



## Full wwPDB EM Validation Report ⓘ

Nov 9, 2024 – 11:07 PM EST

PDB ID : 6ORO  
EMDB ID : EMD-20176  
Title : Modified BG505 SOSIP-based immunogen RC1 in complex with the elicited V3-glycan patch antibody Ab874NHP  
Authors : Abernathy, M.E.; Gristick, H.B.; Bjorkman, P.J.  
Deposited on : 2019-04-30  
Resolution : 3.90 Å (reported)  
Based on initial models : 5T3Z, 4FQQ

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

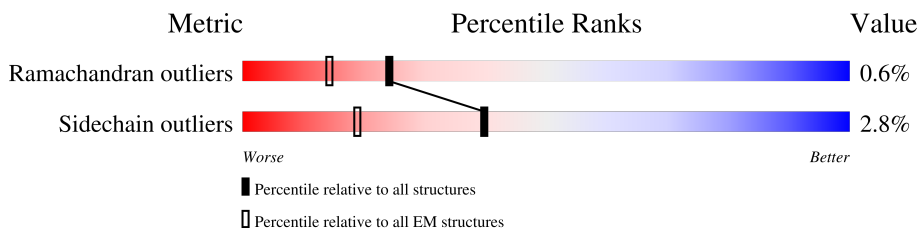
EMDB validation analysis : 0.0.1.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

# 1 Overall quality at a glance

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

The reported resolution of this entry is 3.90 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.






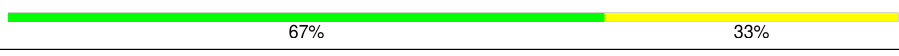
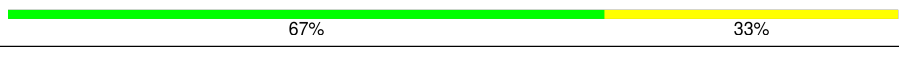




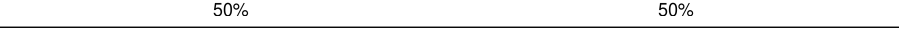

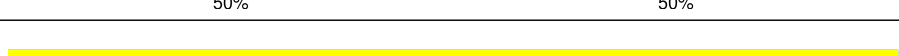
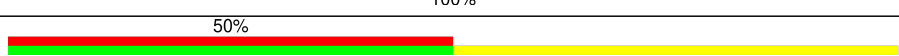
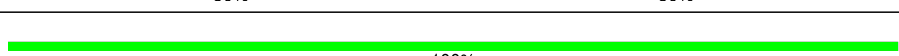

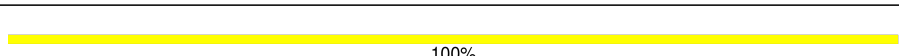
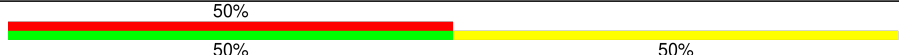



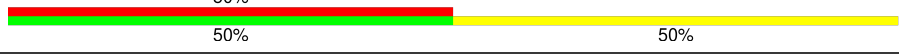
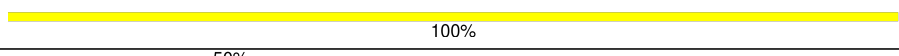

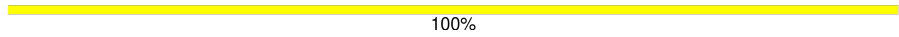

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	153	79% 19%
1	C	153	79% 19%
1	F	153	76% 5% 19%
2	B	481	89% 7%
2	G	481	89% 7%
2	I	481	89% 7%
3	D	254	47% 51%
3	H	254	47% 51%
3	J	254	47% 51%


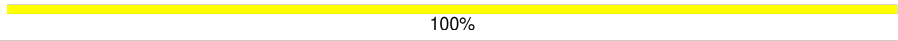

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Mol	Chain	Length	Quality of chain
4	E	233	
4	K	233	
4	L	233	
5	M	3	
5	V	3	
5	e	3	
6	N	6	
6	W	6	
6	f	6	
7	O	4	
7	X	4	
7	g	4	
8	P	2	
8	Q	2	
8	R	2	
8	S	2	
8	T	2	
8	U	2	
8	Y	2	
8	Z	2	
8	a	2	
8	b	2	
8	c	2	
8	d	2	
8	h	2	

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Mol	Chain	Length	Quality of chain
8	i	2	 50% 50%
8	j	2	 100%
8	k	2	 50% 50%
8	l	2	 100%
8	m	2	 50% 50%

## 2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 20085 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 RC1 variant of HIV-1 Env glycoprotein gp41.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	124	987	622	171	188	6	0	0
1	C	124	987	622	171	188	6	0	0
1	F	124	987	622	171	188	6	0	0

- Molecule 2 is a protein called RC1 variant of HIV-1 Env glycoprotein gp120.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	449	3540	2232	622	658	28	0	0
2	G	449	3540	2232	622	658	28	0	0
2	I	449	3540	2232	622	658	28	0	0

- Molecule 3 is a protein called Ab874NHP antibody Fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	124	935	590	157	184	4	0	0
3	H	124	935	590	157	184	4	0	0
3	J	124	935	590	157	184	4	0	0

- Molecule 4 is a protein called Ab874NHP antibody Fab light chain.

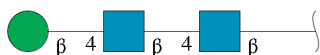
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	E	108	806	495	140	169	2	0	0

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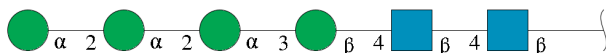
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	K	108	Total	C	N	O	S	0	0
			806	495	140	169	2		
4	L	108	Total	C	N	O	S	0	0
			806	495	140	169	2		

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



Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	M	3	Total	C	N	O	0	0
			39	22	2	15		
5	V	3	Total	C	N	O	0	0
			39	22	2	15		
5	e	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 6 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-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
			Total	C	N	O		
6	N	6	Total	C	N	O	0	0
			72	40	2	30		
6	W	6	Total	C	N	O	0	0
			72	40	2	30		
6	f	6	Total	C	N	O	0	0
			72	40	2	30		

- Molecule 7 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
7	O	4	Total	C	N	O	0	0
			50	28	2	20		
7	X	4	Total	C	N	O	0	0
			50	28	2	20		
7	g	4	Total	C	N	O	0	0
			50	28	2	20		

- Molecule 8 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



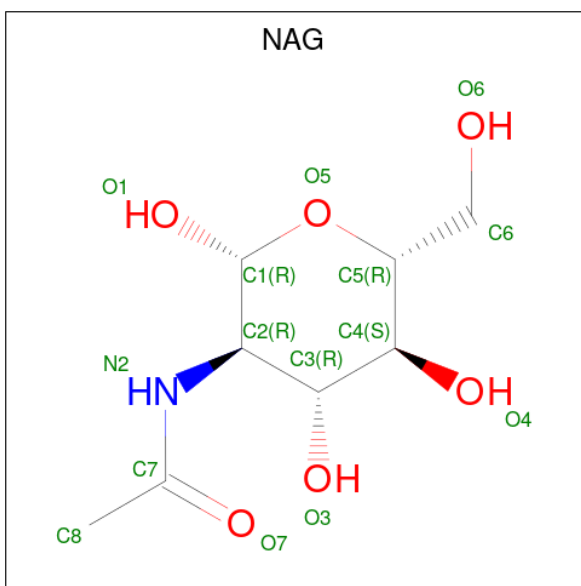
Mol	Chain	Residues	Atoms				AltConf	Trace
8	P	2	Total	C	N	O	0	0
			28	16	2	10		
8	Q	2	Total	C	N	O	0	0
			28	16	2	10		
8	R	2	Total	C	N	O	0	0
			28	16	2	10		
8	S	2	Total	C	N	O	0	0
			28	16	2	10		
8	T	2	Total	C	N	O	0	0
			28	16	2	10		
8	U	2	Total	C	N	O	0	0
			28	16	2	10		
8	Y	2	Total	C	N	O	0	0
			28	16	2	10		
8	Z	2	Total	C	N	O	0	0
			28	16	2	10		
8	a	2	Total	C	N	O	0	0
			28	16	2	10		
8	b	2	Total	C	N	O	0	0
			28	16	2	10		
8	c	2	Total	C	N	O	0	0
			28	16	2	10		
8	d	2	Total	C	N	O	0	0
			28	16	2	10		

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Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
8	h	2	Total 28	C 16	N 2	O 10	0	0
8	i	2	Total 28	C 16	N 2	O 10	0	0
8	j	2	Total 28	C 16	N 2	O 10	0	0
8	k	2	Total 28	C 16	N 2	O 10	0	0
8	l	2	Total 28	C 16	N 2	O 10	0	0
8	m	2	Total 28	C 16	N 2	O 10	0	0

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



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

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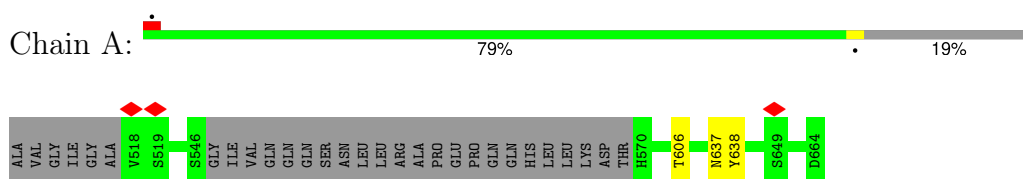
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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
9	B	1	Total 14	8	1	5	0
9	B	1	Total 14	8	1	5	0
9	C	1	Total 14	8	1	5	0
9	C	1	Total 14	8	1	5	0
9	C	1	Total 14	8	1	5	0
9	F	1	Total 14	8	1	5	0
9	F	1	Total 14	8	1	5	0
9	F	1	Total 14	8	1	5	0
9	G	1	Total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

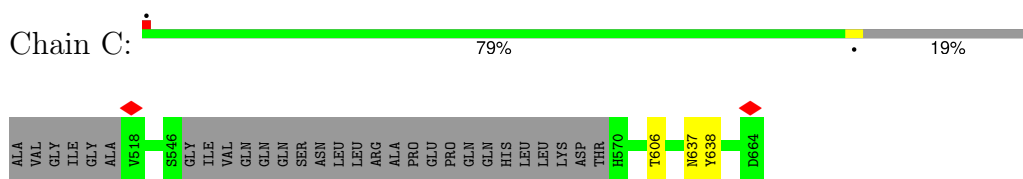
### 3 Residue-property plots [i](#)

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.

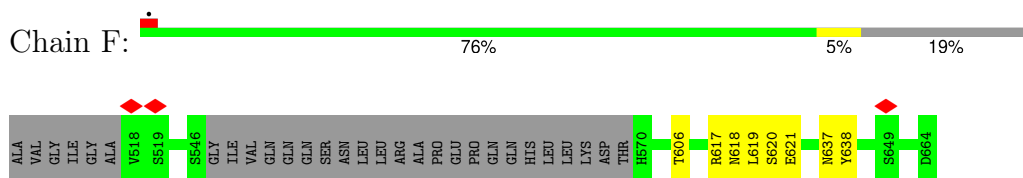
- Molecule 1: RC1 variant of HIV-1 Env glycoprotein gp41



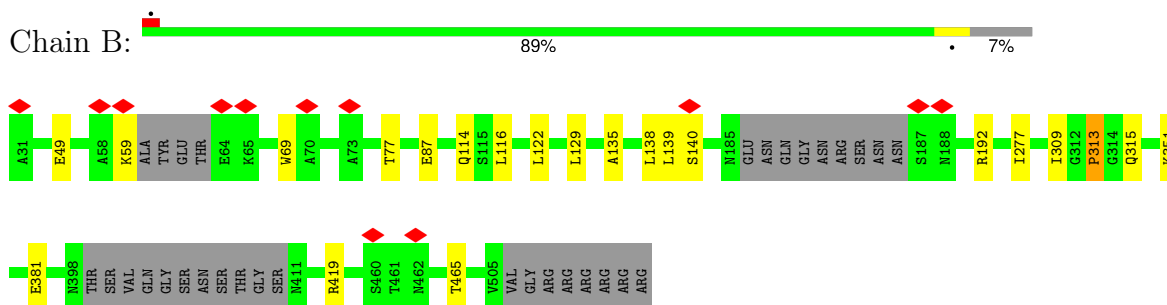
- Molecule 1: RC1 variant of HIV-1 Env glycoprotein gp41



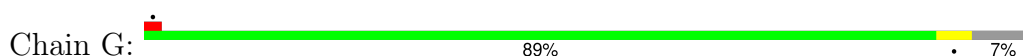
- Molecule 1: RC1 variant of HIV-1 Env glycoprotein gp41

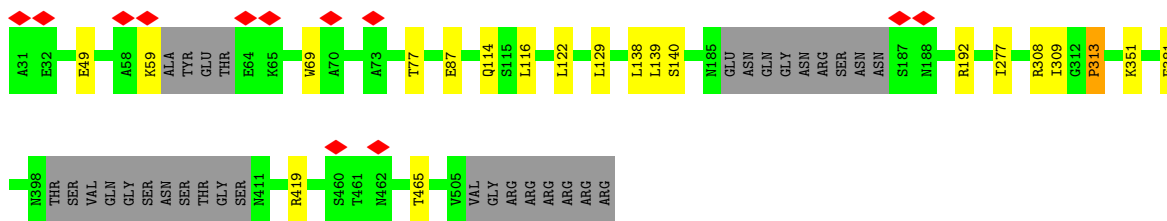


- Molecule 2: RC1 variant of HIV-1 Env glycoprotein gp120



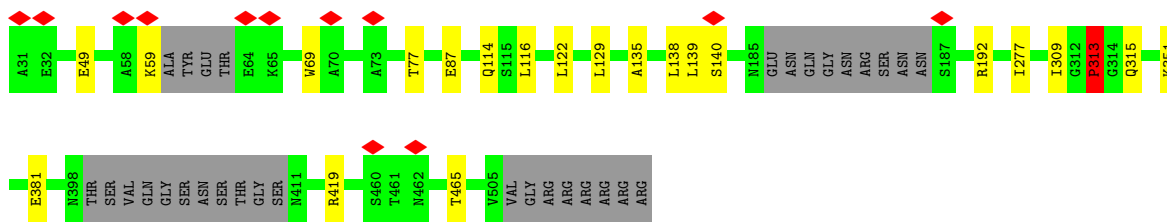
- Molecule 2: RC1 variant of HIV-1 Env glycoprotein gp120





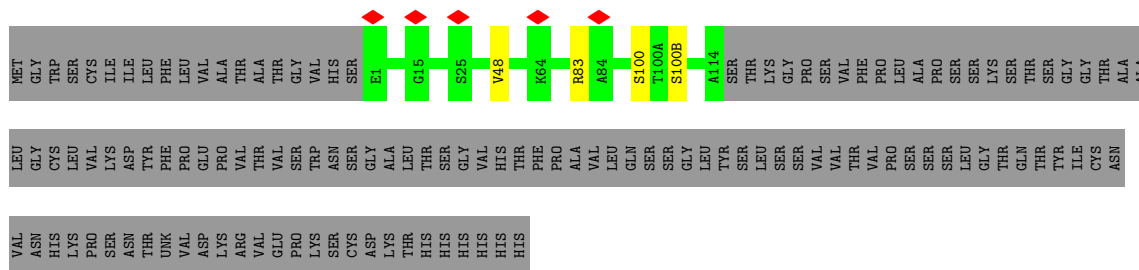
- Molecule 2: RC1 variant of HIV-1 Env glycoprotein gp120

Chain I: 89% 7%



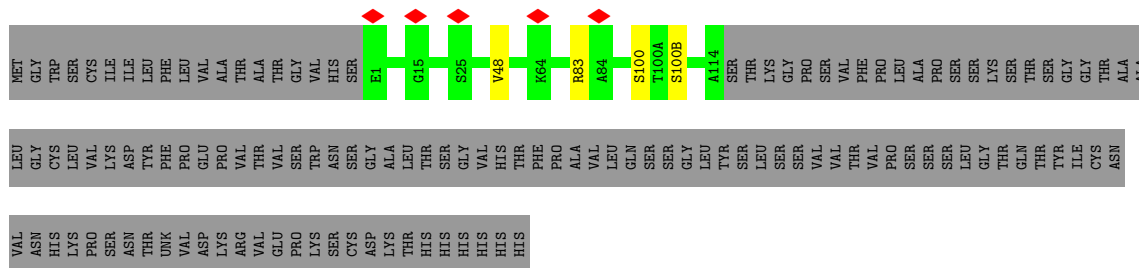
- Molecule 3: Ab874NHP antibody Fab heavy chain

Chain D: 47% 51%



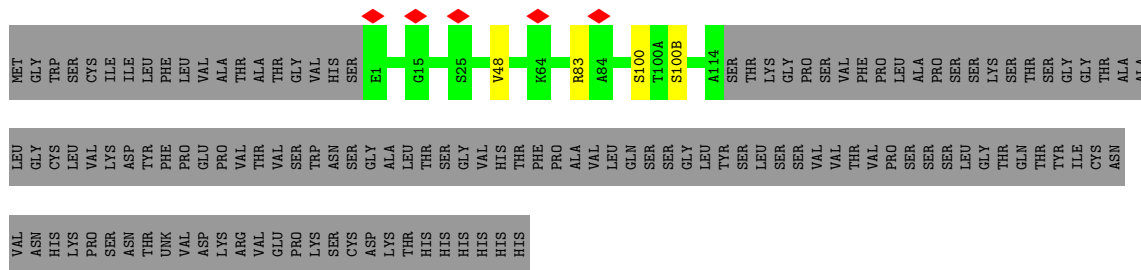
- Molecule 3: Ab874NHP antibody Fab heavy chain

Chain H: 47% 51%

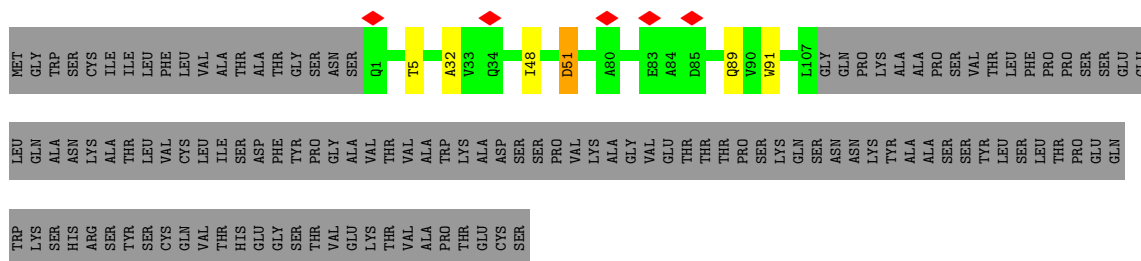


- Molecule 3: Ab874NHP antibody Fab heavy chain

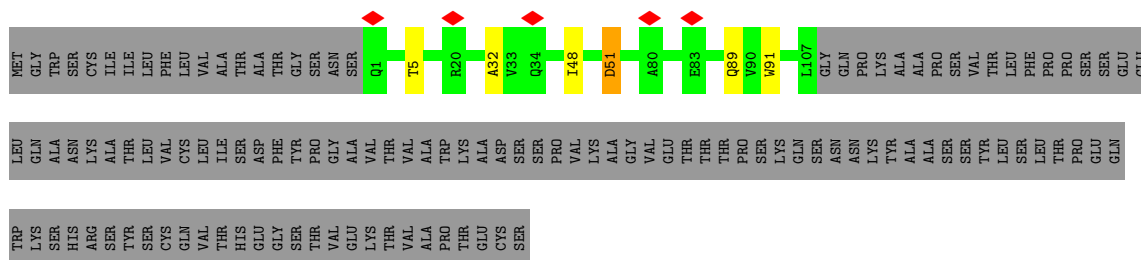
Chain J: 47% 51%



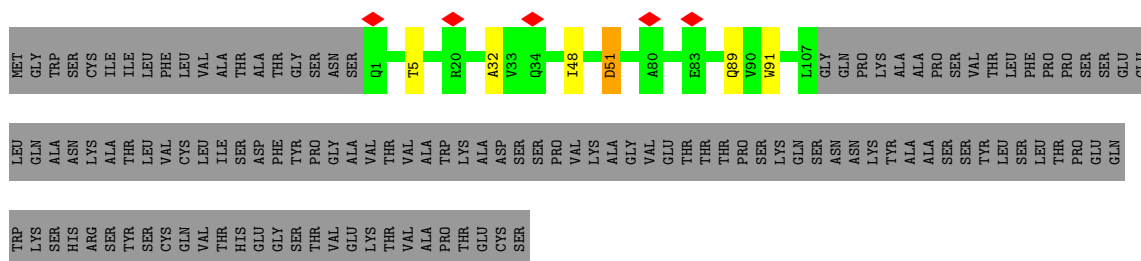
• Molecule 4: Ab874NHP antibody Fab light chain



• Molecule 4: Ab874NHP antibody Fab light chain



• Molecule 4: Ab874NHP antibody Fab light chain



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





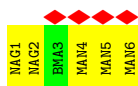
- Molecule 5: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



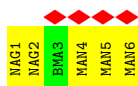
- Molecule 5: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



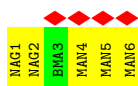
- Molecule 6: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 6: alpha-D-mannopyranose-(1-2)-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



- Molecule 6: alpha-D-mannopyranose-(1-2)-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



- Molecule 7: 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 O:  50% 50%

MAG1  
MAG2  
BMA3  
MAN4

- Molecule 7: 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

- Molecule 7: 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 g:  50% 50%

MAG1  
MAG2  
BMA3  
MAN4

- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain P:  100%

MAG1  
MAG2

- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Q:  50% 50%

MAG1  
MAG2

- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain R:  100%

MAG1  
MAG2

- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain S:  50% 50%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain T: 100%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain U: 50% 50%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Y: 100%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Z: 50% 50%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain a: 100%




- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain b: 50% 50%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain c:  100%




- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain d:  50%  
50% 50%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain h:  100%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain i:  50%  
50% 50%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain j:  100%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain k:  50%  
50% 50%





- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain l:  100%



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain m:  50% 50%



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C3	Depositor
Number of particles used	86564	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	73000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	6.596	Depositor
Minimum map value	-4.371	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.213	Depositor
Recommended contour level	1.02	Depositor
Map size (Å)	367.616, 367.616, 367.616	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.436, 1.436, 1.436	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: MAN, NAG, 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	0.41	0/1006	0.61	0/1365
1	C	0.41	0/1006	0.61	0/1365
1	F	0.51	2/1006 (0.2%)	0.68	1/1365 (0.1%)
2	B	0.42	0/3615	0.68	5/4906 (0.1%)
2	G	0.43	0/3615	0.67	5/4906 (0.1%)
2	I	0.43	0/3615	0.67	5/4906 (0.1%)
3	D	0.38	0/957	0.69	1/1294 (0.1%)
3	H	0.38	0/957	0.69	1/1294 (0.1%)
3	J	0.38	0/957	0.69	1/1294 (0.1%)
4	E	0.34	0/822	0.69	1/1121 (0.1%)
4	K	0.34	0/822	0.69	1/1121 (0.1%)
4	L	0.34	0/822	0.69	1/1121 (0.1%)
All	All	0.41	2/19200 (0.0%)	0.67	22/26058 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	C	0	1
1	F	0	2
2	B	0	2
2	G	0	2
2	I	0	2
3	D	0	2
3	H	0	2
3	J	0	2
4	E	0	2
4	K	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
4	L	0	2
All	All	0	22

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	618	ASN	C-O	-5.83	1.12	1.23
1	F	618	ASN	C-N	-5.11	1.22	1.34

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	313	PRO	CA-N-CD	-10.99	96.11	111.50
2	B	313	PRO	CA-N-CD	-8.81	99.17	111.50
2	I	313	PRO	CA-N-CD	-8.32	99.85	111.50
2	I	77	THR	C-N-CA	6.60	138.19	121.70
2	B	77	THR	C-N-CA	6.59	138.18	121.70
2	G	77	THR	C-N-CA	6.58	138.16	121.70
4	K	51	ASP	CB-CG-OD1	6.43	124.09	118.30
4	E	51	ASP	CB-CG-OD1	6.43	124.09	118.30
4	L	51	ASP	CB-CG-OD1	6.42	124.08	118.30
2	B	122	LEU	CA-CB-CG	5.68	128.36	115.30
2	G	122	LEU	CA-CB-CG	5.65	128.30	115.30
2	I	122	LEU	CA-CB-CG	5.64	128.27	115.30
2	B	116	LEU	CA-CB-CG	5.43	127.80	115.30
2	I	116	LEU	CA-CB-CG	5.43	127.80	115.30
2	G	116	LEU	CA-CB-CG	5.42	127.77	115.30
2	I	465	THR	CA-CB-CG2	-5.33	104.93	112.40
2	G	465	THR	CA-CB-CG2	-5.30	104.97	112.40
2	B	465	THR	CA-CB-CG2	-5.30	104.98	112.40
3	J	100	SER	C-N-CA	5.06	134.36	121.70
3	H	100	SER	C-N-CA	5.05	134.32	121.70
3	D	100	SER	C-N-CA	5.04	134.29	121.70
1	F	618	ASN	CA-C-N	-5.04	106.12	117.20

There are no chirality outliers.

All (22) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	637	ASN	Peptide
2	B	277	ILE	Peptide

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Mol	Chain	Res	Type	Group
2	B	69	TRP	Peptide
1	C	637	ASN	Peptide
3	D	100(B)	SER	Peptide
3	D	48	VAL	Peptide
4	E	32	ALA	Peptide
4	E	91	TRP	Peptide
1	F	617	ARG	Mainchain
1	F	637	ASN	Peptide
2	G	277	ILE	Peptide
2	G	69	TRP	Peptide
3	H	100(B)	SER	Peptide
3	H	48	VAL	Peptide
2	I	277	ILE	Peptide
2	I	69	TRP	Peptide
3	J	100(B)	SER	Peptide
3	J	48	VAL	Peptide
4	K	32	ALA	Peptide
4	K	91	TRP	Peptide
4	L	32	ALA	Peptide
4	L	91	TRP	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	120/153 (78%)	109 (91%)	10 (8%)	1 (1%)	16	51
1	C	120/153 (78%)	109 (91%)	10 (8%)	1 (1%)	16	51
1	F	120/153 (78%)	107 (89%)	10 (8%)	3 (2%)	4	30

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	B	441/481 (92%)	393 (89%)	45 (10%)	3 (1%)	19	54
2	G	441/481 (92%)	390 (88%)	50 (11%)	1 (0%)	44	75
2	I	441/481 (92%)	395 (90%)	44 (10%)	2 (0%)	25	60
3	D	122/254 (48%)	95 (78%)	27 (22%)	0	100	100
3	H	122/254 (48%)	95 (78%)	27 (22%)	0	100	100
3	J	122/254 (48%)	95 (78%)	27 (22%)	0	100	100
4	E	106/233 (46%)	86 (81%)	19 (18%)	1 (1%)	14	48
4	K	106/233 (46%)	85 (80%)	20 (19%)	1 (1%)	14	48
4	L	106/233 (46%)	85 (80%)	20 (19%)	1 (1%)	14	48
All	All	2367/3363 (70%)	2044 (86%)	309 (13%)	14 (1%)	24	57

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	638	TYR
1	C	638	TYR
1	F	619	LEU
1	F	638	TYR
2	B	309	ILE
1	F	621	GLU
2	B	135	ALA
4	E	51	ASP
2	I	135	ALA
2	I	313	PRO
4	K	51	ASP
4	L	51	ASP
2	B	313	PRO
2	G	313	PRO

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	107/130 (82%)	106 (99%)	1 (1%)	75	83
1	C	107/130 (82%)	106 (99%)	1 (1%)	75	83
1	F	107/130 (82%)	105 (98%)	2 (2%)	52	70
2	B	401/428 (94%)	388 (97%)	13 (3%)	34	56
2	G	401/428 (94%)	387 (96%)	14 (4%)	31	54
2	I	401/428 (94%)	386 (96%)	15 (4%)	29	53
3	D	98/210 (47%)	97 (99%)	1 (1%)	73	81
3	H	98/210 (47%)	97 (99%)	1 (1%)	73	81
3	J	98/210 (47%)	97 (99%)	1 (1%)	73	81
4	E	89/195 (46%)	86 (97%)	3 (3%)	32	55
4	K	89/195 (46%)	86 (97%)	3 (3%)	32	55
4	L	89/195 (46%)	86 (97%)	3 (3%)	32	55
All	All	2085/2889 (72%)	2027 (97%)	58 (3%)	40	59

All (58) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	606	THR
2	B	49	GLU
2	B	59	LYS
2	B	87	GLU
2	B	114	GLN
2	B	129	LEU
2	B	138	LEU
2	B	139	LEU
2	B	140	SER
2	B	192	ARG
2	B	315	GLN
2	B	351	LYS
2	B	381	GLU
2	B	419	ARG
1	C	606	THR
3	D	83	ARG
4	E	5	THR
4	E	48	ILE
4	E	89	GLN
1	F	606	THR
1	F	620	SER
2	G	49	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	G	59	LYS
2	G	87	GLU
2	G	114	GLN
2	G	129	LEU
2	G	138	LEU
2	G	139	LEU
2	G	140	SER
2	G	192	ARG
2	G	308	ARG
2	G	309	ILE
2	G	351	LYS
2	G	381	GLU
2	G	419	ARG
3	H	83	ARG
2	I	49	GLU
2	I	59	LYS
2	I	87	GLU
2	I	114	GLN
2	I	129	LEU
2	I	138	LEU
2	I	139	LEU
2	I	140	SER
2	I	192	ARG
2	I	309	ILE
2	I	313	PRO
2	I	315	GLN
2	I	351	LYS
2	I	381	GLU
2	I	419	ARG
3	J	83	ARG
4	K	5	THR
4	K	48	ILE
4	K	89	GLN
4	L	5	THR
4	L	48	ILE
4	L	89	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (40) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	591	GLN
1	A	650	GLN

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Mol	Chain	Res	Type
1	A	652	GLN
2	B	137	ASN
2	B	300	ASN
2	B	363	GLN
2	B	440	GLN
1	C	591	GLN
1	C	650	GLN
1	C	652	GLN
3	D	76	ASN
3	D	82(A)	ASN
3	D	99	GLN
4	E	6	GLN
4	E	34	GLN
4	E	89	GLN
1	F	591	GLN
1	F	625	ASN
1	F	650	GLN
1	F	652	GLN
2	G	137	ASN
2	G	300	ASN
2	G	363	GLN
2	G	440	GLN
3	H	76	ASN
3	H	82(A)	ASN
3	H	99	GLN
2	I	137	ASN
2	I	300	ASN
2	I	363	GLN
2	I	440	GLN
3	J	76	ASN
3	J	82(A)	ASN
3	J	99	GLN
4	K	6	GLN
4	K	34	GLN
4	K	89	GLN
4	L	6	GLN
4	L	34	GLN
4	L	89	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

75 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	M	1	5,2	14,14,15	0.33	0	17,19,21	1.17	2 (11%)
5	NAG	M	2	5	14,14,15	0.30	0	17,19,21	0.59	0
5	BMA	M	3	5	11,11,12	0.72	0	15,15,17	0.79	0
6	NAG	N	1	6,2	14,14,15	0.29	0	17,19,21	1.19	2 (11%)
6	NAG	N	2	6	14,14,15	0.26	0	17,19,21	0.75	1 (5%)
6	BMA	N	3	6	11,11,12	0.82	0	15,15,17	0.90	0
6	MAN	N	4	6	11,11,12	1.19	2 (18%)	15,15,17	0.94	0
6	MAN	N	5	6	11,11,12	0.81	0	15,15,17	1.30	1 (6%)
6	MAN	N	6	6	11,11,12	1.53	3 (27%)	15,15,17	2.20	2 (13%)
7	NAG	O	1	2,7	14,14,15	0.28	0	17,19,21	0.57	0
7	NAG	O	2	7	14,14,15	0.28	0	17,19,21	0.64	0
7	BMA	O	3	7	11,11,12	0.96	1 (9%)	15,15,17	1.12	2 (13%)
7	MAN	O	4	7	11,11,12	0.82	1 (9%)	15,15,17	1.54	2 (13%)
8	NAG	P	1	8,2	14,14,15	0.87	1 (7%)	17,19,21	2.35	3 (17%)
8	NAG	P	2	8	14,14,15	0.58	0	17,19,21	0.70	1 (5%)
8	NAG	Q	1	8,2	14,14,15	0.30	0	17,19,21	0.49	0
8	NAG	Q	2	8	14,14,15	0.51	0	17,19,21	1.04	1 (5%)
8	NAG	R	1	8,2	14,14,15	0.34	0	17,19,21	0.49	0
8	NAG	R	2	8	14,14,15	0.37	0	17,19,21	0.38	0
8	NAG	S	1	8,2	14,14,15	0.32	0	17,19,21	0.76	1 (5%)
8	NAG	S	2	8	14,14,15	0.39	0	17,19,21	0.41	0
8	NAG	T	1	8,2	14,14,15	0.60	0	17,19,21	1.07	2 (11%)
8	NAG	T	2	8	14,14,15	0.38	0	17,19,21	1.19	2 (11%)
8	NAG	U	1	8,2	14,14,15	0.85	1 (7%)	17,19,21	2.42	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
8	NAG	U	2	8	14,14,15	0.56	0	17,19,21	0.43	0
5	NAG	V	1	5,2	14,14,15	0.33	0	17,19,21	1.17	2 (11%)
5	NAG	V	2	5	14,14,15	0.30	0	17,19,21	0.59	0
5	BMA	V	3	5	11,11,12	0.72	0	15,15,17	0.80	0
6	NAG	W	1	6,2	14,14,15	0.28	0	17,19,21	1.19	2 (11%)
6	NAG	W	2	6	14,14,15	0.25	0	17,19,21	0.75	1 (5%)
6	BMA	W	3	6	11,11,12	0.81	0	15,15,17	0.90	0
6	MAN	W	4	6	11,11,12	1.20	2 (18%)	15,15,17	0.93	0
6	MAN	W	5	6	11,11,12	0.80	0	15,15,17	1.29	1 (6%)
6	MAN	W	6	6	11,11,12	1.53	3 (27%)	15,15,17	2.20	2 (13%)
7	NAG	X	1	2,7	14,14,15	0.27	0	17,19,21	0.58	0
7	NAG	X	2	7	14,14,15	0.28	0	17,19,21	0.65	0
7	BMA	X	3	7	11,11,12	0.97	1 (9%)	15,15,17	1.12	2 (13%)
7	MAN	X	4	7	11,11,12	0.83	1 (9%)	15,15,17	1.55	2 (13%)
8	NAG	Y	1	8,2	14,14,15	0.87	1 (7%)	17,19,21	2.35	3 (17%)
8	NAG	Y	2	8	14,14,15	0.58	0	17,19,21	0.70	1 (5%)
8	NAG	Z	1	8,2	14,14,15	0.30	0	17,19,21	0.50	0
8	NAG	Z	2	8	14,14,15	0.51	0	17,19,21	1.03	1 (5%)
8	NAG	a	1	8,2	14,14,15	0.34	0	17,19,21	0.49	0
8	NAG	a	2	8	14,14,15	0.38	0	17,19,21	0.38	0
8	NAG	b	1	8,2	14,14,15	0.32	0	17,19,21	0.76	1 (5%)
8	NAG	b	2	8	14,14,15	0.40	0	17,19,21	0.41	0
8	NAG	c	1	8,2	14,14,15	0.61	0	17,19,21	1.06	2 (11%)
8	NAG	c	2	8	14,14,15	0.39	0	17,19,21	1.20	2 (11%)
8	NAG	d	1	8,2	14,14,15	0.84	1 (7%)	17,19,21	2.41	3 (17%)
8	NAG	d	2	8	14,14,15	0.56	0	17,19,21	0.43	0
5	NAG	e	1	5,2	14,14,15	0.33	0	17,19,21	1.16	2 (11%)
5	NAG	e	2	5	14,14,15	0.30	0	17,19,21	0.60	0
5	BMA	e	3	5	11,11,12	0.73	0	15,15,17	0.79	0
6	NAG	f	1	6,2	14,14,15	0.29	0	17,19,21	1.19	2 (11%)
6	NAG	f	2	6	14,14,15	0.25	0	17,19,21	0.75	1 (5%)
6	BMA	f	3	6	11,11,12	0.82	0	15,15,17	0.90	0
6	MAN	f	4	6	11,11,12	1.19	2 (18%)	15,15,17	0.93	0
6	MAN	f	5	6	11,11,12	0.80	0	15,15,17	1.29	1 (6%)
6	MAN	f	6	6	11,11,12	1.54	3 (27%)	15,15,17	2.21	2 (13%)
7	NAG	g	1	2,7	14,14,15	0.27	0	17,19,21	0.58	0
7	NAG	g	2	7	14,14,15	0.28	0	17,19,21	0.65	0
7	BMA	g	3	7	11,11,12	0.97	1 (9%)	15,15,17	1.12	2 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
7	MAN	g	4	7	11,11,12	0.82	1 (9%)	15,15,17	1.55	2 (13%)
8	NAG	h	1	8,2	14,14,15	0.87	1 (7%)	17,19,21	2.34	3 (17%)
8	NAG	h	2	8	14,14,15	0.58	0	17,19,21	0.69	1 (5%)
8	NAG	i	1	8,2	14,14,15	0.29	0	17,19,21	0.50	0
8	NAG	i	2	8	14,14,15	0.50	0	17,19,21	1.04	1 (5%)
8	NAG	j	1	8,2	14,14,15	0.34	0	17,19,21	0.49	0
8	NAG	j	2	8	14,14,15	0.37	0	17,19,21	0.38	0
8	NAG	k	1	8,2	14,14,15	0.32	0	17,19,21	0.76	1 (5%)
8	NAG	k	2	8	14,14,15	0.40	0	17,19,21	0.42	0
8	NAG	l	1	8,2	14,14,15	0.60	0	17,19,21	1.07	2 (11%)
8	NAG	l	2	8	14,14,15	0.37	0	17,19,21	1.20	2 (11%)
8	NAG	m	1	8,2	14,14,15	0.86	1 (7%)	17,19,21	2.42	3 (17%)
8	NAG	m	2	8	14,14,15	0.55	0	17,19,21	0.43	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. <sup>1,2</sup> means no outliers of that kind were identified.

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

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

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

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	f	6	MAN	O5-C1	3.07	1.48	1.43
6	W	6	MAN	O5-C1	3.06	1.48	1.43
6	N	6	MAN	O5-C1	3.06	1.48	1.43
6	W	6	MAN	O5-C5	2.91	1.49	1.43
6	f	6	MAN	O5-C5	2.89	1.49	1.43
6	N	6	MAN	O5-C5	2.87	1.49	1.43
6	W	4	MAN	C2-C3	2.78	1.56	1.52
6	f	4	MAN	C2-C3	2.72	1.56	1.52
6	N	4	MAN	C2-C3	2.71	1.56	1.52
6	f	6	MAN	C1-C2	2.60	1.58	1.52
6	W	6	MAN	C1-C2	2.58	1.58	1.52
6	N	6	MAN	C1-C2	2.57	1.58	1.52
8	P	1	NAG	C1-C2	2.36	1.55	1.52
7	O	3	BMA	C1-C2	2.29	1.57	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	g	3	BMA	C1-C2	2.29	1.57	1.52
8	h	1	NAG	C1-C2	2.28	1.55	1.52
7	X	3	BMA	C1-C2	2.27	1.57	1.52
8	Y	1	NAG	C1-C2	2.27	1.55	1.52
6	N	4	MAN	O5-C1	-2.16	1.40	1.43
6	f	4	MAN	O5-C1	-2.14	1.40	1.43
6	W	4	MAN	O5-C1	-2.13	1.40	1.43
7	X	4	MAN	O5-C5	2.13	1.47	1.43
8	m	1	NAG	C1-C2	2.11	1.55	1.52
7	O	4	MAN	O5-C5	2.10	1.47	1.43
8	U	1	NAG	C1-C2	2.08	1.55	1.52
7	g	4	MAN	O5-C5	2.08	1.47	1.43
8	d	1	NAG	C1-C2	2.04	1.55	1.52

All (75) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	m	1	NAG	C2-N2-C7	8.51	134.30	122.90
8	U	1	NAG	C2-N2-C7	8.50	134.30	122.90
8	d	1	NAG	C2-N2-C7	8.45	134.23	122.90
8	Y	1	NAG	C2-N2-C7	8.13	133.79	122.90
8	P	1	NAG	C2-N2-C7	8.13	133.79	122.90
8	h	1	NAG	C2-N2-C7	8.08	133.73	122.90
6	f	6	MAN	C1-O5-C5	7.71	122.51	112.19
6	N	6	MAN	C1-O5-C5	7.67	122.46	112.19
6	W	6	MAN	C1-O5-C5	7.67	122.46	112.19
7	X	4	MAN	C1-O5-C5	5.13	119.06	112.19
7	g	4	MAN	C1-O5-C5	5.13	119.06	112.19
7	O	4	MAN	C1-O5-C5	5.10	119.02	112.19
8	m	1	NAG	C1-C2-N2	3.88	116.54	110.43
8	d	1	NAG	C1-C2-N2	3.87	116.54	110.43
6	N	5	MAN	C1-O5-C5	3.86	117.36	112.19
6	f	5	MAN	C1-O5-C5	3.85	117.35	112.19
8	U	1	NAG	C1-C2-N2	3.85	116.50	110.43
6	W	5	MAN	C1-O5-C5	3.84	117.34	112.19
8	h	1	NAG	C1-C2-N2	3.82	116.46	110.43
8	Y	1	NAG	C1-C2-N2	3.82	116.45	110.43
8	P	1	NAG	C1-C2-N2	3.82	116.45	110.43
6	W	1	NAG	C2-N2-C7	3.41	127.47	122.90
6	f	1	NAG	C2-N2-C7	3.40	127.46	122.90
6	N	1	NAG	C2-N2-C7	3.39	127.45	122.90
8	i	2	NAG	C2-N2-C7	3.36	127.40	122.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	Q	2	NAG	C2-N2-C7	3.35	127.39	122.90
8	Z	2	NAG	C2-N2-C7	3.33	127.37	122.90
5	V	1	NAG	C2-N2-C7	3.18	127.16	122.90
8	c	2	NAG	C2-N2-C7	3.15	127.13	122.90
8	T	2	NAG	C2-N2-C7	3.15	127.11	122.90
5	M	1	NAG	C2-N2-C7	3.14	127.11	122.90
8	l	2	NAG	C2-N2-C7	3.14	127.11	122.90
5	e	1	NAG	C2-N2-C7	3.12	127.08	122.90
8	l	1	NAG	C1-O5-C5	3.07	116.30	112.19
8	T	1	NAG	C1-O5-C5	3.07	116.30	112.19
8	c	1	NAG	C1-O5-C5	3.03	116.24	112.19
8	T	2	NAG	C1-O5-C5	2.84	115.99	112.19
8	l	2	NAG	C1-O5-C5	2.84	115.99	112.19
8	c	2	NAG	C1-O5-C5	2.83	115.98	112.19
5	V	1	NAG	C1-O5-C5	2.63	115.71	112.19
5	M	1	NAG	C1-O5-C5	2.62	115.70	112.19
5	e	1	NAG	C1-O5-C5	2.60	115.68	112.19
8	S	1	NAG	C1-O5-C5	2.55	115.61	112.19
8	k	1	NAG	C1-O5-C5	2.55	115.61	112.19
8	b	1	NAG	C1-O5-C5	2.54	115.58	112.19
8	P	2	NAG	C1-O5-C5	2.46	115.48	112.19
8	Y	2	NAG	C1-O5-C5	2.46	115.48	112.19
7	g	4	MAN	O2-C2-C3	-2.45	105.08	110.15
8	h	2	NAG	C1-O5-C5	2.44	115.46	112.19
7	X	4	MAN	O2-C2-C3	-2.44	105.10	110.15
7	O	4	MAN	O2-C2-C3	-2.44	105.11	110.15
6	N	2	NAG	C1-O5-C5	2.35	115.34	112.19
6	W	2	NAG	C1-O5-C5	2.35	115.33	112.19
6	f	2	NAG	C1-O5-C5	2.34	115.33	112.19
6	W	6	MAN	O2-C2-C3	-2.33	105.33	110.15
6	N	6	MAN	O2-C2-C3	-2.32	105.35	110.15
6	f	6	MAN	O2-C2-C3	-2.32	105.35	110.15
7	O	3	BMA	O2-C2-C3	-2.31	105.36	110.15
7	X	3	BMA	O2-C2-C3	-2.31	105.37	110.15
7	g	3	BMA	O2-C2-C3	-2.30	105.38	110.15
7	O	3	BMA	C1-O5-C5	2.23	115.17	112.19
7	X	3	BMA	C1-O5-C5	2.20	115.13	112.19
7	g	3	BMA	C1-O5-C5	2.19	115.12	112.19
8	l	1	NAG	O4-C4-C5	2.18	114.70	109.32
8	c	1	NAG	O4-C4-C5	2.18	114.69	109.32
8	T	1	NAG	O4-C4-C5	2.18	114.68	109.32
8	d	1	NAG	C8-C7-N2	2.16	119.71	116.12

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	m	1	NAG	C8-C7-N2	2.14	119.67	116.12
8	h	1	NAG	C8-C7-N2	2.14	119.67	116.12
8	U	1	NAG	C8-C7-N2	2.14	119.67	116.12
8	P	1	NAG	C8-C7-N2	2.13	119.66	116.12
8	Y	1	NAG	C8-C7-N2	2.10	119.60	116.12
6	f	1	NAG	C1-C2-N2	2.07	113.70	110.43
6	N	1	NAG	C1-C2-N2	2.07	113.70	110.43
6	W	1	NAG	C1-C2-N2	2.06	113.68	110.43

There are no chirality outliers.

All (171) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	O	3	BMA	O5-C5-C6-O6
7	X	3	BMA	O5-C5-C6-O6
7	g	3	BMA	O5-C5-C6-O6
8	Q	1	NAG	O5-C5-C6-O6
8	Z	1	NAG	O5-C5-C6-O6
8	i	1	NAG	O5-C5-C6-O6
8	T	1	NAG	C4-C5-C6-O6
8	c	1	NAG	C4-C5-C6-O6
8	l	1	NAG	C4-C5-C6-O6
7	O	2	NAG	C4-C5-C6-O6
7	X	2	NAG	C4-C5-C6-O6
7	g	2	NAG	C4-C5-C6-O6
8	P	1	NAG	O5-C5-C6-O6
8	Y	1	NAG	O5-C5-C6-O6
8	h	1	NAG	O5-C5-C6-O6
8	Q	1	NAG	C4-C5-C6-O6
8	Z	1	NAG	C4-C5-C6-O6
8	i	1	NAG	C4-C5-C6-O6
7	O	3	BMA	C4-C5-C6-O6
7	X	3	BMA	C4-C5-C6-O6
7	g	3	BMA	C4-C5-C6-O6
7	O	2	NAG	O5-C5-C6-O6
7	X	2	NAG	O5-C5-C6-O6
7	g	2	NAG	O5-C5-C6-O6
8	T	1	NAG	O5-C5-C6-O6
8	c	1	NAG	O5-C5-C6-O6
8	l	1	NAG	O5-C5-C6-O6
8	h	2	NAG	C4-C5-C6-O6
8	P	2	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
8	Y	2	NAG	C4-C5-C6-O6
8	d	2	NAG	O5-C5-C6-O6
8	P	1	NAG	C4-C5-C6-O6
8	Y	1	NAG	C4-C5-C6-O6
8	h	1	NAG	C4-C5-C6-O6
8	U	2	NAG	O5-C5-C6-O6
8	m	2	NAG	O5-C5-C6-O6
6	N	2	NAG	O5-C5-C6-O6
6	W	2	NAG	O5-C5-C6-O6
6	f	2	NAG	O5-C5-C6-O6
6	N	2	NAG	C8-C7-N2-C2
6	N	2	NAG	O7-C7-N2-C2
6	W	2	NAG	C8-C7-N2-C2
6	W	2	NAG	O7-C7-N2-C2
6	f	2	NAG	C8-C7-N2-C2
6	f	2	NAG	O7-C7-N2-C2
8	P	1	NAG	C8-C7-N2-C2
8	P	1	NAG	O7-C7-N2-C2
8	U	1	NAG	C8-C7-N2-C2
8	U	1	NAG	O7-C7-N2-C2
8	Y	1	NAG	C8-C7-N2-C2
8	Y	1	NAG	O7-C7-N2-C2
8	d	1	NAG	C8-C7-N2-C2
8	d	1	NAG	O7-C7-N2-C2
8	h	1	NAG	C8-C7-N2-C2
8	h	1	NAG	O7-C7-N2-C2
8	m	1	NAG	C8-C7-N2-C2
8	m	1	NAG	O7-C7-N2-C2
8	Q	2	NAG	O5-C5-C6-O6
8	Z	2	NAG	O5-C5-C6-O6
8	i	2	NAG	O5-C5-C6-O6
7	O	1	NAG	O5-C5-C6-O6
7	X	1	NAG	O5-C5-C6-O6
7	g	1	NAG	O5-C5-C6-O6
6	N	2	NAG	C4-C5-C6-O6
6	W	2	NAG	C4-C5-C6-O6
6	f	2	NAG	C4-C5-C6-O6
6	N	4	MAN	O5-C5-C6-O6
6	W	4	MAN	O5-C5-C6-O6
6	f	4	MAN	O5-C5-C6-O6
8	P	2	NAG	O5-C5-C6-O6
8	Y	2	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
8	h	2	NAG	O5-C5-C6-O6
8	U	2	NAG	C4-C5-C6-O6
8	d	2	NAG	C4-C5-C6-O6
8	m	2	NAG	C4-C5-C6-O6
5	V	3	BMA	O5-C5-C6-O6
5	M	3	BMA	O5-C5-C6-O6
5	e	3	BMA	O5-C5-C6-O6
6	f	5	MAN	O5-C5-C6-O6
6	N	5	MAN	O5-C5-C6-O6
6	W	5	MAN	O5-C5-C6-O6
8	R	2	NAG	O5-C5-C6-O6
8	a	2	NAG	O5-C5-C6-O6
8	j	2	NAG	O5-C5-C6-O6
8	T	2	NAG	C4-C5-C6-O6
8	c	2	NAG	C4-C5-C6-O6
8	l	2	NAG	C4-C5-C6-O6
8	l	2	NAG	O5-C5-C6-O6
8	T	2	NAG	O5-C5-C6-O6
8	c	2	NAG	O5-C5-C6-O6
8	R	1	NAG	O5-C5-C6-O6
8	a	1	NAG	O5-C5-C6-O6
8	j	1	NAG	O5-C5-C6-O6
5	M	1	NAG	O5-C5-C6-O6
5	V	1	NAG	O5-C5-C6-O6
5	e	1	NAG	O5-C5-C6-O6
8	S	2	NAG	O5-C5-C6-O6
8	b	2	NAG	O5-C5-C6-O6
8	k	2	NAG	O5-C5-C6-O6
6	W	1	NAG	C4-C5-C6-O6
6	f	1	NAG	C4-C5-C6-O6
6	N	1	NAG	C4-C5-C6-O6
8	Q	2	NAG	C4-C5-C6-O6
8	Z	2	NAG	C4-C5-C6-O6
8	i	2	NAG	C4-C5-C6-O6
8	m	1	NAG	C4-C5-C6-O6
8	d	1	NAG	C4-C5-C6-O6
8	U	1	NAG	C4-C5-C6-O6
7	O	1	NAG	C4-C5-C6-O6
7	X	1	NAG	C4-C5-C6-O6
7	g	1	NAG	C4-C5-C6-O6
6	N	4	MAN	C4-C5-C6-O6
6	W	4	MAN	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
6	f	4	MAN	C4-C5-C6-O6
5	M	1	NAG	C3-C2-N2-C7
5	V	1	NAG	C3-C2-N2-C7
5	e	1	NAG	C3-C2-N2-C7
8	P	1	NAG	C3-C2-N2-C7
8	T	2	NAG	C3-C2-N2-C7
8	U	1	NAG	C3-C2-N2-C7
8	Y	1	NAG	C3-C2-N2-C7
8	c	2	NAG	C3-C2-N2-C7
8	d	1	NAG	C3-C2-N2-C7
8	h	1	NAG	C3-C2-N2-C7
8	l	2	NAG	C3-C2-N2-C7
8	m	1	NAG	C3-C2-N2-C7
7	O	4	MAN	O5-C5-C6-O6
7	g	4	MAN	O5-C5-C6-O6
7	X	4	MAN	O5-C5-C6-O6
8	d	1	NAG	O5-C5-C6-O6
8	m	1	NAG	O5-C5-C6-O6
8	U	1	NAG	O5-C5-C6-O6
6	W	1	NAG	O5-C5-C6-O6
6	f	1	NAG	O5-C5-C6-O6
6	N	1	NAG	O5-C5-C6-O6
6	N	3	BMA	C4-C5-C6-O6
6	W	3	BMA	C4-C5-C6-O6
6	f	3	BMA	C4-C5-C6-O6
6	N	3	BMA	O5-C5-C6-O6
6	W	3	BMA	O5-C5-C6-O6
6	f	3	BMA	O5-C5-C6-O6
5	M	1	NAG	C1-C2-N2-C7
5	V	1	NAG	C1-C2-N2-C7
5	e	1	NAG	C1-C2-N2-C7
6	N	1	NAG	C1-C2-N2-C7
6	W	1	NAG	C1-C2-N2-C7
6	f	1	NAG	C1-C2-N2-C7
8	P	1	NAG	C1-C2-N2-C7
8	Q	2	NAG	C1-C2-N2-C7
8	S	2	NAG	C1-C2-N2-C7
8	T	2	NAG	C1-C2-N2-C7
8	U	1	NAG	C1-C2-N2-C7
8	Y	1	NAG	C1-C2-N2-C7
8	Z	2	NAG	C1-C2-N2-C7
8	b	2	NAG	C1-C2-N2-C7

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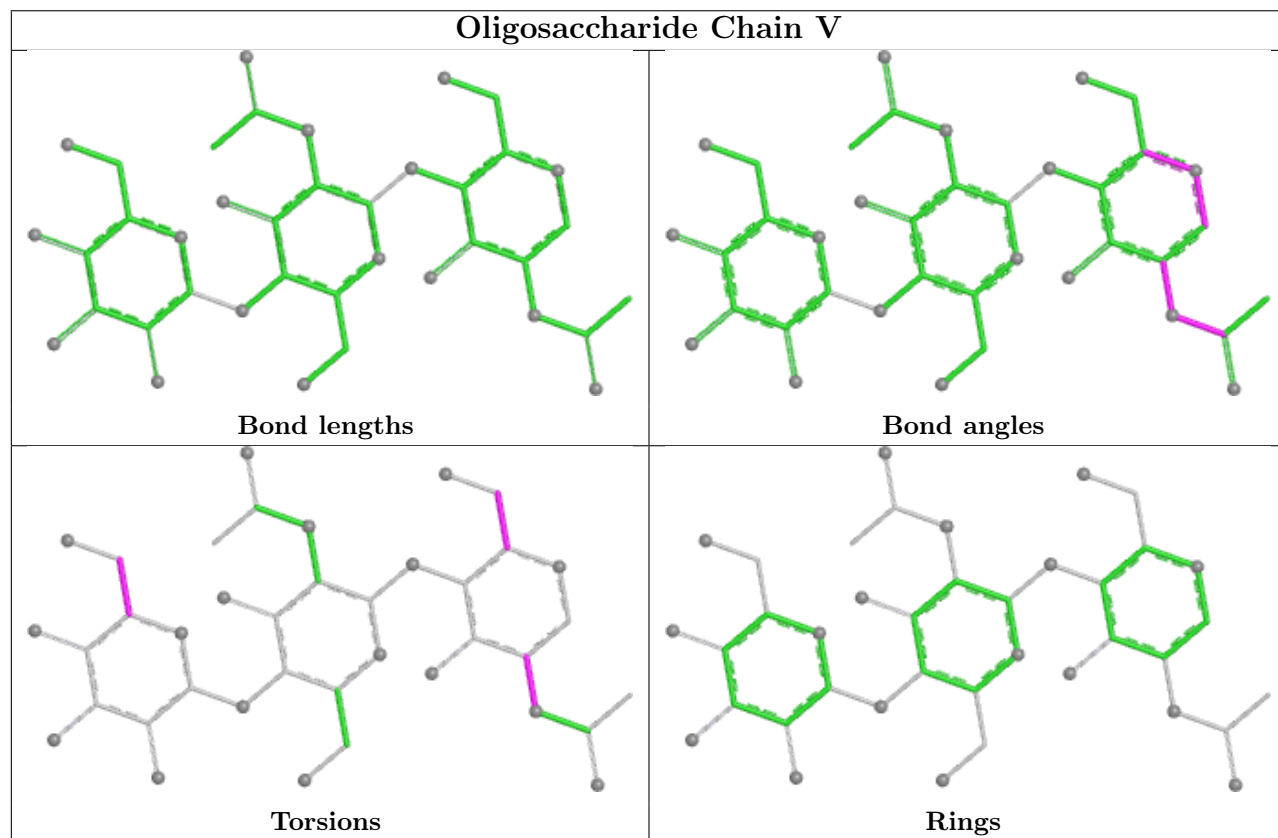
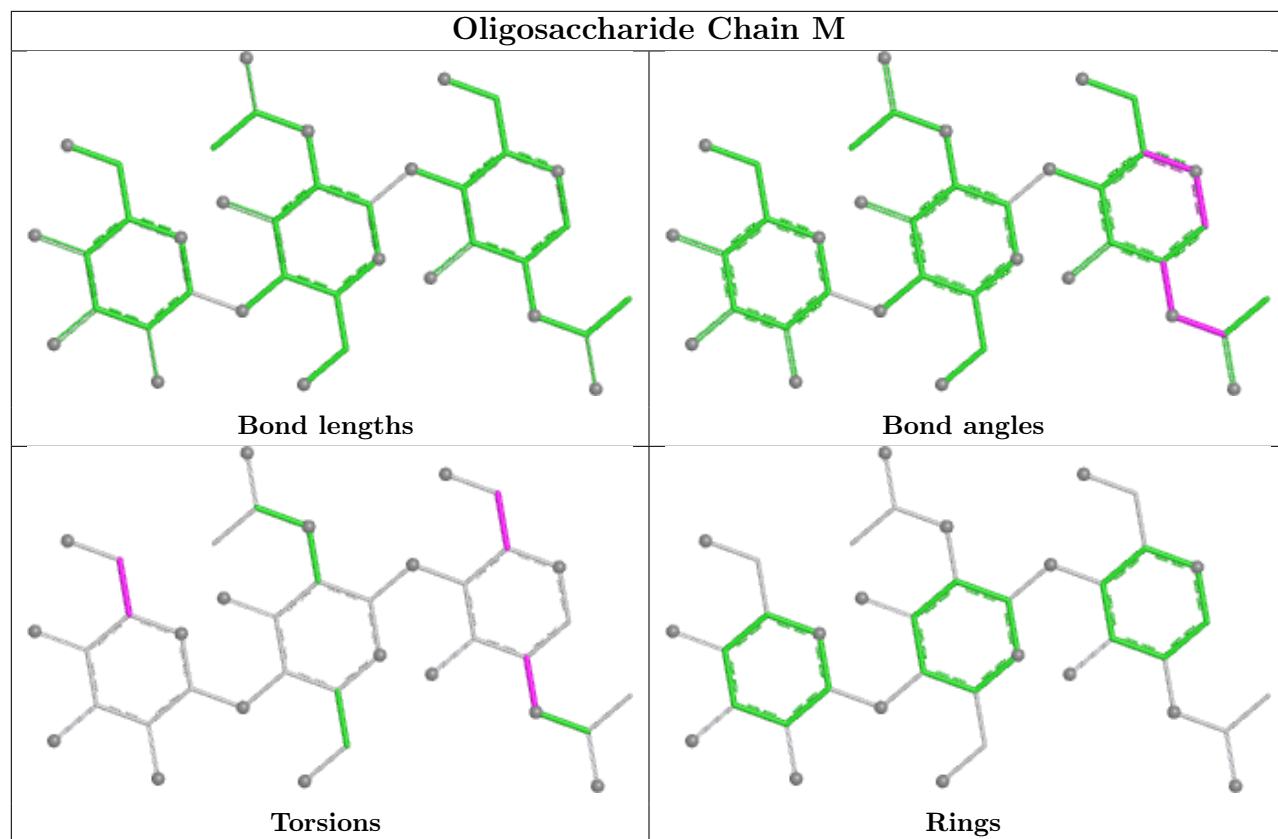
Mol	Chain	Res	Type	Atoms
8	c	2	NAG	C1-C2-N2-C7
8	d	1	NAG	C1-C2-N2-C7
8	h	1	NAG	C1-C2-N2-C7
8	i	2	NAG	C1-C2-N2-C7
8	k	2	NAG	C1-C2-N2-C7
8	l	2	NAG	C1-C2-N2-C7
8	m	1	NAG	C1-C2-N2-C7
6	N	1	NAG	C3-C2-N2-C7
6	W	1	NAG	C3-C2-N2-C7
6	f	1	NAG	C3-C2-N2-C7
8	Q	2	NAG	C3-C2-N2-C7
8	Z	2	NAG	C3-C2-N2-C7
8	i	2	NAG	C3-C2-N2-C7
7	O	4	MAN	C4-C5-C6-O6
7	g	4	MAN	C4-C5-C6-O6
7	X	4	MAN	C4-C5-C6-O6

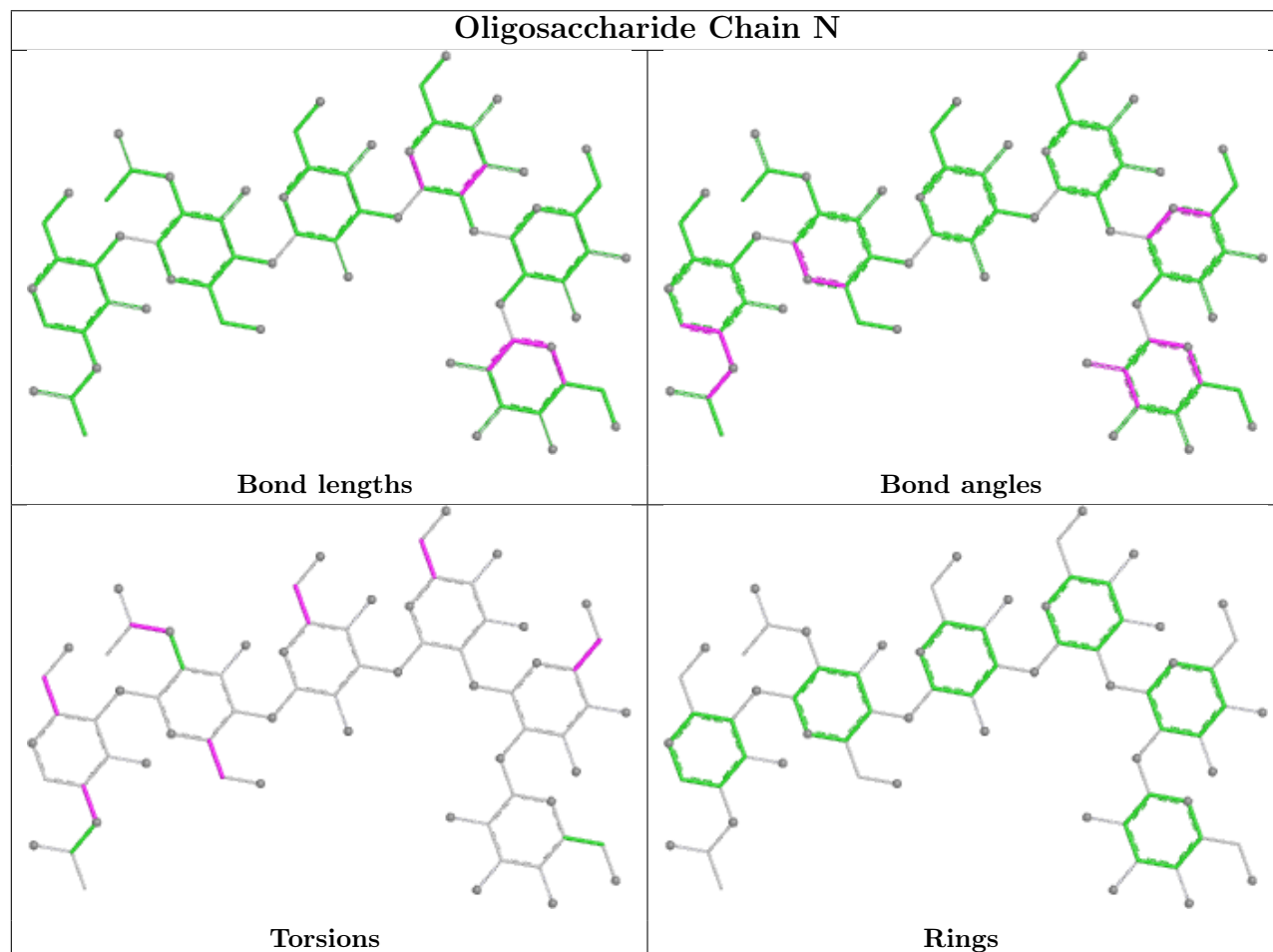
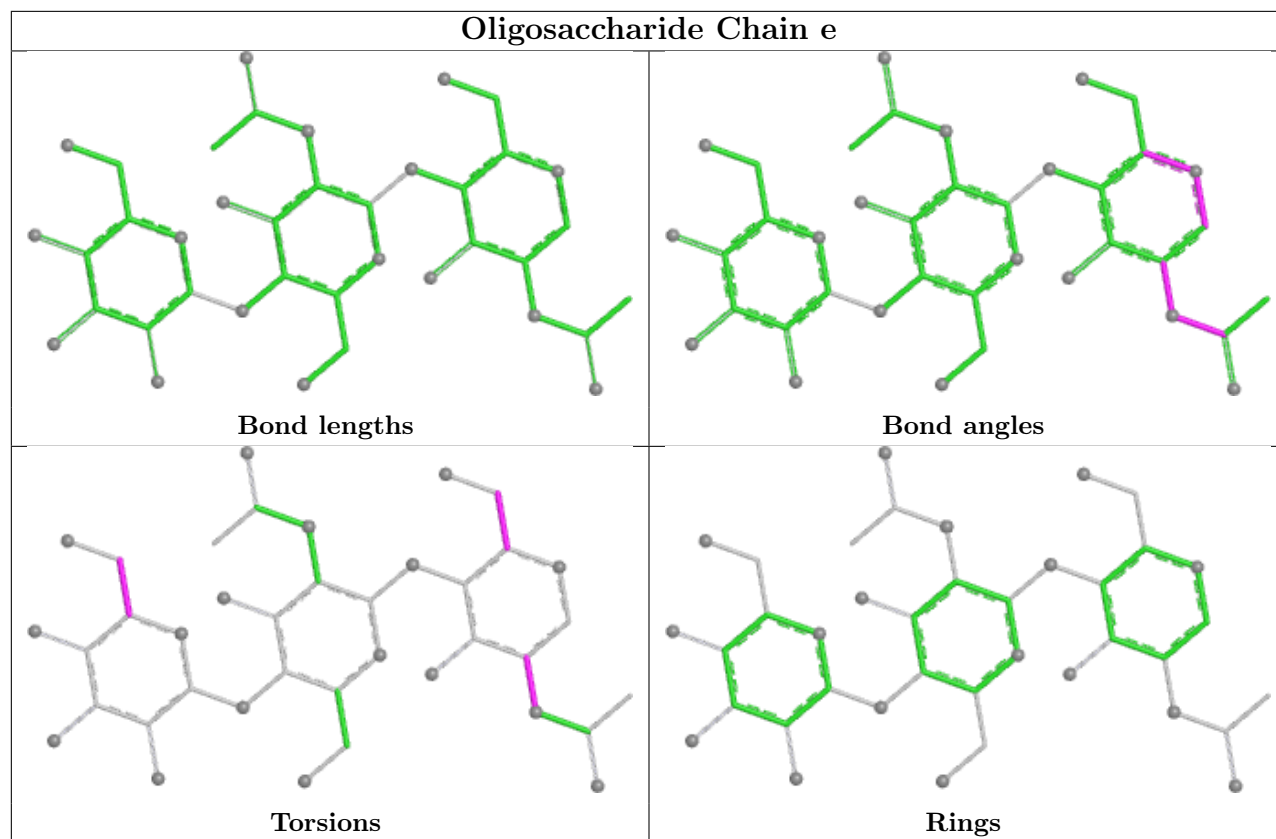
All (3) ring outliers are listed below:

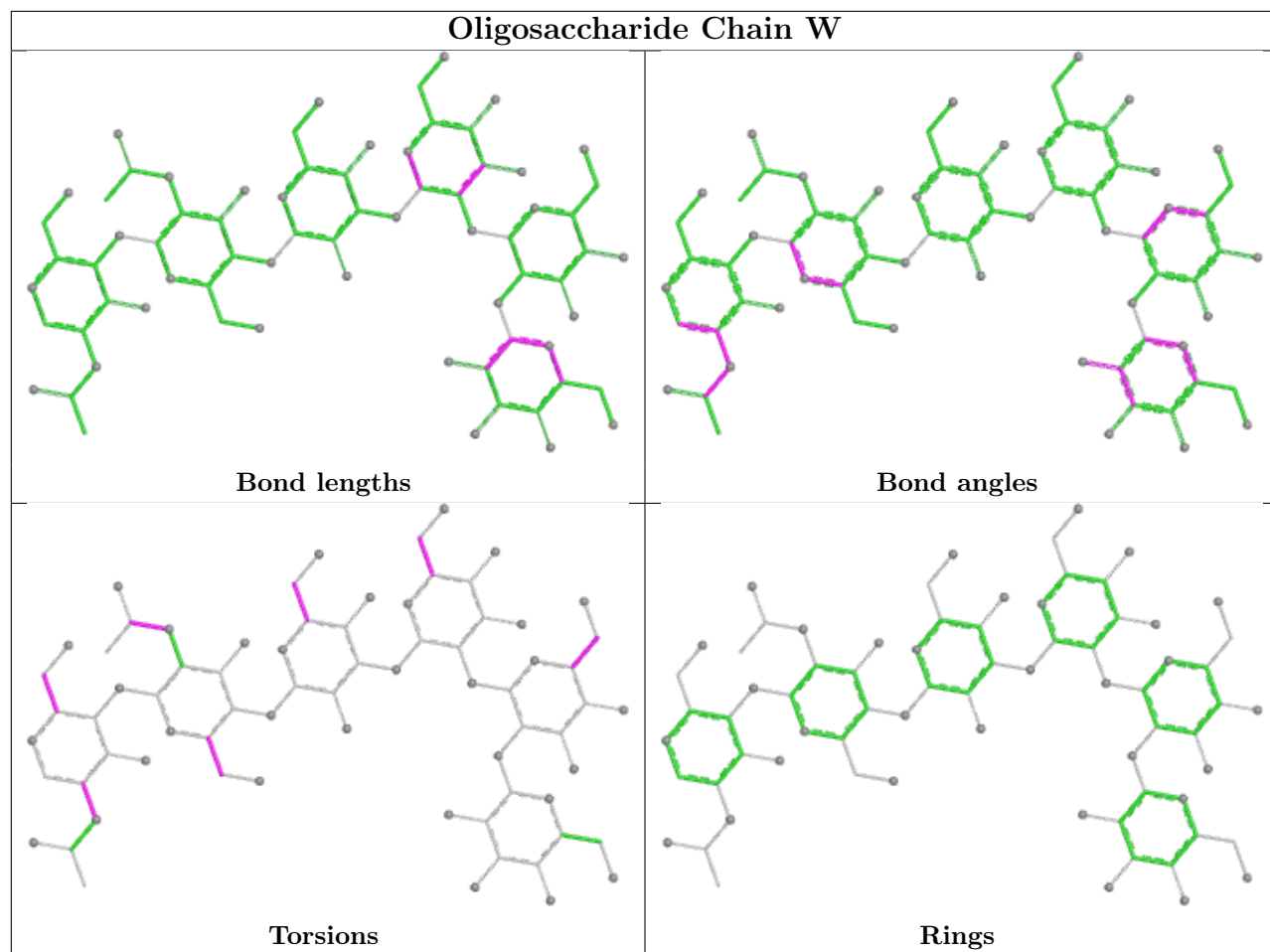
Mol	Chain	Res	Type	Atoms
7	O	4	MAN	C1-C2-C3-C4-C5-O5
7	g	4	MAN	C1-C2-C3-C4-C5-O5
7	X	4	MAN	C1-C2-C3-C4-C5-O5

No monomer is involved in short contacts.

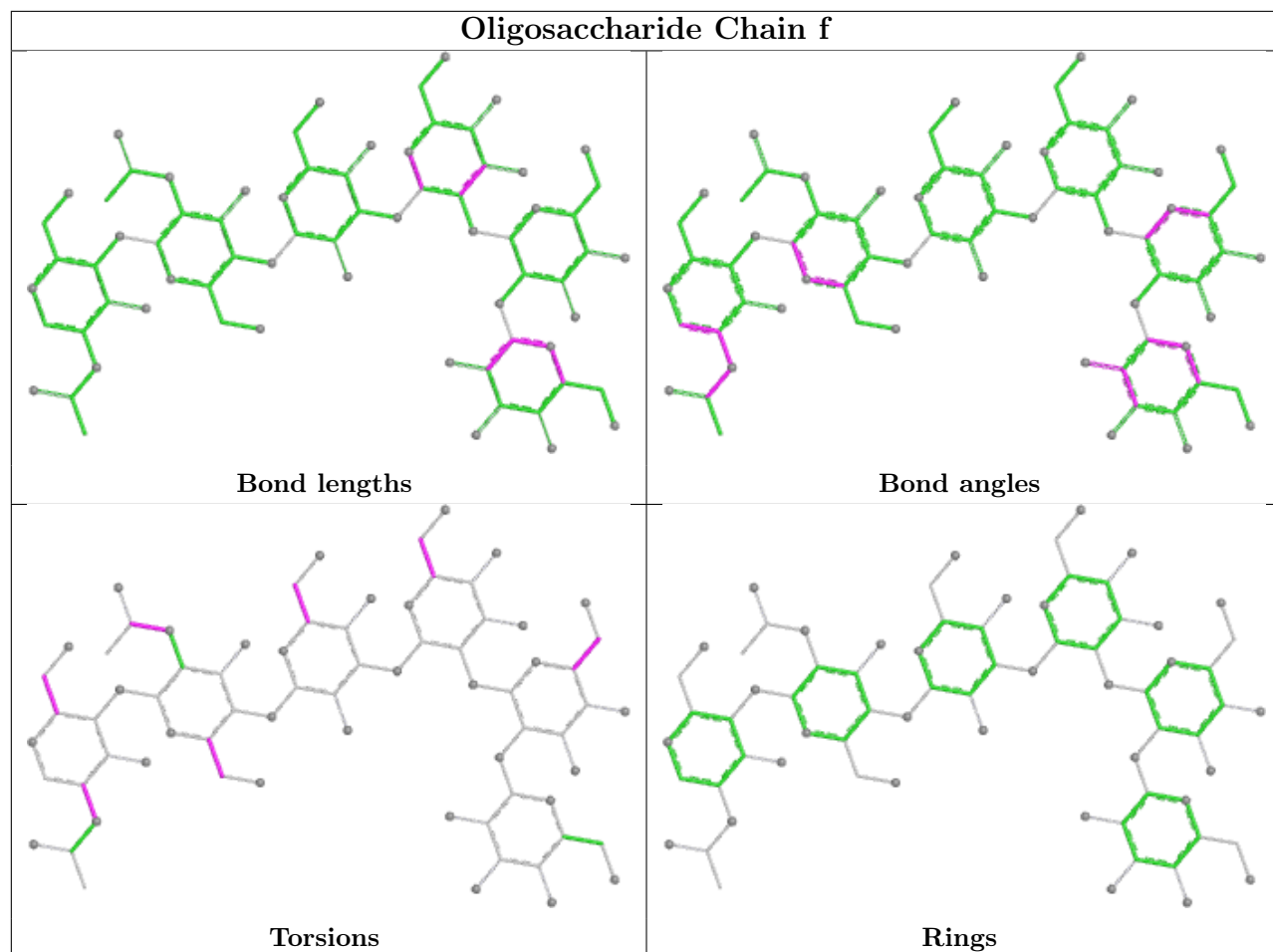
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

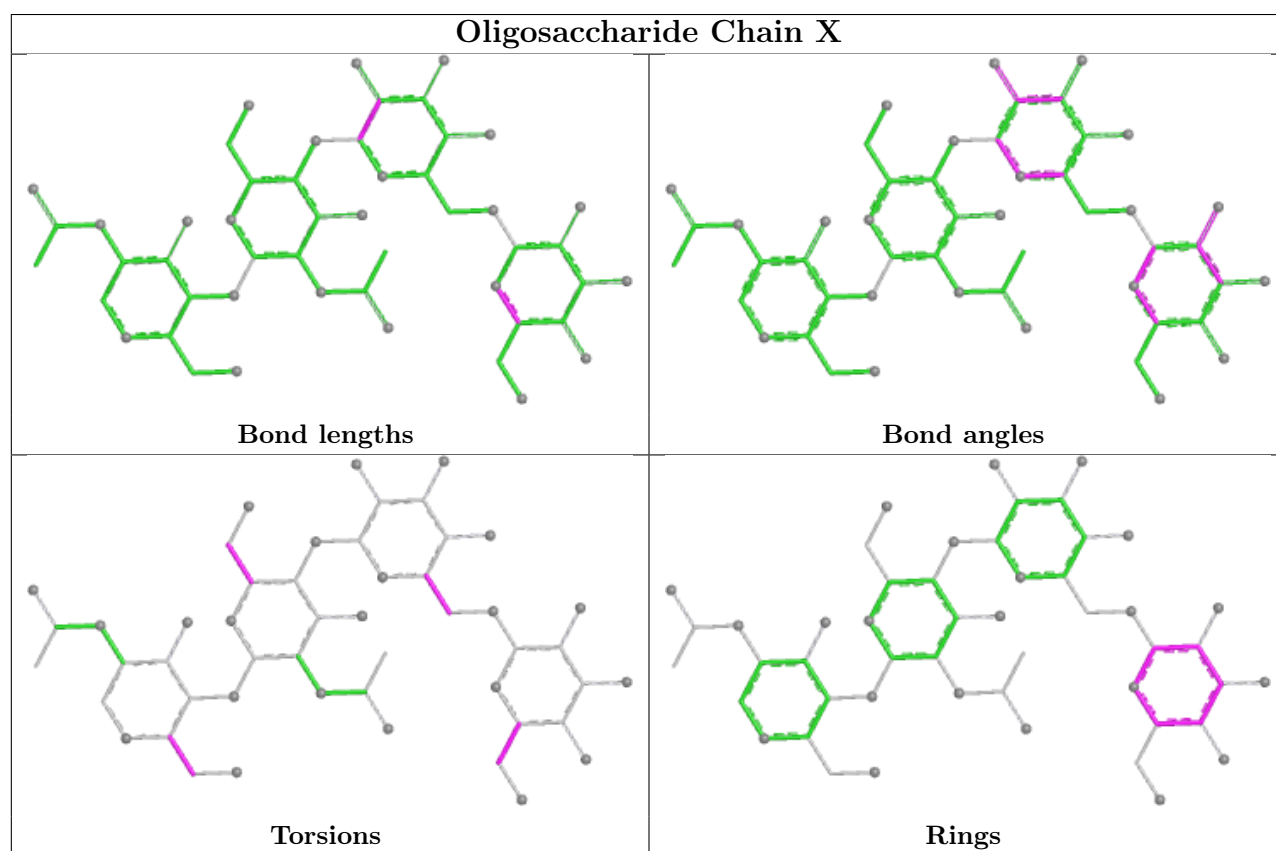
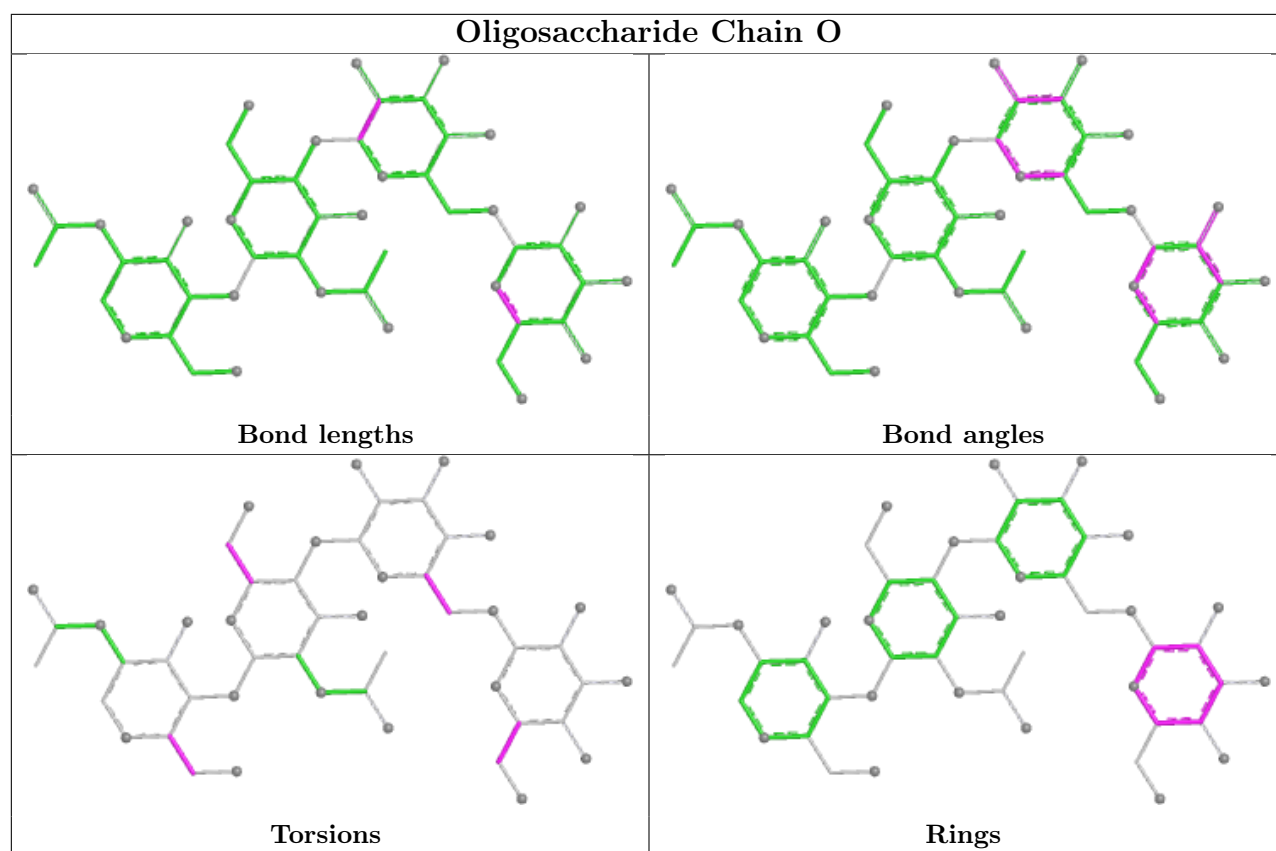


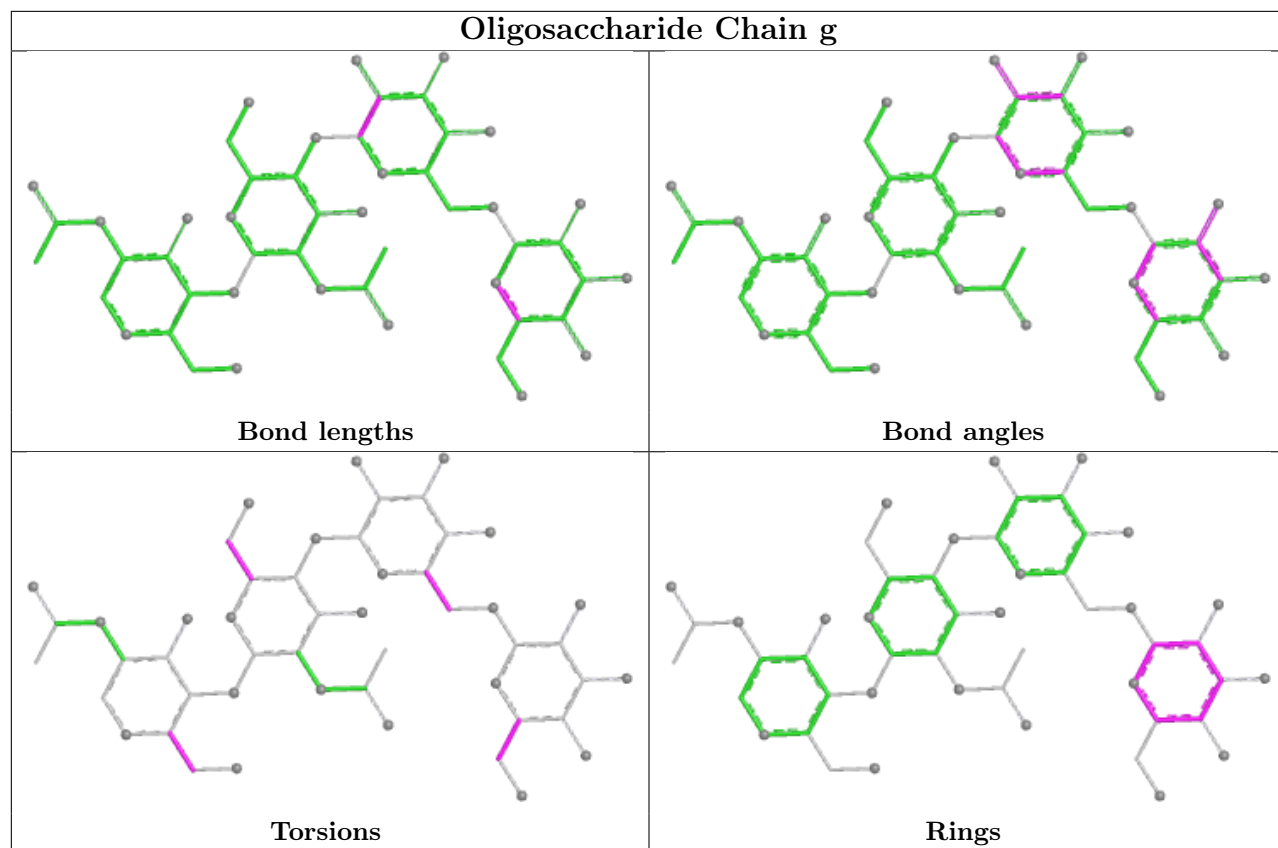


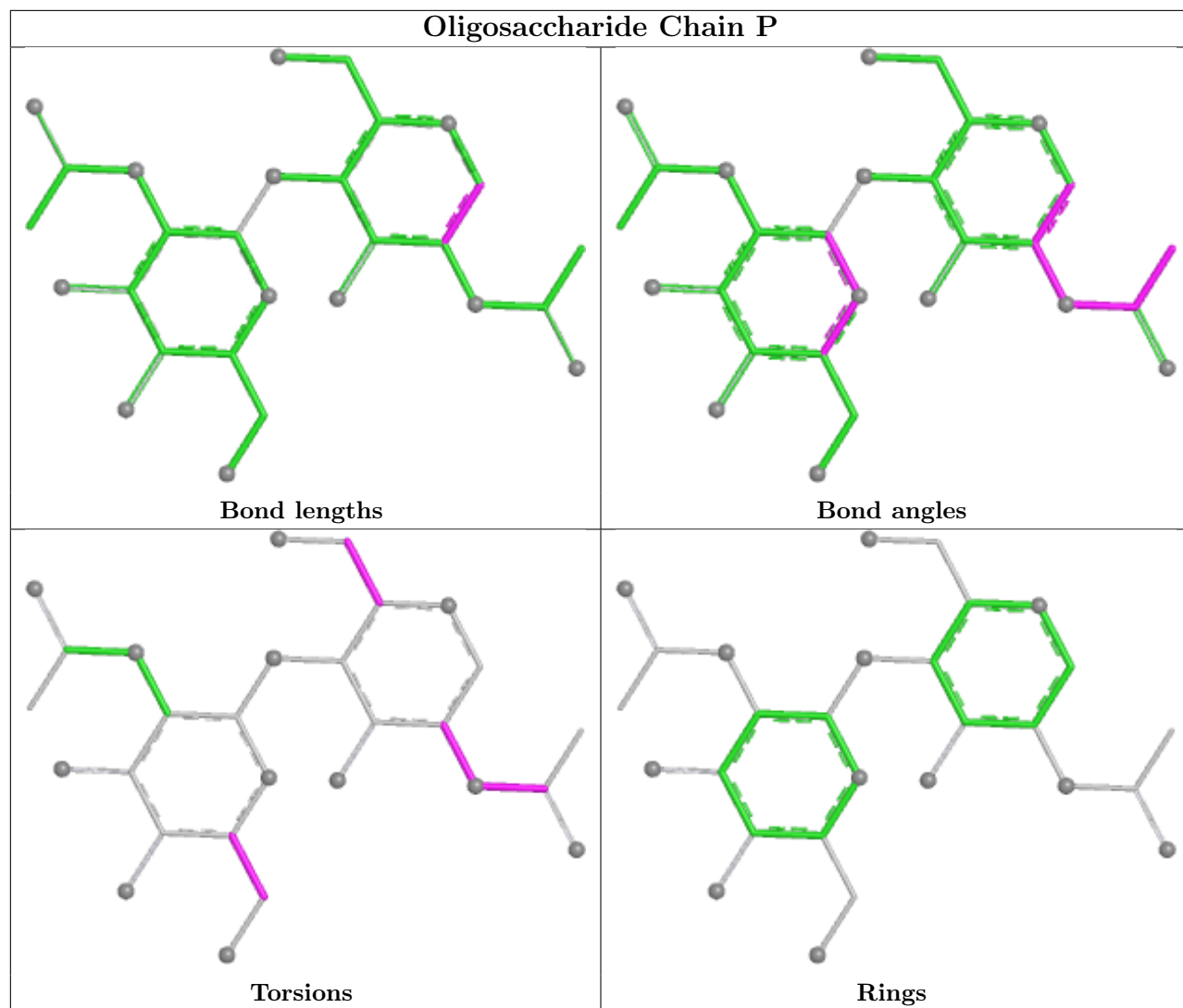


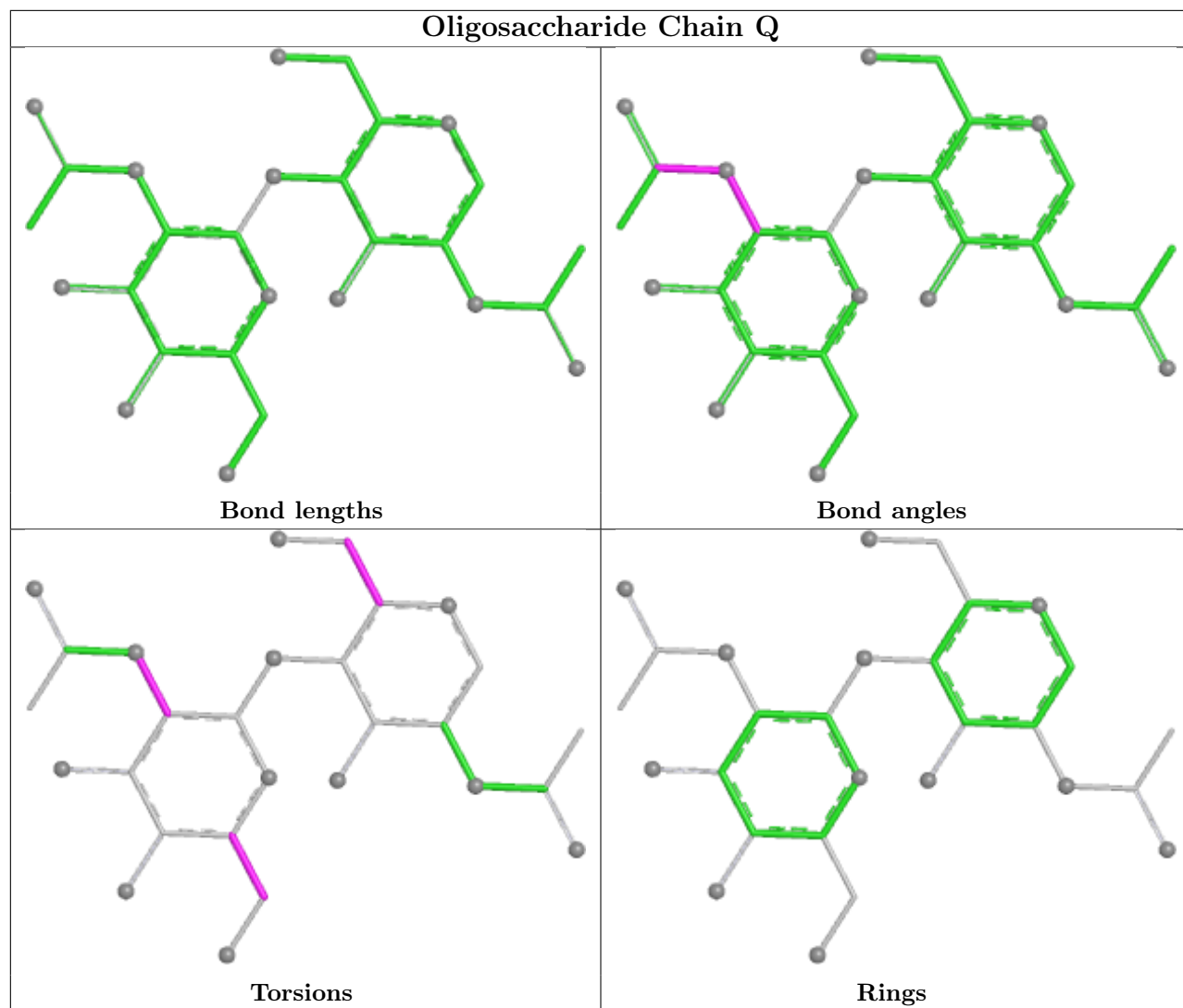


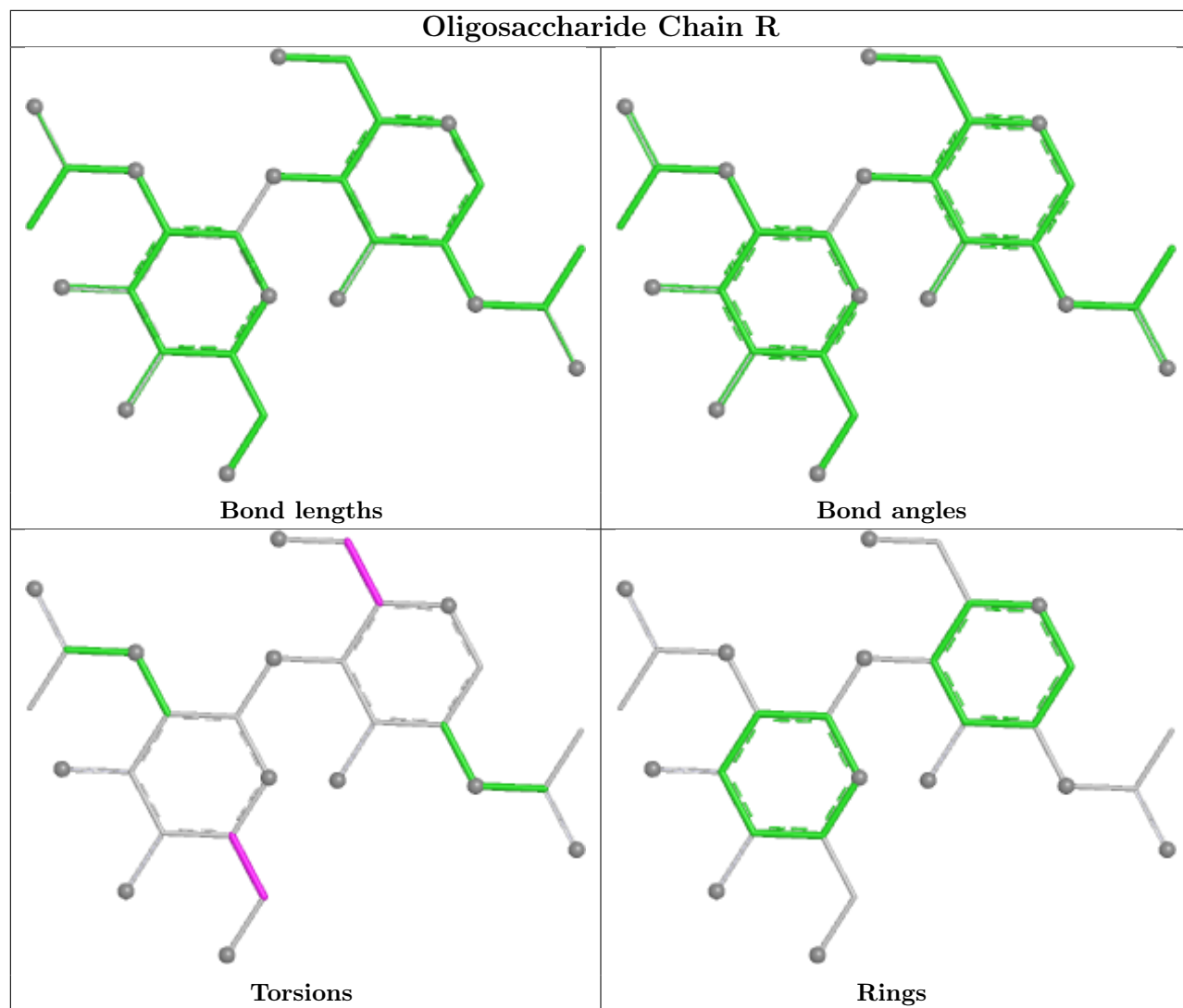


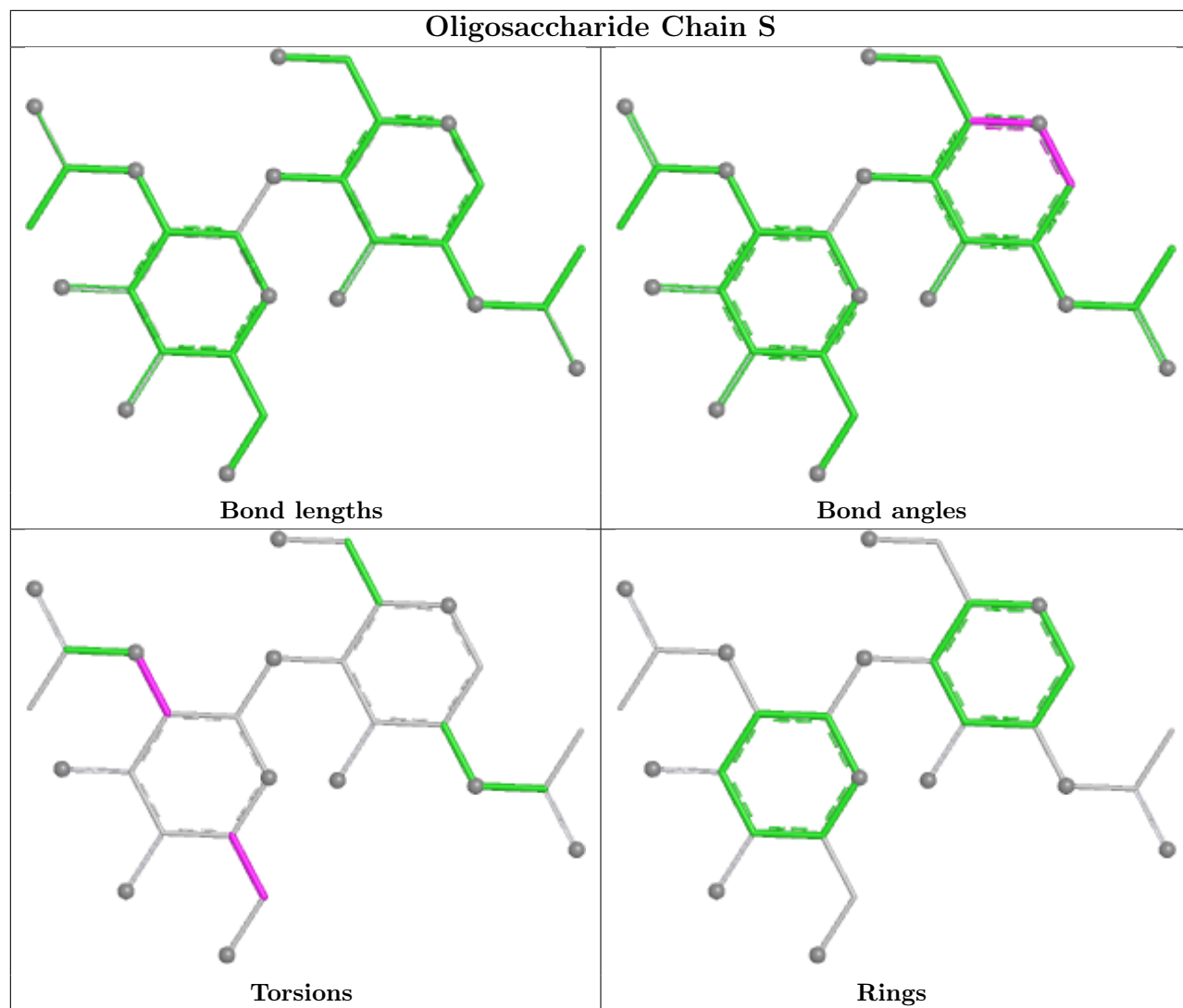


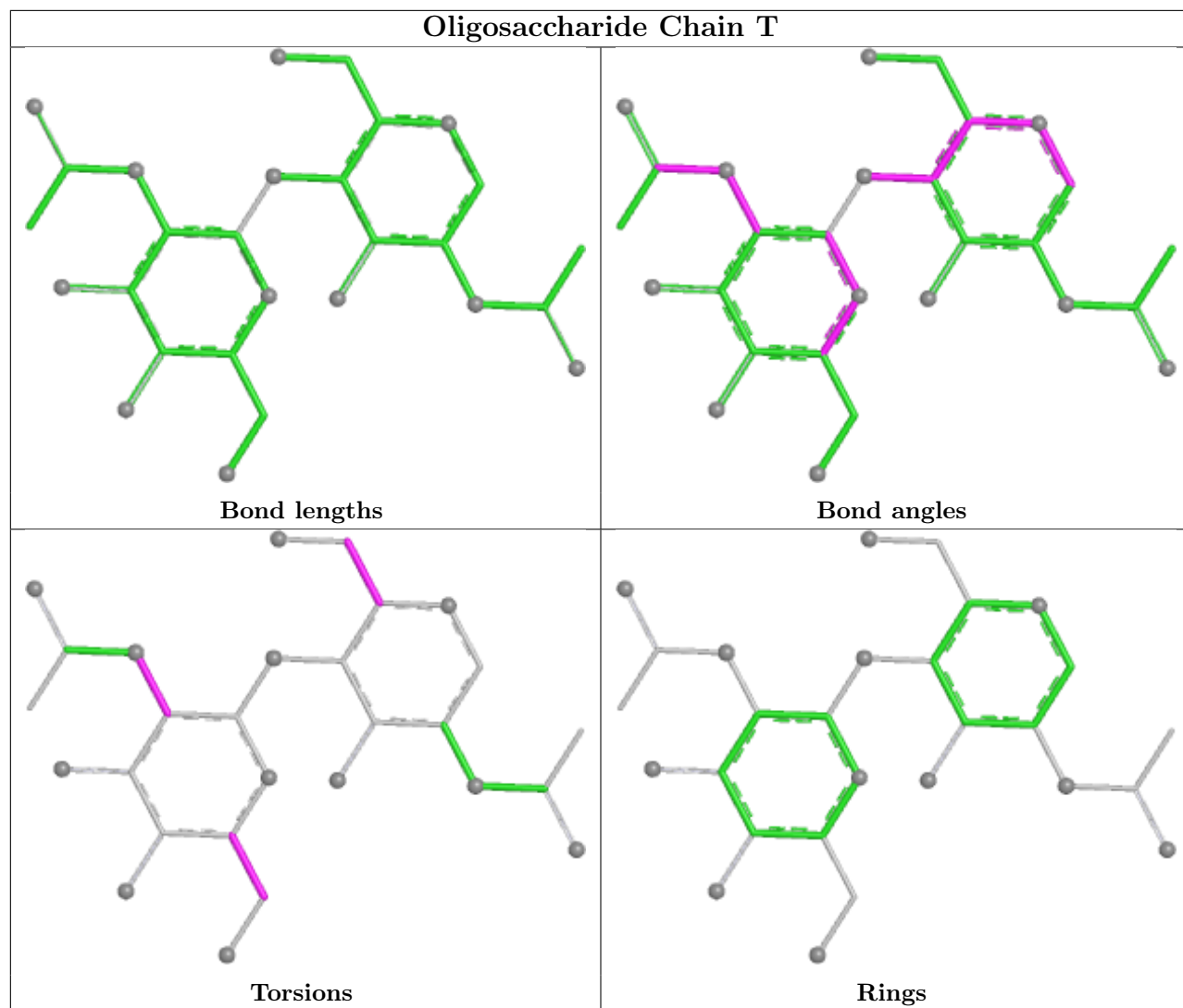




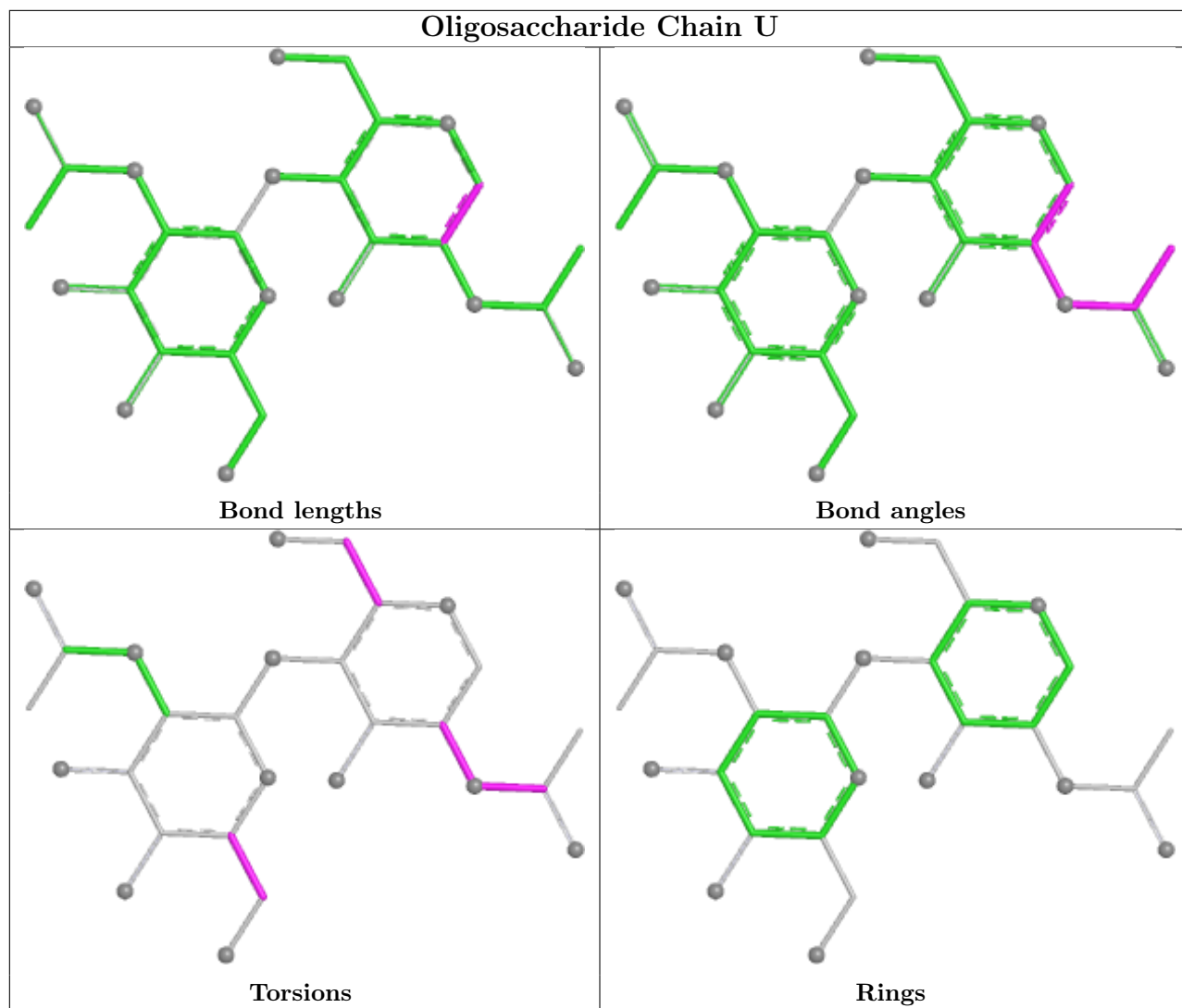


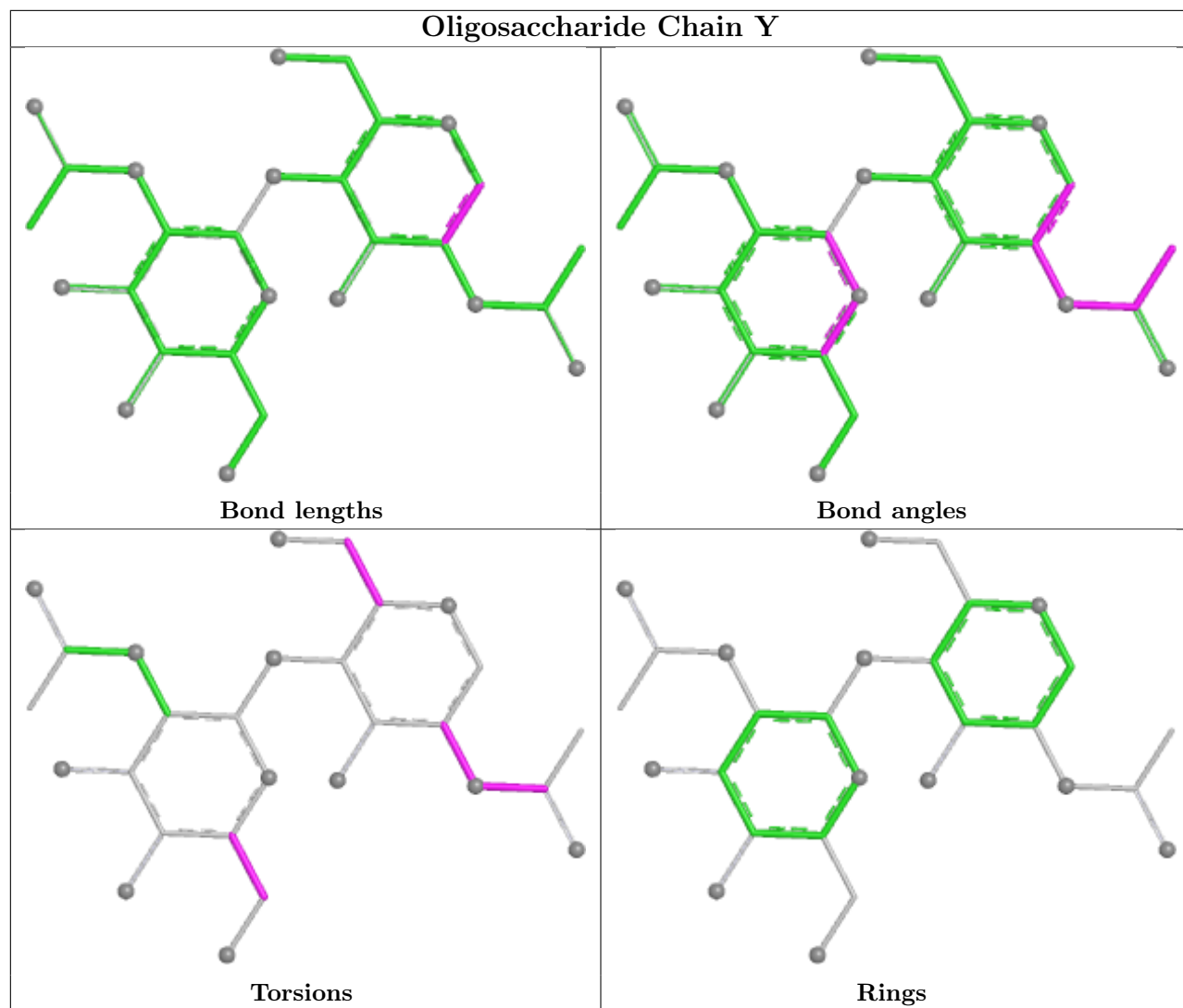


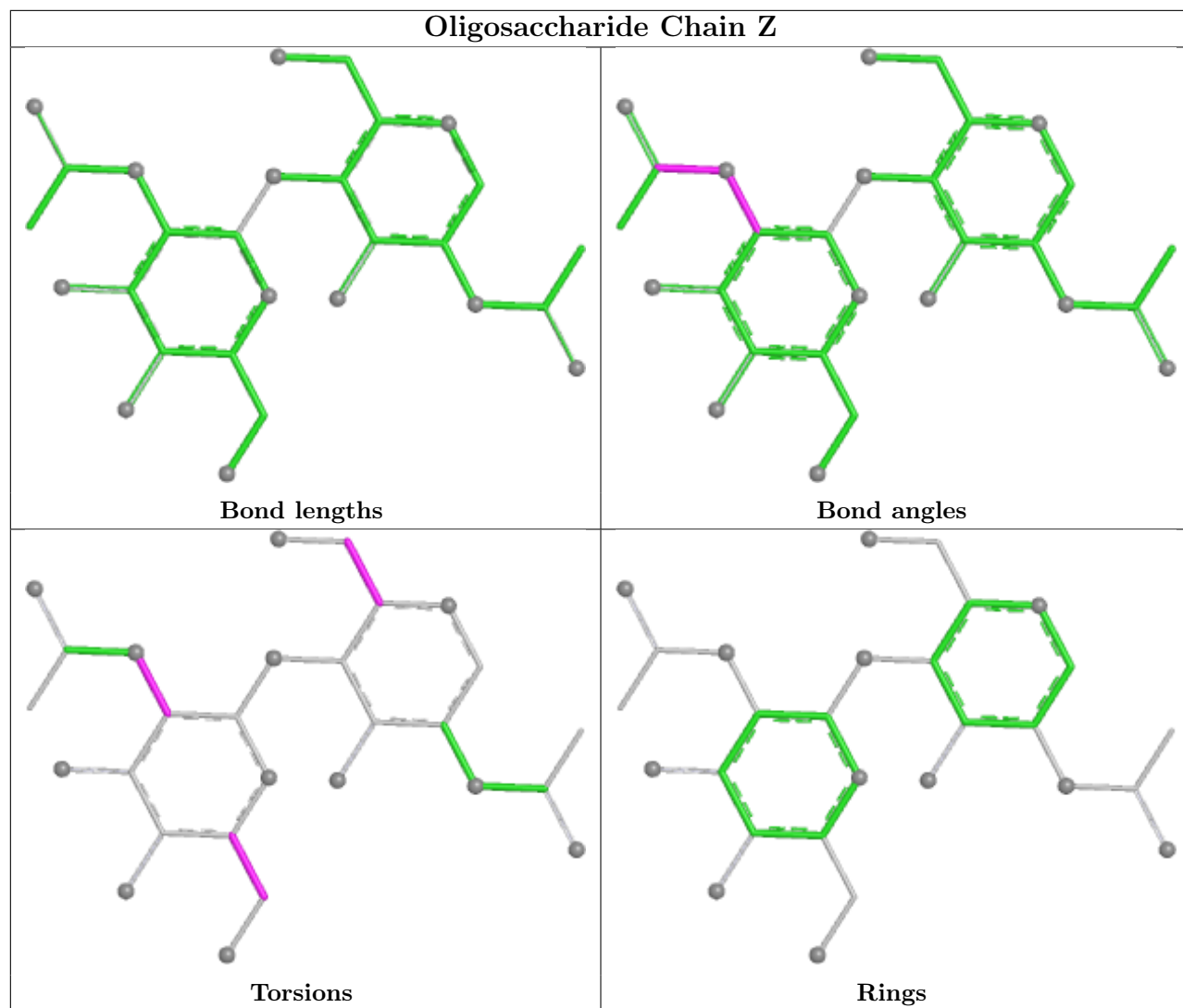


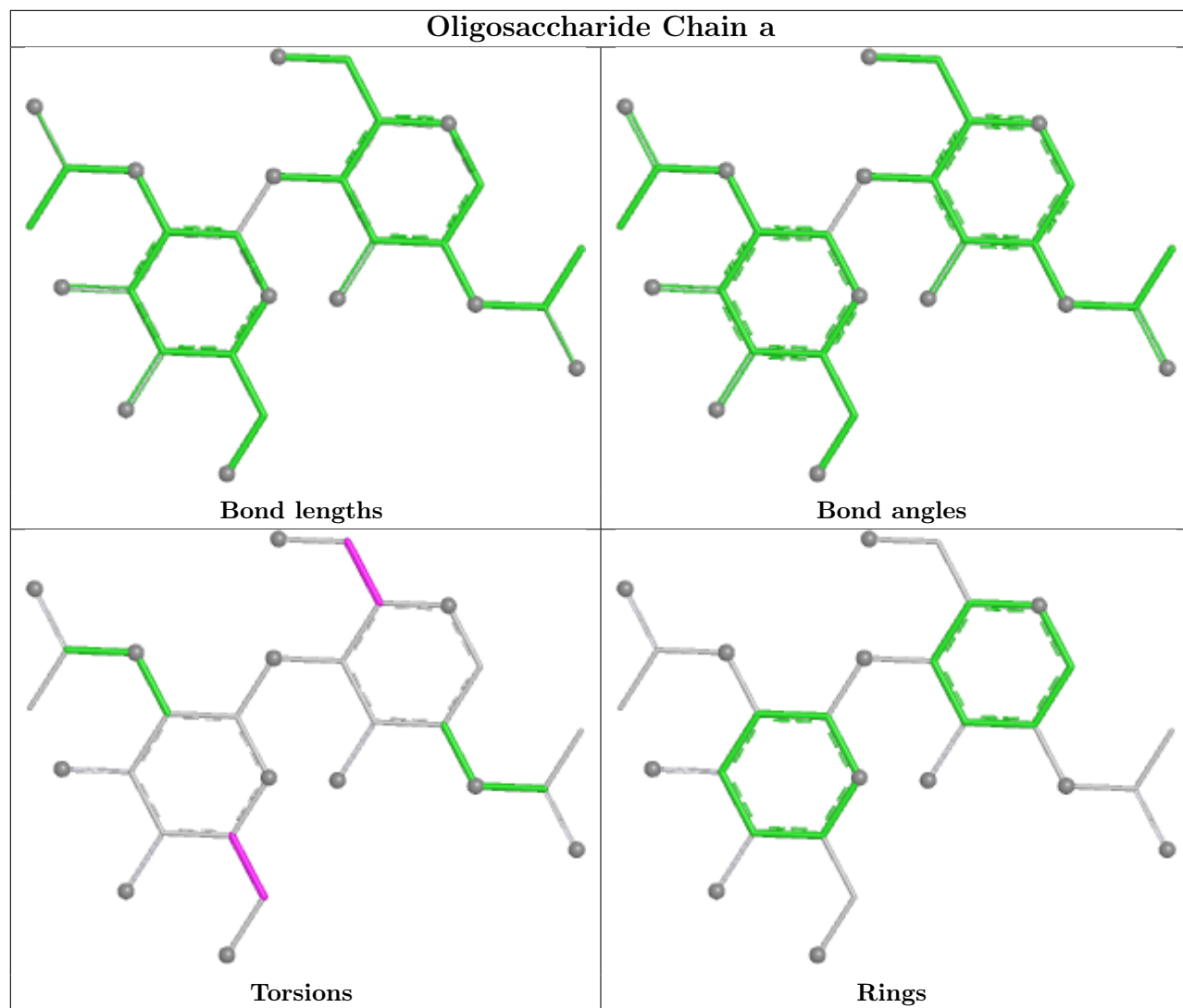


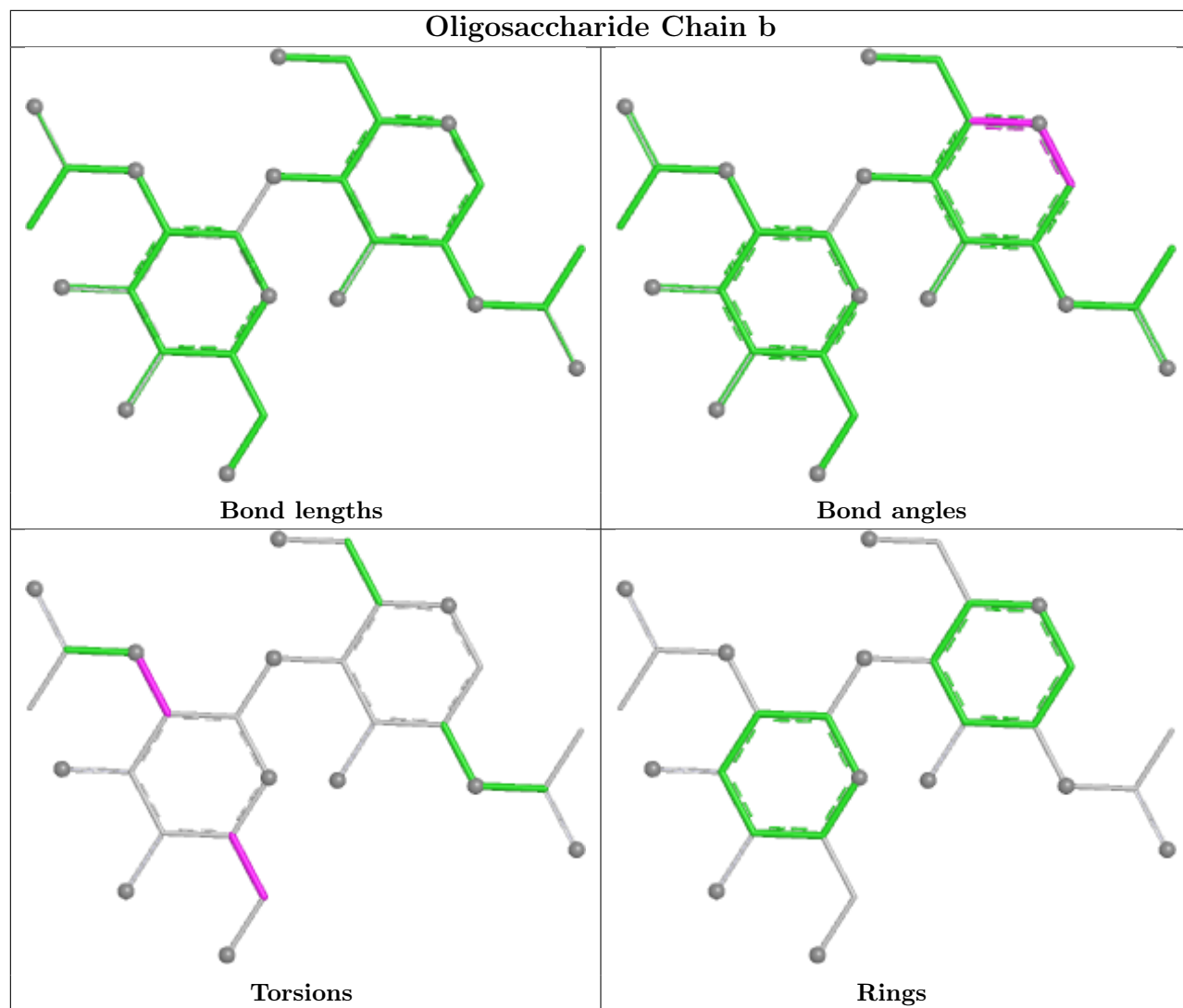


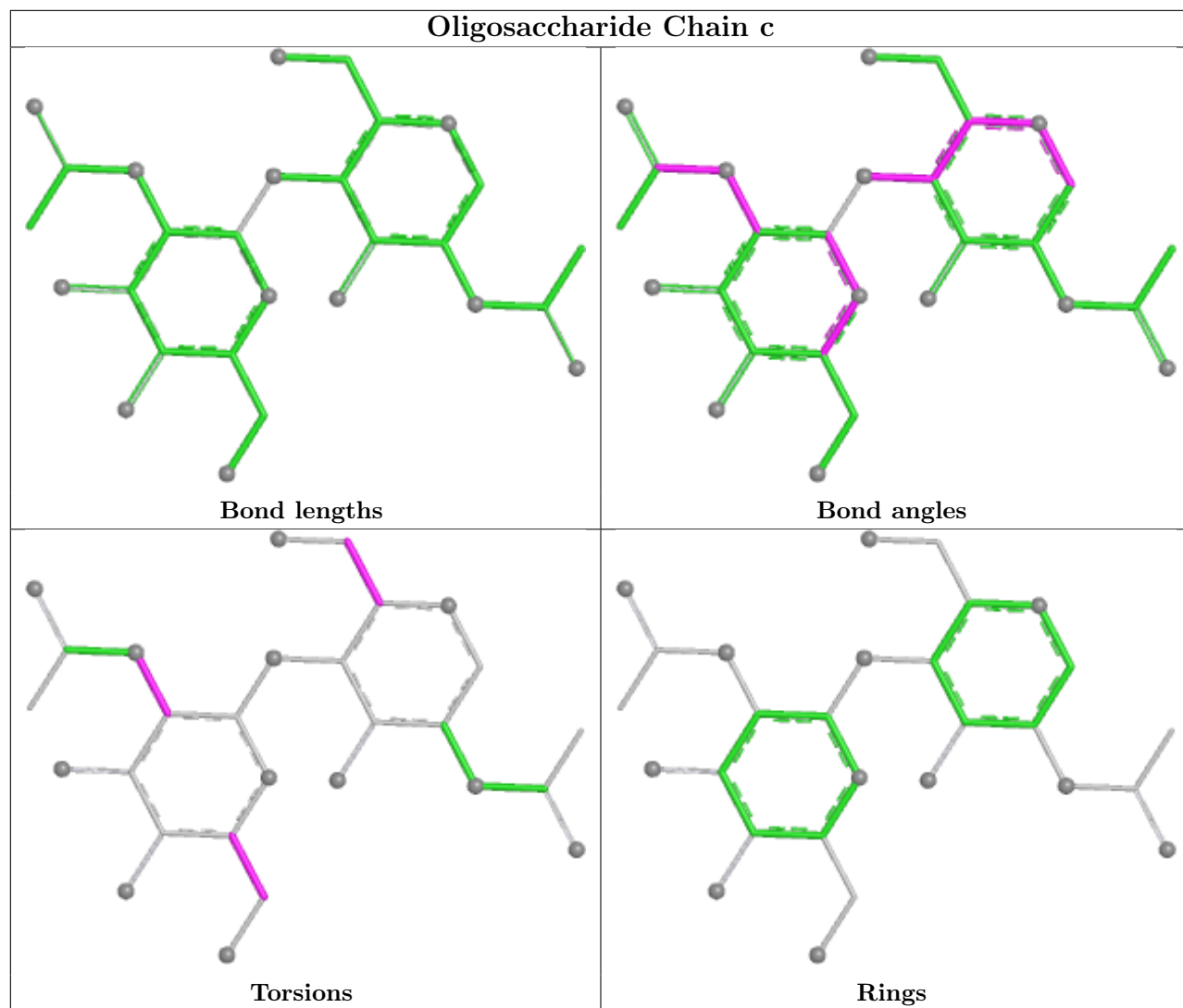


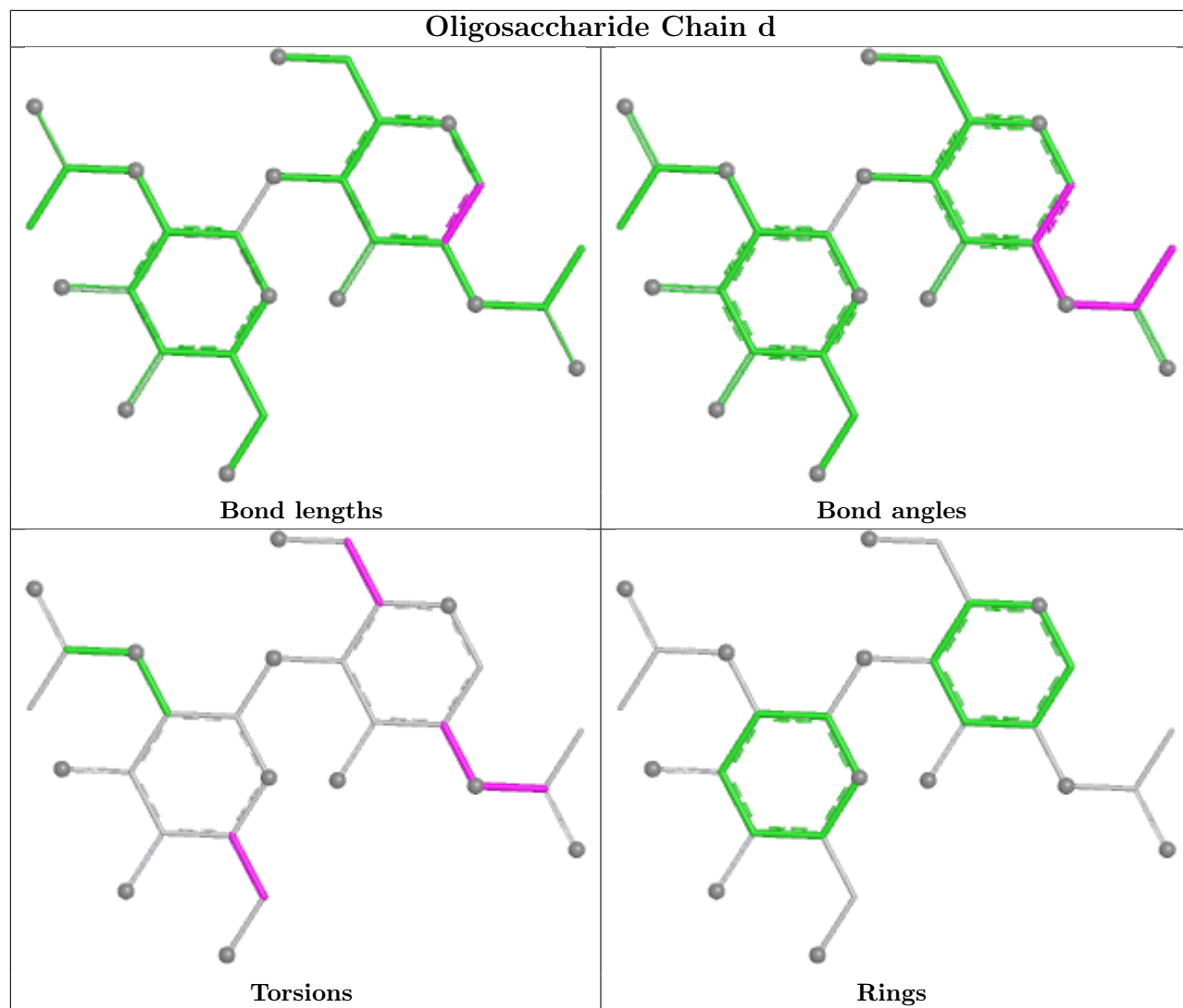


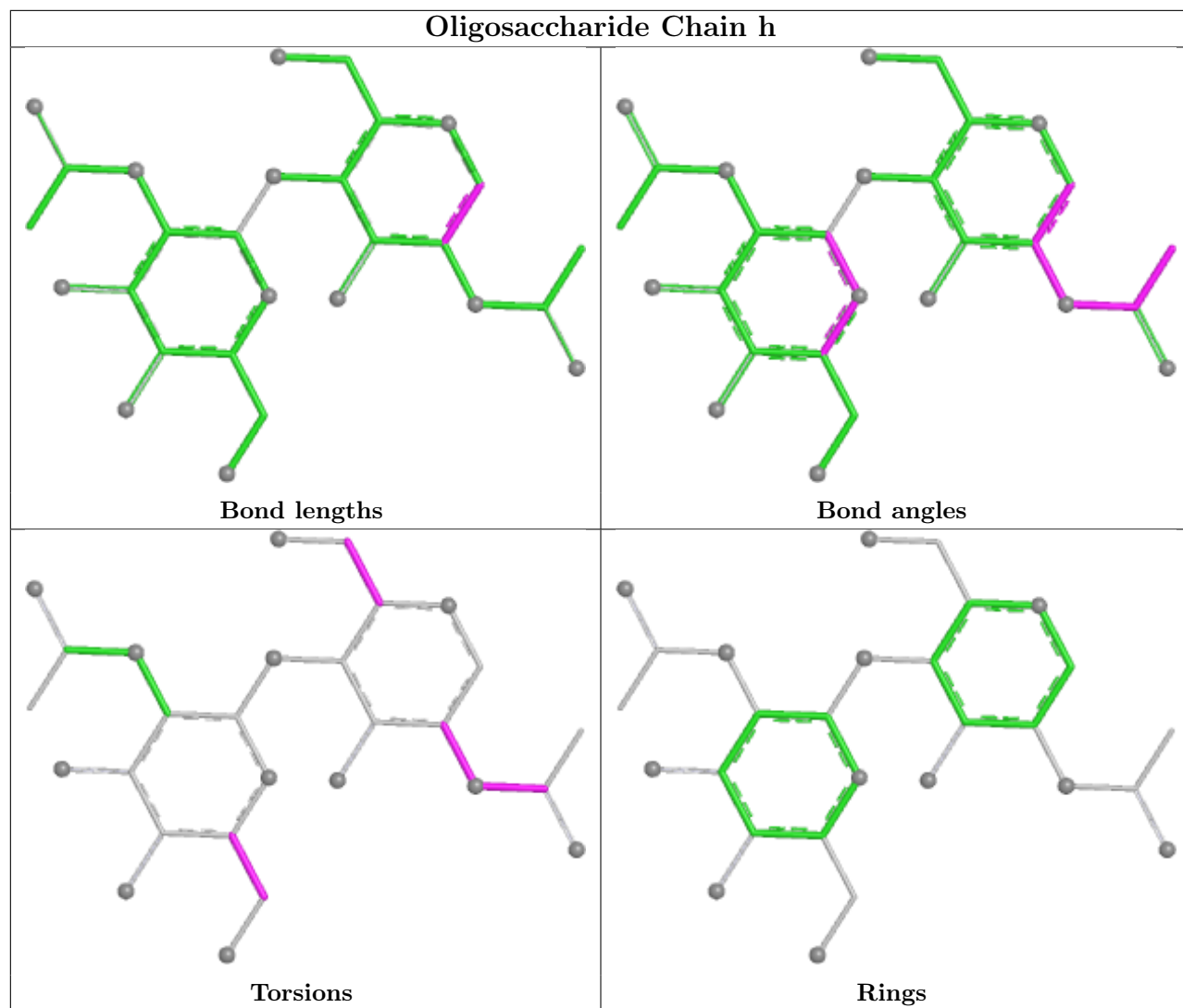




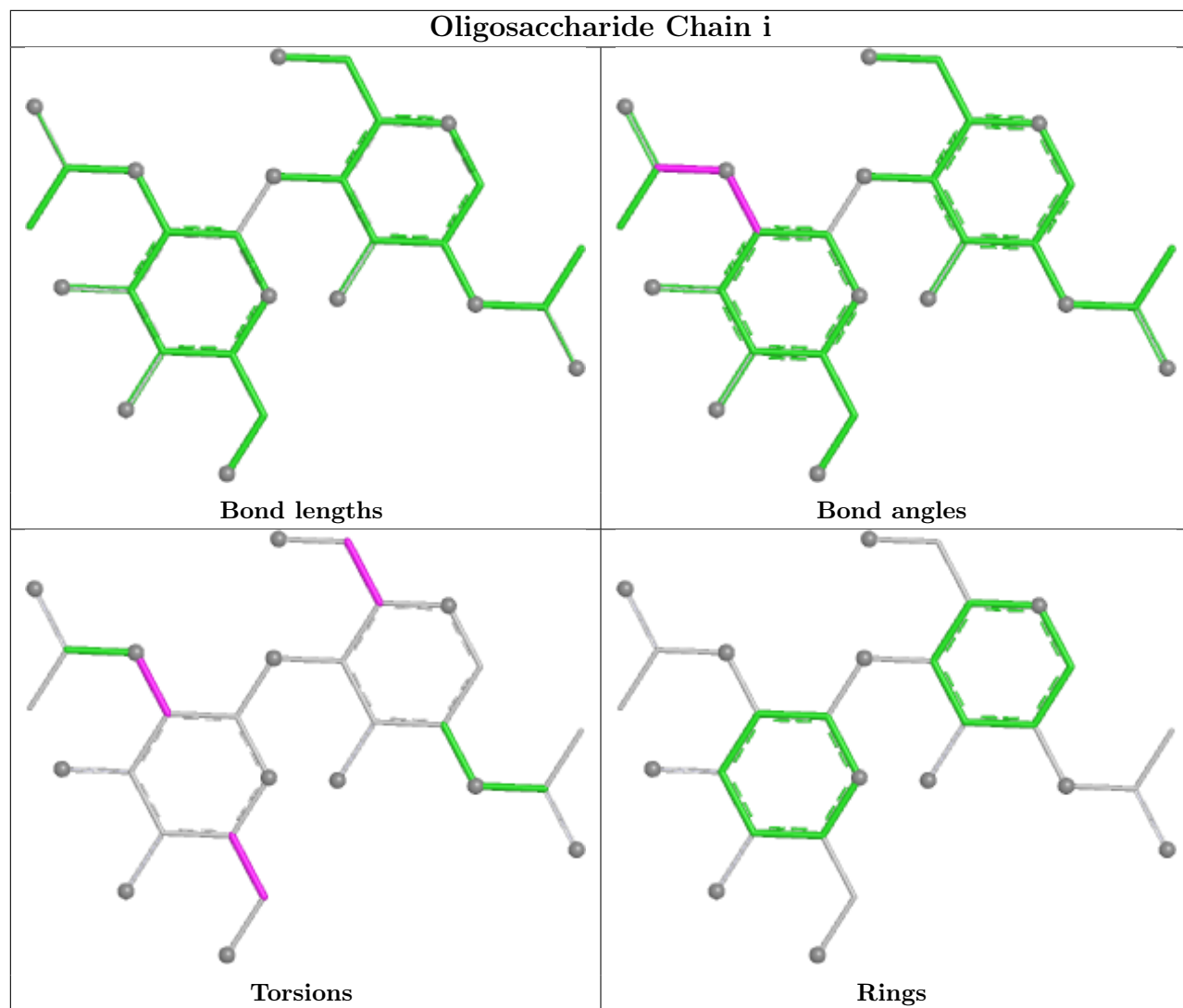


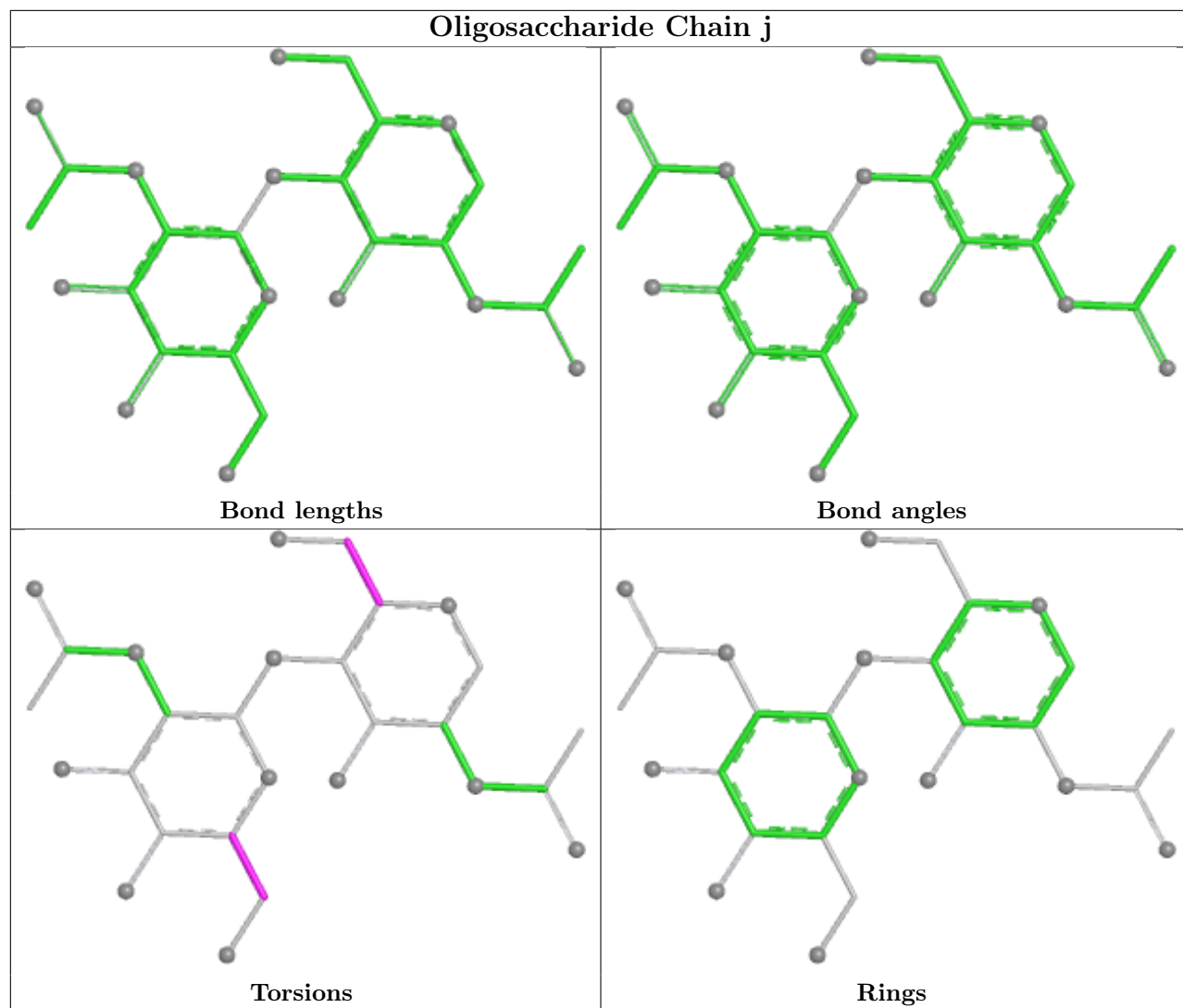


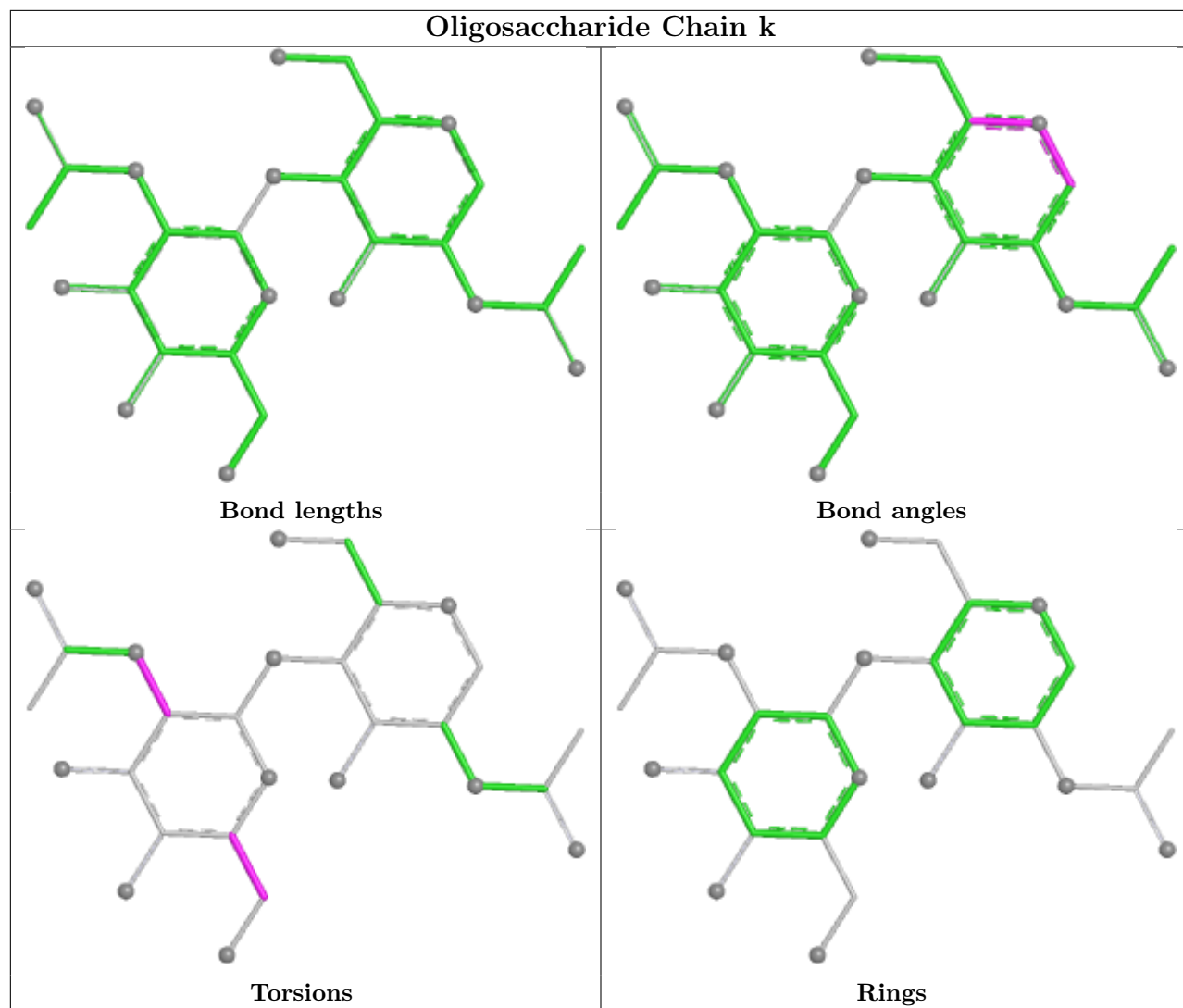


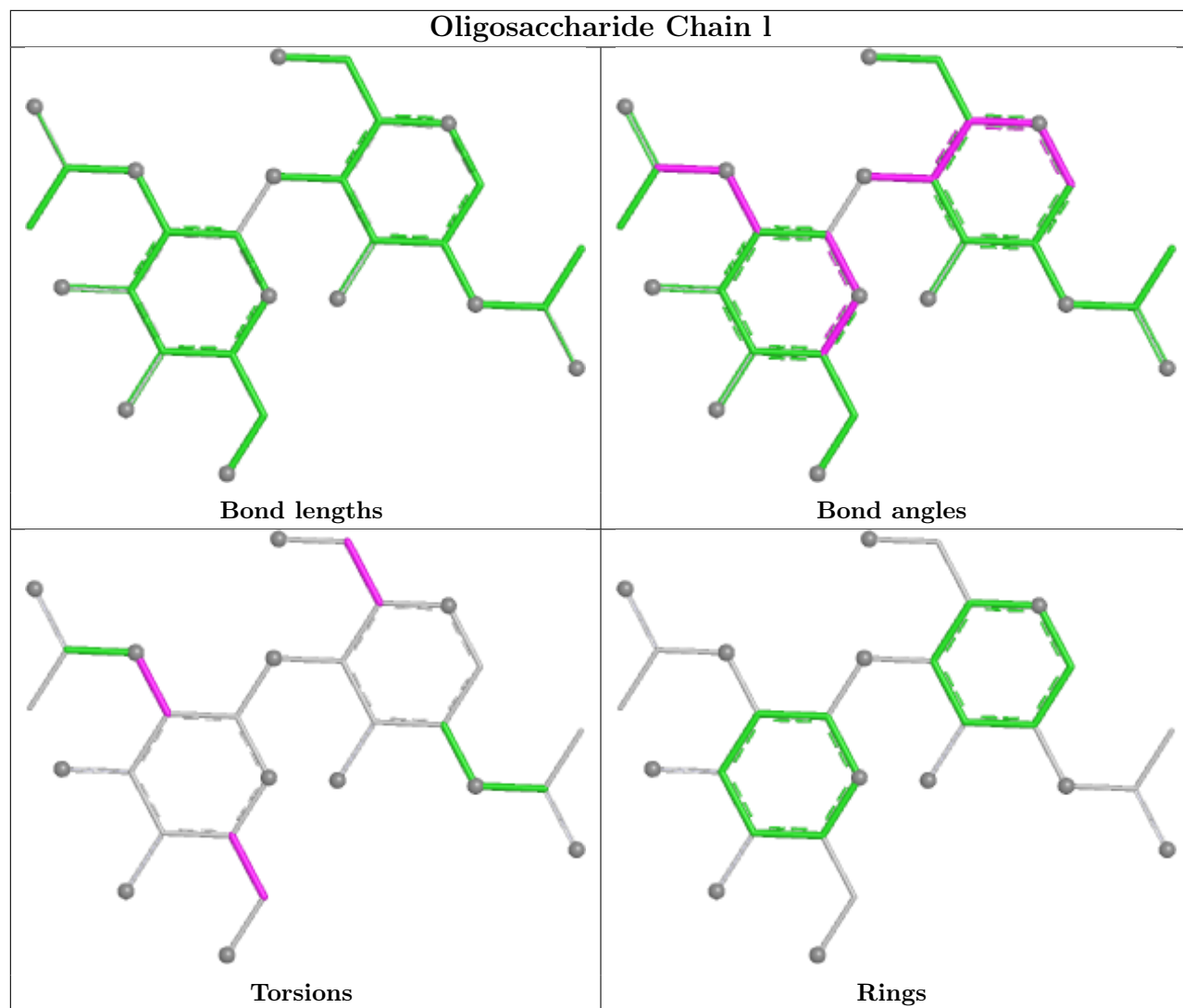


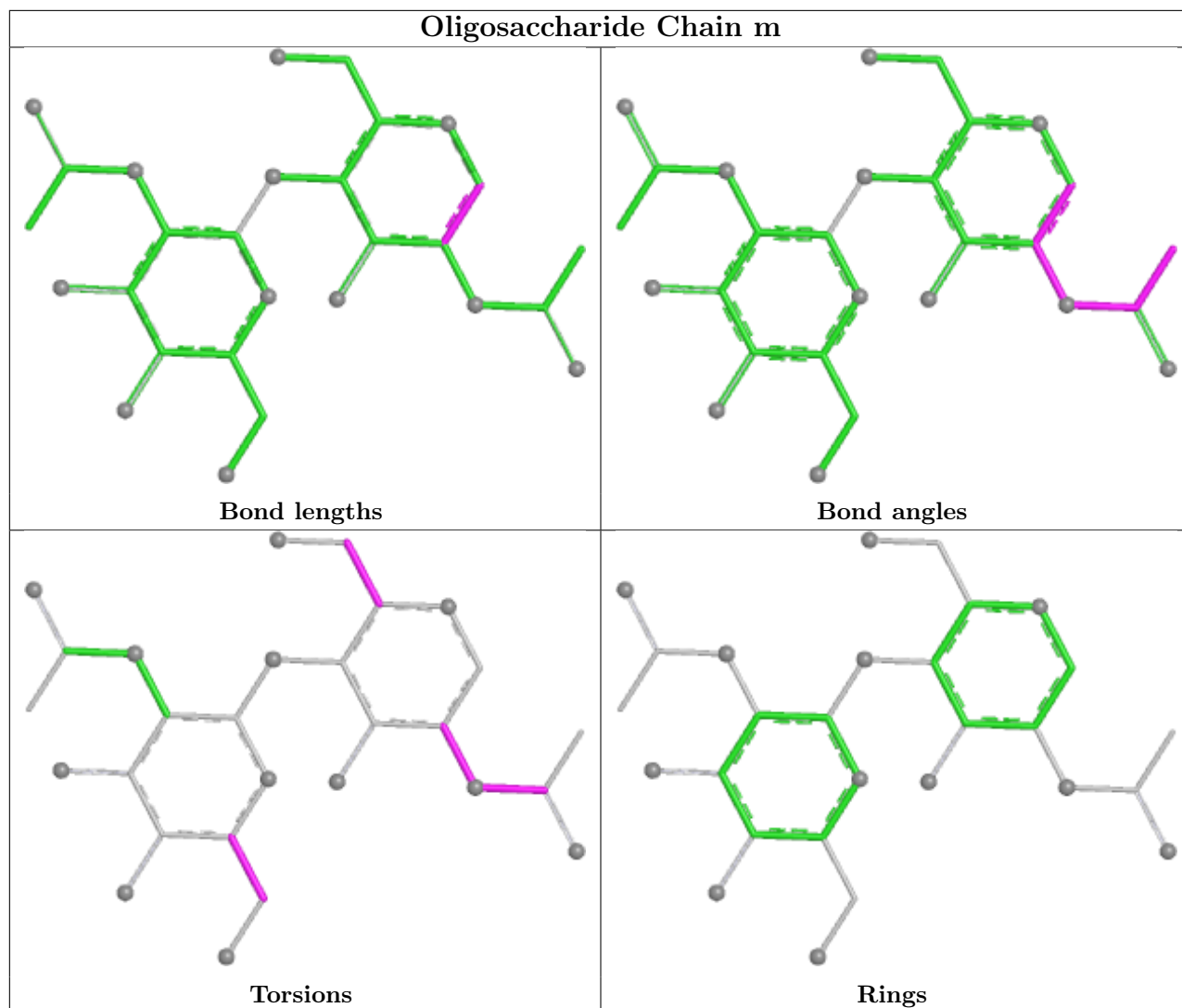












## 5.6 Ligand geometry [i](#)

21 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
9	NAG	G	620	2	14,14,15	0.61	0	17,19,21	0.67	1 (5%)
9	NAG	I	625	2	14,14,15	0.31	0	17,19,21	1.02	1 (5%)
9	NAG	A	701	1	14,14,15	0.47	0	17,19,21	0.75	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
9	NAG	B	629	2	14,14,15	1.76	2 (14%)	17,19,21	1.52	1 (5%)
9	NAG	F	703	1	14,14,15	2.78	8 (57%)	17,19,21	2.68	10 (58%)
9	NAG	C	701	1	14,14,15	0.47	0	17,19,21	0.74	1 (5%)
9	NAG	G	625	2	14,14,15	0.30	0	17,19,21	1.01	1 (5%)
9	NAG	A	703	1	14,14,15	0.27	0	17,19,21	0.66	1 (5%)
9	NAG	A	702	1	14,14,15	0.82	1 (7%)	17,19,21	0.85	1 (5%)
9	NAG	C	703	1	14,14,15	0.26	0	17,19,21	0.65	1 (5%)
9	NAG	C	702	1	14,14,15	0.81	1 (7%)	17,19,21	0.85	1 (5%)
9	NAG	B	625	2	14,14,15	0.30	0	17,19,21	1.02	1 (5%)
9	NAG	F	702	1	14,14,15	0.26	0	17,19,21	0.65	1 (5%)
9	NAG	I	620	2	14,14,15	0.61	0	17,19,21	0.68	1 (5%)
9	NAG	G	629	2	14,14,15	1.76	2 (14%)	17,19,21	1.53	1 (5%)
9	NAG	G	626	2	14,14,15	0.70	1 (7%)	17,19,21	0.85	1 (5%)
9	NAG	F	701	1	14,14,15	0.47	0	17,19,21	0.73	1 (5%)
9	NAG	I	629	2	14,14,15	1.77	2 (14%)	17,19,21	1.52	1 (5%)
9	NAG	B	626	2	14,14,15	0.71	1 (7%)	17,19,21	0.85	1 (5%)
9	NAG	B	620	2	14,14,15	0.61	0	17,19,21	0.68	1 (5%)
9	NAG	I	626	2	14,14,15	0.70	1 (7%)	17,19,21	0.85	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
9	NAG	G	620	2	-	2/6/23/26	0/1/1/1
9	NAG	I	625	2	-	4/6/23/26	0/1/1/1
9	NAG	A	701	1	-	0/6/23/26	0/1/1/1
9	NAG	B	629	2	-	2/6/23/26	0/1/1/1
9	NAG	F	703	1	-	1/6/23/26	0/1/1/1
9	NAG	C	701	1	-	0/6/23/26	0/1/1/1
9	NAG	G	625	2	-	4/6/23/26	0/1/1/1
9	NAG	A	703	1	-	2/6/23/26	0/1/1/1
9	NAG	A	702	1	-	1/6/23/26	0/1/1/1
9	NAG	C	703	1	-	2/6/23/26	0/1/1/1
9	NAG	C	702	1	-	1/6/23/26	0/1/1/1
9	NAG	B	625	2	-	4/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	NAG	F	702	1	-	2/6/23/26	0/1/1/1
9	NAG	I	620	2	-	2/6/23/26	0/1/1/1
9	NAG	G	629	2	-	2/6/23/26	0/1/1/1
9	NAG	G	626	2	-	2/6/23/26	0/1/1/1
9	NAG	F	701	1	-	0/6/23/26	0/1/1/1
9	NAG	I	629	2	-	2/6/23/26	0/1/1/1
9	NAG	B	626	2	-	2/6/23/26	0/1/1/1
9	NAG	B	620	2	-	2/6/23/26	0/1/1/1
9	NAG	I	626	2	-	2/6/23/26	0/1/1/1

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	I	629	NAG	C1-C2	5.04	1.59	1.52
9	G	629	NAG	C1-C2	5.01	1.59	1.52
9	B	629	NAG	C1-C2	4.99	1.59	1.52
9	F	703	NAG	C1-C2	-4.56	1.46	1.52
9	F	703	NAG	O5-C1	-4.38	1.36	1.43
9	I	629	NAG	O5-C1	4.01	1.50	1.43
9	B	629	NAG	O5-C1	4.01	1.50	1.43
9	G	629	NAG	O5-C1	4.01	1.50	1.43
9	F	703	NAG	C3-C2	-3.93	1.44	1.52
9	F	703	NAG	C4-C5	-3.93	1.44	1.53
9	F	703	NAG	O5-C5	-3.35	1.36	1.43
9	F	703	NAG	C4-C3	-3.12	1.44	1.52
9	F	703	NAG	O3-C3	-2.72	1.36	1.43
9	F	703	NAG	O4-C4	-2.47	1.36	1.43
9	A	702	NAG	C1-C2	-2.38	1.49	1.52
9	C	702	NAG	C1-C2	-2.32	1.49	1.52
9	I	626	NAG	C1-C2	2.09	1.55	1.52
9	B	626	NAG	C1-C2	2.09	1.55	1.52
9	G	626	NAG	C1-C2	2.05	1.55	1.52

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	G	629	NAG	C1-O5-C5	5.78	119.93	112.19
9	B	629	NAG	C1-O5-C5	5.74	119.88	112.19
9	I	629	NAG	C1-O5-C5	5.74	119.88	112.19
9	F	703	NAG	C2-N2-C7	5.06	129.68	122.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	F	703	NAG	C8-C7-N2	3.90	122.59	116.12
9	F	703	NAG	O3-C3-C4	-3.75	101.54	110.38
9	F	703	NAG	O5-C5-C6	3.26	114.01	107.66
9	B	625	NAG	C2-N2-C7	3.24	127.25	122.90
9	G	625	NAG	C2-N2-C7	3.22	127.22	122.90
9	I	625	NAG	C2-N2-C7	3.22	127.22	122.90
9	F	703	NAG	O7-C7-C8	-3.09	116.56	122.05
9	F	703	NAG	O5-C5-C4	-3.01	103.50	110.83
9	A	702	NAG	C3-C4-C5	2.63	115.00	110.23
9	C	702	NAG	C3-C4-C5	2.62	114.99	110.23
9	F	703	NAG	C4-C3-C2	-2.62	107.18	111.02
9	I	626	NAG	C1-O5-C5	2.61	115.69	112.19
9	F	703	NAG	O3-C3-C2	-2.61	103.98	109.40
9	A	701	NAG	C1-O5-C5	2.59	115.66	112.19
9	G	626	NAG	C1-O5-C5	2.59	115.66	112.19
9	B	626	NAG	C1-O5-C5	2.58	115.64	112.19
9	C	701	NAG	C1-O5-C5	2.55	115.60	112.19
9	F	701	NAG	C1-O5-C5	2.54	115.59	112.19
9	F	703	NAG	O4-C4-C5	-2.23	103.84	109.32
9	B	620	NAG	C1-O5-C5	2.22	115.16	112.19
9	I	620	NAG	C1-O5-C5	2.21	115.14	112.19
9	G	620	NAG	C1-O5-C5	2.20	115.14	112.19
9	F	703	NAG	C1-C2-N2	2.18	113.86	110.43
9	A	703	NAG	C1-O5-C5	2.16	115.08	112.19
9	C	703	NAG	C1-O5-C5	2.15	115.07	112.19
9	F	702	NAG	C1-O5-C5	2.14	115.06	112.19

There are no chirality outliers.

All (39) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	A	703	NAG	O5-C5-C6-O6
9	C	703	NAG	O5-C5-C6-O6
9	F	702	NAG	O5-C5-C6-O6
9	B	620	NAG	O5-C5-C6-O6
9	B	625	NAG	O5-C5-C6-O6
9	G	620	NAG	O5-C5-C6-O6
9	G	625	NAG	O5-C5-C6-O6
9	I	620	NAG	O5-C5-C6-O6
9	I	625	NAG	O5-C5-C6-O6
9	B	626	NAG	O5-C5-C6-O6
9	G	626	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
9	I	626	NAG	O5-C5-C6-O6
9	B	629	NAG	O5-C5-C6-O6
9	G	629	NAG	O5-C5-C6-O6
9	I	629	NAG	O5-C5-C6-O6
9	B	620	NAG	C4-C5-C6-O6
9	G	620	NAG	C4-C5-C6-O6
9	I	620	NAG	C4-C5-C6-O6
9	B	626	NAG	C4-C5-C6-O6
9	B	629	NAG	C4-C5-C6-O6
9	G	626	NAG	C4-C5-C6-O6
9	G	629	NAG	C4-C5-C6-O6
9	I	626	NAG	C4-C5-C6-O6
9	I	629	NAG	C4-C5-C6-O6
9	A	703	NAG	C4-C5-C6-O6
9	C	703	NAG	C4-C5-C6-O6
9	F	702	NAG	C4-C5-C6-O6
9	B	625	NAG	C4-C5-C6-O6
9	G	625	NAG	C4-C5-C6-O6
9	I	625	NAG	C4-C5-C6-O6
9	F	703	NAG	O5-C5-C6-O6
9	A	702	NAG	O5-C5-C6-O6
9	C	702	NAG	O5-C5-C6-O6
9	B	625	NAG	C1-C2-N2-C7
9	G	625	NAG	C1-C2-N2-C7
9	I	625	NAG	C1-C2-N2-C7
9	B	625	NAG	C3-C2-N2-C7
9	G	625	NAG	C3-C2-N2-C7
9	I	625	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 [i](#)

There are no chain breaks in this entry.

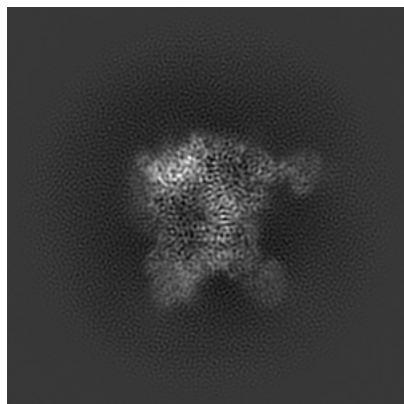
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-20176. These allow visual inspection of the internal detail of the map and identification of artifacts.

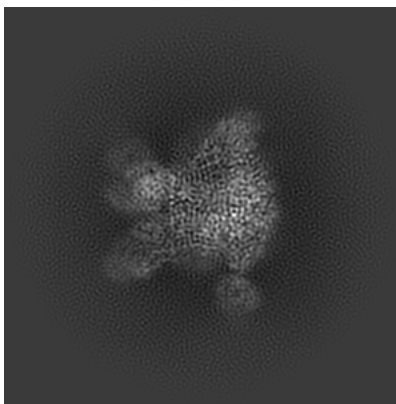
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

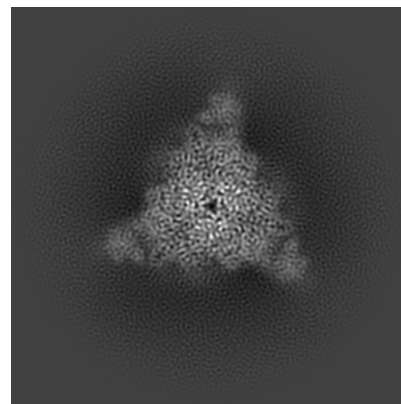
#### 6.1.1 Primary map



X

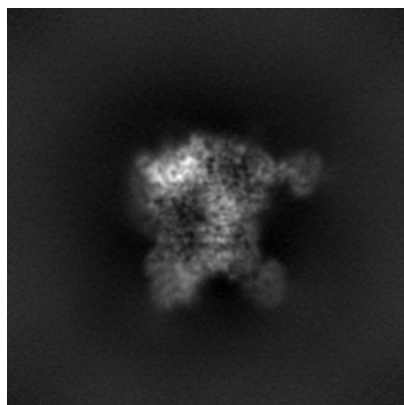


Y

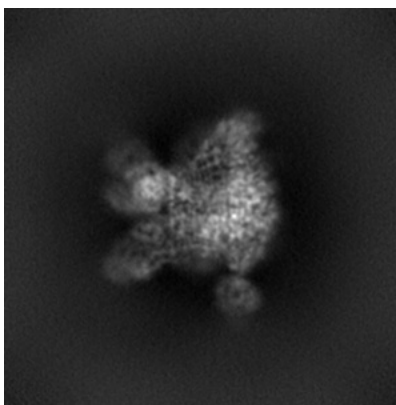


Z

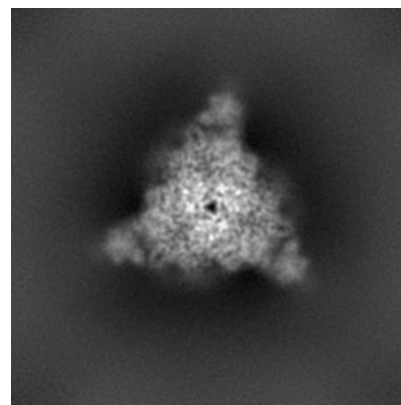
#### 6.1.2 Raw map



X



Y

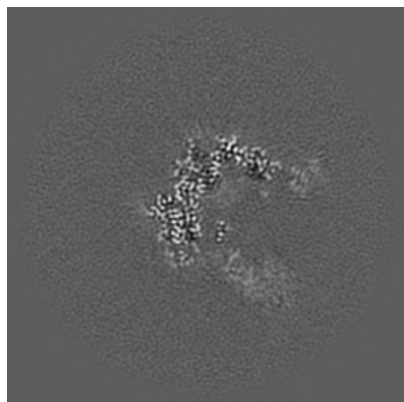


Z

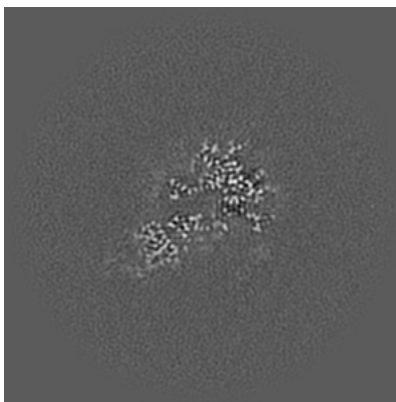
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

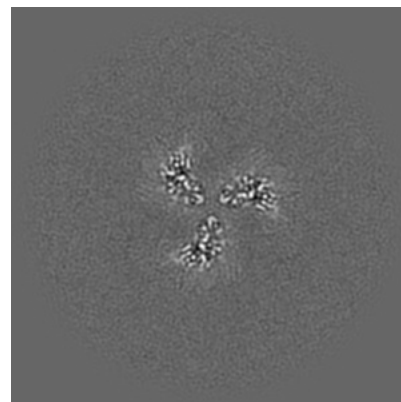
### 6.2.1 Primary map



X Index: 128

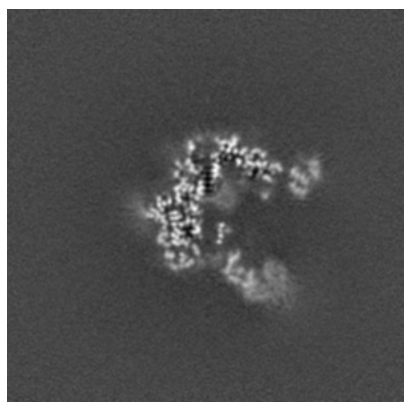


Y Index: 128

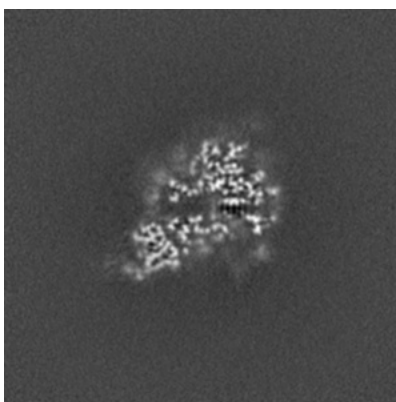


Z Index: 128

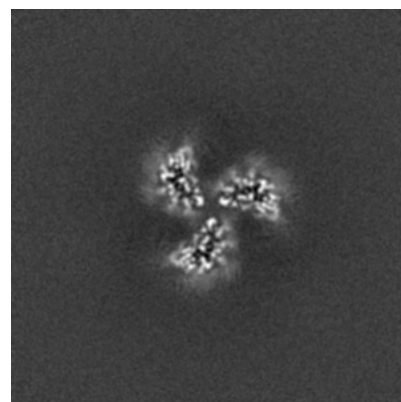
### 6.2.2 Raw map



X Index: 128



Y Index: 128

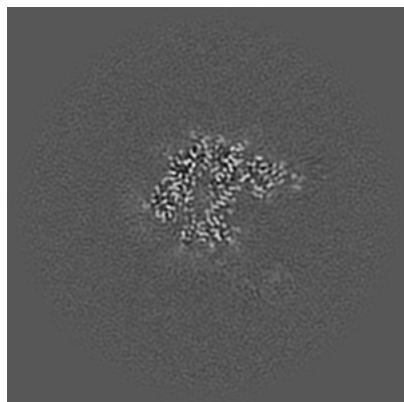


Z Index: 128

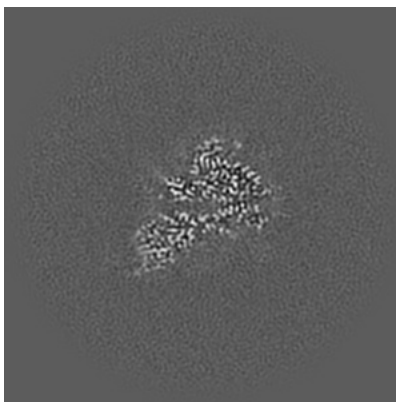
The images above show central slices of the map in three orthogonal directions.

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

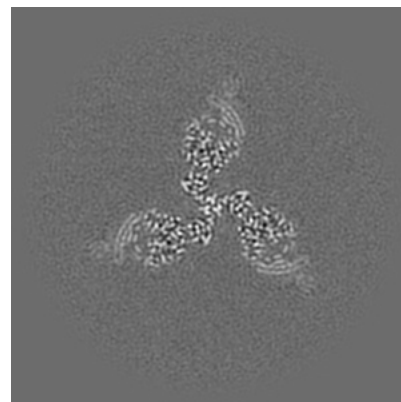
### 6.3.1 Primary map



X Index: 121

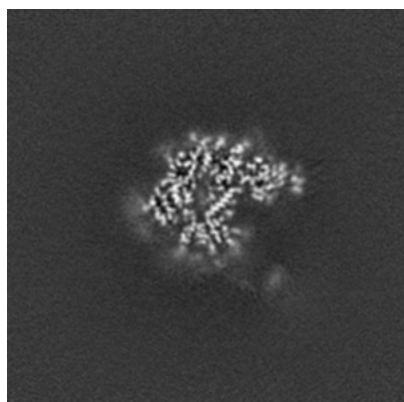


Y Index: 131

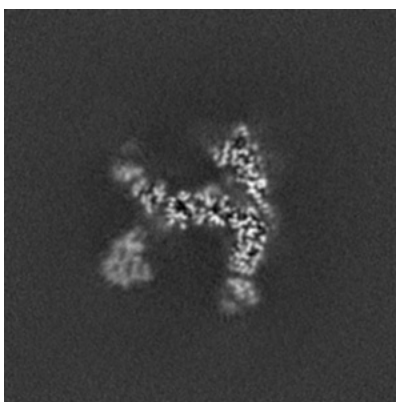


Z Index: 152

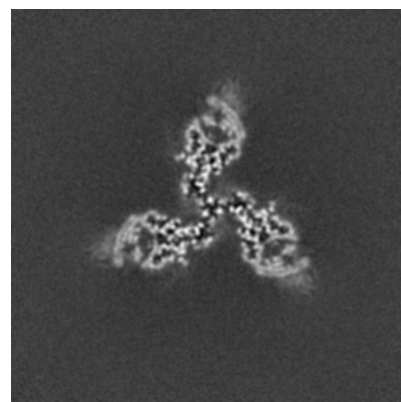
### 6.3.2 Raw map



X Index: 121



Y Index: 115

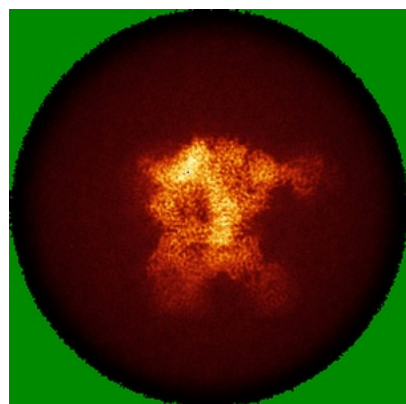


Z Index: 151

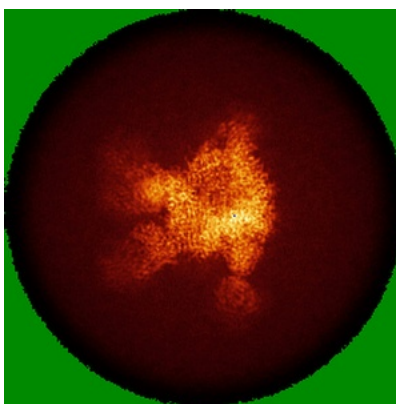
The images above show the largest variance slices of the map in three orthogonal directions.

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

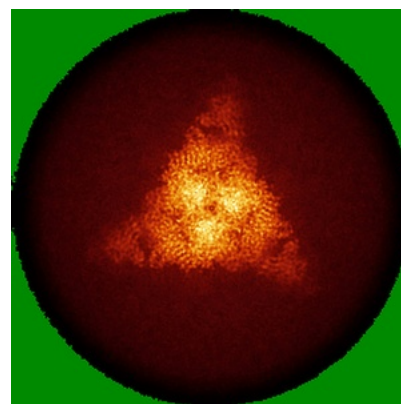
### 6.4.1 Primary map



X

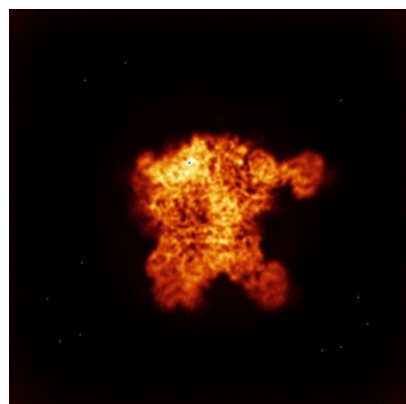


Y

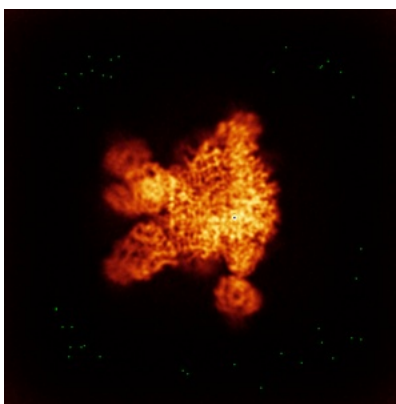


Z

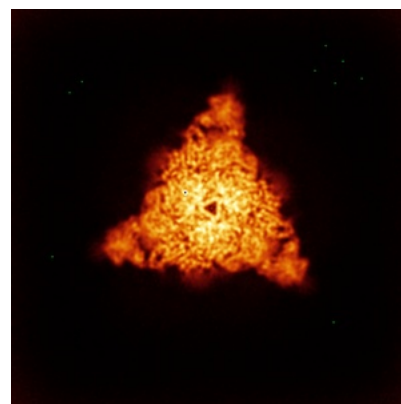
### 6.4.2 Raw map



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 1.02. 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.

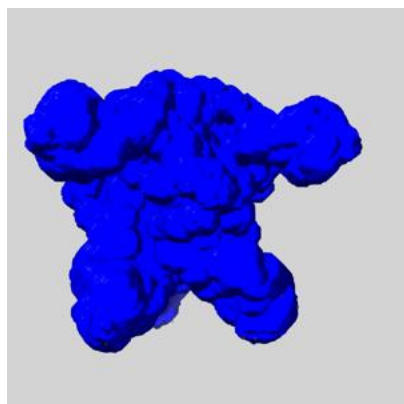
## 6.6 Mask visualisation [i](#)

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

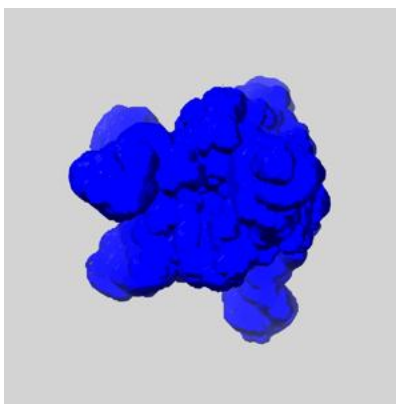
A mask typically either:

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

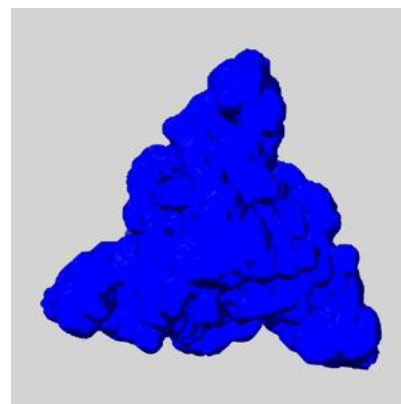
### 6.6.1 emd\_20176\_msk\_1.map [i](#)



X



Y

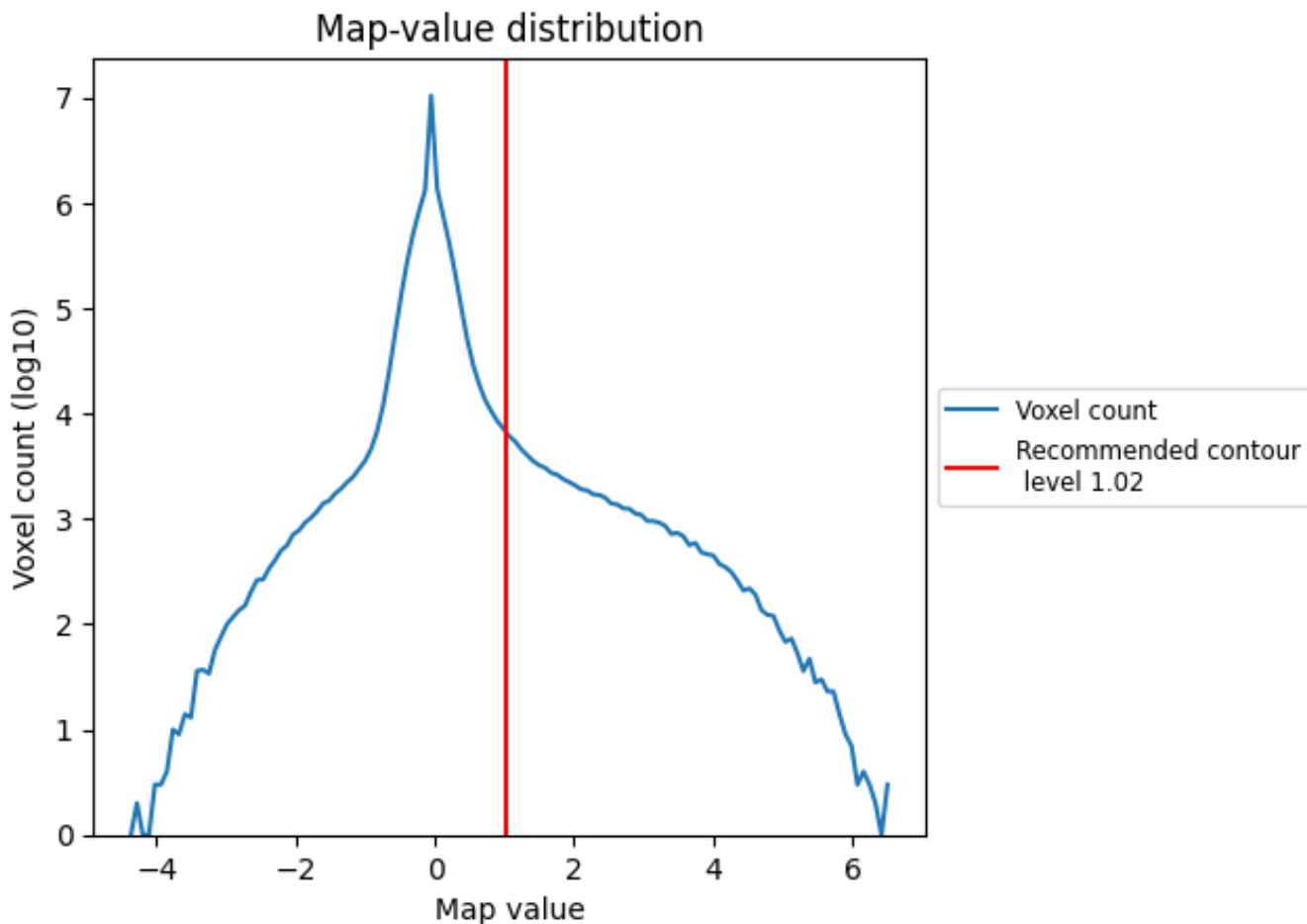


Z

## 7 Map analysis [i](#)

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

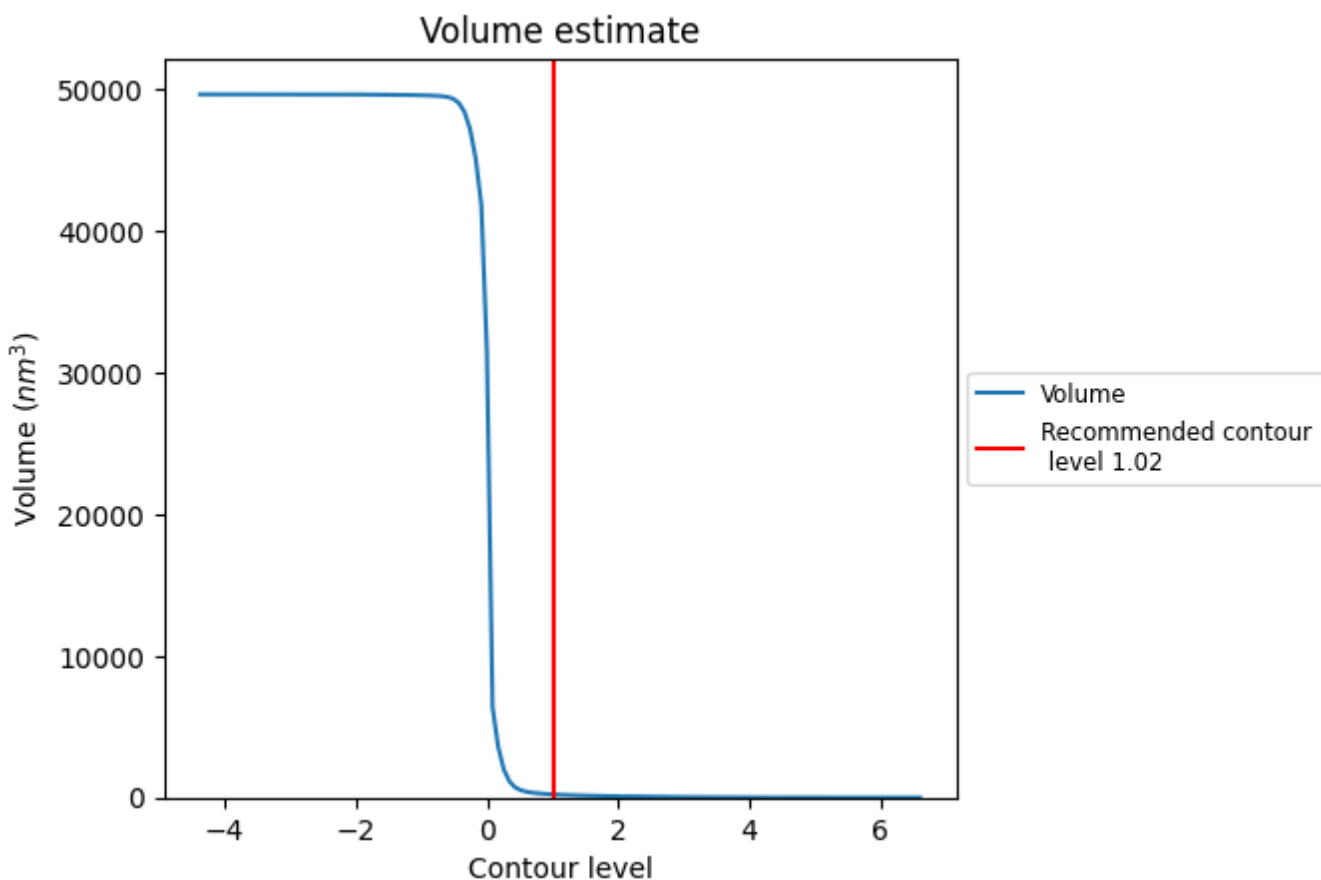
### 7.1 Map-value distribution [i](#)



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.



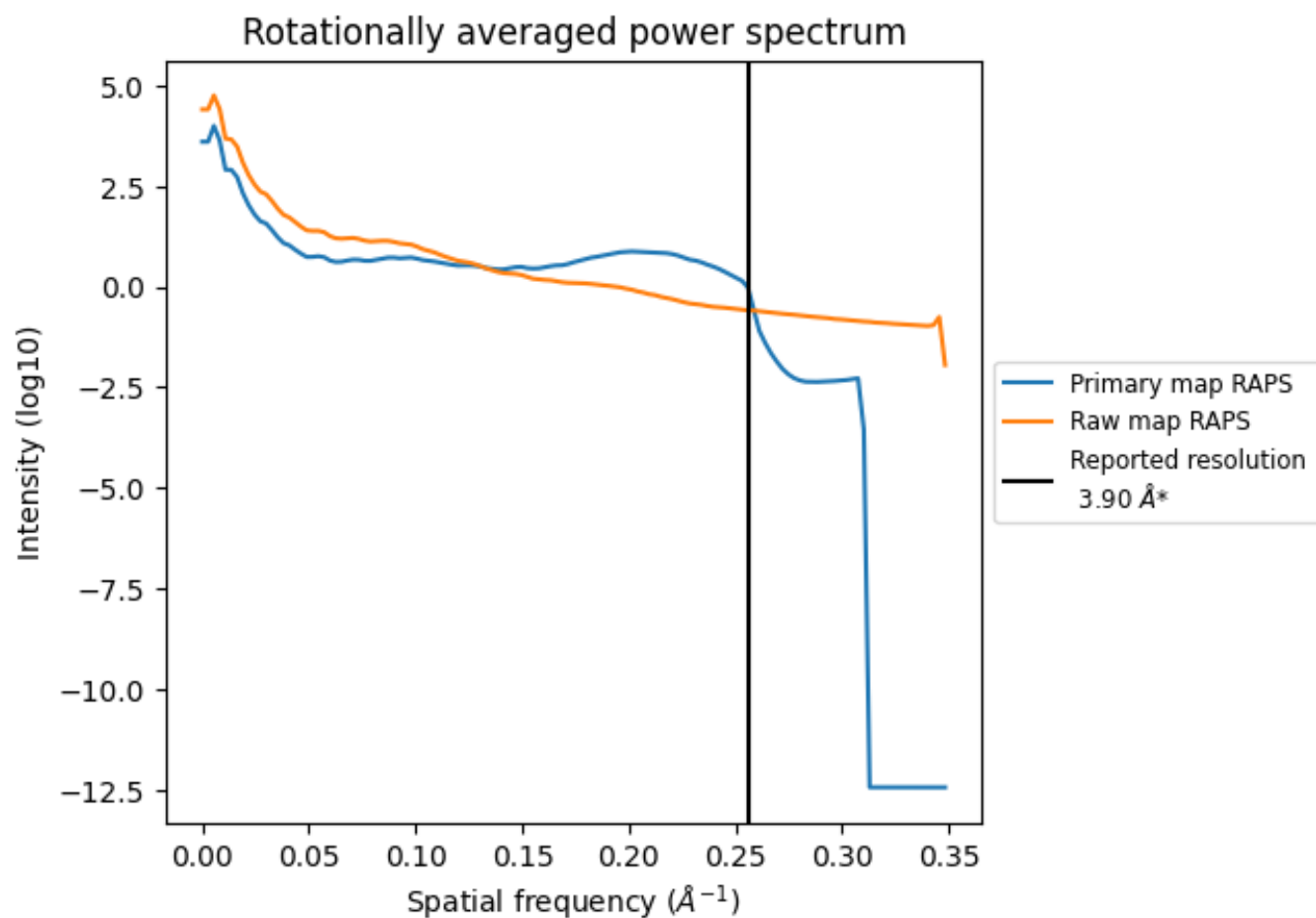
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 218 nm<sup>3</sup>; this corresponds to an approximate mass of 197 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

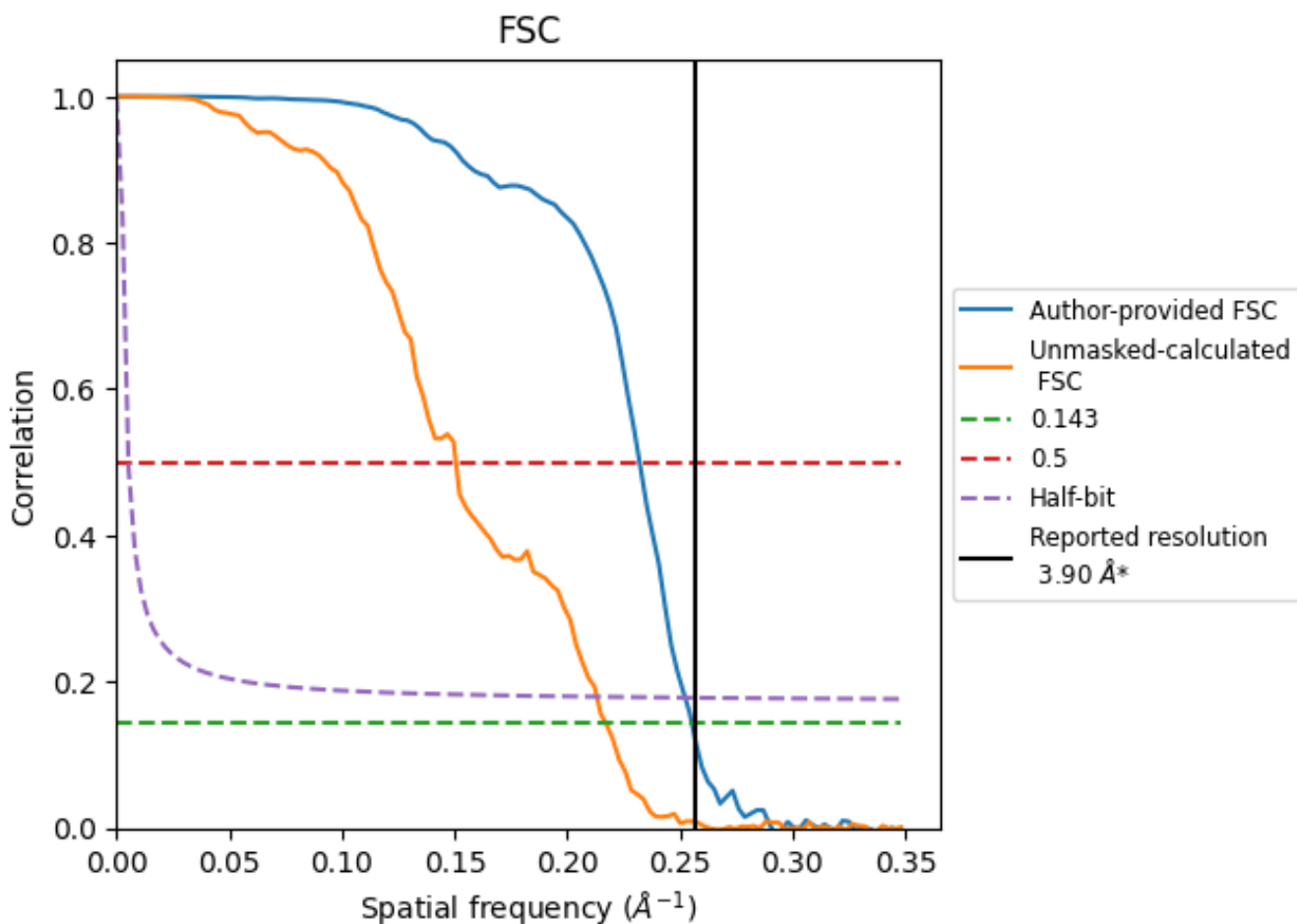


\*Reported resolution corresponds to spatial frequency of  $0.256 \text{ \AA}^{-1}$

## 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 0.256 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

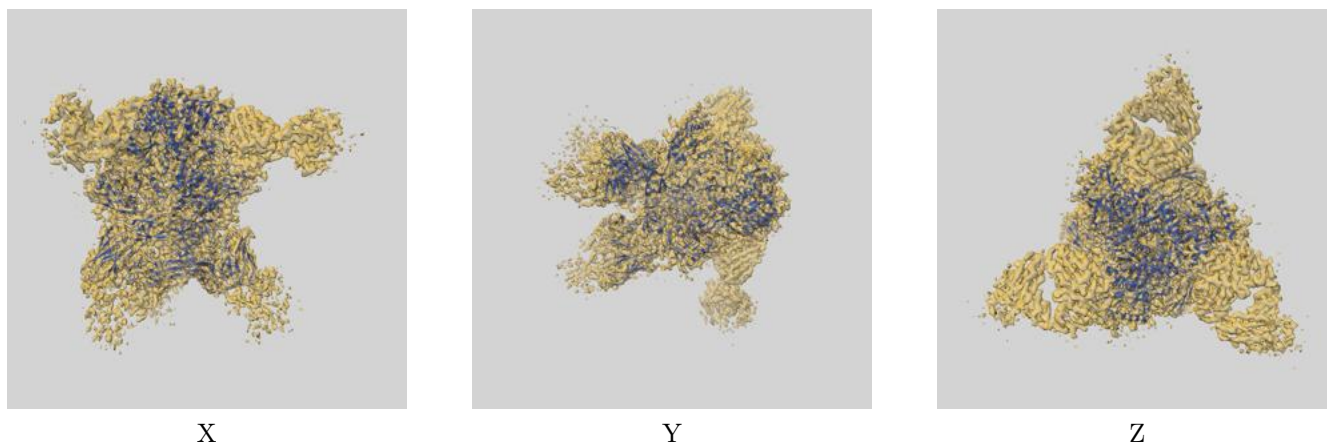
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.90	-	-
Author-provided FSC curve	3.92	4.31	3.96
Unmasked-calculated*	4.60	6.64	4.69

\*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 4.60 differs from the reported value 3.9 by more than 10 %

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

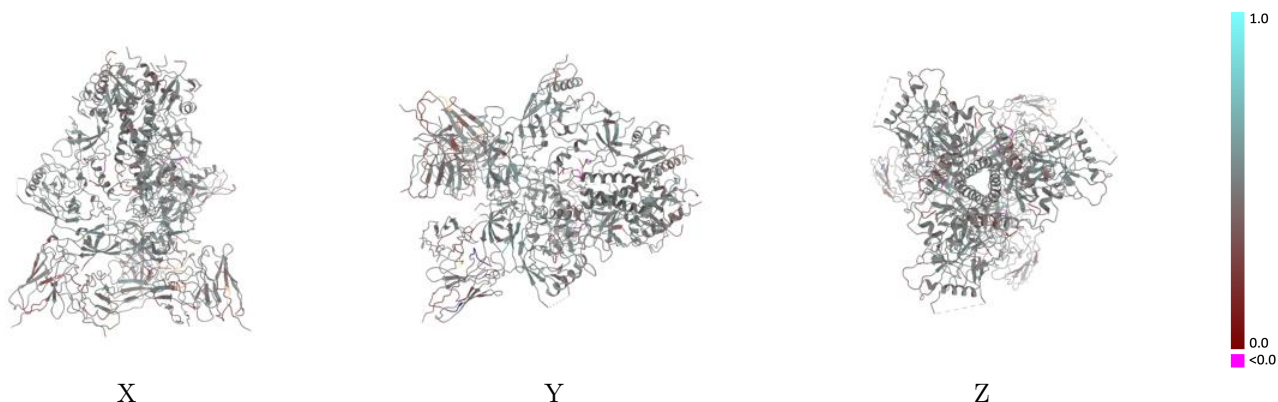
This section contains information regarding the fit between EMDB map EMD-20176 and PDB model 6ORO. Per-residue inclusion information can be found in section 3 on page 10.

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



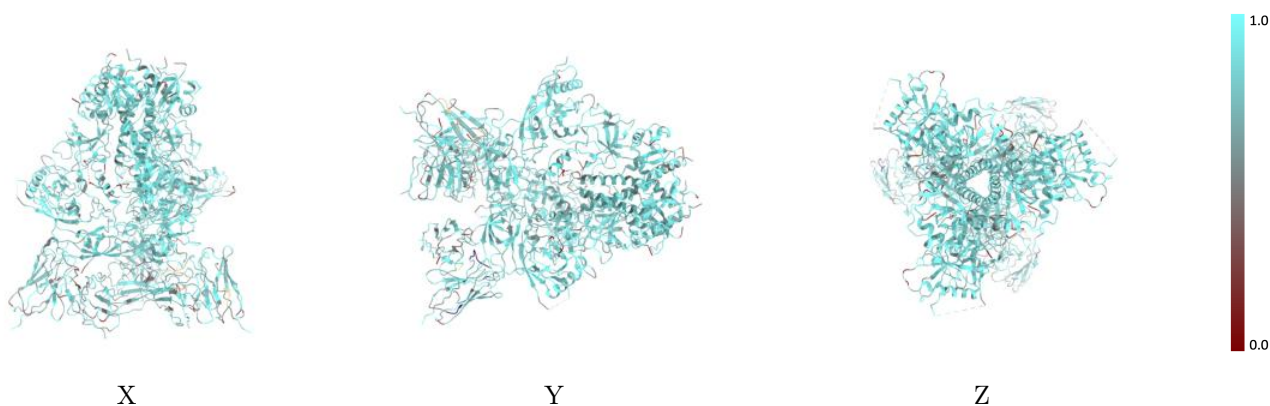
The images above show the 3D surface view of the map at the recommended contour level 1.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



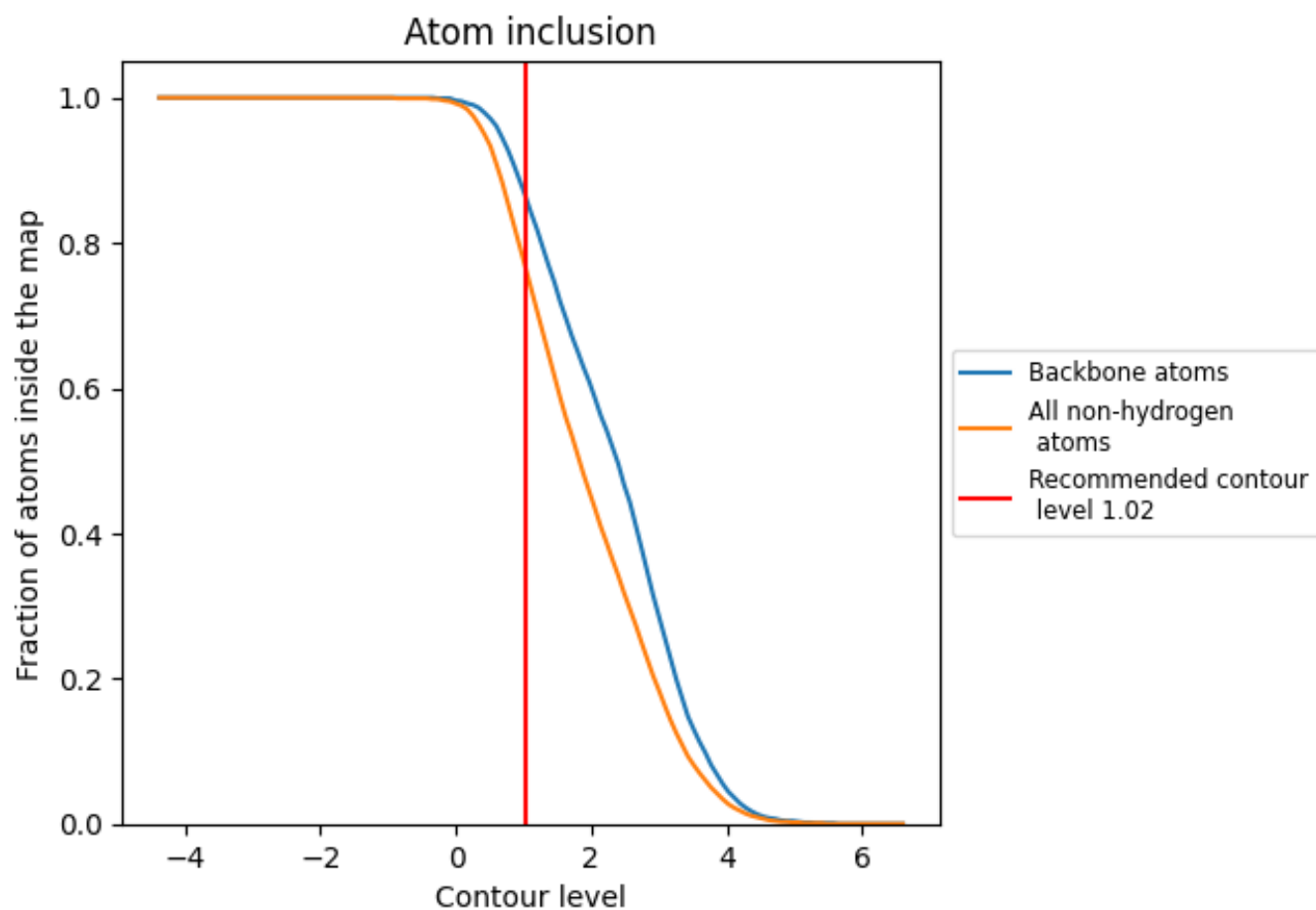
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (1.02).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 87% of all backbone atoms, 77% 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 (1.02) and Q-score for the entire model and for each chain.











Chain	Atom inclusion	Q-score
All	 0.7700	 0.4650
A	 0.8030	 0.4720
B	 0.8030	 0.4830
C	 0.8030	 0.4750
D	 0.7270	 0.4340
E	 0.7090	 0.4210
F	 0.8070	 0.4790
G	 0.8030	 0.4810
H	 0.7330	 0.4340
I	 0.8020	 0.4810
J	 0.7350	 0.4350
K	 0.7110	 0.4230
L	 0.7040	 0.4270
M	 0.6150	 0.4260
N	 0.4170	 0.4410
O	 0.7200	 0.4460
P	 0.5360	 0.4170
Q	 0.4640	 0.4240
R	 0.6790	 0.4630
S	 0.4640	 0.4540
T	 0.7140	 0.4330
U	 0.4640	 0.4250
V	 0.5900	 0.4420
W	 0.4170	 0.4470
X	 0.7000	 0.4480
Y	 0.5360	 0.4010
Z	 0.5000	 0.4410
a	 0.6790	 0.4640
b	 0.4640	 0.4610
c	 0.7500	 0.4370
d	 0.5000	 0.4230
e	 0.5900	 0.4260
f	 0.4030	 0.4430
g	 0.7200	 0.4410
h	 0.5360	 0.4080



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Chain	Atom inclusion	Q-score
i	 0.5000	 0.4380
j	 0.6790	 0.4470
k	 0.4640	 0.4710
l	 0.7140	 0.4490
m	 0.5710	 0.4270