



## Full wwPDB EM Validation Report ⓘ

Oct 13, 2024 – 09:08 am BST

PDB ID : 8OZH  
EMDB ID : EMD-17309  
Title : In situ cryoEM structure of Prototype Foamy Virus Env trimer  
Authors : Calcraft, T.; Nans, A.; Rosenthal, P.B.  
Deposited on : 2023-05-09  
Resolution : 2.91 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](mailto: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>.

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

EMDB validation analysis : 0.0.1.dev113  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4.02b-467  
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) : 2.39

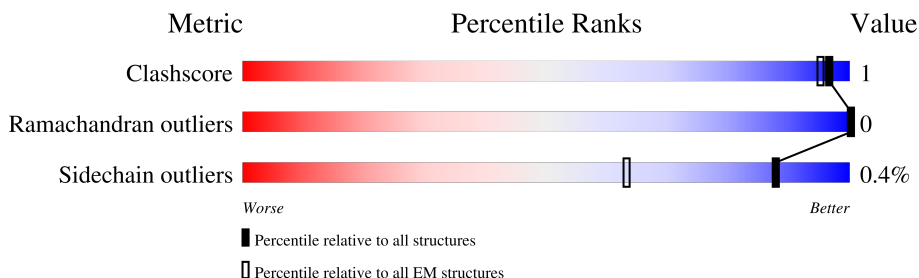
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.91 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.



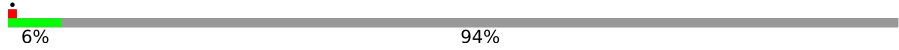
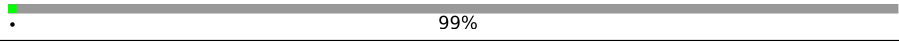
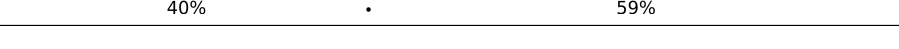







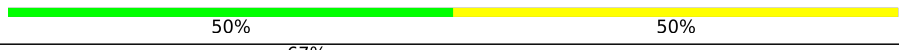
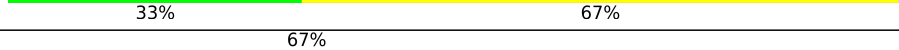

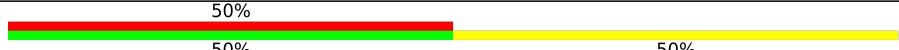


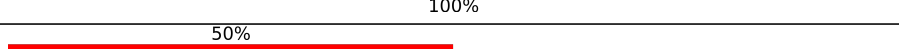







Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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  $\geq 3$ , 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	988	 6% 94%
1	B	988	 99%
1	C	988	 40% 59%
1	D	988	 40% 59%
1	E	988	 6% 94%
1	F	988	 99%
1	G	988	 40% 59%
1	H	988	 40% 59%




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Mol	Chain	Length	Quality of chain
1	I	988	
1	J	988	
1	K	988	
1	L	988	
2	M	2	
2	N	2	
2	O	2	
2	Y	2	
2	Z	2	
2	a	2	
2	b	2	
2	c	2	
2	d	2	
3	S	3	
3	T	3	
3	U	3	
4	V	6	
4	W	6	
4	X	6	
5	P	4	
5	Q	4	
5	R	4	
6	e	8	
6	f	8	
6	g	8	

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Mol	Chain	Length	Quality of chain
7	h	6	
7	i	6	
7	j	6	

## 2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 22836 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 Envelope glycoprotein.

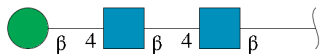
Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	58	Total	C	N	O	S	0	0
			466	309	76	77	4		
1	B	11	Total	C	N	O	S	0	0
			94	61	18	14	1		
1	C	405	Total	C	N	O	S	0	0
			3328	2133	549	628	18		
1	D	405	Total	C	N	O	S	0	0
			3190	2054	536	586	14		
1	E	58	Total	C	N	O	S	0	0
			466	309	76	77	4		
1	F	11	Total	C	N	O	S	0	0
			94	61	18	14	1		
1	G	405	Total	C	N	O	S	0	0
			3328	2133	549	628	18		
1	H	405	Total	C	N	O	S	0	0
			3190	2054	536	586	14		
1	I	58	Total	C	N	O	S	0	0
			466	309	76	77	4		
1	J	11	Total	C	N	O	S	0	0
			94	61	18	14	1		
1	K	405	Total	C	N	O	S	0	0
			3328	2133	549	628	18		
1	L	405	Total	C	N	O	S	0	0
			3190	2054	536	586	14		

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



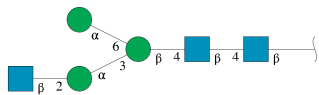
Mol	Chain	Residues	Atoms				AltConf	Trace
2	M	2	Total	C	N	O	0	0
			28	16	2	10		
2	Y	2	Total	C	N	O	0	0
			28	16	2	10		
2	b	2	Total	C	N	O	0	0
			28	16	2	10		
2	N	2	Total	C	N	O	0	0
			28	16	2	10		
2	Z	2	Total	C	N	O	0	0
			28	16	2	10		
2	c	2	Total	C	N	O	0	0
			28	16	2	10		
2	O	2	Total	C	N	O	0	0
			28	16	2	10		
2	a	2	Total	C	N	O	0	0
			28	16	2	10		
2	d	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 3 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.



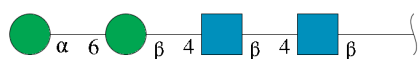
Mol	Chain	Residues	Atoms				AltConf	Trace
3	S	3	Total	C	N	O	0	0
			39	22	2	15		
3	T	3	Total	C	N	O	0	0
			39	22	2	15		
3	U	3	Total	C	N	O	0	0
			39	22	2	15		

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



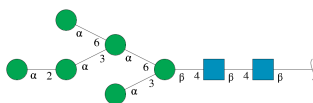
Mol	Chain	Residues	Atoms				AltConf	Trace
4	V	6	Total	C	N	O	0	0
			75	42	3	30		
4	W	6	Total	C	N	O	0	0
			75	42	3	30		
4	X	6	Total	C	N	O	0	0
			75	42	3	30		

- Molecule 5 is an oligosaccharide called 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.



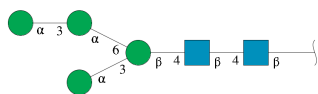
Mol	Chain	Residues	Atoms				AltConf	Trace
5	P	4	Total	C	N	O	0	0
			50	28	2	20		
5	Q	4	Total	C	N	O	0	0
			50	28	2	20		
5	R	4	Total	C	N	O	0	0
			50	28	2	20		

- Molecule 6 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[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.



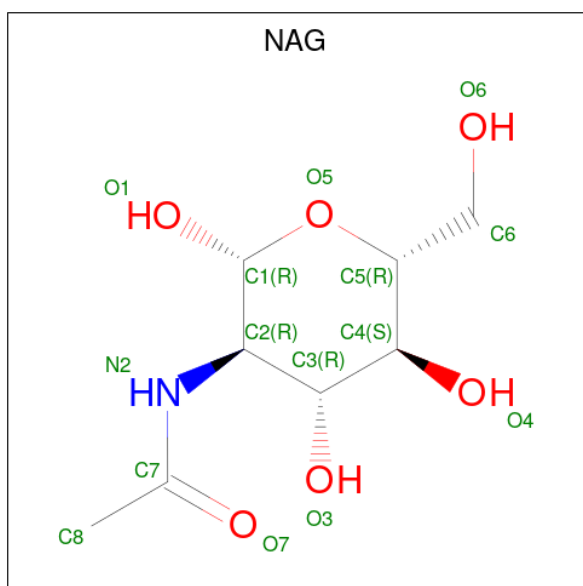
Mol	Chain	Residues	Atoms				AltConf	Trace
6	e	8	Total	C	N	O	0	0
			94	52	2	40		
6	f	8	Total	C	N	O	0	0
			94	52	2	40		
6	g	8	Total	C	N	O	0	0
			94	52	2	40		

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[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
7	h	6	Total	C	N	O	0	0
			72	40	2	30		
7	i	6	Total	C	N	O	0	0
			72	40	2	30		
7	j	6	Total	C	N	O	0	0
			72	40	2	30		

- Molecule 8 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ) (labeled as "Ligand of Interest" by depositor).



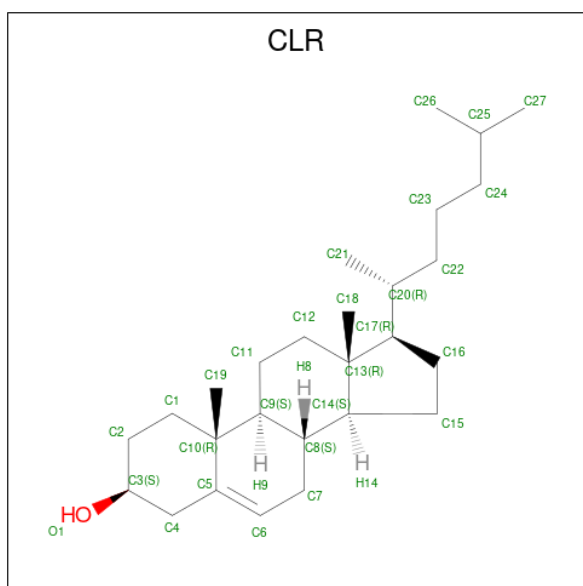
Mol	Chain	Residues	Atoms				AltConf
8	C	1	Total	C	N	O	0
			14	8	1	5	
8	C	1	Total	C	N	O	0
			14	8	1	5	
8	C	1	Total	C	N	O	0
			14	8	1	5	
8	G	1	Total	C	N	O	0
			14	8	1	5	
8	G	1	Total	C	N	O	0
			14	8	1	5	
8	G	1	Total	C	N	O	0
			14	8	1	5	

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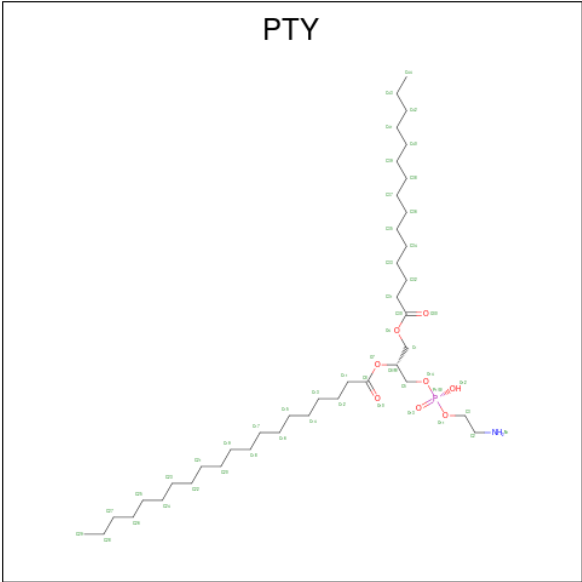
Mol	Chain	Residues	Atoms				AltConf
8	K	1	Total	C	N	O	0
			14	8	1	5	
8	K	1	Total	C	N	O	0
			14	8	1	5	
8	K	1	Total	C	N	O	0
			14	8	1	5	

- Molecule 9 is CHOLESTEROL (three-letter code: CLR) (formula:  $C_{27}H_{46}O$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
9	D	1	Total	C	O		0
			28	27	1		
9	H	1	Total	C	O		0
			28	27	1		
9	L	1	Total	C	O		0
			28	27	1		

- Molecule 10 is PHOSPHATIDYLETHANOLAMINE (three-letter code: PTY) (formula:  $C_{40}H_{80}NO_8P$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
10	D	1	Total	C	N	O	P	0
			50	40	1	8	1	
10	H	1	Total	C	N	O	P	0
			50	40	1	8	1	
10	L	1	Total	C	N	O	P	0
			50	40	1	8	1	



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CYS	CYS	ALA	THR	THR	THR	SER	ARG	VAL	VAL	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
THR	ARG	ARG	ILE	ALA	ARG	S127	Y137	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL
LYS	LYS	LEU	LEU	THR	THR	GLY	THR	GLY	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
GLY	GLY	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
GLN	ILE	ASN	VAL	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
ASN	ALA	LEU	PHE	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
HIS	MET	HIS	PRO	TYR	ALA	CYS	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
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LYS	PHE	PRO	PRO	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
ILE	TYR	LEU	LEU	ARG	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
LEU	GLN	LYS	SER	ASP	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
LEU	VAL	LYS	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
CYS	PRO	VAL	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
ALA	GLU	ARG	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR

LEU	LEU	VAL	ILE	ILE	ILE	ILE	LYS	VAL	VAL	SER	TRP	ILE	PRO	THR	LYS	LYS	LYS	ASN	GLN	GLY	ASP	THR	PRO	ALA	ALA	ALA	ALA	LEU	GLN	GLY	ILE	GLY	ASN	PHE	LEU	SER	GLY	THR	ALA	GLN	GLY	ILE	PHE	GLY	THR	ALA	LEU	LEU	LYS	PRO	ILE	LEU	ILE	GLY	ILE	VAL	VAL	ILE
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MET	ALA	PRO	PRO	MET	THR	LEU	GLN	GLN	TRP	TRP	ILE	ILE	TRP	ASN	LYS	MET	ASN	LYS	ALA	HIS	GLU	ALA	LEU	GLN	ASN	THR	THR	THR	VAL	THR	THR	GLU	GLN	GLN	LYS	GLU	GLN	ILE	ILE	LEU	LEU	ASP	ASP	ILE	GLN	ASN	GLU	GLU	VAL	GLN	PRO	THR	THR	ARG	ARG	ASP	LYS	PHE	ARG	TYR	LEU	LEU	TYR	THR
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[illegible]

1411	GLN	VAL	PRO	GLU	GLY	ASP	GLY	PHE	ASN	ASN	LYS	TRP	MET	HIS	MET	HIS	P432	R436	E443	K444	E445	K448	C449	R450	D451	E452	E453	T454	K455	R456	C457	L458	E467	T563	SER	CYS	ASN	ASN	ARG	LYS	ARG	ARG	SER	VAL	ASP	ASN	ASN	TYR	ALA
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LEU ARG SER MET GLY TYR LEU LEU THR GLY ALA VAL GLN THR LEU SER SER LEU ILE SER ASP ILE ASN ASP GLU ASN LEU LEU GLN GLN GLY ILE TYR LEU LEU ARG ARG ASP HIS HIS ILE THR LEU LEU MET MET GLU GLY MET PHE ALA VAL GLN HIS LEU

[illegible]

THR	ALA	TRP	GLU	ILE	GLY	LEU	TYR	GLU	LEU	VAL	ILE	PRO	LYS	HIS	ILE	TYR	LEU	ASN	ASN	TRP	ASN	VAL	VAL	ASN	ILE	GLY	HIS	LEU	VAL	LYS	SER	ALA	ALA	GLY	GLN	LEU	THR	HIS	VAL	THR	ILE	ALA	HIS	PRO	TYR	TRP	GLU	LYS	ASN	LYS	GLU	CYS	VAL	GLU	THR	ILE	TYR	LEU	HIS
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[illegible]

CYS	GLN	ILE	PRO	PRO	TYR	VAL	PRO	PRO	ILE	SER	VAL	THR	THR	THR	SER	CYS	PHE	GLY	LEU	LEU	ASP	PHE	LYS	ARG	PRO	PRO	LEU	VAL	ALA	GLU	GLU	ARG	ARG	ARG	LEU	LEU	SER	PHE	GLU	PRO	ASN	LEU	GLN	LEU	LEU	ARG	LEU	VAL	GLY	ILE	ILE	ALA	LYS	LYS	LYS	GLY	ILE
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lys ile glu val thr ser ser gly glu ser ser ile lys glu gln gln glu glu arg ala ala ala leu leu leu asp ile his glu gly asp thr pro pro trp ile gln gln leu leu ala ala ala thr lys asp val trp pro ala ala ala thr lys val thr pro ala ala leu gln gly ile gly asn phe

LEU SER GLY THR ALA GLN GLY ILE PHE GLY THR ALA PHE SER LEU LEU GLY TYR LYS LEU ILE ILE ILE LEU LEU VAL VAL GLY GLY ILE ILE LEU LEU VAL ILE ILE LEU PHE LYS ILE ILE VAL SER TRP PRO THR LYS LYS ASN

- Molecule 1: Envelope glycoprotein



MET	ALA	PRO	PRO	MET	THR	LEU	GLN	GLN	TRP	ILE	ILE	TRP	ASN	LYS	MET	ASN	LYS	ALA	GLU	LEU	GLN	ASN	THR	THR	THR	THR	GLU	GLN	GLN	LYS	GLU	GLU	VAL	VAL	ASP	ASP	ILE	ILE	GLN	ASN	GLU	GLU	GLU	VAL	VAL	GLN	PRO	THR	THR	ARG	ARG	ASP	LYS	PHE	ARG	TYR	LEU	LEU	LEU	TYR	THR
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[illegible]

THR	ARG	ARG	ILE	ALA	ARG	SER	LEU	ARG	MET	GLN	HIS	PRO	PRO	VAL	LYS	TYR	VAL	GLU	VAL	ASN	MET	THR	SER	ILE	PRO	GLN	GLY	VAL	TYR	TYR	GLU	HIS	PRO	PRO	GLU	GLU	PRO	ILE	VAL	VAL	VAL	LYS	VAL	GLU	ARG	VAL	LEU	GLY	LEU	SER	GLN	ILE	LEU	ILE	ASN	SER	GLU	ASN	ASN	ALA	ASN
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LEU	GLY	ALA	CYS	LEU
LEU	ASP	GLU	PRO	VAL
ILE	THR	GLU	VAL	LYS
ILE	PRO	ARG	TRP	SER
ILE	PRO	ALA	ALA	ALA
ILE	TRP	SER	GLU	GLY
PHE	ILE	PHE	ALA	GLN
LYS	GLN	GLU	VAL	LEU
ILE	GLN	PRO	LYS	THR
VAL	LEU	ARG	GLU	HIS
SER	ALA	LEU	PRO	THR
TRP	ALA	PRO	PHE	THR
ILE	ALA	ASN	VAL	ILE
THR	THR	LEU	GLN	ALA
PRO	LYS	GLN	VAL	HIS
LYS	VAL	LEU	ASN	PRO
LYS	ASP	ARG	PRO	TYP
LYS	TRP	LEU	LEU	GLJ
ASN	PRO	PRO	LYS	ILE
ASN	ALA	HIS	ASN	ILE
GLN	ALA	LEU	GLY	ASN
	ALA	VAL	SER	LYS
	SER	GLY	TYP	GLJ
	ALA	ILE	LEU	CYS
	LEU	ILE	VAL	VAL
	GLN	ALA	LEU	THR
	GLY	LYS	ILE	ILE
	ILE	LYS	SER	TYP
	GLY	LYS	THR	LEU
	ASN	GLY	THR	LEU
	PHE	ILE	ASP	HIS
	LEU	LYS	CYS	LEU
	SER	ILE	GLU	GLJ
	GLY	GLU	ILE	ASP
	THR	VAL	PRO	CYS
	ALA	THR	PRO	THR
	GLN	SER	TYP	ARG
	GLY	SER	VAL	ASP
	ILE	GLY	PRO	ASP
	PHE	GLU	SER	TYP
	GLY	SER	ILE	VAL
	THR	ILE	VAL	ILE
	ALA	LYS	THR	CYS
	PHE	GLU	VAL	ASP
	SER	GLN	ASN	VAL
	LEU	ILE	GLU	VAL
	LEU	GLJ	THR	LYS
	GLY	ARG	THR	ILE
	TYP	ALA	SER	VAL
	LEU	LYS	GLN	PRO
	LYS	ALA	PHE	CYS
	PRO	GLU	GLY	GLY
	ILE	LEU	LEU	ASN
	LEU	LEU	ASP	ASN
	ILE	ARG	PHE	SER
	VAL	LEU	LYS	SER
	VAL	ASP	ARG	ASP
	GLY	ILE	PRO	THR
	VAL	HIS	LEU	SER
	ILE	GLN	VAL	ASN

- Molecule 1: Envelope glycoprotein

[illegible]

- Molecule 1: Envelope glycoprotein











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

Chain b: 



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

Chain N: 



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

Chain Z: 



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

Chain c: 



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

Chain O: 




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

Chain a: 



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

Chain d:  50% 50%



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

Chain S:  33% 67%



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

Chain T:  33% 67%



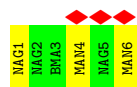
- Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain U:  33% 67%



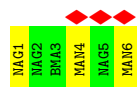
- Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain V:  50% 50%

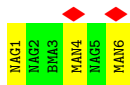


- Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain W:  50% 50%



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



- Molecule 5: 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



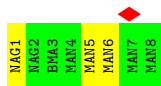
- Molecule 5: alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 5: 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

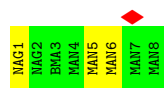


- Molecule 6: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

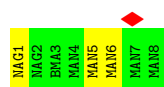


- Molecule 6: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

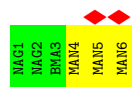
-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



• Molecule 6: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[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



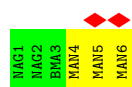
• Molecule 7: alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



• Molecule 7: alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[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



• Molecule 7: alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[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



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C3	Depositor
Number of particles used	286827	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 ( $e^-/\text{\AA}^2$ )	48	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.185	Depositor
Minimum map value	-0.119	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.022	Depositor
Map size (Å)	518.4, 518.4, 518.4	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.08, 1.08, 1.08	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: MAN, PTY, BMA, CLR, NAG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.71	0/476	0.70	0/653
1	B	0.61	0/97	0.74	0/130
1	C	0.67	0/3416	0.74	0/4634
1	D	0.69	0/3260	0.77	0/4441
1	E	0.71	0/476	0.70	0/653
1	F	0.61	0/97	0.74	0/130
1	G	0.67	0/3416	0.74	0/4634
1	H	0.69	0/3260	0.77	0/4441
1	I	0.71	0/476	0.70	0/653
1	J	0.61	0/97	0.74	0/130
1	K	0.67	0/3416	0.74	0/4634
1	L	0.69	0/3260	0.77	0/4441
All	All	0.68	0/21747	0.75	0/29574

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	A	466	0	488	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	94	0	97	0	0
1	C	3328	0	3241	7	0
1	D	3190	0	3242	7	0
1	E	466	0	488	0	0
1	F	94	0	97	0	0
1	G	3328	0	3241	7	0
1	H	3190	0	3242	7	0
1	I	466	0	488	0	0
1	J	94	0	97	0	0
1	K	3328	0	3241	7	0
1	L	3190	0	3242	7	0
2	M	28	0	25	0	0
2	N	28	0	25	0	0
2	O	28	0	25	0	0
2	Y	28	0	25	0	0
2	Z	28	0	25	0	0
2	a	28	0	25	0	0
2	b	28	0	25	0	0
2	c	28	0	25	0	0
2	d	28	0	25	0	0
3	S	39	0	34	0	0
3	T	39	0	34	0	0
3	U	39	0	34	0	0
4	V	75	0	64	0	0
4	W	75	0	64	0	0
4	X	75	0	64	0	0
5	P	50	0	43	0	0
5	Q	50	0	43	0	0
5	R	50	0	43	0	0
6	e	94	0	79	0	0
6	f	94	0	79	0	0
6	g	94	0	79	0	0
7	h	72	0	61	0	0
7	i	72	0	61	0	0
7	j	72	0	61	0	0
8	C	42	0	39	0	0
8	G	42	0	39	0	0
8	K	42	0	39	0	0
9	D	28	0	46	0	0
9	H	28	0	46	0	0
9	L	28	0	46	0	0
10	D	50	0	79	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
10	H	50	0	79	0	0
10	L	50	0	79	0	0
All	All	22836	0	22764	30	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 (30) 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:K:197:ASN:OD1	1:L:700:THR:HG21	1.97	0.65
1:C:197:ASN:OD1	1:D:700:THR:HG21	1.97	0.65
1:G:197:ASN:OD1	1:H:700:THR:HG21	1.97	0.64
1:G:277:ILE:HG21	1:G:298:LEU:HD12	1.89	0.55
1:K:277:ILE:HG21	1:K:298:LEU:HD12	1.89	0.54
1:C:277:ILE:HG21	1:C:298:LEU:HD12	1.88	0.53
1:K:193:THR:HG23	1:L:700:THR:HG23	1.92	0.52
1:G:193:THR:HG23	1:H:700:THR:HG23	1.92	0.51
1:C:193:THR:HG23	1:D:700:THR:HG23	1.92	0.51
1:D:652:GLU:OE2	1:L:654:ARG:NH1	2.47	0.47
1:D:654:ARG:NH1	1:H:652:GLU:OE2	2.47	0.47
1:H:654:ARG:NH1	1:L:652:GLU:OE2	2.47	0.47
1:G:358:ALA:HA	1:G:370:ALA:HB3	1.98	0.46
1:K:358:ALA:HA	1:K:370:ALA:HB3	1.98	0.45
1:H:760:LEU:HD22	1:H:774:VAL:HG22	1.99	0.45
1:L:760:LEU:HD22	1:L:774:VAL:HG22	1.99	0.45
1:C:358:ALA:HA	1:C:370:ALA:HB3	1.97	0.44
1:C:277:ILE:HD11	1:C:302:TYR:HB2	2.00	0.44
1:D:760:LEU:HD22	1:D:774:VAL:HG22	1.99	0.43
1:G:160:VAL:HG22	1:H:774:VAL:HG21	2.01	0.43
1:K:277:ILE:HD11	1:K:302:TYR:HB2	2.00	0.43
1:G:277:ILE:HD11	1:G:302:TYR:HB2	2.00	0.43
1:K:160:VAL:HG22	1:L:774:VAL:HG21	2.01	0.43
1:C:160:VAL:HG22	1:D:774:VAL:HG21	2.01	0.42
1:G:337:GLU:O	1:G:341:LEU:HG	2.20	0.42
1:C:337:GLU:O	1:C:341:LEU:HG	2.20	0.42
1:K:337:GLU:O	1:K:341:LEU:HG	2.20	0.42
1:D:911:THR:HB	1:D:912:PRO:HD3	2.02	0.41
1:H:911:THR:HB	1:H:912:PRO:HD3	2.02	0.41
1:L:911:THR:HB	1:L:912:PRO:HD3	2.02	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	56/988 (6%)	55 (98%)	1 (2%)	0	100	100
1	B	9/988 (1%)	7 (78%)	2 (22%)	0	100	100
1	C	399/988 (40%)	374 (94%)	25 (6%)	0	100	100
1	D	403/988 (41%)	377 (94%)	26 (6%)	0	100	100
1	E	56/988 (6%)	55 (98%)	1 (2%)	0	100	100
1	F	9/988 (1%)	7 (78%)	2 (22%)	0	100	100
1	G	399/988 (40%)	374 (94%)	25 (6%)	0	100	100
1	H	403/988 (41%)	376 (93%)	27 (7%)	0	100	100
1	I	56/988 (6%)	55 (98%)	1 (2%)	0	100	100
1	J	9/988 (1%)	7 (78%)	2 (22%)	0	100	100
1	K	399/988 (40%)	374 (94%)	25 (6%)	0	100	100
1	L	403/988 (41%)	376 (93%)	27 (7%)	0	100	100
All	All	2601/11856 (22%)	2437 (94%)	164 (6%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	54/899 (6%)	54 (100%)	0	100	100
1	B	11/899 (1%)	11 (100%)	0	100	100
1	C	376/899 (42%)	374 (100%)	2 (0%)	86	95
1	D	356/899 (40%)	355 (100%)	1 (0%)	91	97
1	E	54/899 (6%)	54 (100%)	0	100	100
1	F	11/899 (1%)	11 (100%)	0	100	100
1	G	376/899 (42%)	374 (100%)	2 (0%)	86	95
1	H	356/899 (40%)	355 (100%)	1 (0%)	91	97
1	I	54/899 (6%)	54 (100%)	0	100	100
1	J	11/899 (1%)	11 (100%)	0	100	100
1	K	376/899 (42%)	374 (100%)	2 (0%)	86	95
1	L	356/899 (40%)	355 (100%)	1 (0%)	91	97
All	All	2391/10788 (22%)	2382 (100%)	9 (0%)	88	96

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	151	TYR
1	C	405	ASN
1	D	812	LEU
1	G	151	TYR
1	G	405	ASN
1	H	812	LEU
1	K	151	TYR
1	K	405	ASN
1	L	812	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates

99 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
2	NAG	M	1	2,1	14,14,15	0.31	0	17,19,21	1.35	2 (11%)
2	NAG	M	2	2	14,14,15	0.32	0	17,19,21	0.75	0
2	NAG	N	1	2,1	14,14,15	0.31	0	17,19,21	1.34	2 (11%)
2	NAG	N	2	2	14,14,15	0.31	0	17,19,21	0.74	0
2	NAG	O	1	2,1	14,14,15	0.32	0	17,19,21	1.34	2 (11%)
2	NAG	O	2	2	14,14,15	0.32	0	17,19,21	0.74	0
5	NAG	P	1	5,1	14,14,15	0.36	0	17,19,21	1.01	1 (5%)
5	NAG	P	2	5	14,14,15	0.37	0	17,19,21	0.96	1 (5%)
5	BMA	P	3	5	11,11,12	0.40	0	15,15,17	0.88	1 (6%)
5	MAN	P	4	5	11,11,12	0.43	0	15,15,17	0.86	1 (6%)
5	NAG	Q	1	5,1	14,14,15	0.35	0	17,19,21	1.01	1 (5%)
5	NAG	Q	2	5	14,14,15	0.36	0	17,19,21	0.96	1 (5%)
5	BMA	Q	3	5	11,11,12	0.40	0	15,15,17	0.88	1 (6%)
5	MAN	Q	4	5	11,11,12	0.43	0	15,15,17	0.86	1 (6%)
5	NAG	R	1	5,1	14,14,15	0.35	0	17,19,21	1.01	1 (5%)
5	NAG	R	2	5	14,14,15	0.37	0	17,19,21	0.96	1 (5%)
5	BMA	R	3	5	11,11,12	0.40	0	15,15,17	0.87	1 (6%)
5	MAN	R	4	5	11,11,12	0.43	0	15,15,17	0.87	1 (6%)
3	NAG	S	1	3,1	14,14,15	0.42	0	17,19,21	1.40	2 (11%)
3	NAG	S	2	3	14,14,15	0.42	0	17,19,21	1.54	3 (17%)
3	BMA	S	3	3	11,11,12	0.34	0	15,15,17	0.64	0
3	NAG	T	1	3,1	14,14,15	0.42	0	17,19,21	1.40	2 (11%)
3	NAG	T	2	3	14,14,15	0.42	0	17,19,21	1.54	3 (17%)
3	BMA	T	3	3	11,11,12	0.34	0	15,15,17	0.65	0
3	NAG	U	1	3,1	14,14,15	0.42	0	17,19,21	1.40	2 (11%)
3	NAG	U	2	3	14,14,15	0.42	0	17,19,21	1.54	3 (17%)
3	BMA	U	3	3	11,11,12	0.34	0	15,15,17	0.64	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	NAG	V	1	4,1	14,14,15	0.48	0	17,19,21	1.09	1 (5%)
4	NAG	V	2	4	14,14,15	0.30	0	17,19,21	0.79	0
4	BMA	V	3	4	11,11,12	0.36	0	15,15,17	0.77	0
4	MAN	V	4	4	11,11,12	0.65	0	15,15,17	1.38	2 (13%)
4	NAG	V	5	4	14,14,15	0.25	0	17,19,21	0.87	0
4	MAN	V	6	4	11,11,12	0.37	0	15,15,17	0.87	1 (6%)
4	NAG	W	1	4,1	14,14,15	0.48	0	17,19,21	1.09	1 (5%)
4	NAG	W	2	4	14,14,15	0.31	0	17,19,21	0.80	0
4	BMA	W	3	4	11,11,12	0.36	0	15,15,17	0.77	0
4	MAN	W	4	4	11,11,12	0.65	0	15,15,17	1.39	2 (13%)
4	NAG	W	5	4	14,14,15	0.25	0	17,19,21	0.87	0
4	MAN	W	6	4	11,11,12	0.36	0	15,15,17	0.86	1 (6%)
4	NAG	X	1	4,1	14,14,15	0.48	0	17,19,21	1.09	1 (5%)
4	NAG	X	2	4	14,14,15	0.30	0	17,19,21	0.80	0
4	BMA	X	3	4	11,11,12	0.36	0	15,15,17	0.77	0
4	MAN	X	4	4	11,11,12	0.65	0	15,15,17	1.38	2 (13%)
4	NAG	X	5	4	14,14,15	0.26	0	17,19,21	0.87	0
4	MAN	X	6	4	11,11,12	0.37	0	15,15,17	0.86	1 (6%)
2	NAG	Y	1	2,1	14,14,15	0.39	0	17,19,21	0.77	0
2	NAG	Y	2	2	14,14,15	0.31	0	17,19,21	1.00	2 (11%)
2	NAG	Z	1	2,1	14,14,15	0.39	0	17,19,21	0.77	0
2	NAG	Z	2	2	14,14,15	0.32	0	17,19,21	1.00	2 (11%)
2	NAG	a	1	2,1	14,14,15	0.39	0	17,19,21	0.77	0
2	NAG	a	2	2	14,14,15	0.31	0	17,19,21	1.01	2 (11%)
2	NAG	b	1	2,1	14,14,15	0.37	0	17,19,21	0.79	0
2	NAG	b	2	2	14,14,15	0.31	0	17,19,21	1.17	2 (11%)
2	NAG	c	1	2,1	14,14,15	0.38	0	17,19,21	0.79	0
2	NAG	c	2	2	14,14,15	0.31	0	17,19,21	1.17	2 (11%)
2	NAG	d	1	2,1	14,14,15	0.37	0	17,19,21	0.79	0
2	NAG	d	2	2	14,14,15	0.31	0	17,19,21	1.17	2 (11%)
6	NAG	e	1	6,1	14,14,15	0.37	0	17,19,21	1.17	1 (5%)
6	NAG	e	2	6	14,14,15	0.45	0	17,19,21	0.84	0
6	BMA	e	3	6	11,11,12	0.37	0	15,15,17	0.65	0
6	MAN	e	4	6	11,11,12	0.34	0	15,15,17	0.80	0
6	MAN	e	5	6	11,11,12	0.34	0	15,15,17	0.93	1 (6%)
6	MAN	e	6	6	11,11,12	0.35	0	15,15,17	0.89	1 (6%)
6	MAN	e	7	6	11,11,12	0.39	0	15,15,17	0.69	0
6	MAN	e	8	6	11,11,12	0.35	0	15,15,17	0.69	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	NAG	f	1	6,1	14,14,15	0.37	0	17,19,21	1.17	1 (5%)
6	NAG	f	2	6	14,14,15	0.45	0	17,19,21	0.84	0
6	BMA	f	3	6	11,11,12	0.38	0	15,15,17	0.65	0
6	MAN	f	4	6	11,11,12	0.34	0	15,15,17	0.80	0
6	MAN	f	5	6	11,11,12	0.34	0	15,15,17	0.92	1 (6%)
6	MAN	f	6	6	11,11,12	0.35	0	15,15,17	0.89	1 (6%)
6	MAN	f	7	6	11,11,12	0.38	0	15,15,17	0.69	0
6	MAN	f	8	6	11,11,12	0.36	0	15,15,17	0.69	0
6	NAG	g	1	6,1	14,14,15	0.37	0	17,19,21	1.17	1 (5%)
6	NAG	g	2	6	14,14,15	0.45	0	17,19,21	0.84	0
6	BMA	g	3	6	11,11,12	0.37	0	15,15,17	0.65	0
6	MAN	g	4	6	11,11,12	0.34	0	15,15,17	0.80	0
6	MAN	g	5	6	11,11,12	0.35	0	15,15,17	0.93	1 (6%)
6	MAN	g	6	6	11,11,12	0.36	0	15,15,17	0.89	1 (6%)
6	MAN	g	7	6	11,11,12	0.38	0	15,15,17	0.69	0
6	MAN	g	8	6	11,11,12	0.35	0	15,15,17	0.70	0
7	NAG	h	1	1,7	14,14,15	0.50	0	17,19,21	1.08	0
7	NAG	h	2	7	14,14,15	0.47	0	17,19,21	0.82	0
7	BMA	h	3	7	11,11,12	0.40	0	15,15,17	0.66	0
7	MAN	h	4	7	11,11,12	0.37	0	15,15,17	0.86	1 (6%)
7	MAN	h	5	7	11,11,12	0.33	0	15,15,17	0.86	1 (6%)
7	MAN	h	6	7	11,11,12	0.35	0	15,15,17	0.77	1 (6%)
7	NAG	i	1	1,7	14,14,15	0.50	0	17,19,21	1.08	0
7	NAG	i	2	7	14,14,15	0.47	0	17,19,21	0.82	0
7	BMA	i	3	7	11,11,12	0.40	0	15,15,17	0.66	0
7	MAN	i	4	7	11,11,12	0.37	0	15,15,17	0.86	1 (6%)
7	MAN	i	5	7	11,11,12	0.33	0	15,15,17	0.87	1 (6%)
7	MAN	i	6	7	11,11,12	0.35	0	15,15,17	0.77	1 (6%)
7	NAG	j	1	1,7	14,14,15	0.50	0	17,19,21	1.08	0
7	NAG	j	2	7	14,14,15	0.48	0	17,19,21	0.82	0
7	BMA	j	3	7	11,11,12	0.40	0	15,15,17	0.66	0
7	MAN	j	4	7	11,11,12	0.37	0	15,15,17	0.86	1 (6%)
7	MAN	j	5	7	11,11,12	0.33	0	15,15,17	0.86	1 (6%)
7	MAN	j	6	7	11,11,12	0.35	0	15,15,17	0.77	1 (6%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	M	1	2,1	-	1/6/23/26	0/1/1/1
2	NAG	M	2	2	-	0/6/23/26	0/1/1/1
2	NAG	N	1	2,1	-	1/6/23/26	0/1/1/1
2	NAG	N	2	2	-	0/6/23/26	0/1/1/1
2	NAG	O	1	2,1	-	1/6/23/26	0/1/1/1
2	NAG	O	2	2	-	0/6/23/26	0/1/1/1
5	NAG	P	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	P	2	5	-	1/6/23/26	0/1/1/1
5	BMA	P	3	5	-	1/2/19/22	0/1/1/1
5	MAN	P	4	5	-	0/2/19/22	0/1/1/1
5	NAG	Q	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	Q	2	5	-	1/6/23/26	0/1/1/1
5	BMA	Q	3	5	-	1/2/19/22	0/1/1/1
5	MAN	Q	4	5	-	0/2/19/22	0/1/1/1
5	NAG	R	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	R	2	5	-	1/6/23/26	0/1/1/1
5	BMA	R	3	5	-	1/2/19/22	0/1/1/1
5	MAN	R	4	5	-	0/2/19/22	0/1/1/1
3	NAG	S	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	S	2	3	-	2/6/23/26	0/1/1/1
3	BMA	S	3	3	-	0/2/19/22	0/1/1/1
3	NAG	T	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	T	2	3	-	2/6/23/26	0/1/1/1
3	BMA	T	3	3	-	0/2/19/22	0/1/1/1
3	NAG	U	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	U	2	3	-	2/6/23/26	0/1/1/1
3	BMA	U	3	3	-	0/2/19/22	0/1/1/1
4	NAG	V	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	V	2	4	-	0/6/23/26	0/1/1/1
4	BMA	V	3	4	-	0/2/19/22	0/1/1/1
4	MAN	V	4	4	-	1/2/19/22	0/1/1/1
4	NAG	V	5	4	-	1/6/23/26	0/1/1/1
4	MAN	V	6	4	-	0/2/19/22	0/1/1/1
4	NAG	W	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	W	2	4	-	0/6/23/26	0/1/1/1
4	BMA	W	3	4	-	0/2/19/22	0/1/1/1
4	MAN	W	4	4	-	1/2/19/22	0/1/1/1
4	NAG	W	5	4	-	1/6/23/26	0/1/1/1
4	MAN	W	6	4	-	0/2/19/22	0/1/1/1
4	NAG	X	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	X	2	4	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	BMA	X	3	4	-	0/2/19/22	0/1/1/1
4	MAN	X	4	4	-	1/2/19/22	0/1/1/1
4	NAG	X	5	4	-	1/6/23/26	0/1/1/1
4	MAN	X	6	4	-	0/2/19/22	0/1/1/1
2	NAG	Y	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	Y	2	2	-	1/6/23/26	0/1/1/1
2	NAG	Z	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	Z	2	2	-	1/6/23/26	0/1/1/1
2	NAG	a	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	a	2	2	-	1/6/23/26	0/1/1/1
2	NAG	b	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	b	2	2	-	4/6/23/26	0/1/1/1
2	NAG	c	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	c	2	2	-	4/6/23/26	0/1/1/1
2	NAG	d	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	d	2	2	-	4/6/23/26	0/1/1/1
6	NAG	e	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	e	2	6	-	2/6/23/26	0/1/1/1
6	BMA	e	3	6	-	0/2/19/22	0/1/1/1
6	MAN	e	4	6	-	0/2/19/22	0/1/1/1
6	MAN	e	5	6	-	0/2/19/22	0/1/1/1
6	MAN	e	6	6	-	0/2/19/22	0/1/1/1
6	MAN	e	7	6	-	0/2/19/22	0/1/1/1
6	MAN	e	8	6	-	0/2/19/22	0/1/1/1
6	NAG	f	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	f	2	6	-	2/6/23/26	0/1/1/1
6	BMA	f	3	6	-	0/2/19/22	0/1/1/1
6	MAN	f	4	6	-	0/2/19/22	0/1/1/1
6	MAN	f	5	6	-	0/2/19/22	0/1/1/1
6	MAN	f	6	6	-	0/2/19/22	0/1/1/1
6	MAN	f	7	6	-	0/2/19/22	0/1/1/1
6	MAN	f	8	6	-	0/2/19/22	0/1/1/1
6	NAG	g	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	g	2	6	-	2/6/23/26	0/1/1/1
6	BMA	g	3	6	-	0/2/19/22	0/1/1/1
6	MAN	g	4	6	-	0/2/19/22	0/1/1/1
6	MAN	g	5	6	-	0/2/19/22	0/1/1/1
6	MAN	g	6	6	-	0/2/19/22	0/1/1/1
6	MAN	g	7	6	-	0/2/19/22	0/1/1/1
6	MAN	g	8	6	-	0/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	NAG	h	1	1,7	-	0/6/23/26	0/1/1/1
7	NAG	h	2	7	-	0/6/23/26	0/1/1/1
7	BMA	h	3	7	-	0/2/19/22	0/1/1/1
7	MAN	h	4	7	-	1/2/19/22	0/1/1/1
7	MAN	h	5	7	-	0/2/19/22	0/1/1/1
7	MAN	h	6	7	-	0/2/19/22	0/1/1/1
7	NAG	i	1	1,7	-	0/6/23/26	0/1/1/1
7	NAG	i	2	7	-	0/6/23/26	0/1/1/1
7	BMA	i	3	7	-	0/2/19/22	0/1/1/1
7	MAN	i	4	7	-	1/2/19/22	0/1/1/1
7	MAN	i	5	7	-	0/2/19/22	0/1/1/1
7	MAN	i	6	7	-	0/2/19/22	0/1/1/1
7	NAG	j	1	1,7	-	0/6/23/26	0/1/1/1
7	NAG	j	2	7	-	0/6/23/26	0/1/1/1
7	BMA	j	3	7	-	0/2/19/22	0/1/1/1
7	MAN	j	4	7	-	1/2/19/22	0/1/1/1
7	MAN	j	5	7	-	0/2/19/22	0/1/1/1
7	MAN	j	6	7	-	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (75) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	V	4	MAN	O2-C2-C1	4.03	117.39	109.15
4	W	4	MAN	O2-C2-C1	4.03	117.39	109.15
4	X	4	MAN	O2-C2-C1	4.01	117.36	109.15
3	U	2	NAG	C2-N2-C7	3.83	128.35	122.90
3	T	2	NAG	C2-N2-C7	3.82	128.34	122.90
3	S	2	NAG	C2-N2-C7	3.80	128.31	122.90
4	W	1	NAG	C1-O5-C5	3.39	116.78	112.19
4	X	1	NAG	C1-O5-C5	3.39	116.78	112.19
4	V	1	NAG	C1-O5-C5	3.37	116.75	112.19
2	M	1	NAG	C1-O5-C5	3.36	116.75	112.19
2	N	1	NAG	C1-O5-C5	3.35	116.73	112.19
2	O	1	NAG	C1-O5-C5	3.33	116.71	112.19
3	T	1	NAG	C2-N2-C7	3.24	127.52	122.90
3	S	1	NAG	C2-N2-C7	3.23	127.50	122.90
3	U	1	NAG	C2-N2-C7	3.22	127.48	122.90
6	g	1	NAG	C1-O5-C5	2.98	116.23	112.19
6	f	1	NAG	C1-O5-C5	2.96	116.21	112.19
6	e	1	NAG	C1-O5-C5	2.96	116.20	112.19
5	Q	1	NAG	C1-C2-N2	-2.89	105.56	110.49

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	R	1	NAG	C1-C2-N2	-2.88	105.57	110.49
5	P	1	NAG	C1-C2-N2	-2.88	105.57	110.49
4	W	4	MAN	C1-O5-C5	2.87	116.08	112.19
4	X	4	MAN	C1-O5-C5	2.84	116.05	112.19
4	V	4	MAN	C1-O5-C5	2.84	116.04	112.19
3	U	1	NAG	C8-C7-N2	2.82	120.87	116.10
3	T	1	NAG	C8-C7-N2	2.82	120.87	116.10
3	S	1	NAG	C8-C7-N2	2.81	120.86	116.10
2	c	2	NAG	C2-N2-C7	2.78	126.86	122.90
2	b	2	NAG	C2-N2-C7	2.76	126.84	122.90
2	d	2	NAG	C2-N2-C7	2.76	126.83	122.90
3	S	2	NAG	C4-C3-C2	2.67	114.93	111.02
3	U	2	NAG	C4-C3-C2	2.66	114.92	111.02
3	T	2	NAG	C4-C3-C2	2.66	114.91	111.02
2	M	1	NAG	O5-C1-C2	-2.59	107.19	111.29
2	N	1	NAG	O5-C1-C2	-2.58	107.22	111.29
6	g	5	MAN	C1-O5-C5	2.58	115.69	112.19
2	O	1	NAG	O5-C1-C2	-2.57	107.23	111.29
6	e	5	MAN	C1-O5-C5	2.57	115.67	112.19
6	f	5	MAN	C1-O5-C5	2.56	115.67	112.19
6	f	6	MAN	C1-O5-C5	2.54	115.63	112.19
6	e	6	MAN	C1-O5-C5	2.53	115.62	112.19
6	g	6	MAN	C1-O5-C5	2.52	115.61	112.19
7	h	4	MAN	C1-O5-C5	2.52	115.61	112.19
7	j	4	MAN	C1-O5-C5	2.52	115.61	112.19
7	i	4	MAN	C1-O5-C5	2.51	115.59	112.19
5	P	2	NAG	C1-O5-C5	2.49	115.57	112.19
5	R	2	NAG	C1-O5-C5	2.49	115.56	112.19
5	Q	2	NAG	C1-O5-C5	2.48	115.55	112.19
2	d	2	NAG	C8-C7-N2	2.43	120.20	116.10
7	i	5	MAN	C1-O5-C5	2.42	115.47	112.19
2	c	2	NAG	C8-C7-N2	2.42	120.20	116.10
3	S	2	NAG	C1-C2-N2	-2.42	106.36	110.49
2	b	2	NAG	C8-C7-N2	2.42	120.19	116.10
3	T	2	NAG	C1-C2-N2	-2.41	106.36	110.49
3	U	2	NAG	C1-C2-N2	-2.41	106.37	110.49
7	j	5	MAN	C1-O5-C5	2.40	115.44	112.19
7	h	5	MAN	C1-O5-C5	2.38	115.42	112.19
4	V	6	MAN	C1-O5-C5	2.33	115.35	112.19
4	X	6	MAN	C1-O5-C5	2.33	115.35	112.19
4	W	6	MAN	C1-O5-C5	2.32	115.33	112.19
7	j	6	MAN	C1-O5-C5	2.25	115.24	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	h	6	MAN	C1-O5-C5	2.24	115.23	112.19
7	i	6	MAN	C1-O5-C5	2.24	115.22	112.19
5	Q	3	BMA	C1-O5-C5	2.21	115.18	112.19
5	P	3	BMA	C1-O5-C5	2.21	115.18	112.19
5	R	3	BMA	C1-O5-C5	2.19	115.16	112.19
5	R	4	MAN	C1-C2-C3	2.15	112.31	109.67
5	Q	4	MAN	C1-C2-C3	2.12	112.28	109.67
5	P	4	MAN	C1-C2-C3	2.12	112.27	109.67
2	Y	2	NAG	O5-C1-C2	-2.11	107.96	111.29
2	Z	2	NAG	O5-C1-C2	-2.11	107.96	111.29
2	a	2	NAG	O5-C1-C2	-2.10	107.97	111.29
2	a	2	NAG	C1-O5-C5	2.06	114.98	112.19
2	Z	2	NAG	C1-O5-C5	2.04	114.96	112.19
2	Y	2	NAG	C1-O5-C5	2.04	114.95	112.19

There are no chirality outliers.

All (66) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	S	2	NAG	C3-C2-N2-C7
3	T	2	NAG	C3-C2-N2-C7
3	U	2	NAG	C3-C2-N2-C7
2	b	1	NAG	O5-C5-C6-O6
2	c	1	NAG	O5-C5-C6-O6
2	d	1	NAG	O5-C5-C6-O6
2	b	1	NAG	C4-C5-C6-O6
2	c	1	NAG	C4-C5-C6-O6
2	d	1	NAG	C4-C5-C6-O6
2	b	2	NAG	C8-C7-N2-C2
2	b	2	NAG	O7-C7-N2-C2
2	c	2	NAG	C8-C7-N2-C2
2	c	2	NAG	O7-C7-N2-C2
2	d	2	NAG	C8-C7-N2-C2
2	d	2	NAG	O7-C7-N2-C2
3	S	1	NAG	C8-C7-N2-C2
3	S	1	NAG	O7-C7-N2-C2
3	T	1	NAG	C8-C7-N2-C2
3	T	1	NAG	O7-C7-N2-C2
3	U	1	NAG	C8-C7-N2-C2
3	U	1	NAG	O7-C7-N2-C2
6	e	2	NAG	C4-C5-C6-O6
6	f	2	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
6	g	2	NAG	C4-C5-C6-O6
5	P	2	NAG	O5-C5-C6-O6
5	Q	2	NAG	O5-C5-C6-O6
5	R	2	NAG	O5-C5-C6-O6
2	b	2	NAG	C4-C5-C6-O6
2	c	2	NAG	C4-C5-C6-O6
2	d	2	NAG	C4-C5-C6-O6
5	Q	1	NAG	C4-C5-C6-O6
5	P	1	NAG	C4-C5-C6-O6
5	R	1	NAG	C4-C5-C6-O6
2	Y	2	NAG	O5-C5-C6-O6
2	Z	2	NAG	O5-C5-C6-O6
2	a	2	NAG	O5-C5-C6-O6
7	h	4	MAN	O5-C5-C6-O6
7	i	4	MAN	O5-C5-C6-O6
7	j	4	MAN	O5-C5-C6-O6
4	V	4	MAN	O5-C5-C6-O6
4	W	4	MAN	O5-C5-C6-O6
4	X	4	MAN	O5-C5-C6-O6
4	W	1	NAG	C4-C5-C6-O6
4	V	1	NAG	C4-C5-C6-O6
4	X	1	NAG	C4-C5-C6-O6
5	P	3	BMA	O5-C5-C6-O6
5	Q	3	BMA	O5-C5-C6-O6
5	R	3	BMA	O5-C5-C6-O6
6	e	2	NAG	O5-C5-C6-O6
6	f	2	NAG	O5-C5-C6-O6
6	g	2	NAG	O5-C5-C6-O6
2	b	2	NAG	O5-C5-C6-O6
2	c	2	NAG	O5-C5-C6-O6
2	d	2	NAG	O5-C5-C6-O6
2	M	1	NAG	C3-C2-N2-C7
2	N	1	NAG	C3-C2-N2-C7
2	O	1	NAG	C3-C2-N2-C7
4	V	5	NAG	O5-C5-C6-O6
4	W	5	NAG	O5-C5-C6-O6
4	X	5	NAG	O5-C5-C6-O6
3	S	2	NAG	C1-C2-N2-C7
3	T	2	NAG	C1-C2-N2-C7
3	U	2	NAG	C1-C2-N2-C7
5	P	1	NAG	O5-C5-C6-O6
5	Q	1	NAG	O5-C5-C6-O6

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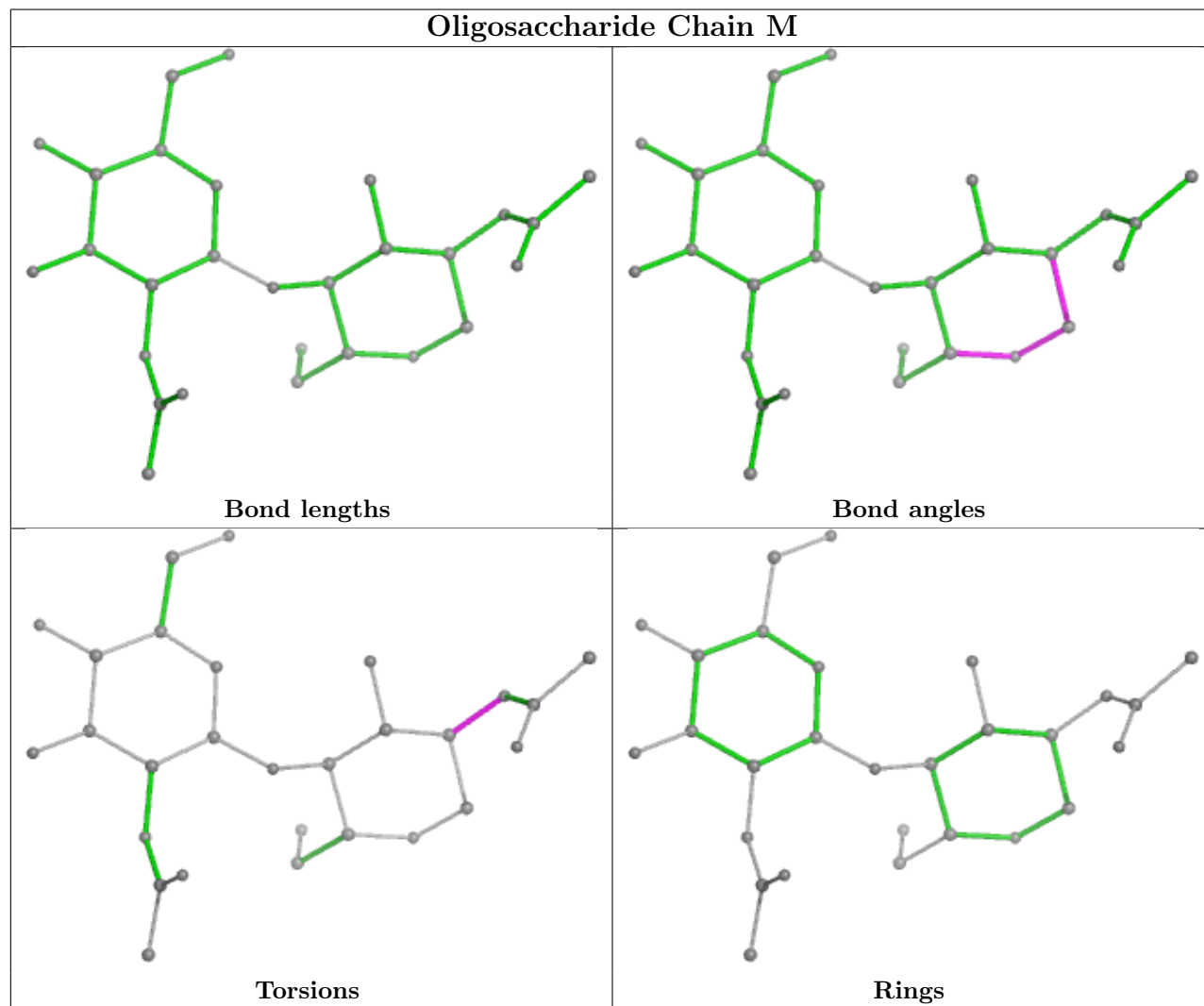
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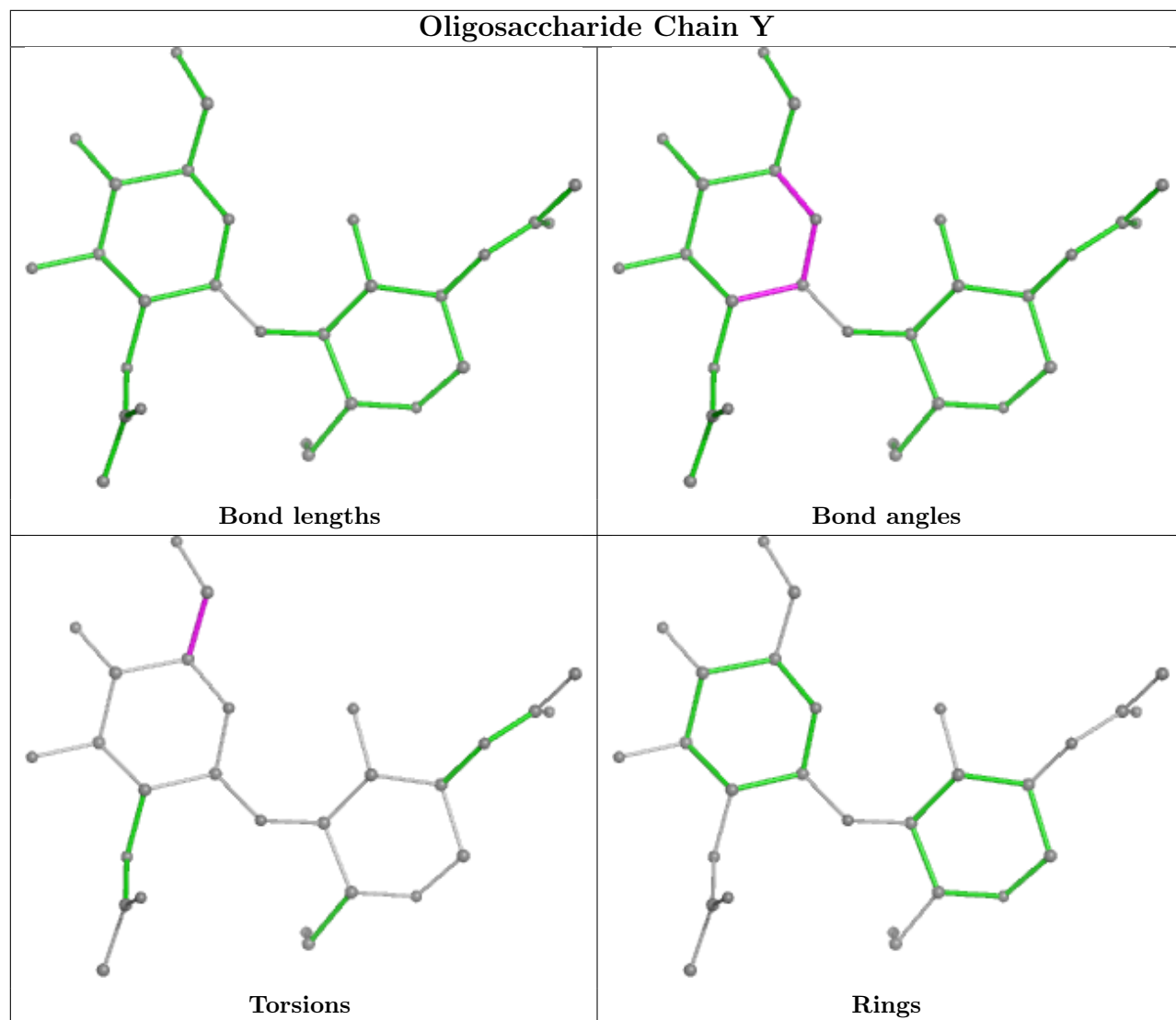
Mol	Chain	Res	Type	Atoms
5	R	1	NAG	O5-C5-C6-O6

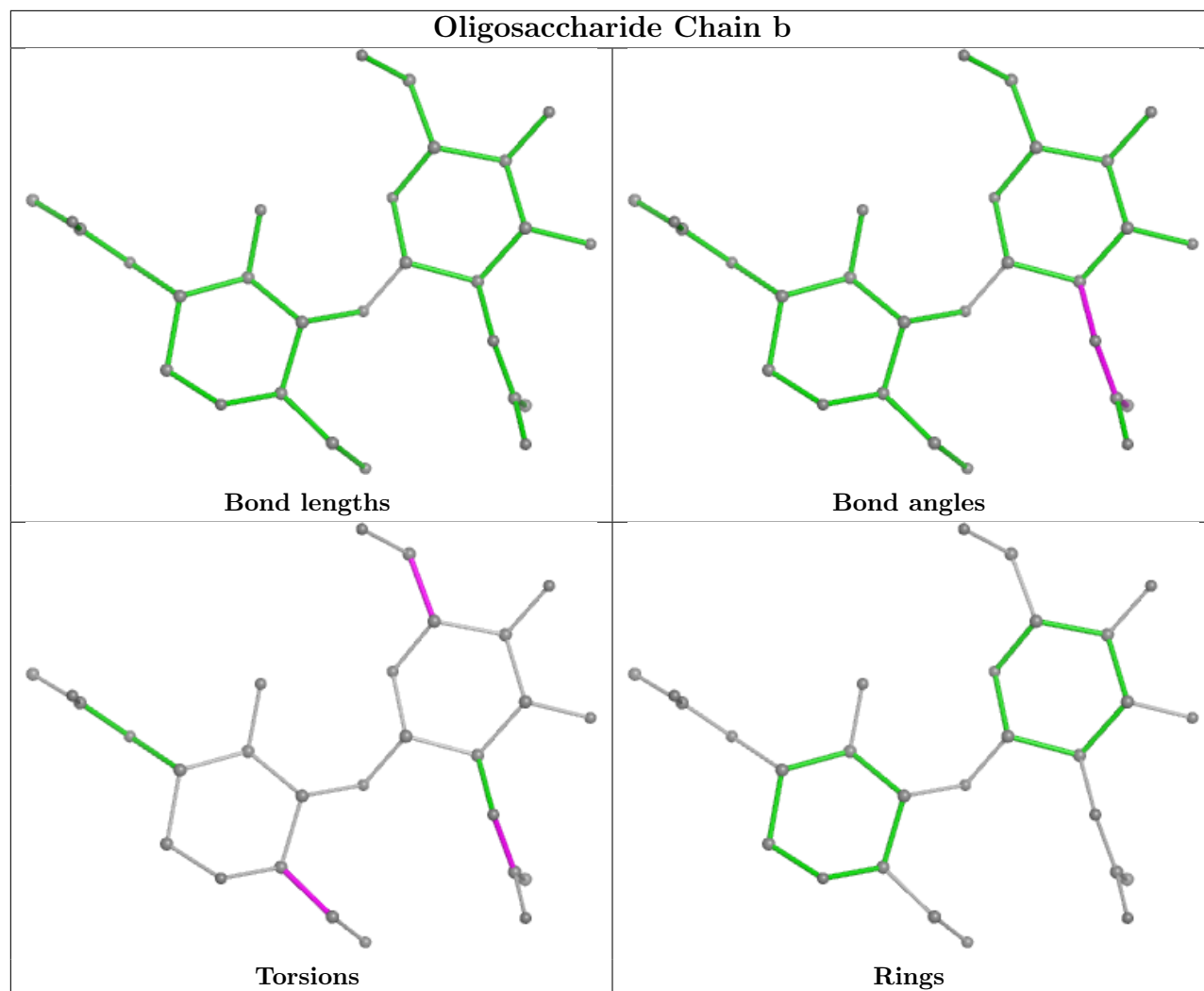
There are no ring outliers.

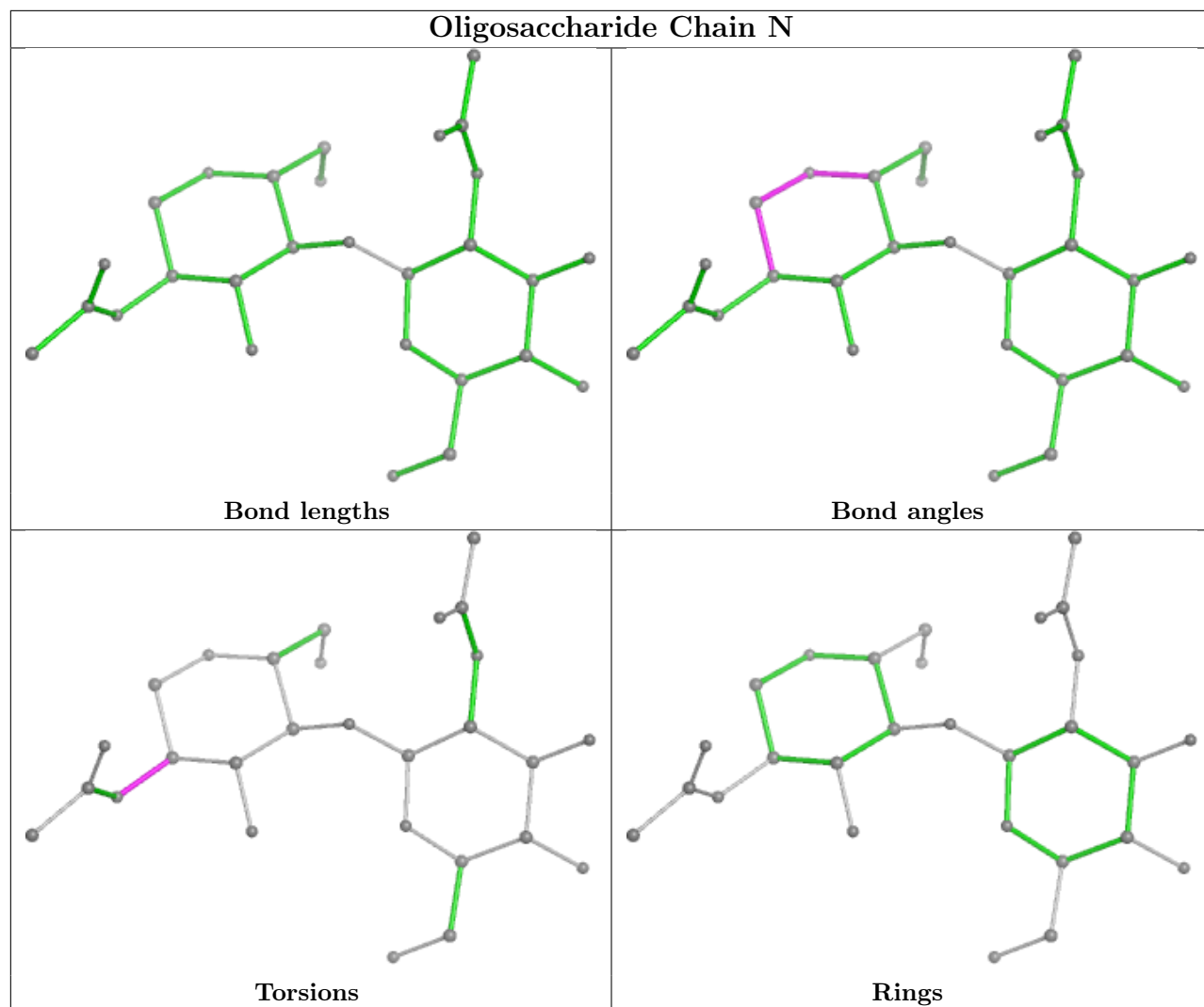
No monomer is involved in short contacts.

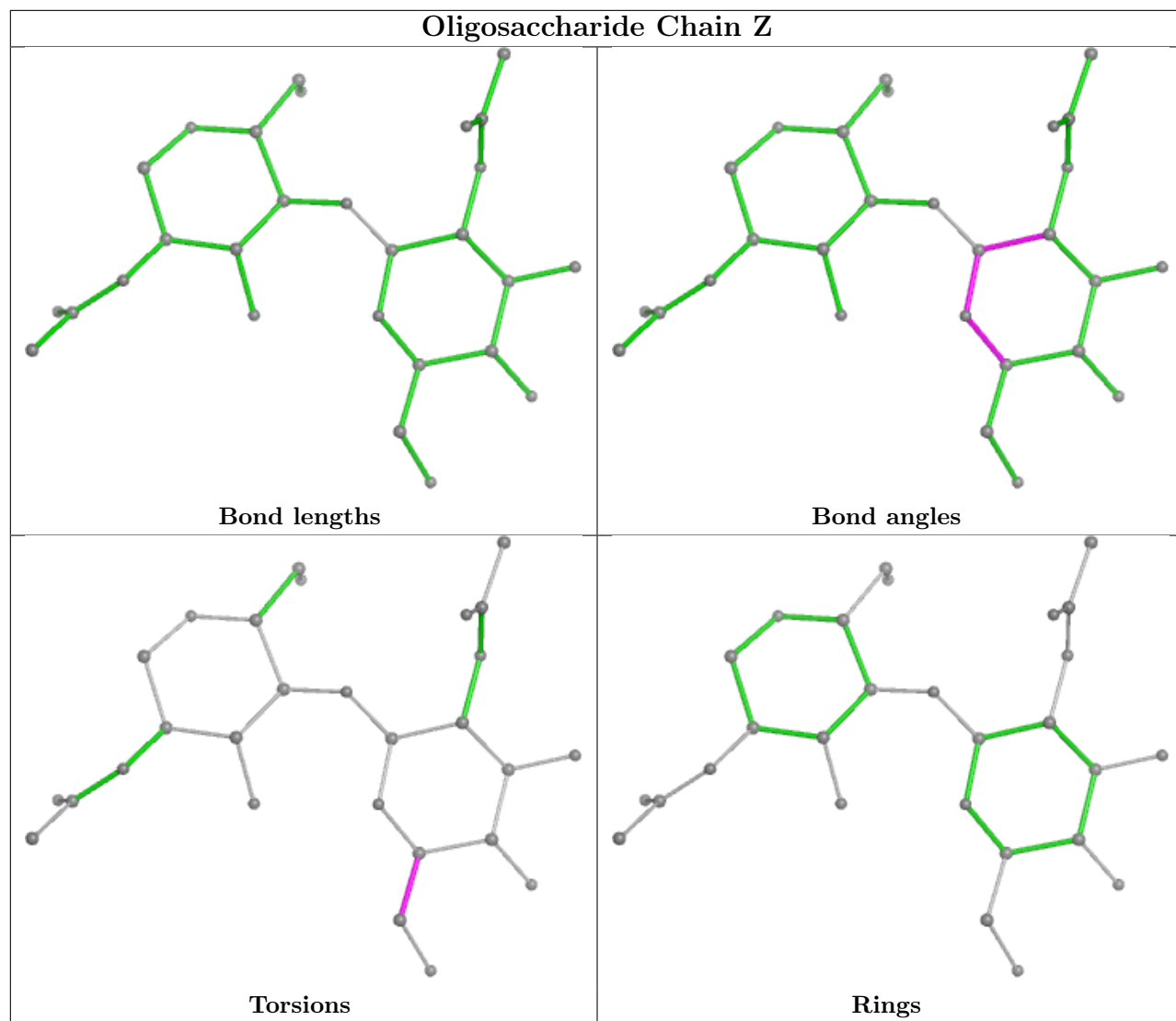
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

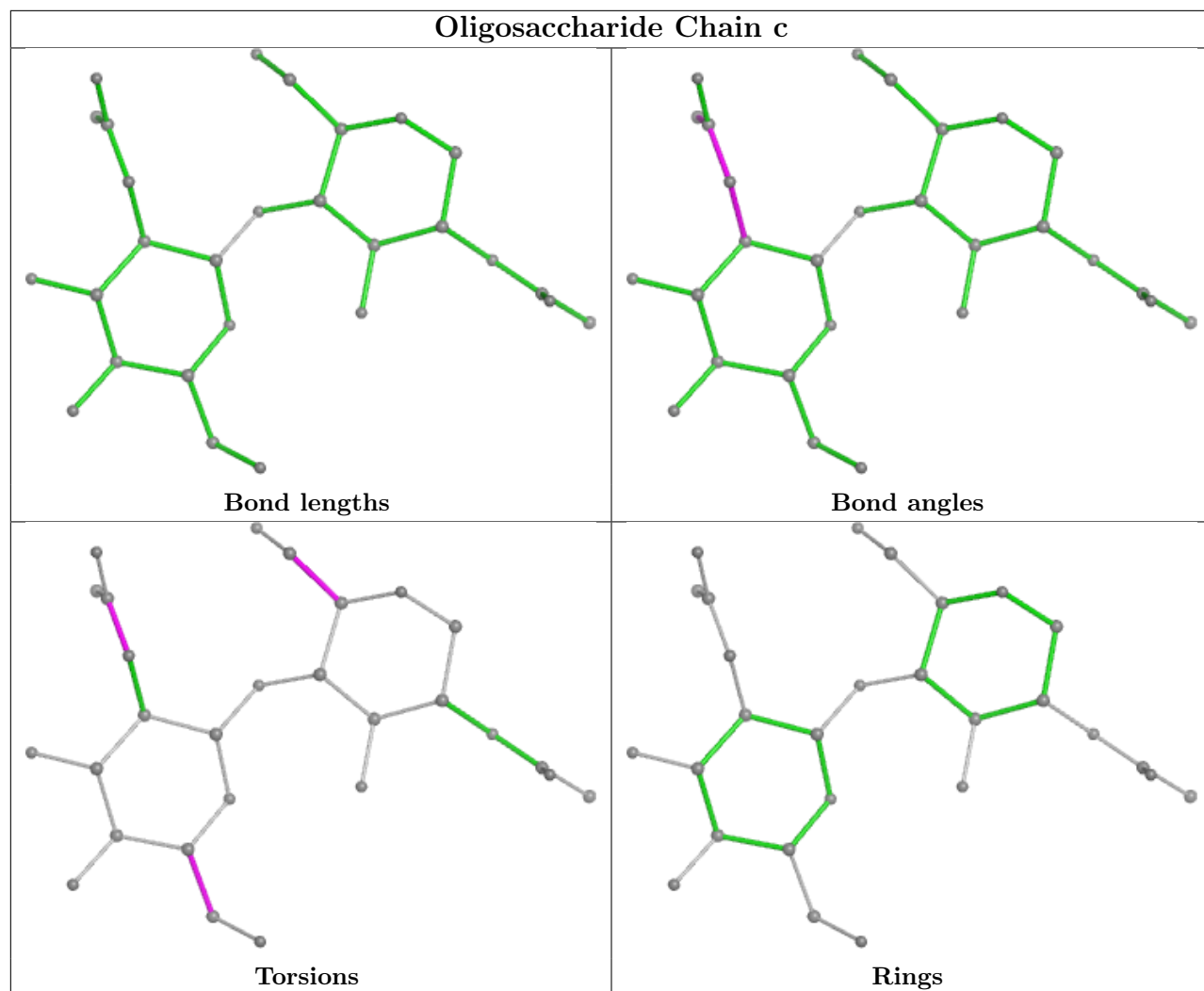


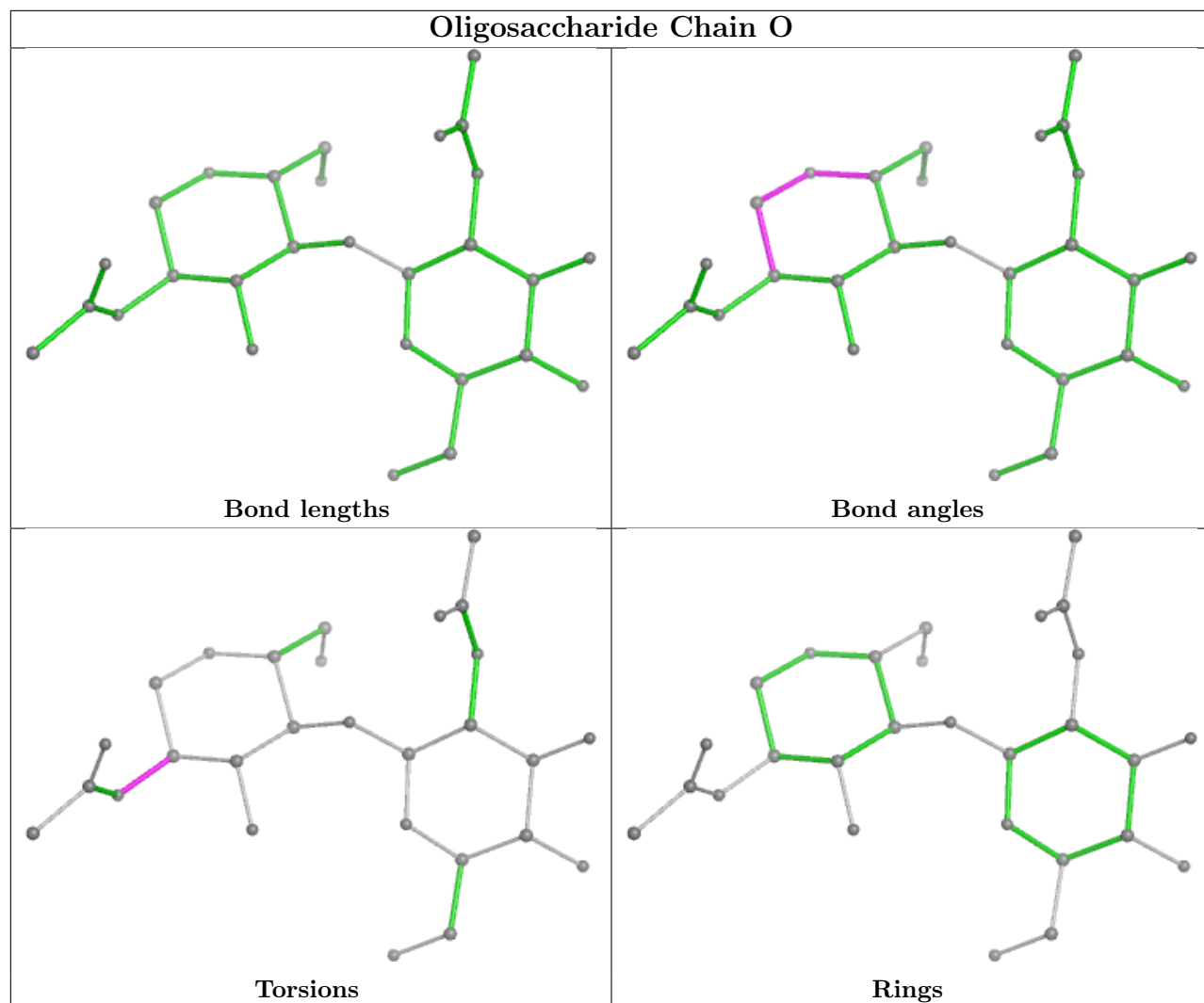


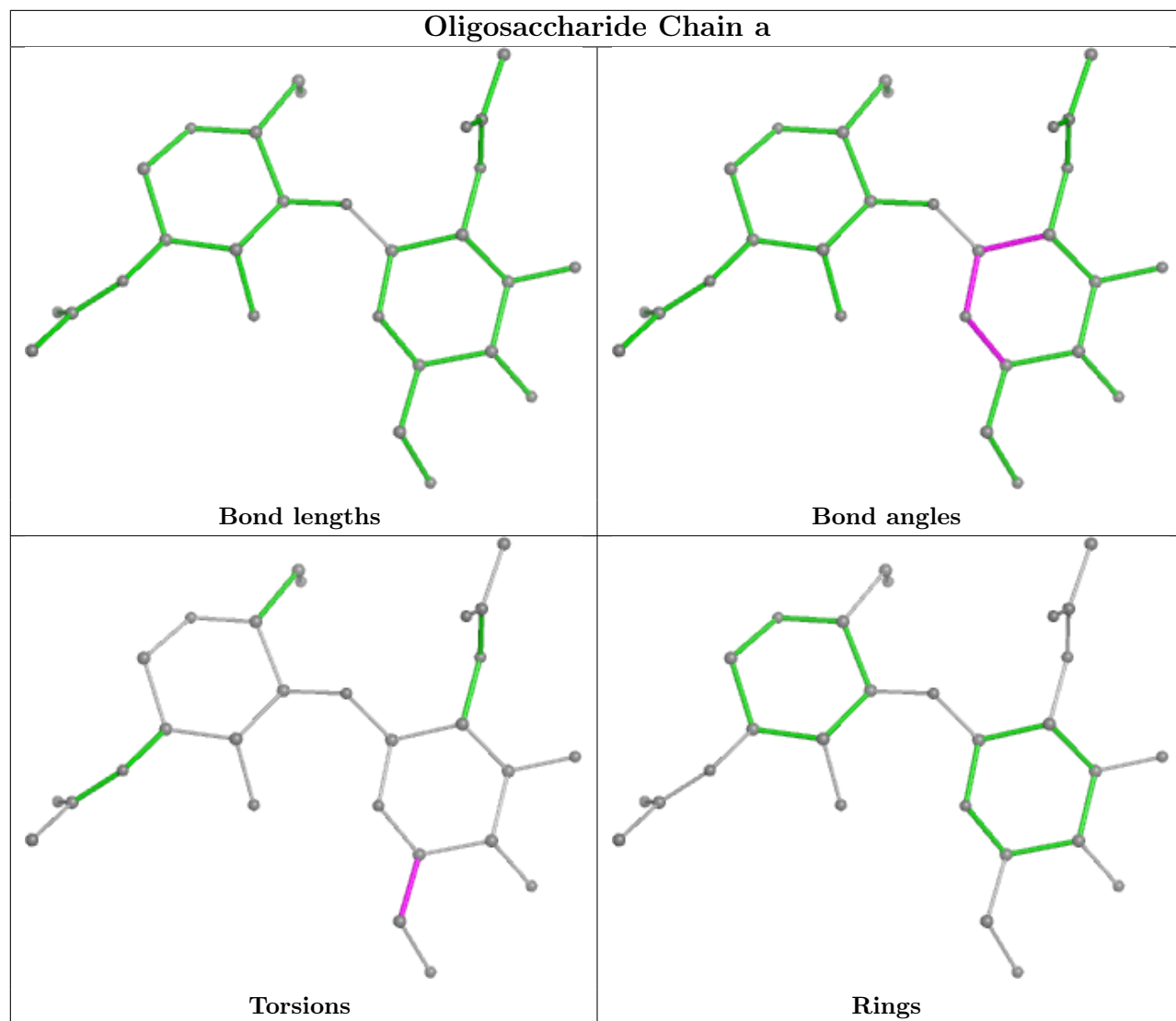


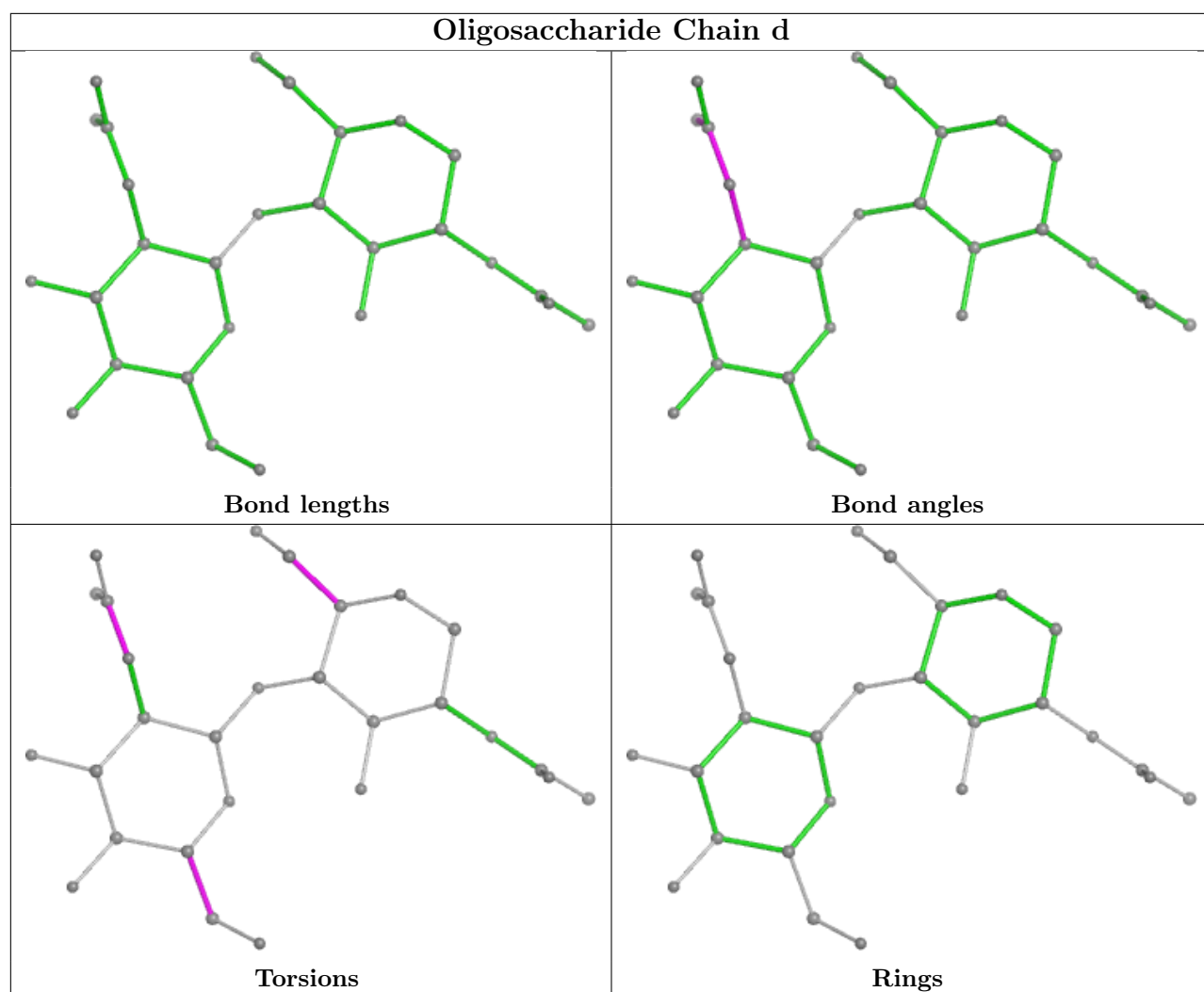


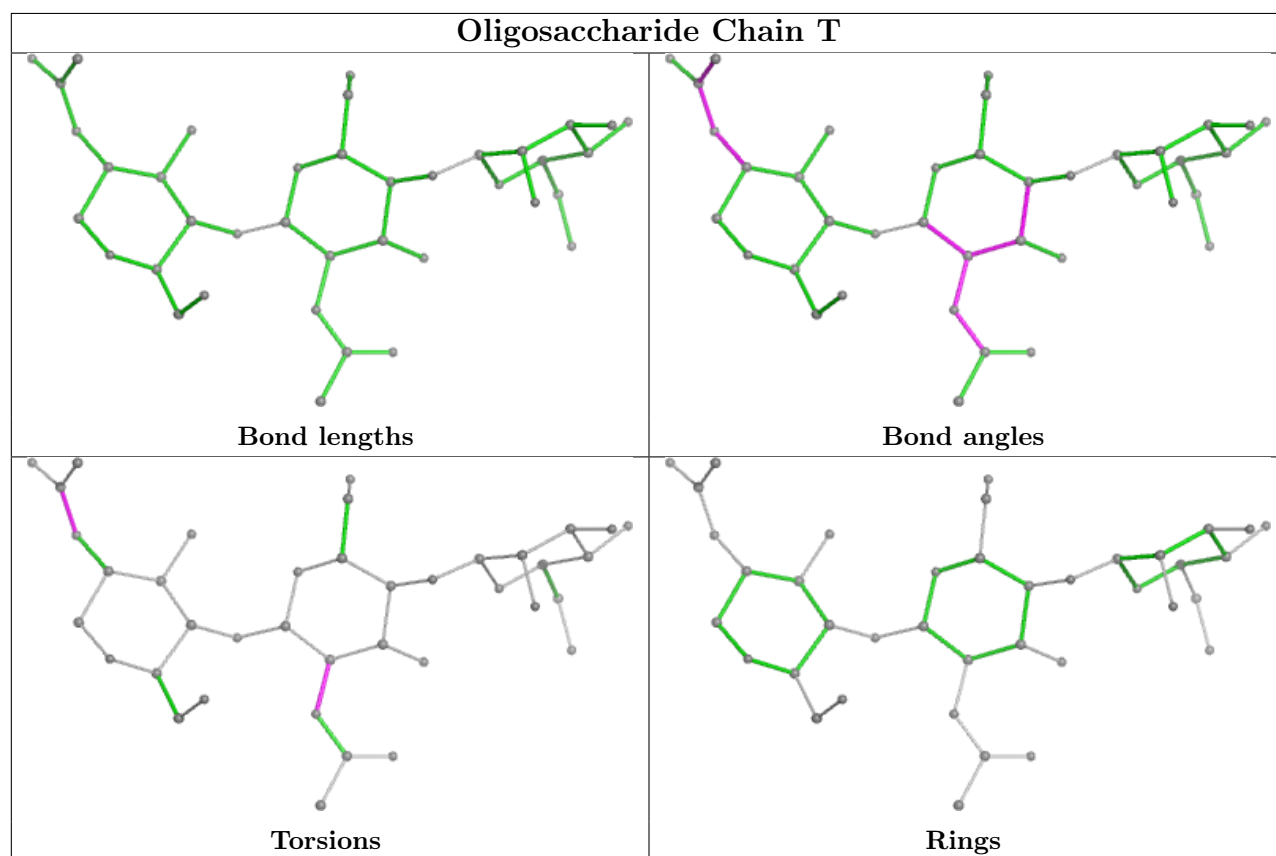
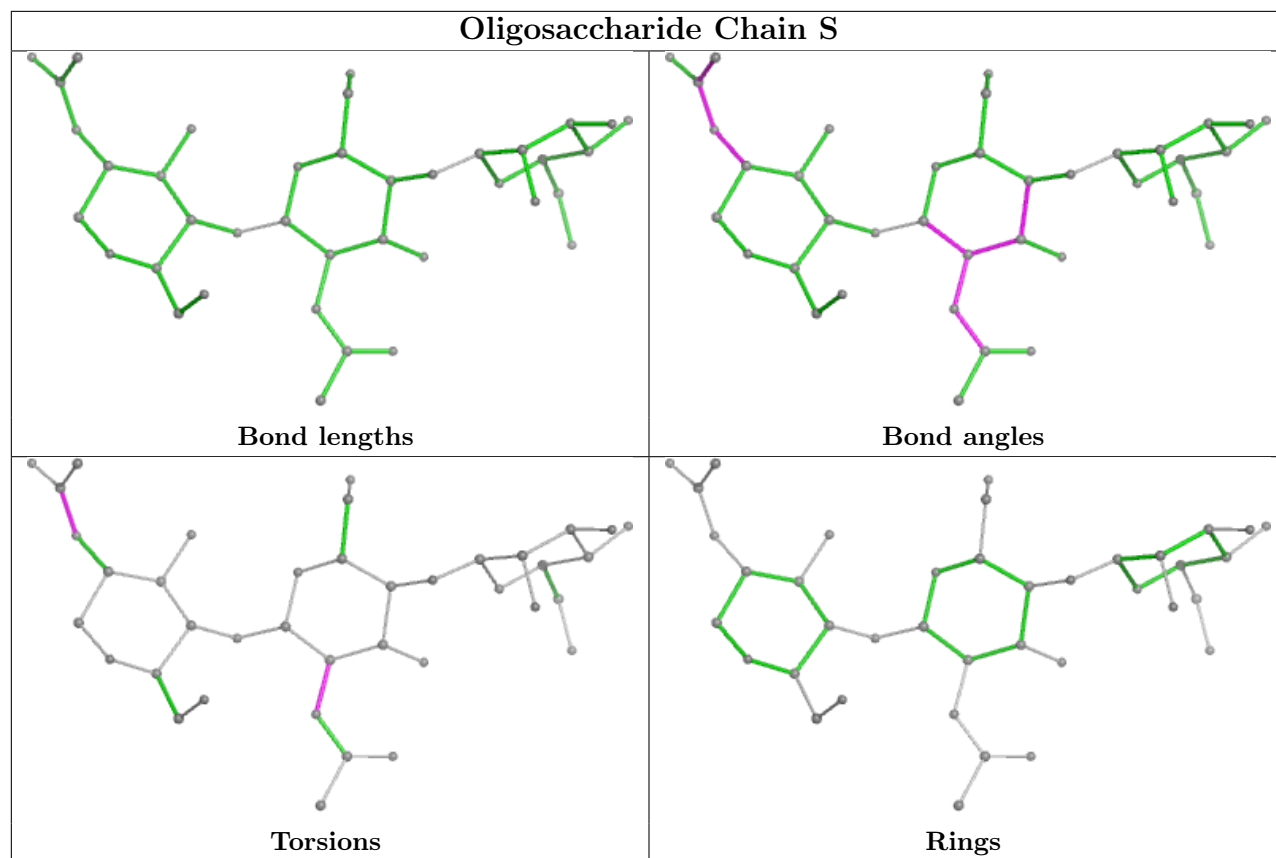


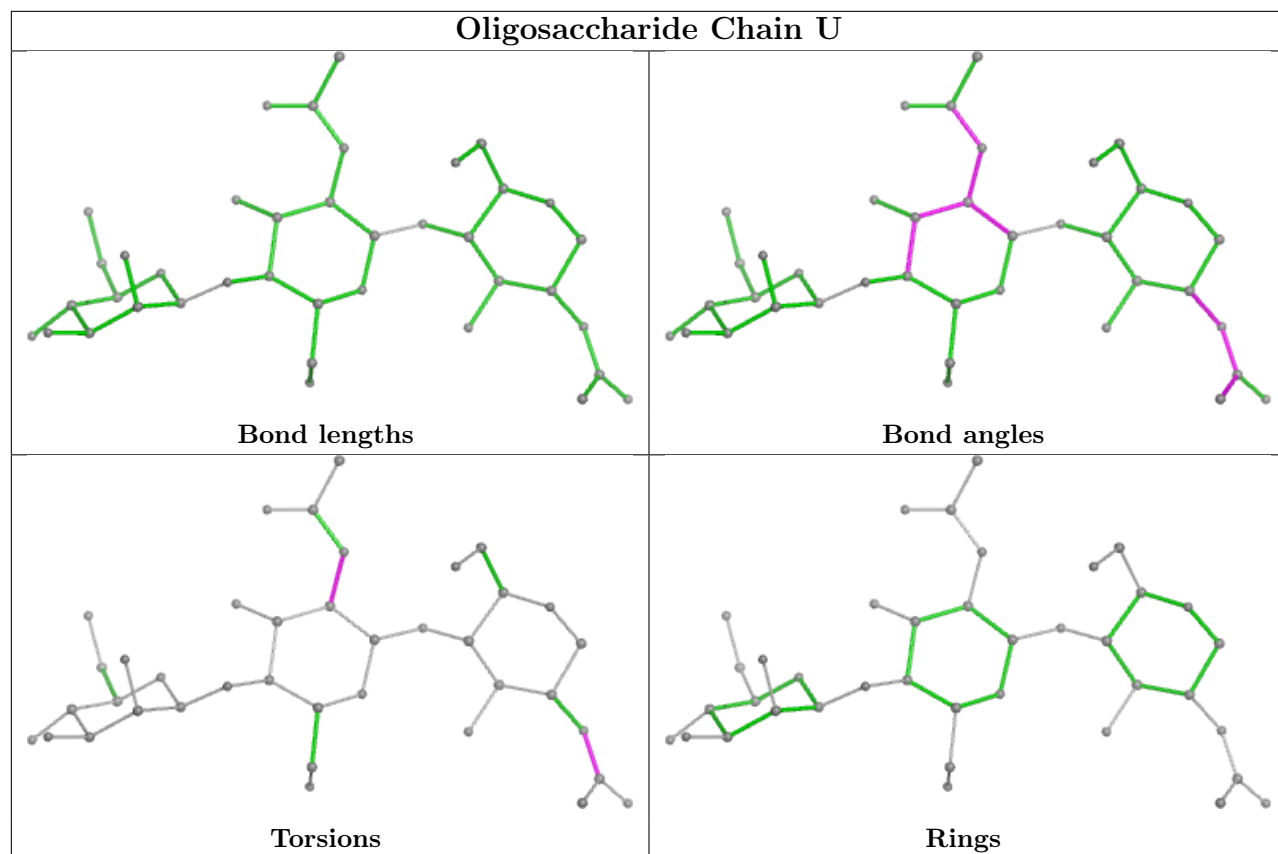


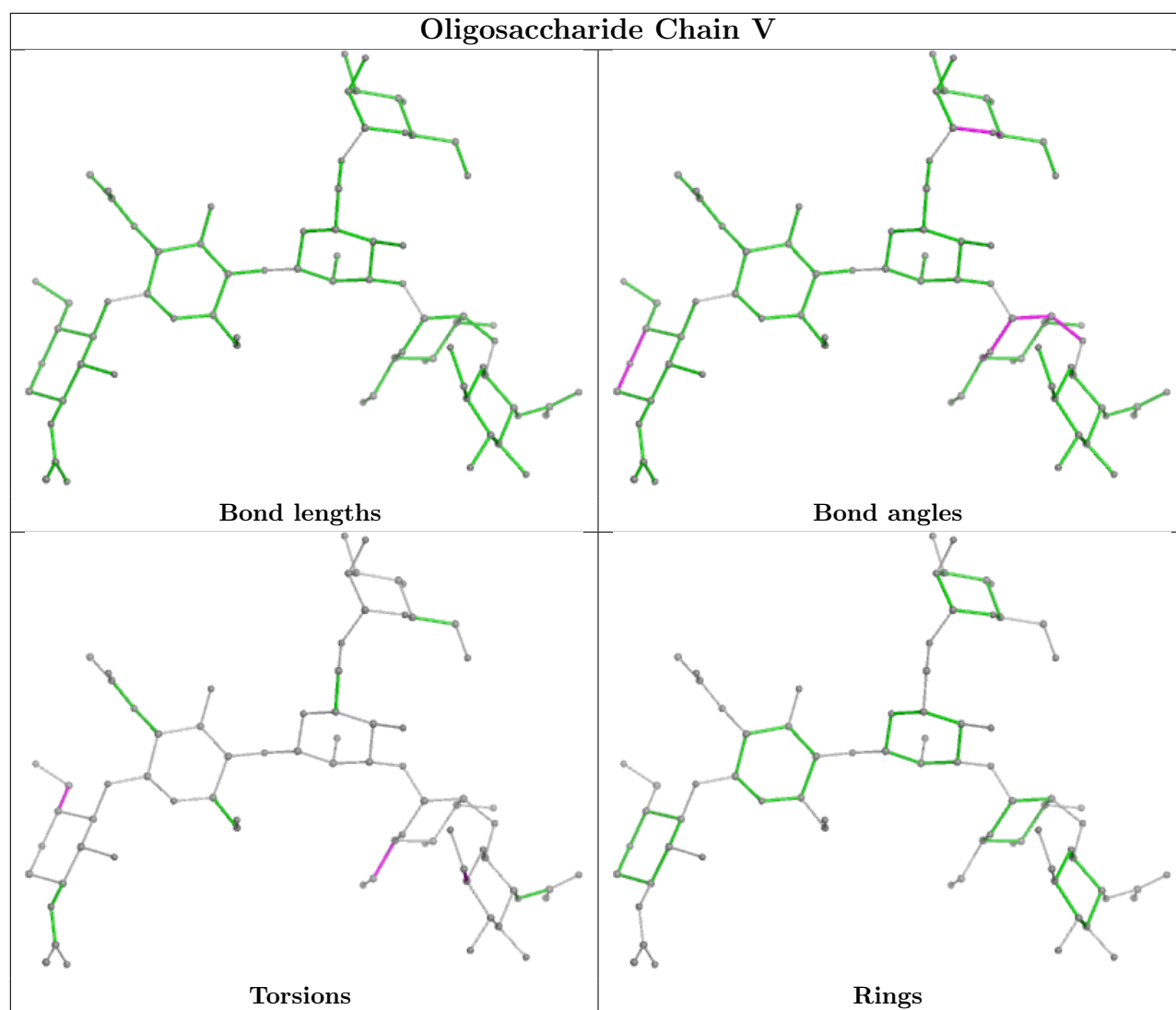


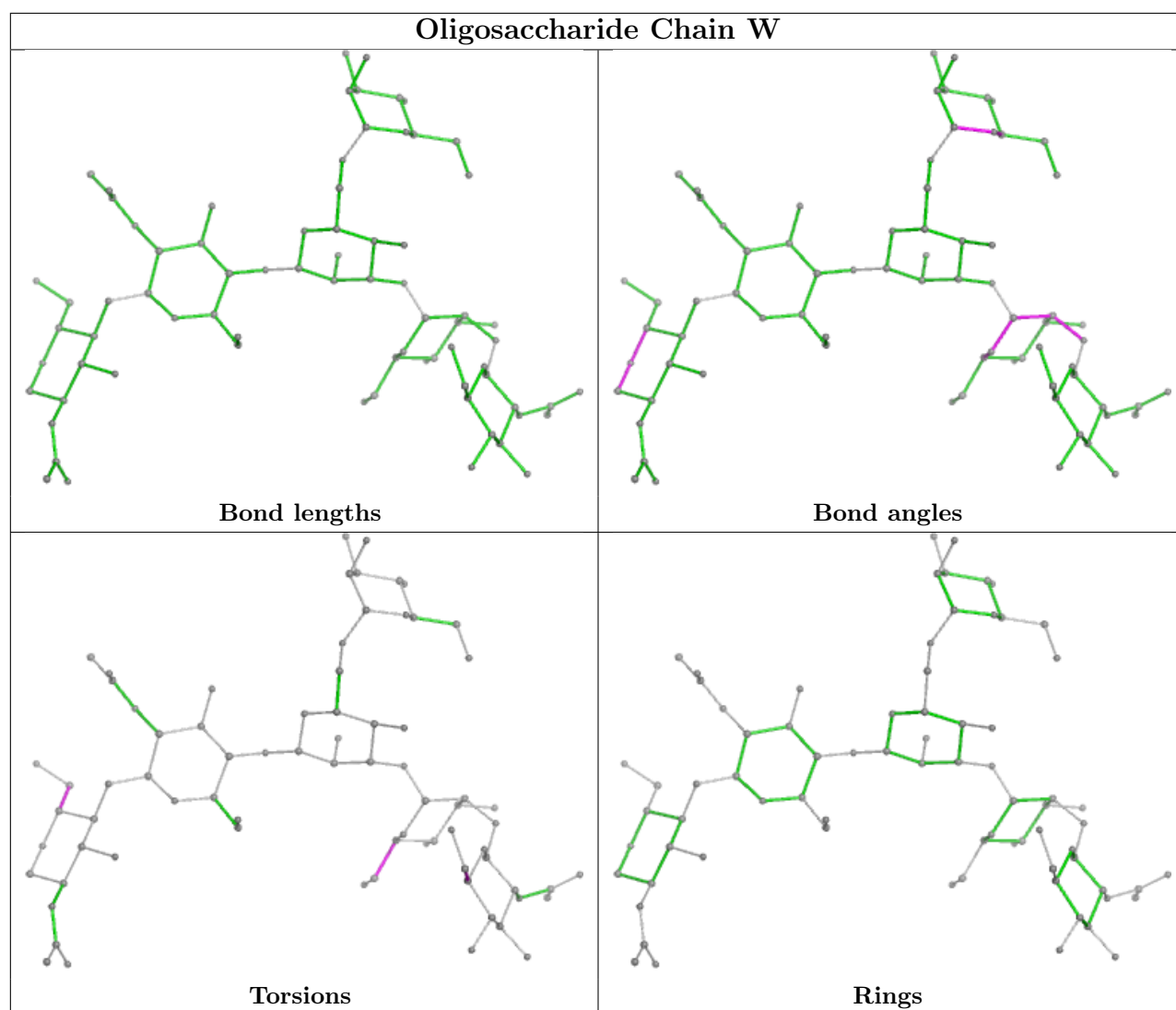


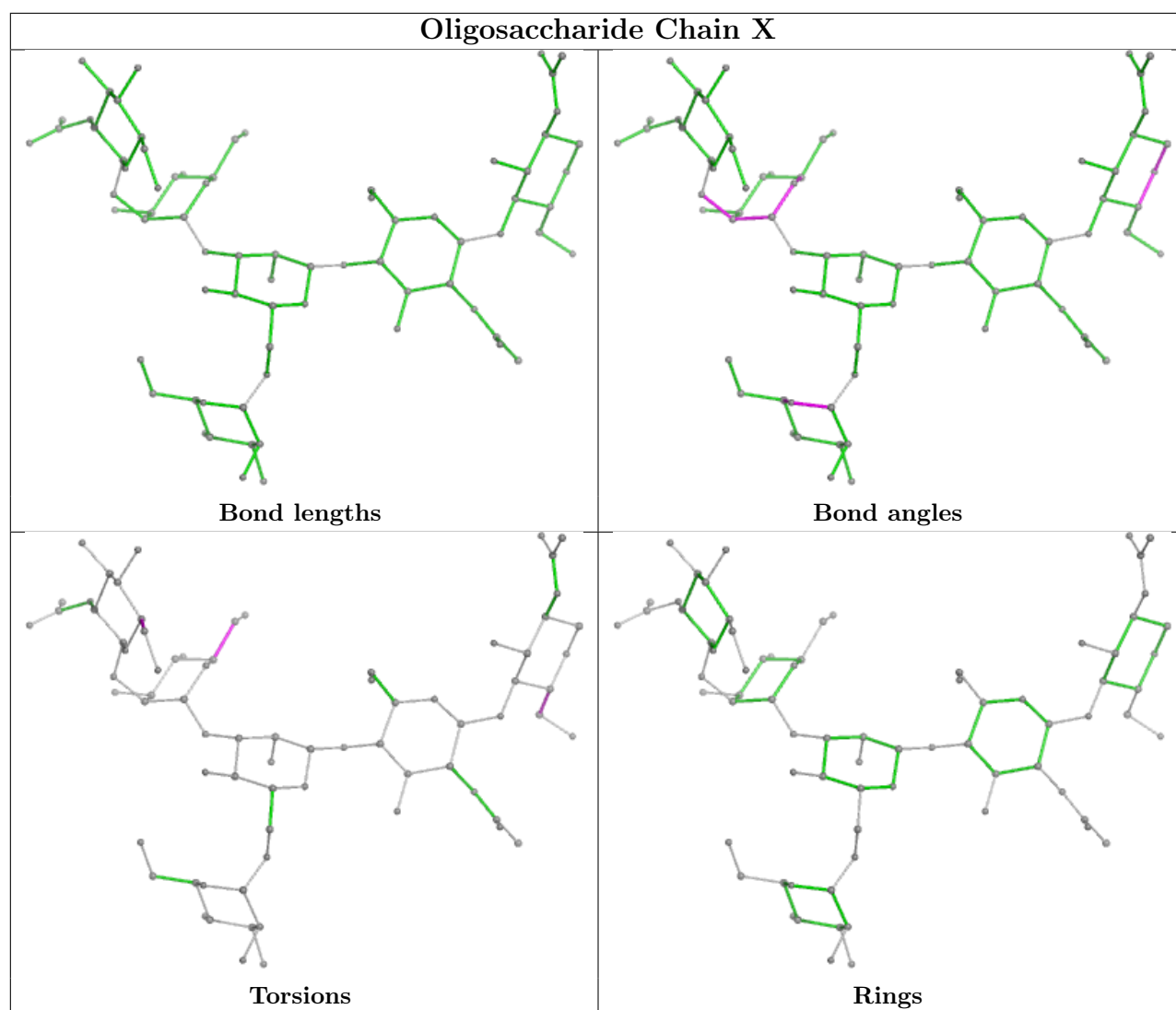


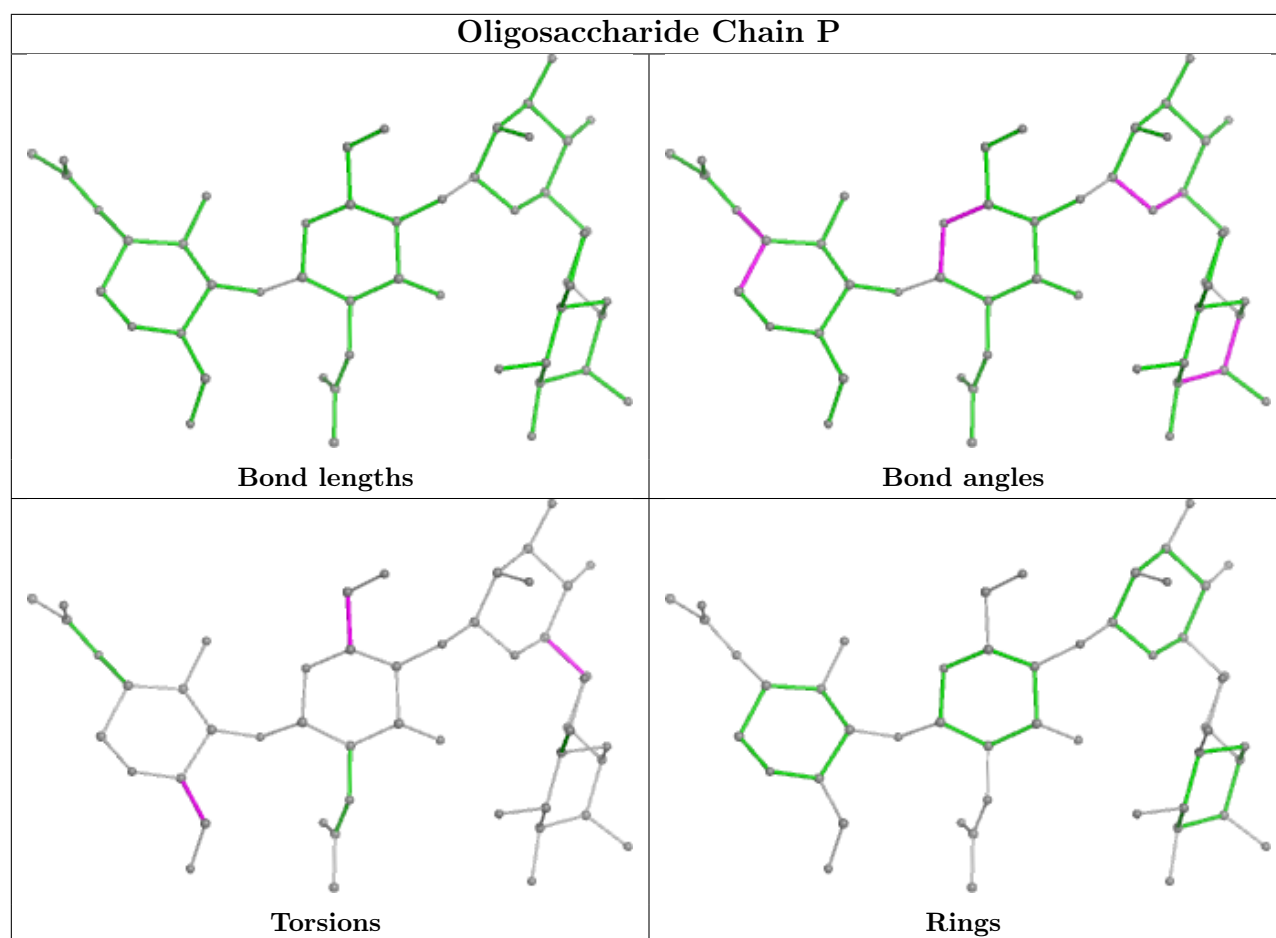


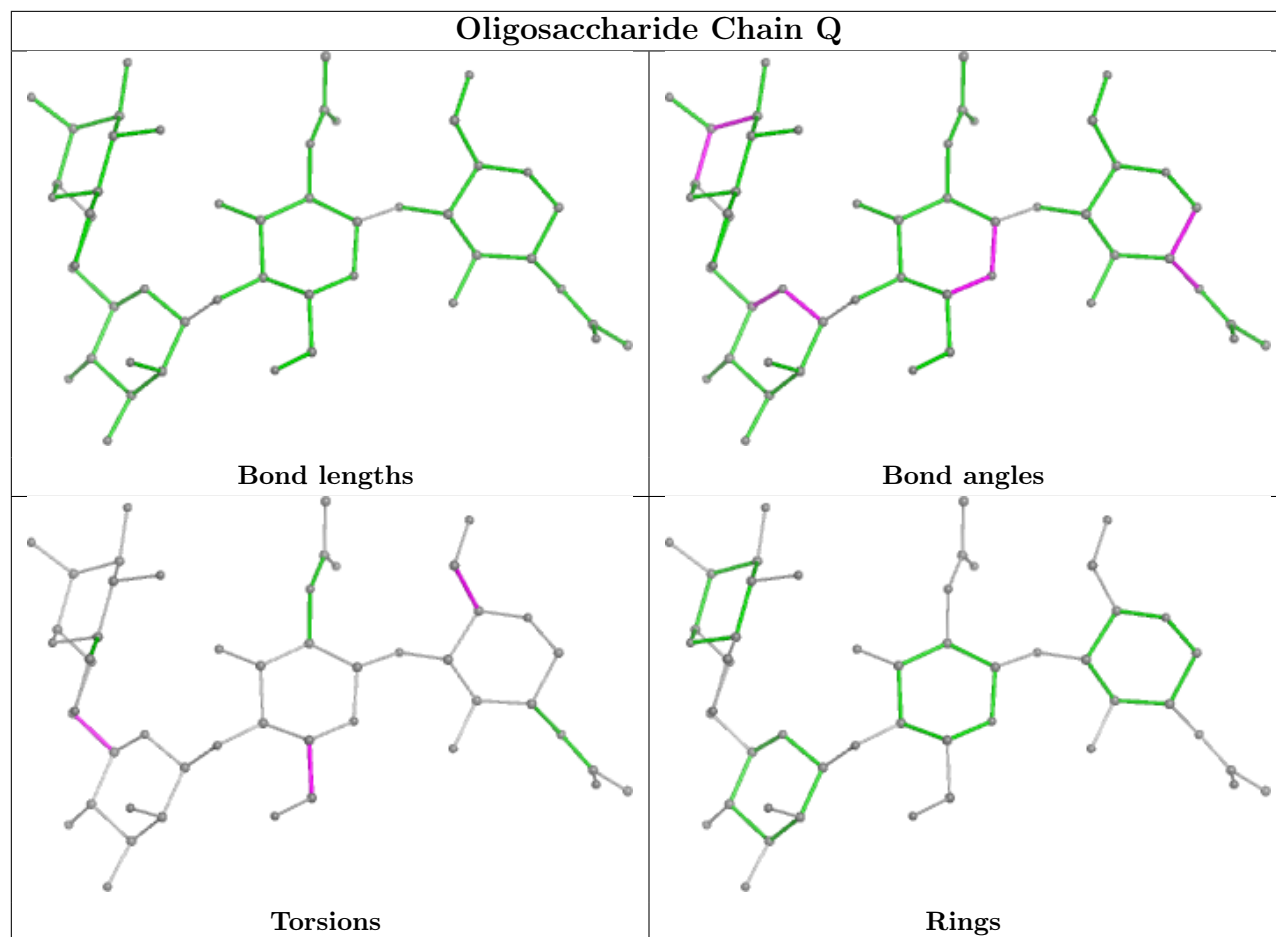


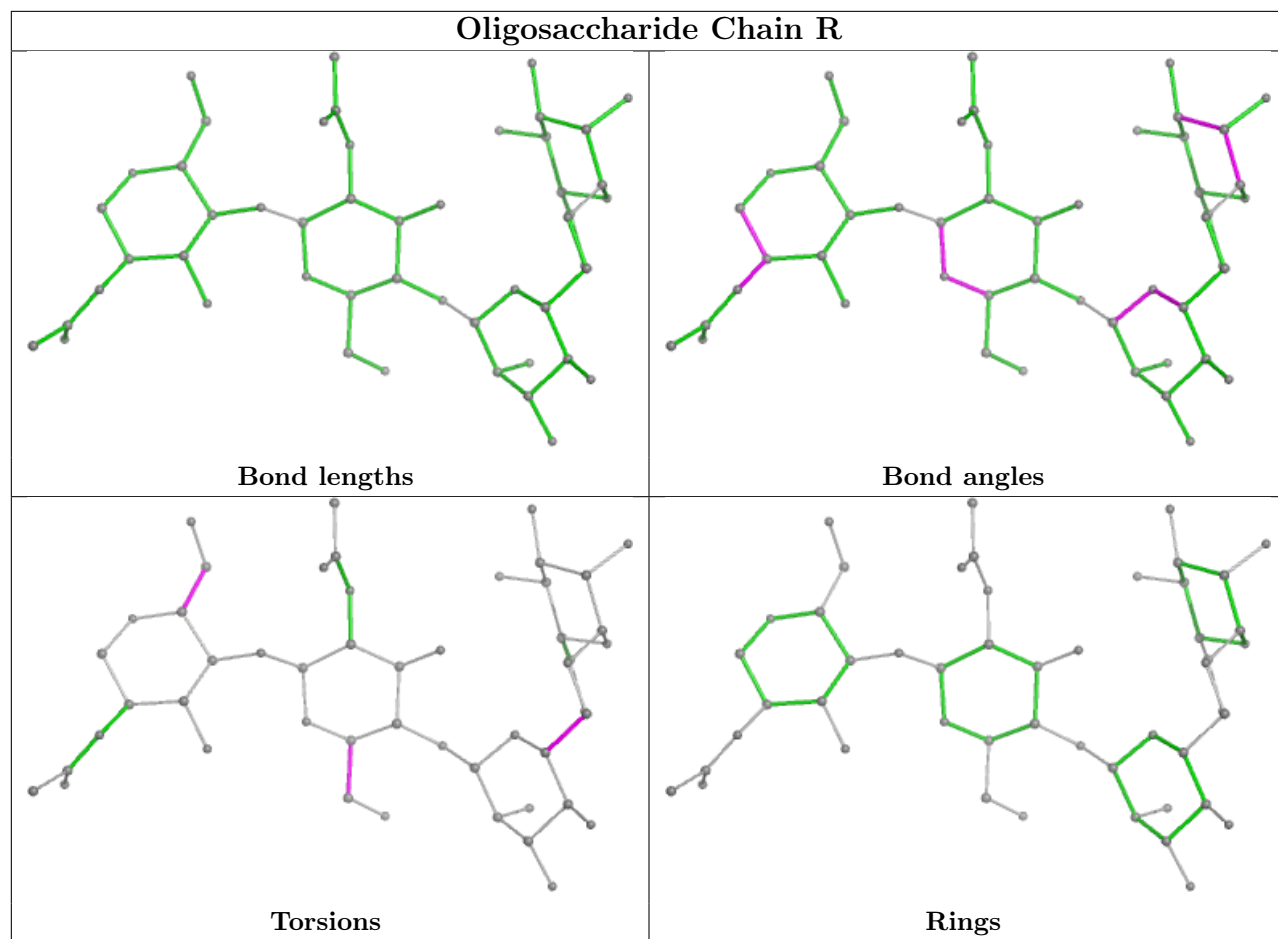


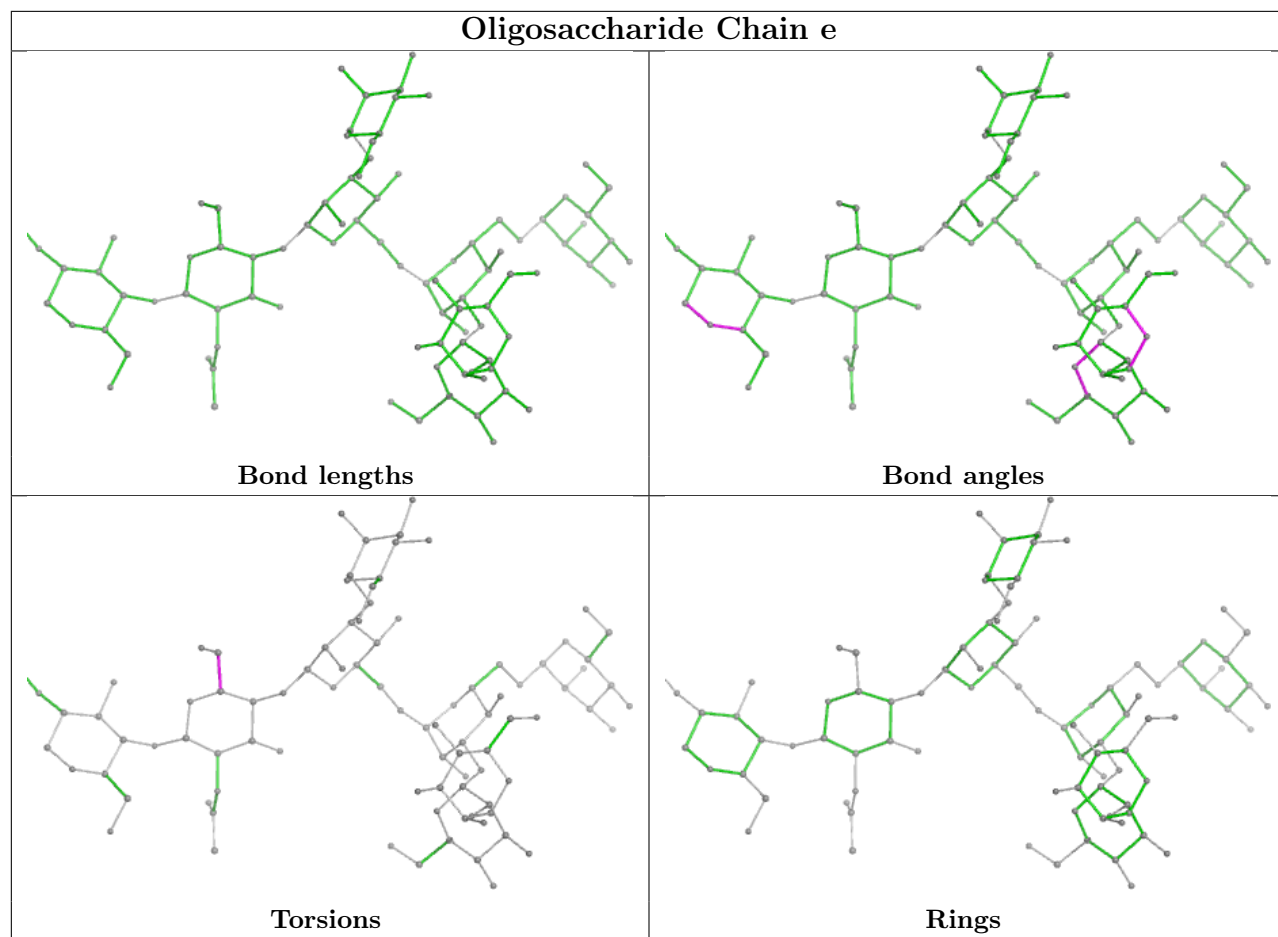


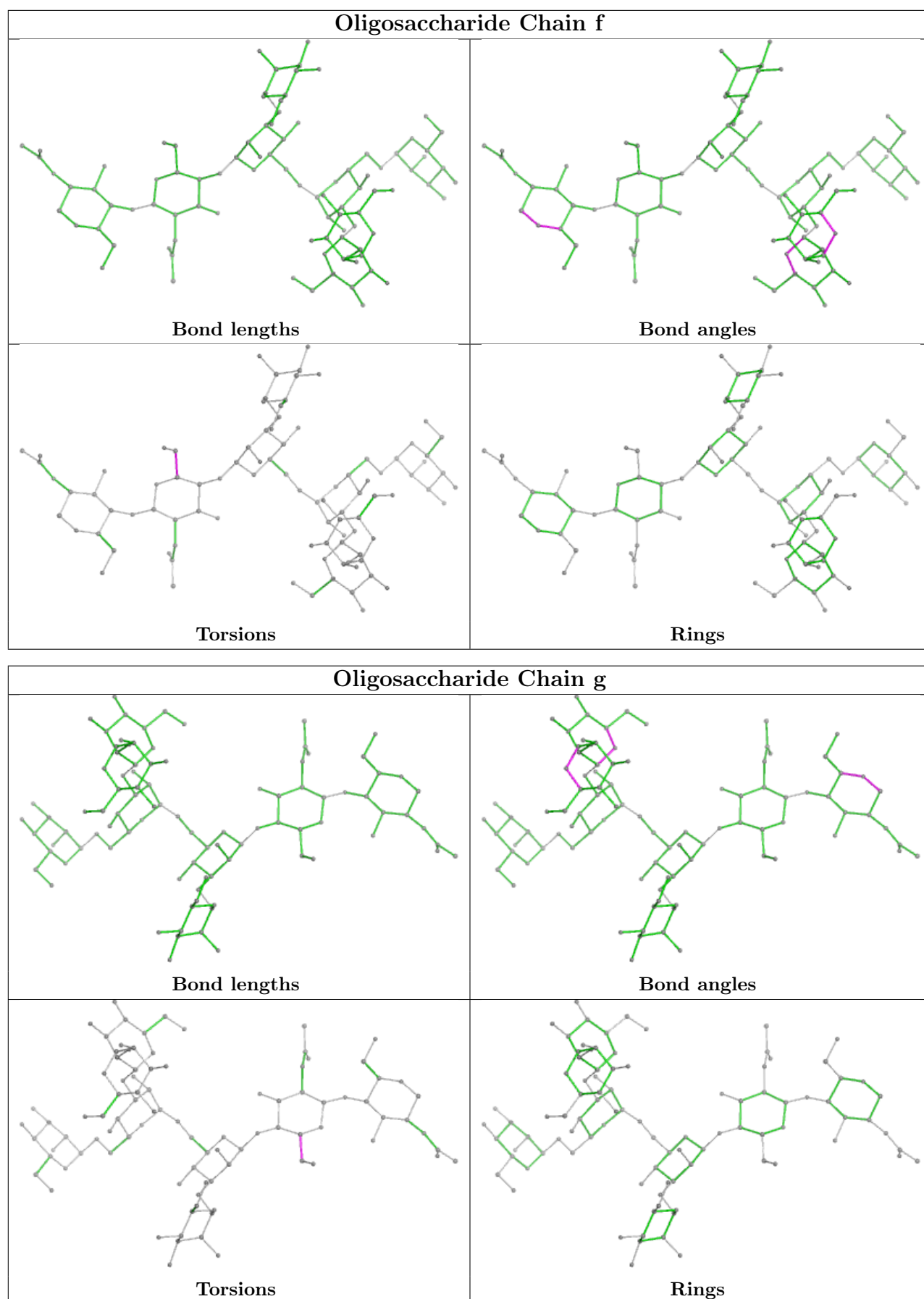


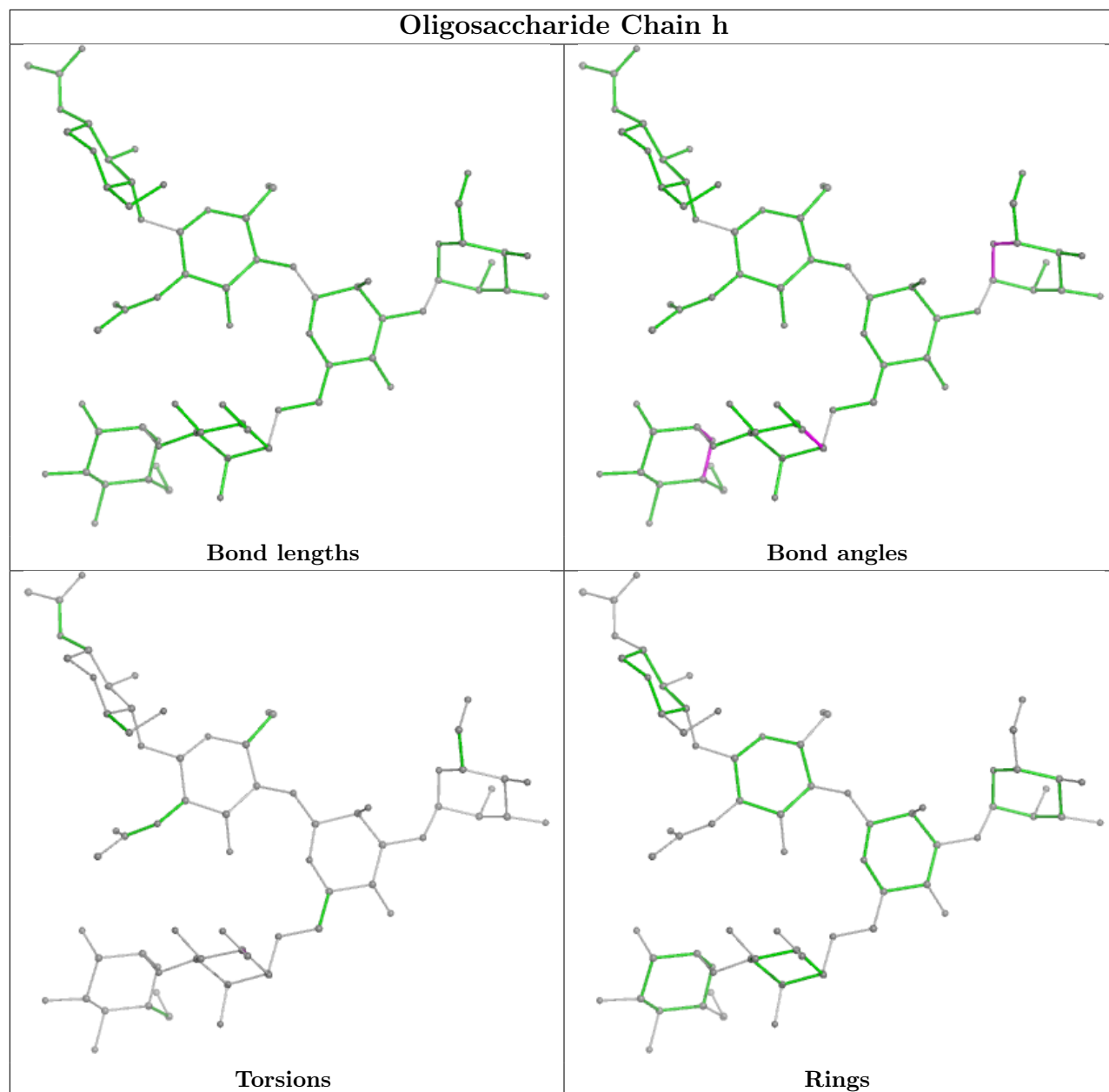


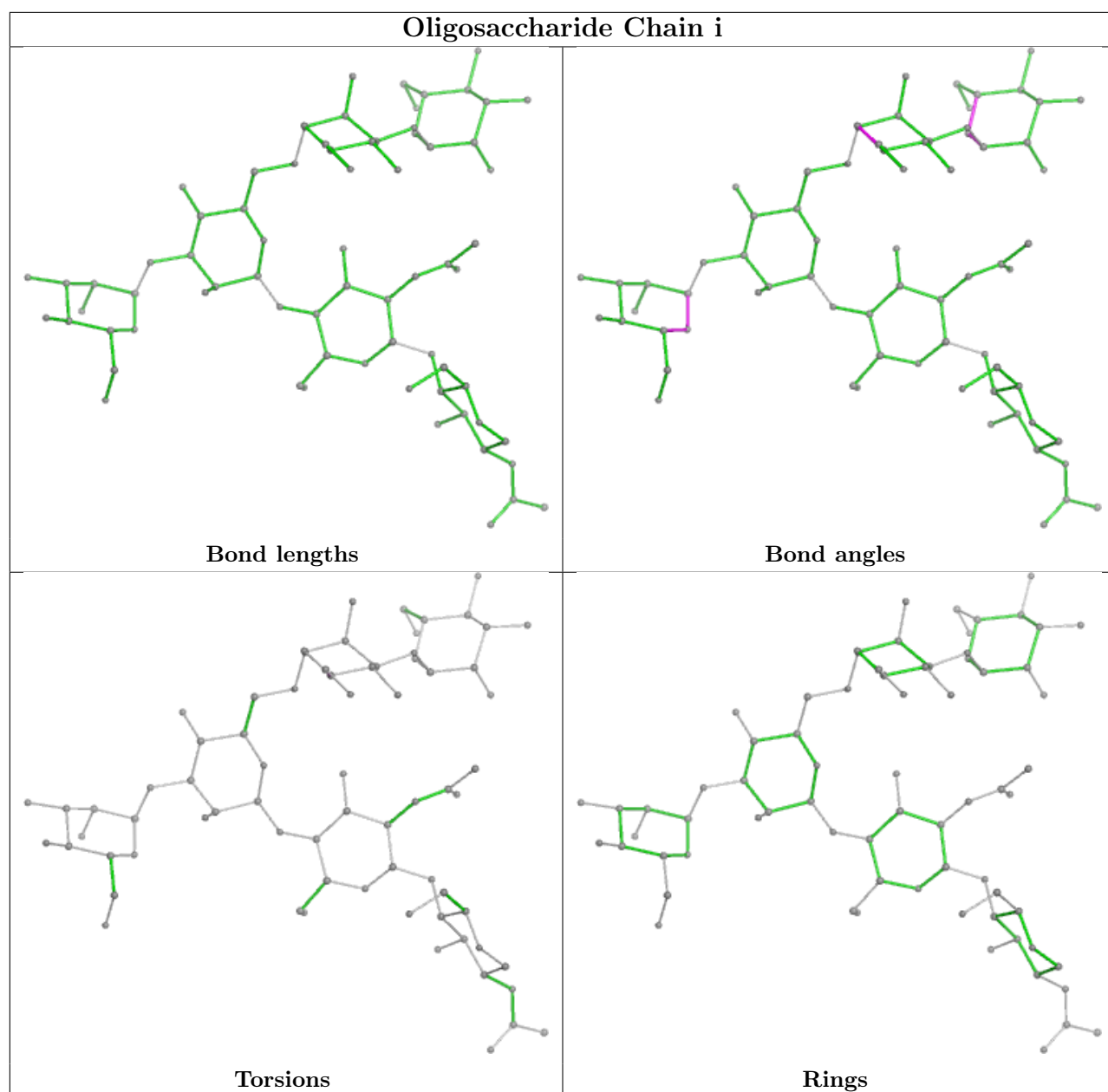


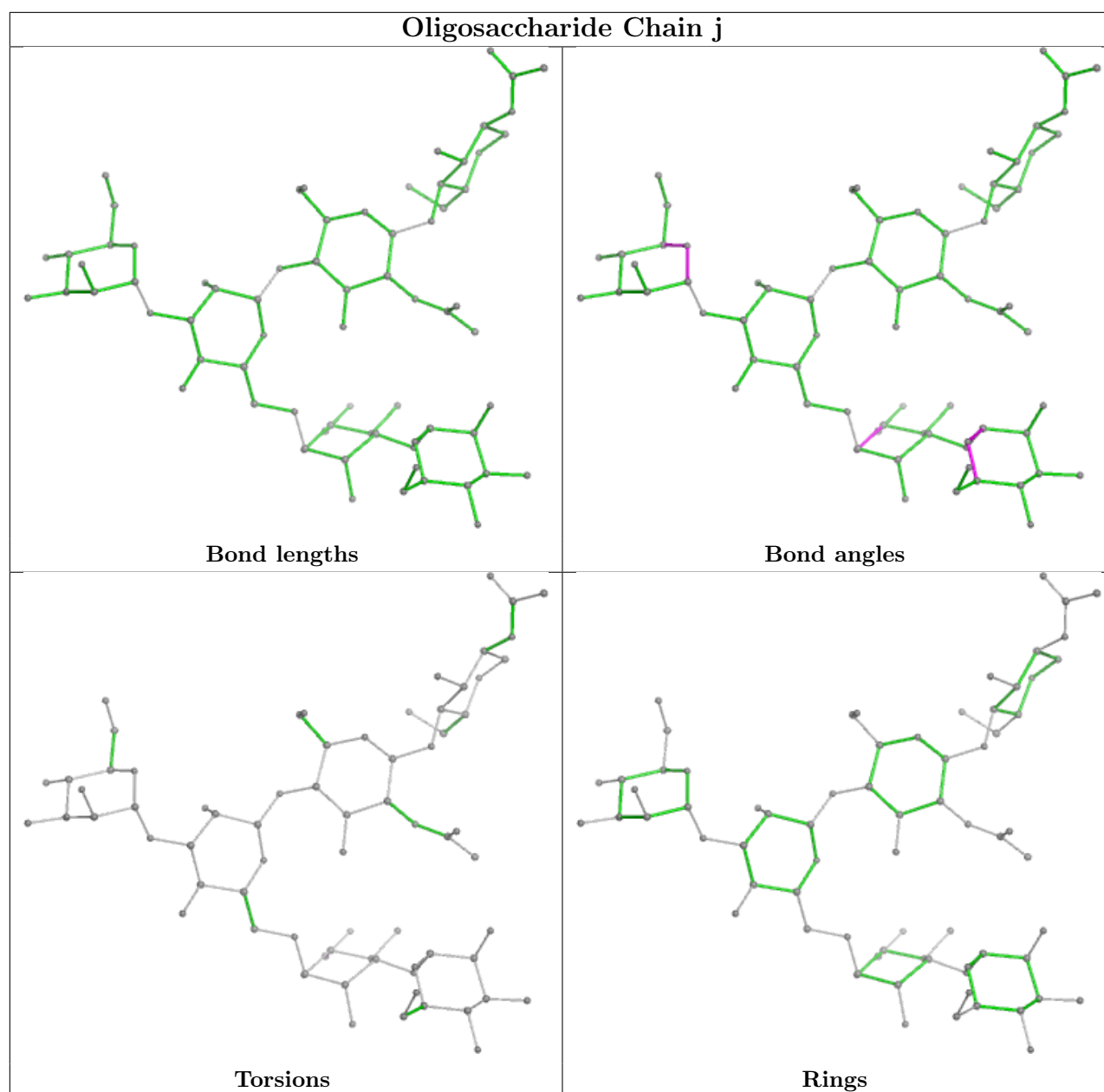












## 5.6 Ligand geometry [i](#)

15 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
8	NAG	G	1002	1	14,14,15	0.39	0	17,19,21	0.88	1 (5%)
8	NAG	G	1001	1	14,14,15	0.30	0	17,19,21	0.59	0
8	NAG	K	1001	1	14,14,15	0.30	0	17,19,21	0.59	0
9	CLR	D	1100	-	31,31,31	0.35	0	48,48,48	0.57	0
9	CLR	H	1100	-	31,31,31	0.35	0	48,48,48	0.57	0
8	NAG	C	1003	1	14,14,15	0.32	0	17,19,21	1.26	3 (17%)
8	NAG	K	1003	1	14,14,15	0.32	0	17,19,21	1.26	3 (17%)
8	NAG	K	1002	1	14,14,15	0.39	0	17,19,21	0.88	1 (5%)
10	PTY	L	1101	-	49,49,49	0.26	0	52,54,54	0.30	0
8	NAG	C	1002	1	14,14,15	0.39	0	17,19,21	0.88	1 (5%)
10	PTY	H	1101	-	49,49,49	0.26	0	52,54,54	0.31	0
8	NAG	C	1001	1	14,14,15	0.30	0	17,19,21	0.60	0
8	NAG	G	1003	1	14,14,15	0.32	0	17,19,21	1.26	3 (17%)
10	PTY	D	1101	-	49,49,49	0.26	0	52,54,54	0.31	0
9	CLR	L	1100	-	31,31,31	0.35	0	48,48,48	0.57	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
8	NAG	G	1002	1	-	1/6/23/26	0/1/1/1
8	NAG	G	1001	1	-	1/6/23/26	0/1/1/1
8	NAG	K	1001	1	-	1/6/23/26	0/1/1/1
9	CLR	D	1100	-	-	6/10/68/68	0/4/4/4
9	CLR	H	1100	-	-	6/10/68/68	0/4/4/4
8	NAG	C	1003	1	-	2/6/23/26	0/1/1/1
8	NAG	K	1003	1	-	2/6/23/26	0/1/1/1
8	NAG	K	1002	1	-	1/6/23/26	0/1/1/1
10	PTY	L	1101	-	-	16/53/53/53	-
8	NAG	C	1002	1	-	1/6/23/26	0/1/1/1
10	PTY	H	1101	-	-	16/53/53/53	-
8	NAG	C	1001	1	-	1/6/23/26	0/1/1/1
8	NAG	G	1003	1	-	2/6/23/26	0/1/1/1
10	PTY	D	1101	-	-	16/53/53/53	-
9	CLR	L	1100	-	-	6/10/68/68	0/4/4/4

There are no bond length outliers.

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	C	1003	NAG	C2-N2-C7	2.66	126.69	122.90
8	K	1003	NAG	C2-N2-C7	2.65	126.68	122.90
8	G	1003	NAG	C2-N2-C7	2.63	126.65	122.90
8	G	1003	NAG	C8-C7-N2	2.57	120.45	116.10
8	C	1003	NAG	C8-C7-N2	2.57	120.44	116.10
8	K	1003	NAG	C8-C7-N2	2.56	120.44	116.10
8	K	1003	NAG	C1-O5-C5	2.50	115.58	112.19
8	C	1003	NAG	C1-O5-C5	2.49	115.56	112.19
8	G	1003	NAG	C1-O5-C5	2.48	115.56	112.19
8	K	1002	NAG	C2-N2-C7	2.21	126.05	122.90
8	C	1002	NAG	C2-N2-C7	2.21	126.05	122.90
8	G	1002	NAG	C2-N2-C7	2.20	126.03	122.90

There are no chirality outliers.

All (78) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	C	1003	NAG	C8-C7-N2-C2
8	C	1003	NAG	O7-C7-N2-C2
8	G	1003	NAG	C8-C7-N2-C2
8	G	1003	NAG	O7-C7-N2-C2
8	K	1003	NAG	C8-C7-N2-C2
8	K	1003	NAG	O7-C7-N2-C2
9	D	1100	CLR	C20-C22-C23-C24
9	H	1100	CLR	C20-C22-C23-C24
9	L	1100	CLR	C20-C22-C23-C24
10	D	1101	PTY	C11-C8-O7-C6
10	H	1101	PTY	C11-C8-O7-C6
10	L	1101	PTY	C11-C8-O7-C6
10	D	1101	PTY	O10-C8-O7-C6
10	H	1101	PTY	O10-C8-O7-C6
10	L	1101	PTY	O10-C8-O7-C6
10	D	1101	PTY	C18-C19-C20-C21
10	H	1101	PTY	C18-C19-C20-C21
10	L	1101	PTY	C18-C19-C20-C21
10	D	1101	PTY	C25-C26-C27-C28
10	H	1101	PTY	C25-C26-C27-C28
10	L	1101	PTY	C25-C26-C27-C28
10	D	1101	PTY	C15-C16-C17-C18
10	H	1101	PTY	C15-C16-C17-C18
10	L	1101	PTY	C15-C16-C17-C18

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms
10	D	1101	PTY	C40-C41-C42-C43
10	H	1101	PTY	C40-C41-C42-C43
10	L	1101	PTY	C40-C41-C42-C43
10	D	1101	PTY	C12-C13-C14-C15
10	L	1101	PTY	C12-C13-C14-C15
10	H	1101	PTY	C12-C13-C14-C15
8	C	1001	NAG	O5-C5-C6-O6
8	G	1001	NAG	O5-C5-C6-O6
8	K	1001	NAG	O5-C5-C6-O6
10	D	1101	PTY	O4-C1-C6-O7
10	H	1101	PTY	O4-C1-C6-O7
10	L	1101	PTY	O4-C1-C6-O7
10	H	1101	PTY	C35-C36-C37-C38
10	D	1101	PTY	C35-C36-C37-C38
10	L	1101	PTY	C35-C36-C37-C38
10	H	1101	PTY	C6-C5-O14-P1
10	L	1101	PTY	C6-C5-O14-P1
9	D	1100	CLR	C21-C20-C22-C23
9	H	1100	CLR	C21-C20-C22-C23
9	L	1100	CLR	C21-C20-C22-C23
10	D	1101	PTY	C6-C5-O14-P1
9	D	1100	CLR	C16-C17-C20-C22
9	H	1100	CLR	C16-C17-C20-C22
9	L	1100	CLR	C16-C17-C20-C22
9	D	1100	CLR	C13-C17-C20-C22
9	H	1100	CLR	C13-C17-C20-C22
9	L	1100	CLR	C13-C17-C20-C22
10	D	1101	PTY	C33-C34-C35-C36
10	L	1101	PTY	C33-C34-C35-C36
10	H	1101	PTY	C33-C34-C35-C36
10	D	1101	PTY	O14-C5-C6-O7
10	H	1101	PTY	O14-C5-C6-O7
10	L	1101	PTY	O14-C5-C6-O7
9	D	1100	CLR	C13-C17-C20-C21
9	H	1100	CLR	C13-C17-C20-C21
9	L	1100	CLR	C13-C17-C20-C21
10	H	1101	PTY	C26-C27-C28-C29
10	L	1101	PTY	C26-C27-C28-C29
10	D	1101	PTY	C26-C27-C28-C29
10	H	1101	PTY	C20-C21-C22-C23
10	D	1101	PTY	C20-C21-C22-C23
10	L	1101	PTY	C20-C21-C22-C23

*Continued on next page...*

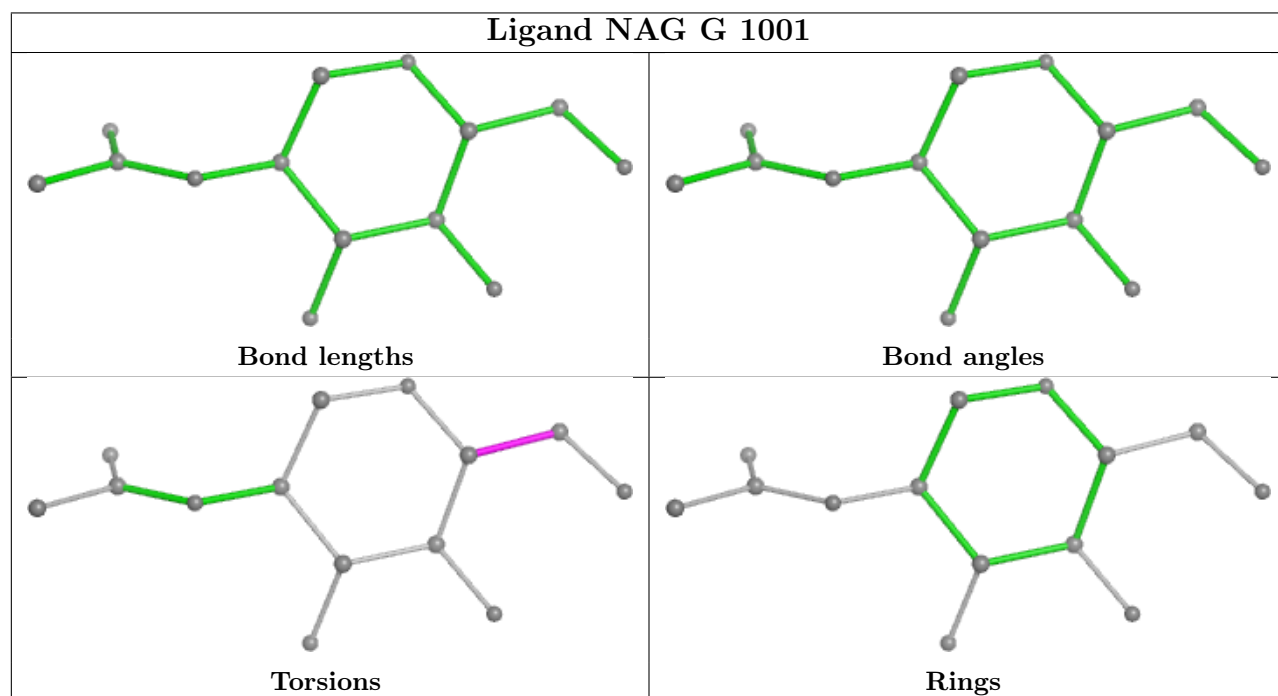
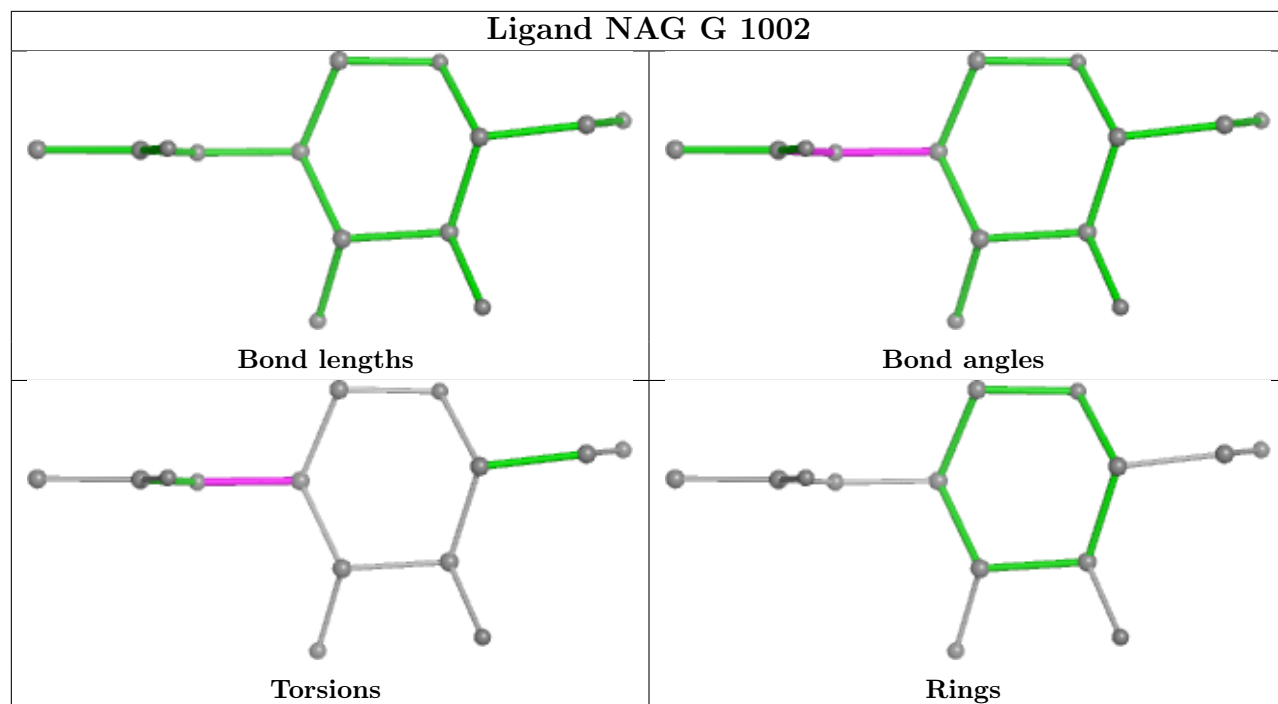
*Continued from previous page...*

Mol	Chain	Res	Type	Atoms
9	D	1100	CLR	C16-C17-C20-C21
9	H	1100	CLR	C16-C17-C20-C21
9	L	1100	CLR	C16-C17-C20-C21
8	C	1002	NAG	C3-C2-N2-C7
8	G	1002	NAG	C3-C2-N2-C7
8	K	1002	NAG	C3-C2-N2-C7
10	D	1101	PTY	O4-C1-C6-C5
10	H	1101	PTY	O4-C1-C6-C5
10	L	1101	PTY	O4-C1-C6-C5
10	L	1101	PTY	C38-C39-C40-C41
10	H	1101	PTY	C38-C39-C40-C41
10	D	1101	PTY	C38-C39-C40-C41

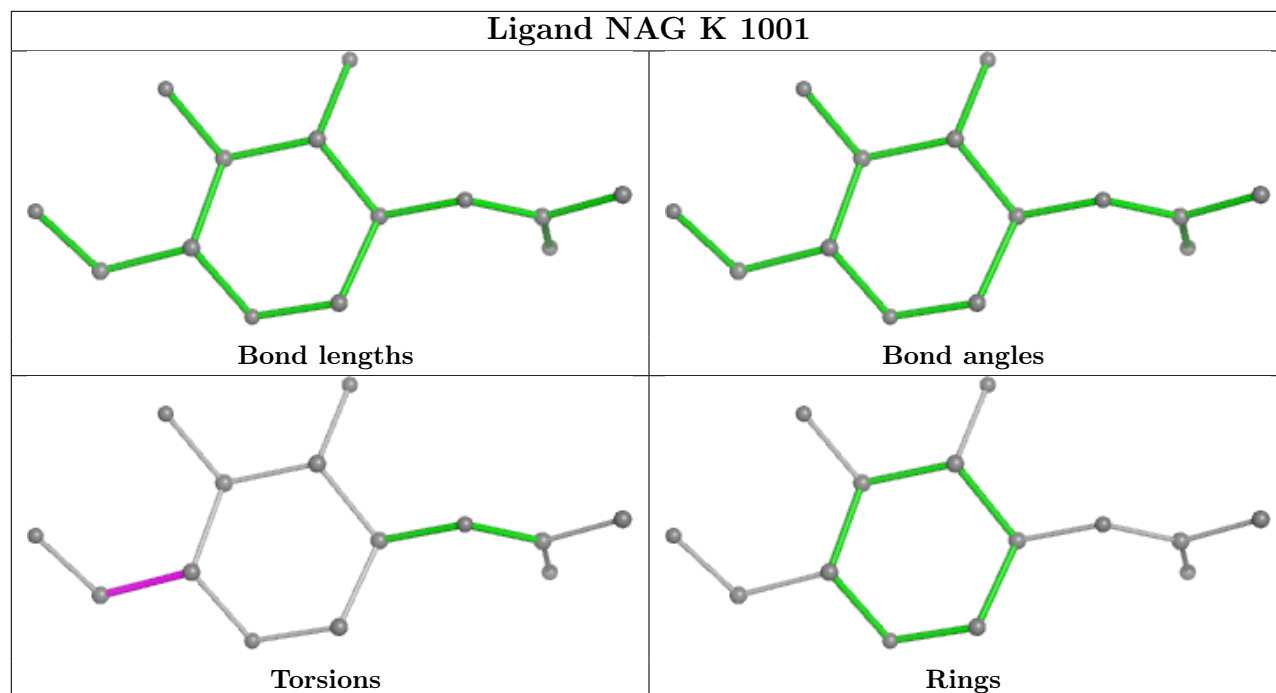
There are no ring outliers.

No monomer is involved in short contacts.

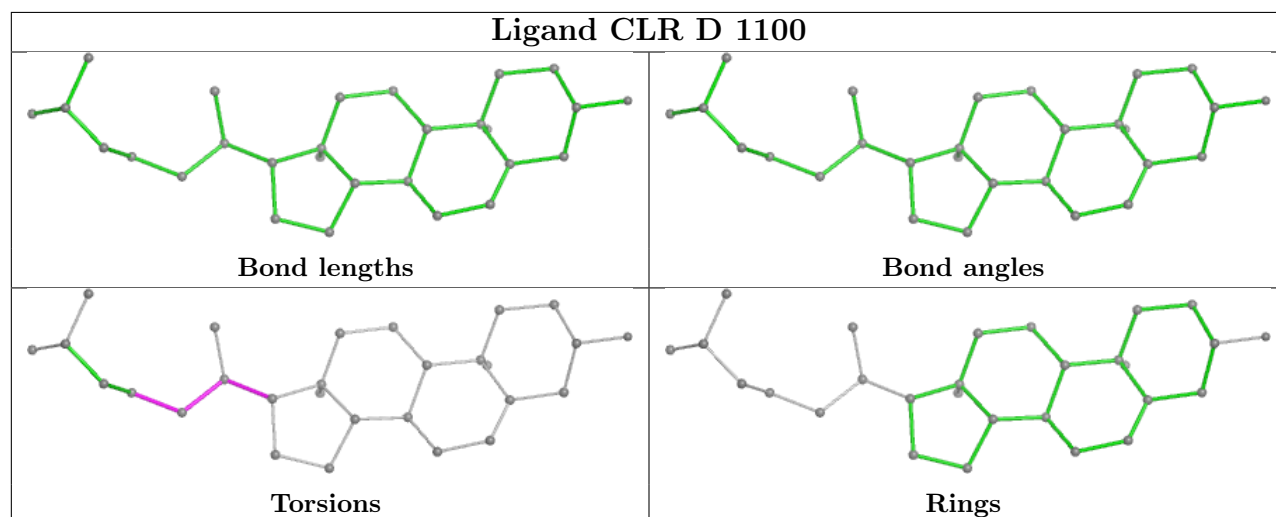
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



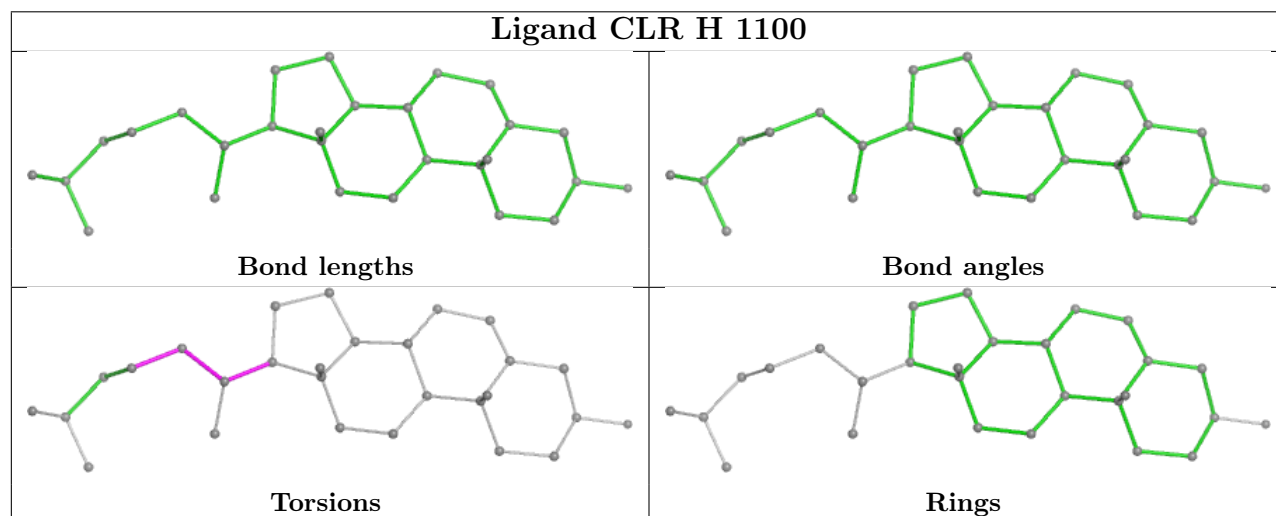
## Ligand NAG K 1001

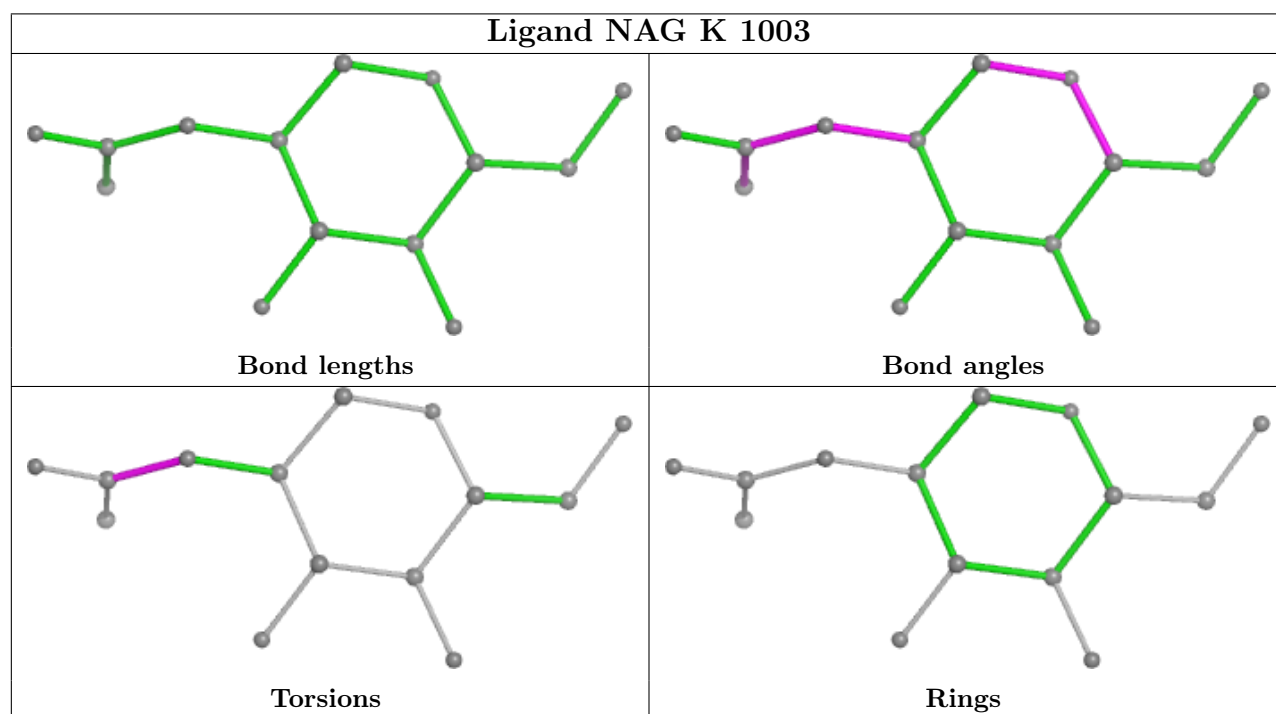
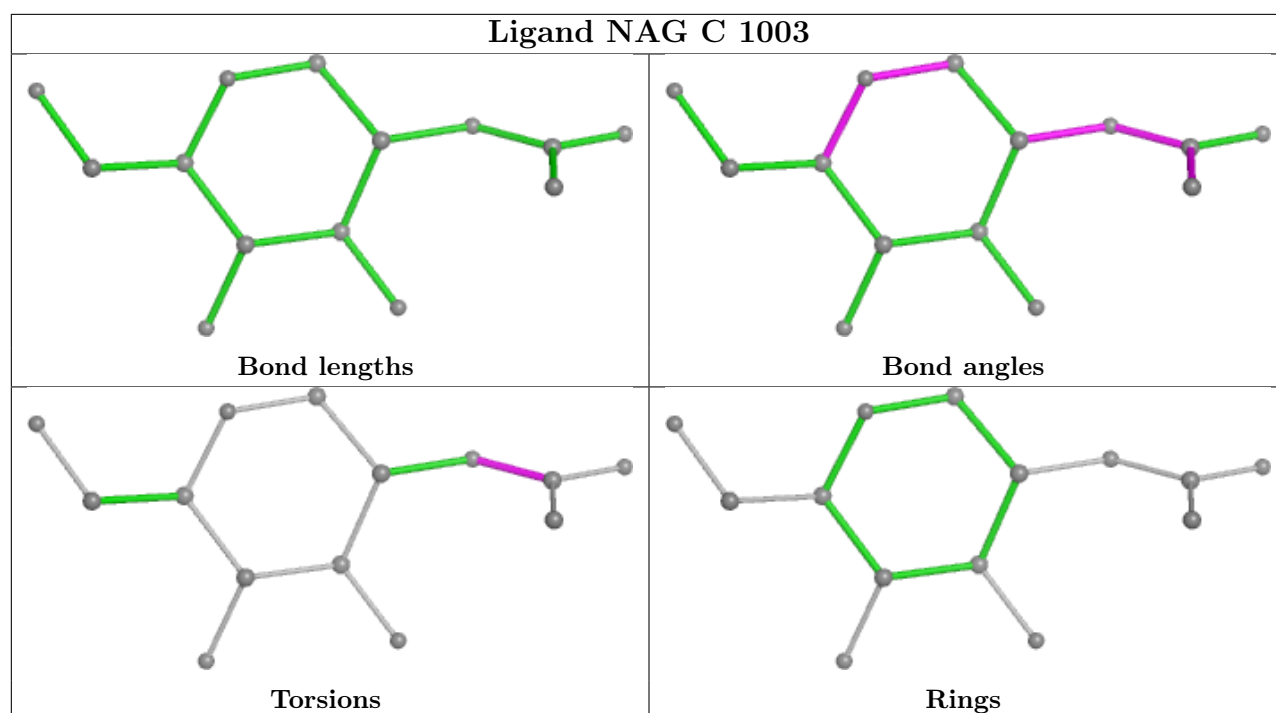


## Ligand CLR D 1100

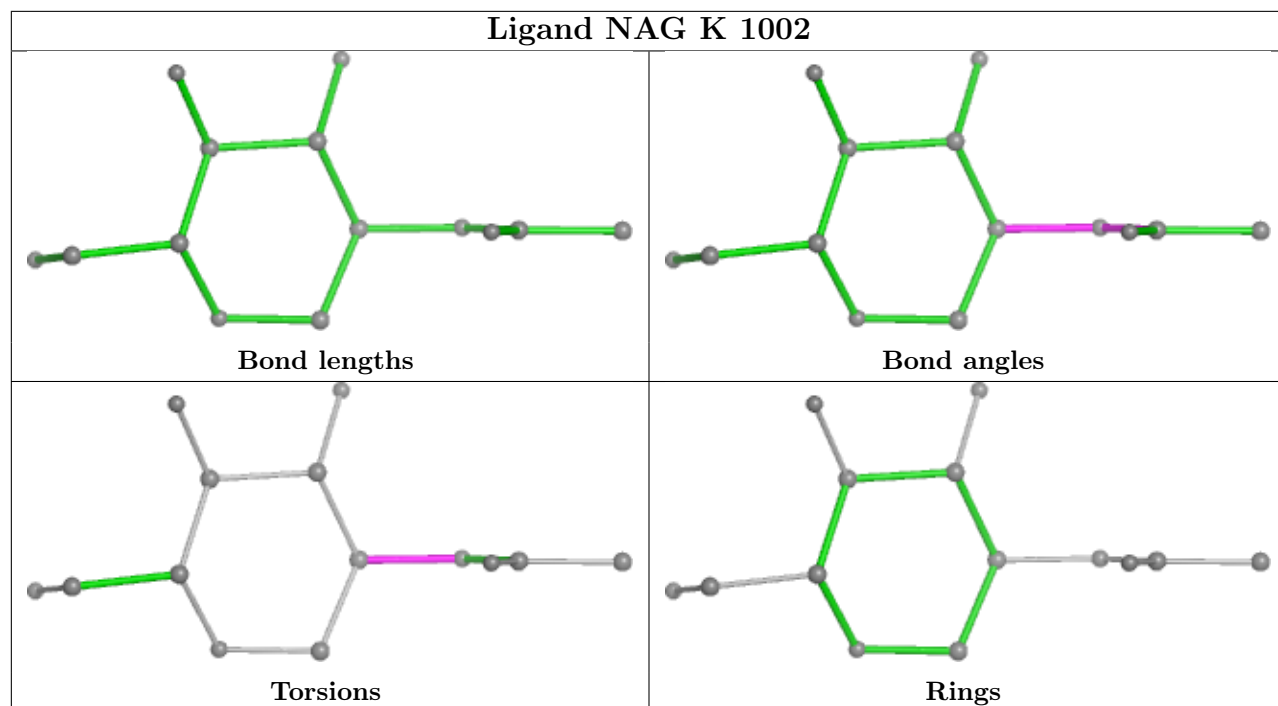


## Ligand CLR H 1100

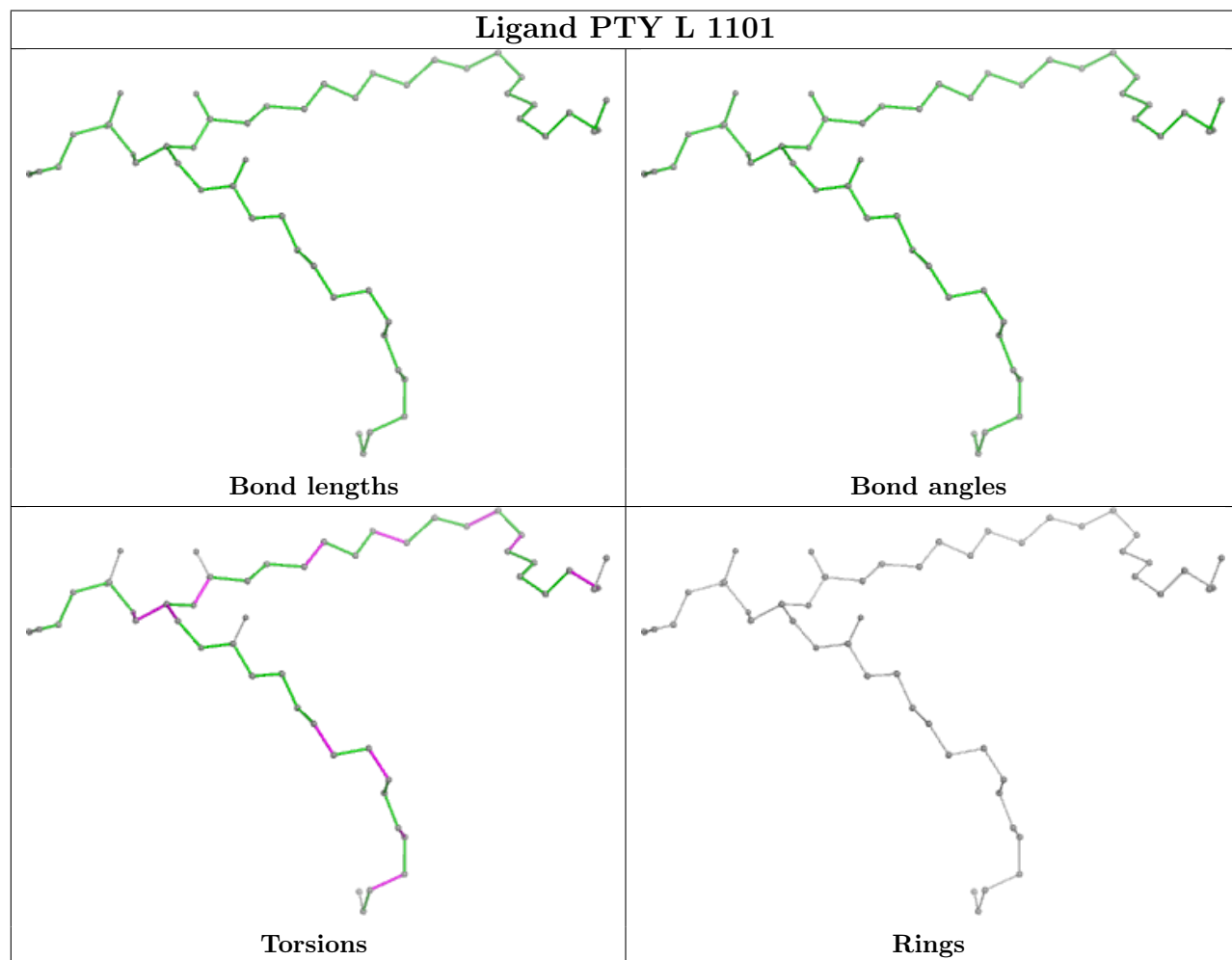


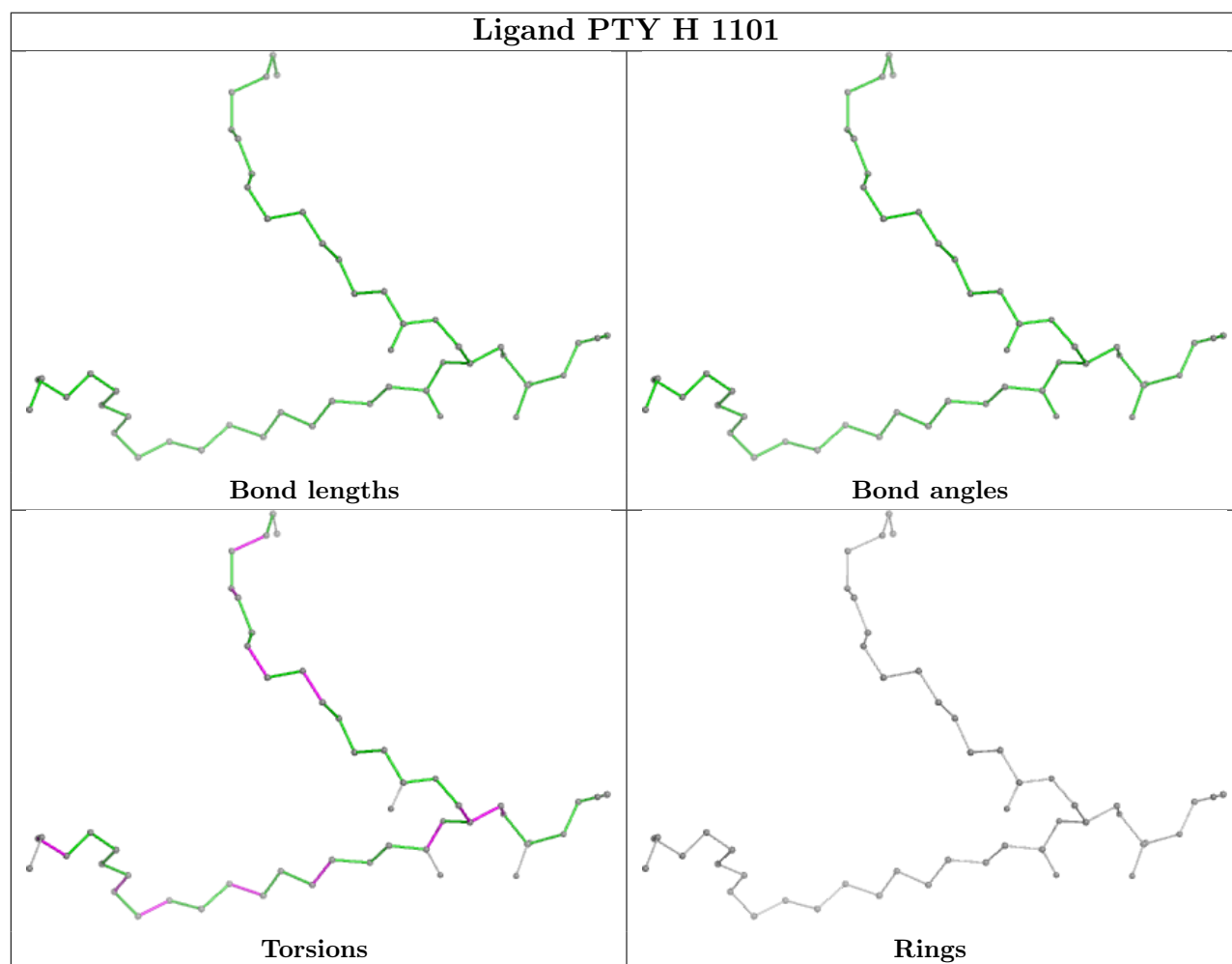
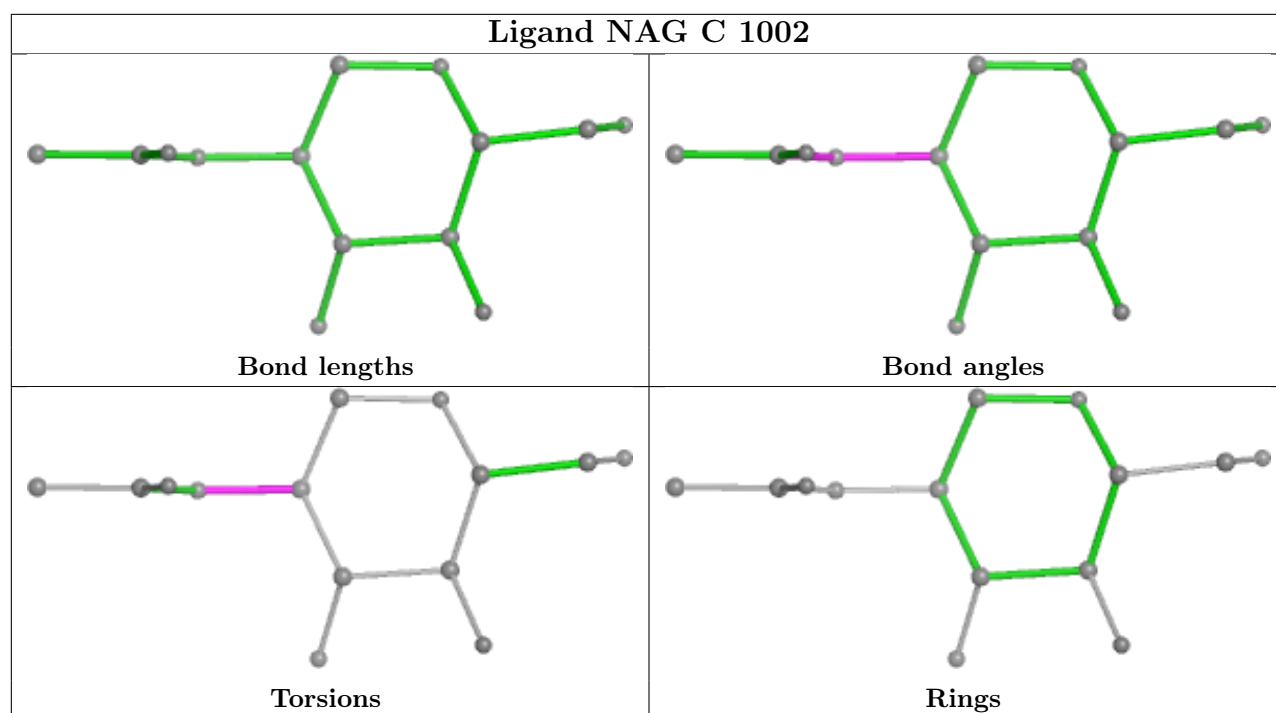


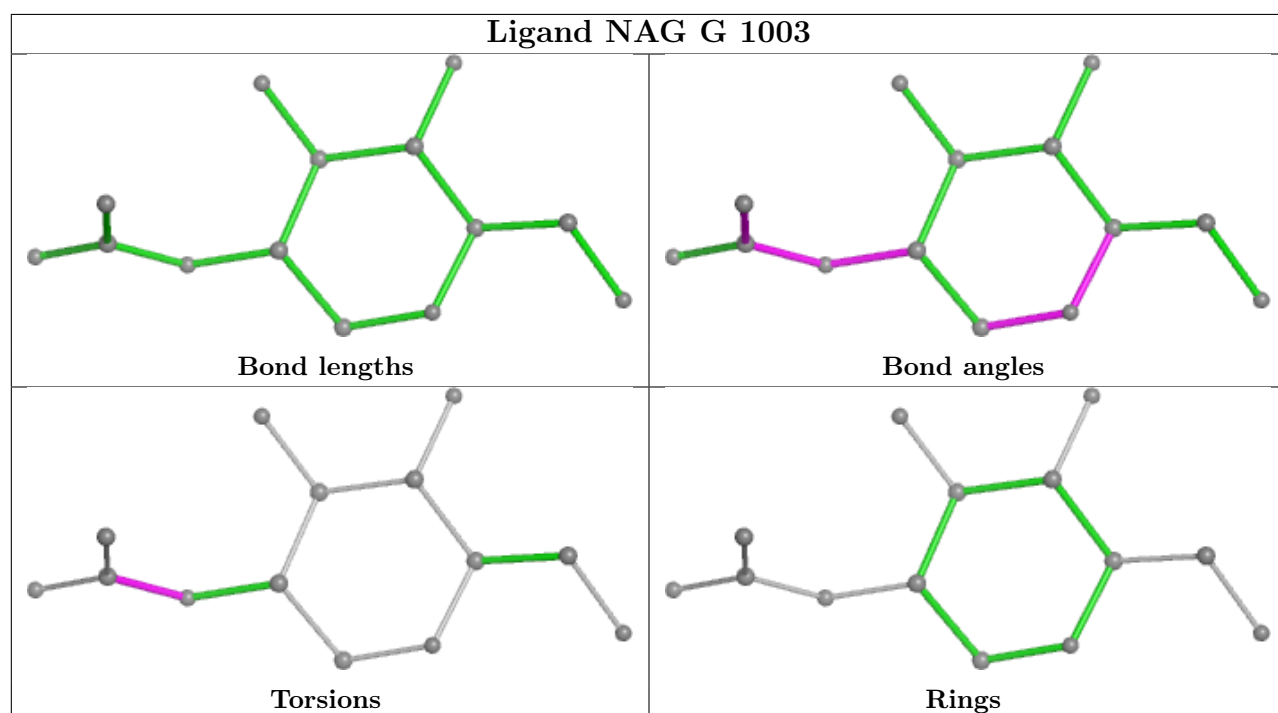
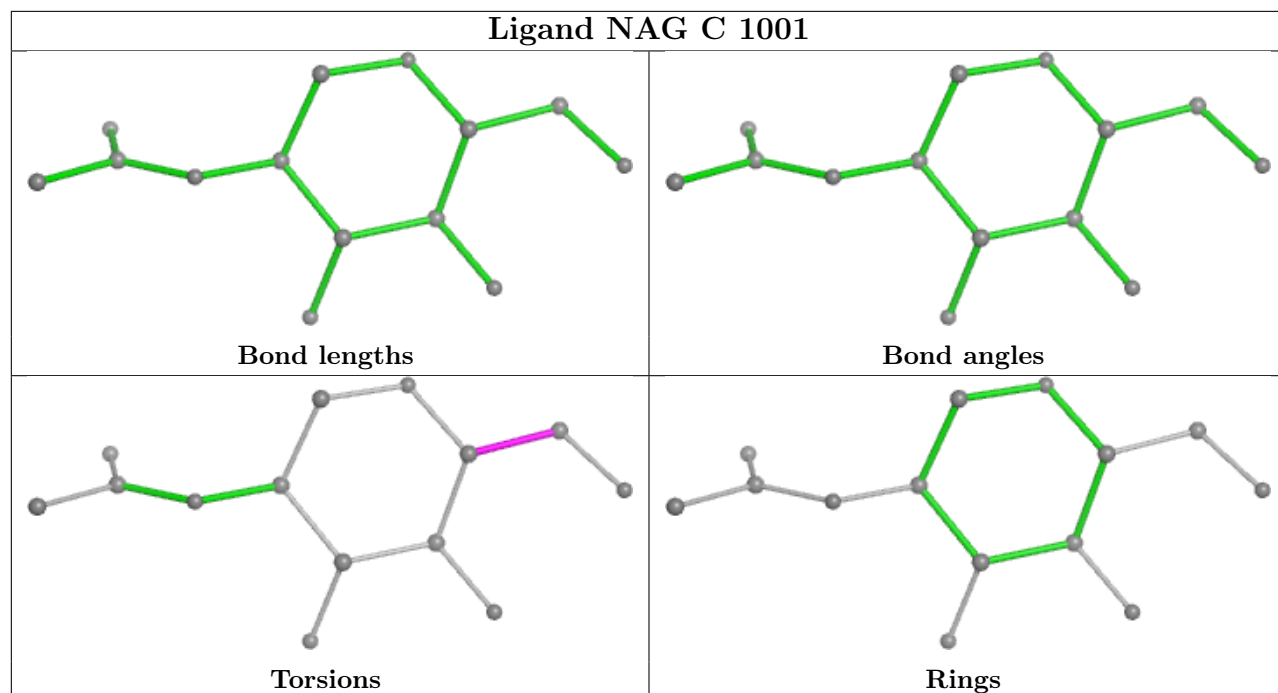
## Ligand NAG K 1002

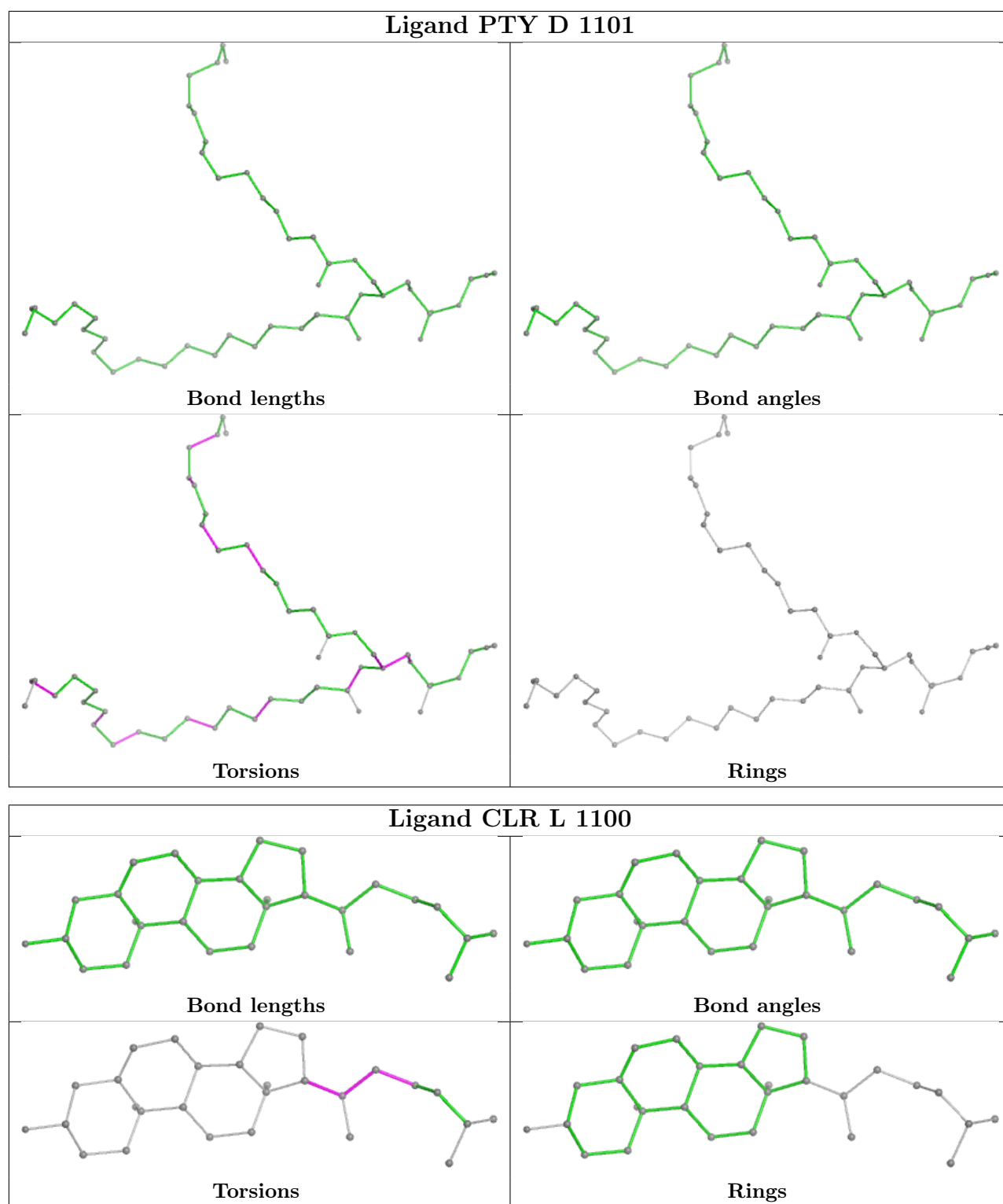


## Ligand PTY L 1101









## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

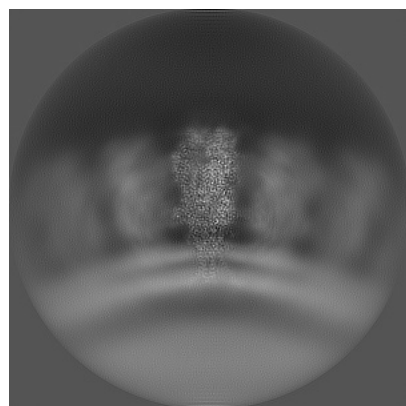
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-17309. These allow visual inspection of the internal detail of the map and identification of artifacts.

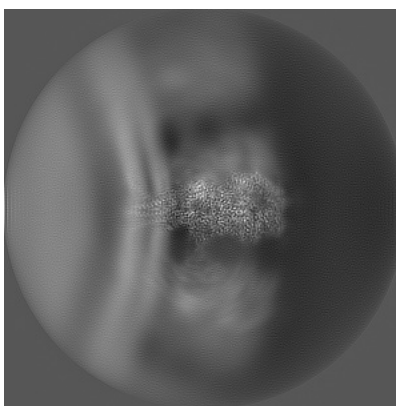
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

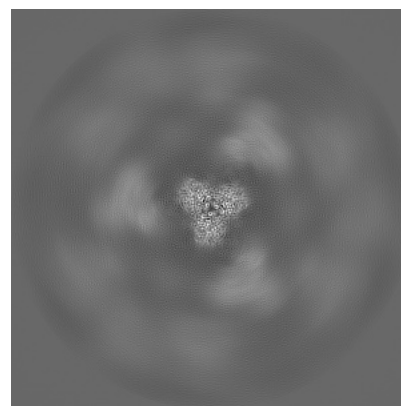
#### 6.1.1 Primary map



X

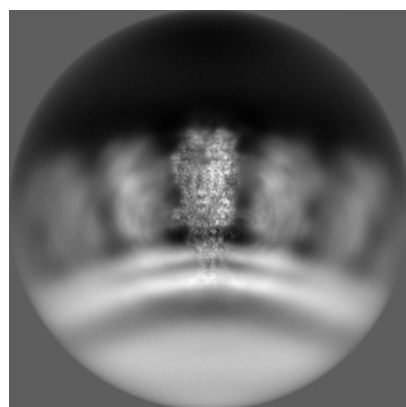


Y

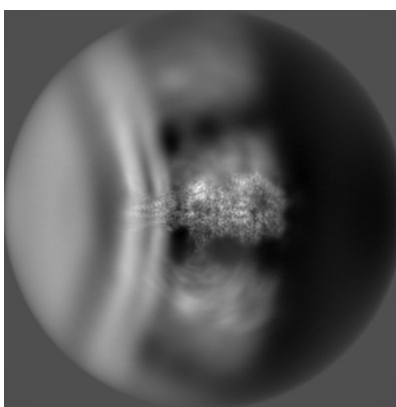


Z

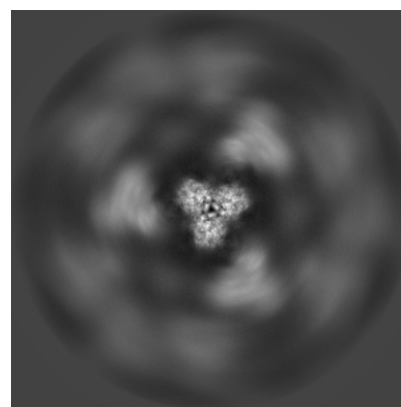
#### 6.1.2 Raw map



X



Y

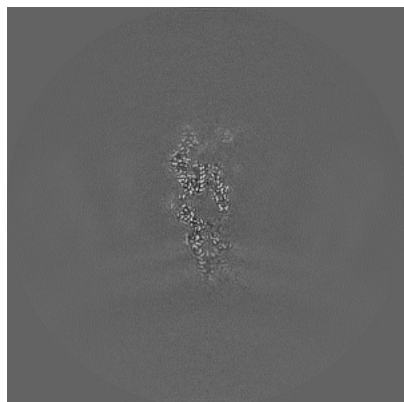


Z

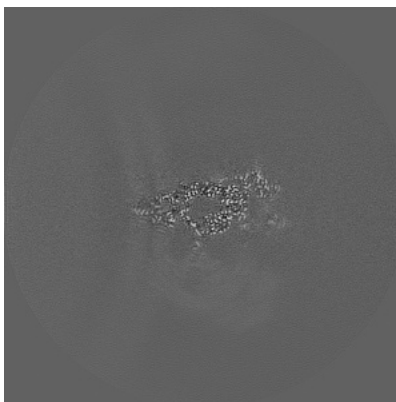
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

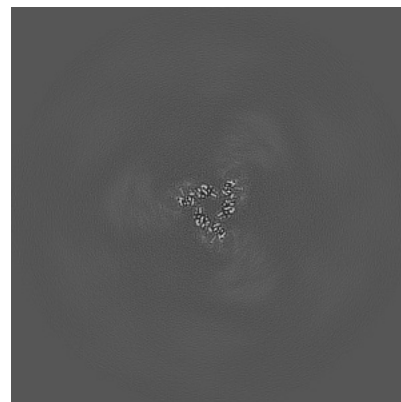
### 6.2.1 Primary map



X Index: 240

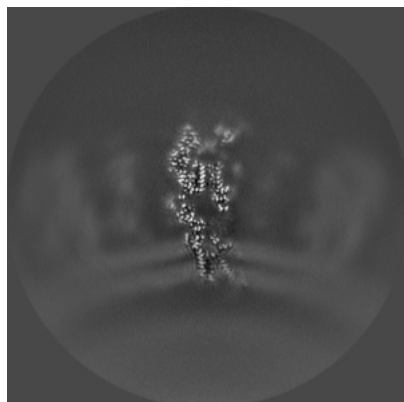


Y Index: 240

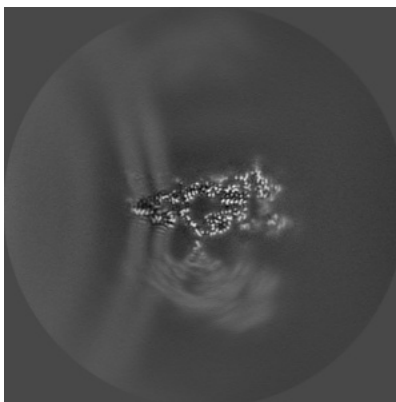


Z Index: 240

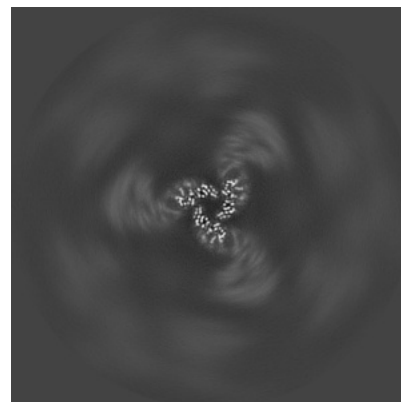
### 6.2.2 Raw map



X Index: 240



Y Index: 240

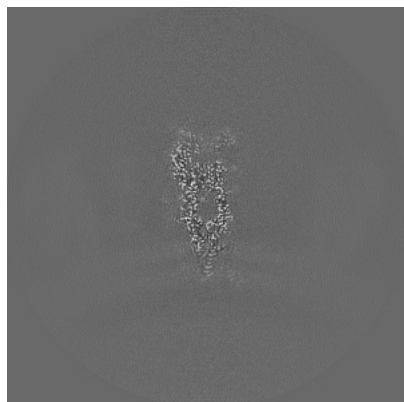


Z Index: 240

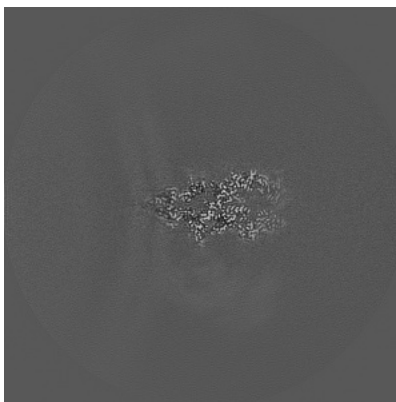
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

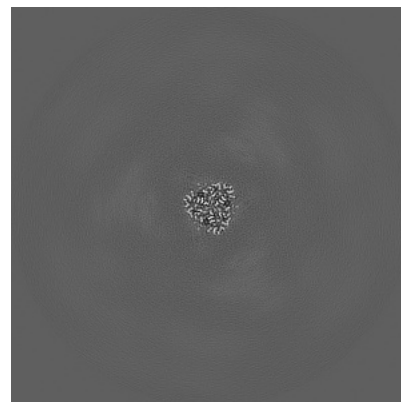
### 6.3.1 Primary map



X Index: 235

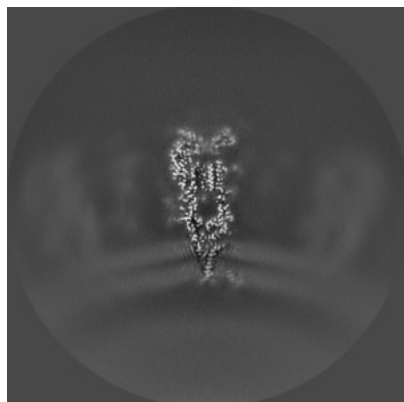


Y Index: 252

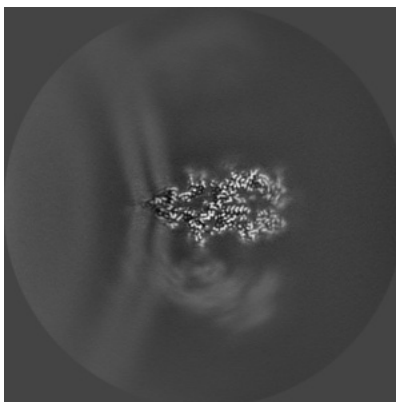


Z Index: 260

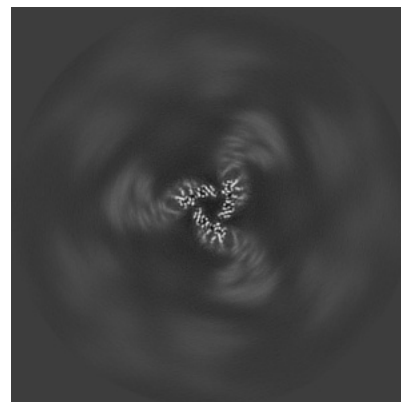
### 6.3.2 Raw map



X Index: 235



Y Index: 252

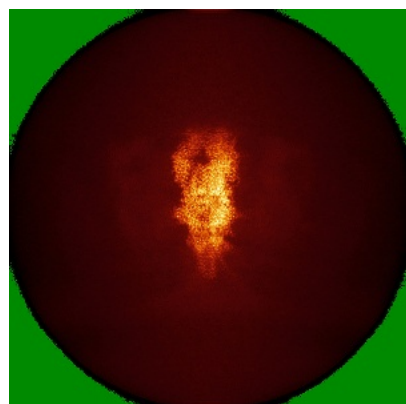


Z Index: 239

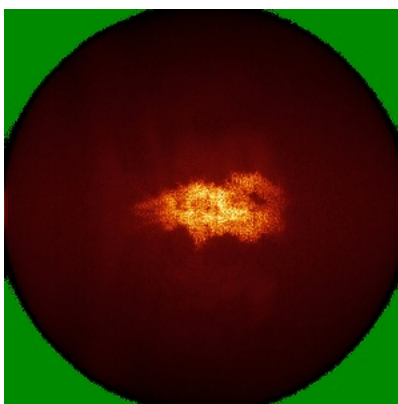
The images above show the largest variance slices of the map in three orthogonal directions.

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

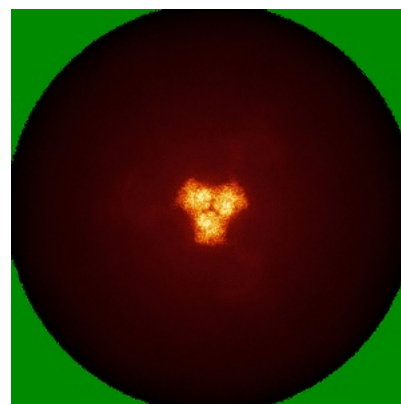
### 6.4.1 Primary map



X

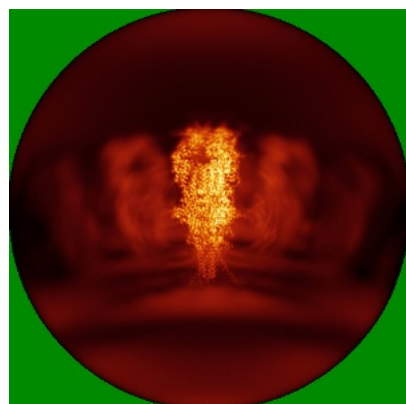


Y

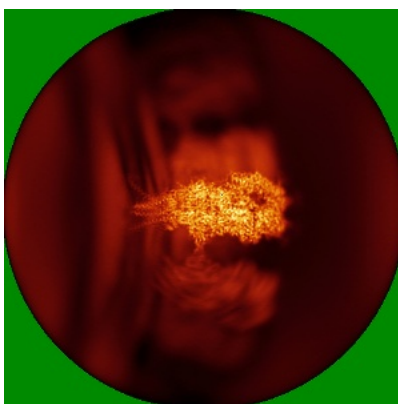


Z

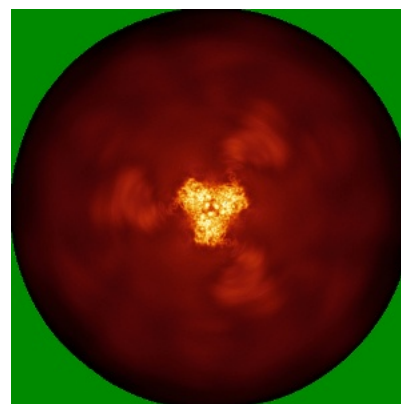
### 6.4.2 Raw map



X



Y

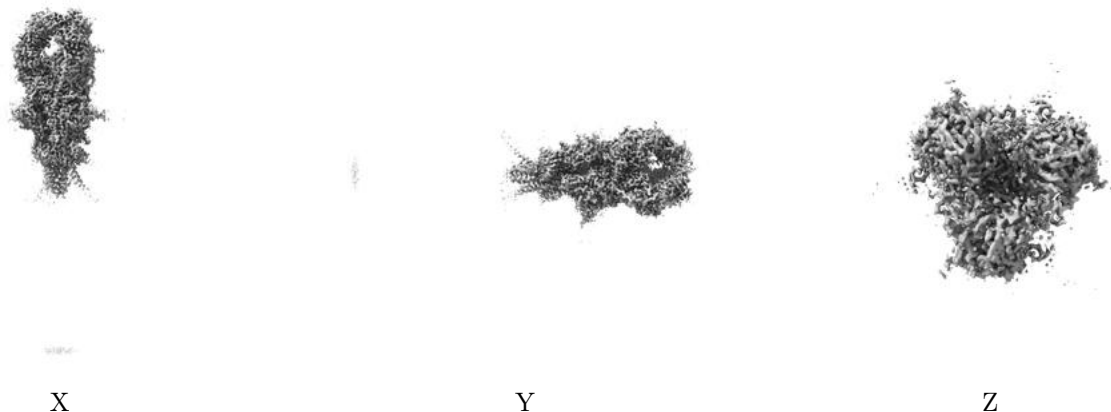


Z

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.

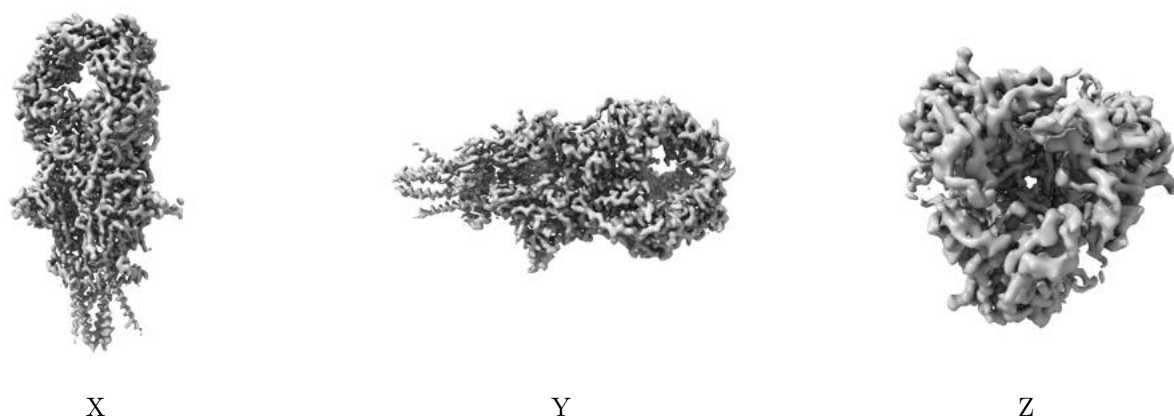
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.022. 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.

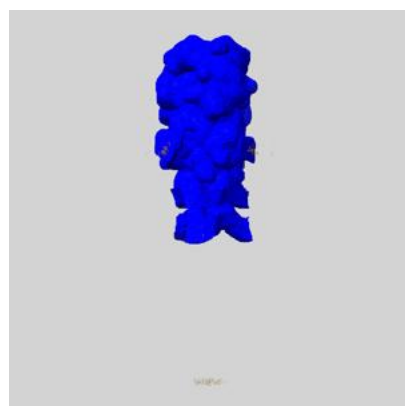
## 6.6 Mask visualisation [i](#)

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

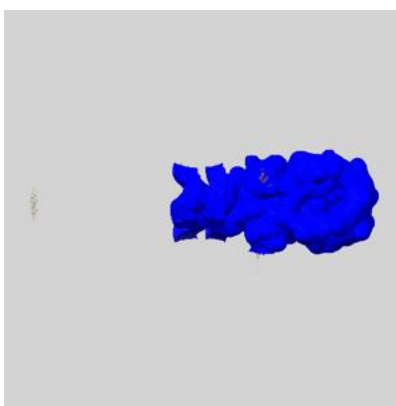
A mask typically either:

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

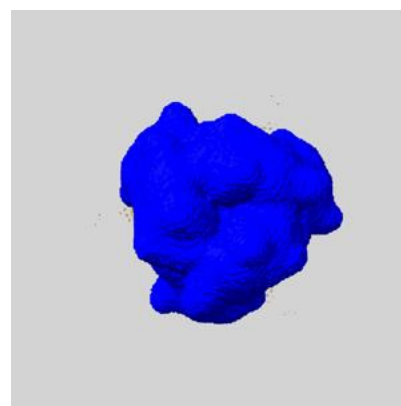
### 6.6.1 emd\_17309\_msk\_1.map [i](#)



X



Y

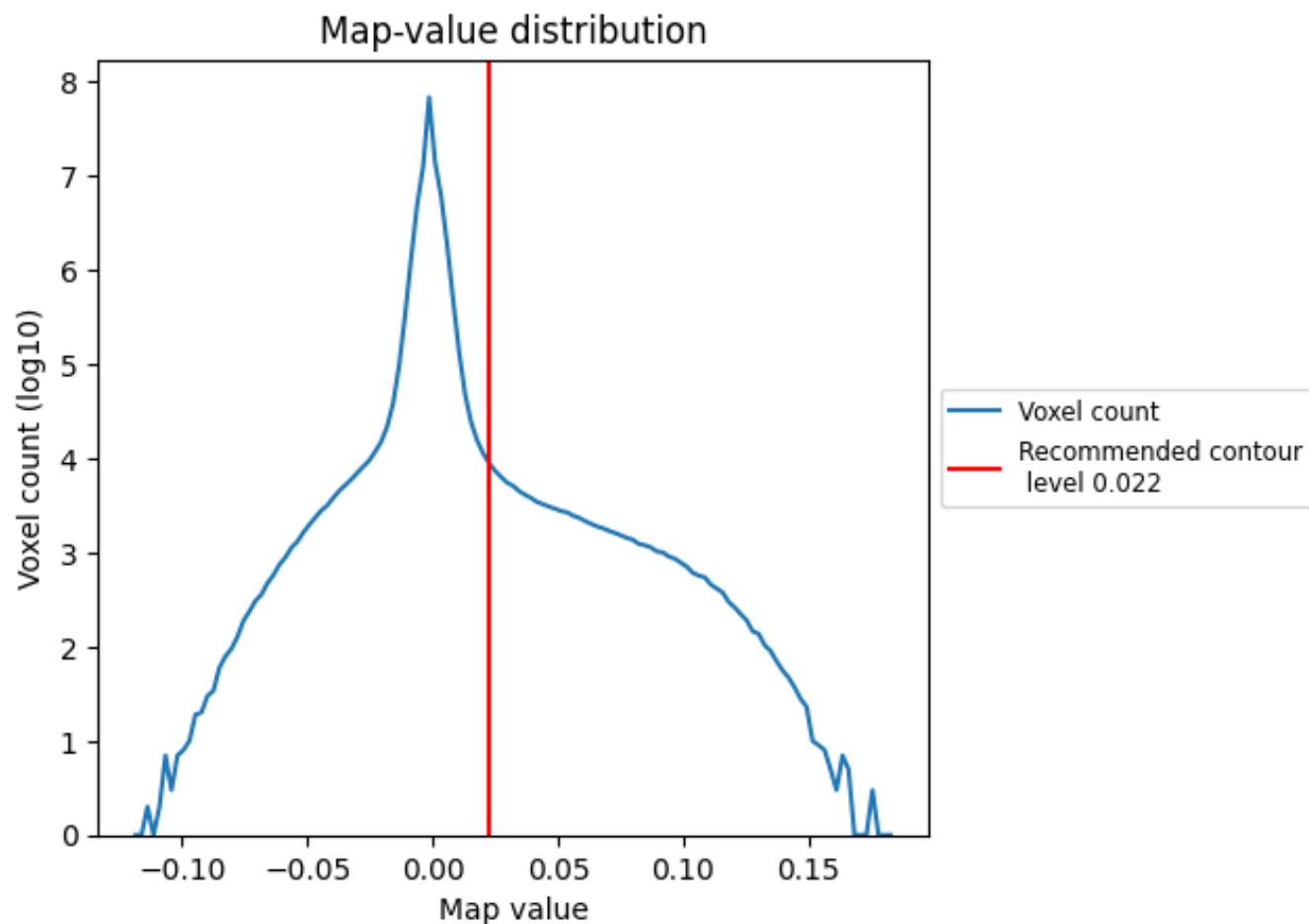


Z

## 7 Map analysis [i](#)

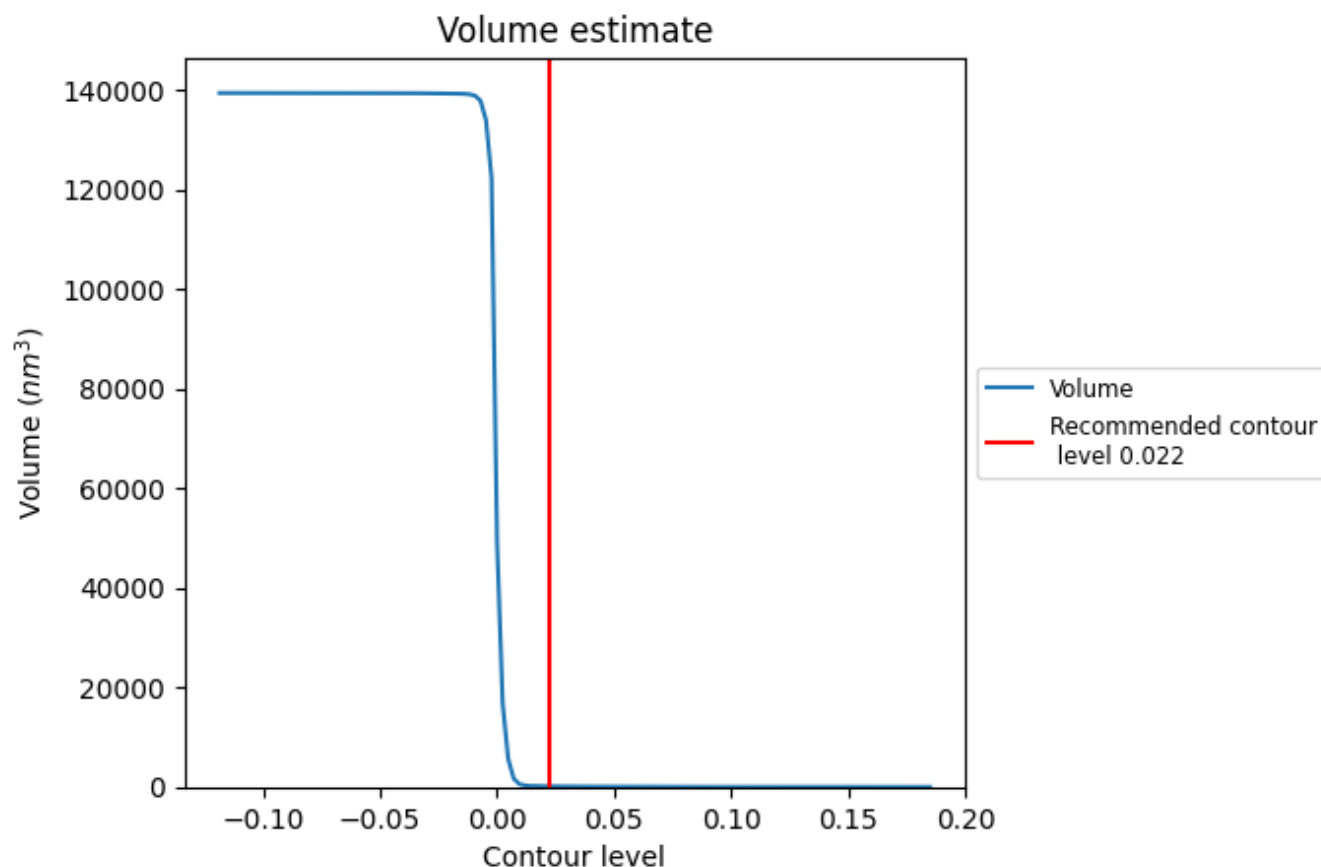
This section contains the results of statistical analysis of the map.

### 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.

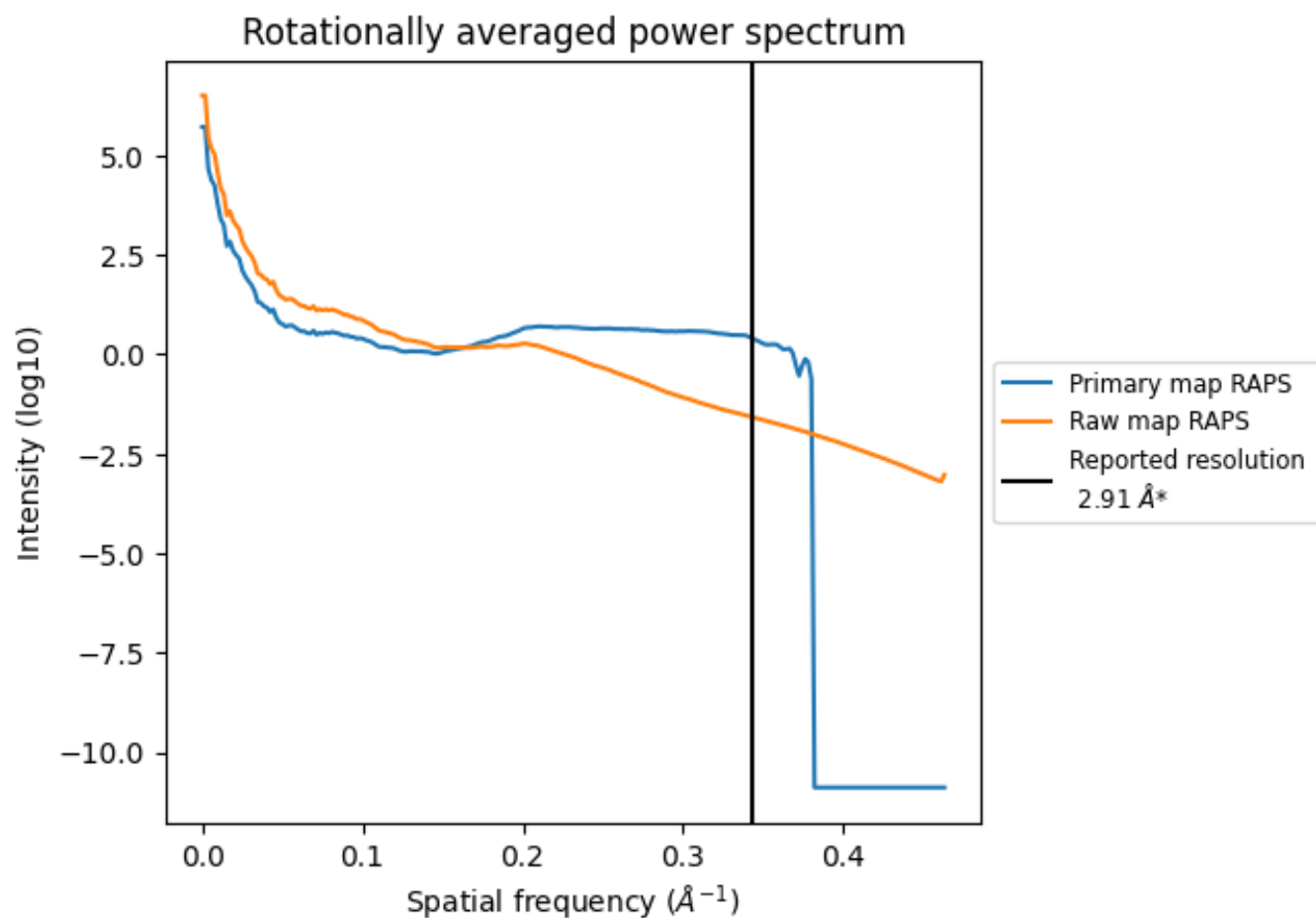
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 126 nm<sup>3</sup>; this corresponds to an approximate mass of 114 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 ⓘ

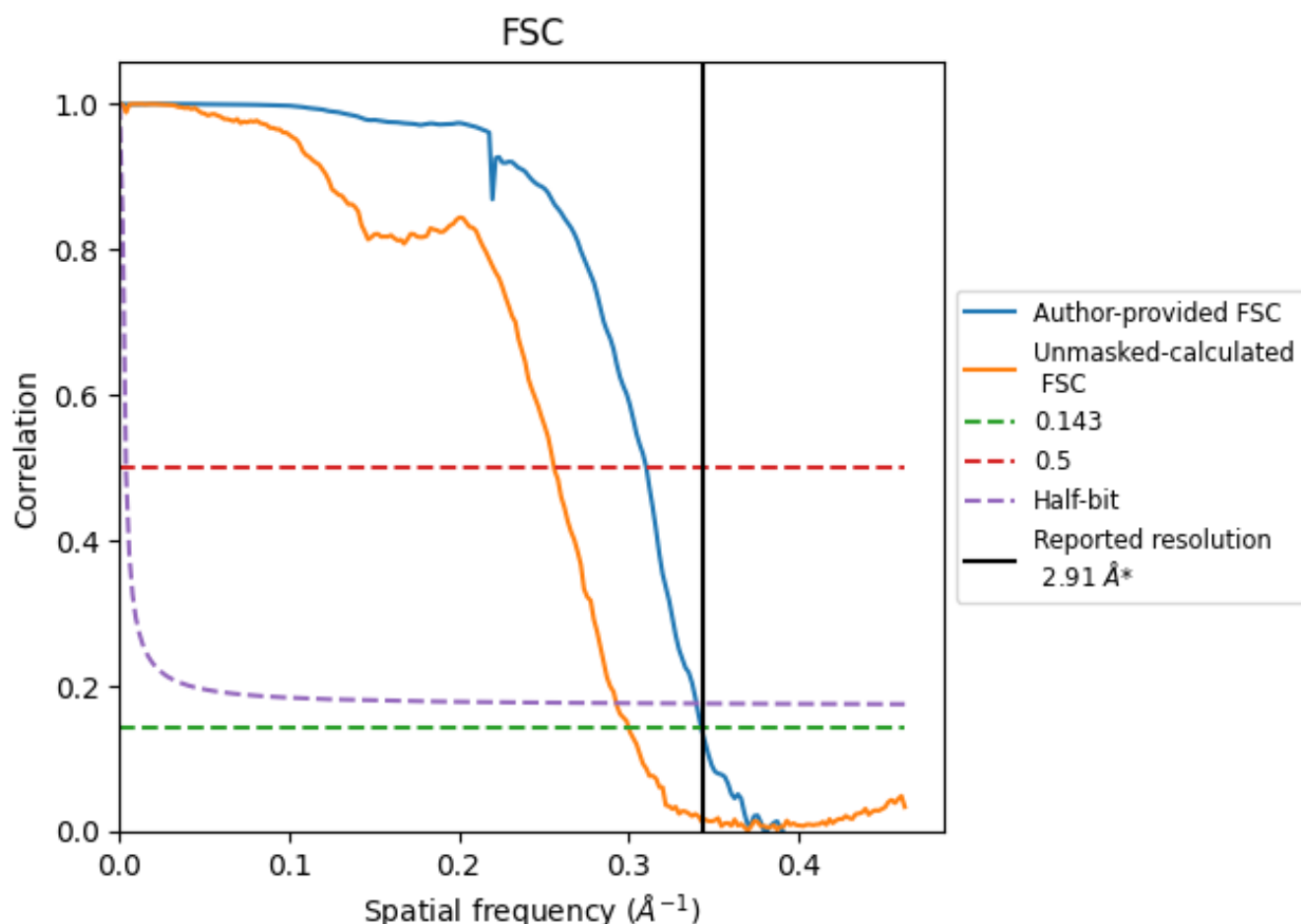


\*Reported resolution corresponds to spatial frequency of 0.344 Å<sup>-1</sup>

## 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 0.344  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

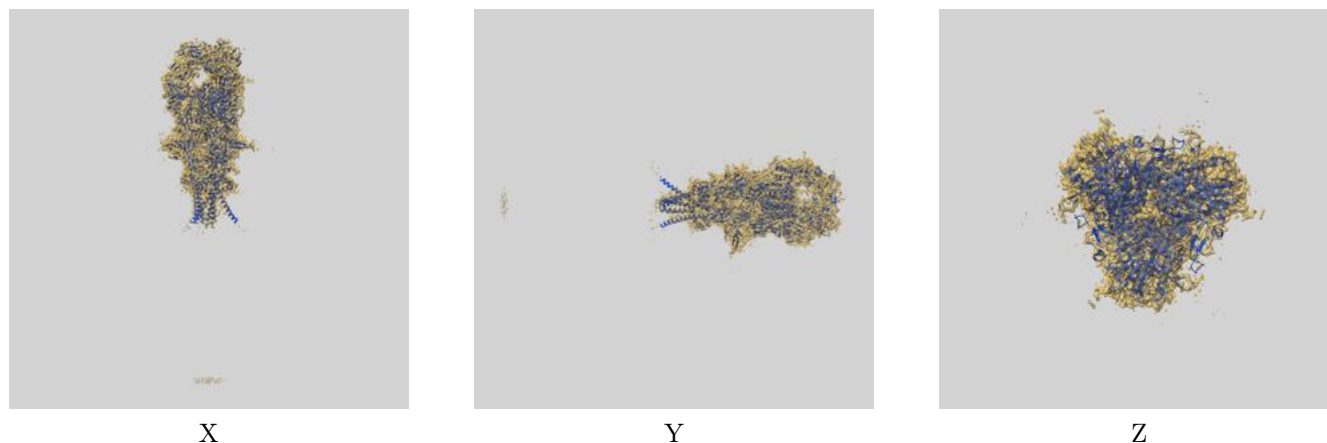
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.91	-	-
Author-provided FSC curve	2.92	3.22	2.94
Unmasked-calculated*	3.33	3.90	3.41

\*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 3.33 differs from the reported value 2.91 by more than 10 %

## 9 Map-model fit [i](#)

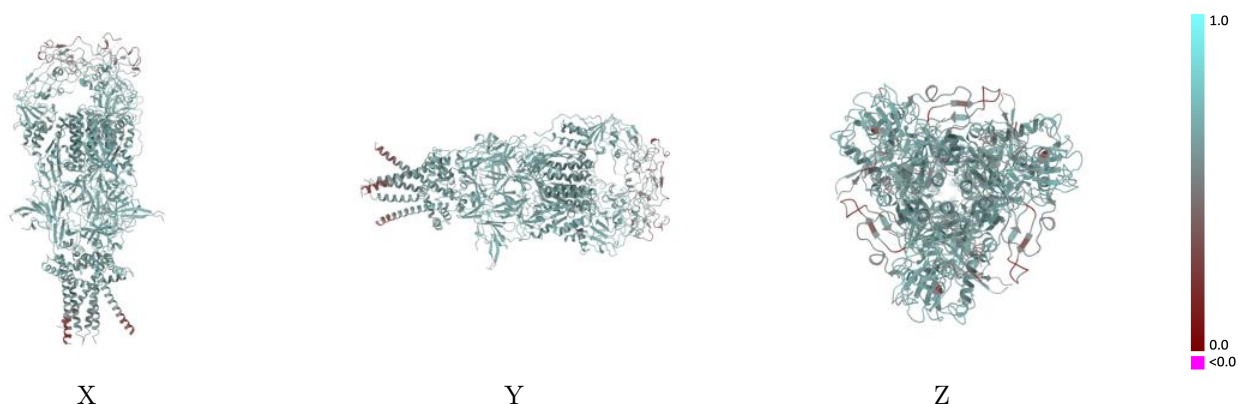
This section contains information regarding the fit between EMDB map EMD-17309 and PDB model 8OZH. Per-residue inclusion information can be found in section 3 on page 11.

### 9.1 Map-model overlay [i](#)



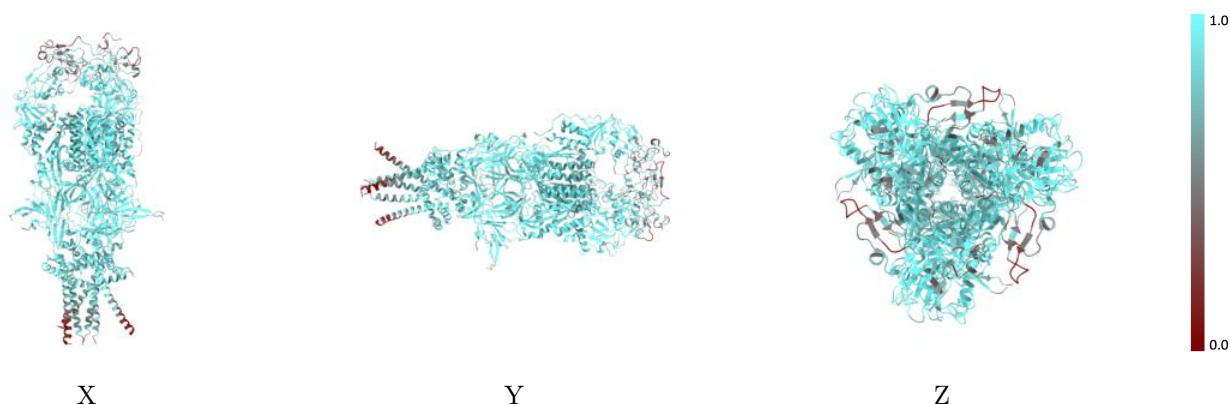
The images above show the 3D surface view of the map at the recommended contour level 0.022 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



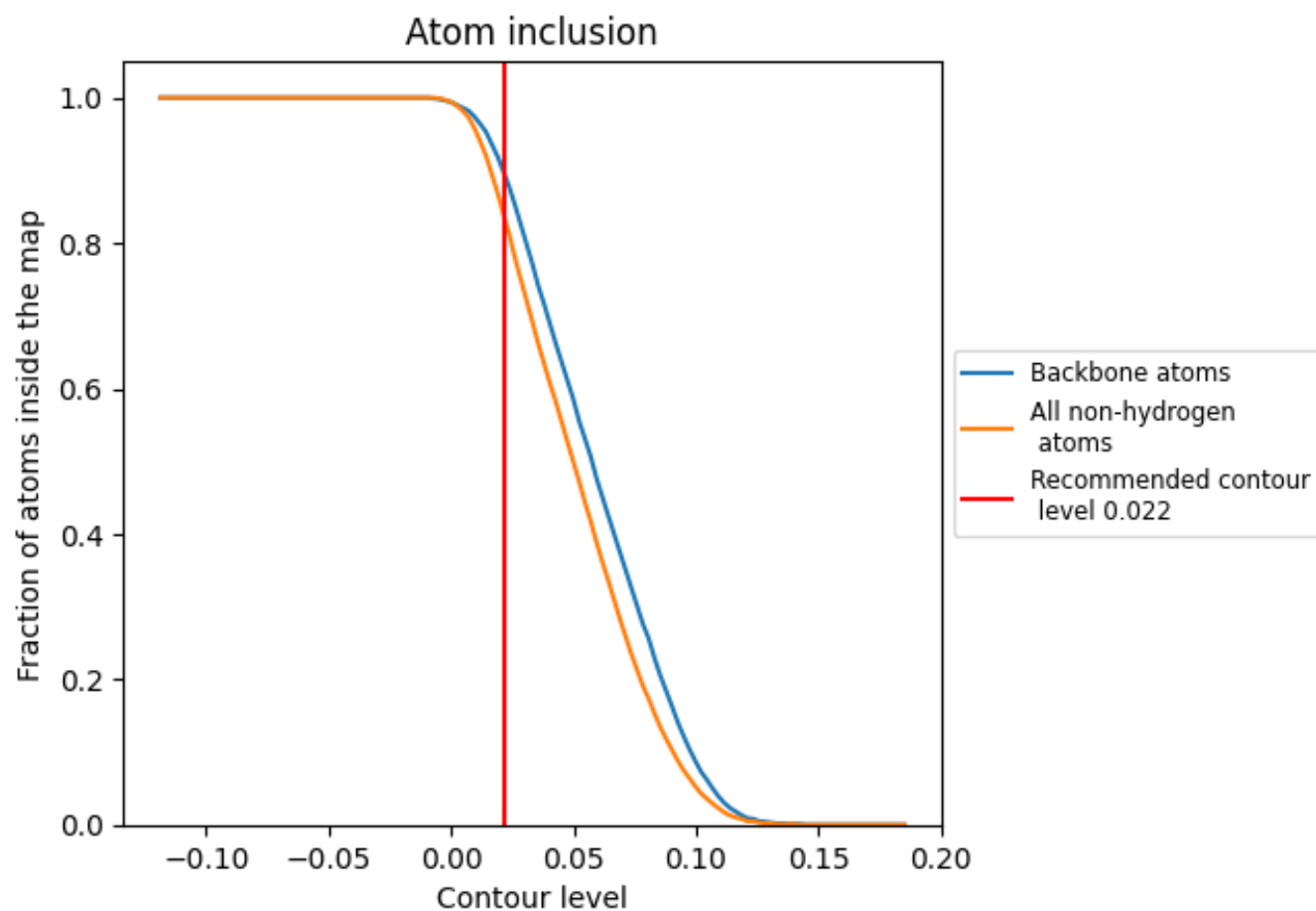
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.022).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 83% 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 (0.022) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8320	 0.6010
A	 0.6880	 0.5530
B	 0.7580	 0.5570
C	 0.8150	 0.5870
D	 0.9020	 0.6310
E	 0.6950	 0.5490
F	 0.7580	 0.5660
G	 0.8160	 0.5850
H	 0.9000	 0.6310
I	 0.6790	 0.5500
J	 0.7800	 0.5670
K	 0.8210	 0.5880
L	 0.8990	 0.6300
M	 0.6430	 0.5310
N	 0.6790	 0.5240
O	 0.6070	 0.5210
P	 0.4600	 0.5210
Q	 0.4400	 0.5140
R	 0.4400	 0.5140
S	 0.2820	 0.4330
T	 0.3080	 0.4360
U	 0.2820	 0.4270
V	 0.6270	 0.5630
W	 0.6270	 0.5680
X	 0.6400	 0.5620
Y	 0.5000	 0.4860
Z	 0.4640	 0.4690
a	 0.5360	 0.4760
b	 0.7140	 0.5440
c	 0.7140	 0.5340
d	 0.6790	 0.5280
e	 0.7450	 0.5720
f	 0.7660	 0.5830
g	 0.7450	 0.5860
h	 0.5970	 0.5750



*Continued on next page...*

*Continued from previous page...*

Chain	Atom inclusion	Q-score
i	 0.6390	 0.5750
j	 0.6110	 0.5840