Full wwPDB X-ray Structure Validation Report ⓘ

Oct 2, 2023 – 12:06 AM EDT

PDB ID	:	6NC8
Title	:	Lipid II flippase MurJ, inward occluded conformation
Authors	:	Kuk, A.C.Y.; Lee, S.-Y.
Deposited on	:	2018-12-11
Resolution	:	2.60 Å(reported)

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 ⓘ

There are 4 unique types of molecules in this entry. The entry contains 7662 atoms, of which 3865 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 Lipid II flippase MurJ.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	467	Total 7380	C 2500	H 3708	N 536	O 628	S 8	0	0	0

- Molecule 2 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 1	Na 1	0	0

- Molecule 3 is (2R)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (three-letter code: OLC) (formula: $C_{21}H_{40}O_4$).
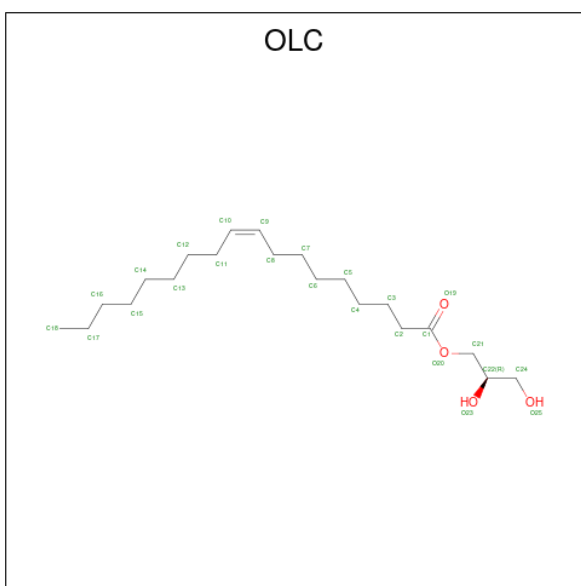
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total 26	C 9	H 14	O 3	0	0
3	A	1	Total 36	C 13	H 21	O 2	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	H	O	0	0
			44	15	25	4		
3	A	1	Total	C	H	O	0	0
			20	6	10	4		
3	A	1	Total	C	H	O	0	0
			32	11	18	3		
3	A	1	Total	C	H	O	0	0
			26	8	14	4		

- Molecule 4 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: $C_{10}H_{22}O_6$).
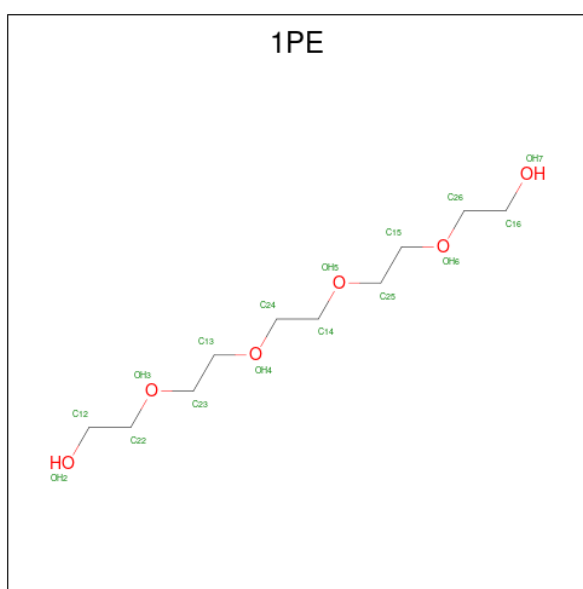
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	H	O	0	0
			29	8	16	5		
4	A	1	Total	C	H	O	0	0
			30	8	17	5		
4	A	1	Total	C	H	O	0	0
			38	10	22	6		

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 2 21 21	Depositor
Cell constants a, b, c, α, β, γ	68.42Å　80.26Å　100.69Å 90.00°　90.00°　90.00°	Depositor
Resolution (Å)	68.42　–　2.60	Depositor
% Data completeness (in resolution range)	99.0 (68.42-2.60)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.01 (at 2.62Å)	Xtriage
Refinement program	PHENIX (1.11.1_2575: ???)	Depositor
R, R_{free}	0.229　,　0.257	Depositor
Wilson B-factor (Å^2)	36.2	Xtriage
Anisotropy	0.124	Xtriage
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	7662	wwPDB-VP
Average B, all atoms (Å^2)	53.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.78% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

4 Model quality ⓘ

4.1 Standard geometry ⓘ

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

4.2 Too-close contacts ⓘ

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

4.3 Torsion angles ⓘ

4.3.1 Protein backbone ⓘ

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

4.3.2 Protein sidechains ⓘ

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

4.3.3 RNA ⓘ

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

4.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

4.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

4.6 Ligand geometry ⓘ

Of 10 ligands modelled in this entry, 1 is monoatomic - leaving 9 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	#$|Z| > 2$
3	OLC	A	505	-	9,9,24	1.24	1 (11%)	10,10,25	1.20	1 (10%)
4	1PE	A	510	-	15,15,15	0.52	0	14,14,14	0.32	0
3	OLC	A	504	-	18,18,24	0.93	1 (5%)	18,19,25	0.97	1 (5%)
3	OLC	A	503	-	14,14,24	1.79	2 (14%)	14,14,25	1.08	1 (7%)
4	1PE	A	508	-	12,12,15	0.51	0	11,11,14	0.34	0
3	OLC	A	506	-	12,13,24	1.04	1 (8%)	12,14,25	1.16	1 (8%)
3	OLC	A	507	-	11,11,24	1.14	1 (9%)	12,12,25	0.97	1 (8%)
4	1PE	A	509	-	12,12,15	0.51	0	11,11,14	0.39	0
3	OLC	A	502	-	11,11,24	1.06	1 (9%)	11,11,25	0.93	1 (9%)

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	OLC	A	505	-	-	0/9/9/24	-
4	1PE	A	510	-	-	6/13/13/13	-
3	OLC	A	504	-	-	9/18/18/24	-
3	OLC	A	503	-	-	3/12/12/24	-
4	1PE	A	508	-	-	5/10/10/13	-
3	OLC	A	506	-	-	3/12/12/24	-
3	OLC	A	507	-	-	2/11/11/24	-
4	1PE	A	509	-	-	7/10/10/13	-
3	OLC	A	502	-	-	2/10/10/24	-

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	503	OLC	O19-C1	5.50	1.40	1.22
3	A	503	OLC	O20-C1	-3.47	1.19	1.30
3	A	507	OLC	O20-C1	2.56	1.40	1.33
3	A	505	OLC	O20-C1	2.54	1.40	1.33
3	A	504	OLC	O20-C1	2.50	1.40	1.33
3	A	506	OLC	O20-C1	2.44	1.40	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	502	OLC	O20-C1	2.38	1.40	1.33

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	505	OLC	O20-C1-C2	3.23	119.84	111.38
3	A	506	OLC	O20-C1-C2	2.68	120.33	111.91
3	A	504	OLC	O20-C1-C2	2.51	119.78	111.91
3	A	507	OLC	O20-C1-C2	2.41	119.46	111.91
3	A	502	OLC	O20-C1-C2	2.14	118.63	111.91
3	A	503	OLC	C3-C2-C1	-2.01	109.40	114.47

There are no chirality outliers.

All (37) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	506	OLC	O20-C21-C22-C24
3	A	507	OLC	O20-C21-C22-C24
3	A	507	OLC	O20-C21-C22-O23
3	A	506	OLC	O20-C21-C22-O23
4	A	510	1PE	OH4-C13-C23-OH3
4	A	509	1PE	OH2-C12-C22-OH3
4	A	508	1PE	OH4-C13-C23-OH3
3	A	504	OLC	O20-C21-C22-C24
4	A	509	1PE	OH5-C14-C24-OH4
3	A	504	OLC	O20-C21-C22-O23
4	A	510	1PE	OH5-C14-C24-OH4
4	A	510	1PE	OH7-C16-C26-OH6
3	A	502	OLC	C1-C2-C3-C4
4	A	510	1PE	OH2-C12-C22-OH3
3	A	506	OLC	C1-C2-C3-C4
3	A	504	OLC	C5-C6-C7-C8
4	A	509	1PE	C24-C14-OH5-C25
4	A	508	1PE	C24-C14-OH5-C25
4	A	509	1PE	C23-C13-OH4-C24
4	A	508	1PE	C13-C23-OH3-C22
4	A	508	1PE	C14-C24-OH4-C13
4	A	510	1PE	C24-C14-OH5-C25
4	A	508	1PE	C12-C22-OH3-C23
3	A	502	OLC	C2-C3-C4-C5
3	A	504	OLC	C9-C10-C11-C12
3	A	504	OLC	C21-C22-C24-O25

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| Mol	Chain	Res	Type	Atoms
3	A	504	OLC	C7-C8-C9-C10
3	A	503	OLC	C9-C10-C11-C12
3	A	503	OLC	C2-C3-C4-C5
4	A	509	1PE	C14-C24-OH4-C13
3	A	503	OLC	C7-C8-C9-C10
3	A	504	OLC	O23-C22-C24-O25
4	A	509	1PE	C12-C22-OH3-C23
3	A	504	OLC	C3-C4-C5-C6
4	A	509	1PE	OH4-C13-C23-OH3
3	A	504	OLC	C6-C7-C8-C9
4	A	510	1PE	C12-C22-OH3-C23

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 then 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.

Ligand OLC A 505

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 504

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 503

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 506

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 507

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 502

Bond lengths

Bond angles

Torsions

Rings
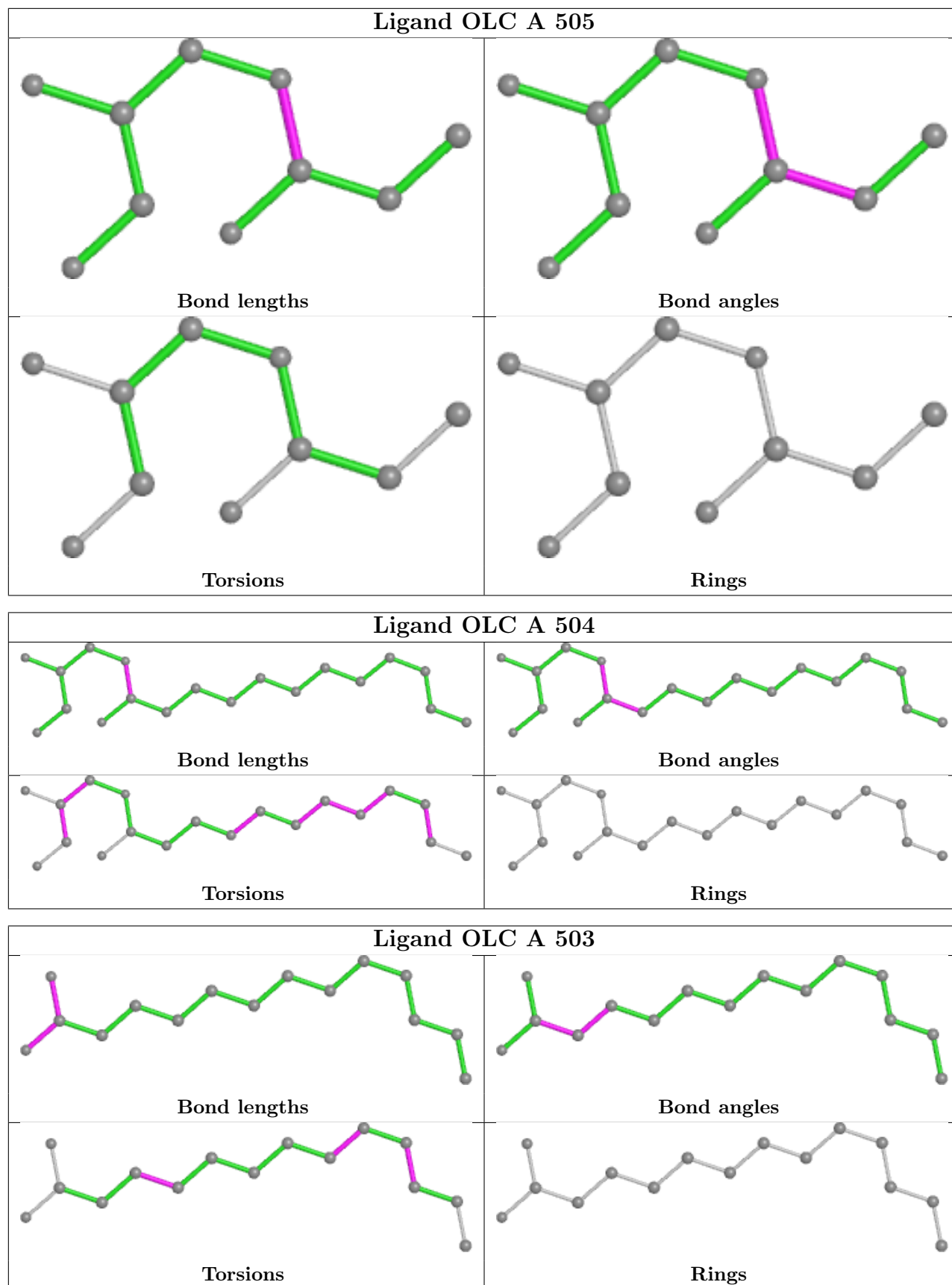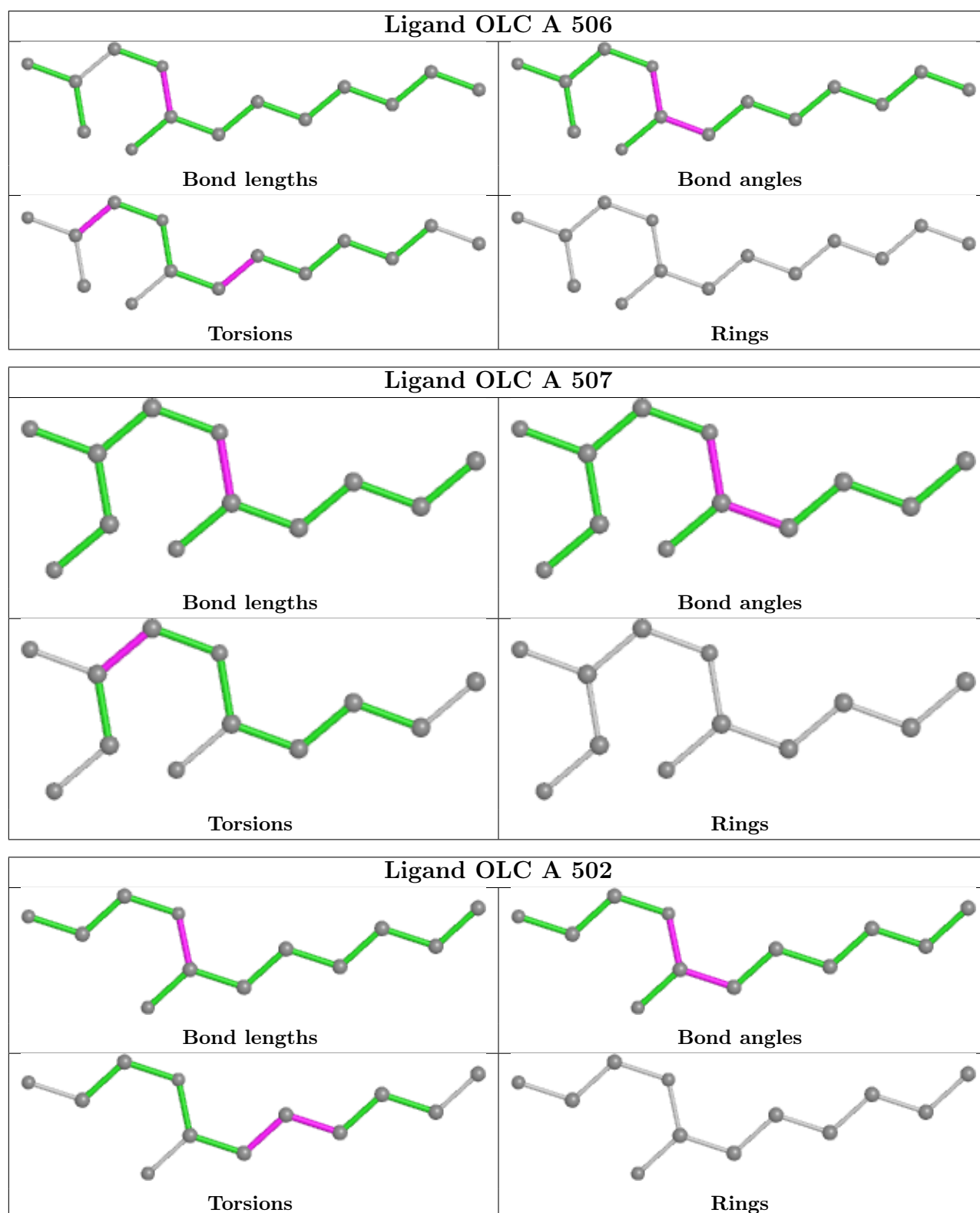
4.7 Other polymers ⓘ

There are no such residues in this entry.

4.8 Polymer linkage issues ⓘ

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.