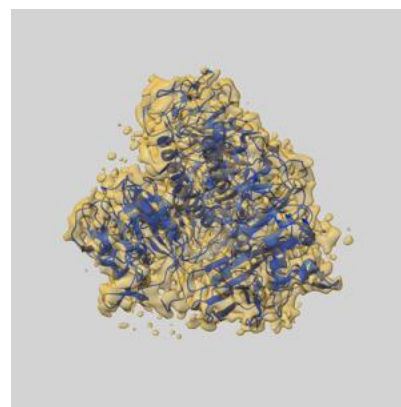
9.1 Map-model overlay [i](#)



X



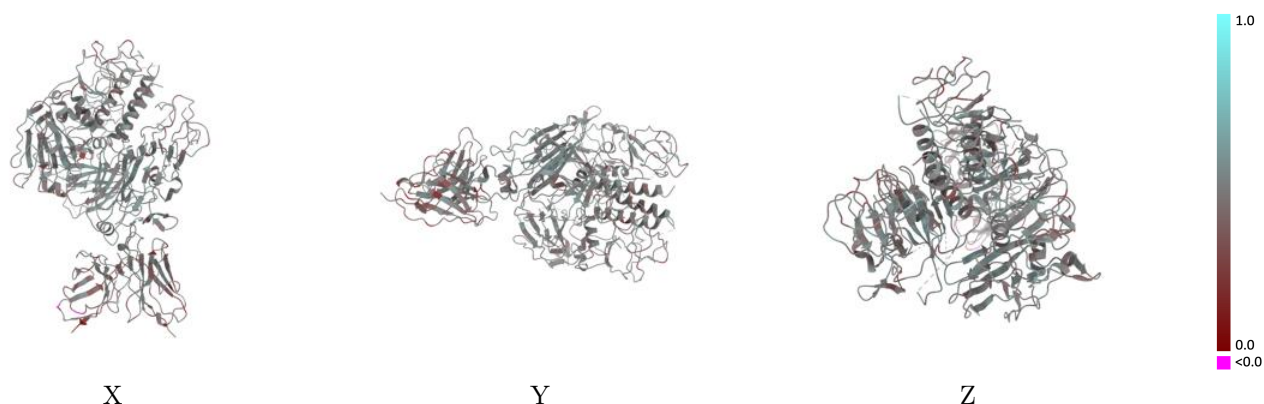
Y



Z

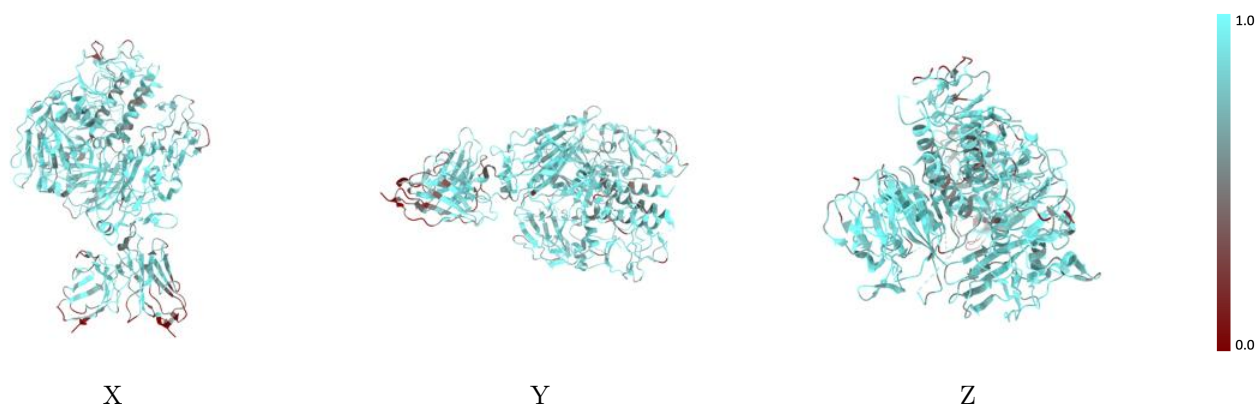
The images above show the 3D surface view of the map at the recommended contour level 0.15 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



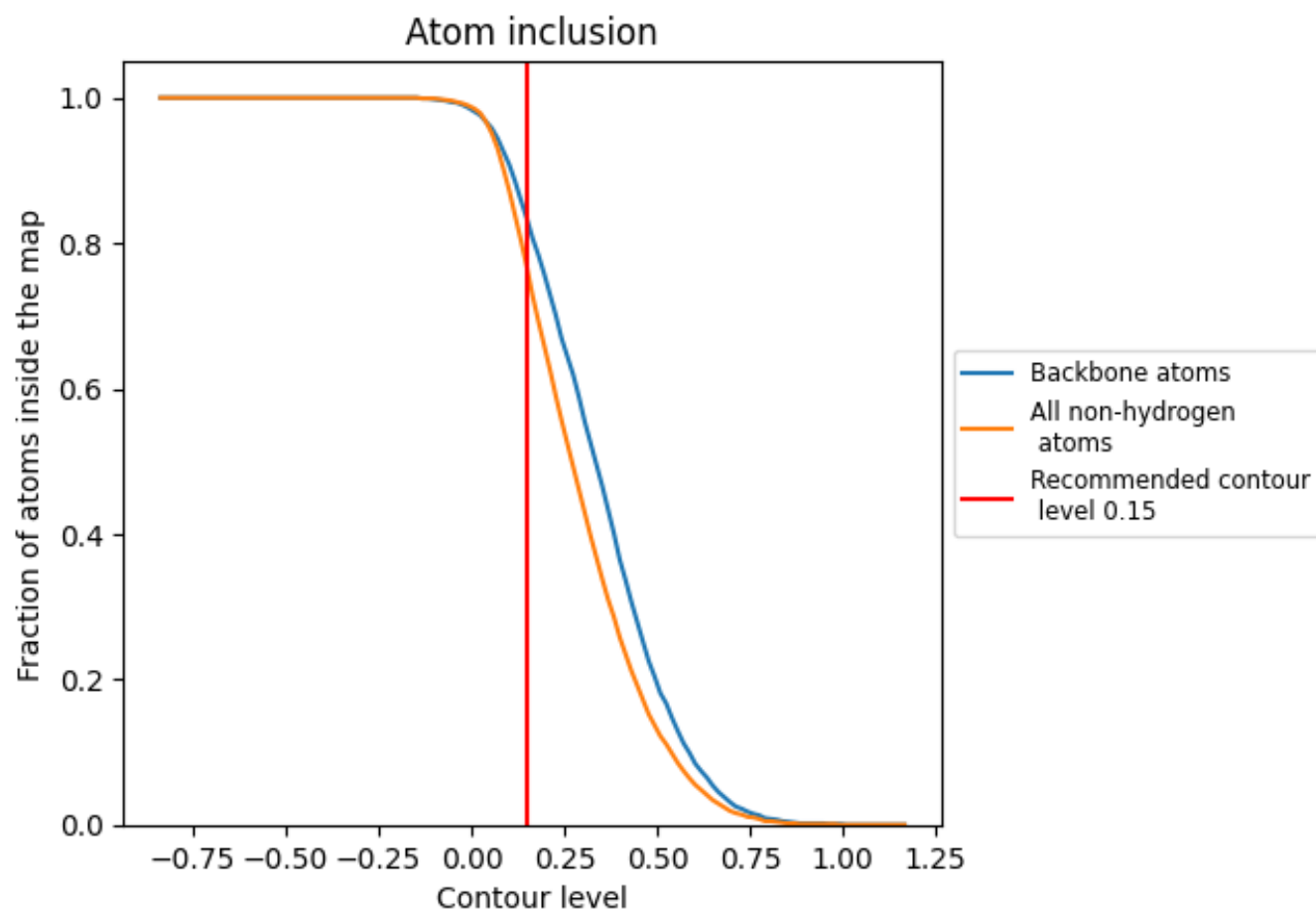
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.15).











































9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 77% 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 (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7660	 0.4620
A	 0.8120	 0.4830
B	 0.7840	 0.4750
C	 0.8170	 0.4690
D	 0.5000	 0.4120
E	 0.6070	 0.4110
F	 0.6920	 0.4740
G	 0.6430	 0.3910
H	 0.6630	 0.4320
I	 0.4640	 0.4160
J	 0.3930	 0.3110
K	 0.3930	 0.4320
L	 0.7060	 0.4080
M	 0.3590	 0.4540
N	 0.2140	 0.3410
O	 0.2860	 0.2830
P	 0.4290	 0.3320
Q	 0.5710	 0.3440
R	 0.7590	 0.4750
S	 0.6430	 0.4130
T	 0.3930	 0.4240

