



wwPDB EM Validation Summary Report ⓘ

May 25, 2024 – 04:17 PM EDT

PDB ID : 9B36
EMDB ID : EMD-44129
Title : Open state of kainate receptor GluK2 in complex with agonist glutamate and positive allosteric modulator BPAM344 bound to two concanavalin A dimers. Composite map.
Authors : Nadezhdin, K.D.; Gangwar, S.P.; Sobolevsky, A.I.
Deposited on : 2024-03-18
Resolution : 4.29 Å(reported)

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:

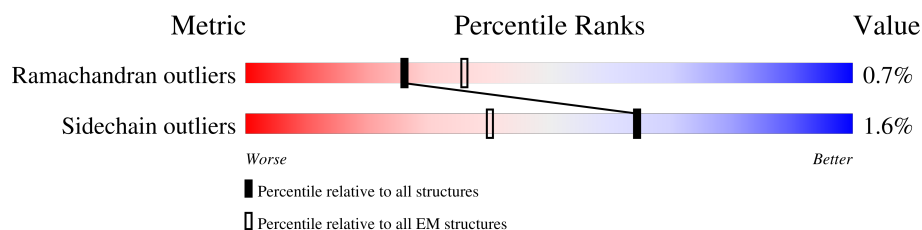
EMDB validation analysis : 0.0.1.dev92
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

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 4.29 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)
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	912	
1	B	912	
1	C	912	
1	D	912	
2	E	237	
2	F	237	
2	G	237	
2	H	237	
3	I	7	

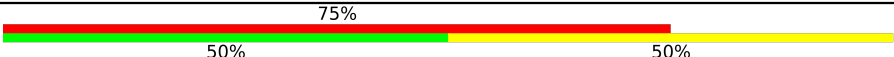
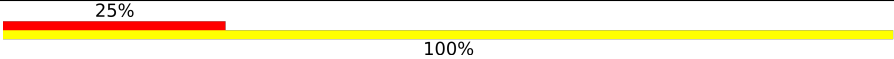
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Mol	Chain	Length	Quality of chain
3	W	7	<div>14%</div> <div>100%</div>
4	J	2	<div>50%</div> <div>50%</div>
4	L	2	<div>50%</div> <div>50%</div>
4	N	2	<div>50%</div> <div>100%</div>
4	O	2	<div>100%</div> <div>50%</div>
4	Q	2	<div>50%</div> <div>50%</div>
4	V	2	<div>50%</div> <div>100%</div>
4	X	2	<div>50%</div> <div>50%</div>
4	Z	2	<div>50%</div> <div>50%</div>
4	b	2	<div>50%</div> <div>100%</div>
4	c	2	<div>100%</div> <div>100%</div>
4	e	2	<div>50%</div> <div>50%</div>
4	j	2	<div>50%</div> <div>100%</div>
5	K	8	<div>62%</div> <div>12%</div> <div>88%</div>
6	M	3	<div>67%</div> <div>33%</div> <div>67%</div>
6	S	3	<div>67%</div> <div>33%</div> <div>67%</div>
6	T	3	<div>67%</div> <div>67%</div> <div>33%</div>
6	a	3	<div>67%</div> <div>67%</div> <div>33%</div>
6	g	3	<div>67%</div> <div>33%</div> <div>67%</div>
7	P	4	<div>25%</div> <div>75%</div>
7	d	4	<div>50%</div> <div>25%</div> <div>75%</div>
8	R	7	<div>14%</div> <div>100%</div>
8	Y	7	<div>14%</div> <div>57%</div> <div>43%</div>
8	f	7	<div>14%</div> <div>14%</div> <div>86%</div>
9	U	4	<div>25%</div> <div>25%</div> <div>75%</div>

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Mol	Chain	Length	Quality of chain
9	h	4	
9	i	4	

2 Entry composition

There are 15 unique types of molecules in this entry. The entry contains 36342 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 Glutamate receptor ionotropic, kainate 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	842	Total	C	N	O	S	2	0
			6684	4283	1117	1244	40		
1	B	842	Total	C	N	O	S	1	0
			6680	4280	1117	1243	40		
1	C	842	Total	C	N	O	S	2	0
			6684	4283	1117	1244	40		
1	D	842	Total	C	N	O	S	1	0
			6680	4280	1117	1243	40		

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	567	VAL	ILE	conflict	UNP P42260
A	571	CYS	TYR	conflict	UNP P42260
A	909	LEU	-	expression tag	UNP P42260
A	910	VAL	-	expression tag	UNP P42260
A	911	PRO	-	expression tag	UNP P42260
A	912	ARG	-	expression tag	UNP P42260
B	567	VAL	ILE	conflict	UNP P42260
B	571	CYS	TYR	conflict	UNP P42260
B	909	LEU	-	expression tag	UNP P42260
B	910	VAL	-	expression tag	UNP P42260
B	911	PRO	-	expression tag	UNP P42260
B	912	ARG	-	expression tag	UNP P42260
C	567	VAL	ILE	conflict	UNP P42260
C	571	CYS	TYR	conflict	UNP P42260
C	909	LEU	-	expression tag	UNP P42260
C	910	VAL	-	expression tag	UNP P42260
C	911	PRO	-	expression tag	UNP P42260
C	912	ARG	-	expression tag	UNP P42260
D	567	VAL	ILE	conflict	UNP P42260
D	571	CYS	TYR	conflict	UNP P42260
D	909	LEU	-	expression tag	UNP P42260
D	910	VAL	-	expression tag	UNP P42260

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Chain	Residue	Modelled	Actual	Comment	Reference
D	911	PRO	-	expression tag	UNP P42260
D	912	ARG	-	expression tag	UNP P42260

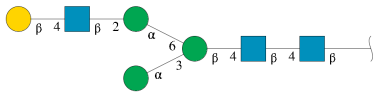
- Molecule 2 is a protein called Concanavalin A.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	E	237	Total	C	N	O	S	0	0
			1806	1140	302	362	2		
2	F	237	Total	C	N	O	S	0	0
			1809	1141	302	364	2		
2	G	237	Total	C	N	O	S	0	0
			1806	1140	302	362	2		
2	H	237	Total	C	N	O	S	0	0
			1809	1141	302	364	2		

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	58	ASP	GLY	conflict	UNP C0HJY1
E	70	ALA	GLY	conflict	UNP C0HJY1
E	129	MET	VAL	conflict	UNP C0HJY1
E	192	GLU	ASP	conflict	UNP C0HJY1
F	58	ASP	GLY	conflict	UNP C0HJY1
F	70	ALA	GLY	conflict	UNP C0HJY1
F	129	MET	VAL	conflict	UNP C0HJY1
F	192	GLU	ASP	conflict	UNP C0HJY1
G	58	ASP	GLY	conflict	UNP C0HJY1
G	70	ALA	GLY	conflict	UNP C0HJY1
G	129	MET	VAL	conflict	UNP C0HJY1
G	192	GLU	ASP	conflict	UNP C0HJY1
H	58	ASP	GLY	conflict	UNP C0HJY1
H	70	ALA	GLY	conflict	UNP C0HJY1
H	129	MET	VAL	conflict	UNP C0HJY1
H	192	GLU	ASP	conflict	UNP C0HJY1

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



Mol	Chain	Residues	Atoms				AltConf	Trace
3	I	7	Total	C	N	O	0	0
			86	48	3	35		
3	W	7	Total	C	N	O	0	0
			86	48	3	35		

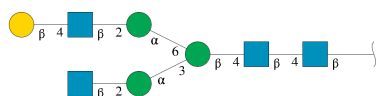
- Molecule 4 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
4	J	2	Total	C	N	O	0	0
			28	16	2	10		
4	L	2	Total	C	N	O	0	0
			28	16	2	10		
4	N	2	Total	C	N	O	0	0
			28	16	2	10		
4	O	2	Total	C	N	O	0	0
			28	16	2	10		
4	Q	2	Total	C	N	O	0	0
			28	16	2	10		
4	V	2	Total	C	N	O	0	0
			28	16	2	10		
4	X	2	Total	C	N	O	0	0
			28	16	2	10		
4	Z	2	Total	C	N	O	0	0
			28	16	2	10		
4	b	2	Total	C	N	O	0	0
			28	16	2	10		
4	c	2	Total	C	N	O	0	0
			28	16	2	10		
4	e	2	Total	C	N	O	0	0
			28	16	2	10		
4	j	2	Total	C	N	O	0	0
			28	16	2	10		

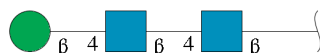
- Molecule 5 is an oligosaccharide called beta-D-galactopyranose-(1-4)-2-acetamido-2-deoxy-b

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



Mol	Chain	Residues	Atoms				AltConf	Trace
5	K	8	Total	C	N	O	0	0
			100	56	4	40		

- Molecule 6 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.



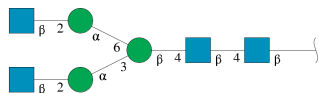
Mol	Chain	Residues	Atoms				AltConf	Trace
6	M	3	Total	C	N	O	0	0
			39	22	2	15		
6	S	3	Total	C	N	O	0	0
			39	22	2	15		
6	T	3	Total	C	N	O	0	0
			39	22	2	15		
6	a	3	Total	C	N	O	0	0
			39	22	2	15		
6	g	3	Total	C	N	O	0	0
			39	22	2	15		

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



Mol	Chain	Residues	Atoms				AltConf	Trace
7	P	4	Total	C	N	O	0	0
			50	28	2	20		
7	d	4	Total	C	N	O	0	0
			50	28	2	20		

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



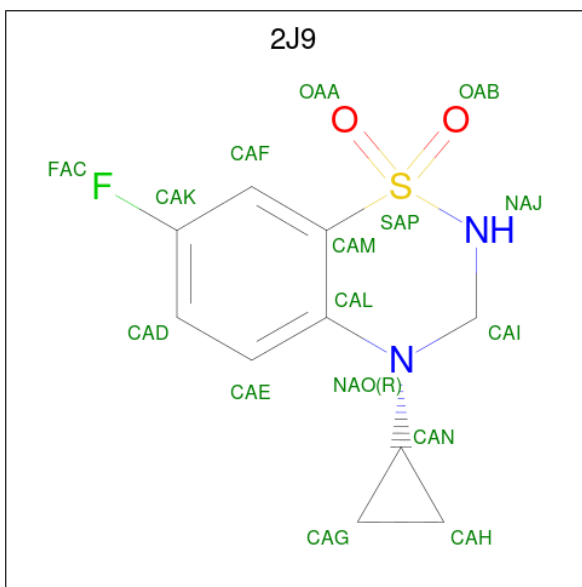
Mol	Chain	Residues	Atoms				AltConf	Trace
8	R	7	Total	C	N	O	0	0
			89	50	4	35		
8	Y	7	Total	C	N	O	0	0
			89	50	4	35		
8	f	7	Total	C	N	O	0	0
			89	50	4	35		

- Molecule 9 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.



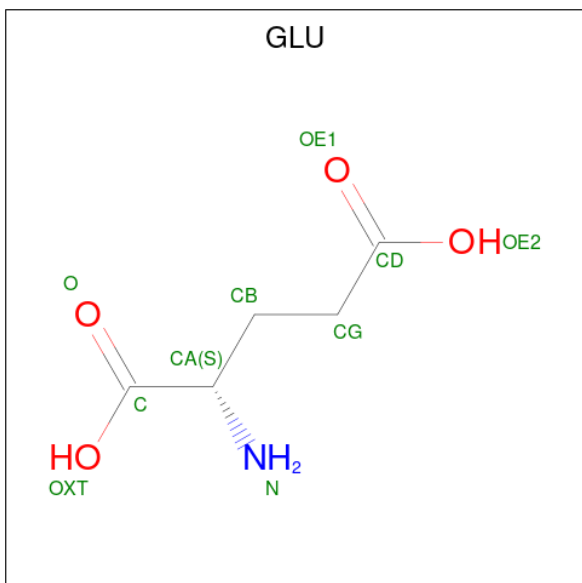
Mol	Chain	Residues	Atoms				AltConf	Trace
9	U	4	Total	C	N	O	0	0
			50	28	2	20		
9	h	4	Total	C	N	O	0	0
			50	28	2	20		
9	i	4	Total	C	N	O	0	0
			50	28	2	20		

- Molecule 10 is 4-cyclopropyl-7-fluoro-3,4-dihydro-2H-1,2,4-benzothiadiazine 1,1-dioxide (three-letter code: 2J9) (formula: C₁₀H₁₁FN₂O₂S) (labeled as "Ligand of Interest" by depositor).



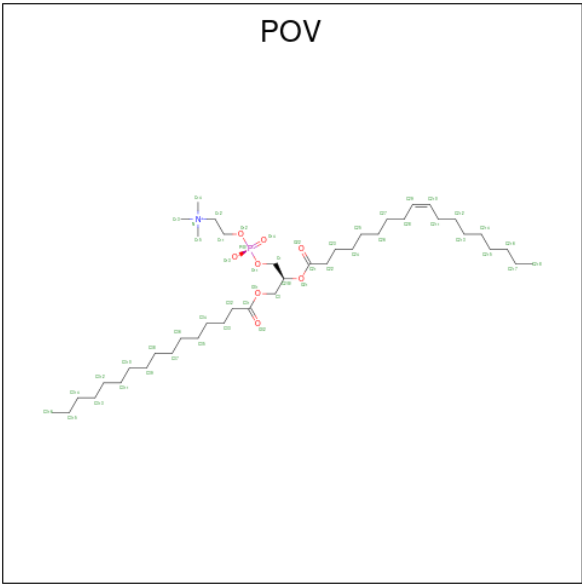
Mol	Chain	Residues	Atoms						AltConf
10	A	1	Total 16	C 10	F 1	N 2	O 2	S 1	0
10	B	1	Total 16	C 10	F 1	N 2	O 2	S 1	0
10	C	1	Total 16	C 10	F 1	N 2	O 2	S 1	0
10	D	1	Total 16	C 10	F 1	N 2	O 2	S 1	0

- Molecule 11 is GLUTAMIC ACID (three-letter code: GLU) (formula: $C_5H_9NO_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
11	A	1	Total	C	N	O	0
			10	5	1	4	
11	B	1	Total	C	N	O	0
			10	5	1	4	
11	C	1	Total	C	N	O	0
			10	5	1	4	
11	D	1	Total	C	N	O	0
			10	5	1	4	

- Molecule 12 is (2S)-3-(hexadecanoyloxy)-2-[(9Z)-octadec-9-enoyloxy]propyl 2-(trimethylammonio)ethyl phosphate (three-letter code: POV) (formula: C₄₂H₈₂NO₈P).



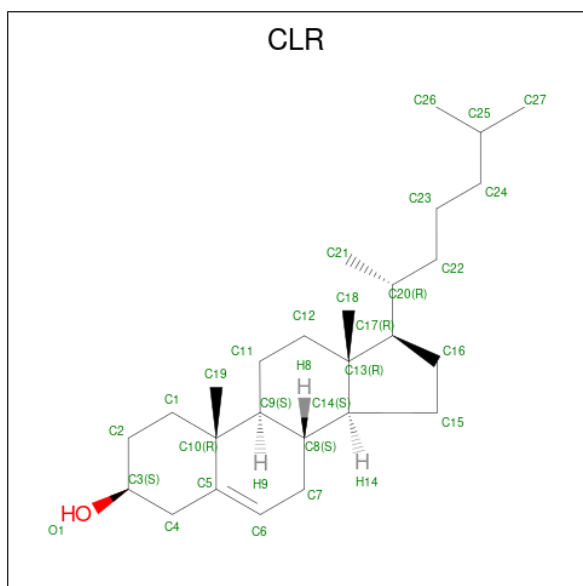
Mol	Chain	Residues	Atoms					AltConf
12	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	B	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	B	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	B	1	Total	C	N	O	P	0
			52	42	1	8	1	

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Mol	Chain	Residues	Atoms					AltConf
12	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	D	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	D	1	Total	C	N	O	P	0
			52	42	1	8	1	
12	D	1	Total	C	N	O	P	0
			52	42	1	8	1	

- Molecule 13 is CHOLESTEROL (three-letter code: CLR) (formula: $C_{27}H_{46}O$).



Mol	Chain	Residues	Atoms			AltConf
13	A	1	Total	C	O	0
			28	27	1	
13	A	1	Total	C	O	0
			28	27	1	
13	A	1	Total	C	O	0
			28	27	1	
13	A	1	Total	C	O	0
			28	27	1	

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Mol	Chain	Residues	Atoms			AltConf
13	B	1	Total	C	O	0
			28	27	1	
13	C	1	Total	C	O	0
			28	27	1	
13	C	1	Total	C	O	0
			28	27	1	
13	C	1	Total	C	O	0
			28	27	1	

- Molecule 14 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
14	E	1	Total	Zn	0
			1	1	
14	F	1	Total	Zn	0
			1	1	
14	G	1	Total	Zn	0
			1	1	
14	H	1	Total	Zn	0
			1	1	

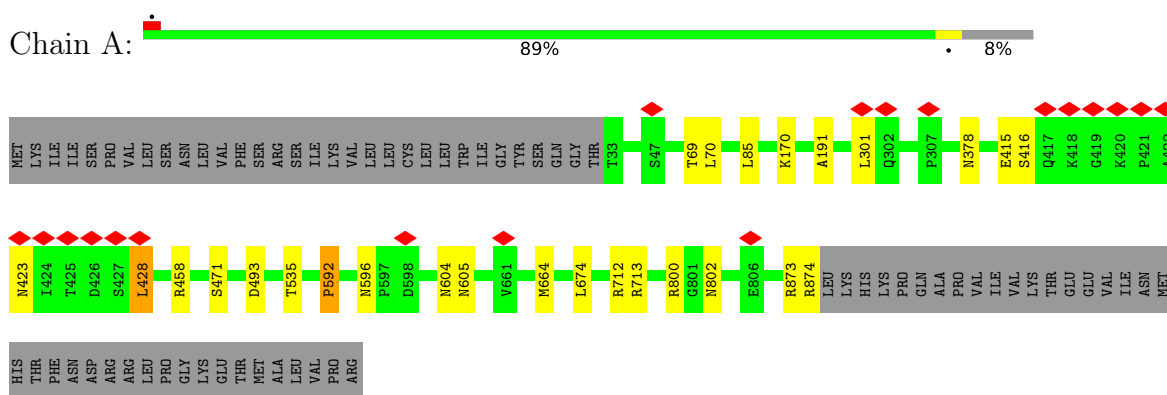
- Molecule 15 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
15	E	1	Total	Ca	0
			1	1	
15	F	1	Total	Ca	0
			1	1	
15	G	1	Total	Ca	0
			1	1	
15	H	1	Total	Ca	0
			1	1	

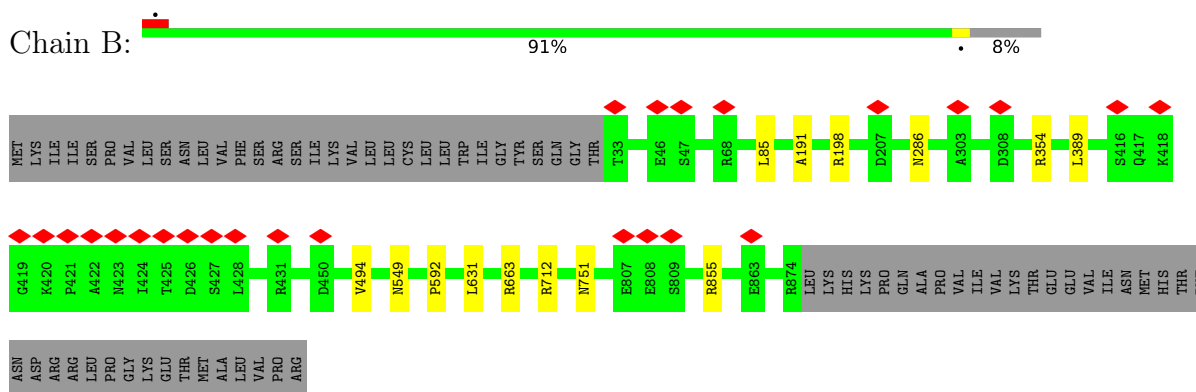
3 Residue-property plots

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.

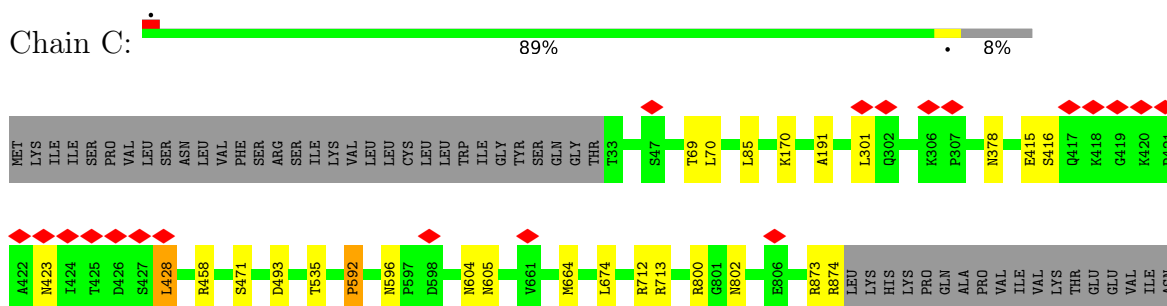
- Molecule 1: Glutamate receptor ionotropic, kainate 2



- Molecule 1: Glutamate receptor ionotropic, kainate 2




- Molecule 1: Glutamate receptor ionotropic, kainate 2



MET
HIS
THR
PHE
ASN
ASP
ARG
ARG
LEU
PRO
GLY
LYS
GLU
THR
MET
ALA
LEU
VAL
PRO
ARG

- Molecule 1: Glutamate receptor ionotropic, kainate 2

Chain D:  91% 8%

MET
LYS
ILE
PHE
SER
PRO
VAL
LEU
SER
ASN
LEU
VAL
PHE
SER
ARG
SER
ILE
LYS
VAL
LEU
LEU
CYS
LEU
LEU
TRP
ILE
GLY
TYR
SER
GLN
GLY
THR
T33
E46
S47
R68
L85
A191
R198
D207
N286
A303
D308
R354
L389
S416
Q417
K418

G419
K420
P421
A422
N423
T424
T425
D426
S427
L428
R431
D450
V494
N549
P592
L631
R663
R712
N751
E807
E808
S809
R855
Q872
R873
R874
LEU
LYS
HIS
LYS
PRO
GLN
ALA
PRO
VAL
ILE
VAL
LYS
THR
GLU
VAL
ILE
ASN
MET
HIS
THR
PHE

ASN
ASP
ARG
ARG
LEU
PRO
GLY
LYS
THR
MET
ALA
LEU
VAL
PRO
ARG

- Molecule 2: Concanavalin A

Chain E:  94% 5%

A1
V47
G48
K59
L115
N118
Q132
S161
N162
I181
W182
E183
S184
S185
A186
V187
A207
L230
N237

- Molecule 2: Concanavalin A

Chain F:  94% 5%

A1
V47
G48
K59
Q98
L115
K116
S117
N118
S119
E122
Q132
R158
N162
I181
W182
E183
S184
S185
A186
V187
D203
A207
S223
N237

- Molecule 2: Concanavalin A

Chain G:  94% 5%

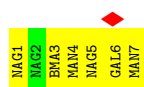
A1
V47
G48
K59
L115
N118
E122
Q132
S161
N162
I181
W182
E183
S184
S185
A186
V187
A207
L230
N237

- Molecule 2: Concanavalin A

Chain H:  94% 5%

A1
V47
G48
K59
L115
K116
S117
N118
S119
Q132
S160
S161
N162
I181
W182
E183
S184
S185
A186
A207
N237

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



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



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



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



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



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



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



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



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



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



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



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





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



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



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



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



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



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



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



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



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



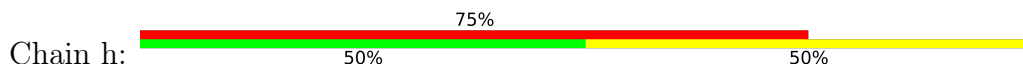
- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 9: alpha-D-mannopyranose-(1-6)-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-(1-6)-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-(1-6)-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, C2	Depositor
Number of particles used	109827	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	58	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	60.657	Depositor
Minimum map value	-32.589	Depositor
Average map value	-0.005	Depositor
Map value standard deviation	1.320	Depositor
Recommended contour level	4.33	Depositor
Map size (\AA)	345.2672, 345.2672, 345.2672	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.3487, 1.3487, 1.3487	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, CA, ZN, 2J9, CLR, GAL, POV, MAN, BMA

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	0.32	0/6840	0.62	6/9258 (0.1%)
1	B	0.32	0/6833	0.58	1/9248 (0.0%)
1	C	0.32	0/6840	0.62	7/9258 (0.1%)
1	D	0.32	0/6833	0.58	1/9248 (0.0%)
2	E	0.36	0/1848	0.76	2/2518 (0.1%)
2	F	0.36	0/1851	0.75	1/2522 (0.0%)
2	G	0.36	0/1848	0.76	2/2518 (0.1%)
2	H	0.36	0/1851	0.75	1/2522 (0.0%)
All	All	0.33	0/34744	0.63	21/47092 (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
1	A	0	3
1	B	0	2
1	C	0	3
1	D	0	2
2	E	0	8
2	F	0	8
2	G	0	8
2	H	0	8
All	All	0	42

There are no bond length outliers.

The worst 5 of 21 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	48	GLY	N-CA-C	10.16	138.50	113.10
2	G	48	GLY	N-CA-C	10.14	138.44	113.10
1	A	428	LEU	CA-CB-CG	9.06	136.15	115.30
1	C	428	LEU	CA-CB-CG	9.04	136.09	115.30
2	H	48	GLY	N-CA-C	8.06	133.25	113.10

There are no chirality outliers.

5 of 42 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	191	ALA	Peptide
1	A	415	GLU	Peptide
1	A	592	PRO	Peptide
1	B	191	ALA	Peptide
1	B	751	ASN	Peptide

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	842/912 (92%)	740 (88%)	98 (12%)	4 (0%)	29	68
1	B	841/912 (92%)	745 (89%)	93 (11%)	3 (0%)	34	72
1	C	842/912 (92%)	740 (88%)	98 (12%)	4 (0%)	29	68
1	D	841/912 (92%)	745 (89%)	93 (11%)	3 (0%)	34	72
2	E	235/237 (99%)	179 (76%)	52 (22%)	4 (2%)	9	43
2	F	235/237 (99%)	171 (73%)	59 (25%)	5 (2%)	7	39
2	G	235/237 (99%)	179 (76%)	52 (22%)	4 (2%)	9	43

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	H	235/237 (99%)	171 (73%)	59 (25%)	5 (2%)	7	39
All	All	4306/4596 (94%)	3670 (85%)	604 (14%)	32 (1%)	26	62

5 of 32 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	E	186	ALA
2	F	186	ALA
2	G	186	ALA
2	H	186	ALA
1	A	416	SER

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	735/798 (92%)	717 (98%)	18 (2%)	49	69
1	B	734/798 (92%)	726 (99%)	8 (1%)	73	85
1	C	735/798 (92%)	717 (98%)	18 (2%)	49	69
1	D	734/798 (92%)	726 (99%)	8 (1%)	73	85
2	E	202/203 (100%)	199 (98%)	3 (2%)	65	80
2	F	203/203 (100%)	200 (98%)	3 (2%)	65	80
2	G	202/203 (100%)	199 (98%)	3 (2%)	65	80
2	H	203/203 (100%)	200 (98%)	3 (2%)	65	80
All	All	3748/4004 (94%)	3684 (98%)	64 (2%)	64	78

5 of 64 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	F	162	ASN
2	G	132	GLN
1	B	712	ARG
1	B	663	ARG

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Mol	Chain	Res	Type
2	G	162	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 37 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	430	ASN
2	G	162	ASN
1	D	549	ASN
1	D	819	ASN
1	B	604	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

102 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
3	NAG	I	1	1,3	14,14,15	1.28	1 (7%)	17,19,21	1.43	2 (11%)
3	NAG	I	2	3	14,14,15	0.37	0	17,19,21	0.49	0
3	BMA	I	3	3	11,11,12	1.82	3 (27%)	15,15,17	2.35	4 (26%)
3	MAN	I	4	3	11,11,12	2.85	3 (27%)	15,15,17	2.34	3 (20%)
3	NAG	I	5	3	14,14,15	1.27	2 (14%)	17,19,21	1.73	1 (5%)
3	GAL	I	6	3	11,11,12	0.56	0	15,15,17	1.39	1 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	MAN	I	7	3	11,11,12	1.40	2 (18%)	15,15,17	1.44	3 (20%)
4	NAG	J	1	4	14,14,15	1.20	1 (7%)	17,19,21	1.35	1 (5%)
4	NAG	J	2	4	14,14,15	0.35	0	17,19,21	0.54	0
5	NAG	K	1	5,1	14,14,15	0.44	0	17,19,21	0.72	0
5	NAG	K	2	5	14,14,15	0.25	0	17,19,21	0.88	1 (5%)
5	BMA	K	3	5	11,11,12	1.21	1 (9%)	15,15,17	1.62	4 (26%)
5	MAN	K	4	5	11,11,12	1.05	1 (9%)	15,15,17	0.92	1 (6%)
5	NAG	K	5	5	14,14,15	0.67	1 (7%)	17,19,21	0.89	1 (5%)
5	GAL	K	6	5	11,11,12	1.29	3 (27%)	15,15,17	1.43	4 (26%)
5	MAN	K	7	5	11,11,12	1.66	3 (27%)	15,15,17	2.11	4 (26%)
5	NAG	K	8	5	14,14,15	0.41	0	17,19,21	0.98	1 (5%)
4	NAG	L	1	1,4	14,14,15	1.41	1 (7%)	17,19,21	1.51	1 (5%)
4	NAG	L	2	4	14,14,15	0.36	0	17,19,21	0.48	0
6	NAG	M	1	6,1	14,14,15	0.40	0	17,19,21	0.70	1 (5%)
6	NAG	M	2	6	14,14,15	0.27	0	17,19,21	0.46	0
6	BMA	M	3	6	11,11,12	0.80	0	15,15,17	1.19	1 (6%)
4	NAG	N	1	1,4	14,14,15	0.86	1 (7%)	17,19,21	0.74	0
4	NAG	N	2	4	14,14,15	1.30	1 (7%)	17,19,21	2.24	3 (17%)
4	NAG	O	1	1,4	14,14,15	1.49	2 (14%)	17,19,21	1.51	1 (5%)
4	NAG	O	2	4	14,14,15	0.43	0	17,19,21	0.50	0
7	NAG	P	1	1,7	14,14,15	0.78	1 (7%)	17,19,21	1.17	2 (11%)
7	NAG	P	2	7	14,14,15	0.84	1 (7%)	17,19,21	2.29	3 (17%)
7	BMA	P	3	7	11,11,12	1.12	1 (9%)	15,15,17	1.10	1 (6%)
7	BMA	P	4	7	11,11,12	0.83	0	15,15,17	0.85	0
4	NAG	Q	1	1,4	14,14,15	0.67	1 (7%)	17,19,21	1.49	1 (5%)
4	NAG	Q	2	4	14,14,15	0.49	0	17,19,21	0.56	0
8	NAG	R	1	8,1	14,14,15	1.53	1 (7%)	17,19,21	1.63	5 (29%)
8	NAG	R	2	8	14,14,15	0.30	0	17,19,21	1.14	1 (5%)
8	BMA	R	3	8	11,11,12	1.72	2 (18%)	15,15,17	2.64	4 (26%)
8	MAN	R	4	8	11,11,12	0.95	0	15,15,17	1.62	3 (20%)
8	NAG	R	5	8	14,14,15	1.30	2 (14%)	17,19,21	2.43	4 (23%)
8	MAN	R	6	8	11,11,12	0.89	0	15,15,17	0.99	1 (6%)
8	NAG	R	7	8	14,14,15	1.57	2 (14%)	17,19,21	1.36	1 (5%)
6	NAG	S	1	6,1	14,14,15	0.46	0	17,19,21	0.68	0
6	NAG	S	2	6	14,14,15	0.29	0	17,19,21	0.92	1 (5%)
6	BMA	S	3	6	11,11,12	1.17	1 (9%)	15,15,17	1.28	2 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	NAG	T	1	6,1	14,14,15	0.26	0	17,19,21	0.56	0
6	NAG	T	2	6	14,14,15	0.29	0	17,19,21	0.53	0
6	BMA	T	3	6	11,11,12	1.24	2 (18%)	15,15,17	1.59	3 (20%)
9	NAG	U	1	1,9	14,14,15	0.52	0	17,19,21	0.90	0
9	NAG	U	2	9	14,14,15	1.58	2 (14%)	17,19,21	1.60	2 (11%)
9	BMA	U	3	9	11,11,12	1.15	1 (9%)	15,15,17	2.22	2 (13%)
9	MAN	U	4	9	11,11,12	1.69	2 (18%)	15,15,17	2.00	3 (20%)
4	NAG	V	1	1,4	14,14,15	1.59	2 (14%)	17,19,21	1.30	1 (5%)
4	NAG	V	2	4	14,14,15	0.50	0	17,19,21	0.65	1 (5%)
3	NAG	W	1	1,3	14,14,15	1.13	1 (7%)	17,19,21	1.36	2 (11%)
3	NAG	W	2	3	14,14,15	0.35	0	17,19,21	1.03	1 (5%)
3	BMA	W	3	3	11,11,12	2.13	4 (36%)	15,15,17	1.72	5 (33%)
3	MAN	W	4	3	11,11,12	1.62	3 (27%)	15,15,17	1.89	3 (20%)
3	NAG	W	5	3	14,14,15	0.16	0	17,19,21	1.47	1 (5%)
3	GAL	W	6	3	11,11,12	1.07	2 (18%)	15,15,17	1.77	2 (13%)
3	MAN	W	7	3	11,11,12	0.94	1 (9%)	15,15,17	1.67	3 (20%)
4	NAG	X	1	4	14,14,15	1.28	2 (14%)	17,19,21	1.33	1 (5%)
4	NAG	X	2	4	14,14,15	0.34	0	17,19,21	0.53	0
8	NAG	Y	1	8,1	14,14,15	0.49	0	17,19,21	0.66	0
8	NAG	Y	2	8	14,14,15	0.62	0	17,19,21	0.58	0
8	BMA	Y	3	8	11,11,12	2.05	3 (27%)	15,15,17	2.03	6 (40%)
8	MAN	Y	4	8	11,11,12	1.00	1 (9%)	15,15,17	1.20	2 (13%)
8	NAG	Y	5	8	14,14,15	0.38	0	17,19,21	0.54	0
8	MAN	Y	6	8	11,11,12	1.19	2 (18%)	15,15,17	1.58	2 (13%)
8	NAG	Y	7	8	14,14,15	0.52	0	17,19,21	0.48	0
4	NAG	Z	1	1,4	14,14,15	1.47	1 (7%)	17,19,21	1.41	1 (5%)
4	NAG	Z	2	4	14,14,15	0.38	0	17,19,21	0.49	0
6	NAG	a	1	6,1	14,14,15	0.27	0	17,19,21	0.61	0
6	NAG	a	2	6	14,14,15	0.27	0	17,19,21	0.52	0
6	BMA	a	3	6	11,11,12	0.97	1 (9%)	15,15,17	0.80	0
4	NAG	b	1	1,4	14,14,15	0.57	0	17,19,21	0.67	0
4	NAG	b	2	4	14,14,15	0.41	0	17,19,21	0.53	0
4	NAG	c	1	1,4	14,14,15	1.27	2 (14%)	17,19,21	1.63	2 (11%)
4	NAG	c	2	4	14,14,15	1.23	1 (7%)	17,19,21	1.23	1 (5%)
7	NAG	d	1	1,7	14,14,15	0.92	1 (7%)	17,19,21	1.22	2 (11%)
7	NAG	d	2	7	14,14,15	0.41	0	17,19,21	1.12	1 (5%)
7	BMA	d	3	7	11,11,12	0.87	0	15,15,17	0.96	1 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	BMA	d	4	7	11,11,12	0.84	0	15,15,17	0.79	0
4	NAG	e	1	1,4	14,14,15	0.74	1 (7%)	17,19,21	1.11	2 (11%)
4	NAG	e	2	4	14,14,15	0.34	0	17,19,21	0.54	0
8	NAG	f	1	8,1	14,14,15	0.67	1 (7%)	17,19,21	1.31	3 (17%)
8	NAG	f	2	8	14,14,15	0.99	2 (14%)	17,19,21	0.59	0
8	BMA	f	3	8	11,11,12	1.49	3 (27%)	15,15,17	1.60	2 (13%)
8	MAN	f	4	8	11,11,12	0.86	0	15,15,17	1.26	1 (6%)
8	NAG	f	5	8	14,14,15	0.46	0	17,19,21	0.40	0
8	MAN	f	6	8	11,11,12	1.06	1 (9%)	15,15,17	1.58	3 (20%)
8	NAG	f	7	8	14,14,15	0.35	0	17,19,21	0.87	1 (5%)
6	NAG	g	1	6,1	14,14,15	0.73	0	17,19,21	1.27	3 (17%)
6	NAG	g	2	6	14,14,15	1.65	1 (7%)	17,19,21	2.01	2 (11%)
6	BMA	g	3	6	11,11,12	0.76	0	15,15,17	0.85	0
9	NAG	h	1	1,9	14,14,15	0.25	0	17,19,21	0.55	0
9	NAG	h	2	9	14,14,15	0.36	0	17,19,21	0.48	0
9	BMA	h	3	9	11,11,12	1.62	4 (36%)	15,15,17	1.73	3 (20%)
9	MAN	h	4	9	11,11,12	1.46	3 (27%)	15,15,17	1.35	1 (6%)
9	NAG	i	1	1,9	14,14,15	0.49	0	17,19,21	1.12	2 (11%)
9	NAG	i	2	9	14,14,15	0.95	1 (7%)	17,19,21	2.29	4 (23%)
9	BMA	i	3	9	11,11,12	0.78	0	15,15,17	0.90	1 (6%)
9	MAN	i	4	9	11,11,12	1.46	2 (18%)	15,15,17	1.92	5 (33%)
4	NAG	j	1	1,4	14,14,15	1.55	2 (14%)	17,19,21	1.37	1 (5%)
4	NAG	j	2	4	14,14,15	0.50	0	17,19,21	0.69	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
3	NAG	I	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	I	2	3	-	1/6/23/26	0/1/1/1
3	BMA	I	3	3	-	1/2/19/22	0/1/1/1
3	MAN	I	4	3	-	1/2/19/22	1/1/1/1
3	NAG	I	5	3	-	2/6/23/26	0/1/1/1
3	GAL	I	6	3	-	2/2/19/22	0/1/1/1
3	MAN	I	7	3	-	2/2/19/22	0/1/1/1
4	NAG	J	1	4	-	2/6/23/26	0/1/1/1

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

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

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

The worst 5 of 93 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	4	MAN	O2-C2	7.42	1.59	1.43
6	g	2	NAG	O5-C1	5.79	1.53	1.43
8	R	1	NAG	O5-C1	-5.58	1.34	1.43
4	Z	1	NAG	O5-C1	5.29	1.52	1.43
8	Y	3	BMA	C1-C2	5.17	1.64	1.52

The worst 5 of 150 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	P	2	NAG	C2-N2-C7	7.92	134.18	122.90
4	N	2	NAG	C2-N2-C7	7.81	134.03	122.90
9	i	2	NAG	C2-N2-C7	7.77	133.96	122.90
8	R	5	NAG	C2-N2-C7	7.53	133.62	122.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	I	3	BMA	C1-O5-C5	7.32	122.11	112.19

There are no chirality outliers.

5 of 192 torsion outliers are listed below:

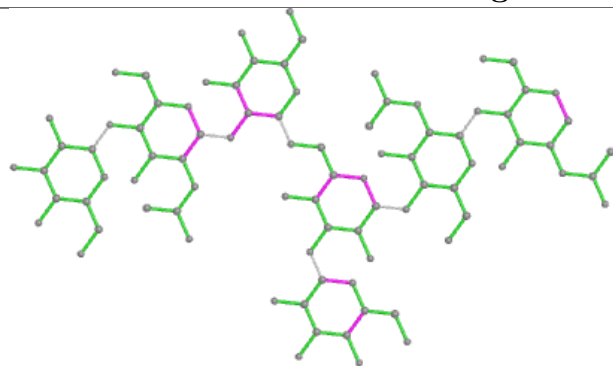
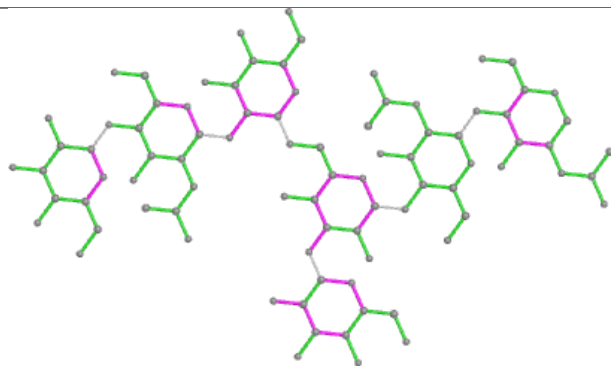
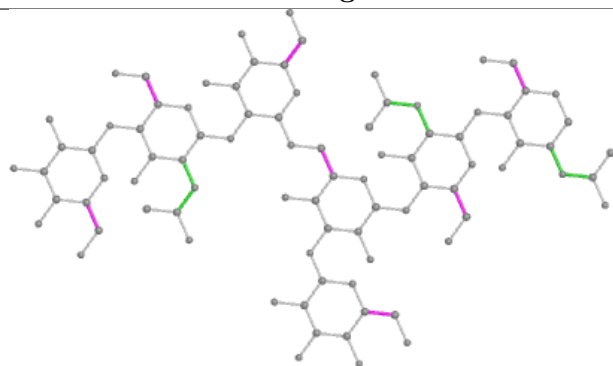
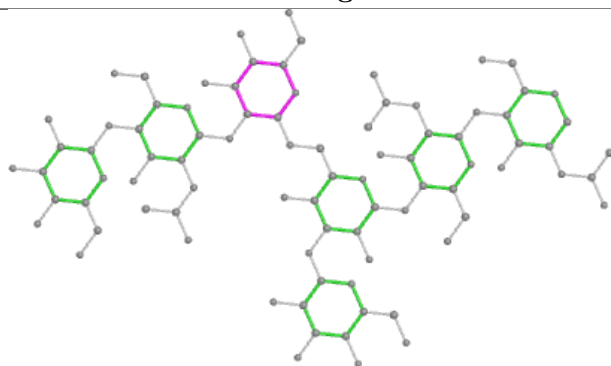
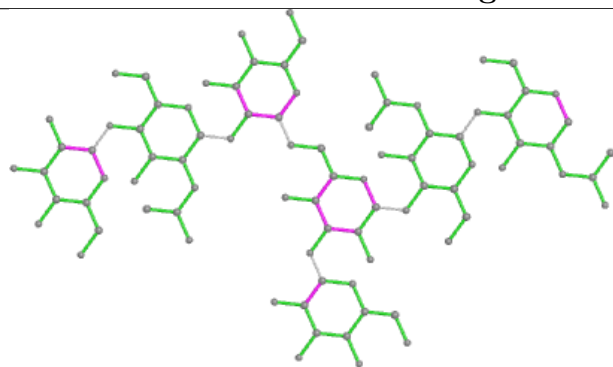
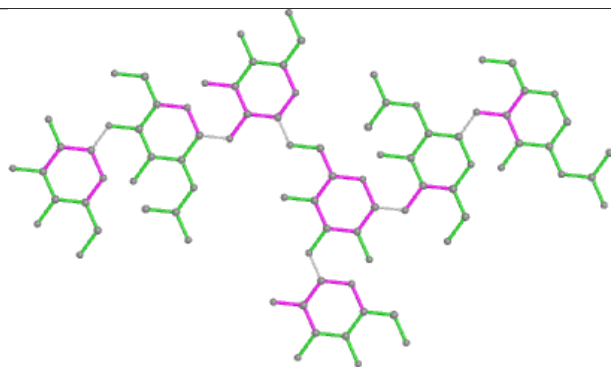
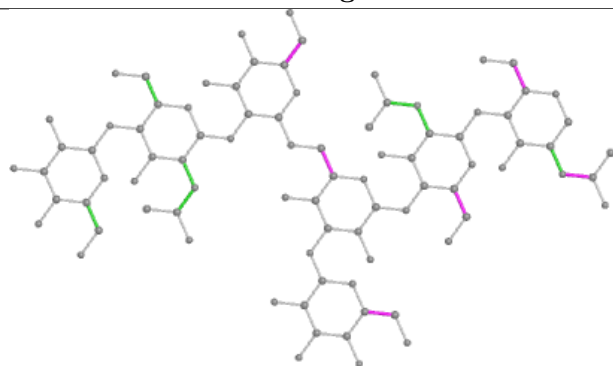
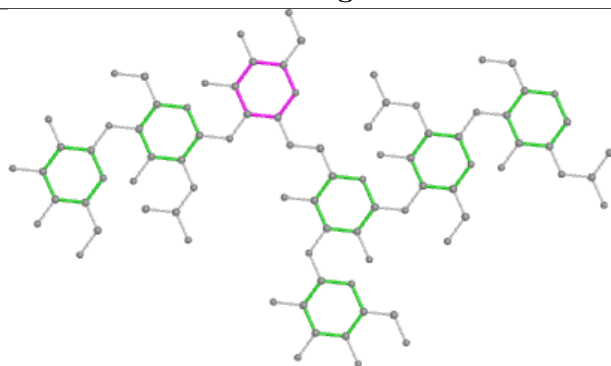
Mol	Chain	Res	Type	Atoms
6	M	3	BMA	O5-C5-C6-O6
7	P	2	NAG	O5-C5-C6-O6
9	i	3	BMA	O5-C5-C6-O6
4	L	2	NAG	O5-C5-C6-O6
7	d	2	NAG	O5-C5-C6-O6

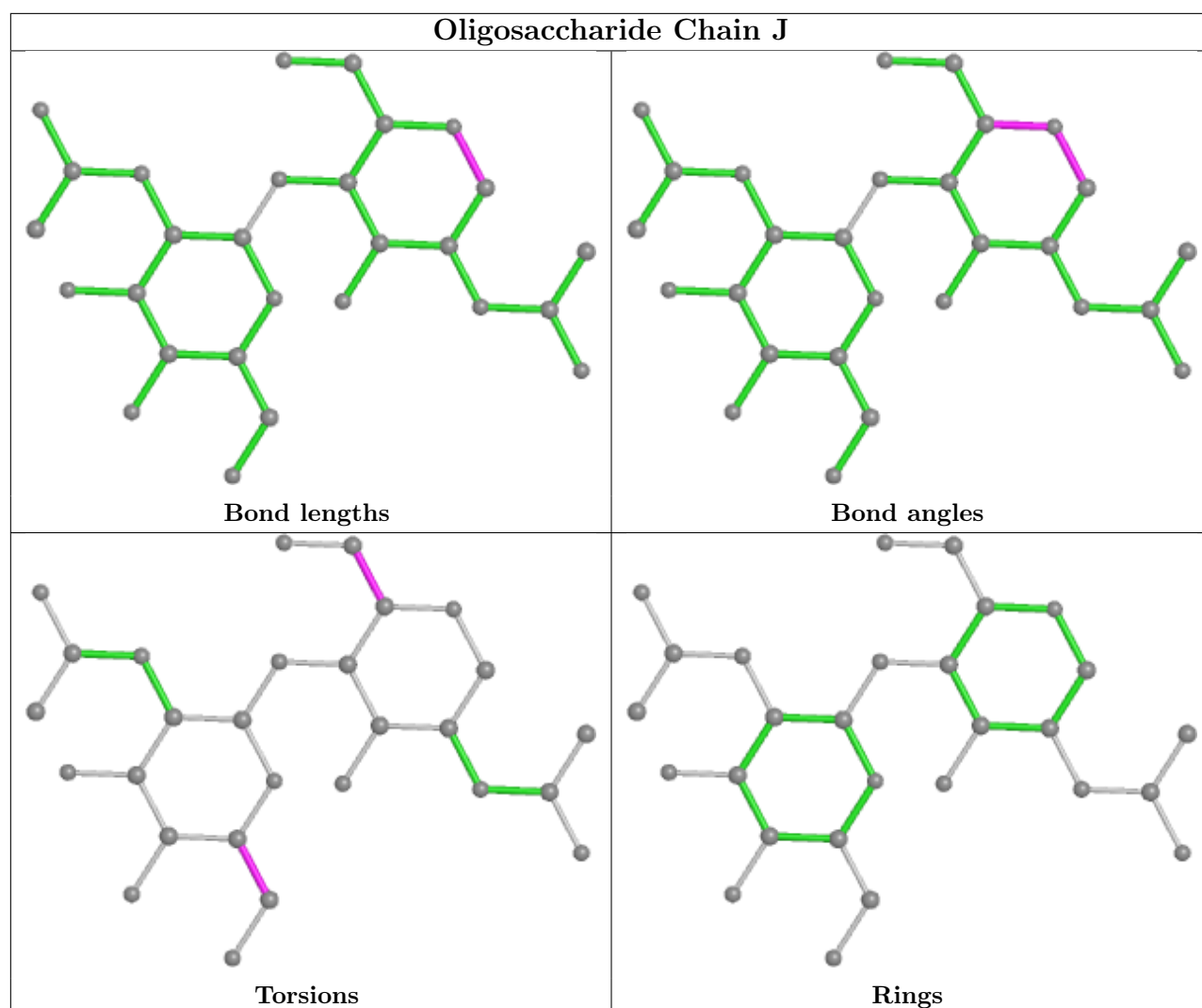
All (5) ring outliers are listed below:

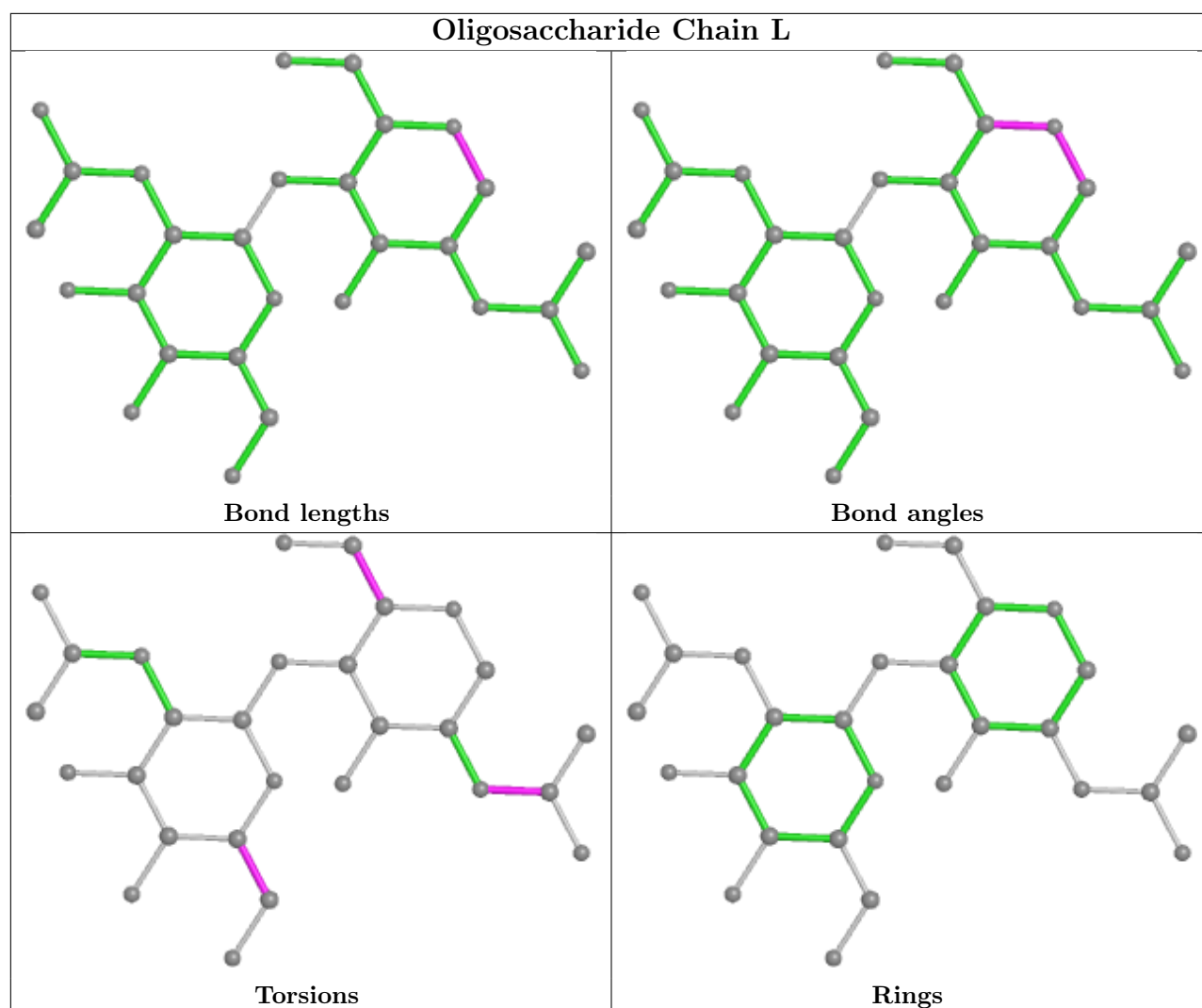
Mol	Chain	Res	Type	Atoms
5	K	4	MAN	C1-C2-C3-C4-C5-O5
8	Y	6	MAN	C1-C2-C3-C4-C5-O5
8	f	4	MAN	C1-C2-C3-C4-C5-O5
3	I	4	MAN	C1-C2-C3-C4-C5-O5
3	W	4	MAN	C1-C2-C3-C4-C5-O5

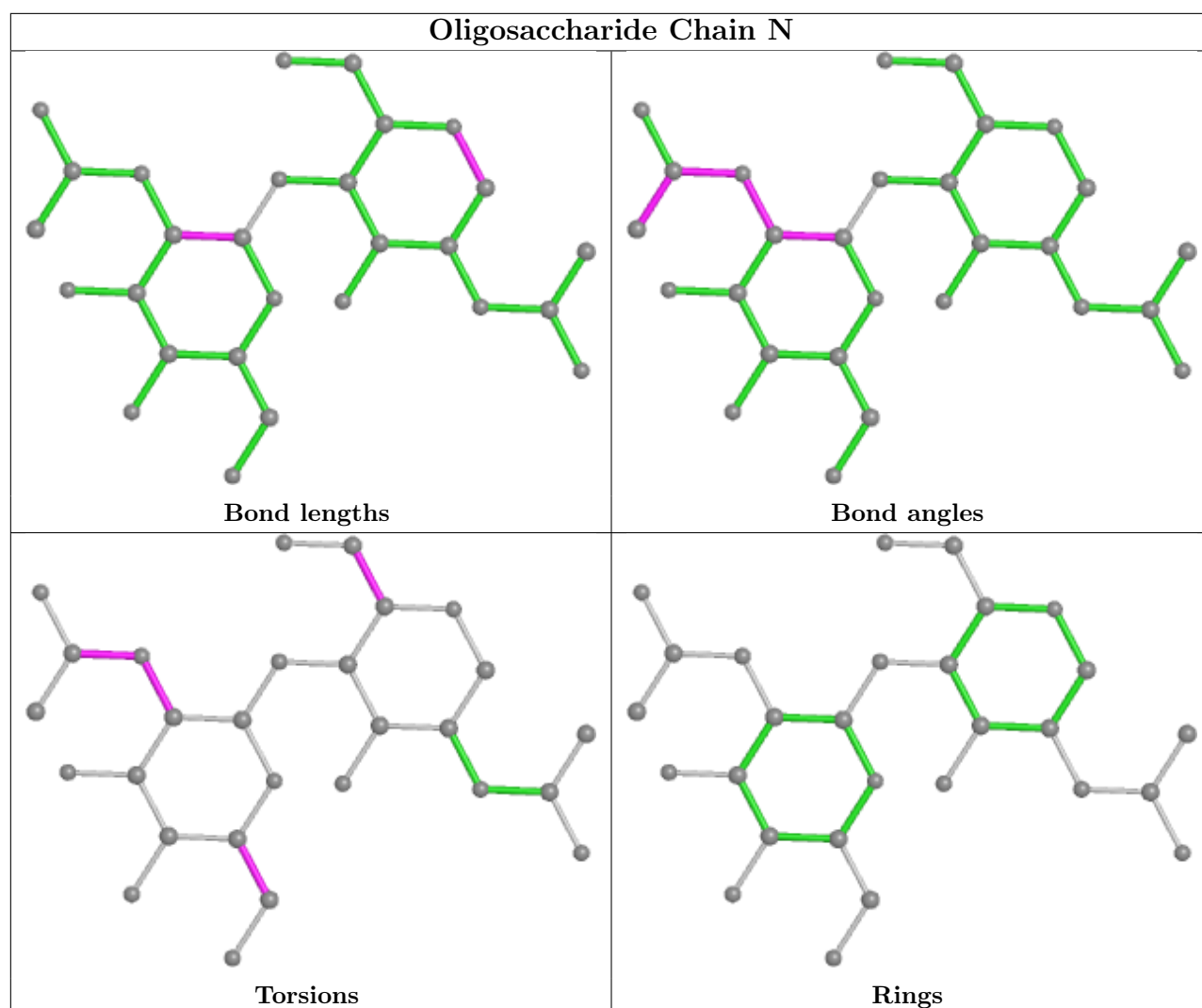
No monomer is involved in short contacts.

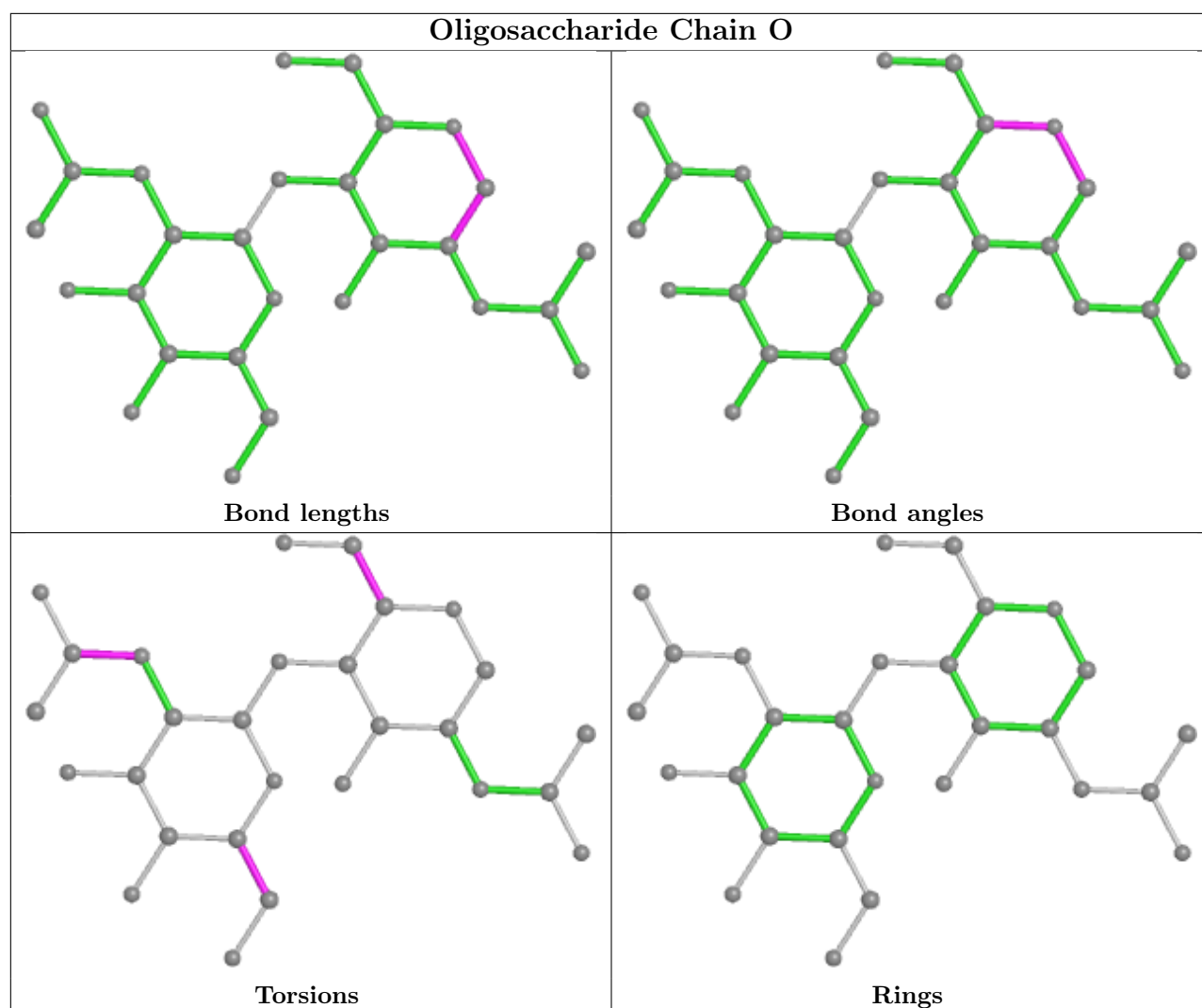
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

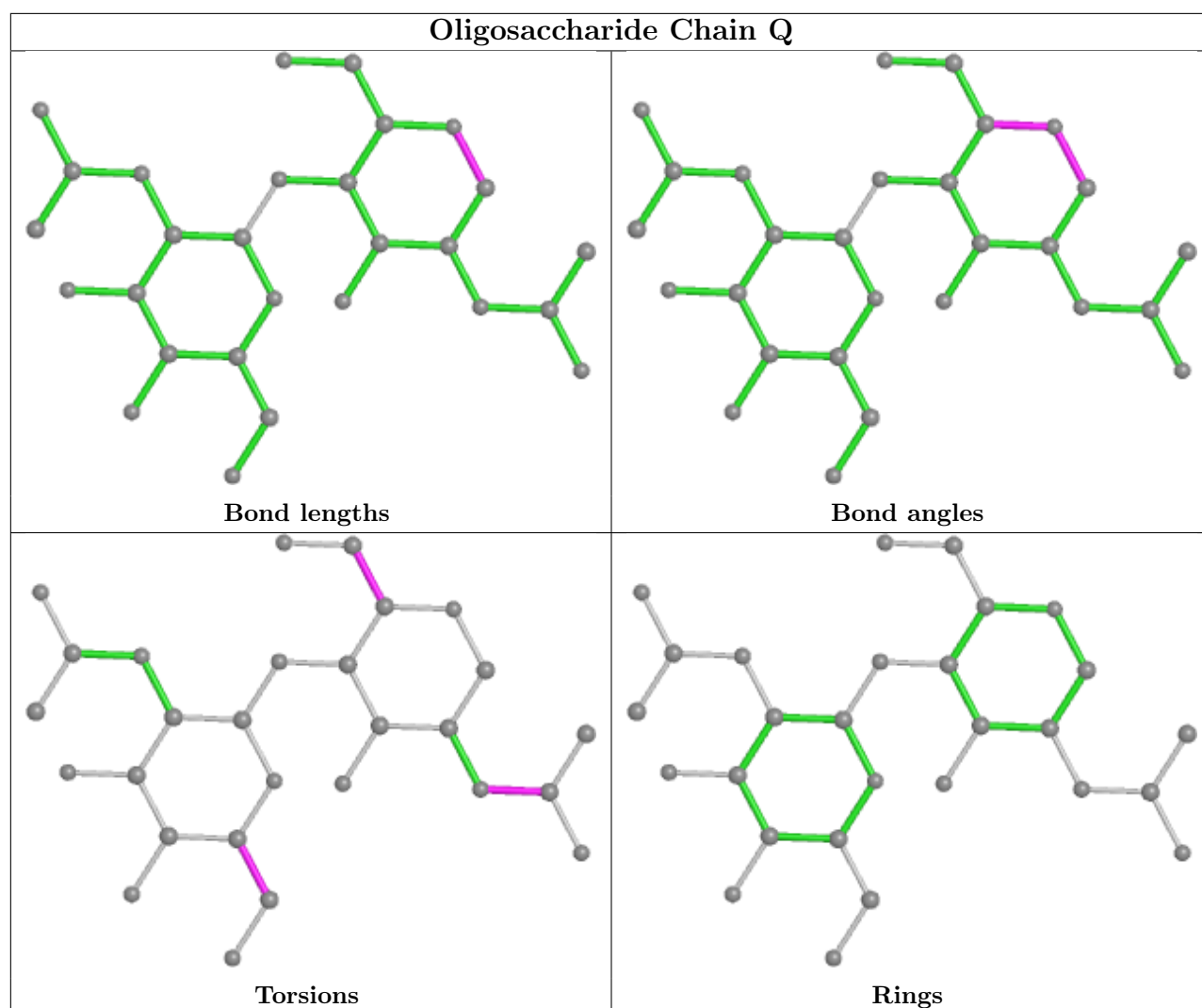
Oligosaccharide Chain I**Bond lengths****Bond angles****Torsions****Rings****Oligosaccharide Chain W****Bond lengths****Bond angles****Torsions****Rings**

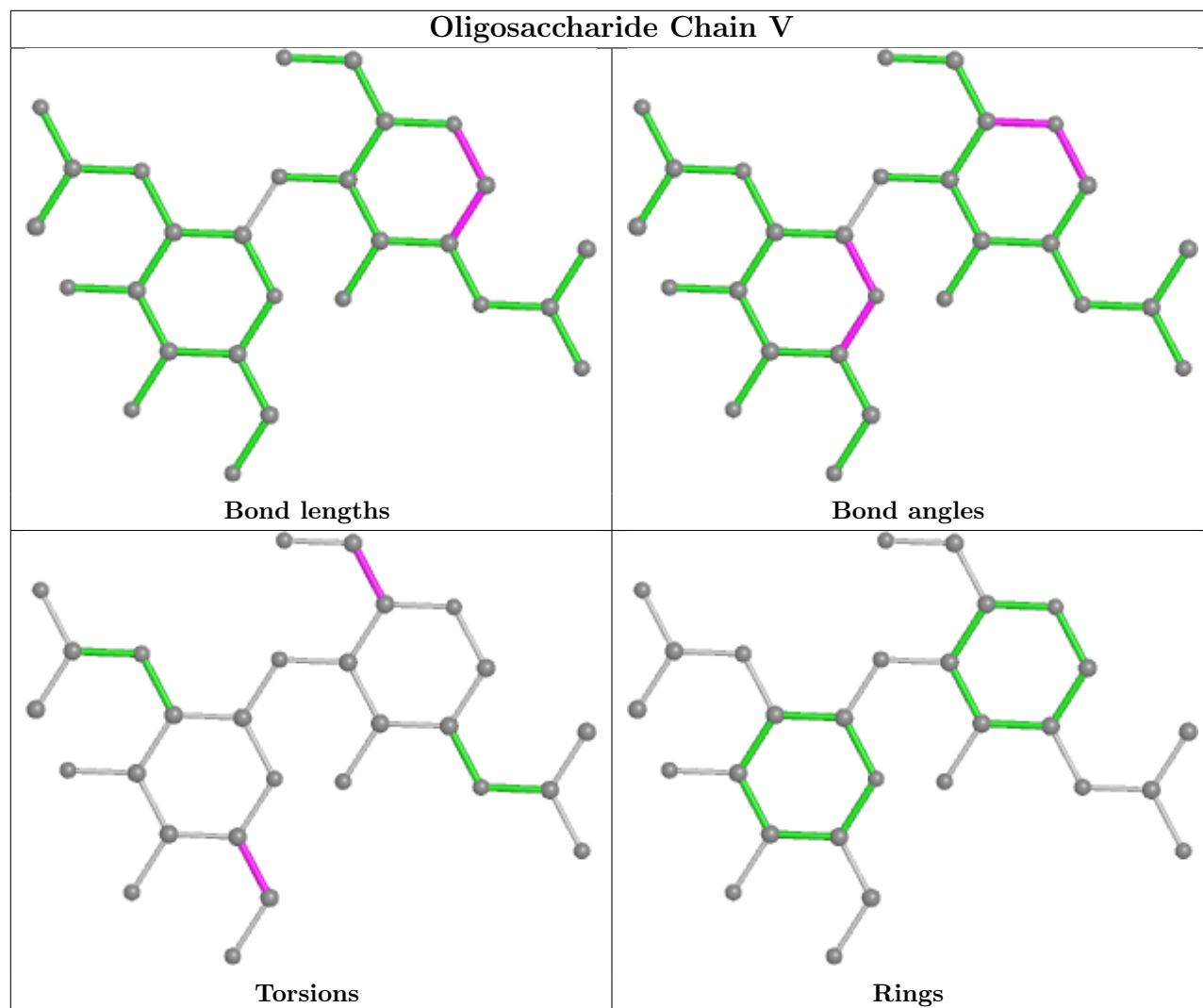


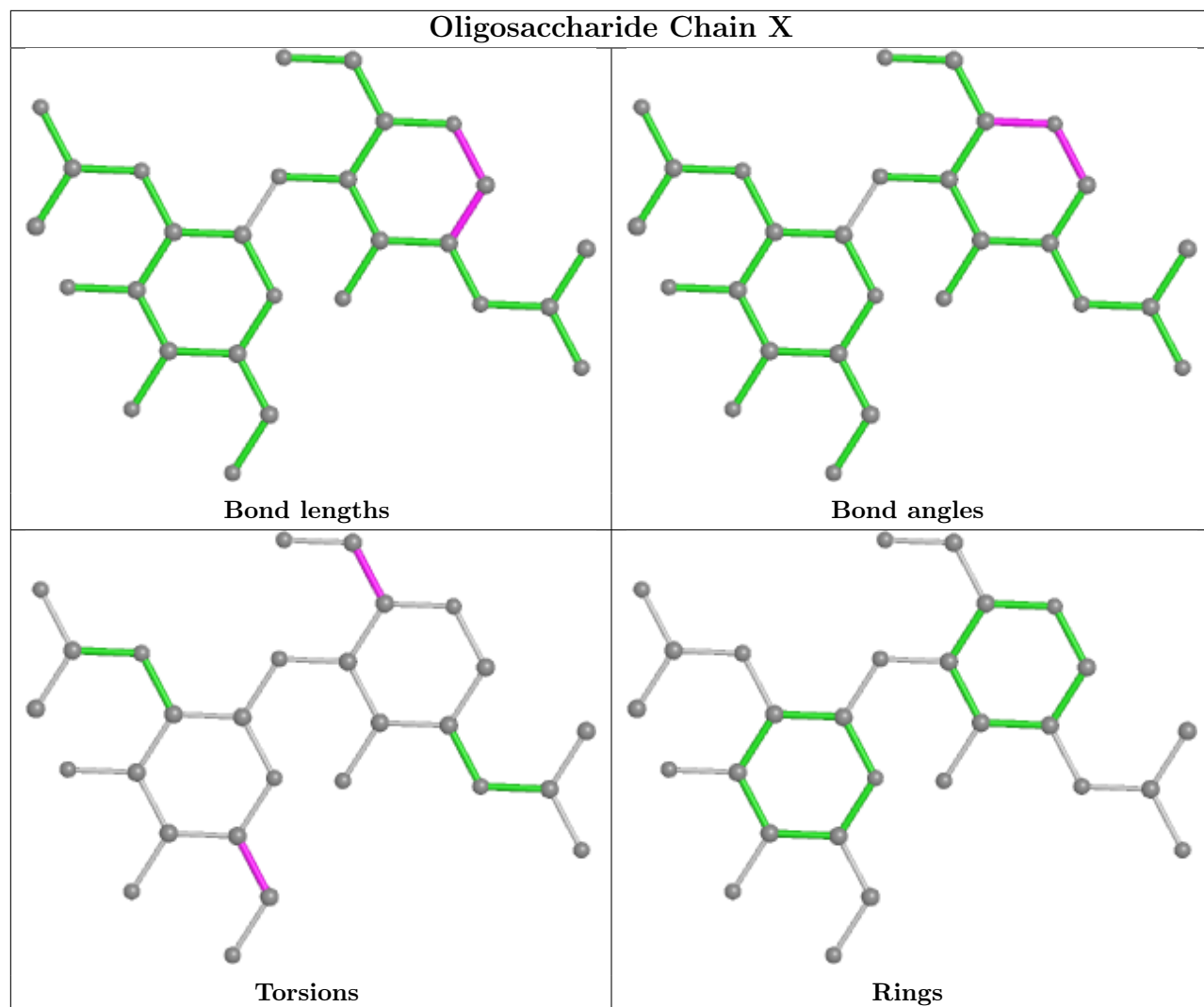


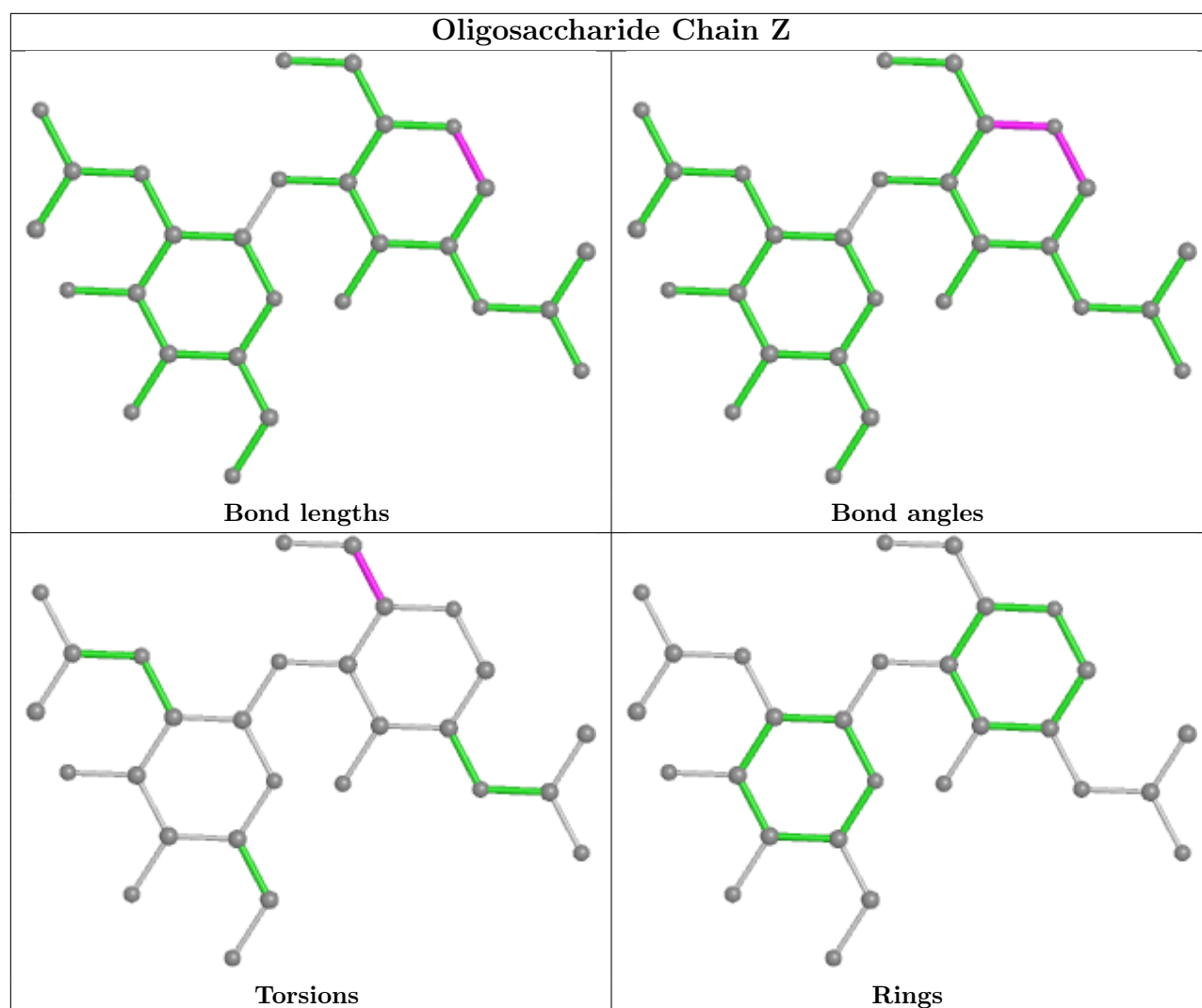


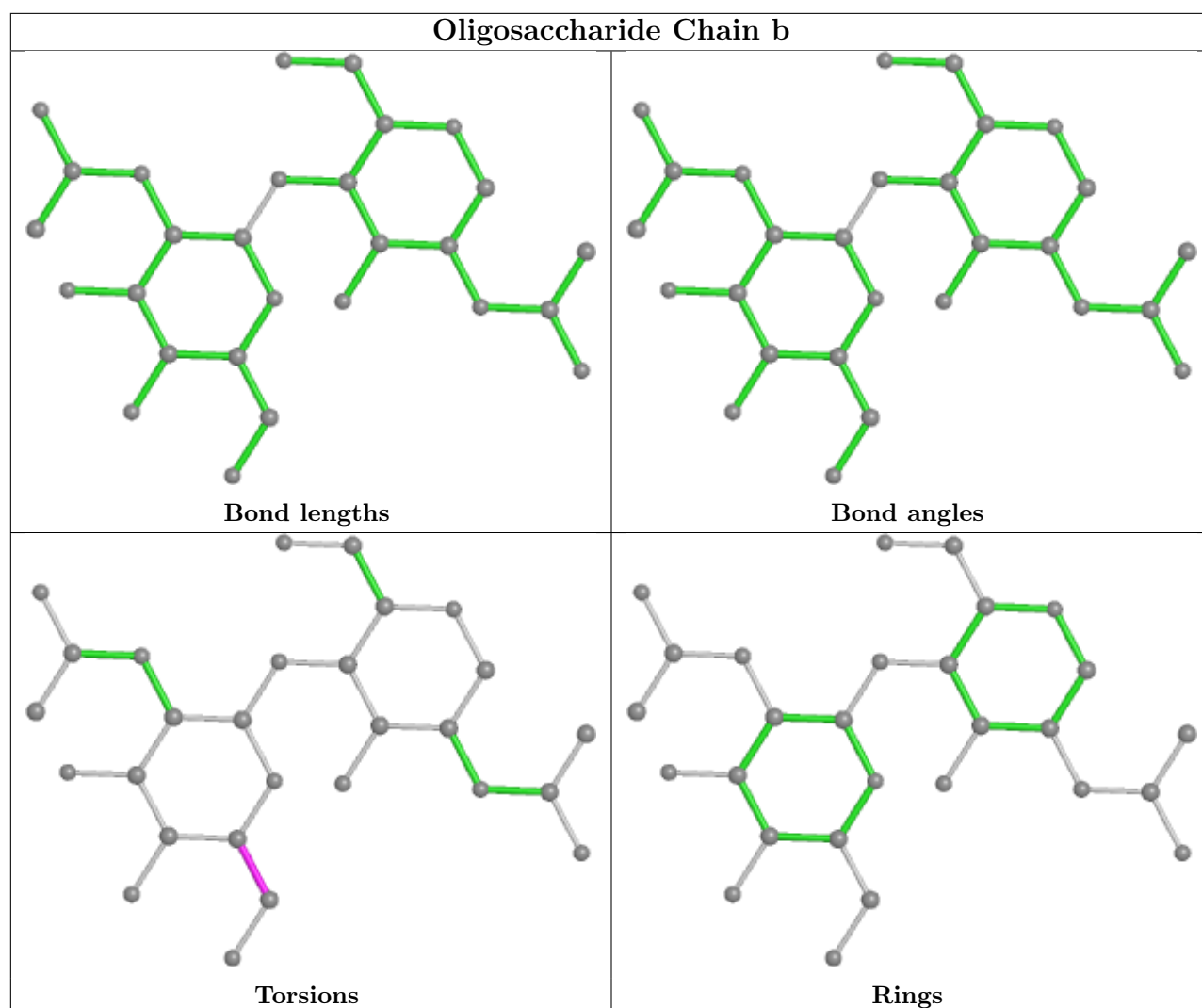


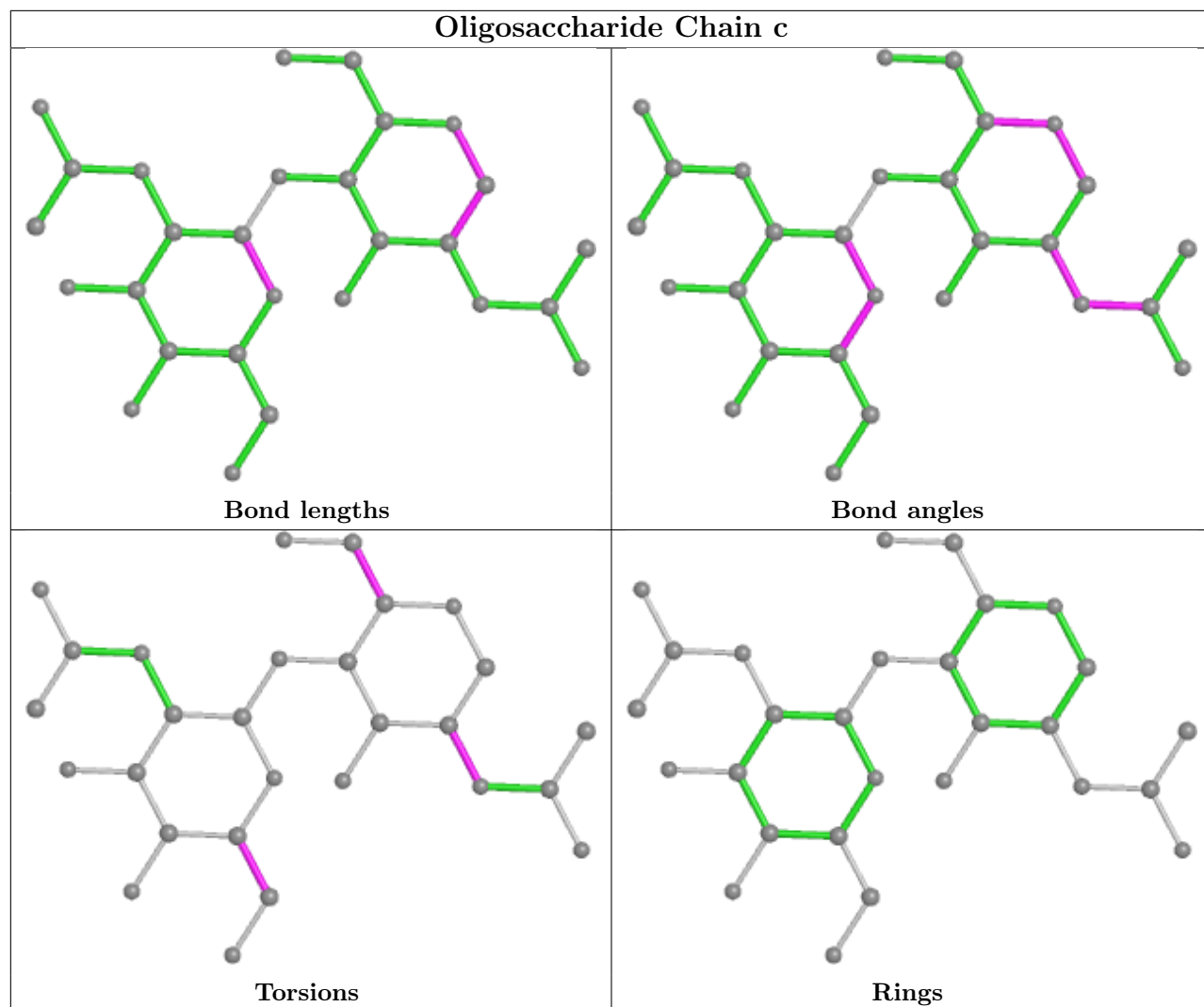


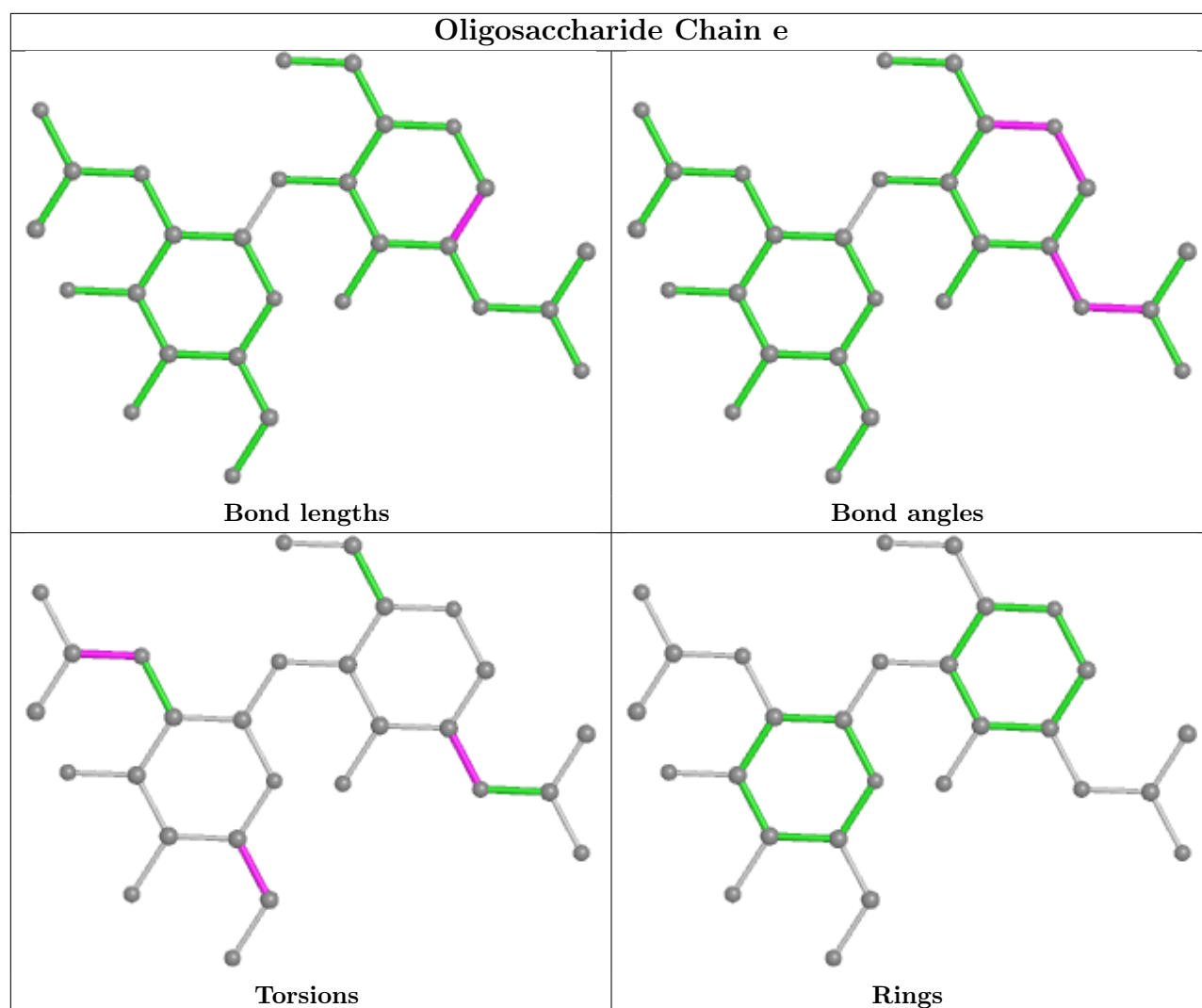


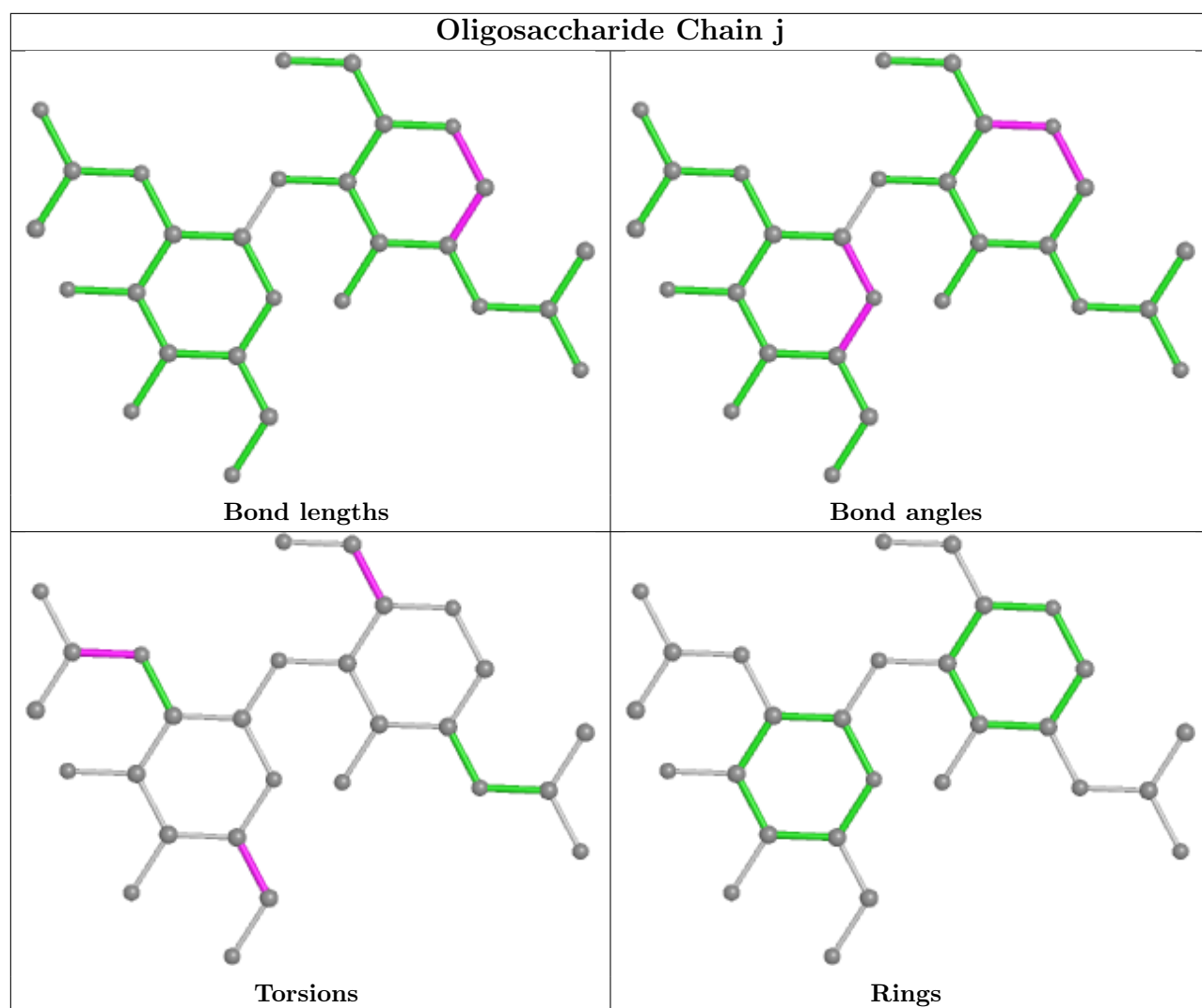


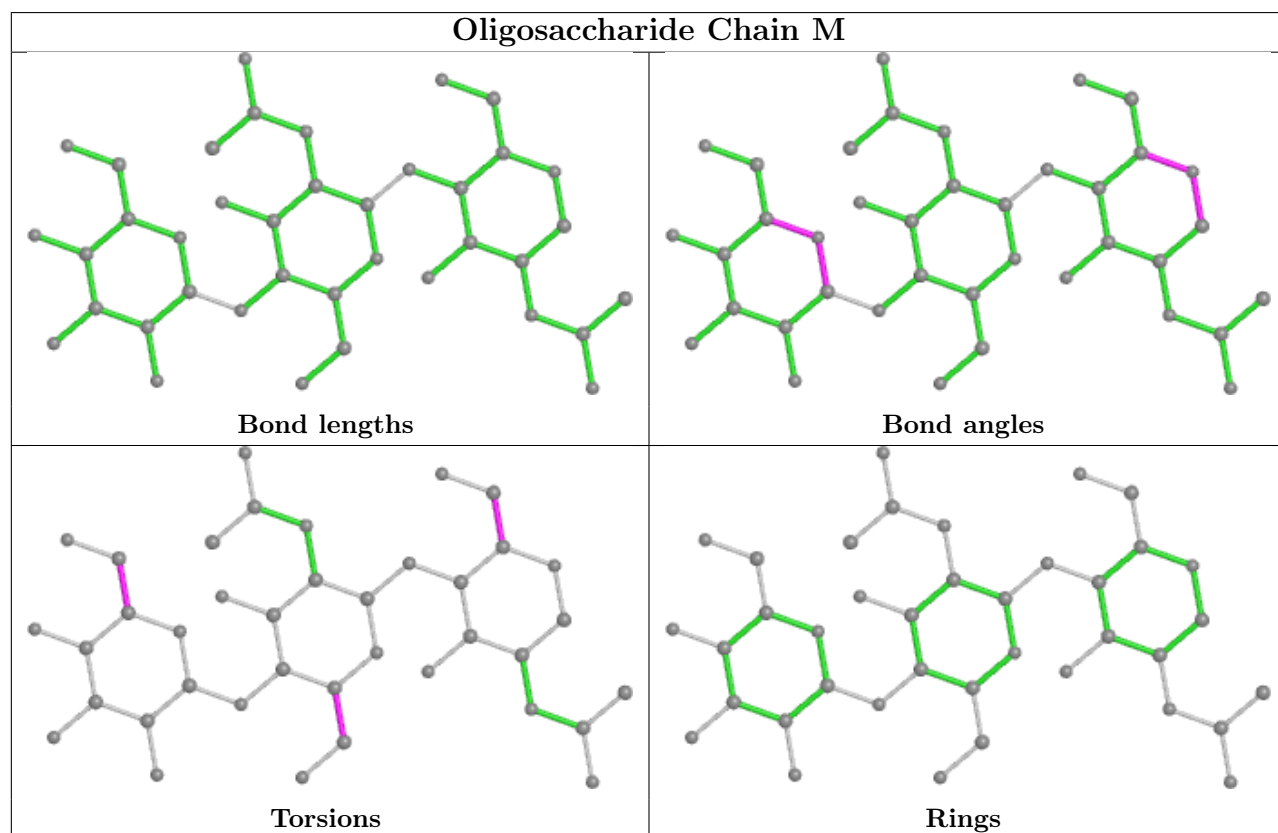
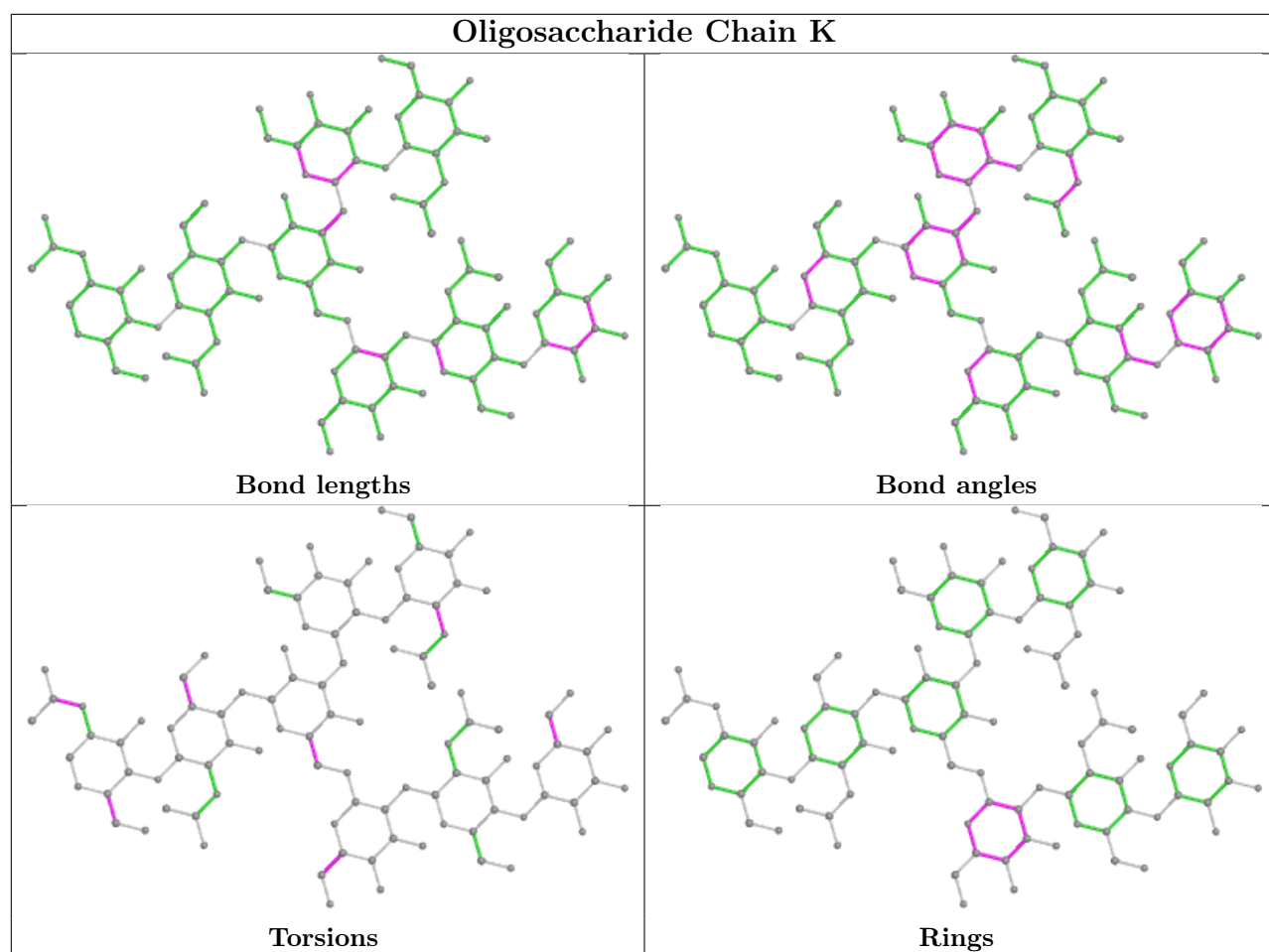


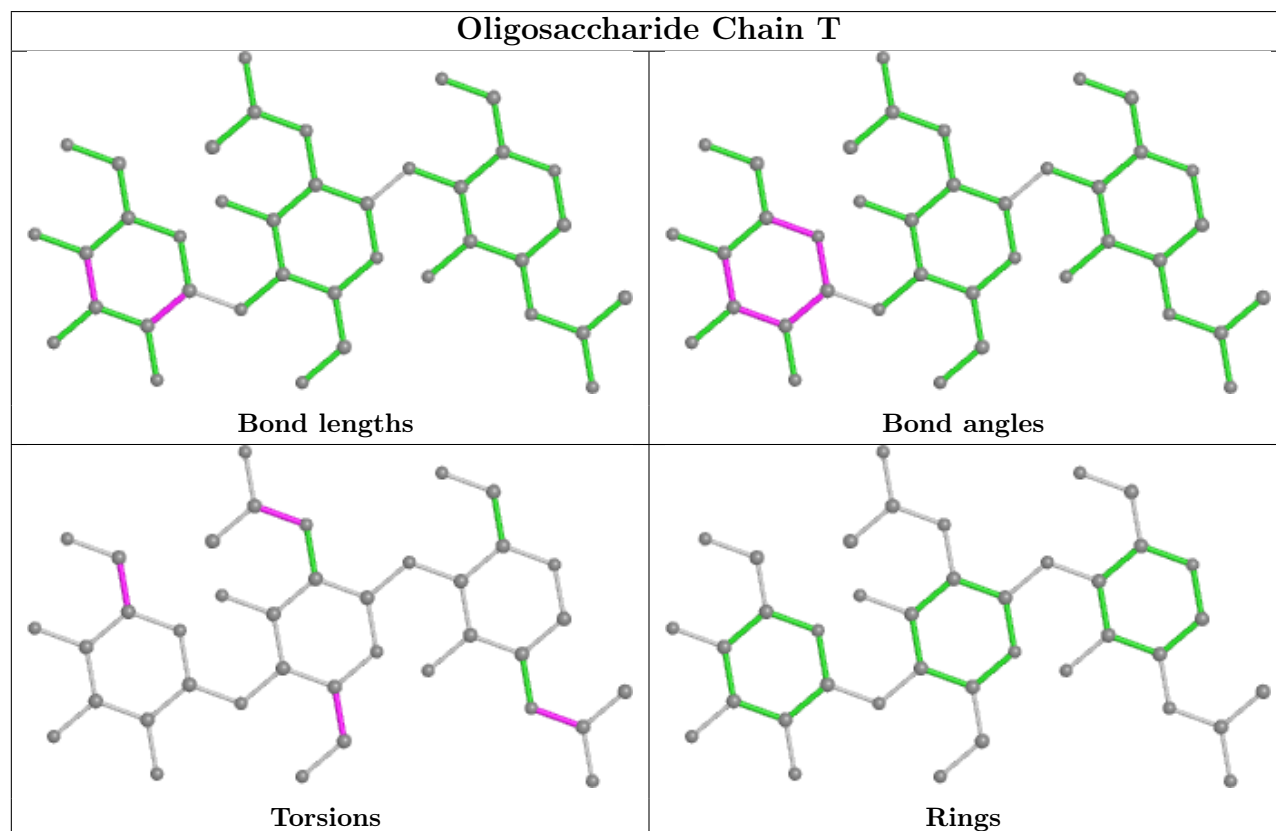
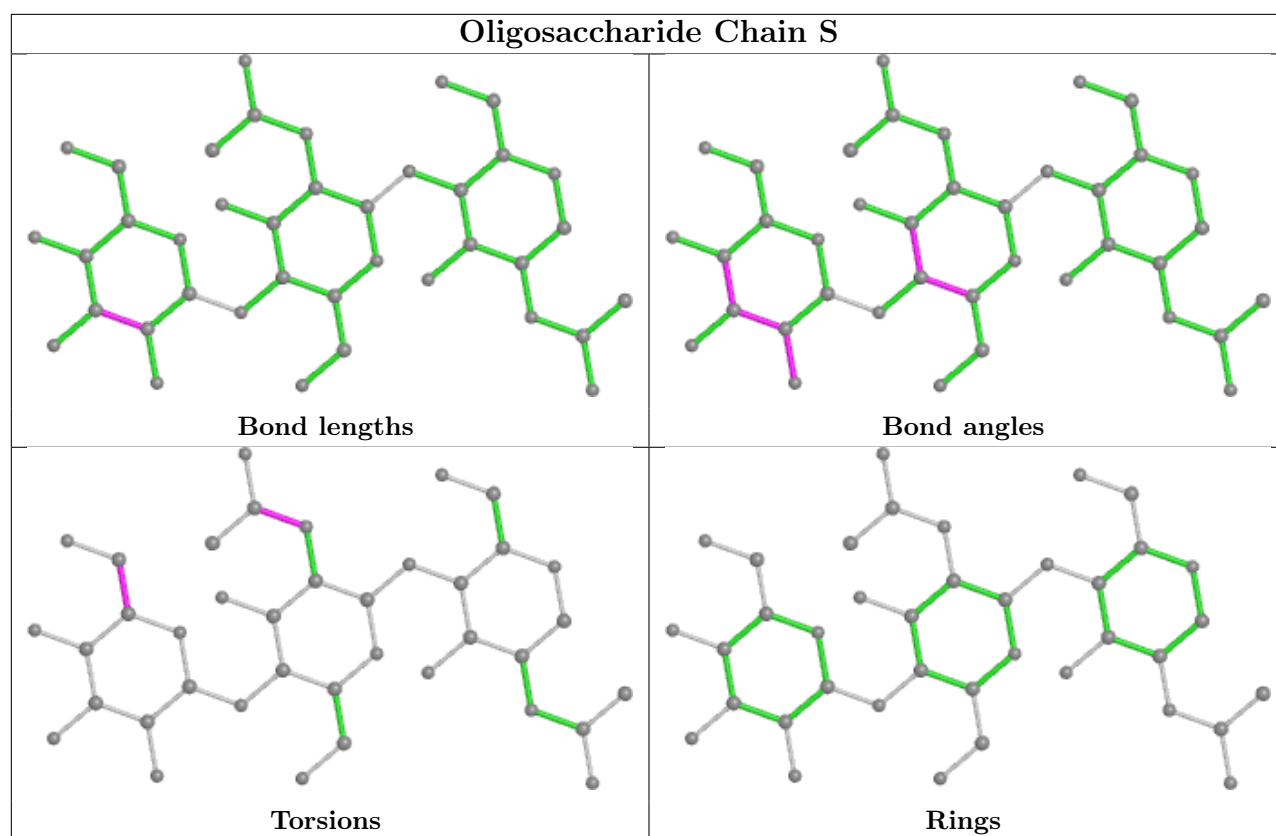


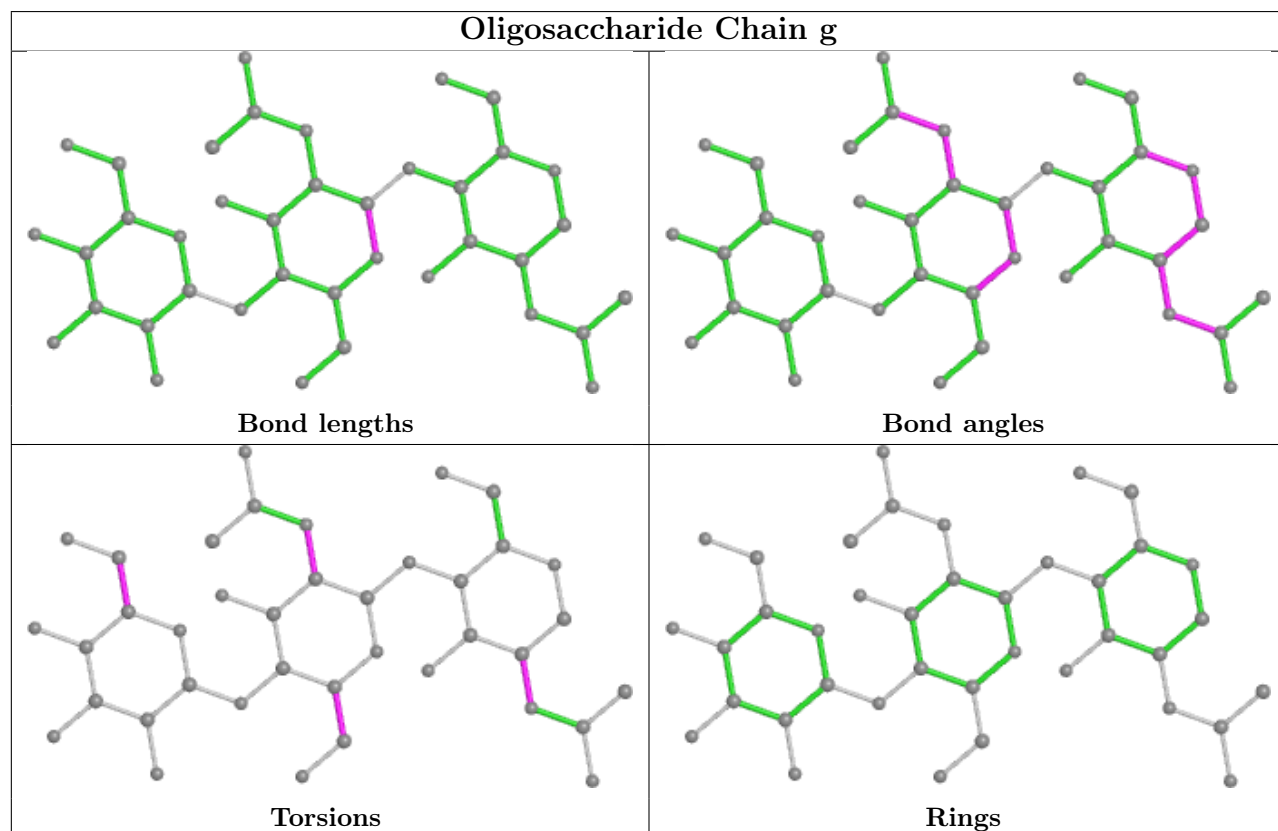
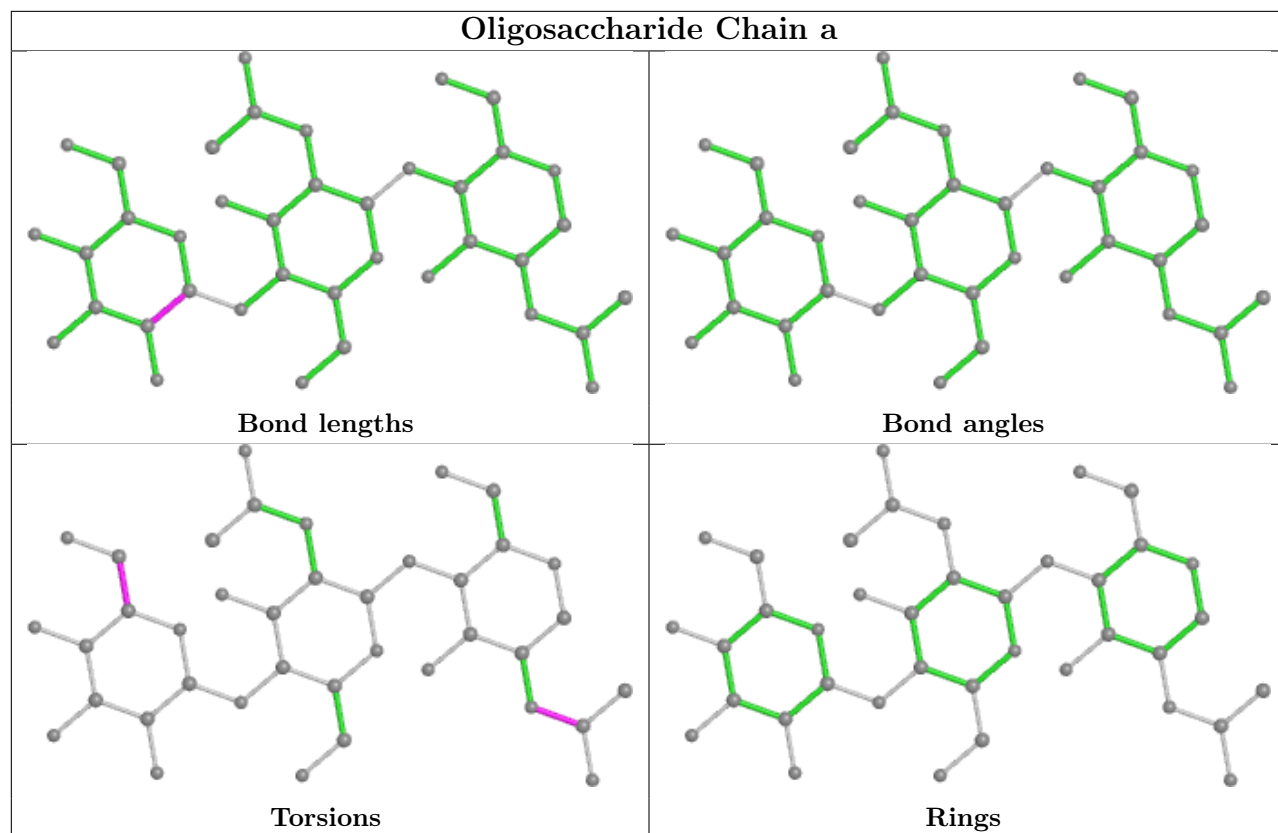


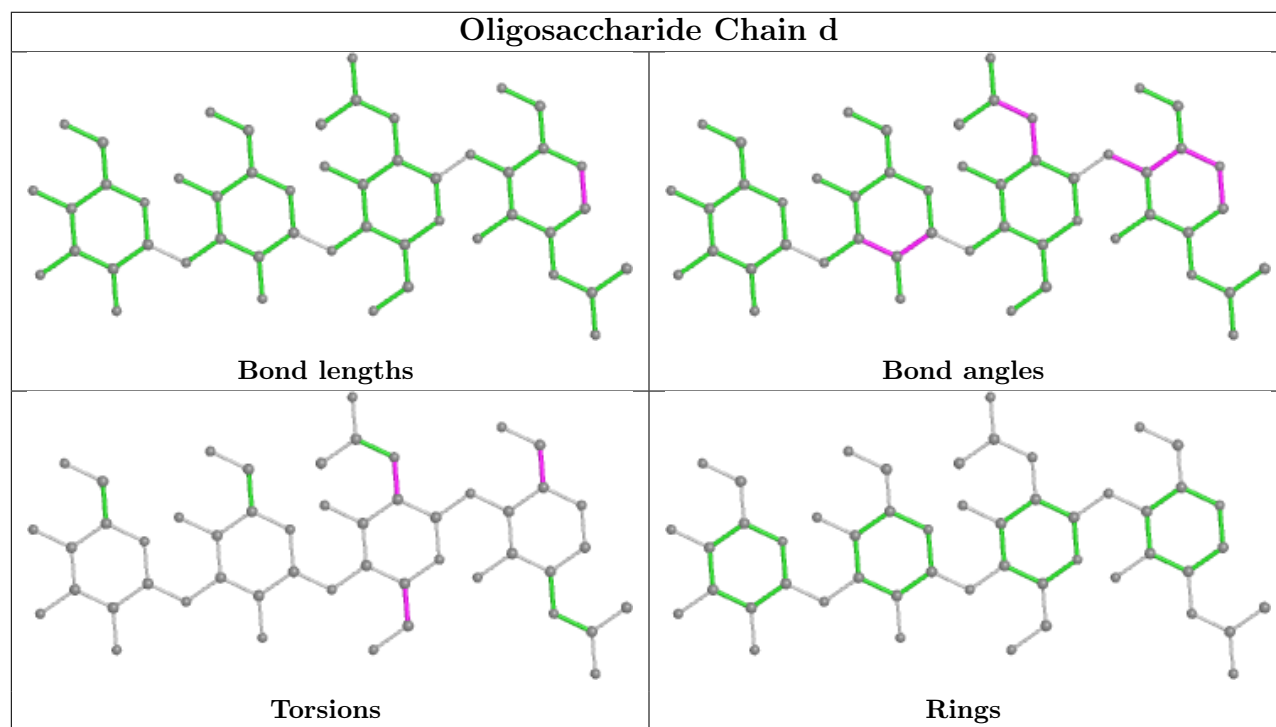
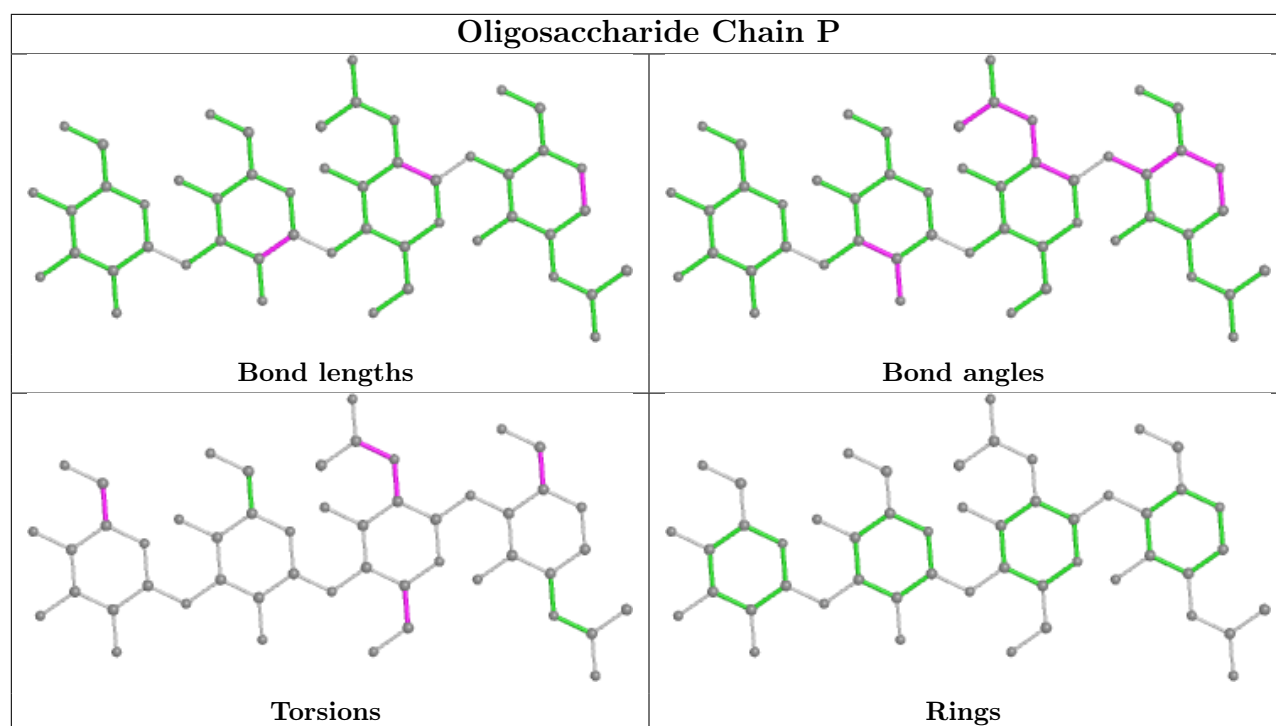


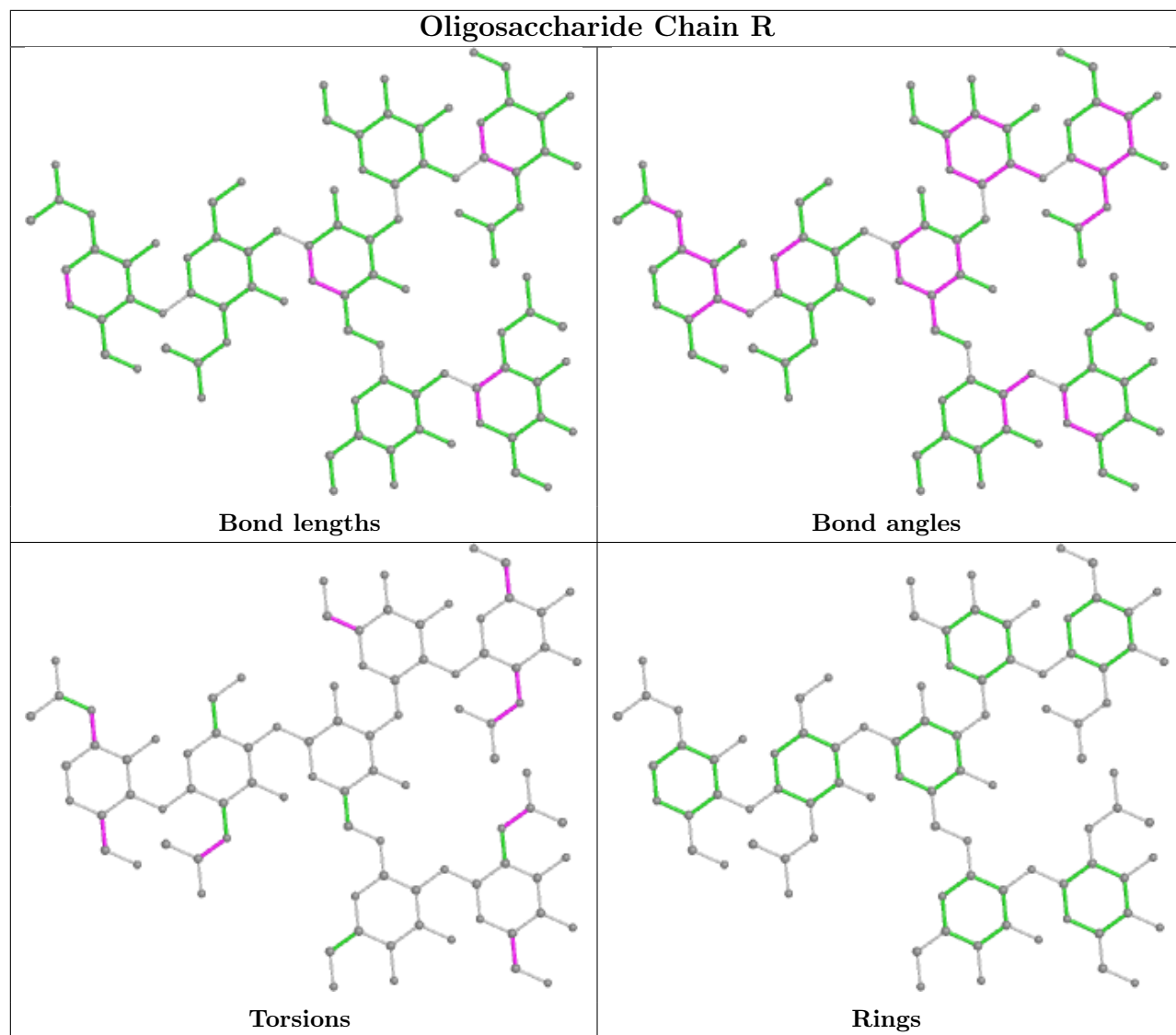


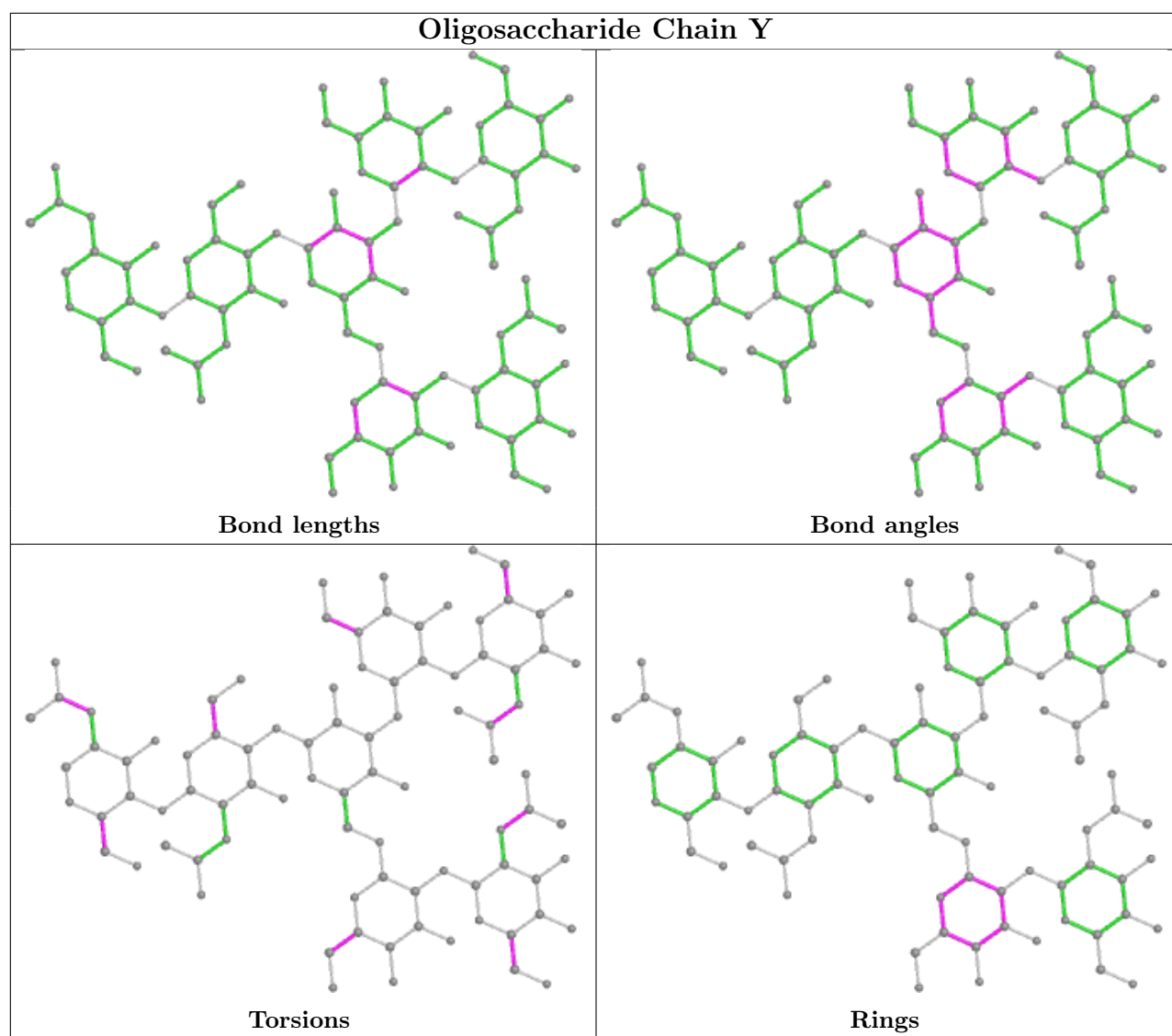


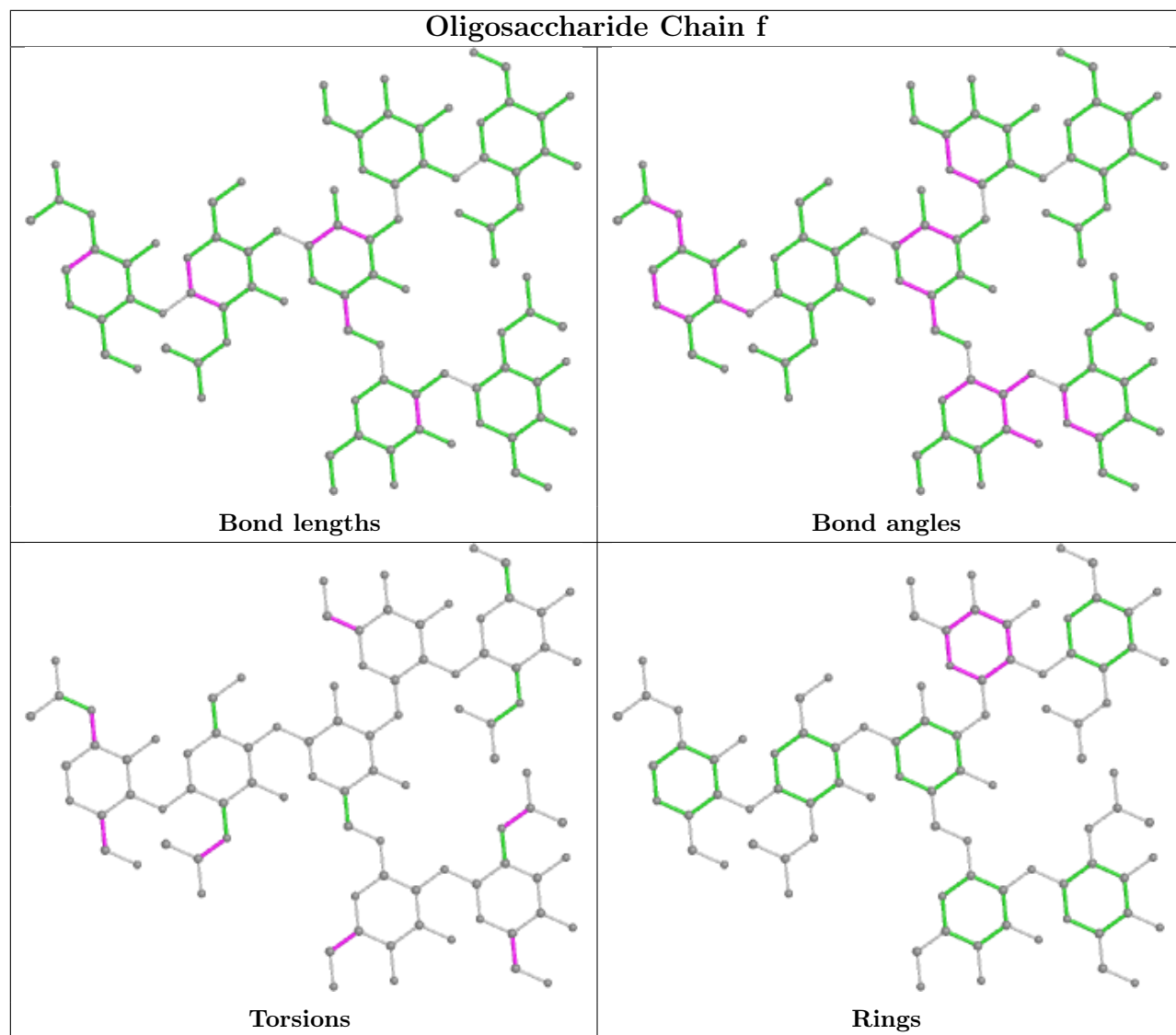


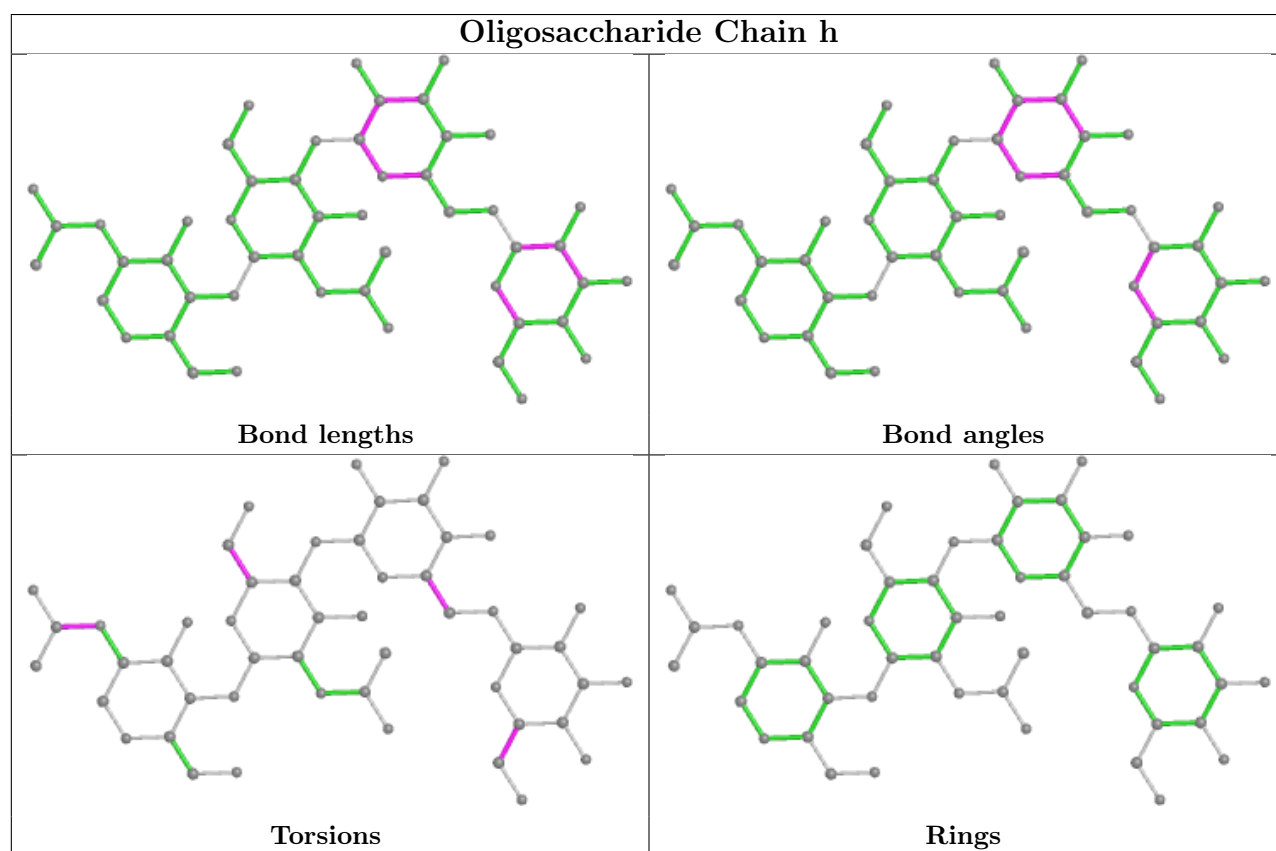
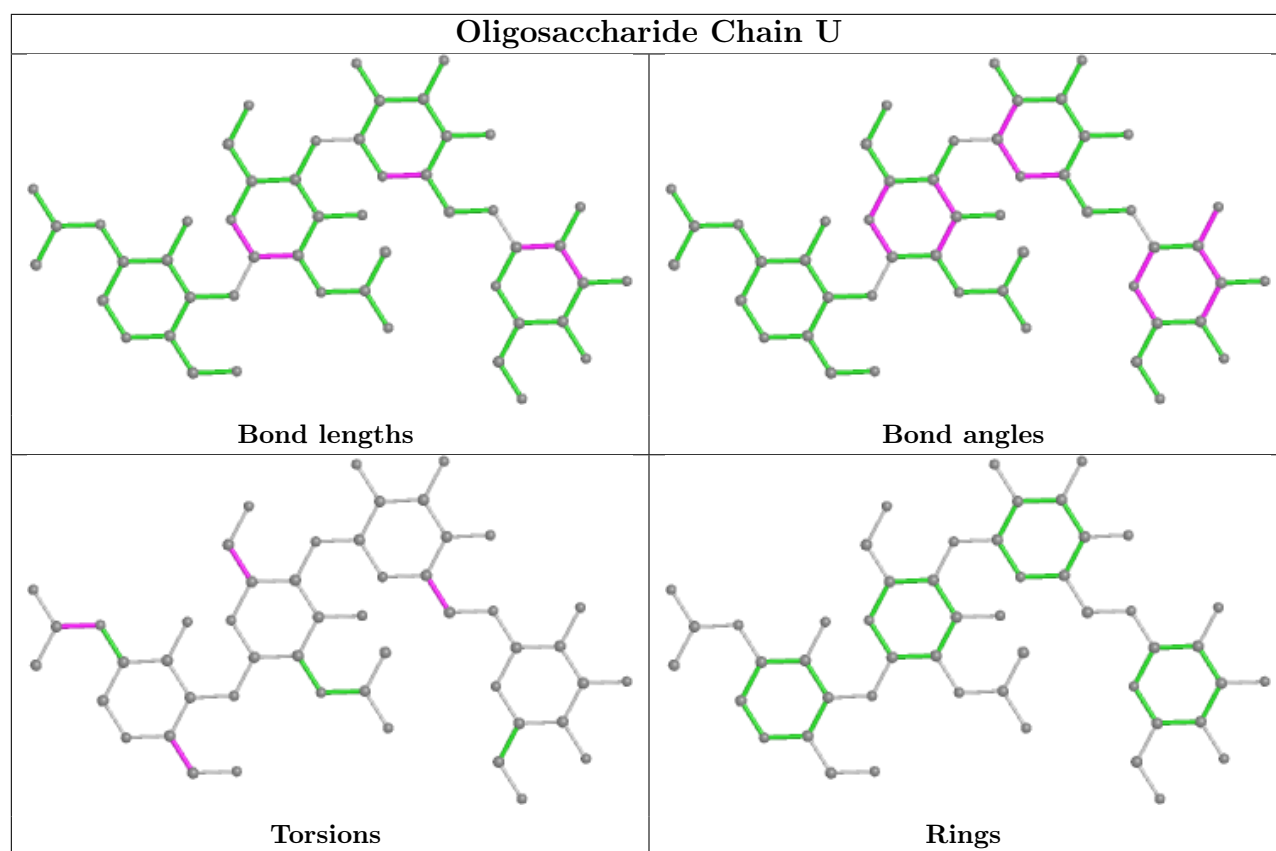


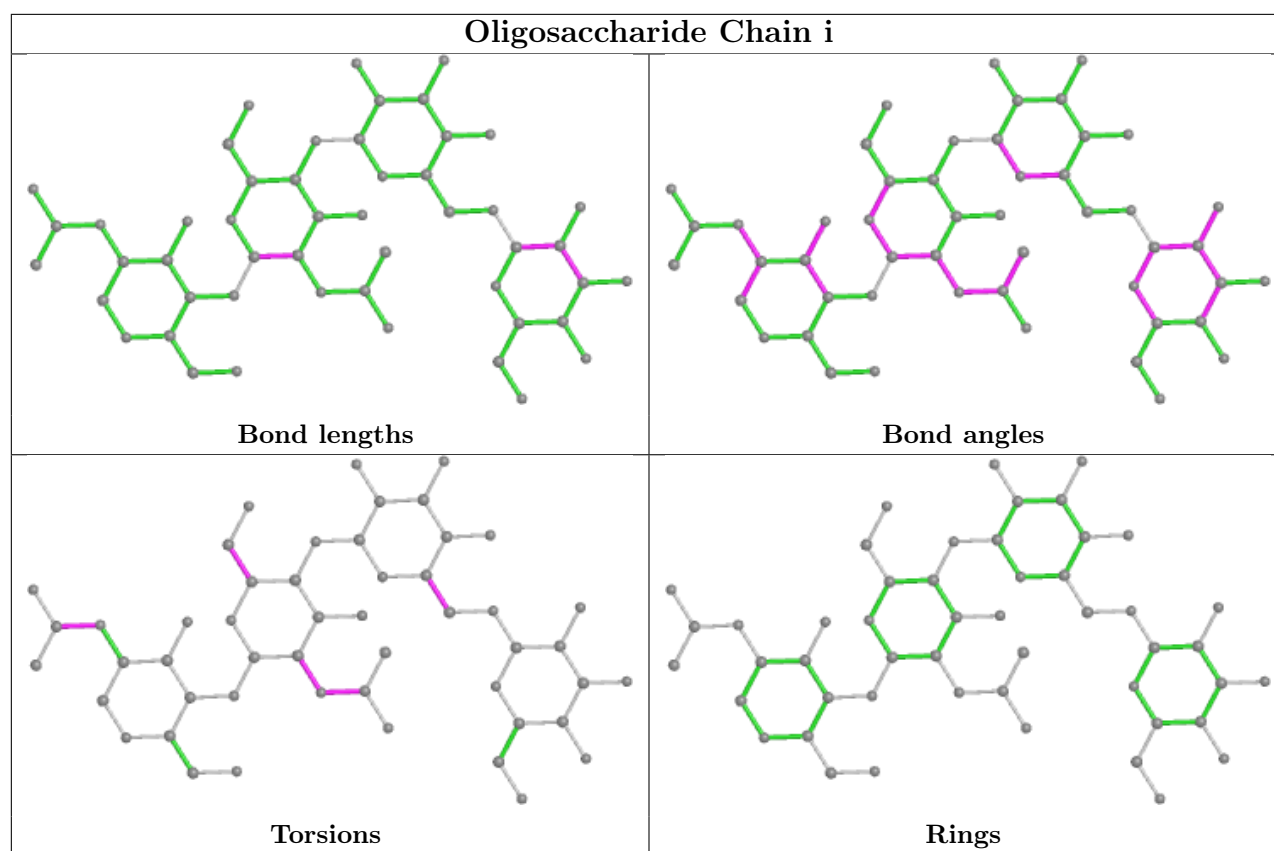












5.6 Ligand geometry [i](#)

Of 38 ligands modelled in this entry, 8 are monoatomic - leaving 30 for Mogul analysis.

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	CLR	A	1008	-	31,31,31	0.19	0	48,48,48	0.38	0
10	2J9	C	1002	-	17,18,18	7.23	8 (47%)	23,28,28	5.38	7 (30%)
13	CLR	A	1009	-	31,31,31	0.16	0	48,48,48	0.30	0
11	GLU	D	1003	-	8,9,9	1.08	1 (12%)	10,11,11	1.24	2 (20%)
10	2J9	D	1002	-	17,18,18	7.28	8 (47%)	23,28,28	5.81	6 (26%)
12	POV	B	1005	-	51,51,51	1.08	3 (5%)	57,59,59	0.94	3 (5%)
13	CLR	C	1009	-	31,31,31	0.18	0	48,48,48	0.32	0
12	POV	D	1001	-	51,51,51	1.07	3 (5%)	57,59,59	0.92	4 (7%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
12	POV	A	1010	-	51,51,51	1.08	3 (5%)	57,59,59	0.91	3 (5%)
12	POV	C	1001	-	51,51,51	1.07	3 (5%)	57,59,59	0.91	3 (5%)
13	CLR	C	1007	-	31,31,31	0.18	0	48,48,48	0.32	0
12	POV	A	1004	-	51,51,51	1.07	3 (5%)	57,59,59	0.86	3 (5%)
12	POV	B	1004	-	51,51,51	1.07	3 (5%)	57,59,59	0.92	3 (5%)
12	POV	C	1004	-	51,51,51	1.06	3 (5%)	57,59,59	0.90	3 (5%)
12	POV	A	1003	-	51,51,51	1.06	3 (5%)	57,59,59	0.91	3 (5%)
12	POV	C	1005	-	51,51,51	1.07	3 (5%)	57,59,59	0.91	3 (5%)
12	POV	D	1004	-	51,51,51	1.07	3 (5%)	57,59,59	0.94	3 (5%)
13	CLR	A	1006	-	31,31,31	0.15	0	48,48,48	0.34	0
13	CLR	C	1008	-	31,31,31	0.19	0	48,48,48	0.37	0
11	GLU	B	1003	-	8,9,9	1.09	1 (12%)	10,11,11	1.24	2 (20%)
11	GLU	C	1003	-	8,9,9	1.13	1 (12%)	10,11,11	1.19	2 (20%)
10	2J9	A	1001	-	17,18,18	7.24	8 (47%)	23,28,28	5.60	6 (26%)
11	GLU	A	1002	-	8,9,9	1.12	1 (12%)	10,11,11	1.20	2 (20%)
13	CLR	A	1007	-	31,31,31	0.18	0	48,48,48	0.32	0
10	2J9	B	1002	-	17,18,18	7.28	8 (47%)	23,28,28	5.65	7 (30%)
12	POV	D	1005	-	51,51,51	1.08	3 (5%)	57,59,59	0.93	3 (5%)
13	CLR	B	1006	-	31,31,31	0.15	0	48,48,48	0.34	0
12	POV	A	1005	-	51,51,51	1.08	2 (3%)	57,59,59	0.96	3 (5%)
12	POV	B	1001	-	51,51,51	1.07	3 (5%)	57,59,59	0.93	4 (7%)
12	POV	C	1006	-	51,51,51	1.08	2 (3%)	57,59,59	0.95	3 (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	CLR	A	1008	-	-	2/10/68/68	0/4/4/4
10	2J9	C	1002	-	-	1/4/22/22	0/3/3/3
13	CLR	A	1009	-	-	6/10/68/68	0/4/4/4
11	GLU	D	1003	-	-	3/9/9/9	-
10	2J9	D	1002	-	-	1/4/22/22	0/3/3/3
12	POV	B	1005	-	-	26/55/55/55	-
13	CLR	C	1009	-	-	6/10/68/68	0/4/4/4
12	POV	D	1001	-	-	29/55/55/55	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
12	POV	A	1010	-	-	28/55/55/55	-
12	POV	C	1001	-	-	26/55/55/55	-
13	CLR	C	1007	-	-	7/10/68/68	0/4/4/4
12	POV	A	1004	-	-	28/55/55/55	-
12	POV	B	1004	-	-	31/55/55/55	-
12	POV	C	1004	-	-	34/55/55/55	-
12	POV	A	1003	-	-	32/55/55/55	-
12	POV	C	1005	-	-	22/55/55/55	-
12	POV	D	1004	-	-	29/55/55/55	-
13	CLR	A	1006	-	-	7/10/68/68	0/4/4/4
13	CLR	C	1008	-	-	2/10/68/68	0/4/4/4
11	GLU	B	1003	-	-	3/9/9/9	-
11	GLU	C	1003	-	-	1/9/9/9	-
10	2J9	A	1001	-	-	1/4/22/22	0/3/3/3
11	GLU	A	1002	-	-	1/9/9/9	-
13	CLR	A	1007	-	-	7/10/68/68	0/4/4/4
10	2J9	B	1002	-	-	2/4/22/22	0/3/3/3
12	POV	D	1005	-	-	30/55/55/55	-
13	CLR	B	1006	-	-	7/10/68/68	0/4/4/4
12	POV	A	1005	-	-	30/55/55/55	-
12	POV	B	1001	-	-	28/55/55/55	-
12	POV	C	1006	-	-	31/55/55/55	-

The worst 5 of 76 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	B	1002	2J9	OAA-SAP	19.96	1.66	1.43
10	D	1002	2J9	OAA-SAP	19.86	1.66	1.43
10	A	1001	2J9	OAA-SAP	19.71	1.65	1.43
10	C	1002	2J9	OAA-SAP	19.68	1.65	1.43
10	C	1002	2J9	OAB-SAP	19.50	1.65	1.43

The worst 5 of 78 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	D	1002	2J9	CAI-NAO-CAL	23.84	120.92	110.25
10	B	1002	2J9	CAI-NAO-CAL	23.03	120.56	110.25
10	A	1001	2J9	CAI-NAO-CAL	22.19	120.18	110.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	C	1002	2J9	CAI-NAO-CAL	20.81	119.57	110.25
10	C	1002	2J9	CAM-SAP-NAJ	11.26	111.28	102.37

There are no chirality outliers.

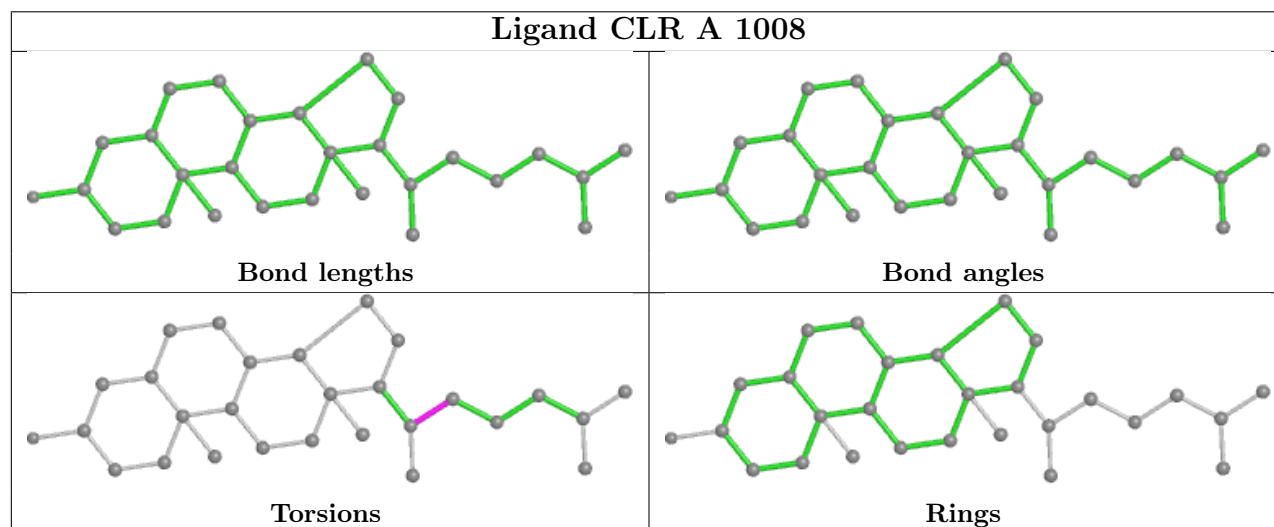
5 of 461 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	B	1002	2J9	CAG-CAN-NAO-CAI
10	B	1002	2J9	CAH-CAN-NAO-CAL
10	C	1002	2J9	CAG-CAN-NAO-CAL
12	A	1003	POV	C1-O11-P-O13
12	A	1003	POV	C1-O11-P-O14

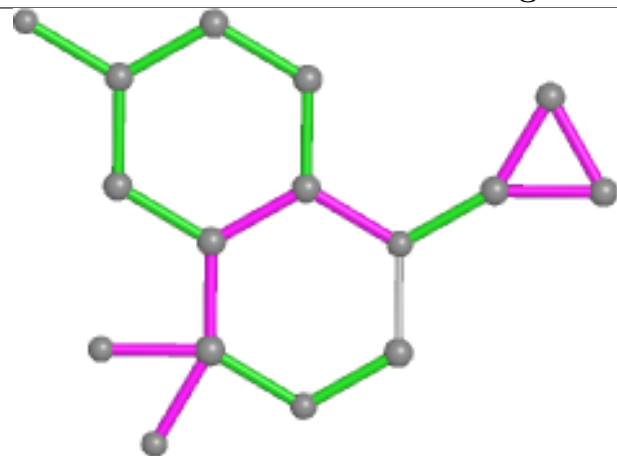
There are no ring outliers.

No monomer is involved in short contacts.

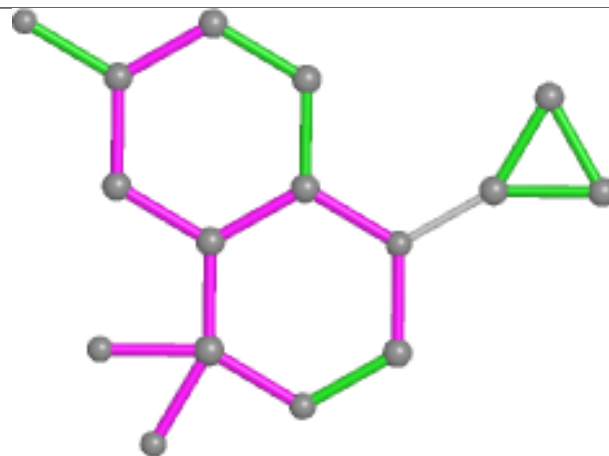
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



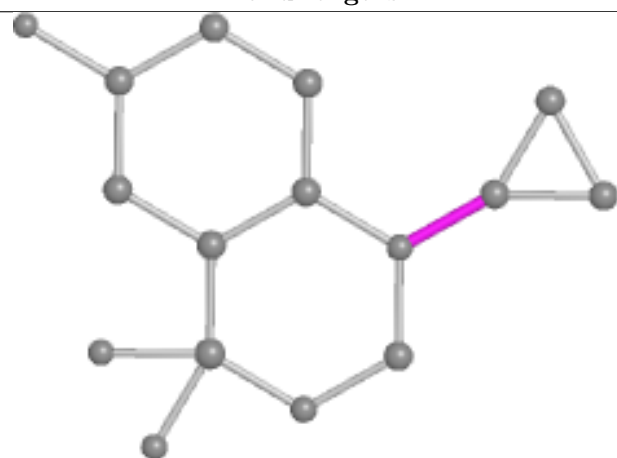
Ligand 2J9 C 1002



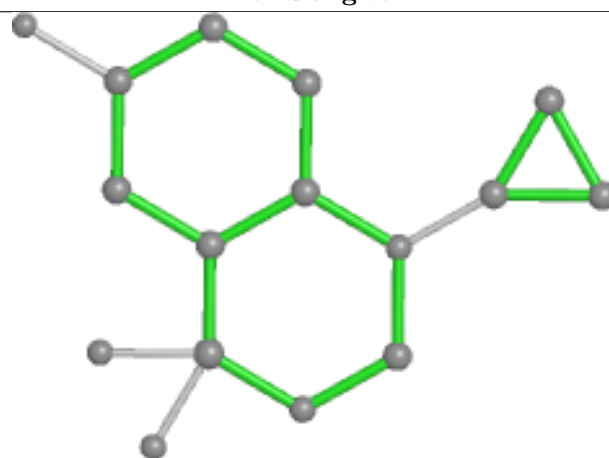
Bond lengths



Bond angles

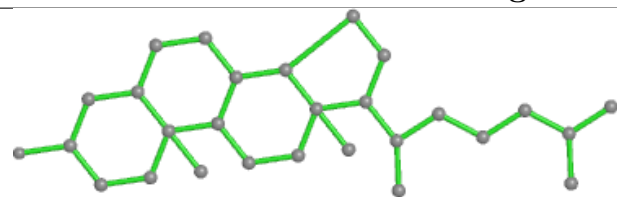


Torsions

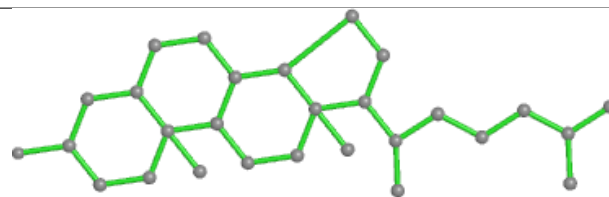


Rings

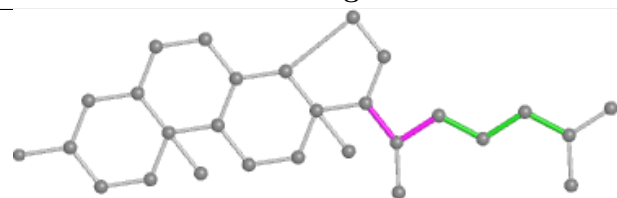
Ligand CLR A 1009



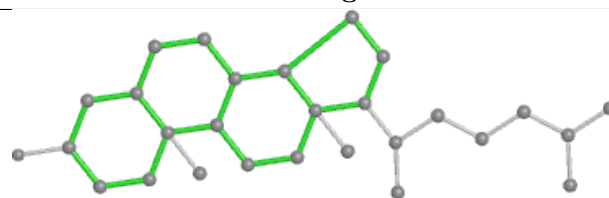
Bond lengths



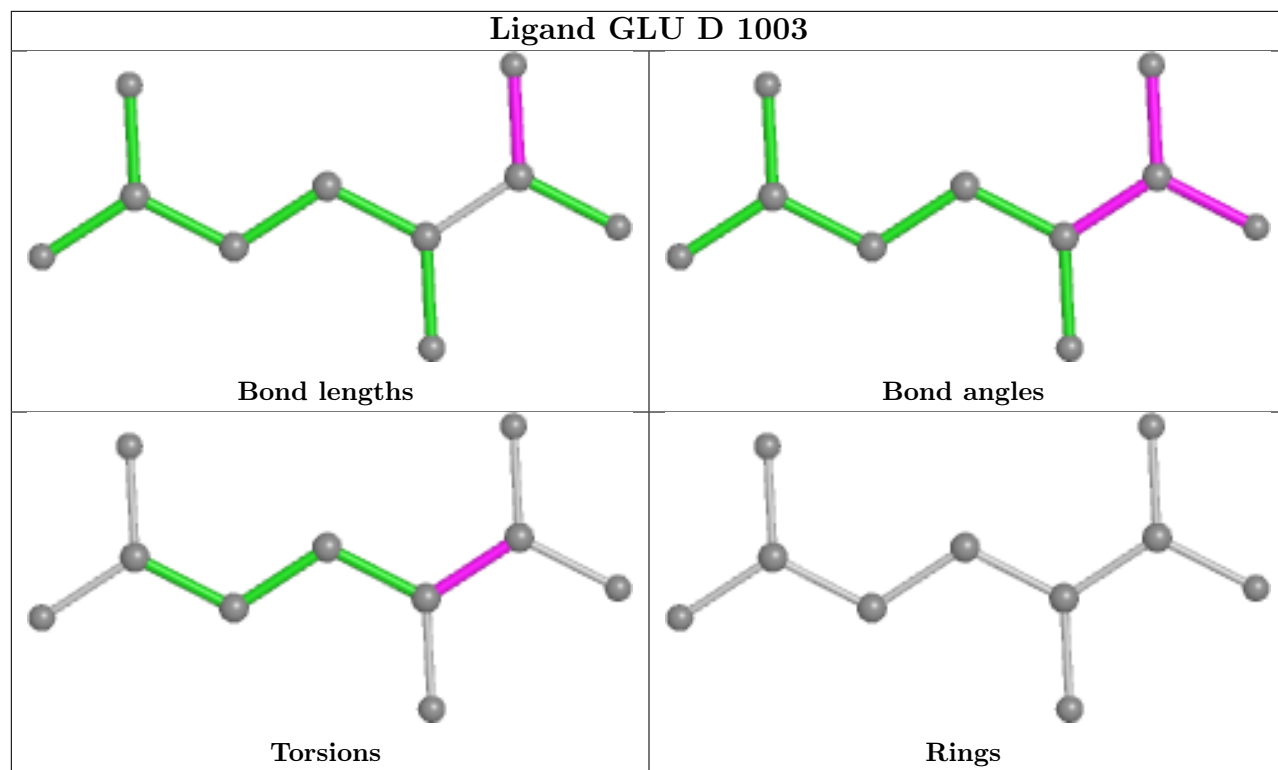
Bond angles

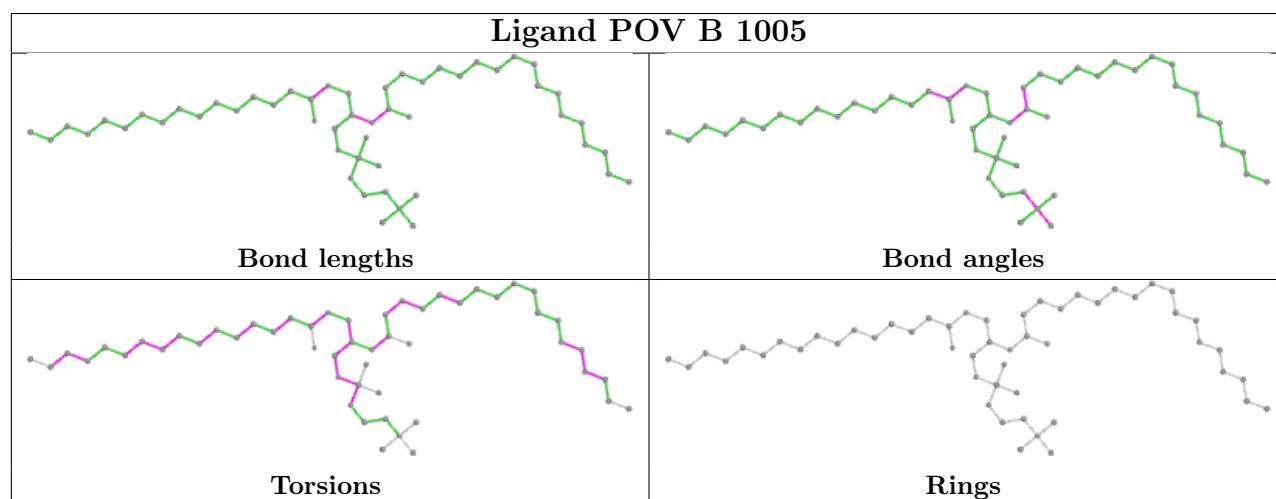
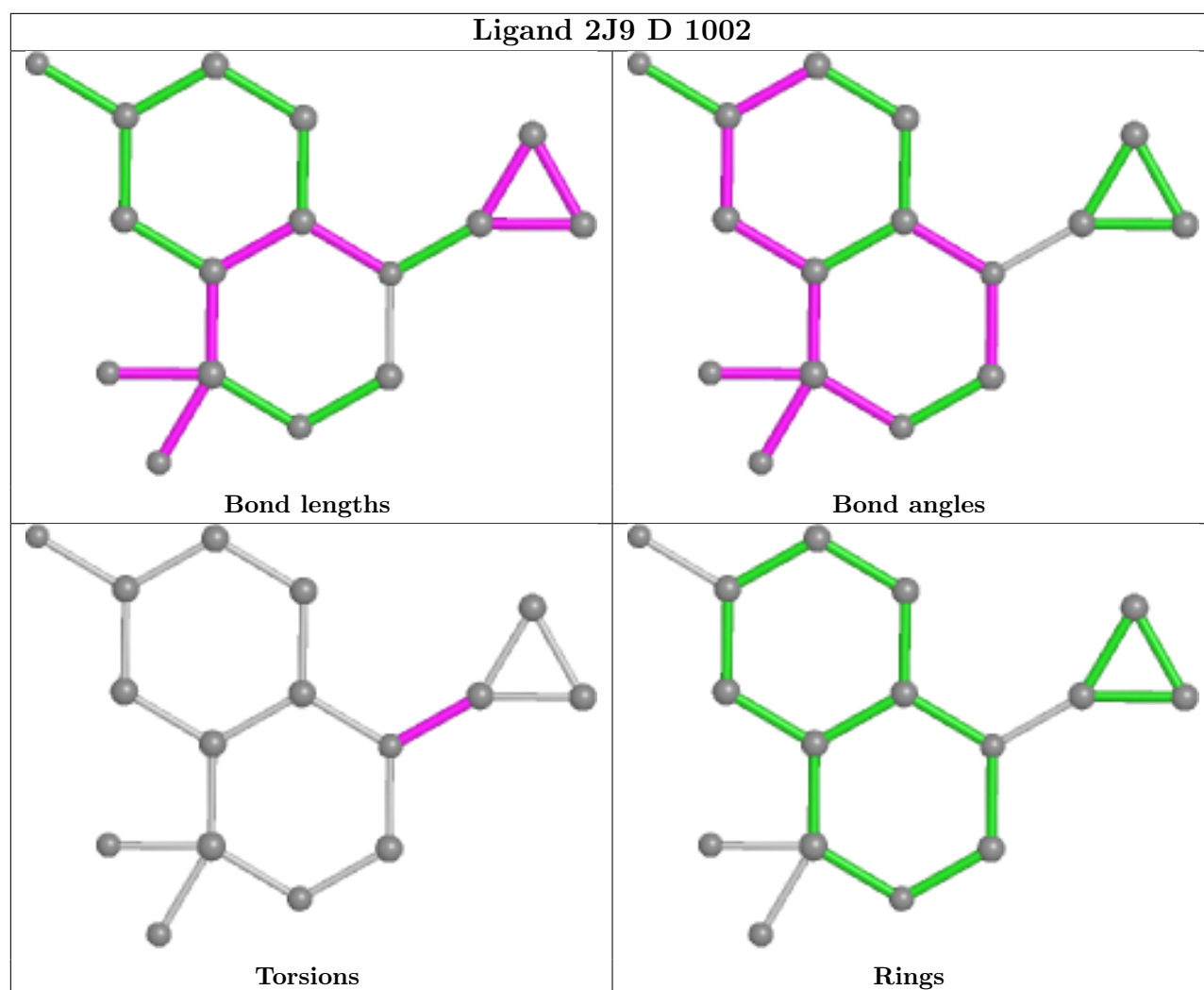


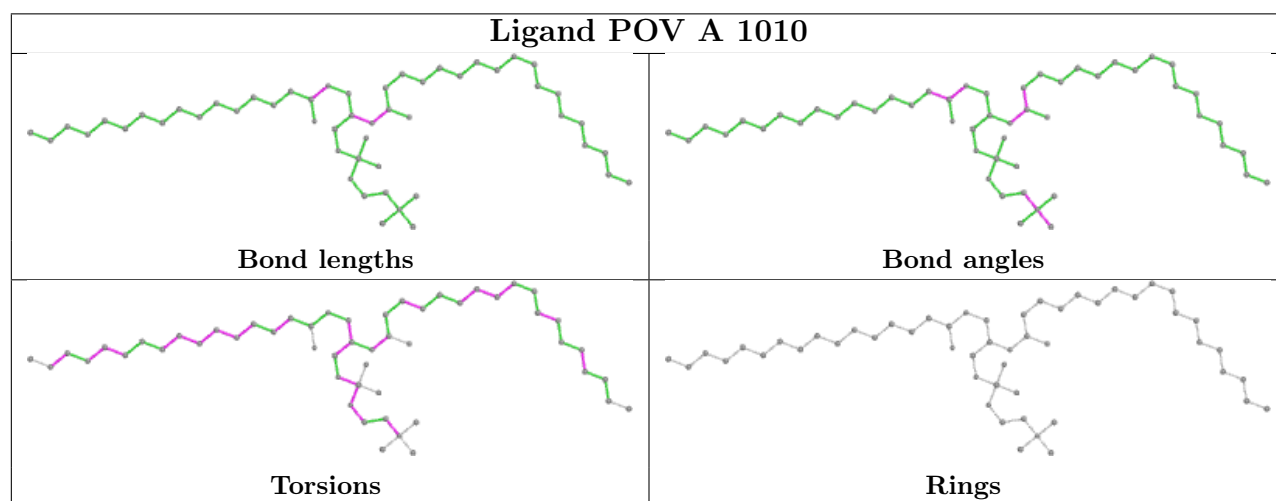
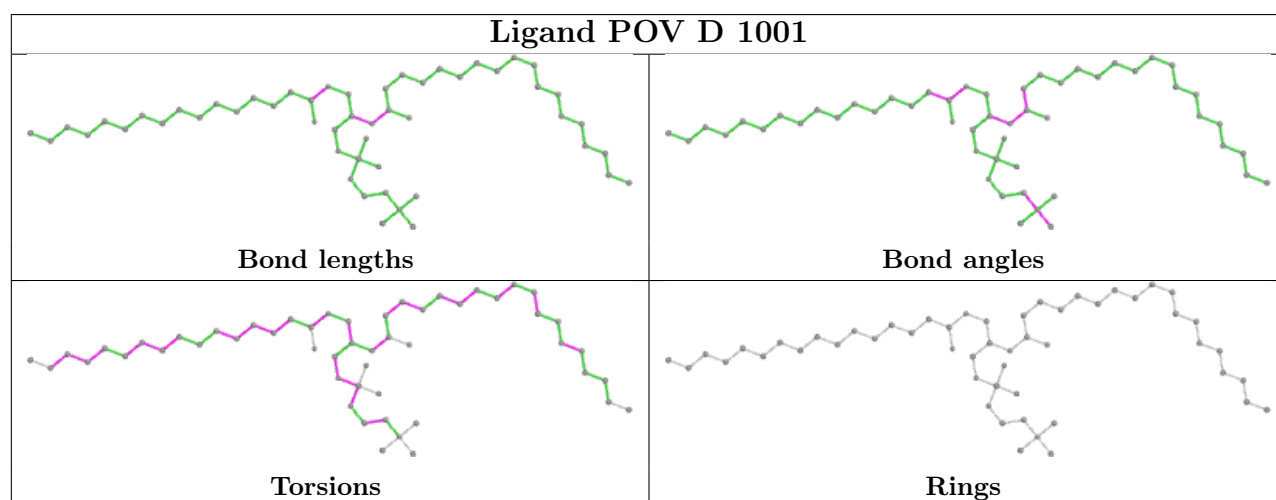
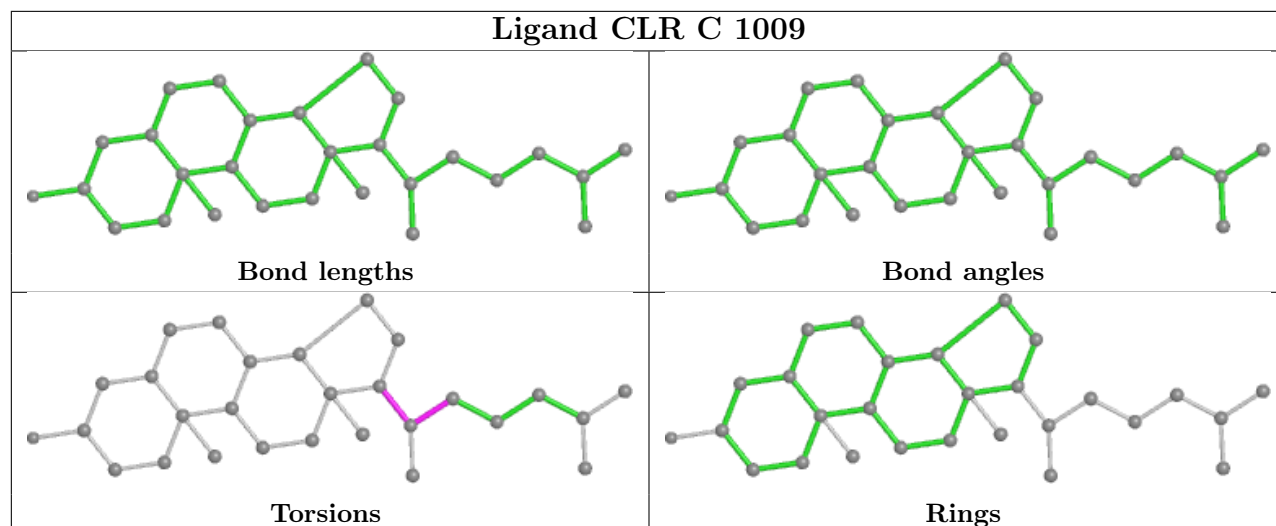
Torsions

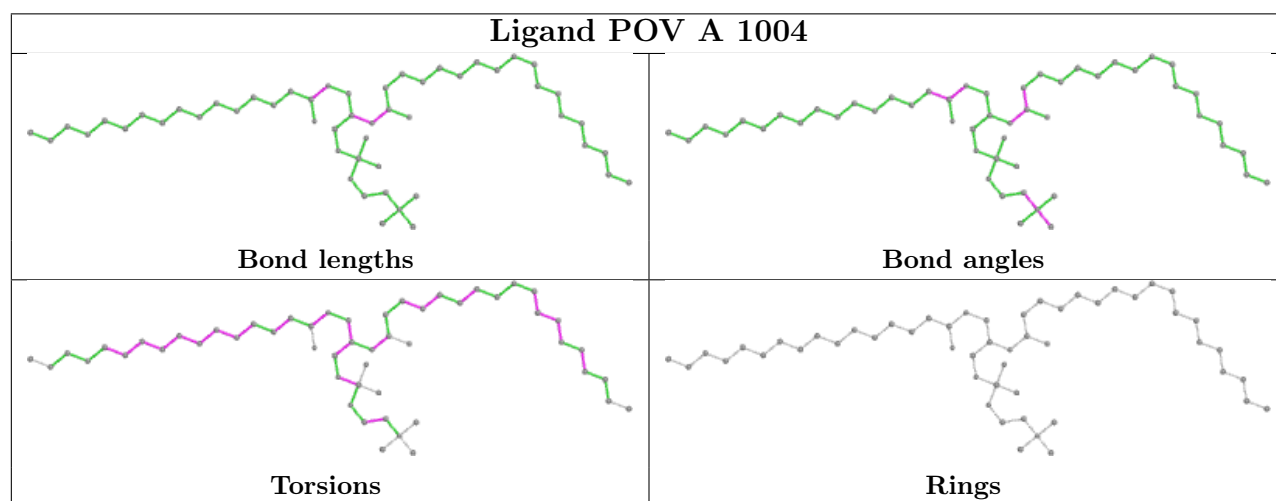
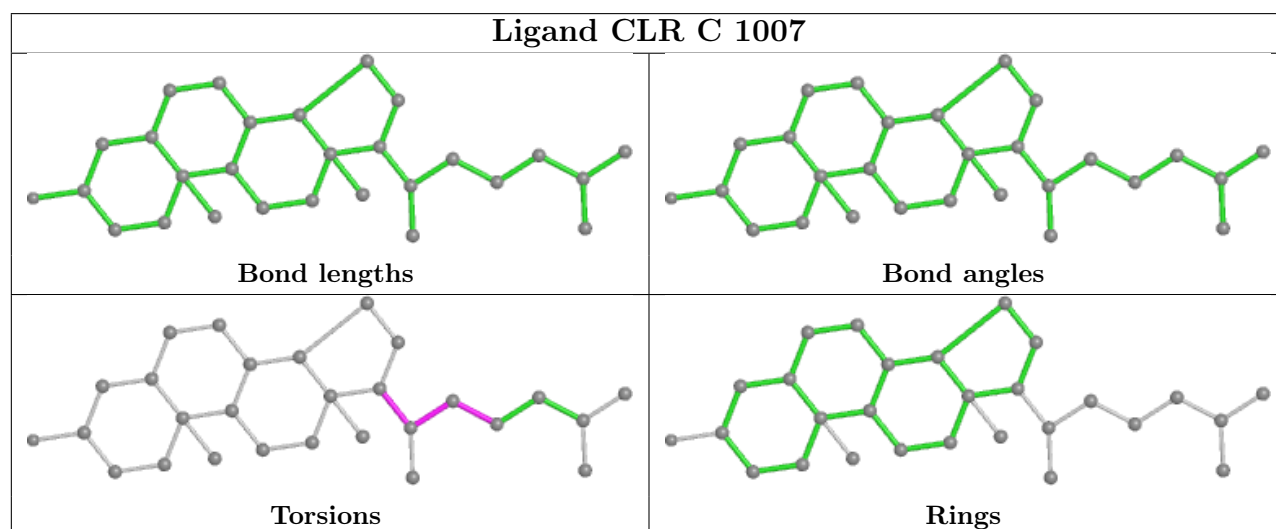
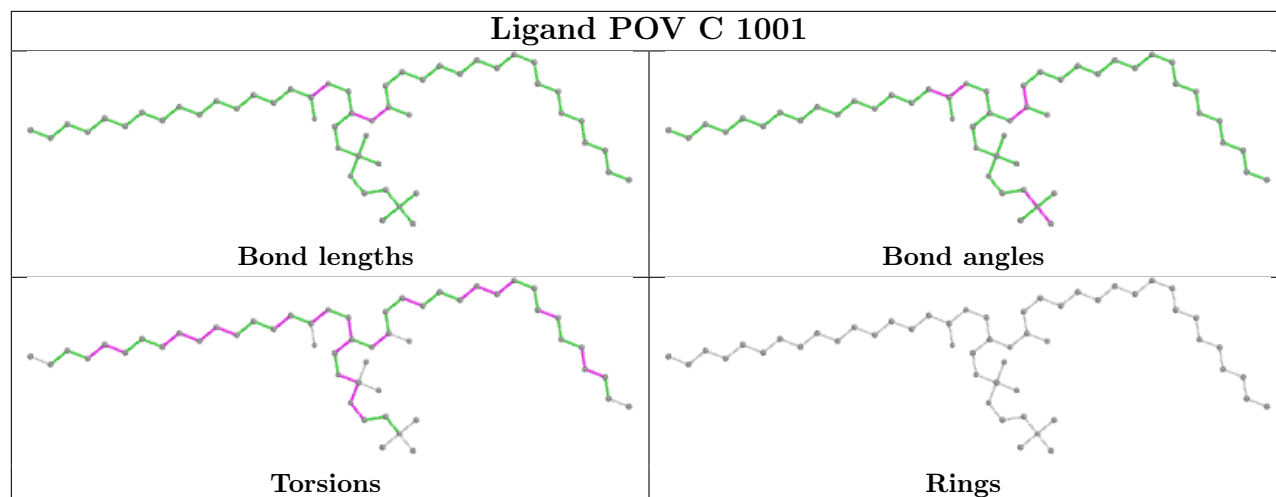


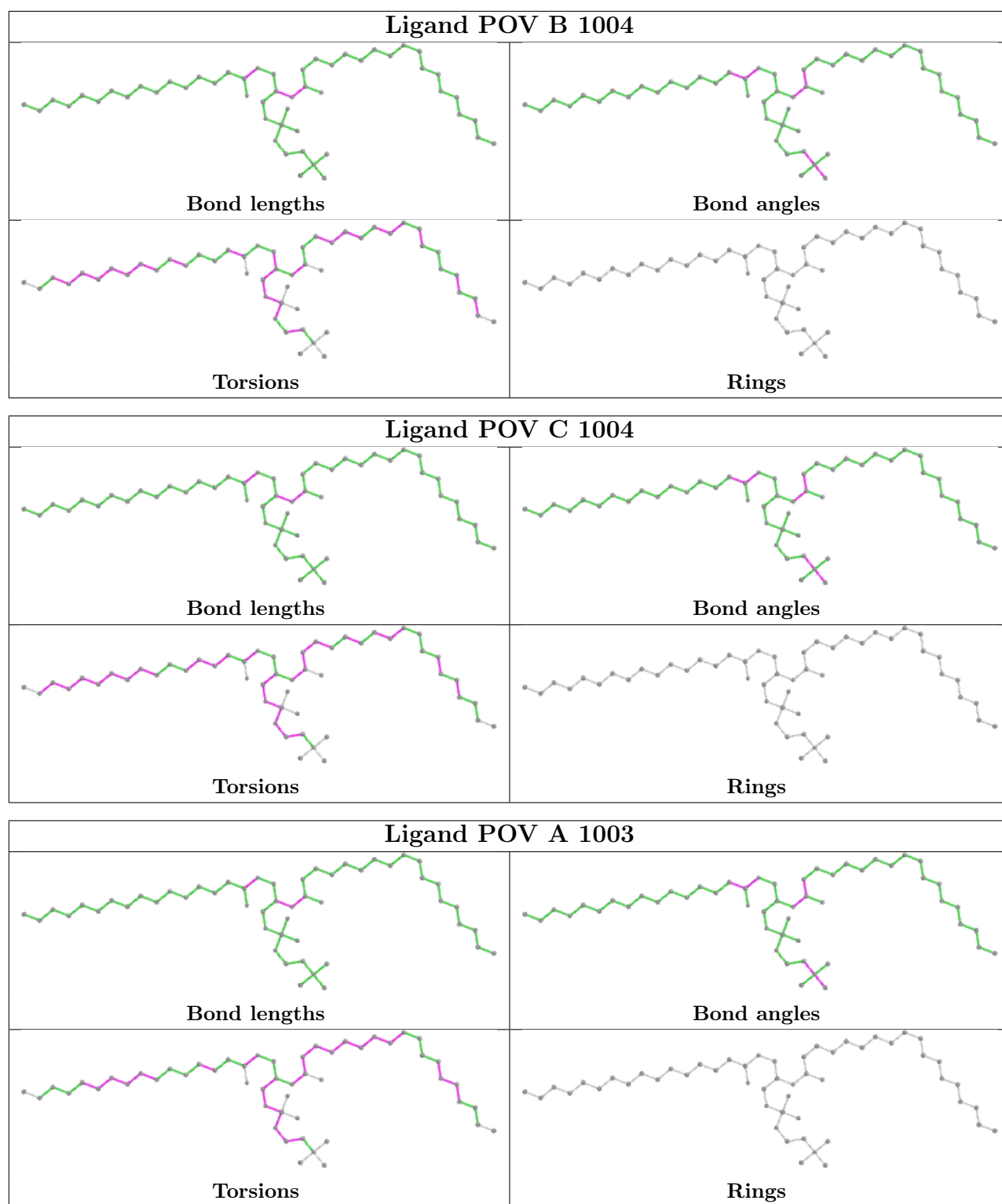
Rings

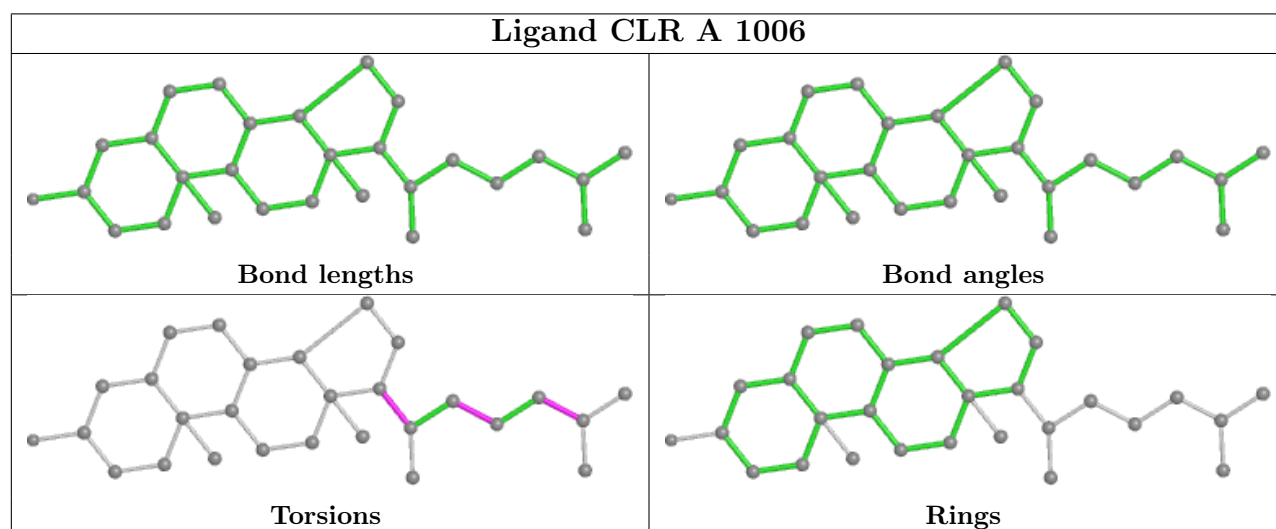
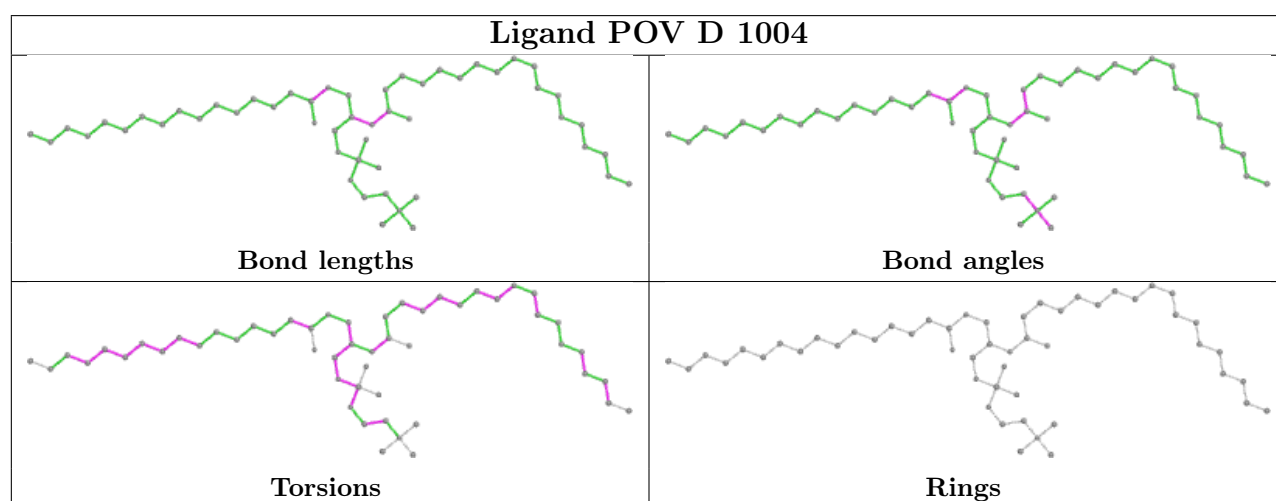
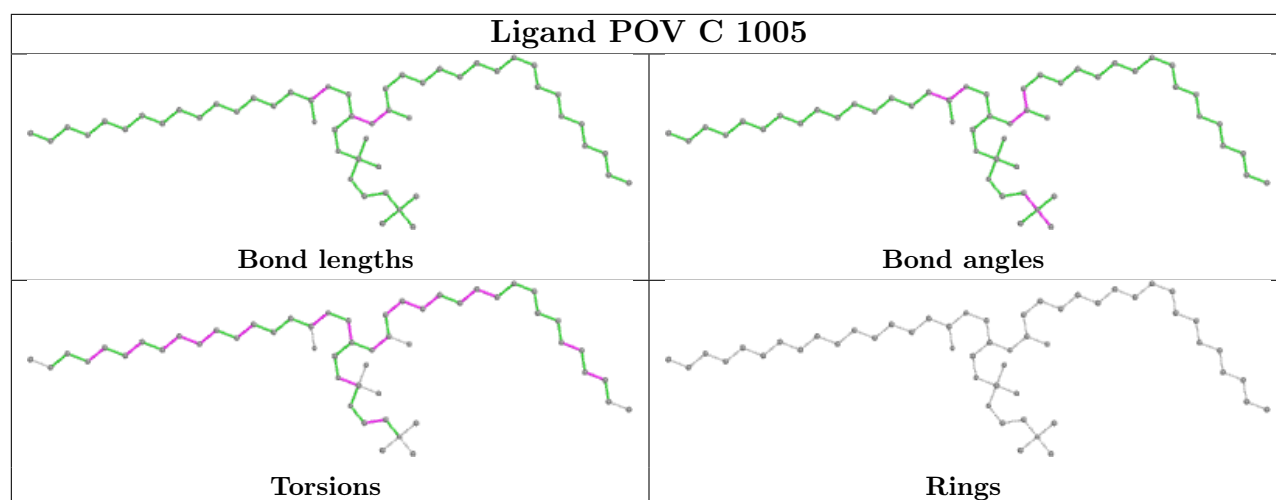


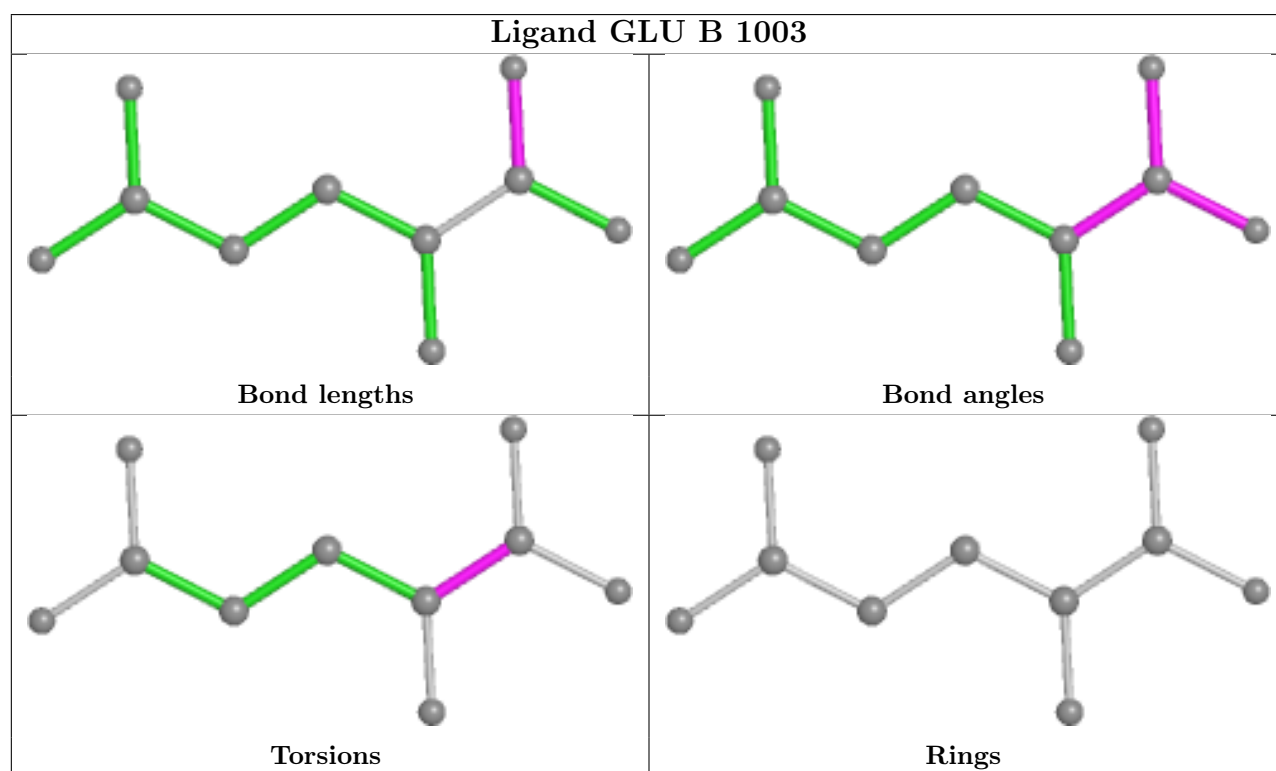
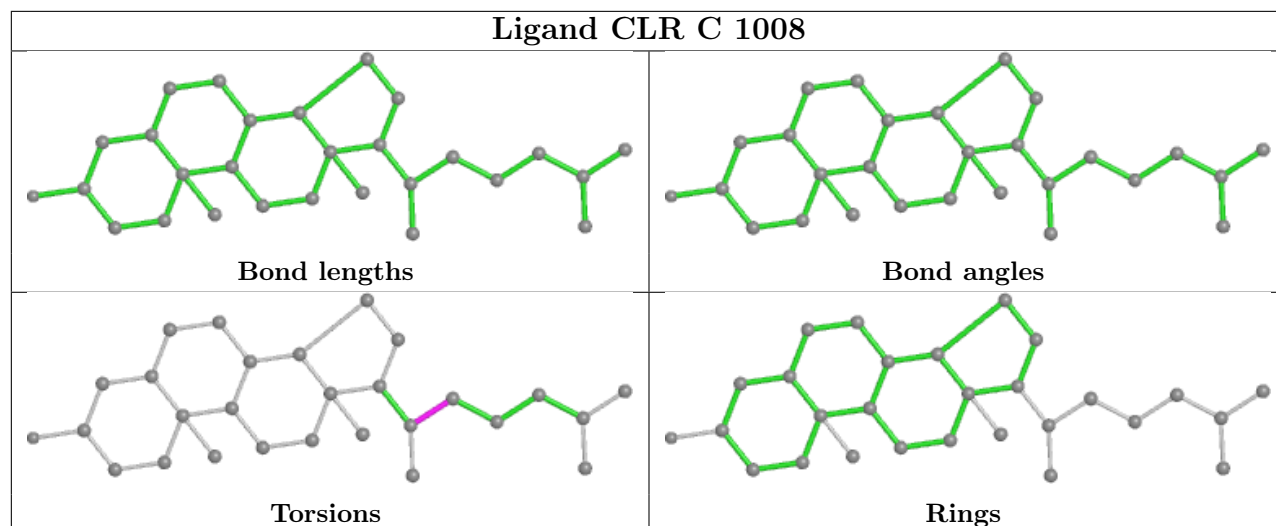


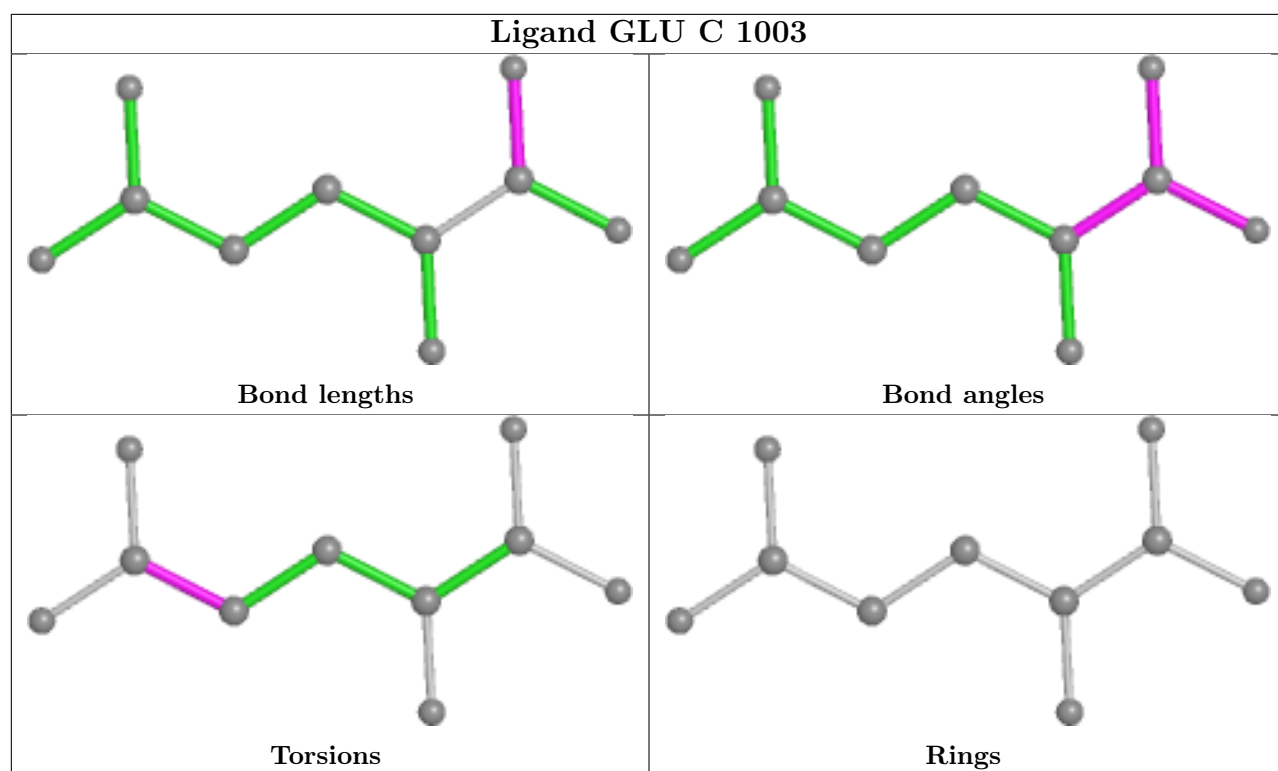




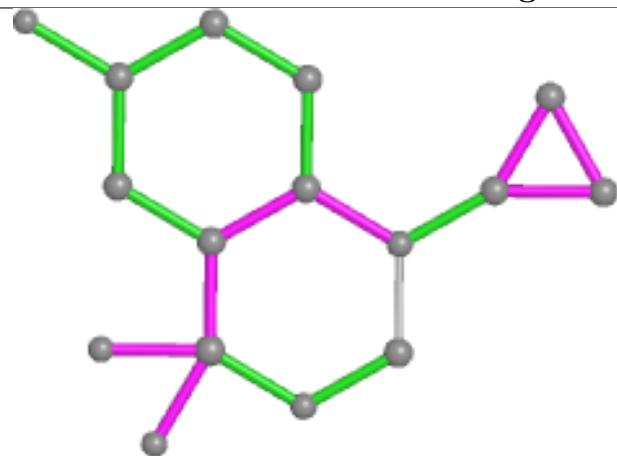




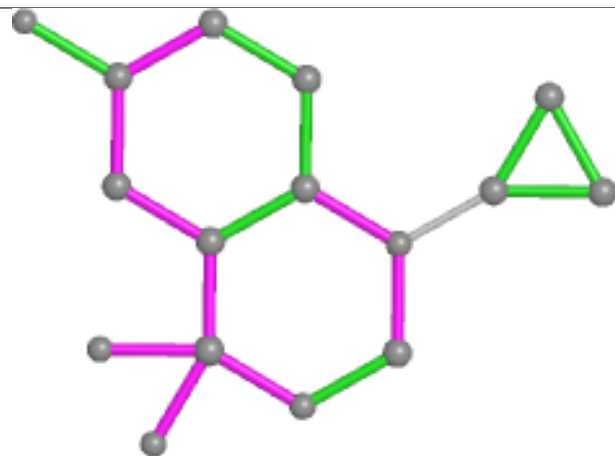




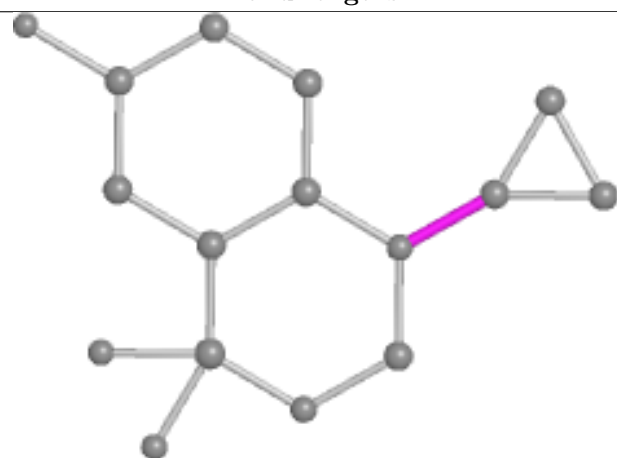
Ligand 2J9 A 1001



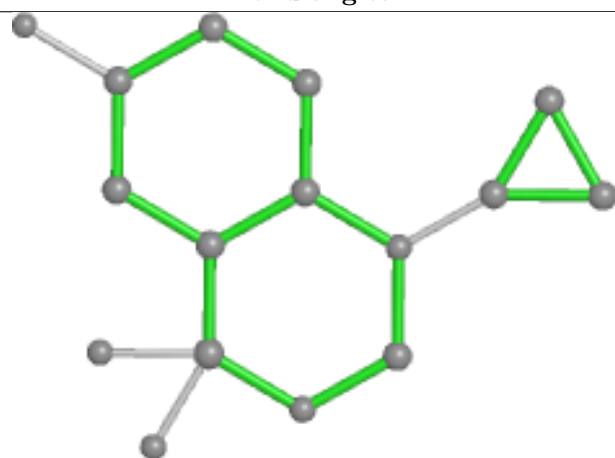
Bond lengths



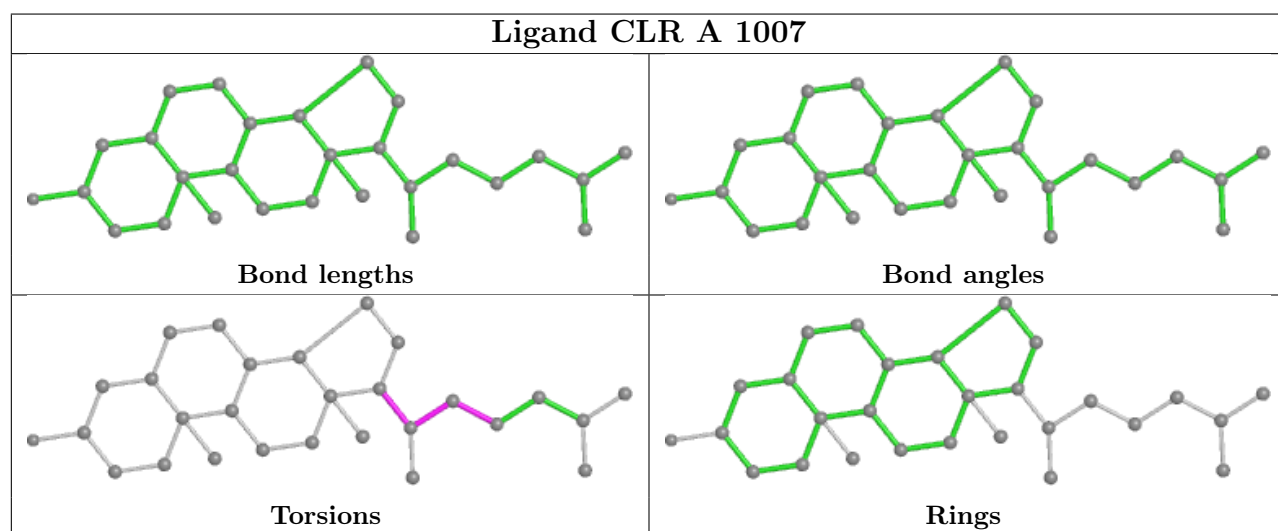
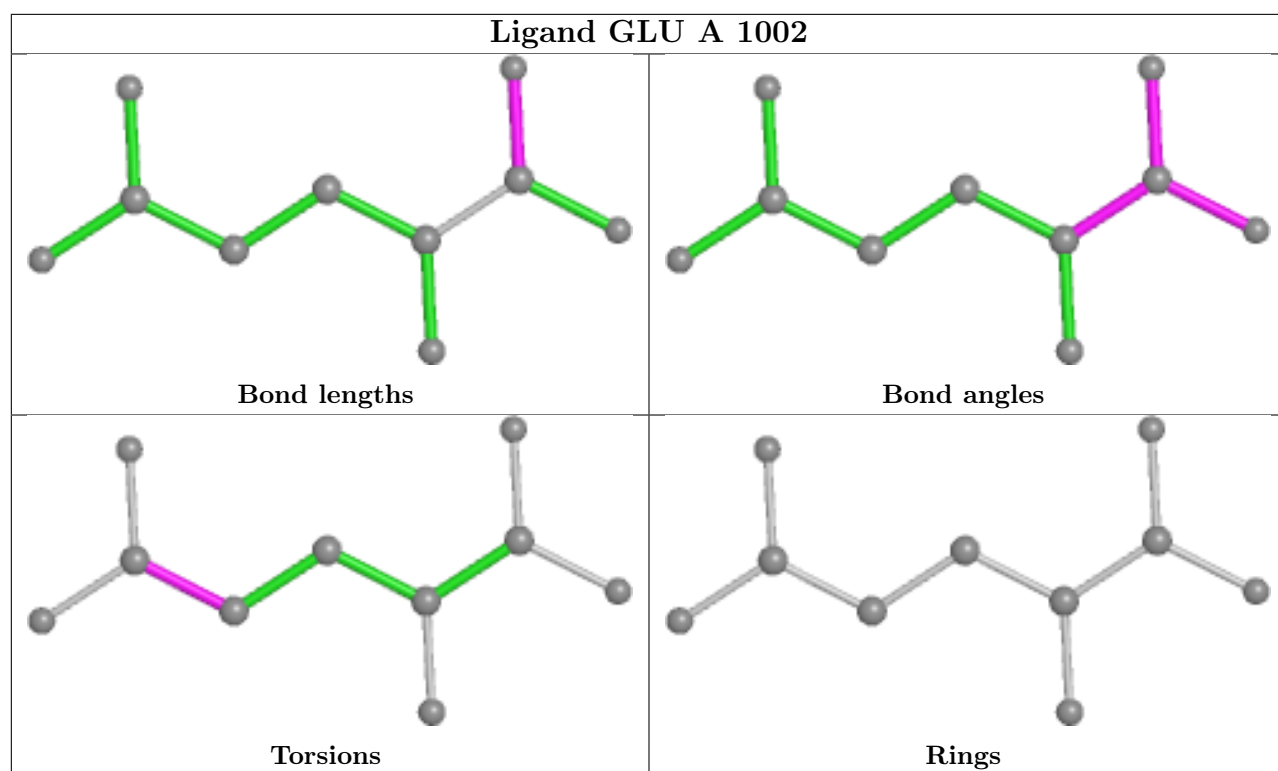
Bond angles

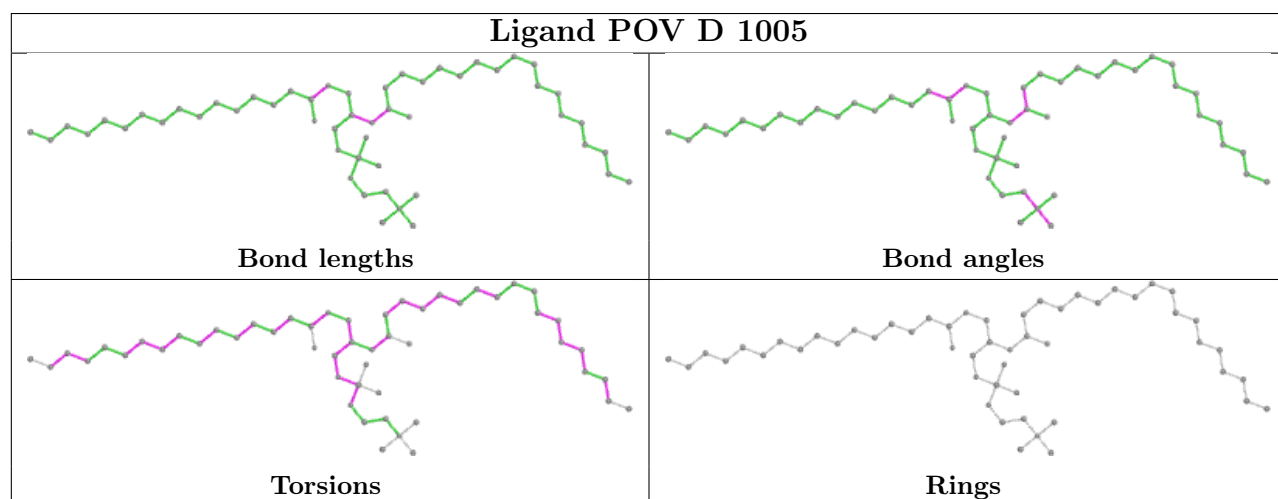
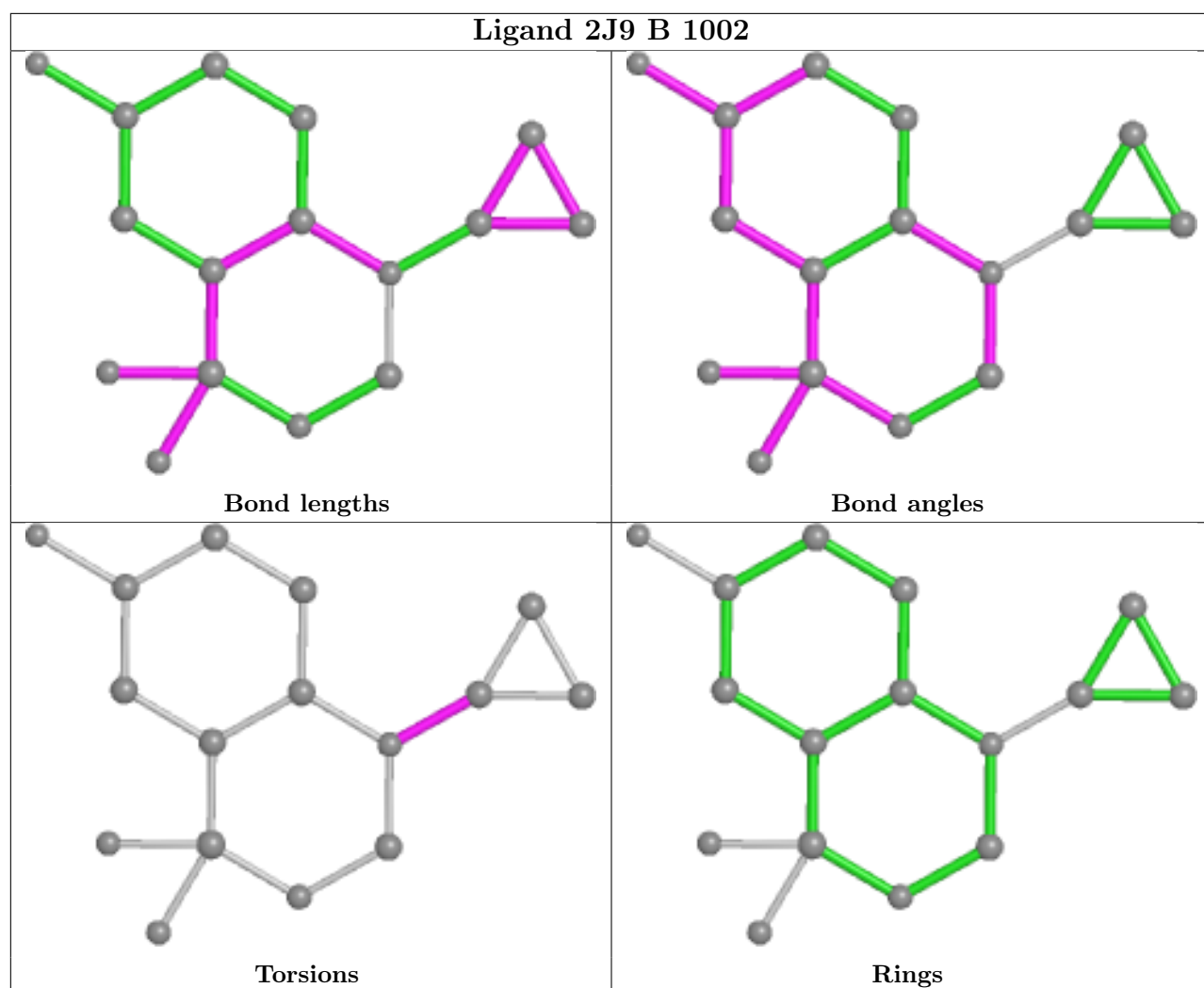


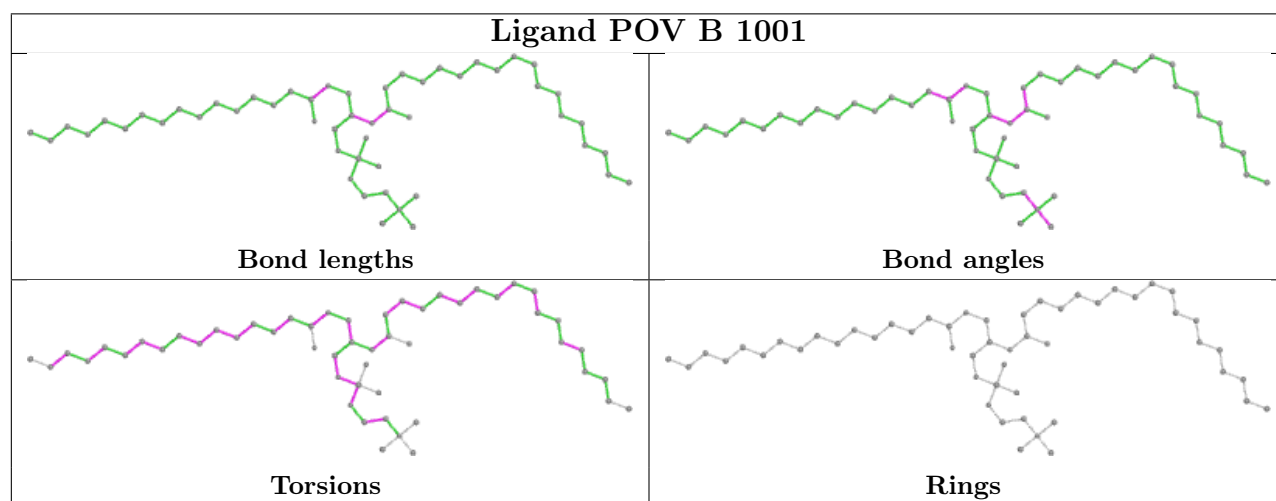
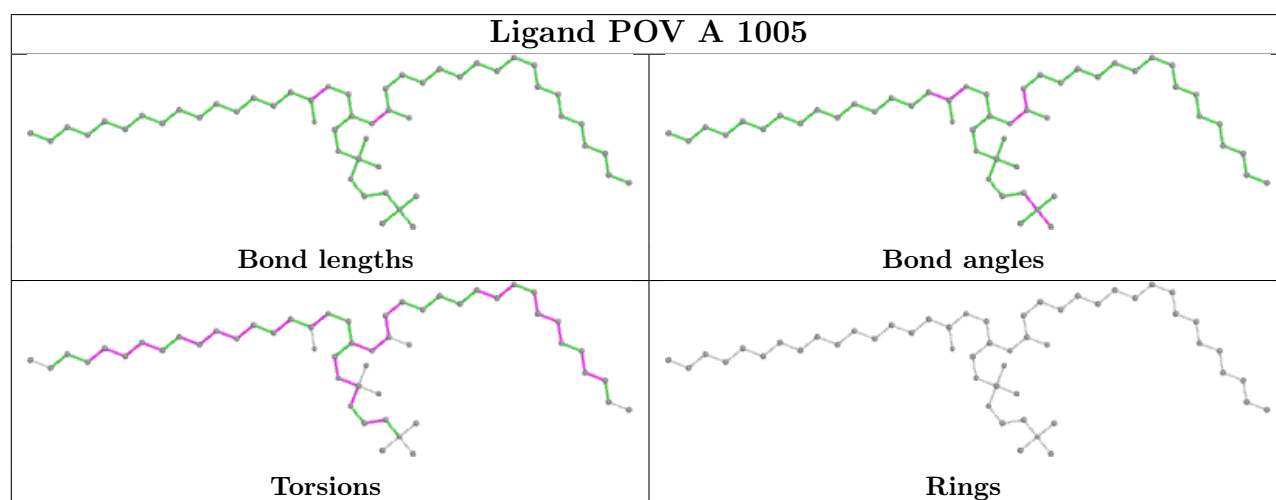
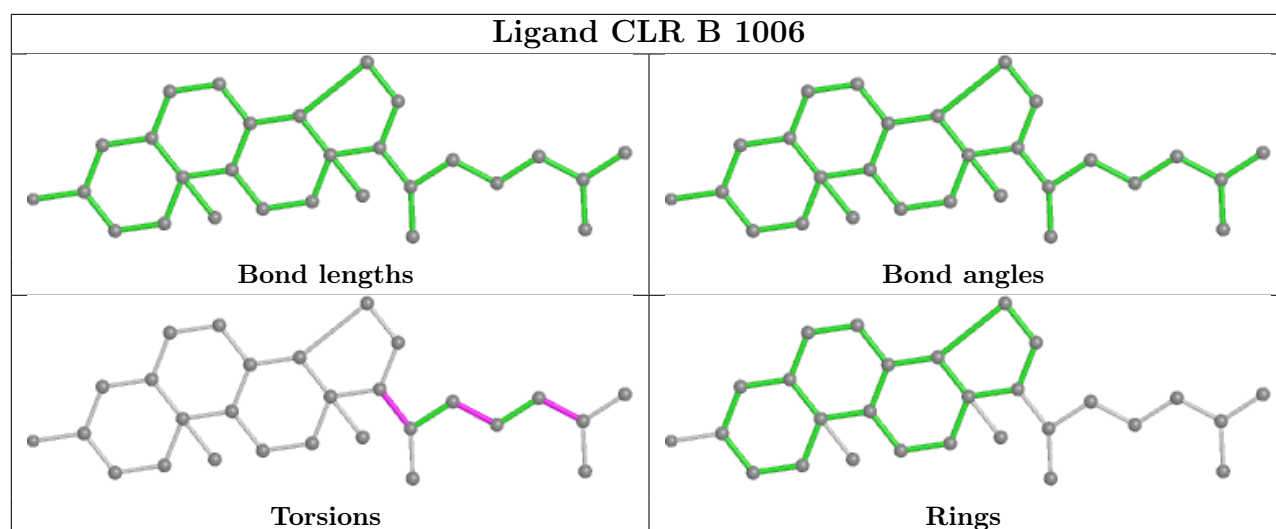
Torsions

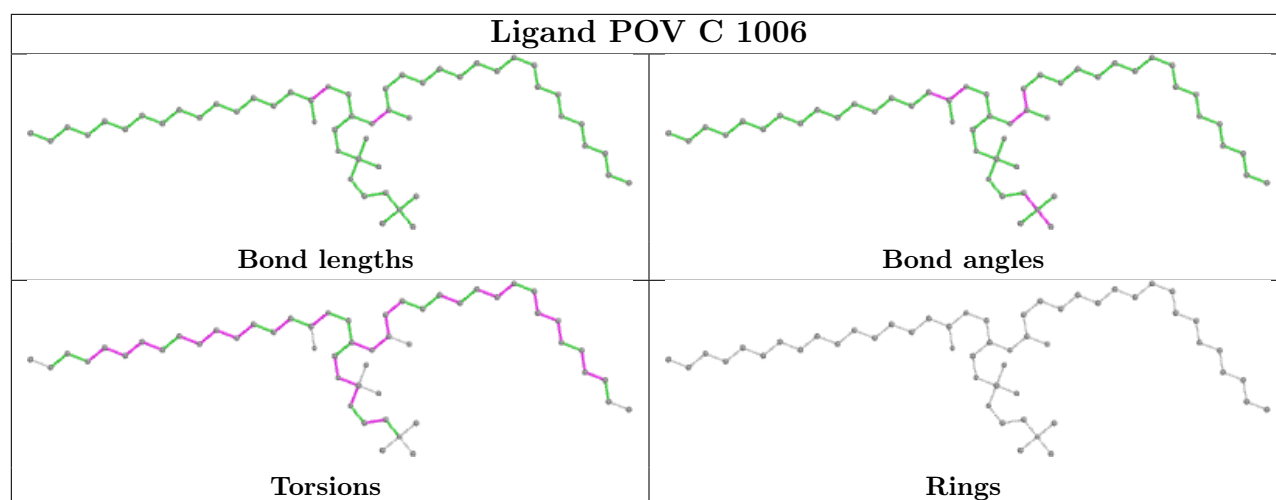


Rings









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.

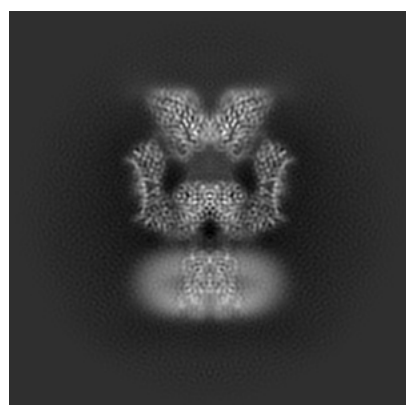
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44129. These allow visual inspection of the internal detail of the map and identification of artifacts.

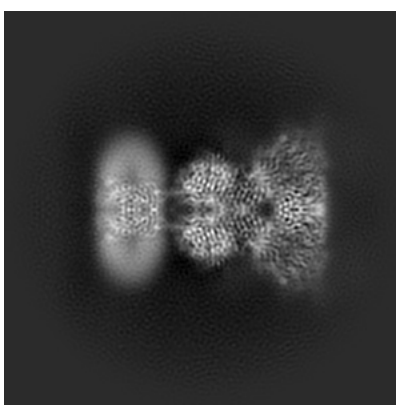
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

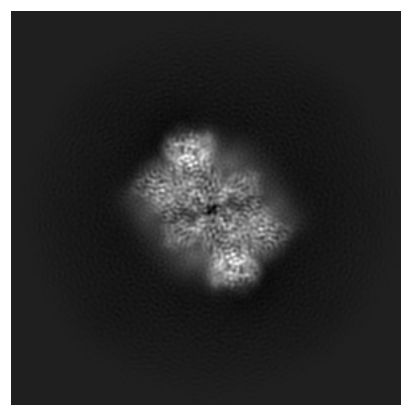
6.1.1 Primary map



X



Y

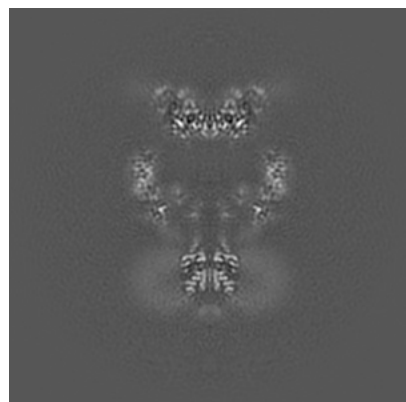


Z

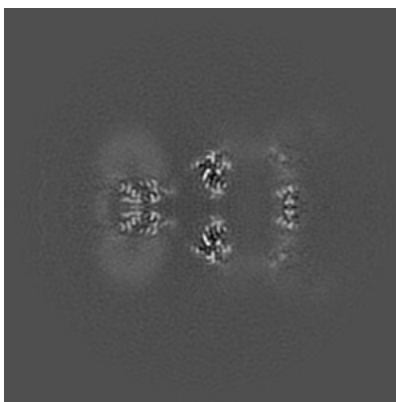
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

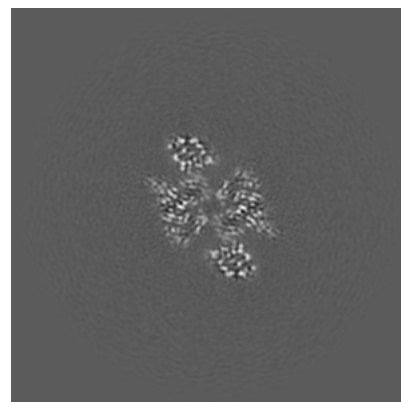
6.2.1 Primary map



X Index: 128



Y Index: 128

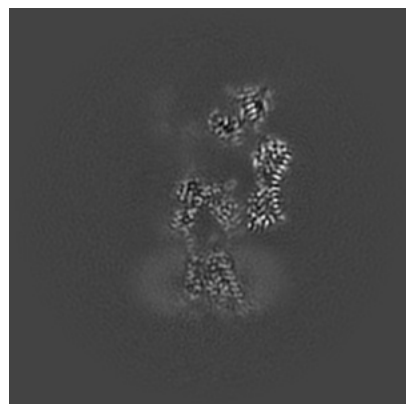


Z Index: 128

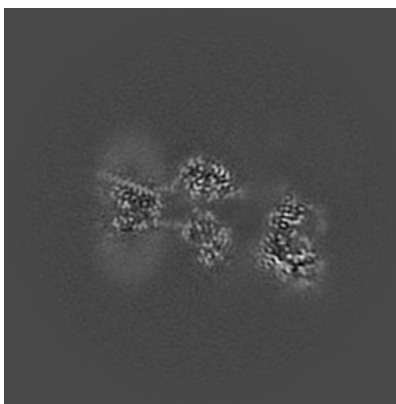
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

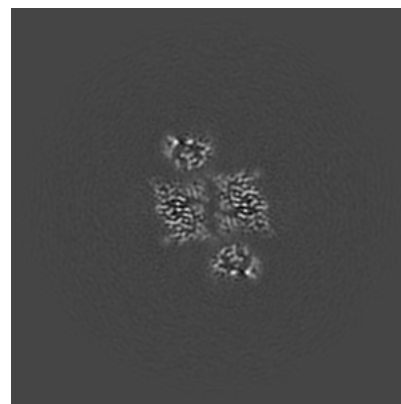
6.3.1 Primary map



X Index: 115



Y Index: 140



Z Index: 133

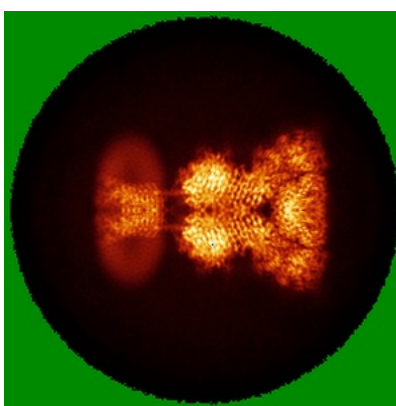
The images above show the largest variance slices of the map in three orthogonal directions.

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

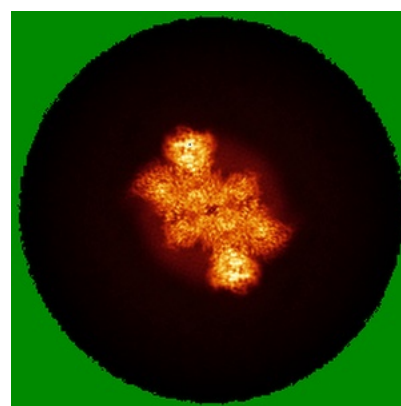
6.4.1 Primary map



X



Y

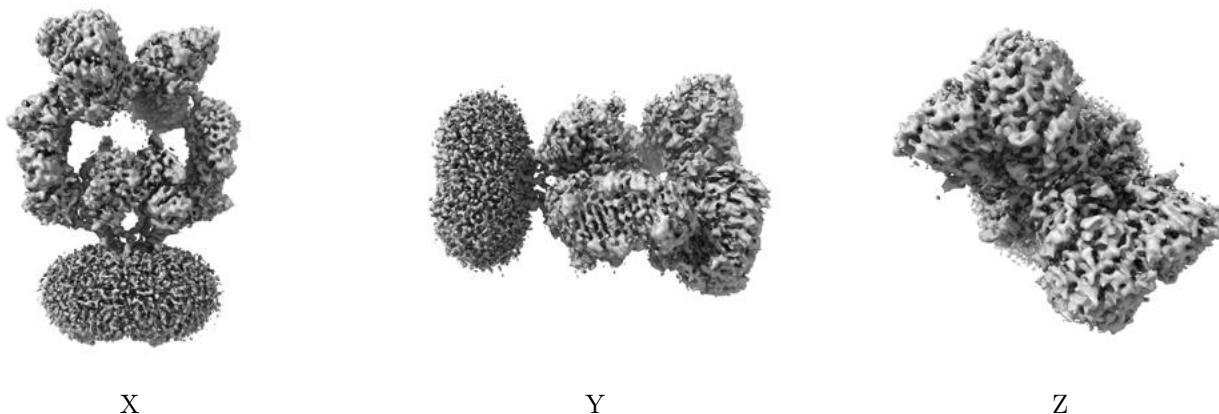


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 4.33. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

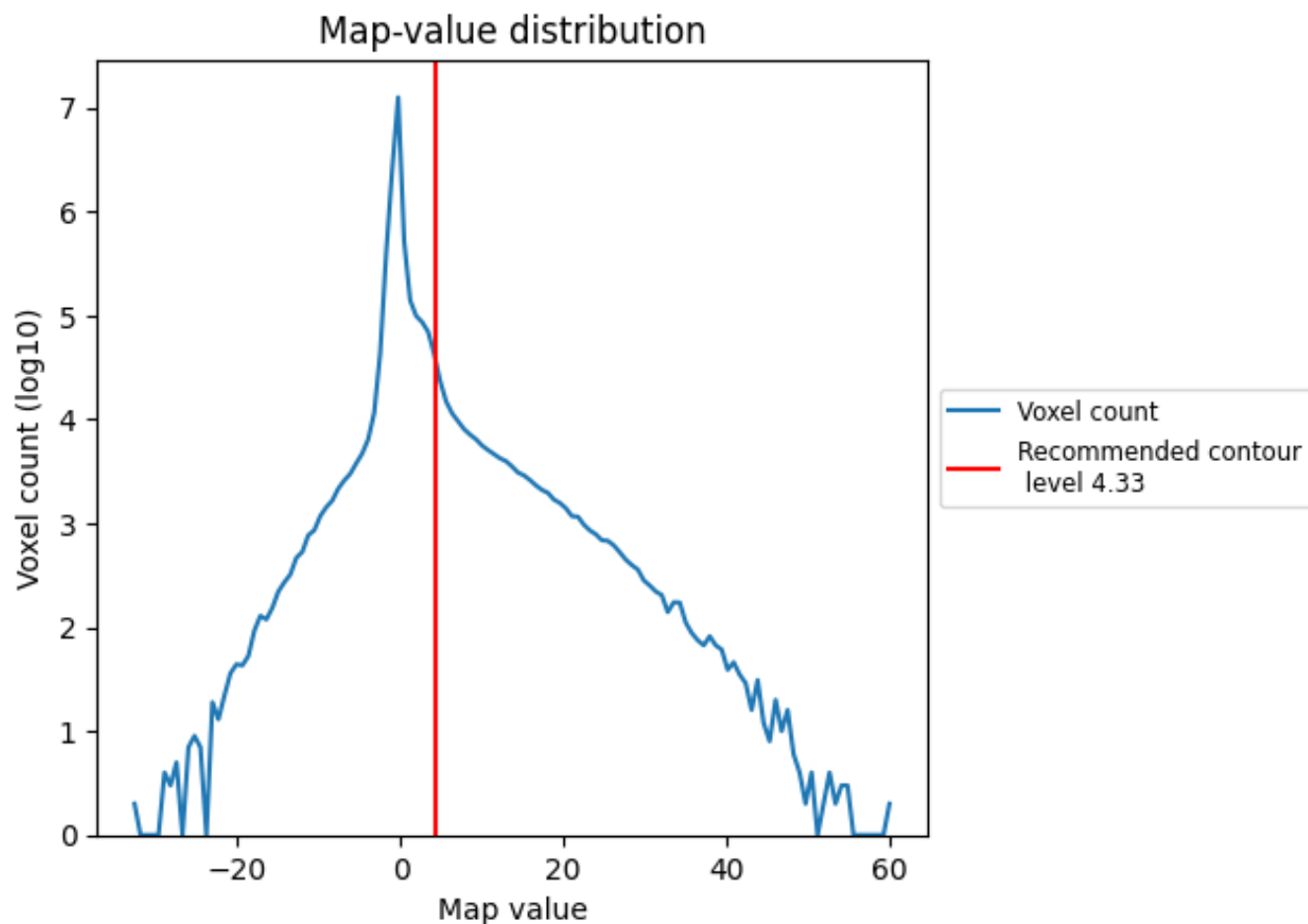
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

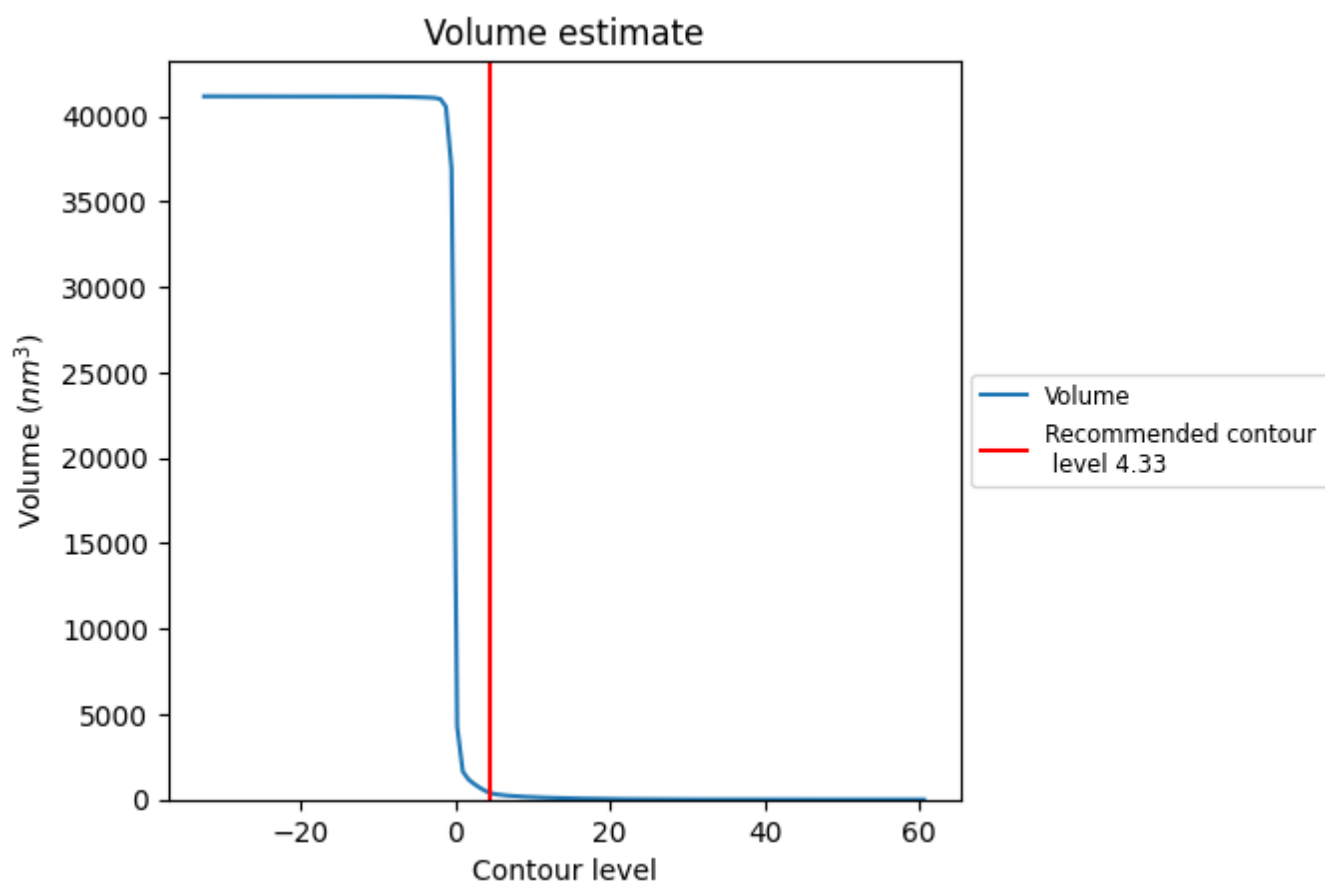
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

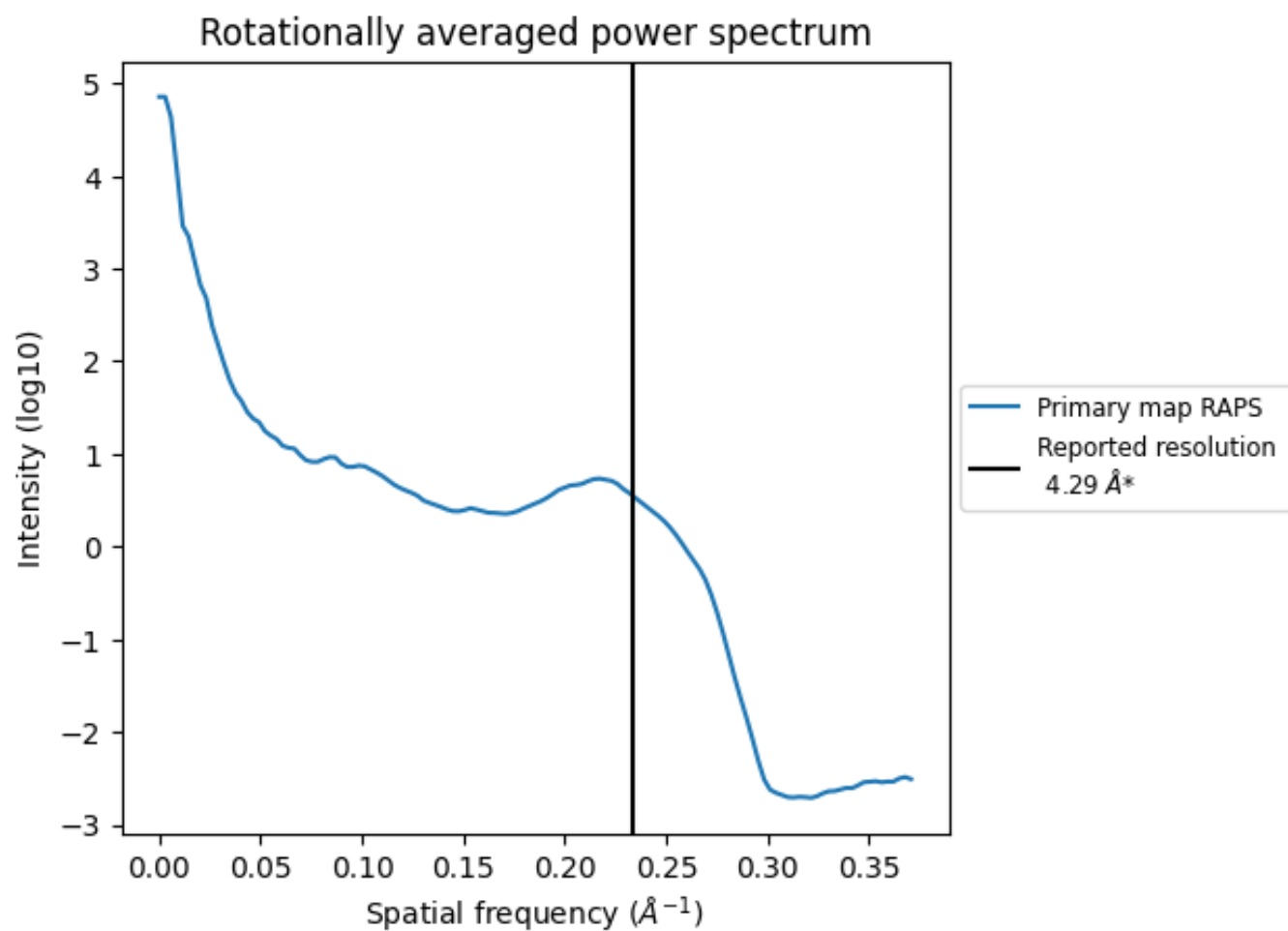
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 417 nm^3 ; this corresponds to an approximate mass of 377 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ



*Reported resolution corresponds to spatial frequency of 0.233 Å⁻¹

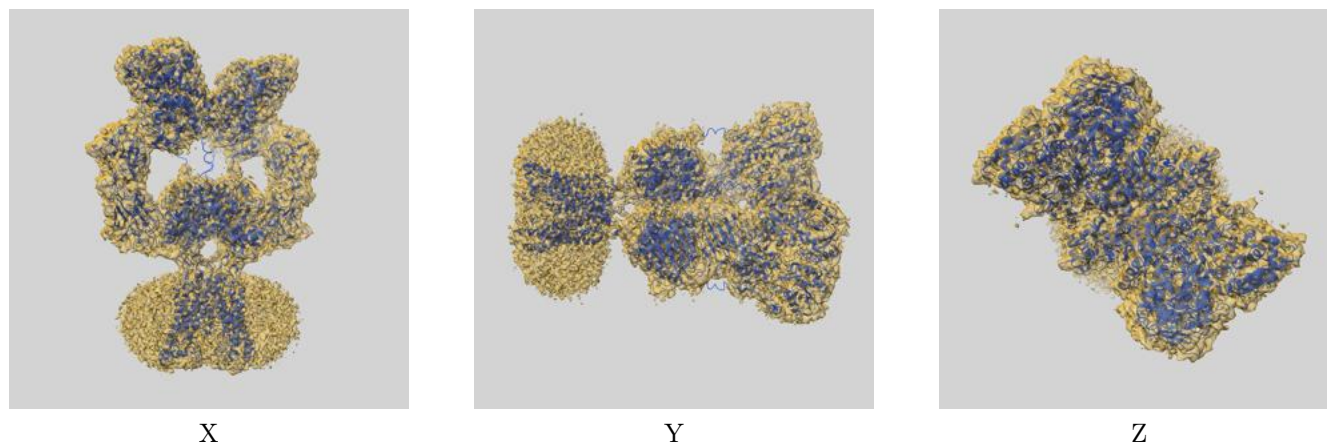
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit [i](#)

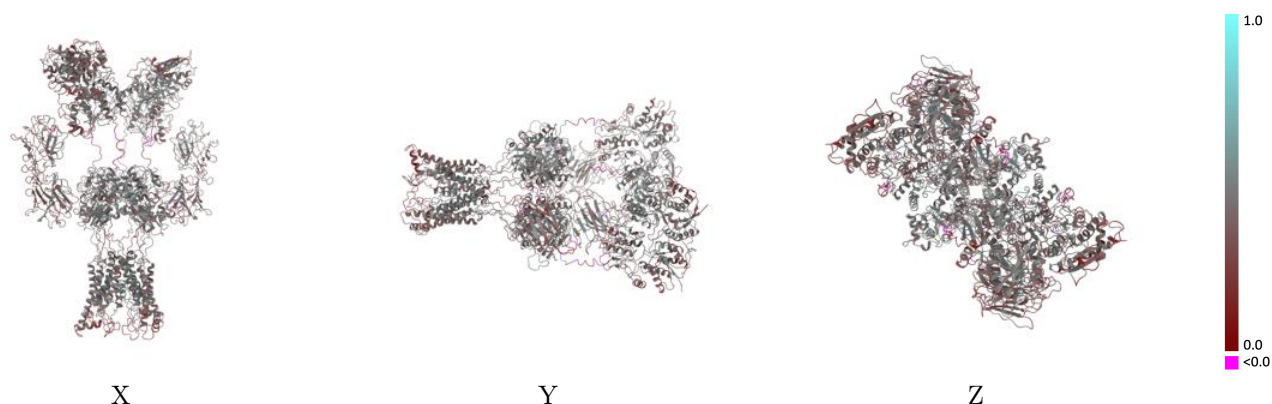
This section contains information regarding the fit between EMDB map EMD-44129 and PDB model 9B36. Per-residue inclusion information can be found in section [3](#) on page [14](#).

9.1 Map-model overlay [i](#)



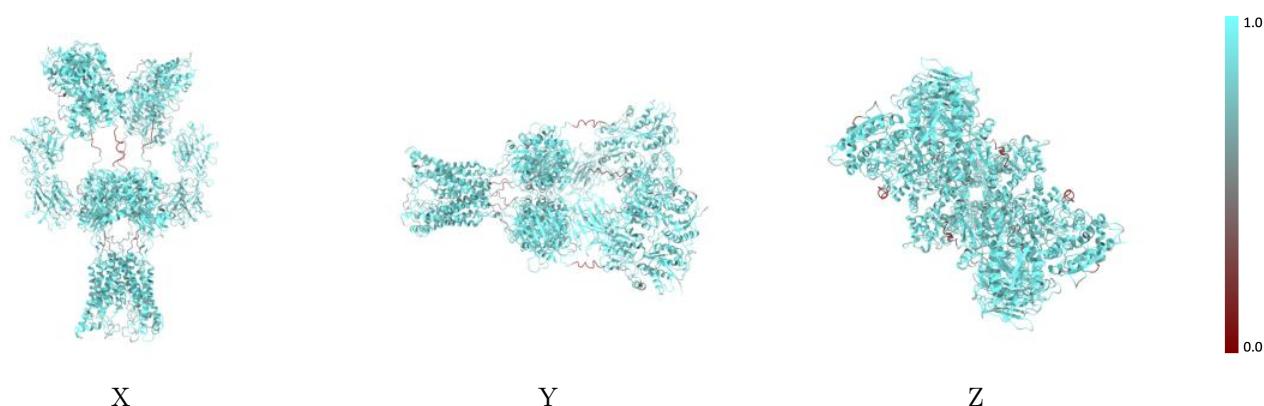
The images above show the 3D surface view of the map at the recommended contour level 4.33 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



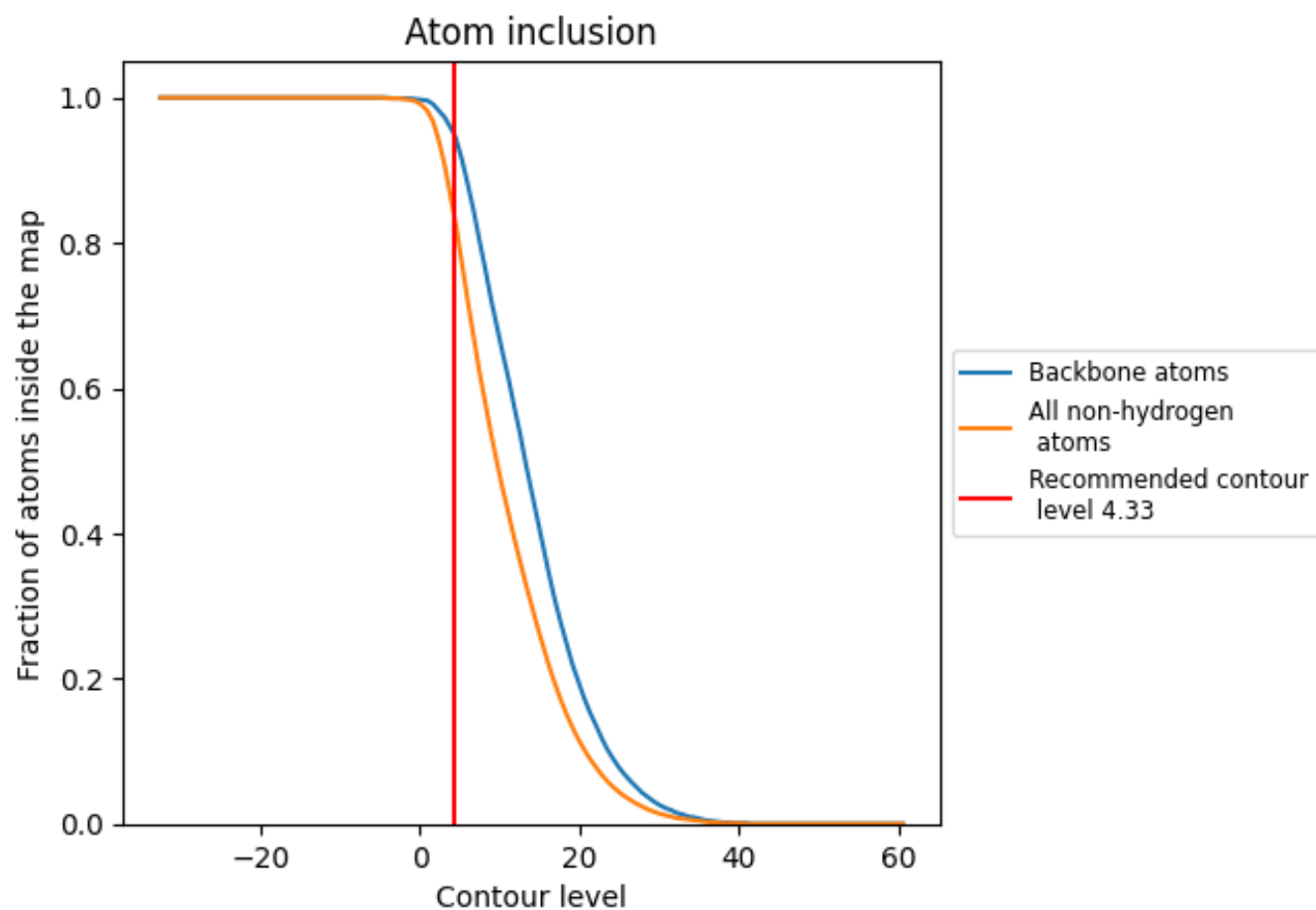
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (4.33).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 95% of all backbone atoms, 84% 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 (4.33) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8370	 0.4020
A	 0.8440	 0.4100
B	 0.8580	 0.4280
C	 0.8440	 0.4090
D	 0.8570	 0.4270
E	 0.9000	 0.3970
F	 0.8100	 0.3350
G	 0.8640	 0.3630
H	 0.8330	 0.3570
I	 0.5930	 0.2600
J	 0.4640	 0.4500
K	 0.4300	 0.2370
L	 0.3930	 0.1120
M	 0.3850	 0.3340
N	 0.3930	 0.2700
O	 0.1070	 0.1580
P	 0.6000	 0.3480
Q	 0.2860	 0.3030
R	 0.7530	 0.2890
S	 0.3590	 0.2370
T	 0.4870	 0.2930
U	 0.4000	 0.2720
V	 0.3570	 0.1380
W	 0.6860	 0.3210
X	 0.4640	 0.4320
Y	 0.5510	 0.2730
Z	 0.3930	 0.1240
a	 0.3850	 0.3260
b	 0.3210	 0.2420
c	 0.1070	 0.2100
d	 0.4800	 0.3520
e	 0.2860	 0.3210
f	 0.7190	 0.3170
g	 0.3330	 0.2680
h	 0.3400	 0.2350



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Chain	Atom inclusion	Q-score
i	 0.4400	 0.2790
j	 0.3930	 0.1440