



wwPDB EM Validation Summary Report ⓘ

Aug 29, 2024 – 10:09 PM JST

PDB ID : 8WLZ
EMDB ID : EMD-37636
Title : Cryo-EM structure of the WIV1 S-hACE2 complex
Authors : Wang, X.; Qiao, S.
Deposited on : 2023-10-01
Resolution : 4.45 Å (reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : **FAILED**
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.38.2

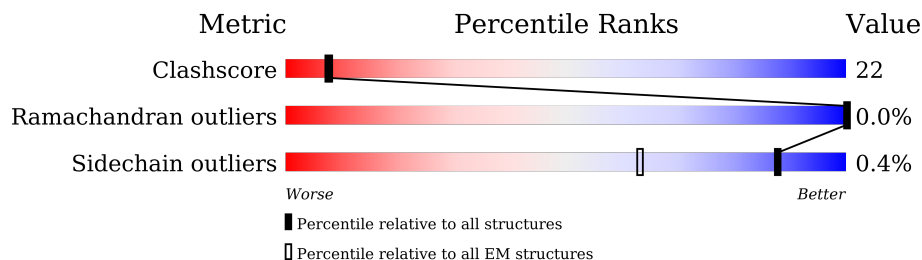
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.45 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
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 ≥ 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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	1271	42% 41% 16%
1	B	1271	45% 38% 16%
1	C	1271	47% 37% 16%
2	D	603	66% 33% .
2	G	603	63% 36% .
3	E	2	100%
3	F	2	100%
3	H	2	50% 50%
3	I	2	100%

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Mol	Chain	Length	Quality of chain
3	J	2	 100%
3	K	2	 50% 50%
3	L	2	 50% 50%
3	O	2	 50% 50%
3	P	2	 50% 50%
3	Q	2	 50% 50%
3	R	2	 100%
3	T	2	 50% 50%
3	U	2	 100%
4	M	3	 100%
4	N	3	 100%
4	S	3	 67% 33%

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 35498 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 Spike glycoprotein,Fibritin.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1068	8332	5317	1387	1587	41	0	0
1	B	1067	8319	5309	1383	1586	41	0	0
1	C	1068	8332	5317	1387	1587	41	0	0

There are 168 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	969	PRO	LYS	conflict	UNP U5WI05
A	970	PRO	VAL	conflict	UNP U5WI05
A	1192	GLY	-	linker	UNP U5WI05
A	1193	SER	-	linker	UNP U5WI05
A	1220	LEU	-	expression tag	UNP A0A346FJN8
A	1221	GLY	-	expression tag	UNP A0A346FJN8
A	1222	ARG	-	expression tag	UNP A0A346FJN8
A	1223	SER	-	expression tag	UNP A0A346FJN8
A	1224	LEU	-	expression tag	UNP A0A346FJN8
A	1225	GLU	-	expression tag	UNP A0A346FJN8
A	1226	VAL	-	expression tag	UNP A0A346FJN8
A	1227	LEU	-	expression tag	UNP A0A346FJN8
A	1228	PHE	-	expression tag	UNP A0A346FJN8
A	1229	GLN	-	expression tag	UNP A0A346FJN8
A	1230	GLY	-	expression tag	UNP A0A346FJN8
A	1231	PRO	-	expression tag	UNP A0A346FJN8
A	1232	GLY	-	expression tag	UNP A0A346FJN8
A	1233	HIS	-	expression tag	UNP A0A346FJN8
A	1234	HIS	-	expression tag	UNP A0A346FJN8
A	1235	HIS	-	expression tag	UNP A0A346FJN8
A	1236	HIS	-	expression tag	UNP A0A346FJN8
A	1237	HIS	-	expression tag	UNP A0A346FJN8
A	1238	HIS	-	expression tag	UNP A0A346FJN8
A	1239	HIS	-	expression tag	UNP A0A346FJN8

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1240	HIS	-	expression tag	UNP A0A346FJN8
A	1241	SER	-	expression tag	UNP A0A346FJN8
A	1242	ALA	-	expression tag	UNP A0A346FJN8
A	1243	TRP	-	expression tag	UNP A0A346FJN8
A	1244	SER	-	expression tag	UNP A0A346FJN8
A	1245	HIS	-	expression tag	UNP A0A346FJN8
A	1246	PRO	-	expression tag	UNP A0A346FJN8
A	1247	GLN	-	expression tag	UNP A0A346FJN8
A	1248	PHE	-	expression tag	UNP A0A346FJN8
A	1249	GLU	-	expression tag	UNP A0A346FJN8
A	1250	LYS	-	expression tag	UNP A0A346FJN8
A	1251	GLY	-	expression tag	UNP A0A346FJN8
A	1252	GLY	-	expression tag	UNP A0A346FJN8
A	1253	GLY	-	expression tag	UNP A0A346FJN8
A	1254	SER	-	expression tag	UNP A0A346FJN8
A	1255	GLY	-	expression tag	UNP A0A346FJN8
A	1256	GLY	-	expression tag	UNP A0A346FJN8
A	1257	GLY	-	expression tag	UNP A0A346FJN8
A	1258	GLY	-	expression tag	UNP A0A346FJN8
A	1259	SER	-	expression tag	UNP A0A346FJN8
A	1260	GLY	-	expression tag	UNP A0A346FJN8
A	1261	GLY	-	expression tag	UNP A0A346FJN8
A	1262	SER	-	expression tag	UNP A0A346FJN8
A	1263	ALA	-	expression tag	UNP A0A346FJN8
A	1264	TRP	-	expression tag	UNP A0A346FJN8
A	1265	SER	-	expression tag	UNP A0A346FJN8
A	1266	HIS	-	expression tag	UNP A0A346FJN8
A	1267	PRO	-	expression tag	UNP A0A346FJN8
A	1268	GLN	-	expression tag	UNP A0A346FJN8
A	1269	PHE	-	expression tag	UNP A0A346FJN8
A	1270	GLU	-	expression tag	UNP A0A346FJN8
A	1271	LYS	-	expression tag	UNP A0A346FJN8
B	969	PRO	LYS	conflict	UNP U5WI05
B	970	PRO	VAL	conflict	UNP U5WI05
B	1192	GLY	-	linker	UNP U5WI05
B	1193	SER	-	linker	UNP U5WI05
B	1220	LEU	-	expression tag	UNP A0A346FJN8
B	1221	GLY	-	expression tag	UNP A0A346FJN8
B	1222	ARG	-	expression tag	UNP A0A346FJN8
B	1223	SER	-	expression tag	UNP A0A346FJN8
B	1224	LEU	-	expression tag	UNP A0A346FJN8
B	1225	GLU	-	expression tag	UNP A0A346FJN8

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1226	VAL	-	expression tag	UNP A0A346FJN8
B	1227	LEU	-	expression tag	UNP A0A346FJN8
B	1228	PHE	-	expression tag	UNP A0A346FJN8
B	1229	GLN	-	expression tag	UNP A0A346FJN8
B	1230	GLY	-	expression tag	UNP A0A346FJN8
B	1231	PRO	-	expression tag	UNP A0A346FJN8
B	1232	GLY	-	expression tag	UNP A0A346FJN8
B	1233	HIS	-	expression tag	UNP A0A346FJN8
B	1234	HIS	-	expression tag	UNP A0A346FJN8
B	1235	HIS	-	expression tag	UNP A0A346FJN8
B	1236	HIS	-	expression tag	UNP A0A346FJN8
B	1237	HIS	-	expression tag	UNP A0A346FJN8
B	1238	HIS	-	expression tag	UNP A0A346FJN8
B	1239	HIS	-	expression tag	UNP A0A346FJN8
B	1240	HIS	-	expression tag	UNP A0A346FJN8
B	1241	SER	-	expression tag	UNP A0A346FJN8
B	1242	ALA	-	expression tag	UNP A0A346FJN8
B	1243	TRP	-	expression tag	UNP A0A346FJN8
B	1244	SER	-	expression tag	UNP A0A346FJN8
B	1245	HIS	-	expression tag	UNP A0A346FJN8
B	1246	PRO	-	expression tag	UNP A0A346FJN8
B	1247	GLN	-	expression tag	UNP A0A346FJN8
B	1248	PHE	-	expression tag	UNP A0A346FJN8
B	1249	GLU	-	expression tag	UNP A0A346FJN8
B	1250	LYS	-	expression tag	UNP A0A346FJN8
B	1251	GLY	-	expression tag	UNP A0A346FJN8
B	1252	GLY	-	expression tag	UNP A0A346FJN8
B	1253	GLY	-	expression tag	UNP A0A346FJN8
B	1254	SER	-	expression tag	UNP A0A346FJN8
B	1255	GLY	-	expression tag	UNP A0A346FJN8
B	1256	GLY	-	expression tag	UNP A0A346FJN8
B	1257	GLY	-	expression tag	UNP A0A346FJN8
B	1258	GLY	-	expression tag	UNP A0A346FJN8
B	1259	SER	-	expression tag	UNP A0A346FJN8
B	1260	GLY	-	expression tag	UNP A0A346FJN8
B	1261	GLY	-	expression tag	UNP A0A346FJN8
B	1262	SER	-	expression tag	UNP A0A346FJN8
B	1263	ALA	-	expression tag	UNP A0A346FJN8
B	1264	TRP	-	expression tag	UNP A0A346FJN8
B	1265	SER	-	expression tag	UNP A0A346FJN8
B	1266	HIS	-	expression tag	UNP A0A346FJN8
B	1267	PRO	-	expression tag	UNP A0A346FJN8

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1268	GLN	-	expression tag	UNP A0A346FJN8
B	1269	PHE	-	expression tag	UNP A0A346FJN8
B	1270	GLU	-	expression tag	UNP A0A346FJN8
B	1271	LYS	-	expression tag	UNP A0A346FJN8
C	969	PRO	LYS	conflict	UNP U5WI05
C	970	PRO	VAL	conflict	UNP U5WI05
C	1192	GLY	-	linker	UNP U5WI05
C	1193	SER	-	linker	UNP U5WI05
C	1220	LEU	-	expression tag	UNP A0A346FJN8
C	1221	GLY	-	expression tag	UNP A0A346FJN8
C	1222	ARG	-	expression tag	UNP A0A346FJN8
C	1223	SER	-	expression tag	UNP A0A346FJN8
C	1224	LEU	-	expression tag	UNP A0A346FJN8
C	1225	GLU	-	expression tag	UNP A0A346FJN8
C	1226	VAL	-	expression tag	UNP A0A346FJN8
C	1227	LEU	-	expression tag	UNP A0A346FJN8
C	1228	PHE	-	expression tag	UNP A0A346FJN8
C	1229	GLN	-	expression tag	UNP A0A346FJN8
C	1230	GLY	-	expression tag	UNP A0A346FJN8
C	1231	PRO	-	expression tag	UNP A0A346FJN8
C	1232	GLY	-	expression tag	UNP A0A346FJN8
C	1233	HIS	-	expression tag	UNP A0A346FJN8
C	1234	HIS	-	expression tag	UNP A0A346FJN8
C	1235	HIS	-	expression tag	UNP A0A346FJN8
C	1236	HIS	-	expression tag	UNP A0A346FJN8
C	1237	HIS	-	expression tag	UNP A0A346FJN8
C	1238	HIS	-	expression tag	UNP A0A346FJN8
C	1239	HIS	-	expression tag	UNP A0A346FJN8
C	1240	HIS	-	expression tag	UNP A0A346FJN8
C	1241	SER	-	expression tag	UNP A0A346FJN8
C	1242	ALA	-	expression tag	UNP A0A346FJN8
C	1243	TRP	-	expression tag	UNP A0A346FJN8
C	1244	SER	-	expression tag	UNP A0A346FJN8
C	1245	HIS	-	expression tag	UNP A0A346FJN8
C	1246	PRO	-	expression tag	UNP A0A346FJN8
C	1247	GLN	-	expression tag	UNP A0A346FJN8
C	1248	PHE	-	expression tag	UNP A0A346FJN8
C	1249	GLU	-	expression tag	UNP A0A346FJN8
C	1250	LYS	-	expression tag	UNP A0A346FJN8
C	1251	GLY	-	expression tag	UNP A0A346FJN8
C	1252	GLY	-	expression tag	UNP A0A346FJN8
C	1253	GLY	-	expression tag	UNP A0A346FJN8

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1254	SER	-	expression tag	UNP A0A346FJN8
C	1255	GLY	-	expression tag	UNP A0A346FJN8
C	1256	GLY	-	expression tag	UNP A0A346FJN8
C	1257	GLY	-	expression tag	UNP A0A346FJN8
C	1258	GLY	-	expression tag	UNP A0A346FJN8
C	1259	SER	-	expression tag	UNP A0A346FJN8
C	1260	GLY	-	expression tag	UNP A0A346FJN8
C	1261	GLY	-	expression tag	UNP A0A346FJN8
C	1262	SER	-	expression tag	UNP A0A346FJN8
C	1263	ALA	-	expression tag	UNP A0A346FJN8
C	1264	TRP	-	expression tag	UNP A0A346FJN8
C	1265	SER	-	expression tag	UNP A0A346FJN8
C	1266	HIS	-	expression tag	UNP A0A346FJN8
C	1267	PRO	-	expression tag	UNP A0A346FJN8
C	1268	GLN	-	expression tag	UNP A0A346FJN8
C	1269	PHE	-	expression tag	UNP A0A346FJN8
C	1270	GLU	-	expression tag	UNP A0A346FJN8
C	1271	LYS	-	expression tag	UNP A0A346FJN8

- Molecule 2 is a protein called Processed angiotensin-converting enzyme 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	D	597	4870	3115	806	920	29	0	0
2	G	597	4870	3115	806	920	29	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	616	HIS	-	expression tag	UNP Q9BYF1
D	617	HIS	-	expression tag	UNP Q9BYF1
D	618	HIS	-	expression tag	UNP Q9BYF1
D	619	HIS	-	expression tag	UNP Q9BYF1
D	620	HIS	-	expression tag	UNP Q9BYF1
D	621	HIS	-	expression tag	UNP Q9BYF1
G	616	HIS	-	expression tag	UNP Q9BYF1
G	617	HIS	-	expression tag	UNP Q9BYF1
G	618	HIS	-	expression tag	UNP Q9BYF1
G	619	HIS	-	expression tag	UNP Q9BYF1
G	620	HIS	-	expression tag	UNP Q9BYF1
G	621	HIS	-	expression tag	UNP Q9BYF1

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



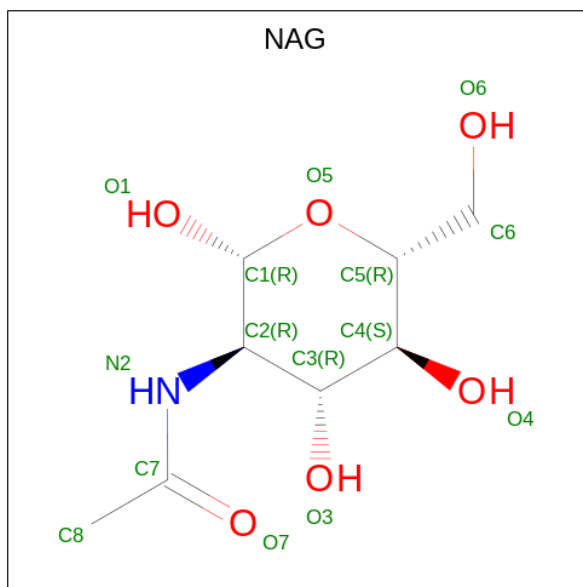
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	E	2	28	16	2	10	0	0
3	F	2	28	16	2	10	0	0
3	H	2	28	16	2	10	0	0
3	I	2	28	16	2	10	0	0
3	J	2	28	16	2	10	0	0
3	K	2	28	16	2	10	0	0
3	L	2	28	16	2	10	0	0
3	O	2	28	16	2	10	0	0
3	P	2	28	16	2	10	0	0
3	Q	2	28	16	2	10	0	0
3	R	2	28	16	2	10	0	0
3	T	2	28	16	2	10	0	0
3	U	2	28	16	2	10	0	0

- Molecule 4 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
4	M	3	Total	C	N	O	0	0
			39	22	2	15		
4	N	3	Total	C	N	O	0	0
			39	22	2	15		
4	S	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

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

Q878	S957	V1053	LYS	PRO	GLY
M853	S958	P1052	ASN	ARG	GLY
M854	Y959	T1060	HIS	ASP	GLY
Y867	L960	T1061	THR	GLY	ALA
R888	N961	P1062	SER	GLN	TRP
F889	D962	P1066	PRO	ALA	SER
I892	L963	H1066	ASP	VAL	HIS
T895	L964	E1067	VAL	VAL	PRO
M897	S965	K1069	ARG	ARG	GLN
V898	L966	G1069	ASP	GLY	PHI
L899	L967	P1073	LEU	LEU	GLU
Y900	P870	R1074	GLY	GLY	LYS
Q903	E971	V1077	ILE	TRP	
I906	A972	F1078	SER	VAL	
A907	E973	V1079	GLY	VAL	
N908	N974	F1080	ASN	LEU	
K912	Q975	W1085	ALA	LEU	
A913	L976	Q1089	SER	GLY	
Q916	I980	R1090	VAL	LEU	
I917	T981	F1092	ASN	LEU	
Q918	G982	F1093	ILE	LEU	
T922	R983	P1095	ARG	LEU	
I923	L984	I1098	GLN	LEU	
V924	Q988	T1099	ASN	GLY	
S925	Y991	V1100	GLY	PRO	
G929	T992	D1101	ASN	GLY	
K930	Q993	N1102	ASN	VAL	
L931	G994	T1103	GLU	VAL	
Q932	A1008	S1108	GLU	HIS	
D933	K1011	C1109	GLU	HIS	
V934	E1014	D1110	SER	HIS	
V935	C1015	V1120	ILE	HIS	
W936	Y1121	Y1121	ALA	SER	
Q937	Q1019	D1122	ALA	TRP	
N938	P1123	L1124	TRP	SER	
Q940	R1022	E1127	HIS	PRO	
A941	F1025	LEU	GLN	PHE	
T944	Y1030	ASP	LYS	GLY	
Q948	H1031	SER	GLY	GLY	
S951	L1032	PHE	GLN	GLY	
F953	M1033	GLY	GLY	GLY	
G954	S1034	GLY	SER	GLY	
A955	G1042	LEU	TRP	ILE	
I956	V1048	ASP	GLY	PHO	
	T1049	LYS	GLY	GLY	
	Y1050	PHE	ALA	SER	

• Molecule 1: Spike glycoprotein,Fibrin



MET	N76	L223	V308	F388	M468	V583	V643
LYS	F77	P224	R308	F389	V469	R564	V647
LEU	D78	L225	K312	V390	P476	D565	E648
VAL	N79	T230	E313	K391	L479	F566	C649
LEU	P83	M231	V314	D392	N480	K567	T568
PHE	F84	F232	V315	D393	D481	S569	I653
ALA	R85	R233	R316	D394	V482	E570	I657
THR	K85	L235	F317	V395	G483	L571	C658
LEU	Y89	L236	N322	Q397	F484	L572	A659
VAL	F90	T237	C324	P400	L486	D573	H662
SER	A91	A238	P325	Q402	T487	S583	T663
TRP	E94	F239	F326	T403	M488	V584	V664
TYR	K95	P241	F330	D408	C491	I585	L667
THR	S96	R242	N331	Y409	V492	T586	Q673
ILE	N97	Y245	A332	N410	Q493	F587	K678
GLU	V98	W246	T333	N411	P494	G588	T679
K19	I99	L173	T334	K412	V495	T589	M680
F23	R100	G174	F335	K413	V496	S592	S681
R26	G101	E175	P336	L413	V497	F593	L682
T27	W102	F186	S337	P414	V498	C604	A696
T32	V103	V187	V338	D415	V499	C604	P698
Q33	F104	D182	W341	L422	S501	V608	I705
F34	G105	L183	E342	A423	F502	VAL	V712
M108	S106	E185	F345	R424	E503	ALA	S713
S37	T107	F186	V255	P261	G419	ILE	M714
H38	M108	V187	V256	T262	C420	ALA	M719
R39	Q113	F188	V257	F263	V421	ASP	N722
G40	S114	R189	L258	M264	L422	GLN	M723
Y42	V115	M190	A259	S265	A423	LEU	Y724
Y42	I116	K191	P260	T261	F510	LEU	I725
D46	I117	F194	T261	T262	V511	THR	C726
I47	M118	H195	F262	M264	C512	TRP	E731
F48	M119	H196	V263	S265	S517	ARG	C732
R49	H200	V197	L265	K266	T518	HIS	A733
S50	S121	Y198	L266	Y267	P519	THR	N734
N51	T122	N123	Y267	Y267	L520	PRO	L736
V52	L124	N124	Y268	T364	I521	SER	L737
L53	V125	V125	E269	G369	N529	TRP	Q738
H54	R127	R127	L273	V370	G532	ARG	Y739
Q57	A128	C129	L284	S371	F546	VAL	S741
D58	C129	N130	L284	K374	Q547	HIS	C743
H59	F131	F131	L287	L375	L449	THR	A634
F60	F132	F132	L287	M376	F450	THR	G740
L61	L133	L133	I296	M376	F453	THR	F742
D64	M136	P137	D297	C379	F454	THR	C745
T68	P137	A216	K298	F380	P548	THR	T744
R69	F138	L218	F380	S381	F549	THR	Q745
F70	F139	P219	Q302	S382	O550	THR	L746
I71	V140	V141	T303	V383	O551	THR	
F73	V141	V141	S304	Y384	F582	THR	
	V141	V141	S305	A395	G553	THR	
	Q148	Q148	F306	S387	S562	THR	
			R307	S387	S562	THR	

Q633	A694	G635	E641	H642	V643	D644	T645	E648	C649	D650	I651	P652	G656	I657	C658	A659	S660	Y661	H662	T663	V664	S665	S666	S669	K673	S674	I675	V676	A677	Y678	T679	L682	G683	A684	D685	S686	S687	N693	T694	I703	S704	I705	V709	M710	P711	V712	S713	M714	D720				
C721	N722	M723	Y724	C725	G726	G727	D728	S729	T730	K731	C732	A733	M734	L735	L736	L737	Q738	Y739	F742	Q745	L746	T663	S665	S666	S669	K673	S674	I675	V676	A677	Y678	T679	L682	G683	A684	D685	S686	S687	N693	T694	I703	S704	I705	V709	M710	P711	V712	S713	M714	D720			
ILE	ASN	ALA	ARG	ASP	LEU	ILE	CYS	ALA	GLN	K837	F838	M839	L844	P845	L736	Y856	T870	A873	Q745	L746	L877	Q878	I879	P880	M883	Y887	I892	L899	Y900	I788	E901	N902	Q905	I906	L805	K808	L811	ALA	ASP	ALA	GLY	PHE	LYS	GLN	TYR	GLY	CYS	LEU	GLY	ASP			
N936	Q937	N938	A941	L942	Y946	K947	Q948	L949	S950	S951	N952	F953	G954	A955	I956	N961	D962	R966	E971	A972	E973	Y974	Q975	I976	D977	R978	I892	L899	Y900	I788	E901	N902	Q905	I906	L805	K808	L811	ALA	ASP	ALA	GLY	PHE	LYS	GLN	TYR	GLY	CYS	LEU	GLY	ASP			
R1022	F1025	C1026	G1029	Y1030	H1041	L1042	V1043	F1044	S1045	L1046	H1047	E1055	T1059	T1060	P1062	H1066	E1067	P1073	R1074	Q975	I976	D977	R978	T1083	I1087	R1090	Q1096	D1101	M1102	T1103	F1104	V1105	S1106	D1110	V1111	V1112	I1113	G1114	I1115	I1116	T1119	E1127	L1012	S1013	E1014	ASP							
SER	PHE	LYS	GLY	LEU	ASP	LYS	TYR	PHE	LYS	ASN	HIS	THR	SER	PRO	VAL	VAL	LEU	ASN	ALA	SER	THR	PHE	VAL	GLY	ASN	ARG	ILE	GLN	LYS	GLU	ILE	ASP	ARG	GLN	LEU	ASN	ASN	ASN	GLY	SER	LEU	ILE	ALA	ASP	ALA	TRP	SER	GLN	LEU	GLY	LYS	TYR	
GLU	GLN	GLY	TYR	GLY	ILE	PRO	GLU	ALA	PRO	ALA	TYR	ASP	GLY	GLN	VAL	ARG	LYS	ASP	GLY	GLU	TRP	VAL	LEU	LEU	SER	THR	PHE	GLN	PHE	GLY	PRO	GLY	GLN	PRO	HIS	HIS	HIS	HIS	HIS	HIS	ALA	ALA	SER	TRP	ALA	SER	HIS	PRO	GLN	PHE	GLU	TYR	
LYS	GLY	GLY	SER	GLY	GLY	GLY	GLY	SER	SER	GLY	ALA	TRP	PRO	GLN	GLM	PHE	GLU	GLY	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS

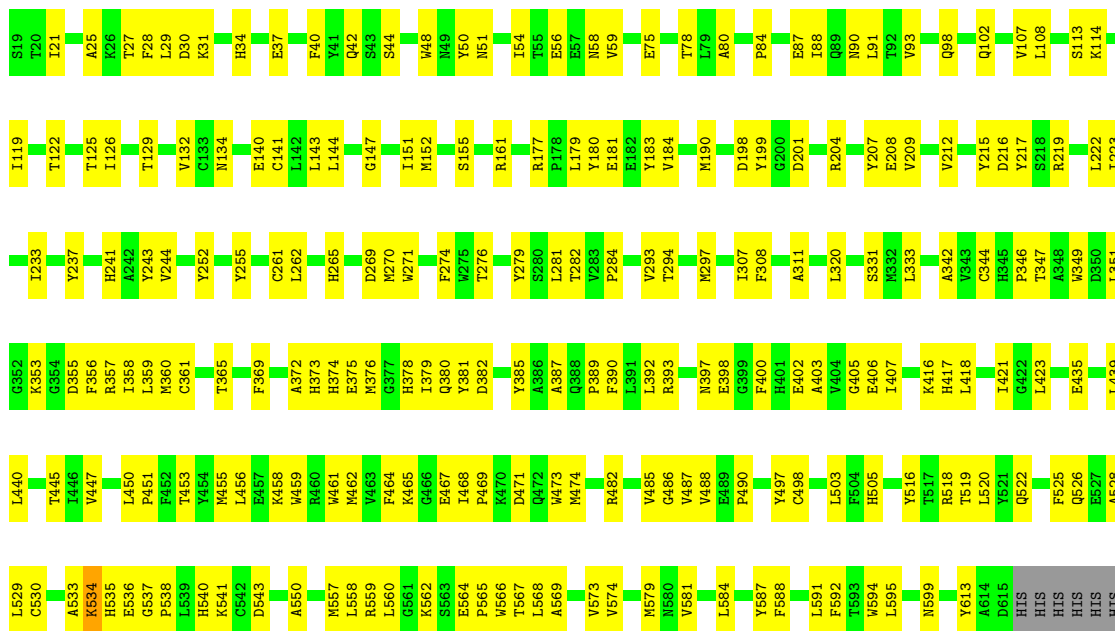
• Molecule 2: Processed angiotensin-converting enzyme 2



S19	T20	E23	Q24	A25	K26	T27	F28	D30	K31	M32	H33	R34	E35	A36	E37	D38	L39	F40	M51	I54	T55	E56	E57	M58	V59	W63	E75	T78	L79	A80	I88	Q89	N90	L91	T92	V93	L100	V107	D111	K114	R115						
L116	I119	M123	S124	T125	I126	Y127	S128	T129	V132	C141	I151	M152	S155	E166	R169	V172	K173	R177	P178	L179	Y180	E181	E182	Y183	V184	V185	L186	N188	M190	N194	E197	D198	Y199	G200	D201	R204	Y207	F208	V209	D216	Y217						
S218	R219	G220	Q221	L222	L223	T229	T233	Y237	E238	H241	A242	Y243	V244	R245	Y252	Y255	C261	L262	P263	L266	L267	G268	D269	M270	W271	W275	L278	L281	T282	I307	F308	F314	F315	V318	G319	L320	Q325	A342	F346	T347	A348	V349					
D350	L351	G352	K353	D354	G355	F356	R357	L358	M360	T365	H366	D367	F369	H374	H378	M380	Q380	Y381	D382	Y385	P389	F390	L391	L392	C496	M499	P500	L503	F504	H506	V506	F406	L407	M408	R419	P426	E430	E435	F438	L439	L440	K441	L444	M557	L558	R559	L560
V447	L450	P451	L452	T453	K458	W459	R460	W461	M462	V463	F464	E467	W473	W478	E479	M480	K481	R482	E483	G486	V487	V488	T496	Y497	C498	D499	P500	L503	F504	H506	V506	F406	L407	M408	R419	P426	E430	E435	F438	L439	L440	K441	L444	M557	L558	R559	L560
E564	A569	V574	V581	L584	F588	F589	F590	L591	F592	T593	W594	L595	W606	S607	T608	D609	W610	Y613	A614	D615	HIS	HIS	HIS	HIS	HIS	HIS	L503	F504	H506	V506	F406	L407	M408	R419	P426	E430	E435	F438	L439	L440	K441	L444	M557	L558	R559	L560	

• Molecule 2: Processed angiotensin-converting enzyme 2





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



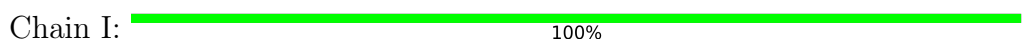
- Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



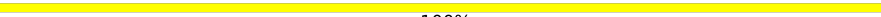
- Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



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



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

Chain J:  100%


MAG1
MAG2

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

Chain K:  50% 50%

MAG1
MAG2

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

Chain L:  50% 50%

MAG1
MAG2

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

Chain O:  50% 50%

MAG1
MAG2

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

Chain P:  50% 50%

MAG1
MAG2

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

Chain Q:  50% 50%

MAG1
MAG2

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

Chain R:  100%



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

Chain T: 50% 50%



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

Chain U: 100%



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

Chain M: 100%



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

Chain N: 100%



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

Chain S: 67% 33%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	31293	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.35	0/8534	0.56	1/11621 (0.0%)
1	B	0.35	0/8520	0.54	0/11601
1	C	0.35	0/8534	0.55	0/11621
2	D	0.27	0/5007	0.49	0/6803
2	G	0.25	0/5007	0.47	0/6803
All	All	0.33	0/35602	0.53	1/48449 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	636	CYS	CA-CB-SG	6.15	125.07	114.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	602	VAL	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	8332	0	8098	471	0
1	B	8319	0	8076	439	0
1	C	8332	0	8091	396	0
2	D	4870	0	4643	158	0
2	G	4870	0	4643	162	0
3	E	28	0	25	0	0
3	F	28	0	25	0	0
3	H	28	0	25	1	0
3	I	28	0	25	0	0
3	J	28	0	25	2	0
3	K	28	0	25	0	0
3	L	28	0	25	1	0
3	O	28	0	25	1	0
3	P	28	0	25	1	0
3	Q	28	0	25	1	0
3	R	28	0	25	0	0
3	T	28	0	25	1	0
3	U	28	0	25	0	0
4	M	39	0	34	0	0
4	N	39	0	34	0	0
4	S	39	0	34	1	0
5	A	56	0	52	0	0
5	B	98	0	91	2	0
5	C	140	0	130	4	0
All	All	35498	0	34251	1568	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 22.

The worst 5 of 1568 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:183:LEU:HB3	1:B:202:GLN:O	1.65	0.96
1:A:128:ALA:HB3	1:A:162:PHE:HB3	1.51	0.93
1:B:103:VAL:HG22	1:B:116:ILE:HG12	1.53	0.91

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:956:ILE:H	1:A:975:GLN:HE22	1.21	0.88
1:B:189:ARG:NH1	1:B:190:ASN:O	2.07	0.87

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1062/1271 (84%)	974 (92%)	87 (8%)	1 (0%)	48	83
1	B	1059/1271 (83%)	998 (94%)	60 (6%)	1 (0%)	48	83
1	C	1062/1271 (84%)	995 (94%)	67 (6%)	0	100	100
2	D	595/603 (99%)	569 (96%)	26 (4%)	0	100	100
2	G	595/603 (99%)	572 (96%)	23 (4%)	0	100	100
All	All	4373/5019 (87%)	4108 (94%)	263 (6%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	246	TRP
1	B	315	VAL

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	932/1100 (85%)	928 (100%)	4 (0%)	89	90
1	B	930/1100 (84%)	928 (100%)	2 (0%)	92	93
1	C	932/1100 (85%)	927 (100%)	5 (0%)	86	89
2	D	527/533 (99%)	526 (100%)	1 (0%)	92	93
2	G	527/533 (99%)	525 (100%)	2 (0%)	89	90
All	All	3848/4366 (88%)	3834 (100%)	14 (0%)	88	90

5 of 14 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	167	LYS
1	C	316	ARG
2	G	534	LYS
2	D	114	LYS
2	G	114	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 22 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	662	HIS
1	B	1102	ASN
1	B	757	GLN
1	C	59	HIS
1	A	878	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

35 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	E	1	3,1	14,14,15	0.33	0	17,19,21	0.38	0
3	NAG	E	2	3	14,14,15	0.26	0	17,19,21	0.42	0
3	NAG	F	1	3,1	14,14,15	0.24	0	17,19,21	0.35	0
3	NAG	F	2	3	14,14,15	0.22	0	17,19,21	0.42	0
3	NAG	H	1	3,1	14,14,15	0.24	0	17,19,21	0.43	0
3	NAG	H	2	3	14,14,15	0.39	0	17,19,21	1.24	1 (5%)
3	NAG	I	1	3,1	14,14,15	0.37	0	17,19,21	0.49	0
3	NAG	I	2	3	14,14,15	0.19	0	17,19,21	0.43	0
3	NAG	J	1	3,1	14,14,15	0.25	0	17,19,21	0.52	0
3	NAG	J	2	3	14,14,15	0.28	0	17,19,21	0.47	0
3	NAG	K	1	3,1	14,14,15	0.18	0	17,19,21	0.65	1 (5%)
3	NAG	K	2	3	14,14,15	0.19	0	17,19,21	0.39	0
3	NAG	L	1	3,1	14,14,15	0.40	0	17,19,21	1.03	1 (5%)
3	NAG	L	2	3	14,14,15	0.36	0	17,19,21	0.36	0
4	NAG	M	1	4,1	14,14,15	0.43	0	17,19,21	0.36	0
4	NAG	M	2	4	14,14,15	0.20	0	17,19,21	0.45	0
4	BMA	M	3	4	11,11,12	0.52	0	15,15,17	0.78	0
4	NAG	N	1	4,1	14,14,15	0.25	0	17,19,21	0.47	0
4	NAG	N	2	4	14,14,15	0.21	0	17,19,21	0.54	0
4	BMA	N	3	4	11,11,12	0.75	0	15,15,17	0.75	0
3	NAG	O	1	3,1	14,14,15	0.25	0	17,19,21	0.51	0
3	NAG	O	2	3	14,14,15	0.18	0	17,19,21	0.43	0
3	NAG	P	1	3,1	14,14,15	0.64	1 (7%)	17,19,21	0.63	0
3	NAG	P	2	3	14,14,15	0.30	0	17,19,21	0.47	0
3	NAG	Q	1	3,1	14,14,15	0.29	0	17,19,21	0.40	0
3	NAG	Q	2	3	14,14,15	0.17	0	17,19,21	0.43	0
3	NAG	R	1	3,1	14,14,15	0.33	0	17,19,21	0.37	0
3	NAG	R	2	3	14,14,15	0.22	0	17,19,21	0.44	0
4	NAG	S	1	4,1	14,14,15	0.40	0	17,19,21	0.53	0
4	NAG	S	2	4	14,14,15	0.26	0	17,19,21	0.39	0
4	BMA	S	3	4	11,11,12	0.53	0	15,15,17	0.82	0
3	NAG	T	1	3,1	14,14,15	0.28	0	17,19,21	0.36	0
3	NAG	T	2	3	14,14,15	0.21	0	17,19,21	0.41	0
3	NAG	U	1	3,1	14,14,15	0.18	0	17,19,21	0.49	0
3	NAG	U	2	3	14,14,15	0.22	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. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	E	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	E	2	3	-	2/6/23/26	0/1/1/1
3	NAG	F	1	3,1	-	1/6/23/26	0/1/1/1
3	NAG	F	2	3	-	2/6/23/26	0/1/1/1
3	NAG	H	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	H	2	3	-	5/6/23/26	0/1/1/1
3	NAG	I	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	I	2	3	-	0/6/23/26	0/1/1/1
3	NAG	J	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	J	2	3	-	2/6/23/26	0/1/1/1
3	NAG	K	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	K	2	3	-	2/6/23/26	0/1/1/1
3	NAG	L	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	L	2	3	-	0/6/23/26	0/1/1/1
4	NAG	M	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	M	2	4	-	2/6/23/26	0/1/1/1
4	BMA	M	3	4	-	0/2/19/22	0/1/1/1
4	NAG	N	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	N	2	4	-	2/6/23/26	0/1/1/1
4	BMA	N	3	4	-	1/2/19/22	0/1/1/1
3	NAG	O	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	O	2	3	-	1/6/23/26	0/1/1/1
3	NAG	P	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	P	2	3	-	2/6/23/26	0/1/1/1
3	NAG	Q	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	Q	2	3	-	1/6/23/26	0/1/1/1
3	NAG	R	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	R	2	3	-	2/6/23/26	0/1/1/1
4	NAG	S	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	S	2	4	-	2/6/23/26	0/1/1/1
4	BMA	S	3	4	-	0/2/19/22	0/1/1/1
3	NAG	T	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	T	2	3	-	0/6/23/26	0/1/1/1
3	NAG	U	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	U	2	3	-	0/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	P	1	NAG	O5-C1	-2.24	1.40	1.43

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	H	2	NAG	C2-N2-C7	4.18	128.85	122.90
3	L	1	NAG	C1-O5-C5	3.05	116.33	112.19
3	K	1	NAG	C1-O5-C5	2.24	115.22	112.19

There are no chirality outliers.

5 of 41 torsion outliers are listed below:

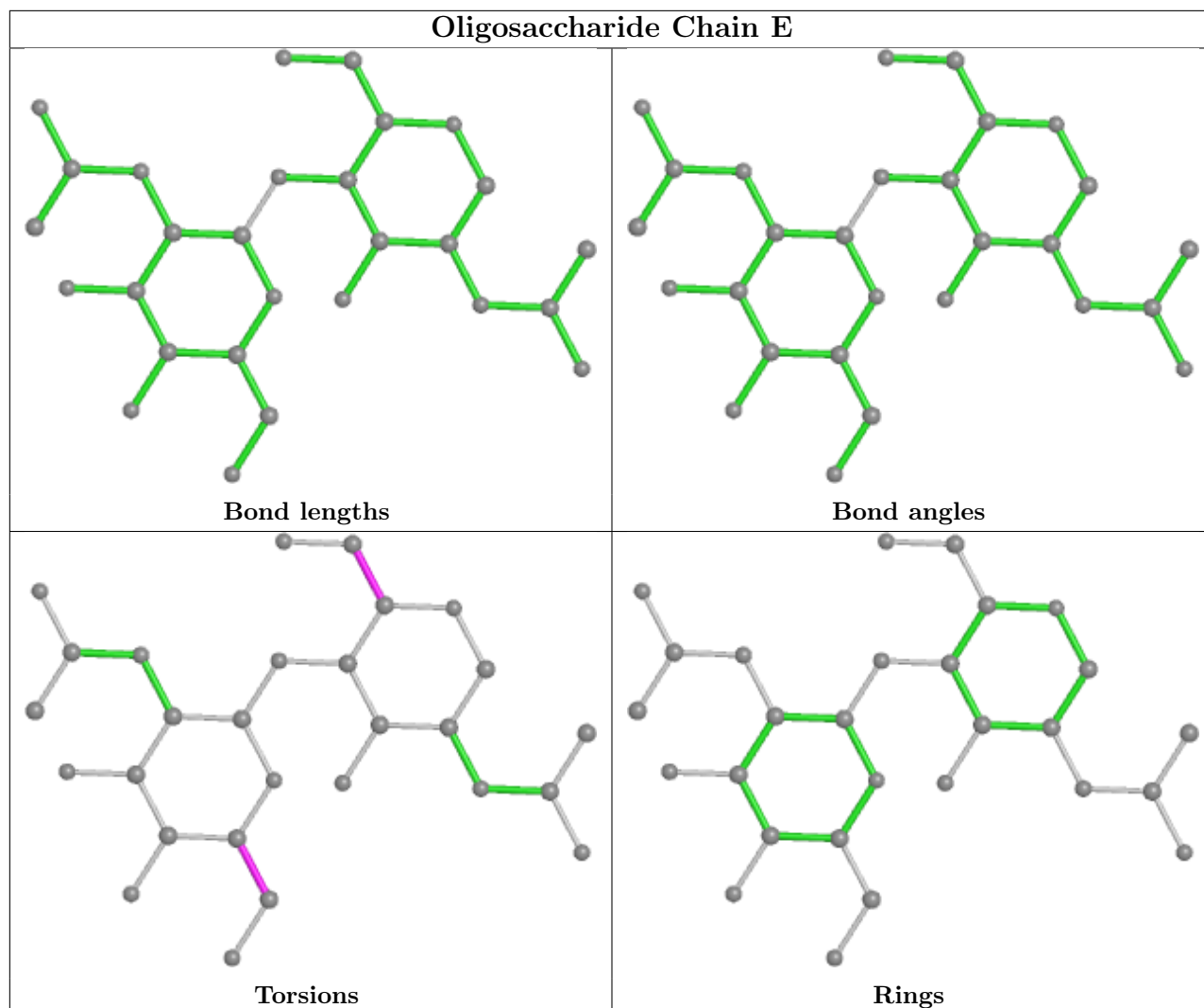
Mol	Chain	Res	Type	Atoms
3	F	2	NAG	C4-C5-C6-O6
3	F	2	NAG	O5-C5-C6-O6
3	E	2	NAG	O5-C5-C6-O6
4	S	2	NAG	O5-C5-C6-O6
3	P	2	NAG	O5-C5-C6-O6

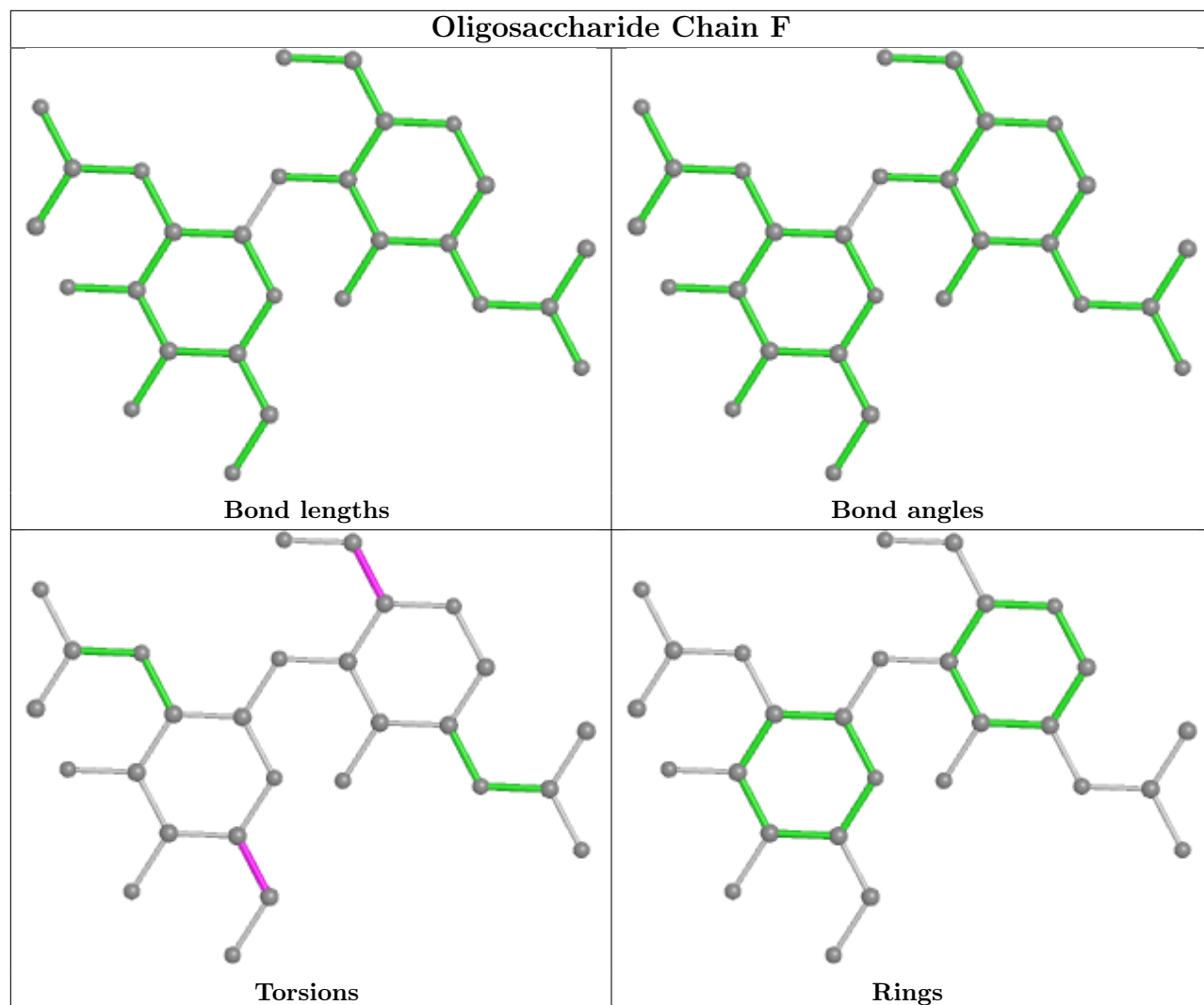
There are no ring outliers.

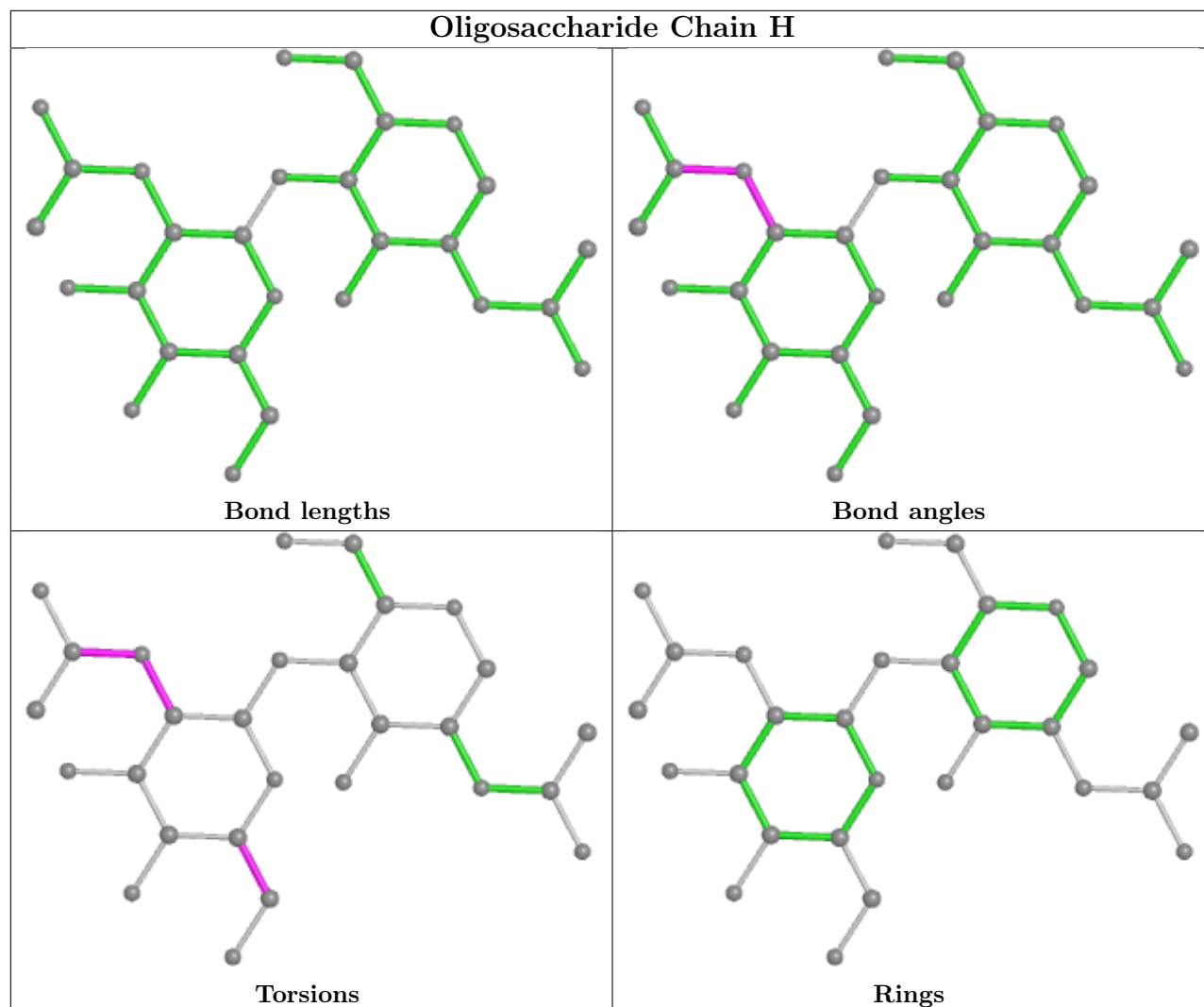
10 monomers are involved in 9 short contacts:

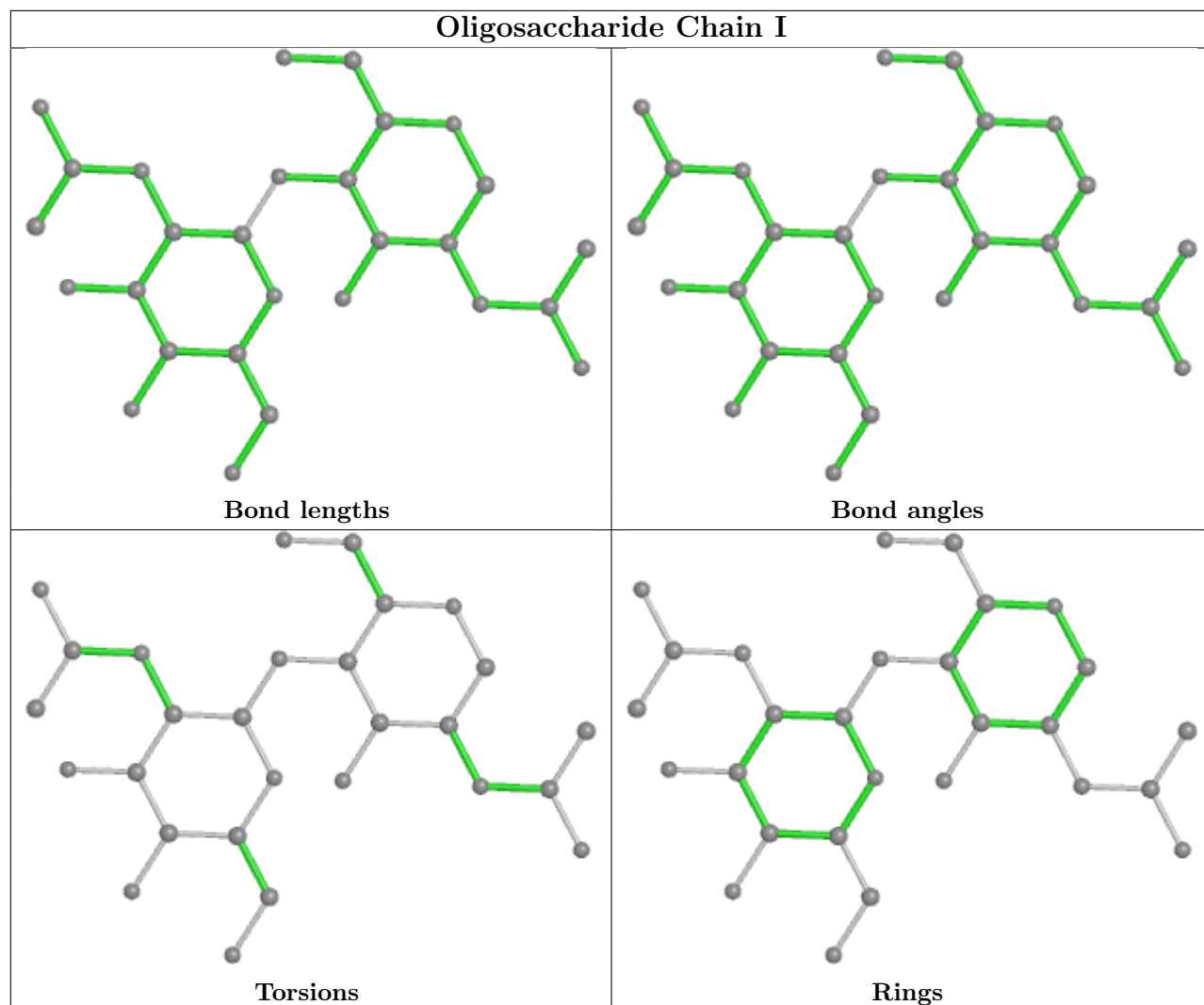
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	O	1	NAG	1	0
4	S	1	NAG	1	0
3	Q	1	NAG	1	0
3	J	2	NAG	1	0
3	J	1	NAG	2	0
3	L	1	NAG	1	0
3	L	2	NAG	1	0
3	H	2	NAG	1	0
3	P	1	NAG	1	0
3	T	1	NAG	1	0

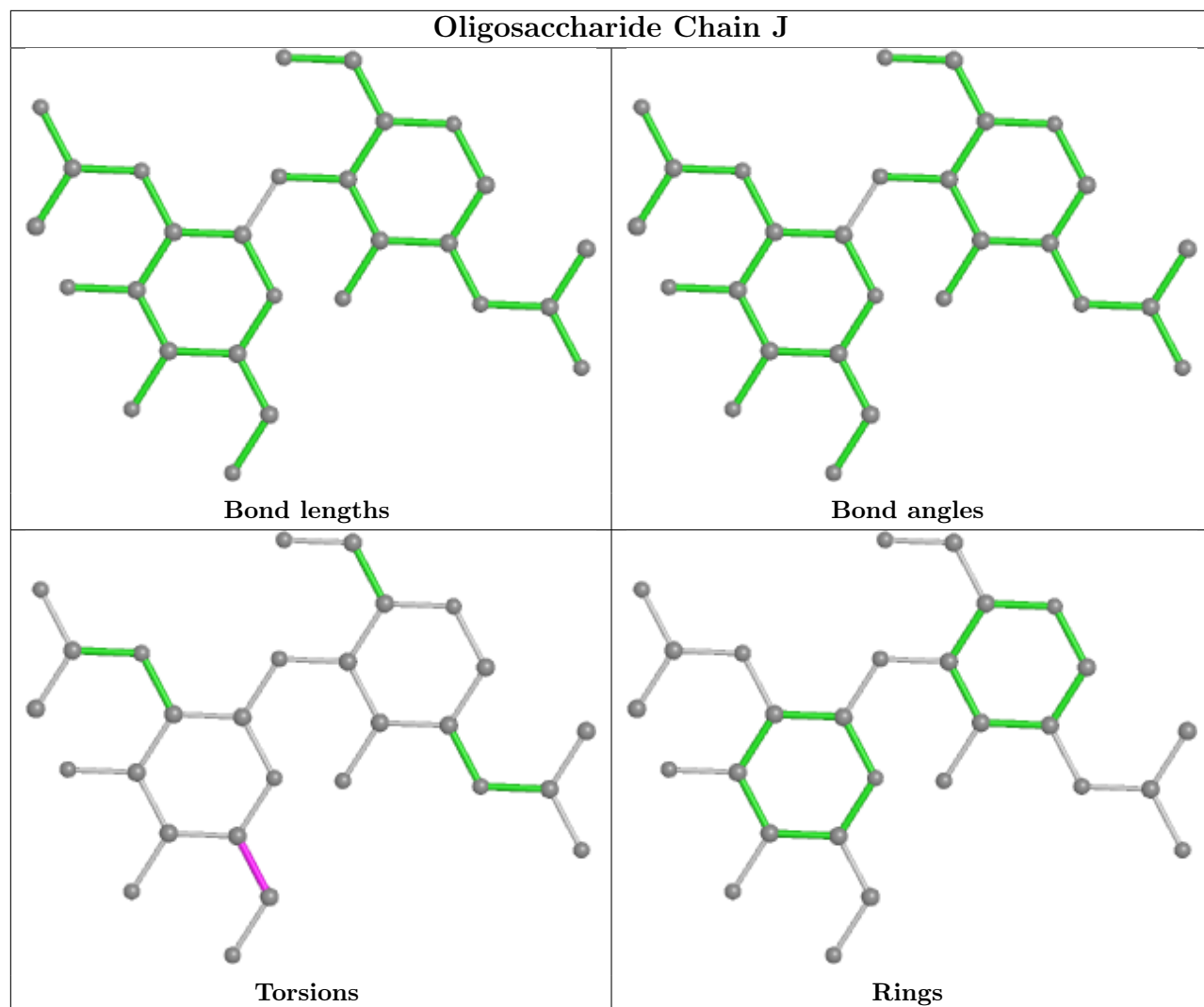
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

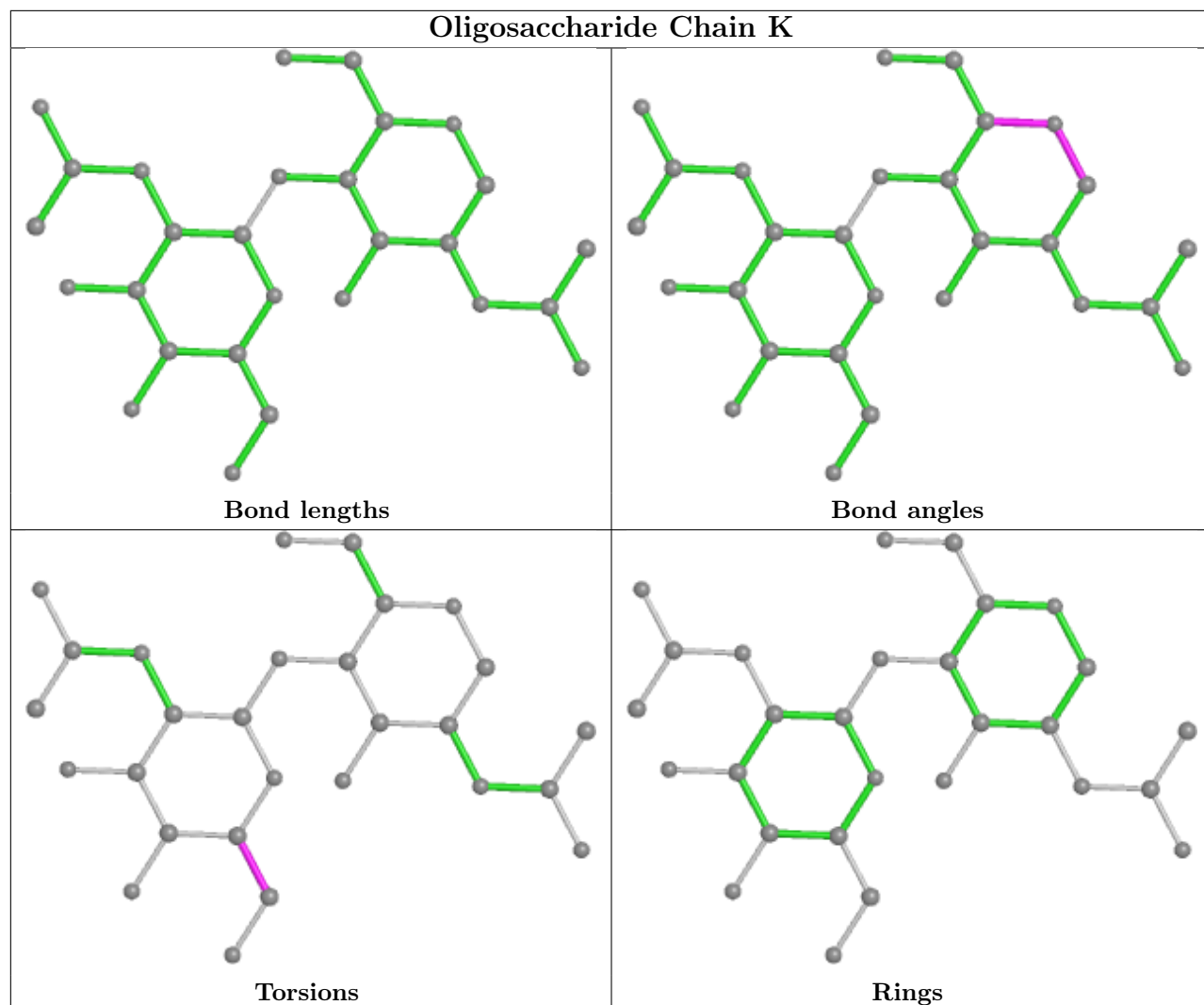


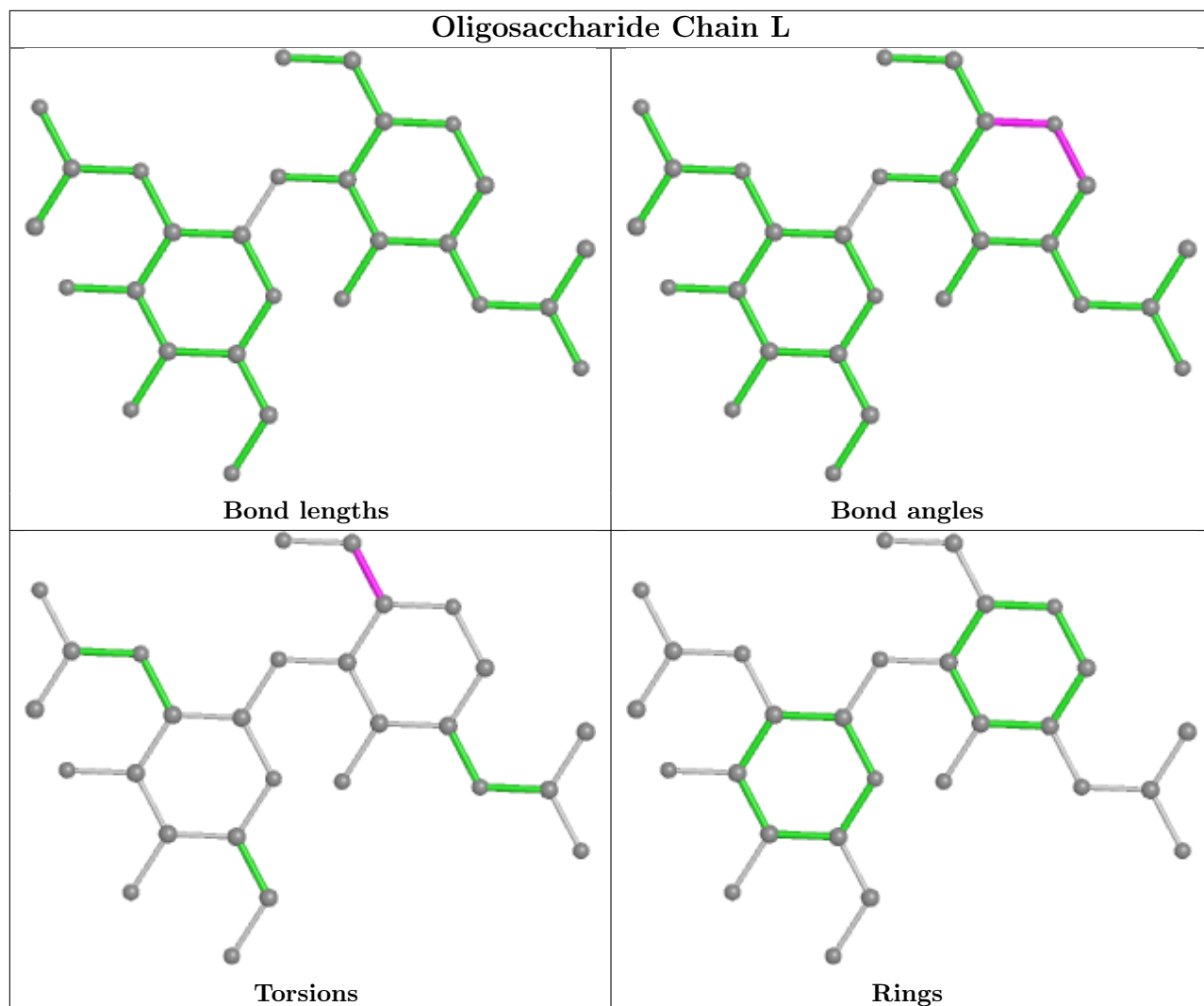


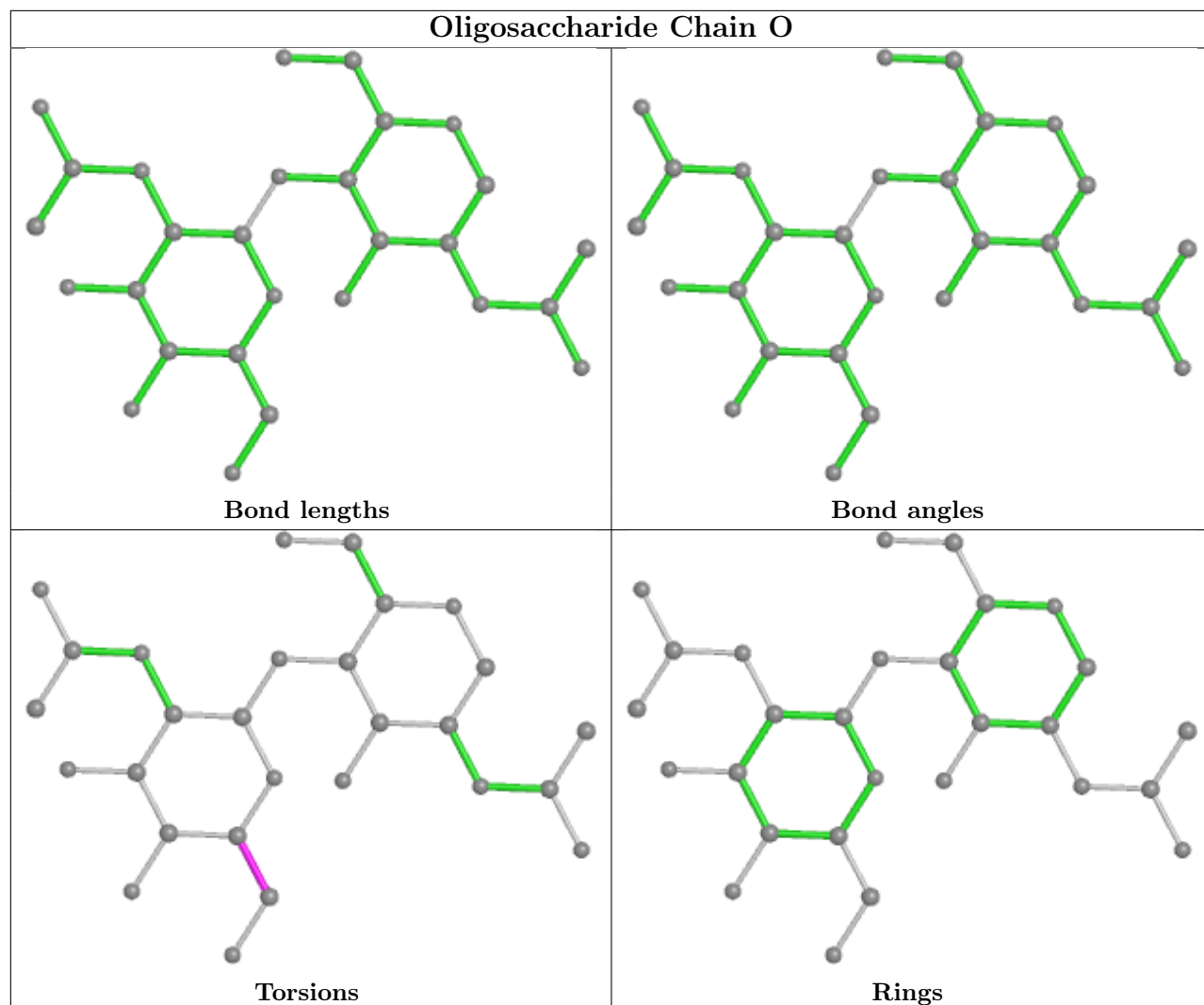


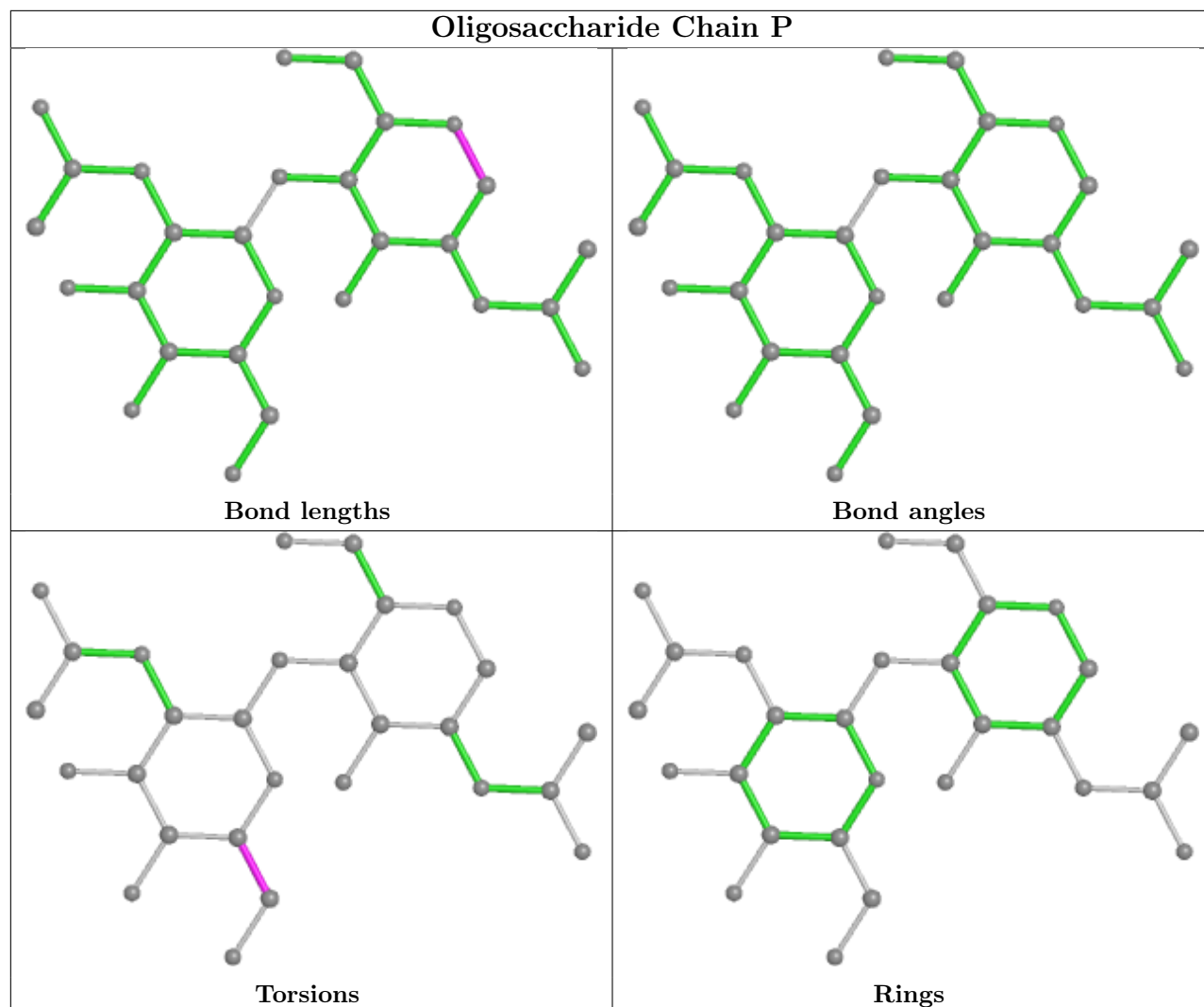


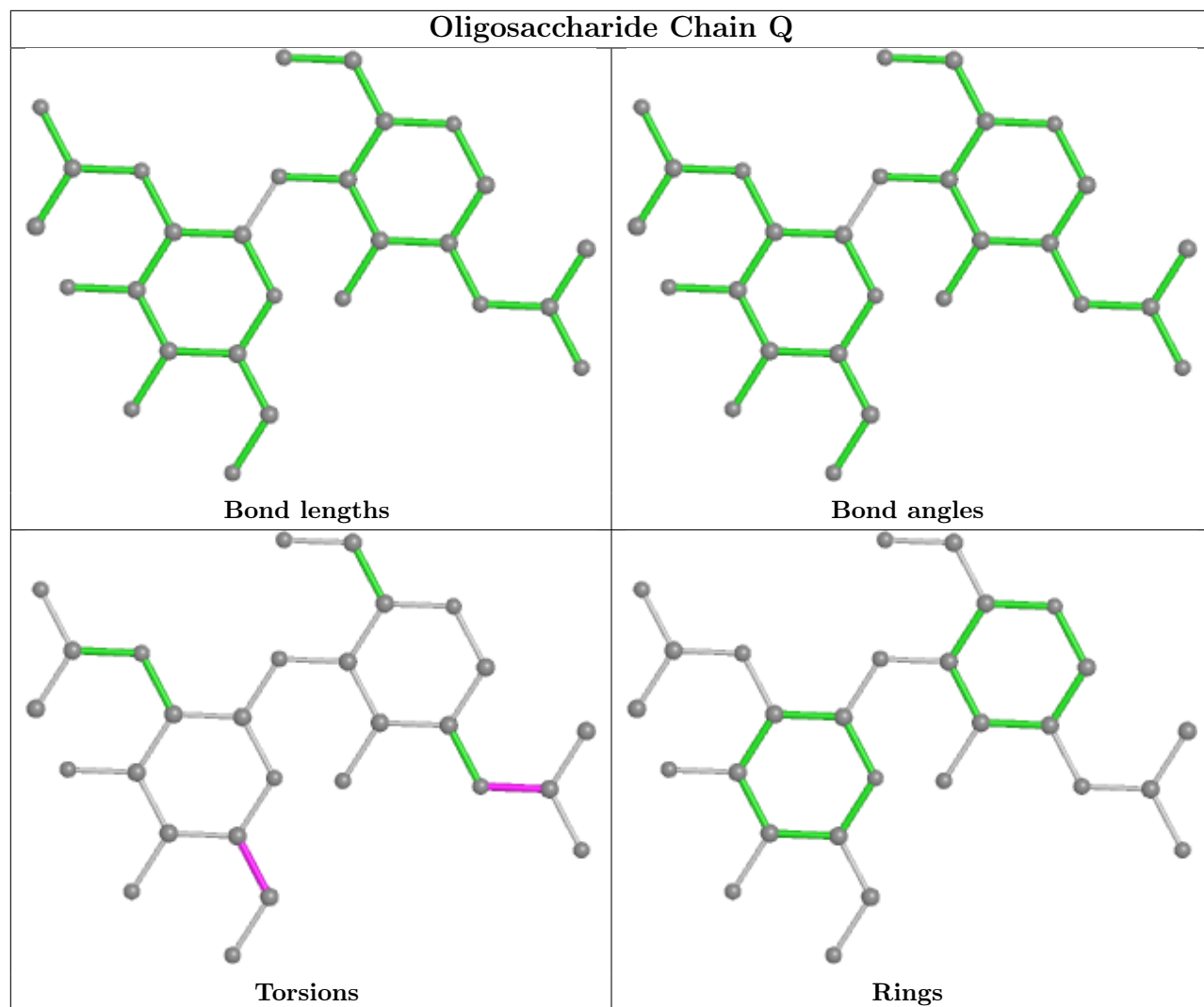


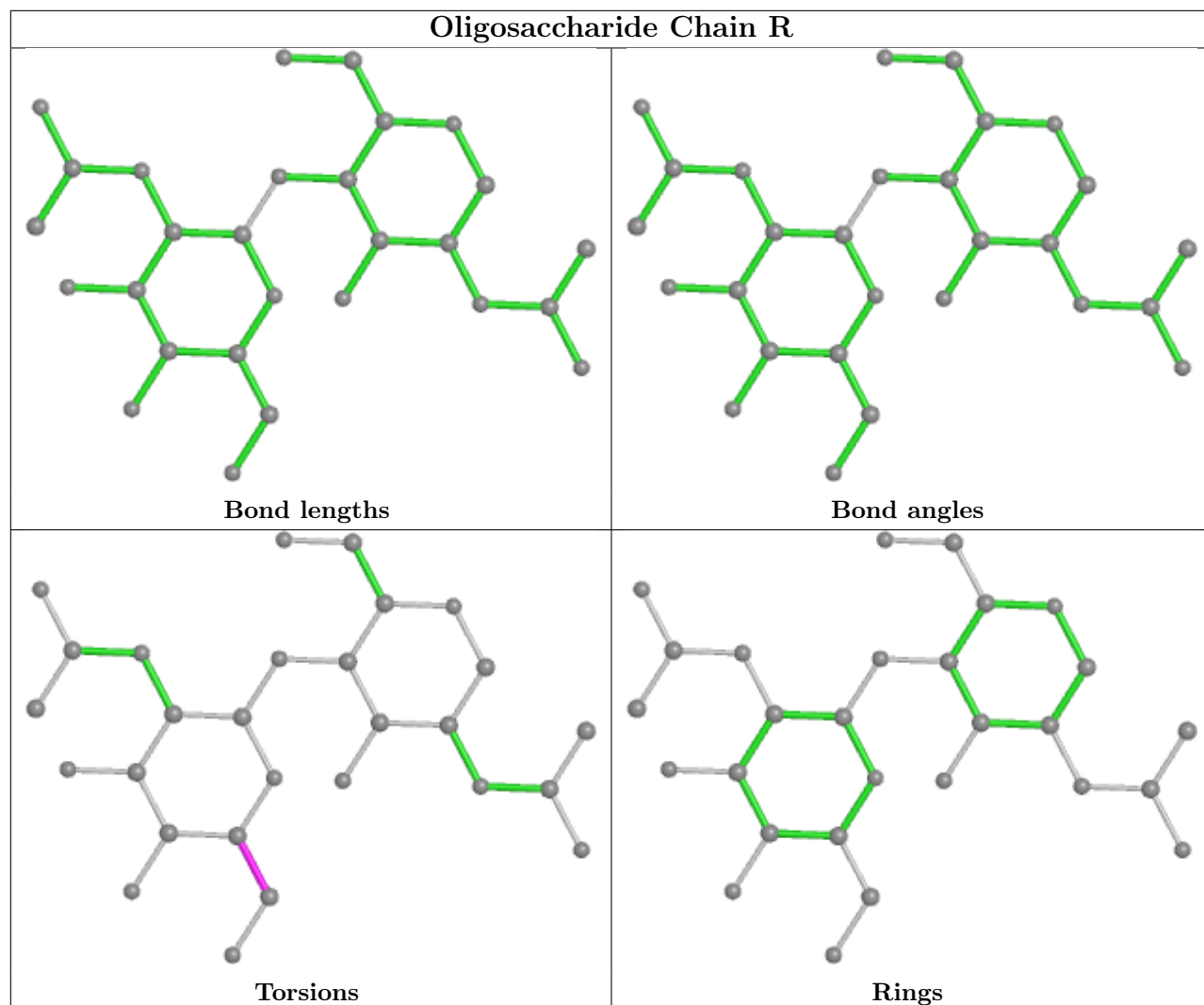


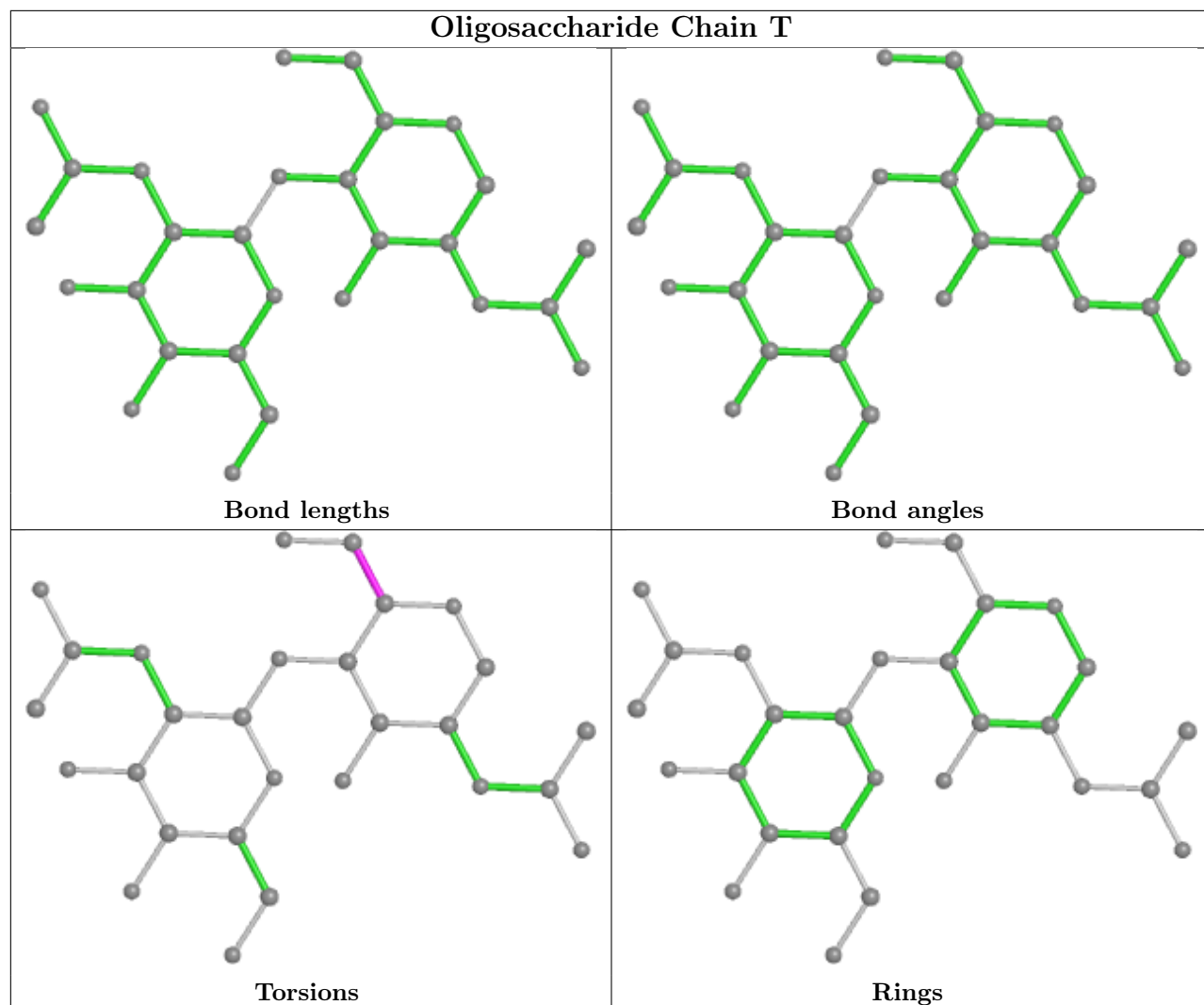


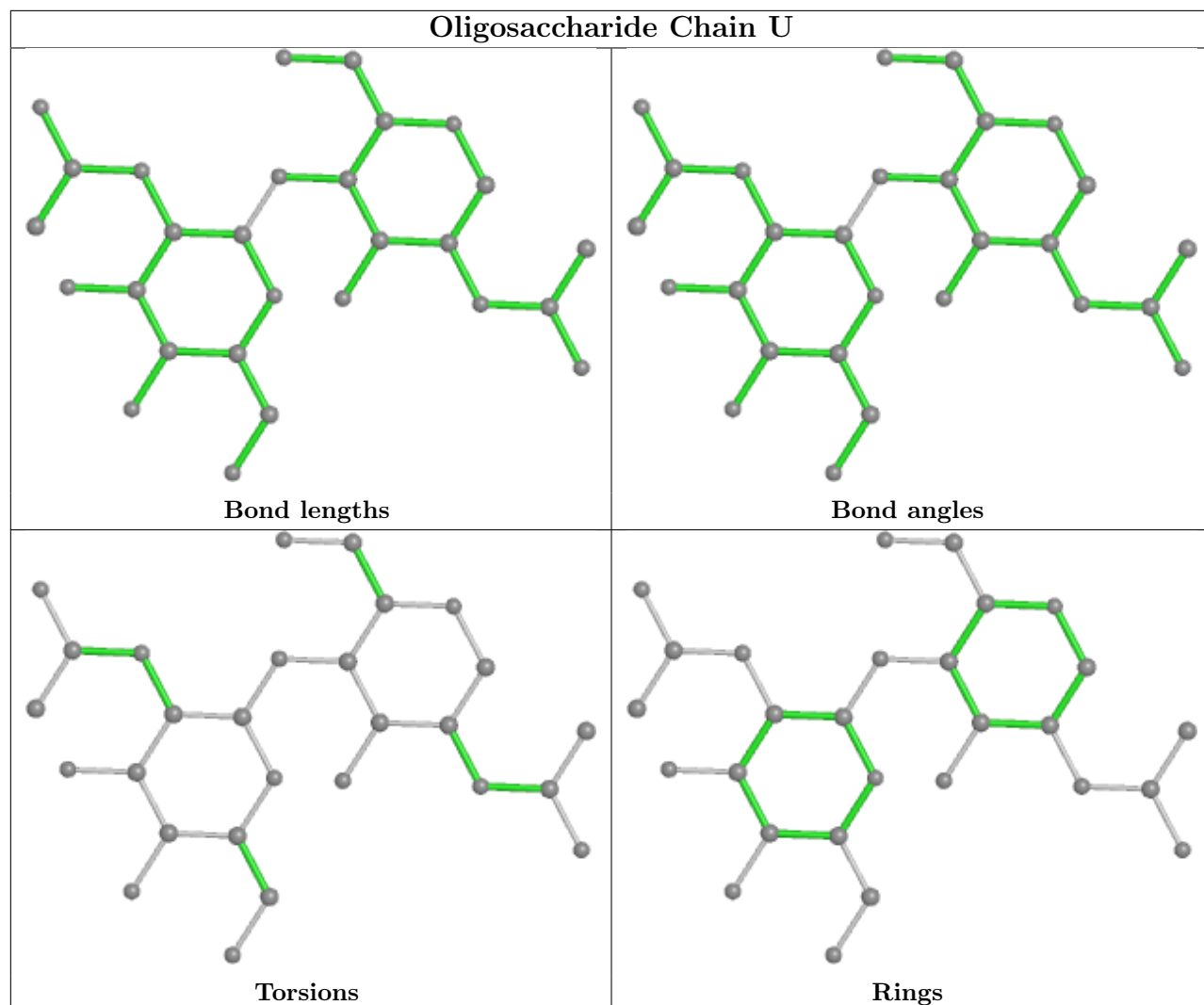


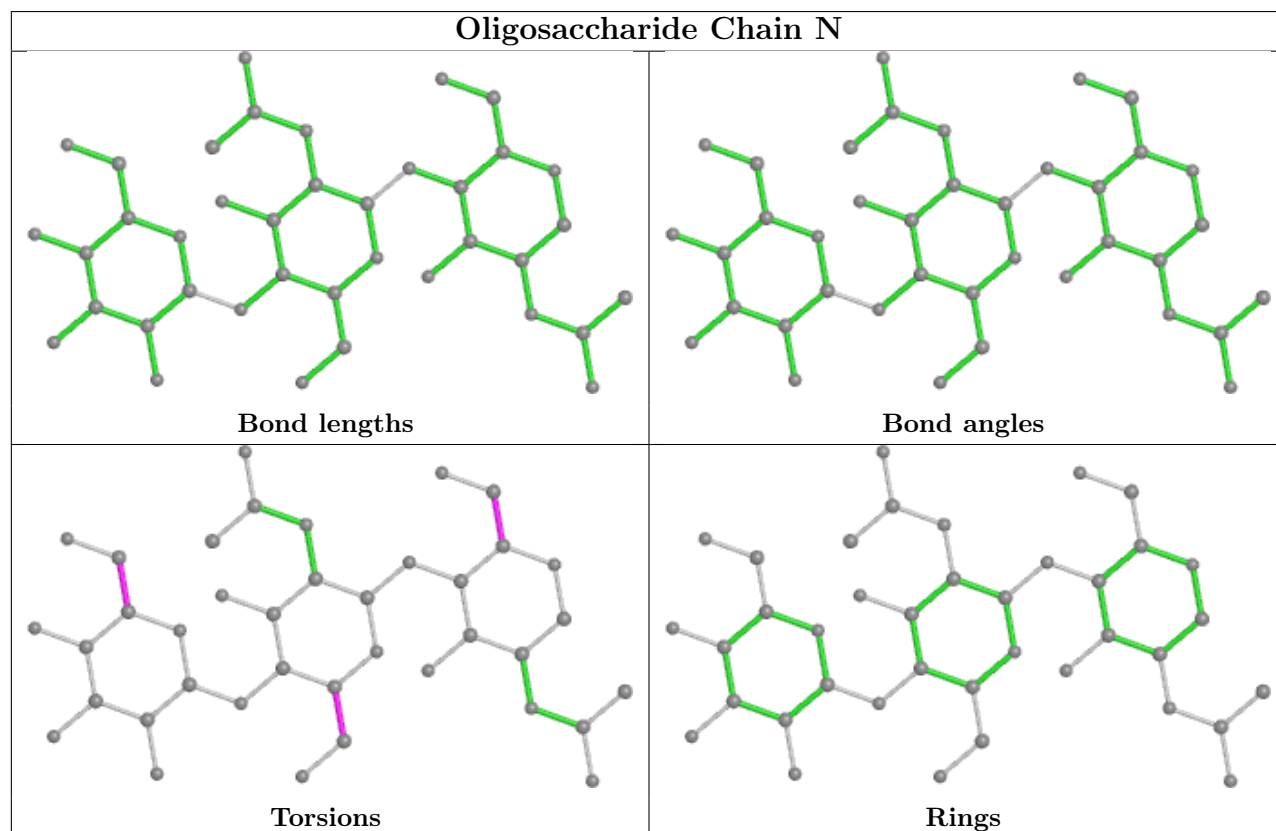
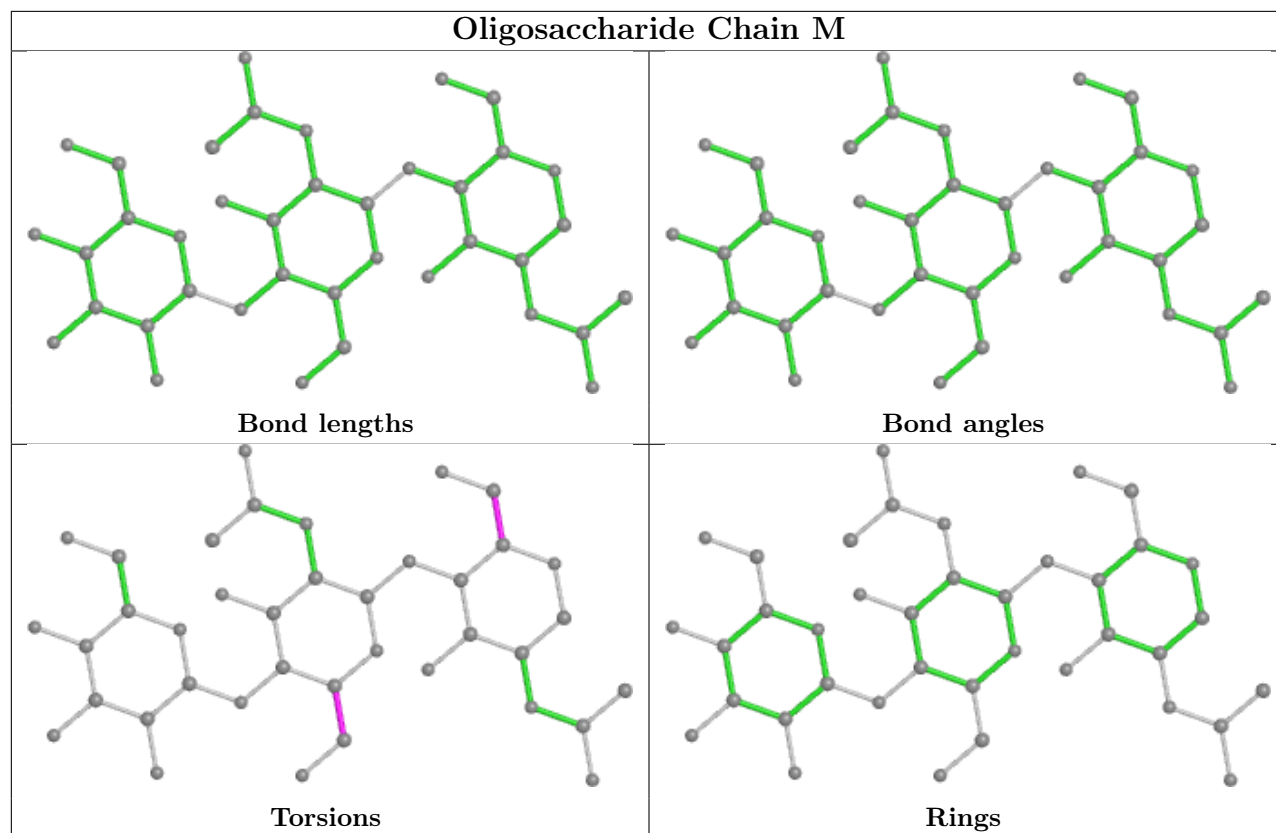


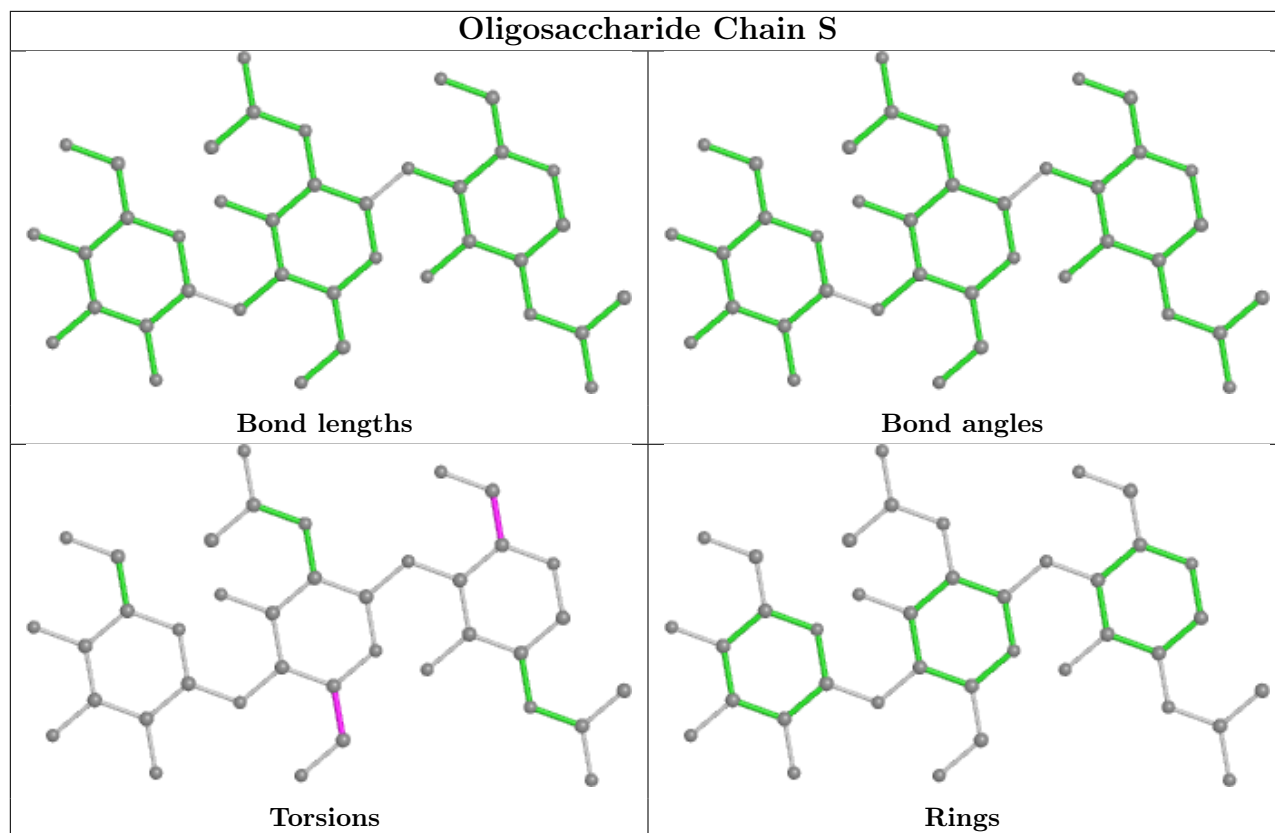












5.6 Ligand geometry [i](#)

21 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
5	NAG	A	1302	1	14,14,15	0.31	0	17,19,21	0.44	0
5	NAG	B	1306	1	14,14,15	0.22	0	17,19,21	0.47	0
5	NAG	B	1307	1	14,14,15	0.19	0	17,19,21	0.45	0
5	NAG	B	1301	1	14,14,15	0.19	0	17,19,21	0.41	0
5	NAG	C	1302	1	14,14,15	0.30	0	17,19,21	0.32	0
5	NAG	C	1303	1	14,14,15	0.21	0	17,19,21	0.38	0
5	NAG	C	1304	1	14,14,15	0.25	0	17,19,21	0.49	0
5	NAG	C	1301	1	14,14,15	0.24	0	17,19,21	0.43	0
5	NAG	C	1308	1	14,14,15	0.31	0	17,19,21	0.34	0
5	NAG	A	1303	1	14,14,15	0.29	0	17,19,21	0.36	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	NAG	B	1304	1	14,14,15	0.20	0	17,19,21	0.42	0
5	NAG	C	1307	1	14,14,15	0.60	0	17,19,21	0.43	0
5	NAG	C	1305	1	14,14,15	0.25	0	17,19,21	0.42	0
5	NAG	C	1309	1	14,14,15	0.25	0	17,19,21	0.39	0
5	NAG	B	1305	1	14,14,15	0.24	0	17,19,21	0.44	0
5	NAG	A	1304	1	14,14,15	0.23	0	17,19,21	0.44	0
5	NAG	C	1306	1	14,14,15	0.22	0	17,19,21	0.37	0
5	NAG	C	1310	1	14,14,15	0.22	0	17,19,21	0.52	0
5	NAG	A	1301	1	14,14,15	0.22	0	17,19,21	0.35	0
5	NAG	B	1303	1	14,14,15	0.22	0	17,19,21	0.59	0
5	NAG	B	1302	1	14,14,15	0.18	0	17,19,21	0.41	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
5	NAG	A	1302	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1306	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1307	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1301	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1302	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1303	1	-	0/6/23/26	0/1/1/1
5	NAG	C	1304	1	-	1/6/23/26	0/1/1/1
5	NAG	C	1301	1	-	4/6/23/26	0/1/1/1
5	NAG	C	1308	1	-	4/6/23/26	0/1/1/1
5	NAG	A	1303	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1304	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1307	1	-	4/6/23/26	0/1/1/1
5	NAG	C	1305	1	-	2/6/23/26	0/1/1/1
5	NAG	C	1309	1	-	0/6/23/26	0/1/1/1
5	NAG	B	1305	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1304	1	-	3/6/23/26	0/1/1/1
5	NAG	C	1306	1	-	3/6/23/26	0/1/1/1
5	NAG	C	1310	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1301	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1303	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1302	1	-	4/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 43 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	1301	NAG	O5-C5-C6-O6
5	B	1304	NAG	C4-C5-C6-O6
5	B	1305	NAG	O5-C5-C6-O6
5	B	1302	NAG	C4-C5-C6-O6
5	A	1302	NAG	O5-C5-C6-O6

There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	C	1302	NAG	1	0
5	C	1304	NAG	1	0
5	C	1309	NAG	2	0
5	B	1302	NAG	2	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.