



wwPDB EM Validation Summary Report ⓘ

Nov 23, 2022 – 09:25 AM EST

PDB ID : 7UCG
EMDB ID : EMD-26443
Title : Structure of the DU422 SOSIP.664 trimer in complex with neutralizing antibody Fab fragments 10-1074 and BG24
Authors : Barnes, C.O.; Bjorkman, P.J.
Deposited on : 2022-03-16
Resolution : 3.50 Å(reported)
Based on initial model : 5CEZ

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

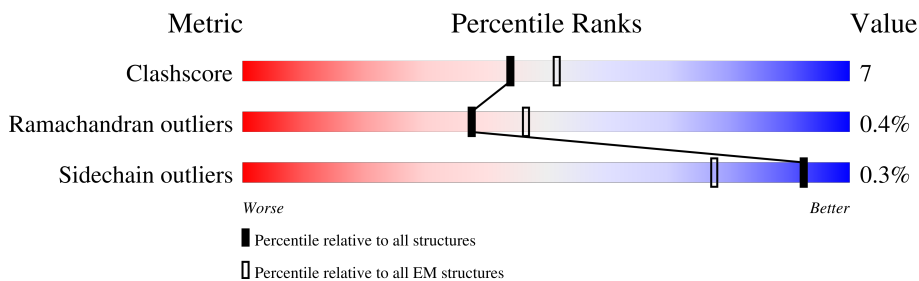
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al.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

1 Overall quality at a glance i

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

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)	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 ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	153	<div style="display: flex; justify-content: space-between;"> 12% 67% 20% • 12% </div>
1	B	153	<div style="display: flex; justify-content: space-between;"> 13% 69% 18% • 12% </div>
1	M	153	<div style="display: flex; justify-content: space-between;"> 13% 65% 22% • 12% </div>
2	C	234	<div style="display: flex; justify-content: space-between;"> 7% 47% 5% 48% </div>
2	D	234	<div style="display: flex; justify-content: space-between;"> 8% 44% 8% 48% </div>
2	N	234	<div style="display: flex; justify-content: space-between;"> 7% 45% 7% 48% </div>
3	E	205	<div style="display: flex; justify-content: space-between;"> 16% 42% 5% 53% </div>
3	F	205	<div style="display: flex; justify-content: space-between;"> 15% 43% • 53% </div>


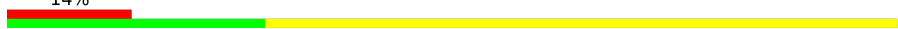
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Mol	Chain	Length	Quality of chain
3	O	205	
4	G	507	
4	I	507	
4	P	507	
5	H	243	
5	J	243	
5	Q	243	
6	K	216	
6	L	216	
6	R	216	
7	S	2	
7	T	2	
7	U	2	
7	V	2	
7	W	2	
7	Y	2	
7	Z	2	
7	a	2	
7	c	2	
7	d	2	
7	e	2	
7	g	2	
7	h	2	
7	i	2	
7	k	2	

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Mol	Chain	Length	Quality of chain
7	l	2	 100%
7	m	2	 50% 100%
7	o	2	 50% 50%
7	p	2	 50% 100%
7	q	2	 50% 50%
7	s	2	 50% 50%
8	X	5	 20% 20% 60% 20%
8	f	5	 20% 40% 60%
8	n	5	 20% 40% 60%
9	b	7	 14% 29% 71%
9	j	7	 14% 14% 86%
9	r	7	 14% 29% 71%

2 Entry composition i

There are 10 unique types of molecules in this entry. The entry contains 25389 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Envelope glycoprotein gp41.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	B	134	1061	667	186	201	7	0	0
1	A	134	1061	667	186	201	7	0	0
1	M	134	1061	667	186	201	7	0	0

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	512	ALA	-	expression tag	UNP Q202J5
B	513	VAL	-	expression tag	UNP Q202J5
B	535	MET	ILE	conflict	UNP Q202J5
B	559	PRO	ILE	conflict	UNP Q202J5
B	605	CYS	ALA	conflict	UNP Q202J5
B	648	GLU	ASP	conflict	UNP Q202J5
A	512	ALA	-	expression tag	UNP Q202J5
A	513	VAL	-	expression tag	UNP Q202J5
A	535	MET	ILE	conflict	UNP Q202J5
A	559	PRO	ILE	conflict	UNP Q202J5
A	605	CYS	ALA	conflict	UNP Q202J5
A	648	GLU	ASP	conflict	UNP Q202J5
M	512	ALA	-	expression tag	UNP Q202J5
M	513	VAL	-	expression tag	UNP Q202J5
M	535	MET	ILE	conflict	UNP Q202J5
M	559	PRO	ILE	conflict	UNP Q202J5
M	605	CYS	ALA	conflict	UNP Q202J5
M	648	GLU	ASP	conflict	UNP Q202J5

- Molecule 2 is a protein called BG24 CDRH2-v2 Fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	121	Total	C	N	O	S	0	0
			962	607	171	178	6		
2	C	121	Total	C	N	O	S	0	0
			962	607	171	178	6		
2	N	121	Total	C	N	O	S	0	0
			962	607	171	178	6		

- Molecule 3 is a protein called BG24 light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	97	Total	C	N	O	S	0	0
			727	452	127	146	2		
3	F	97	Total	C	N	O	S	0	0
			727	452	127	146	2		
3	O	97	Total	C	N	O	S	0	0
			727	452	127	146	2		

- Molecule 4 is a protein called Envelope glycoprotein gp160.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	436	Total	C	N	O	S	0	0
			3455	2189	594	647	25		
4	I	436	Total	C	N	O	S	0	0
			3455	2189	594	647	25		
4	P	436	Total	C	N	O	S	0	0
			3455	2189	594	647	25		

There are 117 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	-4	MET	-	initiating methionine	UNP Q202J5
G	-3	ASP	-	expression tag	UNP Q202J5
G	-2	ALA	-	expression tag	UNP Q202J5
G	-1	MET	-	expression tag	UNP Q202J5
G	0	LYS	-	expression tag	UNP Q202J5
G	1	ARG	-	expression tag	UNP Q202J5
G	2	GLY	-	expression tag	UNP Q202J5
G	3	LEU	-	expression tag	UNP Q202J5
G	4	CYS	-	expression tag	UNP Q202J5
G	5	CYS	-	expression tag	UNP Q202J5
G	6	VAL	-	expression tag	UNP Q202J5
G	7	LEU	-	expression tag	UNP Q202J5
G	8	LEU	-	expression tag	UNP Q202J5

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Chain	Residue	Modelled	Actual	Comment	Reference
G	9	LEU	-	expression tag	UNP Q202J5
G	10	CYS	-	expression tag	UNP Q202J5
G	11	GLY	-	expression tag	UNP Q202J5
G	12	ALA	-	expression tag	UNP Q202J5
G	13	VAL	-	expression tag	UNP Q202J5
G	14	PHE	-	expression tag	UNP Q202J5
G	15	VAL	-	expression tag	UNP Q202J5
G	16	SER	-	expression tag	UNP Q202J5
G	17	PRO	-	expression tag	UNP Q202J5
G	18	SER	-	expression tag	UNP Q202J5
G	19	GLN	-	expression tag	UNP Q202J5
G	20	GLU	-	expression tag	UNP Q202J5
G	21	ILE	-	expression tag	UNP Q202J5
G	22	HIS	-	expression tag	UNP Q202J5
G	23	ALA	-	expression tag	UNP Q202J5
G	24	ARG	-	expression tag	UNP Q202J5
G	25	PHE	-	expression tag	UNP Q202J5
G	26	ARG	-	expression tag	UNP Q202J5
G	28	GLY	VAL	conflict	UNP Q202J5
G	29	ALA	VAL	conflict	UNP Q202J5
G	30	GLU	GLY	conflict	UNP Q202J5
G	66	ARG	HIS	conflict	UNP Q202J5
G	295	ASN	LYS	conflict	UNP Q202J5
G	316	TRP	THR	conflict	UNP Q202J5
G	384	ASN	ASP	conflict	UNP Q202J5
G	498	CYS	SER	conflict	UNP Q202J5
I	-4	MET	-	initiating methionine	UNP Q202J5
I	-3	ASP	-	expression tag	UNP Q202J5
I	-2	ALA	-	expression tag	UNP Q202J5
I	-1	MET	-	expression tag	UNP Q202J5
I	0	LYS	-	expression tag	UNP Q202J5
I	1	ARG	-	expression tag	UNP Q202J5
I	2	GLY	-	expression tag	UNP Q202J5
I	3	LEU	-	expression tag	UNP Q202J5
I	4	CYS	-	expression tag	UNP Q202J5
I	5	CYS	-	expression tag	UNP Q202J5
I	6	VAL	-	expression tag	UNP Q202J5
I	7	LEU	-	expression tag	UNP Q202J5
I	8	LEU	-	expression tag	UNP Q202J5
I	9	LEU	-	expression tag	UNP Q202J5
I	10	CYS	-	expression tag	UNP Q202J5
I	11	GLY	-	expression tag	UNP Q202J5

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Chain	Residue	Modelled	Actual	Comment	Reference
I	12	ALA	-	expression tag	UNP Q202J5
I	13	VAL	-	expression tag	UNP Q202J5
I	14	PHE	-	expression tag	UNP Q202J5
I	15	VAL	-	expression tag	UNP Q202J5
I	16	SER	-	expression tag	UNP Q202J5
I	17	PRO	-	expression tag	UNP Q202J5
I	18	SER	-	expression tag	UNP Q202J5
I	19	GLN	-	expression tag	UNP Q202J5
I	20	GLU	-	expression tag	UNP Q202J5
I	21	ILE	-	expression tag	UNP Q202J5
I	22	HIS	-	expression tag	UNP Q202J5
I	23	ALA	-	expression tag	UNP Q202J5
I	24	ARG	-	expression tag	UNP Q202J5
I	25	PHE	-	expression tag	UNP Q202J5
I	26	ARG	-	expression tag	UNP Q202J5
I	28	GLY	VAL	conflict	UNP Q202J5
I	29	ALA	VAL	conflict	UNP Q202J5
I	30	GLU	GLY	conflict	UNP Q202J5
I	66	ARG	HIS	conflict	UNP Q202J5
I	295	ASN	LYS	conflict	UNP Q202J5
I	316	TRP	THR	conflict	UNP Q202J5
I	384	ASN	ASP	conflict	UNP Q202J5
I	498	CYS	SER	conflict	UNP Q202J5
P	-4	MET	-	initiating methionine	UNP Q202J5
P	-3	ASP	-	expression tag	UNP Q202J5
P	-2	ALA	-	expression tag	UNP Q202J5
P	-1	MET	-	expression tag	UNP Q202J5
P	0	LYS	-	expression tag	UNP Q202J5
P	1	ARG	-	expression tag	UNP Q202J5
P	2	GLY	-	expression tag	UNP Q202J5
P	3	LEU	-	expression tag	UNP Q202J5
P	4	CYS	-	expression tag	UNP Q202J5
P	5	CYS	-	expression tag	UNP Q202J5
P	6	VAL	-	expression tag	UNP Q202J5
P	7	LEU	-	expression tag	UNP Q202J5
P	8	LEU	-	expression tag	UNP Q202J5
P	9	LEU	-	expression tag	UNP Q202J5
P	10	CYS	-	expression tag	UNP Q202J5
P	11	GLY	-	expression tag	UNP Q202J5
P	12	ALA	-	expression tag	UNP Q202J5
P	13	VAL	-	expression tag	UNP Q202J5
P	14	PHE	-	expression tag	UNP Q202J5

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Chain	Residue	Modelled	Actual	Comment	Reference
P	15	VAL	-	expression tag	UNP Q202J5
P	16	SER	-	expression tag	UNP Q202J5
P	17	PRO	-	expression tag	UNP Q202J5
P	18	SER	-	expression tag	UNP Q202J5
P	19	GLN	-	expression tag	UNP Q202J5
P	20	GLU	-	expression tag	UNP Q202J5
P	21	ILE	-	expression tag	UNP Q202J5
P	22	HIS	-	expression tag	UNP Q202J5
P	23	ALA	-	expression tag	UNP Q202J5
P	24	ARG	-	expression tag	UNP Q202J5
P	25	PHE	-	expression tag	UNP Q202J5
P	26	ARG	-	expression tag	UNP Q202J5
P	28	GLY	VAL	conflict	UNP Q202J5
P	29	ALA	VAL	conflict	UNP Q202J5
P	30	GLU	GLY	conflict	UNP Q202J5
P	66	ARG	HIS	conflict	UNP Q202J5
P	295	ASN	LYS	conflict	UNP Q202J5
P	316	TRP	THR	conflict	UNP Q202J5
P	384	ASN	ASP	conflict	UNP Q202J5
P	498	CYS	SER	conflict	UNP Q202J5

- Molecule 5 is a protein called 10-1074 Fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	H	128	Total	C	N	O	S	0	0
			1008	638	169	197	4		
5	J	128	Total	C	N	O	S	0	0
			1008	638	169	197	4		
5	Q	128	Total	C	N	O	S	0	0
			1008	638	169	197	4		

- Molecule 6 is a protein called 10-1074 light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	L	105	Total	C	N	O	S	0	0
			812	507	150	152	3		
6	K	105	Total	C	N	O	S	0	0
			812	507	150	152	3		
6	R	105	Total	C	N	O	S	0	0
			812	507	150	152	3		

- Molecule 7 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-a

cetamido-2-deoxy-beta-D-glucopyranose.



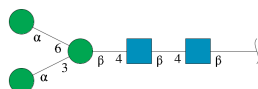
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
7	S	2	28	16	2	10	0	0
7	T	2	28	16	2	10	0	0
7	U	2	28	16	2	10	0	0
7	V	2	28	16	2	10	0	0
7	W	2	28	16	2	10	0	0
7	Y	2	28	16	2	10	0	0
7	Z	2	28	16	2	10	0	0
7	a	2	28	16	2	10	0	0
7	c	2	28	16	2	10	0	0
7	d	2	28	16	2	10	0	0
7	e	2	28	16	2	10	0	0
7	g	2	28	16	2	10	0	0
7	h	2	28	16	2	10	0	0
7	i	2	28	16	2	10	0	0
7	k	2	28	16	2	10	0	0
7	l	2	28	16	2	10	0	0
7	m	2	28	16	2	10	0	0
7	o	2	28	16	2	10	0	0
7	p	2	28	16	2	10	0	0

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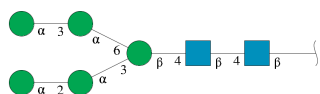
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
7	q	2	28	16	2	10	0	0
7	s	2	28	16	2	10	0	0

- Molecule 8 is an oligosaccharide called 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	X	5	61	34	2	25	0	0
8	f	5	61	34	2	25	0	0
8	n	5	61	34	2	25	0	0

- Molecule 9 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[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		
9	b	7	83	46	2	35	0	0
9	j	7	83	46	2	35	0	0
9	r	7	83	46	2	35	0	0

- Molecule 10 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



Mol	Chain	Residues	Atoms			AltConf	
			Total	C	N		O
10	G	1	98	56	7	35	0
10	G	1	98	56	7	35	0
10	G	1	98	56	7	35	0
10	G	1	98	56	7	35	0
10	G	1	98	56	7	35	0
10	G	1	98	56	7	35	0
10	G	1	98	56	7	35	0
10	G	1	98	56	7	35	0
10	I	1	98	56	7	35	0
10	I	1	98	56	7	35	0
10	I	1	98	56	7	35	0
10	I	1	98	56	7	35	0
10	I	1	98	56	7	35	0
10	I	1	98	56	7	35	0
10	I	1	98	56	7	35	0
10	I	1	98	56	7	35	0

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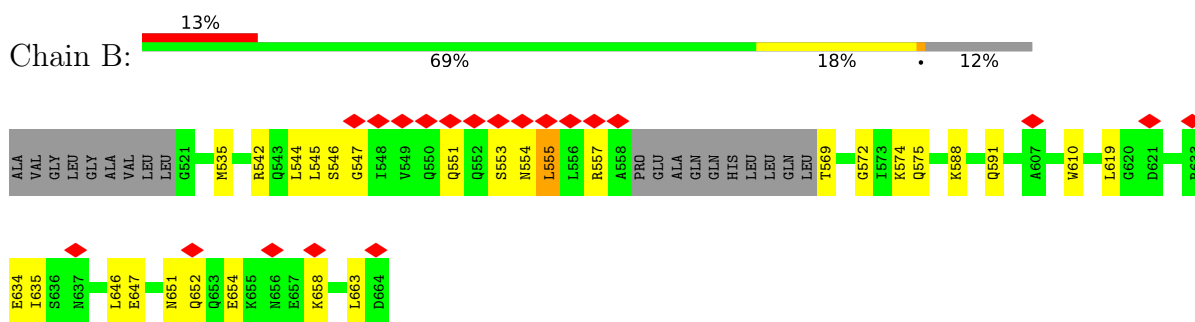
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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
10	P	1	Total 98	C 56	N 7	O 35	0
10	P	1	Total 98	C 56	N 7	O 35	0
10	P	1	Total 98	C 56	N 7	O 35	0
10	P	1	Total 98	C 56	N 7	O 35	0
10	P	1	Total 98	C 56	N 7	O 35	0
10	P	1	Total 98	C 56	N 7	O 35	0
10	P	1	Total 98	C 56	N 7	O 35	0

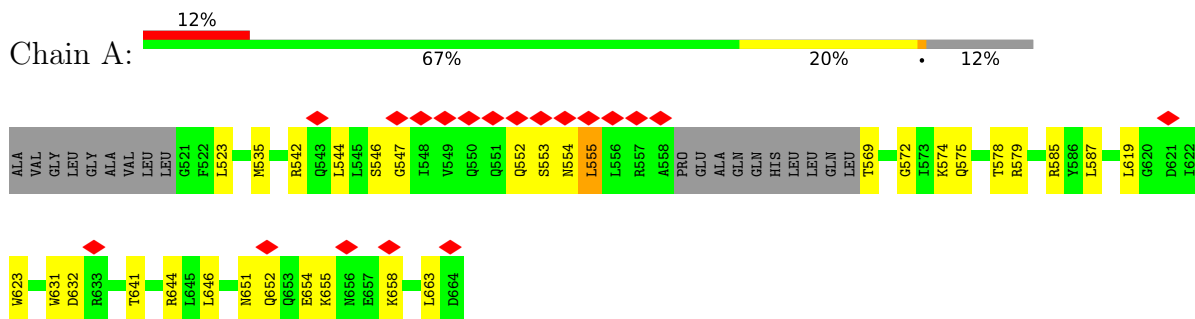
3 Residue-property plots [i](#)

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 atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

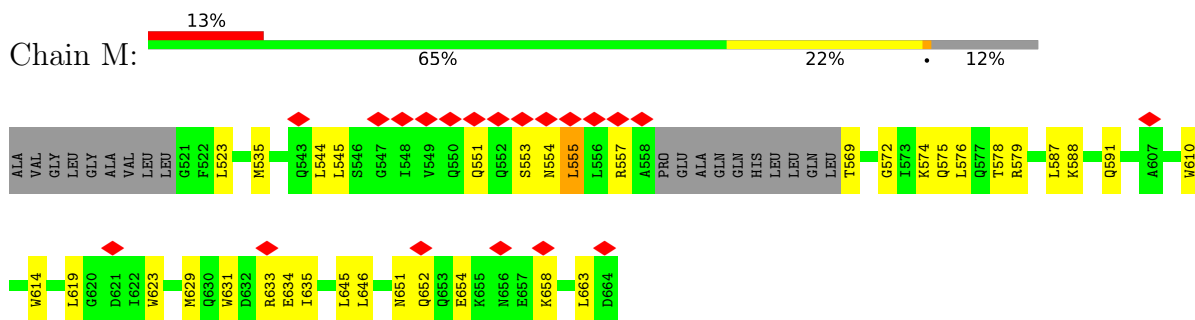
- Molecule 1: Envelope glycoprotein gp41



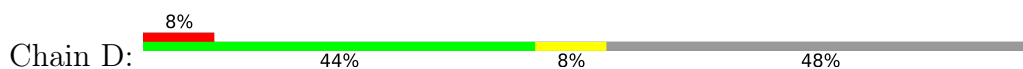
- Molecule 1: Envelope glycoprotein gp41

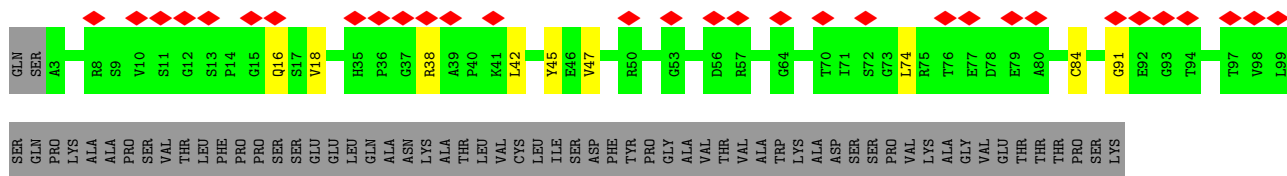


- Molecule 1: Envelope glycoprotein gp41

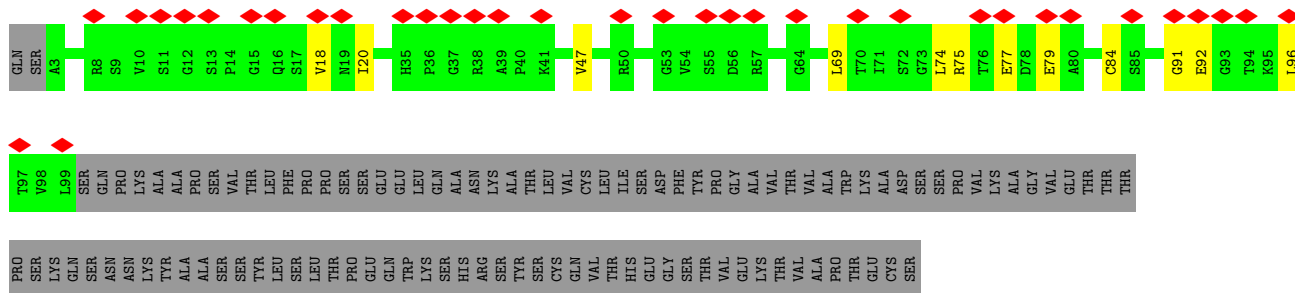
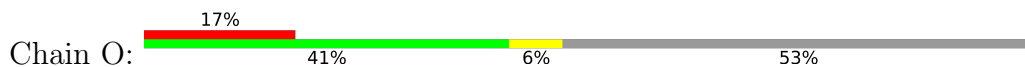


- Molecule 2: BG24 CDRH2-v2 Fab heavy chain

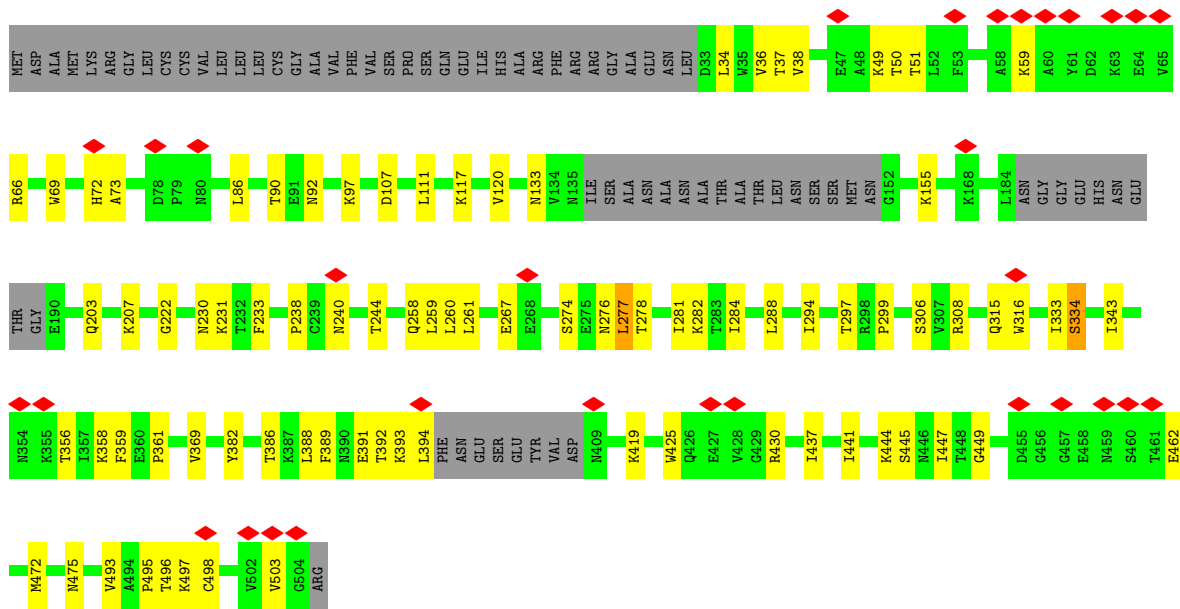




• Molecule 3: BG24 light chain



• Molecule 4: Envelope glycoprotein gp160



• Molecule 4: Envelope glycoprotein gp160





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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



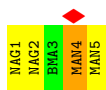
- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



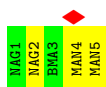
- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



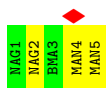
- Molecule 8: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 8: 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 8: 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 9: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[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 9: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[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 9: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[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



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C3	Depositor
Number of particles used	204220	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TECNAI ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.101	Depositor
Minimum map value	-0.073	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.013	Depositor
Map size (Å)	291.984, 291.984, 291.984	wwPDB
Map dimensions	336, 336, 336	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.869, 0.869, 0.869	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: BMA, 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	A	0.28	0/1078	0.69	2/1458 (0.1%)
1	B	0.28	0/1078	0.70	1/1458 (0.1%)
1	M	0.29	0/1078	0.73	2/1458 (0.1%)
2	C	0.25	0/988	0.53	0/1346
2	D	0.26	0/988	0.53	0/1346
2	N	0.26	0/988	0.55	0/1346
3	E	0.28	0/743	0.60	0/1007
3	F	0.29	0/743	0.62	0/1007
3	O	0.29	0/743	0.60	0/1007
4	G	0.28	0/3529	0.54	1/4792 (0.0%)
4	I	0.29	0/3529	0.55	1/4792 (0.0%)
4	P	0.29	0/3529	0.56	1/4792 (0.0%)
5	H	0.27	0/1033	0.57	0/1406
5	J	0.28	0/1033	0.58	0/1406
5	Q	0.26	0/1033	0.56	0/1406
6	K	0.26	0/833	0.58	0/1132
6	L	0.26	0/833	0.60	0/1132
6	R	0.26	0/833	0.59	0/1132
All	All	0.28	0/24612	0.58	8/33423 (0.0%)

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
4	G	0	1
4	I	0	2
4	P	0	1
All	All	0	4

There are no bond length outliers.

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	555	LEU	CA-CB-CG	8.83	135.61	115.30
1	B	555	LEU	CA-CB-CG	7.39	132.29	115.30
1	M	555	LEU	CA-CB-CG	6.69	130.68	115.30
1	M	523	LEU	CA-CB-CG	6.29	129.78	115.30
1	A	523	LEU	CA-CB-CG	6.13	129.40	115.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	G	334	SER	Peptide
4	I	234	ASN	Peptide
4	I	334	SER	Peptide
4	P	334	SER	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1061	0	1051	29	0
1	B	1061	0	1051	27	0
1	M	1061	0	1051	31	0
2	C	962	0	922	7	0
2	D	962	0	922	11	0
2	N	962	0	922	14	0
3	E	727	0	688	7	0
3	F	727	0	688	6	0
3	O	727	0	688	6	0
4	G	3455	0	3419	57	0
4	I	3455	0	3416	62	0
4	P	3455	0	3419	92	0
5	H	1008	0	972	11	0
5	J	1008	0	972	4	0
5	Q	1008	0	972	6	0
6	K	812	0	774	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	L	812	0	774	7	0
6	R	812	0	774	8	0
7	S	28	0	25	1	0
7	T	28	0	25	1	0
7	U	28	0	25	0	0
7	V	28	0	25	0	0
7	W	28	0	25	0	0
7	Y	28	0	25	1	0
7	Z	28	0	25	0	0
7	a	28	0	25	0	0
7	c	28	0	25	0	0
7	d	28	0	25	0	0
7	e	28	0	25	0	0
7	g	28	0	25	0	0
7	h	28	0	25	0	0
7	i	28	0	25	0	0
7	k	28	0	25	0	0
7	l	28	0	25	0	0
7	m	28	0	25	0	0
7	o	28	0	25	0	0
7	p	28	0	25	0	0
7	q	28	0	25	0	0
7	s	28	0	25	0	0
8	X	61	0	52	4	0
8	f	61	0	52	0	0
8	n	61	0	52	0	0
9	b	83	0	70	0	0
9	j	83	0	70	0	0
9	r	83	0	70	0	0
10	G	98	0	91	0	0
10	I	98	0	91	0	0
10	P	98	0	91	6	0
All	All	25389	0	24639	329	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 7.

The worst 5 of 329 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)
4:P:346:LYS:HB3	4:P:394:LEU:HD11	1.55	0.87

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:358:LYS:HB3	4:G:392:THR:HG23	1.60	0.84
4:P:358:LYS:HD3	4:P:464:VAL:HG22	1.61	0.83
4:I:358:LYS:HB3	4:I:392:THR:HG23	1.60	0.83
4:P:358:LYS:HA	4:P:392:THR:HA	1.66	0.77

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	130/153 (85%)	123 (95%)	7 (5%)	0	100	100
1	B	130/153 (85%)	123 (95%)	7 (5%)	0	100	100
1	M	130/153 (85%)	124 (95%)	6 (5%)	0	100	100
2	C	119/234 (51%)	114 (96%)	5 (4%)	0	100	100
2	D	119/234 (51%)	109 (92%)	10 (8%)	0	100	100
2	N	119/234 (51%)	109 (92%)	10 (8%)	0	100	100
3	E	95/205 (46%)	89 (94%)	5 (5%)	1 (1%)	14	52
3	F	95/205 (46%)	90 (95%)	4 (4%)	1 (1%)	14	52
3	O	95/205 (46%)	90 (95%)	4 (4%)	1 (1%)	14	52
4	G	428/507 (84%)	399 (93%)	26 (6%)	3 (1%)	22	61
4	I	428/507 (84%)	400 (94%)	26 (6%)	2 (0%)	29	68
4	P	428/507 (84%)	396 (92%)	28 (6%)	4 (1%)	17	56
5	H	126/243 (52%)	123 (98%)	3 (2%)	0	100	100
5	J	126/243 (52%)	123 (98%)	3 (2%)	0	100	100
5	Q	126/243 (52%)	123 (98%)	3 (2%)	0	100	100
6	K	103/216 (48%)	97 (94%)	6 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	L	103/216 (48%)	98 (95%)	5 (5%)	0	100	100
6	R	103/216 (48%)	100 (97%)	3 (3%)	0	100	100
All	All	3003/4674 (64%)	2830 (94%)	161 (5%)	12 (0%)	38	72

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	E	47	VAL
4	G	334	SER
3	F	47	VAL
4	I	334	SER
3	O	47	VAL

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	115/129 (89%)	115 (100%)	0	100	100
1	B	115/129 (89%)	115 (100%)	0	100	100
1	M	115/129 (89%)	115 (100%)	0	100	100
2	C	102/201 (51%)	102 (100%)	0	100	100
2	D	102/201 (51%)	102 (100%)	0	100	100
2	N	102/201 (51%)	102 (100%)	0	100	100
3	E	78/173 (45%)	78 (100%)	0	100	100
3	F	78/173 (45%)	78 (100%)	0	100	100
3	O	78/173 (45%)	78 (100%)	0	100	100
4	G	394/451 (87%)	393 (100%)	1 (0%)	92	97
4	I	394/451 (87%)	394 (100%)	0	100	100
4	P	394/451 (87%)	394 (100%)	0	100	100
5	H	112/213 (53%)	110 (98%)	2 (2%)	59	81
5	J	112/213 (53%)	110 (98%)	2 (2%)	59	81

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	Q	112/213 (53%)	110 (98%)	2 (2%)	59	81
6	K	84/183 (46%)	84 (100%)	0	100	100
6	L	84/183 (46%)	83 (99%)	1 (1%)	71	87
6	R	84/183 (46%)	83 (99%)	1 (1%)	71	87
All	All	2655/4050 (66%)	2646 (100%)	9 (0%)	92	97

5 of 9 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
5	Q	103	ARG
6	R	39	ARG
6	L	39	ARG
5	J	13	LYS
5	J	103	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 6 such sidechains are listed below:

Mol	Chain	Res	Type
2	N	57	GLN
4	P	287	HIS
4	P	475	ASN
2	D	57	GLN
1	B	575	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](#)

78 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
7	NAG	S	1	7,3	14,14,15	1.32	2 (14%)	17,19,21	1.15	1 (5%)
7	NAG	S	2	7	14,14,15	0.38	0	17,19,21	0.48	0
7	NAG	T	1	7,3	14,14,15	1.33	2 (14%)	17,19,21	1.16	1 (5%)
7	NAG	T	2	7	14,14,15	0.38	0	17,19,21	0.48	0
7	NAG	U	1	7,3	14,14,15	0.58	0	17,19,21	0.50	0
7	NAG	U	2	7	14,14,15	0.41	0	17,19,21	0.48	0
7	NAG	V	1	4,7	14,14,15	0.24	0	17,19,21	0.40	0
7	NAG	V	2	7	14,14,15	0.33	0	17,19,21	0.43	0
7	NAG	W	1	4,7	14,14,15	0.37	0	17,19,21	0.60	0
7	NAG	W	2	7	14,14,15	2.04	1 (7%)	17,19,21	2.61	1 (5%)
8	NAG	X	1	4,8	14,14,15	0.28	0	17,19,21	0.44	0
8	NAG	X	2	8	14,14,15	0.32	0	17,19,21	0.82	1 (5%)
8	BMA	X	3	8	11,11,12	0.64	0	15,15,17	0.79	0
8	MAN	X	4	8	11,11,12	0.79	0	15,15,17	0.92	2 (13%)
8	MAN	X	5	8	11,11,12	0.69	0	15,15,17	1.03	2 (13%)
7	NAG	Y	1	4,7	14,14,15	0.32	0	17,19,21	0.48	0
7	NAG	Y	2	7	14,14,15	0.28	0	17,19,21	0.84	1 (5%)
7	NAG	Z	1	4,7	14,14,15	0.37	0	17,19,21	0.52	0
7	NAG	Z	2	7	14,14,15	0.28	0	17,19,21	0.36	0
7	NAG	a	1	4,7	14,14,15	0.68	0	17,19,21	0.65	0
7	NAG	a	2	7	14,14,15	0.42	0	17,19,21	0.50	0
9	NAG	b	1	4,9	14,14,15	0.25	0	17,19,21	0.58	0
9	NAG	b	2	9	14,14,15	0.20	0	17,19,21	0.51	0
9	BMA	b	3	9	11,11,12	0.78	0	15,15,17	1.32	1 (6%)
9	MAN	b	4	9	11,11,12	0.63	0	15,15,17	1.31	1 (6%)
9	MAN	b	5	9	11,11,12	0.59	0	15,15,17	1.14	2 (13%)
9	MAN	b	6	9	11,11,12	0.71	0	15,15,17	1.05	2 (13%)
9	MAN	b	7	9	11,11,12	0.66	0	15,15,17	1.08	2 (13%)
7	NAG	c	1	4,7	14,14,15	0.31	0	17,19,21	0.55	0
7	NAG	c	2	7	14,14,15	0.46	0	17,19,21	0.78	1 (5%)
7	NAG	d	1	4,7	14,14,15	1.34	1 (7%)	17,19,21	1.29	1 (5%)
7	NAG	d	2	7	14,14,15	0.31	0	17,19,21	0.43	0
7	NAG	e	1	4,7	14,14,15	0.29	0	17,19,21	0.52	0
7	NAG	e	2	7	14,14,15	0.30	0	17,19,21	0.43	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
8	NAG	f	1	4,8	14,14,15	0.45	0	17,19,21	0.51	0
8	NAG	f	2	8	14,14,15	0.30	0	17,19,21	0.82	1 (5%)
8	BMA	f	3	8	11,11,12	0.61	0	15,15,17	0.83	0
8	MAN	f	4	8	11,11,12	0.81	0	15,15,17	0.89	1 (6%)
8	MAN	f	5	8	11,11,12	0.69	0	15,15,17	1.05	2 (13%)
7	NAG	g	1	4,7	14,14,15	0.59	0	17,19,21	0.73	0
7	NAG	g	2	7	14,14,15	0.36	0	17,19,21	0.97	2 (11%)
7	NAG	h	1	4,7	14,14,15	0.26	0	17,19,21	0.49	0
7	NAG	h	2	7	14,14,15	0.27	0	17,19,21	0.39	0
7	NAG	i	1	4,7	14,14,15	0.40	0	17,19,21	0.76	1 (5%)
7	NAG	i	2	7	14,14,15	0.71	1 (7%)	17,19,21	1.96	2 (11%)
9	NAG	j	1	4,9	14,14,15	0.23	0	17,19,21	0.74	1 (5%)
9	NAG	j	2	9	14,14,15	0.20	0	17,19,21	0.52	0
9	BMA	j	3	9	11,11,12	0.82	0	15,15,17	1.38	2 (13%)
9	MAN	j	4	9	11,11,12	0.67	0	15,15,17	1.34	1 (6%)
9	MAN	j	5	9	11,11,12	0.60	0	15,15,17	1.12	2 (13%)
9	MAN	j	6	9	11,11,12	0.71	0	15,15,17	1.01	2 (13%)
9	MAN	j	7	9	11,11,12	0.69	0	15,15,17	1.07	2 (13%)
7	NAG	k	1	4,7	14,14,15	0.31	0	17,19,21	0.48	0
7	NAG	k	2	7	14,14,15	0.52	0	17,19,21	0.79	1 (5%)
7	NAG	l	1	4,7	14,14,15	0.25	0	17,19,21	0.42	0
7	NAG	l	2	7	14,14,15	0.31	0	17,19,21	0.43	0
7	NAG	m	1	4,7	14,14,15	0.51	0	17,19,21	0.82	1 (5%)
7	NAG	m	2	7	14,14,15	2.21	2 (14%)	17,19,21	2.42	1 (5%)
8	NAG	n	1	4,8	14,14,15	0.32	0	17,19,21	0.45	0
8	NAG	n	2	8	14,14,15	0.28	0	17,19,21	0.86	1 (5%)
8	BMA	n	3	8	11,11,12	0.62	0	15,15,17	0.77	0
8	MAN	n	4	8	11,11,12	0.86	0	15,15,17	0.91	1 (6%)
8	MAN	n	5	8	11,11,12	0.68	0	15,15,17	1.05	2 (13%)
7	NAG	o	1	4,7	14,14,15	0.35	0	17,19,21	0.55	0
7	NAG	o	2	7	14,14,15	0.29	0	17,19,21	0.88	1 (5%)
7	NAG	p	1	4,7	14,14,15	0.38	0	17,19,21	0.61	0
7	NAG	p	2	7	14,14,15	0.29	0	17,19,21	0.38	0
7	NAG	q	1	4,7	14,14,15	0.41	0	17,19,21	0.74	1 (5%)
7	NAG	q	2	7	14,14,15	0.32	0	17,19,21	0.43	0
9	NAG	r	1	4,9	14,14,15	0.26	0	17,19,21	0.57	0
9	NAG	r	2	9	14,14,15	0.21	0	17,19,21	0.49	0
9	BMA	r	3	9	11,11,12	0.75	0	15,15,17	1.29	2 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
9	MAN	r	4	9	11,11,12	0.67	0	15,15,17	1.39	1 (6%)
9	MAN	r	5	9	11,11,12	0.63	0	15,15,17	1.15	1 (6%)
9	MAN	r	6	9	11,11,12	0.72	0	15,15,17	1.05	2 (13%)
9	MAN	r	7	9	11,11,12	0.67	0	15,15,17	1.07	2 (13%)
7	NAG	s	1	4,7	14,14,15	0.33	0	17,19,21	0.46	0
7	NAG	s	2	7	14,14,15	0.60	0	17,19,21	0.78	1 (5%)

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

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

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	MAN	b	5	9	-	1/2/19/22	0/1/1/1
9	MAN	b	6	9	-	2/2/19/22	0/1/1/1
9	MAN	b	7	9	-	2/2/19/22	0/1/1/1
7	NAG	c	1	4,7	-	2/6/23/26	0/1/1/1
7	NAG	c	2	7	-	2/6/23/26	0/1/1/1
7	NAG	d	1	4,7	-	1/6/23/26	0/1/1/1
7	NAG	d	2	7	-	0/6/23/26	0/1/1/1
7	NAG	e	1	4,7	-	0/6/23/26	0/1/1/1
7	NAG	e	2	7	-	2/6/23/26	0/1/1/1
8	NAG	f	1	4,8	-	2/6/23/26	0/1/1/1
8	NAG	f	2	8	-	1/6/23/26	0/1/1/1
8	BMA	f	3	8	-	0/2/19/22	0/1/1/1
8	MAN	f	4	8	-	0/2/19/22	0/1/1/1
8	MAN	f	5	8	-	0/2/19/22	0/1/1/1
7	NAG	g	1	4,7	-	0/6/23/26	0/1/1/1
7	NAG	g	2	7	-	3/6/23/26	0/1/1/1
7	NAG	h	1	4,7	-	2/6/23/26	0/1/1/1
7	NAG	h	2	7	-	2/6/23/26	0/1/1/1
7	NAG	i	1	4,7	-	0/6/23/26	0/1/1/1
7	NAG	i	2	7	-	4/6/23/26	0/1/1/1
9	NAG	j	1	4,9	-	2/6/23/26	0/1/1/1
9	NAG	j	2	9	-	4/6/23/26	0/1/1/1
9	BMA	j	3	9	-	0/2/19/22	0/1/1/1
9	MAN	j	4	9	-	2/2/19/22	0/1/1/1
9	MAN	j	5	9	-	1/2/19/22	0/1/1/1
9	MAN	j	6	9	-	1/2/19/22	0/1/1/1
9	MAN	j	7	9	-	1/2/19/22	0/1/1/1
7	NAG	k	1	4,7	-	2/6/23/26	0/1/1/1
7	NAG	k	2	7	-	1/6/23/26	0/1/1/1
7	NAG	l	1	4,7	-	1/6/23/26	0/1/1/1
7	NAG	l	2	7	-	2/6/23/26	0/1/1/1
7	NAG	m	1	4,7	-	0/6/23/26	0/1/1/1
7	NAG	m	2	7	-	0/6/23/26	0/1/1/1
8	NAG	n	1	4,8	-	2/6/23/26	0/1/1/1
8	NAG	n	2	8	-	1/6/23/26	0/1/1/1
8	BMA	n	3	8	-	0/2/19/22	0/1/1/1
8	MAN	n	4	8	-	2/2/19/22	0/1/1/1
8	MAN	n	5	8	-	2/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	NAG	o	1	4,7	-	2/6/23/26	0/1/1/1
7	NAG	o	2	7	-	3/6/23/26	0/1/1/1
7	NAG	p	1	4,7	-	0/6/23/26	0/1/1/1
7	NAG	p	2	7	-	2/6/23/26	0/1/1/1
7	NAG	q	1	4,7	-	2/6/23/26	0/1/1/1
7	NAG	q	2	7	-	0/6/23/26	0/1/1/1
9	NAG	r	1	4,9	-	1/6/23/26	0/1/1/1
9	NAG	r	2	9	-	2/6/23/26	0/1/1/1
9	BMA	r	3	9	-	0/2/19/22	0/1/1/1
9	MAN	r	4	9	-	2/2/19/22	0/1/1/1
9	MAN	r	5	9	-	1/2/19/22	0/1/1/1
9	MAN	r	6	9	-	2/2/19/22	0/1/1/1
9	MAN	r	7	9	-	2/2/19/22	0/1/1/1
7	NAG	s	1	4,7	-	2/6/23/26	0/1/1/1
7	NAG	s	2	7	-	3/6/23/26	0/1/1/1

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	m	2	NAG	O5-C1	7.95	1.56	1.43
7	W	2	NAG	O5-C1	7.37	1.55	1.43
7	d	1	NAG	O5-C1	-4.55	1.36	1.43
7	T	1	NAG	O5-C1	4.07	1.50	1.43
7	S	1	NAG	O5-C1	4.05	1.50	1.43

The worst 5 of 56 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	W	2	NAG	C1-O5-C5	10.47	126.38	112.19
7	m	2	NAG	C1-O5-C5	9.73	125.38	112.19
7	i	2	NAG	C2-N2-C7	6.91	132.74	122.90
7	T	1	NAG	C1-O5-C5	4.42	118.17	112.19
7	S	1	NAG	C1-O5-C5	4.38	118.13	112.19

There are no chirality outliers.

5 of 107 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	S	2	NAG	O5-C5-C6-O6

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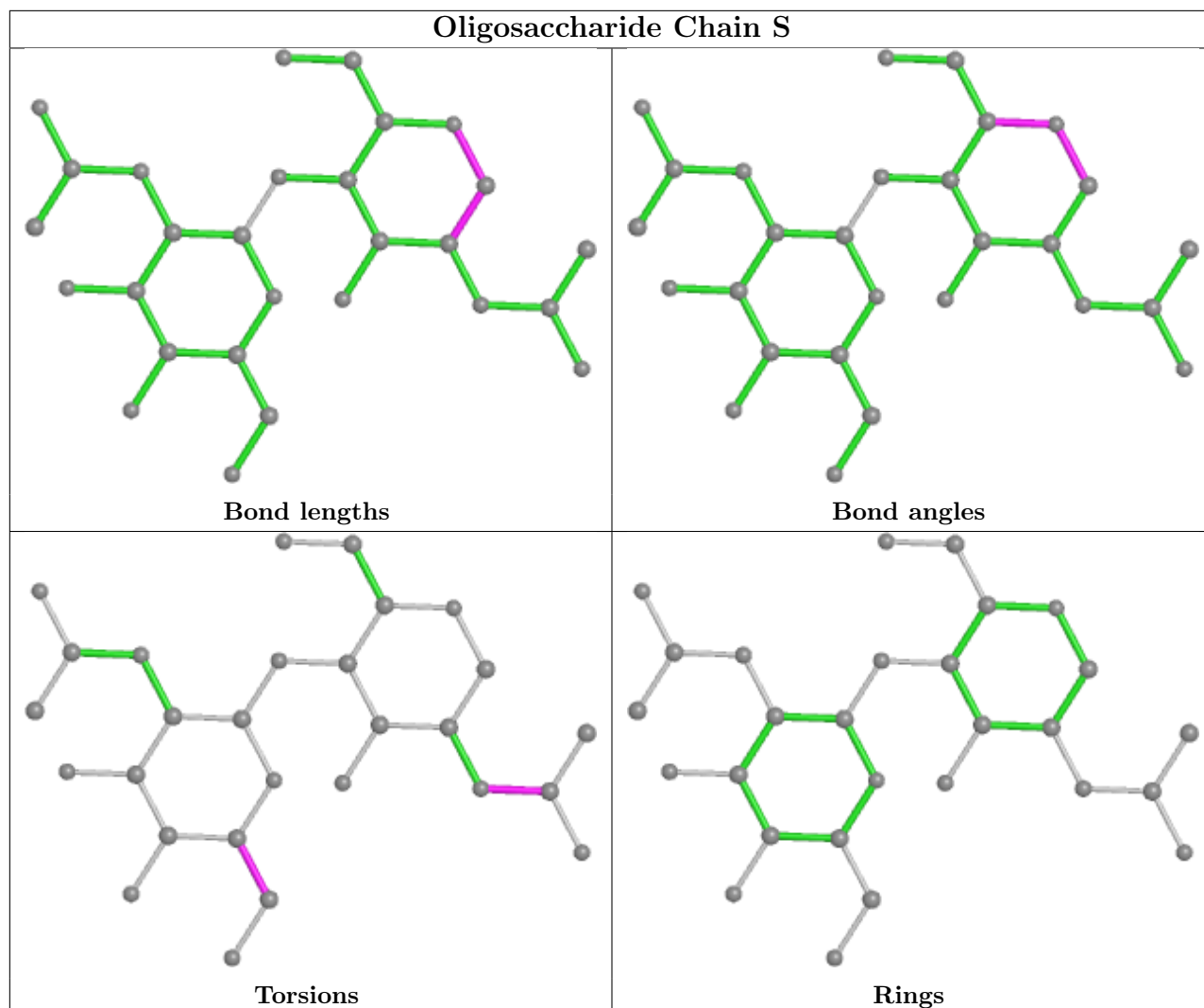
Mol	Chain	Res	Type	Atoms
7	T	2	NAG	O5-C5-C6-O6
8	n	4	MAN	O5-C5-C6-O6
7	o	1	NAG	O5-C5-C6-O6
7	o	2	NAG	O5-C5-C6-O6

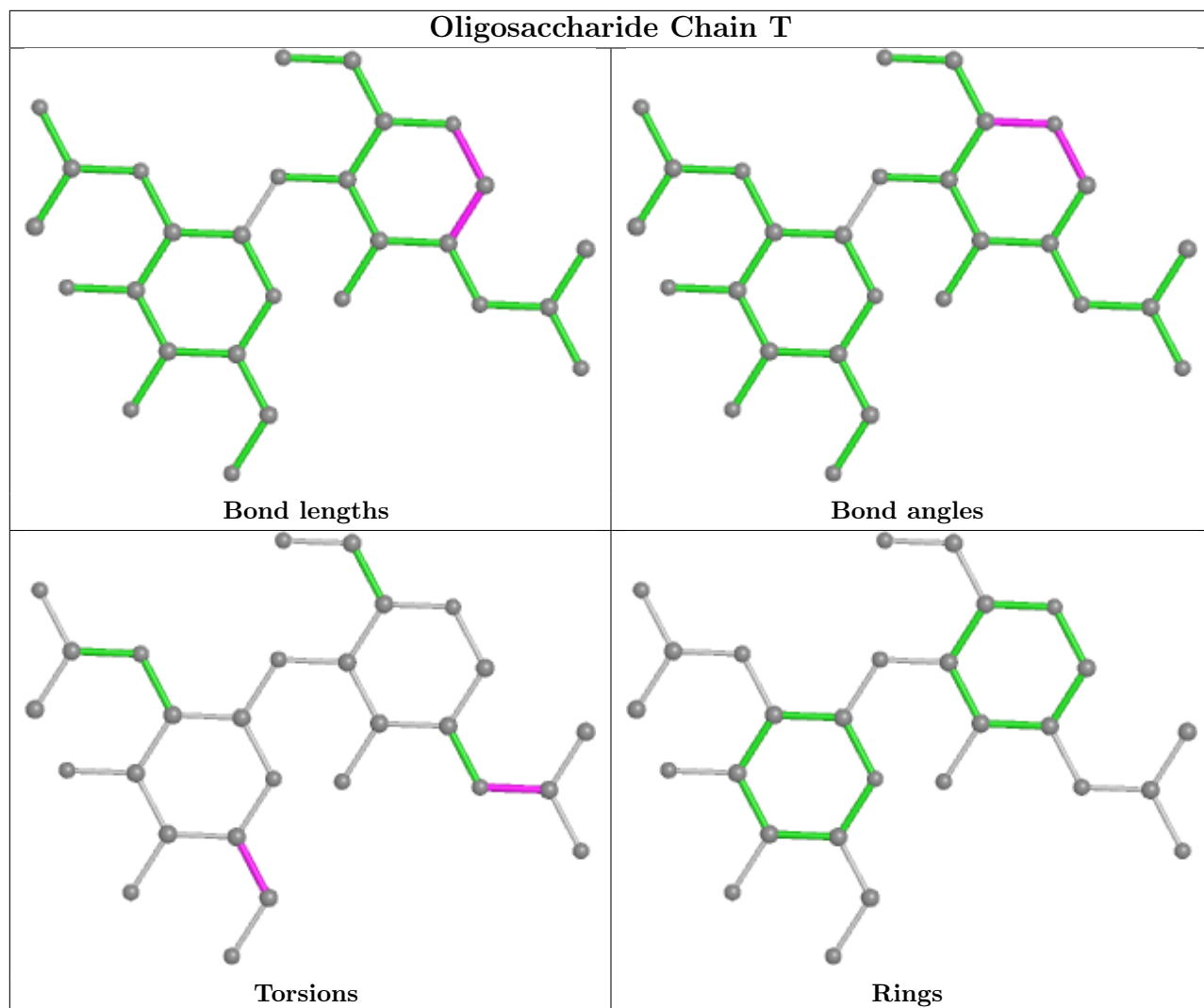
There are no ring outliers.

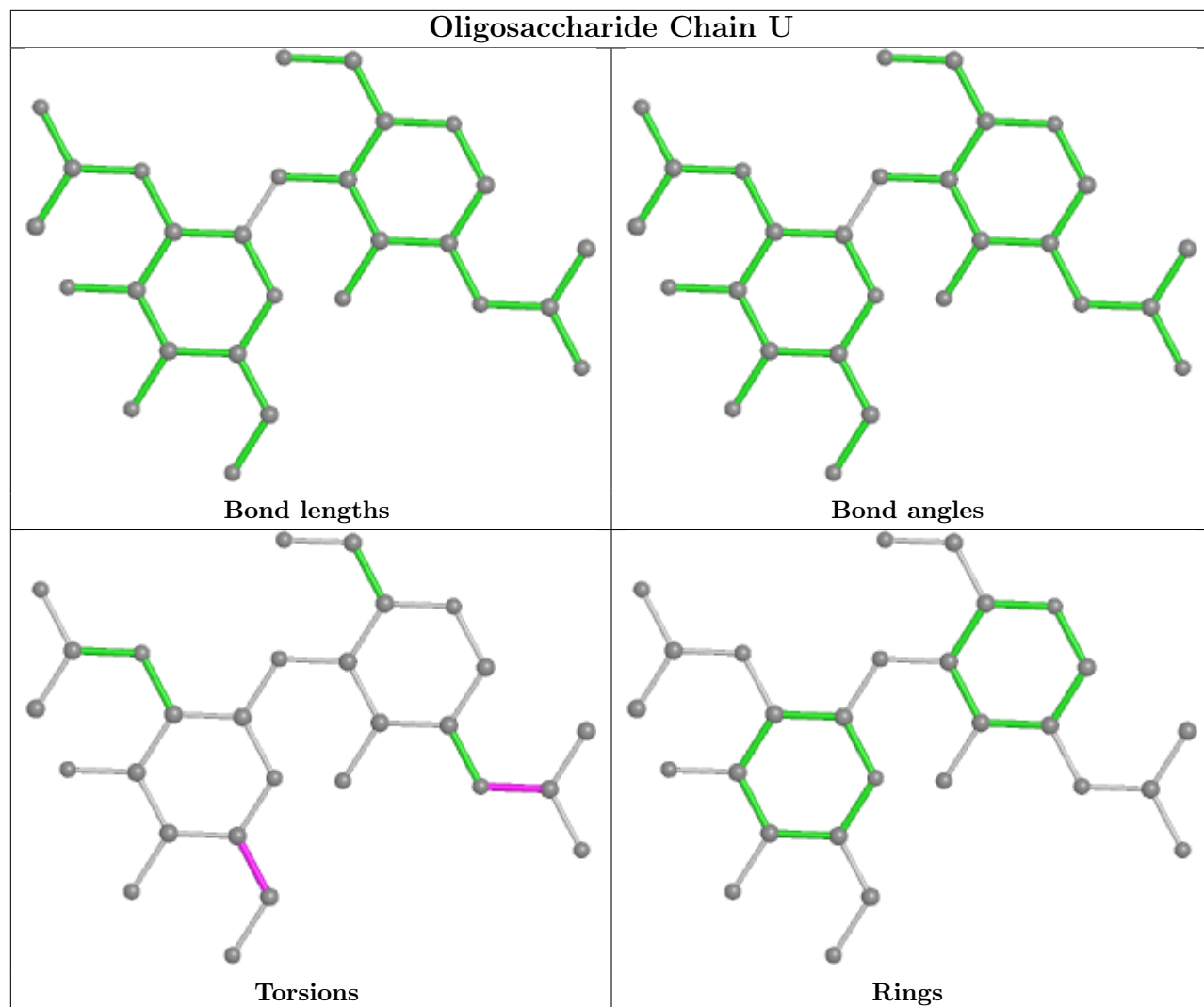
5 monomers are involved in 7 short contacts:

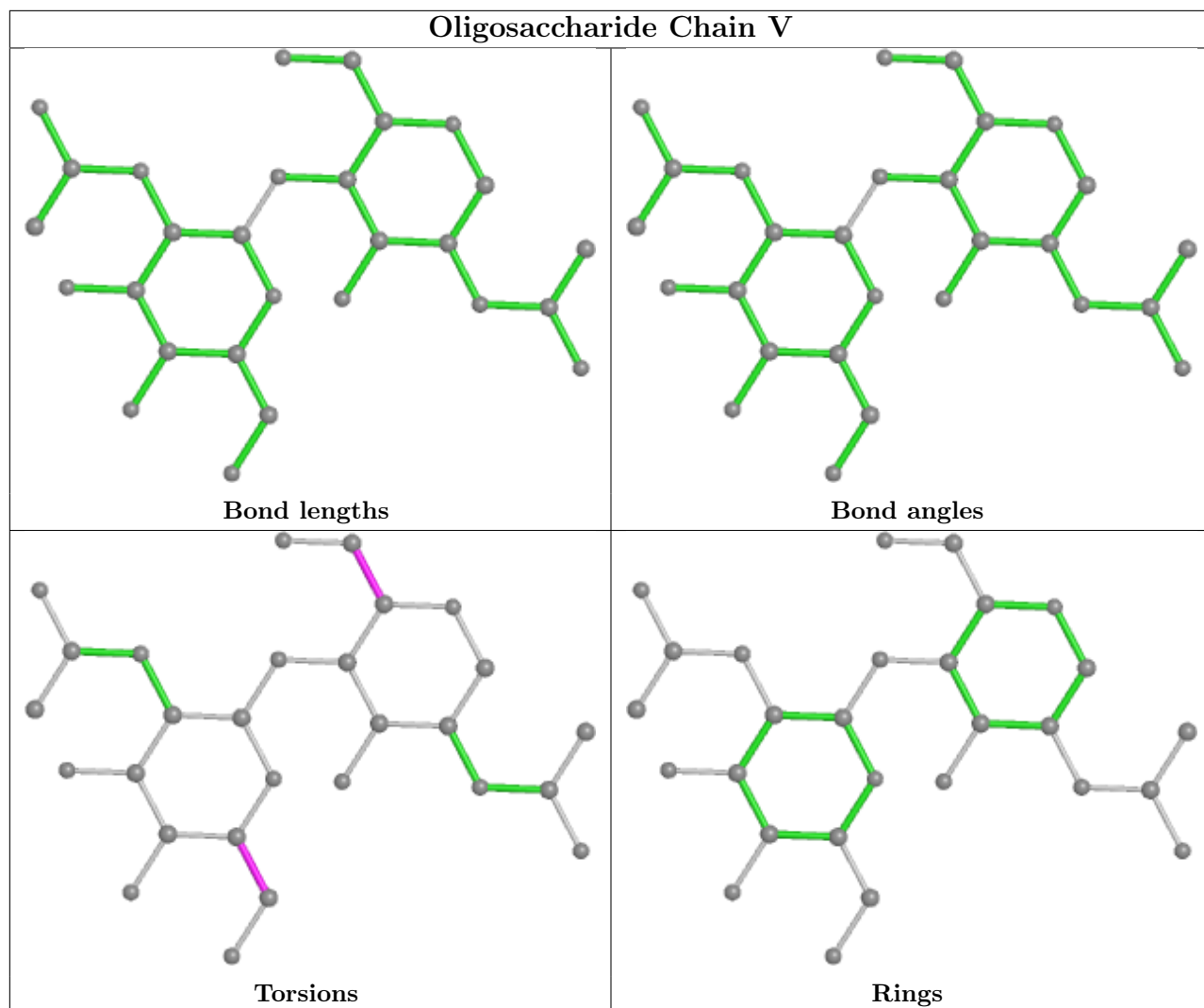
Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	X	4	MAN	3	0
7	Y	1	NAG	1	0
8	X	1	NAG	1	0
7	T	1	NAG	1	0
7	S	1	NAG	1	0

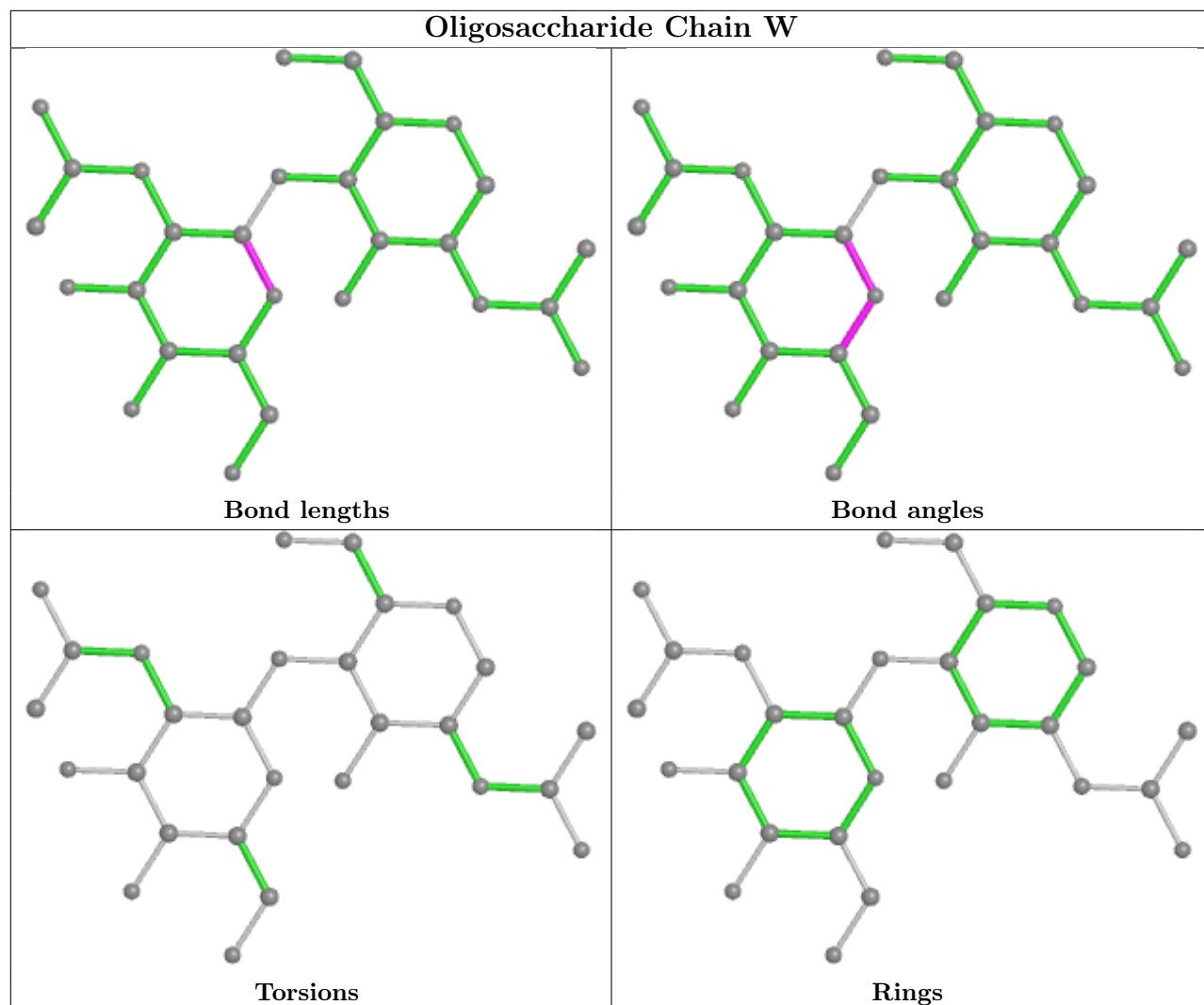
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

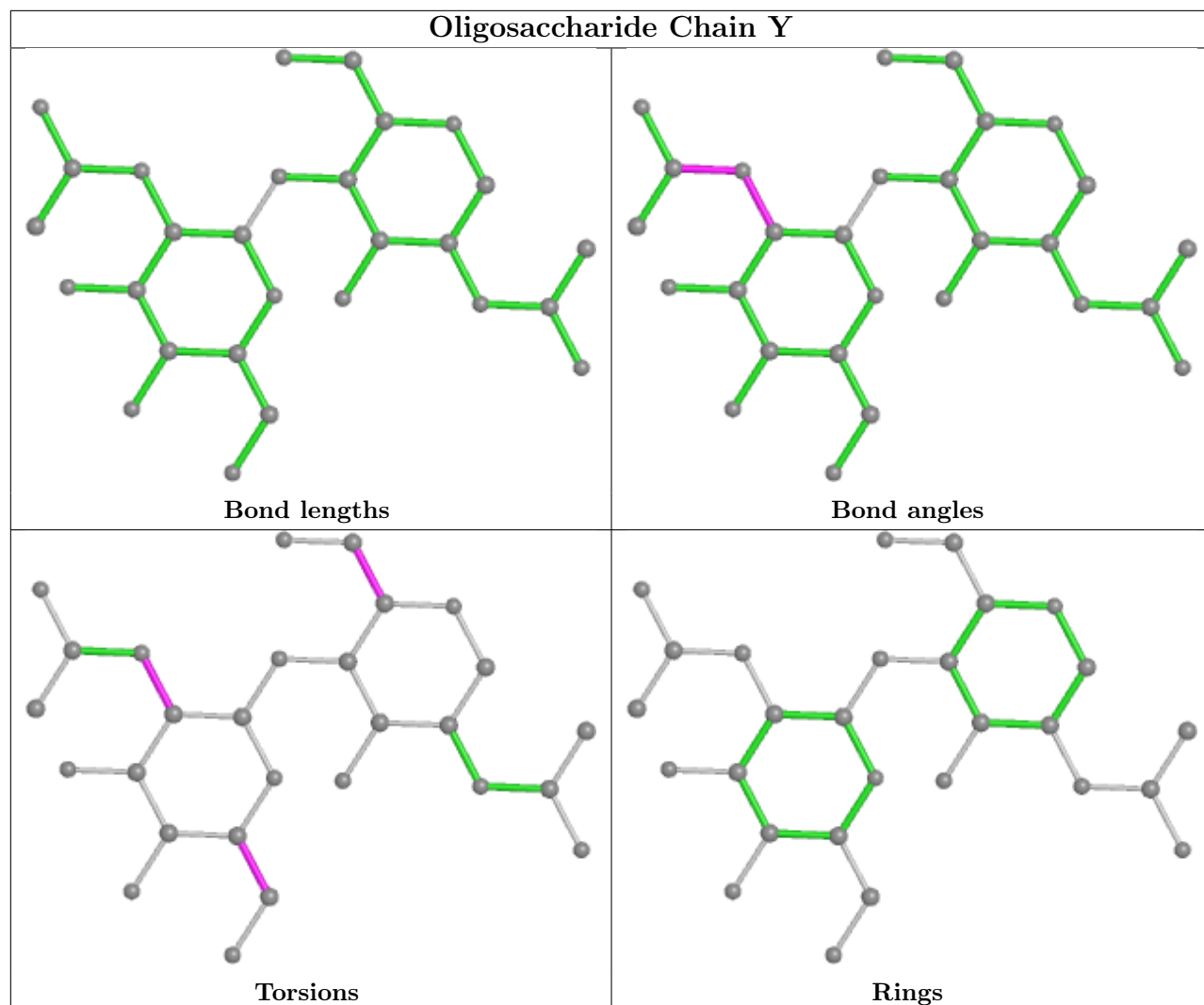


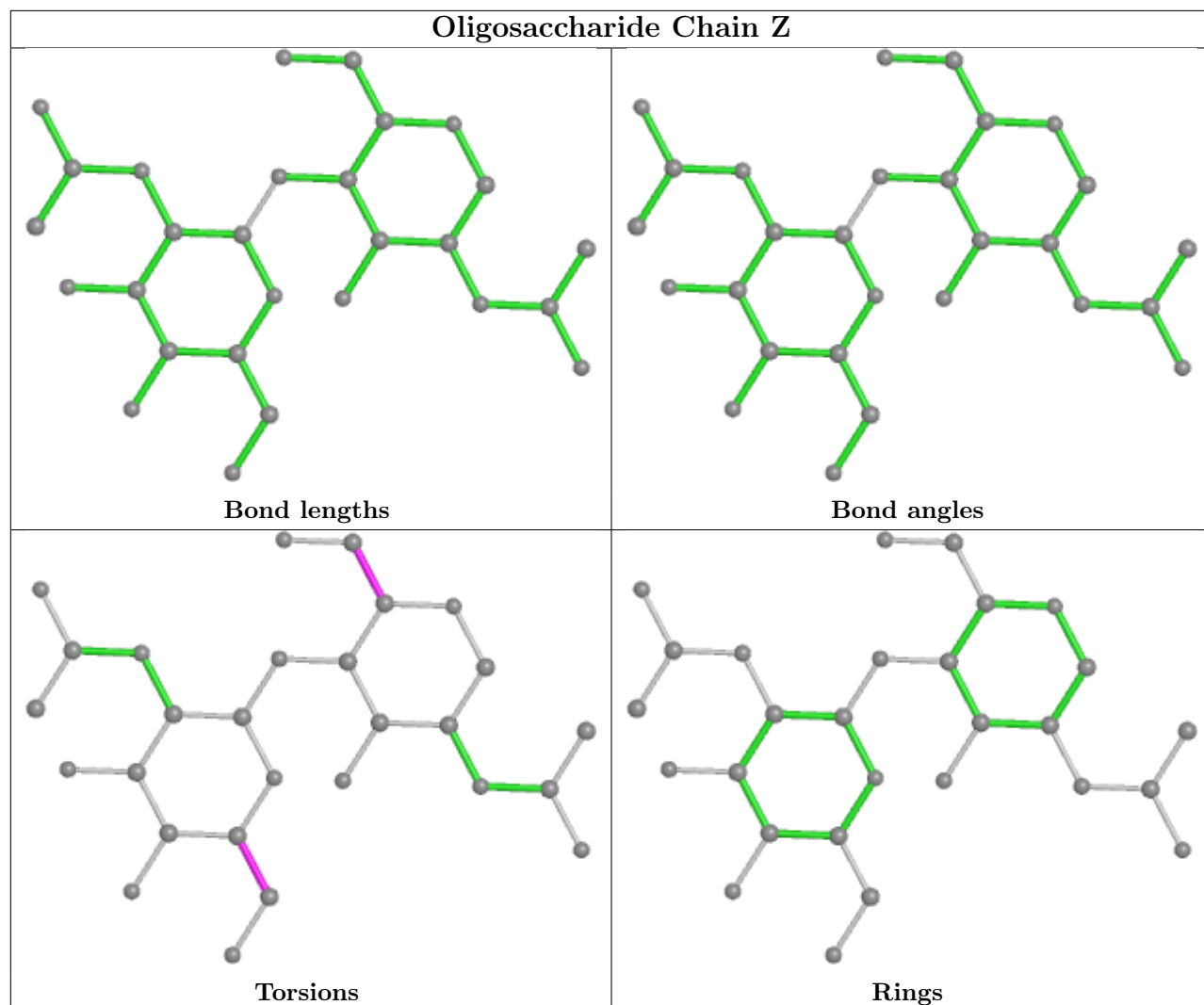


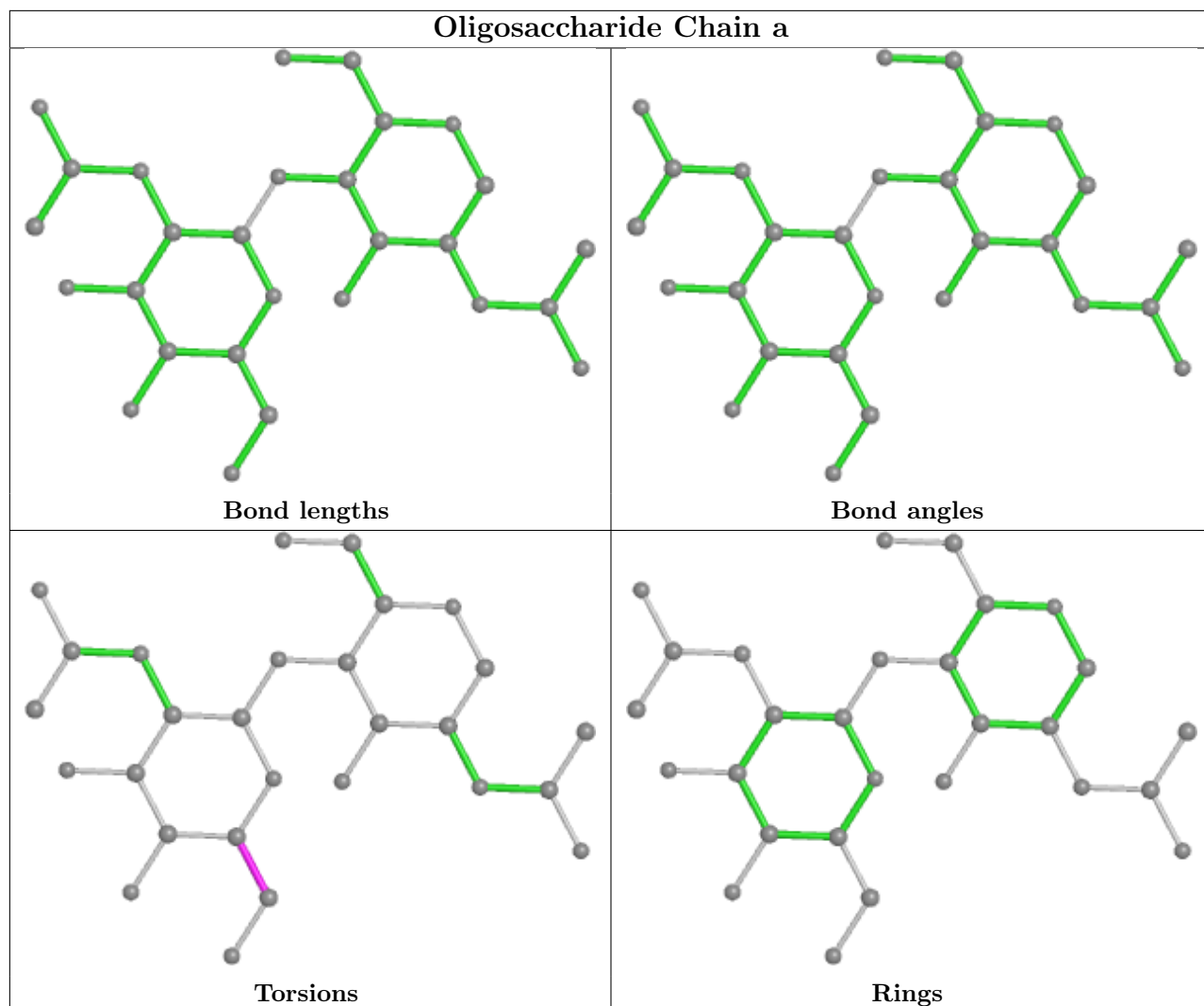


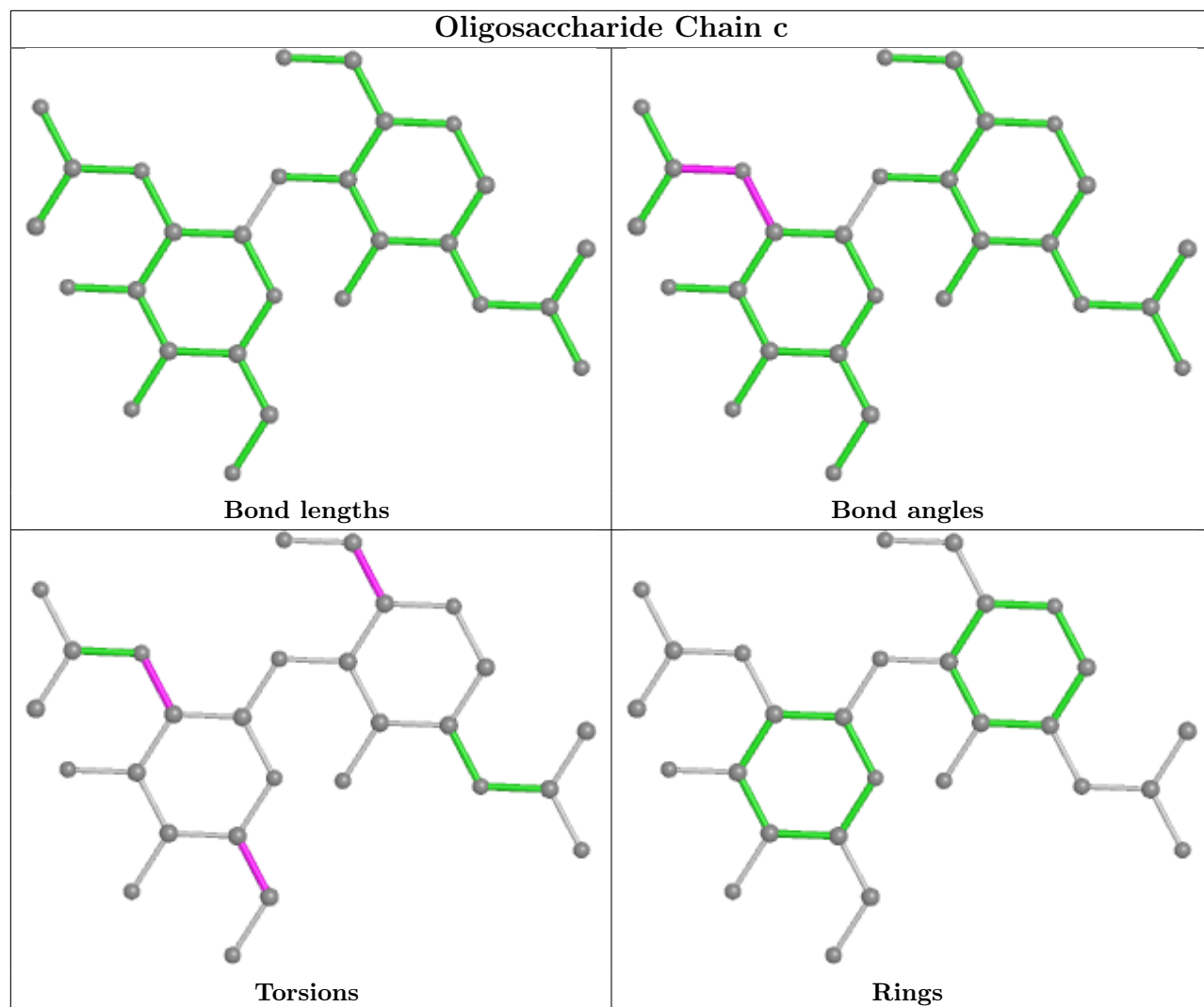


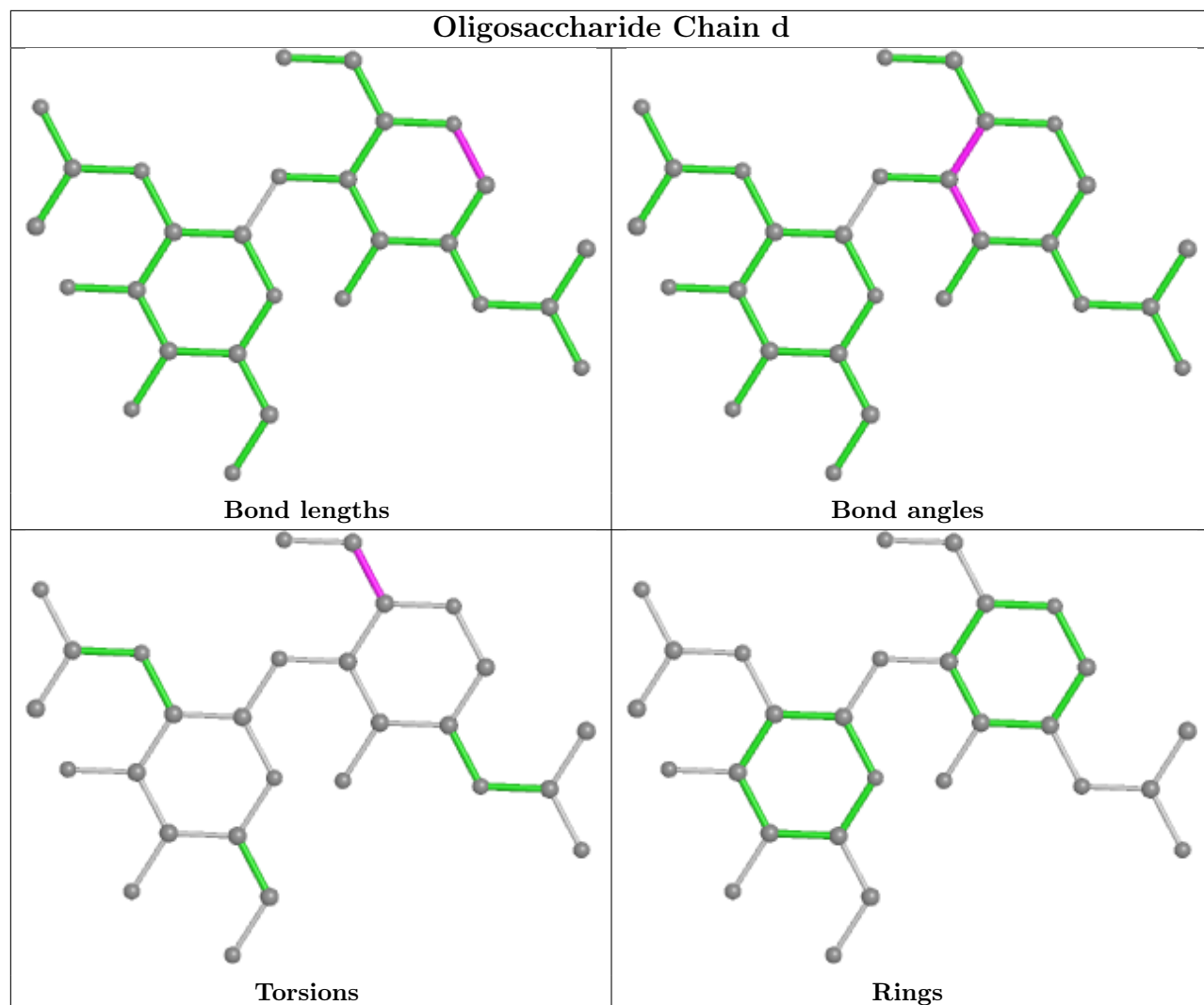


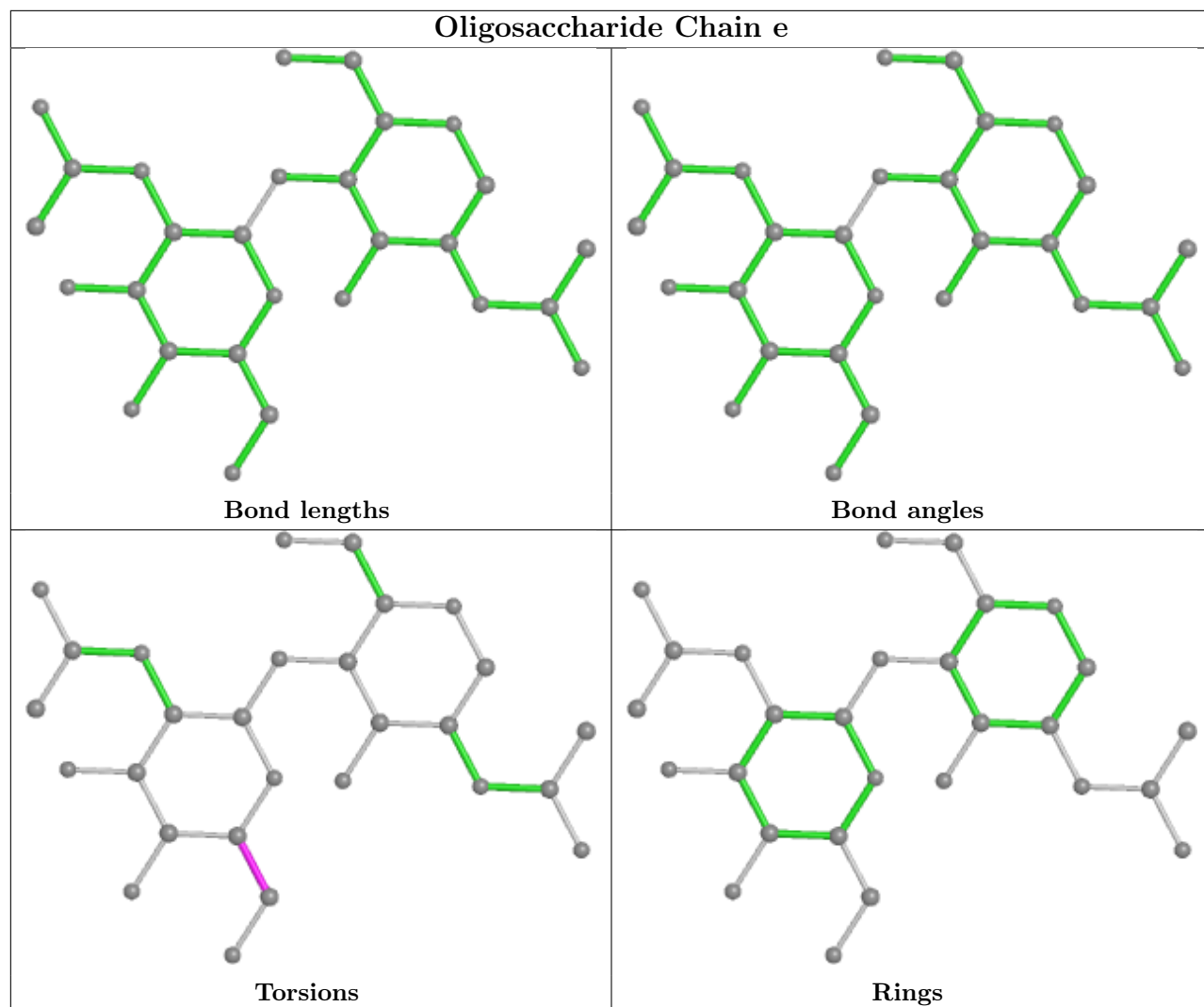


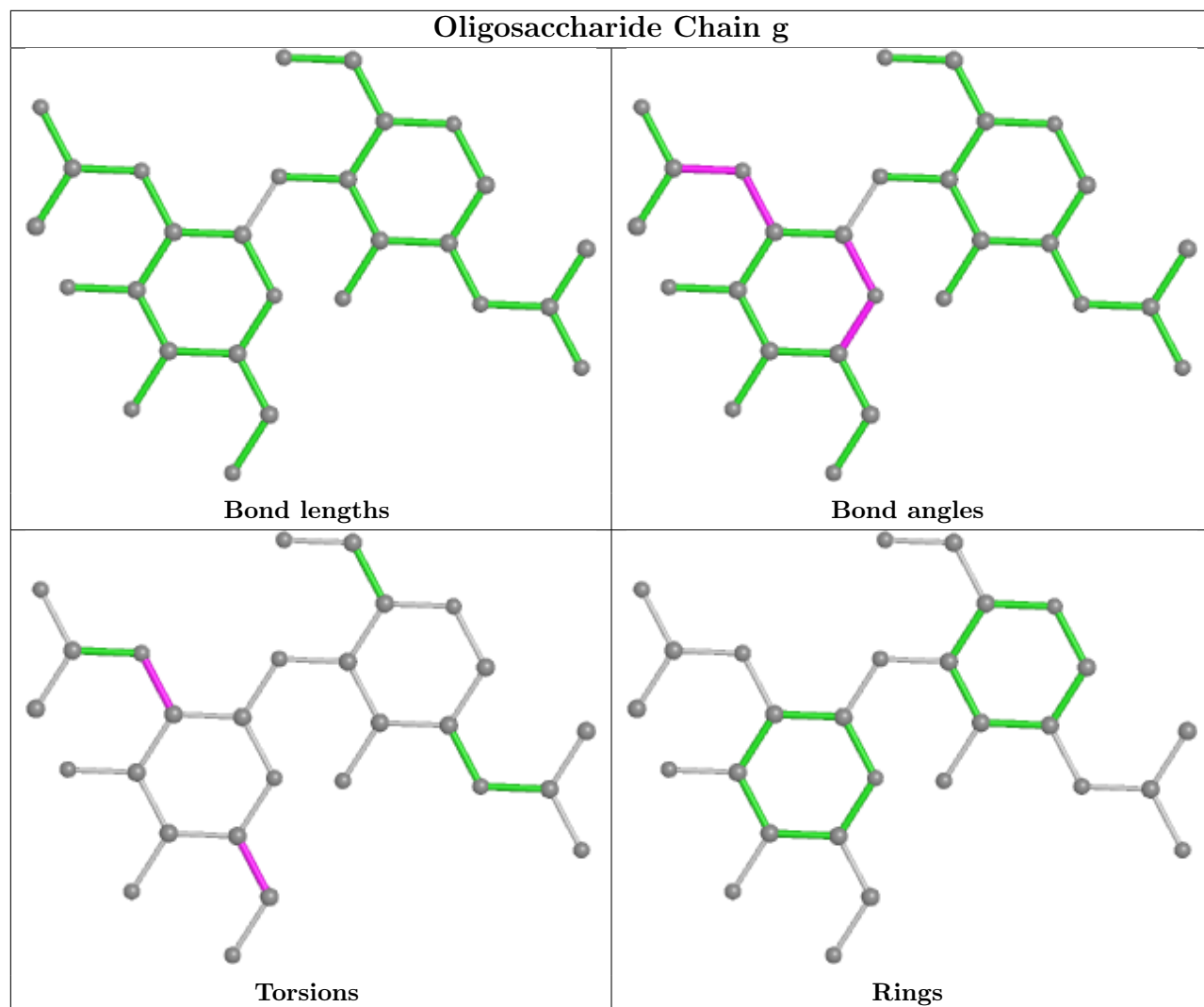


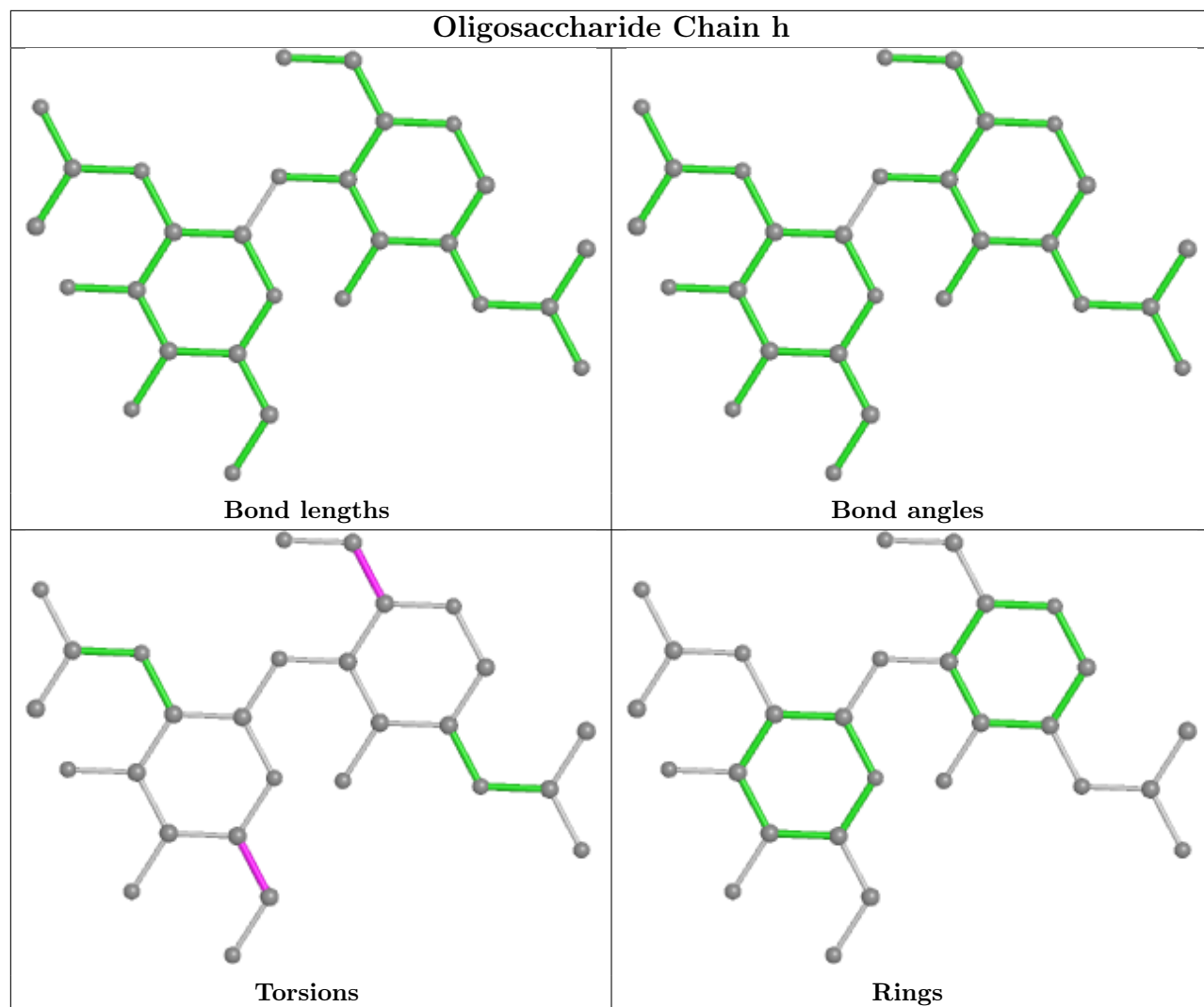


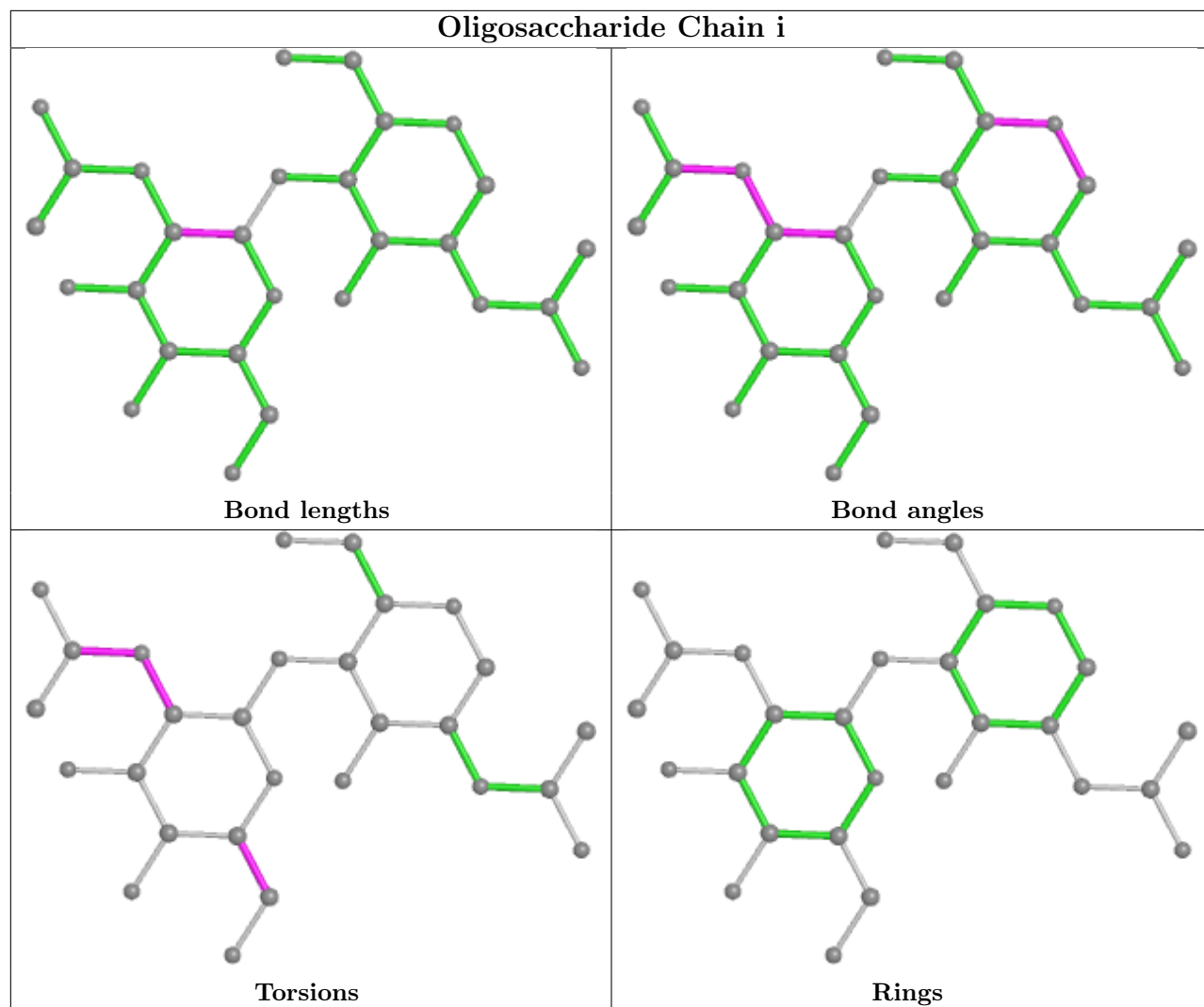


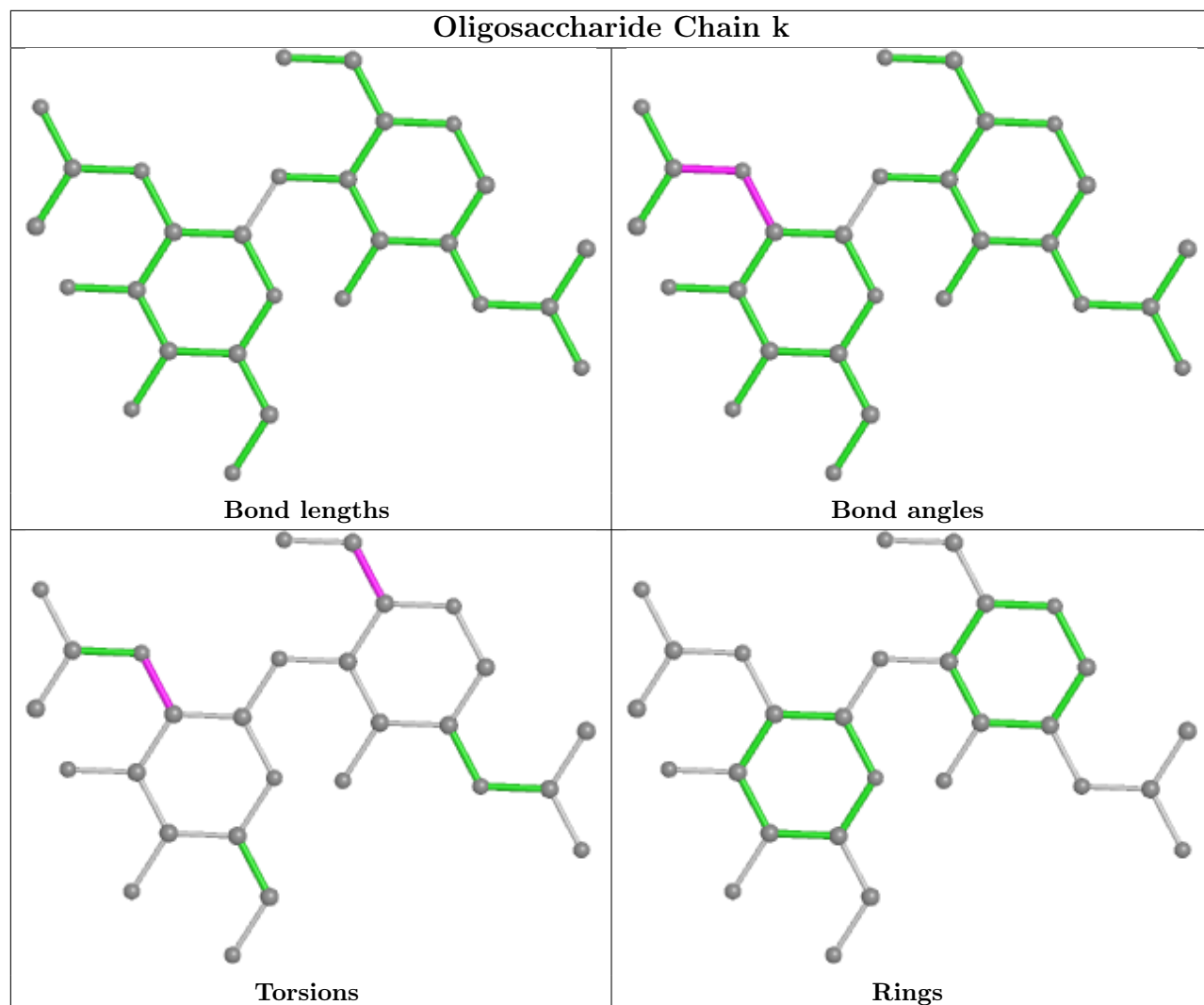


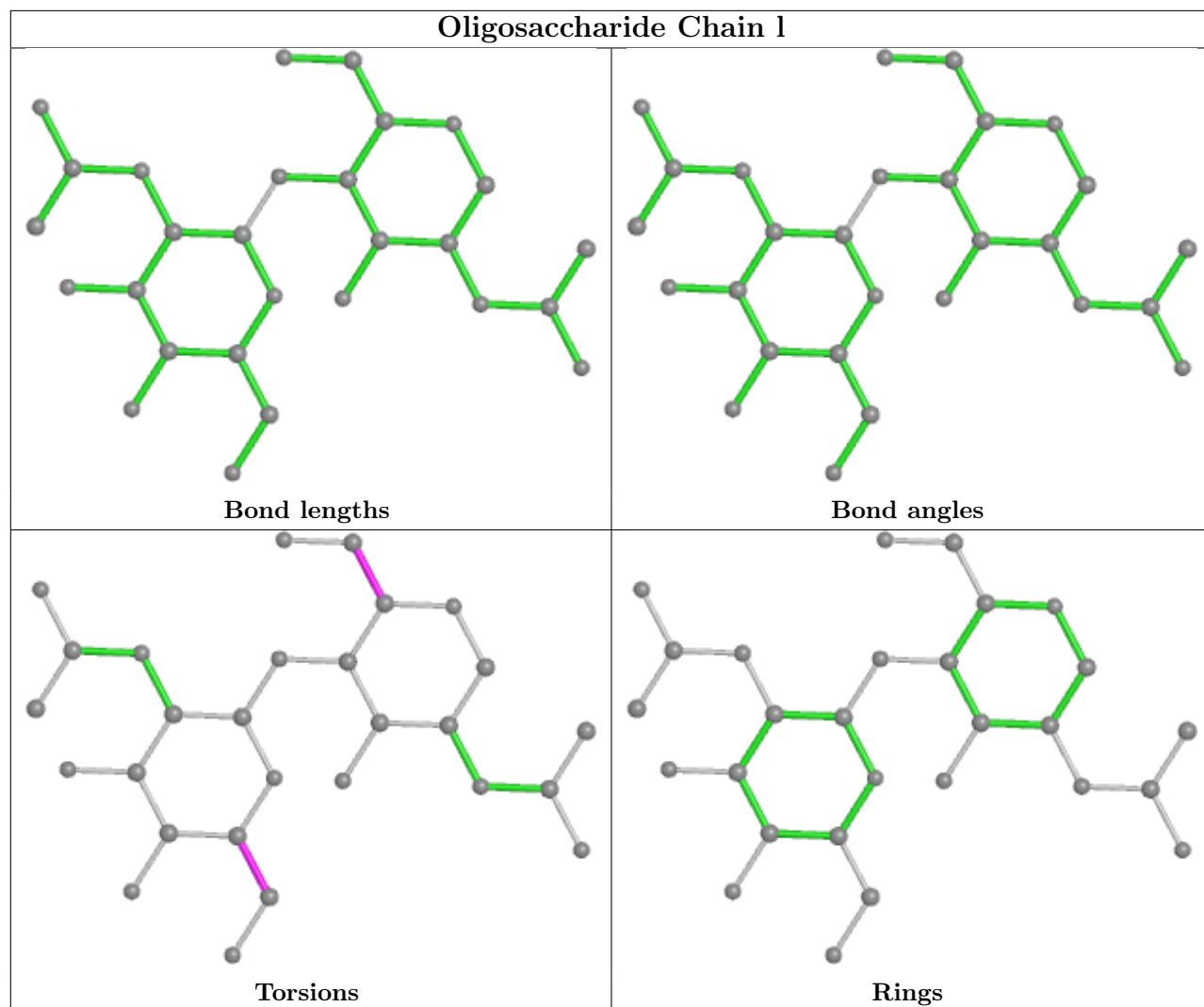


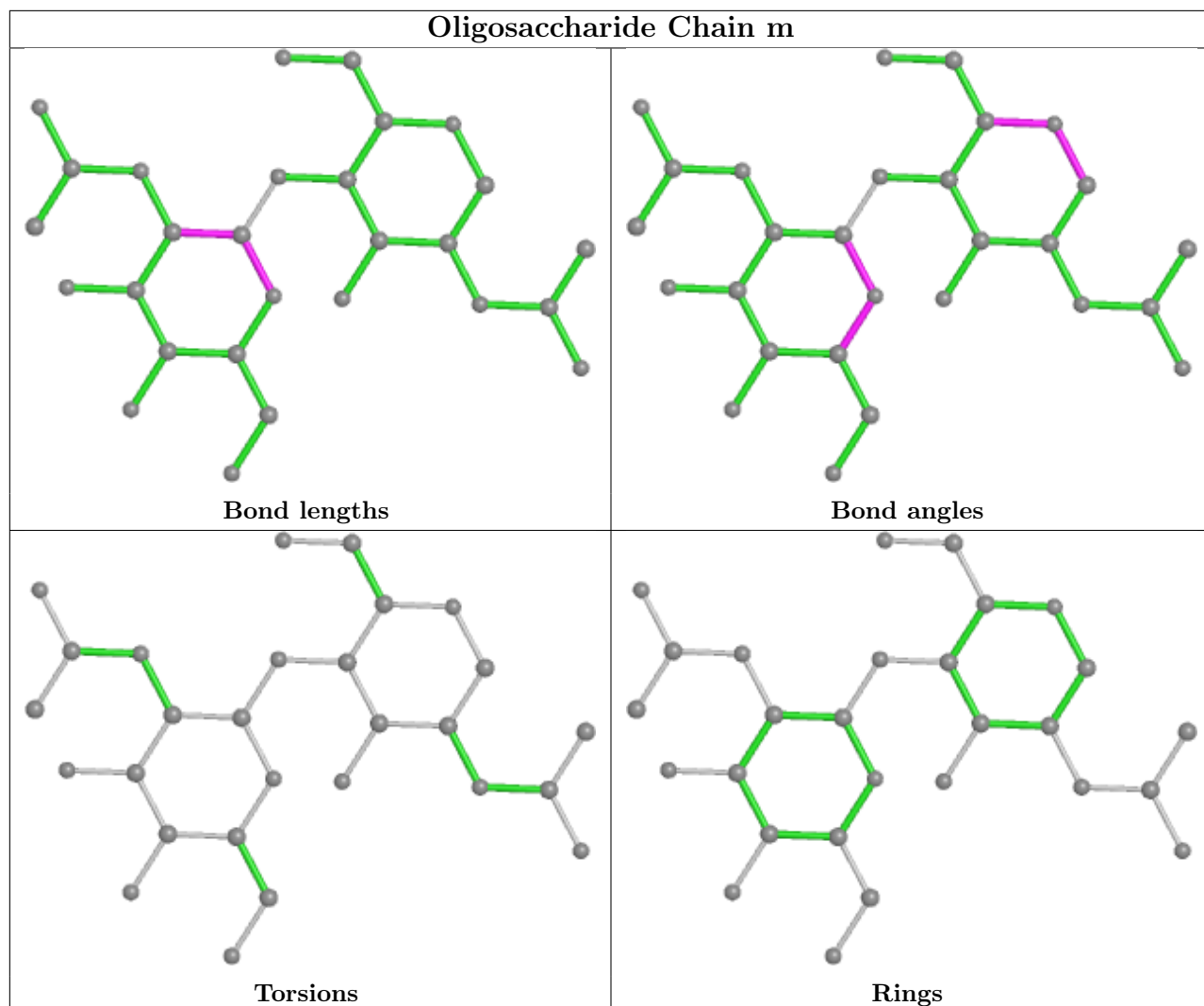


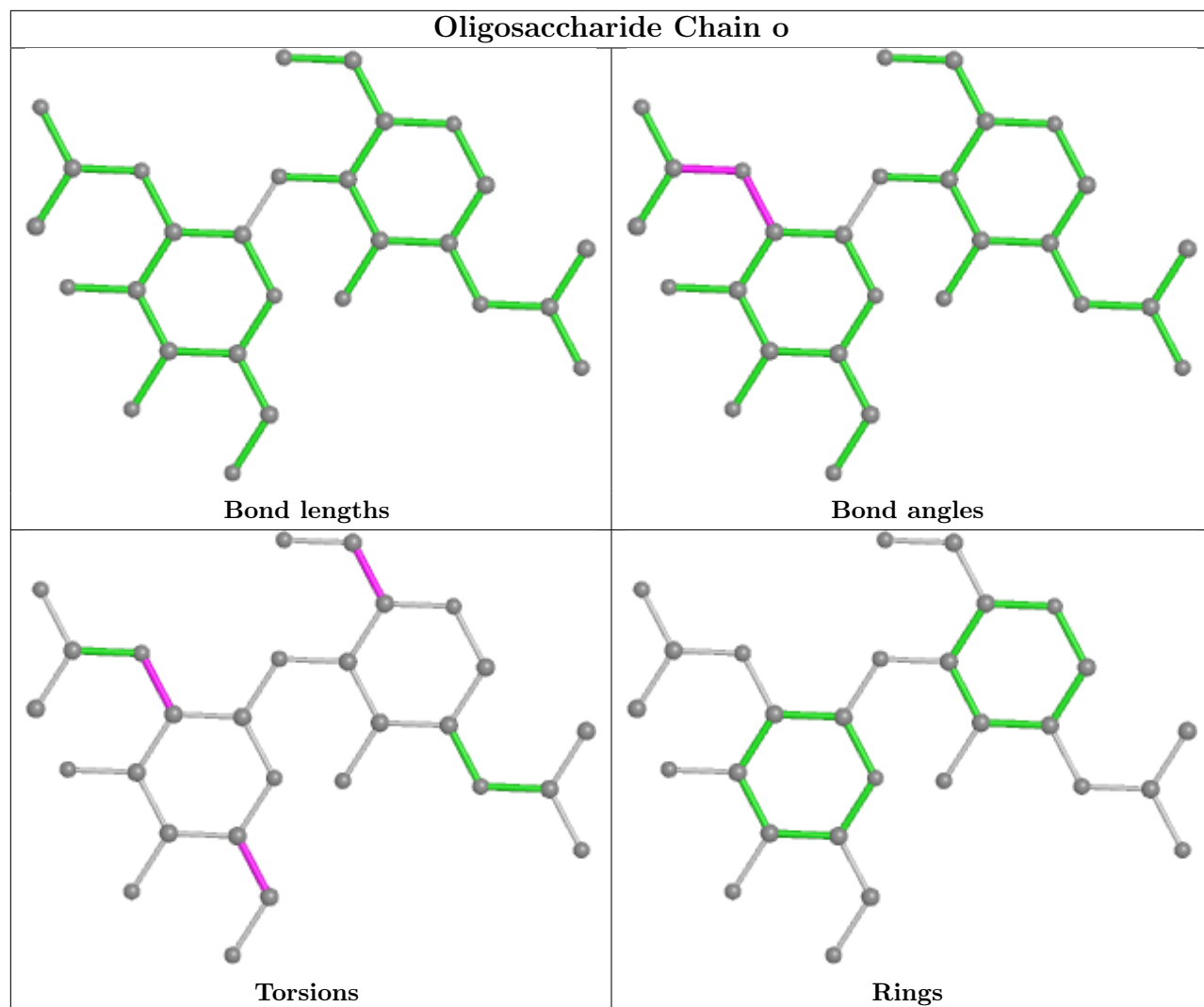


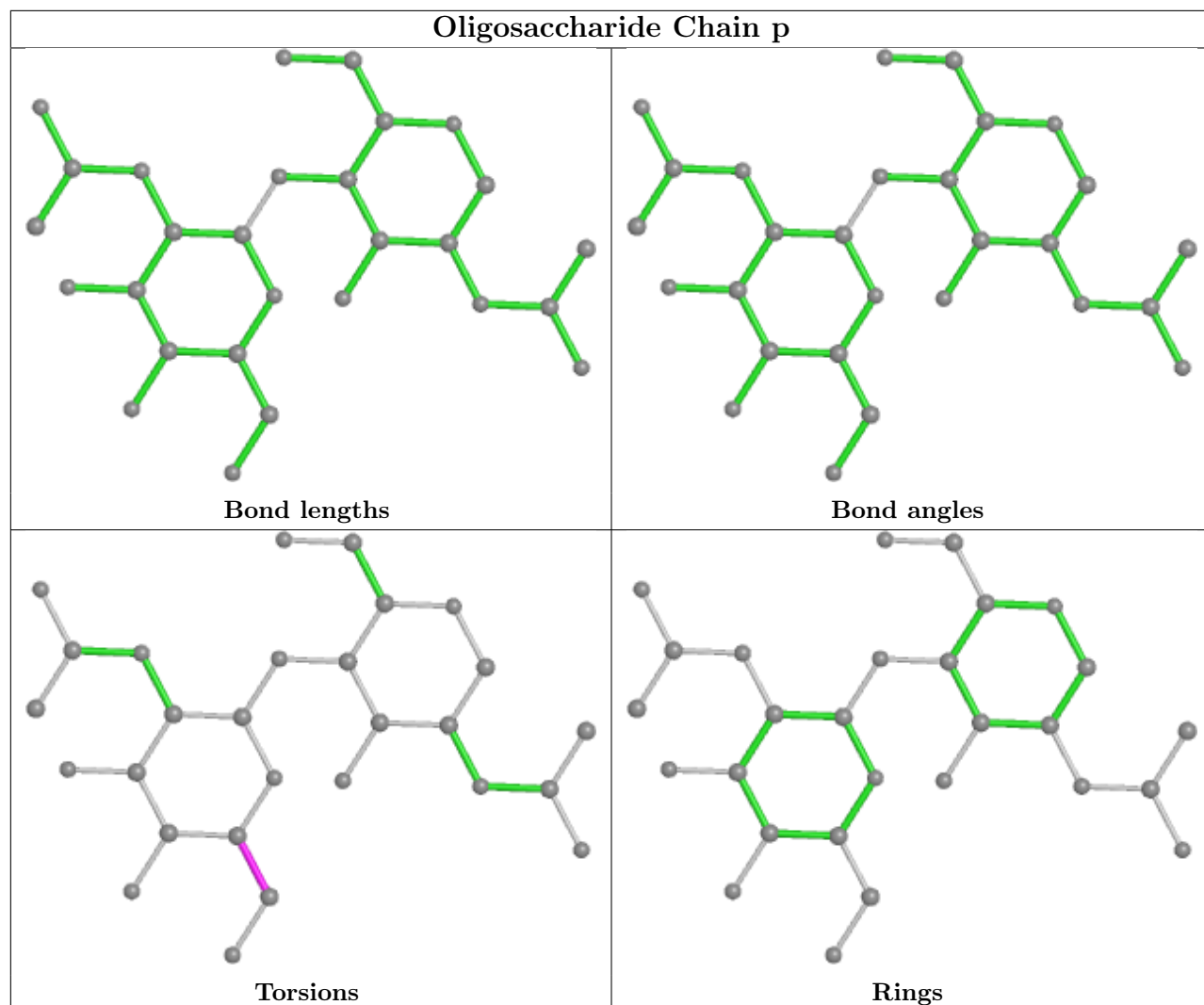


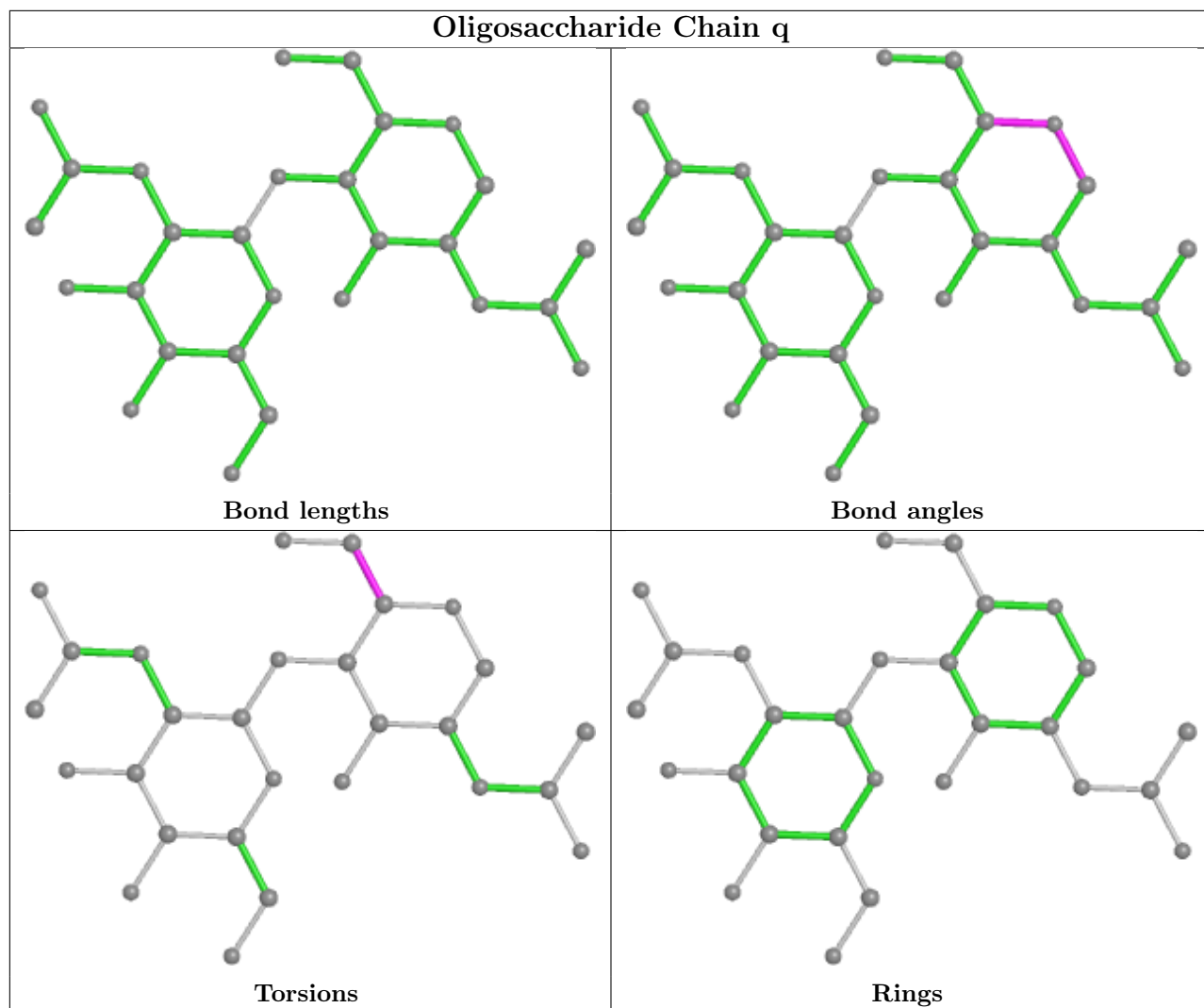


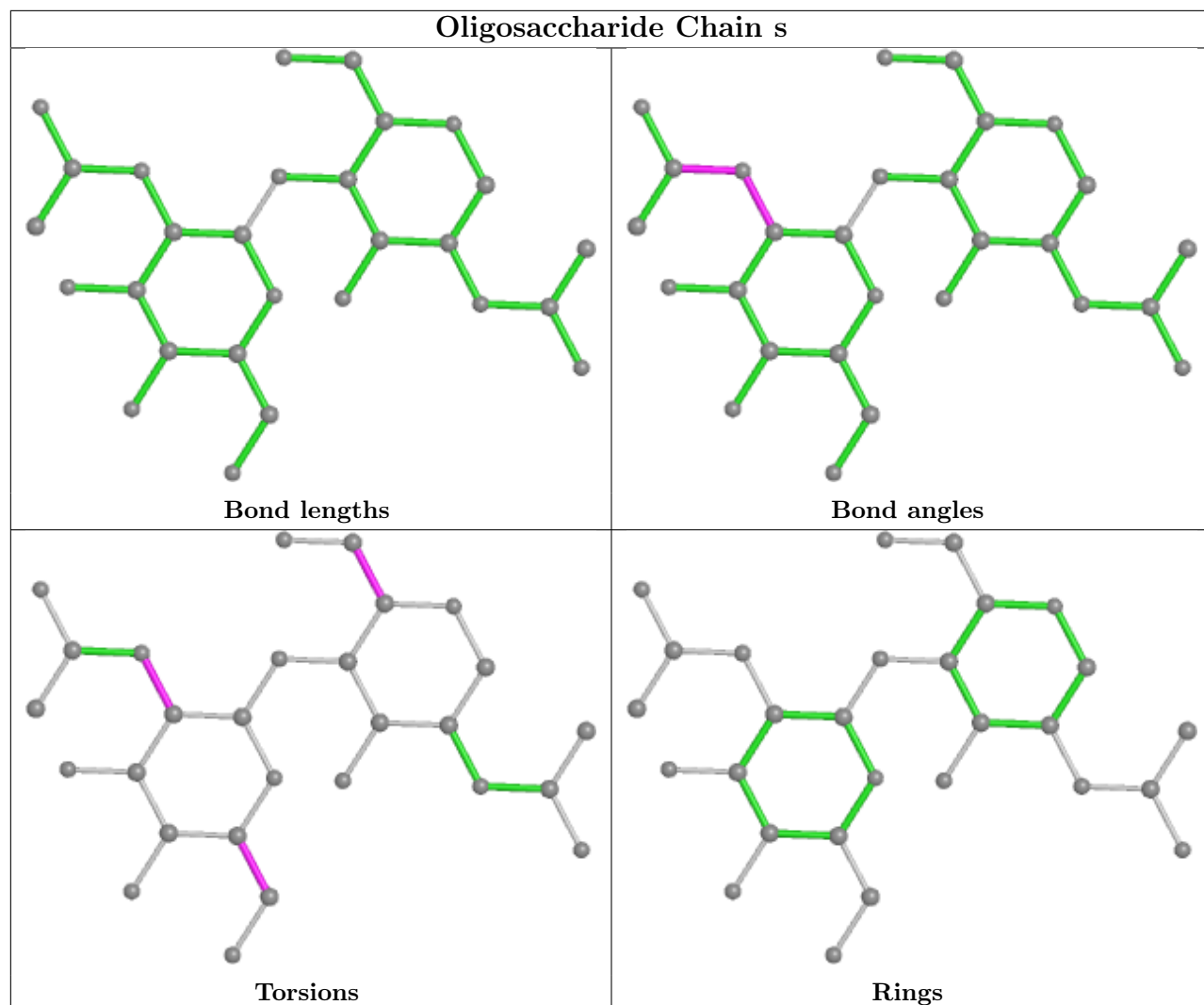


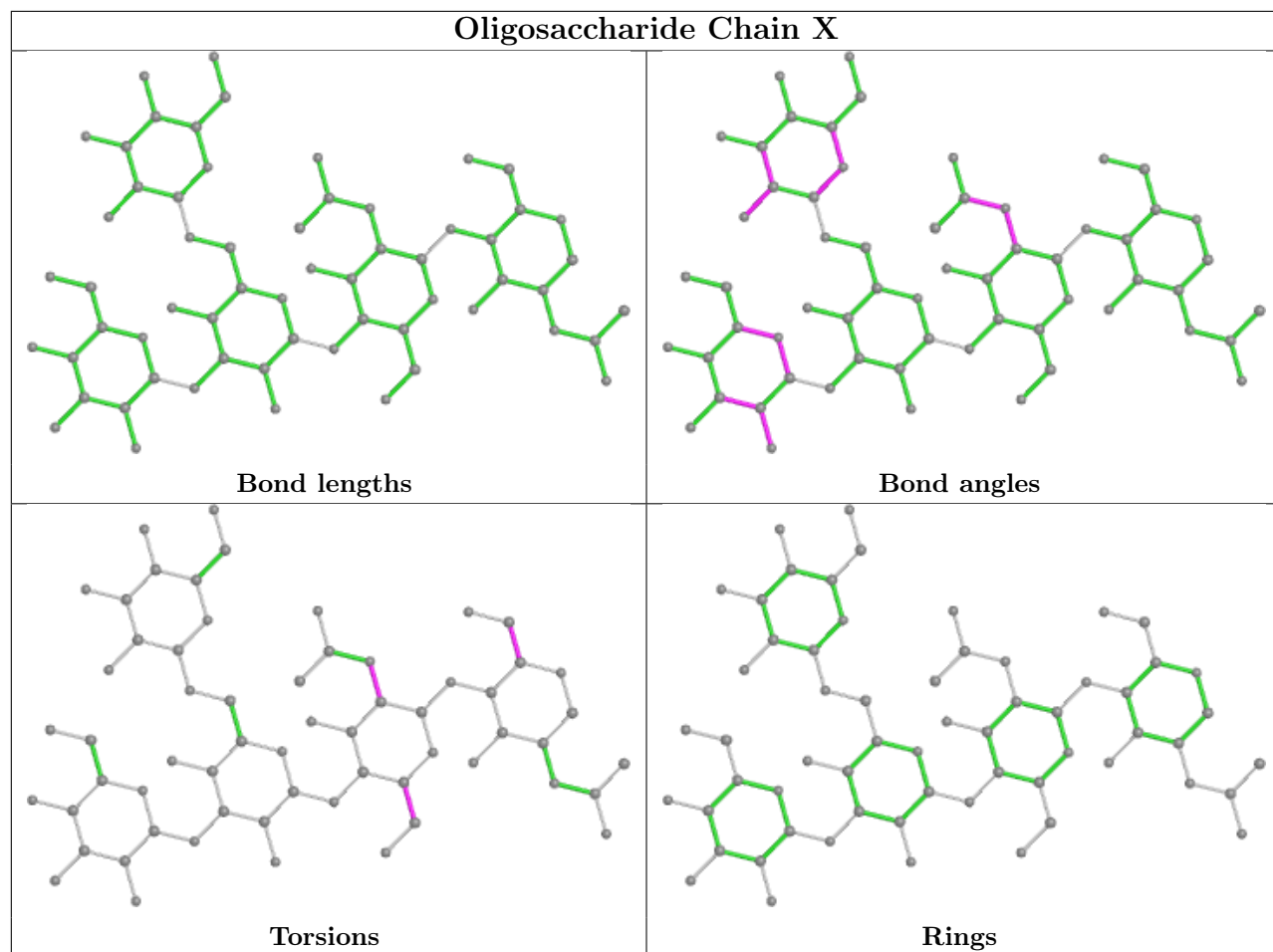


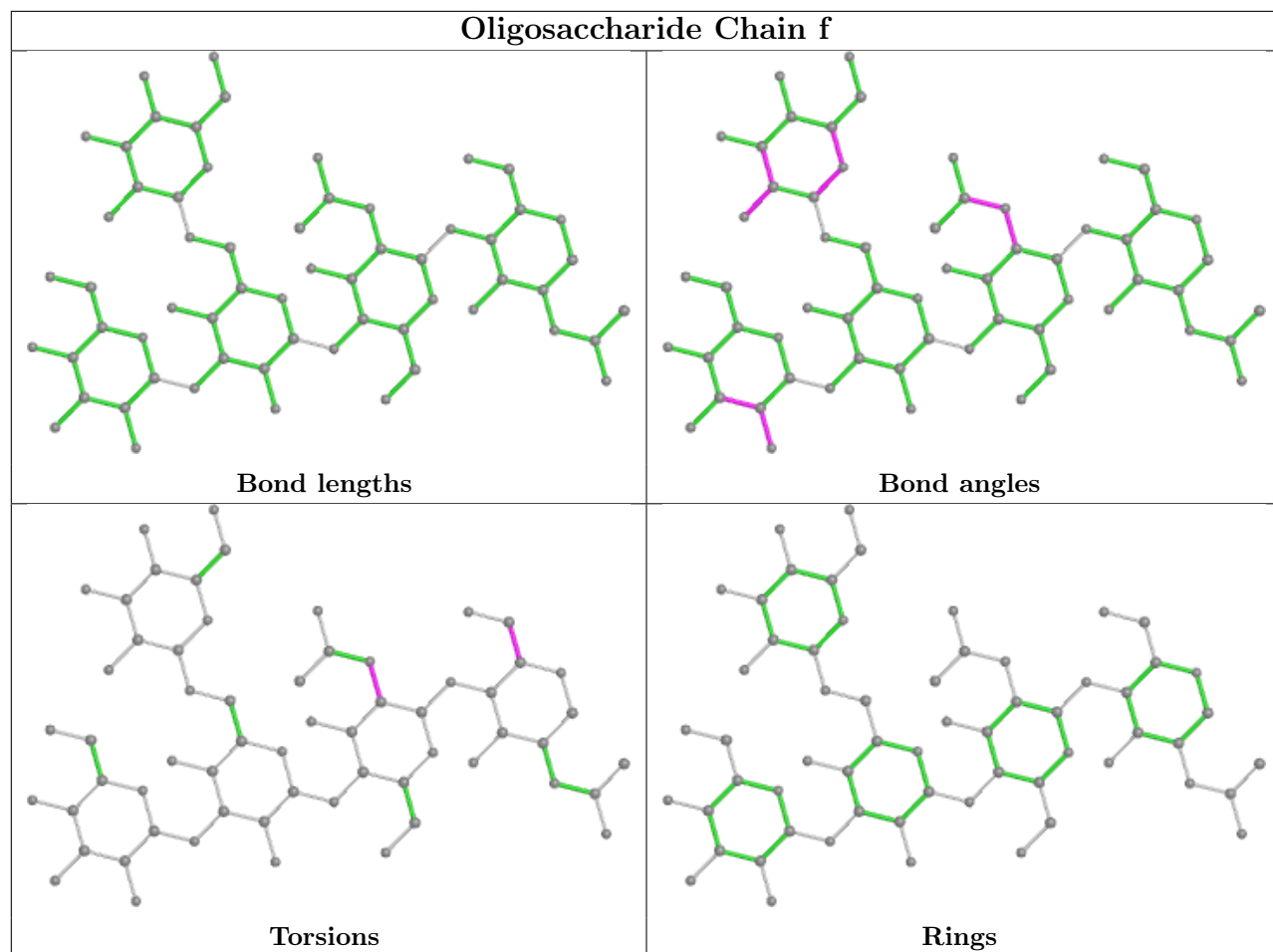


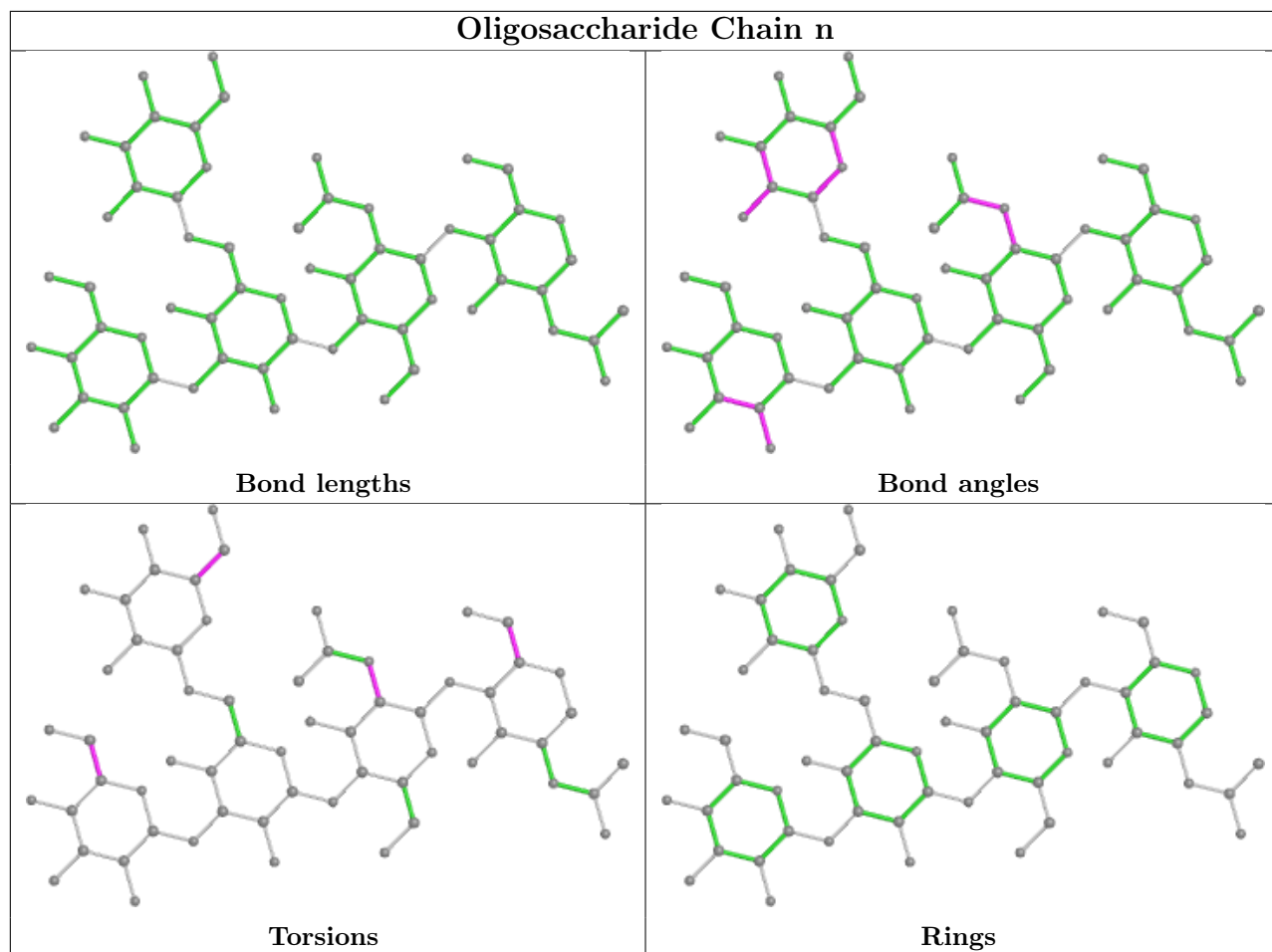


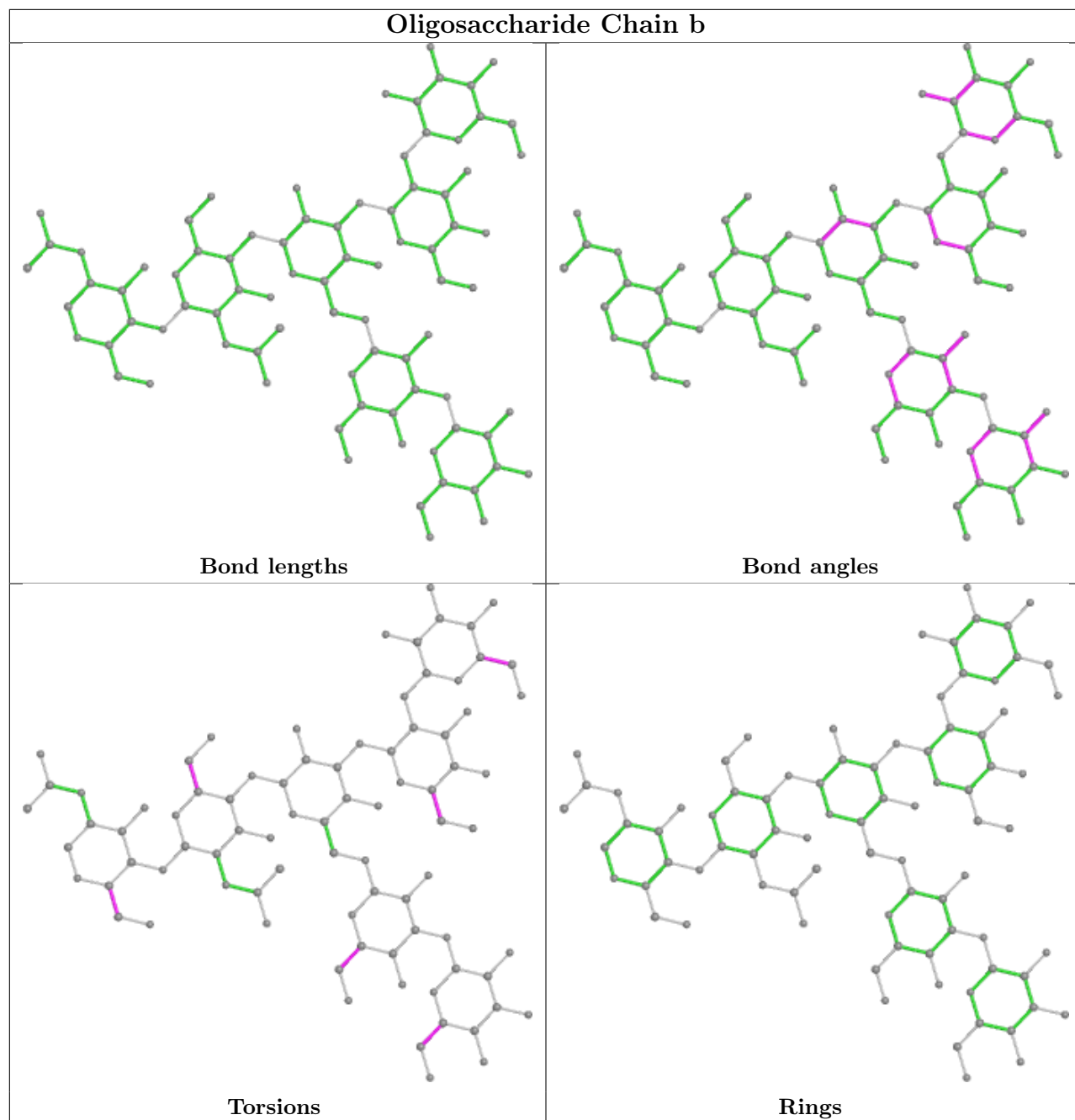


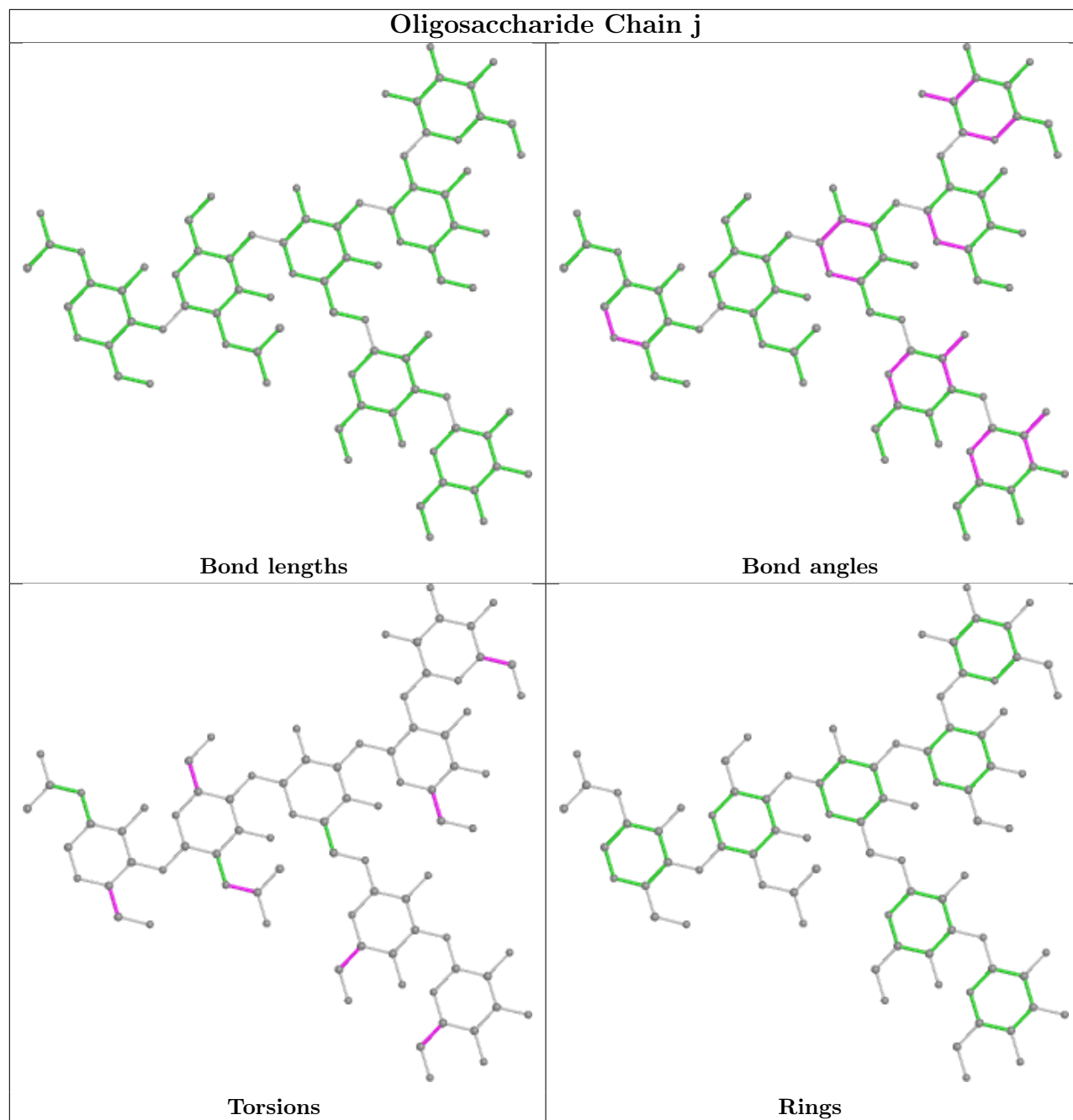


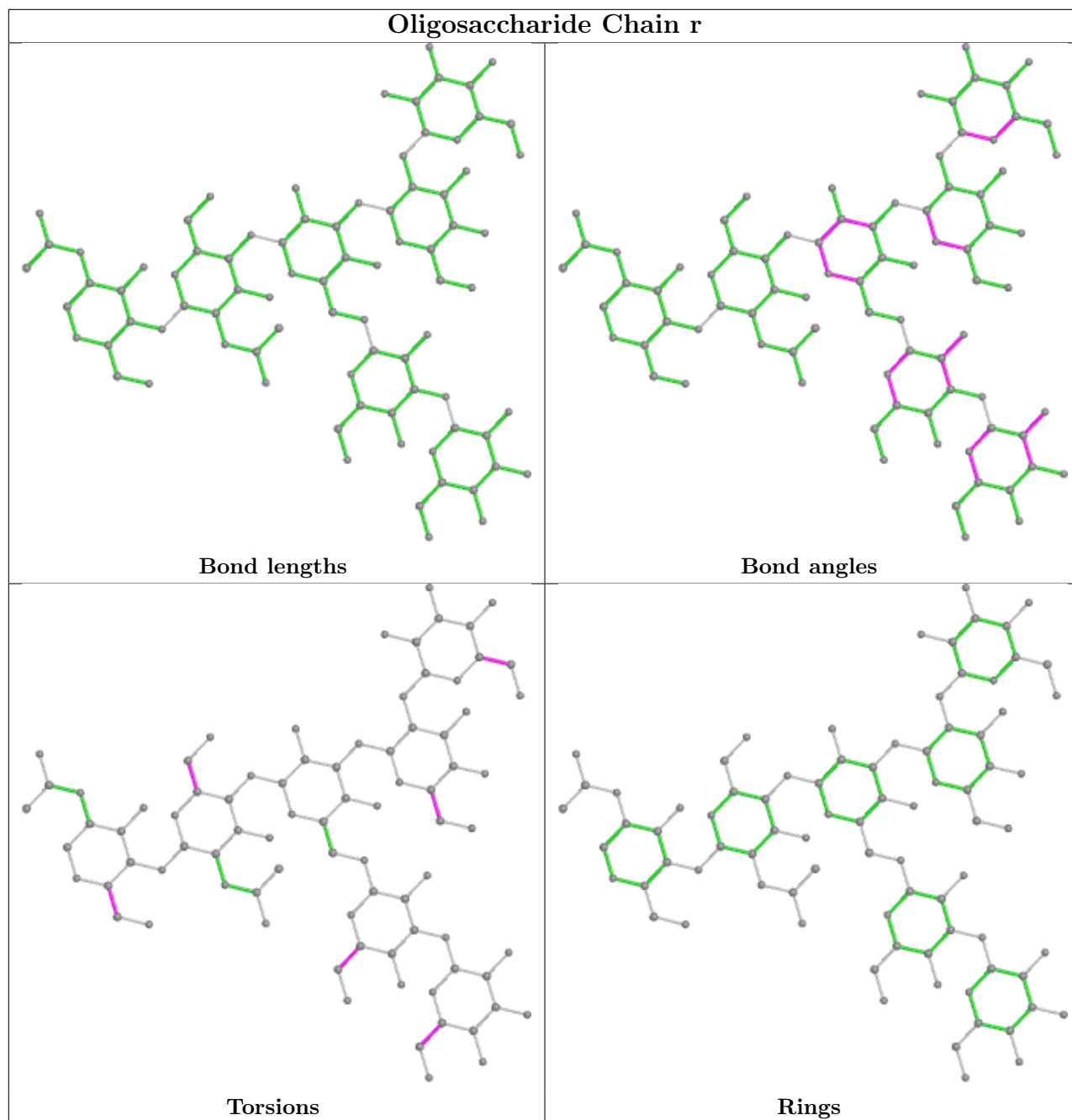












5.6 Ligand geometry [i](#)

21 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
10	NAG	P	604	4	14,14,15	0.33	0	17,19,21	0.50	0
10	NAG	P	601	4	14,14,15	0.47	0	17,19,21	0.87	1 (5%)
10	NAG	G	605	4	14,14,15	0.35	0	17,19,21	0.48	0
10	NAG	I	602	4	14,14,15	0.55	0	17,19,21	0.85	1 (5%)
10	NAG	P	607	4	14,14,15	0.31	0	17,19,21	0.73	0
10	NAG	I	601	4	14,14,15	0.51	0	17,19,21	0.89	2 (11%)
10	NAG	G	607	4	14,14,15	0.38	0	17,19,21	0.39	0
10	NAG	I	606	4	14,14,15	0.40	0	17,19,21	0.45	0
10	NAG	G	601	4	14,14,15	0.71	1 (7%)	17,19,21	0.98	2 (11%)
10	NAG	G	602	4	14,14,15	0.67	0	17,19,21	1.97	2 (11%)
10	NAG	P	603	4	14,14,15	0.66	1 (7%)	17,19,21	0.69	1 (5%)
10	NAG	P	605	4	14,14,15	0.50	0	17,19,21	0.43	0
10	NAG	G	604	4	14,14,15	0.23	0	17,19,21	0.37	0
10	NAG	G	606	4	14,14,15	0.47	0	17,19,21	0.43	0
10	NAG	I	603	4	14,14,15	0.42	0	17,19,21	0.43	0
10	NAG	G	603	4	14,14,15	0.30	0	17,19,21	0.48	0
10	NAG	I	604	4	14,14,15	0.31	0	17,19,21	0.55	0
10	NAG	I	607	4	14,14,15	0.33	0	17,19,21	0.32	0
10	NAG	P	606	4	14,14,15	0.49	0	17,19,21	0.55	0
10	NAG	I	605	4	14,14,15	0.35	0	17,19,21	0.42	0
10	NAG	P	602	4	14,14,15	0.27	0	17,19,21	0.48	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
10	NAG	P	604	4	-	2/6/23/26	0/1/1/1
10	NAG	P	601	4	-	3/6/23/26	0/1/1/1
10	NAG	G	605	4	-	2/6/23/26	0/1/1/1
10	NAG	I	602	4	-	2/6/23/26	0/1/1/1
10	NAG	P	607	4	-	1/6/23/26	0/1/1/1
10	NAG	I	601	4	-	3/6/23/26	0/1/1/1
10	NAG	G	607	4	-	2/6/23/26	0/1/1/1
10	NAG	I	606	4	-	0/6/23/26	0/1/1/1
10	NAG	G	601	4	-	1/6/23/26	0/1/1/1
10	NAG	G	602	4	-	5/6/23/26	0/1/1/1
10	NAG	P	603	4	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
10	NAG	P	605	4	-	0/6/23/26	0/1/1/1
10	NAG	G	604	4	-	1/6/23/26	0/1/1/1
10	NAG	G	606	4	-	2/6/23/26	0/1/1/1
10	NAG	I	603	4	-	2/6/23/26	0/1/1/1
10	NAG	G	603	4	-	2/6/23/26	0/1/1/1
10	NAG	I	604	4	-	1/6/23/26	0/1/1/1
10	NAG	I	607	4	-	2/6/23/26	0/1/1/1
10	NAG	P	606	4	-	2/6/23/26	0/1/1/1
10	NAG	I	605	4	-	2/6/23/26	0/1/1/1
10	NAG	P	602	4	-	2/6/23/26	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	G	601	NAG	C1-C2	2.39	1.55	1.52
10	P	603	NAG	C1-C2	2.23	1.55	1.52

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	G	602	NAG	C2-N2-C7	6.95	132.81	122.90
10	G	602	NAG	C1-C2-N2	3.08	115.75	110.49
10	I	602	NAG	C1-O5-C5	3.08	116.36	112.19
10	G	601	NAG	C1-O5-C5	2.64	115.77	112.19
10	P	601	NAG	C2-N2-C7	2.42	126.35	122.90

There are no chirality outliers.

5 of 39 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	G	605	NAG	O5-C5-C6-O6
10	P	601	NAG	O5-C5-C6-O6
10	P	603	NAG	C4-C5-C6-O6
10	G	606	NAG	C4-C5-C6-O6
10	G	603	NAG	O5-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	P	607	NAG	3	0
10	P	603	NAG	1	0
10	P	605	NAG	2	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

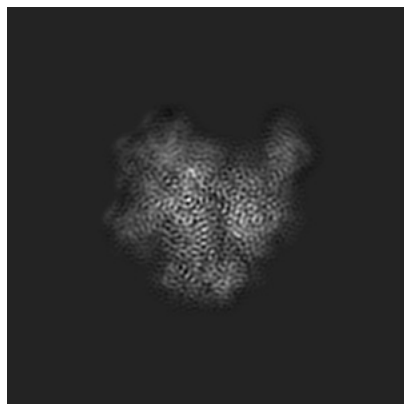
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-26443. These allow visual inspection of the internal detail of the map and identification of artifacts.

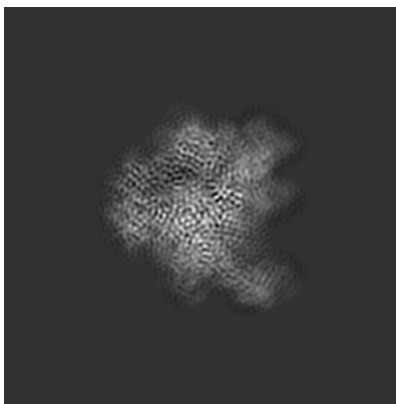
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

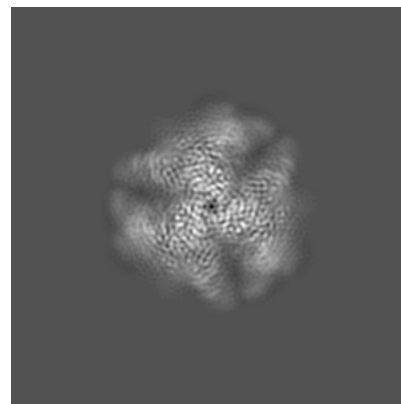
6.1.1 Primary map



X

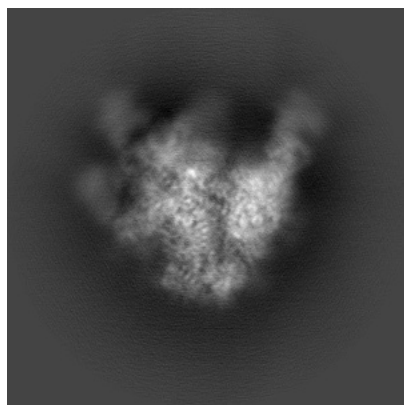


Y

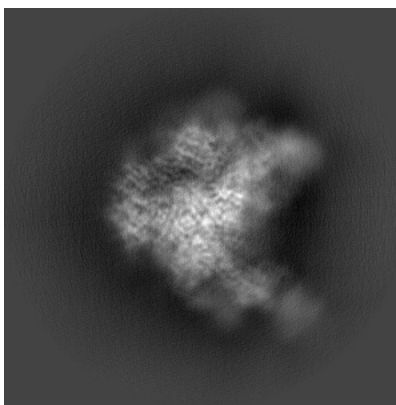


Z

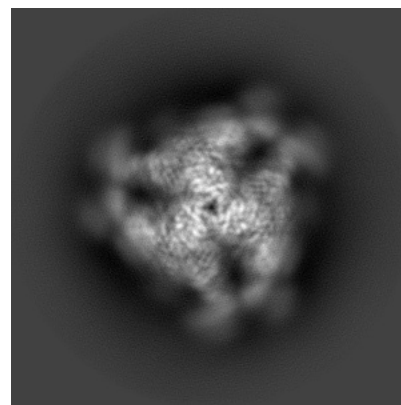
6.1.2 Raw map



X



Y

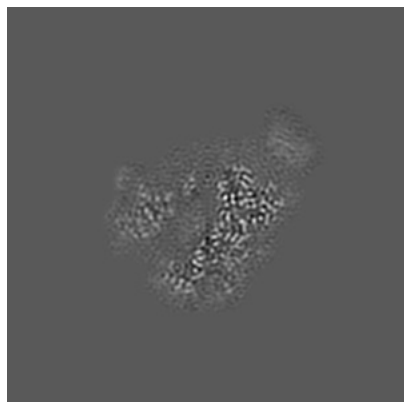


Z

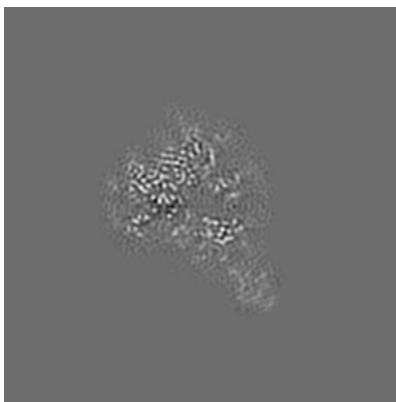
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

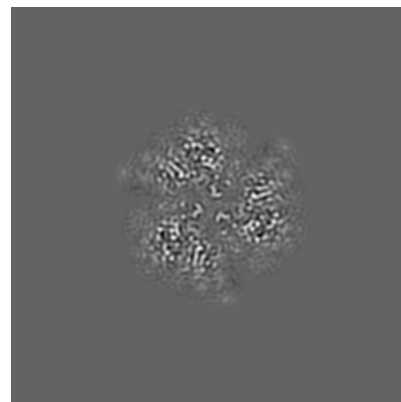
6.2.1 Primary map



X Index: 168

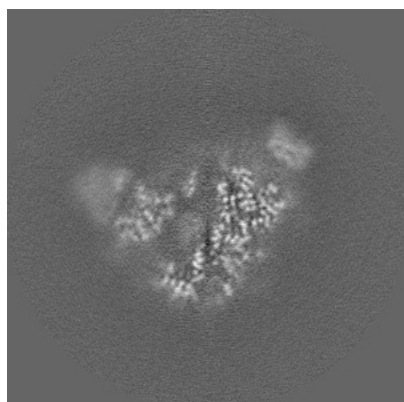


Y Index: 168

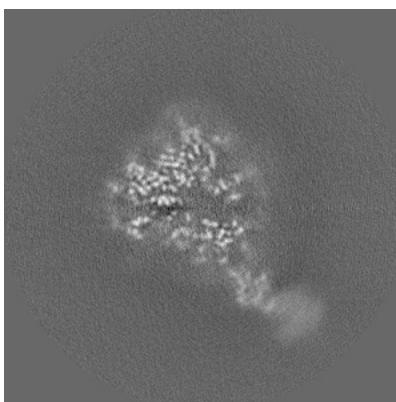


Z Index: 168

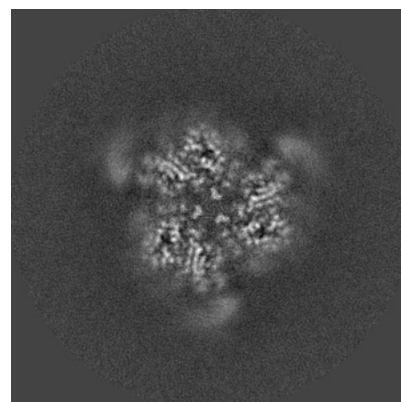
6.2.2 Raw map



X Index: 168



Y Index: 168

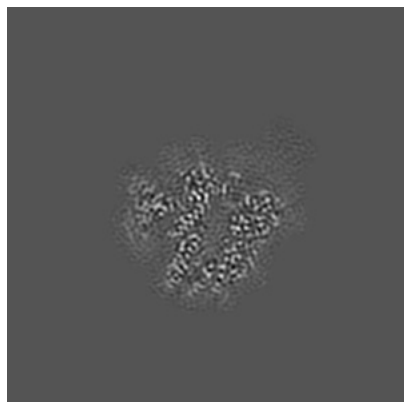


Z Index: 168

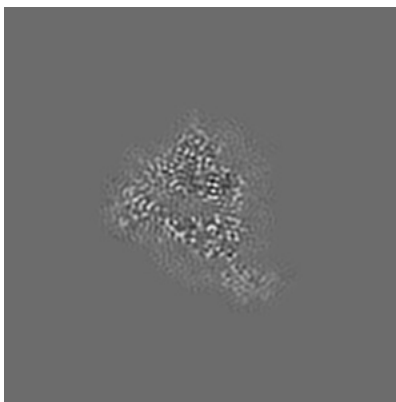
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

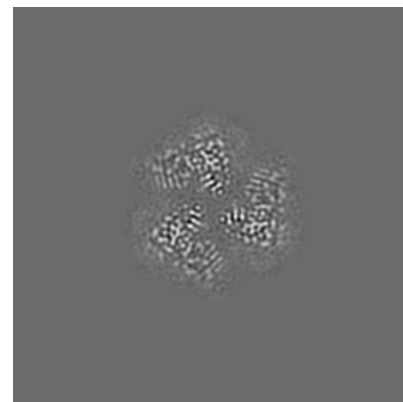
6.3.1 Primary map



X Index: 155

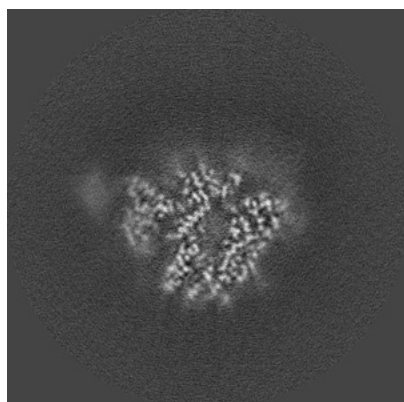


Y Index: 157

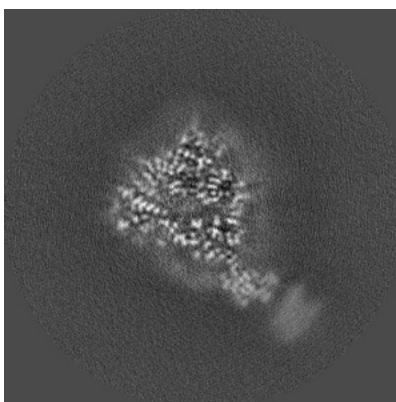


Z Index: 174

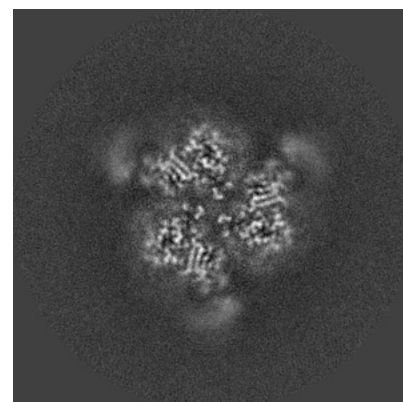
6.3.2 Raw map



X Index: 156



Y Index: 158



Z Index: 169

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

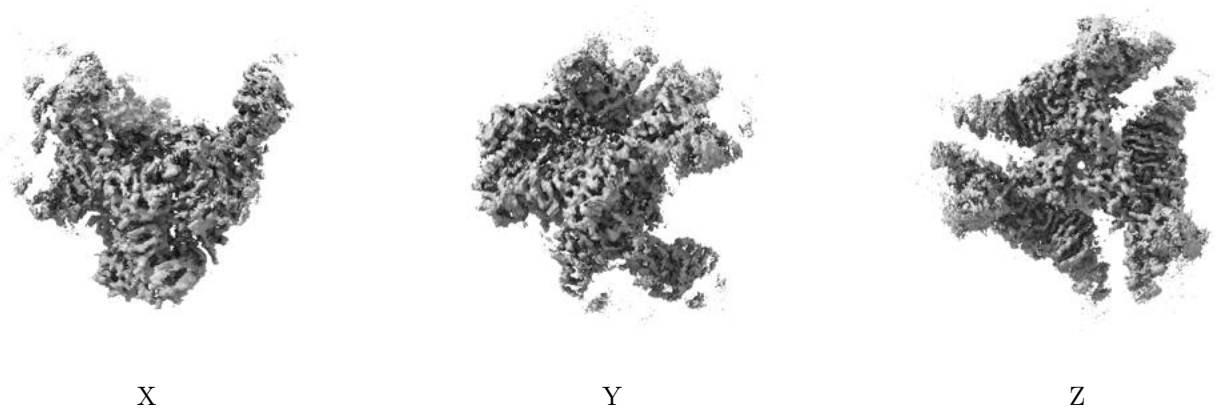
6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.013. 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.

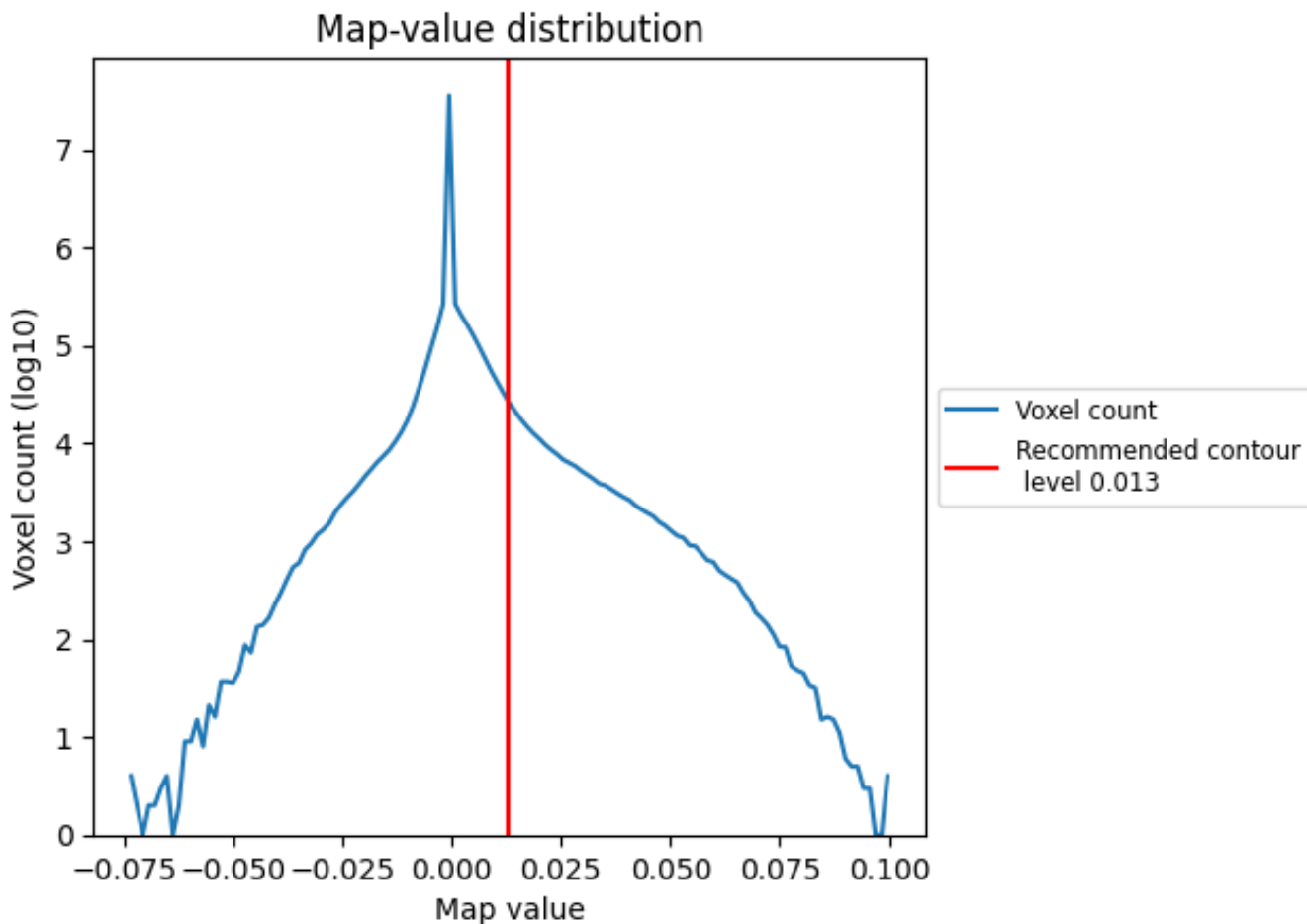
6.5 Mask visualisation [i](#)

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

7 Map analysis [i](#)

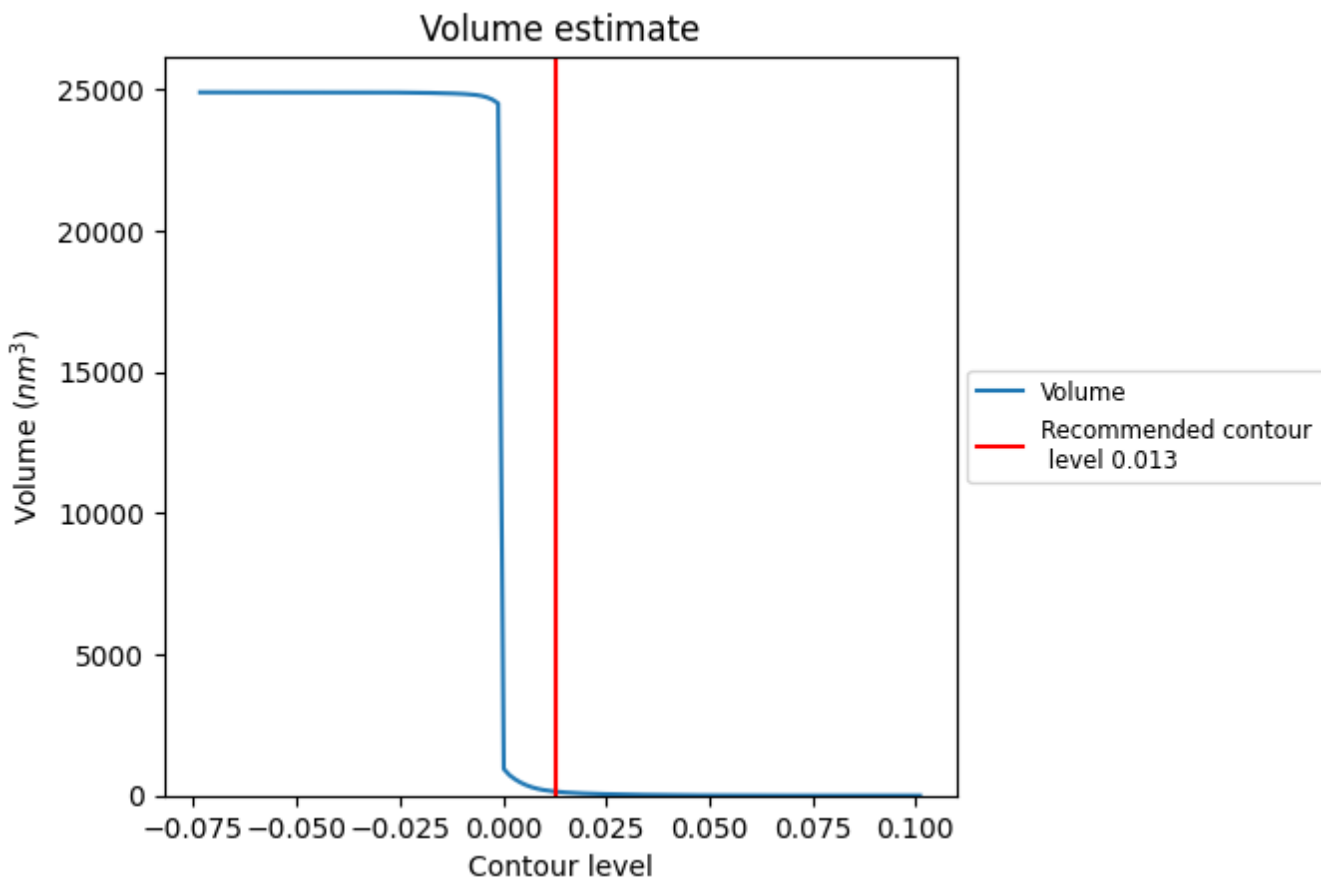
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

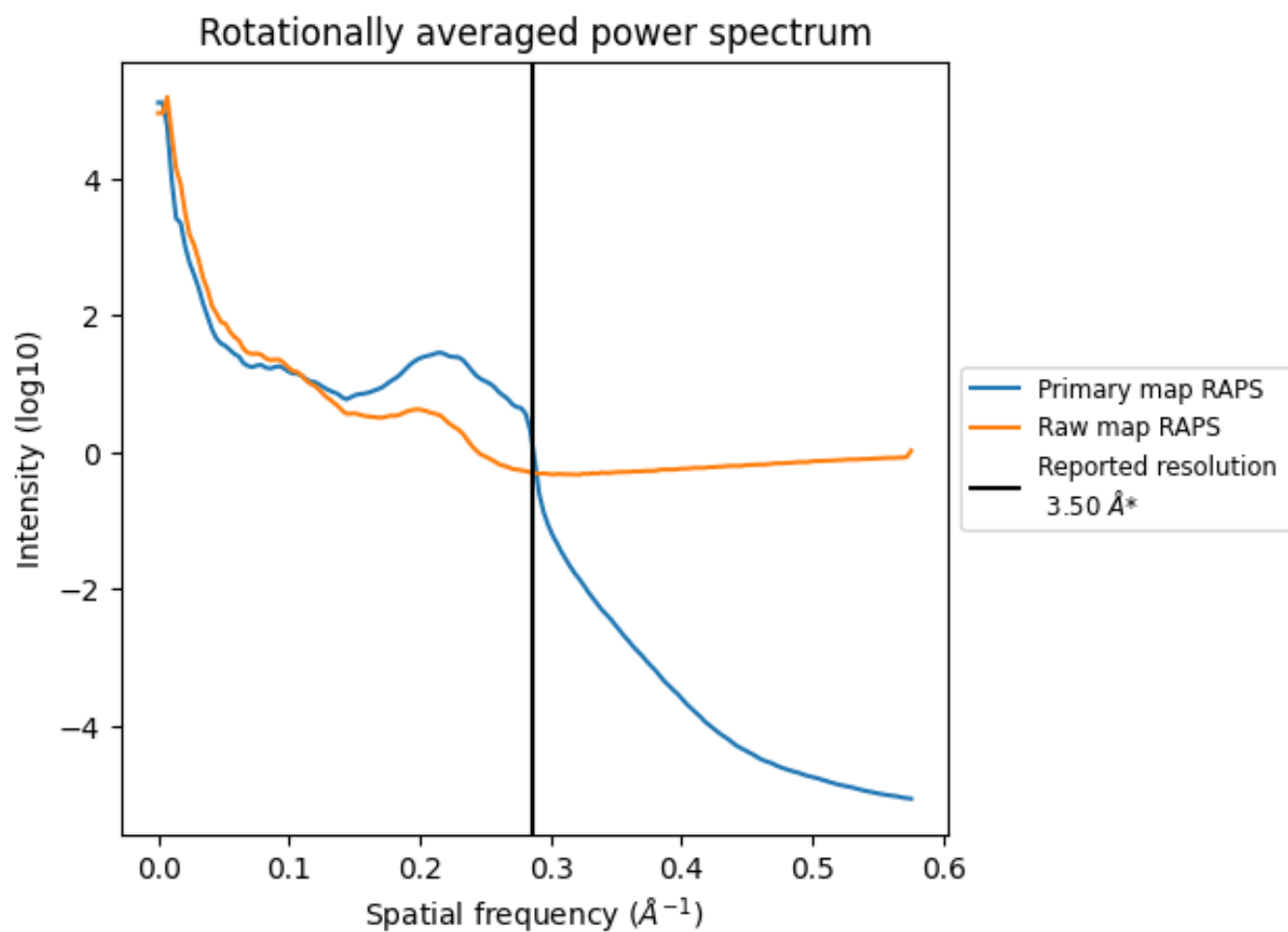
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 137 nm³; this corresponds to an approximate mass of 124 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

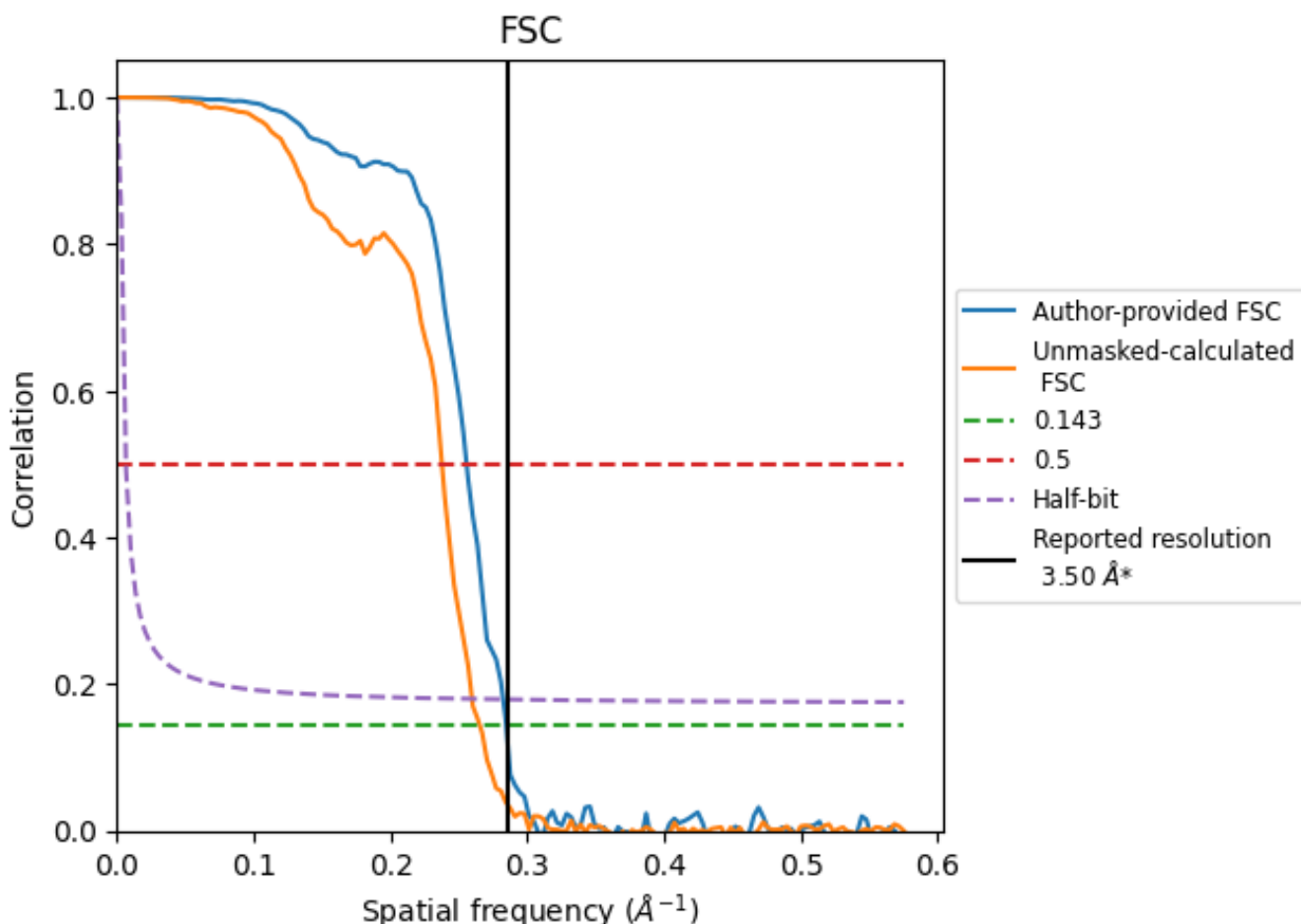


*Reported resolution corresponds to spatial frequency of 0.286 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.286 Å⁻¹

8.2 Resolution estimates [i](#)

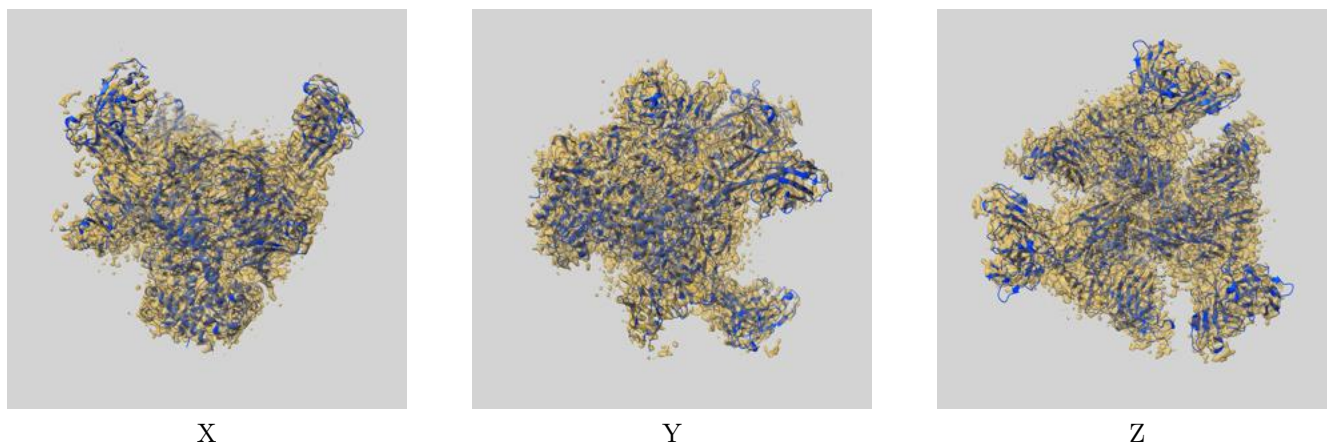
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.50	-	-
Author-provided FSC curve	3.51	3.91	3.54
Unmasked-calculated*	3.77	4.21	3.85

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

9 Map-model fit [i](#)

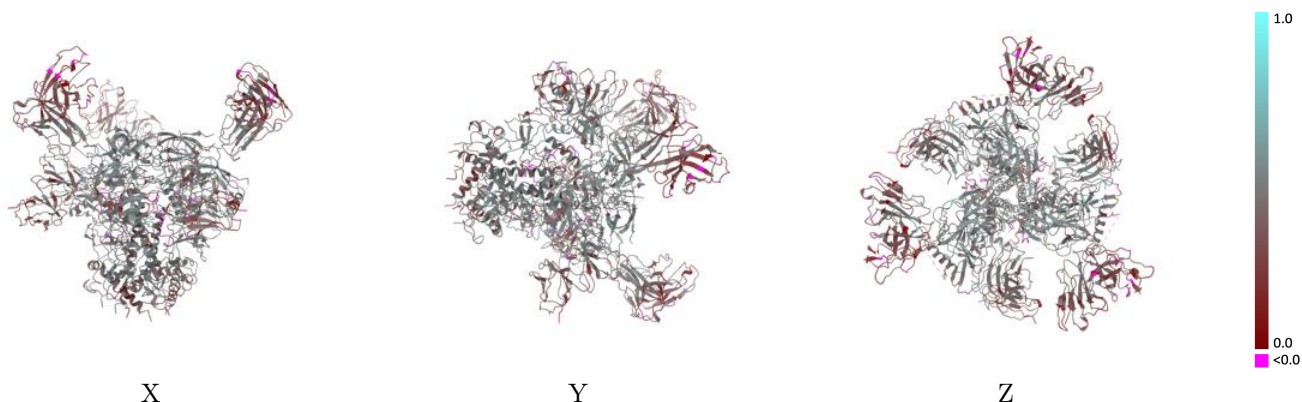
This section contains information regarding the fit between EMDB map EMD-26443 and PDB model 7UCG. Per-residue inclusion information can be found in section [3](#) on page [14](#).

9.1 Map-model overlay [i](#)



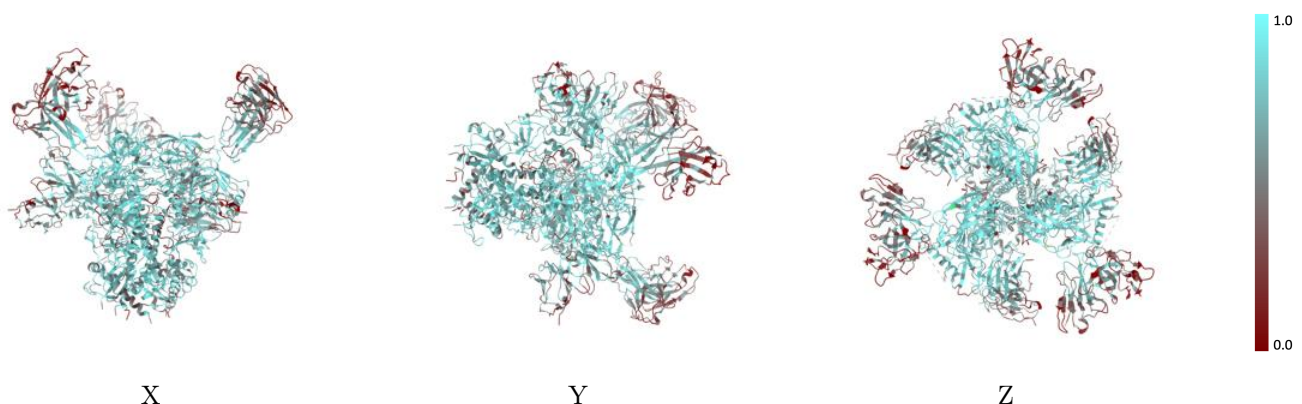
The images above show the 3D surface view of the map at the recommended contour level 0.013 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



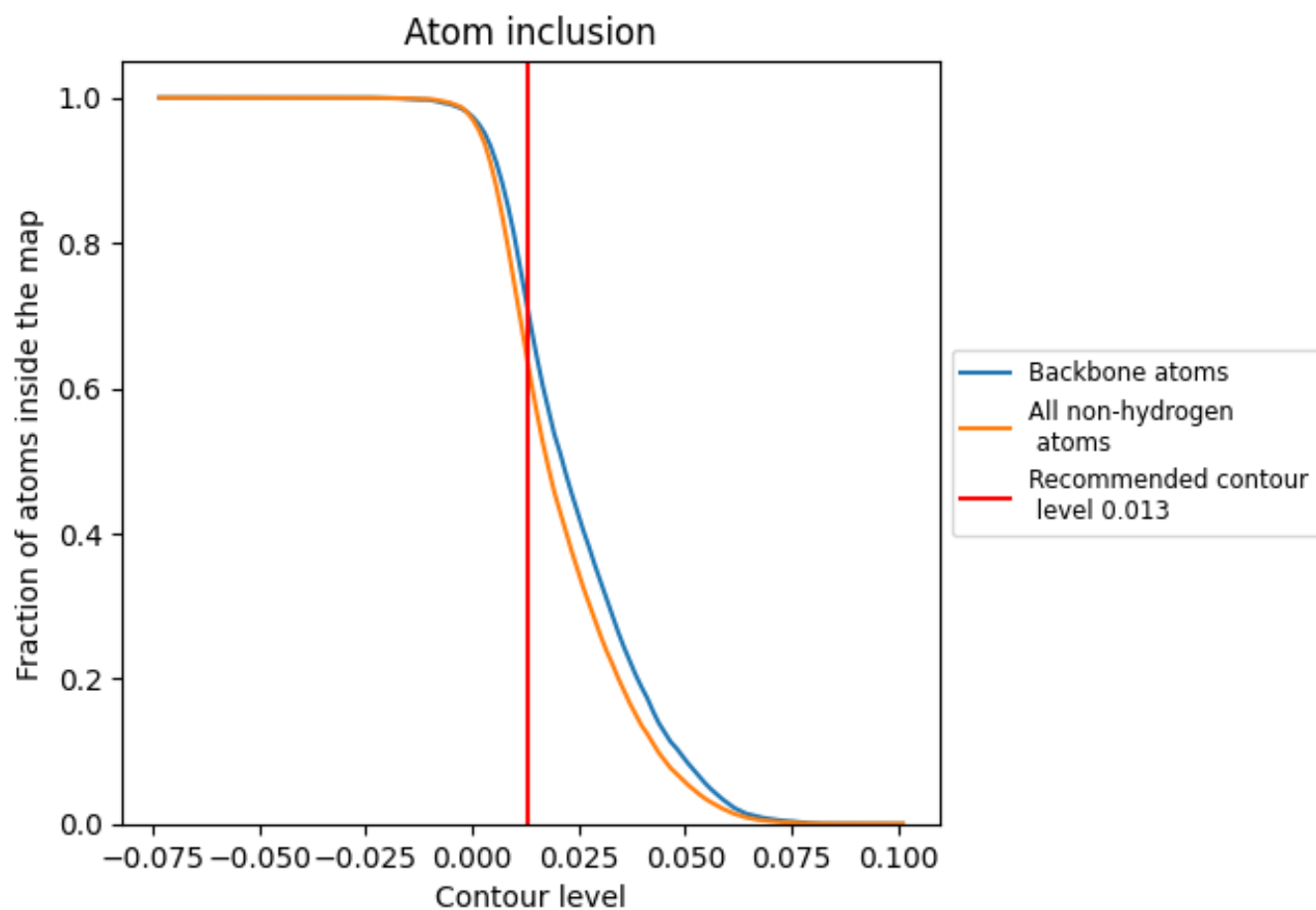
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.013).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 71% of all backbone atoms, 64% 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 (0.013) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6369	 0.4110
A	 0.6779	 0.4050
B	 0.6712	 0.4070
C	 0.6902	 0.4330
D	 0.6848	 0.4370
E	 0.5162	 0.3660
F	 0.5162	 0.3630
G	 0.7451	 0.4590
H	 0.3929	 0.3040
I	 0.7434	 0.4550
J	 0.3969	 0.3070
K	 0.5146	 0.3780
L	 0.5197	 0.3760
M	 0.6654	 0.3990
N	 0.6774	 0.4410
O	 0.5190	 0.3640
P	 0.7388	 0.4550
Q	 0.3990	 0.3100
R	 0.5134	 0.3690
S	 0.0000	 0.1550
T	 0.0000	 0.1820
U	 0.0000	 0.0900
V	 0.5714	 0.4800
W	 0.4643	 0.3280
X	 0.6230	 0.4200
Y	 0.5714	 0.2900
Z	 0.5000	 0.3170
a	 0.3571	 0.3490
b	 0.7470	 0.4890
c	 0.5714	 0.4050
d	 0.5357	 0.4110
e	 0.5000	 0.3230
f	 0.6557	 0.4220
g	 0.5357	 0.2870
h	 0.5000	 0.3540



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Chain	Atom inclusion	Q-score
i	 0.3214	 0.3220
j	 0.7349	 0.4760
k	 0.6071	 0.4450
l	 0.6071	 0.4750
m	 0.3929	 0.3290
n	 0.6393	 0.4190
o	 0.5000	 0.2320
p	 0.3571	 0.2420
q	 0.3571	 0.3380
r	 0.7470	 0.4820
s	 0.5714	 0.4050