



## wwPDB EM Validation Summary Report ⓘ

Nov 9, 2022 – 09:26 AM EST

PDB ID : 6OPP  
EMDB ID : EMD-20152  
Title : Asymmetric model of CD4- and 17-bound B41 HIV-1 Env SOSIP in complex with DDM  
Authors : Ozorowski, G.; Torres, J.L.; Ward, A.B.  
Deposited on : 2019-04-25  
Resolution : 3.70 Å(reported)  
Based on initial model : 5VN3

This is a wwPDB EM 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/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:

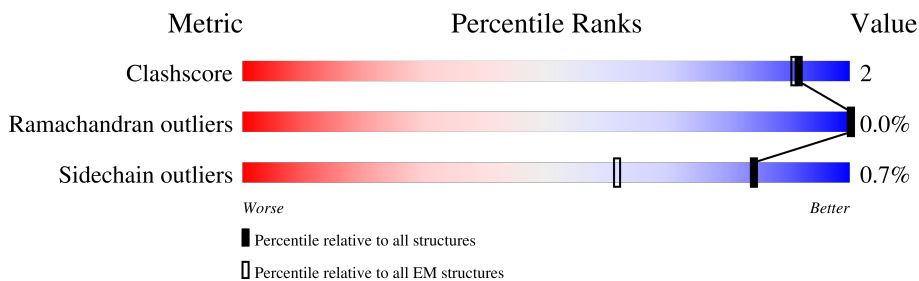
EMDB validation analysis : 0.0.1.dev43  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.2

# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:  
*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.70 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	I	214	
1	L	214	
1	O	214	
2	B	153	
2	E	153	
2	K	153	
3	A	524	
3	D	524	

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Mol	Chain	Length	Quality of chain
3	J	524	69% 27%
4	C	208	44% 53%
4	F	208	44% 53%
4	M	208	44% 53%
5	G	229	52% 45%
5	H	229	53% 45%
5	N	229	7% 52% 45%
6	P	2	50% 100%
6	T	2	50% 100%
6	U	2	100%
6	W	2	50% 100%
6	Z	2	50% 100%
6	a	2	50% 100%
6	b	2	50% 100%
6	e	2	50% 100%
6	f	2	100%
6	h	2	100%
6	k	2	50% 100%
6	l	2	50% 100%
6	m	2	100%
6	p	2	50% 100%
6	q	2	50% 100%
6	v	2	50% 100%
7	Q	3	33% 100%
7	S	3	33% 100%

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Mol	Chain	Length	Quality of chain
7	X	3	100%
7	Y	3	33% 100%
7	d	3	33% 100%
7	i	3	33% 100%
7	j	3	100%
7	s	3	33% 100%
7	t	3	33% 100%
7	u	3	67% 100%
8	R	7	14% 100%
8	c	7	14% 100%
9	V	4	25% 100%
9	g	4	50% 100%
9	r	4	25% 100%
10	n	6	17% 100%
11	o	4	75% 100%

## 2 Entry composition [i](#)

There are 13 unique types of molecules in this entry. The entry contains 21852 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 17b Fab light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	L	110	849	531	148	168	2	0	0
1	I	110	849	531	148	168	2	0	0
1	O	110	849	531	148	168	2	0	0

- Molecule 2 is a protein called Envelope glycoprotein gp41.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	135	1071	683	180	201	7	0	0
2	E	138	1101	702	186	205	8	0	0
2	K	130	1046	667	175	196	8	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	559	PRO	ILE	engineered mutation	UNP B3UEZ6
B	605	CYS	THR	engineered mutation	UNP B3UEZ6
E	559	PRO	ILE	engineered mutation	UNP B3UEZ6
E	605	CYS	THR	engineered mutation	UNP B3UEZ6
K	559	PRO	ILE	engineered mutation	UNP B3UEZ6
K	605	CYS	THR	engineered mutation	UNP B3UEZ6

- Molecule 3 is a protein called Envelope glycoprotein gp160.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	A	389	3051	1914	541	572	24	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	389	Total	C	N	O	S	0	0
			3051	1914	541	572	24		
3	J	382	Total	C	N	O	S	0	0
			2998	1881	532	562	23		

There are 120 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	MET	-	initiating methionine	UNP B3UES2
A	-3	ASP	-	expression tag	UNP B3UES2
A	-2	ALA	-	expression tag	UNP B3UES2
A	-1	MET	-	expression tag	UNP B3UES2
A	0	LYS	-	expression tag	UNP B3UES2
A	1	ARG	-	expression tag	UNP B3UES2
A	2	GLY	-	expression tag	UNP B3UES2
A	3	LEU	-	expression tag	UNP B3UES2
A	4	CYS	-	expression tag	UNP B3UES2
A	5	CYS	-	expression tag	UNP B3UES2
A	6	VAL	-	expression tag	UNP B3UES2
A	7	LEU	-	expression tag	UNP B3UES2
A	8	LEU	-	expression tag	UNP B3UES2
A	9	LEU	-	expression tag	UNP B3UES2
A	10	CYS	-	expression tag	UNP B3UES2
A	11	GLY	-	expression tag	UNP B3UES2
A	12	ALA	-	expression tag	UNP B3UES2
A	13	VAL	-	expression tag	UNP B3UES2
A	14	PHE	-	expression tag	UNP B3UES2
A	15	VAL	-	expression tag	UNP B3UES2
A	16	SER	-	expression tag	UNP B3UES2
A	17	PRO	-	expression tag	UNP B3UES2
A	18	SER	-	expression tag	UNP B3UES2
A	19	GLN	-	expression tag	UNP B3UES2
A	20	GLU	-	expression tag	UNP B3UES2
A	21	ILE	-	expression tag	UNP B3UES2
A	22	HIS	-	expression tag	UNP B3UES2
A	23	ALA	-	expression tag	UNP B3UES2
A	24	ARG	-	expression tag	UNP B3UES2
A	25	PHE	-	expression tag	UNP B3UES2
A	26	ARG	-	expression tag	UNP B3UES2
A	27	ARG	-	expression tag	UNP B3UES2
A	28	GLY	-	expression tag	UNP B3UES2
A	29	ALA	-	expression tag	UNP B3UES2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	30	ARG	-	expression tag	UNP B3UES2
A	501	CYS	ALA	engineered mutation	UNP B3UES2
A	509	ARG	GLU	engineered mutation	UNP B3UES2
A	510	ARG	LYS	engineered mutation	UNP B3UES2
A	512	ARG	ALA	engineered mutation	UNP B3UES2
A	513	ARG	VAL	engineered mutation	UNP B3UES2
D	-4	MET	-	initiating methionine	UNP B3UES2
D	-3	ASP	-	expression tag	UNP B3UES2
D	-2	ALA	-	expression tag	UNP B3UES2
D	-1	MET	-	expression tag	UNP B3UES2
D	0	LYS	-	expression tag	UNP B3UES2
D	1	ARG	-	expression tag	UNP B3UES2
D	2	GLY	-	expression tag	UNP B3UES2
D	3	LEU	-	expression tag	UNP B3UES2
D	4	CYS	-	expression tag	UNP B3UES2
D	5	CYS	-	expression tag	UNP B3UES2
D	6	VAL	-	expression tag	UNP B3UES2
D	7	LEU	-	expression tag	UNP B3UES2
D	8	LEU	-	expression tag	UNP B3UES2
D	9	LEU	-	expression tag	UNP B3UES2
D	10	CYS	-	expression tag	UNP B3UES2
D	11	GLY	-	expression tag	UNP B3UES2
D	12	ALA	-	expression tag	UNP B3UES2
D	13	VAL	-	expression tag	UNP B3UES2
D	14	PHE	-	expression tag	UNP B3UES2
D	15	VAL	-	expression tag	UNP B3UES2
D	16	SER	-	expression tag	UNP B3UES2
D	17	PRO	-	expression tag	UNP B3UES2
D	18	SER	-	expression tag	UNP B3UES2
D	19	GLN	-	expression tag	UNP B3UES2
D	20	GLU	-	expression tag	UNP B3UES2
D	21	ILE	-	expression tag	UNP B3UES2
D	22	HIS	-	expression tag	UNP B3UES2
D	23	ALA	-	expression tag	UNP B3UES2
D	24	ARG	-	expression tag	UNP B3UES2
D	25	PHE	-	expression tag	UNP B3UES2
D	26	ARG	-	expression tag	UNP B3UES2
D	27	ARG	-	expression tag	UNP B3UES2
D	28	GLY	-	expression tag	UNP B3UES2
D	29	ALA	-	expression tag	UNP B3UES2
D	30	ARG	-	expression tag	UNP B3UES2
D	501	CYS	ALA	engineered mutation	UNP B3UES2

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Chain	Residue	Modelled	Actual	Comment	Reference
D	509	ARG	GLU	engineered mutation	UNP B3UES2
D	510	ARG	LYS	engineered mutation	UNP B3UES2
D	512	ARG	ALA	engineered mutation	UNP B3UES2
D	513	ARG	VAL	engineered mutation	UNP B3UES2
J	-4	MET	-	initiating methionine	UNP B3UES2
J	-3	ASP	-	expression tag	UNP B3UES2
J	-2	ALA	-	expression tag	UNP B3UES2
J	-1	MET	-	expression tag	UNP B3UES2
J	0	LYS	-	expression tag	UNP B3UES2
J	1	ARG	-	expression tag	UNP B3UES2
J	2	GLY	-	expression tag	UNP B3UES2
J	3	LEU	-	expression tag	UNP B3UES2
J	4	CYS	-	expression tag	UNP B3UES2
J	5	CYS	-	expression tag	UNP B3UES2
J	6	VAL	-	expression tag	UNP B3UES2
J	7	LEU	-	expression tag	UNP B3UES2
J	8	LEU	-	expression tag	UNP B3UES2
J	9	LEU	-	expression tag	UNP B3UES2
J	10	CYS	-	expression tag	UNP B3UES2
J	11	GLY	-	expression tag	UNP B3UES2
J	12	ALA	-	expression tag	UNP B3UES2
J	13	VAL	-	expression tag	UNP B3UES2
J	14	PHE	-	expression tag	UNP B3UES2
J	15	VAL	-	expression tag	UNP B3UES2
J	16	SER	-	expression tag	UNP B3UES2
J	17	PRO	-	expression tag	UNP B3UES2
J	18	SER	-	expression tag	UNP B3UES2
J	19	GLN	-	expression tag	UNP B3UES2
J	20	GLU	-	expression tag	UNP B3UES2
J	21	ILE	-	expression tag	UNP B3UES2
J	22	HIS	-	expression tag	UNP B3UES2
J	23	ALA	-	expression tag	UNP B3UES2
J	24	ARG	-	expression tag	UNP B3UES2
J	25	PHE	-	expression tag	UNP B3UES2
J	26	ARG	-	expression tag	UNP B3UES2
J	27	ARG	-	expression tag	UNP B3UES2
J	28	GLY	-	expression tag	UNP B3UES2
J	29	ALA	-	expression tag	UNP B3UES2
J	30	ARG	-	expression tag	UNP B3UES2
J	501	CYS	ALA	engineered mutation	UNP B3UES2
J	509	ARG	GLU	engineered mutation	UNP B3UES2
J	510	ARG	LYS	engineered mutation	UNP B3UES2

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Chain	Residue	Modelled	Actual	Comment	Reference
J	512	ARG	ALA	engineered mutation	UNP B3UES2
J	513	ARG	VAL	engineered mutation	UNP B3UES2

- Molecule 4 is a protein called T-cell surface glycoprotein CD4.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	C	97	Total	C	N	O	S	0	0
			775	487	136	150	2		
4	M	97	Total	C	N	O	S	0	0
			775	487	136	150	2		
4	F	97	Total	C	N	O	S	0	0
			775	487	136	150	2		

There are 87 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-19	MET	-	initiating methionine	UNP P01730
C	-18	GLU	-	expression tag	UNP P01730
C	-17	THR	-	expression tag	UNP P01730
C	-16	ASP	-	expression tag	UNP P01730
C	-15	THR	-	expression tag	UNP P01730
C	-14	LEU	-	expression tag	UNP P01730
C	-13	LEU	-	expression tag	UNP P01730
C	-12	LEU	-	expression tag	UNP P01730
C	-11	TRP	-	expression tag	UNP P01730
C	-10	VAL	-	expression tag	UNP P01730
C	-9	LEU	-	expression tag	UNP P01730
C	-8	LEU	-	expression tag	UNP P01730
C	-7	LEU	-	expression tag	UNP P01730
C	-6	TRP	-	expression tag	UNP P01730
C	-5	VAL	-	expression tag	UNP P01730
C	-4	PRO	-	expression tag	UNP P01730
C	-3	GLY	-	expression tag	UNP P01730
C	-2	SER	-	expression tag	UNP P01730
C	-1	THR	-	expression tag	UNP P01730
C	179	GLY	-	expression tag	UNP P01730
C	180	GLY	-	expression tag	UNP P01730
C	181	SER	-	expression tag	UNP P01730
C	182	GLY	-	expression tag	UNP P01730
C	183	HIS	-	expression tag	UNP P01730
C	184	HIS	-	expression tag	UNP P01730
C	185	HIS	-	expression tag	UNP P01730

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Chain	Residue	Modelled	Actual	Comment	Reference
C	186	HIS	-	expression tag	UNP P01730
C	187	HIS	-	expression tag	UNP P01730
C	188	HIS	-	expression tag	UNP P01730
M	-19	MET	-	initiating methionine	UNP P01730
M	-18	GLU	-	expression tag	UNP P01730
M	-17	THR	-	expression tag	UNP P01730
M	-16	ASP	-	expression tag	UNP P01730
M	-15	THR	-	expression tag	UNP P01730
M	-14	LEU	-	expression tag	UNP P01730
M	-13	LEU	-	expression tag	UNP P01730
M	-12	LEU	-	expression tag	UNP P01730
M	-11	TRP	-	expression tag	UNP P01730
M	-10	VAL	-	expression tag	UNP P01730
M	-9	LEU	-	expression tag	UNP P01730
M	-8	LEU	-	expression tag	UNP P01730
M	-7	LEU	-	expression tag	UNP P01730
M	-6	TRP	-	expression tag	UNP P01730
M	-5	VAL	-	expression tag	UNP P01730
M	-4	PRO	-	expression tag	UNP P01730
M	-3	GLY	-	expression tag	UNP P01730
M	-2	SER	-	expression tag	UNP P01730
M	-1	THR	-	expression tag	UNP P01730
M	179	GLY	-	expression tag	UNP P01730
M	180	GLY	-	expression tag	UNP P01730
M	181	SER	-	expression tag	UNP P01730
M	182	GLY	-	expression tag	UNP P01730
M	183	HIS	-	expression tag	UNP P01730
M	184	HIS	-	expression tag	UNP P01730
M	185	HIS	-	expression tag	UNP P01730
M	186	HIS	-	expression tag	UNP P01730
M	187	HIS	-	expression tag	UNP P01730
M	188	HIS	-	expression tag	UNP P01730
F	-19	MET	-	initiating methionine	UNP P01730
F	-18	GLU	-	expression tag	UNP P01730
F	-17	THR	-	expression tag	UNP P01730
F	-16	ASP	-	expression tag	UNP P01730
F	-15	THR	-	expression tag	UNP P01730
F	-14	LEU	-	expression tag	UNP P01730
F	-13	LEU	-	expression tag	UNP P01730
F	-12	LEU	-	expression tag	UNP P01730
F	-11	TRP	-	expression tag	UNP P01730
F	-10	VAL	-	expression tag	UNP P01730

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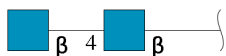
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Chain	Residue	Modelled	Actual	Comment	Reference
F	-9	LEU	-	expression tag	UNP P01730
F	-8	LEU	-	expression tag	UNP P01730
F	-7	LEU	-	expression tag	UNP P01730
F	-6	TRP	-	expression tag	UNP P01730
F	-5	VAL	-	expression tag	UNP P01730
F	-4	PRO	-	expression tag	UNP P01730
F	-3	GLY	-	expression tag	UNP P01730
F	-2	SER	-	expression tag	UNP P01730
F	-1	THR	-	expression tag	UNP P01730
F	179	GLY	-	expression tag	UNP P01730
F	180	GLY	-	expression tag	UNP P01730
F	181	SER	-	expression tag	UNP P01730
F	182	GLY	-	expression tag	UNP P01730
F	183	HIS	-	expression tag	UNP P01730
F	184	HIS	-	expression tag	UNP P01730
F	185	HIS	-	expression tag	UNP P01730
F	186	HIS	-	expression tag	UNP P01730
F	187	HIS	-	expression tag	UNP P01730
F	188	HIS	-	expression tag	UNP P01730

- Molecule 5 is a protein called 17b Fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	H	127	987	623	169	192	3	0	0
5	G	127	987	623	169	192	3	0	0
5	N	127	987	623	169	192	3	0	0

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



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

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Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
6	U	2	28	16	2	10	0	0
6	W	2	28	16	2	10	0	0
6	Z	2	28	16	2	10	0	0
6	a	2	28	16	2	10	0	0
6	b	2	28	16	2	10	0	0
6	e	2	28	16	2	10	0	0
6	f	2	28	16	2	10	0	0
6	h	2	28	16	2	10	0	0
6	k	2	28	16	2	10	0	0
6	l	2	28	16	2	10	0	0
6	m	2	28	16	2	10	0	0
6	p	2	28	16	2	10	0	0
6	q	2	28	16	2	10	0	0
6	v	2	28	16	2	10	0	0

- Molecule 7 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.



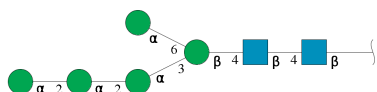
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
7	Q	3	39	22	2	15	0	0
7	S	3	39	22	2	15	0	0
7	X	3	39	22	2	15	0	0

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Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
7	Y	3	39	22	2	15	0	0
7	d	3	39	22	2	15	0	0
7	i	3	39	22	2	15	0	0
7	j	3	39	22	2	15	0	0
7	s	3	39	22	2	15	0	0
7	t	3	39	22	2	15	0	0
7	u	3	39	22	2	15	0	0

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



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

- Molecule 9 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



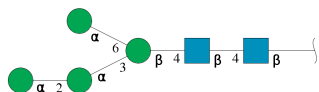
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
9	V	4	50	28	2	20	0	0

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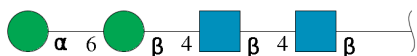
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
9	g	4	Total	C	N	O	0	0
			50	28	2	20		
9	r	4	Total	C	N	O	0	0
			50	28	2	20		

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



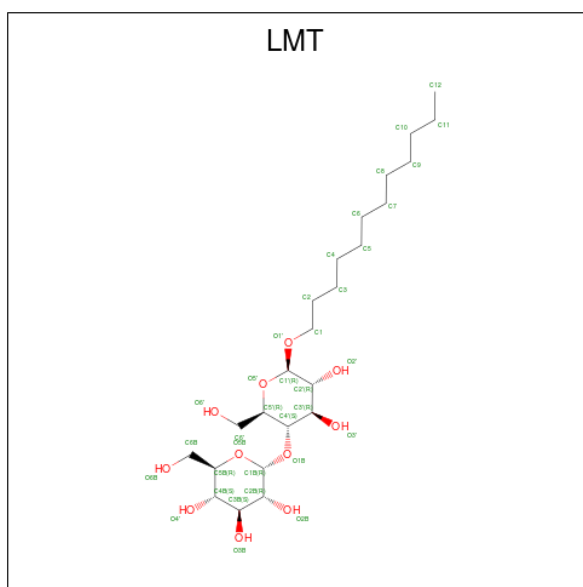
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
10	n	6	Total	C	N	O	0	0
			72	40	2	30		

- Molecule 11 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.



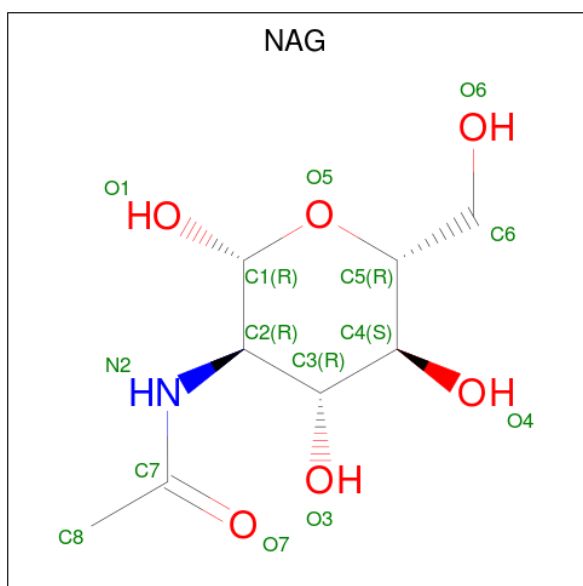
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
11	o	4	Total	C	N	O	0	0
			50	28	2	20		

- Molecule 12 is DODECYL-BETA-D-MALTOSIDE (three-letter code: LMT) (formula: C<sub>24</sub>H<sub>46</sub>O<sub>11</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms		AltConf
12	B	1	Total	C O	0
			70	48 22	
12	B	1	Total	C O	0
			70	48 22	
12	E	1	Total	C O	0
			19	13 6	

- Molecule 13 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).



Mol	Chain	Residues	Atoms				AltConf
13	B	1	Total	C	N	O	0
			56	32	4	20	
13	B	1	Total	C	N	O	0
			56	32	4	20	
13	B	1	Total	C	N	O	0
			56	32	4	20	
13	B	1	Total	C	N	O	0
			56	32	4	20	
13	A	1	Total	C	N	O	0
			56	32	4	20	
13	A	1	Total	C	N	O	0
			56	32	4	20	
13	A	1	Total	C	N	O	0
			56	32	4	20	
13	A	1	Total	C	N	O	0
			56	32	4	20	
13	D	1	Total	C	N	O	0
			56	32	4	20	
13	D	1	Total	C	N	O	0
			56	32	4	20	
13	D	1	Total	C	N	O	0
			56	32	4	20	
13	D	1	Total	C	N	O	0
			56	32	4	20	
13	E	1	Total	C	N	O	0
			56	32	4	20	
13	E	1	Total	C	N	O	0
			56	32	4	20	
13	E	1	Total	C	N	O	0
			56	32	4	20	
13	E	1	Total	C	N	O	0
			56	32	4	20	
13	K	1	Total	C	N	O	0
			56	32	4	20	
13	K	1	Total	C	N	O	0
			56	32	4	20	
13	K	1	Total	C	N	O	0
			56	32	4	20	
13	K	1	Total	C	N	O	0
			56	32	4	20	
13	J	1	Total	C	N	O	0
			56	32	4	20	
13	J	1	Total	C	N	O	0
			56	32	4	20	

*Continued on next page...*

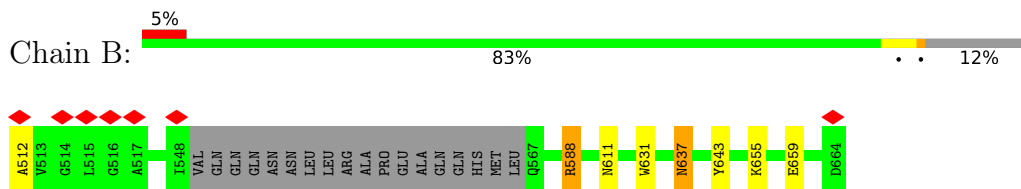


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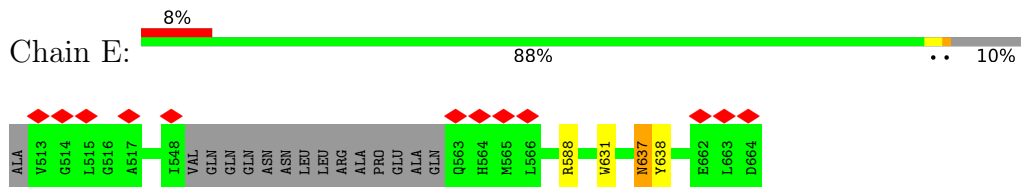
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
13	J	1	56	32	4	20	0
13	J	1	56	32	4	20	0



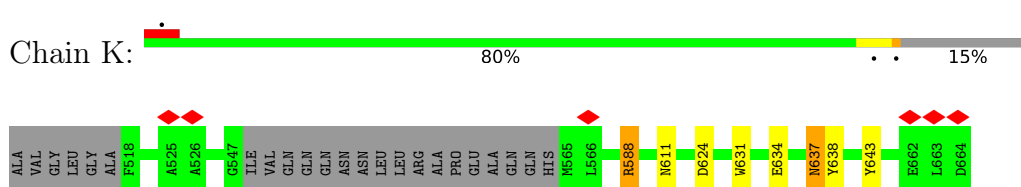
• Molecule 2: Envelope glycoprotein gp41



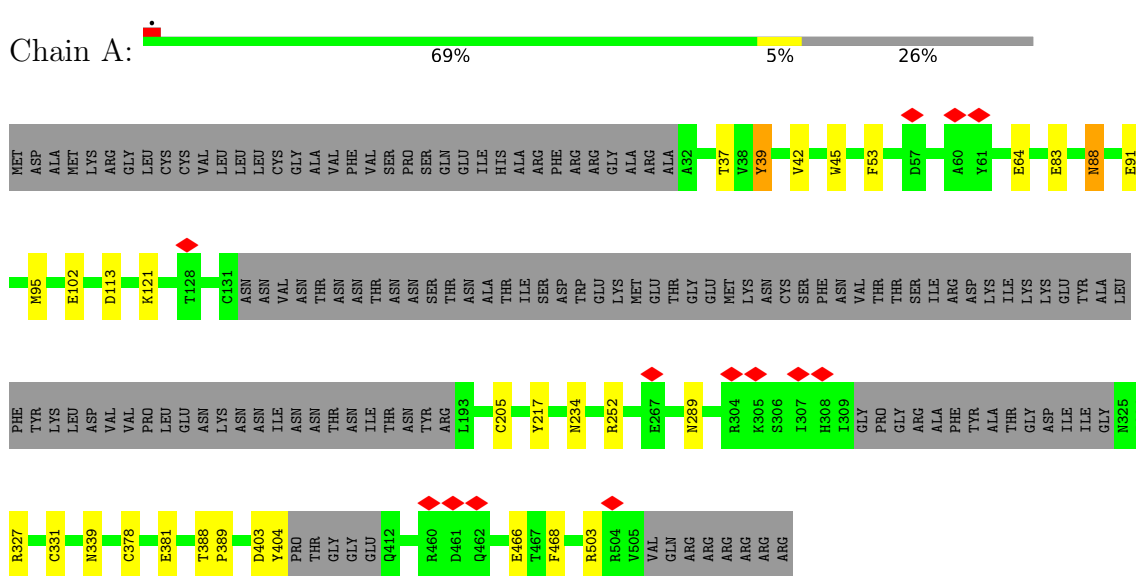
• Molecule 2: Envelope glycoprotein gp41



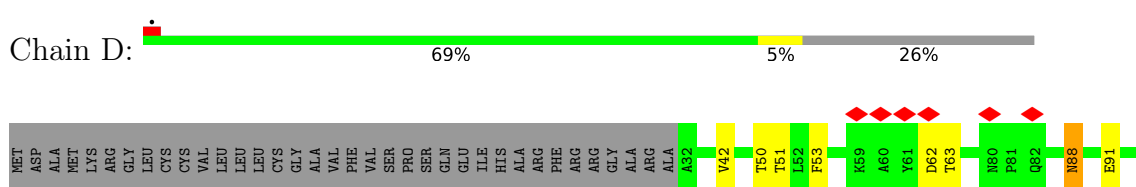
• Molecule 2: Envelope glycoprotein gp41



• Molecule 3: Envelope glycoprotein gp160



• Molecule 3: Envelope glycoprotein gp160





LEU  
ALA  
GLY  
GLY  
SER  
SER  
GLY  
GLY  
HIS  
HIS  
HIS  
HIS  
HIS

• Molecule 4: T-cell surface glycoprotein CD4

Chain F:



MET  
GLU  
THR  
ASP  
THR  
THR  
LEU  
LEU  
LEU  
TRP  
VAL  
LEU  
LEU  
TRP  
VAL  
PRO  
GLY  
SER  
SER  
THR  
GLY  
K1  
E13  
K21  
F26  
K29  
N39  
D56  
I76  
E77  
C84  
E85  
V97  
PHE  
GLY  
LEU  
THR  
ALA  
ASN  
SER  
SER  
ASP  
THR  
HIS  
HIS  
LEU  
LEU  
GLN  
GLY  
GLN  
SER  
LEU

THR  
LEU  
GLU  
SER  
PRO  
PRO  
GLY  
SER  
SER  
VAL  
ARG  
SER  
ARG  
GLY  
THR  
LYS  
ASN  
ILE  
GLN  
GLY  
GLY  
LYS  
THR  
LEU  
SER  
SER  
VAL  
SER  
SER  
GLN  
LEU  
LEU  
LEU  
GLN  
ASP  
SER  
GLY  
THR  
TRP  
THR  
CYS  
THR  
VAL  
LEU  
THR  
GLN  
ASN  
GLY  
PHE  
LEU  
LYS  
ILE  
ASP  
ILE  
VAL

LEU  
ALA  
GLY  
GLY  
SER  
SER  
GLY  
GLY  
HIS  
HIS  
HIS  
HIS  
HIS

• Molecule 5: 17b Fab heavy chain

Chain H:



Q1  
E6  
S7  
G8  
A9  
D27  
T28  
F29  
Y32  
D55  
R83  
S84  
D85  
D86  
E97  
T107  
T112  
ALA  
SER  
SER  
THR  
LYS  
LEU  
PRO  
SER  
VAL  
PHE  
PRO  
PRO  
LEU  
SER  
PRO  
SER  
SER  
LYS  
SER  
GLY  
THR  
ALA  
ALA  
ALA  
HIS  
LEU  
GLY  
LEU  
VAL  
ASN  
VAL  
PHE  
PRO

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

ASP  
LYS  
LYS  
VAL  
GLU  
PRO  
LYS

• Molecule 5: 17b Fab heavy chain

Chain G:



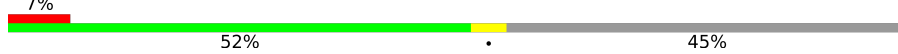
Q1  
E6  
S7  
G8  
A9  
S16  
S17  
G26  
F29  
I30  
R31  
A40  
Q43  
G44  
D55  
C92  
T112  
SER  
ALA  
SER  
THR  
LYS  
GLY  
PRO  
VAL  
VAL  
PHE  
PRO  
LEU  
SER  
SER  
SER  
SER  
SER  
GLY  
THR  
LYS  
THR  
THR  
SER  
SER  
GLY  
THR  
ASN  
VAL  
ALA  
ALA  
HIS  
LEU  
GLY  
CYS  
LEU  
VAL  
ASN  
VAL  
TYR  
PHE

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

VAL  
ASP  
LYS  
LYS  
VAL  
GLU  
PRO  
LYS

• Molecule 5: 17b Fab heavy chain

Chain N:



Q1  
G8  
A9  
E10  
P14  
G15  
S16  
S17  
R31  
Y32  
H36  
P41  
Q42  
Q43  
Q44  
W47  
D55  
H58  
Q64  
G65  
H66  
L80  
R83  
S84  
D85  
W89  
C92  
D100A  
W103  
T112  
SER  
ALA  
SER  
SER  
VAL  
LYS  
GLY  
PRO  
VAL  
PHE  
PRO  
LEU  
ALA  
PRO

SER  
SER  
LYS  
SER  
THR  
SER  
GLY  
GLY  
THR  
THR  
ALA  
ALA  
LEU  
GLY  
CYS  
LEU  
VAL  
LYS  
ASP  
TYR  
PHE  
PRO  
GLU  
PRO  
VAL  
THR  
VAL  
SER  
TRP  
ASN  
SER  
SER  
GLY  
ALA  
LEU  
THR  
SER  
SER  
GLY  
VAL  
HIS  
THR  
PHE  
PRO  
PRO  
VAL  
LEU  
GLN  
SER

SER SER LEU GLY THR GLN THR TYR ILE CYS ASN VAL ASN HIS LYS SER ASN THR LYS VAL ASP LYS LYS VAL GLU PRO LYS

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



MAG1  
MAG2

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



MAG1  
MAG2

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



MAG1  
MAG2

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



MAG1  
MAG2

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



MAG1  
MAG2

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





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



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



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



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



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

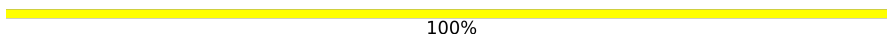


- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose





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

Chain m:  100%



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

Chain p:  50% 100%



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

Chain q:  50% 100%



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

Chain v:  50% 100%



- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Q:  33% 100%



- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose





- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



  
 MAG1  
 MAG2  
 BMA3

- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



  
 MAG1  
 MAG2  
 BMA3


- Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



  
  
 MAG1  
 MAG2  
 BMA3

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



  
 MAG1  
 MAG2  
 BMA3  
 MAN4  
 MAN5  
 MAN6  
 MAN7

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



  
 MAG1  
 MAG2  
 BMA3  
 MAN4  
 MAN5  
 MAN6  
 MAN7

- Molecule 9: 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



  
 MAG1  
 MAG2  
 BMA3  
 MAN4

- Molecule 9: 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



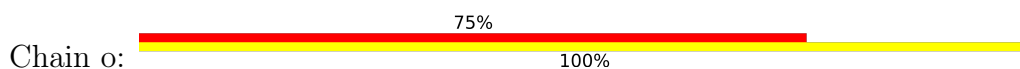
- Molecule 9: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



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



- Molecule 11: 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



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	183480	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 ( $e^-/\text{\AA}^2$ )	58	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	22500	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	2.834	Depositor
Minimum map value	-1.188	Depositor
Average map value	-0.002	Depositor
Map value standard deviation	0.074	Depositor
Recommended contour level	0.58	Depositor
Map size (Å)	377.27997, 377.27997, 377.27997	wwPDB
Map dimensions	288, 288, 288	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.31, 1.31, 1.31	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: BMA, LMT, MAN, 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	I	1.16	2/869 (0.2%)	1.05	2/1181 (0.2%)
1	L	1.26	7/869 (0.8%)	1.02	2/1181 (0.2%)
1	O	1.08	1/869 (0.1%)	0.98	2/1181 (0.2%)
2	B	1.15	1/1090 (0.1%)	0.83	2/1477 (0.1%)
2	E	1.17	2/1121 (0.2%)	0.82	1/1518 (0.1%)
2	K	1.19	4/1065 (0.4%)	0.83	2/1442 (0.1%)
3	A	1.12	15/3116 (0.5%)	0.89	5/4239 (0.1%)
3	D	1.06	7/3116 (0.2%)	0.89	9/4239 (0.2%)
3	J	1.07	9/3063 (0.3%)	0.89	5/4166 (0.1%)
4	C	1.03	2/785 (0.3%)	0.85	0/1053
4	F	1.05	1/785 (0.1%)	0.86	0/1053
4	M	1.04	2/785 (0.3%)	0.91	1/1053 (0.1%)
5	G	1.17	3/1008 (0.3%)	0.95	1/1368 (0.1%)
5	H	1.18	5/1008 (0.5%)	0.97	2/1368 (0.1%)
5	N	1.15	3/1008 (0.3%)	0.98	1/1368 (0.1%)
All	All	1.12	64/20557 (0.3%)	0.91	35/27887 (0.1%)

The worst 5 of 64 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L	91	TYR	CB-CG	-9.25	1.37	1.51
5	N	92	CYS	CB-SG	-9.04	1.66	1.82
1	O	91	TYR	CD1-CE1	-9.04	1.25	1.39
4	F	84	CYS	CB-SG	-8.25	1.68	1.82
1	L	88	CYS	CB-SG	-8.24	1.68	1.82

The worst 5 of 35 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	N	31	ARG	NE-CZ-NH2	-9.35	115.62	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L	61	ARG	NE-CZ-NH2	-8.97	115.82	120.30
3	J	304	ARG	NE-CZ-NH2	-8.95	115.83	120.30
1	O	54	ARG	NE-CZ-NH2	-8.69	115.96	120.30
1	I	24	ARG	NE-CZ-NH2	-8.68	115.96	120.30

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

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	I	849	0	819	0	0
1	L	849	0	819	2	0
1	O	849	0	819	13	0
2	B	1071	0	1056	6	0
2	E	1101	0	1086	2	0
2	K	1046	0	1029	5	0
3	A	3051	0	2982	7	0
3	D	3051	0	2982	6	0
3	J	2998	0	2925	4	0
4	C	775	0	795	2	0
4	F	775	0	795	2	0
4	M	775	0	795	1	0
5	G	987	0	958	2	0
5	H	987	0	958	0	0
5	N	987	0	958	5	0
6	P	28	0	25	0	0
6	T	28	0	25	0	0
6	U	28	0	25	0	0
6	W	28	0	25	0	0
6	Z	28	0	25	0	0
6	a	28	0	25	0	0
6	b	28	0	25	0	0
6	e	28	0	25	0	0
6	f	28	0	25	0	0
6	h	28	0	25	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	k	28	0	25	0	0
6	l	28	0	25	0	0
6	m	28	0	25	0	0
6	p	28	0	25	0	0
6	q	28	0	25	0	0
6	v	28	0	25	0	0
7	Q	39	0	33	0	0
7	S	39	0	33	0	0
7	X	39	0	33	0	0
7	Y	39	0	33	0	0
7	d	39	0	33	0	0
7	i	39	0	33	0	0
7	j	39	0	33	0	0
7	s	39	0	33	0	0
7	t	39	0	33	0	0
7	u	39	0	33	0	0
8	R	83	0	67	0	0
8	c	83	0	67	0	0
9	V	50	0	41	0	0
9	g	50	0	41	0	0
9	r	50	0	41	0	0
10	n	72	0	58	0	0
11	o	50	0	41	0	0
12	B	70	0	92	18	0
12	E	19	0	20	1	0
13	A	56	0	52	0	0
13	B	56	0	52	0	0
13	D	56	0	52	0	0
13	E	56	0	52	0	0
13	J	56	0	52	0	0
13	K	56	0	52	1	0
All	All	21852	0	21286	65	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 2.

The worst 5 of 65 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)
12:B:706:LMT:O2B	12:B:706:LMT:H3'	1.81	0.81
2:B:588:ARG:HA	12:B:706:LMT:H61	1.63	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:512:ALA:HB2	12:B:701:LMT:H82	1.69	0.74
3:A:88:ASN:OD1	3:A:88:ASN:N	2.27	0.66
2:E:588:ARG:HA	12:E:705:LMT:H52	1.78	0.65

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	I	108/214 (50%)	105 (97%)	3 (3%)	0	100	100
1	L	108/214 (50%)	106 (98%)	2 (2%)	0	100	100
1	O	108/214 (50%)	102 (94%)	6 (6%)	0	100	100
2	B	131/153 (86%)	130 (99%)	1 (1%)	0	100	100
2	E	134/153 (88%)	134 (100%)	0	0	100	100
2	K	126/153 (82%)	126 (100%)	0	0	100	100
3	A	381/524 (73%)	373 (98%)	8 (2%)	0	100	100
3	D	381/524 (73%)	376 (99%)	5 (1%)	0	100	100
3	J	374/524 (71%)	362 (97%)	11 (3%)	1 (0%)	41	74
4	C	95/208 (46%)	93 (98%)	2 (2%)	0	100	100
4	F	95/208 (46%)	94 (99%)	1 (1%)	0	100	100
4	M	95/208 (46%)	93 (98%)	2 (2%)	0	100	100
5	G	125/229 (55%)	123 (98%)	2 (2%)	0	100	100
5	H	125/229 (55%)	124 (99%)	1 (1%)	0	100	100
5	N	125/229 (55%)	122 (98%)	3 (2%)	0	100	100
All	All	2511/3984 (63%)	2463 (98%)	47 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:



Mol	Chain	Res	Type
3	J	299	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 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	I	91/184 (50%)	91 (100%)	0	100	100
1	L	91/184 (50%)	91 (100%)	0	100	100
1	O	91/184 (50%)	89 (98%)	2 (2%)	52	72
2	B	114/130 (88%)	112 (98%)	2 (2%)	59	77
2	E	118/130 (91%)	117 (99%)	1 (1%)	81	89
2	K	113/130 (87%)	111 (98%)	2 (2%)	59	77
3	A	345/461 (75%)	342 (99%)	3 (1%)	78	88
3	D	345/461 (75%)	343 (99%)	2 (1%)	86	93
3	J	338/461 (73%)	336 (99%)	2 (1%)	86	93
4	C	89/186 (48%)	89 (100%)	0	100	100
4	F	89/186 (48%)	89 (100%)	0	100	100
4	M	89/186 (48%)	89 (100%)	0	100	100
5	G	105/193 (54%)	105 (100%)	0	100	100
5	H	105/193 (54%)	104 (99%)	1 (1%)	76	86
5	N	105/193 (54%)	105 (100%)	0	100	100
All	All	2228/3462 (64%)	2213 (99%)	15 (1%)	84	91

5 of 15 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	D	339	ASN
3	J	88	ASN
2	E	637	ASN
3	J	339	ASN
2	K	611	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	L	6	GLN

### 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](#)

98 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
6	NAG	P	1	3,6	14,14,15	1.98	3 (21%)	17,19,21	1.53	2 (11%)
6	NAG	P	2	6	14,14,15	2.22	2 (14%)	17,19,21	0.85	1 (5%)
7	NAG	Q	1	7,3	14,14,15	2.03	3 (21%)	17,19,21	1.11	3 (17%)
7	NAG	Q	2	7	14,14,15	2.13	3 (21%)	17,19,21	0.73	0
7	BMA	Q	3	7	11,11,12	1.80	2 (18%)	15,15,17	0.99	1 (6%)
8	NAG	R	1	3,8	14,14,15	2.05	2 (14%)	17,19,21	0.80	1 (5%)
8	NAG	R	2	8	14,14,15	2.10	3 (21%)	17,19,21	1.01	1 (5%)
8	BMA	R	3	8	11,11,12	1.87	2 (18%)	15,15,17	1.19	1 (6%)
8	MAN	R	4	8	11,11,12	1.64	2 (18%)	15,15,17	0.92	0
8	MAN	R	5	8	11,11,12	1.58	2 (18%)	15,15,17	1.48	4 (26%)
8	MAN	R	6	8	11,11,12	1.84	2 (18%)	15,15,17	1.08	2 (13%)
8	MAN	R	7	8	11,11,12	1.81	2 (18%)	15,15,17	1.08	1 (6%)
7	NAG	S	1	7,3	14,14,15	2.04	4 (28%)	17,19,21	1.55	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
7	NAG	S	2	7	14,14,15	2.13	3 (21%)	17,19,21	0.98	2 (11%)
7	BMA	S	3	7	11,11,12	1.83	2 (18%)	15,15,17	1.00	1 (6%)
6	NAG	T	1	3,6	14,14,15	2.08	2 (14%)	17,19,21	1.00	2 (11%)
6	NAG	T	2	6	14,14,15	2.17	2 (14%)	17,19,21	0.81	0
6	NAG	U	1	3,6	14,14,15	1.96	3 (21%)	17,19,21	1.03	1 (5%)
6	NAG	U	2	6	14,14,15	2.19	2 (14%)	17,19,21	0.79	1 (5%)
9	NAG	V	1	3,9	14,14,15	2.09	4 (28%)	17,19,21	0.89	2 (11%)
9	NAG	V	2	9	14,14,15	2.13	4 (28%)	17,19,21	0.98	1 (5%)
9	BMA	V	3	9	11,11,12	1.91	2 (18%)	15,15,17	1.38	2 (13%)
9	MAN	V	4	9	11,11,12	1.80	2 (18%)	15,15,17	1.12	3 (20%)
6	NAG	W	1	3,6	14,14,15	1.97	4 (28%)	17,19,21	1.60	4 (23%)
6	NAG	W	2	6	14,14,15	2.21	2 (14%)	17,19,21	0.87	1 (5%)
7	NAG	X	1	7,3	14,14,15	2.01	4 (28%)	17,19,21	1.17	3 (17%)
7	NAG	X	2	7	14,14,15	2.08	2 (14%)	17,19,21	0.72	1 (5%)
7	BMA	X	3	7	11,11,12	1.87	3 (27%)	15,15,17	0.90	1 (6%)
7	NAG	Y	1	7,3	14,14,15	1.98	3 (21%)	17,19,21	0.90	1 (5%)
7	NAG	Y	2	7	14,14,15	2.17	3 (21%)	17,19,21	0.82	1 (5%)
7	BMA	Y	3	7	11,11,12	1.80	2 (18%)	15,15,17	0.98	1 (6%)
6	NAG	Z	1	3,6	14,14,15	2.14	2 (14%)	17,19,21	1.02	2 (11%)
6	NAG	Z	2	6	14,14,15	2.24	2 (14%)	17,19,21	0.83	1 (5%)
6	NAG	a	1	3,6	14,14,15	2.13	3 (21%)	17,19,21	1.09	3 (17%)
6	NAG	a	2	6	14,14,15	2.21	2 (14%)	17,19,21	0.88	1 (5%)
6	NAG	b	1	3,6	14,14,15	2.07	4 (28%)	17,19,21	1.73	4 (23%)
6	NAG	b	2	6	14,14,15	2.19	2 (14%)	17,19,21	0.84	1 (5%)
8	NAG	c	1	3,8	14,14,15	2.08	2 (14%)	17,19,21	1.22	4 (23%)
8	NAG	c	2	8	14,14,15	2.16	4 (28%)	17,19,21	1.24	3 (17%)
8	BMA	c	3	8	11,11,12	1.87	2 (18%)	15,15,17	1.13	1 (6%)
8	MAN	c	4	8	11,11,12	1.58	2 (18%)	15,15,17	0.84	0
8	MAN	c	5	8	11,11,12	1.55	2 (18%)	15,15,17	1.36	4 (26%)
8	MAN	c	6	8	11,11,12	1.82	2 (18%)	15,15,17	1.08	3 (20%)
8	MAN	c	7	8	11,11,12	1.81	2 (18%)	15,15,17	1.08	1 (6%)
7	NAG	d	1	7,3	14,14,15	2.11	3 (21%)	17,19,21	1.13	2 (11%)
7	NAG	d	2	7	14,14,15	2.14	2 (14%)	17,19,21	0.77	0
7	BMA	d	3	7	11,11,12	1.83	2 (18%)	15,15,17	0.96	1 (6%)
6	NAG	e	1	3,6	14,14,15	2.07	3 (21%)	17,19,21	1.14	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	NAG	e	2	6	14,14,15	2.20	2 (14%)	17,19,21	0.85	1 (5%)
6	NAG	f	1	3,6	14,14,15	1.98	3 (21%)	17,19,21	1.24	3 (17%)
6	NAG	f	2	6	14,14,15	2.16	2 (14%)	17,19,21	0.76	1 (5%)
9	NAG	g	1	3,9	14,14,15	2.19	5 (35%)	17,19,21	1.39	3 (17%)
9	NAG	g	2	9	14,14,15	2.14	3 (21%)	17,19,21	0.88	1 (5%)
9	BMA	g	3	9	11,11,12	1.88	2 (18%)	15,15,17	1.21	2 (13%)
9	MAN	g	4	9	11,11,12	1.82	2 (18%)	15,15,17	1.11	3 (20%)
6	NAG	h	1	3,6	14,14,15	2.03	2 (14%)	17,19,21	1.39	4 (23%)
6	NAG	h	2	6	14,14,15	2.17	2 (14%)	17,19,21	0.82	1 (5%)
7	NAG	i	1	7,3	14,14,15	1.95	2 (14%)	17,19,21	0.84	1 (5%)
7	NAG	i	2	7	14,14,15	2.17	2 (14%)	17,19,21	0.82	1 (5%)
7	BMA	i	3	7	11,11,12	1.86	2 (18%)	15,15,17	1.05	1 (6%)
7	NAG	j	1	7,3	14,14,15	2.05	4 (28%)	17,19,21	1.19	2 (11%)
7	NAG	j	2	7	14,14,15	2.22	3 (21%)	17,19,21	0.82	1 (5%)
7	BMA	j	3	7	11,11,12	1.84	2 (18%)	15,15,17	1.00	1 (6%)
6	NAG	k	1	3,6	14,14,15	2.11	3 (21%)	17,19,21	1.01	1 (5%)
6	NAG	k	2	6	14,14,15	2.22	2 (14%)	17,19,21	0.76	0
6	NAG	l	1	3,6	14,14,15	2.04	3 (21%)	17,19,21	1.35	1 (5%)
6	NAG	l	2	6	14,14,15	2.24	2 (14%)	17,19,21	0.73	0
6	NAG	m	1	3,6	14,14,15	2.01	2 (14%)	17,19,21	1.17	3 (17%)
6	NAG	m	2	6	14,14,15	2.16	2 (14%)	17,19,21	0.78	1 (5%)
10	NAG	n	1	3,10	14,14,15	2.06	2 (14%)	17,19,21	1.00	2 (11%)
10	NAG	n	2	10	14,14,15	2.15	3 (21%)	17,19,21	1.11	2 (11%)
10	BMA	n	3	10	11,11,12	1.91	2 (18%)	15,15,17	1.08	1 (6%)
10	MAN	n	4	10	11,11,12	1.62	2 (18%)	15,15,17	0.99	1 (6%)
10	MAN	n	5	10	11,11,12	1.75	2 (18%)	15,15,17	1.14	1 (6%)
10	MAN	n	6	10	11,11,12	1.84	2 (18%)	15,15,17	1.09	2 (13%)
11	NAG	o	1	3,11	14,14,15	2.09	3 (21%)	17,19,21	0.89	1 (5%)
11	NAG	o	2	11	14,14,15	2.14	4 (28%)	17,19,21	0.92	0
11	BMA	o	3	11	11,11,12	1.88	2 (18%)	15,15,17	0.92	0
11	MAN	o	4	11	11,11,12	1.82	2 (18%)	15,15,17	1.05	1 (6%)
6	NAG	p	1	3,6	14,14,15	2.08	2 (14%)	17,19,21	1.03	2 (11%)
6	NAG	p	2	6	14,14,15	2.15	2 (14%)	17,19,21	0.82	1 (5%)
6	NAG	q	1	3,6	14,14,15	2.06	4 (28%)	17,19,21	0.94	0
6	NAG	q	2	6	14,14,15	2.20	2 (14%)	17,19,21	0.94	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
9	NAG	r	1	3,9	14,14,15	2.08	4 (28%)	17,19,21	0.86	1 (5%)
9	NAG	r	2	9	14,14,15	2.14	4 (28%)	17,19,21	0.87	1 (5%)
9	BMA	r	3	9	11,11,12	1.86	2 (18%)	15,15,17	1.01	1 (6%)
9	MAN	r	4	9	11,11,12	1.83	3 (27%)	15,15,17	1.22	2 (13%)
7	NAG	s	1	7,3	14,14,15	2.01	4 (28%)	17,19,21	1.41	3 (17%)
7	NAG	s	2	7	14,14,15	2.14	3 (21%)	17,19,21	0.90	0
7	BMA	s	3	7	11,11,12	1.84	2 (18%)	15,15,17	0.94	1 (6%)
7	NAG	t	1	7,3	14,14,15	2.07	3 (21%)	17,19,21	0.77	1 (5%)
7	NAG	t	2	7	14,14,15	2.13	3 (21%)	17,19,21	0.87	1 (5%)
7	BMA	t	3	7	11,11,12	1.84	2 (18%)	15,15,17	1.01	1 (6%)
7	NAG	u	1	7,3	14,14,15	2.01	2 (14%)	17,19,21	1.05	1 (5%)
7	NAG	u	2	7	14,14,15	2.16	2 (14%)	17,19,21	0.84	0
7	BMA	u	3	7	11,11,12	1.83	2 (18%)	15,15,17	0.94	1 (6%)
6	NAG	v	1	3,6	14,14,15	2.15	3 (21%)	17,19,21	1.14	3 (17%)
6	NAG	v	2	6	14,14,15	2.21	2 (14%)	17,19,21	0.94	1 (5%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	P	1	3,6	-	4/6/23/26	0/1/1/1
6	NAG	P	2	6	-	2/6/23/26	0/1/1/1
7	NAG	Q	1	7,3	-	0/6/23/26	0/1/1/1
7	NAG	Q	2	7	-	0/6/23/26	0/1/1/1
7	BMA	Q	3	7	-	1/2/19/22	0/1/1/1
8	NAG	R	1	3,8	-	1/6/23/26	0/1/1/1
8	NAG	R	2	8	-	1/6/23/26	0/1/1/1
8	BMA	R	3	8	-	0/2/19/22	0/1/1/1
8	MAN	R	4	8	-	1/2/19/22	0/1/1/1
8	MAN	R	5	8	-	1/2/19/22	0/1/1/1
8	MAN	R	6	8	-	1/2/19/22	0/1/1/1
8	MAN	R	7	8	-	1/2/19/22	0/1/1/1
7	NAG	S	1	7,3	-	0/6/23/26	0/1/1/1
7	NAG	S	2	7	-	1/6/23/26	0/1/1/1
7	BMA	S	3	7	-	1/2/19/22	0/1/1/1
6	NAG	T	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	T	2	6	-	1/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	U	1	3,6	-	1/6/23/26	0/1/1/1
6	NAG	U	2	6	-	1/6/23/26	0/1/1/1
9	NAG	V	1	3,9	-	2/6/23/26	0/1/1/1
9	NAG	V	2	9	-	0/6/23/26	0/1/1/1
9	BMA	V	3	9	-	2/2/19/22	0/1/1/1
9	MAN	V	4	9	-	1/2/19/22	0/1/1/1
6	NAG	W	1	3,6	-	2/6/23/26	0/1/1/1
6	NAG	W	2	6	-	2/6/23/26	0/1/1/1
7	NAG	X	1	7,3	-	1/6/23/26	0/1/1/1
7	NAG	X	2	7	-	1/6/23/26	0/1/1/1
7	BMA	X	3	7	-	1/2/19/22	0/1/1/1
7	NAG	Y	1	7,3	-	0/6/23/26	0/1/1/1
7	NAG	Y	2	7	-	1/6/23/26	0/1/1/1
7	BMA	Y	3	7	-	2/2/19/22	0/1/1/1
6	NAG	Z	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	Z	2	6	-	1/6/23/26	0/1/1/1
6	NAG	a	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	a	2	6	-	2/6/23/26	0/1/1/1
6	NAG	b	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	b	2	6	-	2/6/23/26	0/1/1/1
8	NAG	c	1	3,8	-	2/6/23/26	0/1/1/1
8	NAG	c	2	8	-	2/6/23/26	0/1/1/1
8	BMA	c	3	8	-	0/2/19/22	0/1/1/1
8	MAN	c	4	8	-	1/2/19/22	0/1/1/1
8	MAN	c	5	8	-	1/2/19/22	0/1/1/1
8	MAN	c	6	8	-	1/2/19/22	0/1/1/1
8	MAN	c	7	8	-	1/2/19/22	0/1/1/1
7	NAG	d	1	7,3	-	0/6/23/26	0/1/1/1
7	NAG	d	2	7	-	0/6/23/26	0/1/1/1
7	BMA	d	3	7	-	2/2/19/22	0/1/1/1
6	NAG	e	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	e	2	6	-	2/6/23/26	0/1/1/1
6	NAG	f	1	3,6	-	1/6/23/26	0/1/1/1
6	NAG	f	2	6	-	1/6/23/26	0/1/1/1
9	NAG	g	1	3,9	-	0/6/23/26	0/1/1/1
9	NAG	g	2	9	-	1/6/23/26	0/1/1/1
9	BMA	g	3	9	-	1/2/19/22	0/1/1/1
9	MAN	g	4	9	-	1/2/19/22	0/1/1/1
6	NAG	h	1	3,6	-	1/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	h	2	6	-	2/6/23/26	0/1/1/1
7	NAG	i	1	7,3	-	1/6/23/26	0/1/1/1
7	NAG	i	2	7	-	0/6/23/26	0/1/1/1
7	BMA	i	3	7	-	2/2/19/22	0/1/1/1
7	NAG	j	1	7,3	-	0/6/23/26	0/1/1/1
7	NAG	j	2	7	-	1/6/23/26	0/1/1/1
7	BMA	j	3	7	-	2/2/19/22	0/1/1/1
6	NAG	k	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	k	2	6	-	1/6/23/26	0/1/1/1
6	NAG	l	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	l	2	6	-	2/6/23/26	0/1/1/1
6	NAG	m	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	m	2	6	-	2/6/23/26	0/1/1/1
10	NAG	n	1	3,10	-	2/6/23/26	0/1/1/1
10	NAG	n	2	10	-	2/6/23/26	0/1/1/1
10	BMA	n	3	10	-	1/2/19/22	0/1/1/1
10	MAN	n	4	10	-	1/2/19/22	0/1/1/1
10	MAN	n	5	10	-	2/2/19/22	0/1/1/1
10	MAN	n	6	10	-	1/2/19/22	0/1/1/1
11	NAG	o	1	3,11	-	0/6/23/26	0/1/1/1
11	NAG	o	2	11	-	0/6/23/26	0/1/1/1
11	BMA	o	3	11	-	2/2/19/22	0/1/1/1
11	MAN	o	4	11	-	2/2/19/22	0/1/1/1
6	NAG	p	1	3,6	-	1/6/23/26	0/1/1/1
6	NAG	p	2	6	-	2/6/23/26	0/1/1/1
6	NAG	q	1	3,6	-	2/6/23/26	0/1/1/1
6	NAG	q	2	6	-	2/6/23/26	0/1/1/1
9	NAG	r	1	3,9	-	2/6/23/26	0/1/1/1
9	NAG	r	2	9	-	0/6/23/26	0/1/1/1
9	BMA	r	3	9	-	1/2/19/22	0/1/1/1
9	MAN	r	4	9	-	2/2/19/22	0/1/1/1
7	NAG	s	1	7,3	-	1/6/23/26	0/1/1/1
7	NAG	s	2	7	-	1/6/23/26	0/1/1/1
7	BMA	s	3	7	-	1/2/19/22	0/1/1/1
7	NAG	t	1	7,3	-	0/6/23/26	0/1/1/1
7	NAG	t	2	7	-	0/6/23/26	0/1/1/1
7	BMA	t	3	7	-	2/2/19/22	0/1/1/1
7	NAG	u	1	7,3	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	NAG	u	2	7	-	0/6/23/26	0/1/1/1
7	BMA	u	3	7	-	1/2/19/22	0/1/1/1
6	NAG	v	1	3,6	-	1/6/23/26	0/1/1/1
6	NAG	v	2	6	-	2/6/23/26	0/1/1/1

The worst 5 of 249 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	Z	2	NAG	O5-C1	7.22	1.55	1.43
7	j	2	NAG	O5-C1	7.20	1.55	1.43
6	k	2	NAG	O5-C1	7.20	1.55	1.43
6	W	2	NAG	O5-C1	7.19	1.55	1.43
6	b	2	NAG	O5-C1	7.17	1.55	1.43

The worst 5 of 146 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	P	1	NAG	C1-O5-C5	-3.80	107.04	112.19
6	W	1	NAG	O5-C5-C6	-3.77	101.29	107.20
6	b	1	NAG	C3-C4-C5	-3.73	103.58	110.24
6	b	1	NAG	O5-C5-C6	-3.54	101.65	107.20
7	S	1	NAG	O5-C5-C6	-3.54	101.65	107.20

There are no chirality outliers.

5 of 103 torsion outliers are listed below:

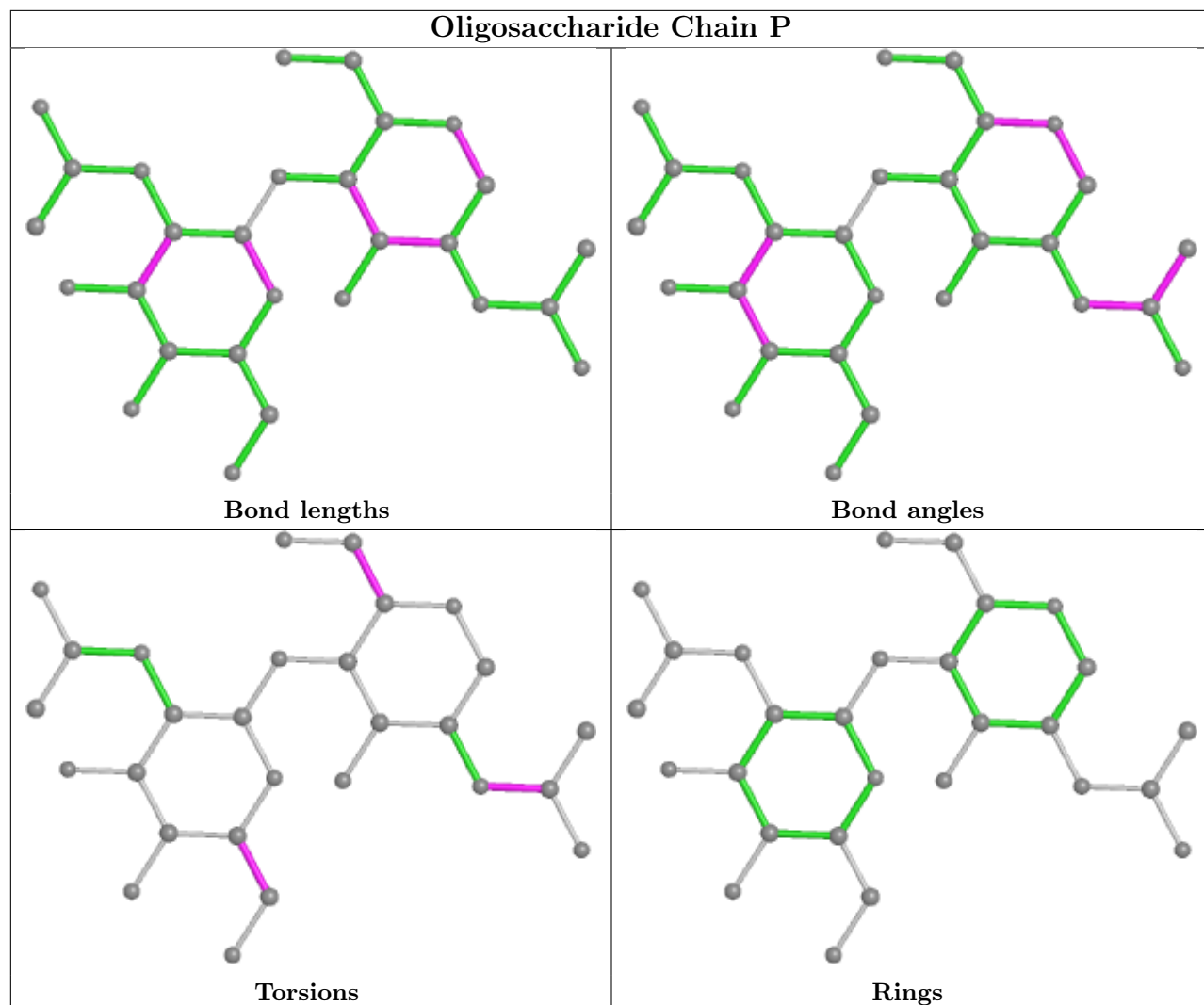
Mol	Chain	Res	Type	Atoms
11	o	3	BMA	O5-C5-C6-O6
7	i	3	BMA	O5-C5-C6-O6
6	v	2	NAG	O5-C5-C6-O6
6	a	2	NAG	O5-C5-C6-O6
6	h	2	NAG	O5-C5-C6-O6

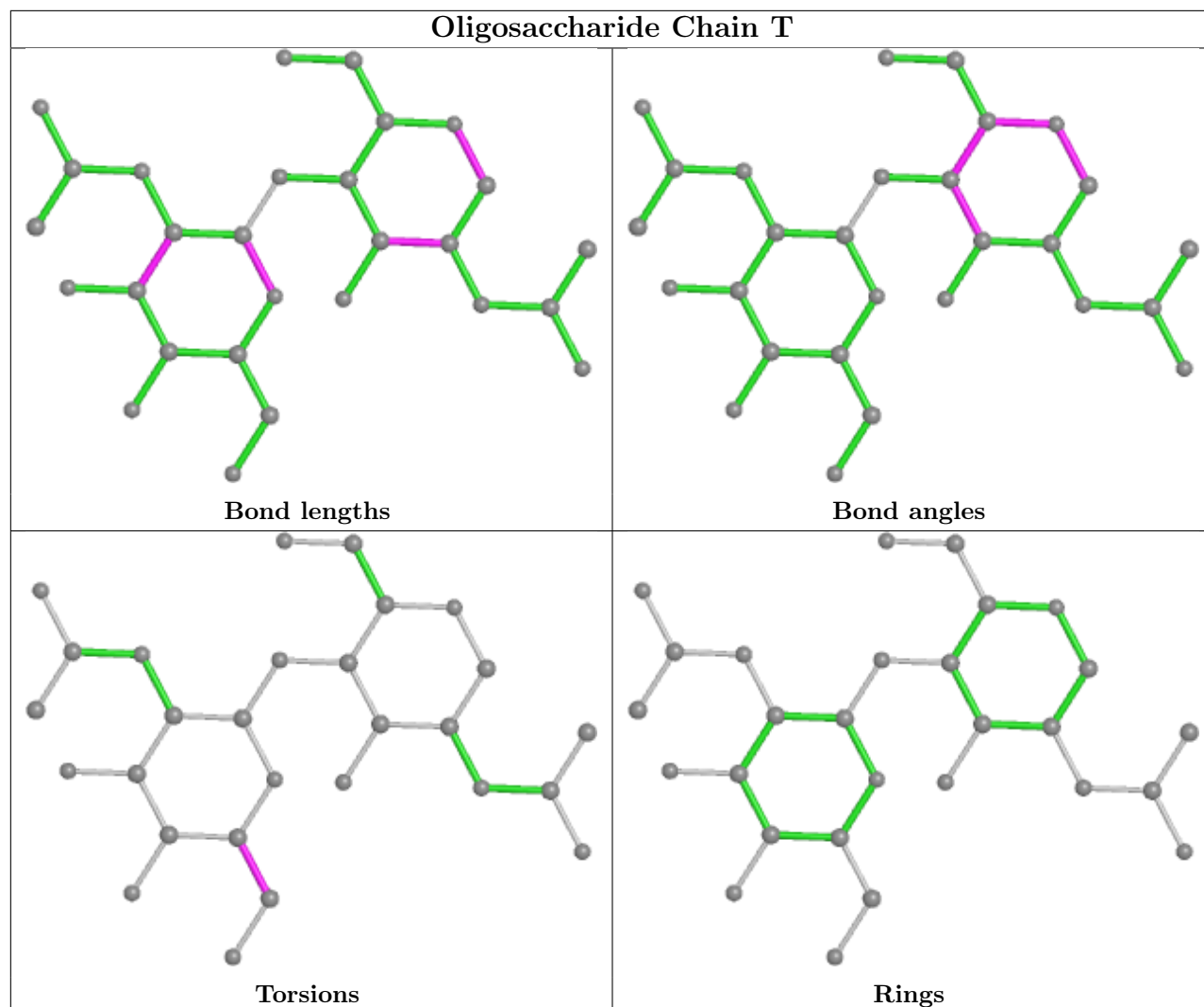
There are no ring outliers.

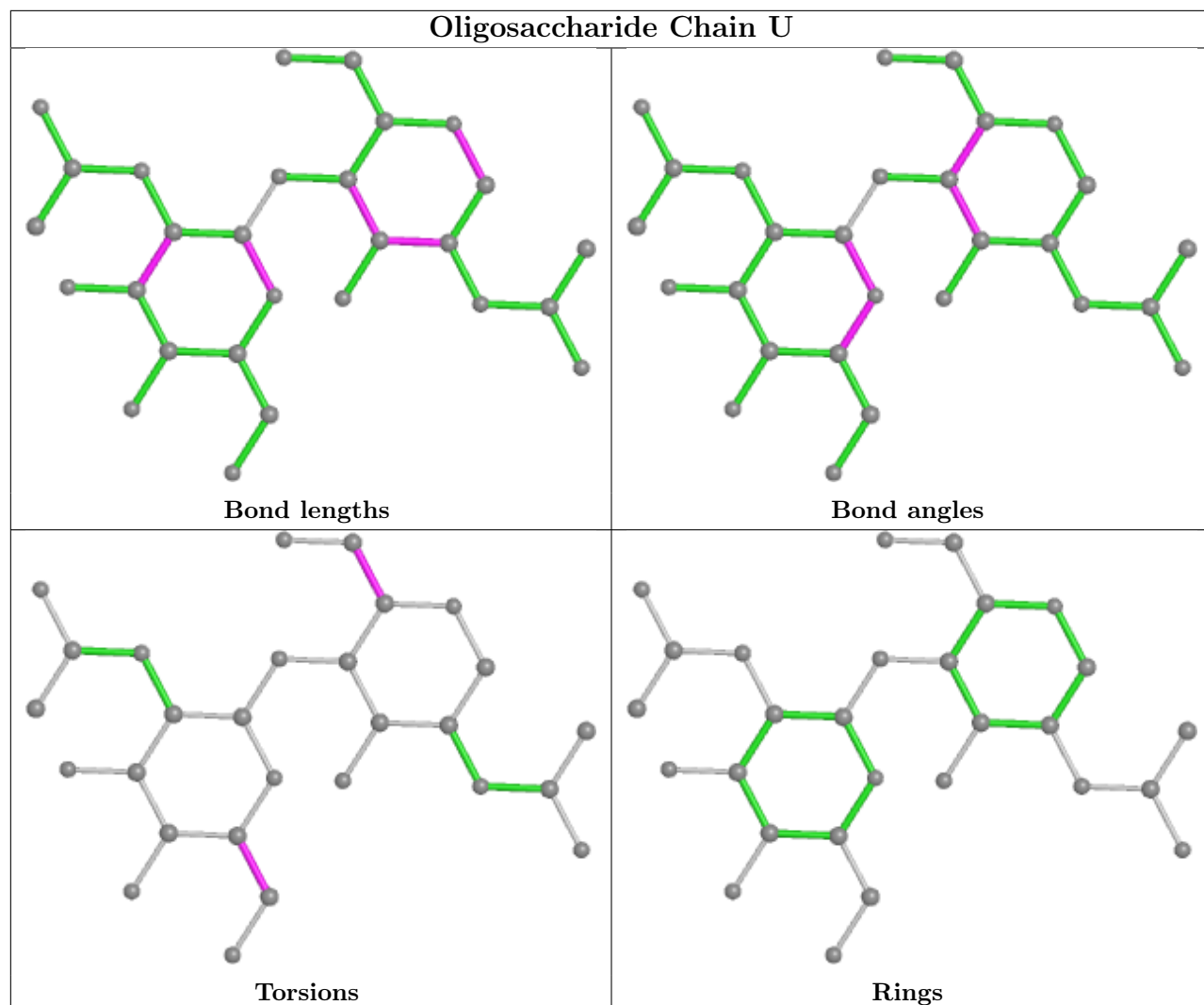
No monomer is involved in short contacts.

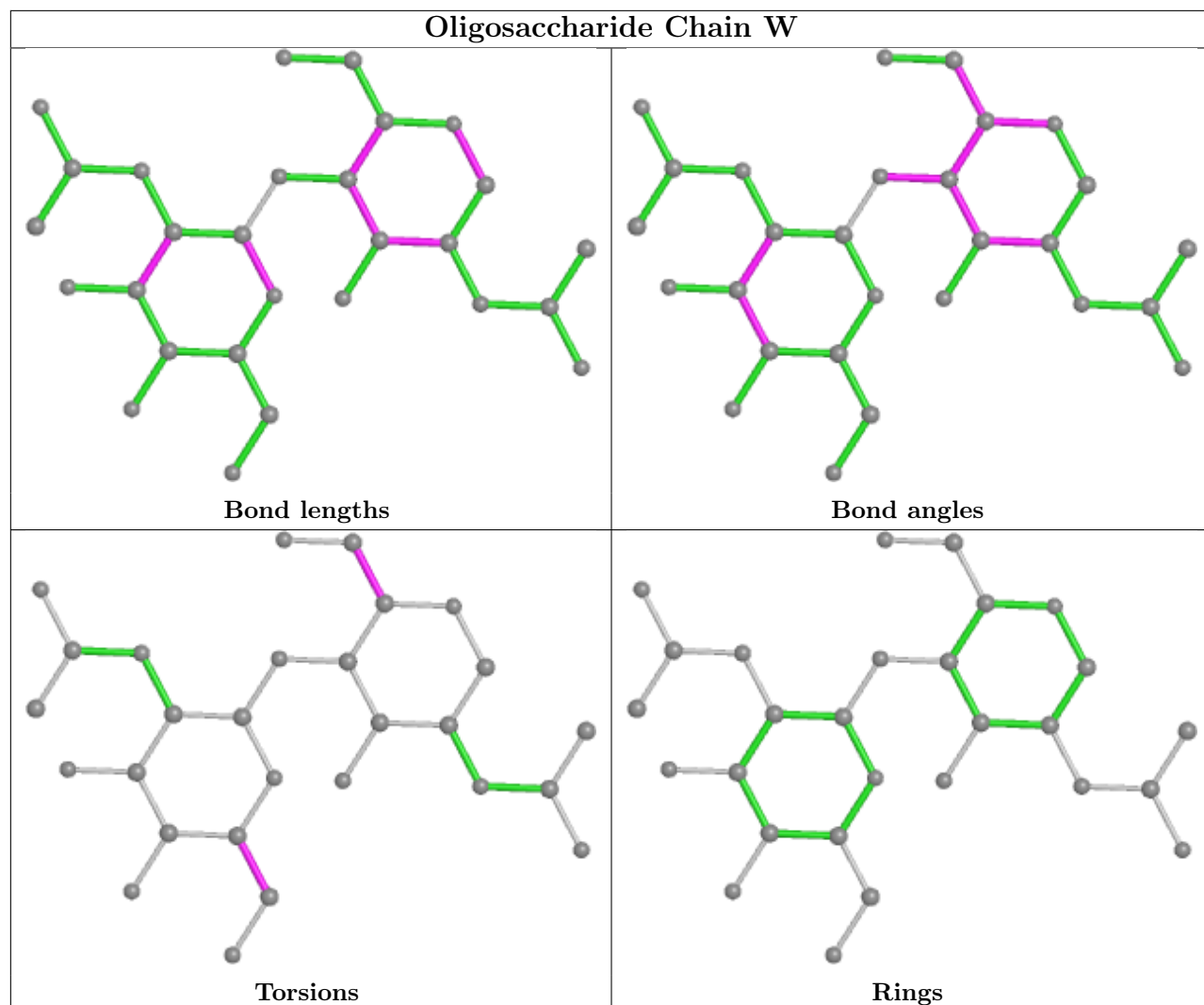
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

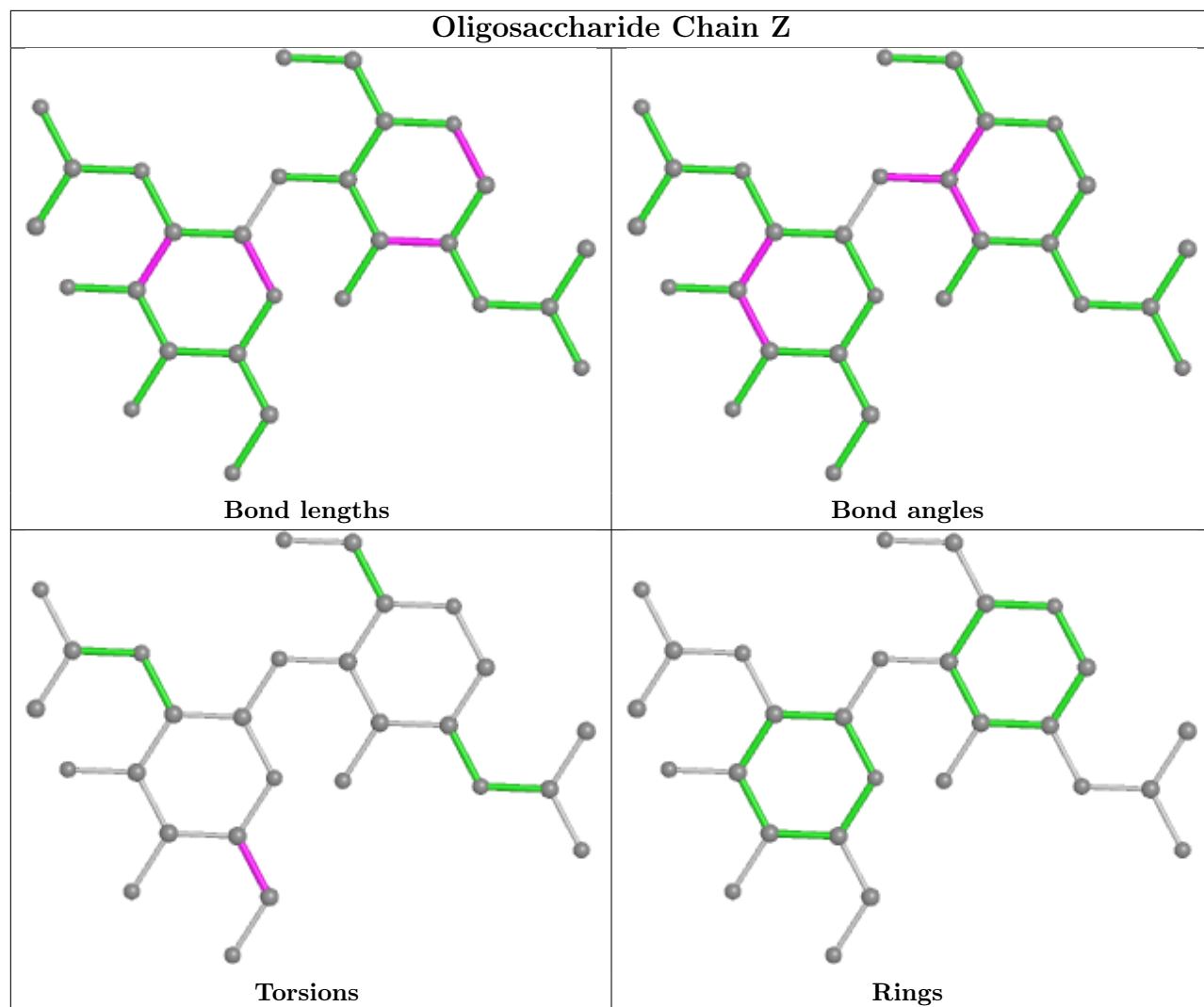


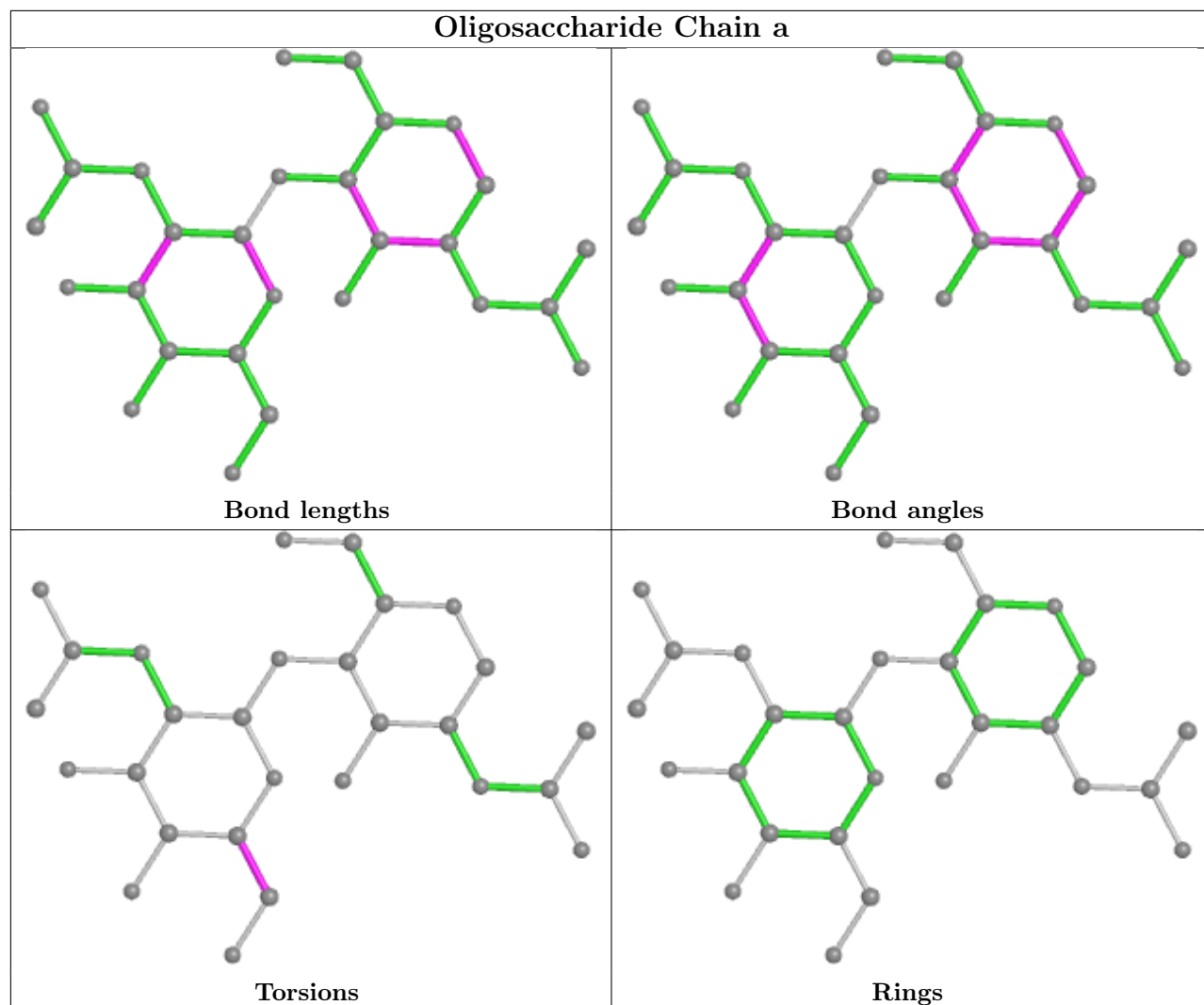


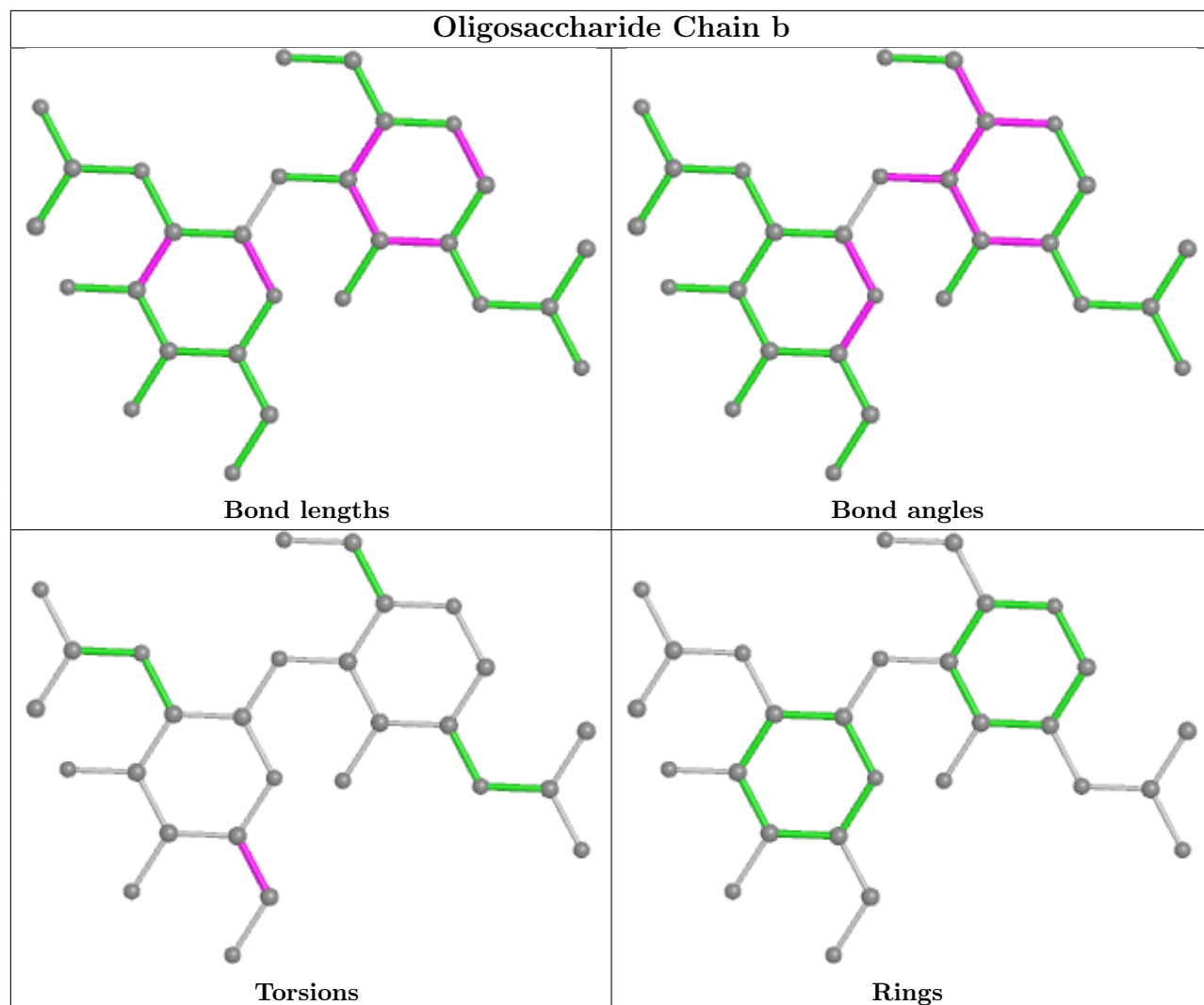


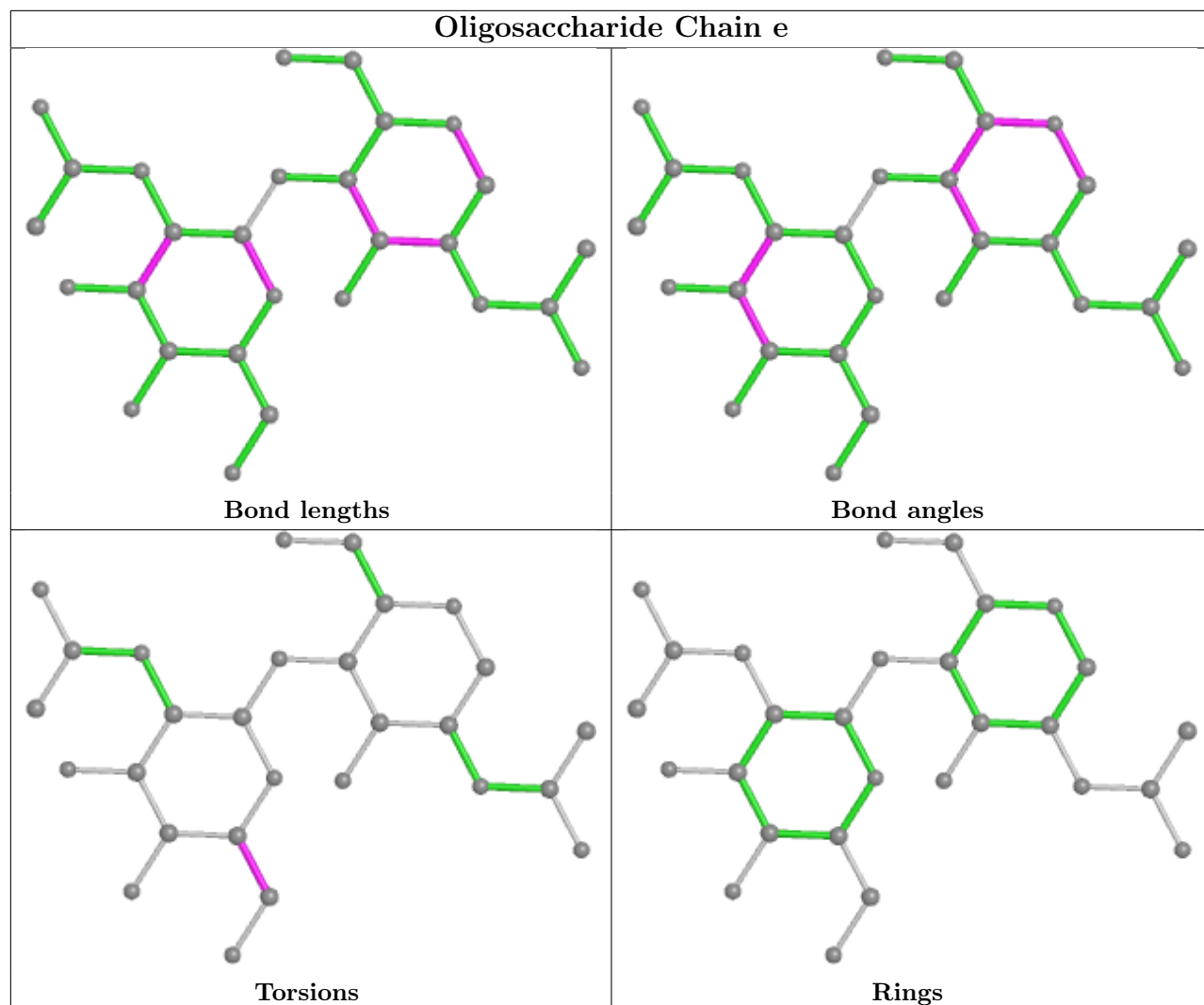




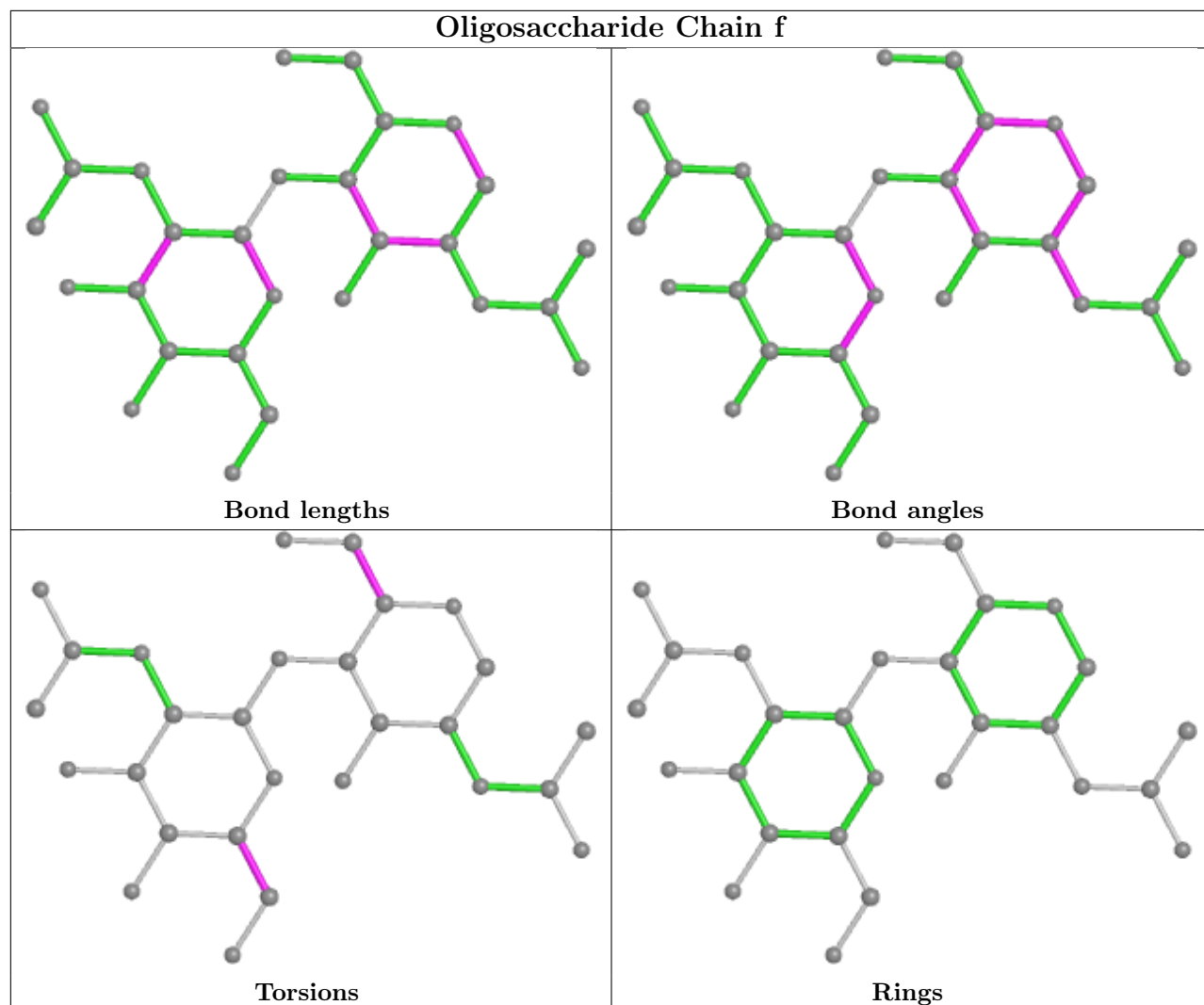


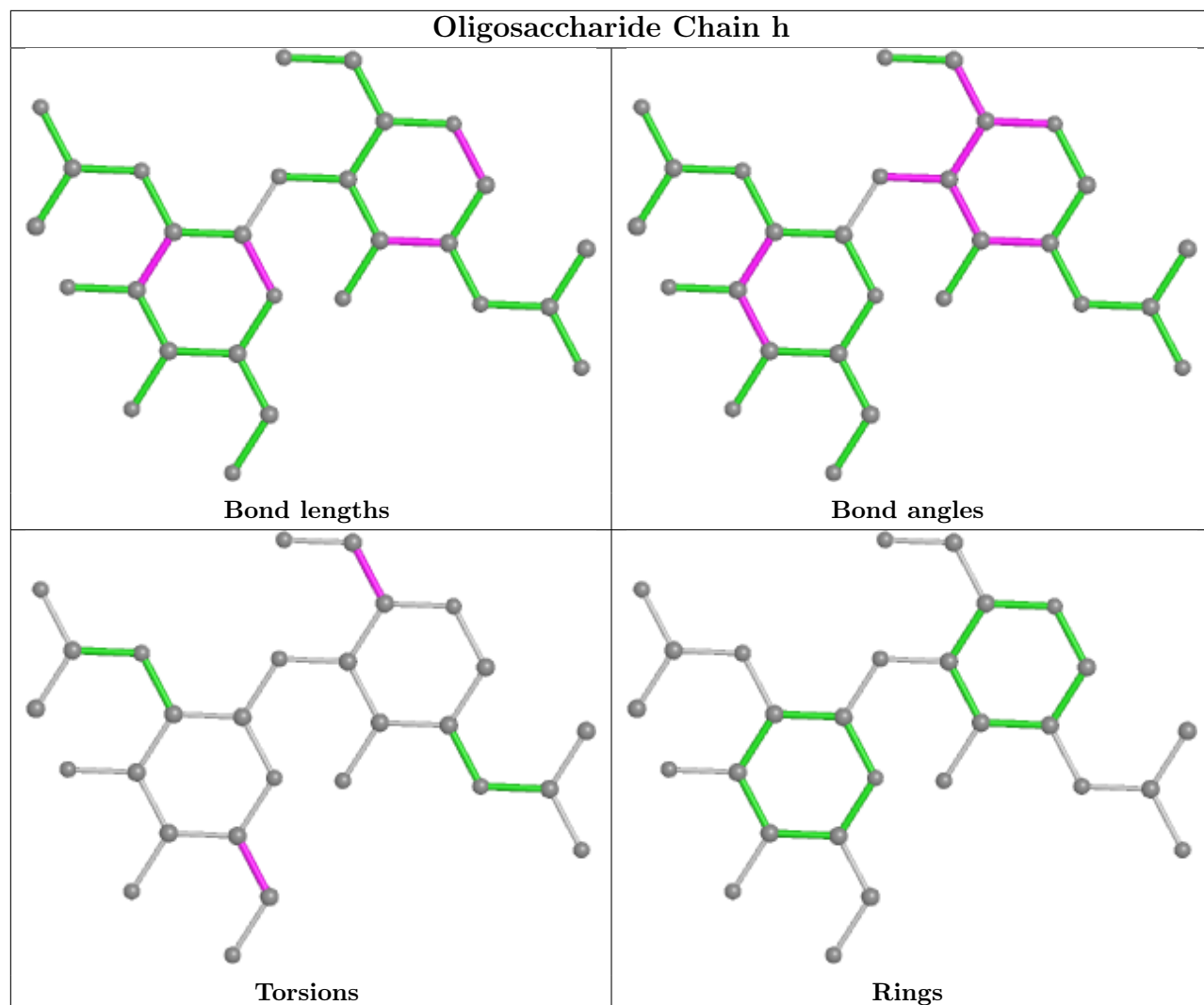


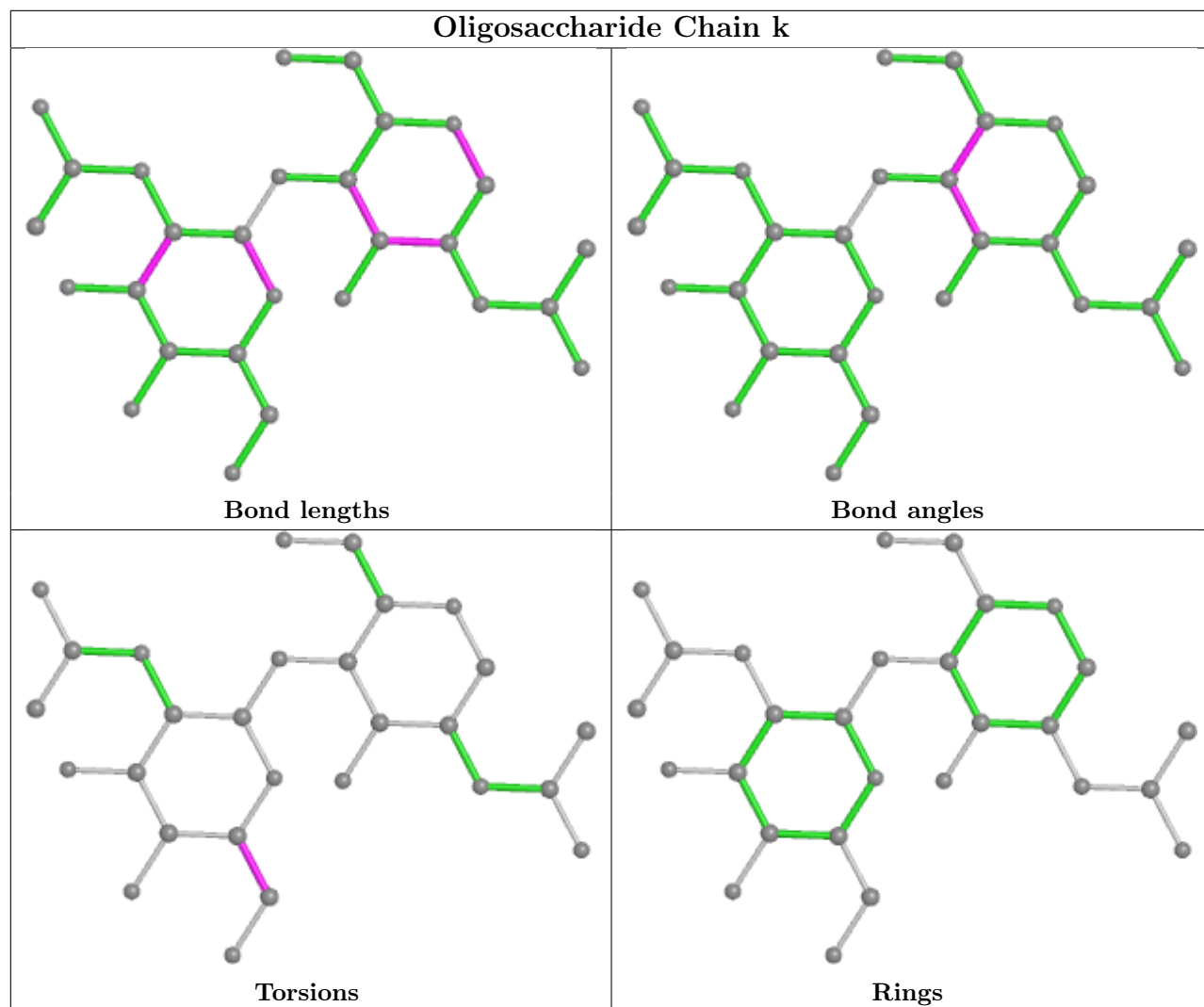


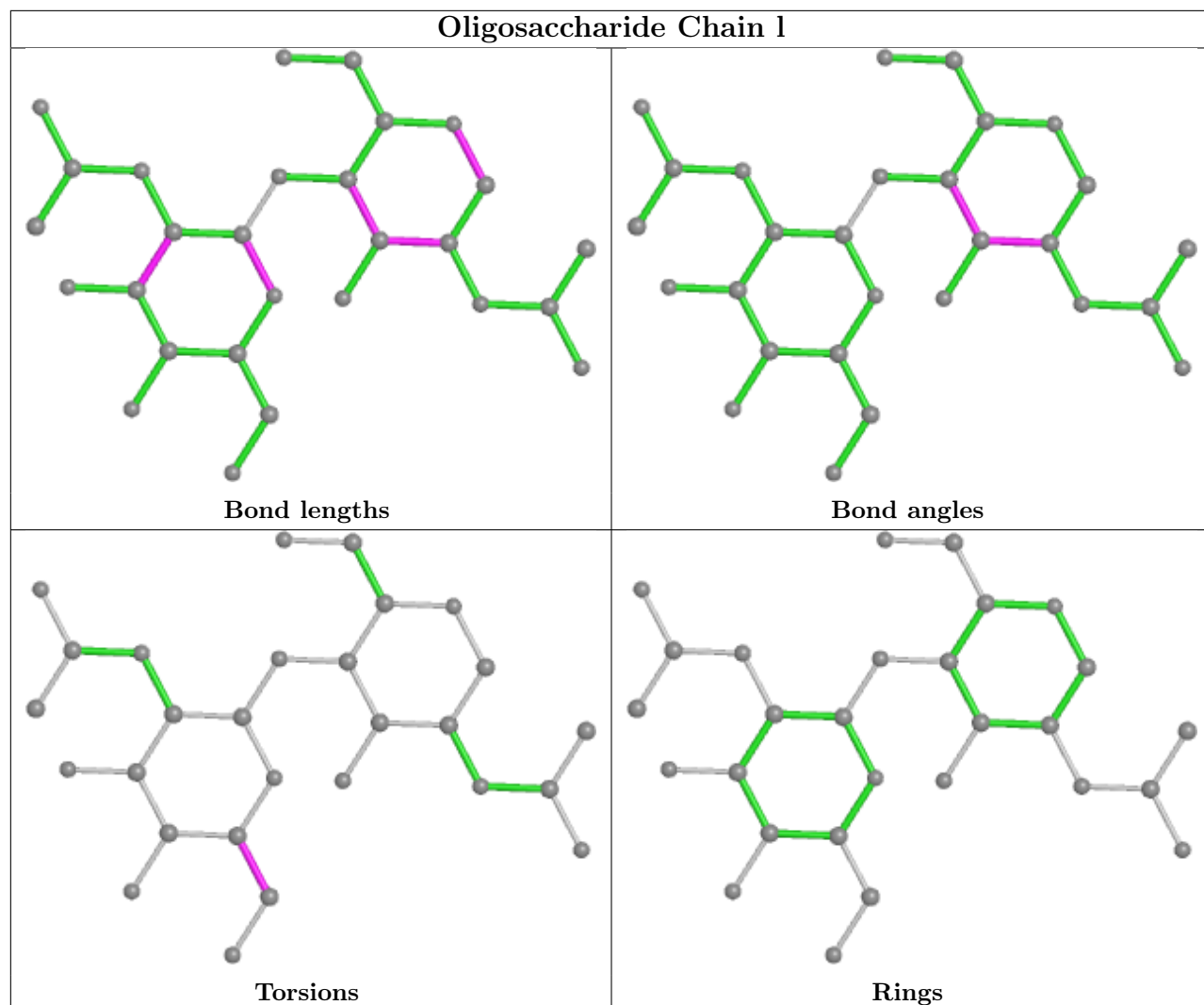


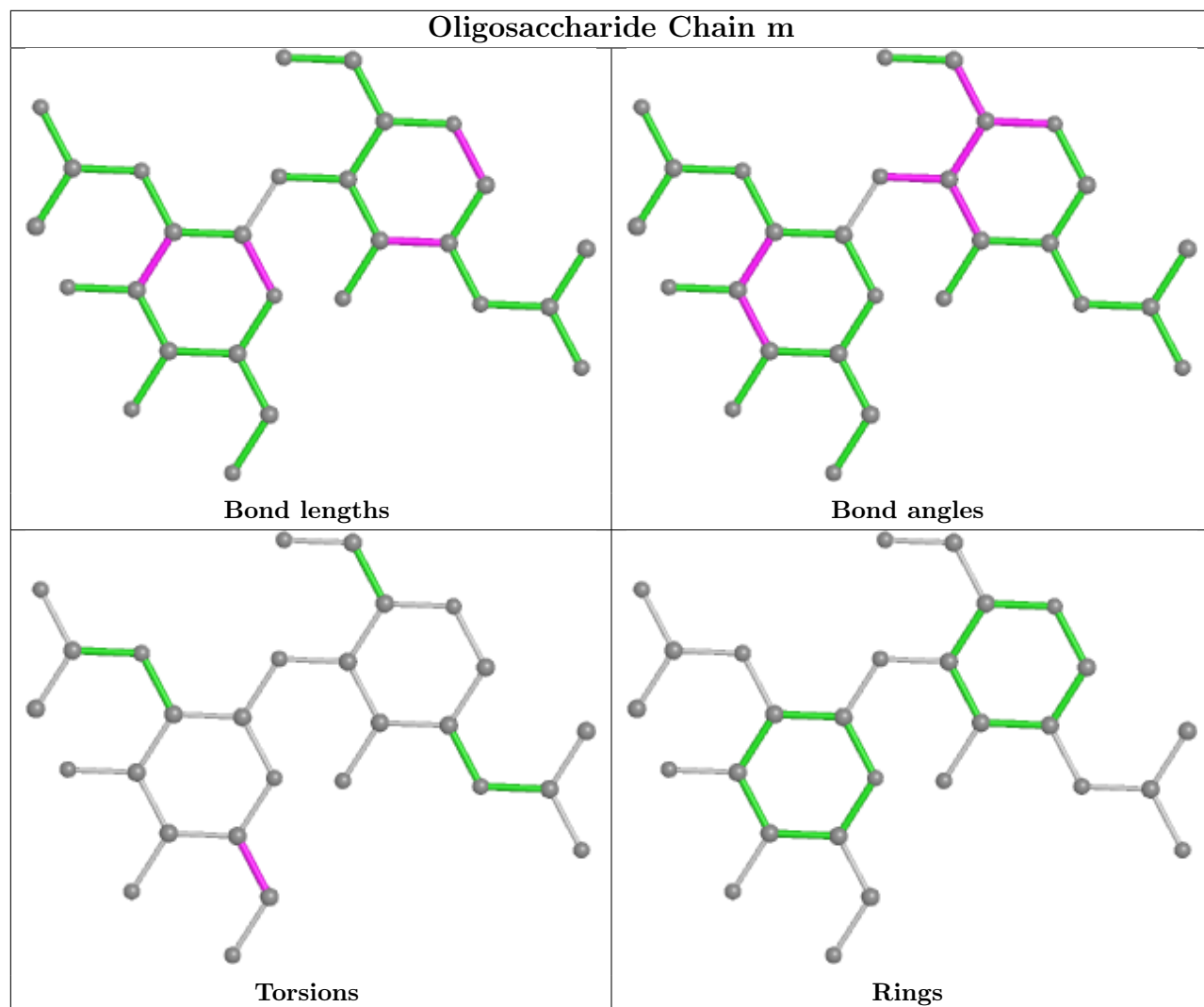


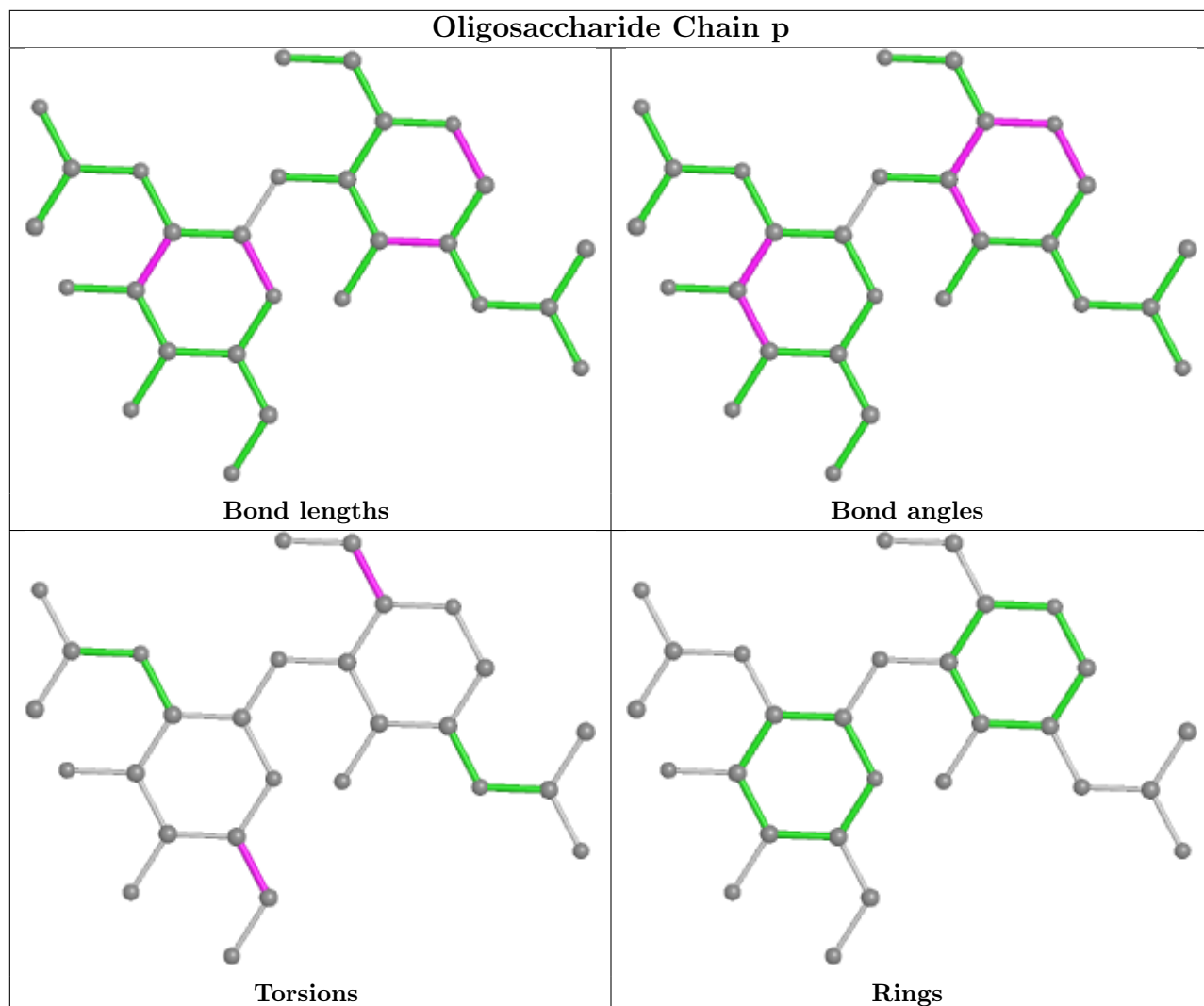


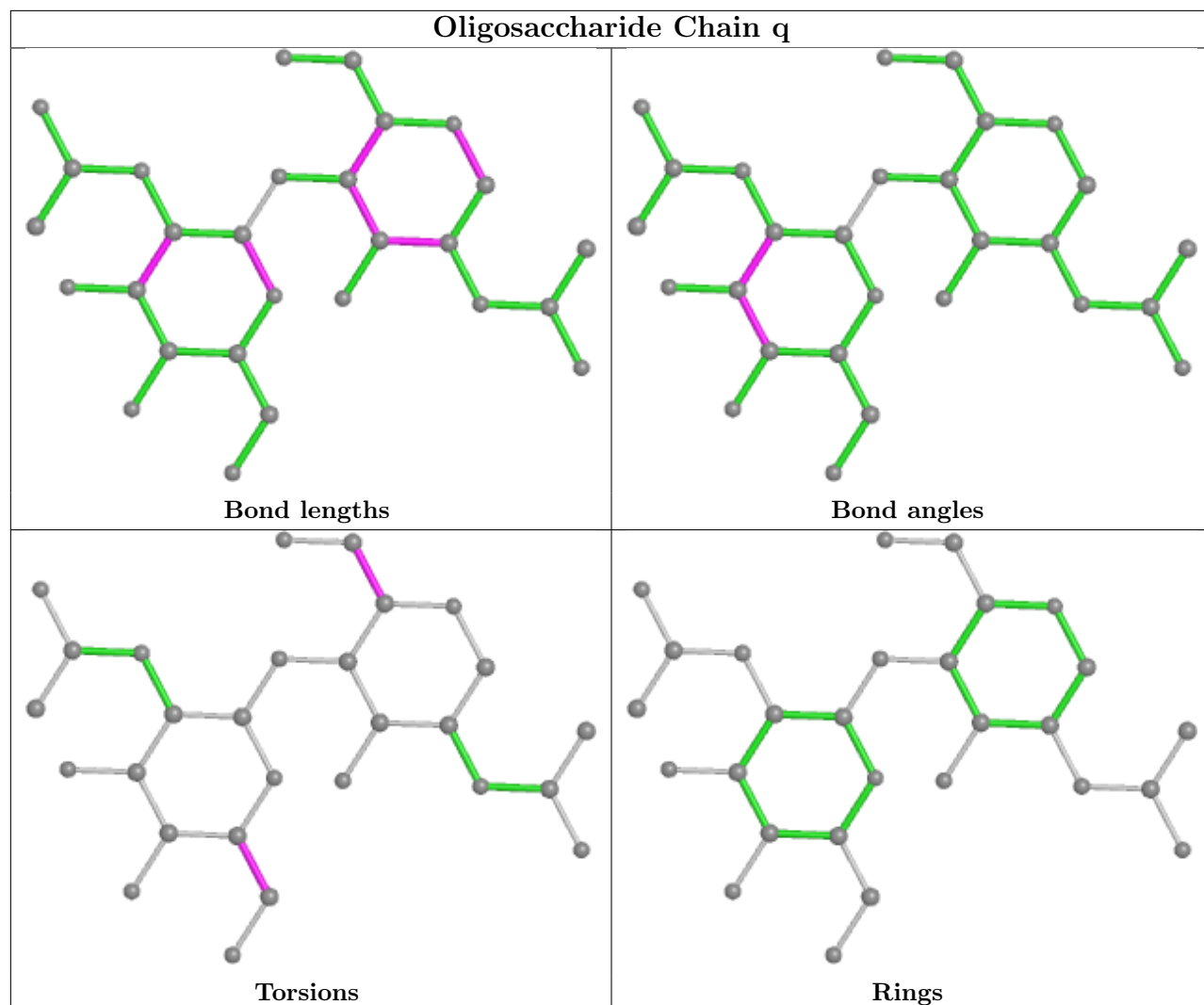


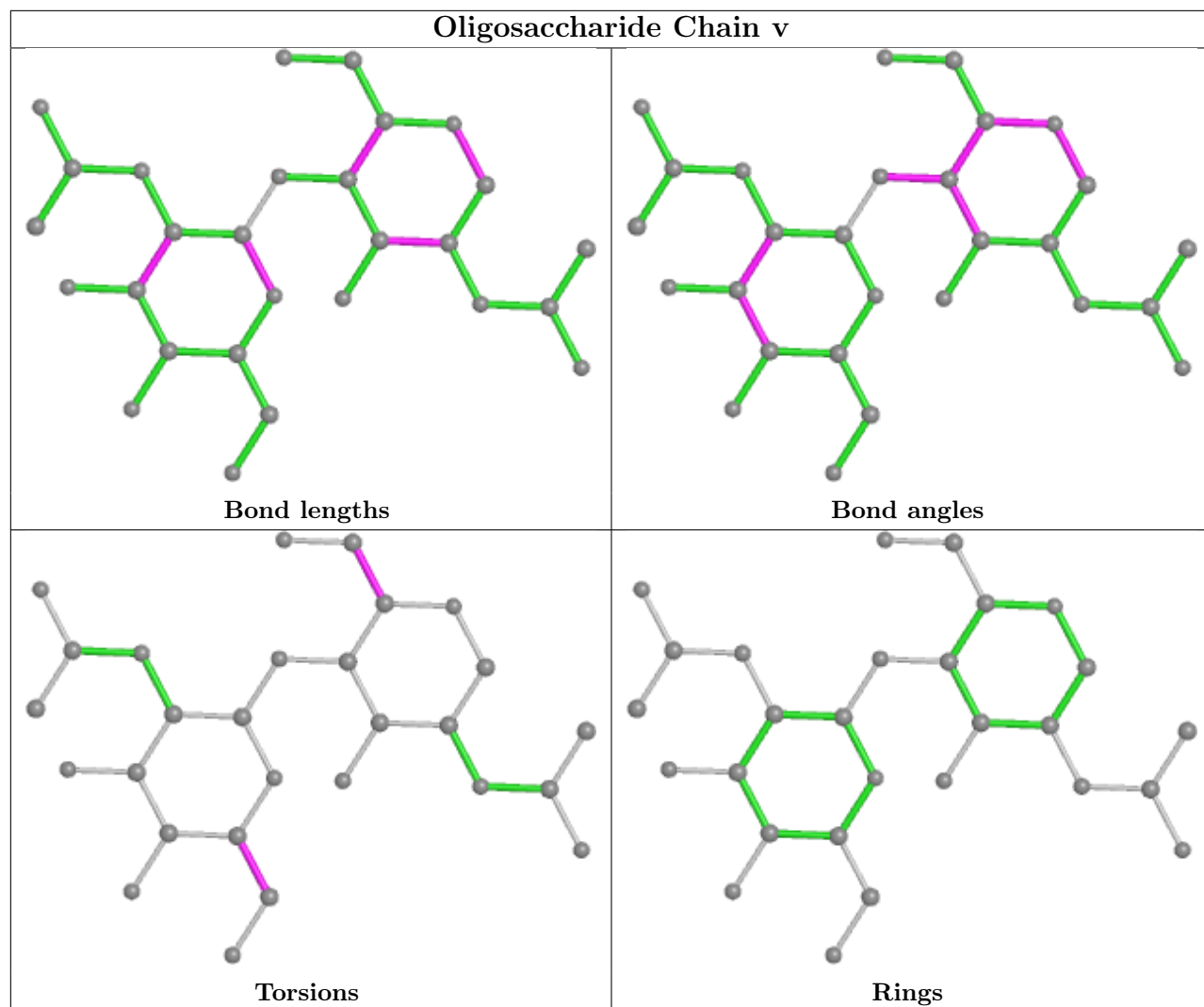




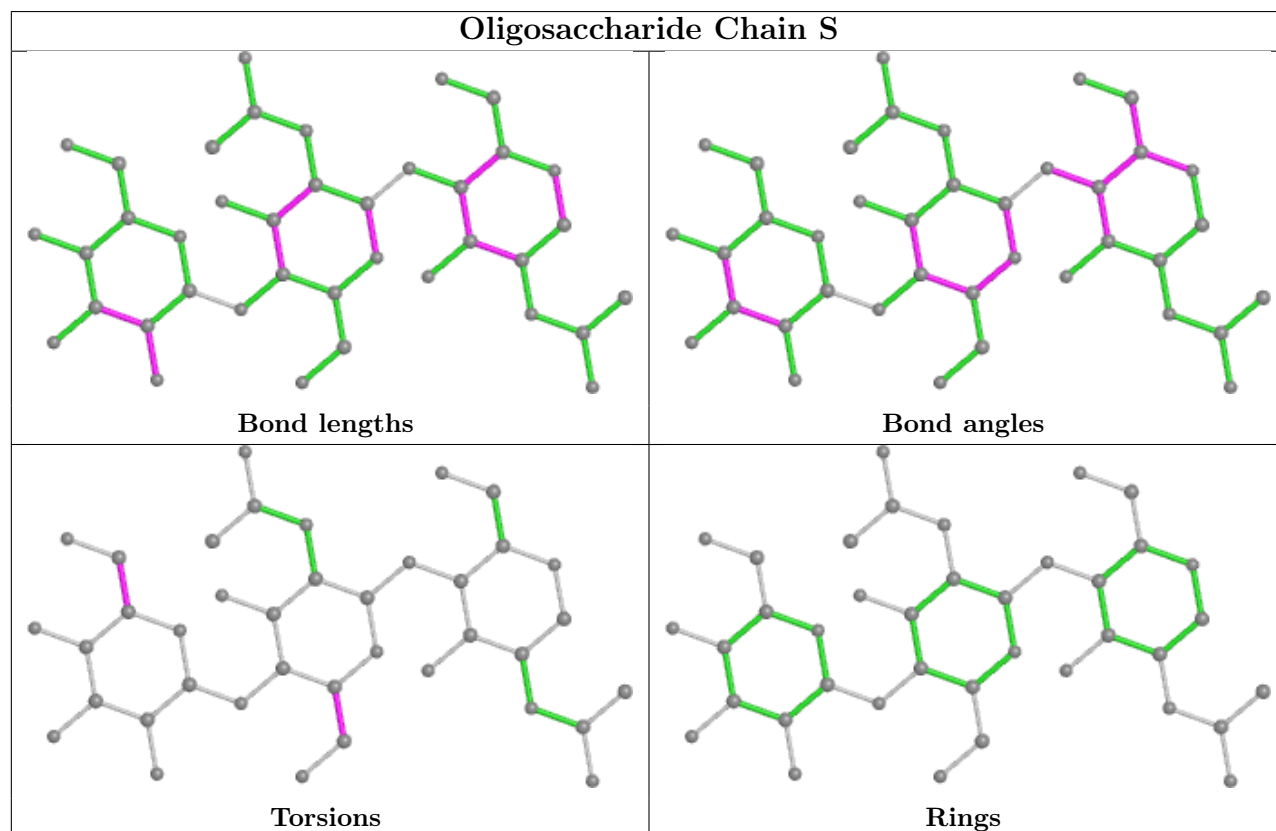
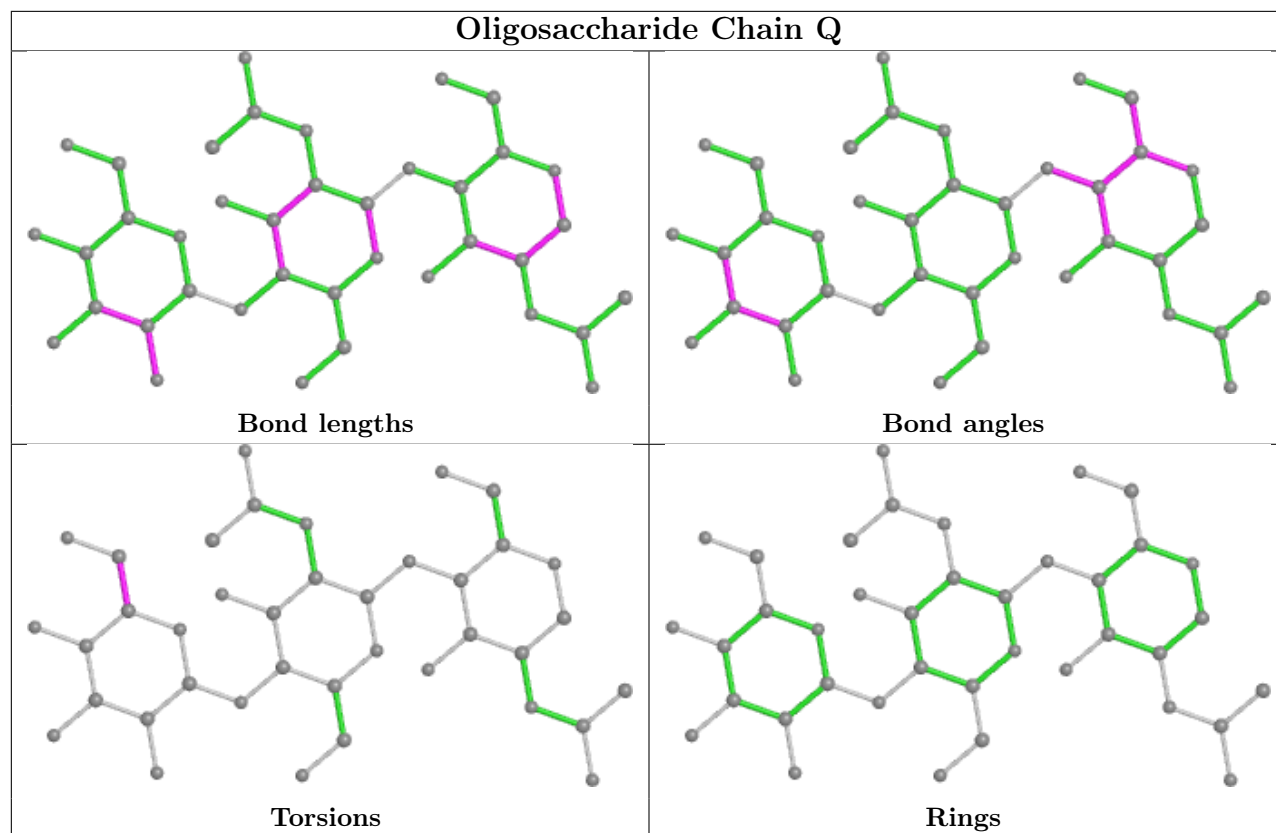


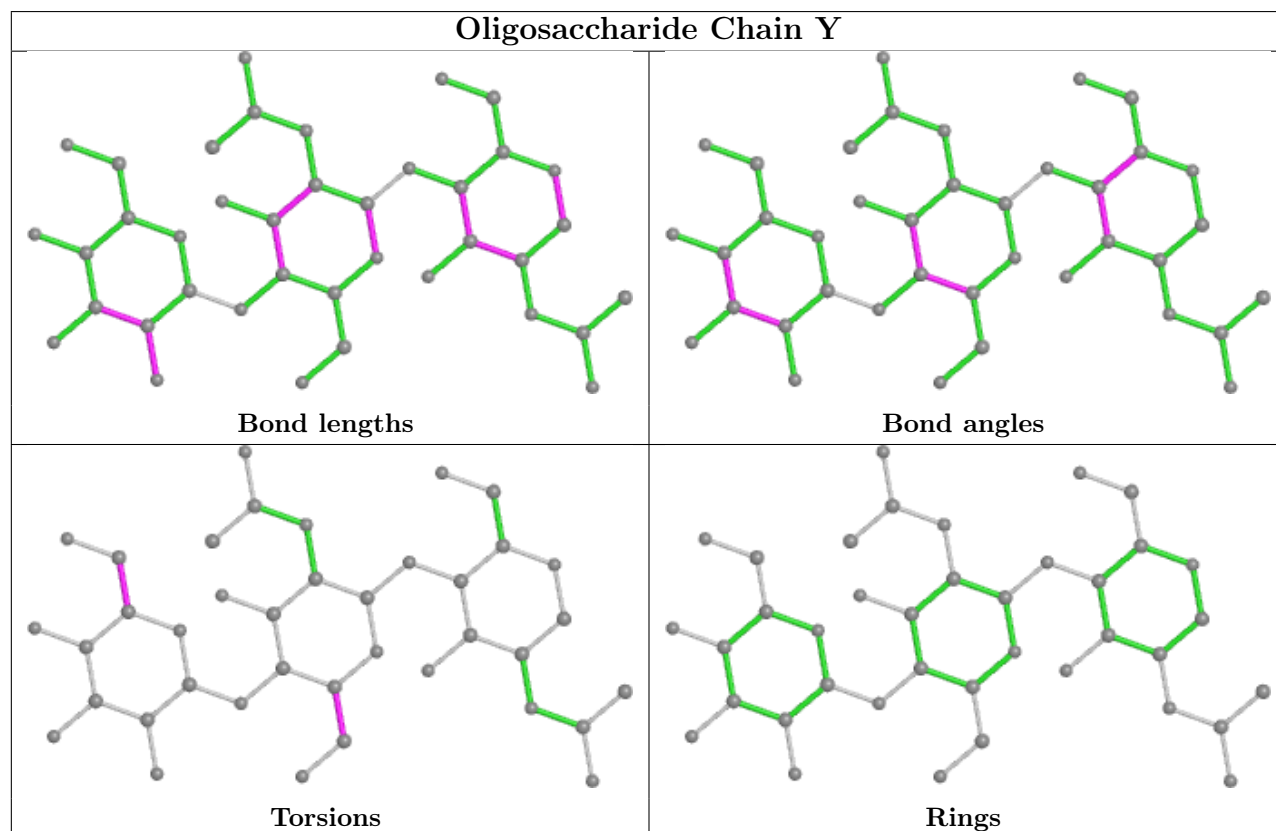
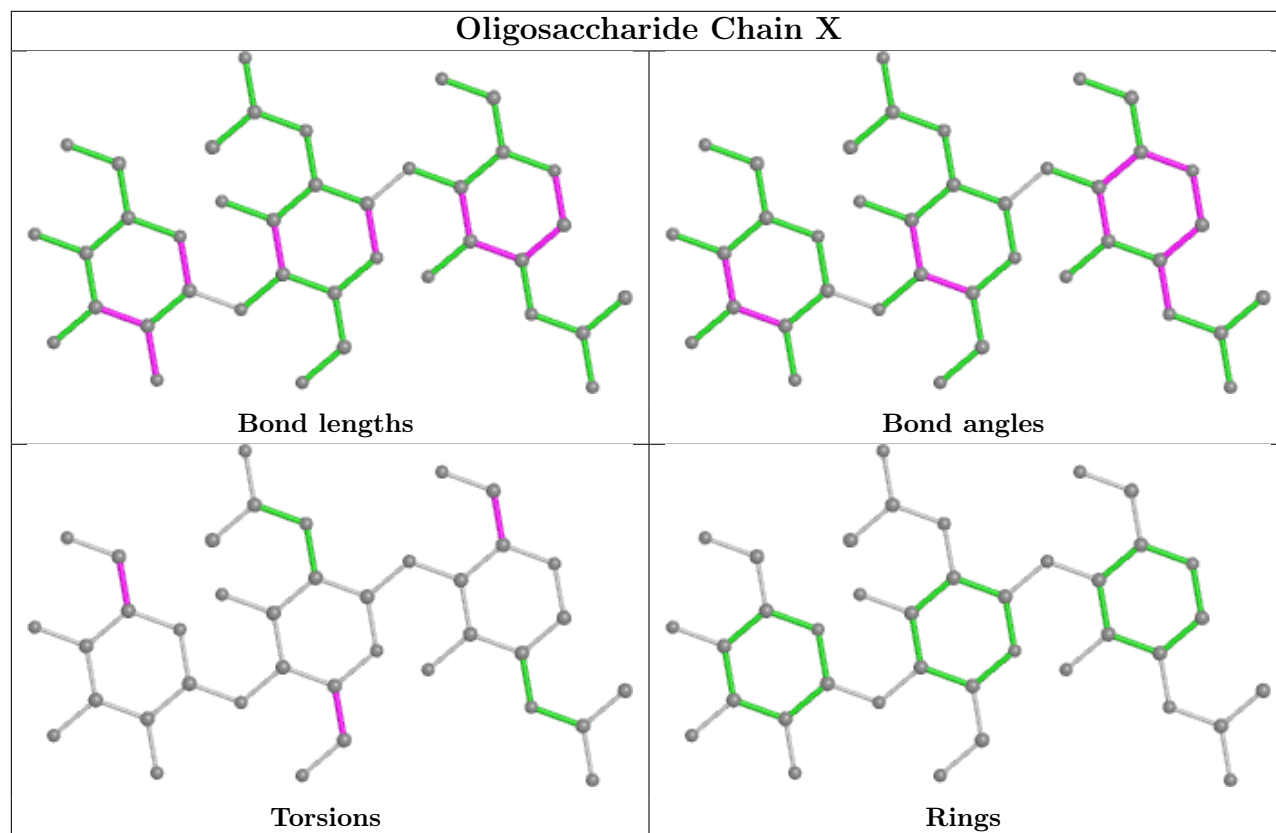


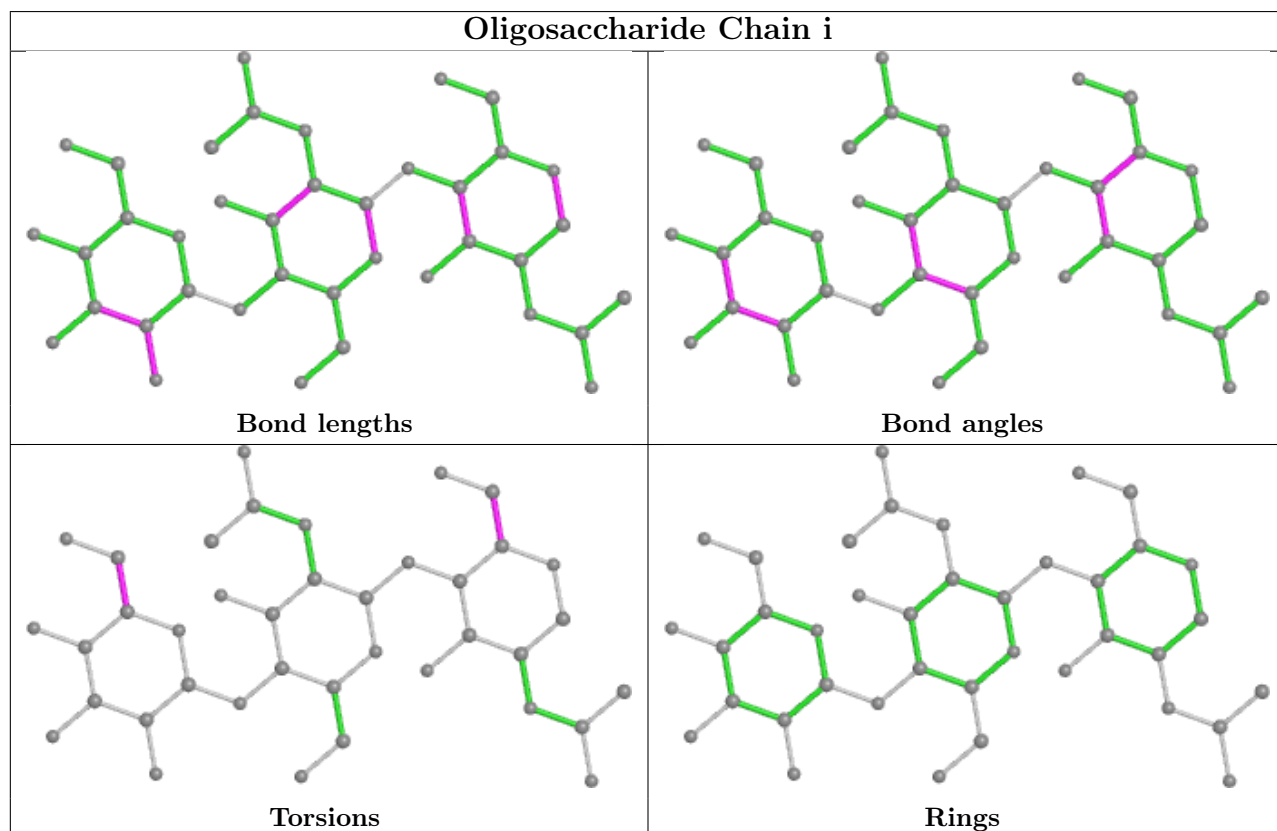
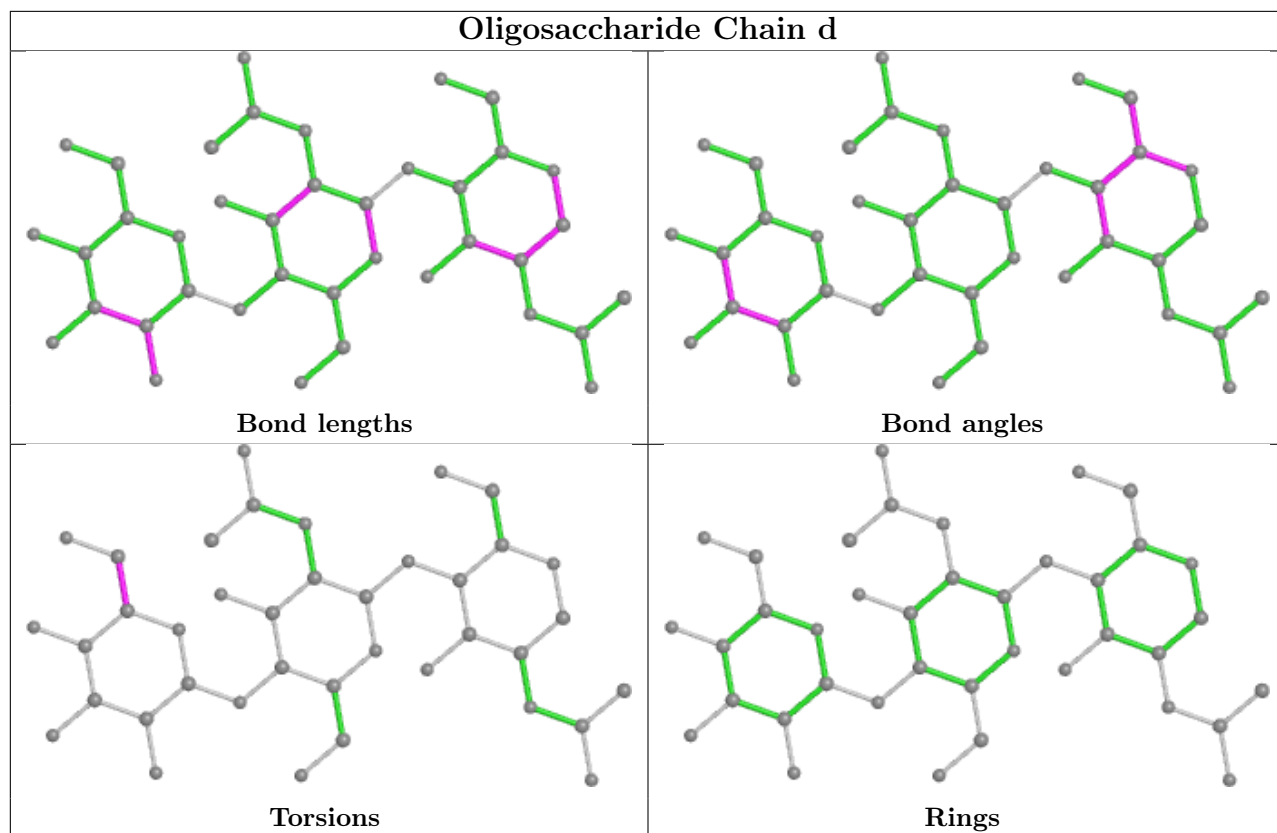


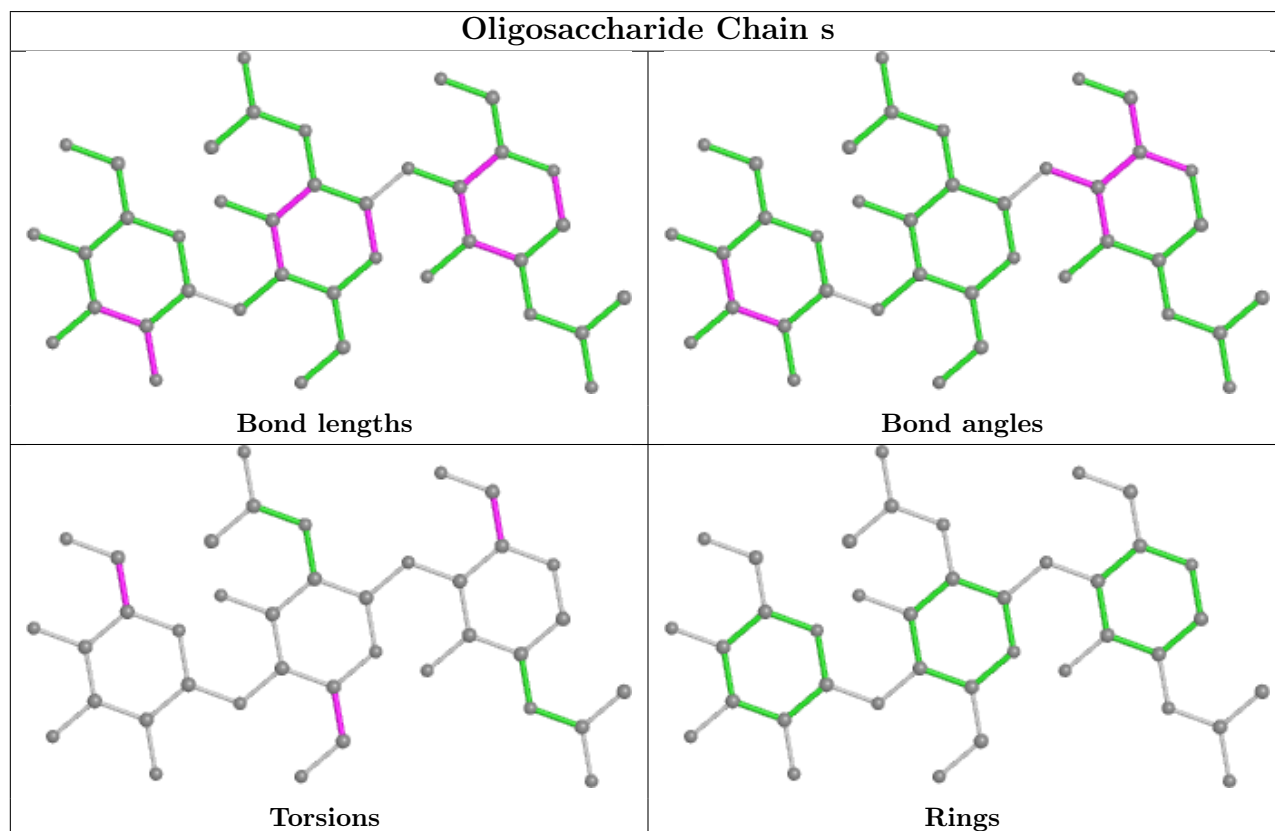
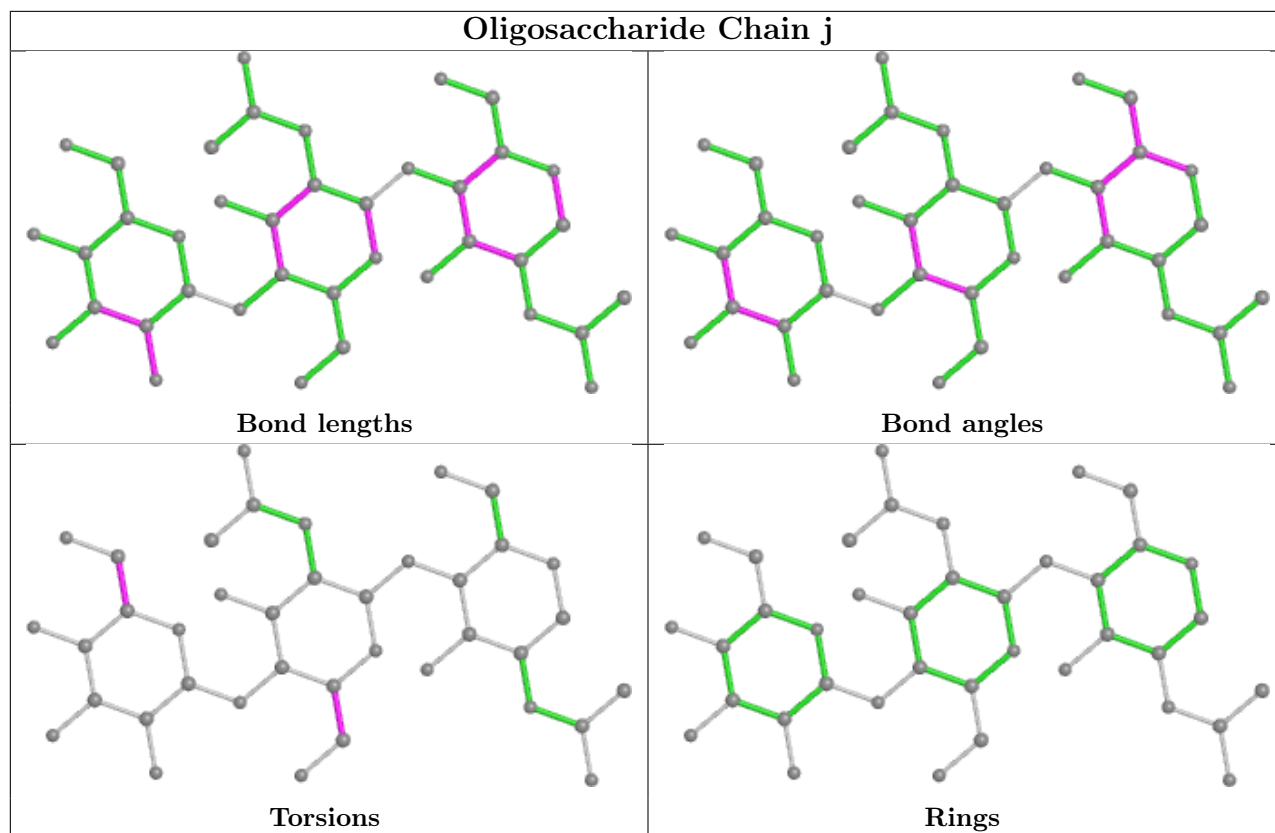


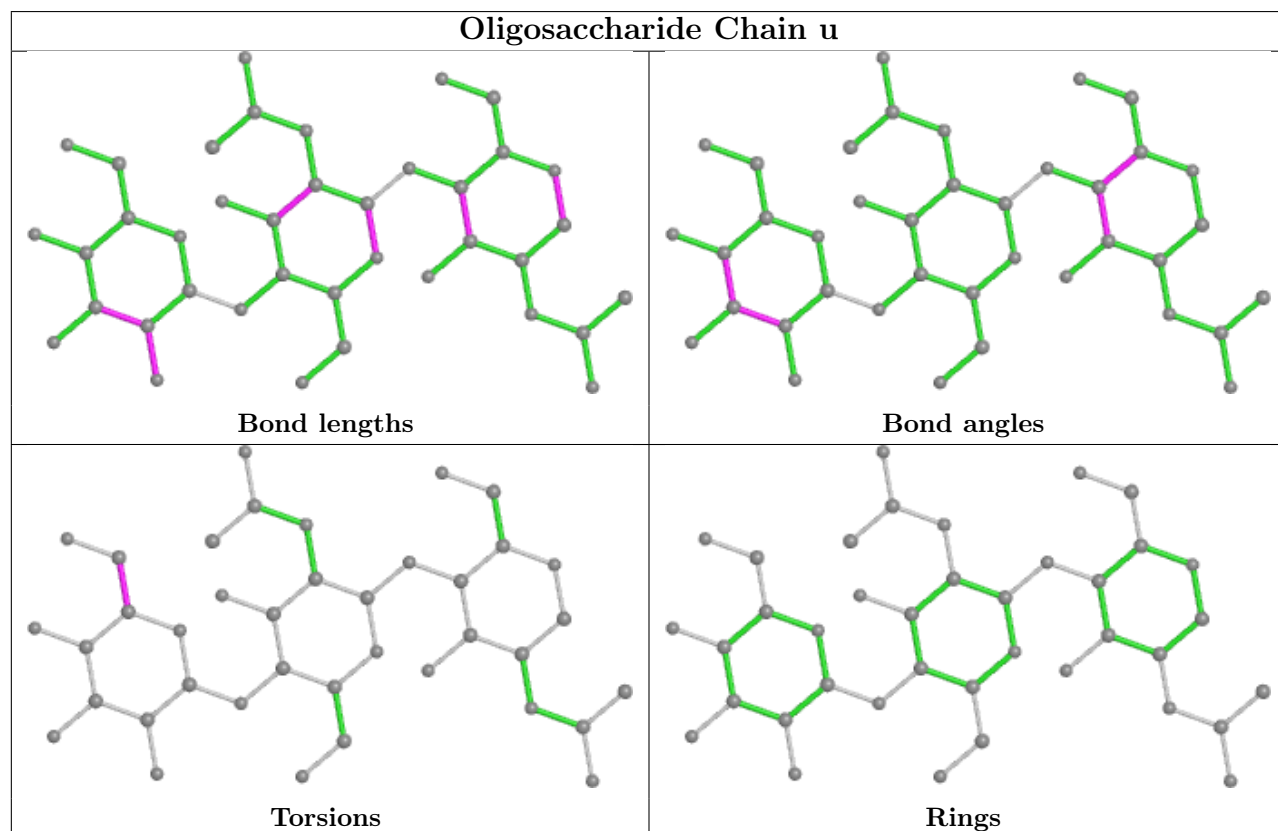
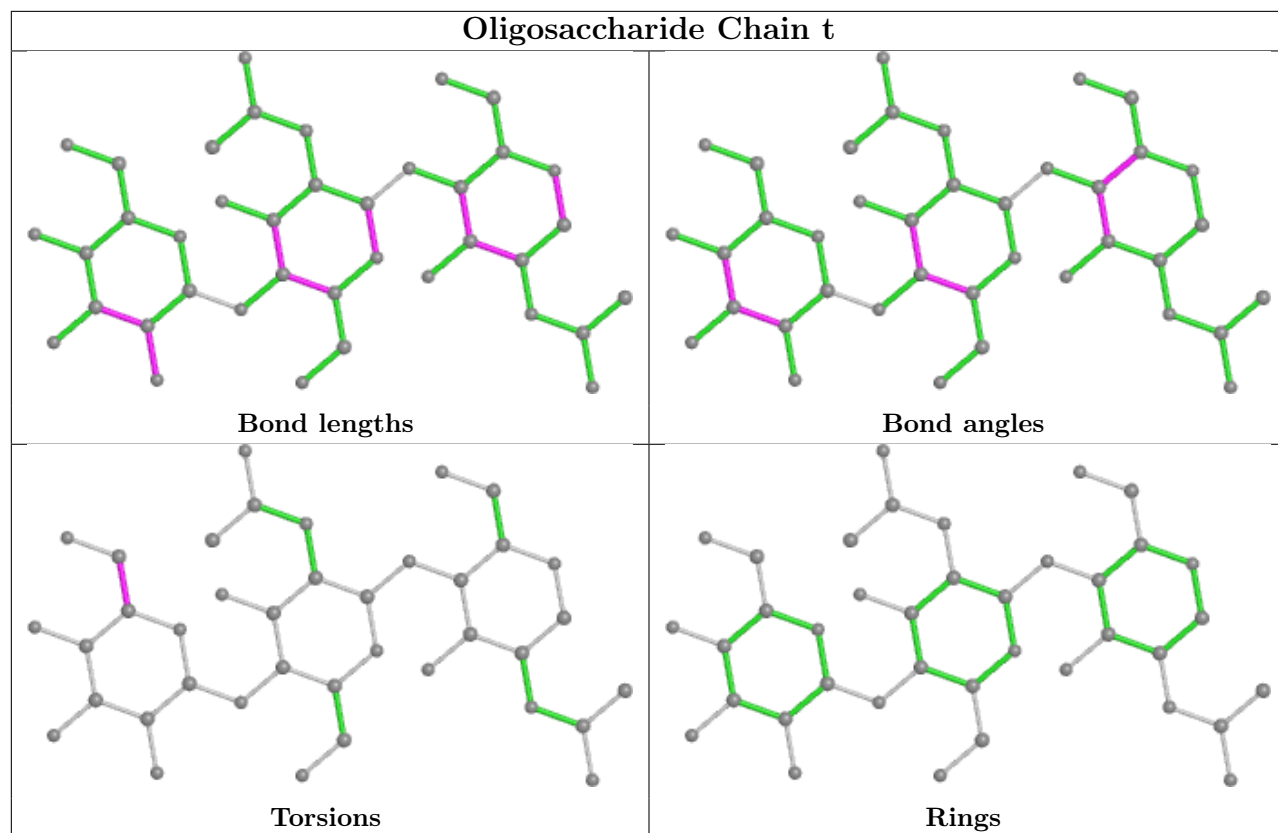


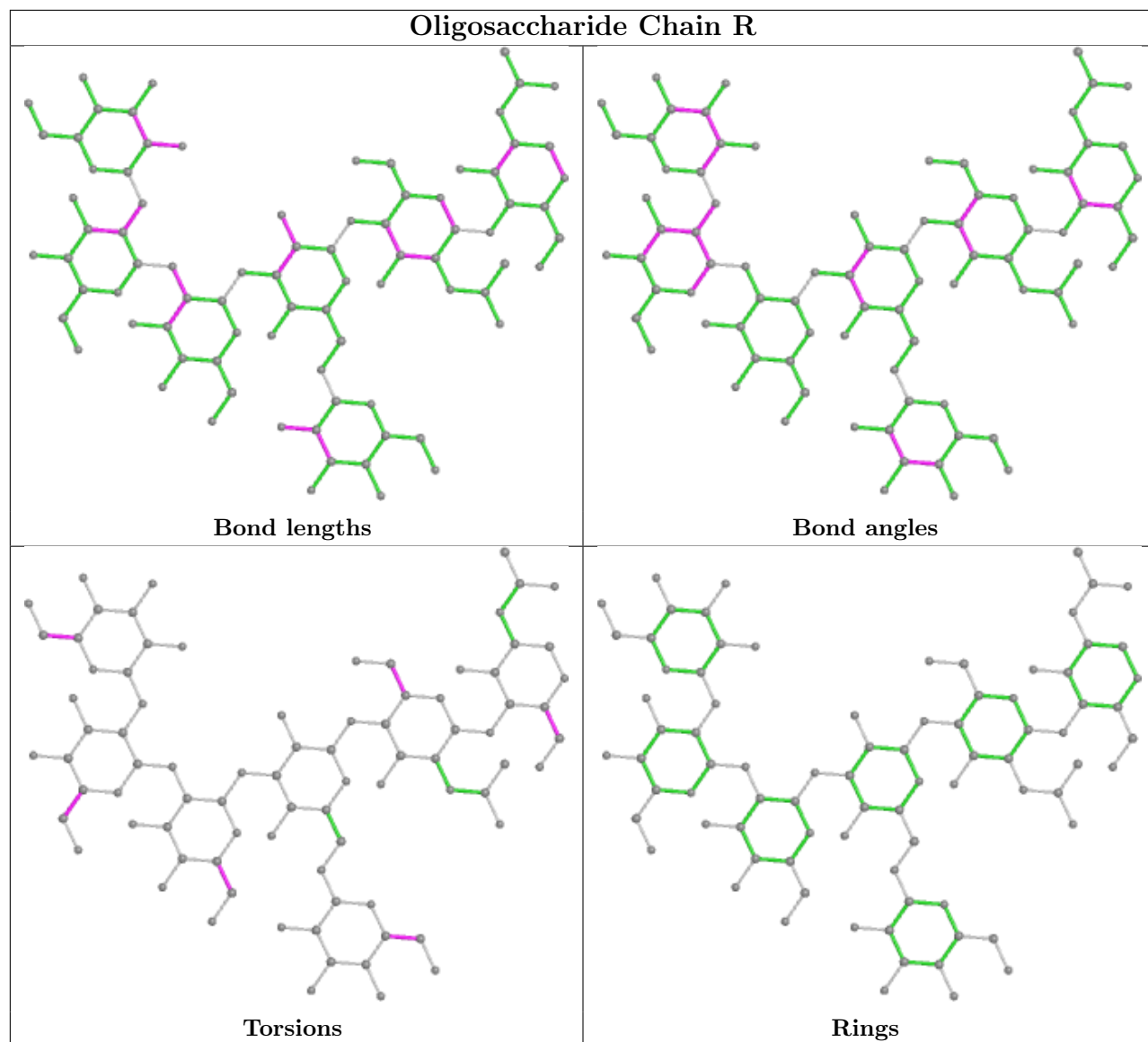


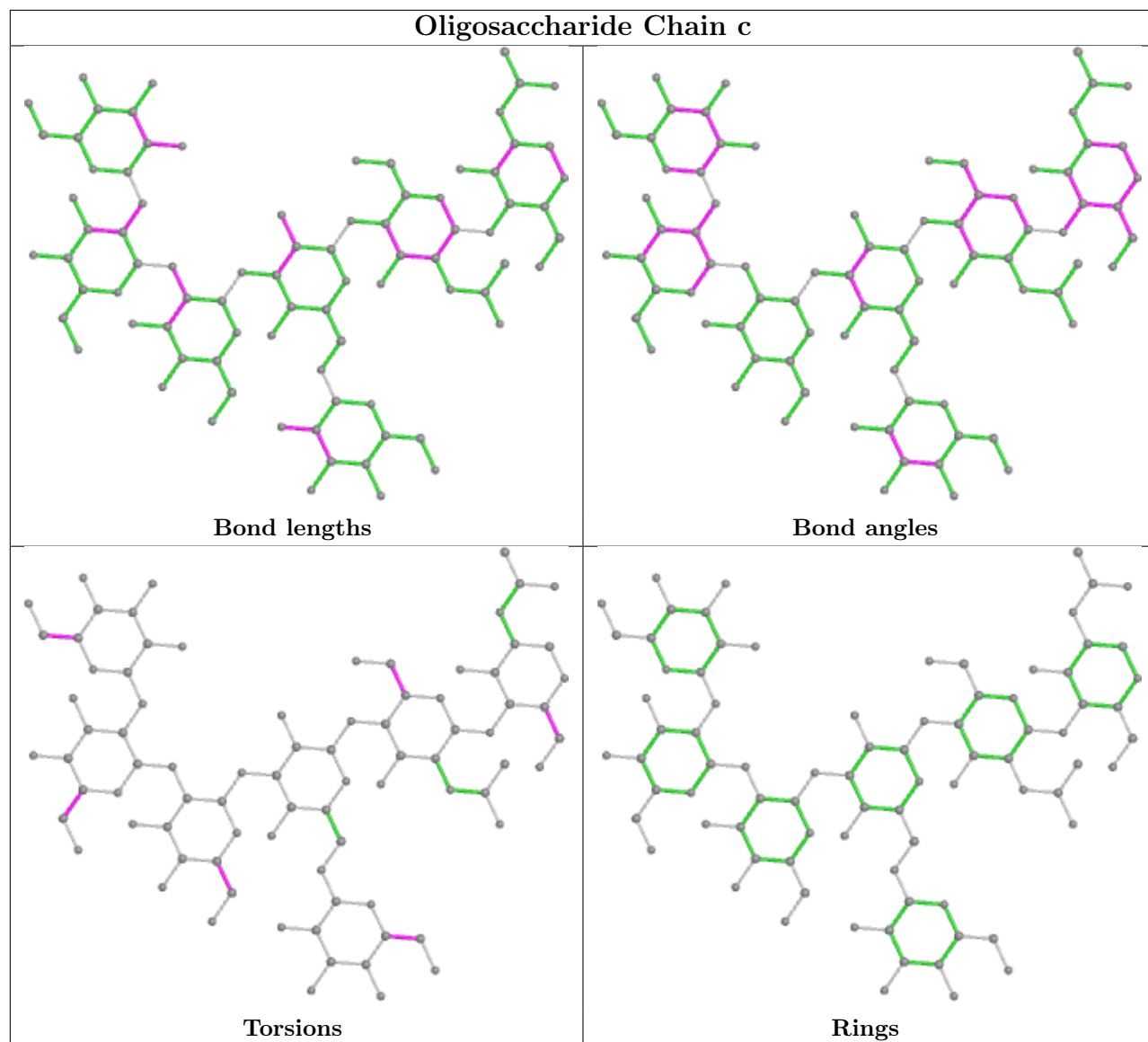


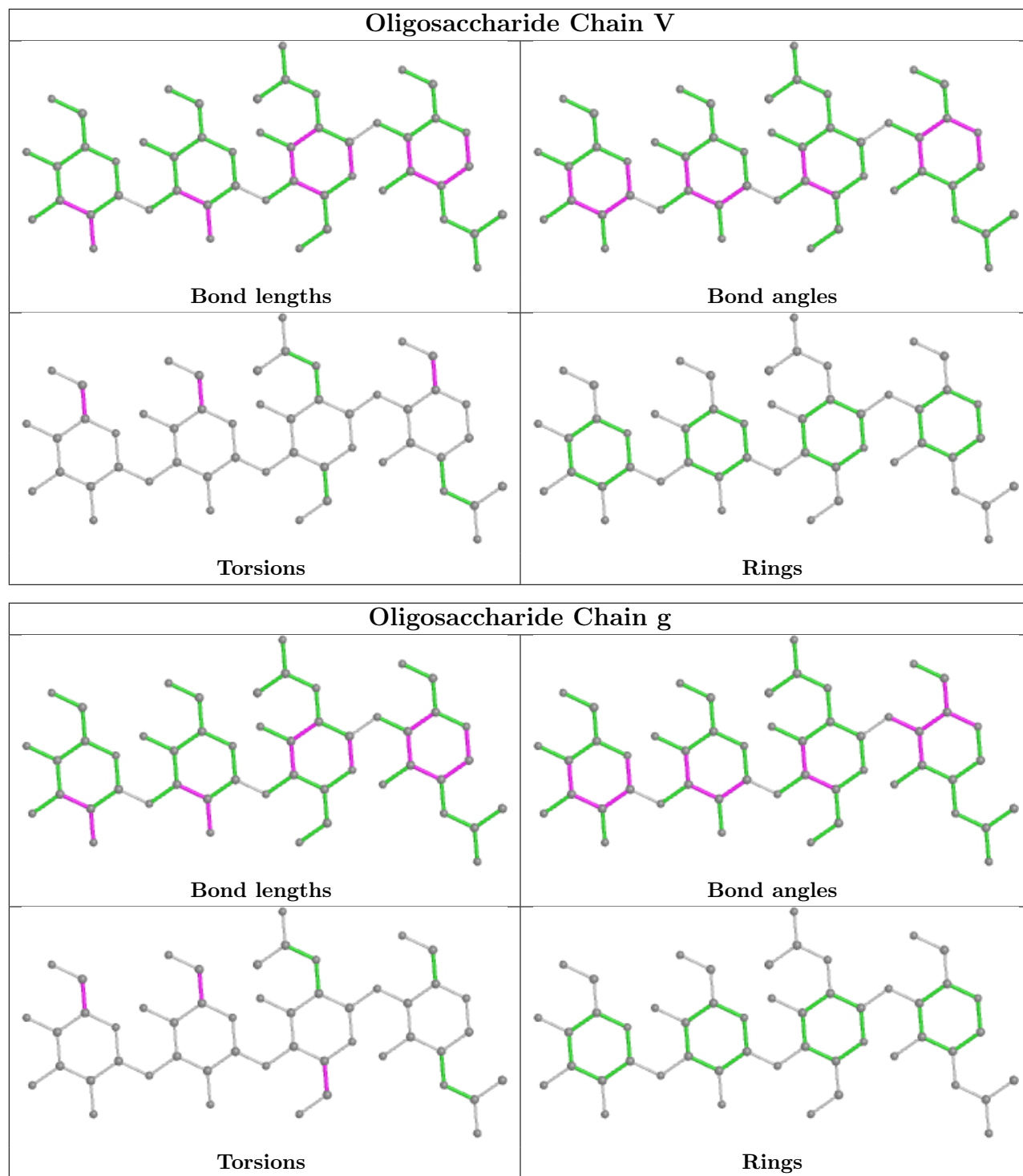




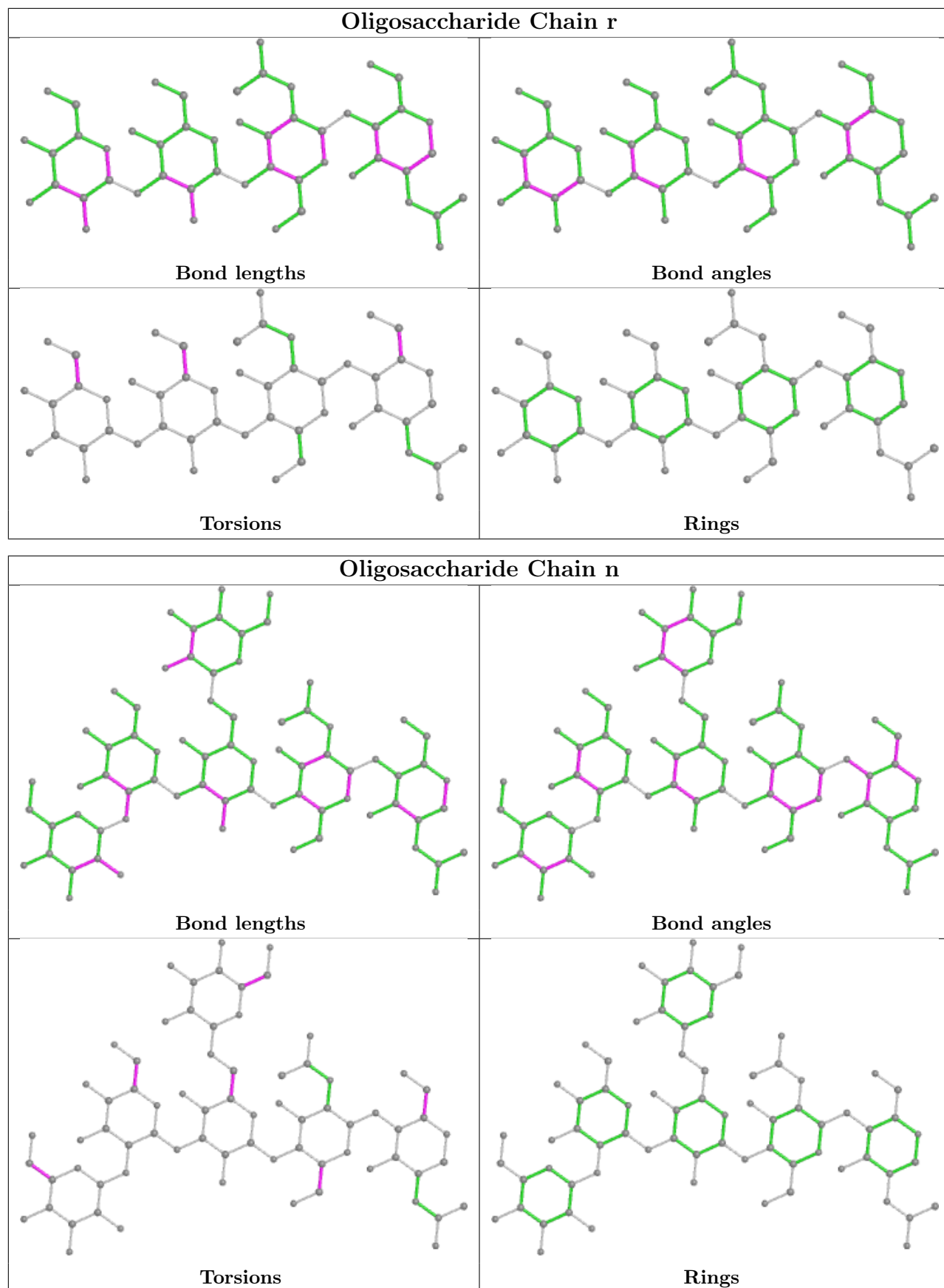


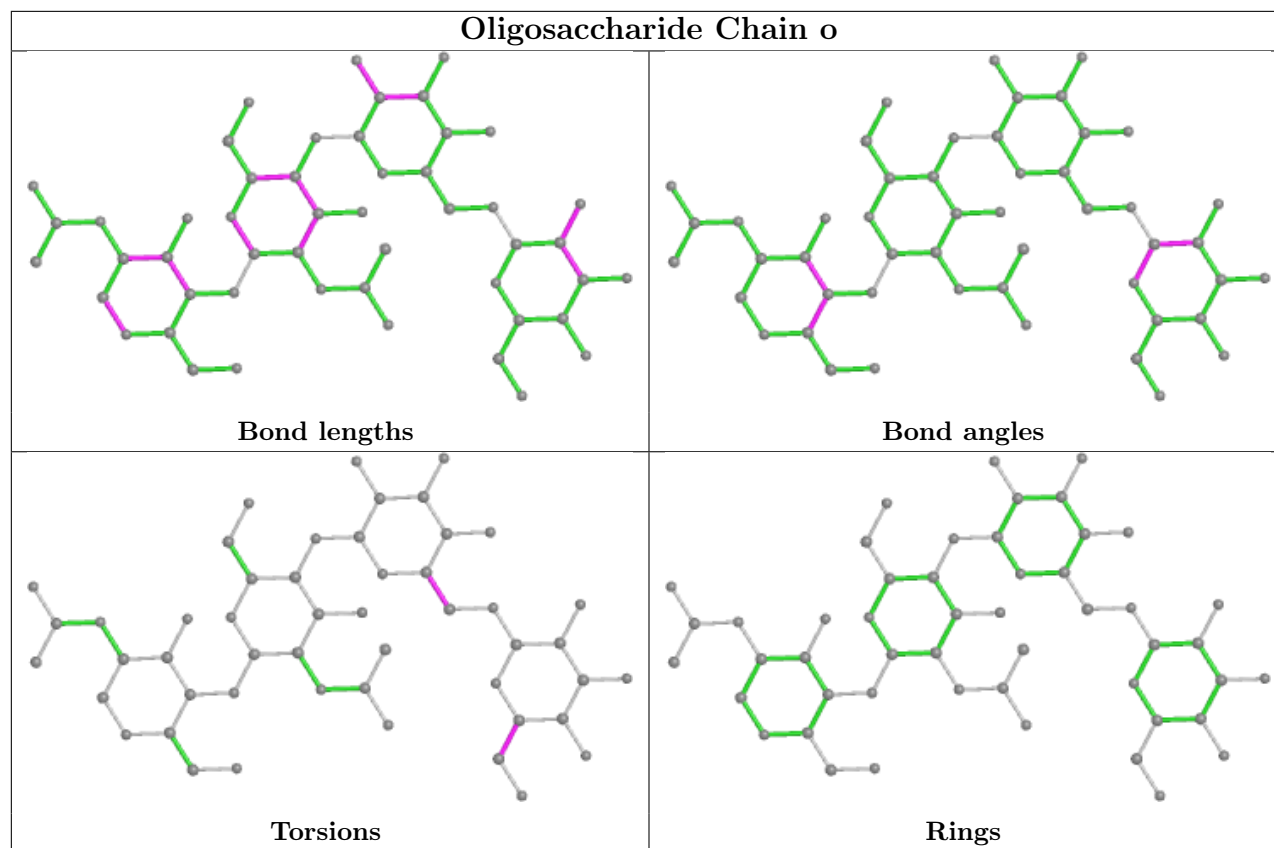












## 5.6 Ligand geometry [i](#)

27 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
13	NAG	J	621	3	14,14,15	2.12	2 (14%)	17,19,21	0.73	0
13	NAG	D	621	3	14,14,15	2.12	2 (14%)	17,19,21	0.80	0
13	NAG	K	701	2	14,14,15	2.09	2 (14%)	17,19,21	0.69	0
13	NAG	J	601	3	14,14,15	2.16	2 (14%)	17,19,21	1.06	1 (5%)
13	NAG	A	601	3	14,14,15	2.12	2 (14%)	17,19,21	0.83	1 (5%)
12	LMT	B	701	-	36,36,36	0.43	0	47,47,47	1.24	4 (8%)
13	NAG	E	702	2	14,14,15	2.15	2 (14%)	17,19,21	0.84	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
13	NAG	D	620	3	14,14,15	2.07	1 (7%)	17,19,21	0.62	0
13	NAG	B	704	2	14,14,15	2.15	2 (14%)	17,19,21	0.68	0
13	NAG	E	703	2	14,14,15	2.13	2 (14%)	17,19,21	0.63	0
13	NAG	A	632	3	14,14,15	2.14	2 (14%)	17,19,21	0.63	0
13	NAG	B	702	2	14,14,15	2.09	2 (14%)	17,19,21	0.92	1 (5%)
13	NAG	B	703	2	14,14,15	2.08	2 (14%)	17,19,21	0.79	1 (5%)
13	NAG	E	704	2	14,14,15	2.15	2 (14%)	17,19,21	0.89	1 (5%)
13	NAG	K	702	2	14,14,15	2.12	2 (14%)	17,19,21	0.87	1 (5%)
13	NAG	K	703	2	14,14,15	2.15	2 (14%)	17,19,21	0.83	1 (5%)
13	NAG	D	631	3	14,14,15	2.14	1 (7%)	17,19,21	0.80	1 (5%)
13	NAG	A	622	3	14,14,15	2.17	2 (14%)	17,19,21	0.77	1 (5%)
13	NAG	K	704	2	14,14,15	2.14	3 (21%)	17,19,21	0.91	1 (5%)
13	NAG	J	620	3	14,14,15	2.11	2 (14%)	17,19,21	1.11	1 (5%)
12	LMT	E	705	-	19,19,36	0.44	0	24,24,47	0.90	1 (4%)
13	NAG	B	705	2	14,14,15	2.14	2 (14%)	17,19,21	1.04	1 (5%)
12	LMT	B	706	-	36,36,36	0.36	0	47,47,47	0.96	1 (2%)
13	NAG	J	632	3	14,14,15	2.16	2 (14%)	17,19,21	0.87	1 (5%)
13	NAG	D	601	3	14,14,15	2.11	2 (14%)	17,19,21	1.01	1 (5%)
13	NAG	A	621	3	14,14,15	2.12	2 (14%)	17,19,21	0.88	1 (5%)
13	NAG	E	701	2	14,14,15	2.10	2 (14%)	17,19,21	0.91	1 (5%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
13	NAG	J	621	3	-	2/6/23/26	0/1/1/1
13	NAG	D	621	3	-	2/6/23/26	0/1/1/1
13	NAG	K	701	2	-	1/6/23/26	0/1/1/1
13	NAG	J	601	3	-	2/6/23/26	0/1/1/1
13	NAG	A	601	3	-	2/6/23/26	0/1/1/1
12	LMT	B	701	-	-	13/21/61/61	0/2/2/2
13	NAG	E	702	2	-	1/6/23/26	0/1/1/1
13	NAG	D	620	3	-	2/6/23/26	0/1/1/1
13	NAG	B	704	2	-	1/6/23/26	0/1/1/1
13	NAG	E	703	2	-	1/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
13	NAG	A	632	3	-	1/6/23/26	0/1/1/1
13	NAG	B	702	2	-	1/6/23/26	0/1/1/1
13	NAG	B	703	2	-	2/6/23/26	0/1/1/1
13	NAG	E	704	2	-	2/6/23/26	0/1/1/1
13	NAG	K	702	2	-	2/6/23/26	0/1/1/1
13	NAG	K	703	2	-	2/6/23/26	0/1/1/1
13	NAG	D	631	3	-	2/6/23/26	0/1/1/1
13	NAG	A	622	3	-	2/6/23/26	0/1/1/1
13	NAG	K	704	2	-	2/6/23/26	0/1/1/1
13	NAG	J	620	3	-	2/6/23/26	0/1/1/1
12	LMT	E	705	-	-	6/11/31/61	0/1/1/2
13	NAG	B	705	2	-	2/6/23/26	0/1/1/1
12	LMT	B	706	-	-	15/21/61/61	0/2/2/2
13	NAG	J	632	3	-	1/6/23/26	0/1/1/1
13	NAG	D	601	3	-	2/6/23/26	0/1/1/1
13	NAG	A	621	3	-	2/6/23/26	0/1/1/1
13	NAG	E	701	2	-	2/6/23/26	0/1/1/1

The worst 5 of 47 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
13	A	622	NAG	O5-C1	7.05	1.55	1.43
13	K	703	NAG	O5-C1	7.04	1.55	1.43
13	B	704	NAG	O5-C1	7.03	1.54	1.43
13	J	632	NAG	O5-C1	7.00	1.54	1.43
13	A	632	NAG	O5-C1	6.99	1.54	1.43

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
12	B	701	LMT	C1B-O1B-C4'	-3.85	108.45	117.96
13	J	601	NAG	C4-C3-C2	-3.30	106.19	111.02
13	J	620	NAG	C4-C3-C2	-3.25	106.26	111.02
13	B	705	NAG	C4-C3-C2	-3.09	106.50	111.02
12	E	705	LMT	O5'-C1'-C2'	-2.72	104.60	110.35

There are no chirality outliers.

5 of 75 torsion outliers are listed below:

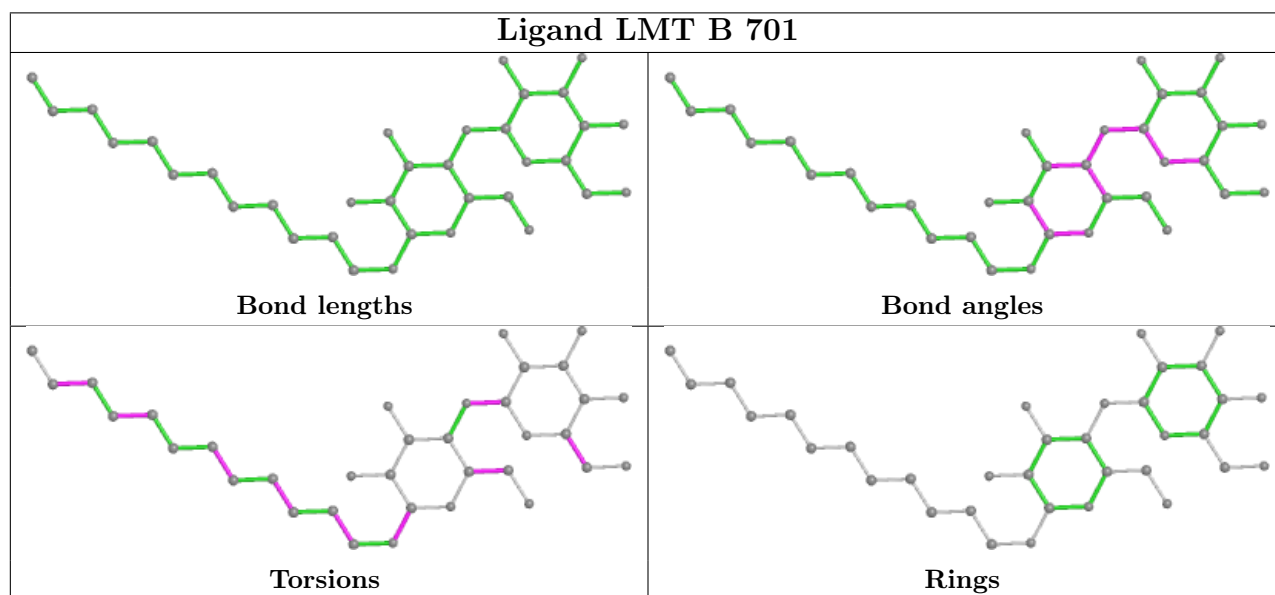
Mol	Chain	Res	Type	Atoms
12	B	701	LMT	C2'-C1'-O1'-C1
12	B	701	LMT	O5'-C1'-O1'-C1
12	B	706	LMT	C2'-C1'-O1'-C1
12	B	706	LMT	O5'-C1'-O1'-C1
12	E	705	LMT	C2'-C1'-O1'-C1

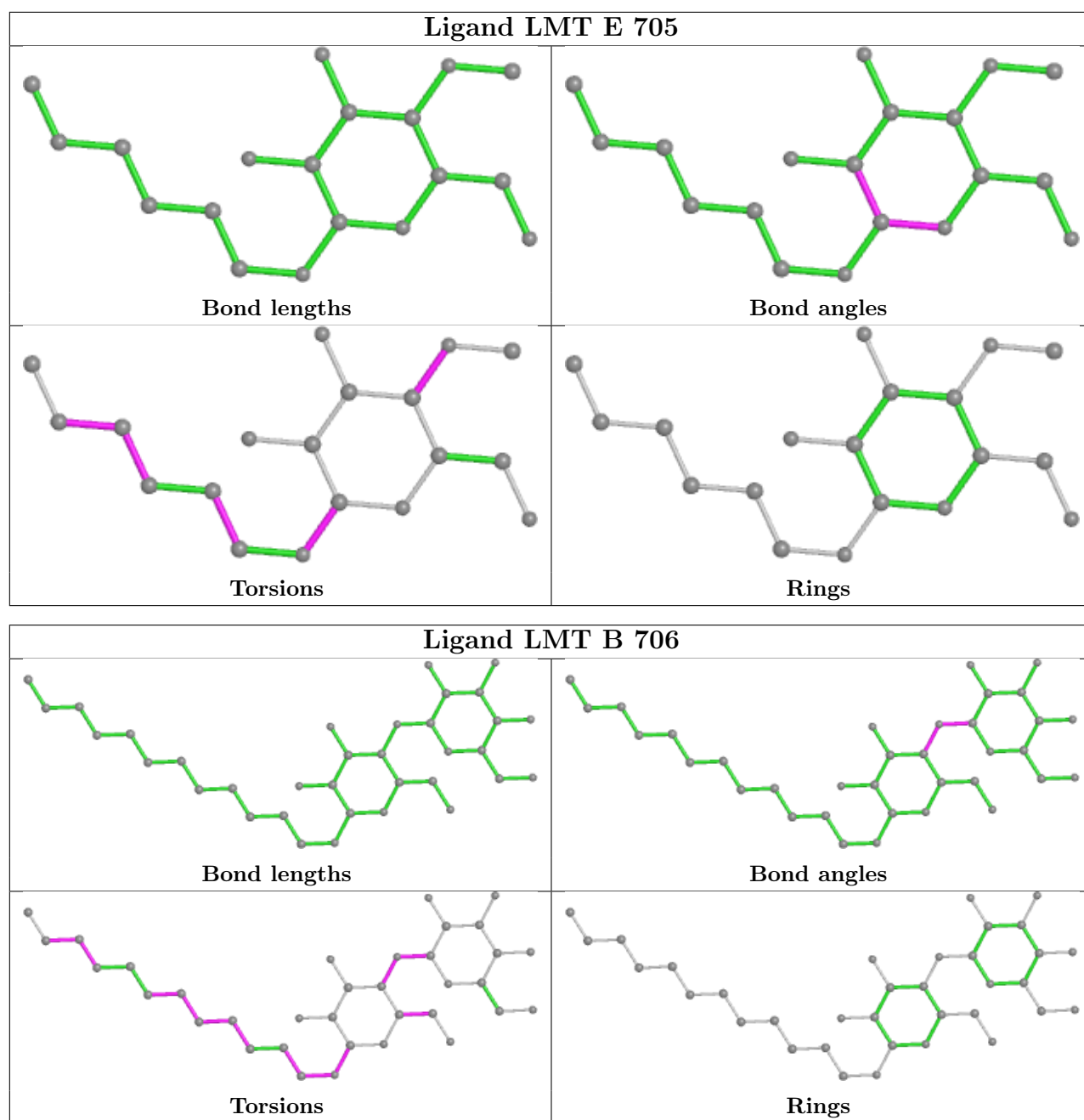
There are no ring outliers.

4 monomers are involved in 20 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
12	B	701	LMT	8	0
13	K	703	NAG	1	0
12	E	705	LMT	1	0
12	B	706	LMT	10	0

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





## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

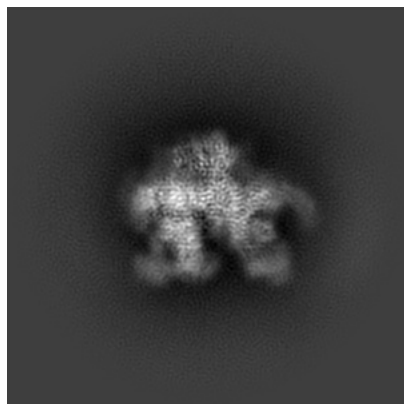
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-20152. These allow visual inspection of the internal detail of the map and identification of artifacts.

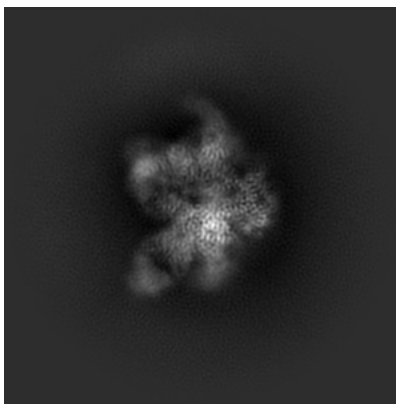
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

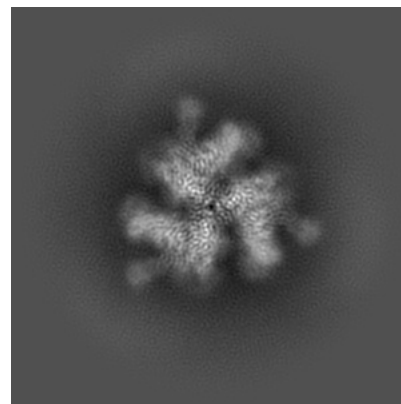
#### 6.1.1 Primary map



X

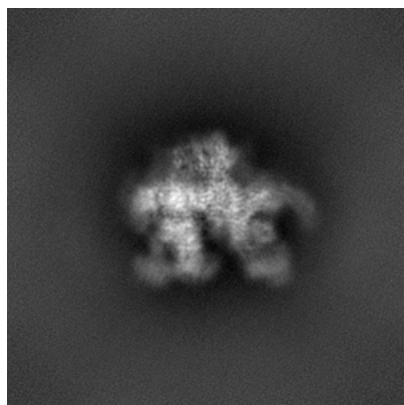


Y

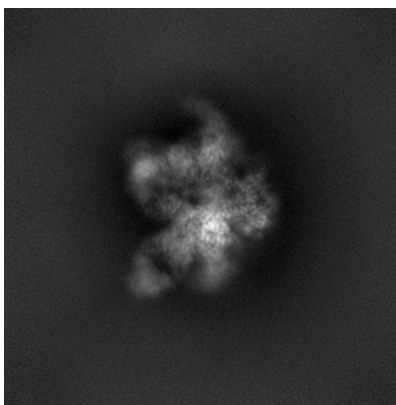


Z

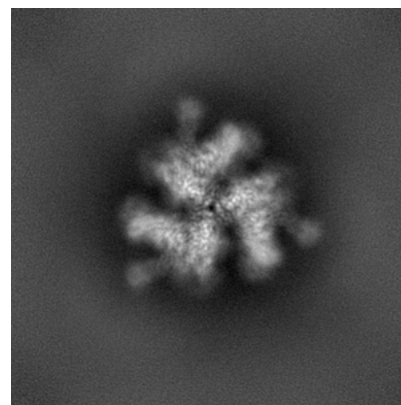
#### 6.1.2 Raw map



X



Y



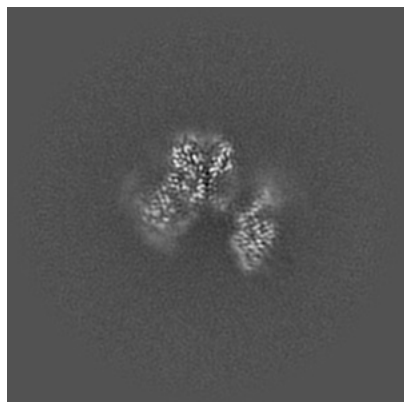
Z

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

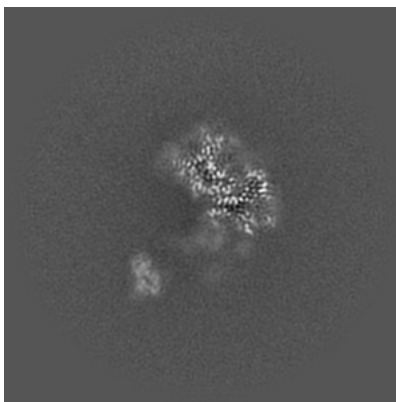


## 6.2 Central slices [i](#)

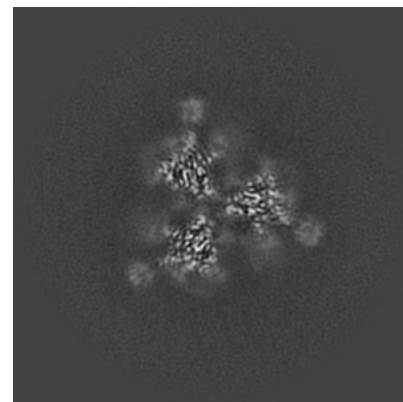
### 6.2.1 Primary map



X Index: 144

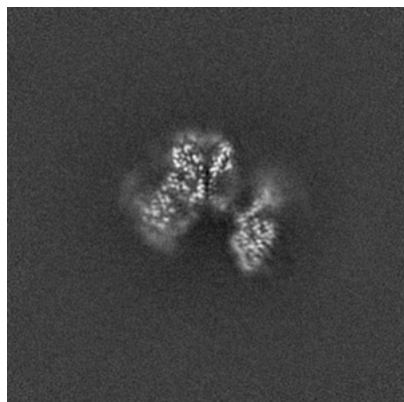


Y Index: 144

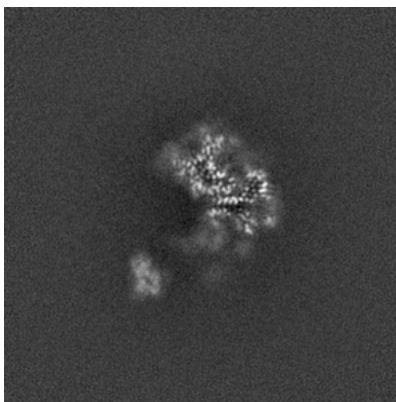


Z Index: 144

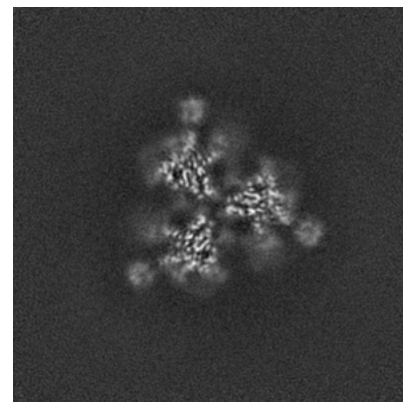
### 6.2.2 Raw map



X Index: 144



Y Index: 144



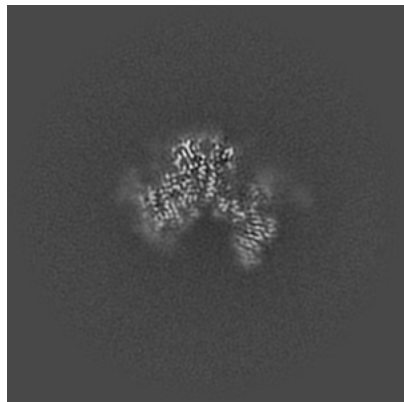
Z Index: 144

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

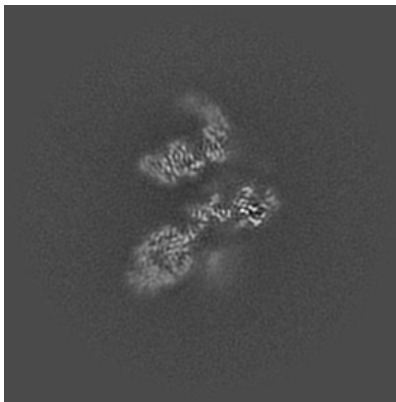


## 6.3 Largest variance slices [i](#)

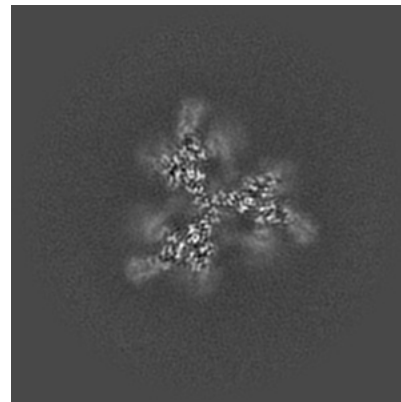
### 6.3.1 Primary map



X Index: 140

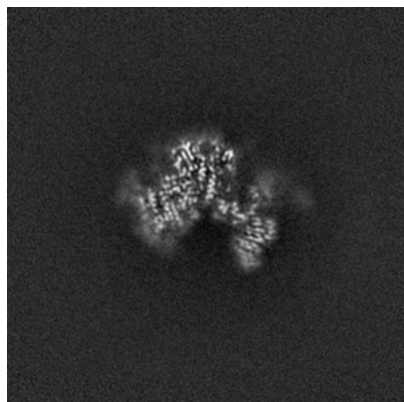


Y Index: 132

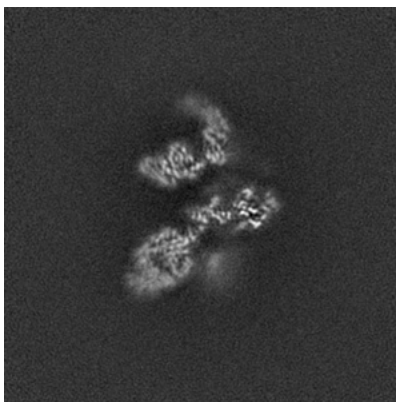


Z Index: 150

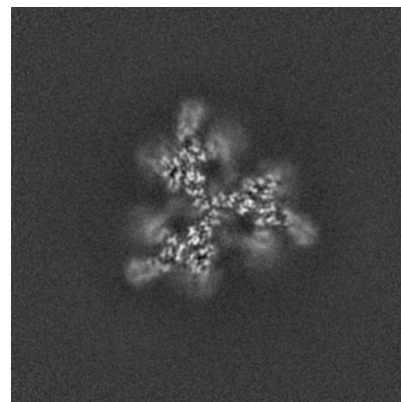
### 6.3.2 Raw map



X Index: 140



Y Index: 132

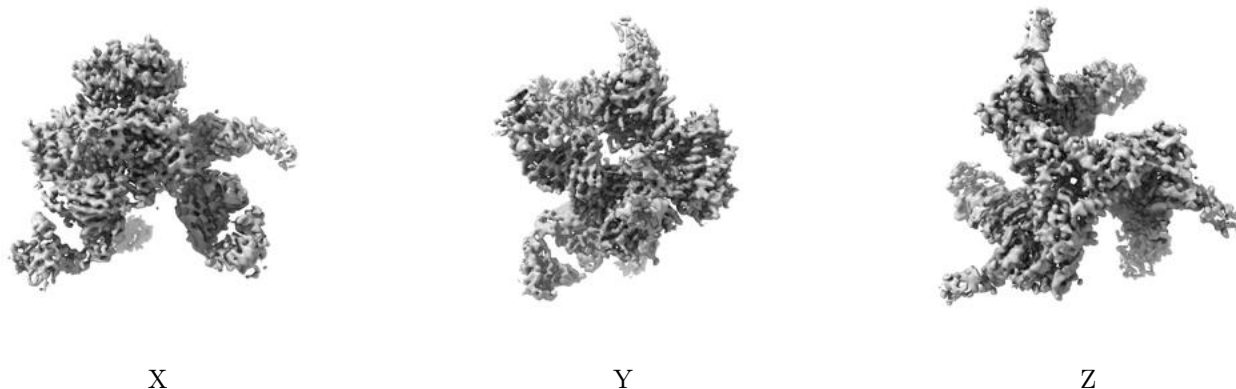


Z Index: 150

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

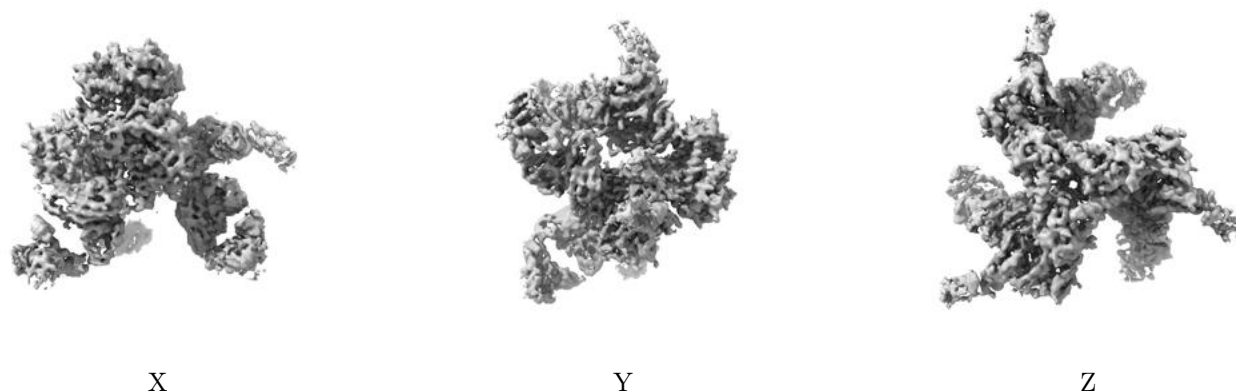
## 6.4 Orthogonal surface views [i](#)

### 6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.58. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.4.2 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.

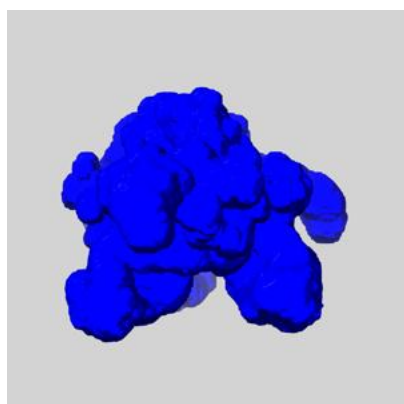
## 6.5 Mask visualisation [i](#)

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

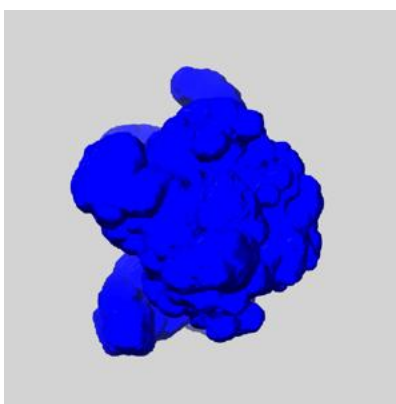
A mask typically either:

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

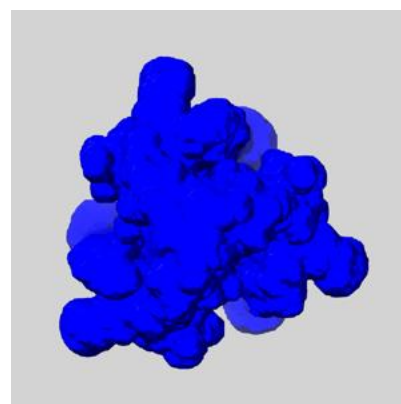
### 6.5.1 emd\_20152\_msk\_1.map [i](#)



X



Y

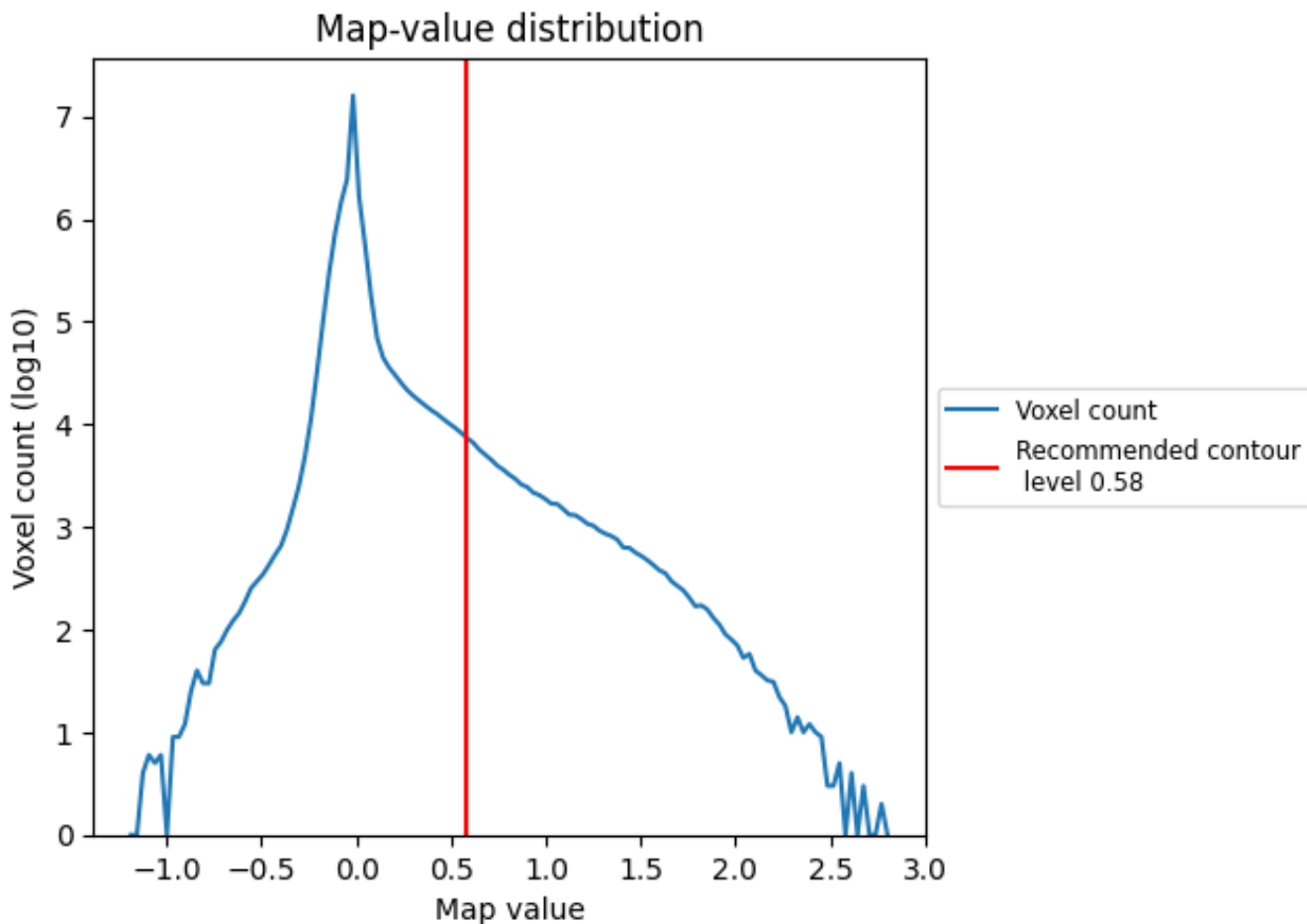


Z

## 7 Map analysis [i](#)

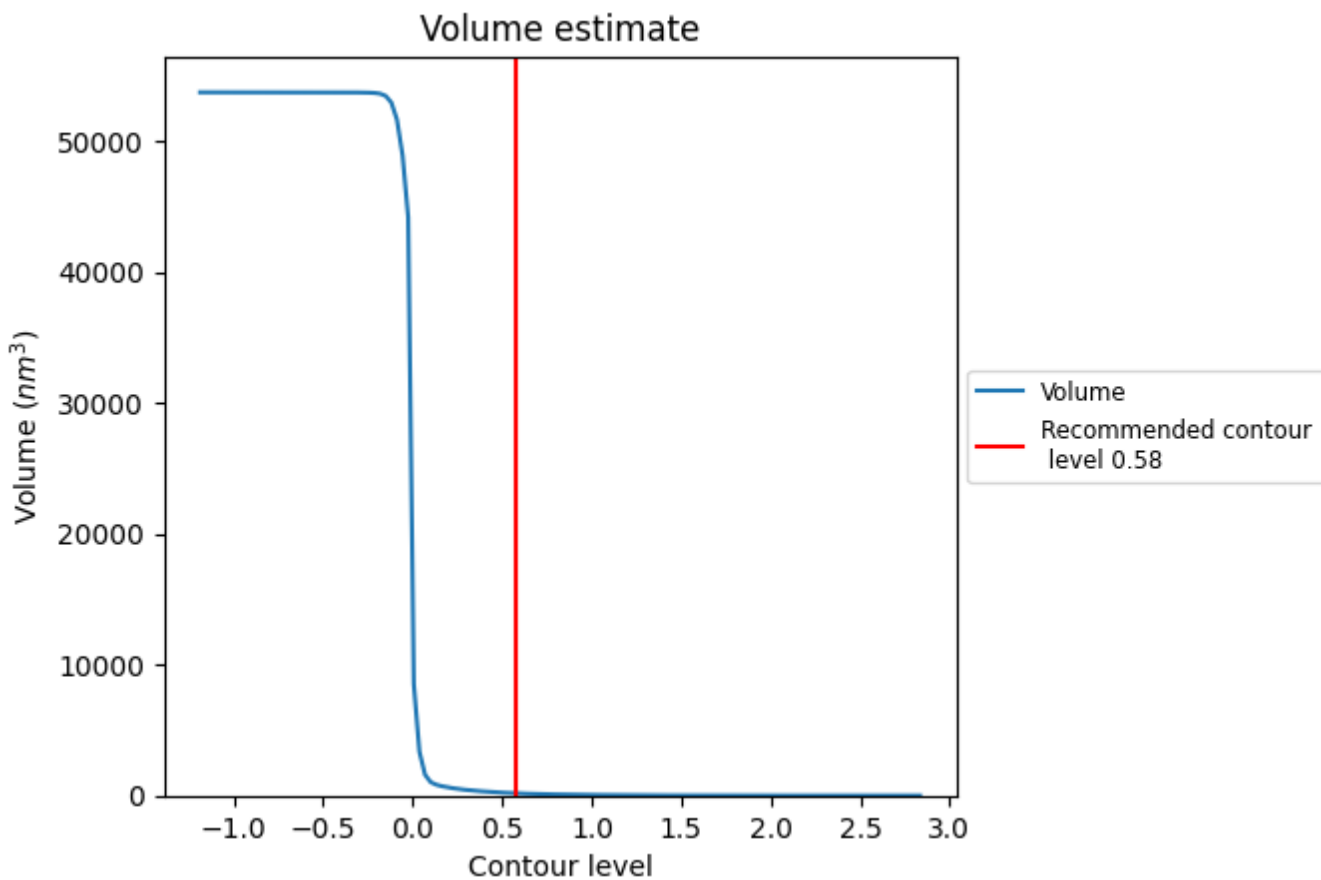
This section contains the results of statistical analysis of the map.

### 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.

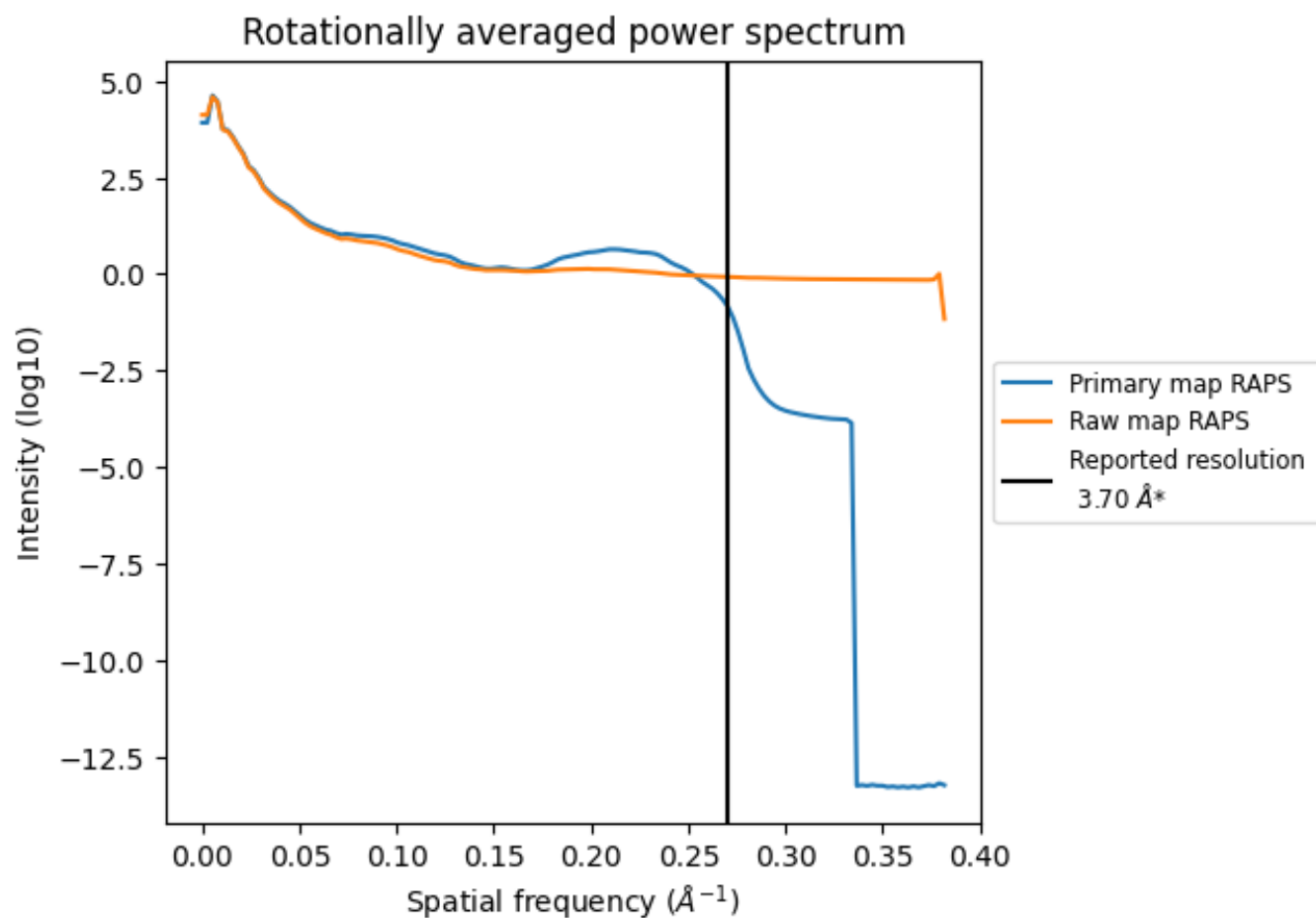
## 7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 171 nm<sup>3</sup>; this corresponds to an approximate mass of 155 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 [i](#)

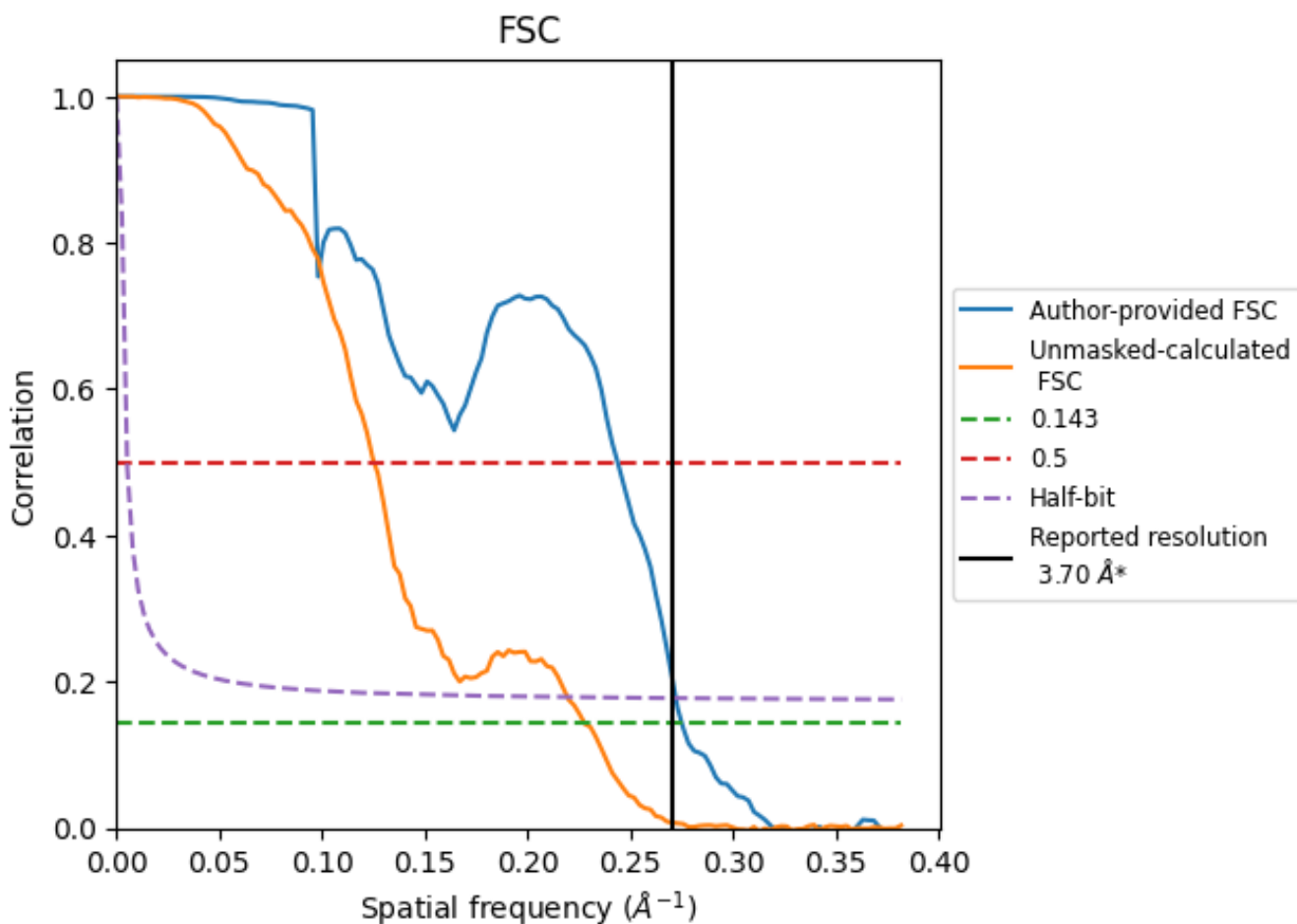


\*Reported resolution corresponds to spatial frequency of 0.270 Å<sup>-1</sup>

## 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 0.270 Å<sup>-1</sup>

## 8.2 Resolution estimates

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	3.64	4.10	3.68
Unmasked-calculated*	4.39	7.98	4.56

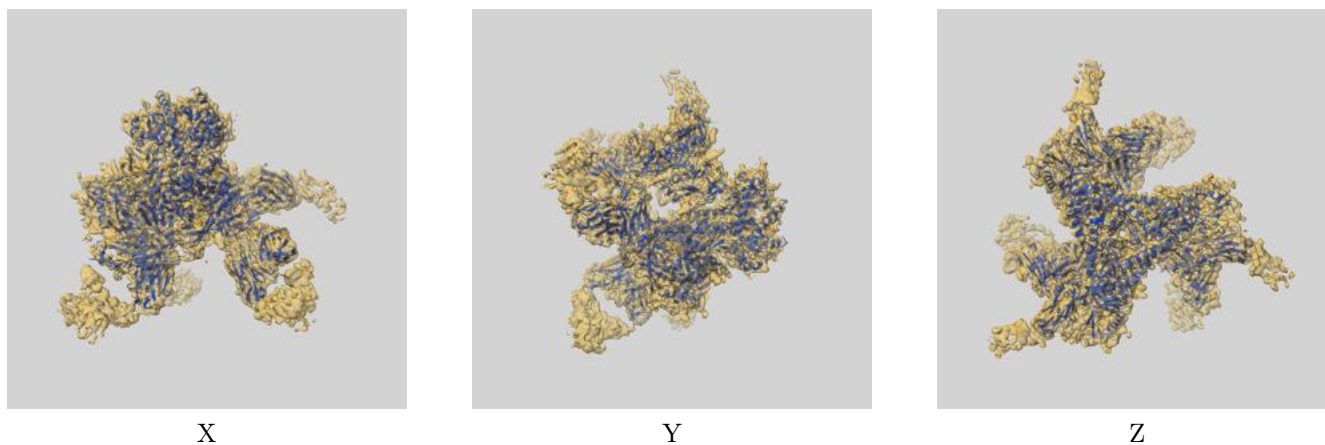
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.39 differs from the reported value 3.7 by more than 10 %



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

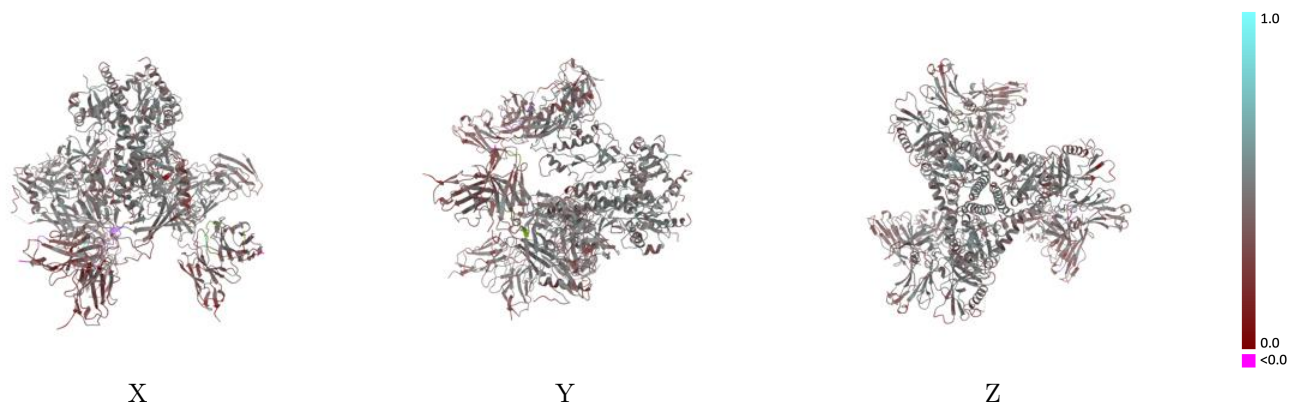
This section contains information regarding the fit between EMDB map EMD-20152 and PDB model 6OPP. Per-residue inclusion information can be found in section 3 on page 18.

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



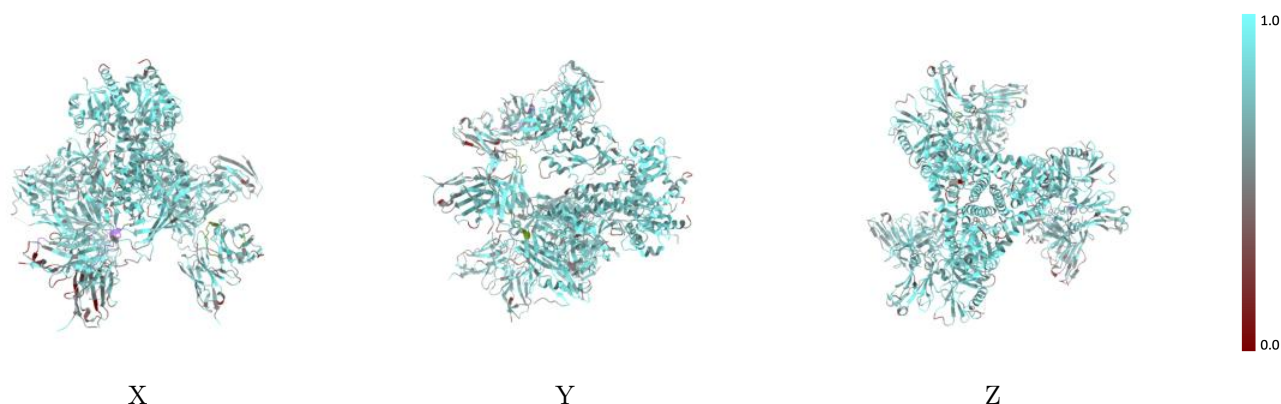
The images above show the 3D surface view of the map at the recommended contour level 0.58 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



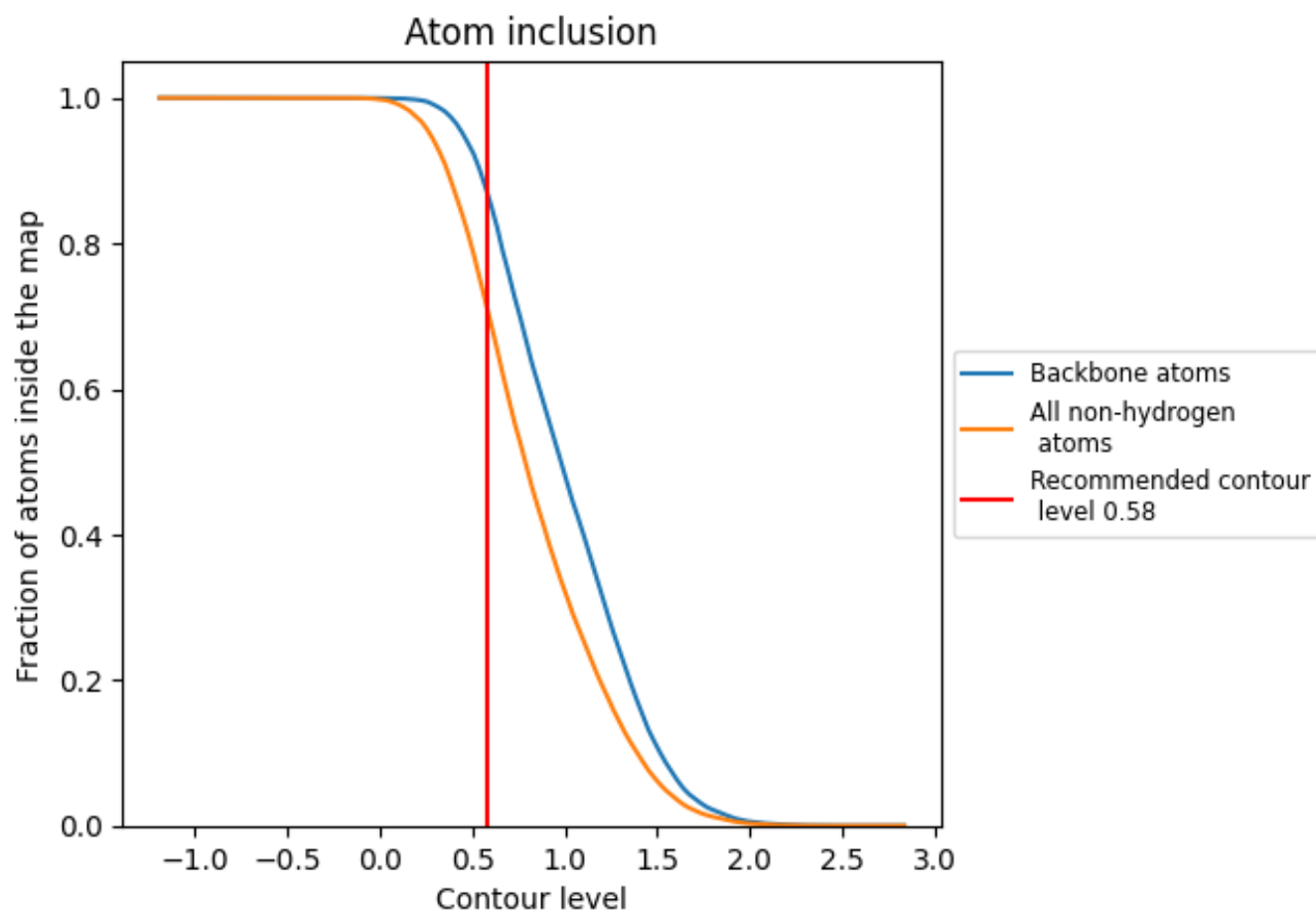
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.58).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 87% of all backbone atoms, 71% 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 (0.58) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7131	 0.4110
A	 0.7630	 0.4380
B	 0.7320	 0.4460
C	 0.7063	 0.4120
D	 0.7607	 0.4410
E	 0.7288	 0.4420
F	 0.6880	 0.3980
G	 0.7205	 0.3700
H	 0.7215	 0.3910
I	 0.6812	 0.3400
J	 0.7412	 0.4260
K	 0.7537	 0.4280
L	 0.6885	 0.3810
M	 0.6945	 0.4050
N	 0.6346	 0.3320
O	 0.5939	 0.3190
P	 0.4286	 0.3870
Q	 0.4359	 0.4290
R	 0.6747	 0.4710
S	 0.4103	 0.3740
T	 0.6071	 0.3800
U	 0.6786	 0.3800
V	 0.5800	 0.4010
W	 0.5357	 0.4280
X	 0.7179	 0.4650
Y	 0.5385	 0.3760
Z	 0.4286	 0.3150
a	 0.3929	 0.3730
b	 0.5357	 0.3990
c	 0.6506	 0.4670
d	 0.4872	 0.3930
e	 0.5357	 0.3820
f	 0.6786	 0.4170
g	 0.4600	 0.3840
h	 0.6071	 0.4100



*Continued on next page...*

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Chain	Atom inclusion	Q-score
i	 0.6923	 0.4480
j	 0.6923	 0.4620
k	 0.3214	 0.3720
l	 0.4286	 0.3280
m	 0.5714	 0.4130
n	 0.6806	 0.4590
o	 0.2800	 0.3480
p	 0.5000	 0.4180
q	 0.5714	 0.3430
r	 0.4600	 0.4280
s	 0.4103	 0.3710
t	 0.6154	 0.3970
u	 0.4615	 0.3670
v	 0.2500	 0.3820