



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 12:32 PM UTC

PDB ID : 6H59 / pdb_00006h59
Title : Crystal structure of Mycobacterium tuberculosis phosphatidylinositol phosphate synthase (PgsA1) with CDP-DAG bound
Authors : Grave, K.; Hogbom, M.
Deposited on : 2018-07-24
Resolution : 1.80 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

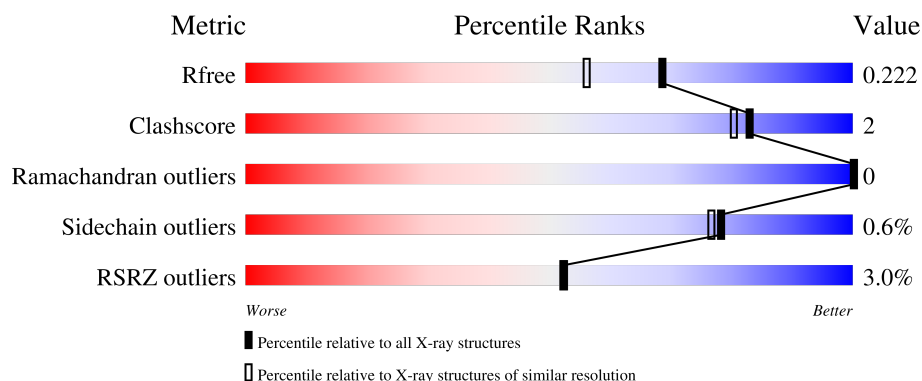
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

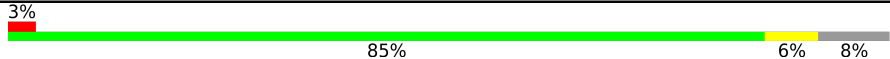
The reported resolution of this entry is 1.80 Å.

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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	7662 (1.80-1.80)
Clashscore	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)
RSRZ outliers	180081	7663 (1.80-1.80)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	217	
1	B	217	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
6	OLB	B	314	X	-	-	-

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 6809 atoms, of which 3380 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.

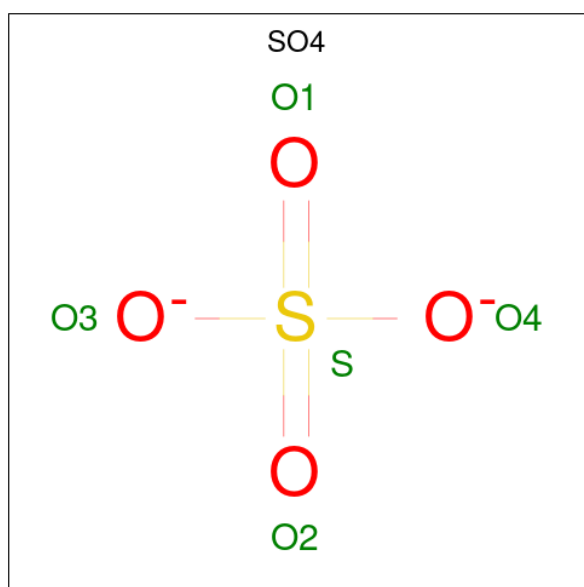
- Molecule 1 is a protein called CDP-diacylglycerol--inositol 3-phosphatidyltransferase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	199	Total	C	H	N	O	S	0	6	0
			3082	987	1559	262	263	11			
1	B	196	Total	C	H	N	O	S	0	4	0
			3014	964	1530	254	255	11			

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

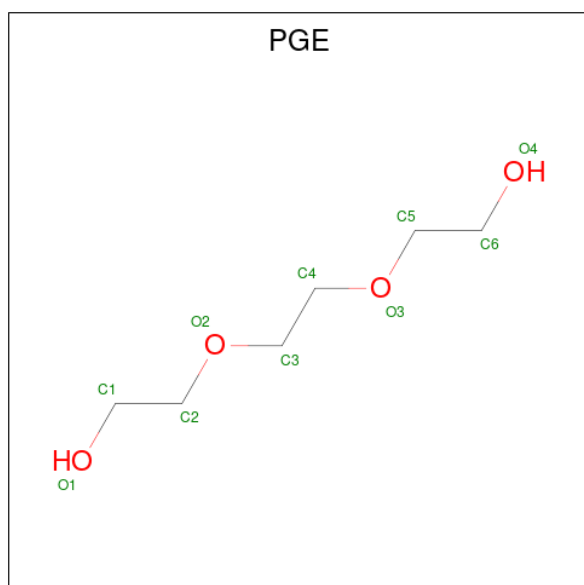
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total	Mg	0	0
			2	2		
2	B	2	Total	Mg	0	0
			2	2		

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



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

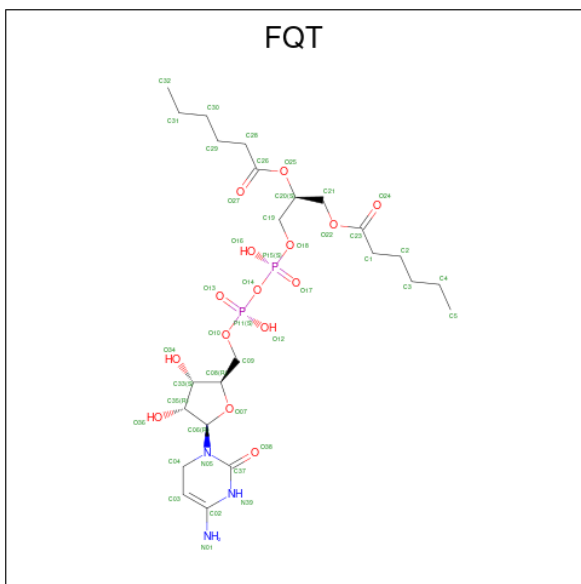
- Molecule 4 is TRIETHYLENE GLYCOL (CCD ID: PGE) (formula: C₆H₁₄O₄).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C H O 24 6 14 4	0	0

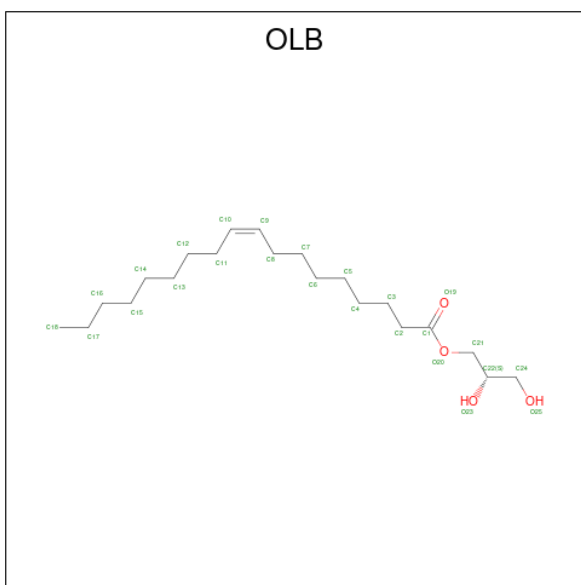
- Molecule 5 is [(2 {S})]-3-[[[(2 {R}),3 {S}),4 {R}),5 {R}))-5-(6-azanyl-2-oxidanylidene-1,4

-dihydropyrimidin-3-yl)-3,4-bis(oxidanyl)oxolan-2-yl]methoxy-oxidanyl-phosphoryl]oxy-oxidanyl-phosphoryl]oxy-2-hexanoyloxy-propyl] hexanoate (CCD ID: FQT) (formula: C₂₄H₄₃N₃O₁₅P₂).



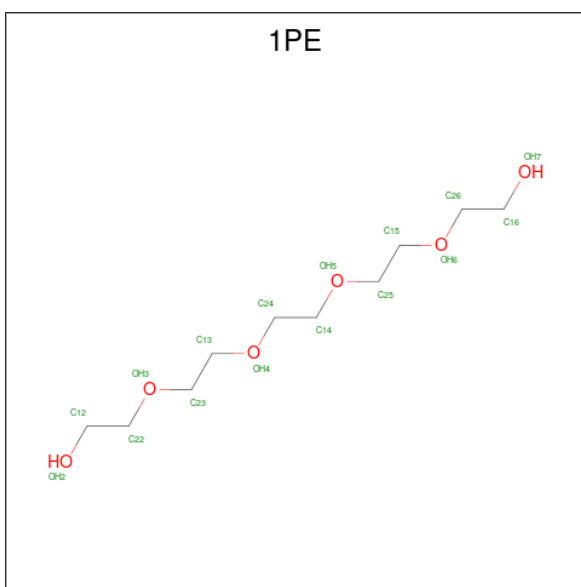
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
5	A	1	Total 65	C 19	H 26	N 3	O 15	P 2	0	0
5	B	1	Total 66	C 19	H 27	N 3	O 15	P 2	0	0

- Molecule 6 is (2S)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (CCD ID: OLB) (formula: $C_{21}H_{40}O_4$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C H O 38 12 22 4	0	0
6	A	1	Total C H 19 7 12	0	0
6	A	1	Total C H 19 7 12	0	0
6	A	1	Total C H 19 7 12	0	0
6	A	1	Total C H 19 7 12	0	0
6	A	1	Total C H 19 7 12	0	0
6	A	1	Total C H 19 7 12	0	0
6	A	1	Total C H 19 7 12	0	0
6	B	1	Total C H O 48 16 28 4	0	0
6	B	1	Total C H O 23 7 12 4	0	0
6	B	1	Total C H 19 7 12	0	0
6	B	1	Total C H 18 7 11	0	0
6	B	1	Total C H 18 7 11	0	0
6	B	1	Total C H O 38 12 22 4	0	0

- Molecule 7 is PENTAETHYLENE GLYCOL (CCD ID: 1PE) (formula: $C_{10}H_{22}O_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	B	1	Total	C	H	O	0	0
			38	10	22	6		

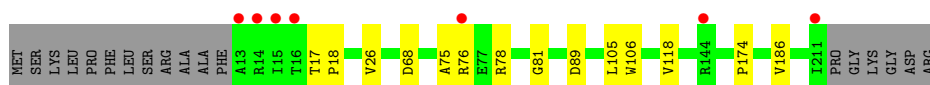
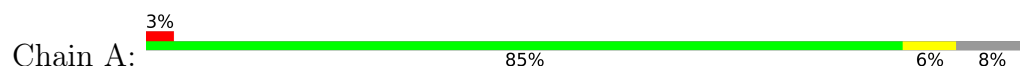
- Molecule 8 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	59	Total O 59 59	0	0
8	B	72	Total O 72 72	0	0

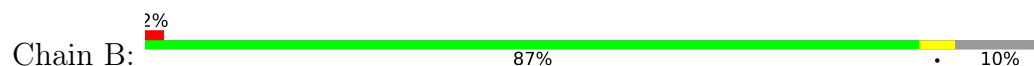
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: CDP-diacylglycerol--inositol 3-phosphatidyltransferase



- Molecule 1: CDP-diacylglycerol--inositol 3-phosphatidyltransferase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	97.99Å 115.08Å 45.47Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.62 – 1.80 49.62 – 1.80	Depositor EDS
% Data completeness (in resolution range)	99.4 (49.62-1.80) 99.4 (49.62-1.80)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.54 (at 1.80Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.196 , 0.229 (Not available) , 0.222	Depositor DCC
R_{free} test set	2386 reflections (4.91%)	wwPDB-VP
Wilson B-factor (Å ²)	17.3	Xtriage
Anisotropy	0.344	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.40 , 45.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	6809	wwPDB-VP
Average B, all atoms (Å ²)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 16.75% 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.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MG, PGE, 1PE, SO4, FQT, OLB

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	0.48	0/1587	0.63	0/2165
1	B	0.45	0/1535	0.61	0/2094
All	All	0.47	0/3122	0.62	0/4259

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	1523	1559	1547	11	0
1	B	1484	1530	1510	5	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
3	A	30	0	0	0	0
3	B	20	0	0	0	0
4	A	10	14	14	2	0
5	A	39	26	0	1	0
5	B	39	27	0	0	0
6	A	65	106	91	2	0
6	B	68	96	89	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	B	16	22	22	0	0
8	A	59	0	0	3	0
8	B	72	0	0	2	0
All	All	3429	3380	3273	16	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 2.

All (16) 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:A:89[B]:ASP:OD1	8:A:402:HOH:O	1.70	1.10
1:B:128[A]:SER:OG	8:B:401:HOH:O	1.76	1.03
1:A:78:ARG:NH1	8:A:403:HOH:O	2.20	0.74
1:B:89:ASP:OD1	8:B:402:HOH:O	2.09	0.70
1:B:73:ALA:HA	1:B:76:ARG:HG2	1.91	0.53
1:A:174:PRO:HB3	4:A:308:PGE:H52	1.94	0.50
1:A:68:ASP:CG	5:A:309:FQT:O16	2.54	0.50
1:B:43:ALA:O	1:B:47:THR:HG23	2.11	0.49
1:A:76:ARG:NH2	8:A:408:HOH:O	2.47	0.48
1:B:76:ARG:HG3	1:B:77:GLU:N	2.31	0.45
1:A:17:THR:HB	1:A:18:PRO:HD3	1.99	0.44
1:A:106:TRP:CE2	6:A:310:OLB:H22	2.52	0.44
1:A:186:VAL:HG22	6:A:313:OLB:H17	1.98	0.44
1:A:105:LEU:HD11	1:A:118:VAL:HG13	1.99	0.44
1:A:174:PRO:HB3	4:A:308:PGE:C5	2.48	0.43
1:A:75:ALA:HB1	1:A:81:GLY:HA2	2.02	0.40

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 X-ray entries followed by that with respect to entries of similar resolution.

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	205/217 (94%)	201 (98%)	4 (2%)	0	100	100
1	B	198/217 (91%)	195 (98%)	3 (2%)	0	100	100
All	All	403/434 (93%)	396 (98%)	7 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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	162/169 (96%)	161 (99%)	1 (1%)	78	77
1	B	157/169 (93%)	156 (99%)	1 (1%)	78	77
All	All	319/338 (94%)	317 (99%)	2 (1%)	78	77

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	26	VAL
1	B	15	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 32 ligands modelled in this entry, 4 are monoatomic - leaving 28 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$
6	OLB	A	313	-	6,6,24	0.13	0	5,5,25	0.34	0
6	OLB	B	309	-	10,10,24	0.27	0	11,11,25	0.28	0
3	SO4	A	305	-	4,4,4	0.23	0	6,6,6	0.28	0
6	OLB	A	310	-	15,15,24	0.22	0	16,16,25	0.22	0
5	FQT	A	309	2	40,40,45	2.26	13 (32%)	46,56,62	1.30	4 (8%)
6	OLB	B	308	-	19,19,24	0.21	0	20,20,25	0.19	0
3	SO4	A	304	-	4,4,4	0.23	0	6,6,6	0.34	0
5	FQT	B	307	2	40,40,45	2.28	11 (27%)	46,56,62	1.51	4 (8%)
3	SO4	B	304	-	4,4,4	0.34	0	6,6,6	0.20	0
6	OLB	B	311	-	6,6,24	0.10	0	5,5,25	0.40	0
6	OLB	A	312	-	6,6,24	0.13	0	5,5,25	0.24	0
3	SO4	A	303	-	4,4,4	0.32	0	6,6,6	0.22	0
7	1PE	B	313	-	15,15,15	0.46	0	14,14,14	0.24	0
6	OLB	A	315	-	6,6,24	0.16	0	5,5,25	0.55	0
6	OLB	A	317	-	6,6,24	0.17	0	5,5,25	0.28	0
6	OLB	A	311	-	6,6,24	0.14	0	5,5,25	0.31	0
6	OLB	A	316	-	6,6,24	0.18	0	5,5,25	0.24	0
6	OLB	B	314	-	15,15,24	1.25	3 (20%)	16,16,25	1.41	3 (18%)
3	SO4	A	306	-	4,4,4	0.30	0	6,6,6	0.16	0
6	OLB	B	312	-	6,6,24	0.16	0	5,5,25	0.52	0
6	OLB	A	314	-	6,6,24	0.18	0	5,5,25	0.34	0
3	SO4	B	305	-	4,4,4	0.28	0	6,6,6	0.20	0
3	SO4	A	307	-	4,4,4	0.23	0	6,6,6	0.05	0
3	SO4	B	306	-	4,4,4	0.23	0	6,6,6	0.23	0
6	OLB	B	310	-	6,6,24	0.14	0	5,5,25	0.27	0
4	PGE	A	308	-	9,9,9	0.25	0	8,8,8	0.63	0
3	SO4	B	301	-	4,4,4	0.28	0	6,6,6	0.09	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	SO4	A	318	-	4,4,4	0.29	0	6,6,6	0.17	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
6	OLB	A	313	-	-	0/4/4/24	-
6	OLB	A	317	-	-	2/4/4/24	-
6	OLB	B	309	-	-	4/10/10/24	-
6	OLB	A	311	-	-	1/4/4/24	-
6	OLB	A	316	-	-	3/4/4/24	-
5	FQT	B	307	2	-	8/35/64/70	0/2/2/2
6	OLB	B	314	-	1/1/2/4	4/15/15/24	-
6	OLB	B	308	-	-	7/19/19/24	-
6	OLB	B	310	-	-	0/4/4/24	-
6	OLB	B	311	-	-	2/4/4/24	-
6	OLB	B	312	-	-	1/4/4/24	-
6	OLB	A	310	-	-	5/15/15/24	-
6	OLB	A	312	-	-	3/4/4/24	-
7	1PE	B	313	-	-	1/13/13/13	-
4	PGE	A	308	-	-	5/7/7/7	-
6	OLB	A	315	-	-	0/4/4/24	-
5	FQT	A	309	2	-	7/35/64/70	0/2/2/2
6	OLB	A	314	-	-	0/4/4/24	-

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	307	FQT	C35-C33	-7.72	1.32	1.53
5	A	309	FQT	C35-C33	-7.71	1.32	1.53
5	B	307	FQT	O07-C08	-5.93	1.31	1.45
5	A	309	FQT	O07-C08	-5.76	1.32	1.45
5	A	309	FQT	O07-C06	4.63	1.52	1.42
5	B	307	FQT	O07-C06	4.46	1.52	1.42
5	B	307	FQT	O25-C26	3.83	1.45	1.34
5	B	307	FQT	C33-C08	3.72	1.62	1.53
5	A	309	FQT	O25-C26	3.58	1.44	1.34
5	A	309	FQT	C04-N05	-3.43	1.35	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	307	FQT	C04-C03	-3.33	1.37	1.48
5	B	307	FQT	C04-N05	-3.31	1.35	1.46
5	A	309	FQT	C33-C08	3.23	1.61	1.53
5	A	309	FQT	C04-C03	-3.03	1.38	1.48
6	B	314	OLB	O20-C21	-2.74	1.39	1.45
5	B	307	FQT	C37-N39	-2.64	1.33	1.38
5	B	307	FQT	C02-N39	-2.56	1.33	1.37
5	A	309	FQT	C19-C20	2.39	1.58	1.50
5	B	307	FQT	C19-C20	2.38	1.58	1.50
5	A	309	FQT	P11-O14	2.30	1.62	1.59
5	A	309	FQT	C02-N39	-2.28	1.34	1.37
6	B	314	OLB	O20-C1	2.27	1.40	1.33
5	B	307	FQT	O22-C23	2.25	1.41	1.33
5	A	309	FQT	C37-N39	-2.23	1.34	1.38
5	A	309	FQT	O22-C23	2.21	1.41	1.33
6	B	314	OLB	O19-C1	-2.21	1.15	1.22
5	A	309	FQT	C28-C26	2.13	1.56	1.50

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	307	FQT	O25-C26-C28	5.76	123.94	111.48
5	B	307	FQT	O07-C06-N05	4.89	115.96	109.30
5	A	309	FQT	O07-C06-N05	4.01	114.76	109.30
5	A	309	FQT	N39-C37-N05	3.27	119.94	116.65
5	A	309	FQT	O16-P15-O14	3.18	115.86	107.27
5	B	307	FQT	N39-C37-N05	3.16	119.83	116.65
5	A	309	FQT	O25-C26-C28	3.14	118.27	111.48
6	B	314	OLB	O20-C1-C2	2.96	120.86	111.83
6	B	314	OLB	C3-C2-C1	2.70	123.57	113.69
5	B	307	FQT	C20-O25-C26	-2.23	112.45	117.80
6	B	314	OLB	O20-C1-O19	-2.23	118.06	123.63

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
6	B	314	OLB	C22

All (53) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	309	FQT	O24-C23-O22-C21

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Mol	Chain	Res	Type	Atoms
5	B	307	FQT	O24-C23-O22-C21
6	B	308	OLB	O20-C21-C22-C24
6	B	314	OLB	C21-C22-C24-O25
6	B	308	OLB	O20-C21-C22-O23
4	A	308	PGE	O1-C1-C2-O2
6	B	309	OLB	C2-C1-O20-C21
4	A	308	PGE	O2-C3-C4-O3
7	B	313	1PE	OH2-C12-C22-OH3
6	A	316	OLB	C2-C3-C4-C5
6	B	309	OLB	O19-C1-O20-C21
6	A	317	OLB	C3-C4-C5-C6
6	B	308	OLB	C5-C6-C7-C8
5	B	307	FQT	C28-C26-O25-C20
6	A	310	OLB	C4-C5-C6-C7
5	B	307	FQT	O27-C26-O25-C20
6	B	314	OLB	O23-C22-C24-O25
6	A	310	OLB	C6-C7-C8-C9
6	B	309	OLB	C1-C2-C3-C4
6	B	308	OLB	C3-C4-C5-C6
6	B	308	OLB	C2-C1-O20-C21
6	B	308	OLB	O19-C1-O20-C21
6	B	308	OLB	C2-C3-C4-C5
6	A	312	OLB	C2-C3-C4-C5
6	A	310	OLB	C2-C1-O20-C21
5	B	307	FQT	C28-C29-C30-C31
5	A	309	FQT	P15-O14-P11-O13
6	A	316	OLB	C4-C5-C6-C7
6	B	314	OLB	C6-C7-C8-C9
6	A	311	OLB	C4-C5-C6-C7
6	A	310	OLB	O19-C1-O20-C21
6	B	314	OLB	C4-C5-C6-C7
5	A	309	FQT	O18-C19-C20-O25
5	B	307	FQT	O25-C20-C21-O22
5	B	307	FQT	P11-O14-P15-O17
6	A	317	OLB	C1-C2-C3-C4
4	A	308	PGE	C1-C2-O2-C3
6	A	316	OLB	C3-C4-C5-C6
5	B	307	FQT	C19-C20-C21-O22
6	B	309	OLB	O23-C22-C24-O25
6	A	312	OLB	C3-C4-C5-C6
4	A	308	PGE	C6-C5-O3-C4
5	A	309	FQT	C21-C20-O25-C26

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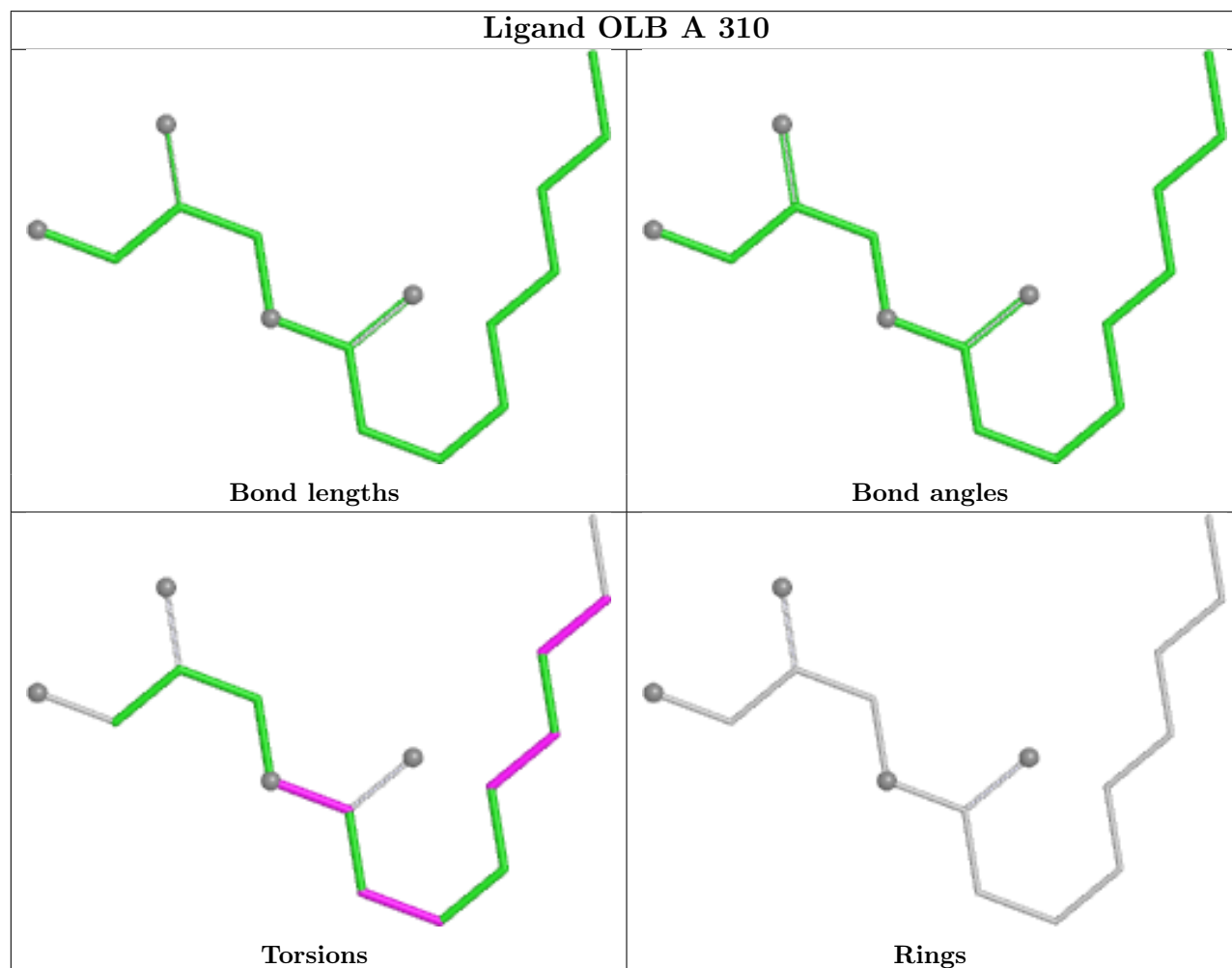
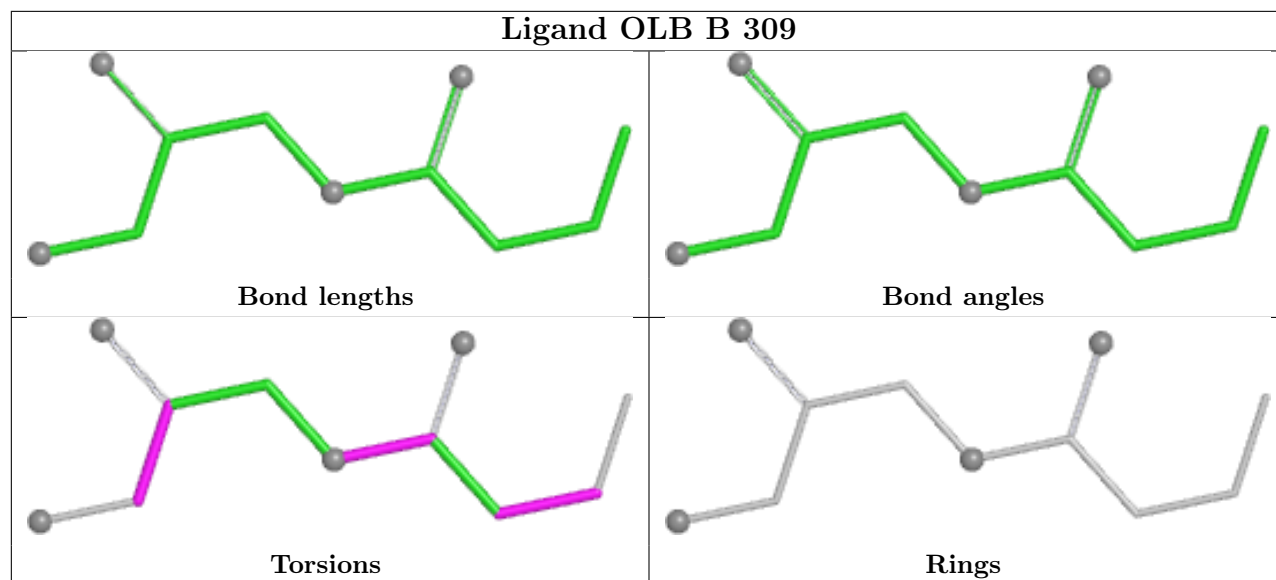
Mol	Chain	Res	Type	Atoms
6	A	312	OLB	C1-C2-C3-C4
5	A	309	FQT	P15-O14-P11-O12
5	A	309	FQT	O18-C19-C20-C21
6	B	311	OLB	C1-C2-C3-C4
6	B	311	OLB	C3-C4-C5-C6
6	B	312	OLB	C3-C4-C5-C6
4	A	308	PGE	C3-C4-O3-C5
5	B	307	FQT	P11-O14-P15-O16
5	A	309	FQT	O25-C26-C28-C29
6	A	310	OLB	C1-C2-C3-C4

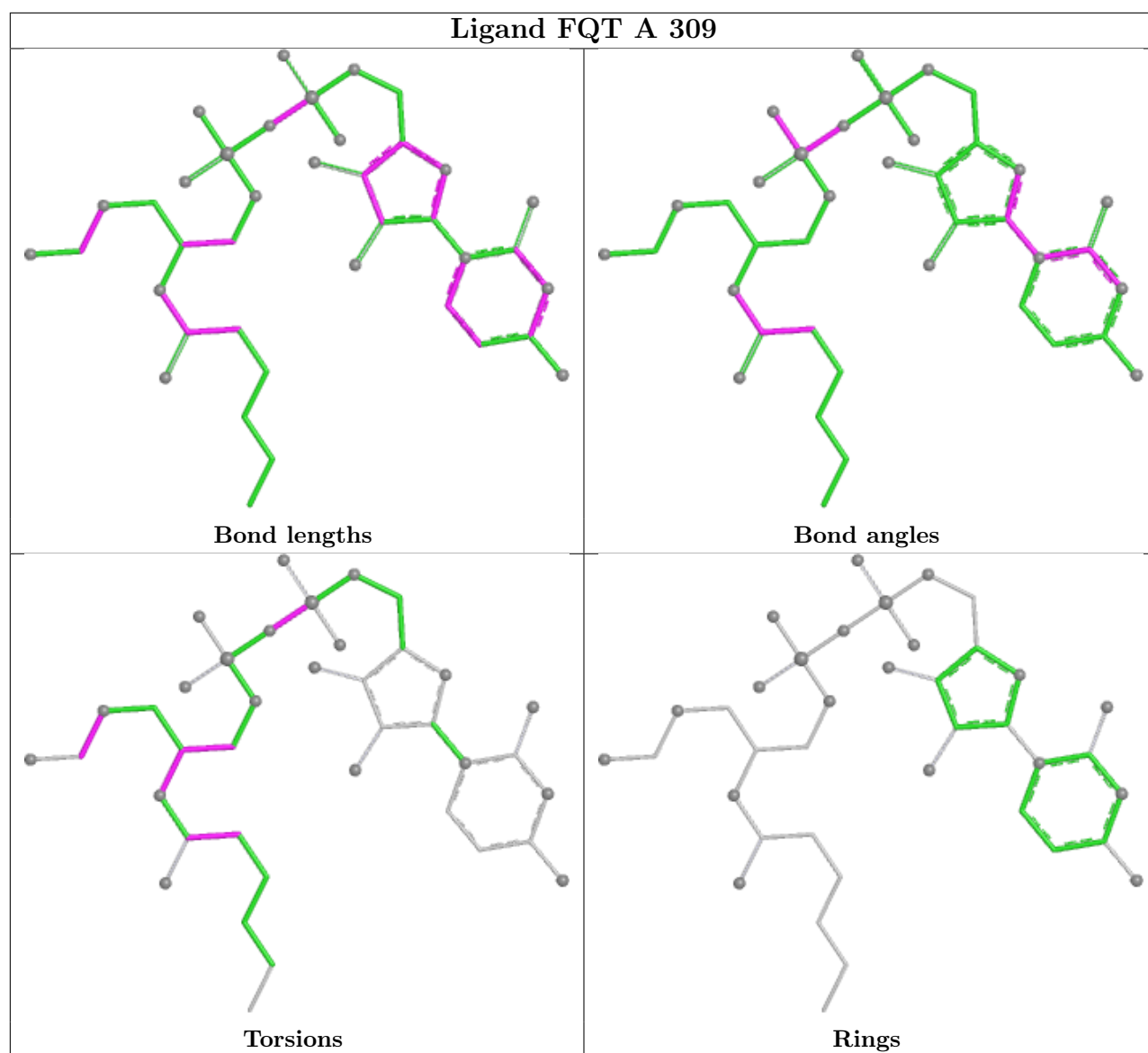
There are no ring outliers.

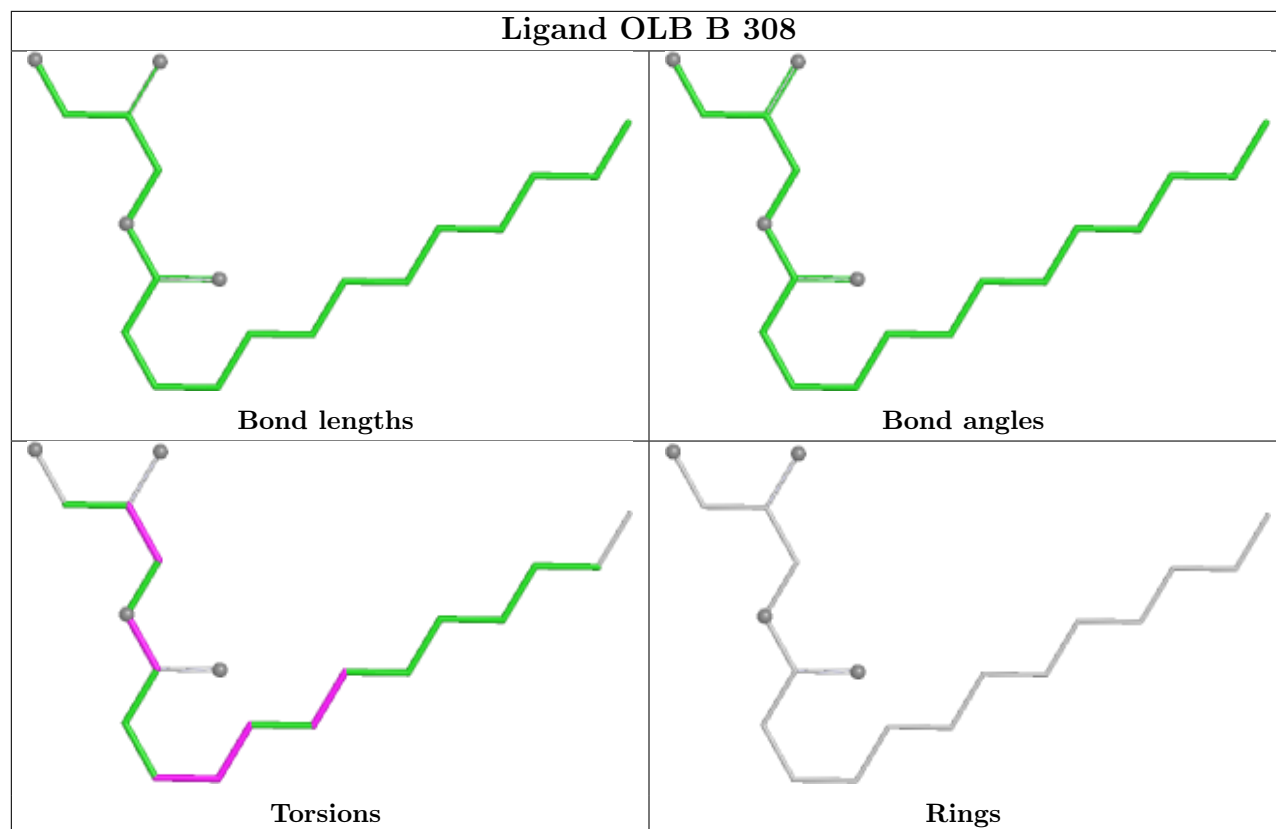
4 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	313	OLB	1	0
6	A	310	OLB	1	0
5	A	309	FQT	1	0
4	A	308	PGE	2	0

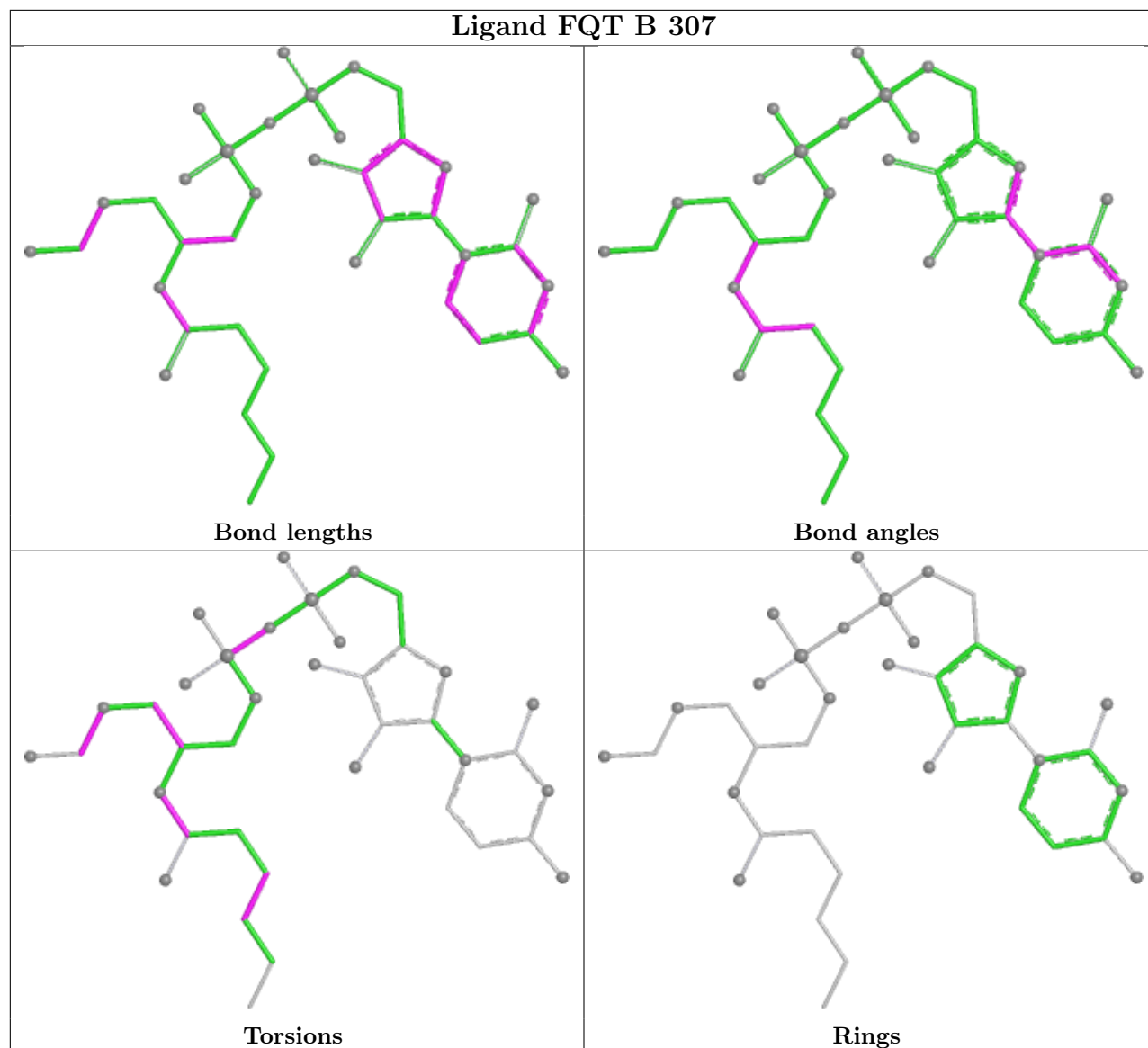
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

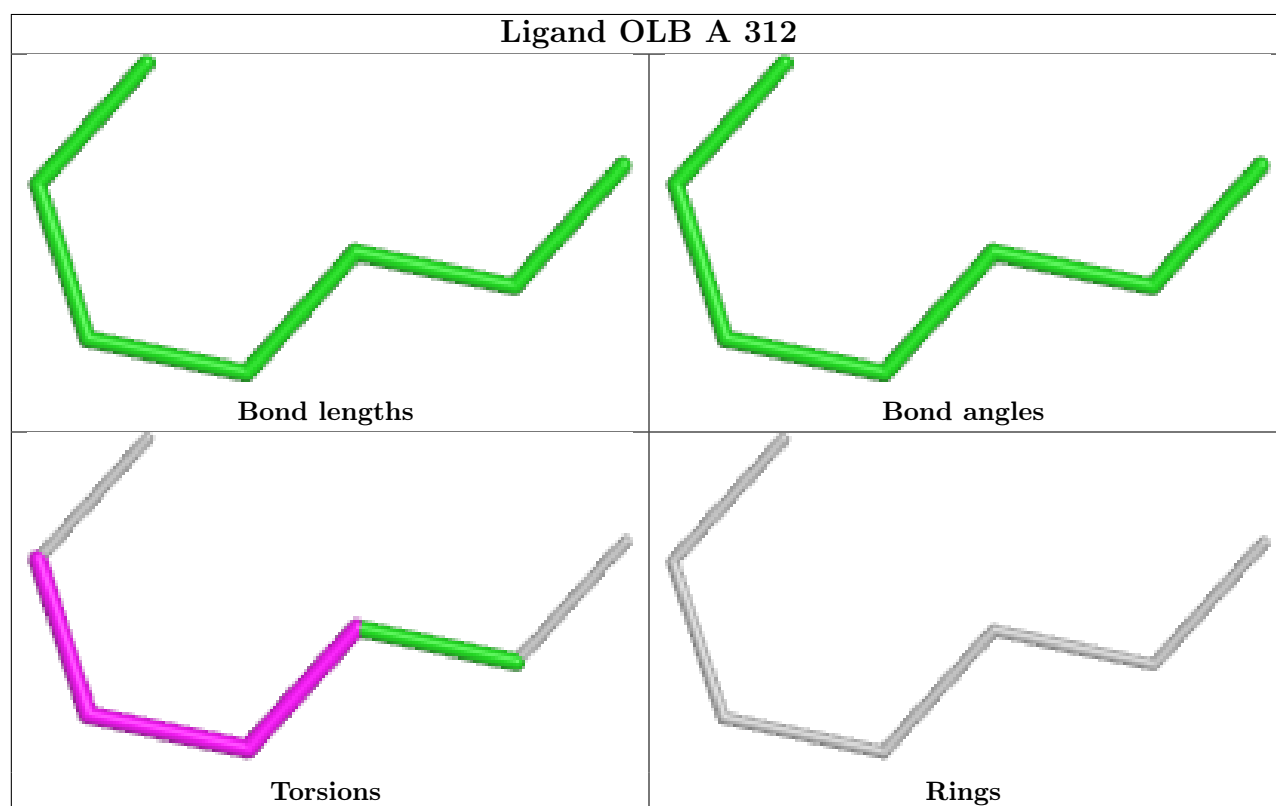
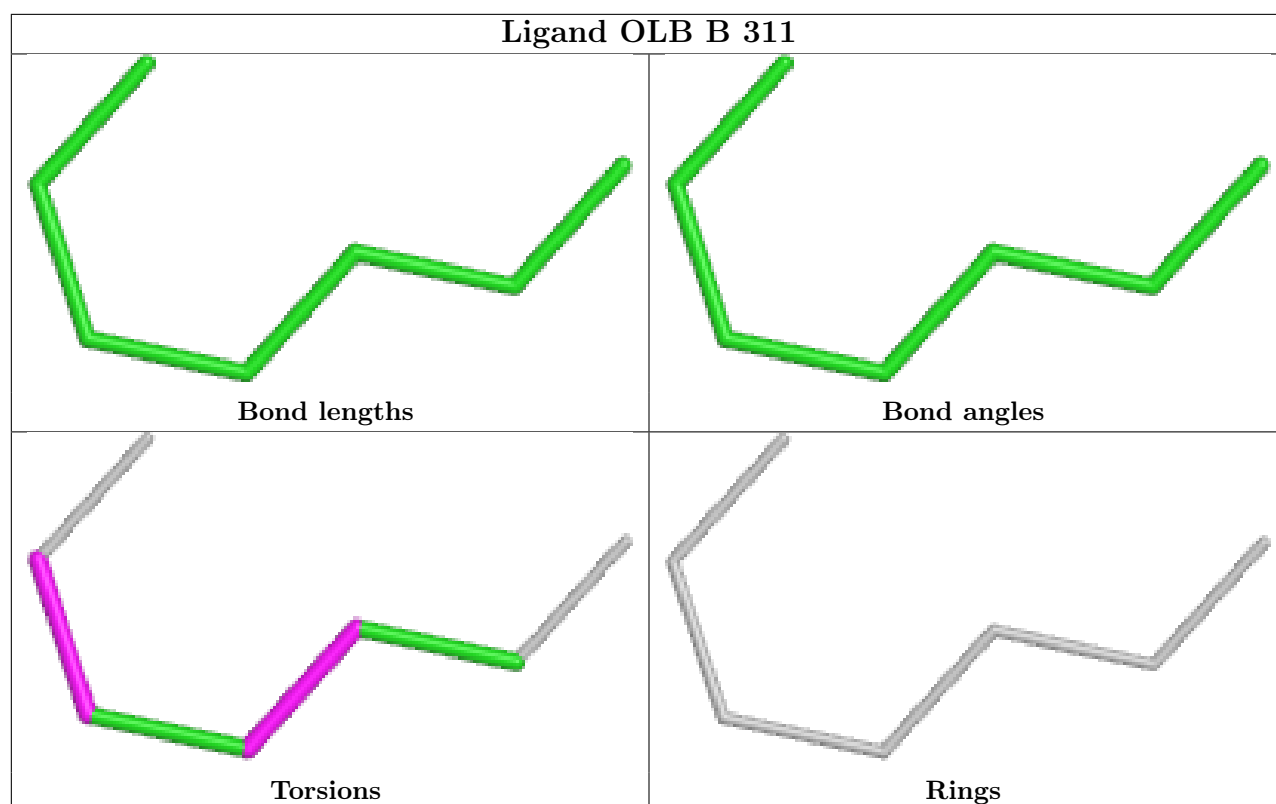


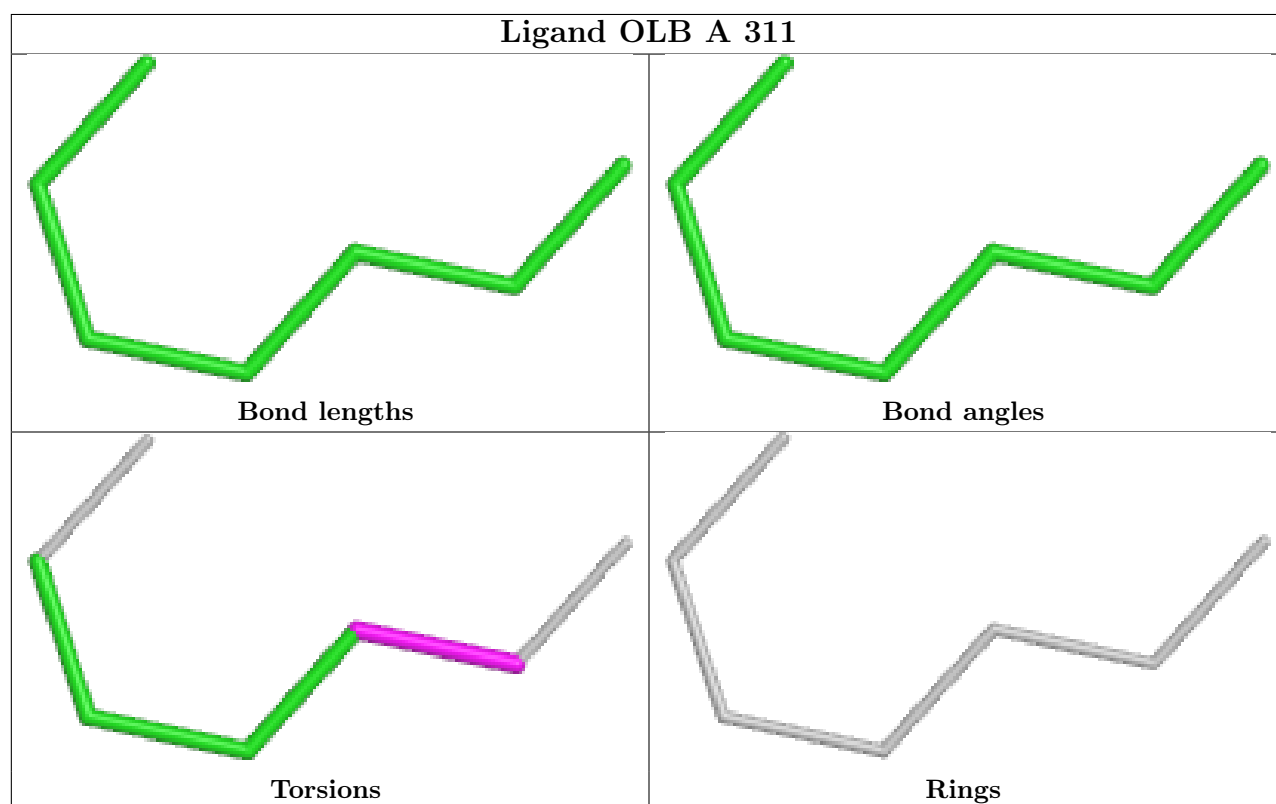
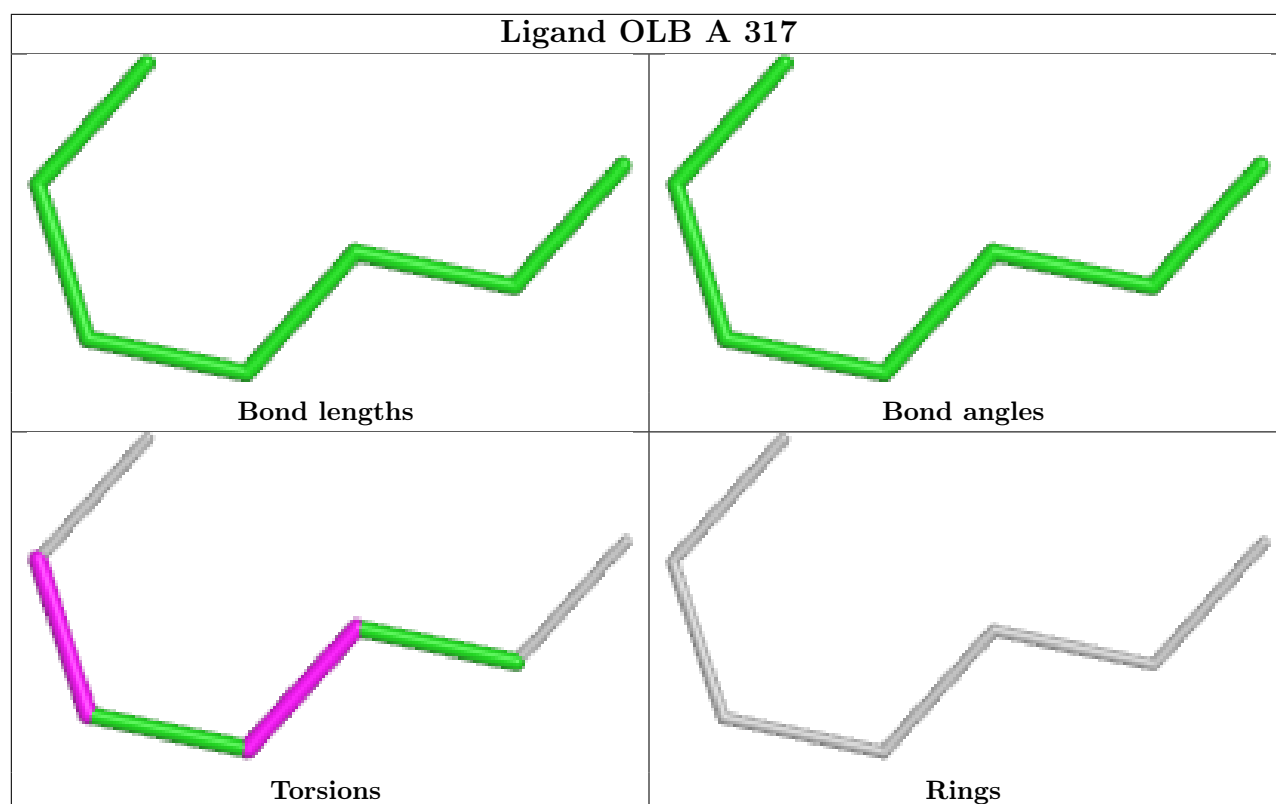


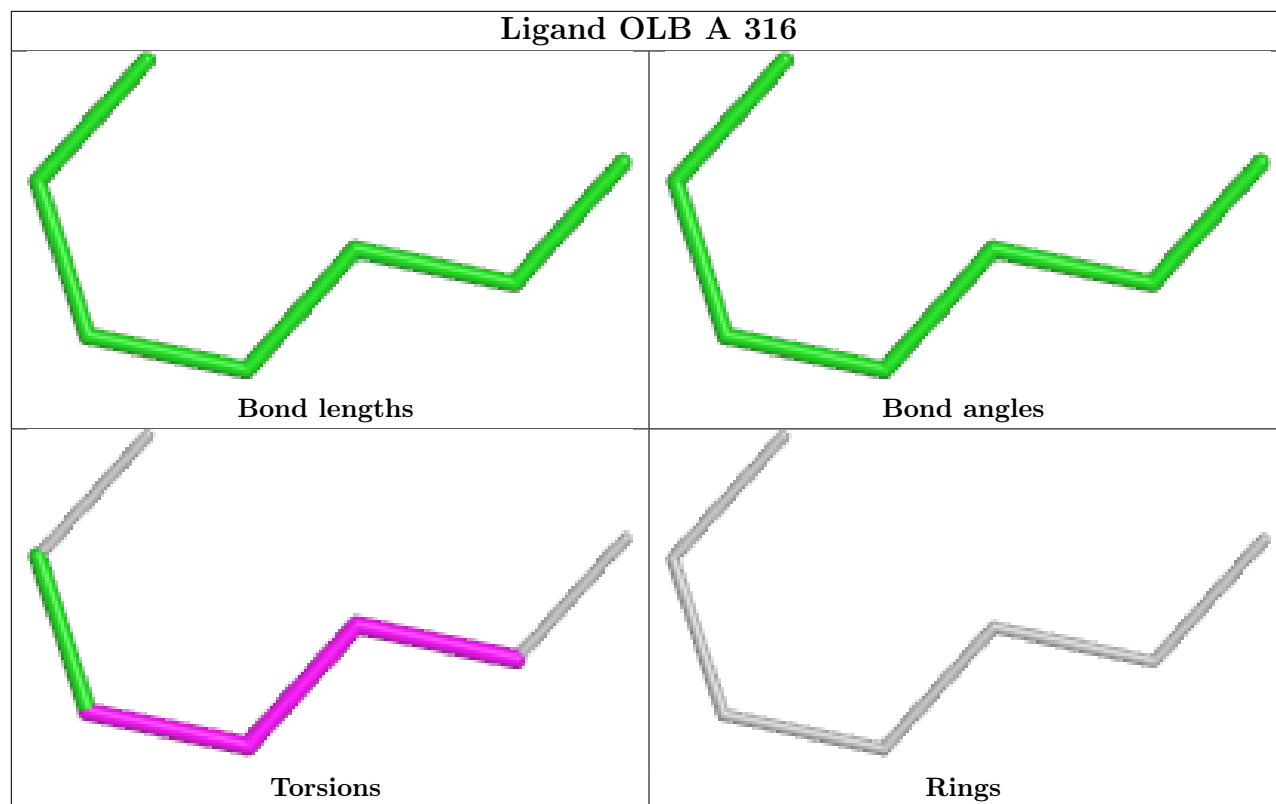


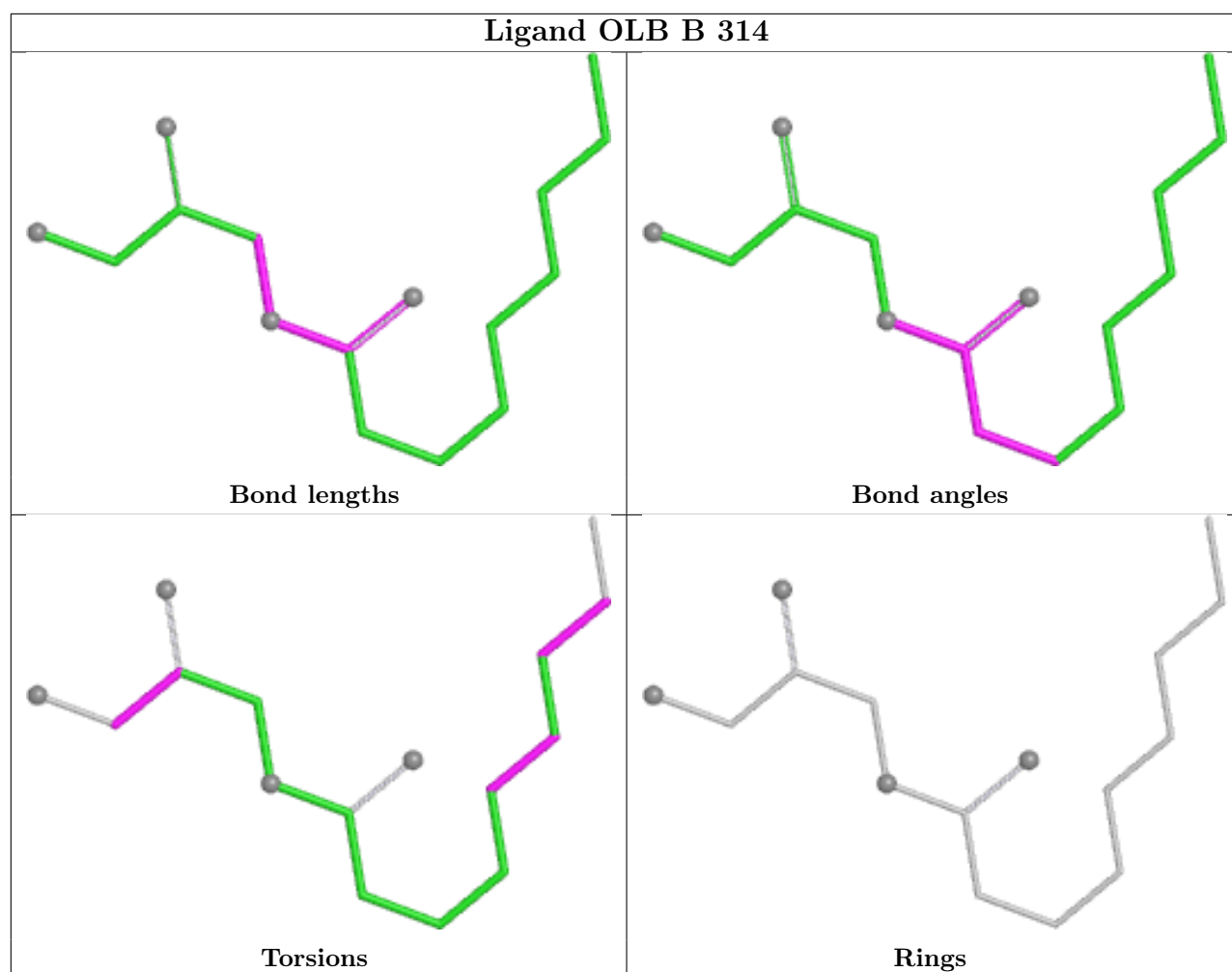
Ligand FQT B 307

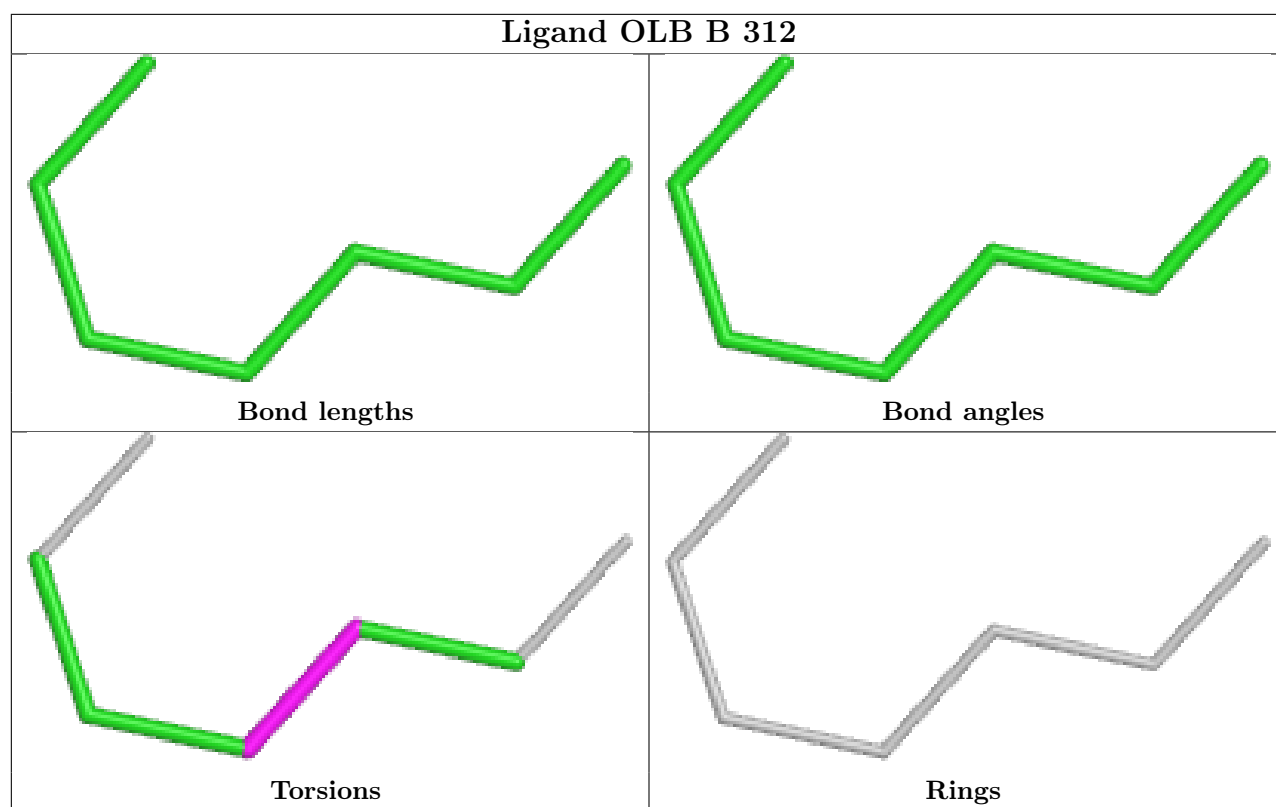












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	199/217 (91%)	0.03	7 (3%) 47 47	5, 19, 40, 63	3 (1%)
1	B	196/217 (90%)	-0.10	5 (2%) 57 57	8, 17, 37, 58	2 (1%)
All	All	395/434 (91%)	-0.03	12 (3%) 52 52	5, 18, 38, 63	5 (1%)

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	211	ILE	4.1
1	A	14	ARG	4.1
1	A	13	ALA	3.6
1	B	210	ALA	3.6
1	B	15	ILE	3.5
1	A	144	ARG	2.9
1	B	77	GLU	2.9
1	B	76	ARG	2.5
1	A	76	ARG	2.3
1	B	21	ARG	2.2
1	A	16	THR	2.2
1	A	15	ILE	2.2

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

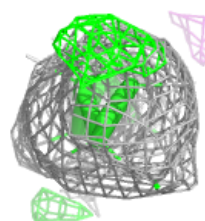
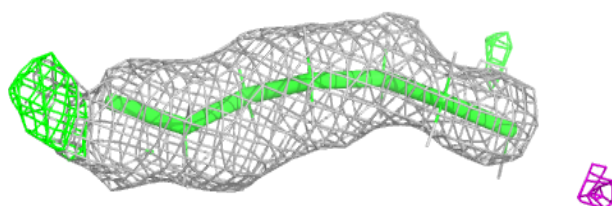
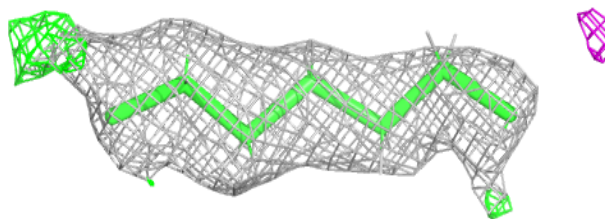
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	OLB	B	310	7/25	0.61	0.25	30,38,49,49	0
6	OLB	A	315	7/25	0.70	0.23	27,35,55,55	0
6	OLB	B	311	7/25	0.70	0.24	29,39,46,46	0
6	OLB	A	314	7/25	0.73	0.21	24,30,43,43	0
6	OLB	A	317	7/25	0.73	0.21	25,34,48,48	0
6	OLB	A	316	7/25	0.75	0.18	25,34,42,42	0
3	SO4	A	305	5/5	0.77	0.14	48,48,61,62	0
3	SO4	B	301	5/5	0.77	0.15	35,41,63,75	0
3	SO4	B	306	5/5	0.78	0.17	31,43,61,65	5
6	OLB	A	312	7/25	0.78	0.18	30,41,50,50	0
6	OLB	B	314	16/25	0.78	0.15	30,30,30,30	0
6	OLB	B	309	11/25	0.79	0.24	27,38,52,69	0
3	SO4	A	318	5/5	0.80	0.12	33,37,57,68	0
6	OLB	B	312	7/25	0.80	0.19	23,29,40,41	0
6	OLB	A	313	7/25	0.80	0.19	32,42,57,57	0
6	OLB	B	308	20/25	0.81	0.18	25,39,50,60	0
3	SO4	A	306	5/5	0.81	0.15	39,62,71,73	5
3	SO4	A	307	5/5	0.82	0.15	43,43,48,48	5
6	OLB	A	311	7/25	0.82	0.19	28,35,43,43	0
6	OLB	A	310	16/25	0.85	0.14	21,31,47,56	0
2	MG	A	302	1/1	0.87	0.09	27,27,27,27	0
3	SO4	B	304	5/5	0.89	0.14	31,37,50,62	0
5	FQT	B	307	39/44	0.90	0.15	12,41,72,77	0
3	SO4	A	304	5/5	0.91	0.11	32,35,43,63	0
2	MG	B	302	1/1	0.91	0.07	31,31,31,31	0
4	PGE	A	308	10/10	0.91	0.12	22,35,51,76	0
3	SO4	A	303	5/5	0.92	0.10	30,35,53,55	0
7	1PE	B	313	16/16	0.92	0.11	15,31,49,74	0
3	SO4	B	305	5/5	0.93	0.09	28,34,49,52	0
2	MG	A	301	1/1	0.95	0.10	26,26,26,26	0
5	FQT	A	309	39/44	0.95	0.12	10,24,60,68	0
2	MG	B	303	1/1	0.95	0.06	26,26,26,26	0

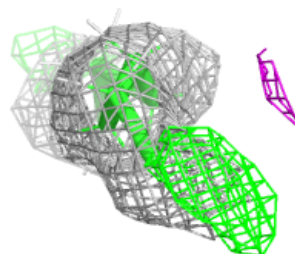
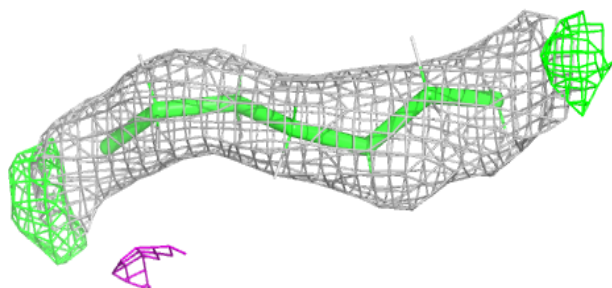
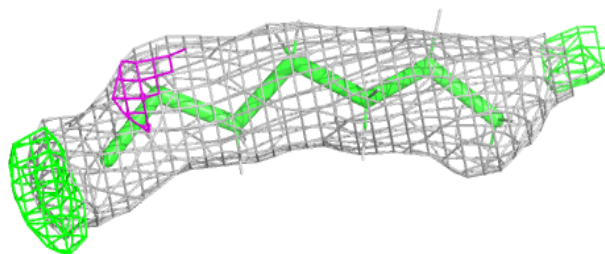
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around OLB B 311:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

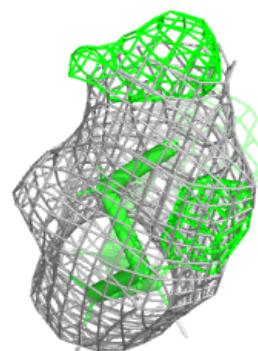
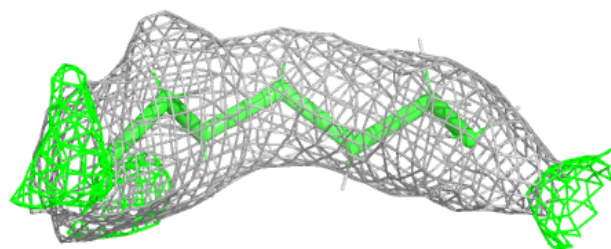
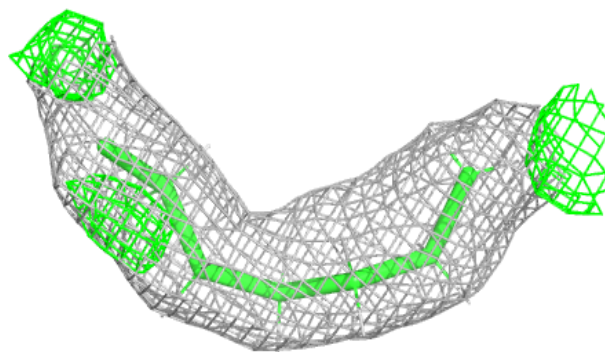
**Electron density around OLB A 317:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

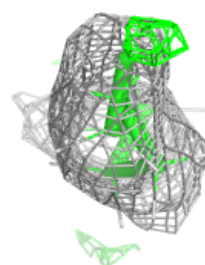
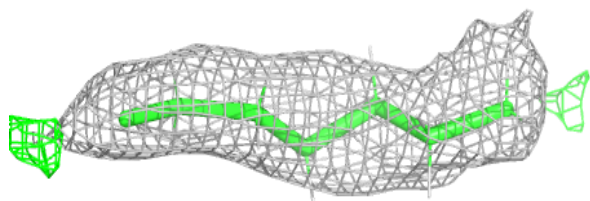
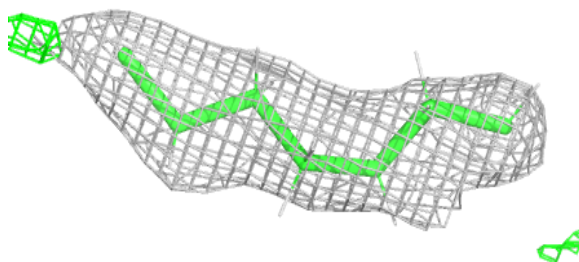


Electron density around OLB A 316:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

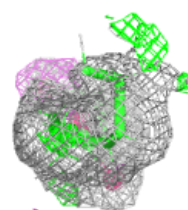
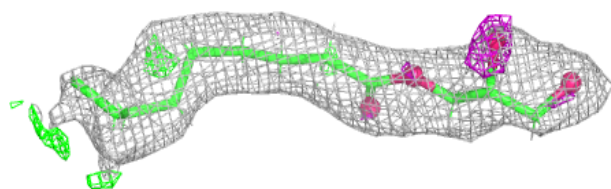
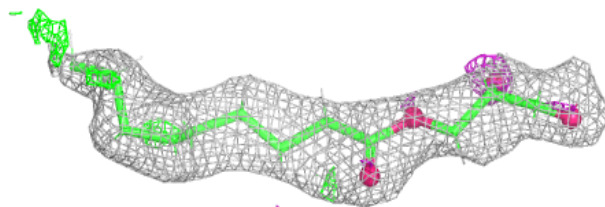
**Electron density around OLB A 312:**

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

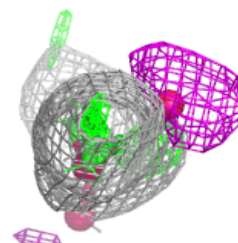
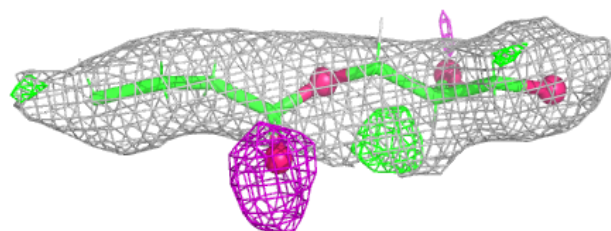
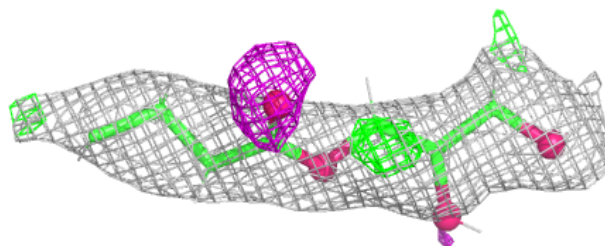


Electron density around OLB B 314:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

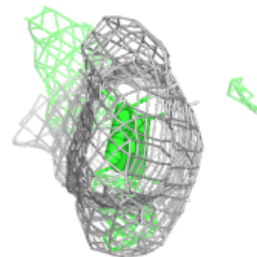
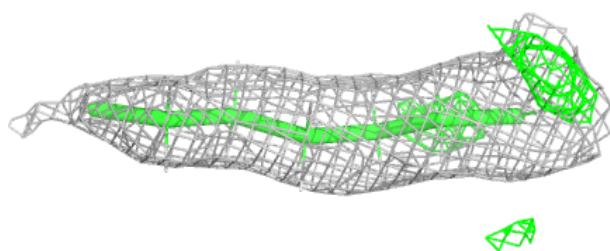
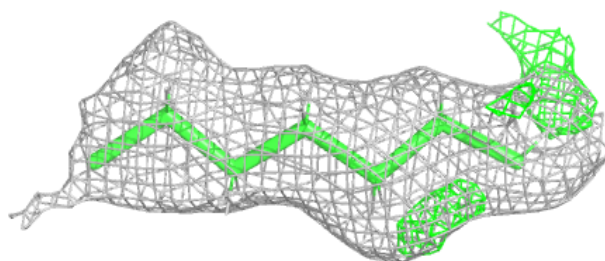
**Electron density around OLB B 309:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

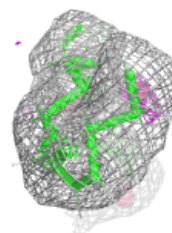
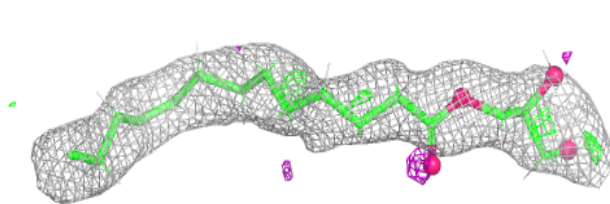
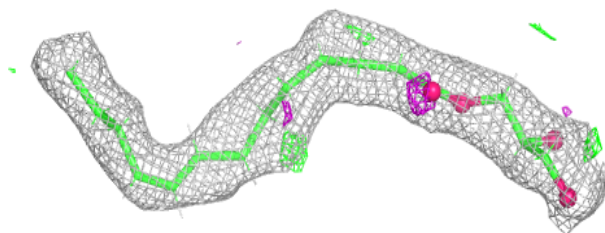


Electron density around OLB B 312:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

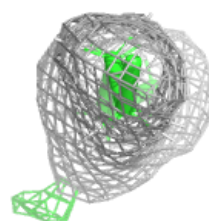
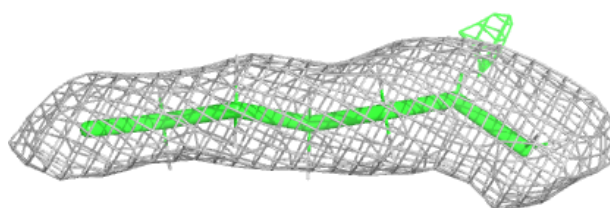
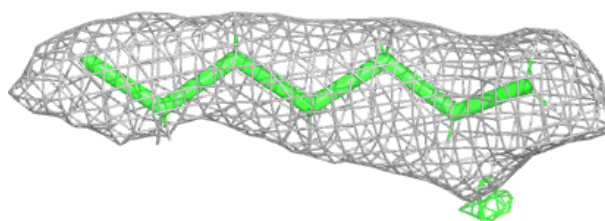
**Electron density around OLB B 308:**

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

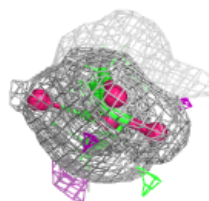
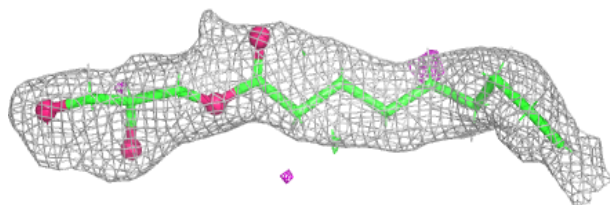
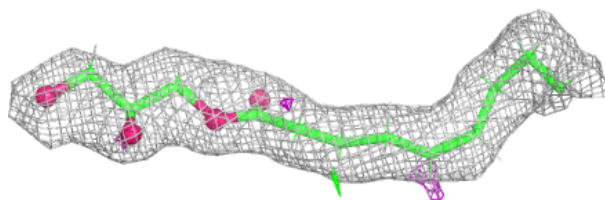


Electron density around OLB A 311:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

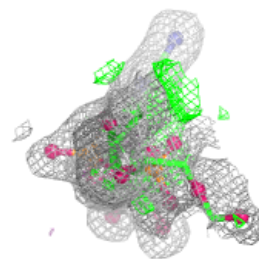
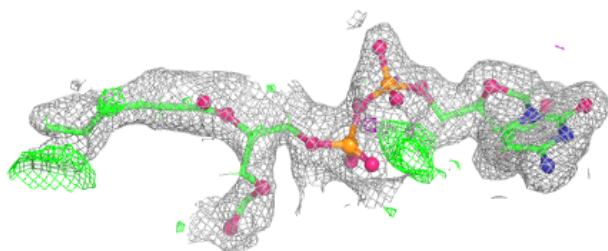
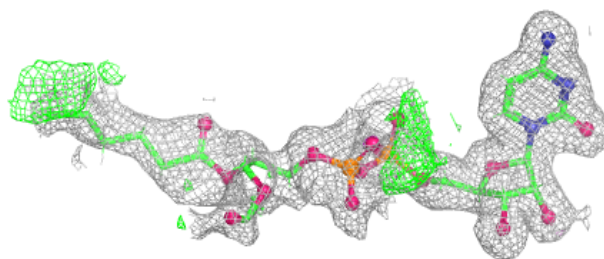
**Electron density around OLB A 310:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

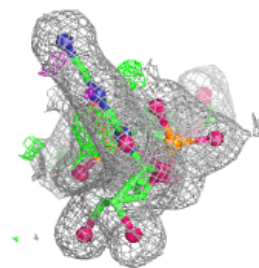
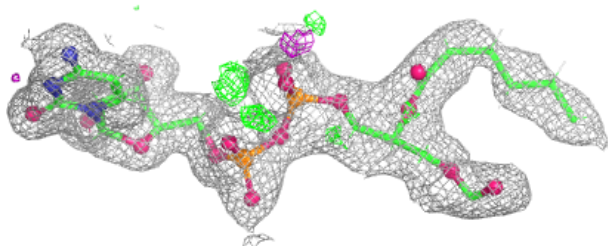
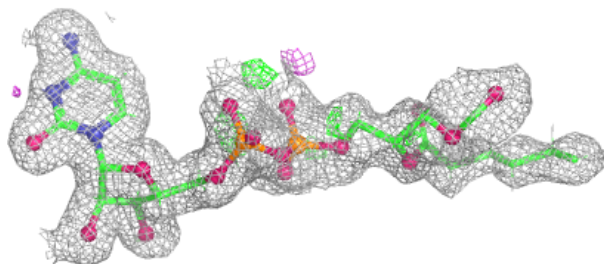


Electron density around FQT B 307:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

**Electron density around FQT A 309:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers [i](#)

There are no such residues in this entry.