



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 15, 2024 – 05:18 PM EDT

PDB ID : 2H6O  
Title : Epstein Barr Virus Major Envelope Glycoprotein  
Authors : Chen, X.S.  
Deposited on : 2006-05-31  
Resolution : 3.50 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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/XrayValidationReportHelp>

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:

MolProbity : 4.02b-467  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 2.37.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

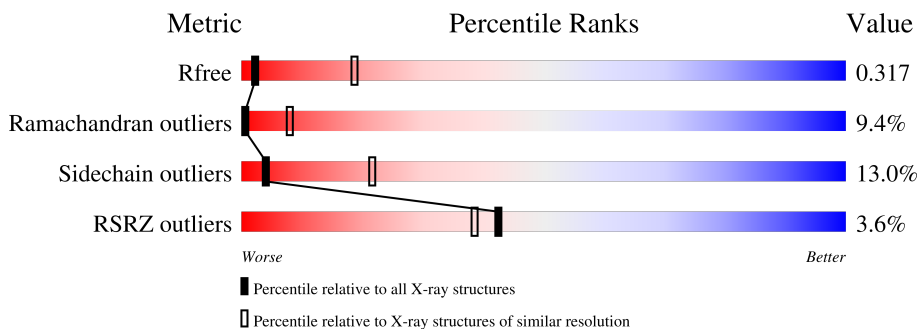
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*


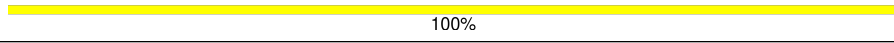
The reported resolution of this entry is 3.50 Å.

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.



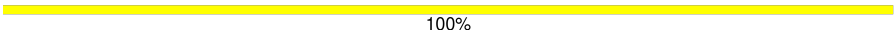
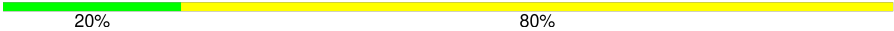
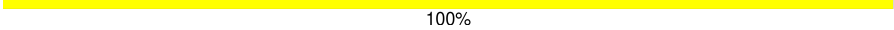

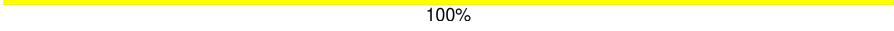
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1659 (3.60-3.40)
Ramachandran outliers	138981	1005 (3.58-3.42)
Sidechain outliers	138945	1006 (3.58-3.42)
RSRZ outliers	127900	1559 (3.60-3.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	470	 3% 75% 16% 6%
2	B	7	 100%
3	D	7	 100%
4	F	8	 100%
5	J	9	 100%
6	M	10	 10% 90%
7	Q	9	 11% 89%

Continued on next page...

*Continued from previous page...*

Mol	Chain	Length	Quality of chain
8	U	11	 100%
9	Y	3	 100%
10	Z	5	 20% 80%
11	b	8	 100%
12	d	9	 11% 89%
13	f	10	 100%
14	i	3	 100%
15	j	2	 100%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
10	MAN	Z	3	-	-	-	X
10	MAN	Z	4	-	-	-	X
10	MAN	Z	5	-	-	-	X
11	MAN	b	4	-	-	-	X
11	MAN	b	5	-	-	-	X
11	MAN	b	6	-	-	-	X
11	MAN	b	7	-	-	-	X
11	BMA	b	8	-	-	-	X
12	MAN	d	3	-	-	-	X
12	MAN	d	4	-	-	-	X
12	NAG	d	5	-	-	-	X
12	MAN	d	6	-	-	-	X
12	MAN	d	7	-	-	-	X
12	MAN	d	8	-	-	-	X
12	FUC	d	9	-	-	-	X
13	FUC	f	10	-	-	-	X
13	MAN	f	3	-	-	-	X
13	MAN	f	4	-	-	-	X
13	NAG	f	5	-	-	-	X
13	MAN	f	6	-	-	-	X
13	MAN	f	7	-	-	-	X
13	BMA	f	8	-	-	-	X
13	MAN	f	9	-	-	-	X

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
14	NAG	i	1	-	-	-	X
14	NAG	i	2	-	-	-	X
14	MAN	i	3	-	-	-	X
15	NAG	j	1	-	-	-	X
15	NAG	j	2	-	-	-	X
2	MAN	B	3	-	-	-	X
2	MAN	B	4	-	-	-	X
2	BMA	B	5	-	-	-	X
2	MAN	B	6	-	-	-	X
2	MAN	B	7	-	-	-	X
3	NAG	D	1	-	-	-	X
3	NAG	D	2	-	-	-	X
3	MAN	D	3	-	-	-	X
3	MAN	D	4	-	-	-	X
3	MAN	D	5	-	-	-	X
3	BMA	D	6	-	-	-	X
3	MAN	D	7	-	-	-	X
4	NAG	F	2	-	-	-	X
4	MAN	F	3	-	-	-	X
4	MAN	F	4	-	-	-	X
4	MAN	F	5	-	-	-	X
4	MAN	F	6	-	-	-	X
4	MAN	F	7	-	-	-	X
4	MAN	F	8	-	-	-	X
5	MAN	J	4	-	-	-	X
5	MAN	J	5	-	-	-	X
5	MAN	J	6	-	-	-	X
5	MAN	J	7	-	-	-	X
5	MAN	J	8	-	-	-	X
5	MAN	J	9	-	-	-	X
6	NAG	M	1	-	-	-	X
6	MAN	M	10	-	-	-	X
6	NAG	M	2	-	-	-	X
6	MAN	M	3	-	-	-	X
6	MAN	M	4	-	-	-	X
6	MAN	M	5	-	-	-	X
6	MAN	M	6	-	-	-	X
6	GAL	M	7	-	-	-	X
6	GAL	M	8	-	-	-	X
6	MAN	M	9	-	-	-	X
7	MAN	Q	3	-	-	-	X
7	MAN	Q	4	-	-	-	X

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
7	MAN	Q	5	-	-	-	X
7	MAN	Q	6	-	-	-	X
7	GAL	Q	7	-	-	-	X
7	GAL	Q	8	-	-	-	X
7	MAN	Q	9	-	-	-	X
8	MAN	U	10	-	-	-	X
8	MAN	U	11	-	-	-	X
8	MAN	U	4	-	-	-	X
8	MAN	U	5	-	-	-	X
8	MAN	U	6	-	-	-	X
8	GAL	U	7	-	-	-	X
8	GAL	U	8	-	-	-	X
8	BMA	U	9	-	-	-	X
9	NAG	Y	2	-	-	-	X
9	MAN	Y	3	-	-	-	X

## 2 Entry composition i

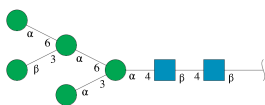
There are 15 unique types of molecules in this entry. The entry contains 4500 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 Major outer envelope glycoprotein gp350.

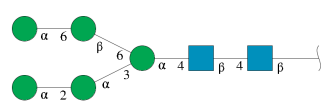
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	440	3301	2082	542	660	17	0	0	0

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



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

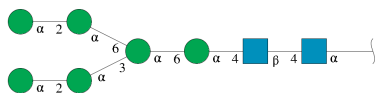
- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	D	7	83	46	2	35	0	0	0

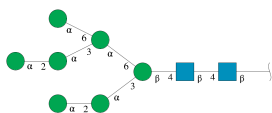
- Molecule 4 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-

2-acetamido-2-deoxy-alpha-D-glucopyranose.



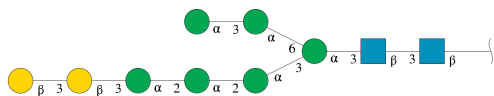
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	F	8	94	52	2	40	0	0	0

- Molecule 5 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-(1-2)-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.



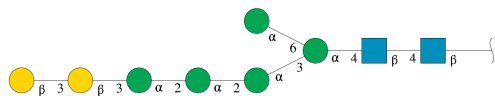
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
5	J	9	105	58	2	45	0	0	0

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



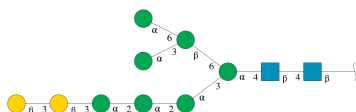
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
6	M	10	116	64	2	50	0	0	0

- Molecule 7 is an oligosaccharide called beta-D-galactopyranose-(1-3)-beta-D-galactopyranose-(1-3)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



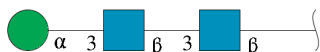
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
7	Q	9	Total	C	N	O	0	0	0
			105	58	2	45			

- Molecule 8 is an oligosaccharide called beta-D-galactopyranose-(1-3)-beta-D-galactopyranose-(1-3)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]]beta-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



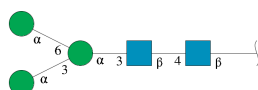
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
8	U	11	Total	C	N	O	0	0	0
			127	70	2	55			

- Molecule 9 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose.



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

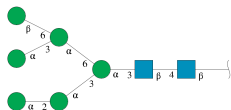
- Molecule 10 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.





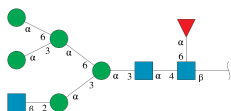
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
10	Z	5	61	34	2	25	0	0	0

- Molecule 11 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-3)-[beta-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



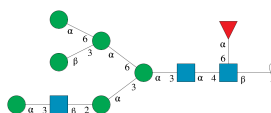
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
11	b	8	94	52	2	40	0	0	0

- Molecule 12 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-alpha-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



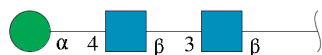
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
12	d	9	107	60	3	44	0	0	0

- Molecule 13 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[beta-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-alpha-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



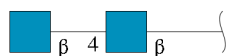
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
13	f	10	118	66	3	49	0	0	0

- Molecule 14 is an oligosaccharide called alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose.



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

- Molecule 15 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

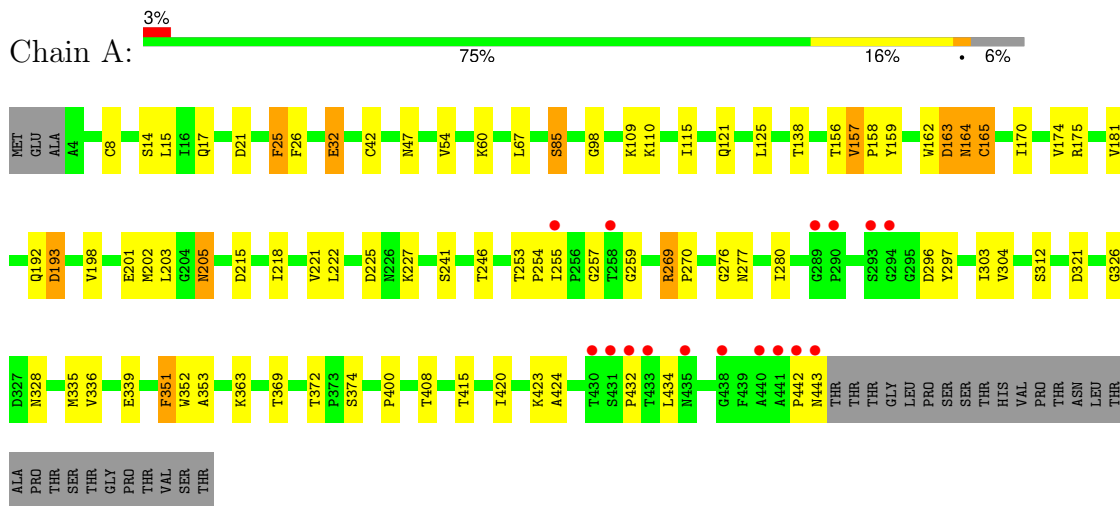


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
15	j	2	28	16	2	10	0	0	0

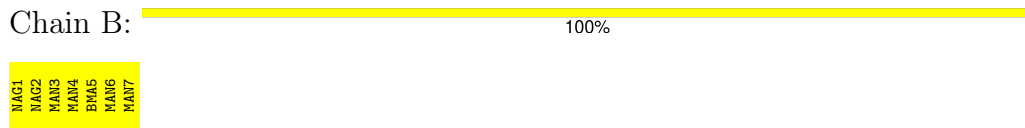
### 3 Residue-property plots [\(i\)](#)

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

- Molecule 1: Major outer envelope glycoprotein gp350



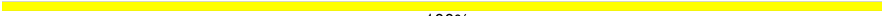
- Molecule 2: beta-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



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

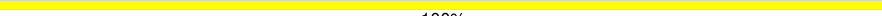


- Molecule 4: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-alpha-D-glucopyranose

Chain F:  100%


MAN1  
MAN2  
MAN3  
MAN4  
MAN5  
MAN6  
MAN7  
MAN8

- Molecule 5: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J:  100%

MAN1  
MAN2  
MAN3  
MAN4  
MAN5  
MAN6  
MAN7  
MAN8  
MAN9

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

Chain M:  10% 90%

MAN1  
MAN2  
MAN3  
MAN4  
MAN5  
MAN6  
MAN7  
GAL7  
GAL8  
MAN9  
MAN10

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

Chain Q:  11% 89%

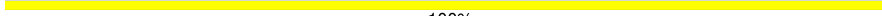
MAN1  
MAN2  
MAN3  
MAN4  
MAN5  
MAN6  
MAN7  
GAL7  
GAL8  
MAN9

- Molecule 8: beta-D-galactopyranose-(1-3)-beta-D-galactopyranose-(1-3)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain U:  100%


MAN1  
MAN2  
MAN3  
MAN4  
MAN5  
MAN6  
MAN7  
GAL7  
GAL8  
MAN9  
MAN10  
MAN11

- Molecule 9: alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose

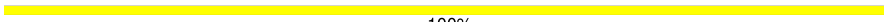
Chain Y:  100%

MAG1  
MAG2  
MAN3

- Molecule 10: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Z:  20% 80%MAG1  
MAG2  
MAN3  
MAN4  
MAN5

- Molecule 11: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-3)-[beta-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain b:  100%MAG1  
MAG2  
MAN3  
MAN4  
MAG5  
MAG6  
MAN7  
BNA8

- Molecule 12: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-alpha-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain d:  11% 89%MAG1  
MAG2  
MAN3  
MAN4  
MAG5  
MAG6  
MAN7  
MAG8  
FUC9

- Molecule 13: alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[beta-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-3)-2-acetamido-2-deoxy-alpha-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain f:  100%MAG1  
MAG2  
MAN3  
MAN4  
MAG5  
MAG6  
MAN7  
BNA8  
MAN9  
FUC10

- Molecule 14: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-3)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain i:  100%MAG1  
MAG2  
MAN3

- Molecule 15: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain j:

100%

MAG1  
MAG2

## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	110.01Å 110.01Å 146.13Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	20.00 – 3.50 24.91 – 2.99	Depositor EDS
% Data completeness (in resolution range)	(Not available) (20.00-3.50) 87.8 (24.91-2.99)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.21 (at 2.99Å)	Xtrriage
Refinement program	CNS	Depositor
R, $R_{free}$	0.326 , 0.368 0.287 , 0.317	Depositor DCC
$R_{free}$ test set	947 reflections (4.53%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	81.4	Xtrriage
Anisotropy	0.324	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 60.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.033 for -h,-k,l	Xtrriage
$F_o, F_c$ correlation	0.86	EDS
Total number of atoms	4500	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	70.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.36% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 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, MAN, GAL, NDG, BMA, FUC

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	0.58	3/3377 (0.1%)	0.98	11/4621 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	443	ASN	CA-C	7.14	1.71	1.52
1	A	443	ASN	C-O	7.04	1.36	1.23
1	A	352	TRP	NE1-CE2	-6.49	1.29	1.37

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	25	PHE	CB-CA-C	-7.25	95.90	110.40
1	A	352	TRP	CE2-CD2-CG	-6.95	101.74	107.30
1	A	163	ASP	N-CA-C	6.76	129.26	111.00
1	A	443	ASN	CB-CA-C	-6.64	97.12	110.40
1	A	352	TRP	CD2-CE2-CZ2	-6.58	114.40	122.30

There are no chirality outliers.

All (1) planarity outliers are listed below:



Mol	Chain	Res	Type	Group
1	A	351	PHE	Sidechain

## 5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

## 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 X-ray entries followed by that with respect to entries of similar resolution.

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	438/470 (93%)	327 (75%)	70 (16%)	41 (9%)	<b>0</b> <b>8</b>

5 of 41 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	8	CYS
1	A	32	GLU
1	A	85	SER
1	A	115	ILE
1	A	158	PRO

### 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 X-ray entries followed by that with respect to entries of similar resolution.

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	362/404 (90%)	315 (87%)	47 (13%)	<b>4</b> <b>21</b>

5 of 47 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	205	ASN
1	A	280	ILE
1	A	215	ASP
1	A	246	THR
1	A	303	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 17 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	378	ASN
1	A	435	ASN
1	A	177	GLN
1	A	277	ASN
1	A	278	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](#)

101 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	NAG	B	1	2	14,14,15	1.60	4 (28%)	17,19,21	1.43	3 (17%)
2	NAG	B	2	2	14,14,15	1.13	2 (14%)	17,19,21	1.83	5 (29%)
2	MAN	B	3	2	11,11,12	1.36	1 (9%)	15,15,17	0.93	0
2	MAN	B	4	2	11,11,12	1.54	2 (18%)	15,15,17	1.30	1 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	BMA	B	5	2	11,11,12	1.20	2 (18%)	15,15,17	1.41	3 (20%)
2	MAN	B	6	2	11,11,12	1.17	1 (9%)	15,15,17	1.37	2 (13%)
2	MAN	B	7	2	11,11,12	1.26	1 (9%)	15,15,17	1.22	1 (6%)
3	NAG	D	1	3,1	14,14,15	1.00	1 (7%)	17,19,21	0.83	1 (5%)
3	NAG	D	2	3	14,14,15	0.93	1 (7%)	17,19,21	0.91	2 (11%)
3	MAN	D	3	3	11,11,12	1.29	2 (18%)	15,15,17	1.03	1 (6%)
3	MAN	D	4	3	11,11,12	1.48	3 (27%)	15,15,17	1.13	1 (6%)
3	MAN	D	5	3	11,11,12	1.19	1 (9%)	15,15,17	1.37	2 (13%)
3	BMA	D	6	3	11,11,12	1.63	3 (27%)	15,15,17	1.46	4 (26%)
3	MAN	D	7	3	11,11,12	0.94	1 (9%)	15,15,17	1.16	2 (13%)
4	NDG	F	1	4,1	14,14,15	1.54	2 (14%)	17,19,21	1.38	4 (23%)
4	NAG	F	2	4	14,14,15	0.88	0	17,19,21	1.25	2 (11%)
4	MAN	F	3	4	11,11,12	1.54	2 (18%)	15,15,17	1.09	0
4	MAN	F	4	4	11,11,12	1.22	3 (27%)	15,15,17	1.55	4 (26%)
4	MAN	F	5	4	11,11,12	1.38	2 (18%)	15,15,17	1.17	1 (6%)
4	MAN	F	6	4	11,11,12	1.27	1 (9%)	15,15,17	1.24	2 (13%)
4	MAN	F	7	4	11,11,12	1.32	2 (18%)	15,15,17	0.88	1 (6%)
4	MAN	F	8	4	11,11,12	1.00	0	15,15,17	1.00	1 (6%)
5	NAG	J	1	5,1	14,14,15	1.00	1 (7%)	17,19,21	0.77	0
5	NAG	J	2	5	14,14,15	1.03	1 (7%)	17,19,21	0.89	1 (5%)
5	BMA	J	3	5	11,11,12	1.77	3 (27%)	15,15,17	2.39	5 (33%)
5	MAN	J	4	5	11,11,12	1.97	4 (36%)	15,15,17	2.32	5 (33%)
5	MAN	J	5	5	11,11,12	1.16	1 (9%)	15,15,17	1.09	1 (6%)
5	MAN	J	6	5	11,11,12	1.25	1 (9%)	15,15,17	1.11	1 (6%)
5	MAN	J	7	5	11,11,12	1.07	1 (9%)	15,15,17	1.10	2 (13%)
5	MAN	J	8	5	11,11,12	1.63	3 (27%)	15,15,17	0.92	0
5	MAN	J	9	5	11,11,12	0.91	0	15,15,17	1.63	4 (26%)
6	NAG	M	1	1,6	14,14,15	2.58	4 (28%)	17,19,21	2.14	4 (23%)
6	MAN	M	10	6	11,11,12	1.06	1 (9%)	15,15,17	1.10	1 (6%)
6	NAG	M	2	6	14,14,15	1.05	0	17,19,21	1.64	5 (29%)
6	MAN	M	3	6	11,11,12	2.86	5 (45%)	15,15,17	1.96	4 (26%)
6	MAN	M	4	6	11,11,12	1.84	4 (36%)	15,15,17	1.04	1 (6%)
6	MAN	M	5	6	11,11,12	1.90	3 (27%)	15,15,17	1.80	3 (20%)
6	MAN	M	6	6	11,11,12	1.32	3 (27%)	15,15,17	0.82	0
6	GAL	M	7	6	11,11,12	1.14	2 (18%)	15,15,17	0.84	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	GAL	M	8	6	11,11,12	0.32	0	15,15,17	0.81	0
6	MAN	M	9	6	11,11,12	1.27	2 (18%)	15,15,17	1.16	2 (13%)
7	NAG	Q	1	7,1	14,14,15	1.05	1 (7%)	17,19,21	1.49	3 (17%)
7	NAG	Q	2	7	14,14,15	1.11	1 (7%)	17,19,21	1.75	5 (29%)
7	MAN	Q	3	7	11,11,12	1.47	1 (9%)	15,15,17	2.34	6 (40%)
7	MAN	Q	4	7	11,11,12	1.26	1 (9%)	15,15,17	1.00	0
7	MAN	Q	5	7	11,11,12	1.49	3 (27%)	15,15,17	0.96	1 (6%)
7	MAN	Q	6	7	11,11,12	1.16	1 (9%)	15,15,17	1.15	1 (6%)
7	GAL	Q	7	7	11,11,12	1.09	1 (9%)	15,15,17	1.00	2 (13%)
7	GAL	Q	8	7	11,11,12	0.36	0	15,15,17	0.81	0
7	MAN	Q	9	7	11,11,12	0.87	0	15,15,17	1.32	2 (13%)
8	NAG	U	1	8	14,14,15	1.00	1 (7%)	17,19,21	1.43	3 (17%)
8	MAN	U	10	8	11,11,12	1.09	1 (9%)	15,15,17	1.17	2 (13%)
8	MAN	U	11	8	11,11,12	1.15	2 (18%)	15,15,17	1.28	2 (13%)
8	NAG	U	2	8	14,14,15	0.94	1 (7%)	17,19,21	1.44	2 (11%)
8	MAN	U	3	8	11,11,12	1.36	2 (18%)	15,15,17	0.86	0
8	MAN	U	4	8	11,11,12	1.35	2 (18%)	15,15,17	1.16	2 (13%)
8	MAN	U	5	8	11,11,12	1.24	3 (27%)	15,15,17	1.14	1 (6%)
8	MAN	U	6	8	11,11,12	1.38	3 (27%)	15,15,17	1.33	2 (13%)
8	GAL	U	7	8	11,11,12	1.04	1 (9%)	15,15,17	1.15	2 (13%)
8	GAL	U	8	8	11,11,12	1.09	1 (9%)	15,15,17	0.76	0
8	BMA	U	9	8	11,11,12	1.43	1 (9%)	15,15,17	1.72	4 (26%)
9	NAG	Y	1	9	14,14,15	2.42	3 (21%)	17,19,21	1.66	3 (17%)
9	NAG	Y	2	9	14,14,15	1.69	3 (21%)	17,19,21	1.57	5 (29%)
9	MAN	Y	3	9	11,11,12	1.54	3 (27%)	15,15,17	1.60	2 (13%)
10	NAG	Z	1	10,1	14,14,15	1.27	2 (14%)	17,19,21	1.61	4 (23%)
10	NAG	Z	2	10	14,14,15	1.46	2 (14%)	17,19,21	2.20	5 (29%)
10	MAN	Z	3	10	11,11,12	1.81	3 (27%)	15,15,17	1.58	1 (6%)
10	MAN	Z	4	10	11,11,12	1.05	1 (9%)	15,15,17	1.17	1 (6%)
10	MAN	Z	5	10	11,11,12	0.99	0	15,15,17	0.69	0
11	NAG	b	1	1,11	14,14,15	1.49	3 (21%)	17,19,21	1.72	4 (23%)
11	NAG	b	2	11	14,14,15	2.03	1 (7%)	17,19,21	2.15	6 (35%)
11	MAN	b	3	11	11,11,12	1.61	2 (18%)	15,15,17	2.38	8 (53%)
11	MAN	b	4	11	11,11,12	1.06	1 (9%)	15,15,17	0.96	0
11	MAN	b	5	11	11,11,12	1.00	0	15,15,17	1.12	1 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
11	MAN	b	6	11	11,11,12	1.53	2 (18%)	15,15,17	1.12	1 (6%)
11	MAN	b	7	11	11,11,12	2.15	3 (27%)	15,15,17	1.52	1 (6%)
11	BMA	b	8	11	11,11,12	2.28	3 (27%)	15,15,17	1.57	2 (13%)
12	NAG	d	1	12,1	14,14,15	1.25	2 (14%)	17,19,21	1.41	2 (11%)
12	NDG	d	2	12	14,14,15	1.58	4 (28%)	17,19,21	1.36	4 (23%)
12	MAN	d	3	12	11,11,12	1.06	1 (9%)	15,15,17	1.83	3 (20%)
12	MAN	d	4	12	11,11,12	1.01	1 (9%)	15,15,17	1.30	2 (13%)
12	NAG	d	5	12	14,14,15	1.71	3 (21%)	17,19,21	1.37	2 (11%)
12	MAN	d	6	12	11,11,12	1.02	0	15,15,17	1.40	1 (6%)
12	MAN	d	7	12	11,11,12	1.05	1 (9%)	15,15,17	1.28	1 (6%)
12	MAN	d	8	12	11,11,12	0.65	0	15,15,17	1.32	1 (6%)
12	FUC	d	9	12	10,10,11	0.57	0	14,14,16	0.64	0
13	NAG	f	1	13,1	14,14,15	1.23	1 (7%)	17,19,21	1.94	5 (29%)
13	FUC	f	10	13	10,10,11	1.23	2 (20%)	14,14,16	0.29	0
13	NDG	f	2	13	14,14,15	1.02	1 (7%)	17,19,21	1.89	6 (35%)
13	MAN	f	3	13	11,11,12	1.34	1 (9%)	15,15,17	1.09	2 (13%)
13	MAN	f	4	13	11,11,12	1.85	3 (27%)	15,15,17	1.44	4 (26%)
13	NAG	f	5	13	14,14,15	1.48	2 (14%)	17,19,21	2.22	6 (35%)
13	MAN	f	6	13	11,11,12	1.14	1 (9%)	15,15,17	0.90	0
13	MAN	f	7	13	11,11,12	1.41	1 (9%)	15,15,17	1.51	3 (20%)
13	BMA	f	8	13	11,11,12	1.24	2 (18%)	15,15,17	1.15	1 (6%)
13	MAN	f	9	13	11,11,12	1.66	3 (27%)	15,15,17	2.17	7 (46%)
14	NAG	i	1	14,1	14,14,15	2.03	2 (14%)	17,19,21	2.01	4 (23%)
14	NAG	i	2	14	14,14,15	1.37	2 (14%)	17,19,21	1.97	5 (29%)
14	MAN	i	3	14	11,11,12	1.40	1 (9%)	15,15,17	0.86	0
15	NAG	j	1	15	14,14,15	1.36	2 (14%)	17,19,21	1.57	5 (29%)
15	NAG	j	2	15	14,14,15	0.99	0	17,19,21	1.78	4 (23%)

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. <sup>1</sup>-<sup>2</sup> means no outliers of that kind were identified.

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

Continued on next page...

*Continued from previous page...*

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MAN	B	3	2	-	0/2/19/22	0/1/1/1
2	MAN	B	4	2	-	0/2/19/22	0/1/1/1
2	BMA	B	5	2	-	2/2/19/22	0/1/1/1
2	MAN	B	6	2	-	0/2/19/22	0/1/1/1
2	MAN	B	7	2	-	0/2/19/22	0/1/1/1
3	NAG	D	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	D	2	3	-	0/6/23/26	0/1/1/1
3	MAN	D	3	3	-	0/2/19/22	0/1/1/1
3	MAN	D	4	3	-	0/2/19/22	0/1/1/1
3	MAN	D	5	3	-	0/2/19/22	0/1/1/1
3	BMA	D	6	3	-	0/2/19/22	0/1/1/1
3	MAN	D	7	3	-	2/2/19/22	0/1/1/1
4	NDG	F	1	4,1	-	4/6/23/26	0/1/1/1
4	NAG	F	2	4	-	1/6/23/26	0/1/1/1
4	MAN	F	3	4	-	0/2/19/22	0/1/1/1
4	MAN	F	4	4	-	0/2/19/22	0/1/1/1
4	MAN	F	5	4	-	0/2/19/22	0/1/1/1
4	MAN	F	6	4	-	0/2/19/22	0/1/1/1
4	MAN	F	7	4	-	2/2/19/22	0/1/1/1
4	MAN	F	8	4	-	2/2/19/22	0/1/1/1
5	NAG	J	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	J	2	5	-	0/6/23/26	0/1/1/1
5	BMA	J	3	5	-	2/2/19/22	0/1/1/1
5	MAN	J	4	5	-	2/2/19/22	0/1/1/1
5	MAN	J	5	5	-	2/2/19/22	0/1/1/1
5	MAN	J	6	5	-	0/2/19/22	0/1/1/1
5	MAN	J	7	5	-	2/2/19/22	0/1/1/1
5	MAN	J	8	5	-	0/2/19/22	0/1/1/1
5	MAN	J	9	5	-	0/2/19/22	0/1/1/1
6	NAG	M	1	1,6	-	4/6/23/26	0/1/1/1
6	MAN	M	10	6	-	0/2/19/22	0/1/1/1
6	NAG	M	2	6	-	2/6/23/26	0/1/1/1
6	MAN	M	3	6	-	0/2/19/22	0/1/1/1
6	MAN	M	4	6	-	0/2/19/22	0/1/1/1
6	MAN	M	5	6	-	1/2/19/22	0/1/1/1
6	MAN	M	6	6	-	0/2/19/22	0/1/1/1
6	GAL	M	7	6	-	2/2/19/22	0/1/1/1
6	GAL	M	8	6	-	2/2/19/22	0/1/1/1

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	MAN	M	9	6	-	2/2/19/22	0/1/1/1
7	NAG	Q	1	7,1	-	0/6/23/26	0/1/1/1
7	NAG	Q	2	7	-	2/6/23/26	0/1/1/1
7	MAN	Q	3	7	-	2/2/19/22	0/1/1/1
7	MAN	Q	4	7	-	0/2/19/22	0/1/1/1
7	MAN	Q	5	7	-	2/2/19/22	0/1/1/1
7	MAN	Q	6	7	-	0/2/19/22	0/1/1/1
7	GAL	Q	7	7	-	2/2/19/22	0/1/1/1
7	GAL	Q	8	7	-	2/2/19/22	0/1/1/1
7	MAN	Q	9	7	-	2/2/19/22	0/1/1/1
8	NAG	U	1	8	-	4/6/23/26	0/1/1/1
8	MAN	U	10	8	-	0/2/19/22	0/1/1/1
8	MAN	U	11	8	-	2/2/19/22	0/1/1/1
8	NAG	U	2	8	-	0/6/23/26	0/1/1/1
8	MAN	U	3	8	-	0/2/19/22	0/1/1/1
8	MAN	U	4	8	-	0/2/19/22	0/1/1/1
8	MAN	U	5	8	-	2/2/19/22	0/1/1/1
8	MAN	U	6	8	-	0/2/19/22	0/1/1/1
8	GAL	U	7	8	-	2/2/19/22	0/1/1/1
8	GAL	U	8	8	-	2/2/19/22	0/1/1/1
8	BMA	U	9	8	-	0/2/19/22	0/1/1/1
9	NAG	Y	1	9	-	4/6/23/26	0/1/1/1
9	NAG	Y	2	9	-	0/6/23/26	0/1/1/1
9	MAN	Y	3	9	-	0/2/19/22	0/1/1/1
10	NAG	Z	1	10,1	-	4/6/23/26	0/1/1/1
10	NAG	Z	2	10	-	0/6/23/26	0/1/1/1
10	MAN	Z	3	10	-	2/2/19/22	0/1/1/1
10	MAN	Z	4	10	-	0/2/19/22	0/1/1/1
10	MAN	Z	5	10	-	0/2/19/22	0/1/1/1
11	NAG	b	1	1,11	-	2/6/23/26	0/1/1/1
11	NAG	b	2	11	-	1/6/23/26	0/1/1/1
11	MAN	b	3	11	-	0/2/19/22	0/1/1/1
11	MAN	b	4	11	-	2/2/19/22	0/1/1/1
11	MAN	b	5	11	-	2/2/19/22	0/1/1/1
11	MAN	b	6	11	-	0/2/19/22	0/1/1/1
11	MAN	b	7	11	-	2/2/19/22	0/1/1/1
11	BMA	b	8	11	-	2/2/19/22	0/1/1/1

*Continued on next page...*

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
12	NAG	d	1	12,1	-	4/6/23/26	0/1/1/1
12	NDG	d	2	12	-	1/6/23/26	0/1/1/1
12	MAN	d	3	12	-	0/2/19/22	0/1/1/1
12	MAN	d	4	12	-	2/2/19/22	0/1/1/1
12	NAG	d	5	12	-	4/6/23/26	0/1/1/1
12	MAN	d	6	12	-	2/2/19/22	0/1/1/1
12	MAN	d	7	12	-	2/2/19/22	0/1/1/1
12	MAN	d	8	12	-	2/2/19/22	0/1/1/1
12	FUC	d	9	12	-	-	0/1/1/1
13	NAG	f	1	13,1	-	2/6/23/26	0/1/1/1
13	FUC	f	10	13	-	-	0/1/1/1
13	NDG	f	2	13	-	3/6/23/26	0/1/1/1
13	MAN	f	3	13	-	0/2/19/22	0/1/1/1
13	MAN	f	4	13	-	0/2/19/22	0/1/1/1
13	NAG	f	5	13	-	2/6/23/26	0/1/1/1
13	MAN	f	6	13	-	0/2/19/22	0/1/1/1
13	MAN	f	7	13	-	0/2/19/22	0/1/1/1
13	BMA	f	8	13	-	0/2/19/22	0/1/1/1
13	MAN	f	9	13	-	0/2/19/22	0/1/1/1
14	NAG	i	1	14,1	-	2/6/23/26	0/1/1/1
14	NAG	i	2	14	-	2/6/23/26	0/1/1/1
14	MAN	i	3	14	-	0/2/19/22	0/1/1/1
15	NAG	j	1	15	-	0/6/23/26	0/1/1/1
15	NAG	j	2	15	-	6/6/23/26	0/1/1/1

The worst 5 of 171 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	M	1	NAG	C1-C2	-7.81	1.41	1.52
11	b	2	NAG	O5-C1	6.46	1.54	1.43
14	i	1	NAG	C1-C2	-6.25	1.43	1.52
9	Y	1	NAG	O3-C3	-6.23	1.27	1.43
6	M	3	MAN	O3-C3	-5.57	1.29	1.43

The worst 5 of 234 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	Z	2	NAG	O5-C1-C2	6.67	121.60	111.29
6	M	1	NAG	C1-O5-C5	-6.51	103.47	112.19

Continued on next page...



*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
14	i	1	NAG	O5-C1-C2	5.96	120.51	111.29
7	Q	3	MAN	O5-C1-C2	5.65	124.28	110.79
12	d	3	MAN	O5-C1-C2	5.54	124.01	110.79

There are no chirality outliers.

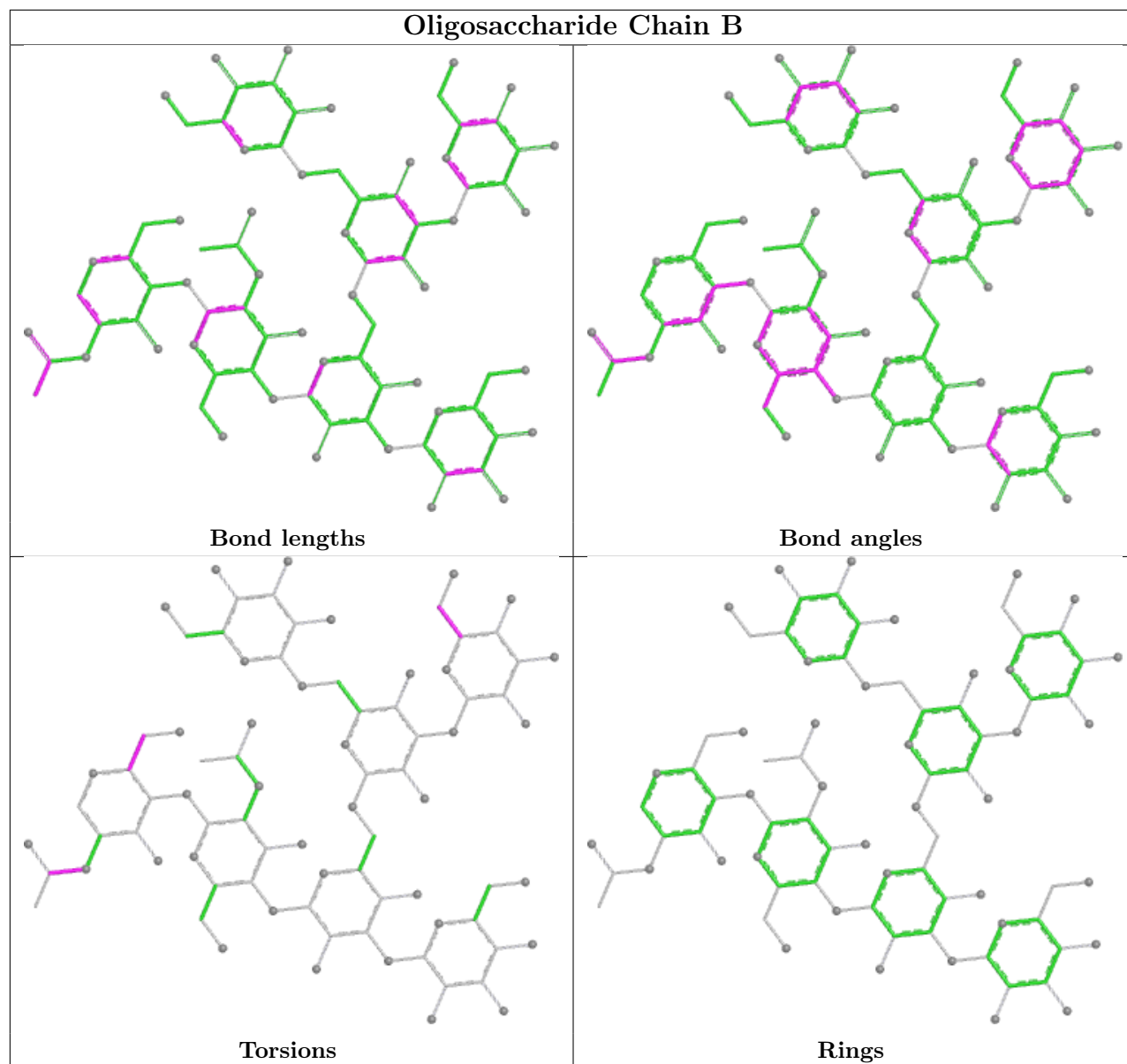
5 of 121 torsion outliers are listed below:

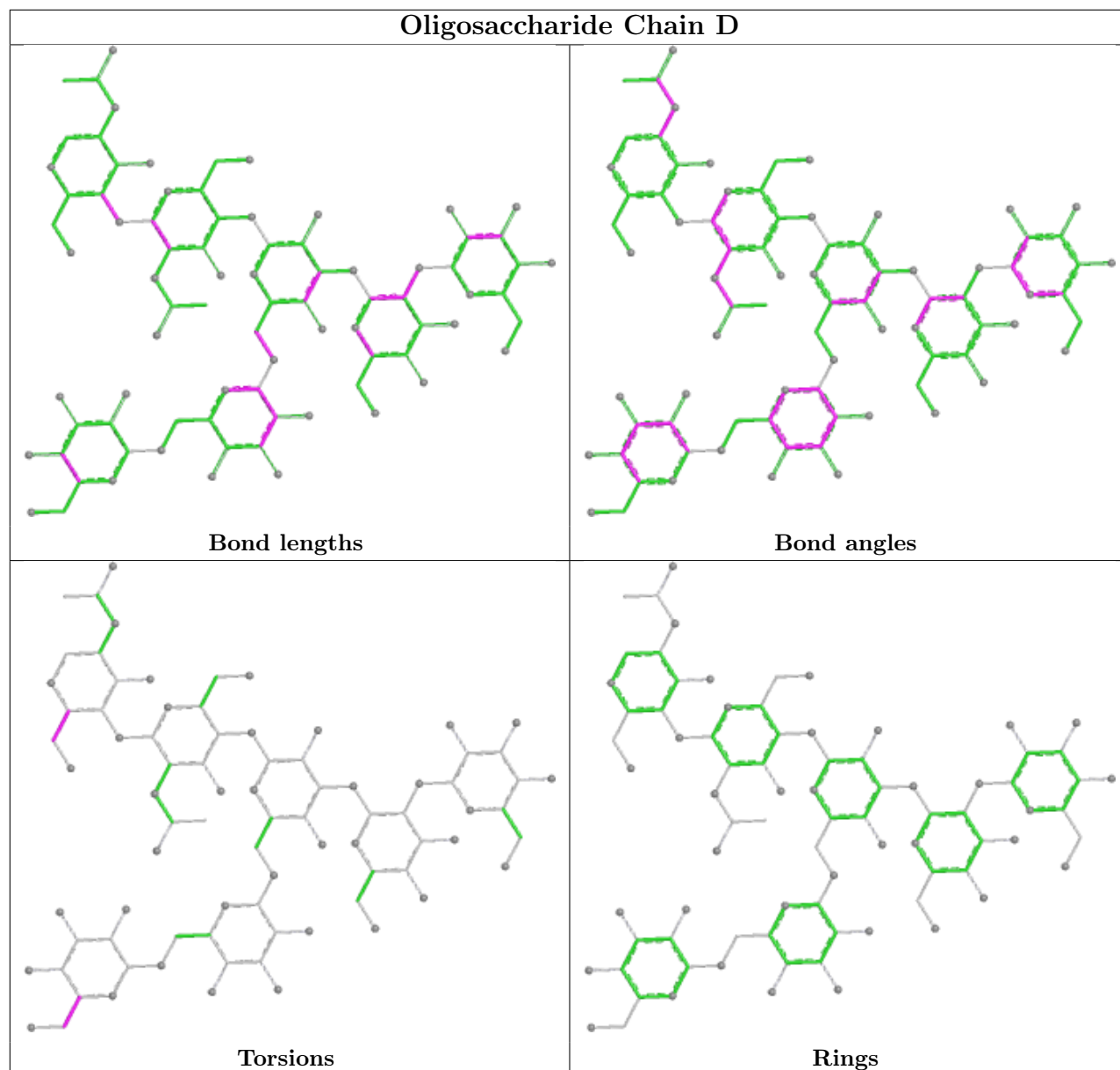
Mol	Chain	Res	Type	Atoms
2	B	1	NAG	O7-C7-N2-C2
11	b	1	NAG	O7-C7-N2-C2
15	j	2	NAG	C1-C2-N2-C7
12	d	1	NAG	O5-C5-C6-O6
2	B	1	NAG	C8-C7-N2-C2

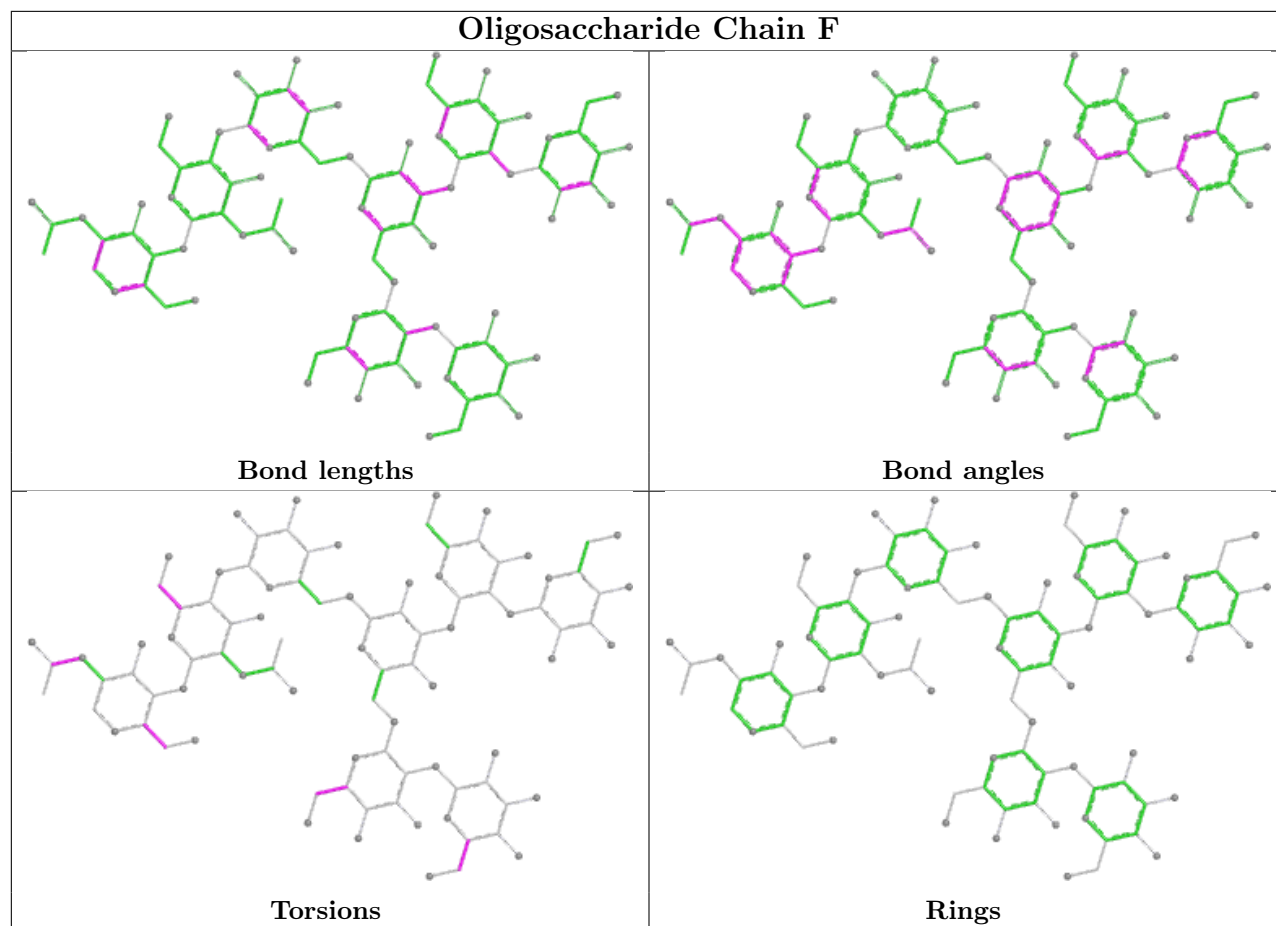
There are no ring outliers.

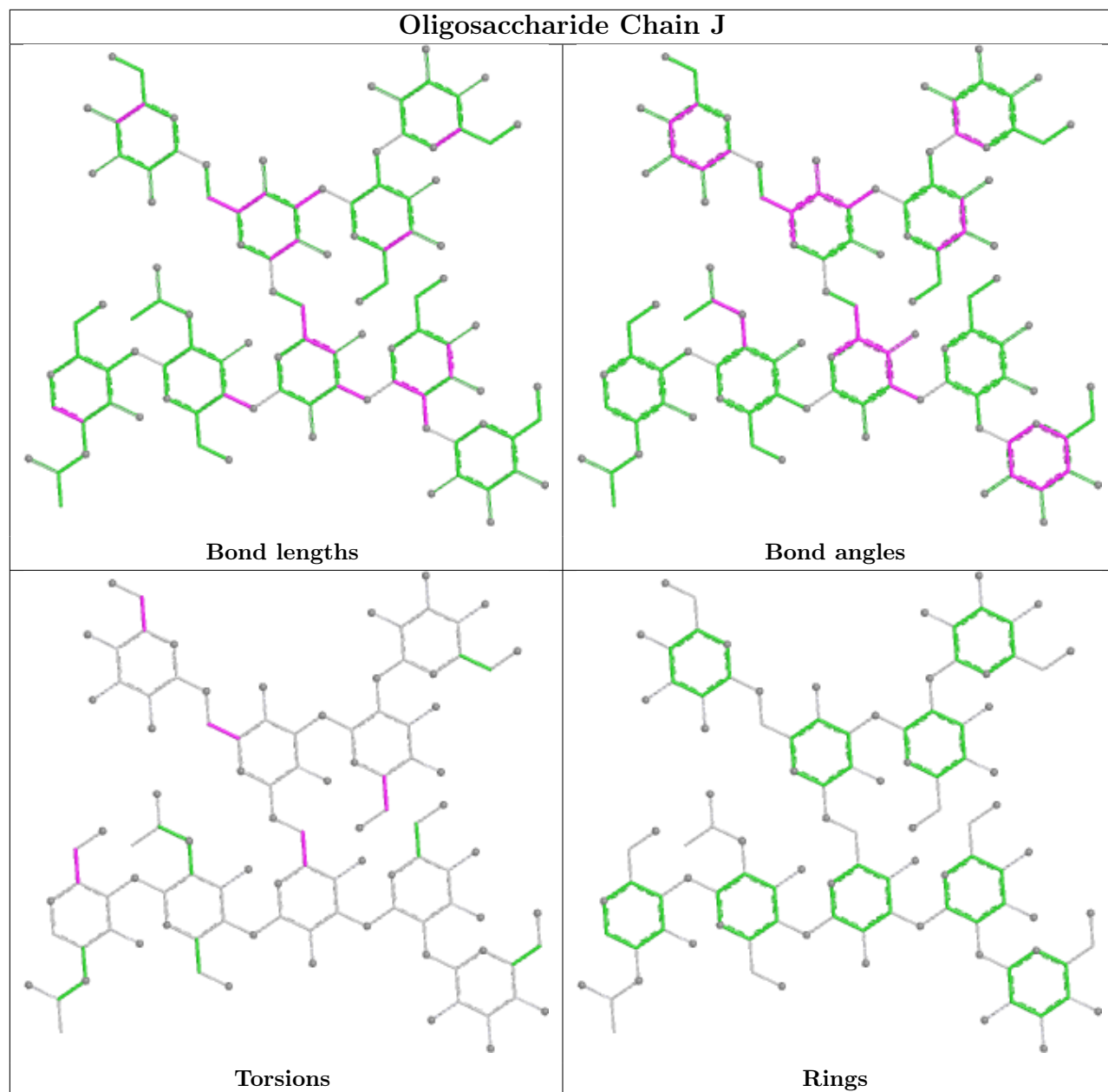
No monomer is involved in short contacts.

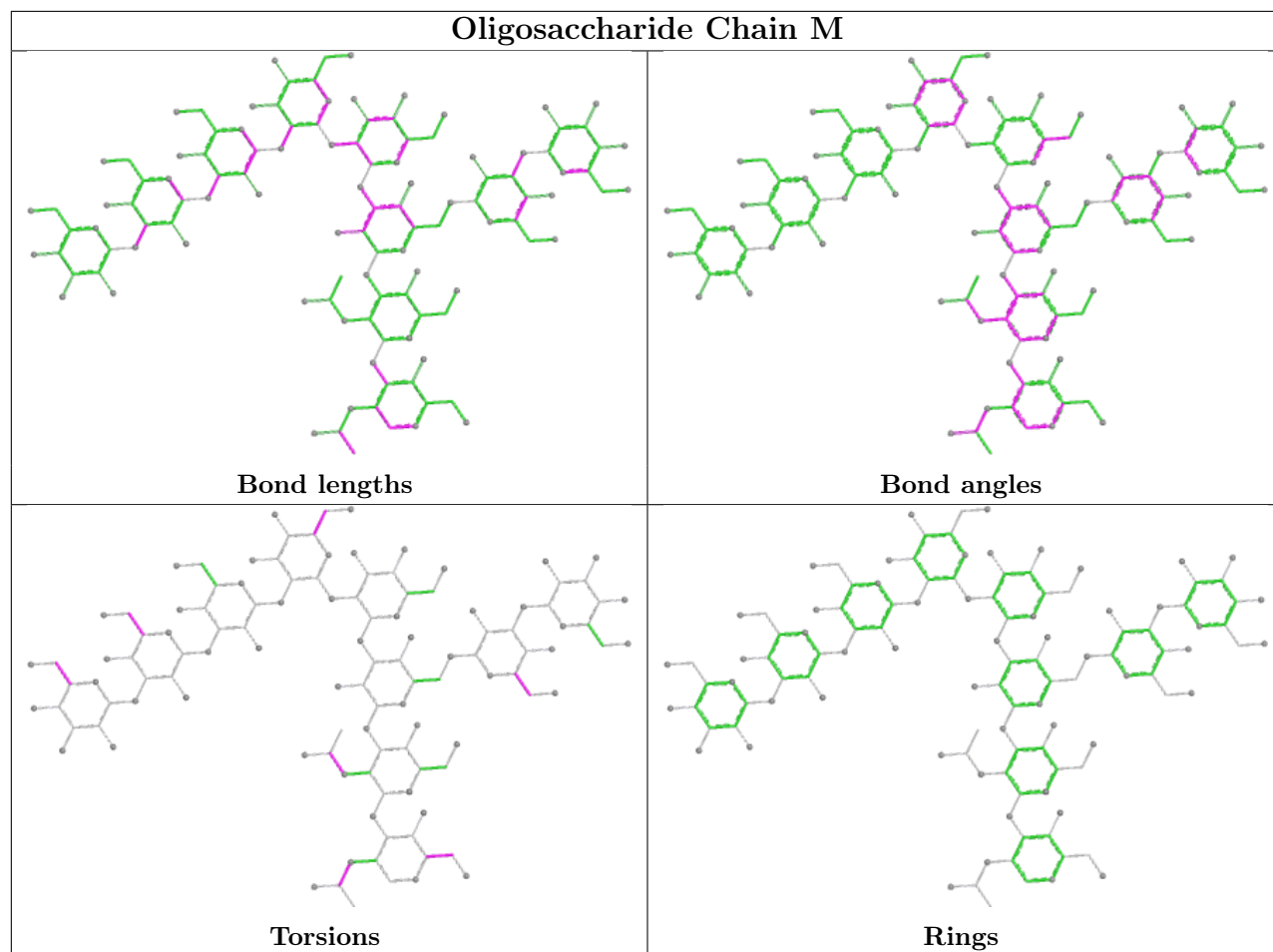
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

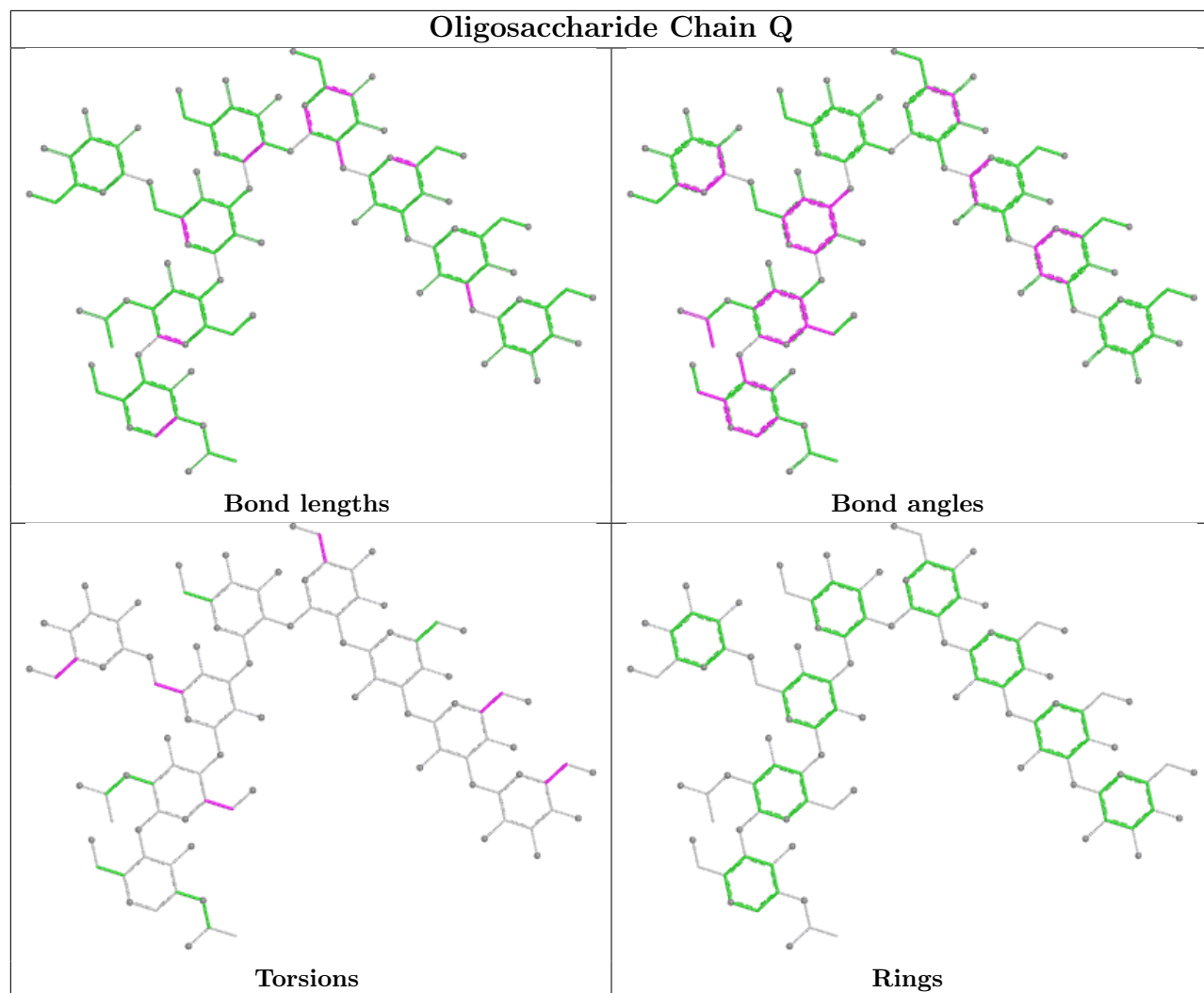


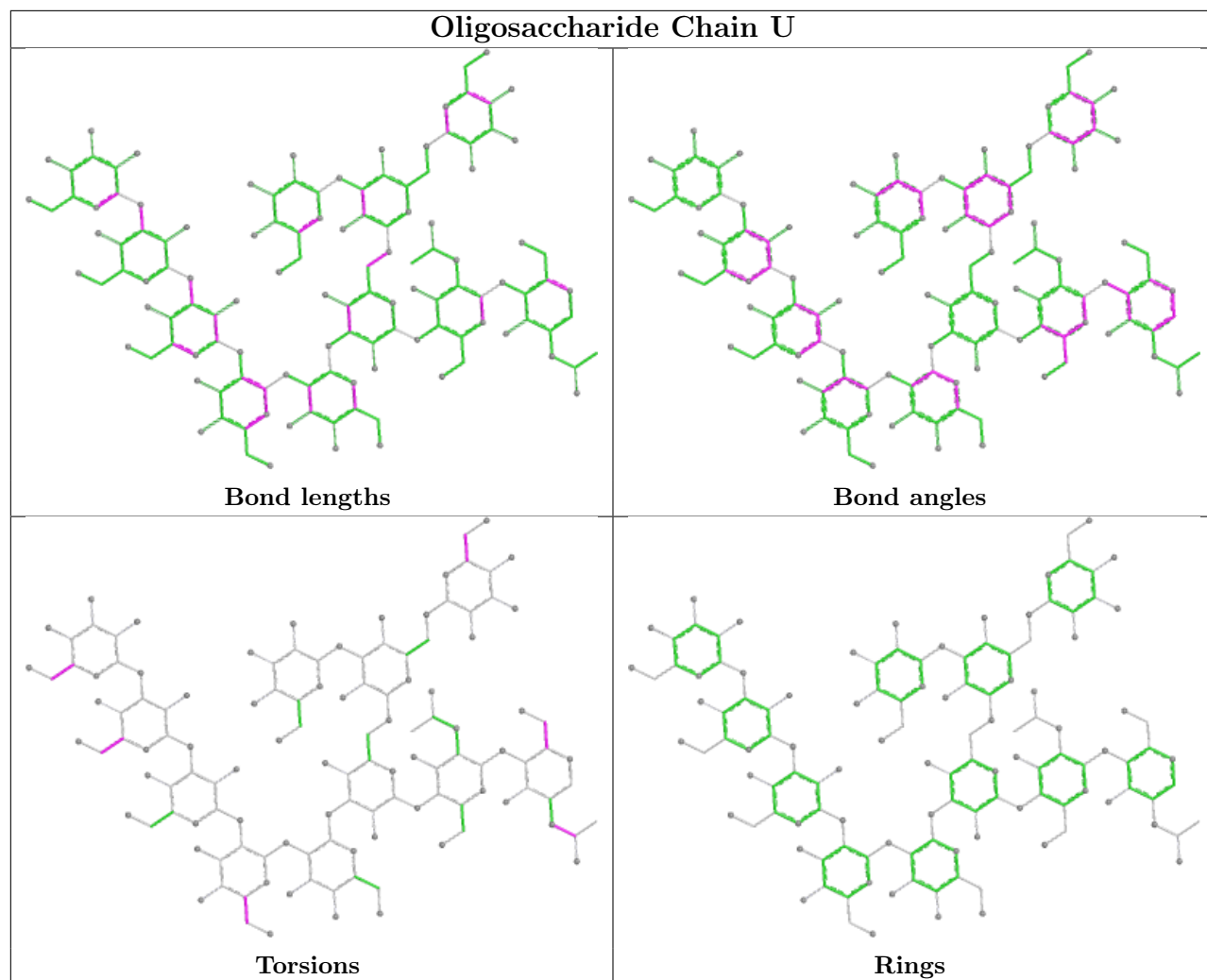




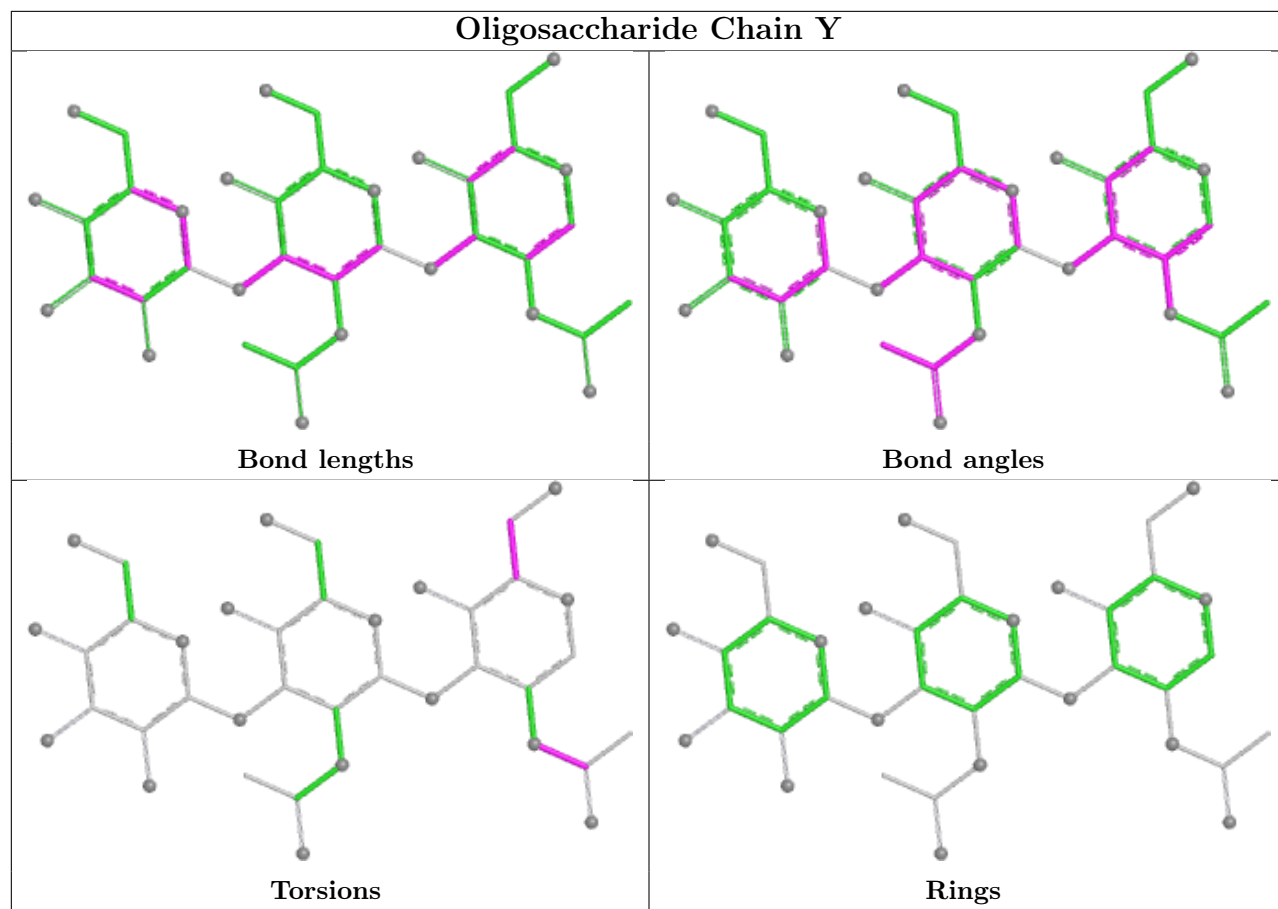


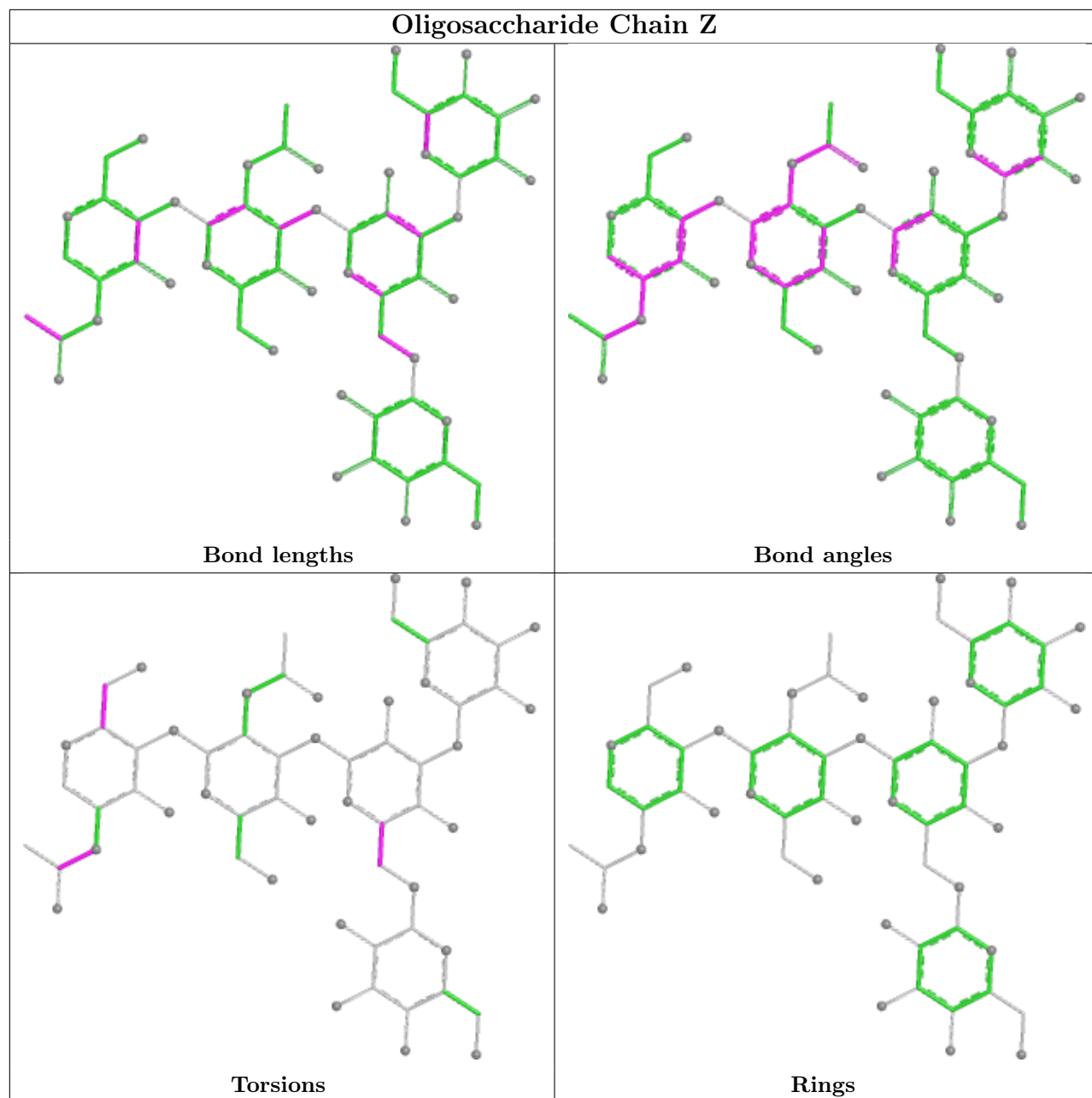


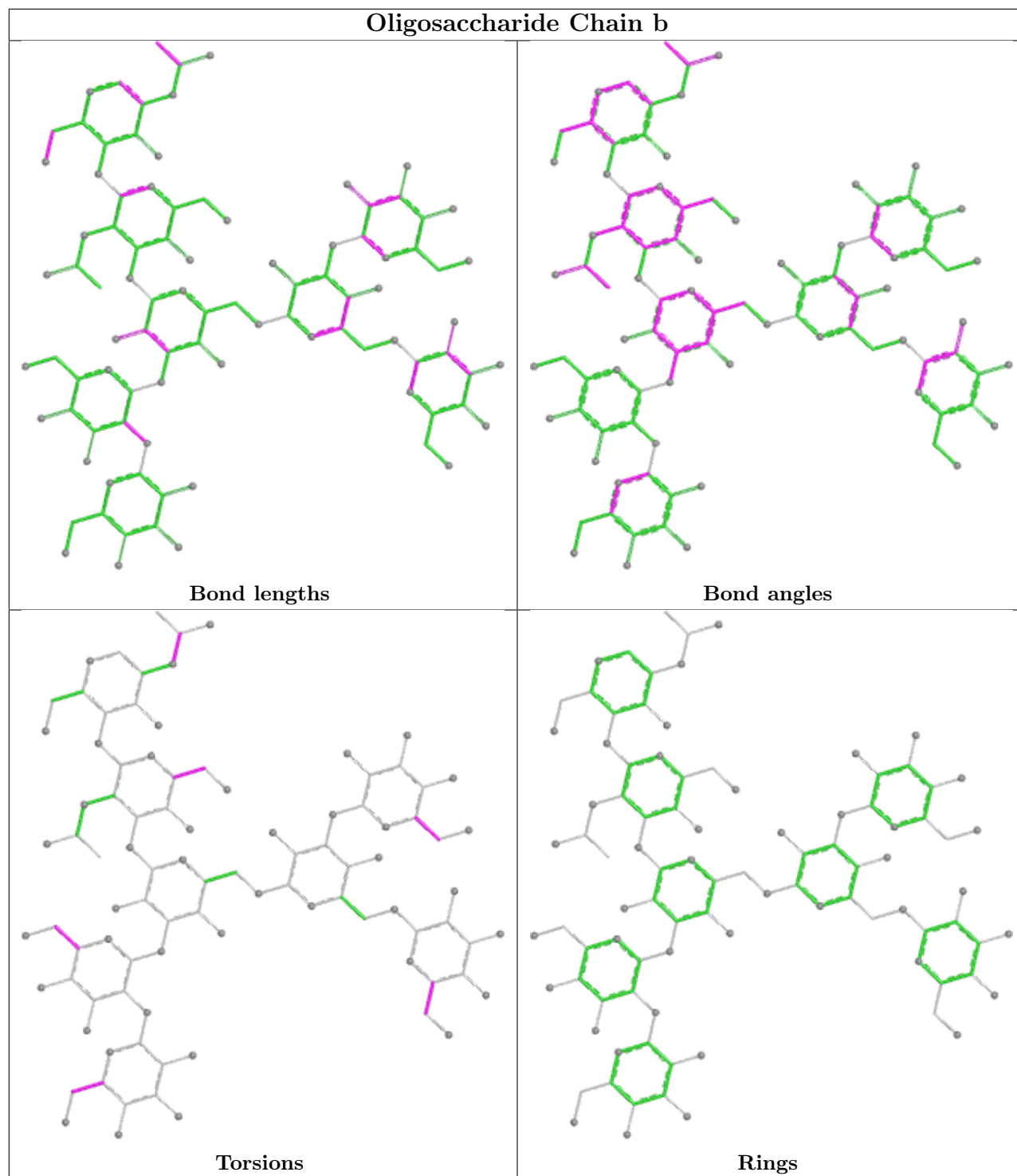


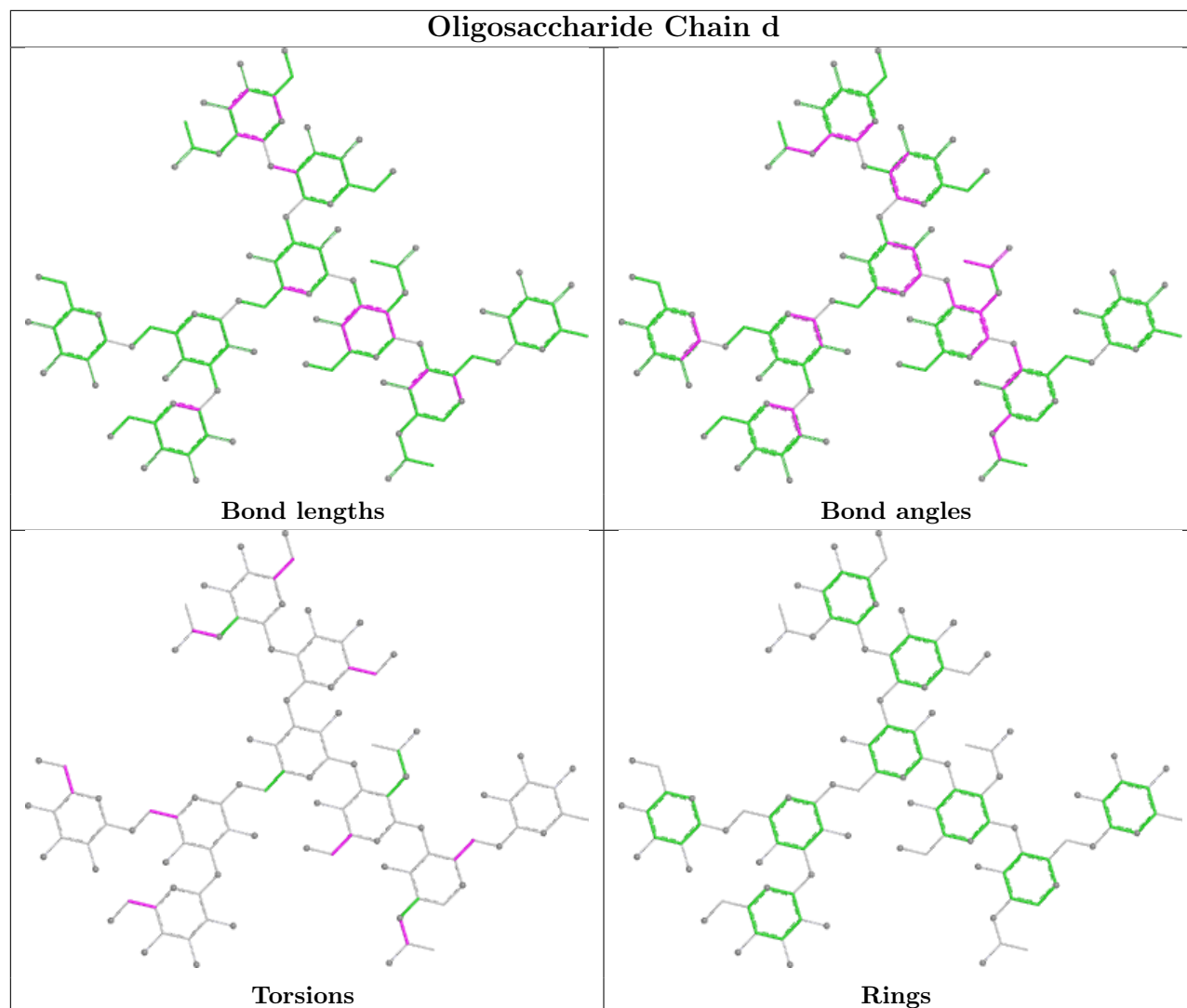


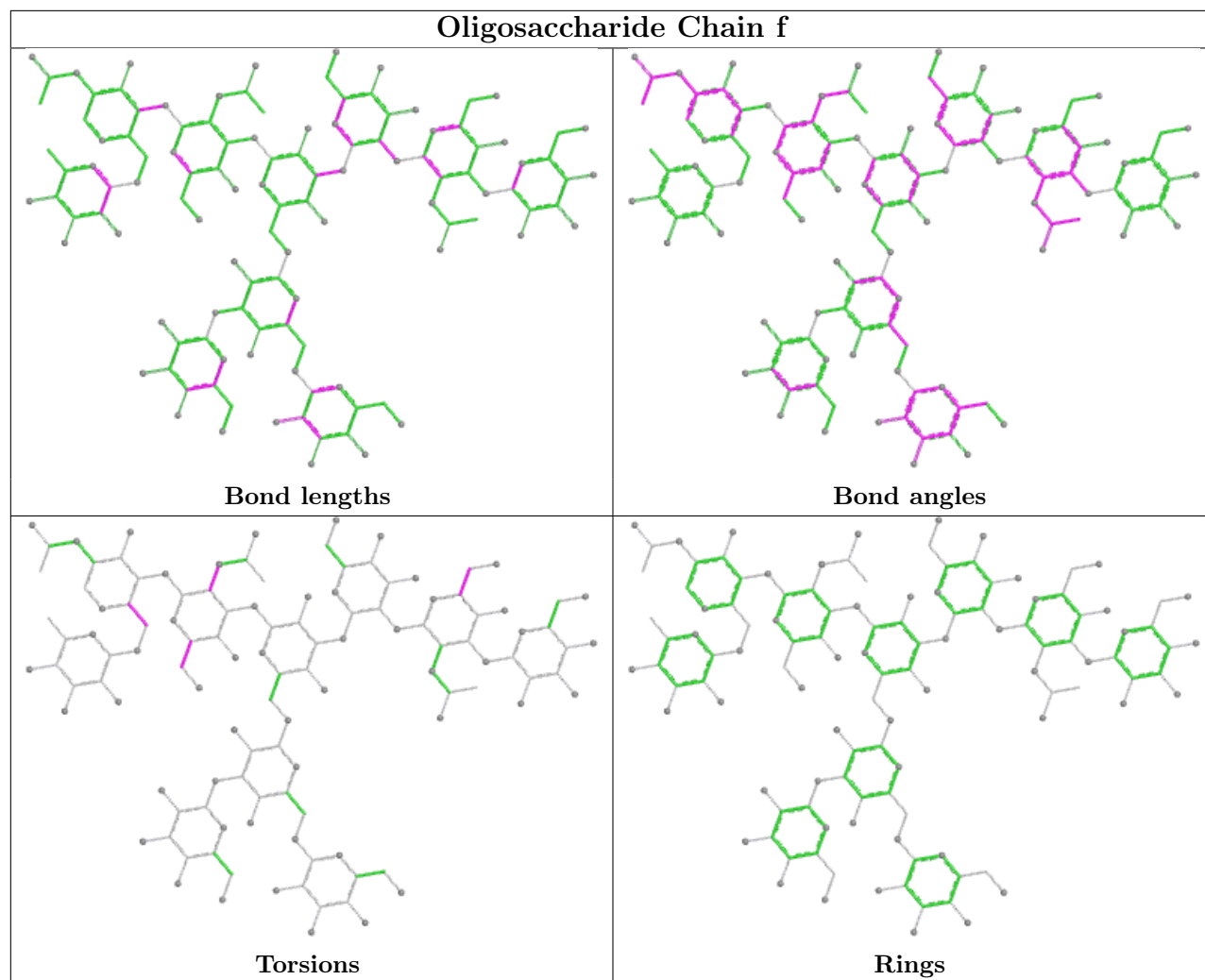


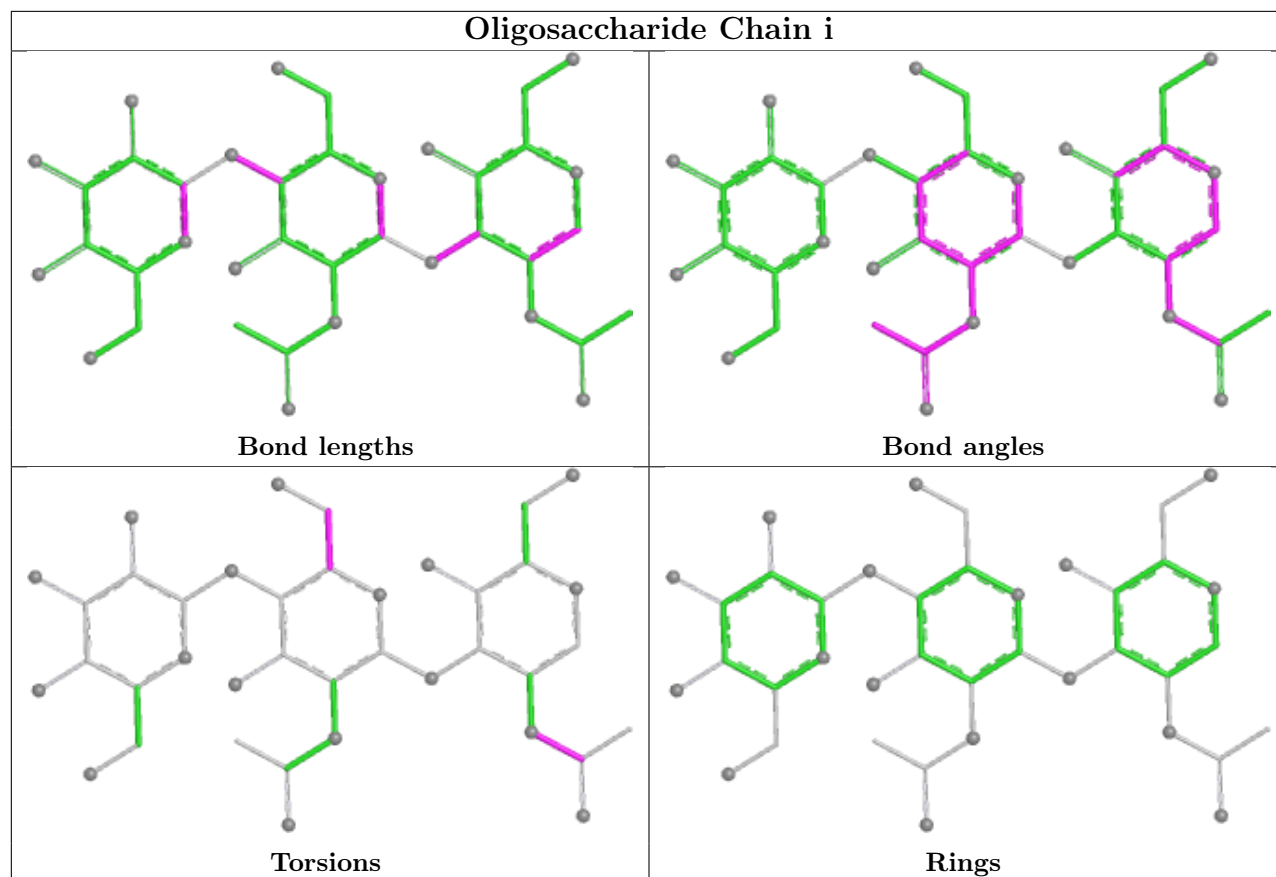


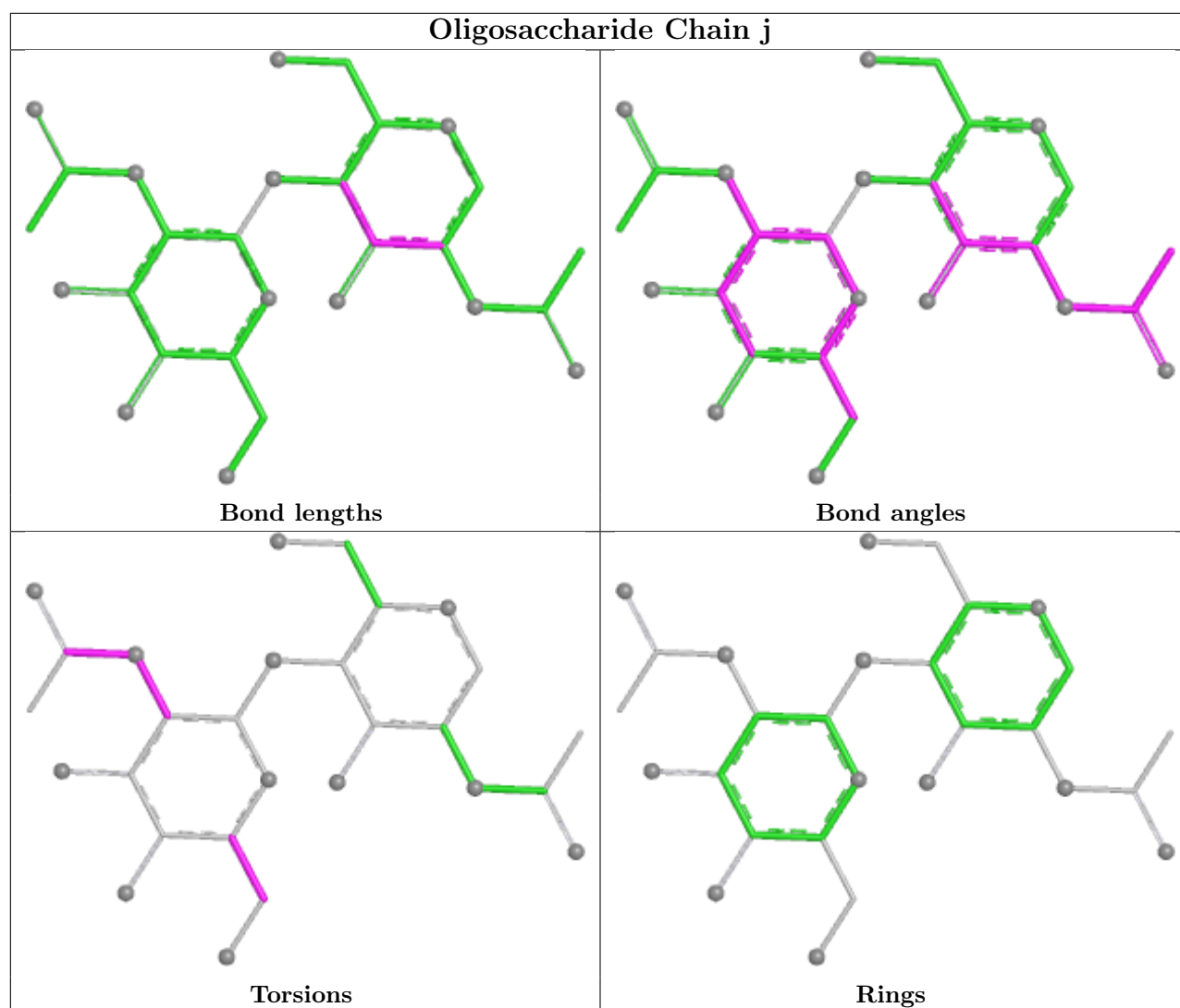












## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 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 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled '#RSRZ > 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q < 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	440/470 (93%)	-0.01	16 (3%) 42 38	22, 46, 85, 97	0

The worst 5 of 16 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	435	ASN	7.7
1	A	443	ASN	5.1
1	A	431	SER	5.0
1	A	433	THR	4.4
1	A	432	PRO	4.3

### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

### 6.3 Carbohydrates [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q < 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
7	MAN	Q	5	11/12	0.00	0.76	129,129,129,129	0
11	MAN	b	5	11/12	0.01	1.05	129,129,129,129	0
5	MAN	J	9	11/12	0.03	0.71	129,129,129,129	0
4	MAN	F	6	11/12	0.09	1.45	129,129,129,129	0
5	MAN	J	7	11/12	0.10	0.68	129,129,129,129	0
11	BMA	b	8	11/12	0.11	0.85	129,129,129,129	0
14	NAG	i	2	14/15	0.17	1.00	129,129,129,129	0

*Continued on next page...*



*Continued from previous page...*

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
15	NAG	j	1	14/15	0.17	1.23	129,129,129,129	0
8	MAN	U	6	11/12	0.19	0.76	129,129,129,129	0
4	MAN	F	3	11/12	0.20	0.79	129,129,129,129	0
12	MAN	d	4	11/12	0.21	0.51	129,129,129,129	0
4	MAN	F	8	11/12	0.22	0.70	129,129,129,129	0
8	BMA	U	9	11/12	0.24	0.75	129,129,129,129	0
7	MAN	Q	4	11/12	0.26	0.62	129,129,129,129	0
6	GAL	M	7	11/12	0.27	0.56	129,129,129,129	0
3	MAN	D	3	11/12	0.30	0.51	129,129,129,129	0
6	MAN	M	4	11/12	0.32	0.66	129,129,129,129	0
6	MAN	M	6	11/12	0.32	0.69	129,129,129,129	0
11	MAN	b	7	11/12	0.33	0.90	129,129,129,129	0
3	NAG	D	2	14/15	0.34	0.50	129,129,129,129	0
12	MAN	d	8	11/12	0.34	1.04	129,129,129,129	0
8	MAN	U	11	11/12	0.35	0.95	129,129,129,129	0
8	MAN	U	5	11/12	0.35	0.57	129,129,129,129	0
13	MAN	f	4	11/12	0.36	0.42	129,129,129,129	0
5	MAN	J	6	11/12	0.38	0.84	129,129,129,129	0
12	MAN	d	7	11/12	0.38	0.82	129,129,129,129	0
11	MAN	b	3	11/12	0.39	0.30	129,129,129,129	0
5	BMA	J	3	11/12	0.39	0.33	129,129,129,129	0
2	BMA	B	5	11/12	0.40	0.81	129,129,129,129	0
4	MAN	F	4	11/12	0.41	0.76	129,129,129,129	0
7	GAL	Q	8	11/12	0.42	0.64	129,129,129,129	0
2	MAN	B	4	11/12	0.43	0.63	129,129,129,129	0
10	MAN	Z	3	11/12	0.44	0.53	129,129,129,129	0
12	MAN	d	6	11/12	0.45	0.93	129,129,129,129	0
13	MAN	f	6	11/12	0.45	0.53	129,129,129,129	0
8	MAN	U	10	11/12	0.46	0.79	129,129,129,129	0
13	BMA	f	8	11/12	0.46	0.64	129,129,129,129	0
11	MAN	b	6	11/12	0.46	0.79	129,129,129,129	0
5	MAN	J	4	11/12	0.46	0.60	129,129,129,129	0
10	NAG	Z	1	14/15	0.47	0.32	129,129,129,129	0
3	MAN	D	7	11/12	0.47	0.58	129,129,129,129	0
15	NAG	j	2	14/15	0.47	1.05	129,129,129,129	0
9	MAN	Y	3	11/12	0.48	0.51	129,129,129,129	0
3	MAN	D	5	11/12	0.48	0.64	129,129,129,129	0
6	GAL	M	8	11/12	0.48	0.46	129,129,129,129	0
14	MAN	i	3	11/12	0.51	0.42	129,129,129,129	0
10	MAN	Z	5	11/12	0.51	0.58	129,129,129,129	0
13	MAN	f	7	11/12	0.51	0.66	129,129,129,129	0

*Continued on next page...*

Continued from previous page...

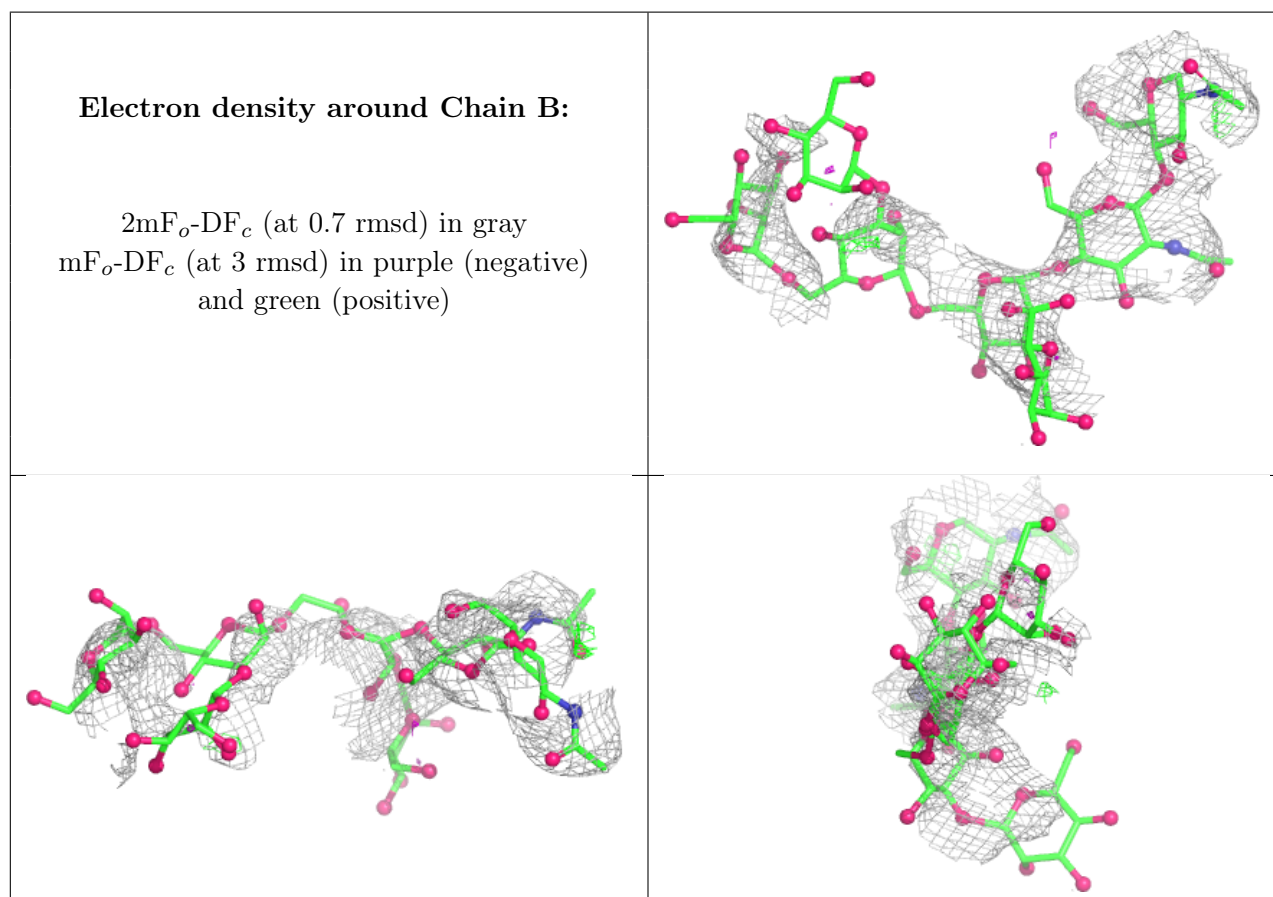
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
8	MAN	U	3	11/12	0.52	0.34	129,129,129,129	0
11	MAN	b	4	11/12	0.52	0.69	129,129,129,129	0
6	MAN	M	10	11/12	0.53	0.56	129,129,129,129	0
6	MAN	M	3	11/12	0.54	0.81	129,129,129,129	0
13	MAN	f	3	11/12	0.54	0.61	129,129,129,129	0
13	MAN	f	9	11/12	0.55	0.66	129,129,129,129	0
12	NDG	d	2	14/15	0.56	0.37	129,129,129,129	0
12	MAN	d	3	11/12	0.56	0.81	129,129,129,129	0
8	GAL	U	8	11/12	0.56	0.54	129,129,129,129	0
3	BMA	D	6	11/12	0.56	0.57	129,129,129,129	0
4	NDG	F	1	14/15	0.57	0.33	129,129,129,129	0
6	NAG	M	2	14/15	0.59	0.87	129,129,129,129	0
13	NAG	f	5	14/15	0.60	0.58	129,129,129,129	0
2	MAN	B	6	11/12	0.61	0.65	129,129,129,129	0
2	MAN	B	7	11/12	0.61	0.89	129,129,129,129	0
8	MAN	U	4	11/12	0.61	0.54	129,129,129,129	0
7	MAN	Q	3	11/12	0.62	0.65	129,129,129,129	0
5	MAN	J	5	11/12	0.63	0.83	129,129,129,129	0
2	MAN	B	3	11/12	0.63	0.44	129,129,129,129	0
7	NAG	Q	2	14/15	0.64	0.37	129,129,129,129	0
9	NAG	Y	2	14/15	0.64	0.41	129,129,129,129	0
4	MAN	F	5	11/12	0.64	0.71	129,129,129,129	0
12	FUC	d	9	10/11	0.64	0.48	129,129,129,129	0
12	NAG	d	5	14/15	0.64	0.47	129,129,129,129	0
8	GAL	U	7	11/12	0.65	0.76	129,129,129,129	0
6	NAG	M	1	14/15	0.65	0.59	129,129,129,129	0
12	NAG	d	1	14/15	0.65	0.26	129,129,129,129	0
13	FUC	f	10	10/11	0.65	0.44	129,129,129,129	0
5	MAN	J	8	11/12	0.66	1.11	129,129,129,129	0
14	NAG	i	1	14/15	0.66	0.50	129,129,129,129	0
7	MAN	Q	6	11/12	0.67	0.59	129,129,129,129	0
7	MAN	Q	9	11/12	0.67	0.52	129,129,129,129	0
7	GAL	Q	7	11/12	0.68	0.53	129,129,129,129	0
3	NAG	D	1	14/15	0.69	0.67	129,129,129,129	0
6	MAN	M	9	11/12	0.69	0.84	129,129,129,129	0
9	NAG	Y	1	14/15	0.69	0.39	129,129,129,129	0
6	MAN	M	5	11/12	0.69	0.60	129,129,129,129	0
10	MAN	Z	4	11/12	0.70	0.59	129,129,129,129	0
10	NAG	Z	2	14/15	0.73	0.37	129,129,129,129	0
4	MAN	F	7	11/12	0.73	0.89	129,129,129,129	0
4	NAG	F	2	14/15	0.77	0.46	129,129,129,129	0

Continued on next page...

Continued from previous page...

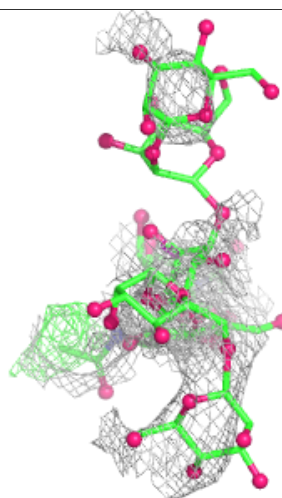
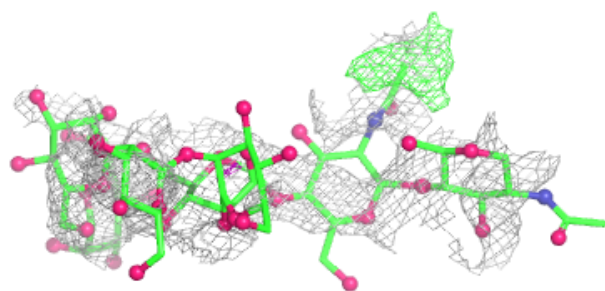
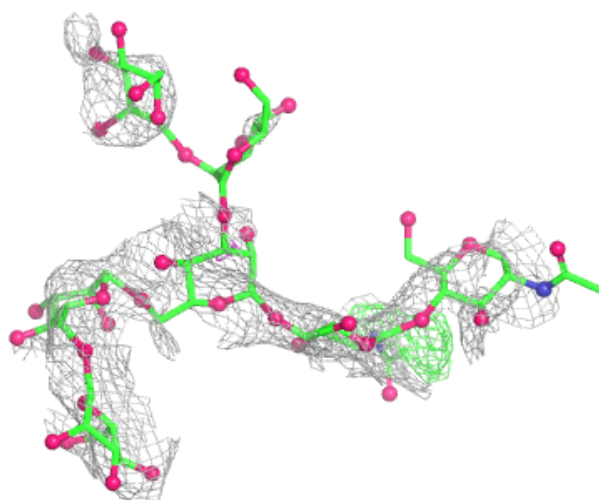
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
11	NAG	b	2	14/15	0.78	0.18	129,129,129,129	0
3	MAN	D	4	11/12	0.80	0.92	129,129,129,129	0
7	NAG	Q	1	14/15	0.81	0.42	129,129,129,129	0
8	NAG	U	1	14/15	0.81	0.37	129,129,129,129	0
5	NAG	J	2	14/15	0.81	0.17	129,129,129,129	0
13	NAG	f	1	14/15	0.82	0.19	129,129,129,129	0
11	NAG	b	1	14/15	0.83	0.26	129,129,129,129	0
13	NDG	f	2	14/15	0.84	0.36	129,129,129,129	0
5	NAG	J	1	14/15	0.84	0.32	129,129,129,129	0
2	NAG	B	2	14/15	0.85	0.35	129,129,129,129	0
8	NAG	U	2	14/15	0.86	0.26	129,129,129,129	0
2	NAG	B	1	14/15	0.87	0.22	129,129,129,129	0

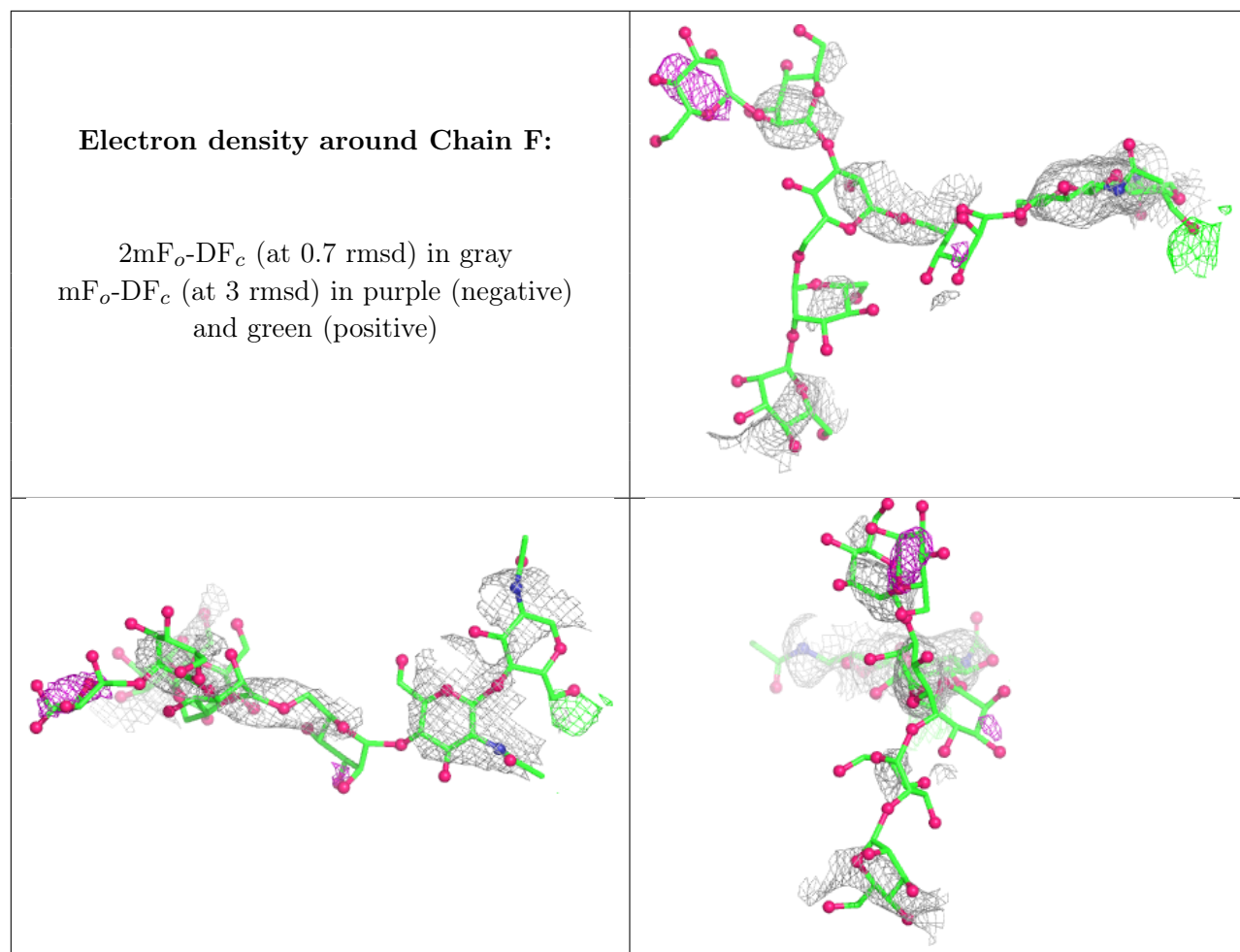
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.



**Electron density around Chain D:**

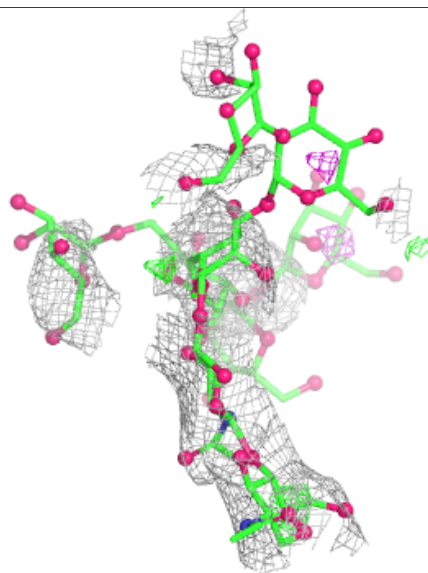
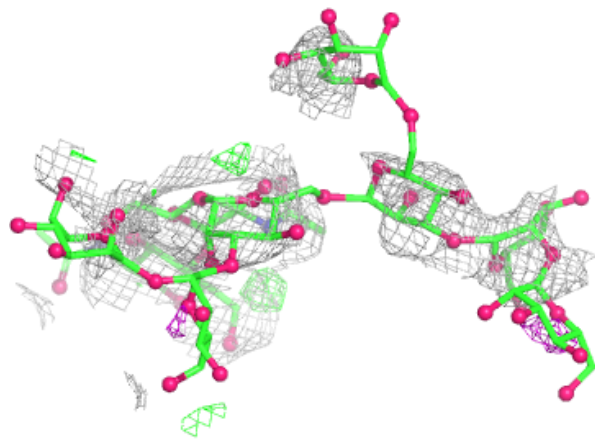
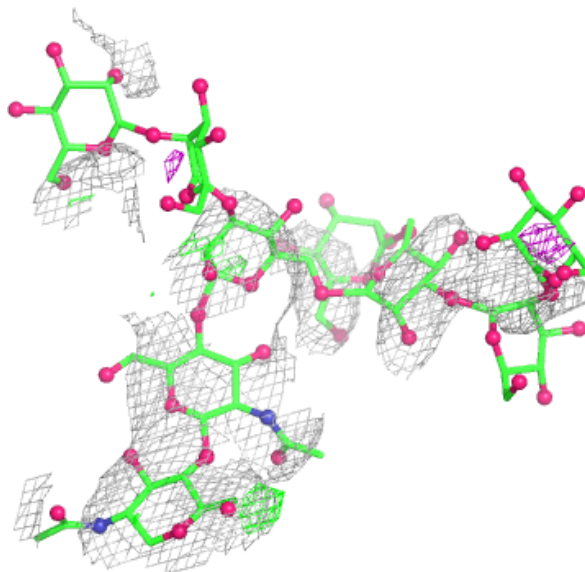
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





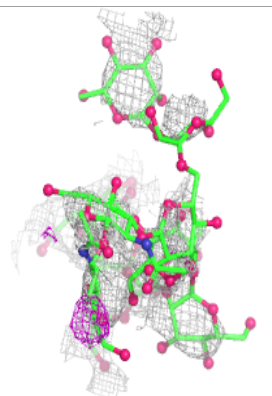
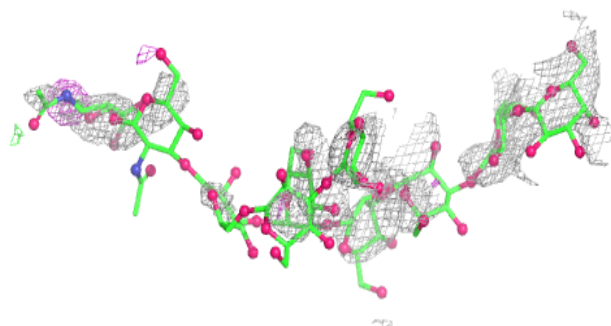
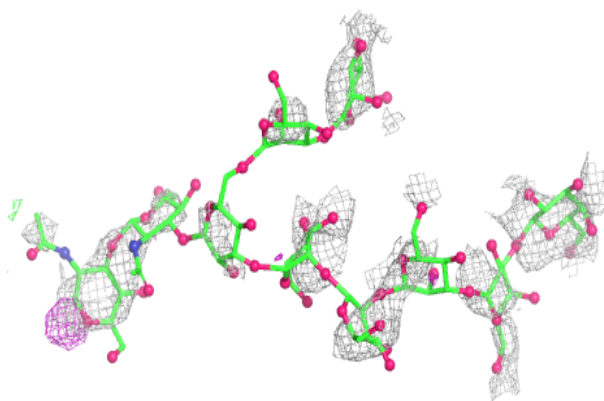
**Electron density around Chain J:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

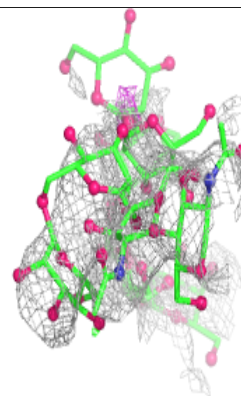
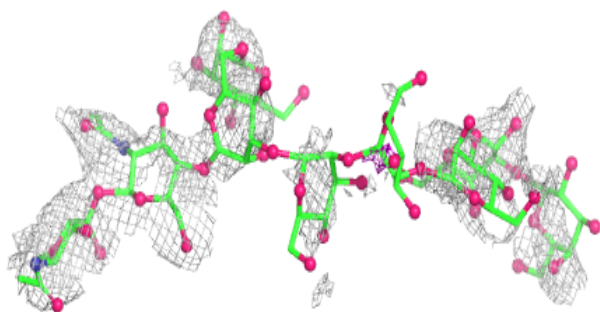
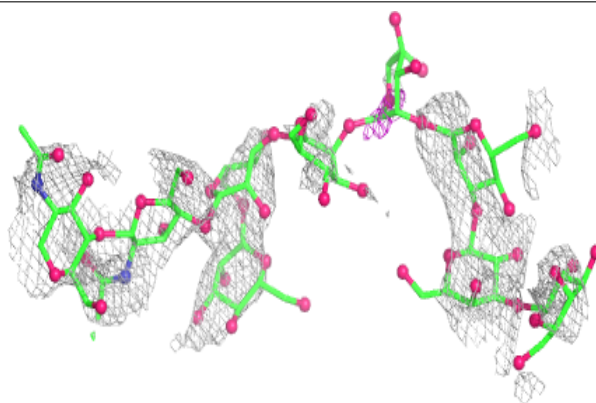


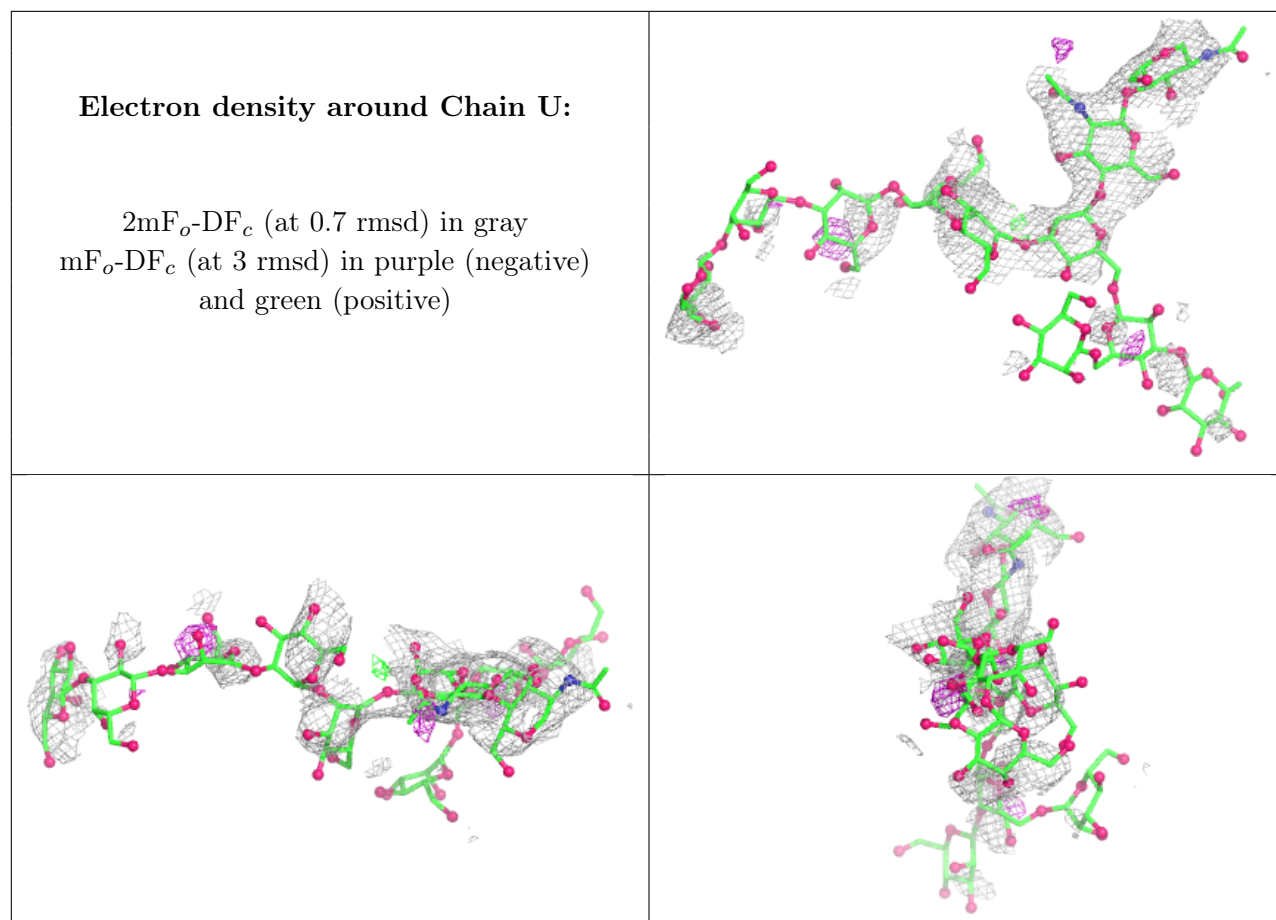
**Electron density around Chain M:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around Chain Q:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

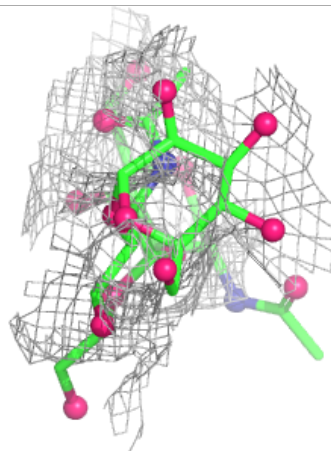
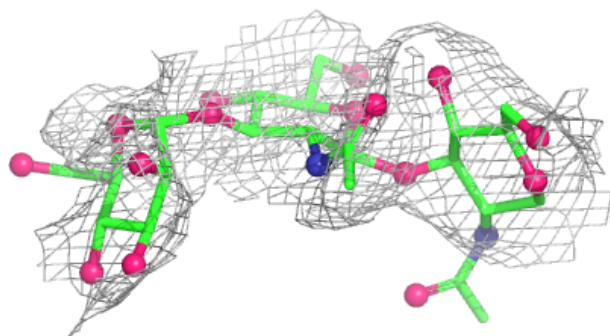
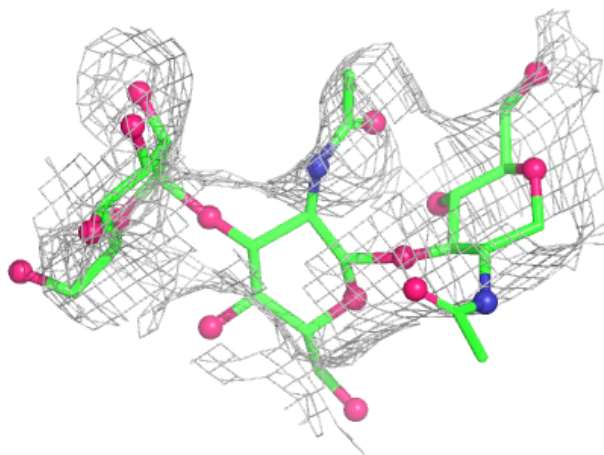






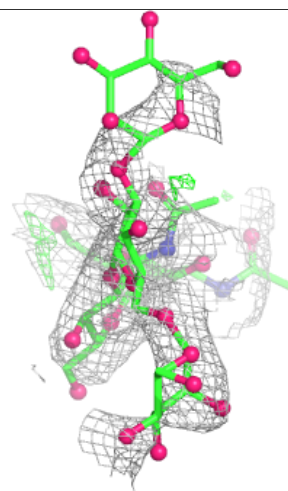
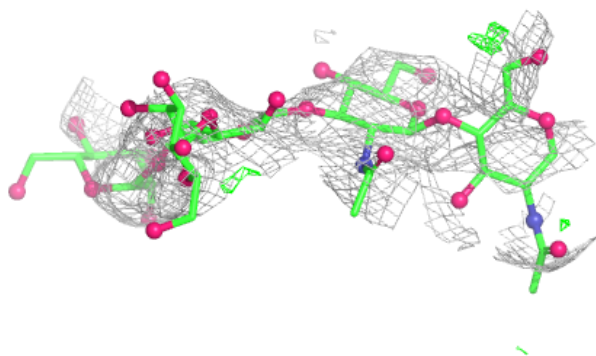
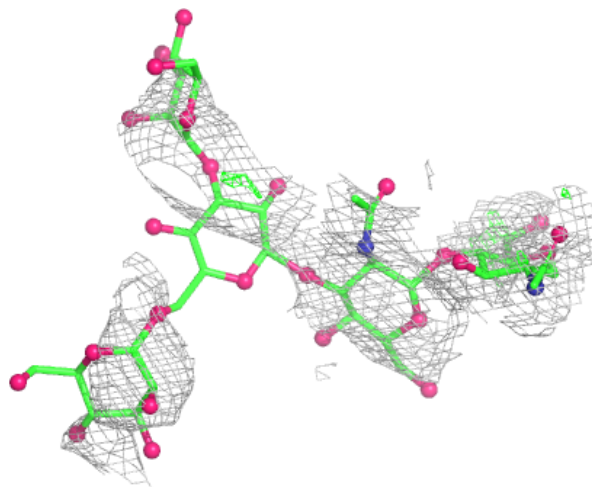
**Electron density around Chain Y:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



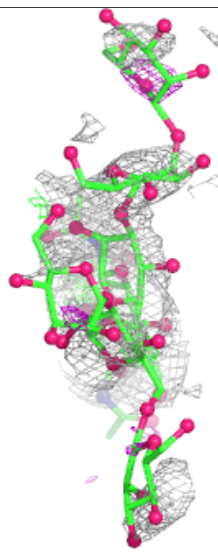
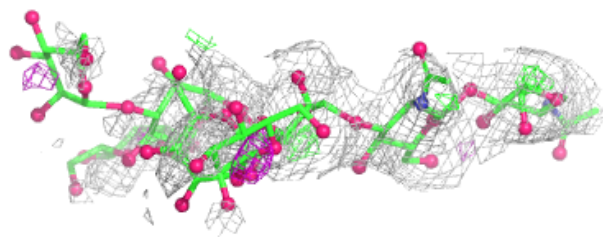
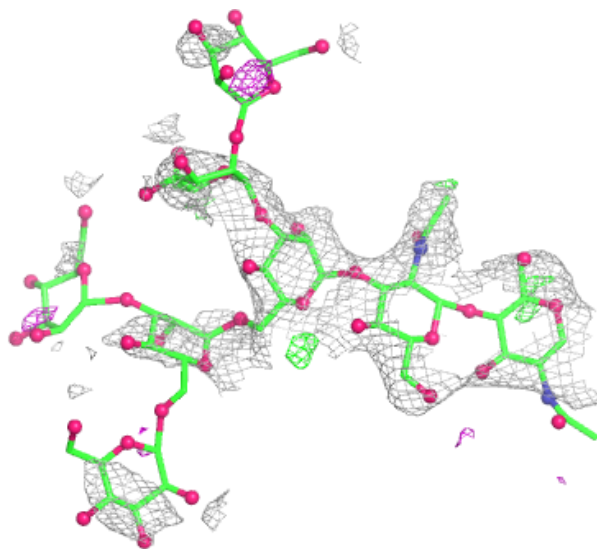
**Electron density around Chain Z:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



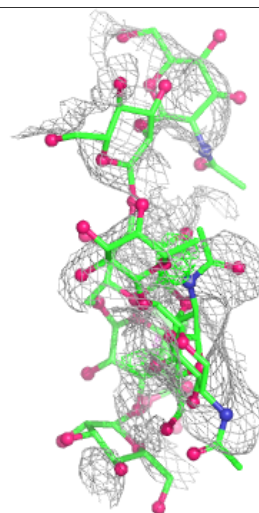
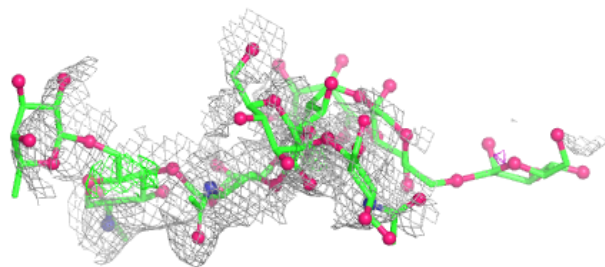
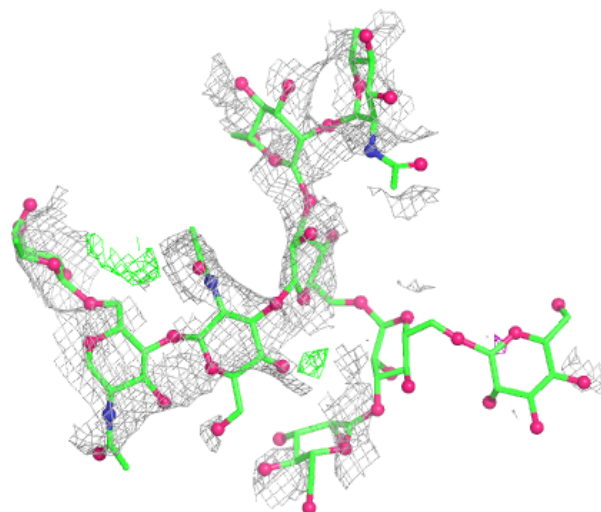
**Electron density around Chain b:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



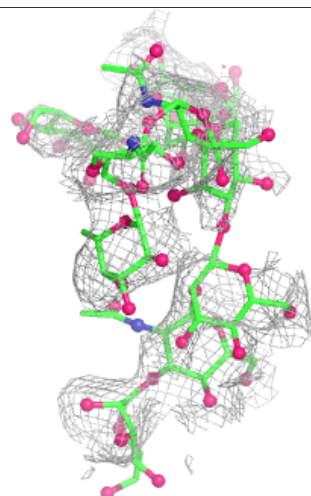
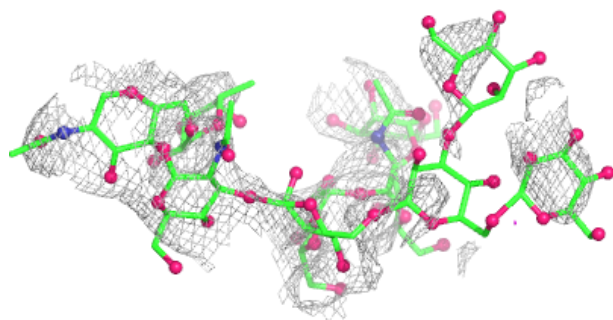
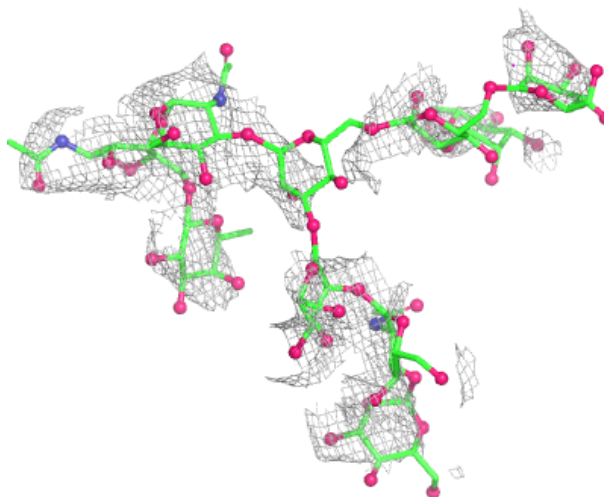
**Electron density around Chain d:**

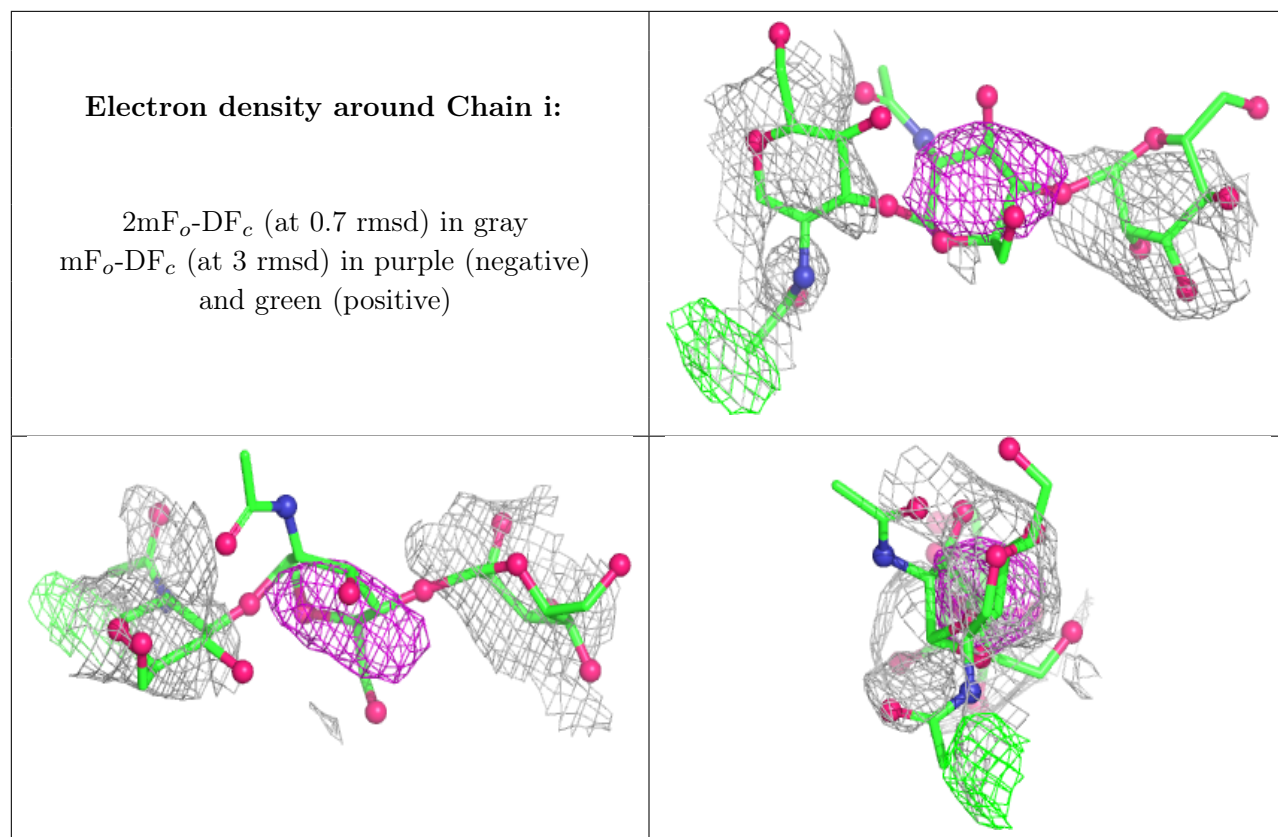
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

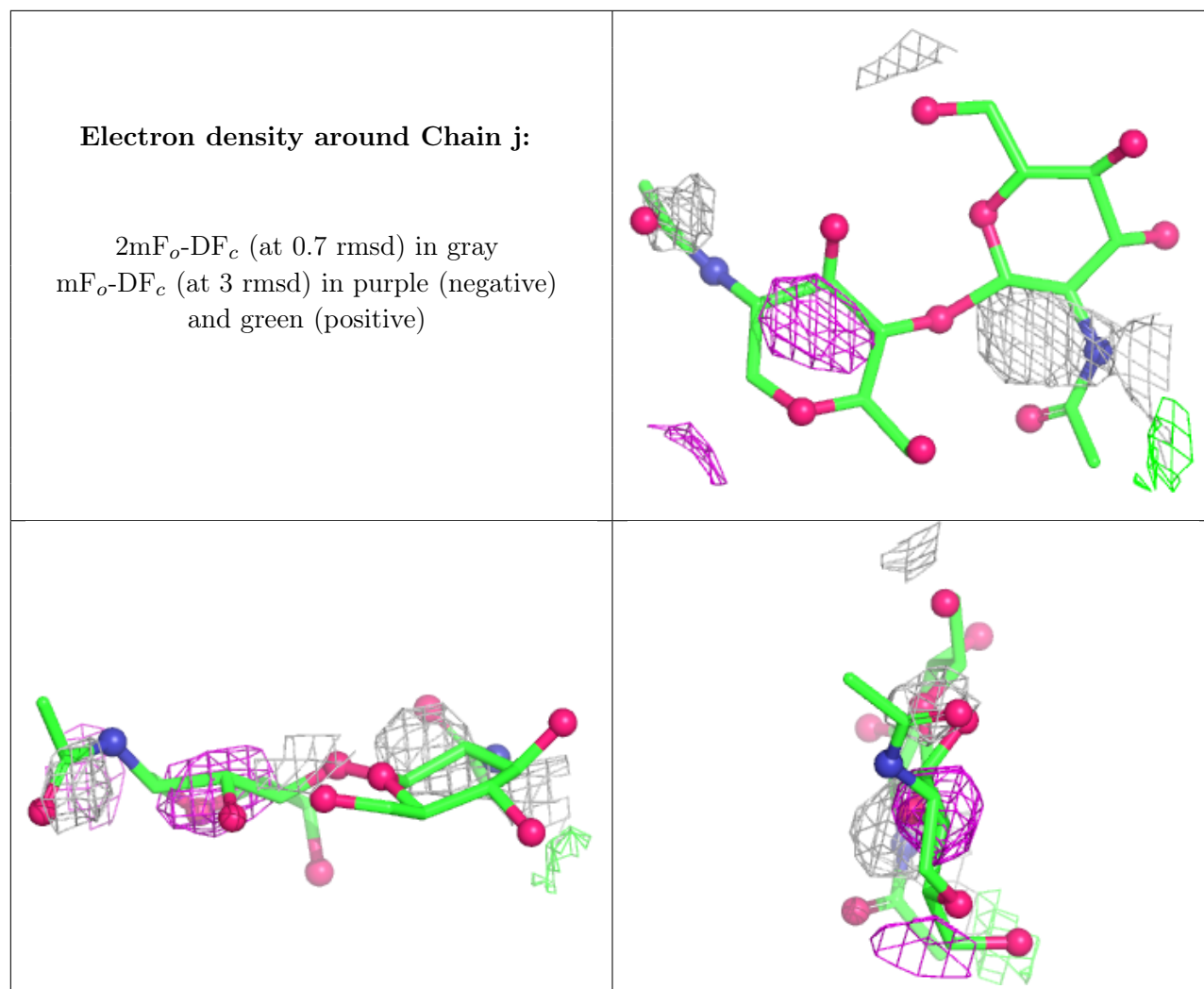


**Electron density around Chain f:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)







## 6.4 Ligands [i](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.