



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 5, 2023 – 01:11 AM EDT

PDB ID : 6V3R  
Title : Crystal structure of murine cyclooxygenase in complex with a harmaline analog,  
4,9-dihydro-3H-pyrido[3,4-b]indole  
Authors : Xu, S.; Uddin, M.J.; Banerjee, S.; Marnett, L.J.  
Deposited on : 2019-11-26  
Resolution : 2.66 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp>

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:

MolProbity : **FAILED**  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : **FAILED**  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35.1

## 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.66 Å.

There are no overall percentile quality scores available for this entry.

MolProbity and EDS failed to run properly - the sequence quality summary graphics cannot be shown.

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 18772 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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.

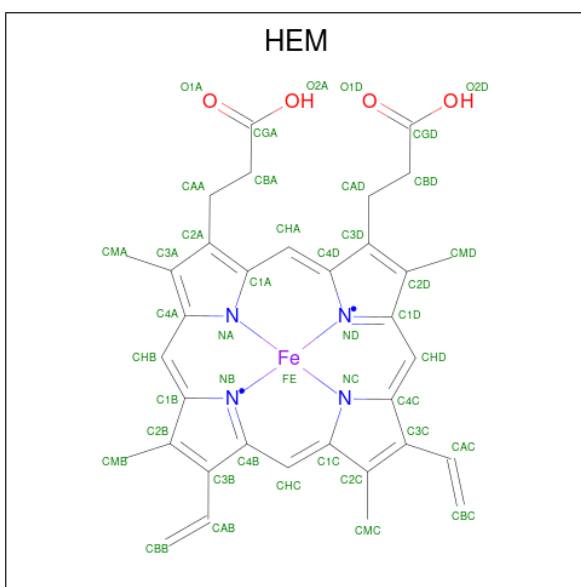
- Molecule 1 is a protein called Prostaglandin G/H synthase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	552	4499	2899	756	819	25	0	3	0
1	B	552	4499	2899	756	819	25	0	3	0
1	C	552	4499	2899	756	819	25	0	3	0
1	D	552	4499	2899	756	819	25	0	3	0

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

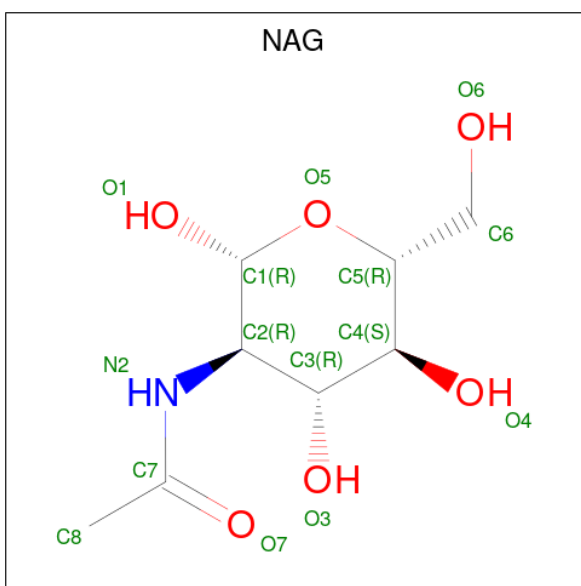
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	E	2	28	16	2	10	0	0	0
2	F	2	28	16	2	10	0	0	0
2	G	2	28	16	2	10	0	0	0
2	H	2	28	16	2	10	0	0	0

- Molecule 3 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula:  $C_{34}H_{32}FeN_4O_4$ ).



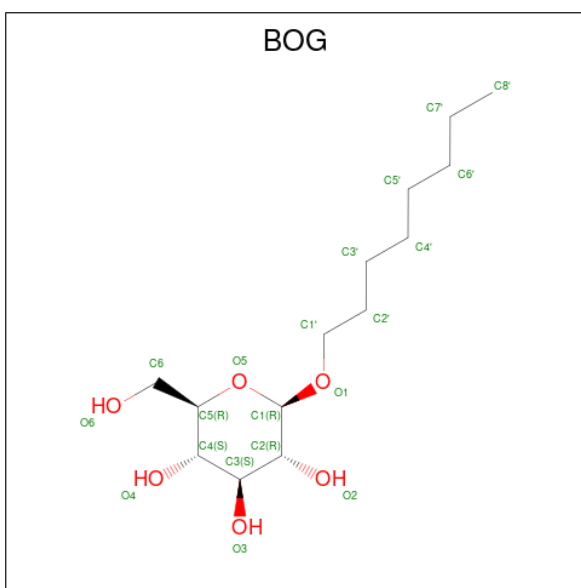
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	Fe	N			O
3	A	1	43	34	1	4	4	0	0
3	B	1	43	34	1	4	4	0	0
3	C	1	43	34	1	4	4	0	0
3	D	1	43	34	1	4	4	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



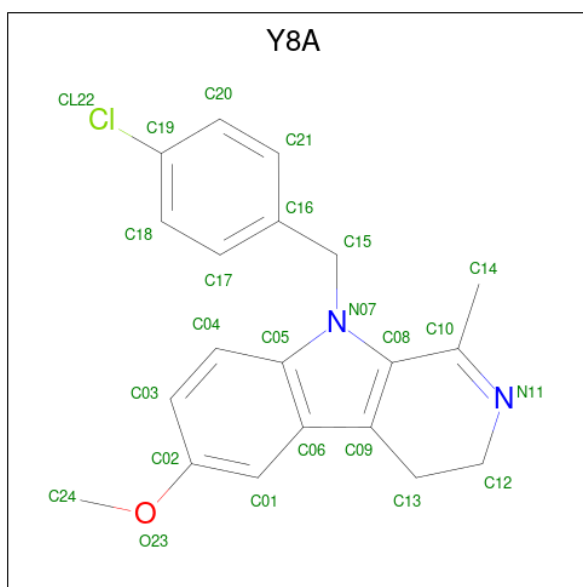
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			14	8	1	5		
4	A	1	Total	C	N	O	0	0
			14	8	1	5		
4	B	1	Total	C	N	O	0	0
			14	8	1	5		
4	B	1	Total	C	N	O	0	0
			14	8	1	5		
4	C	1	Total	C	N	O	0	0
			14	8	1	5		
4	C	1	Total	C	N	O	0	0
			14	8	1	5		
4	D	1	Total	C	N	O	0	0
			14	8	1	5		
4	D	1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

- Molecule 5 is octyl beta-D-glucopyranoside (three-letter code: BOG) (formula: C<sub>14</sub>H<sub>28</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			20	14	6		
5	D	1	Total	C	O	0	0
			20	14	6		

- Molecule 6 is 9-[(4-chlorophenyl)methyl]-6-methoxy-1-methyl-4,9-dihydro-3H-beta-carboline (three-letter code: Y8A) (formula: C<sub>20</sub>H<sub>19</sub>ClN<sub>2</sub>O) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	Cl	N			O
6	A	1	24	20	1	2	1	0	0
6	B	1	24	20	1	2	1	0	0
6	C	1	24	20	1	2	1	0	0
6	D	1	24	20	1	2	1	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	56	Total	O	0	0
			56	56		
7	B	55	Total	O	0	0
			55	55		
7	C	57	Total	O	0	0
			57	57		
7	D	76	Total	O	0	0
			76	76		

MolProbity and EDS failed to run properly - this section is therefore empty.

### 3 Data and refinement statistics i

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	217.15Å 124.38Å 136.54Å 90.00° 123.84° 90.00°	Depositor
Resolution (Å)	102.39 – 2.66	Depositor
% Data completeness (in resolution range)	98.0 (102.39-2.66)	Depositor
$R_{merge}$	0.16	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.10 (at 2.65Å)	Xtriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, $R_{free}$	0.219 , 0.264	Depositor
Wilson B-factor (Å <sup>2</sup> )	42.6	Xtriage
Anisotropy	0.110	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.000 for 1/2*h-3/2*k,-1/2*h-1/2*k,-1/2*h +1/2*k-1 0.000 for 1/2*h+3/2*k,1/2*h-1/2*k,-1/2*h- 1/2*k-1	Xtriage
Total number of atoms	18772	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	49.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.24% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 4 Model quality [i](#)

### 4.1 Standard geometry [i](#)

MolProbity failed to run properly - this section is therefore empty.

### 4.2 Too-close contacts [i](#)

MolProbity failed to run properly - this section is therefore empty.

### 4.3 Torsion angles [i](#)

#### 4.3.1 Protein backbone [i](#)

MolProbity failed to run properly - this section is therefore empty.

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

MolProbity failed to run properly - this section is therefore empty.

#### 4.3.3 RNA [i](#)

MolProbity failed to run properly - this section is therefore empty.

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

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

### 4.5 Carbohydrates [i](#)

8 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
2	NAG	E	1	2,1	14,14,15	0.22	0	17,19,21	0.52	0
2	NAG	E	2	2	14,14,15	0.28	0	17,19,21	0.42	0
2	NAG	F	1	2,1	14,14,15	0.33	0	17,19,21	0.45	0
2	NAG	F	2	2	14,14,15	0.30	0	17,19,21	0.42	0
2	NAG	G	1	2,1	14,14,15	0.29	0	17,19,21	0.47	0
2	NAG	G	2	2	14,14,15	0.27	0	17,19,21	0.46	0
2	NAG	H	1	2,1	14,14,15	0.30	0	17,19,21	0.51	0
2	NAG	H	2	2	14,14,15	0.35	0	17,19,21	0.45	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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	E	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	E	2	2	-	0/6/23/26	0/1/1/1
2	NAG	F	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	F	2	2	-	0/6/23/26	0/1/1/1
2	NAG	G	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	G	2	2	-	0/6/23/26	0/1/1/1
2	NAG	H	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	H	2	2	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

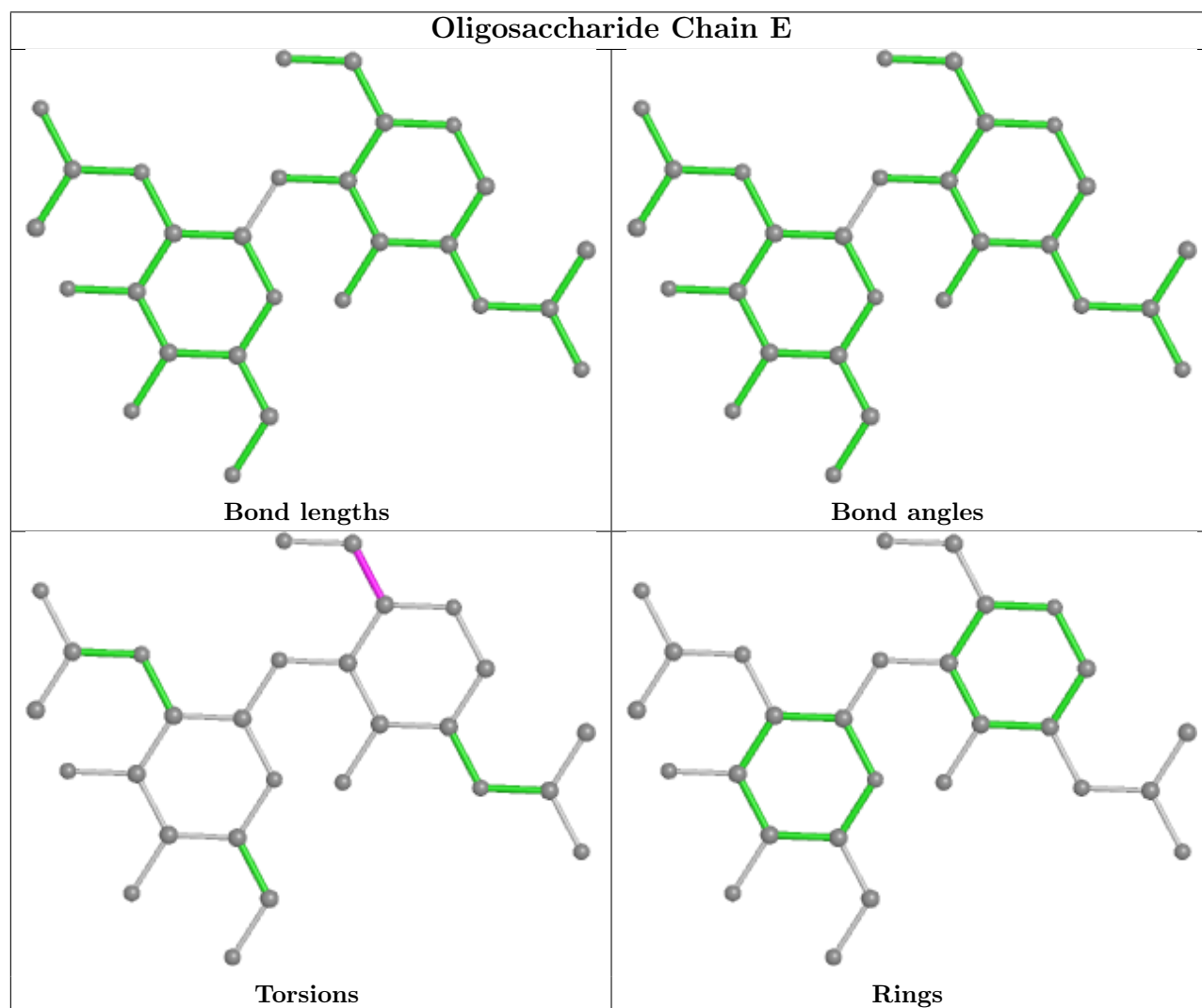
All (6) torsion outliers are listed below:

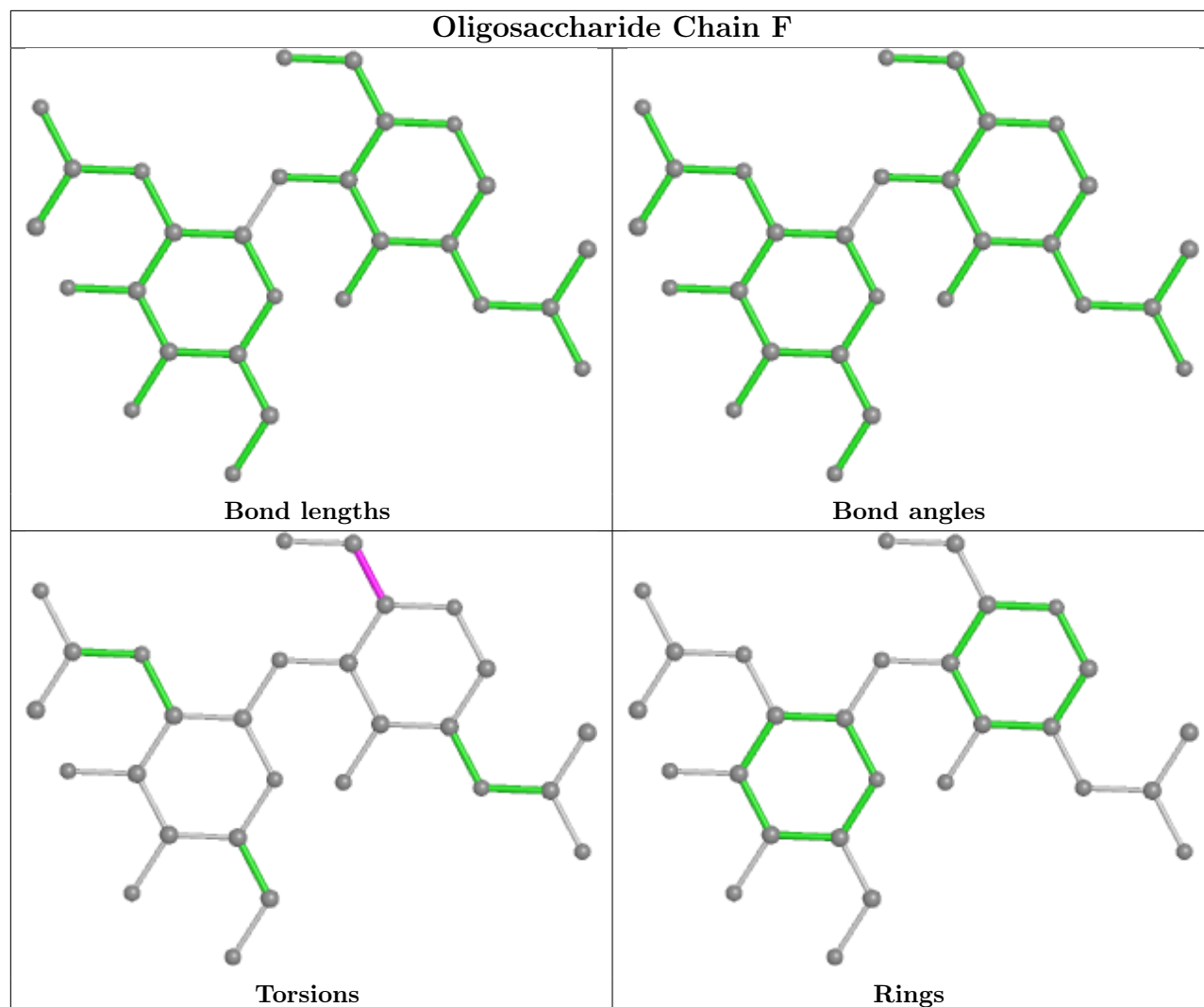
Mol	Chain	Res	Type	Atoms
2	H	2	NAG	O5-C5-C6-O6
2	H	2	NAG	C4-C5-C6-O6
2	E	1	NAG	O5-C5-C6-O6
2	E	1	NAG	C4-C5-C6-O6
2	F	1	NAG	C4-C5-C6-O6
2	F	1	NAG	O5-C5-C6-O6

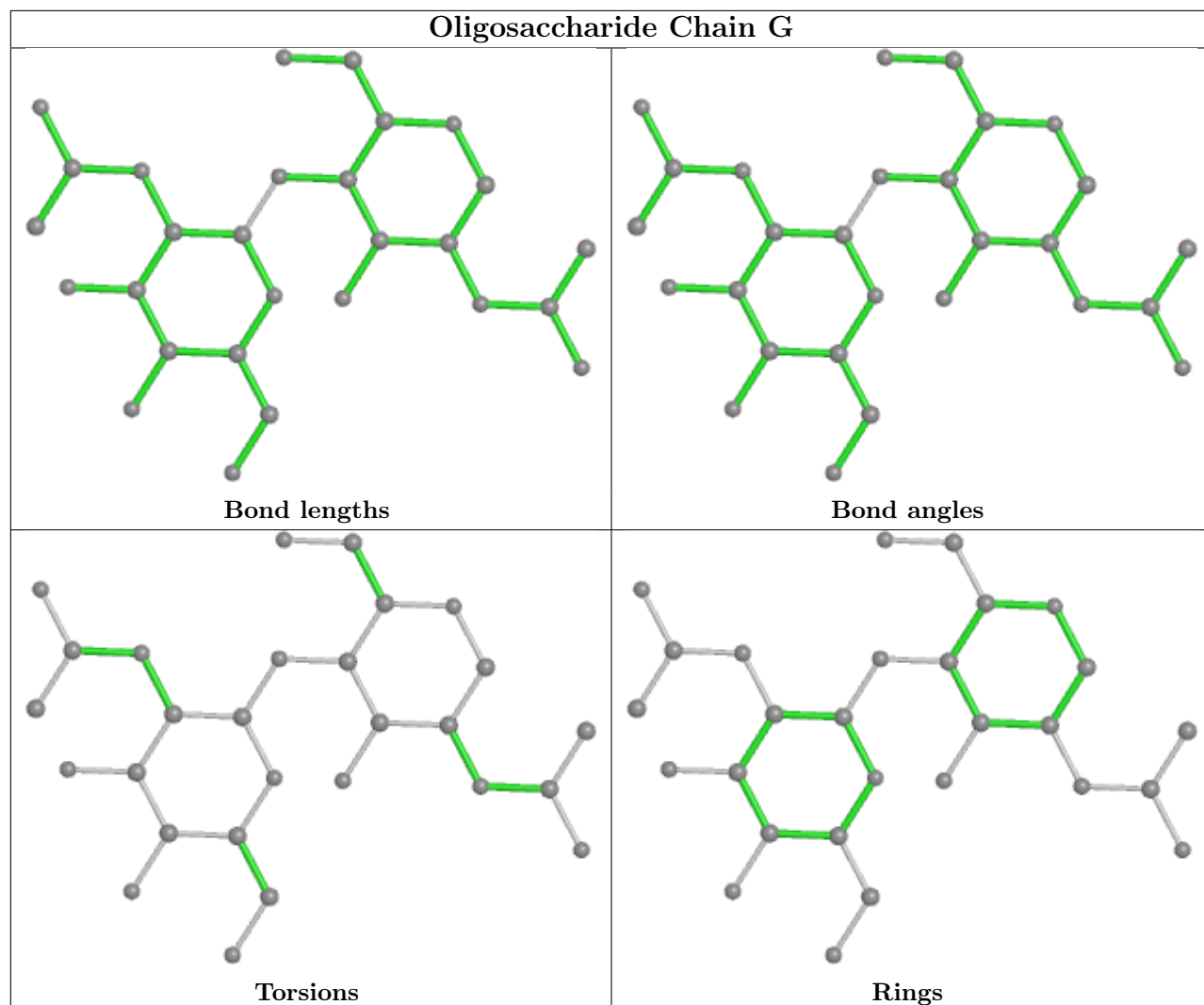
There are no ring outliers.

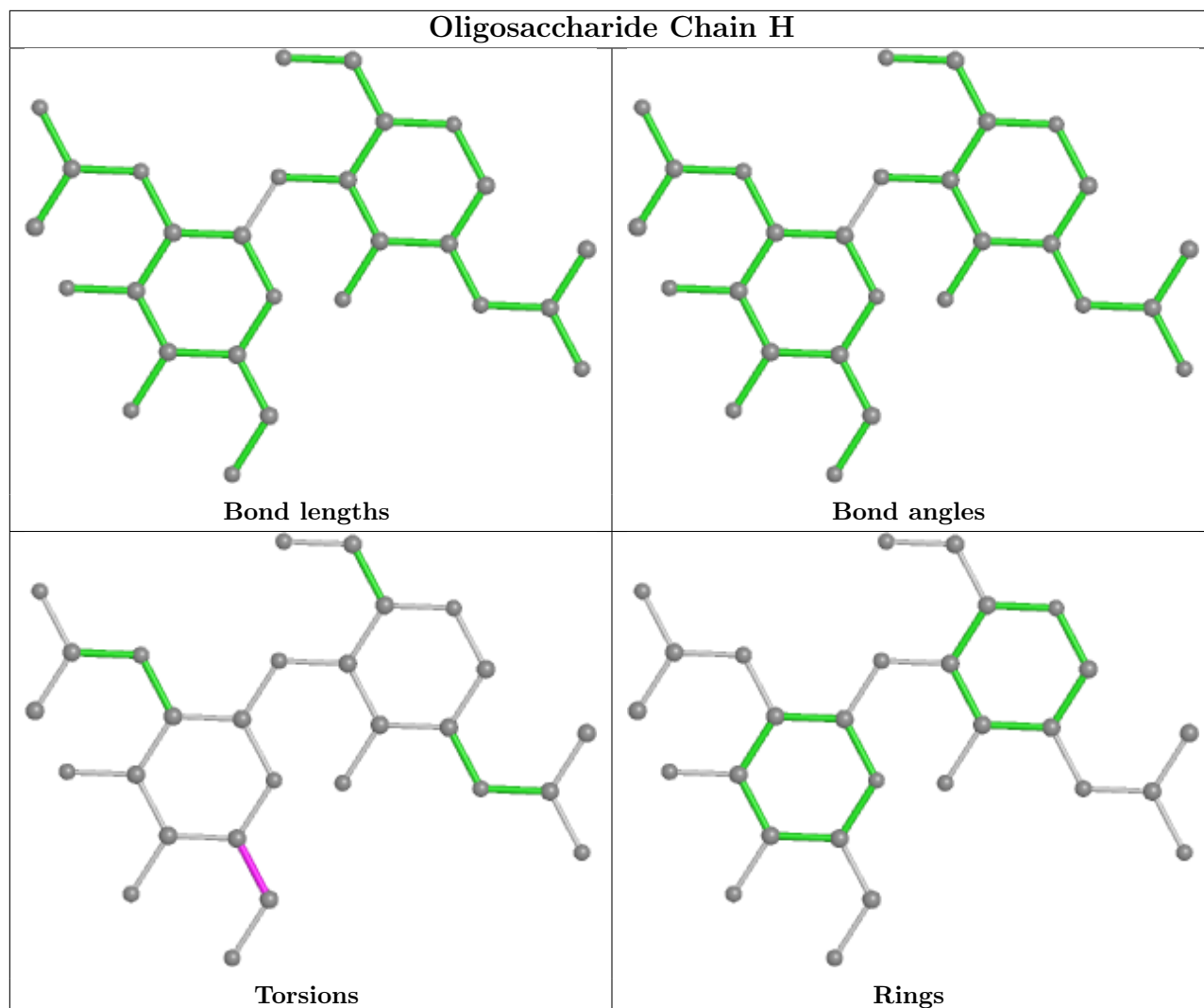
No monomer is involved in short contacts.

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









## 4.6 Ligand geometry [i](#)

18 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	BOG	A	706	-	20,20,20	1.22	2 (10%)	25,25,25	0.79	0
4	NAG	C	703	1	14,14,15	0.26	0	17,19,21	0.59	0
3	HEM	B	702	-	41,50,50	1.53	5 (12%)	45,82,82	1.47	8 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	HEM	D	702	1	41,50,50	1.52	4 (9%)	45,82,82	1.51	7 (15%)
4	NAG	D	706	1	14,14,15	0.26	0	17,19,21	0.43	0
6	Y8A	A	707	-	23,27,27	4.69	1 (4%)	26,39,39	1.11	2 (7%)
4	NAG	A	705	1	14,14,15	0.21	0	17,19,21	0.46	0
4	NAG	A	702	1	14,14,15	0.44	0	17,19,21	0.34	0
4	NAG	B	706	1	14,14,15	0.22	0	17,19,21	0.44	0
3	HEM	C	702	1	41,50,50	1.52	3 (7%)	45,82,82	1.49	7 (15%)
4	NAG	B	703	1	14,14,15	0.32	0	17,19,21	0.55	0
4	NAG	D	703	1	14,14,15	0.33	0	17,19,21	0.38	0
4	NAG	C	706	1	14,14,15	0.24	0	17,19,21	0.42	0
6	Y8A	B	701	-	23,27,27	4.60	2 (8%)	26,39,39	1.27	4 (15%)
6	Y8A	D	701	-	23,27,27	4.68	1 (4%)	26,39,39	1.20	2 (7%)
3	HEM	A	701	-	41,50,50	1.51	4 (9%)	45,82,82	1.53	7 (15%)
6	Y8A	C	701	-	23,27,27	4.58	1 (4%)	26,39,39	1.08	1 (3%)
5	BOG	D	707	-	20,20,20	1.22	2 (10%)	25,25,25	0.75	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	BOG	A	706	-	-	7/11/31/31	0/1/1/1
4	NAG	C	703	1	-	3/6/23/26	0/1/1/1
3	HEM	B	702	-	-	1/12/54/54	-
3	HEM	D	702	1	-	1/12/54/54	-
4	NAG	D	706	1	-	1/6/23/26	0/1/1/1
6	Y8A	A	707	-	-	4/6/16/16	0/4/4/4
4	NAG	A	705	1	-	2/6/23/26	0/1/1/1
4	NAG	A	702	1	-	1/6/23/26	0/1/1/1
4	NAG	B	706	1	-	0/6/23/26	0/1/1/1
3	HEM	C	702	1	-	1/12/54/54	-
4	NAG	B	703	1	-	3/6/23/26	0/1/1/1
4	NAG	D	703	1	-	4/6/23/26	0/1/1/1
4	NAG	C	706	1	-	2/6/23/26	0/1/1/1
6	Y8A	B	701	-	-	4/6/16/16	0/4/4/4
6	Y8A	D	701	-	-	4/6/16/16	0/4/4/4
3	HEM	A	701	-	-	3/12/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	Y8A	C	701	-	-	4/6/16/16	0/4/4/4
5	BOG	D	707	-	-	4/11/31/31	0/1/1/1

All (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	707	Y8A	C10-N11	21.84	1.44	1.28
6	D	701	Y8A	C10-N11	21.84	1.44	1.28
6	B	701	Y8A	C10-N11	21.42	1.44	1.28
6	C	701	Y8A	C10-N11	21.34	1.43	1.28
3	A	701	HEM	C3C-C2C	-4.70	1.33	1.40
3	C	702	HEM	C3C-C2C	-4.52	1.34	1.40
3	D	702	HEM	C3C-C2C	-4.47	1.34	1.40
3	B	702	HEM	C3C-C2C	-4.46	1.34	1.40
3	D	702	HEM	C3C-CAC	3.71	1.55	1.47
3	B	702	HEM	C3C-CAC	3.70	1.55	1.47
3	C	702	HEM	C3C-CAC	3.69	1.55	1.47
5	A	706	BOG	O5-C1	3.55	1.50	1.41
5	D	707	BOG	O5-C1	3.52	1.50	1.41
3	A	701	HEM	C3C-CAC	3.49	1.55	1.47
3	C	702	HEM	CAB-C3B	2.92	1.55	1.47
3	B	702	HEM	CAB-C3B	2.91	1.55	1.47
3	D	702	HEM	CAB-C3B	2.89	1.55	1.47
3	A	701	HEM	CAB-C3B	2.80	1.55	1.47
5	D	707	BOG	O1-C1	-2.28	1.36	1.40
5	A	706	BOG	O1-C1	-2.26	1.36	1.40
3	A	701	HEM	FE-NB	2.18	2.07	1.96
3	B	702	HEM	FE-ND	2.16	2.07	1.96
3	B	702	HEM	FE-NB	2.08	2.07	1.96
6	B	701	Y8A	C13-C09	2.06	1.55	1.51
3	D	702	HEM	FE-NB	2.03	2.06	1.96

All (38) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	701	HEM	C4B-CHC-C1C	3.53	127.22	122.56
6	B	701	Y8A	C14-C10-C08	3.44	124.11	117.53
6	C	701	Y8A	C14-C10-C08	3.44	124.11	117.53
3	A	701	HEM	C1B-NB-C4B	3.43	108.62	105.07
6	D	701	Y8A	C14-C10-C08	3.33	123.88	117.53
6	A	707	Y8A	C14-C10-C08	3.16	123.56	117.53
6	B	701	Y8A	C12-N11-C10	3.14	121.44	117.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	702	HEM	C4B-CHC-C1C	3.13	126.69	122.56
3	C	702	HEM	C1B-NB-C4B	3.13	108.31	105.07
3	B	702	HEM	C4D-ND-C1D	2.99	108.17	105.07
3	D	702	HEM	C1B-NB-C4B	2.98	108.15	105.07
3	D	702	HEM	C3B-C2B-C1B	2.96	108.69	106.49
3	C	702	HEM	C3B-C2B-C1B	2.96	108.68	106.49
3	C	702	HEM	C4D-ND-C1D	2.93	108.10	105.07
3	C	702	HEM	C4B-CHC-C1C	2.93	126.42	122.56
3	D	702	HEM	C4B-CHC-C1C	2.92	126.42	122.56
3	B	702	HEM	C1B-NB-C4B	2.89	108.06	105.07
3	D	702	HEM	C4D-ND-C1D	2.88	108.05	105.07
6	D	701	Y8A	C12-N11-C10	2.78	120.94	117.11
3	A	701	HEM	C4D-ND-C1D	2.77	107.93	105.07
3	D	702	HEM	C4C-CHD-C1D	2.73	126.16	122.56
3	A	701	HEM	C3B-C2B-C1B	2.73	108.51	106.49
3	B	702	HEM	C3B-C2B-C1B	2.71	108.49	106.49
3	C	702	HEM	C4C-CHD-C1D	2.66	126.07	122.56
3	A	701	HEM	CHC-C4B-C3B	2.58	128.52	124.57
6	A	707	Y8A	C12-N11-C10	2.56	120.64	117.11
3	A	701	HEM	C4C-CHD-C1D	2.44	125.78	122.56
3	B	702	HEM	C4C-CHD-C1D	2.30	125.60	122.56
3	B	702	HEM	CHC-C4B-C3B	2.19	127.92	124.57
3	D	702	HEM	CHC-C4B-C3B	2.19	127.92	124.57
3	B	702	HEM	CAA-CBA-CGA	-2.17	107.67	113.76
3	A	701	HEM	CAA-CBA-CGA	-2.14	107.77	113.76
3	D	702	HEM	C3D-C4D-ND	-2.12	107.80	110.17
3	B	702	HEM	C3D-C4D-ND	-2.12	107.81	110.17
3	C	702	HEM	CHC-C4B-C3B	2.06	127.73	124.57
6	B	701	Y8A	C12-C13-C09	2.04	115.39	110.39
6	B	701	Y8A	C24-O23-C02	-2.02	113.13	117.51
3	C	702	HEM	C3D-C4D-ND	-2.01	107.93	110.17

There are no chirality outliers.

All (49) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	D	707	BOG	C2'-C1'-O1-C1
6	A	707	Y8A	C03-C02-O23-C24
6	B	701	Y8A	C01-C02-O23-C24
6	C	701	Y8A	C01-C02-O23-C24
6	A	707	Y8A	C01-C02-O23-C24
6	B	701	Y8A	C03-C02-O23-C24

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Mol	Chain	Res	Type	Atoms
6	C	701	Y8A	C03-C02-O23-C24
6	D	701	Y8A	C03-C02-O23-C24
6	D	701	Y8A	C01-C02-O23-C24
5	D	707	BOG	C4-C5-C6-O6
4	C	703	NAG	O5-C5-C6-O6
4	D	703	NAG	O5-C5-C6-O6
4	C	703	NAG	C4-C5-C6-O6
5	D	707	BOG	O5-C5-C6-O6
4	B	703	NAG	O5-C5-C6-O6
4	D	703	NAG	C4-C5-C6-O6
4	C	706	NAG	C4-C5-C6-O6
4	B	703	NAG	C4-C5-C6-O6
4	A	705	NAG	C4-C5-C6-O6
4	C	706	NAG	O5-C5-C6-O6
5	A	706	BOG	O1-C1'-C2'-C3'
5	A	706	BOG	C1'-C2'-C3'-C4'
4	A	705	NAG	O5-C5-C6-O6
5	D	707	BOG	C1'-C2'-C3'-C4'
5	A	706	BOG	C2'-C1'-O1-C1
6	C	701	Y8A	N07-C15-C16-C21
6	B	701	Y8A	N07-C15-C16-C21
4	D	703	NAG	C1-C2-N2-C7
5	A	706	BOG	C3'-C4'-C5'-C6'
3	A	701	HEM	C4B-C3B-CAB-CBB
3	B	702	HEM	C4B-C3B-CAB-CBB
3	C	702	HEM	C4B-C3B-CAB-CBB
3	D	702	HEM	C4B-C3B-CAB-CBB
6	C	701	Y8A	N07-C15-C16-C17
6	B	701	Y8A	N07-C15-C16-C17
4	A	702	NAG	C1-C2-N2-C7
6	D	701	Y8A	N07-C15-C16-C17
6	A	707	Y8A	N07-C15-C16-C17
6	A	707	Y8A	N07-C15-C16-C21
6	D	701	Y8A	N07-C15-C16-C21
5	A	706	BOG	C2'-C3'-C4'-C5'
4	B	703	NAG	C3-C2-N2-C7
4	C	703	NAG	C3-C2-N2-C7
5	A	706	BOG	C2-C1-O1-C1'
4	D	706	NAG	C4-C5-C6-O6
3	A	701	HEM	CAA-CBA-CGA-O2A
3	A	701	HEM	CAA-CBA-CGA-O1A
5	A	706	BOG	O5-C1-O1-C1'

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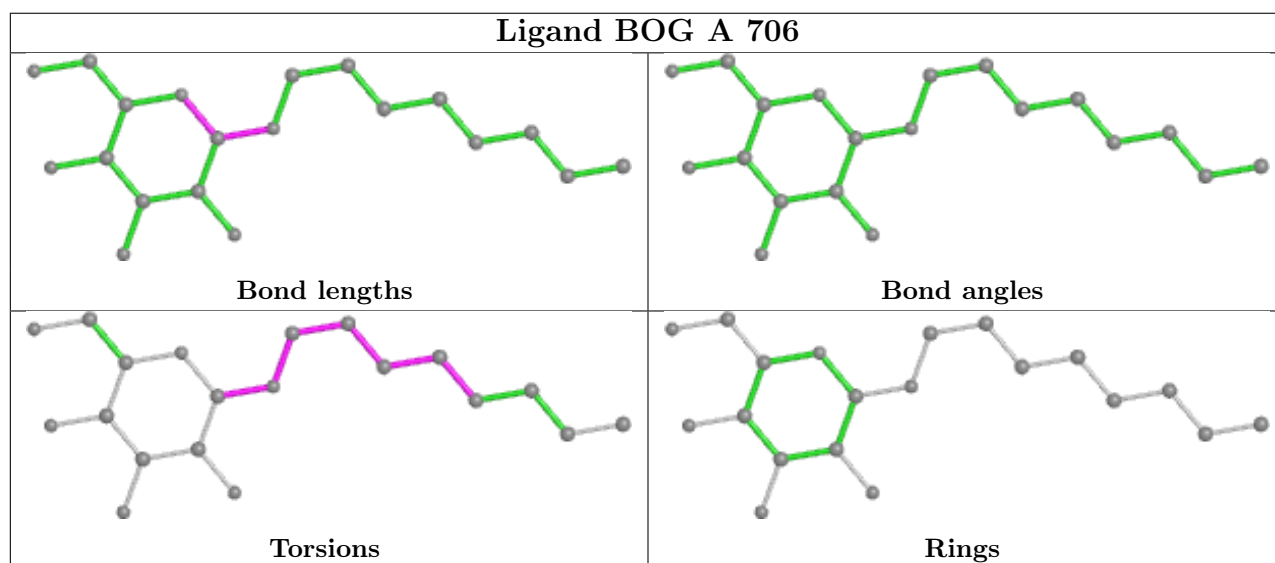
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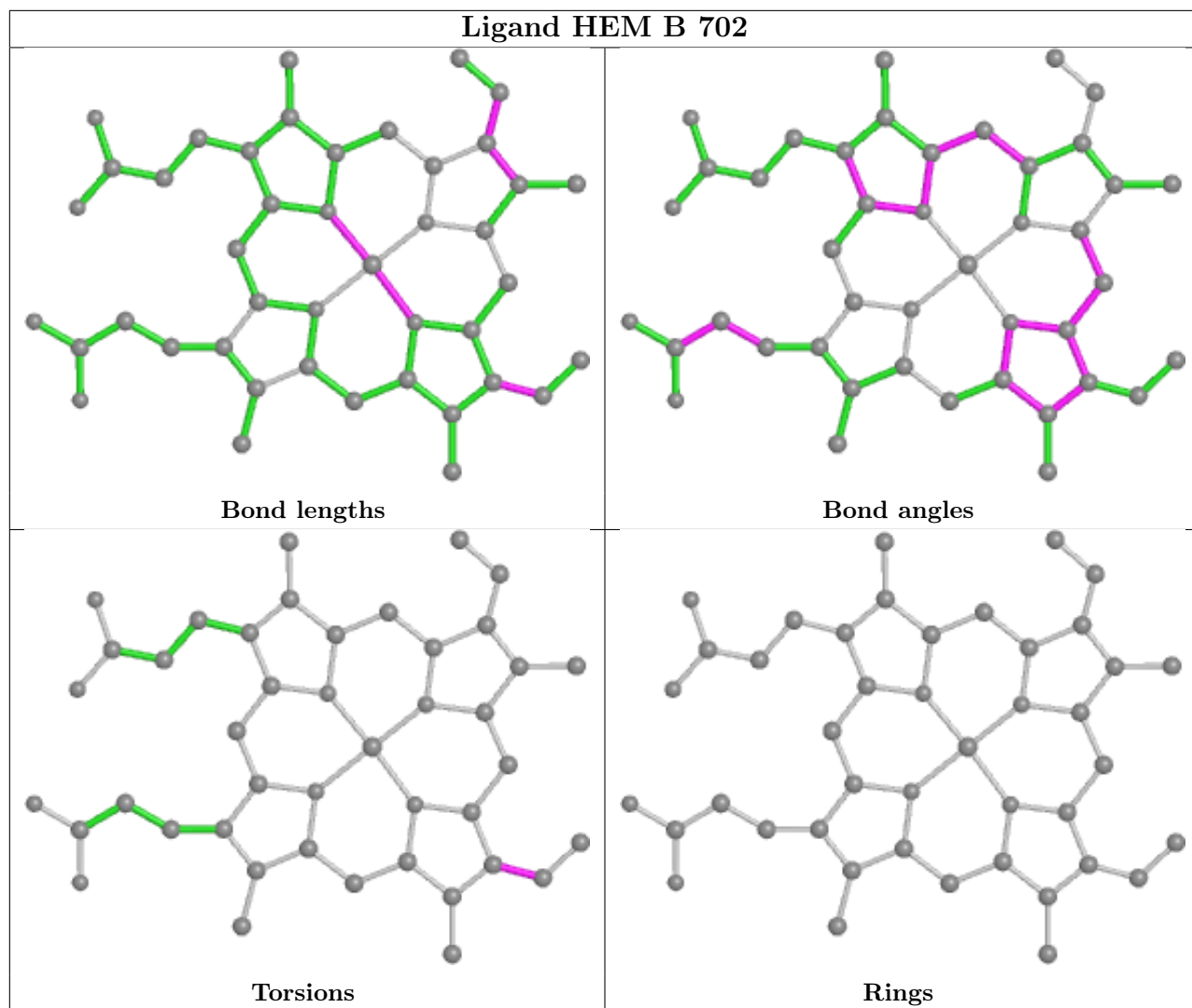
Mol	Chain	Res	Type	Atoms
4	D	703	NAG	C3-C2-N2-C7

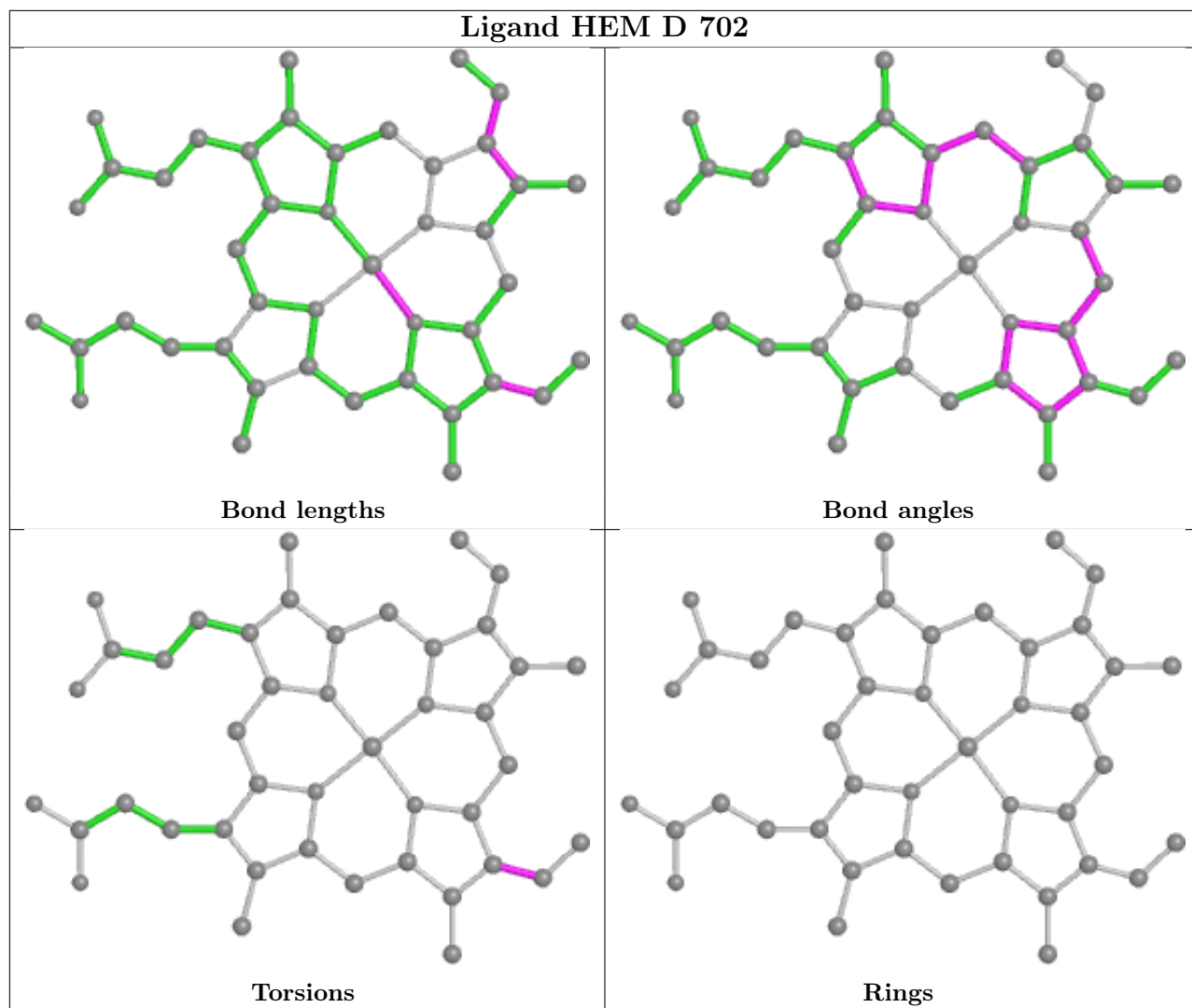
There are no ring outliers.

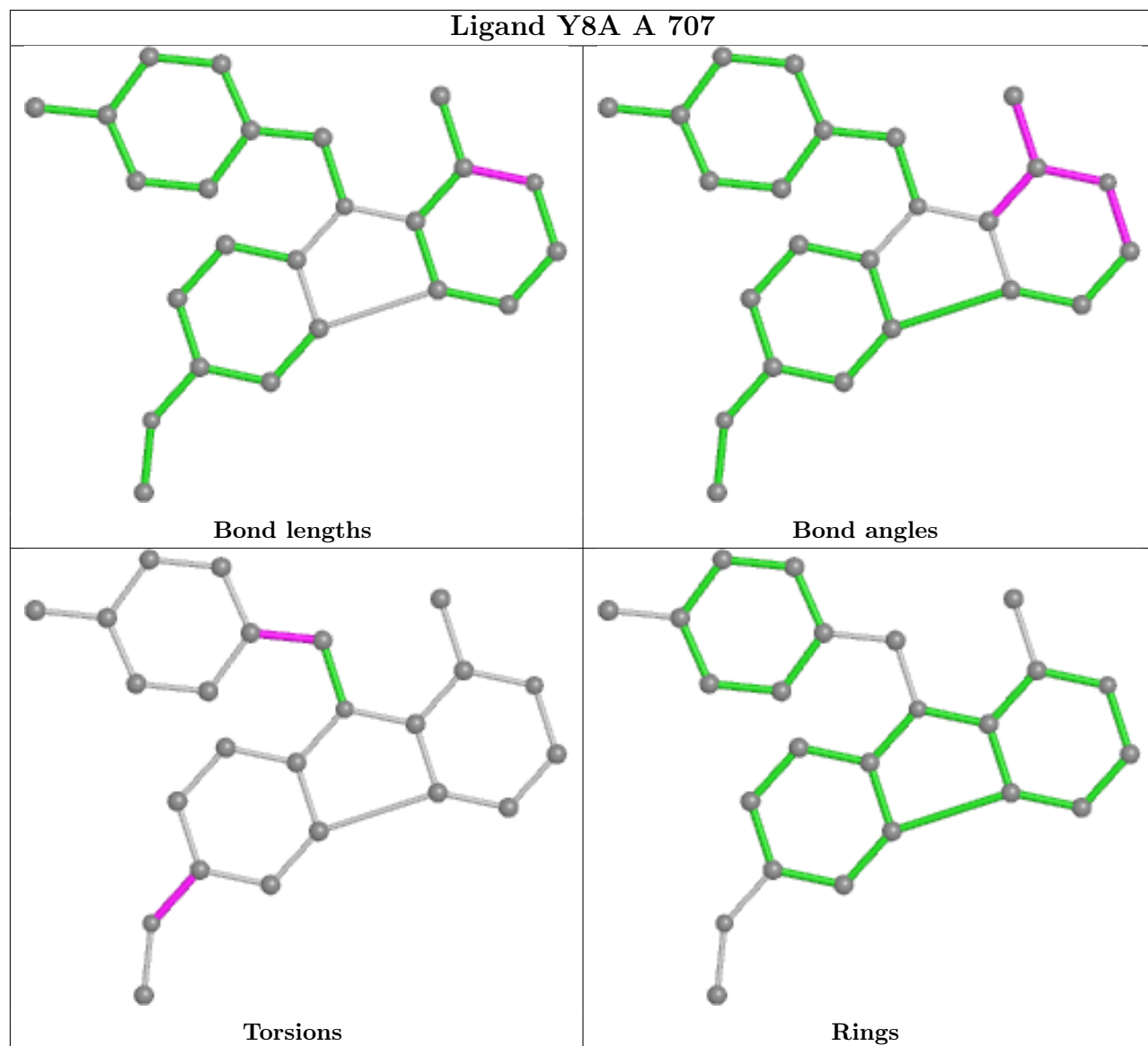
No monomer is involved in short contacts.

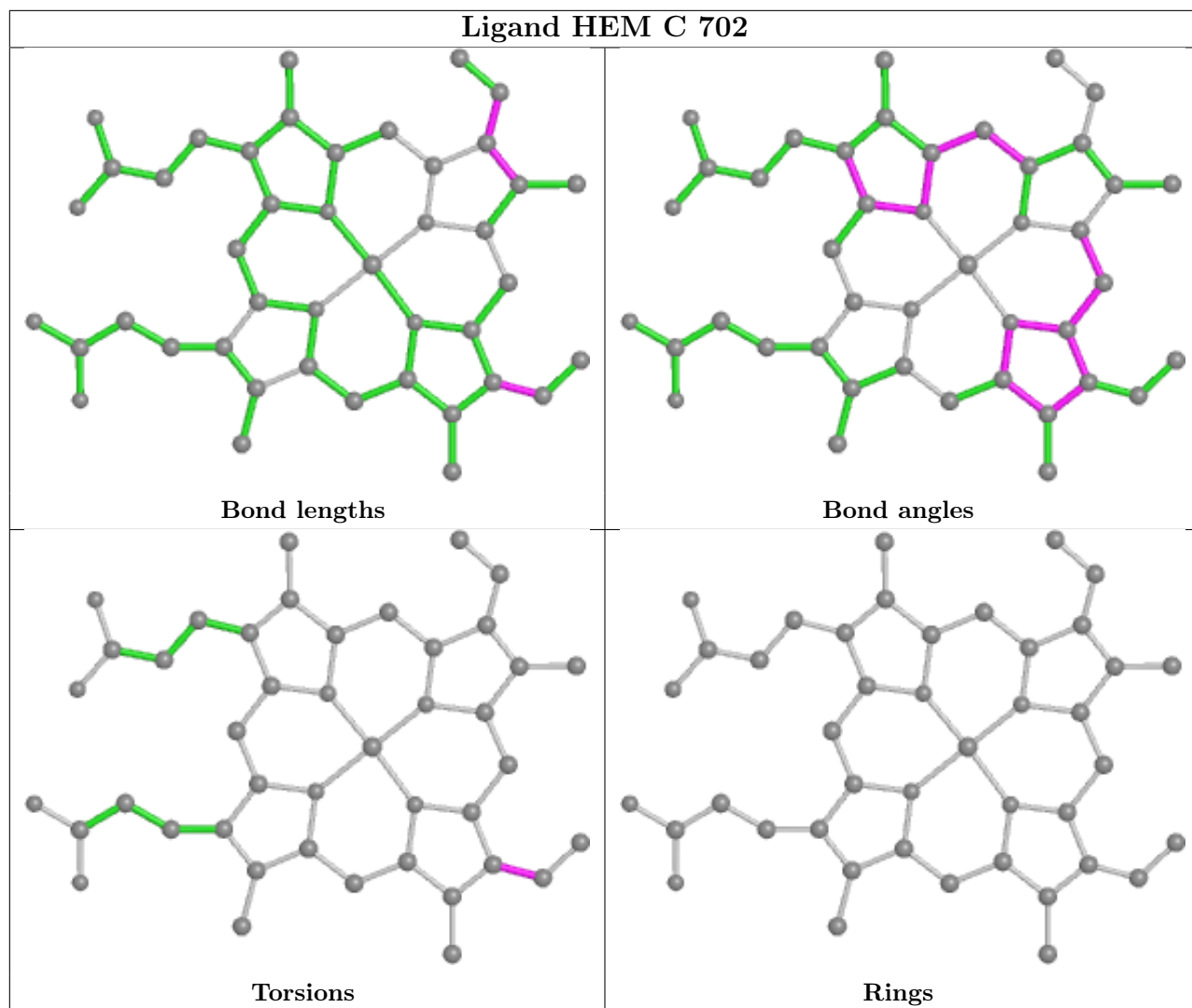
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

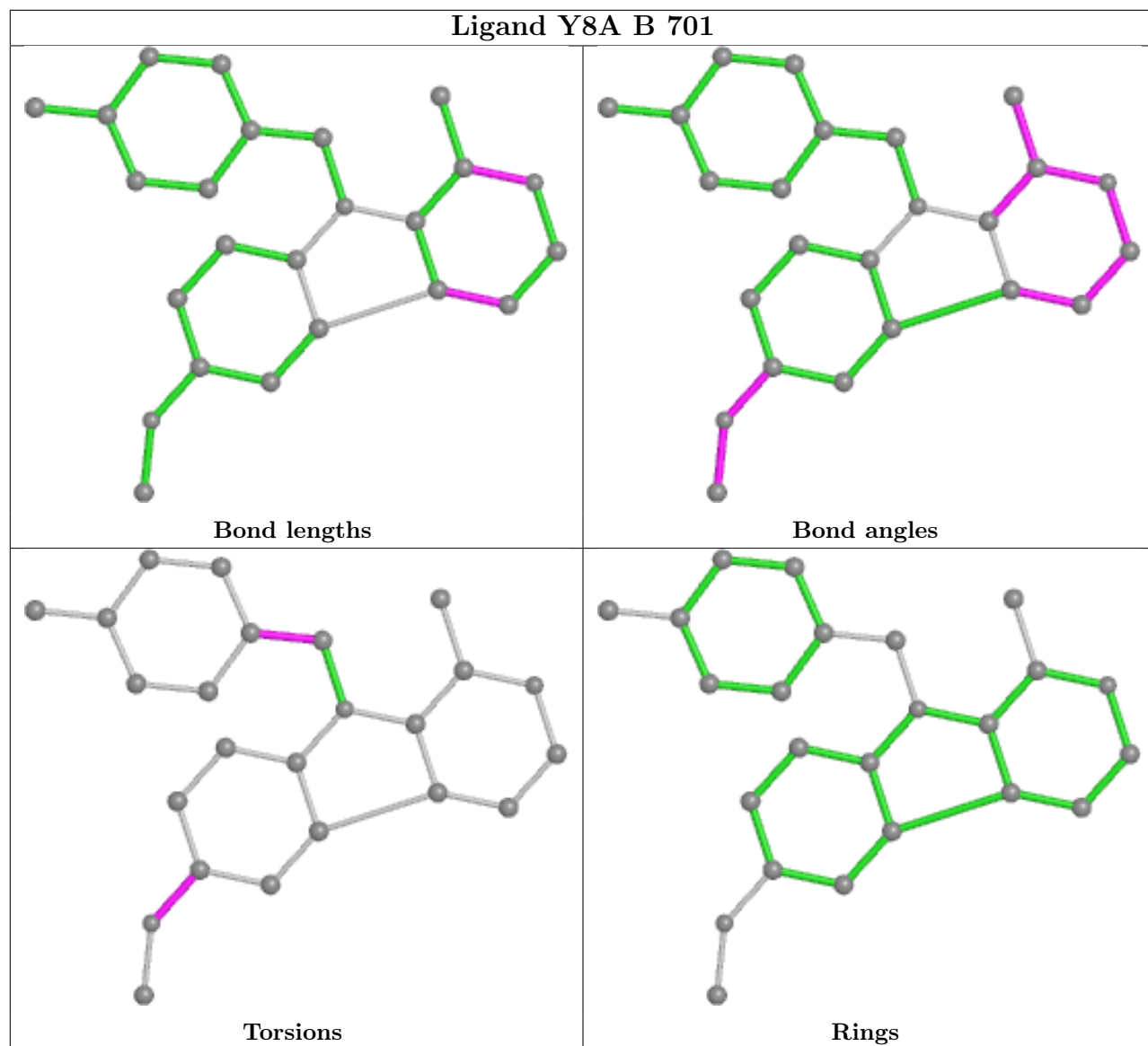


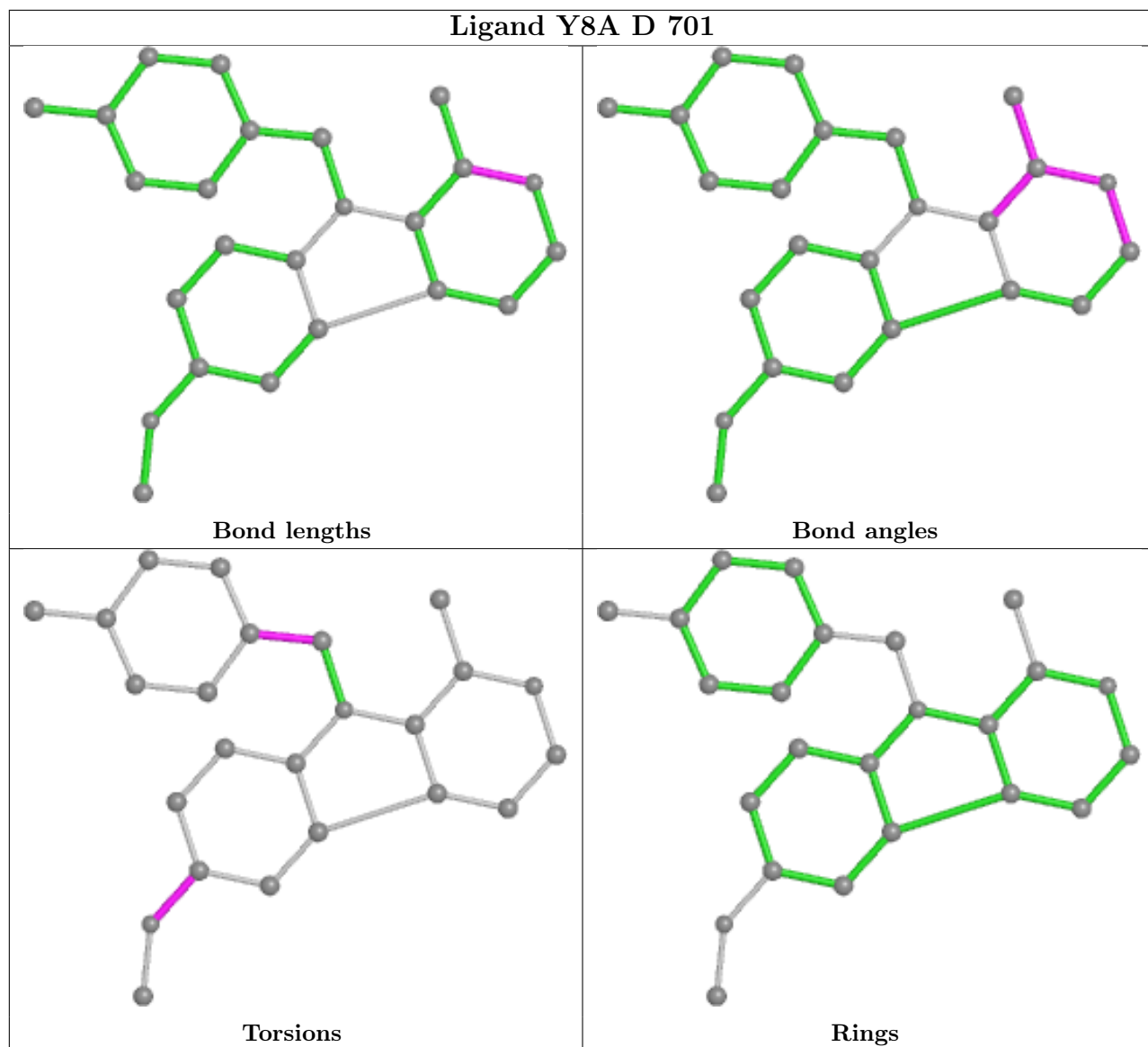




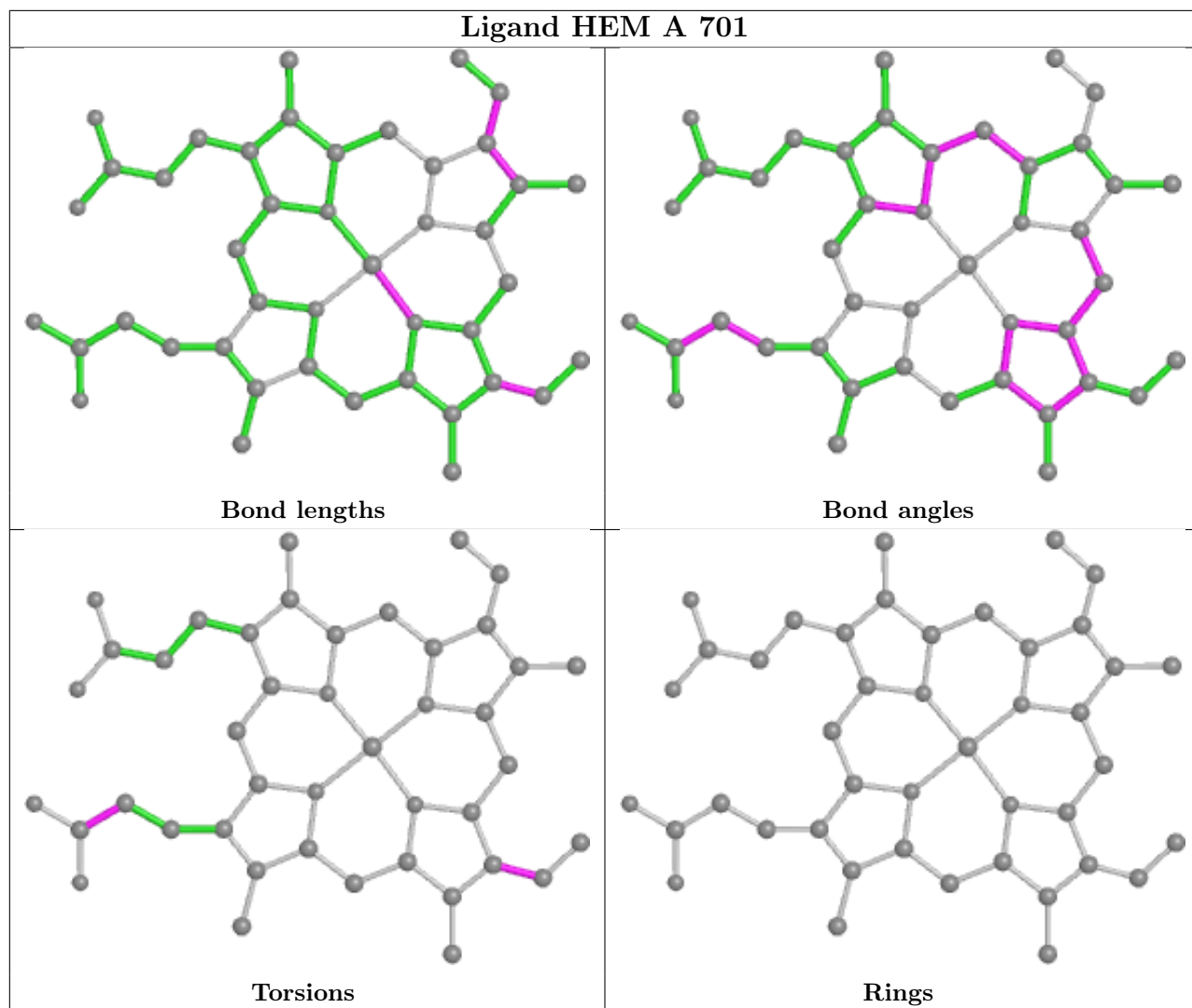


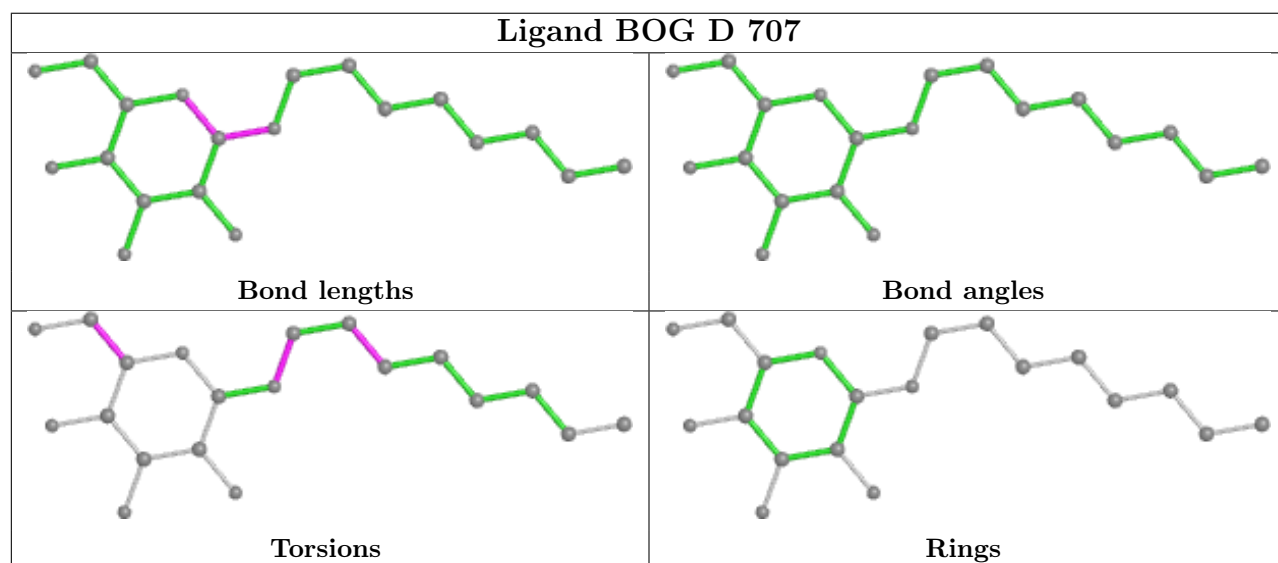
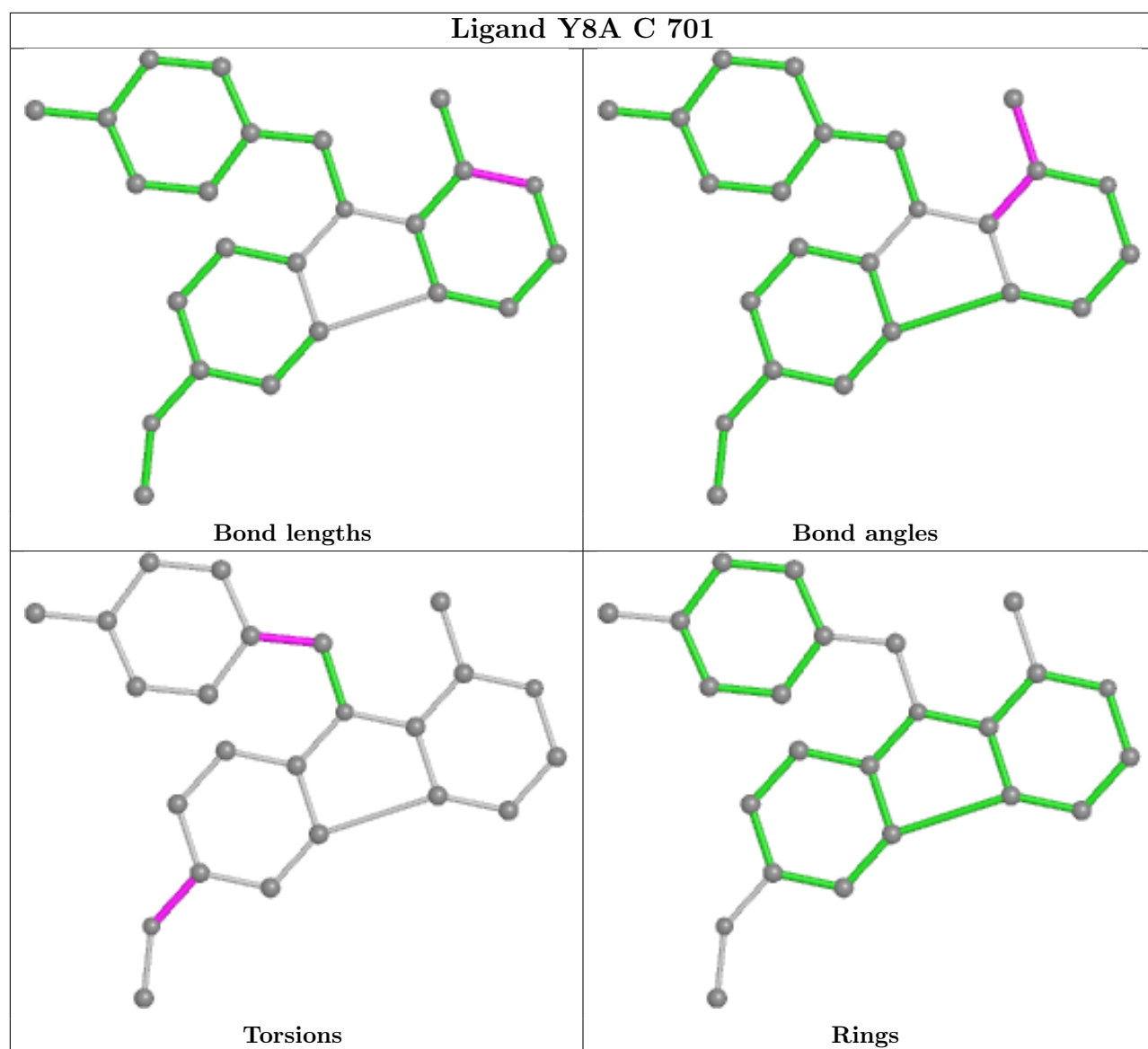












#### 4.7 Other polymers [i](#)

There are no such residues in this entry.

#### 4.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 5 Fit of model and data

### 5.1 Protein, DNA and RNA chains

EDS failed to run properly - this section is therefore empty.

### 5.2 Non-standard residues in protein, DNA, RNA chains

EDS failed to run properly - this section is therefore empty.

### 5.3 Carbohydrates

EDS failed to run properly - this section is therefore empty.

### 5.4 Ligands

EDS failed to run properly - this section is therefore empty.

### 5.5 Other polymers

EDS failed to run properly - this section is therefore empty.