



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 4, 2023 – 10:56 PM EDT

PDB ID : 6VJ7
Title : Crystal structure of red kidney bean purple acid phosphatase in complex with adenosine 5'-(beta,gamma imido)triphosphate
Authors : Feder, D.; Schenk, G.; Guddat, L.W.; McGeary, R.P.; Mitic, N.; Furtado, A.; Schulz, B.L.; Henry, R.J.; Schmidt, S.
Deposited on : 2020-01-15
Resolution : 2.60 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

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>.

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)
Xtriage (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 2.60 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 [i](#)

There are 18 unique types of molecules in this entry. The entry contains 15691 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 Fe(3+)-Zn(2+) purple acid phosphatase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	424	Total 3506	C 2250	N 608	O 638	S 10	0	2	0
1	B	425	Total 3521	C 2260	N 611	O 640	S 10	0	3	0
1	C	423	Total 3482	C 2237	N 603	O 632	S 10	0	0	0
1	D	426	Total 3546	C 2275	N 618	O 642	S 11	0	5	0

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

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	E	4	Total 50	C 28	N 2	O 20	0	0	0

- Molecule 3 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				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	F	3	Total 39	C 22	N 2	O 15	0	0	0
3	H	3	Total 39	C 22	N 2	O 15	0	0	0

- Molecule 4 is an oligosaccharide called beta-D-mannopyranose-(1-4)-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				ZeroOcc	AltConf	Trace
4	G	4	Total	C	N	O	0	0	0
			50	28	2	20			

- Molecule 5 is an oligosaccharide called alpha-L-fucopyranose-(1-3)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)]2-acetamido-2-deoxy-beta-D-glucopyranose.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
5	I	3	Total	C	N	O	0	0	0
			38	22	2	14			
5	J	3	Total	C	N	O	0	0	0
			38	22	2	14			

- Molecule 6 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
6	K	2	Total	C	N	O	0	0	0
			28	16	2	10			
6	L	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 7 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total	Zn	0	0
			1	1		
7	B	1	Total	Zn	0	0
			1	1		
7	C	1	Total	Zn	0	0
			1	1		
7	D	1	Total	Zn	0	0
			1	1		

- Molecule 8 is FE (III) ION (three-letter code: FE) (formula: Fe).

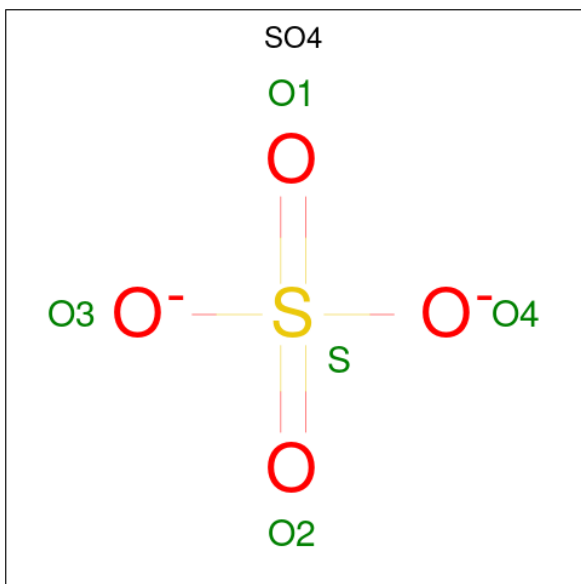
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	1	Total	Fe	0	0
			1	1		
8	B	1	Total	Fe	0	0
			1	1		
8	C	1	Total	Fe	0	0
			1	1		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	D	1	Total Fe 1 1	0	0

- Molecule 9 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	1	Total O S 5 4 1	0	0
9	A	1	Total O S 5 4 1	0	0
9	A	1	Total O S 5 4 1	0	0
9	B	1	Total O S 5 4 1	0	0
9	B	1	Total O S 5 4 1	0	0
9	B	1	Total O S 5 4 1	0	0
9	B	1	Total O S 5 4 1	0	0
9	C	1	Total O S 5 4 1	0	0
9	C	1	Total O S 5 4 1	0	0
9	C	1	Total O S 5 4 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	C	1	Total	O	S	0	0
			5	4	1		
9	C	1	Total	O	S	0	0
			5	4	1		
9	C	1	Total	O	S	0	0
			5	4	1		
9	C	1	Total	O	S	0	0
			5	4	1		
9	C	1	Total	O	S	0	0
			5	4	1		
9	D	1	Total	O	S	0	0
			5	4	1		
9	D	1	Total	O	S	0	0
			5	4	1		
9	D	1	Total	O	S	0	0
			5	4	1		
9	D	1	Total	O	S	0	0
			5	4	1		
9	D	1	Total	O	S	0	0
			5	4	1		
9	D	1	Total	O	S	0	0
			5	4	1		
9	D	1	Total	O	S	0	0
			5	4	1		

- Molecule 10 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	1	Total C O 6 3 3	0	0
10	A	1	Total C O 12 6 6	0	1
10	A	1	Total C O 6 3 3	0	0
10	A	1	Total C O 6 3 3	0	0
10	C	1	Total C O 6 3 3	0	0
10	D	1	Total C O 6 3 3	0	0
10	D	1	Total C O 6 3 3	0	0
10	D	1	Total C O 6 3 3	0	0
10	D	1	Total C O 6 3 3	0	0

- Molecule 11 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



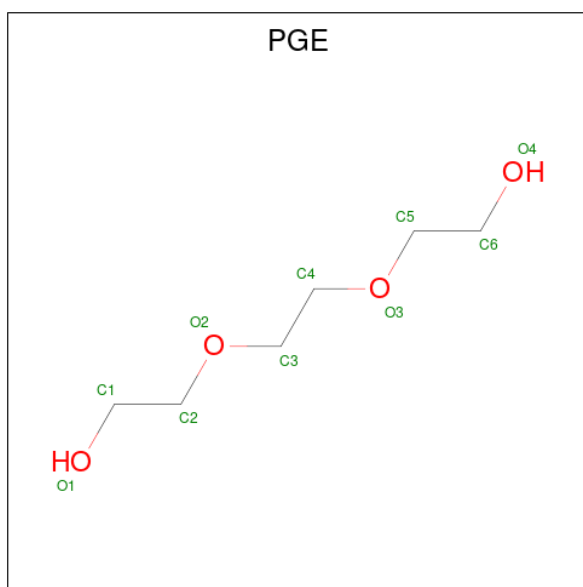
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	A	1	Total C O 4 2 2	0	0
11	A	1	Total C O 4 2 2	0	0
11	A	1	Total C O 4 2 2	0	0
11	A	1	Total C O 4 2 2	0	0
11	A	1	Total C O 4 2 2	0	0
11	B	1	Total C O 4 2 2	0	0
11	B	1	Total C O 4 2 2	0	0
11	B	1	Total C O 4 2 2	0	0
11	B	1	Total C O 4 2 2	0	0
11	B	1	Total C O 4 2 2	0	0
11	B	1	Total C O 4 2 2	0	0
11	C	1	Total C O 4 2 2	0	0
11	C	1	Total C O 4 2 2	0	0
11	C	1	Total C O 4 2 2	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	C	1	Total C O 4 2 2	0	0
11	C	1	Total C O 4 2 2	0	0
11	C	1	Total C O 4 2 2	0	0
11	C	1	Total C O 4 2 2	0	0
11	C	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0
11	D	1	Total C O 4 2 2	0	0

- Molecule 12 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: C₆H₁₄O₄).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	1	Total C O 7 4 3	0	0
12	B	1	Total C O 7 4 3	0	0
12	B	1	Total C O 7 4 3	0	0
12	C	1	Total C O 10 6 4	0	0
12	C	1	Total C O 7 4 3	0	0
12	D	1	Total C O 7 4 3	0	0
12	D	1	Total C O 7 4 3	0	0

- Molecule 13 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



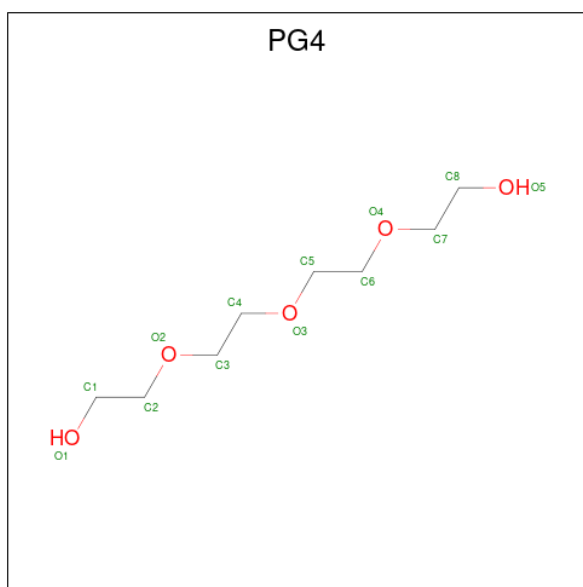
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
13	A	1	Total 14	C 8	N 1	O 5	0	0
13	A	1	Total 14	C 8	N 1	O 5	0	0
13	B	1	Total 14	C 8	N 1	O 5	0	0
13	C	1	Total 14	C 8	N 1	O 5	0	0
13	C	1	Total 14	C 8	N 1	O 5	0	0
13	D	1	Total 14	C 8	N 1	O 5	0	0
13	D	1	Total 14	C 8	N 1	O 5	0	0

- Molecule 14 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
14	A	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
14	C	1	Total	C	N	O	P	0	0
			15	2	1	9	3		
14	D	1	Total	C	N	O	P	0	0
			14	1	1	9	3		

- Molecule 15 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: C₈H₁₈O₅).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
15	A	1	Total	C	O	0	0
			13	8	5		

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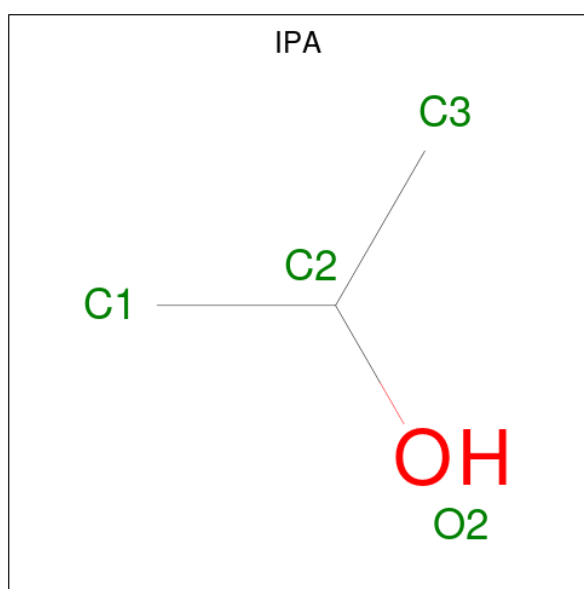
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
15	D	1	Total	C	O	0	0
			13	8	5		

- Molecule 16 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
16	A	1	Total	Na	0	0
			1	1		
16	B	1	Total	Na	0	0
			1	1		
16	C	1	Total	Na	0	0
			1	1		

- Molecule 17 is ISOPROPYL ALCOHOL (three-letter code: IPA) (formula: C₃H₈O).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
17	C	1	Total	C	O	0	0
			4	3	1		

- Molecule 18 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
18	A	208	Total	O	0	0
			208	208		
18	B	179	Total	O	0	0
			179	179		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
18	C	192	Total 192	O 192	0	0
18	D	192	Total 192	O 192	0	0

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	P 31 2 1	Depositor
Cell constants a, b, c, α , β , γ	125.70Å 125.70Å 298.15Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	40.76 – 2.60	Depositor
% Data completeness (in resolution range)	74.9 (40.76-2.60)	Depositor
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.73 (at 2.61Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.213 , 0.274	Depositor
Wilson B-factor (Å ²)	36.2	Xtrriage
Anisotropy	0.108	Xtrriage
L-test for twinning ²	$\langle L \rangle = 0.54$, $\langle L^2 \rangle = 0.37$	Xtrriage
Estimated twinning fraction	0.000 for -h,-k,l	Xtrriage
Total number of atoms	15691	wwPDB-VP
Average B, all atoms (Å ²)	36.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.63% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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](#)

24 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	0.39	0	17,19,21	0.69	0
2	NAG	E	2	2	14,14,15	0.48	0	17,19,21	0.51	0
2	BMA	E	3	2	11,11,12	1.07	1 (9%)	15,15,17	2.50	2 (13%)
2	BMA	E	4	2	11,11,12	0.60	0	15,15,17	0.86	1 (6%)
3	NAG	F	1	3,1	14,14,15	0.44	0	17,19,21	1.14	1 (5%)
3	NAG	F	2	3	14,14,15	1.50	1 (7%)	17,19,21	1.68	1 (5%)
3	BMA	F	3	3	11,11,12	1.59	3 (27%)	15,15,17	1.49	3 (20%)
4	NAG	G	1	4,1	14,14,15	0.42	0	17,19,21	0.85	0
4	NAG	G	2	4	14,14,15	0.30	0	17,19,21	0.72	1 (5%)
4	BMA	G	3	4	11,11,12	1.11	1 (9%)	15,15,17	1.08	1 (6%)
4	BMA	G	4	4	11,11,12	1.40	2 (18%)	15,15,17	2.49	6 (40%)
3	NAG	H	1	3,1	14,14,15	0.60	1 (7%)	17,19,21	0.53	0
3	NAG	H	2	3	14,14,15	0.37	0	17,19,21	0.73	0
3	BMA	H	3	3	11,11,12	1.62	3 (27%)	15,15,17	1.88	4 (26%)
5	NAG	I	1	5,1	14,14,15	0.47	0	17,19,21	1.56	2 (11%)
5	FUC	I	2	5	10,10,11	1.02	1 (10%)	14,14,16	1.64	3 (21%)
5	NAG	I	3	5	14,14,15	0.46	0	17,19,21	0.44	0
5	NAG	J	1	5,1	14,14,15	0.55	0	17,19,21	1.29	4 (23%)
5	FUC	J	2	5	10,10,11	1.17	1 (10%)	14,14,16	2.12	4 (28%)
5	NAG	J	3	5	14,14,15	0.28	0	17,19,21	1.23	2 (11%)
6	NAG	K	1	6,1	14,14,15	0.90	1 (7%)	17,19,21	0.92	1 (5%)
6	NAG	K	2	6	14,14,15	0.56	0	17,19,21	1.45	2 (11%)
6	NAG	L	1	6,1	14,14,15	0.49	0	17,19,21	0.54	0
6	NAG	L	2	6	14,14,15	0.40	0	17,19,21	0.36	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
2	NAG	E	1	2,1	-	4/6/23/26	0/1/1/1
2	NAG	E	2	2	-	2/6/23/26	0/1/1/1
2	BMA	E	3	2	-	1/2/19/22	0/1/1/1
2	BMA	E	4	2	-	0/2/19/22	1/1/1/1
3	NAG	F	1	3,1	-	4/6/23/26	0/1/1/1
3	NAG	F	2	3	-	2/6/23/26	0/1/1/1
3	BMA	F	3	3	-	2/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	G	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	G	2	4	-	2/6/23/26	0/1/1/1
4	BMA	G	3	4	-	1/2/19/22	1/1/1/1
4	BMA	G	4	4	-	1/2/19/22	1/1/1/1
3	NAG	H	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	H	2	3	-	4/6/23/26	0/1/1/1
3	BMA	H	3	3	-	2/2/19/22	0/1/1/1
5	NAG	I	1	5,1	-	0/6/23/26	0/1/1/1
5	FUC	I	2	5	-	-	0/1/1/1
5	NAG	I	3	5	-	0/6/23/26	0/1/1/1
5	NAG	J	1	5,1	-	2/6/23/26	0/1/1/1
5	FUC	J	2	5	-	-	0/1/1/1
5	NAG	J	3	5	-	5/6/23/26	0/1/1/1
6	NAG	K	1	6,1	-	2/6/23/26	0/1/1/1
6	NAG	K	2	6	-	5/6/23/26	0/1/1/1
6	NAG	L	1	6,1	-	2/6/23/26	0/1/1/1
6	NAG	L	2	6	-	2/6/23/26	0/1/1/1

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	2	NAG	O5-C1	5.48	1.52	1.43
3	H	3	BMA	C1-C2	3.62	1.60	1.52
3	F	3	BMA	C2-C3	3.37	1.57	1.52
5	J	2	FUC	C1-C2	3.00	1.59	1.52
3	H	3	BMA	C2-C3	2.83	1.56	1.52
4	G	3	BMA	C1-C2	2.75	1.58	1.52
4	G	4	BMA	O5-C1	2.59	1.47	1.43
3	F	3	BMA	C4-C3	2.53	1.58	1.52
4	G	4	BMA	O5-C5	2.37	1.48	1.43
3	F	3	BMA	C1-C2	2.35	1.57	1.52
3	H	1	NAG	C1-C2	2.06	1.55	1.52
5	I	2	FUC	O5-C5	2.04	1.47	1.43
3	H	3	BMA	O5-C1	2.03	1.47	1.43
6	K	1	NAG	C1-C2	2.02	1.55	1.52
2	E	3	BMA	O5-C5	2.00	1.47	1.43

All (38) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	3	BMA	C1-O5-C5	8.28	123.41	112.19
4	G	4	BMA	C1-O5-C5	6.65	121.20	112.19
3	F	2	NAG	C1-O5-C5	6.45	120.93	112.19
6	K	2	NAG	C2-N2-C7	4.64	129.51	122.90
5	I	1	NAG	C1-O5-C5	4.59	118.41	112.19
3	H	3	BMA	C1-O5-C5	4.52	118.31	112.19
5	J	2	FUC	O5-C1-C2	4.35	117.49	110.77
5	J	2	FUC	C1-C2-C3	4.25	114.90	109.67
5	J	3	NAG	C2-N2-C7	4.10	128.75	122.90
5	J	2	FUC	C1-O5-C5	3.70	121.15	112.78
2	E	3	BMA	O5-C1-C2	3.58	116.30	110.77
3	F	1	NAG	C1-O5-C5	3.53	116.97	112.19
4	G	4	BMA	C1-C2-C3	3.52	113.99	109.67
3	F	3	BMA	C2-C3-C4	3.49	116.93	110.89
5	I	1	NAG	O3-C3-C4	3.39	118.19	110.35
4	G	4	BMA	O5-C1-C2	3.36	115.96	110.77
5	I	2	FUC	C1-O5-C5	3.25	120.15	112.78
3	H	3	BMA	C1-C2-C3	3.22	113.62	109.67
5	I	2	FUC	O5-C1-C2	2.87	115.20	110.77
3	H	3	BMA	C3-C4-C5	-2.82	105.22	110.24
5	J	1	NAG	O3-C3-C4	2.76	116.74	110.35
5	I	2	FUC	O5-C5-C4	2.69	114.34	109.52
3	F	3	BMA	C1-C2-C3	2.68	112.96	109.67
4	G	4	BMA	C3-C4-C5	2.63	114.93	110.24
6	K	2	NAG	C1-C2-N2	2.62	114.96	110.49
5	J	1	NAG	C1-O5-C5	2.60	115.72	112.19
4	G	4	BMA	C2-C3-C4	2.52	115.25	110.89
3	H	3	BMA	O5-C1-C2	2.37	114.43	110.77
4	G	4	BMA	O5-C5-C6	2.31	110.82	107.20
5	J	1	NAG	C3-C4-C5	-2.15	106.41	110.24
2	E	4	BMA	C1-O5-C5	2.13	115.08	112.19
5	J	1	NAG	O3-C3-C2	2.13	113.88	109.47
4	G	3	BMA	O2-C2-C3	-2.13	105.88	110.14
3	F	3	BMA	C3-C4-C5	2.11	114.00	110.24
6	K	1	NAG	O4-C4-C3	-2.09	105.51	110.35
5	J	2	FUC	O5-C5-C4	2.07	113.23	109.52
4	G	2	NAG	O4-C4-C3	-2.07	105.57	110.35
5	J	3	NAG	C1-C2-N2	2.04	113.97	110.49

There are no chirality outliers.

All (45) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	F	1	NAG	O5-C5-C6-O6
6	K	1	NAG	O5-C5-C6-O6
6	K	2	NAG	O5-C5-C6-O6
3	F	1	NAG	C4-C5-C6-O6
6	K	1	NAG	C4-C5-C6-O6
4	G	1	NAG	O5-C5-C6-O6
2	E	1	NAG	O5-C5-C6-O6
6	K	2	NAG	C4-C5-C6-O6
3	H	3	BMA	C4-C5-C6-O6
4	G	1	NAG	C4-C5-C6-O6
2	E	1	NAG	C4-C5-C6-O6
2	E	1	NAG	C8-C7-N2-C2
2	E	1	NAG	O7-C7-N2-C2
2	E	2	NAG	C8-C7-N2-C2
2	E	2	NAG	O7-C7-N2-C2
3	F	1	NAG	C8-C7-N2-C2
3	F	1	NAG	O7-C7-N2-C2
3	H	2	NAG	C8-C7-N2-C2
3	H	2	NAG	O7-C7-N2-C2
4	G	2	NAG	C8-C7-N2-C2
4	G	2	NAG	O7-C7-N2-C2
5	J	3	NAG	C8-C7-N2-C2
5	J	3	NAG	O7-C7-N2-C2
6	K	2	NAG	C8-C7-N2-C2
6	K	2	NAG	O7-C7-N2-C2
6	L	1	NAG	C8-C7-N2-C2
6	L	1	NAG	O7-C7-N2-C2
5	J	3	NAG	C4-C5-C6-O6
3	F	2	NAG	O5-C5-C6-O6
5	J	1	NAG	O5-C5-C6-O6
5	J	1	NAG	C4-C5-C6-O6
3	H	3	BMA	O5-C5-C6-O6
5	J	3	NAG	O5-C5-C6-O6
3	H	2	NAG	C4-C5-C6-O6
4	G	4	BMA	O5-C5-C6-O6
3	F	3	BMA	C4-C5-C6-O6
6	L	2	NAG	C4-C5-C6-O6
2	E	3	BMA	O5-C5-C6-O6
4	G	3	BMA	O5-C5-C6-O6
3	H	2	NAG	O5-C5-C6-O6
6	L	2	NAG	O5-C5-C6-O6
3	F	3	BMA	O5-C5-C6-O6
5	J	3	NAG	C3-C2-N2-C7

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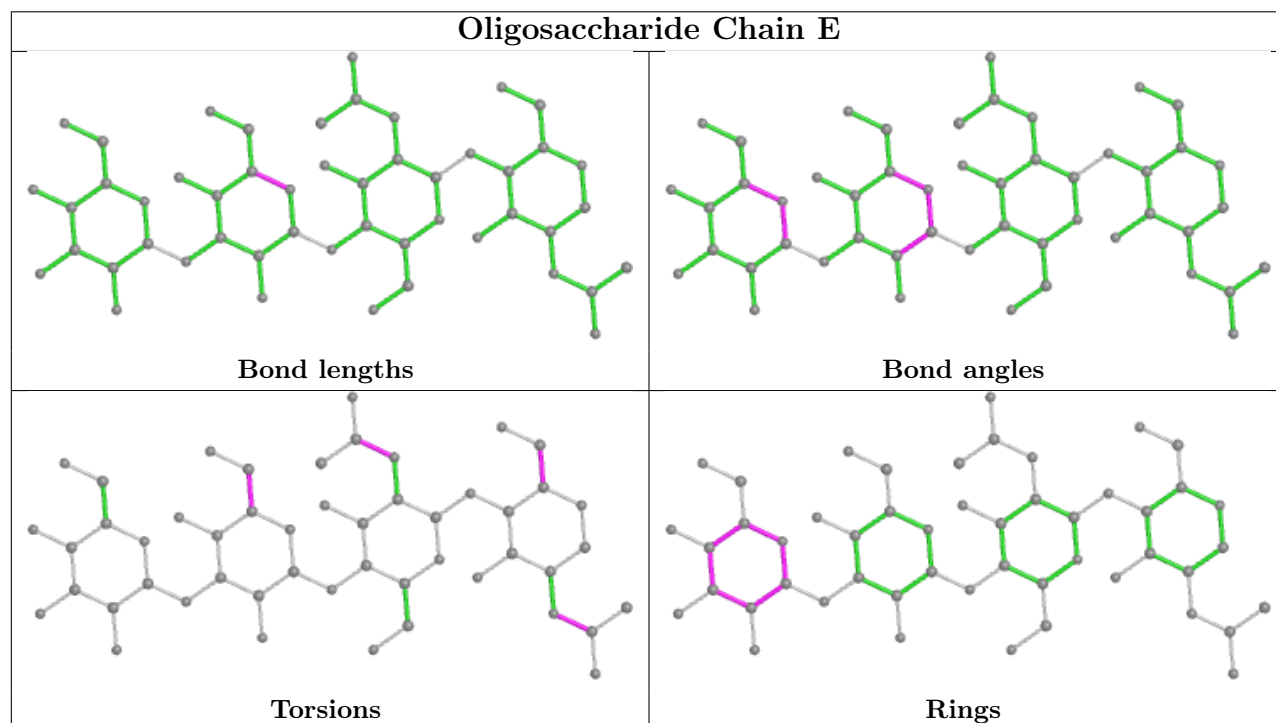
Mol	Chain	Res	Type	Atoms
6	K	2	NAG	C3-C2-N2-C7
3	F	2	NAG	C4-C5-C6-O6

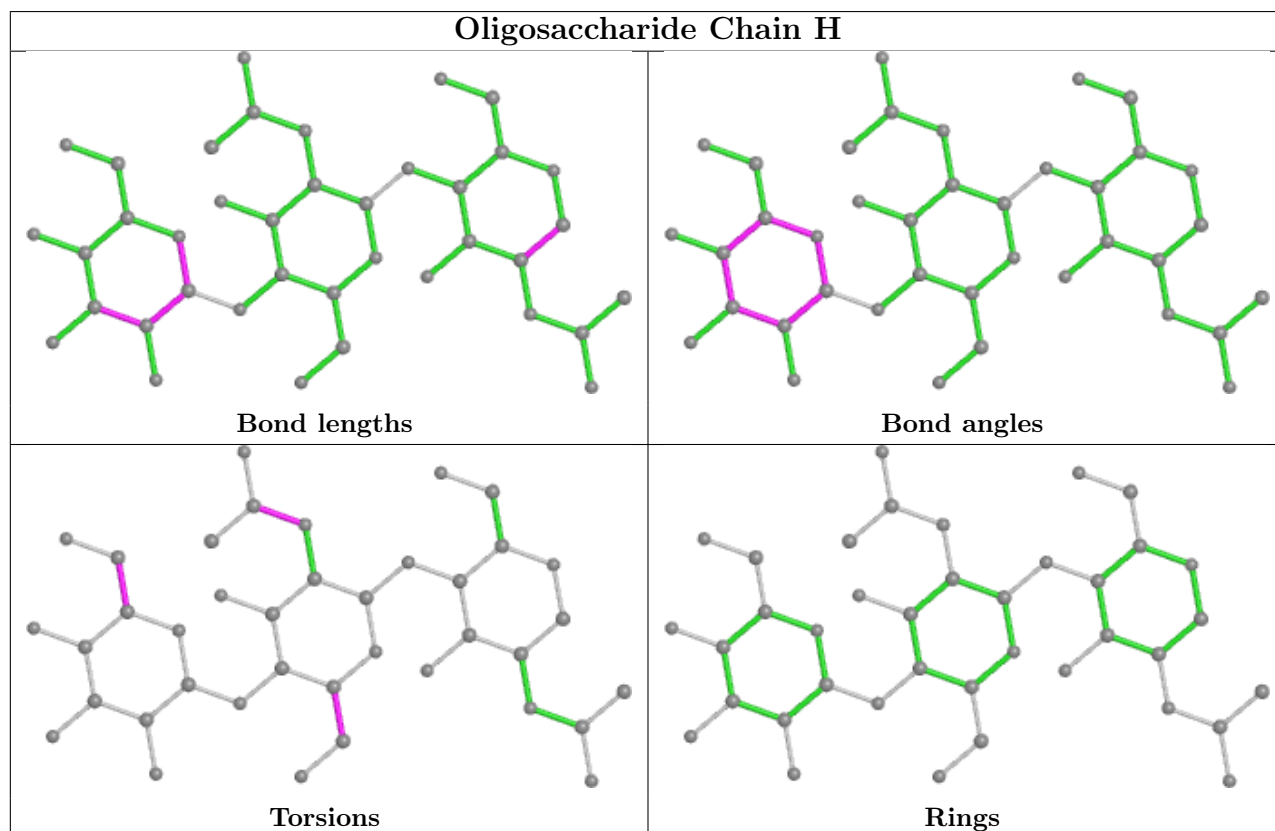
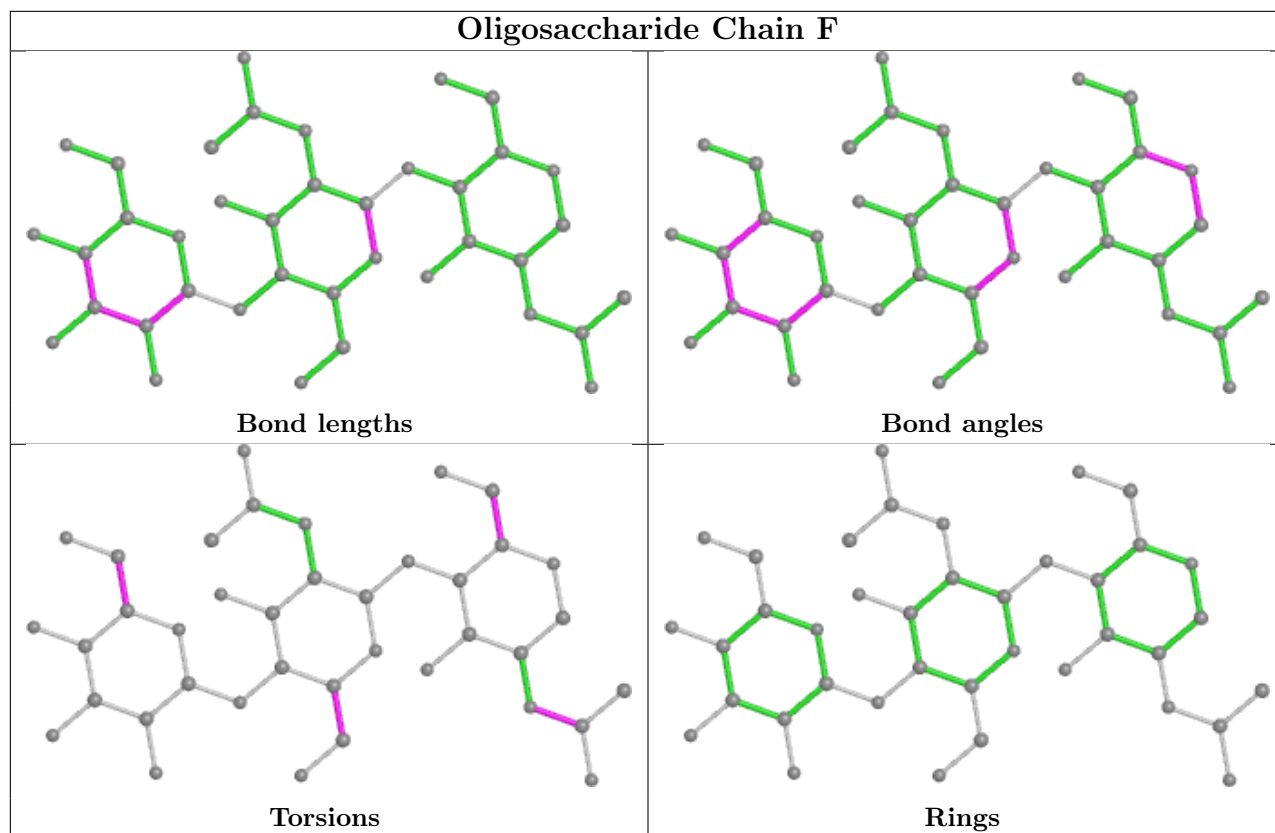
All (3) ring outliers are listed below:

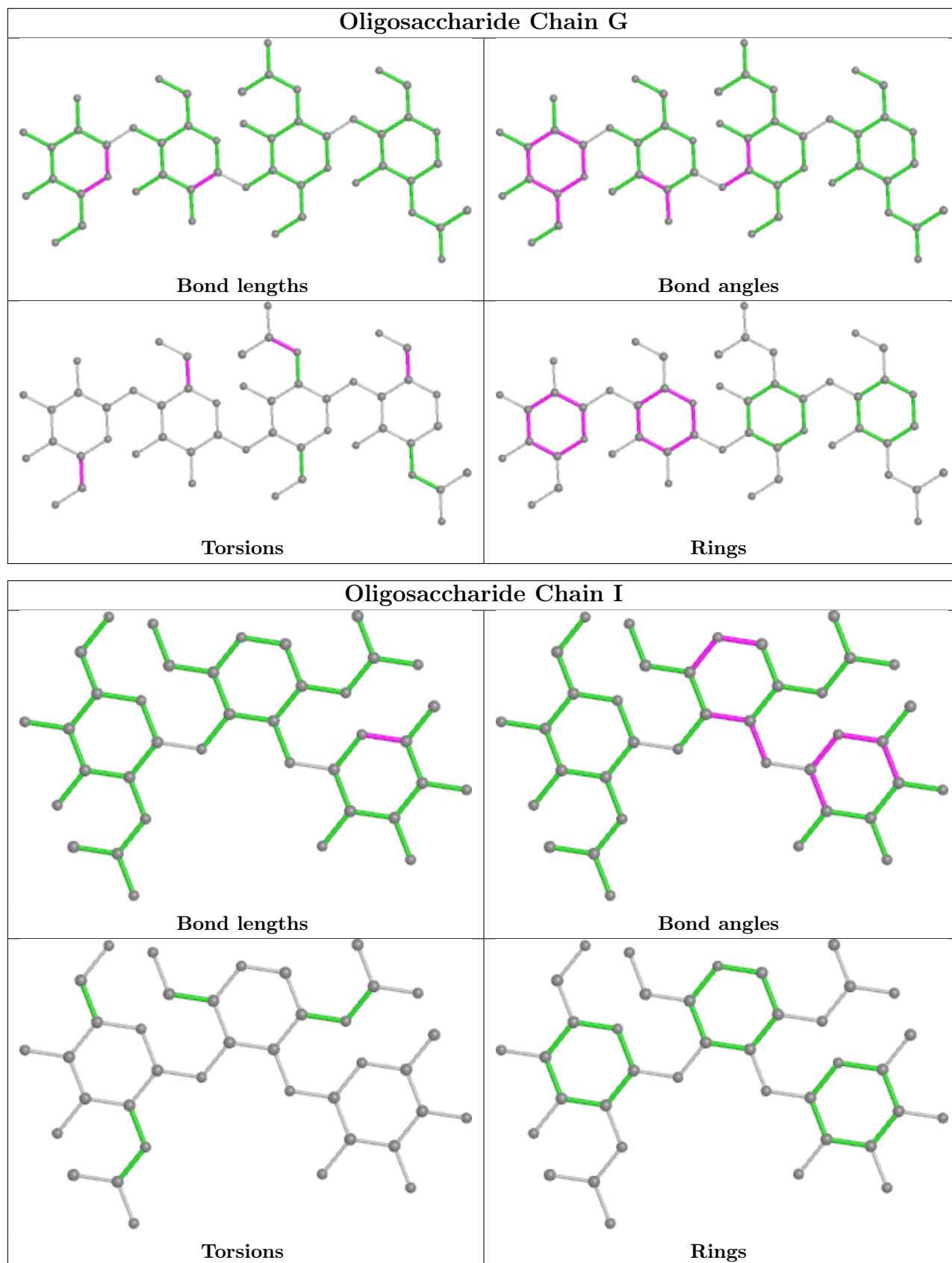
Mol	Chain	Res	Type	Atoms
4	G	4	BMA	C1-C2-C3-C4-C5-O5
4	G	3	BMA	C1-C2-C3-C4-C5-O5
2	E	4	BMA	C1-C2-C3-C4-C5-O5

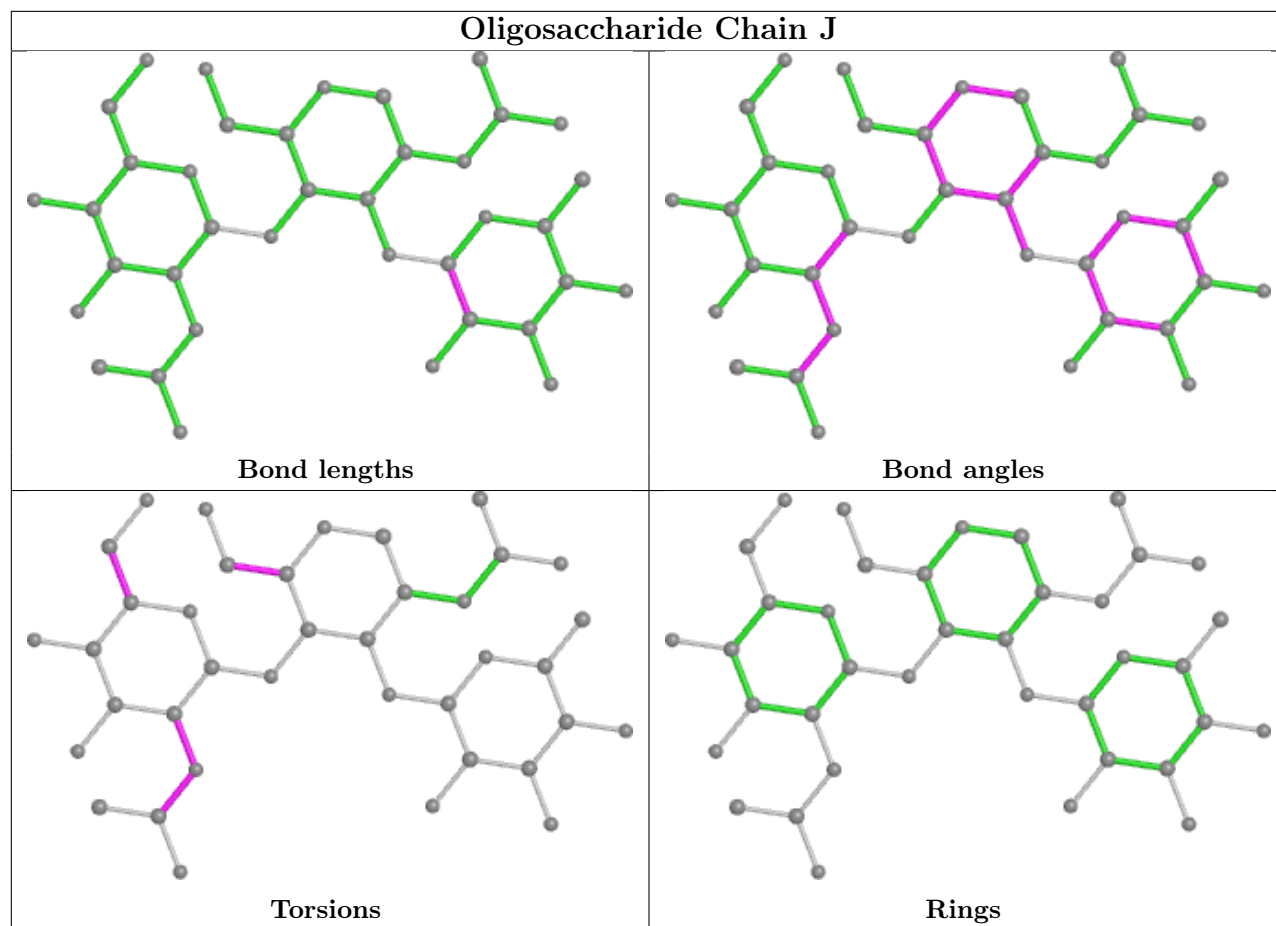
No monomer is involved in short contacts.

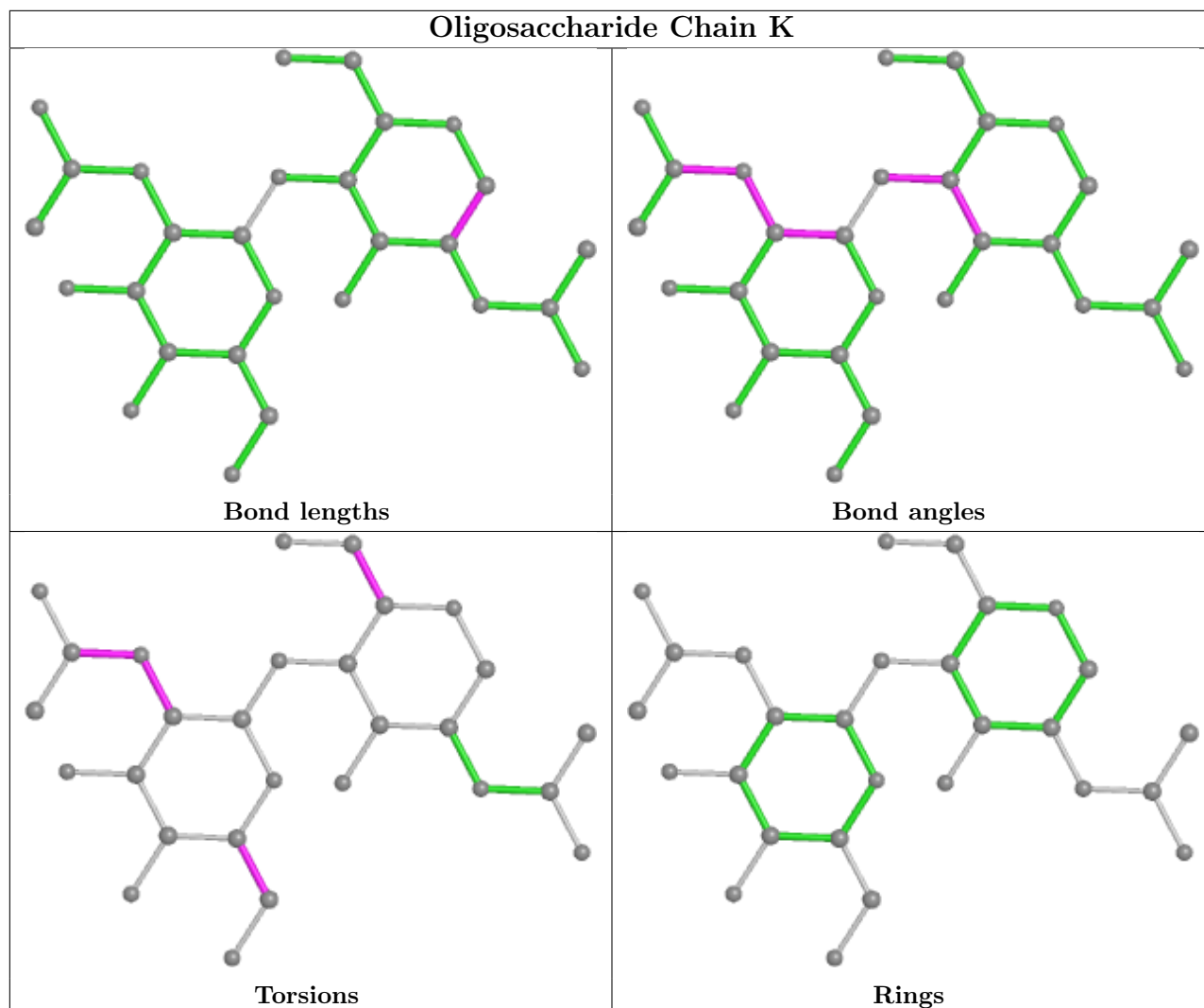
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

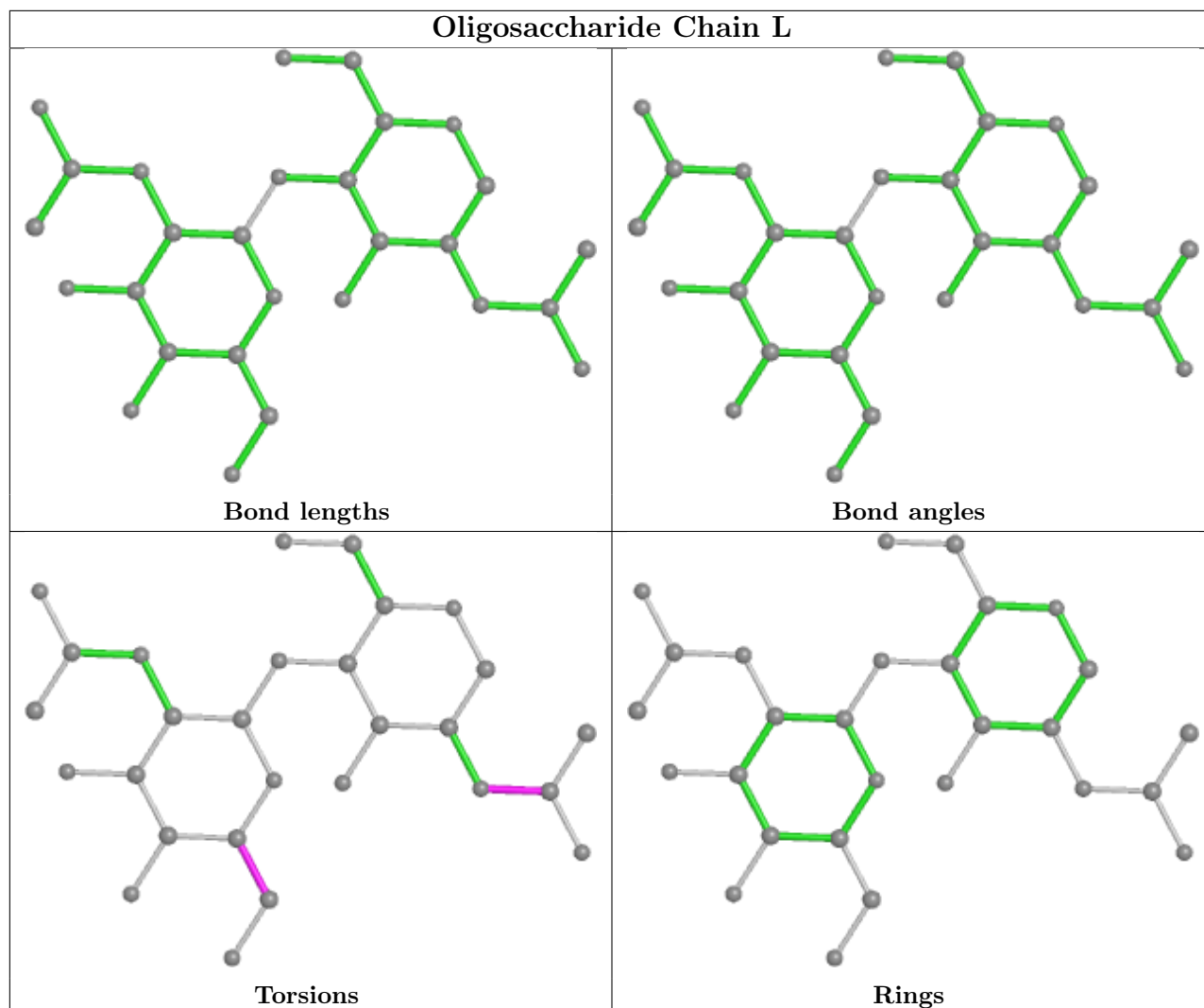












4.6 Ligand geometry [i](#)

Of 96 ligands modelled in this entry, 11 are monoatomic - leaving 85 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
11	EDO	C	514	-	3,3,3	0.48	0	2,2,2	0.43	0
9	SO4	C	511	-	4,4,4	0.13	0	6,6,6	0.12	0
10	GOL	A	506	-	5,5,5	1.01	0	5,5,5	0.89	0
11	EDO	C	513	-	3,3,3	0.54	0	2,2,2	0.28	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
11	EDO	D	721	-	3,3,3	0.54	0	2,2,2	0.53	0
9	SO4	A	503	-	4,4,4	0.14	0	6,6,6	0.15	0
9	SO4	D	707	-	4,4,4	0.15	0	6,6,6	0.24	0
11	EDO	C	520	-	3,3,3	0.71	0	2,2,2	0.04	0
9	SO4	D	709	-	4,4,4	0.16	0	6,6,6	0.08	0
9	SO4	D	711	-	4,4,4	0.14	0	6,6,6	0.07	0
12	PGE	B	513	-	6,6,9	0.30	0	5,5,8	0.43	0
9	SO4	C	507	-	4,4,4	0.16	0	6,6,6	0.12	0
9	SO4	D	704	-	4,4,4	0.15	0	6,6,6	0.07	0
11	EDO	D	717	-	3,3,3	0.51	0	2,2,2	0.29	0
11	EDO	C	518	-	3,3,3	0.68	0	2,2,2	0.56	0
11	EDO	A	510	-	3,3,3	0.53	0	2,2,2	0.22	0
11	EDO	C	515	-	3,3,3	0.53	0	2,2,2	0.29	0
15	PG4	A	526	-	12,12,12	0.44	0	11,11,11	0.38	0
9	SO4	B	504	-	4,4,4	0.13	0	6,6,6	0.16	0
9	SO4	C	508	-	4,4,4	0.15	0	6,6,6	0.10	0
9	SO4	D	706	-	4,4,4	0.12	0	6,6,6	0.19	0
14	ANP	C	530	8,7	13,14,33	2.68	4 (30%)	14,22,52	2.06	3 (21%)
11	EDO	D	727	-	3,3,3	0.54	0	2,2,2	0.81	0
10	GOL	C	512	-	5,5,5	0.86	0	5,5,5	1.02	0
9	SO4	C	510	-	4,4,4	0.12	0	6,6,6	0.10	0
10	GOL	D	715	-	5,5,5	0.92	0	5,5,5	1.03	0
9	SO4	A	505	-	4,4,4	0.47	0	6,6,6	0.42	0
9	SO4	B	503	-	4,4,4	0.14	0	6,6,6	0.17	0
11	EDO	B	509	-	3,3,3	0.51	0	2,2,2	0.16	0
11	EDO	C	517	-	3,3,3	0.66	0	2,2,2	0.33	0
13	NAG	C	502	1	14,14,15	2.18	2 (14%)	17,19,21	2.31	1 (5%)
11	EDO	D	728	-	3,3,3	0.58	0	2,2,2	0.37	0
9	SO4	D	708	-	4,4,4	0.10	0	6,6,6	0.12	0
11	EDO	D	726	-	3,3,3	0.69	0	2,2,2	0.40	0
13	NAG	D	733	1	14,14,15	0.96	1 (7%)	17,19,21	1.91	5 (29%)
9	SO4	C	509	-	4,4,4	0.15	0	6,6,6	0.12	0
11	EDO	A	514	-	3,3,3	0.70	0	2,2,2	0.33	0
10	GOL	D	713	-	5,5,5	0.92	0	5,5,5	0.78	0
12	PGE	D	729	-	6,6,9	0.26	0	5,5,8	0.70	0
10	GOL	A	508	-	5,5,5	1.31	1 (20%)	5,5,5	0.88	0
11	EDO	A	513	-	3,3,3	0.63	0	2,2,2	0.47	0
9	SO4	D	712	-	4,4,4	0.15	0	6,6,6	0.09	0
13	NAG	B	522	1	14,14,15	0.25	0	17,19,21	0.36	0
11	EDO	D	723	-	3,3,3	0.72	0	2,2,2	0.53	0
9	SO4	C	506	-	4,4,4	0.16	0	6,6,6	0.10	0
11	EDO	A	512	-	3,3,3	0.70	0	2,2,2	0.28	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
11	EDO	D	725	-	3,3,3	0.68	0	2,2,2	0.28	0
15	PG4	D	701	-	12,12,12	0.47	0	11,11,11	0.38	0
9	SO4	D	710	-	4,4,4	0.12	0	6,6,6	0.20	0
11	EDO	D	724	-	3,3,3	0.72	0	2,2,2	0.20	0
9	SO4	B	506	-	4,4,4	0.13	0	6,6,6	0.08	0
11	EDO	B	512	-	3,3,3	0.53	0	2,2,2	0.34	0
11	EDO	D	718	-	3,3,3	0.50	0	2,2,2	0.18	0
11	EDO	D	720	-	3,3,3	0.53	0	2,2,2	0.26	0
12	PGE	A	515	-	6,6,9	0.29	0	5,5,8	0.30	0
12	PGE	C	521	-	9,9,9	0.34	0	8,8,8	0.23	0
9	SO4	B	505	-	4,4,4	0.14	0	6,6,6	0.16	0
11	EDO	B	507	-	3,3,3	0.48	0	2,2,2	0.42	0
12	PGE	B	514	-	6,6,9	0.44	0	5,5,8	0.44	0
11	EDO	B	511	-	3,3,3	0.53	0	2,2,2	0.17	0
10	GOL	A	507[A]	-	5,5,5	0.97	0	5,5,5	0.98	0
11	EDO	D	722	-	3,3,3	0.42	0	2,2,2	0.32	0
12	PGE	C	522	-	6,6,9	0.31	0	5,5,8	0.26	0
11	EDO	D	719	-	3,3,3	0.45	0	2,2,2	0.53	0
11	EDO	A	511	-	3,3,3	0.54	0	2,2,2	0.27	0
14	ANP	A	525	8,7	29,33,33	2.03	6 (20%)	31,52,52	1.70	5 (16%)
10	GOL	D	714	-	5,5,5	0.82	0	5,5,5	1.02	0
14	ANP	D	735	8,7	12,13,33	2.94	4 (33%)	14,21,52	1.83	4 (28%)
13	NAG	D	734	1	14,14,15	0.45	0	17,19,21	0.74	1 (5%)
9	SO4	C	505	-	4,4,4	0.15	0	6,6,6	0.07	0
13	NAG	A	520	1	14,14,15	0.38	0	17,19,21	0.56	0
11	EDO	B	508	-	3,3,3	0.59	0	2,2,2	0.15	0
13	NAG	A	521	-	14,14,15	1.69	3 (21%)	17,19,21	1.36	3 (17%)
17	IPA	C	529	-	3,3,3	0.56	0	3,3,3	0.23	0
9	SO4	D	705	-	4,4,4	0.16	0	6,6,6	0.16	0
10	GOL	D	716	-	5,5,5	0.89	0	5,5,5	1.00	0
10	GOL	A	507[B]	-	5,5,5	0.85	0	5,5,5	1.05	0
11	EDO	B	510	-	3,3,3	0.49	0	2,2,2	0.28	0
12	PGE	D	730	-	6,6,9	0.56	0	5,5,8	0.56	0
10	GOL	A	509	-	5,5,5	1.13	0	5,5,5	0.94	0
13	NAG	C	526	1	14,14,15	0.30	0	17,19,21	0.65	1 (5%)
9	SO4	A	504	-	4,4,4	0.16	0	6,6,6	0.12	0
9	SO4	C	501	16	4,4,4	0.22	0	6,6,6	0.34	0
11	EDO	C	516	-	3,3,3	0.45	0	2,2,2	0.35	0
11	EDO	C	519	-	3,3,3	0.66	0	2,2,2	0.28	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
11	EDO	C	514	-	-	0/1/1/1	-
13	NAG	D	733	1	-	3/6/23/26	0/1/1/1
14	ANP	A	525	8,7	-	3/14/38/38	0/3/3/3
10	GOL	D	714	-	-	2/4/4/4	-
10	GOL	A	506	-	-	0/4/4/4	-
14	ANP	D	735	8,7	-	1/11/15/38	-
13	NAG	D	734	1	-	2/6/23/26	0/1/1/1
11	EDO	C	513	-	-	0/1/1/1	-
11	EDO	D	721	-	-	0/1/1/1	-
13	NAG	A	520	1	-	2/6/23/26	0/1/1/1
11	EDO	A	514	-	-	1/1/1/1	-
11	EDO	C	520	-	-	0/1/1/1	-
10	GOL	D	713	-	-	2/4/4/4	-
14	ANP	C	530	8,7	-	1/12/16/38	-
12	PGE	D	729	-	-	1/4/4/7	-
10	GOL	A	508	-	-	4/4/4/4	-
11	EDO	D	727	-	-	1/1/1/1	-
11	EDO	A	513	-	-	1/1/1/1	-
10	GOL	C	512	-	-	4/4/4/4	-
13	NAG	B	522	1	-	2/6/23/26	0/1/1/1
10	GOL	D	715	-	-	2/4/4/4	-
11	EDO	B	508	-	-	0/1/1/1	-
11	EDO	D	723	-	-	0/1/1/1	-
11	EDO	A	512	-	-	1/1/1/1	-
11	EDO	D	725	-	-	1/1/1/1	-
13	NAG	A	521	-	-	2/6/23/26	0/1/1/1
15	PG4	D	701	-	-	5/10/10/10	-
12	PGE	B	513	-	-	2/4/4/7	-
11	EDO	D	724	-	-	1/1/1/1	-
11	EDO	D	720	-	-	0/1/1/1	-
11	EDO	B	512	-	-	0/1/1/1	-
11	EDO	D	718	-	-	0/1/1/1	-
10	GOL	D	716	-	-	1/4/4/4	-
11	EDO	D	717	-	-	0/1/1/1	-
12	PGE	A	515	-	-	3/4/4/7	-
10	GOL	A	507[B]	-	-	2/4/4/4	-
11	EDO	B	510	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
12	PGE	D	730	-	-	1/4/4/7	-
11	EDO	B	509	-	-	0/1/1/1	-
11	EDO	C	517	-	-	1/1/1/1	-
10	GOL	A	509	-	-	1/4/4/4	-
12	PGE	C	521	-	-	4/7/7/7	-
11	EDO	C	518	-	-	0/1/1/1	-
13	NAG	C	526	1	-	2/6/23/26	0/1/1/1
11	EDO	A	510	-	-	0/1/1/1	-
11	EDO	C	516	-	-	0/1/1/1	-
11	EDO	B	507	-	-	1/1/1/1	-
11	EDO	C	515	-	-	1/1/1/1	-
12	PGE	B	514	-	-	2/4/4/7	-
11	EDO	B	511	-	-	1/1/1/1	-
10	GOL	A	507[A]	-	-	2/4/4/4	-
13	NAG	C	502	1	-	2/6/23/26	0/1/1/1
11	EDO	D	728	-	-	1/1/1/1	-
15	PG4	A	526	-	-	3/10/10/10	-
11	EDO	D	719	-	-	1/1/1/1	-
11	EDO	D	722	-	-	1/1/1/1	-
12	PGE	C	522	-	-	1/4/4/7	-
11	EDO	C	519	-	-	1/1/1/1	-
11	EDO	A	511	-	-	0/1/1/1	-
11	EDO	D	726	-	-	0/1/1/1	-

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
13	C	502	NAG	O5-C1	7.47	1.55	1.43
14	D	735	ANP	PG-O1G	6.98	1.57	1.46
14	A	525	ANP	PG-O1G	6.57	1.56	1.46
14	C	530	ANP	PG-O1G	6.18	1.56	1.46
14	C	530	ANP	PB-O1B	5.97	1.55	1.46
14	D	735	ANP	PB-O1B	5.85	1.55	1.46
14	A	525	ANP	PB-O1B	5.77	1.55	1.46
13	A	521	NAG	O5-C1	4.57	1.51	1.43
13	C	502	NAG	C1-C2	3.11	1.57	1.52
14	A	525	ANP	O4'-C1'	3.03	1.45	1.41
14	A	525	ANP	PB-O3A	2.99	1.62	1.59
14	D	735	ANP	PB-O3A	2.97	1.62	1.59
14	C	530	ANP	PB-O3A	2.66	1.62	1.59
10	A	508	GOL	C1-C2	2.51	1.62	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
14	A	525	ANP	C8-N7	-2.46	1.30	1.34
13	D	733	NAG	C1-C2	-2.45	1.48	1.52
13	A	521	NAG	C2-N2	2.34	1.50	1.46
14	D	735	ANP	PB-N3B	2.34	1.69	1.63
13	A	521	NAG	C3-C2	2.31	1.57	1.52
14	C	530	ANP	PB-N3B	2.31	1.69	1.63
14	A	525	ANP	PB-N3B	2.19	1.69	1.63

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
13	C	502	NAG	C1-O5-C5	8.73	124.02	112.19
14	C	530	ANP	PB-O3A-PA	-6.05	111.30	132.62
13	D	733	NAG	C1-O5-C5	5.25	119.30	112.19
14	D	735	ANP	PB-O3A-PA	-4.80	115.72	132.62
14	A	525	ANP	PB-O3A-PA	-4.63	116.29	132.62
14	A	525	ANP	N3-C2-N1	-3.74	122.83	128.68
14	A	525	ANP	O1B-PB-N3B	-3.56	106.53	111.77
13	A	521	NAG	O6-C6-C5	2.87	121.13	111.29
14	A	525	ANP	PA-O5'-C5'	-2.62	106.30	121.68
13	A	521	NAG	C1-C2-N2	2.61	114.94	110.49
13	D	733	NAG	C4-C3-C2	-2.58	107.23	111.02
13	D	733	NAG	C1-C2-N2	2.54	114.83	110.49
14	C	530	ANP	PA-O5'-C5'	-2.52	107.03	121.56
13	D	733	NAG	C2-N2-C7	2.51	126.47	122.90
13	D	734	NAG	C1-O5-C5	2.50	115.58	112.19
14	D	735	ANP	PA-O5'-C5'	-2.42	108.54	121.97
14	A	525	ANP	O3G-PG-O1G	-2.39	107.44	113.45
14	D	735	ANP	O2G-PG-O1G	-2.37	107.49	113.45
13	D	733	NAG	C3-C4-C5	2.26	114.27	110.24
13	C	526	NAG	C1-O5-C5	2.14	115.09	112.19
13	A	521	NAG	C1-O5-C5	2.11	115.05	112.19
14	D	735	ANP	O3A-PA-O5'	2.06	109.02	102.58
14	C	530	ANP	O3G-PG-O1G	-2.01	108.41	113.45

There are no chirality outliers.

All (76) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	A	507[A]	GOL	O1-C1-C2-O2
10	A	507[A]	GOL	O1-C1-C2-C3
10	A	507[B]	GOL	O1-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
10	A	508	GOL	O1-C1-C2-C3
10	A	509	GOL	C1-C2-C3-O3
10	C	512	GOL	O1-C1-C2-C3
10	D	713	GOL	C1-C2-C3-O3
10	D	713	GOL	O2-C2-C3-O3
10	D	714	GOL	O1-C1-C2-C3
14	A	525	ANP	C3'-C4'-C5'-O5'
14	C	530	ANP	PG-N3B-PB-O1B
14	D	735	ANP	PB-N3B-PG-O1G
13	D	733	NAG	O5-C5-C6-O6
14	A	525	ANP	O4'-C4'-C5'-O5'
13	D	733	NAG	C4-C5-C6-O6
13	C	502	NAG	O5-C5-C6-O6
12	C	521	PGE	O2-C3-C4-O3
13	A	520	NAG	C8-C7-N2-C2
13	A	520	NAG	O7-C7-N2-C2
13	C	526	NAG	C8-C7-N2-C2
13	C	526	NAG	O7-C7-N2-C2
13	D	734	NAG	C8-C7-N2-C2
13	D	734	NAG	O7-C7-N2-C2
15	D	701	PG4	O2-C3-C4-O3
13	C	502	NAG	C4-C5-C6-O6
10	D	714	GOL	O1-C1-C2-O2
12	D	729	PGE	O2-C3-C4-O3
12	D	730	PGE	O2-C3-C4-O3
12	C	521	PGE	C3-C4-O3-C5
12	A	515	PGE	O3-C5-C6-O4
15	D	701	PG4	O4-C7-C8-O5
15	A	526	PG4	O3-C5-C6-O4
10	A	508	GOL	O1-C1-C2-O2
10	C	512	GOL	O1-C1-C2-O2
11	A	513	EDO	O1-C1-C2-O2
11	C	515	EDO	O1-C1-C2-O2
11	C	519	EDO	O1-C1-C2-O2
11	D	724	EDO	O1-C1-C2-O2
11	D	725	EDO	O1-C1-C2-O2
13	B	522	NAG	C4-C5-C6-O6
13	B	522	NAG	O5-C5-C6-O6
15	D	701	PG4	C6-C5-O3-C4
12	B	514	PGE	O1-C1-C2-O2
12	B	514	PGE	O2-C3-C4-O3
10	A	507[B]	GOL	O1-C1-C2-O2

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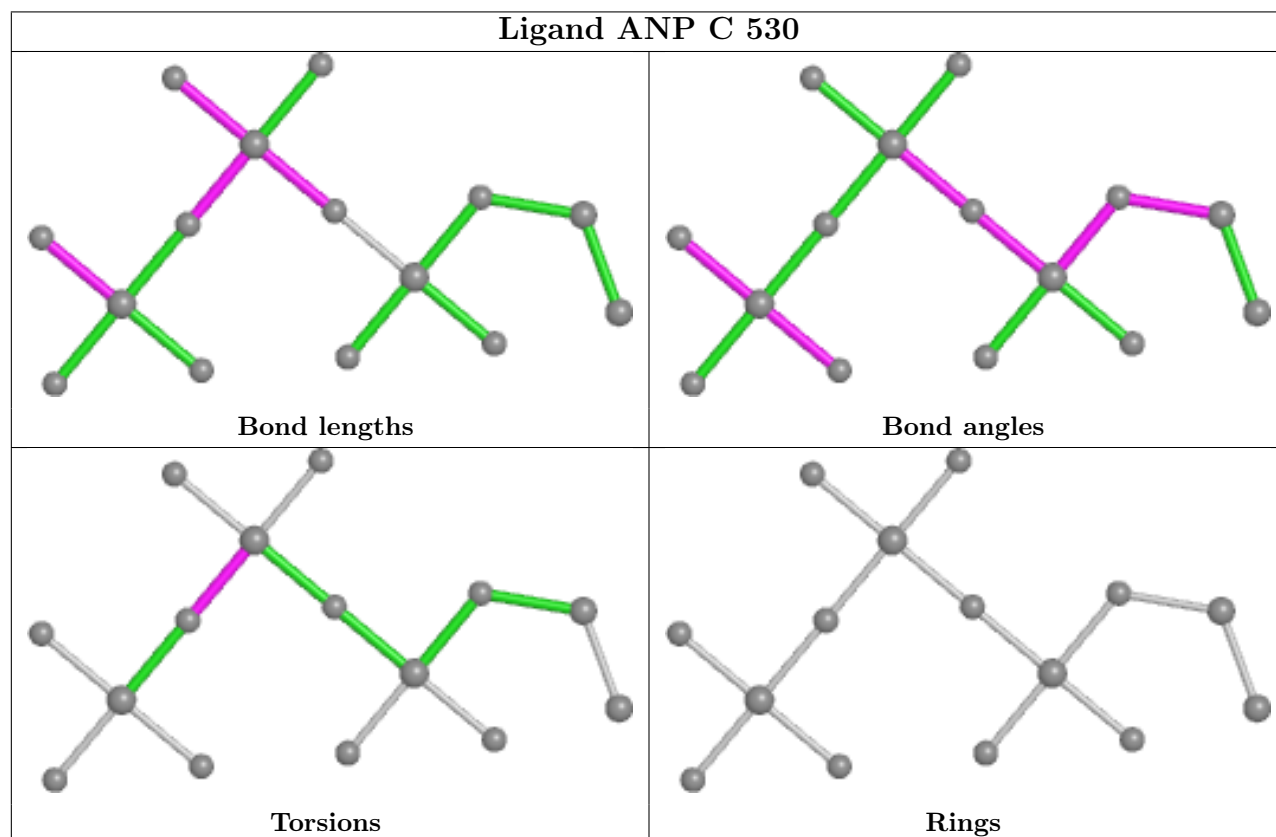
Mol	Chain	Res	Type	Atoms
12	C	521	PGE	C4-C3-O2-C2
12	C	521	PGE	O3-C5-C6-O4
10	A	508	GOL	O2-C2-C3-O3
13	A	521	NAG	C4-C5-C6-O6
14	A	525	ANP	PB-O3A-PA-O5'
12	B	513	PGE	O2-C3-C4-O3
12	B	513	PGE	C1-C2-O2-C3
12	A	515	PGE	C3-C4-O3-C5
10	C	512	GOL	O2-C2-C3-O3
12	C	522	PGE	C4-C3-O2-C2
11	A	512	EDO	O1-C1-C2-O2
15	D	701	PG4	C5-C6-O4-C7
15	A	526	PG4	O2-C3-C4-O3
15	A	526	PG4	C3-C4-O3-C5
11	C	517	EDO	O1-C1-C2-O2
11	D	722	EDO	O1-C1-C2-O2
13	D	733	NAG	C3-C2-N2-C7
10	D	716	GOL	C1-C2-C3-O3
11	A	514	EDO	O1-C1-C2-O2
11	B	507	EDO	O1-C1-C2-O2
11	D	727	EDO	O1-C1-C2-O2
11	D	728	EDO	O1-C1-C2-O2
15	D	701	PG4	C3-C4-O3-C5
13	A	521	NAG	O5-C5-C6-O6
11	B	511	EDO	O1-C1-C2-O2
10	A	508	GOL	C1-C2-C3-O3
10	C	512	GOL	C1-C2-C3-O3
10	D	715	GOL	C1-C2-C3-O3
10	D	715	GOL	O2-C2-C3-O3
11	D	719	EDO	O1-C1-C2-O2
12	A	515	PGE	O2-C3-C4-O3

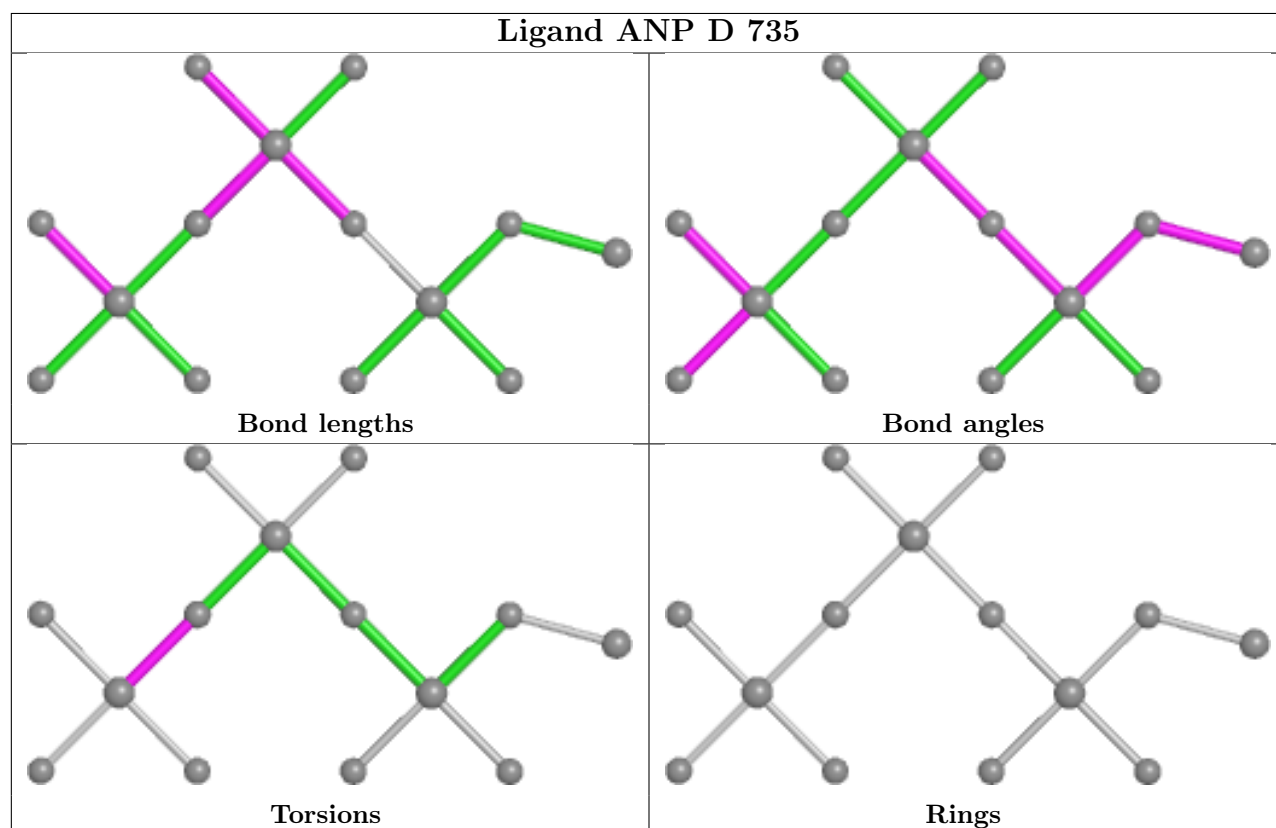
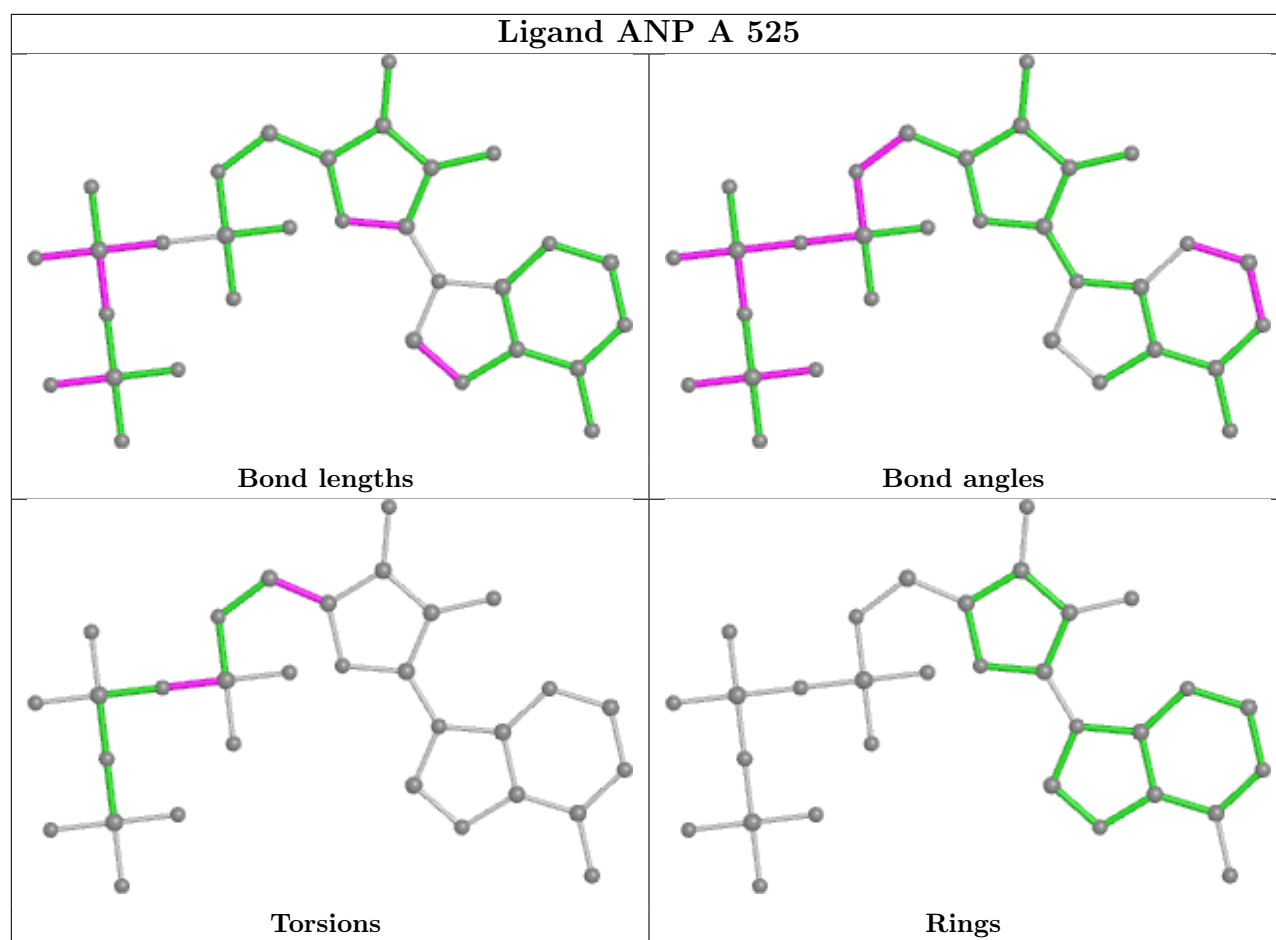
There are no ring outliers.

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.