



Full wwPDB EM Validation Report ⓘ

Jul 15, 2023 – 01:10 PM EDT

PDB ID : 8FL1
EMDB ID : EMD-29264
Title : Cryo-EM Structure of PG9RSH DU025 Fab in complex with BG505 DS-SOSIP.664
Authors : Gorman, J.; Kwong, P.D.
Deposited on : 2022-12-21
Resolution : 3.75 Å (reported)
Based on initial model : 6NNF

This is a Full wwPDB EM Validation 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.dev50
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) : 2.34

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 3.75 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	153	82% 18%
1	B	153	81% 19%
1	F	153	82% 18%
2	C	481	94% 6%
2	G	481	94% 6%
2	I	481	94% 6%
3	H	248	54% 45%
4	L	216	50% 50%
5	D	2	100%

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Mol	Chain	Length	Quality of chain
5	E	2	100%
5	K	2	100%
5	M	2	50% 50%
5	N	2	100%
5	O	2	100%
5	P	2	100%
5	R	2	50% 50%
5	S	2	100%
5	T	2	100%
5	U	2	100%
5	W	2	100%
5	Y	2	100%
5	Z	2	50% 50%
5	a	2	100%
5	b	2	100%
5	c	2	100%
6	J	6	50% 50%
6	X	6	50% 50%
7	Q	5	60% 40%
8	V	5	20% 60% 40%
8	d	5	60% 40%
9	e	7	43% 57%

2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 16951 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	A	125	997	631	171	189	6	0	0
1	B	124	990	626	170	188	6	0	0
1	F	126	1001	633	172	190	6	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	559	PRO	ILE	conflict	UNP Q2N0S6
A	605	CYS	THR	conflict	UNP Q2N0S6
B	559	PRO	ILE	conflict	UNP Q2N0S6
B	605	CYS	THR	conflict	UNP Q2N0S6
F	559	PRO	ILE	conflict	UNP Q2N0S6
F	605	CYS	THR	conflict	UNP Q2N0S6

- Molecule 2 is a protein called Envelope glycoprotein gp120.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	450	3535	2215	626	664	30	0	0
2	G	451	3543	2219	628	666	30	0	0
2	I	451	3544	2220	627	667	30	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	201	CYS	ILE	conflict	UNP Q2N0S6
C	332	ASN	THR	conflict	UNP Q2N0S6
C	433	CYS	ALA	conflict	UNP Q2N0S6

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Chain	Residue	Modelled	Actual	Comment	Reference
C	501	CYS	ALA	conflict	UNP Q2N0S6
C	509	ARG	GLU	conflict	UNP Q2N0S6
C	510	ARG	LYS	conflict	UNP Q2N0S6
C	512	ARG	ALA	conflict	UNP Q2N0S6
C	513	ARG	VAL	conflict	UNP Q2N0S6
G	201	CYS	ILE	conflict	UNP Q2N0S6
G	332	ASN	THR	conflict	UNP Q2N0S6
G	433	CYS	ALA	conflict	UNP Q2N0S6
G	501	CYS	ALA	conflict	UNP Q2N0S6
G	509	ARG	GLU	conflict	UNP Q2N0S6
G	510	ARG	LYS	conflict	UNP Q2N0S6
G	512	ARG	ALA	conflict	UNP Q2N0S6
G	513	ARG	VAL	conflict	UNP Q2N0S6
I	201	CYS	ILE	conflict	UNP Q2N0S6
I	332	ASN	THR	conflict	UNP Q2N0S6
I	433	CYS	ALA	conflict	UNP Q2N0S6
I	501	CYS	ALA	conflict	UNP Q2N0S6
I	509	ARG	GLU	conflict	UNP Q2N0S6
I	510	ARG	LYS	conflict	UNP Q2N0S6
I	512	ARG	ALA	conflict	UNP Q2N0S6
I	513	ARG	VAL	conflict	UNP Q2N0S6

- Molecule 3 is a protein called PG9 DU025 Heavy.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	H	136	1094	682	187	218	7	0	0

- Molecule 4 is a protein called PG9 DU025 Light.

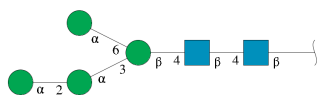
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	L	109	801	492	141	166	2	0	0

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



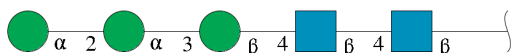
Mol	Chain	Residues	Atoms				AltConf	Trace
5	D	2	Total	C	N	O	0	0
			28	16	2	10		
5	E	2	Total	C	N	O	0	0
			28	16	2	10		
5	K	2	Total	C	N	O	0	0
			28	16	2	10		
5	M	2	Total	C	N	O	0	0
			28	16	2	10		
5	N	2	Total	C	N	O	0	0
			28	16	2	10		
5	O	2	Total	C	N	O	0	0
			28	16	2	10		
5	P	2	Total	C	N	O	0	0
			28	16	2	10		
5	R	2	Total	C	N	O	0	0
			28	16	2	10		
5	S	2	Total	C	N	O	0	0
			28	16	2	10		
5	T	2	Total	C	N	O	0	0
			28	16	2	10		
5	U	2	Total	C	N	O	0	0
			28	16	2	10		
5	W	2	Total	C	N	O	0	0
			28	16	2	10		
5	Y	2	Total	C	N	O	0	0
			28	16	2	10		
5	Z	2	Total	C	N	O	0	0
			28	16	2	10		
5	a	2	Total	C	N	O	0	0
			28	16	2	10		
5	b	2	Total	C	N	O	0	0
			28	16	2	10		
5	c	2	Total	C	N	O	0	0
			28	16	2	10		

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



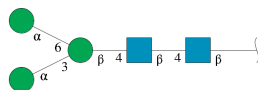
Mol	Chain	Residues	Atoms				AltConf	Trace
6	J	6	Total	C	N	O	0	0
			72	40	2	30		
6	X	6	Total	C	N	O	0	0
			72	40	2	30		

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



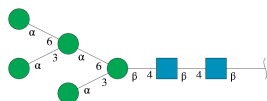
Mol	Chain	Residues	Atoms				AltConf	Trace
7	Q	5	Total	C	N	O	0	0
			61	34	2	25		

- 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.



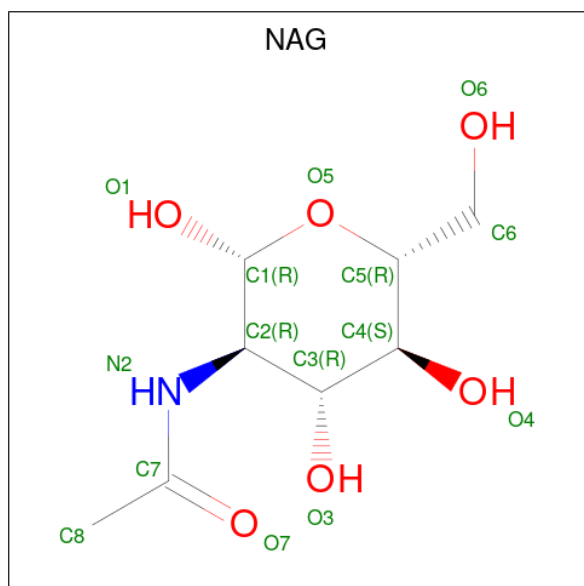
Mol	Chain	Residues	Atoms				AltConf	Trace
8	V	5	Total	C	N	O	0	0
			61	34	2	25		
8	d	5	Total	C	N	O	0	0
			61	34	2	25		

- Molecule 9 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
9	e	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	A	1	Total	C	N	O	0
			14	8	1	5	
10	A	1	Total	C	N	O	0
			14	8	1	5	
10	A	1	Total	C	N	O	0
			14	8	1	5	
10	B	1	Total	C	N	O	0
			14	8	1	5	
10	B	1	Total	C	N	O	0
			14	8	1	5	
10	C	1	Total	C	N	O	0
			14	8	1	5	
10	C	1	Total	C	N	O	0
			14	8	1	5	
10	C	1	Total	C	N	O	0
			14	8	1	5	
10	C	1	Total	C	N	O	0
			14	8	1	5	

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

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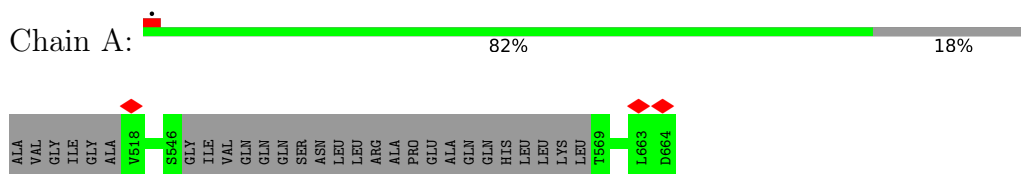
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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
10	I	1	Total 14	8	1	5	0
10	I	1	Total 14	8	1	5	0
10	I	1	Total 14	8	1	5	0
10	I	1	Total 14	8	1	5	0
10	I	1	Total 14	8	1	5	0
10	I	1	Total 14	8	1	5	0
10	I	1	Total 14	8	1	5	0
10	I	1	Total 14	8	1	5	0
10	I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

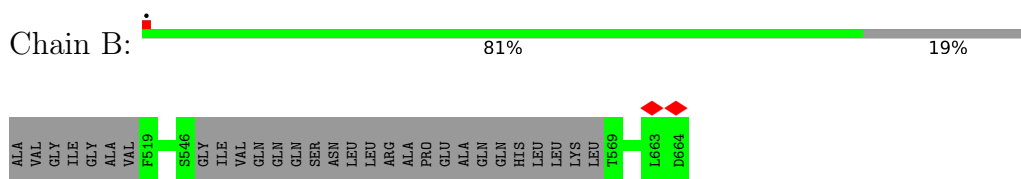
3 Residue-property plots [i](#)

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.

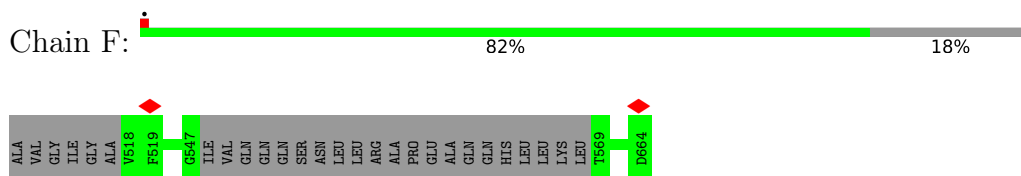
- Molecule 1: Envelope glycoprotein gp41



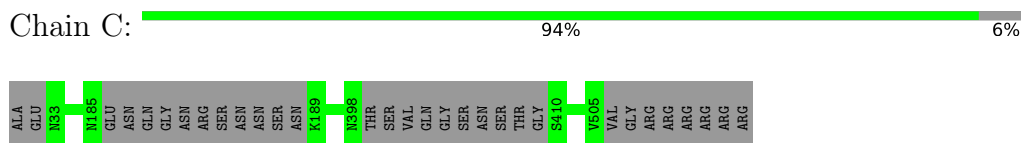
- Molecule 1: Envelope glycoprotein gp41



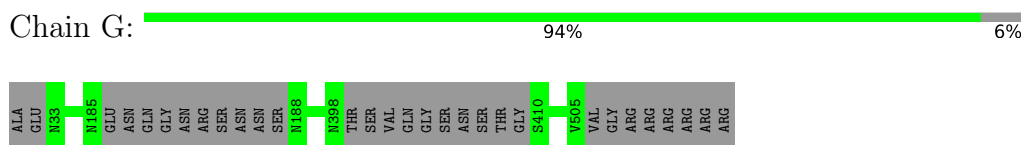
- Molecule 1: Envelope glycoprotein gp41



- Molecule 2: Envelope glycoprotein gp120



- Molecule 2: Envelope glycoprotein gp120



- Molecule 2: Envelope glycoprotein gp120

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

Chain M:  50% 50%

MAG1
MAG2

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

Chain N:  100%

MAG1
MAG2

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

Chain O:  100%

MAG1
MAG2

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

Chain P:  100%

MAG1
MAG2

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

Chain R:  50% 50%

MAG1
MAG2

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

Chain S:  100%

MAG1
MAG2

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

Chain T:  100%

MAG1
MAG2

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

Chain U:  100%MAG1
MAG2

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

Chain W:  100%MAG1
MAG2

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

Chain Y:  100%MAG1
MAG2

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

Chain Z:  50%MAG1
MAG2

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

Chain a:  100%MAG1
MAG2

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

Chain b: 100%MAG1
MAG2

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

Chain c:  100%

MAG1
MAG2

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

Chain J:  50% 50%

MAG1
MAG2
BMA3
MAN4
MAN5
MAN6

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

Chain X:  50% 50%

MAG1
MAG2
BMA3
MAN4
MAN5
MAN6

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

Chain Q:  60% 40%

MAG1
MAG2
BMA3
MAN4
MAN5

- 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

Chain V:  20% 60% 40%

MAG1
MAG2
BMA3
MAN4
MAN5

- 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

Chain d:  60% 40%



- Molecule 9: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain e:  43% 57%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	104665	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	63.75	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.858	Depositor
Minimum map value	-1.704	Depositor
Average map value	0.004	Depositor
Map value standard deviation	0.048	Depositor
Recommended contour level	0.22	Depositor
Map size (\AA)	368.21997, 368.21997, 368.21997	wwPDB
Map dimensions	340, 340, 340	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.083, 1.083, 1.083	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, BMA, MAN, TYS

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	0.22	0/1015	0.43	0/1377
1	B	0.23	0/1008	0.43	0/1367
1	F	0.22	0/1019	0.44	0/1382
2	C	0.25	0/3608	0.49	0/4898
2	G	0.24	0/3616	0.48	0/4909
2	I	0.25	0/3617	0.49	0/4910
3	H	0.25	0/1089	0.48	0/1472
4	L	0.23	0/816	0.46	0/1105
All	All	0.24	0/15788	0.48	0/21420

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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	121/153 (79%)	120 (99%)	1 (1%)	0	100	100
1	B	120/153 (78%)	119 (99%)	1 (1%)	0	100	100
1	F	122/153 (80%)	121 (99%)	1 (1%)	0	100	100
2	C	444/481 (92%)	429 (97%)	15 (3%)	0	100	100
2	G	445/481 (92%)	436 (98%)	9 (2%)	0	100	100
2	I	445/481 (92%)	427 (96%)	18 (4%)	0	100	100
3	H	132/248 (53%)	130 (98%)	2 (2%)	0	100	100
4	L	107/216 (50%)	104 (97%)	3 (3%)	0	100	100
All	All	1936/2366 (82%)	1886 (97%)	50 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	108/129 (84%)	108 (100%)	0	100	100
1	B	107/129 (83%)	107 (100%)	0	100	100
1	F	108/129 (84%)	108 (100%)	0	100	100
2	C	402/429 (94%)	402 (100%)	0	100	100
2	G	403/429 (94%)	403 (100%)	0	100	100
2	I	403/429 (94%)	403 (100%)	0	100	100
3	H	111/208 (53%)	111 (100%)	0	100	100
4	L	91/183 (50%)	91 (100%)	0	100	100
All	All	1733/2065 (84%)	1733 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	540	GLN
2	C	195	ASN
1	F	607	ASN
1	F	653	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](#)

2 non-standard protein/DNA/RNA residues 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	TYS	H	100(G)	3	15,16,17	0.87	1 (6%)	18,22,24	1.17	1 (5%)
3	TYS	H	100(H)	3	15,16,17	1.33	3 (20%)	18,22,24	0.84	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	TYS	H	100(G)	3	-	2/10/11/13	0/1/1/1
3	TYS	H	100(H)	3	-	1/10/11/13	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	100(H)	TYS	OH-CZ	-3.13	1.37	1.42
3	H	100(H)	TYS	OH-S	-2.84	1.54	1.58
3	H	100(H)	TYS	O3-S	2.21	1.64	1.50
3	H	100(G)	TYS	OH-S	-2.11	1.55	1.58

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	H	100(H)	TYS	CG-CB-CA	-2.30	109.44	114.10
3	H	100(G)	TYS	OH-S-O1	-2.07	101.66	107.71

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	H	100(G)	TYS	CZ-OH-S-O3
3	H	100(G)	TYS	CZ-OH-S-O1
3	H	100(H)	TYS	CZ-OH-S-O1

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

68 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
5	NAG	D	1	2,5	14,14,15	0.22	0	17,19,21	0.47	0
5	NAG	D	2	5	14,14,15	0.23	0	17,19,21	0.42	0
5	NAG	E	1	2,5	14,14,15	0.20	0	17,19,21	0.41	0
5	NAG	E	2	5	14,14,15	0.23	0	17,19,21	0.41	0
6	NAG	J	1	2,6	14,14,15	0.25	0	17,19,21	0.49	0
6	NAG	J	2	6	14,14,15	0.23	0	17,19,21	0.40	0
6	BMA	J	3	6	11,11,12	0.66	0	15,15,17	0.86	0
6	MAN	J	4	6	11,11,12	0.69	0	15,15,17	1.13	1 (6%)
6	MAN	J	5	6	11,11,12	0.67	0	15,15,17	1.09	2 (13%)
6	MAN	J	6	6	11,11,12	0.64	0	15,15,17	1.00	2 (13%)
5	NAG	K	1	2,5	14,14,15	0.23	0	17,19,21	0.41	0
5	NAG	K	2	5	14,14,15	0.22	0	17,19,21	0.41	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	NAG	M	1	2,5	14,14,15	0.38	0	17,19,21	1.26	2 (11%)
5	NAG	M	2	5	14,14,15	0.29	0	17,19,21	0.54	0
5	NAG	N	1	2,5	14,14,15	0.23	0	17,19,21	0.39	0
5	NAG	N	2	5	14,14,15	0.24	0	17,19,21	0.40	0
5	NAG	O	1	2,5	14,14,15	0.22	0	17,19,21	0.43	0
5	NAG	O	2	5	14,14,15	0.22	0	17,19,21	0.40	0
5	NAG	P	1	2,5	14,14,15	0.26	0	17,19,21	0.44	0
5	NAG	P	2	5	14,14,15	0.24	0	17,19,21	0.39	0
7	NAG	Q	1	2,7	14,14,15	0.24	0	17,19,21	0.49	0
7	NAG	Q	2	7	14,14,15	0.22	0	17,19,21	0.40	0
7	BMA	Q	3	7	11,11,12	0.60	0	15,15,17	0.73	0
7	MAN	Q	4	7	11,11,12	0.67	0	15,15,17	1.00	1 (6%)
7	MAN	Q	5	7	11,11,12	0.67	0	15,15,17	1.20	2 (13%)
5	NAG	R	1	2,5	14,14,15	0.41	0	17,19,21	1.26	1 (5%)
5	NAG	R	2	5	14,14,15	0.27	0	17,19,21	0.52	0
5	NAG	S	1	2,5	14,14,15	0.21	0	17,19,21	0.43	0
5	NAG	S	2	5	14,14,15	0.22	0	17,19,21	0.43	0
5	NAG	T	1	2,5	14,14,15	0.21	0	17,19,21	0.50	0
5	NAG	T	2	5	14,14,15	0.24	0	17,19,21	0.39	0
5	NAG	U	1	2,5	14,14,15	0.24	0	17,19,21	0.48	0
5	NAG	U	2	5	14,14,15	0.24	0	17,19,21	0.41	0
8	NAG	V	1	2,8	14,14,15	0.16	0	17,19,21	0.41	0
8	NAG	V	2	8	14,14,15	0.25	0	17,19,21	0.49	0
8	BMA	V	3	8	11,11,12	0.58	0	15,15,17	0.74	0
8	MAN	V	4	8	11,11,12	0.66	0	15,15,17	1.03	2 (13%)
8	MAN	V	5	8	11,11,12	0.66	0	15,15,17	0.98	2 (13%)
5	NAG	W	1	2,5	14,14,15	0.23	0	17,19,21	0.45	0
5	NAG	W	2	5	14,14,15	0.24	0	17,19,21	0.41	0
6	NAG	X	1	2,6	14,14,15	0.20	0	17,19,21	0.46	0
6	NAG	X	2	6	14,14,15	0.19	0	17,19,21	0.41	0
6	BMA	X	3	6	11,11,12	0.59	0	15,15,17	0.82	0
6	MAN	X	4	6	11,11,12	0.76	0	15,15,17	1.23	1 (6%)
6	MAN	X	5	6	11,11,12	0.65	0	15,15,17	1.06	2 (13%)
6	MAN	X	6	6	11,11,12	0.65	0	15,15,17	1.02	2 (13%)
5	NAG	Y	1	2,5	14,14,15	0.23	0	17,19,21	0.42	0
5	NAG	Y	2	5	14,14,15	0.23	0	17,19,21	0.40	0
5	NAG	Z	1	2,5	14,14,15	0.40	0	17,19,21	1.26	1 (5%)
5	NAG	Z	2	5	14,14,15	0.27	0	17,19,21	0.55	0
5	NAG	a	1	2,5	14,14,15	0.23	0	17,19,21	0.44	0
5	NAG	a	2	5	14,14,15	0.23	0	17,19,21	0.42	0
5	NAG	b	1	2,5	14,14,15	0.23	0	17,19,21	0.49	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	NAG	b	2	5	14,14,15	0.23	0	17,19,21	0.40	0
5	NAG	c	1	2,5	14,14,15	0.25	0	17,19,21	0.51	0
5	NAG	c	2	5	14,14,15	0.24	0	17,19,21	0.41	0
8	NAG	d	1	2,8	14,14,15	0.21	0	17,19,21	0.41	0
8	NAG	d	2	8	14,14,15	0.24	0	17,19,21	0.52	0
8	BMA	d	3	8	11,11,12	0.57	0	15,15,17	0.71	0
8	MAN	d	4	8	11,11,12	0.65	0	15,15,17	1.01	2 (13%)
8	MAN	d	5	8	11,11,12	0.67	0	15,15,17	1.03	2 (13%)
9	NAG	e	1	2,9	14,14,15	0.21	0	17,19,21	0.50	0
9	NAG	e	2	9	14,14,15	0.18	0	17,19,21	0.39	0
9	BMA	e	3	9	11,11,12	0.59	0	15,15,17	0.79	0
9	MAN	e	4	9	11,11,12	0.94	1 (9%)	15,15,17	1.63	2 (13%)
9	MAN	e	5	9	11,11,12	0.72	0	15,15,17	1.12	2 (13%)
9	MAN	e	6	9	11,11,12	0.64	0	15,15,17	0.99	2 (13%)
9	MAN	e	7	9	11,11,12	0.66	0	15,15,17	1.00	2 (13%)

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
5	NAG	D	1	2,5	-	0/6/23/26	0/1/1/1
5	NAG	D	2	5	-	2/6/23/26	0/1/1/1
5	NAG	E	1	2,5	-	0/6/23/26	0/1/1/1
5	NAG	E	2	5	-	2/6/23/26	0/1/1/1
6	NAG	J	1	2,6	-	0/6/23/26	0/1/1/1
6	NAG	J	2	6	-	2/6/23/26	0/1/1/1
6	BMA	J	3	6	-	1/2/19/22	0/1/1/1
6	MAN	J	4	6	-	0/2/19/22	0/1/1/1
6	MAN	J	5	6	-	0/2/19/22	0/1/1/1
6	MAN	J	6	6	-	1/2/19/22	0/1/1/1
5	NAG	K	1	2,5	-	0/6/23/26	0/1/1/1
5	NAG	K	2	5	-	4/6/23/26	0/1/1/1
5	NAG	M	1	2,5	-	5/6/23/26	0/1/1/1
5	NAG	M	2	5	-	3/6/23/26	0/1/1/1
5	NAG	N	1	2,5	-	0/6/23/26	0/1/1/1
5	NAG	N	2	5	-	2/6/23/26	0/1/1/1
5	NAG	O	1	2,5	-	0/6/23/26	0/1/1/1

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

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

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	e	4	MAN	O3-C3	2.06	1.47	1.43

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	e	4	MAN	O3-C3-C2	4.48	118.58	109.99
5	R	1	NAG	C2-N2-C7	4.33	129.06	122.90
5	Z	1	NAG	C2-N2-C7	4.31	129.04	122.90
5	M	1	NAG	C2-N2-C7	4.31	129.03	122.90
6	X	4	MAN	C1-O5-C5	3.54	116.98	112.19
7	Q	5	MAN	C1-O5-C5	3.46	116.88	112.19
9	e	4	MAN	C1-O5-C5	3.15	116.46	112.19
9	e	5	MAN	C1-O5-C5	3.12	116.41	112.19
6	J	4	MAN	C1-O5-C5	3.07	116.35	112.19
6	J	5	MAN	C1-O5-C5	2.70	115.86	112.19
7	Q	4	MAN	C1-O5-C5	2.65	115.78	112.19
6	X	5	MAN	C1-O5-C5	2.65	115.78	112.19
8	V	4	MAN	C1-O5-C5	2.46	115.53	112.19
8	d	5	MAN	C1-O5-C5	2.46	115.53	112.19
6	X	6	MAN	C1-O5-C5	2.37	115.40	112.19
9	e	6	MAN	C1-O5-C5	2.32	115.33	112.19
8	d	4	MAN	C1-O5-C5	2.31	115.32	112.19
6	J	6	MAN	C1-O5-C5	2.30	115.31	112.19
9	e	5	MAN	O2-C2-C3	-2.27	105.60	110.14
9	e	7	MAN	C1-O5-C5	2.27	115.26	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	J	5	MAN	O2-C2-C3	-2.23	105.67	110.14
8	d	4	MAN	O2-C2-C3	-2.23	105.67	110.14
9	e	7	MAN	O2-C2-C3	-2.23	105.67	110.14
6	J	6	MAN	O2-C2-C3	-2.23	105.68	110.14
6	X	6	MAN	O2-C2-C3	-2.21	105.70	110.14
9	e	6	MAN	O2-C2-C3	-2.21	105.70	110.14
6	X	5	MAN	O2-C2-C3	-2.20	105.72	110.14
8	d	5	MAN	O2-C2-C3	-2.20	105.72	110.14
8	V	4	MAN	O2-C2-C3	-2.19	105.74	110.14
7	Q	5	MAN	O2-C2-C3	-2.19	105.75	110.14
8	V	5	MAN	O2-C2-C3	-2.19	105.76	110.14
8	V	5	MAN	C1-O5-C5	2.14	115.09	112.19
5	M	1	NAG	C1-C2-N2	2.06	114.01	110.49

There are no chirality outliers.

All (77) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	M	2	NAG	C4-C5-C6-O6
5	U	2	NAG	C4-C5-C6-O6
5	K	2	NAG	O5-C5-C6-O6
5	b	1	NAG	O5-C5-C6-O6
5	D	2	NAG	O5-C5-C6-O6
5	Z	1	NAG	O5-C5-C6-O6
5	W	1	NAG	O5-C5-C6-O6
8	V	3	BMA	O5-C5-C6-O6
5	E	2	NAG	O5-C5-C6-O6
5	b	2	NAG	O5-C5-C6-O6
6	J	2	NAG	O5-C5-C6-O6
5	b	1	NAG	C4-C5-C6-O6
5	O	2	NAG	O5-C5-C6-O6
5	Z	2	NAG	O5-C5-C6-O6
5	a	1	NAG	C4-C5-C6-O6
5	M	2	NAG	O5-C5-C6-O6
5	P	1	NAG	O5-C5-C6-O6
5	P	2	NAG	O5-C5-C6-O6
8	V	1	NAG	O5-C5-C6-O6
5	D	2	NAG	C4-C5-C6-O6
5	R	1	NAG	O5-C5-C6-O6
5	K	2	NAG	C4-C5-C6-O6
5	E	2	NAG	C4-C5-C6-O6
5	P	1	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
5	P	2	NAG	C4-C5-C6-O6
5	R	1	NAG	C4-C5-C6-O6
8	V	1	NAG	C4-C5-C6-O6
5	W	1	NAG	C4-C5-C6-O6
8	V	3	BMA	C4-C5-C6-O6
5	K	2	NAG	C8-C7-N2-C2
5	K	2	NAG	O7-C7-N2-C2
5	M	1	NAG	C8-C7-N2-C2
5	M	1	NAG	O7-C7-N2-C2
5	R	1	NAG	C8-C7-N2-C2
5	R	1	NAG	O7-C7-N2-C2
5	Z	1	NAG	C8-C7-N2-C2
5	Z	1	NAG	O7-C7-N2-C2
7	Q	1	NAG	C8-C7-N2-C2
7	Q	1	NAG	O7-C7-N2-C2
5	Z	1	NAG	C4-C5-C6-O6
5	Z	2	NAG	C4-C5-C6-O6
5	U	2	NAG	O5-C5-C6-O6
5	a	1	NAG	O5-C5-C6-O6
5	O	2	NAG	C4-C5-C6-O6
6	J	2	NAG	C4-C5-C6-O6
5	M	1	NAG	O5-C5-C6-O6
5	M	1	NAG	C4-C5-C6-O6
5	S	1	NAG	O5-C5-C6-O6
7	Q	5	MAN	O5-C5-C6-O6
6	X	3	BMA	O5-C5-C6-O6
9	e	4	MAN	O5-C5-C6-O6
5	R	2	NAG	C4-C5-C6-O6
6	X	3	BMA	C4-C5-C6-O6
5	W	2	NAG	O5-C5-C6-O6
6	X	6	MAN	O5-C5-C6-O6
5	b	2	NAG	C4-C5-C6-O6
6	J	6	MAN	O5-C5-C6-O6
5	N	2	NAG	C4-C5-C6-O6
8	V	5	MAN	O5-C5-C6-O6
9	e	1	NAG	O5-C5-C6-O6
8	V	2	NAG	O5-C5-C6-O6
5	Y	2	NAG	C4-C5-C6-O6
5	S	1	NAG	C4-C5-C6-O6
5	R	2	NAG	O5-C5-C6-O6
5	N	2	NAG	O5-C5-C6-O6
5	Y	2	NAG	O5-C5-C6-O6

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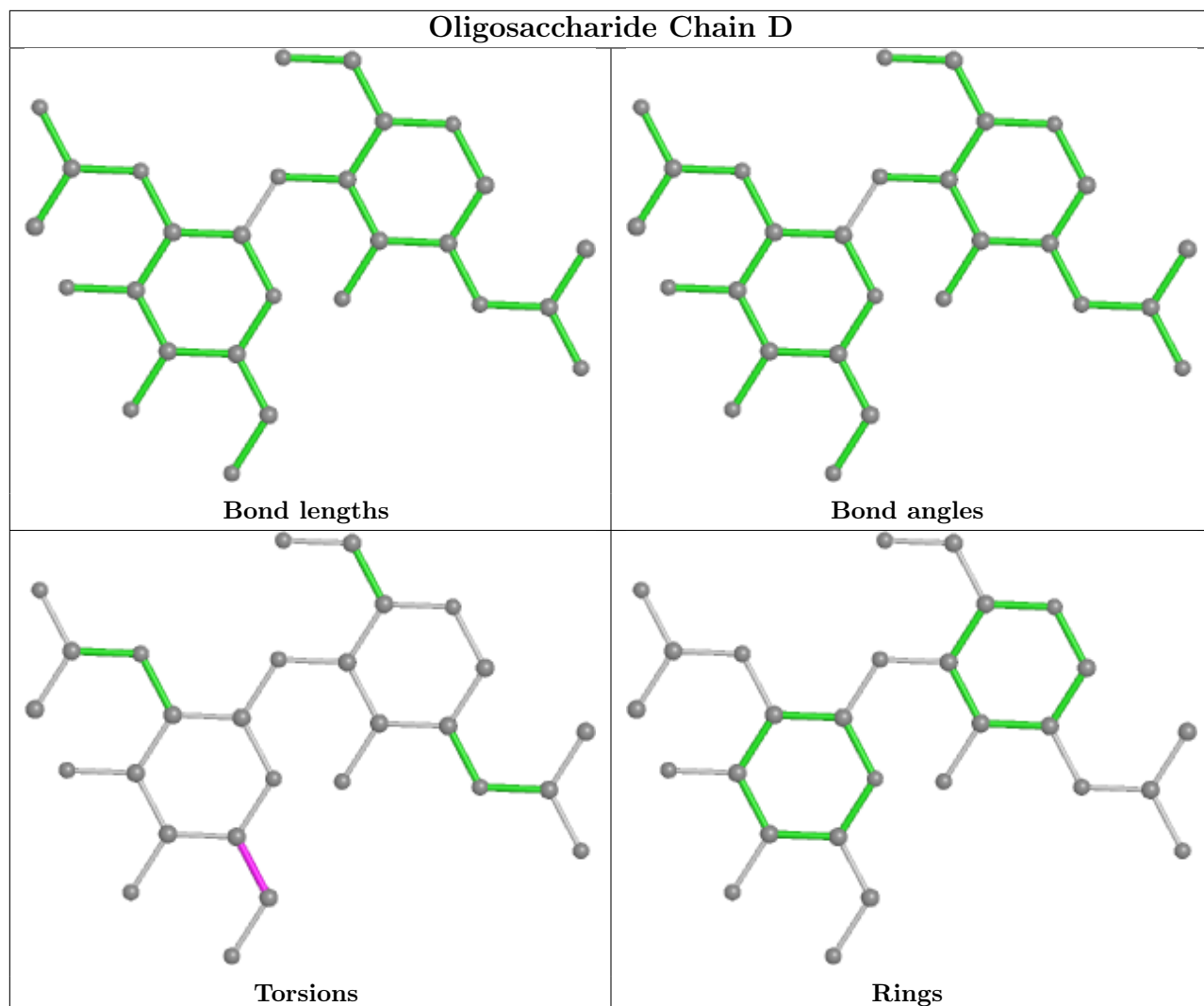
Mol	Chain	Res	Type	Atoms
5	M	2	NAG	C3-C2-N2-C7
5	R	2	NAG	C3-C2-N2-C7
5	Z	2	NAG	C3-C2-N2-C7
8	d	2	NAG	C3-C2-N2-C7
5	U	1	NAG	C4-C5-C6-O6
6	J	3	BMA	C4-C5-C6-O6
7	Q	2	NAG	C4-C5-C6-O6
5	U	1	NAG	O5-C5-C6-O6
5	M	1	NAG	C3-C2-N2-C7
5	R	1	NAG	C3-C2-N2-C7
5	Z	1	NAG	C3-C2-N2-C7

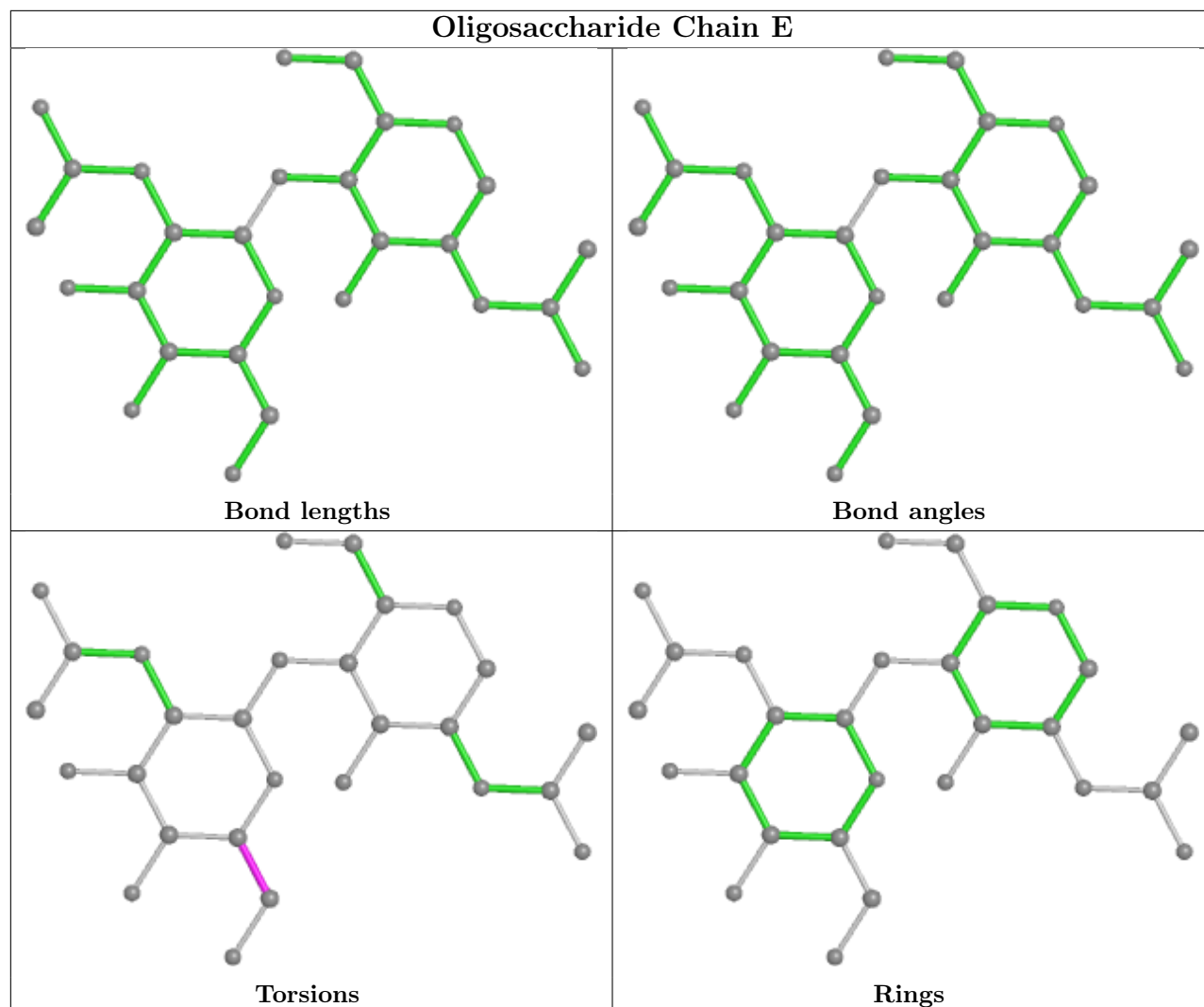
All (1) ring outliers are listed below:

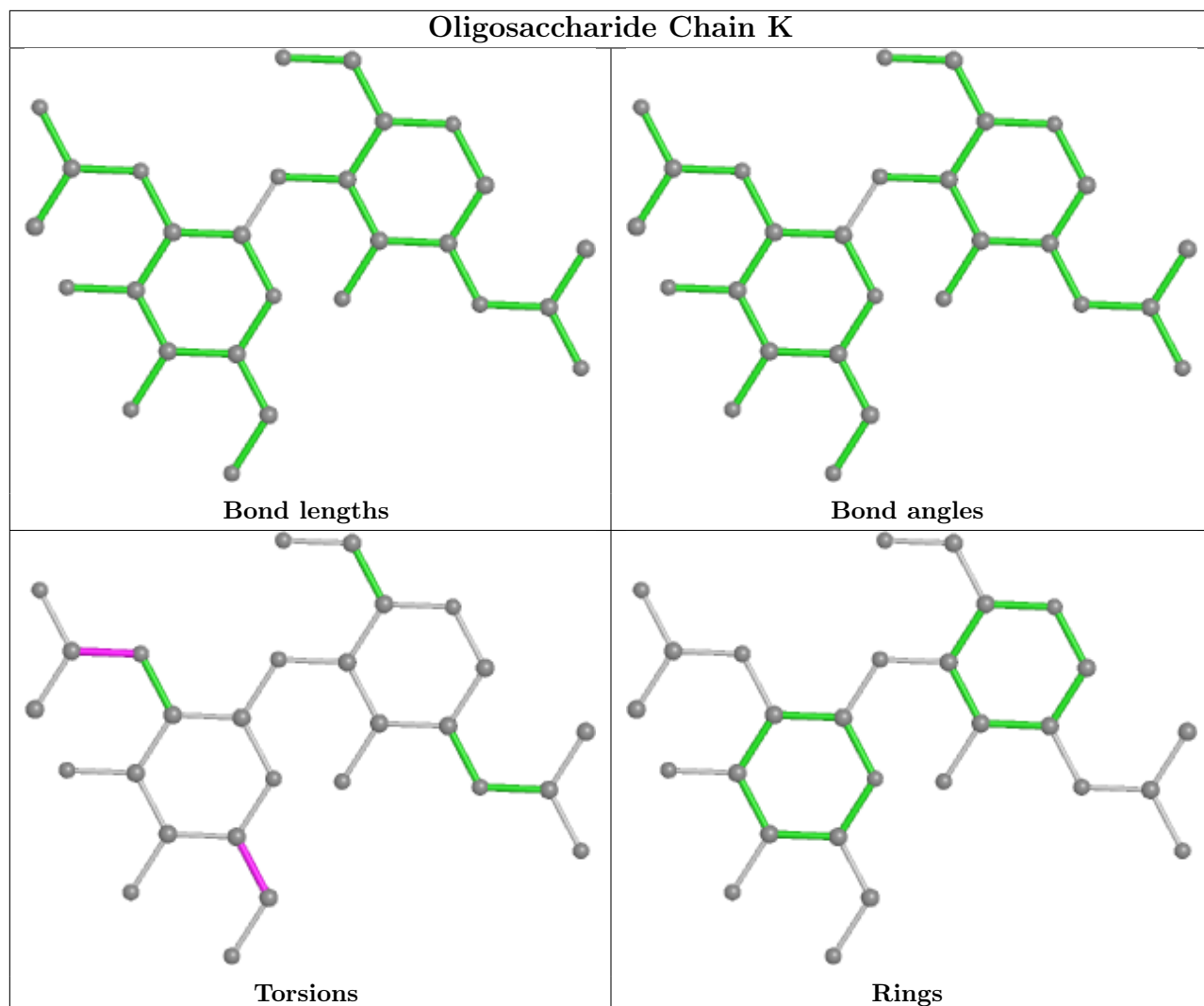
Mol	Chain	Res	Type	Atoms
9	e	5	MAN	C1-C2-C3-C4-C5-O5

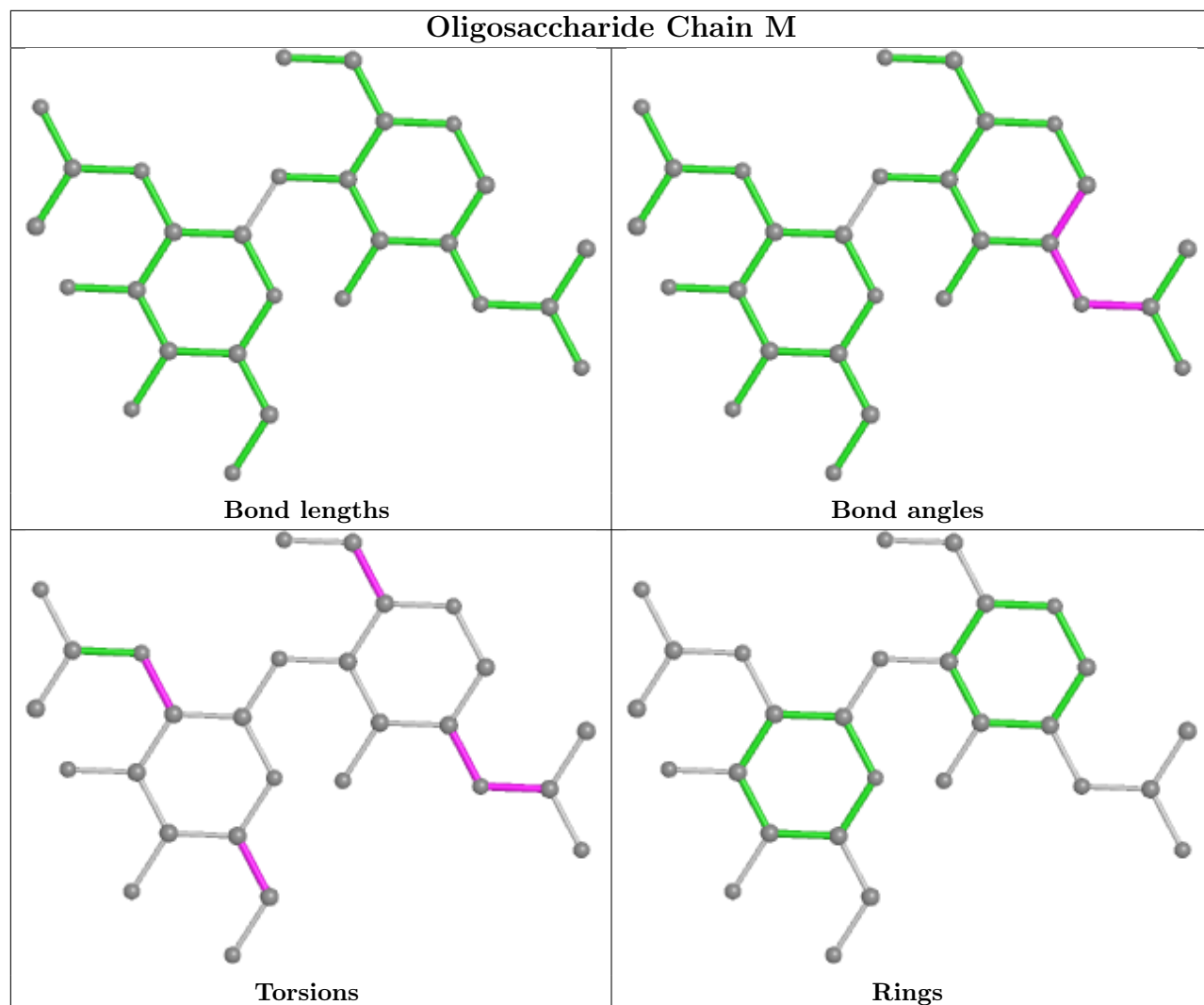
No monomer is involved in short contacts.

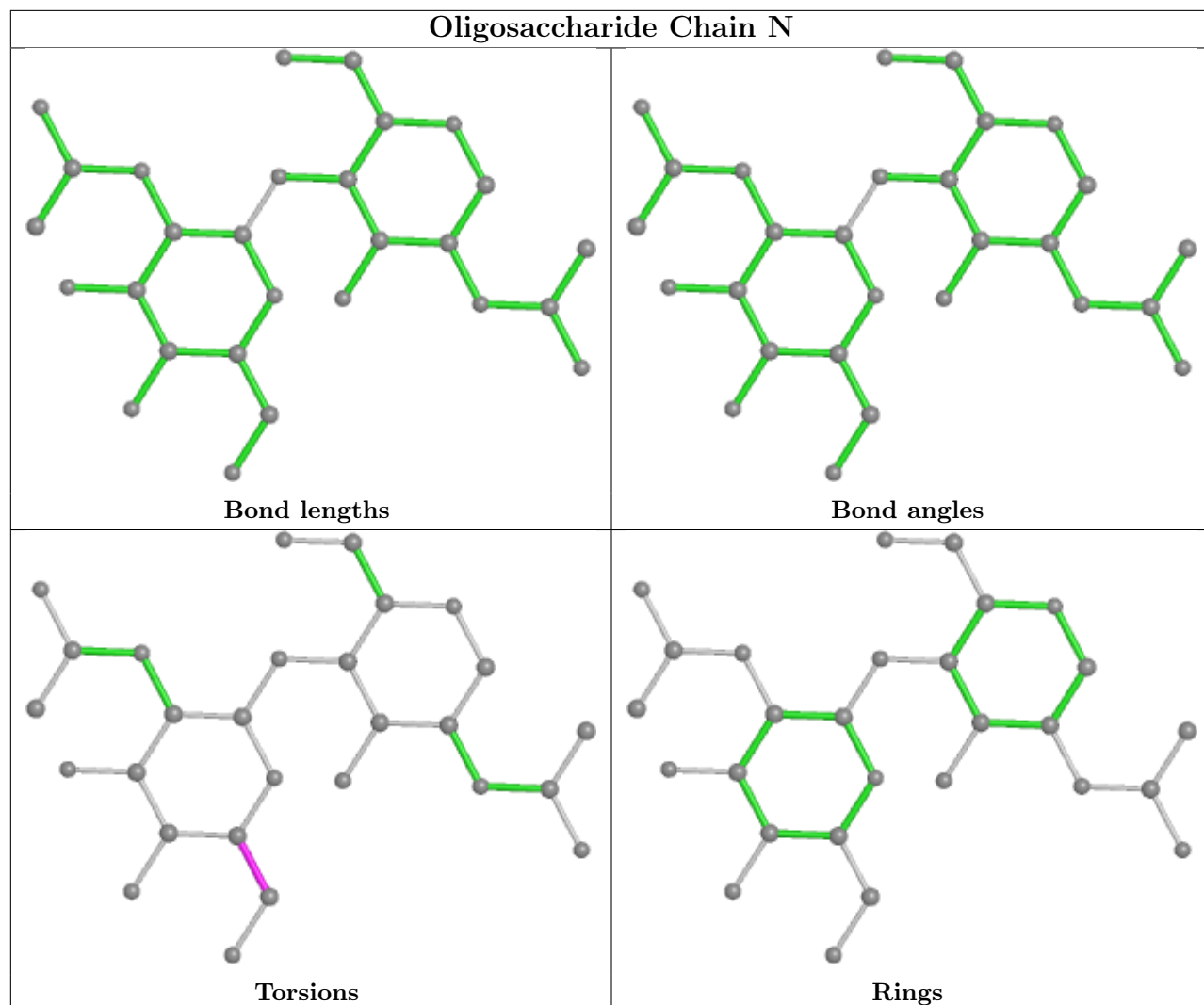
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

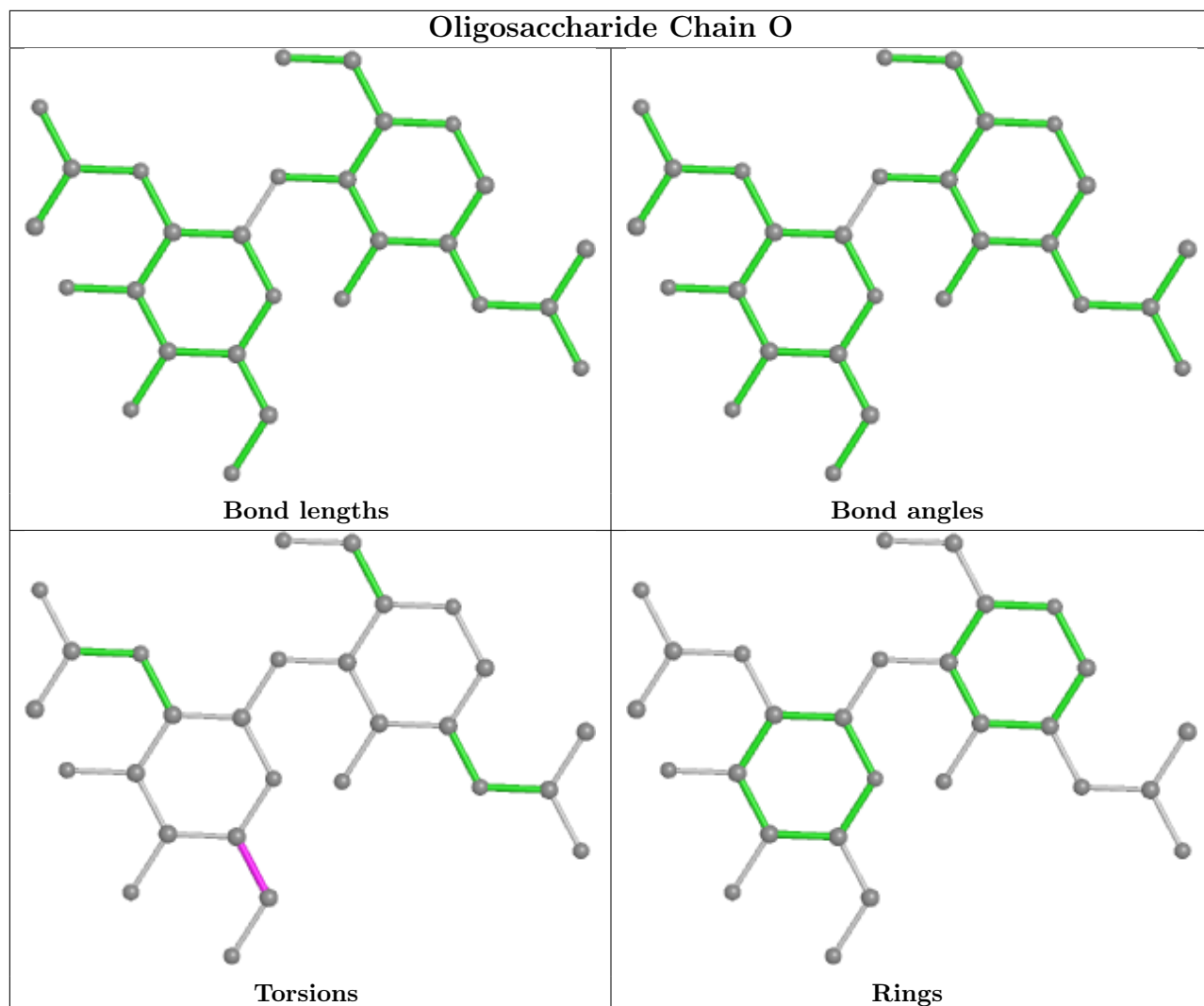


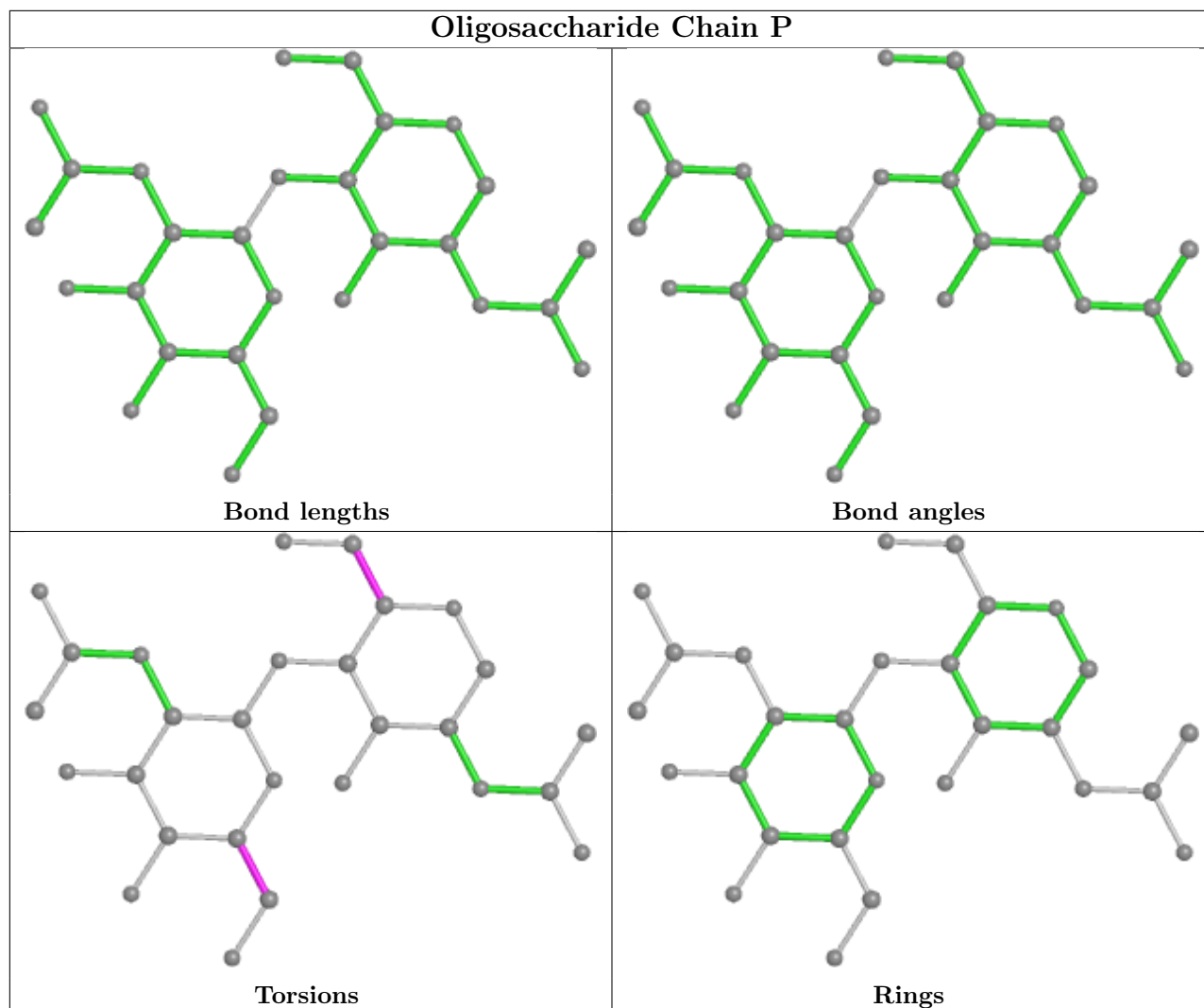


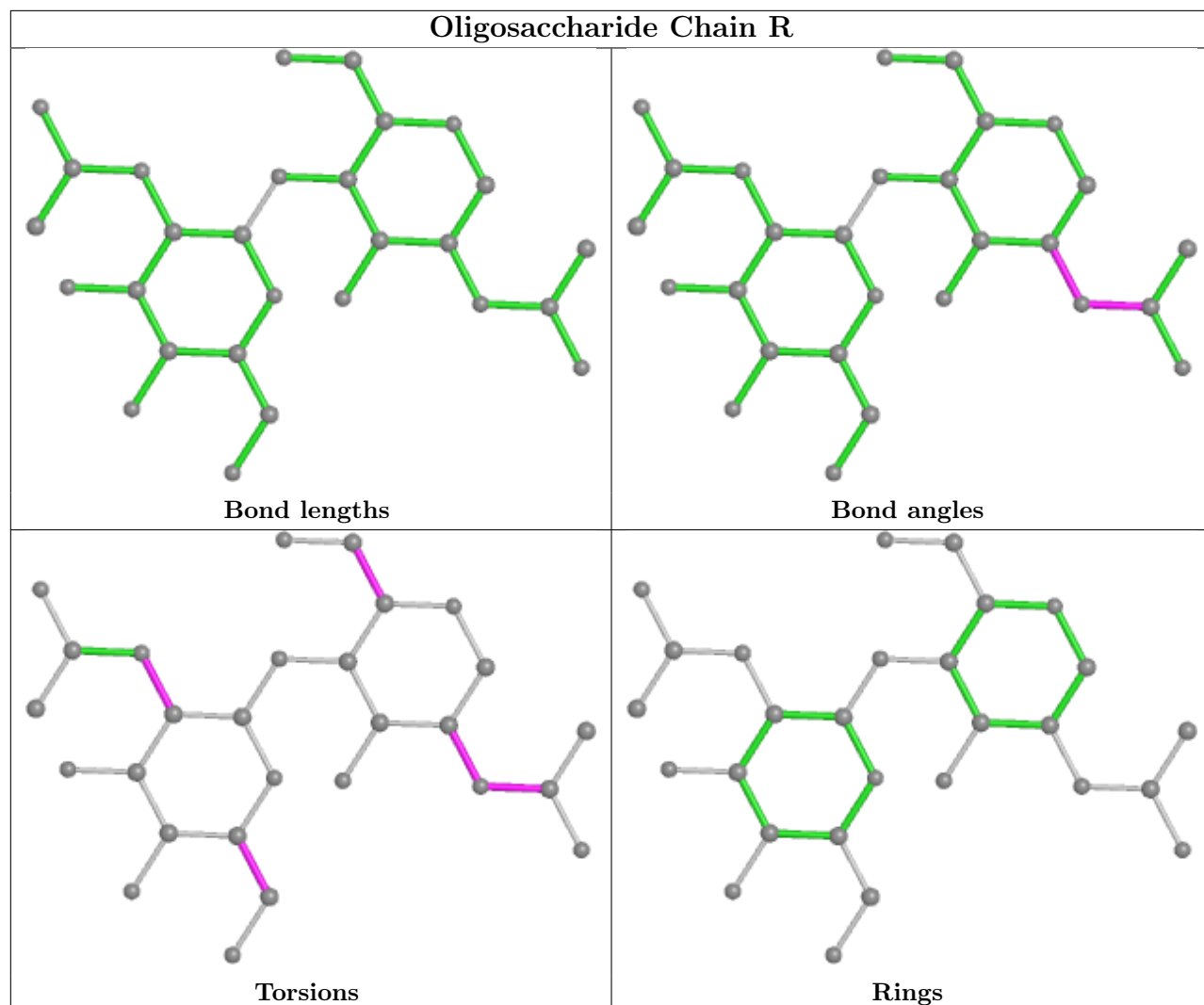


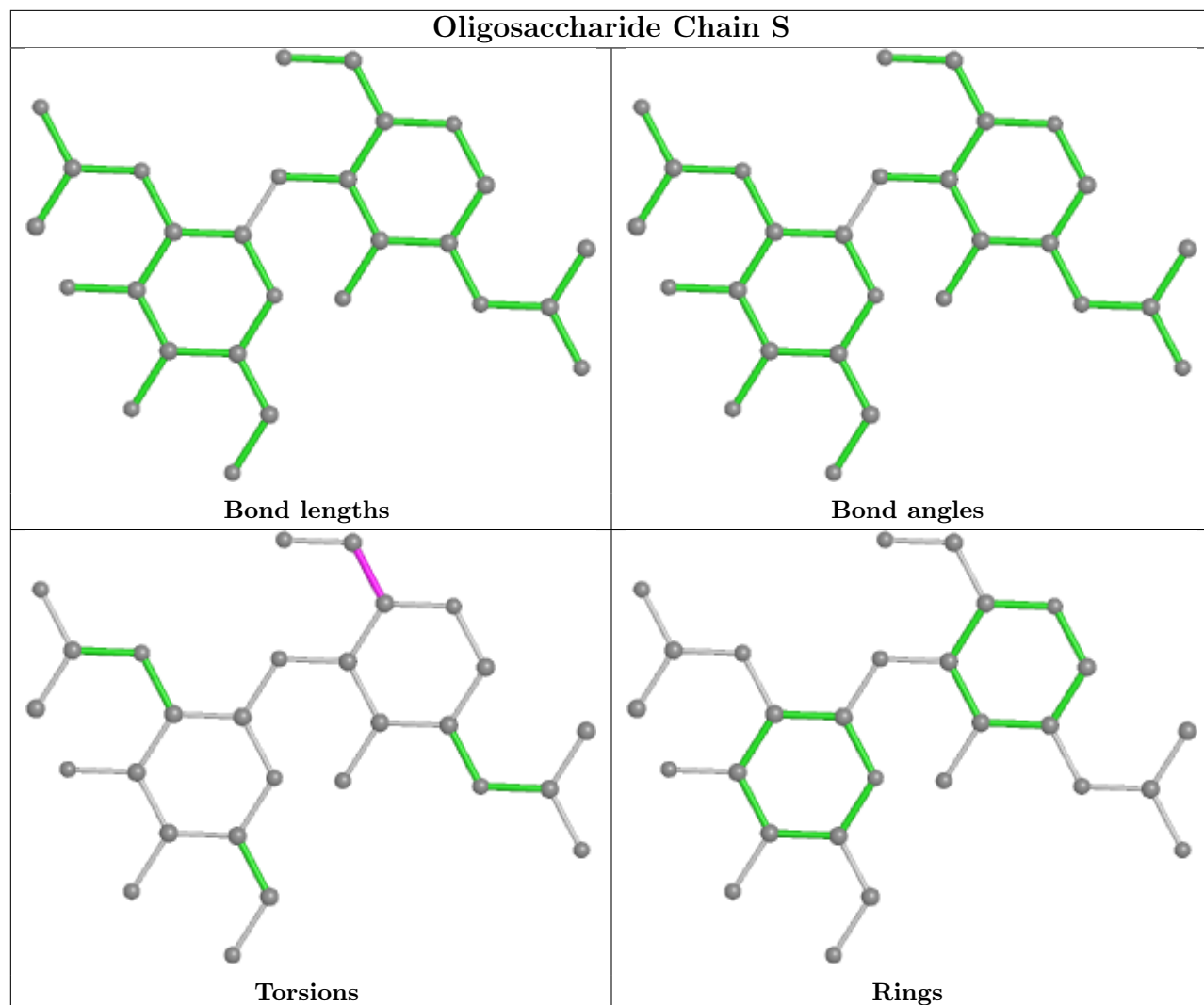


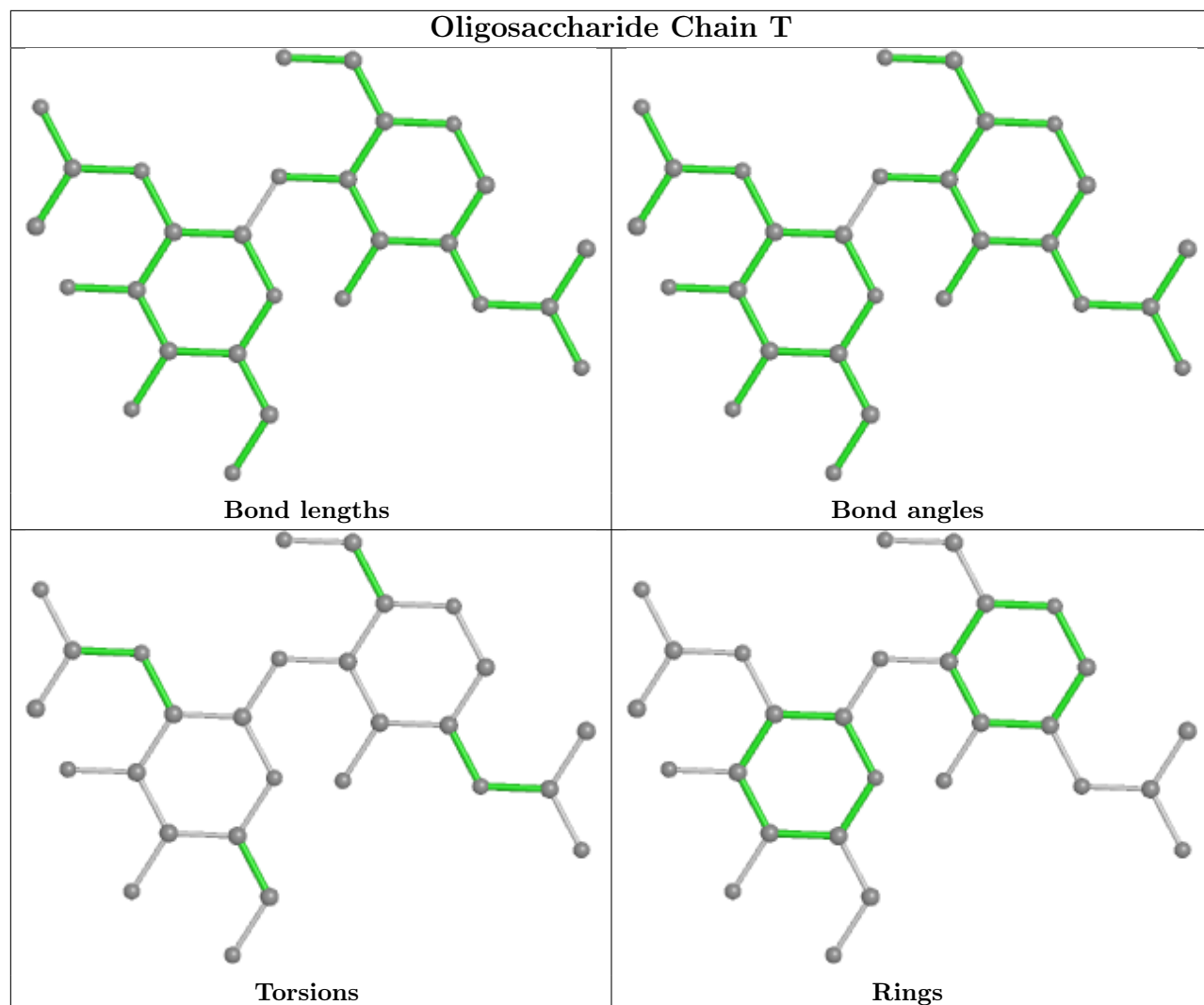


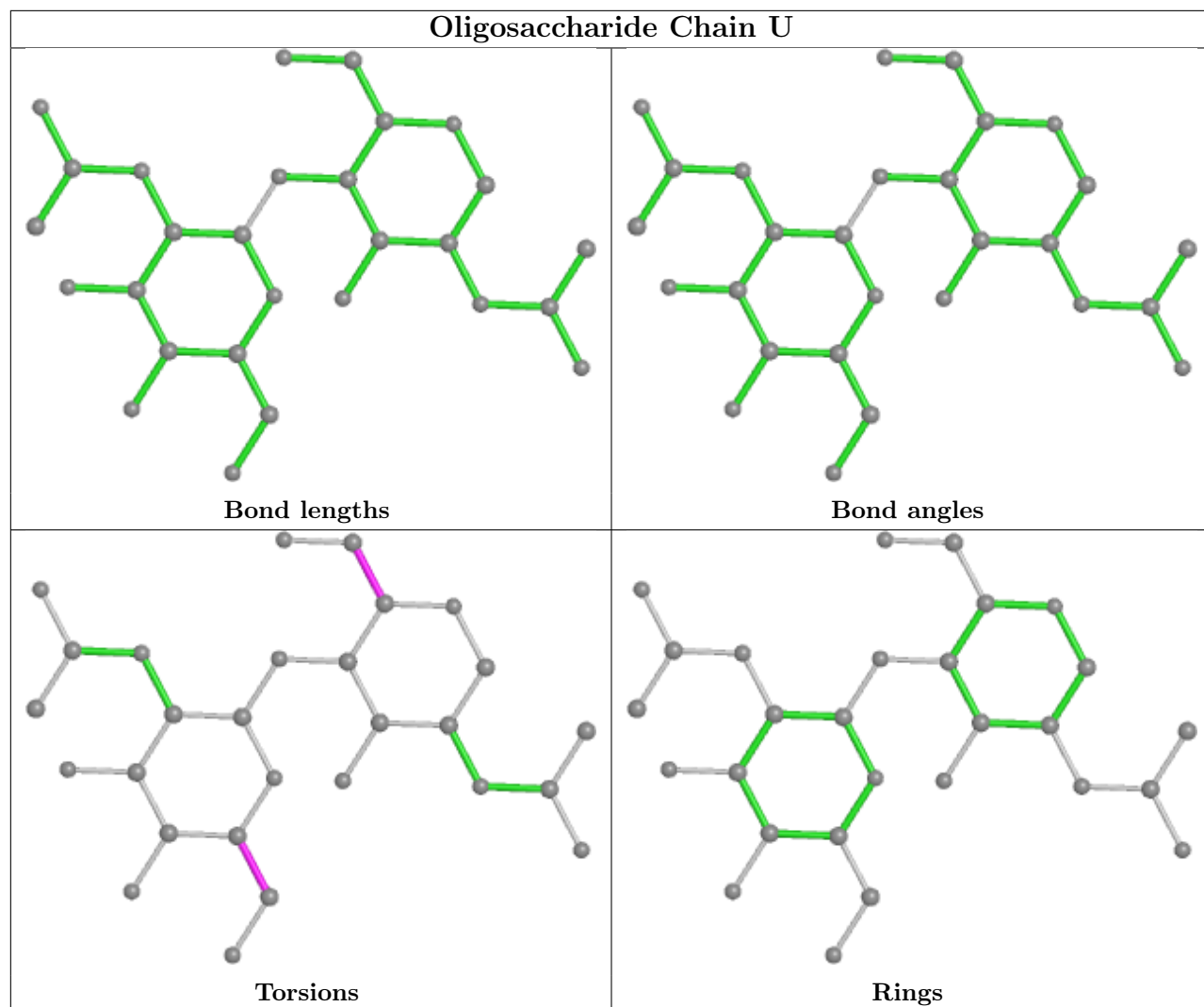


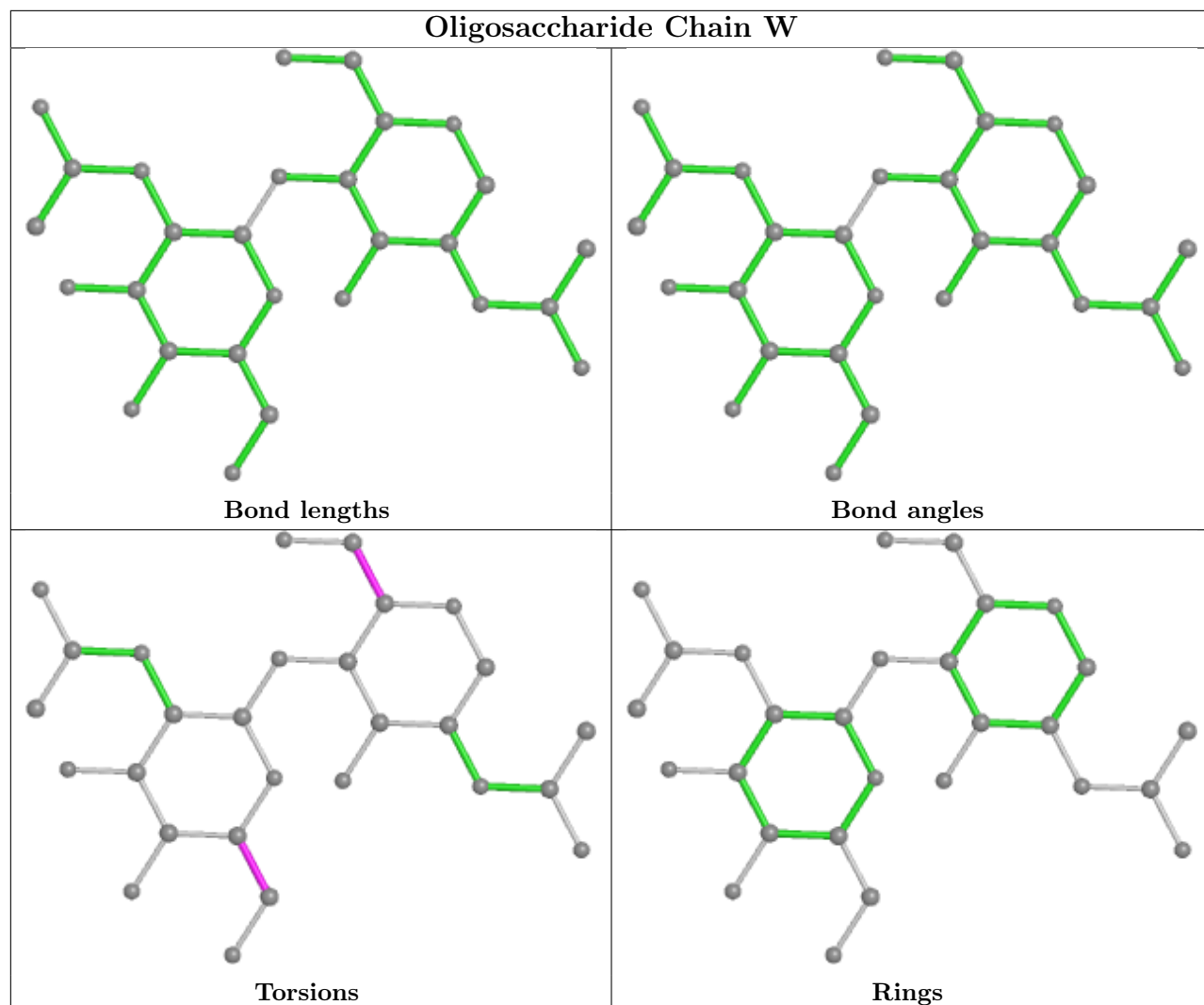


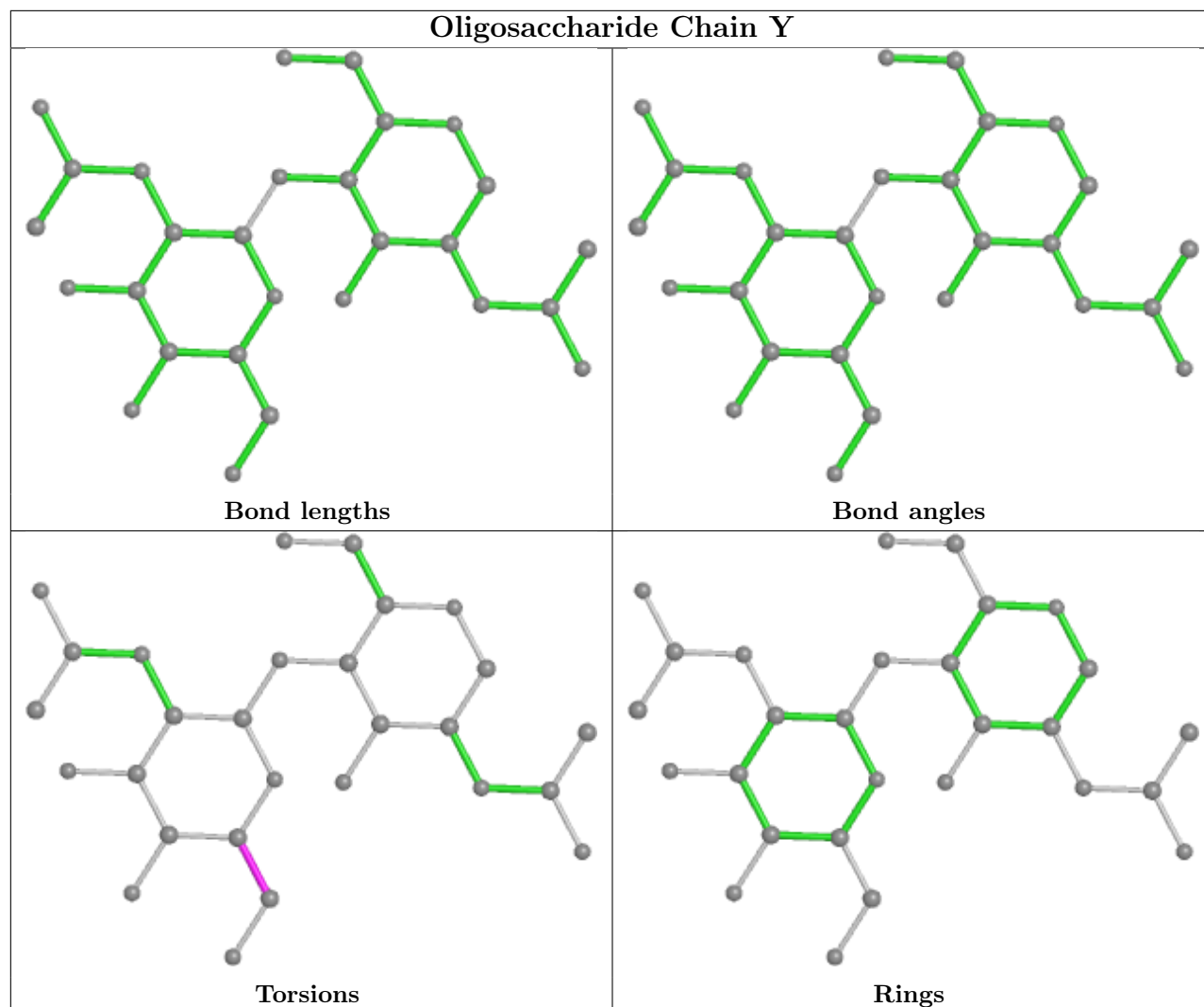


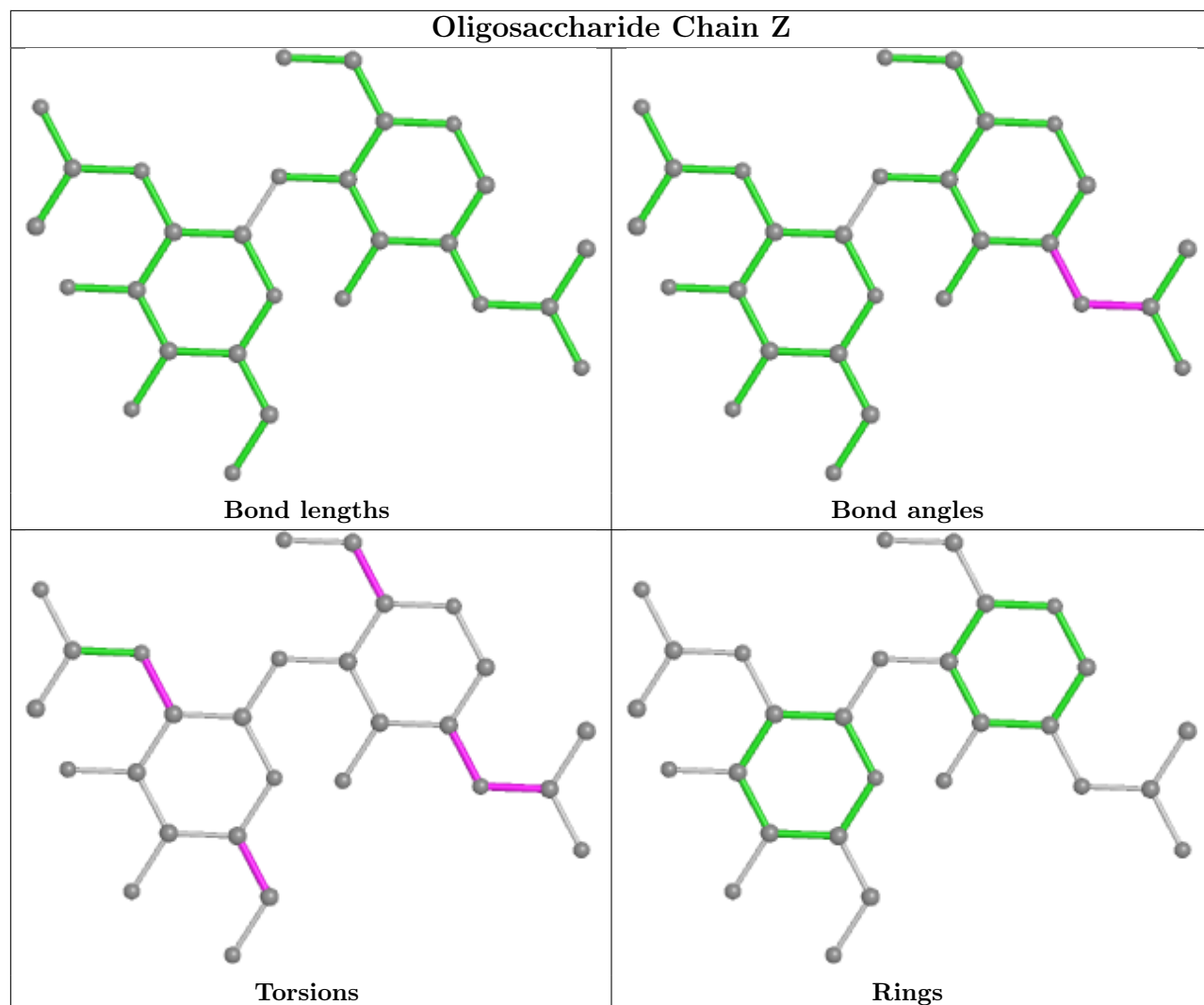


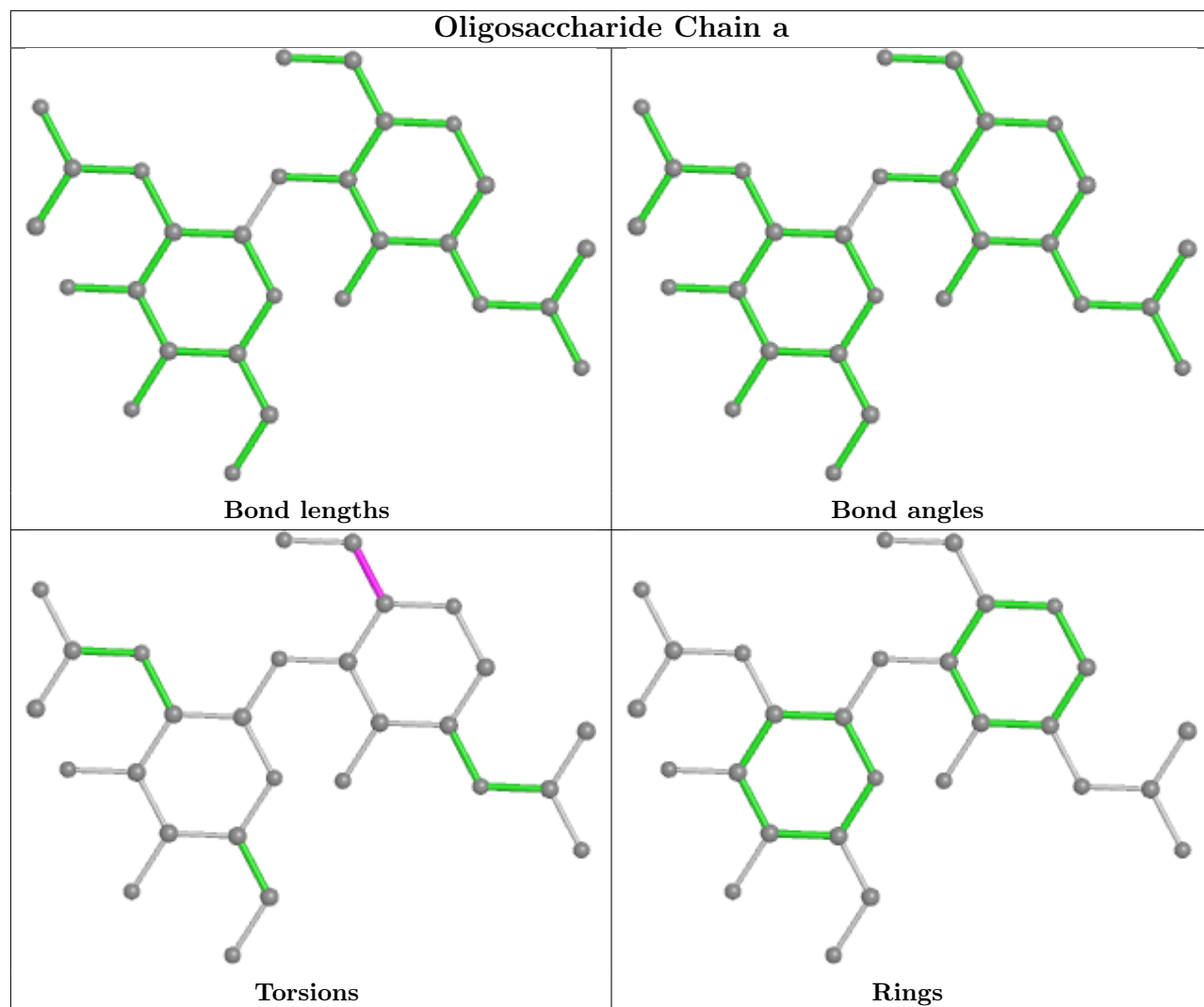


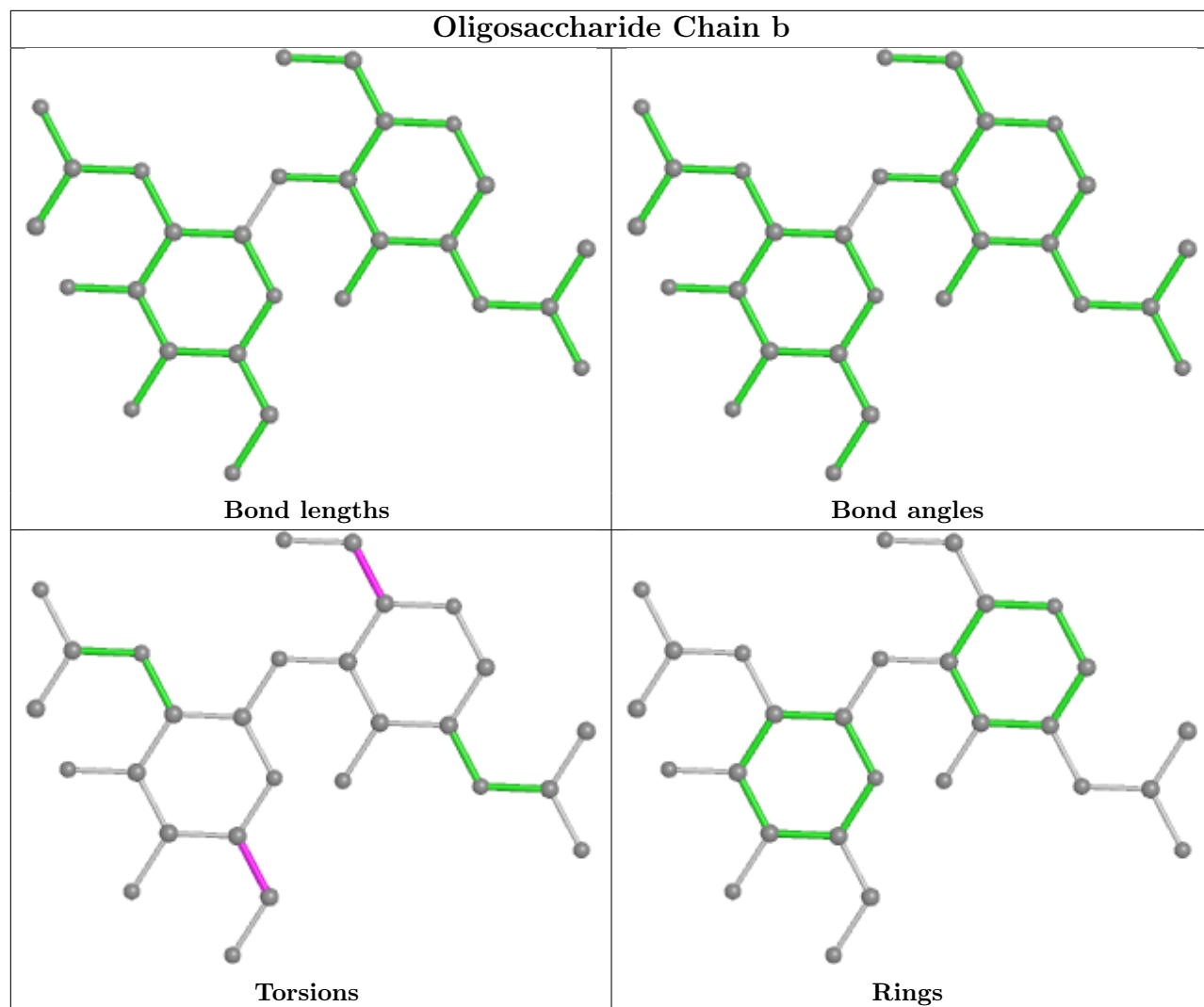


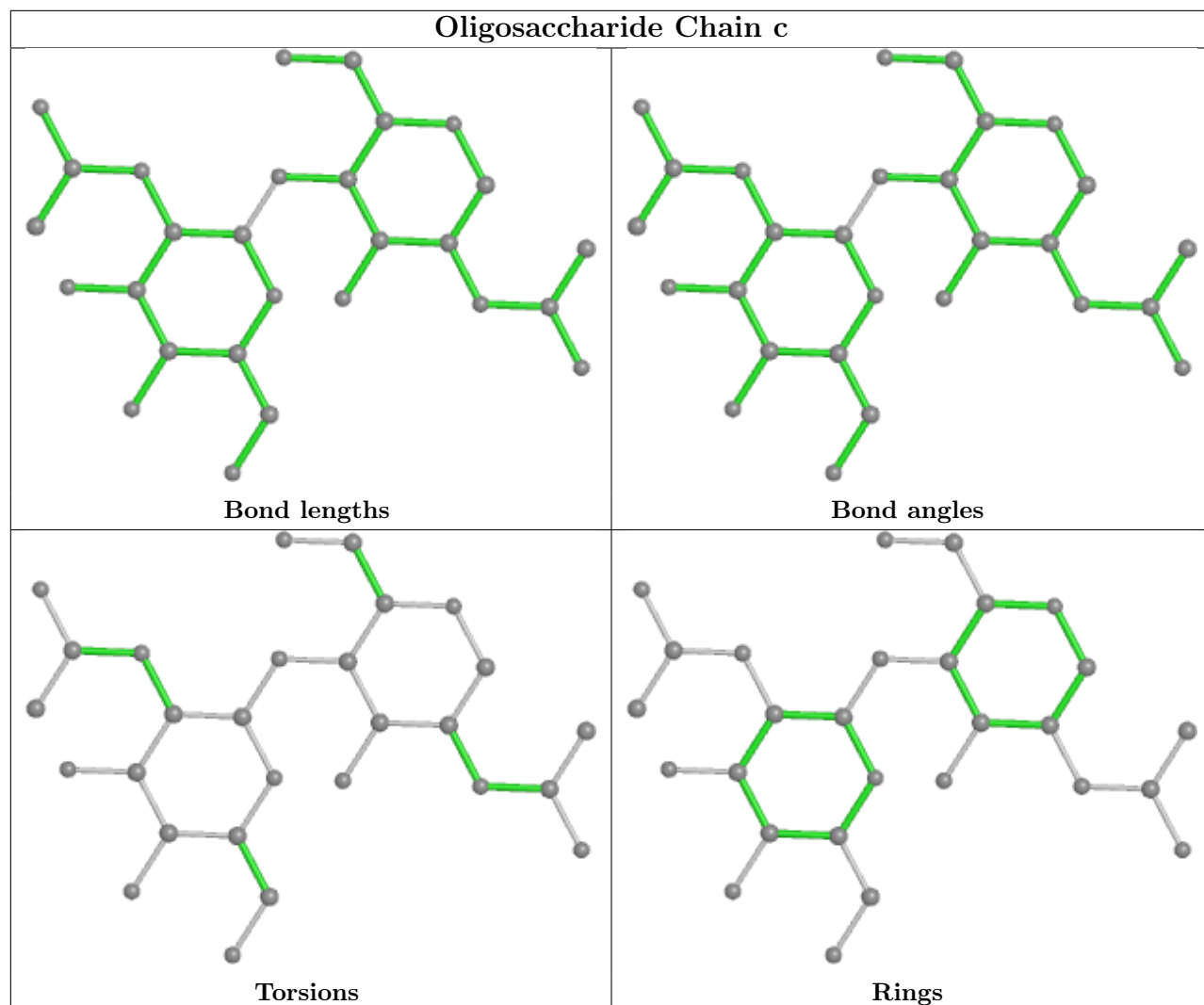


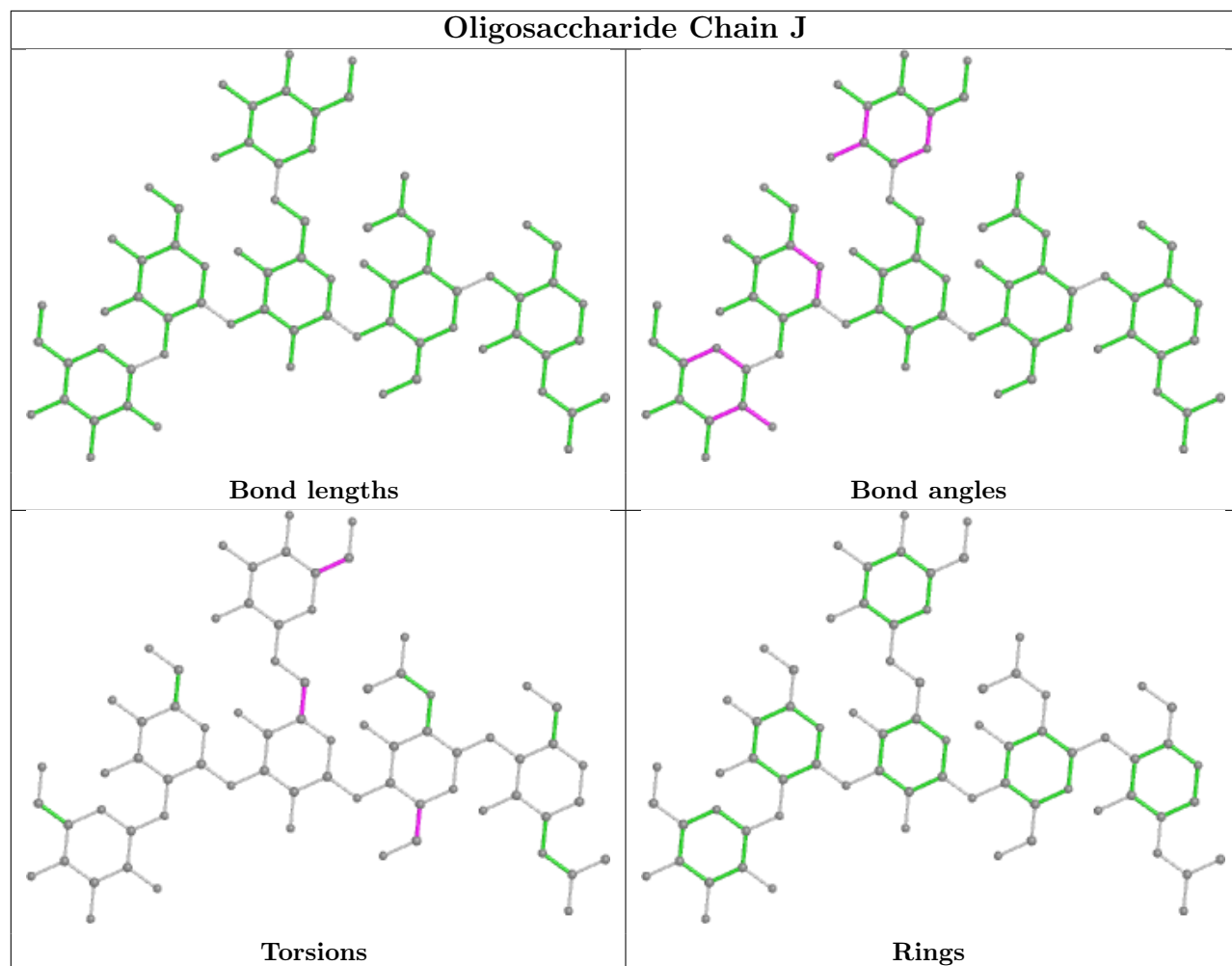


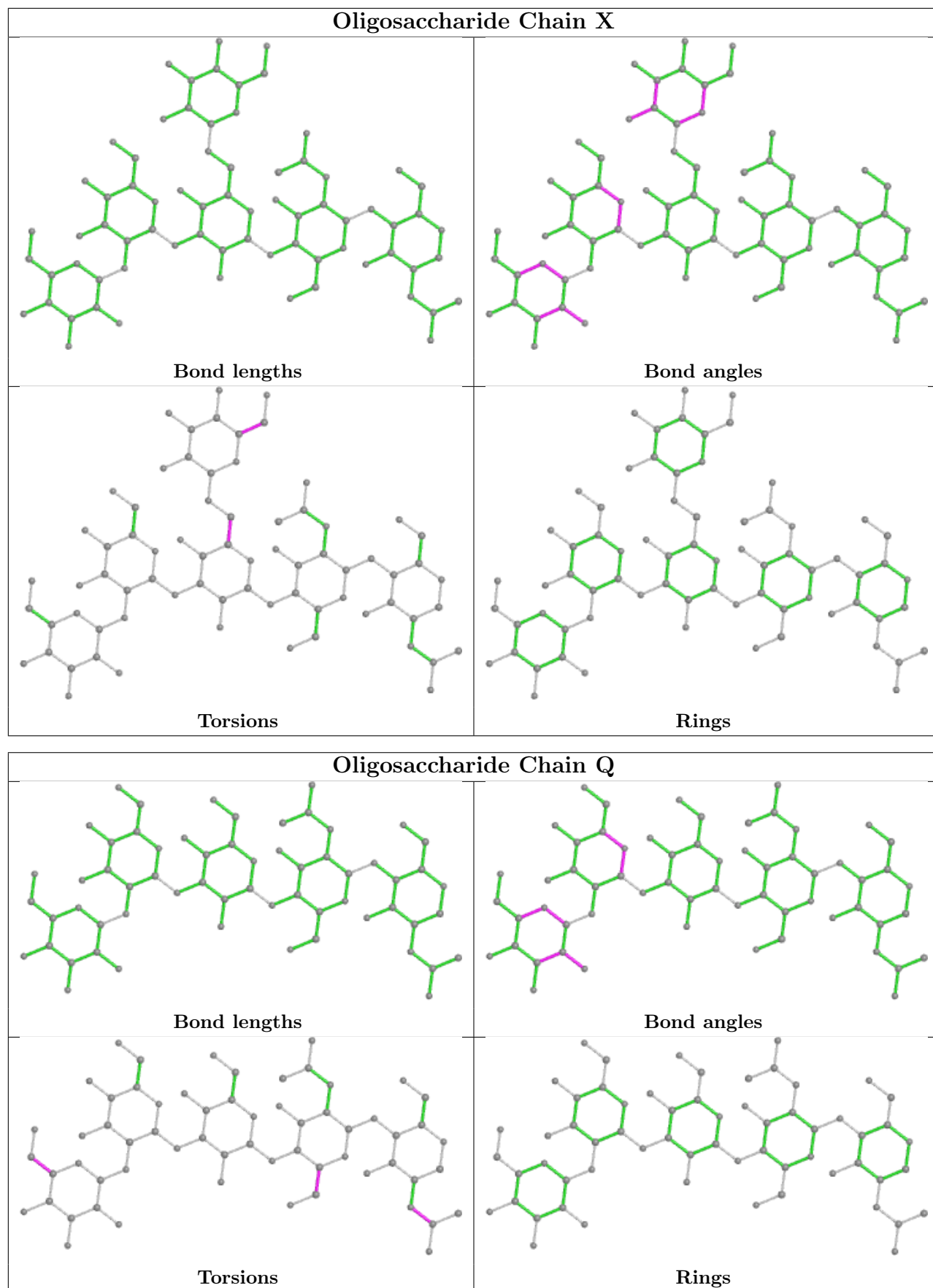


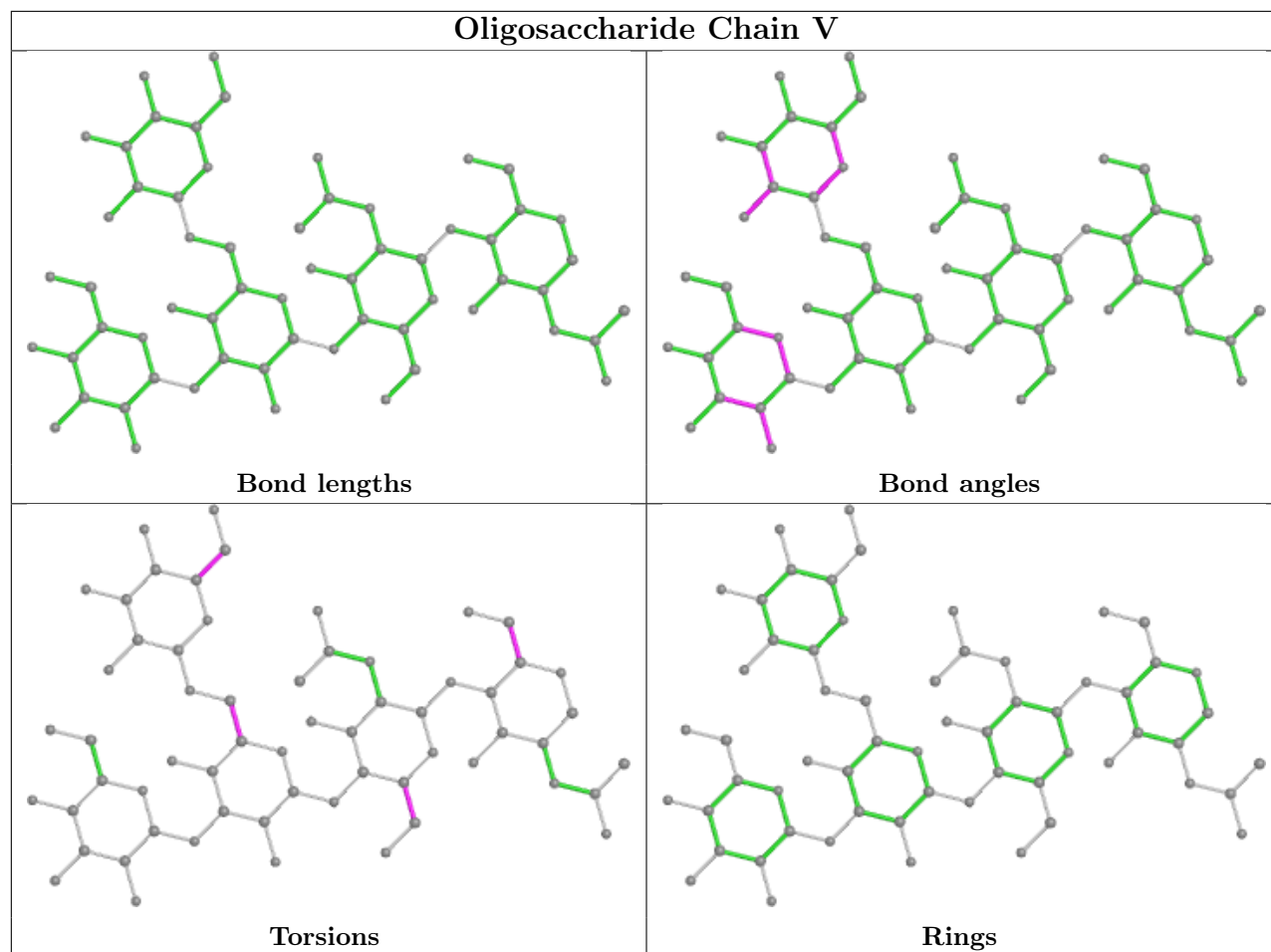


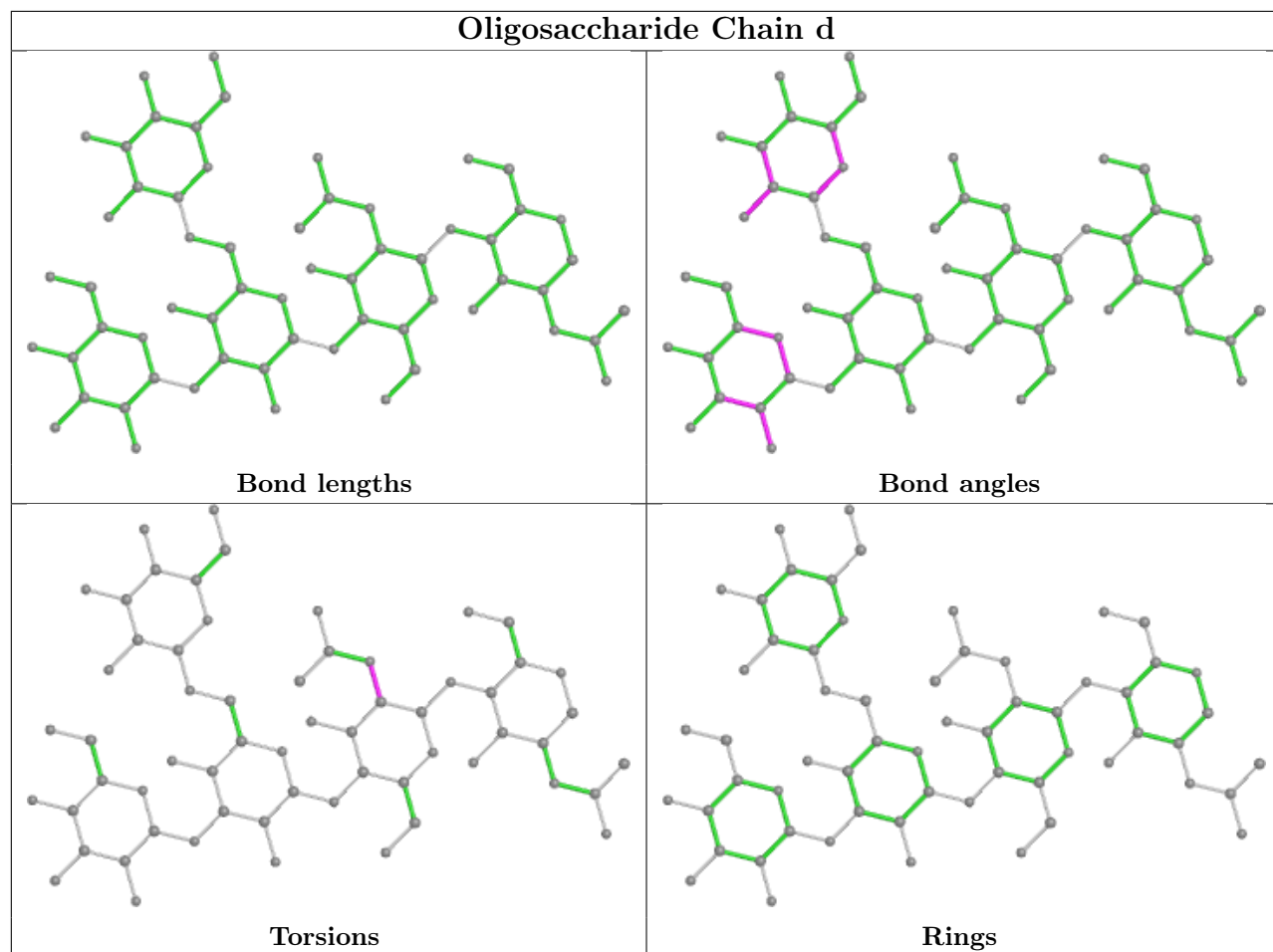


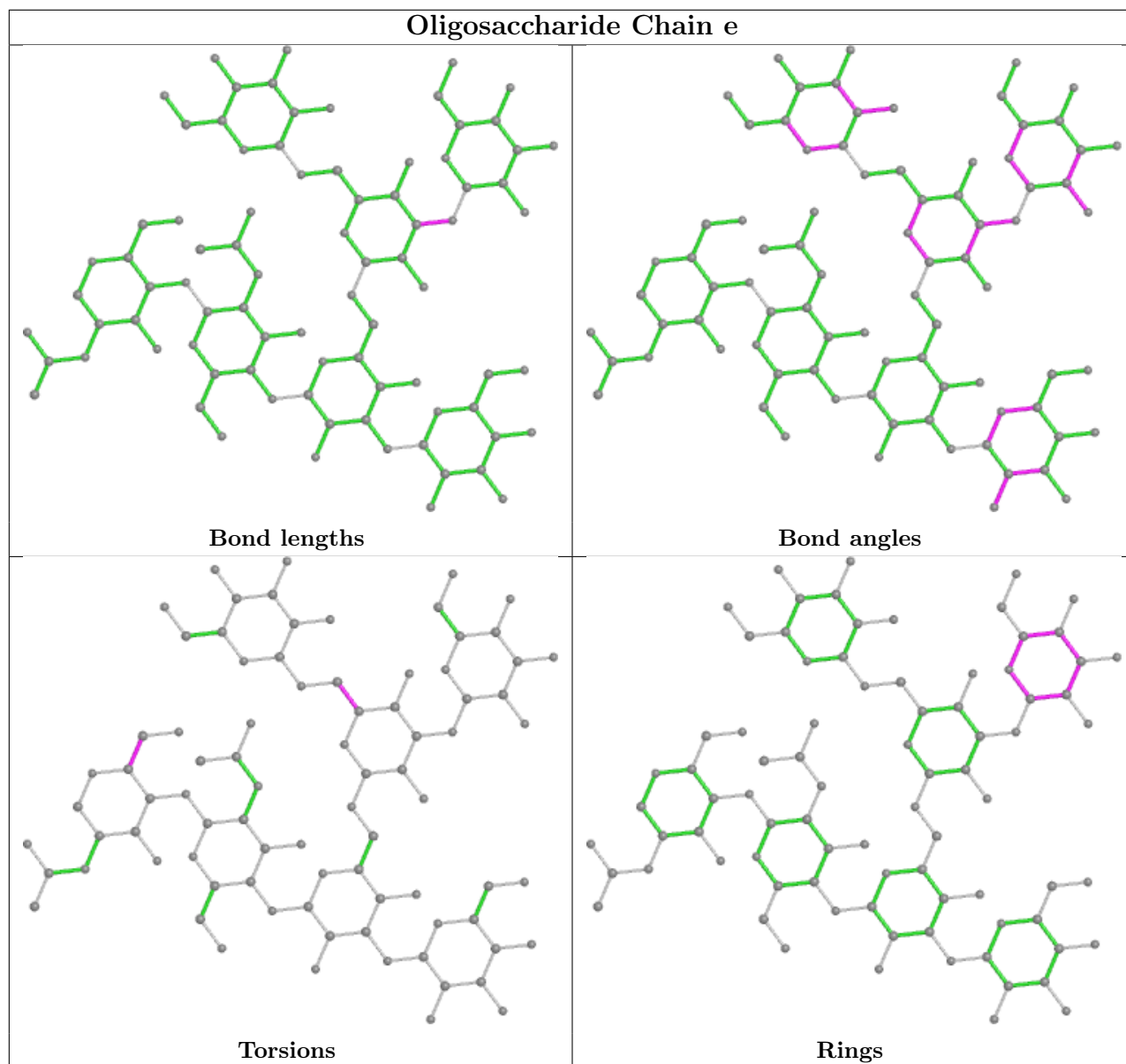












5.6 Ligand geometry [i](#)

40 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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
10	NAG	G	610	2	14,14,15	0.22	0	17,19,21	0.39	0
10	NAG	A	703	1	14,14,15	0.24	0	17,19,21	0.42	0
10	NAG	C	602	2	14,14,15	0.23	0	17,19,21	0.43	0
10	NAG	I	605	2	14,14,15	0.20	0	17,19,21	0.52	0
10	NAG	C	606	2	14,14,15	0.19	0	17,19,21	0.53	0
10	NAG	F	703	1	14,14,15	0.26	0	17,19,21	0.44	0
10	NAG	C	607	2	14,14,15	0.24	0	17,19,21	0.44	0
10	NAG	F	701	1	14,14,15	0.24	0	17,19,21	0.41	0
10	NAG	I	602	2	14,14,15	0.21	0	17,19,21	0.44	0
10	NAG	A	702	1	14,14,15	0.22	0	17,19,21	0.41	0
10	NAG	C	609	2	14,14,15	0.21	0	17,19,21	0.41	0
10	NAG	B	701	1	14,14,15	0.24	0	17,19,21	0.43	0
10	NAG	G	606	2	14,14,15	0.23	0	17,19,21	0.53	0
10	NAG	I	609	2	14,14,15	0.23	0	17,19,21	0.43	0
10	NAG	I	610	2	14,14,15	0.25	0	17,19,21	0.43	0
10	NAG	C	603	2	14,14,15	0.18	0	17,19,21	0.42	0
10	NAG	G	605	2	14,14,15	0.24	0	17,19,21	0.42	0
10	NAG	A	701	1	14,14,15	0.25	0	17,19,21	0.43	0
10	NAG	G	608	2	14,14,15	0.37	0	17,19,21	0.42	0
10	NAG	G	609	2	14,14,15	0.21	0	17,19,21	0.42	0
10	NAG	G	603	2	14,14,15	0.20	0	17,19,21	0.41	0
10	NAG	F	702	1	14,14,15	0.21	0	17,19,21	0.41	0
10	NAG	G	604	2	14,14,15	0.22	0	17,19,21	0.42	0
10	NAG	C	611	2	14,14,15	0.45	0	17,19,21	0.46	0
10	NAG	G	611	2	14,14,15	0.27	0	17,19,21	0.54	0
10	NAG	I	606	2	14,14,15	0.23	0	17,19,21	0.43	0
10	NAG	I	601	2	14,14,15	0.24	0	17,19,21	0.53	0
10	NAG	C	605	2	14,14,15	0.21	0	17,19,21	0.41	0
10	NAG	I	607	2	14,14,15	0.21	0	17,19,21	0.37	0
10	NAG	C	601	2	14,14,15	0.25	0	17,19,21	0.53	0
10	NAG	B	702	1	14,14,15	0.21	0	17,19,21	0.42	0
10	NAG	G	601	2	14,14,15	0.24	0	17,19,21	0.53	0
10	NAG	I	608	2	14,14,15	0.30	0	17,19,21	0.47	0
10	NAG	C	604	2	14,14,15	0.21	0	17,19,21	0.41	0
10	NAG	G	607	2	14,14,15	0.22	0	17,19,21	0.42	0
10	NAG	C	608	2	14,14,15	0.23	0	17,19,21	0.40	0
10	NAG	I	603	2	14,14,15	0.23	0	17,19,21	0.41	0
10	NAG	I	604	2	14,14,15	0.20	0	17,19,21	0.43	0
10	NAG	C	610	2	14,14,15	0.28	0	17,19,21	0.58	0
10	NAG	G	602	2	14,14,15	0.22	0	17,19,21	0.42	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	G	610	2	-	2/6/23/26	0/1/1/1
10	NAG	A	703	1	-	0/6/23/26	0/1/1/1
10	NAG	C	602	2	-	2/6/23/26	0/1/1/1
10	NAG	I	605	2	-	3/6/23/26	0/1/1/1
10	NAG	C	606	2	-	2/6/23/26	0/1/1/1
10	NAG	F	703	1	-	2/6/23/26	0/1/1/1
10	NAG	C	607	2	-	0/6/23/26	0/1/1/1
10	NAG	F	701	1	-	2/6/23/26	0/1/1/1
10	NAG	I	602	2	-	2/6/23/26	0/1/1/1
10	NAG	A	702	1	-	0/6/23/26	0/1/1/1
10	NAG	C	609	2	-	2/6/23/26	0/1/1/1
10	NAG	B	701	1	-	0/6/23/26	0/1/1/1
10	NAG	G	606	2	-	3/6/23/26	0/1/1/1
10	NAG	I	609	2	-	2/6/23/26	0/1/1/1
10	NAG	I	610	2	-	2/6/23/26	0/1/1/1
10	NAG	C	603	2	-	2/6/23/26	0/1/1/1
10	NAG	G	605	2	-	0/6/23/26	0/1/1/1
10	NAG	A	701	1	-	2/6/23/26	0/1/1/1
10	NAG	G	608	2	-	2/6/23/26	0/1/1/1
10	NAG	G	609	2	-	0/6/23/26	0/1/1/1
10	NAG	G	603	2	-	2/6/23/26	0/1/1/1
10	NAG	F	702	1	-	2/6/23/26	0/1/1/1
10	NAG	G	604	2	-	2/6/23/26	0/1/1/1
10	NAG	C	611	2	-	2/6/23/26	0/1/1/1
10	NAG	G	611	2	-	3/6/23/26	0/1/1/1
10	NAG	I	606	2	-	2/6/23/26	0/1/1/1
10	NAG	I	601	2	-	3/6/23/26	0/1/1/1
10	NAG	C	605	2	-	1/6/23/26	0/1/1/1
10	NAG	I	607	2	-	1/6/23/26	0/1/1/1
10	NAG	C	601	2	-	3/6/23/26	0/1/1/1
10	NAG	B	702	1	-	2/6/23/26	0/1/1/1
10	NAG	G	601	2	-	1/6/23/26	0/1/1/1
10	NAG	I	608	2	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
10	NAG	C	604	2	-	2/6/23/26	0/1/1/1
10	NAG	G	607	2	-	2/6/23/26	0/1/1/1
10	NAG	C	608	2	-	1/6/23/26	0/1/1/1
10	NAG	I	603	2	-	0/6/23/26	0/1/1/1
10	NAG	I	604	2	-	0/6/23/26	0/1/1/1
10	NAG	C	610	2	-	0/6/23/26	0/1/1/1
10	NAG	G	602	2	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (61) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	I	602	NAG	O5-C5-C6-O6
10	G	606	NAG	C4-C5-C6-O6
10	C	611	NAG	C4-C5-C6-O6
10	I	605	NAG	C4-C5-C6-O6
10	C	601	NAG	C4-C5-C6-O6
10	C	609	NAG	C4-C5-C6-O6
10	I	610	NAG	C4-C5-C6-O6
10	F	701	NAG	O5-C5-C6-O6
10	F	702	NAG	O5-C5-C6-O6
10	G	604	NAG	O5-C5-C6-O6
10	I	608	NAG	O5-C5-C6-O6
10	C	602	NAG	C4-C5-C6-O6
10	C	603	NAG	C4-C5-C6-O6
10	G	607	NAG	O5-C5-C6-O6
10	I	601	NAG	O5-C5-C6-O6
10	C	611	NAG	O5-C5-C6-O6
10	A	701	NAG	C4-C5-C6-O6
10	A	701	NAG	O5-C5-C6-O6
10	B	702	NAG	O5-C5-C6-O6
10	G	603	NAG	O5-C5-C6-O6
10	I	605	NAG	O5-C5-C6-O6
10	I	606	NAG	O5-C5-C6-O6
10	F	702	NAG	C4-C5-C6-O6
10	G	611	NAG	C4-C5-C6-O6
10	C	602	NAG	O5-C5-C6-O6
10	G	606	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
10	C	601	NAG	O5-C5-C6-O6
10	C	609	NAG	O5-C5-C6-O6
10	I	601	NAG	C4-C5-C6-O6
10	I	602	NAG	C4-C5-C6-O6
10	I	608	NAG	C4-C5-C6-O6
10	I	610	NAG	O5-C5-C6-O6
10	G	603	NAG	C4-C5-C6-O6
10	G	608	NAG	C4-C5-C6-O6
10	C	604	NAG	O5-C5-C6-O6
10	F	701	NAG	C4-C5-C6-O6
10	G	604	NAG	C4-C5-C6-O6
10	C	603	NAG	O5-C5-C6-O6
10	B	702	NAG	C4-C5-C6-O6
10	C	604	NAG	C4-C5-C6-O6
10	I	606	NAG	C4-C5-C6-O6
10	F	703	NAG	C4-C5-C6-O6
10	G	610	NAG	O5-C5-C6-O6
10	G	610	NAG	C4-C5-C6-O6
10	G	608	NAG	O5-C5-C6-O6
10	G	607	NAG	C4-C5-C6-O6
10	G	611	NAG	O5-C5-C6-O6
10	F	703	NAG	O5-C5-C6-O6
10	C	605	NAG	O5-C5-C6-O6
10	C	608	NAG	O5-C5-C6-O6
10	I	607	NAG	O5-C5-C6-O6
10	I	609	NAG	C4-C5-C6-O6
10	I	609	NAG	O5-C5-C6-O6
10	C	601	NAG	C3-C2-N2-C7
10	G	601	NAG	C3-C2-N2-C7
10	G	606	NAG	C3-C2-N2-C7
10	G	611	NAG	C3-C2-N2-C7
10	I	601	NAG	C3-C2-N2-C7
10	C	606	NAG	C1-C2-N2-C7
10	C	606	NAG	C3-C2-N2-C7
10	I	605	NAG	C3-C2-N2-C7

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

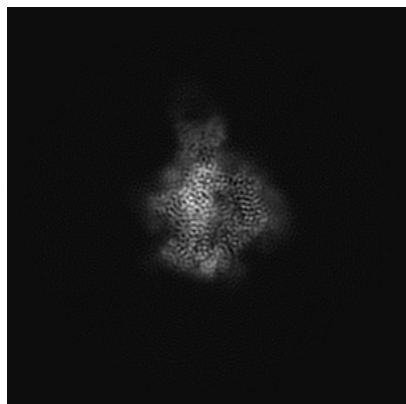
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-29264. These allow visual inspection of the internal detail of the map and identification of artifacts.

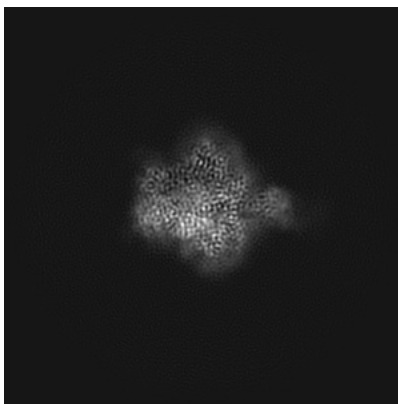
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

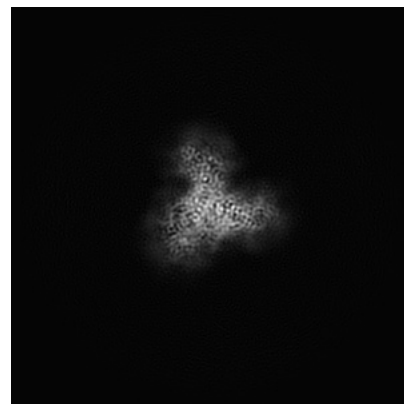
6.1.1 Primary map



X

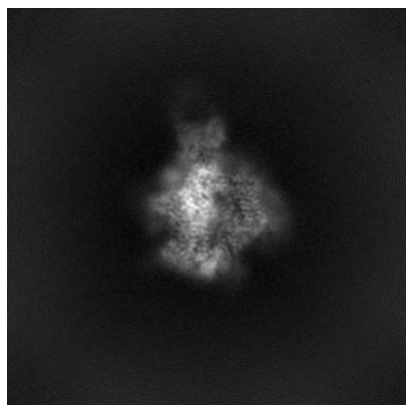


Y

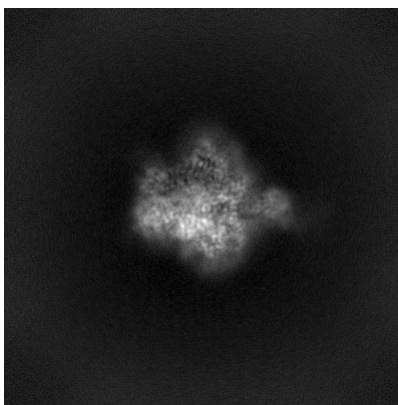


Z

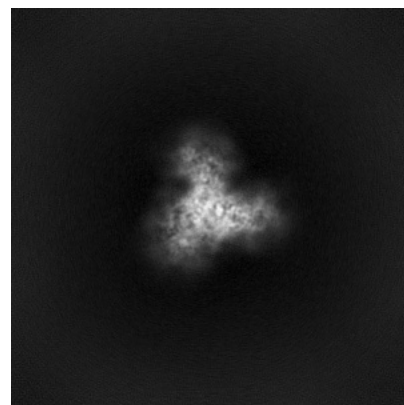
6.1.2 Raw map



X



Y

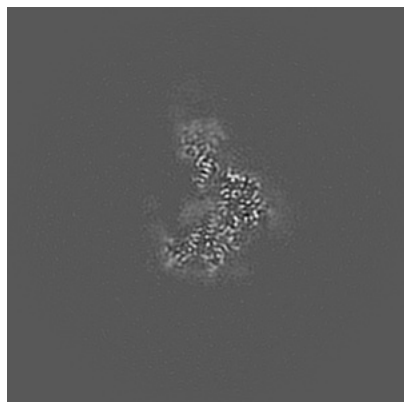


Z

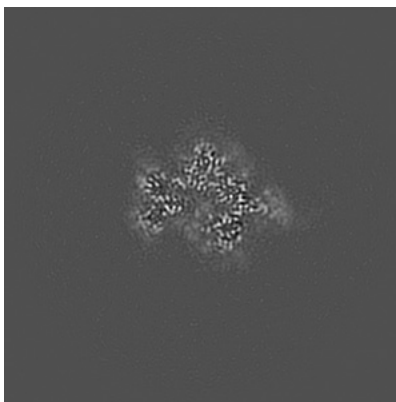
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

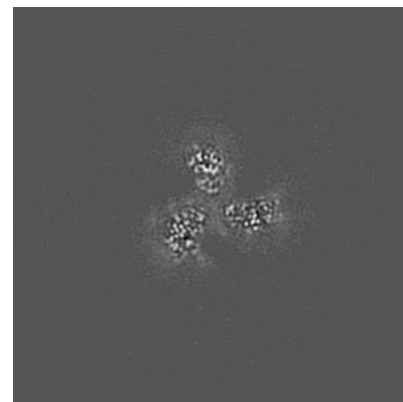
6.2.1 Primary map



X Index: 170

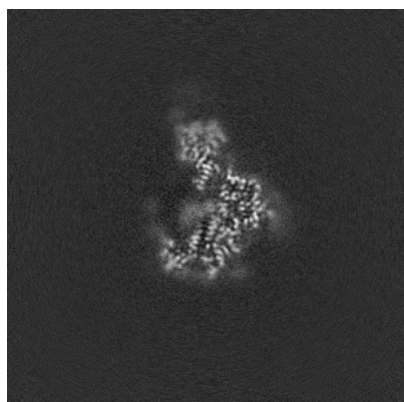


Y Index: 170

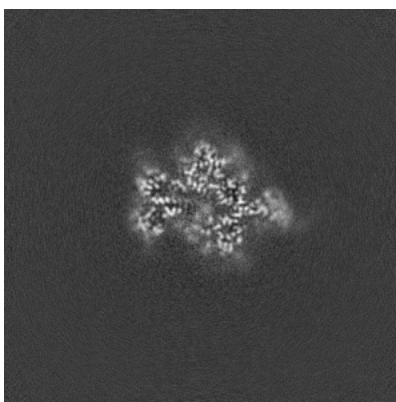


Z Index: 170

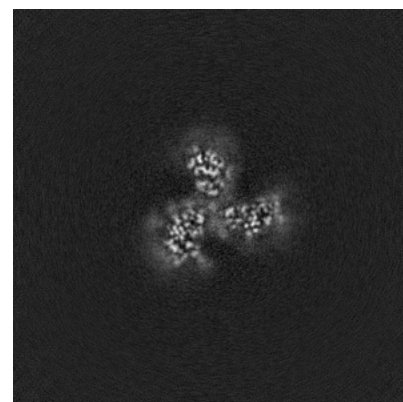
6.2.2 Raw map



X Index: 170



Y Index: 170

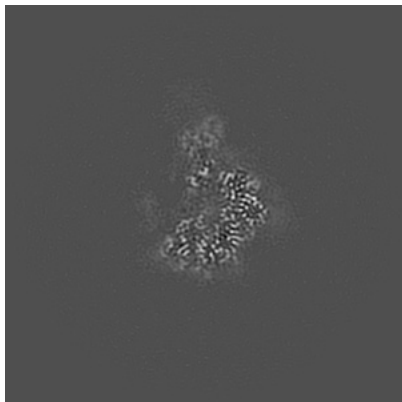


Z Index: 170

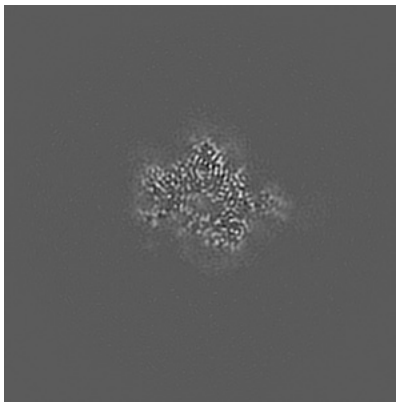
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

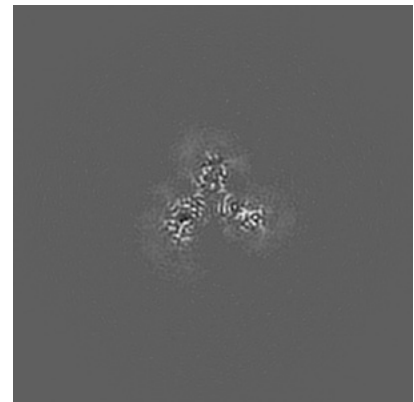
6.3.1 Primary map



X Index: 164

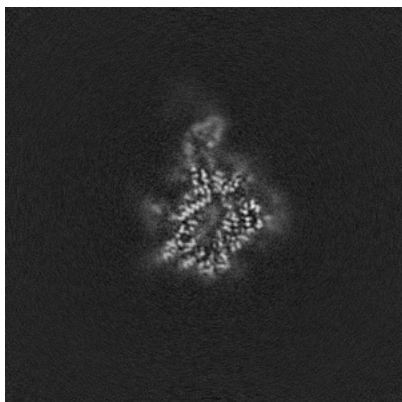


Y Index: 164

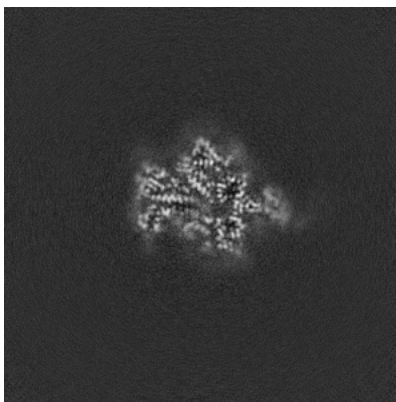


Z Index: 184

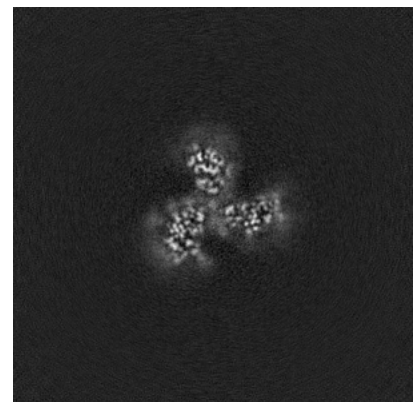
6.3.2 Raw map



X Index: 159



Y Index: 168

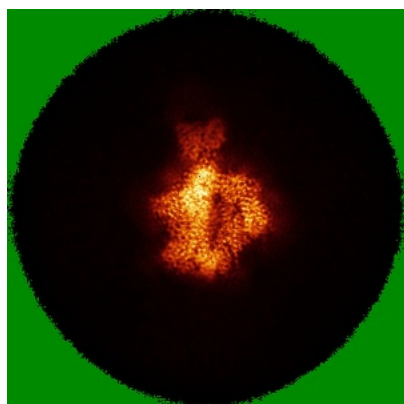


Z Index: 170

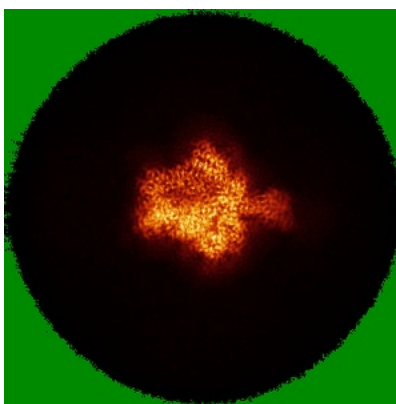
The images above show the largest variance slices of the map in three orthogonal directions.

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

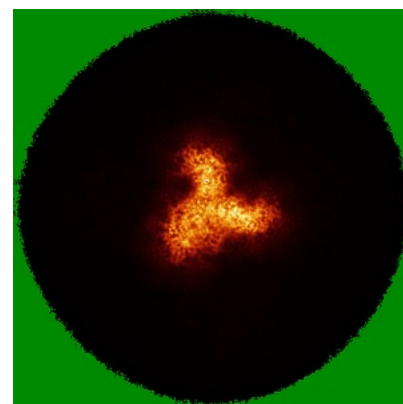
6.4.1 Primary map



X

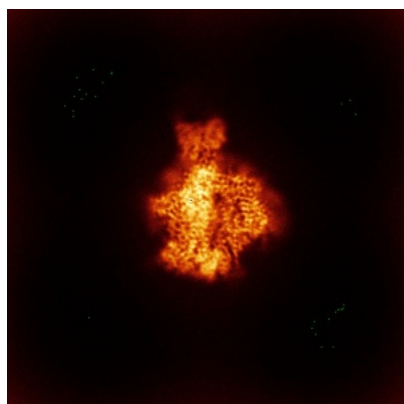


Y

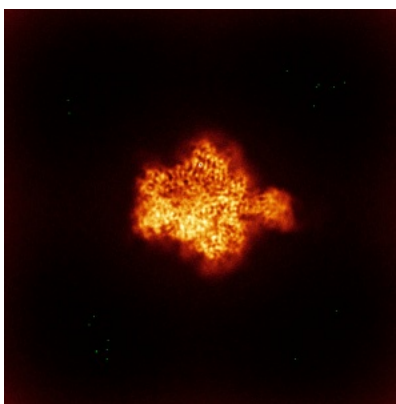


Z

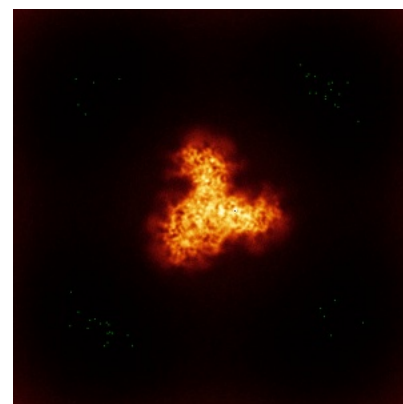
6.4.2 Raw map



X



Y

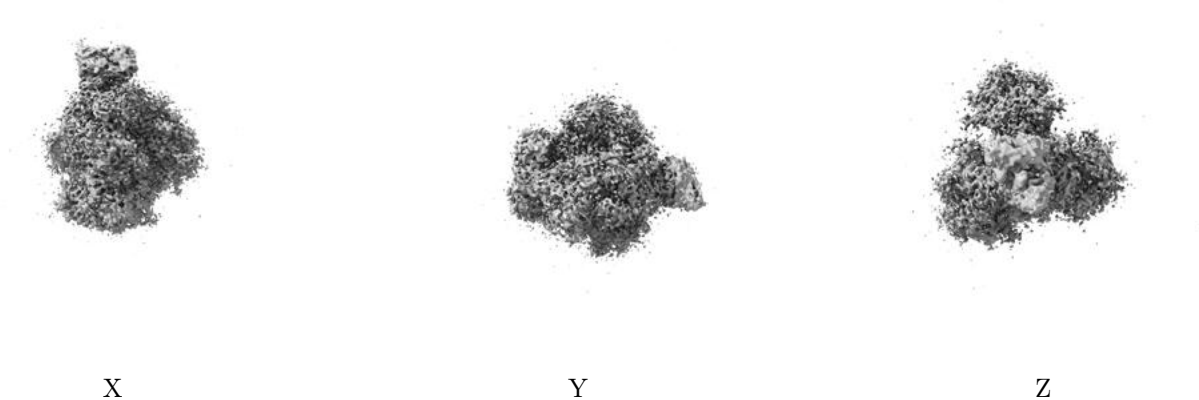


Z

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

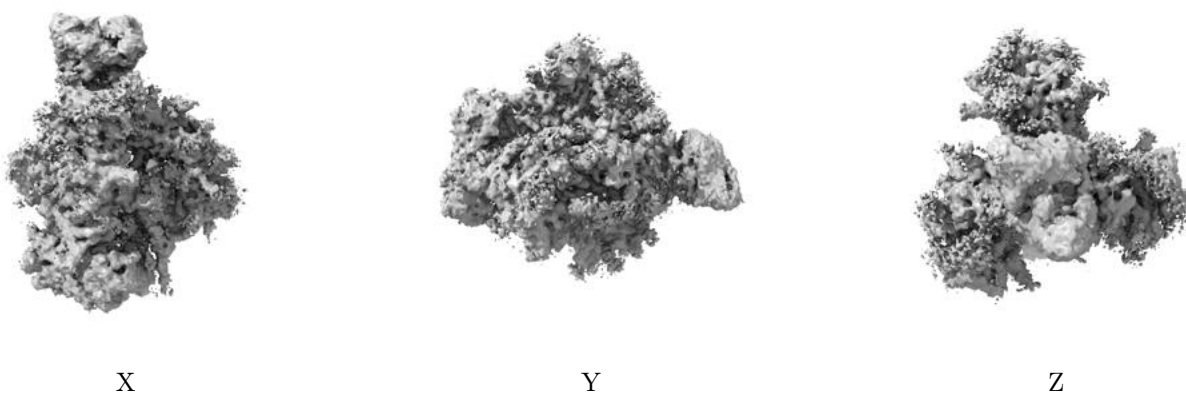
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.22. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

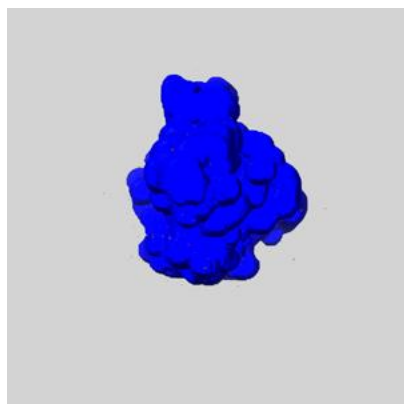
6.6 Mask visualisation [i](#)

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

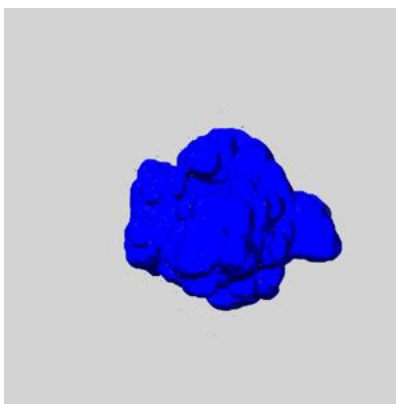
A mask typically either:

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

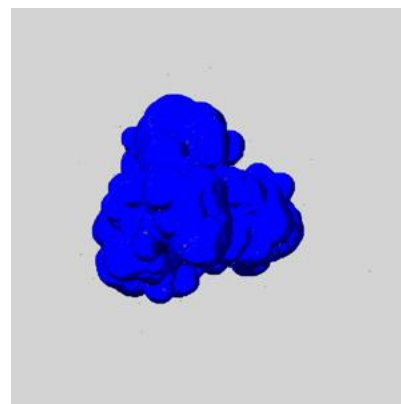
6.6.1 emd_29264_msk_1.map [i](#)



X



Y

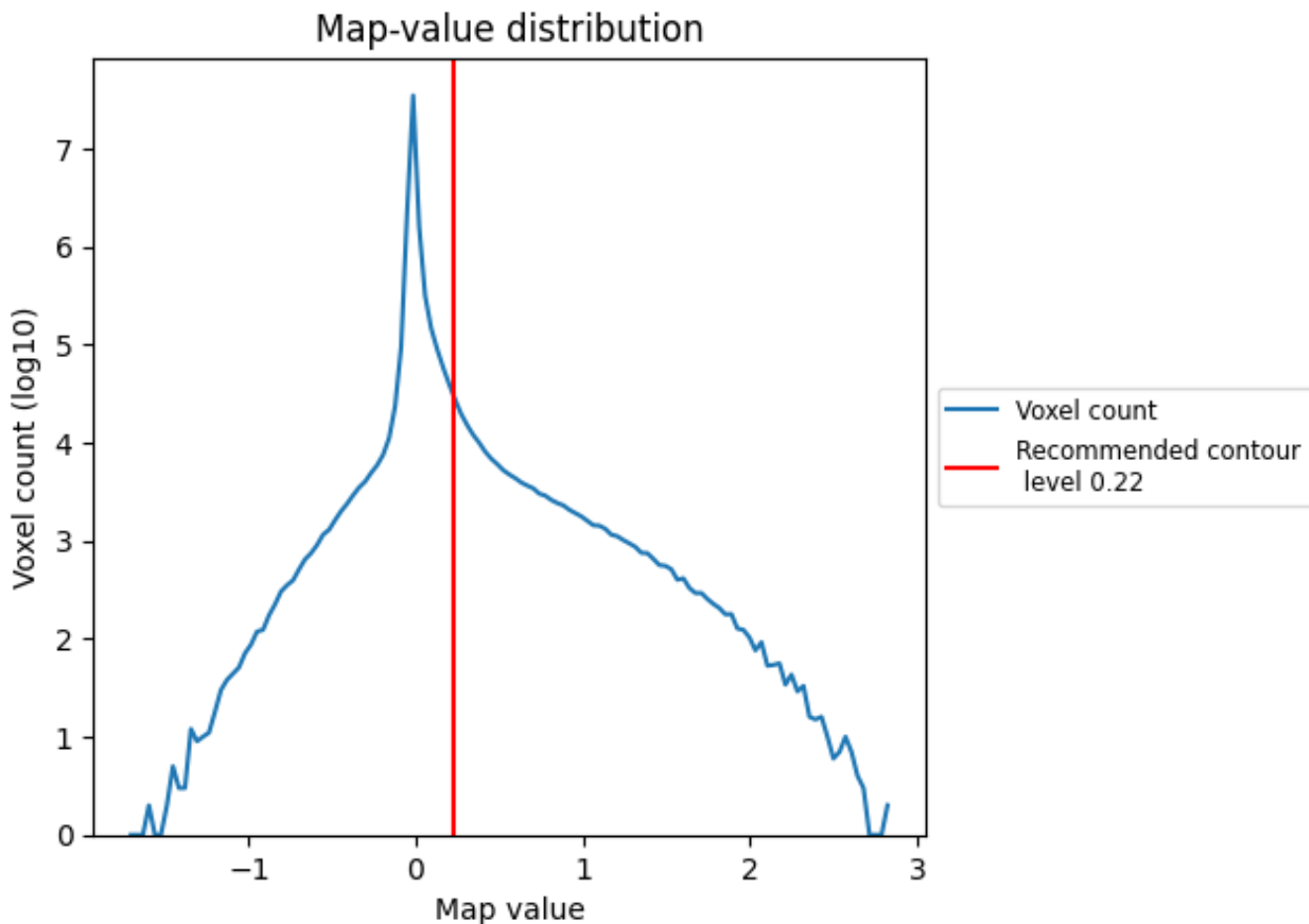


Z

7 Map analysis [i](#)

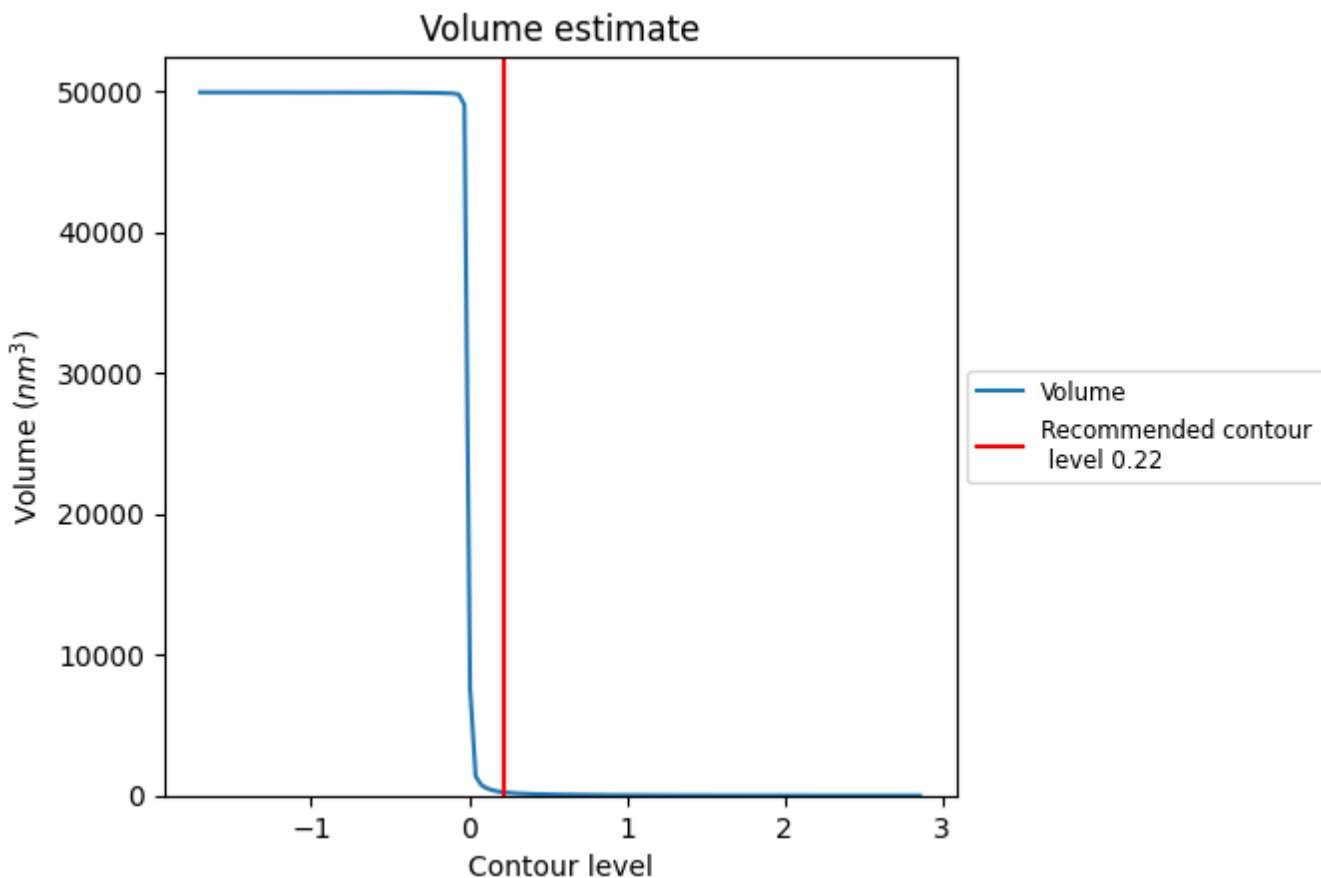
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

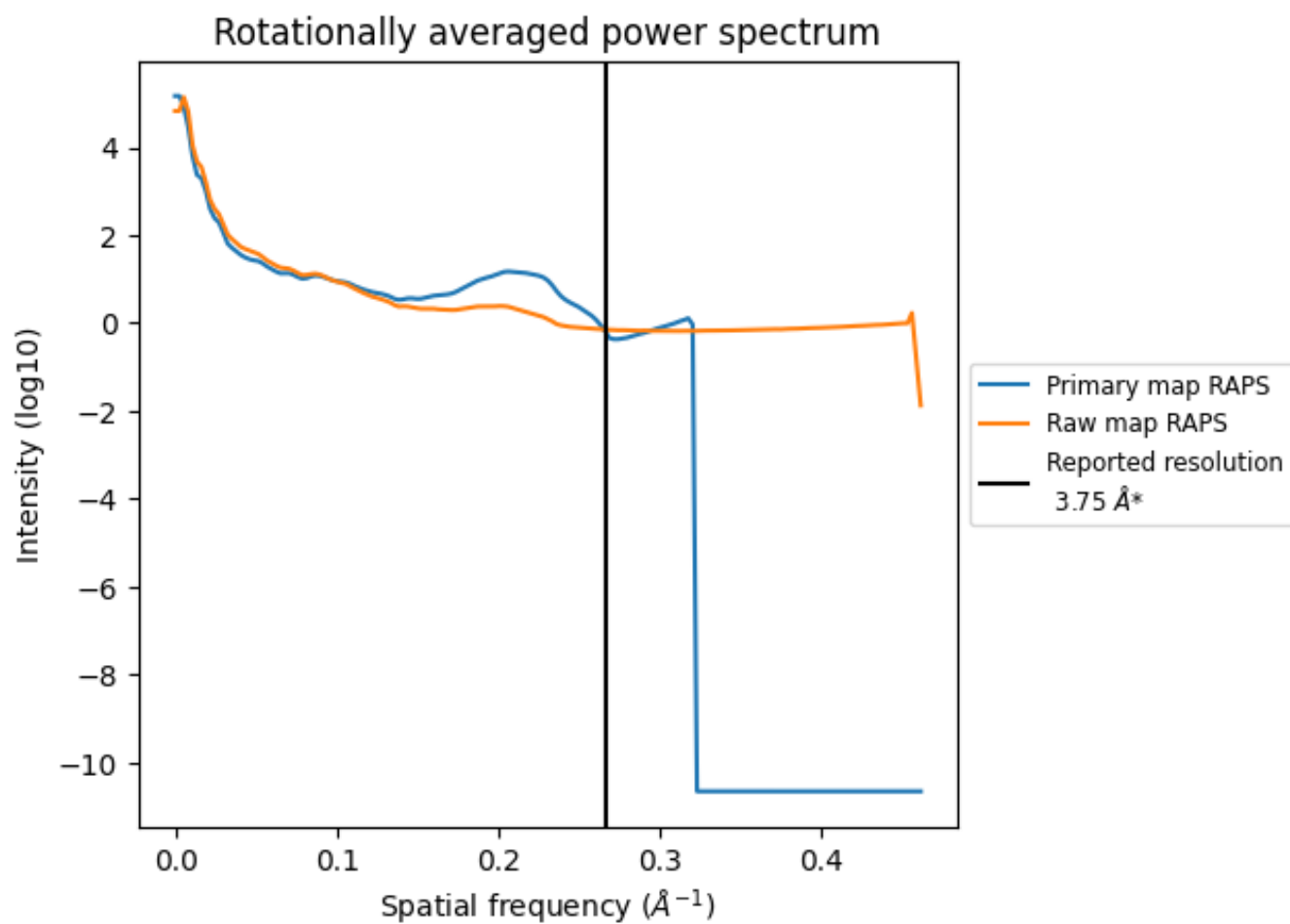
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 232 nm³; this corresponds to an approximate mass of 210 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](#)

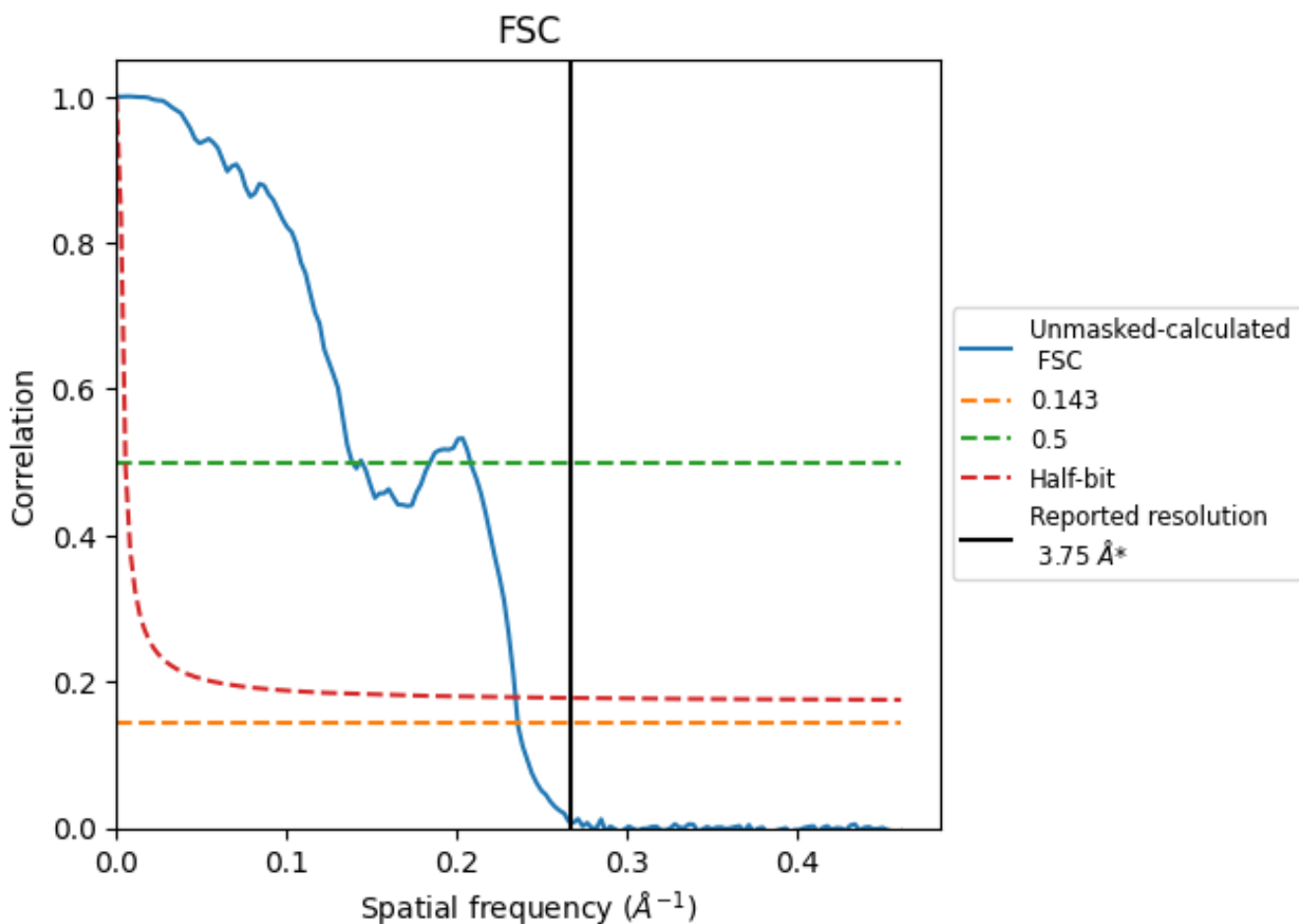


*Reported resolution corresponds to spatial frequency of 0.267 Å⁻¹

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 0.267 Å⁻¹

8.2 Resolution estimates [i](#)

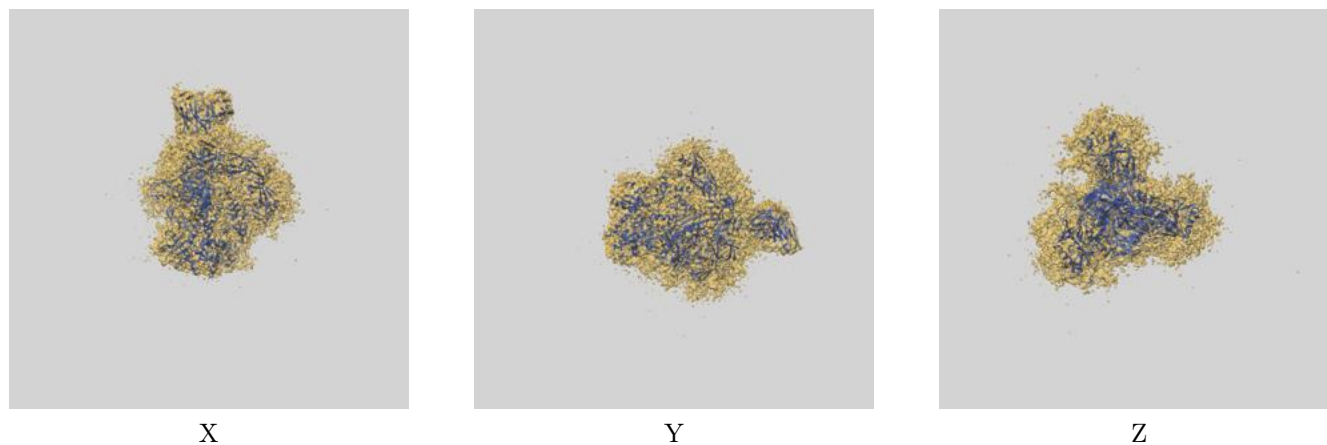
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.75	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.24	7.21	4.26

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.24 differs from the reported value 3.75 by more than 10 %

9 Map-model fit [i](#)

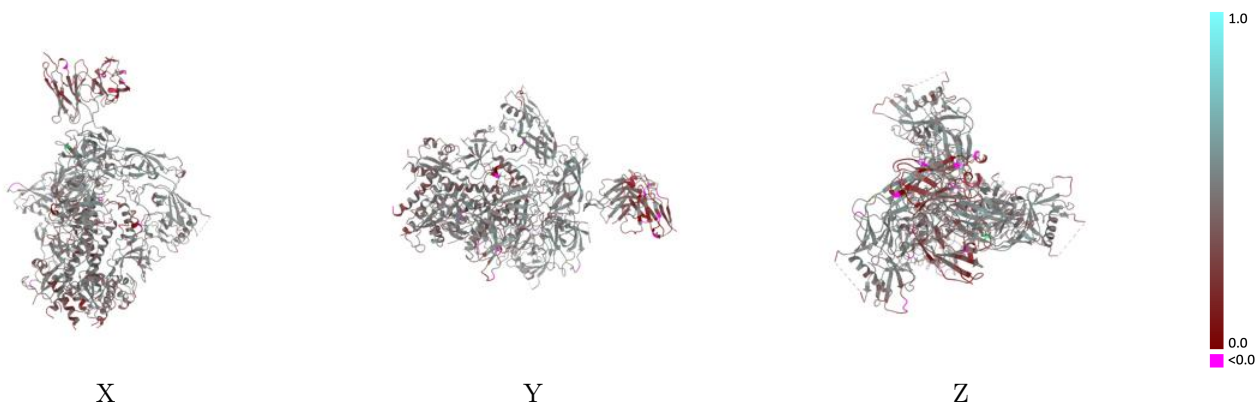
This section contains information regarding the fit between EMDB map EMD-29264 and PDB model 8FL1. Per-residue inclusion information can be found in section 3 on page 11.

9.1 Map-model overlay [i](#)



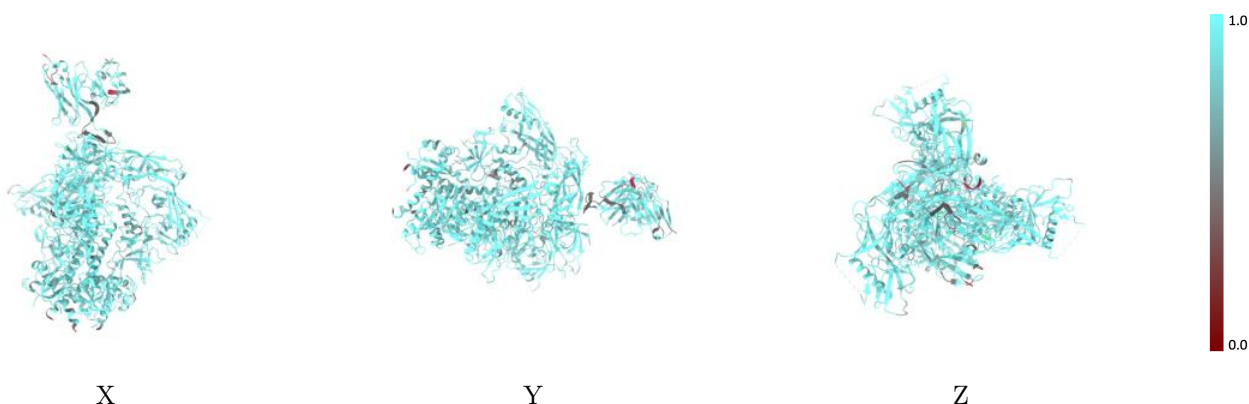
The images above show the 3D surface view of the map at the recommended contour level 0.22 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



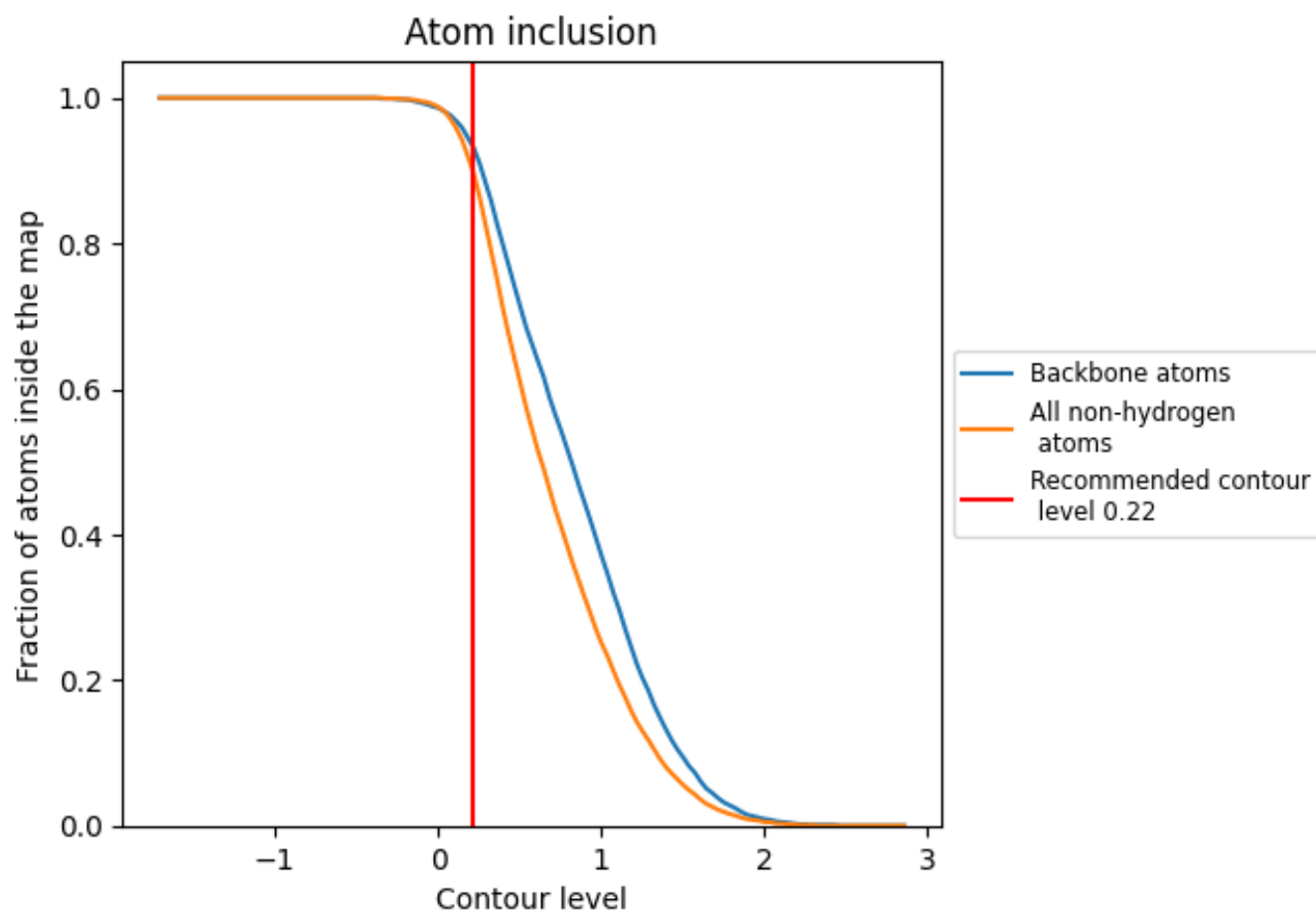
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.22).

































































9.4 Atom inclusion [i](#)



At the recommended contour level, 93% of all backbone atoms, 90% 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 (0.22) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8960	 0.4180
A	 0.8900	 0.4080
B	 0.8820	 0.4020
C	 0.9130	 0.4430
D	 0.8210	 0.3750
E	 0.7860	 0.3610
F	 0.8770	 0.4020
G	 0.9060	 0.4430
H	 0.8890	 0.3670
I	 0.9060	 0.4450
J	 0.8750	 0.3720
K	 0.8570	 0.3490
L	 0.8410	 0.2540
M	 0.7860	 0.3810
N	 0.9290	 0.3130
O	 0.9640	 0.4530
P	 0.7140	 0.3360
Q	 0.8690	 0.3790
R	 0.8570	 0.3430
S	 0.7500	 0.2940
T	 0.8570	 0.3830
U	 0.8930	 0.4290
V	 0.6560	 0.3030
W	 0.8570	 0.3620
X	 0.9310	 0.4170
Y	 0.7860	 0.2680
Z	 0.7500	 0.3050
a	 0.7860	 0.3010
b	 0.9290	 0.4270
c	 0.8570	 0.3770
d	 0.8690	 0.3390
e	 0.9160	 0.4460

