



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 16, 2024 – 10:53 AM EDT

PDB ID : 4X5M
Title : Crystal structure of SemiSWEET in the inward-open conformation
Authors : Lee, Y.; Nishizawa, T.; Yamashita, K.; Ishitani, R.; Nureki, O.
Deposited on : 2014-12-05
Resolution : 2.00 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 : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.37.1
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.37.1

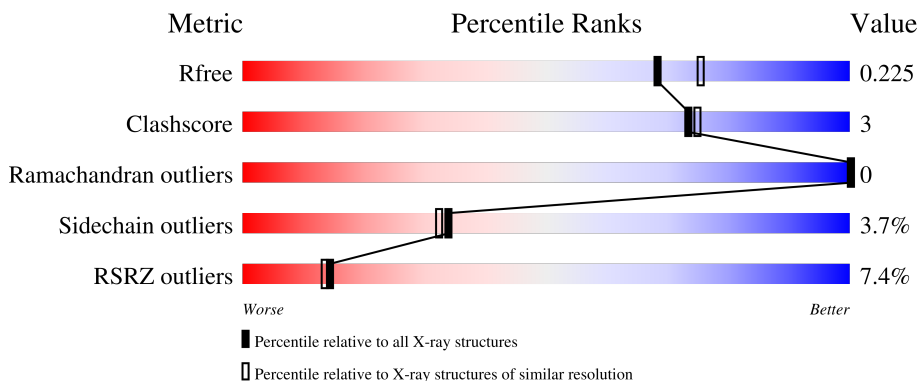
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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}	130704	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (2.00-2.00)

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	100	 7% 79% 5% 14%
1	B	100	 6% 84% 9% 7%
1	C	100	 7% 88% 5% 7%

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
4	SO4	B	201	-	-	X	-

2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 2402 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 Uncharacterized protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	86	666	447	108	108	3	0	0	0
1	B	93	707	474	111	119	3	0	0	0
1	C	93	704	471	113	117	3	0	0	0

There are 33 discrepancies between the modelled and reference sequences:

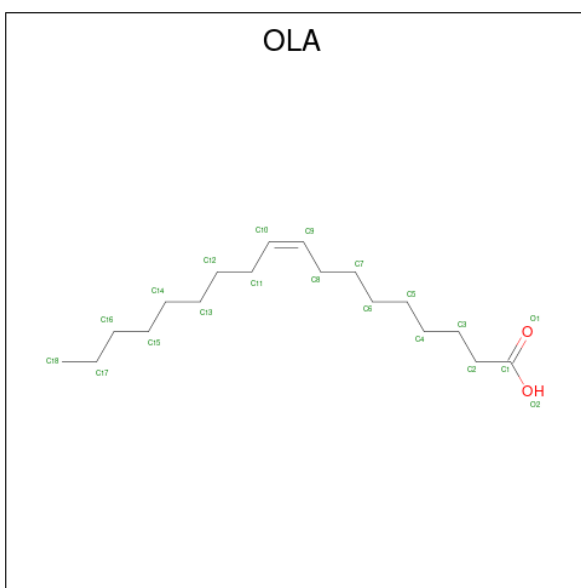
Chain	Residue	Modelled	Actual	Comment	Reference
A	90	LEU	-	expression tag	UNP T8UDF6
A	91	GLU	-	expression tag	UNP T8UDF6
A	92	SER	-	expression tag	UNP T8UDF6
A	93	SER	-	expression tag	UNP T8UDF6
A	94	GLY	-	expression tag	UNP T8UDF6
A	95	GLU	-	expression tag	UNP T8UDF6
A	96	ASN	-	expression tag	UNP T8UDF6
A	97	LEU	-	expression tag	UNP T8UDF6
A	98	TYR	-	expression tag	UNP T8UDF6
A	99	PHE	-	expression tag	UNP T8UDF6
A	100	GLN	-	expression tag	UNP T8UDF6
B	90	LEU	-	expression tag	UNP T8UDF6
B	91	GLU	-	expression tag	UNP T8UDF6
B	92	SER	-	expression tag	UNP T8UDF6
B	93	SER	-	expression tag	UNP T8UDF6
B	94	GLY	-	expression tag	UNP T8UDF6
B	95	GLU	-	expression tag	UNP T8UDF6
B	96	ASN	-	expression tag	UNP T8UDF6
B	97	LEU	-	expression tag	UNP T8UDF6
B	98	TYR	-	expression tag	UNP T8UDF6
B	99	PHE	-	expression tag	UNP T8UDF6
B	100	GLN	-	expression tag	UNP T8UDF6
C	90	LEU	-	expression tag	UNP T8UDF6

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Chain	Residue	Modelled	Actual	Comment	Reference
C	91	GLU	-	expression tag	UNP T8UDF6
C	92	SER	-	expression tag	UNP T8UDF6
C	93	SER	-	expression tag	UNP T8UDF6
C	94	GLY	-	expression tag	UNP T8UDF6
C	95	GLU	-	expression tag	UNP T8UDF6
C	96	ASN	-	expression tag	UNP T8UDF6
C	97	LEU	-	expression tag	UNP T8UDF6
C	98	TYR	-	expression tag	UNP T8UDF6
C	99	PHE	-	expression tag	UNP T8UDF6
C	100	GLN	-	expression tag	UNP T8UDF6

- Molecule 2 is OLEIC ACID (three-letter code: OLA) (formula: $C_{18}H_{34}O_2$).



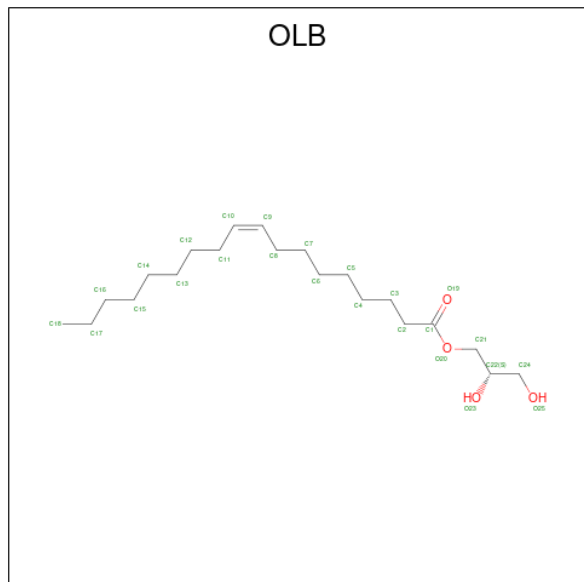
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 20 18 2	0	0
2	A	1	Total C O 20 18 2	0	0
2	A	1	Total C 7 7	0	0
2	B	1	Total C O 20 18 2	0	0
2	B	1	Total C O 14 12 2	0	0
2	B	1	Total C O 20 18 2	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total C 9 9	0	0
2	B	1	Total C O 15 13 2	0	0
2	B	1	Total C O 8 6 2	0	0
2	B	1	Total C 8 8	0	0
2	C	1	Total C O 20 18 2	0	0

- Molecule 3 is (2S)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (three-letter code: OLB) (formula: C₂₁H₄₀O₄).



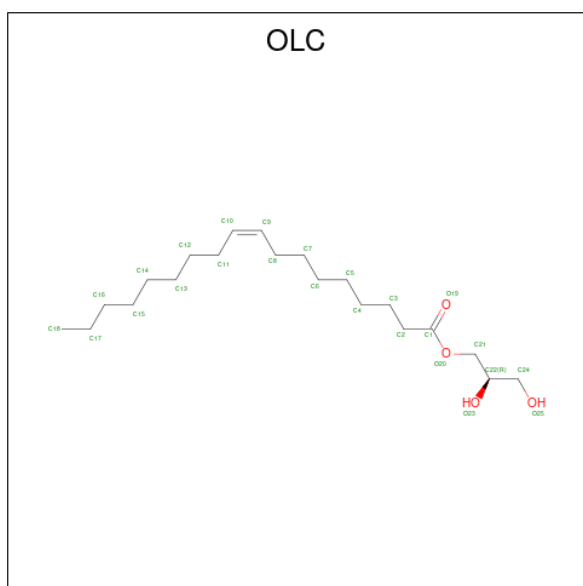
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 25 21 4	0	0
3	B	1	Total C O 22 18 4	0	0

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



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

- Molecule 5 is (2R)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (three-letter code: OLC) (formula: C₂₁H₄₀O₄).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total C O 25 21 4	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
5	B	1	16	12	4	0	0

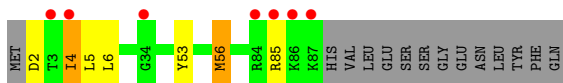
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	23	Total	O	0	0
			23	23		
6	B	23	Total	O	0	0
			23	23		
6	C	20	Total	O	0	0
			20	20		

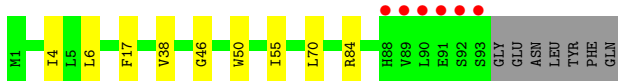
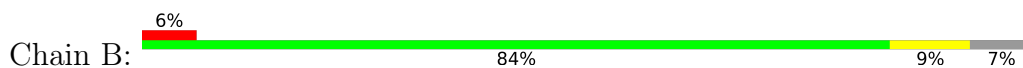
3 Residue-property plots [i](#)

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.

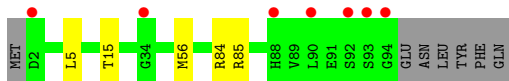
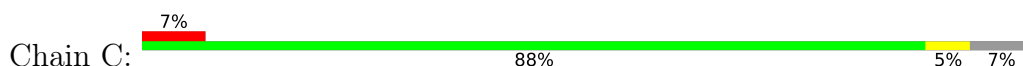
- Molecule 1: Uncharacterized protein



- Molecule 1: Uncharacterized protein



- Molecule 1: Uncharacterized protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	53.68Å 102.12Å 58.95Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.52 – 2.00 47.52 – 2.00	Depositor EDS
% Data completeness (in resolution range)	99.9 (47.52-2.00) 93.9 (47.52-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.78 (at 2.00Å)	Xtrriage
Refinement program	PHENIX (phenix.refine: 1.9_1692)	Depositor
R, R_{free}	0.197 , 0.224 0.198 , 0.225	Depositor DCC
R_{free} test set	2260 reflections (10.01%)	wwPDB-VP
Wilson B-factor (Å ²)	30.1	Xtrriage
Anisotropy	0.490	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 61.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	2402	wwPDB-VP
Average B, all atoms (Å ²)	38.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.75% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: OLA, OLB, SO4, OLC

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	0.22	0/679	0.39	0/924
1	B	0.22	0/721	0.40	0/983
1	C	0.22	0/718	0.39	0/979
All	All	0.22	0/2118	0.39	0/2886

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 [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	666	0	710	3	0
1	B	707	0	740	8	0
1	C	704	0	734	4	0
2	A	47	0	79	1	0
2	B	94	0	141	3	0
2	C	20	0	33	0	0
3	A	25	0	40	1	0
3	B	22	0	31	1	0
4	B	5	0	0	2	0
4	C	5	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	41	0	61	1	0
6	A	23	0	0	1	0
6	B	23	0	0	0	0
6	C	20	0	0	0	0
All	All	2402	0	2569	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 3.

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)
2:A:201:OLA:H151	2:A:202:OLA:H142	1.75	0.68
2:B:206:OLA:H22	2:B:207:OLA:H21	1.76	0.68
1:A:53:TYR:HA	1:A:56:MET:HE2	1.82	0.62
1:C:84:ARG:NH1	4:C:201:SO4:O1	2.31	0.61
1:B:84:ARG:NH1	4:B:201:SO4:O4	2.35	0.57
1:B:17:PHE:HE2	3:B:211:OLB:H30	1.71	0.54
1:A:2:ASP:N	6:A:315:HOH:O	2.41	0.53
1:B:4:ILE:HA	1:C:56:MET:HE1	1.92	0.51
5:B:209:OLC:H11A	5:B:209:OLC:H8	1.69	0.47
1:B:50:TRP:CD1	1:C:15:THR:HG21	2.49	0.47
1:B:70:LEU:HD21	2:B:204:OLA:H121	1.97	0.45
1:A:4:ILE:HG13	1:A:5:LEU:N	2.32	0.44
1:B:55:ILE:HD11	2:B:205:OLA:H132	1.98	0.44
1:B:84:ARG:NH1	4:B:201:SO4:O2	2.51	0.42
3:A:204:OLB:H34	3:A:204:OLB:H29	1.74	0.42
1:B:46:GLY:HA3	1:C:15:THR:HG23	2.03	0.41

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	84/100 (84%)	84 (100%)	0	0	100	100
1	B	91/100 (91%)	91 (100%)	0	0	100	100
1	C	91/100 (91%)	91 (100%)	0	0	100	100
All	All	266/300 (89%)	266 (100%)	0	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	70/86 (81%)	66 (94%)	4 (6%)	20	16
1	B	74/86 (86%)	72 (97%)	2 (3%)	44	46
1	C	73/86 (85%)	71 (97%)	2 (3%)	44	46
All	All	217/258 (84%)	209 (96%)	8 (4%)	34	32

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	ILE
1	A	6	LEU
1	A	56	MET
1	A	85	ARG
1	B	6	LEU
1	B	38	VAL
1	C	5	LEU
1	C	85	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	83	ASN
1	C	88	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

17 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
2	OLA	B	203	-	13,13,19	0.57	0	12,13,19	1.17	0
2	OLA	B	205	-	8,8,19	0.11	0	7,7,19	0.81	0
2	OLA	B	206	-	14,14,19	0.54	0	14,14,19	1.02	0
2	OLA	A	202	-	19,19,19	0.48	0	19,19,19	1.04	1 (5%)
4	SO4	C	201	-	4,4,4	0.14	0	6,6,6	0.07	0
2	OLA	B	204	-	19,19,19	0.47	0	19,19,19	1.00	0
3	OLB	B	211	-	21,21,24	0.75	2 (9%)	22,22,25	0.99	1 (4%)
2	OLA	A	201	-	19,19,19	0.47	0	19,19,19	1.03	1 (5%)
2	OLA	A	203	-	6,6,19	0.13	0	5,5,19	0.72	0
2	OLA	B	207	-	7,7,19	0.73	0	7,7,19	1.27	0
3	OLB	A	204	-	24,24,24	0.69	1 (4%)	25,25,25	0.95	1 (4%)
5	OLC	B	209	-	24,24,24	0.69	1 (4%)	25,25,25	0.97	1 (4%)
5	OLC	B	210	-	15,15,24	0.85	1 (6%)	16,16,25	0.95	1 (6%)
2	OLA	B	202	-	19,19,19	0.47	0	19,19,19	1.04	1 (5%)
2	OLA	B	208	-	7,7,19	0.12	0	6,6,19	0.76	0
4	SO4	B	201	-	4,4,4	0.15	0	6,6,6	0.05	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	OLA	C	202	-	19,19,19	0.47	0	19,19,19	1.03	1 (5%)

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	OLA	B	203	-	-	6/11/11/17	-
2	OLA	B	205	-	-	1/6/6/17	-
2	OLA	B	206	-	-	7/12/12/17	-
2	OLA	A	202	-	-	9/17/17/17	-
2	OLA	B	204	-	-	12/17/17/17	-
3	OLB	B	211	-	-	8/21/21/24	-
2	OLA	A	201	-	-	4/17/17/17	-
2	OLA	A	203	-	-	2/4/4/17	-
2	OLA	B	207	-	-	3/5/5/17	-
3	OLB	A	204	-	-	14/24/24/24	-
5	OLC	B	209	-	-	7/24/24/24	-
5	OLC	B	210	-	-	3/15/15/24	-
2	OLA	B	202	-	-	3/17/17/17	-
2	OLA	B	208	-	-	1/5/5/17	-
2	OLA	C	202	-	-	10/17/17/17	-

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	210	OLC	O20-C1	2.60	1.40	1.33
3	A	204	OLB	O20-C1	2.57	1.40	1.33
5	B	209	OLC	O20-C1	2.53	1.40	1.33
3	B	211	OLB	O20-C1	2.45	1.40	1.33
3	B	211	OLB	O20-C21	-2.07	1.40	1.45

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	211	OLB	O20-C1-C2	2.60	120.07	111.91
3	A	204	OLB	O20-C1-C2	2.57	119.97	111.91
5	B	210	OLC	O20-C1-C2	2.33	119.22	111.91

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	209	OLC	O20-C1-C2	2.21	118.86	111.91
2	A	202	OLA	C3-C2-C1	-2.12	109.13	114.47
2	C	202	OLA	C3-C2-C1	-2.10	109.19	114.47
2	A	201	OLA	C3-C2-C1	-2.07	109.25	114.47
2	B	202	OLA	C3-C2-C1	-2.01	109.40	114.47

There are no chirality outliers.

All (90) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	204	OLB	O20-C21-C22-C24
3	B	211	OLB	O19-C1-O20-C21
3	B	211	OLB	C2-C1-O20-C21
3	A	204	OLB	O20-C21-C22-O23
2	B	202	OLA	C1-C2-C3-C4
2	B	203	OLA	C1-C2-C3-C4
2	A	202	OLA	C1-C2-C3-C4
2	B	204	OLA	C1-C2-C3-C4
3	A	204	OLB	C1-C2-C3-C4
5	B	210	OLC	C1-C2-C3-C4
2	B	206	OLA	C1-C2-C3-C4
5	B	209	OLC	C2-C1-O20-C21
5	B	209	OLC	C6-C7-C8-C9
3	A	204	OLB	C5-C6-C7-C8
2	C	202	OLA	C3-C4-C5-C6
2	A	203	OLA	C14-C15-C16-C17
3	A	204	OLB	C21-C22-C24-O25
2	B	203	OLA	C6-C7-C8-C9
2	B	204	OLA	C11-C12-C13-C14
5	B	209	OLC	O19-C1-O20-C21
2	C	202	OLA	C12-C13-C14-C15
5	B	209	OLC	C12-C13-C14-C15
2	B	206	OLA	C3-C4-C5-C6
3	A	204	OLB	O23-C22-C24-O25
3	B	211	OLB	O20-C21-C22-O23
2	B	204	OLA	C4-C5-C6-C7
2	C	202	OLA	C6-C7-C8-C9
3	B	211	OLB	C10-C11-C12-C13
3	B	211	OLB	O20-C21-C22-C24
2	A	202	OLA	C11-C12-C13-C14
3	B	211	OLB	C6-C7-C8-C9
5	B	210	OLC	C2-C3-C4-C5

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Mol	Chain	Res	Type	Atoms
2	B	207	OLA	C1-C2-C3-C4
2	C	202	OLA	C11-C12-C13-C14
2	A	201	OLA	C3-C4-C5-C6
5	B	209	OLC	C3-C4-C5-C6
2	C	202	OLA	C1-C2-C3-C4
2	B	204	OLA	C6-C7-C8-C9
3	A	204	OLB	C10-C11-C12-C13
3	A	204	OLB	C14-C15-C16-C17
3	B	211	OLB	C12-C13-C14-C15
2	A	201	OLA	C1-C2-C3-C4
2	B	204	OLA	C14-C15-C16-C17
3	B	211	OLB	C4-C5-C6-C7
2	A	203	OLA	C15-C16-C17-C18
2	B	204	OLA	C3-C4-C5-C6
2	A	201	OLA	C4-C5-C6-C7
3	A	204	OLB	C2-C3-C4-C5
5	B	210	OLC	C6-C7-C8-C9
5	B	209	OLC	C13-C14-C15-C16
2	B	204	OLA	C5-C6-C7-C8
2	B	205	OLA	C12-C13-C14-C15
2	C	202	OLA	C5-C6-C7-C8
2	B	204	OLA	C2-C3-C4-C5
2	C	202	OLA	C4-C5-C6-C7
2	A	202	OLA	C6-C7-C8-C9
3	A	204	OLB	C15-C16-C17-C18
3	A	204	OLB	C6-C7-C8-C9
2	B	206	OLA	C5-C6-C7-C8
2	A	202	OLA	C3-C4-C5-C6
2	B	203	OLA	O1-C1-C2-C3
2	A	202	OLA	C9-C10-C11-C12
2	B	203	OLA	C7-C8-C9-C10
2	B	206	OLA	O1-C1-C2-C3
2	B	206	OLA	O2-C1-C2-C3
2	B	203	OLA	C5-C6-C7-C8
2	B	208	OLA	C3-C4-C5-C6
5	B	209	OLC	C15-C16-C17-C18
2	A	202	OLA	O1-C1-C2-C3
2	B	203	OLA	O2-C1-C2-C3
2	A	202	OLA	O2-C1-C2-C3
2	A	202	OLA	C12-C13-C14-C15
2	B	204	OLA	O2-C1-C2-C3
3	A	204	OLB	C2-C1-O20-C21

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Mol	Chain	Res	Type	Atoms
2	B	204	OLA	O1-C1-C2-C3
2	B	204	OLA	C7-C8-C9-C10
3	A	204	OLB	C11-C12-C13-C14
2	B	206	OLA	C7-C8-C9-C10
2	C	202	OLA	C7-C8-C9-C10
2	A	201	OLA	C9-C10-C11-C12
3	A	204	OLB	O19-C1-O20-C21
2	C	202	OLA	O2-C1-C2-C3
2	A	202	OLA	C7-C8-C9-C10
2	B	202	OLA	C7-C8-C9-C10
2	B	204	OLA	C9-C10-C11-C12
2	B	206	OLA	C9-C10-C11-C12
2	B	207	OLA	O2-C1-C2-C3
2	C	202	OLA	O1-C1-C2-C3
2	B	202	OLA	O2-C1-C2-C3
2	B	207	OLA	O1-C1-C2-C3

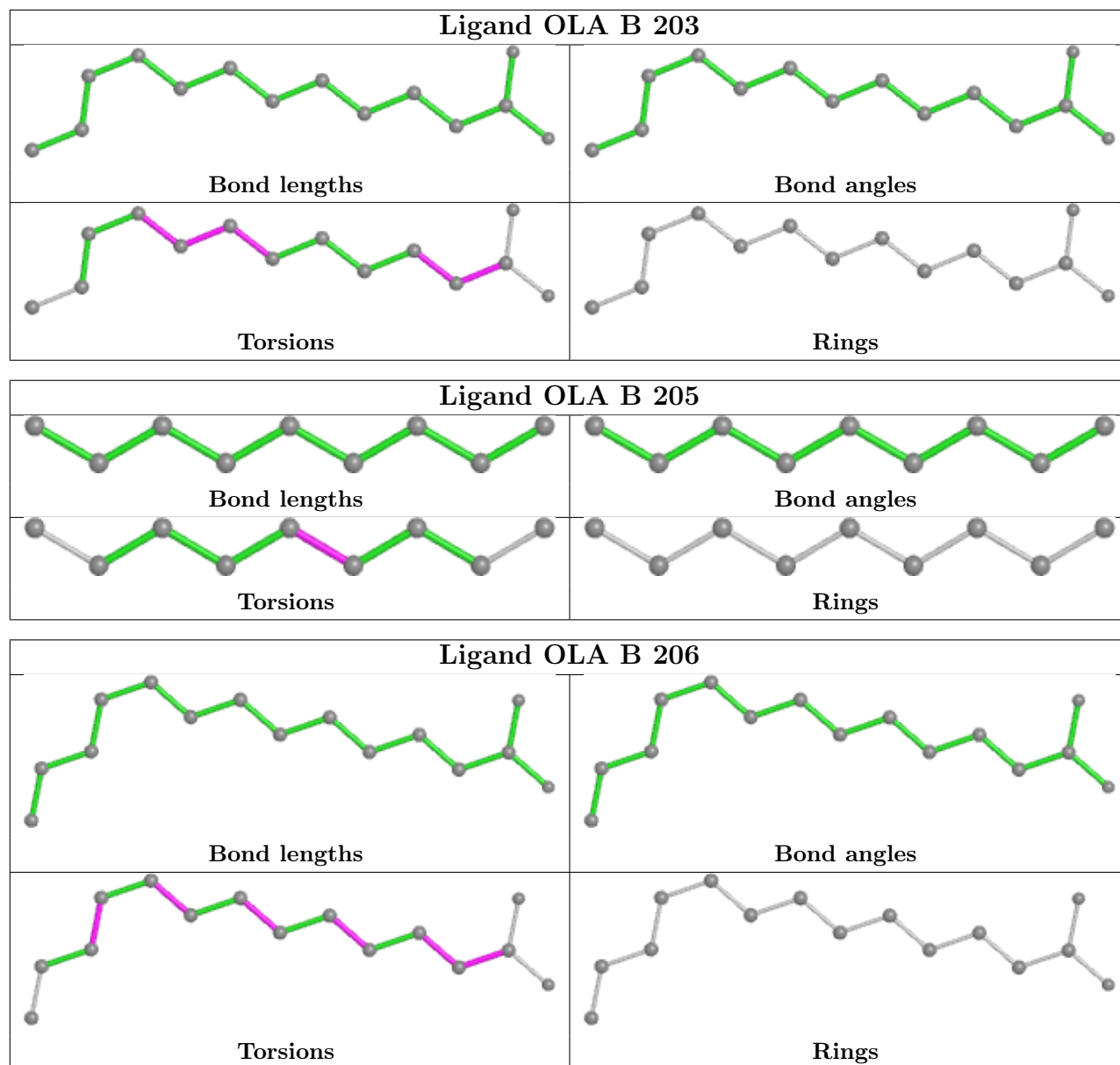
There are no ring outliers.

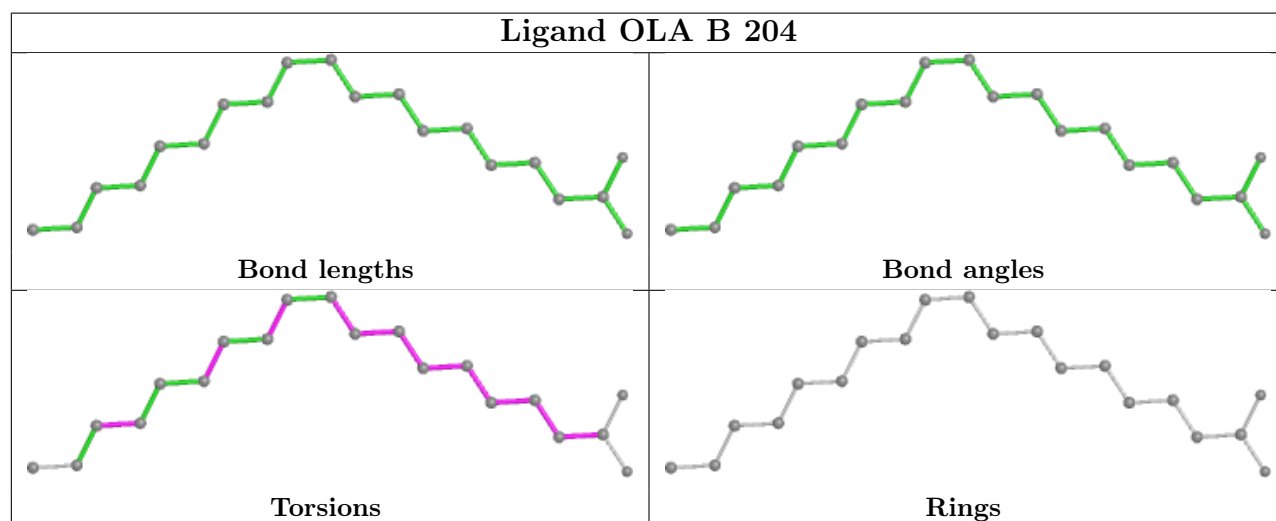
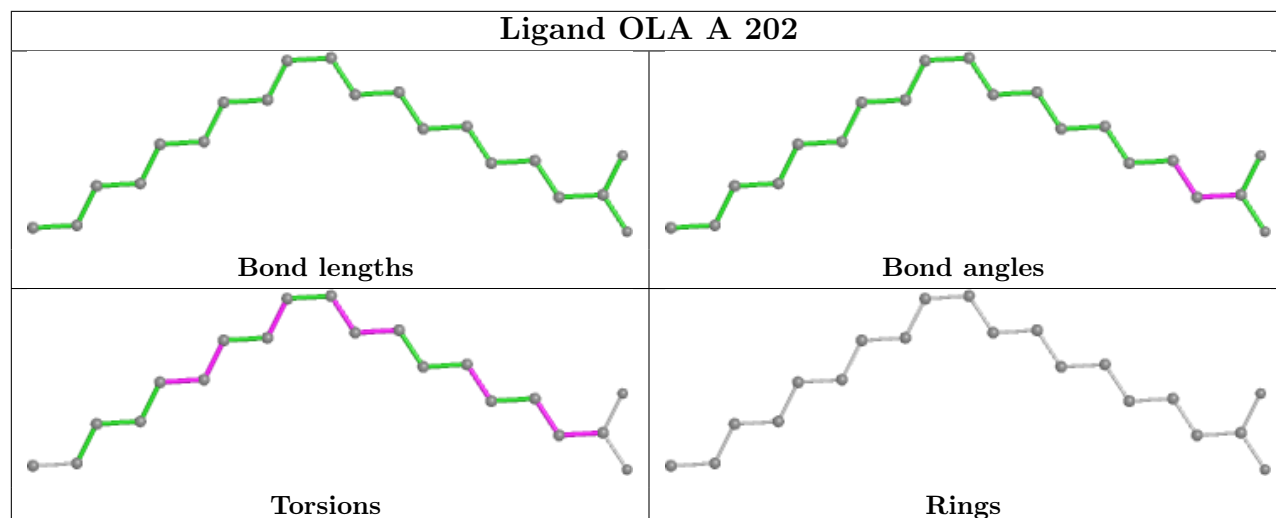
11 monomers are involved in 10 short contacts:

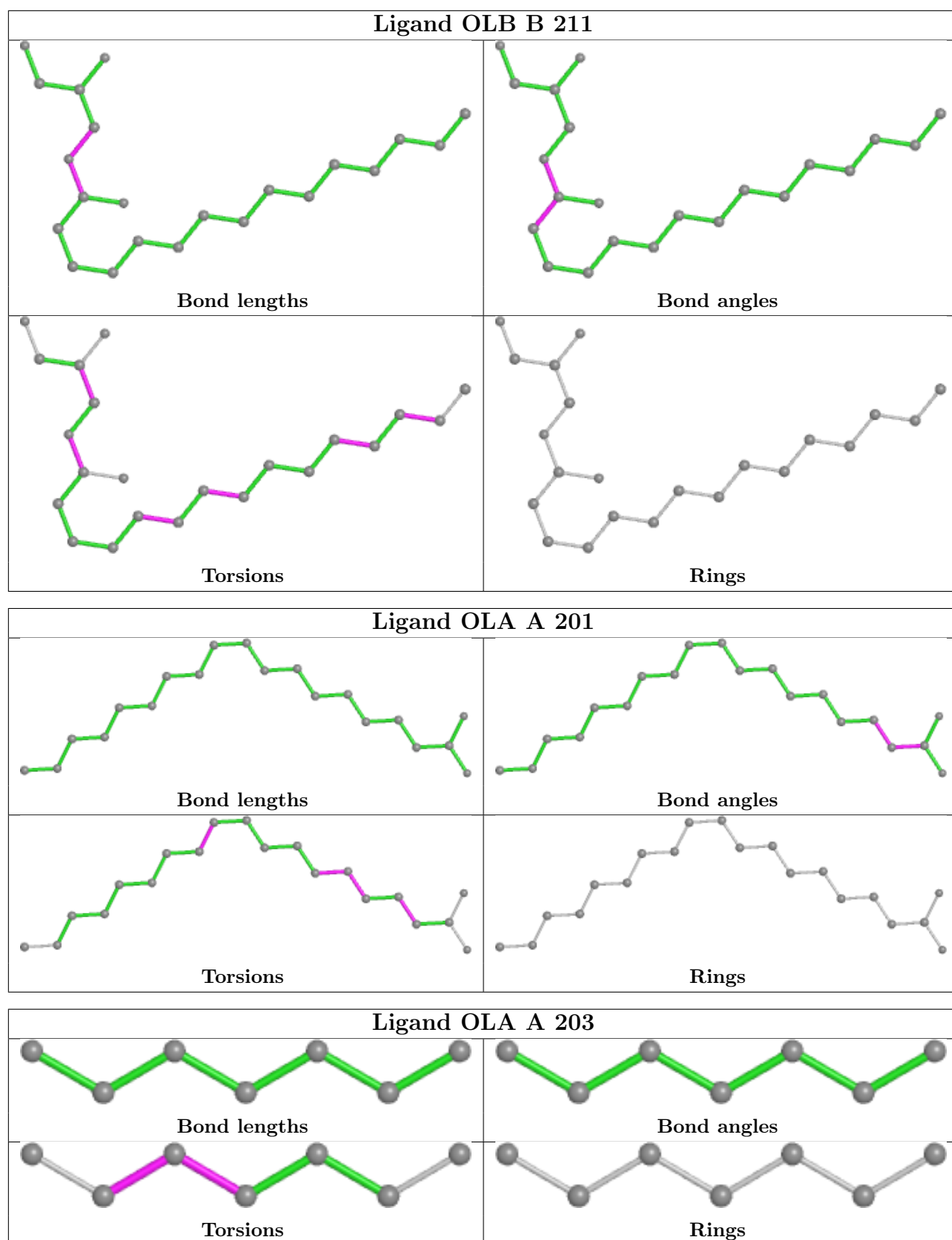
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	205	OLA	1	0
2	B	206	OLA	1	0
2	A	202	OLA	1	0
4	C	201	SO4	1	0
2	B	204	OLA	1	0
3	B	211	OLB	1	0
2	A	201	OLA	1	0
2	B	207	OLA	1	0
3	A	204	OLB	1	0
5	B	209	OLC	1	0
4	B	201	SO4	2	0

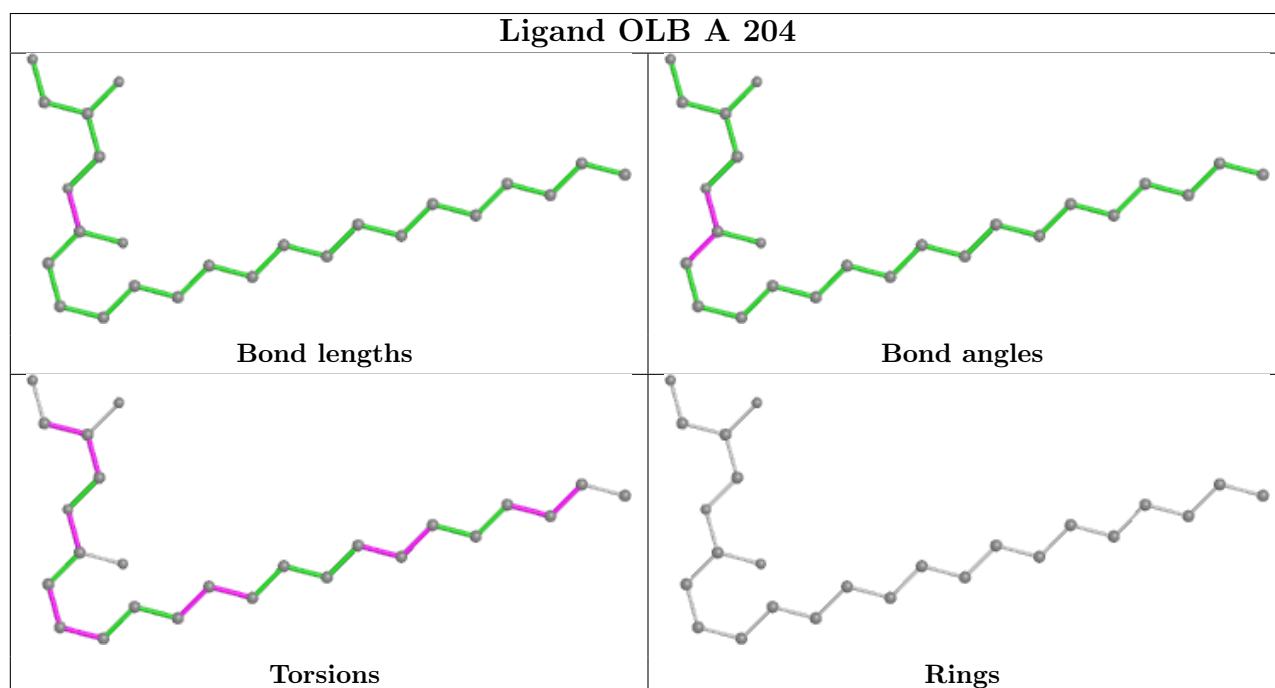
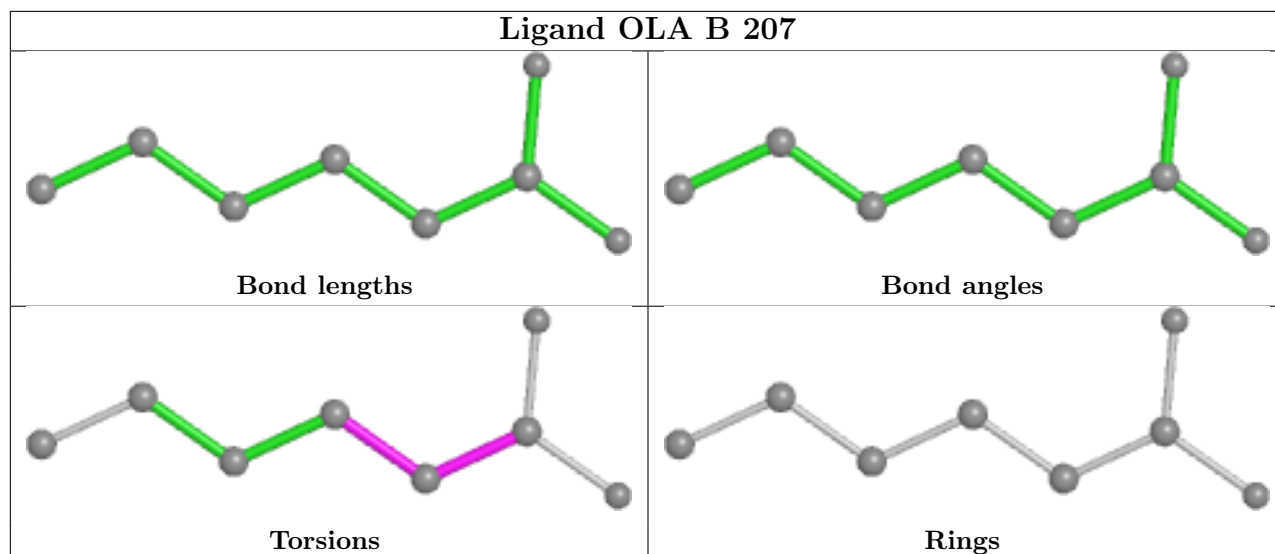
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

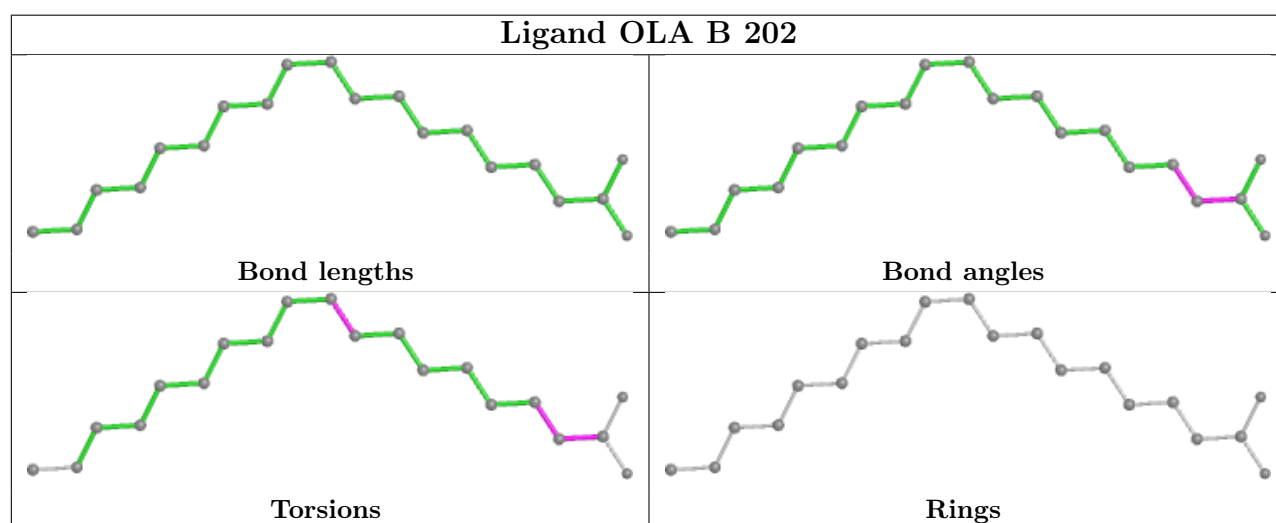
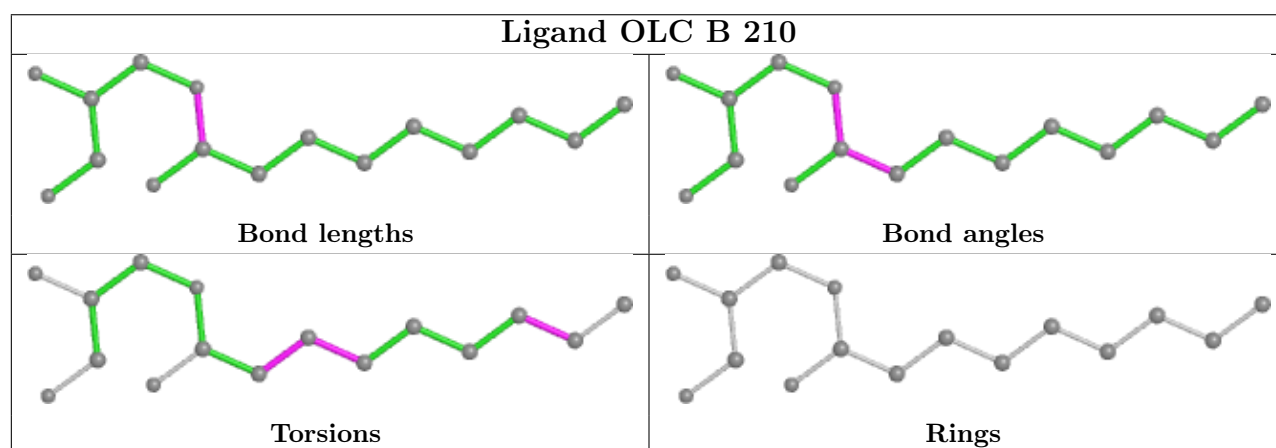
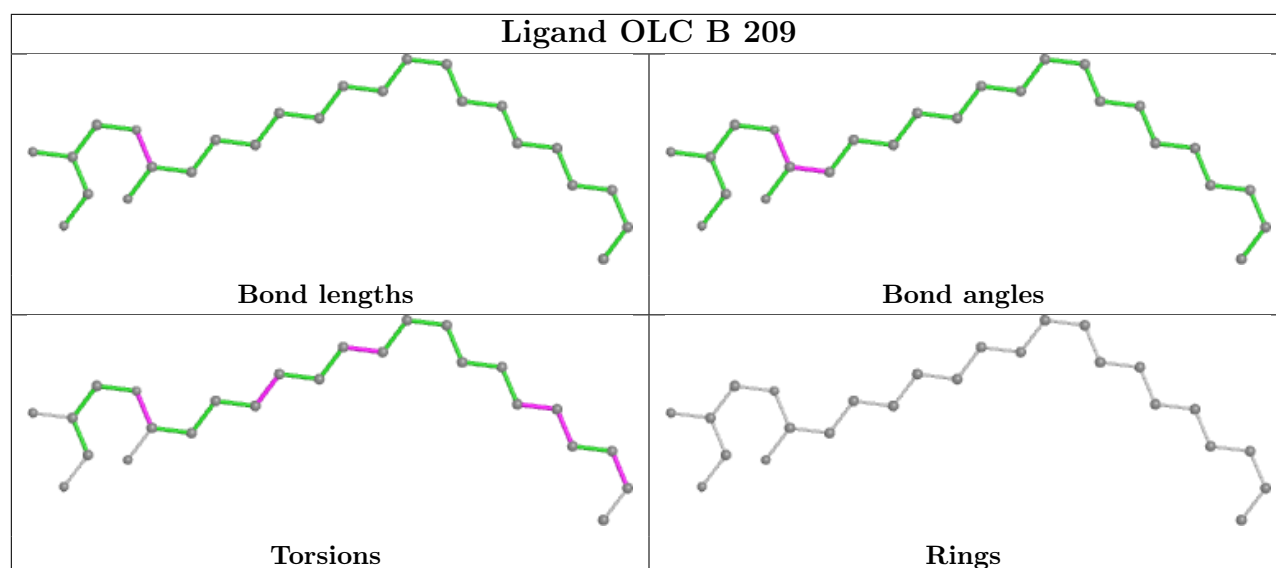
any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

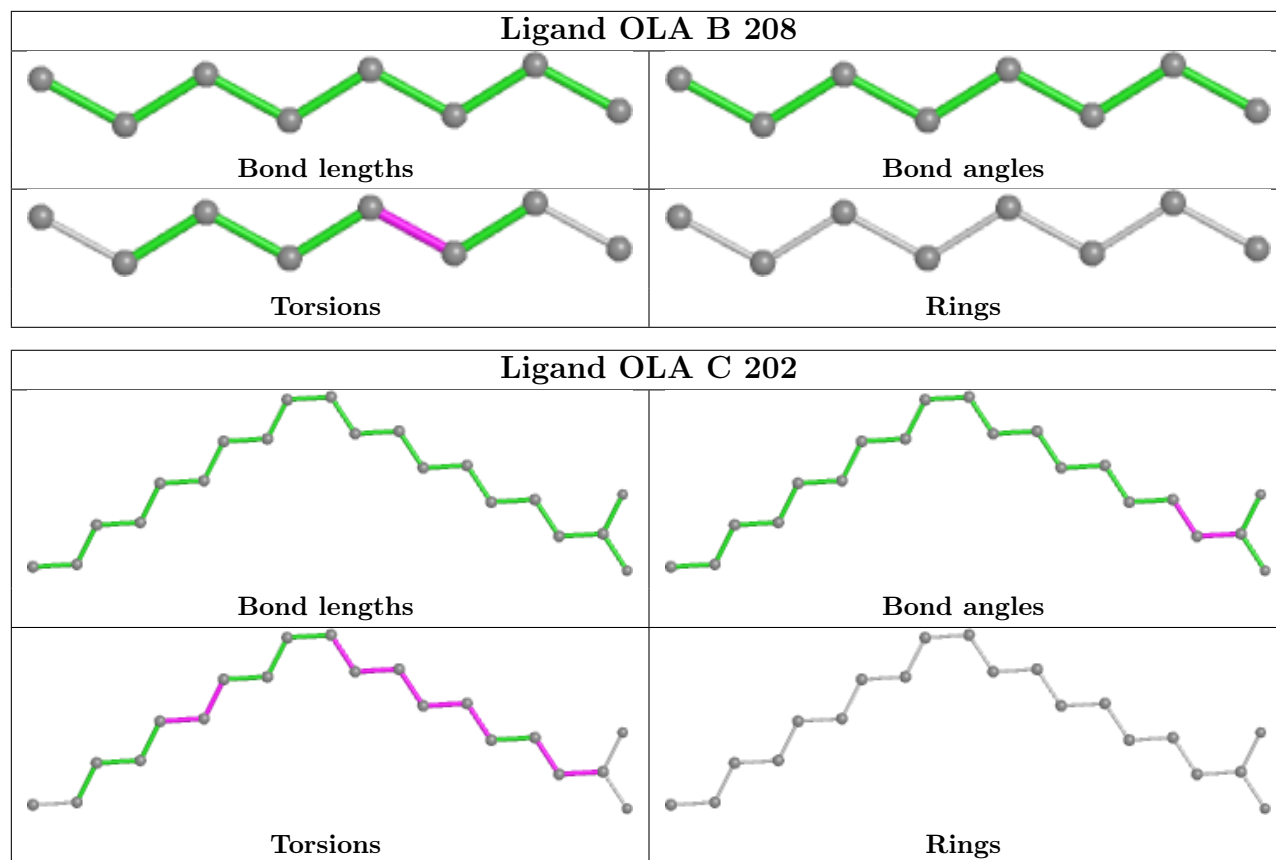












5.7 Other polymers [i](#)

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

6.1 Protein, DNA and RNA chains

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	86/100 (86%)	-0.01	7 (8%) 12 11	23, 32, 58, 85	0
1	B	93/100 (93%)	0.10	6 (6%) 18 18	20, 31, 65, 93	0
1	C	93/100 (93%)	0.37	7 (7%) 14 13	21, 32, 65, 88	0
All	All	272/300 (90%)	0.16	20 (7%) 14 13	20, 32, 65, 93	0

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	92	SER	4.9
1	B	92	SER	4.3
1	C	90	LEU	4.2
1	C	88	HIS	3.9
1	B	93	SER	3.6
1	A	3	THR	3.4
1	A	85	ARG	3.3
1	C	93	SER	3.2
1	B	91	GLU	3.2
1	C	94	GLY	3.0
1	A	86	LYS	3.0
1	B	88	HIS	2.7
1	A	87	LYS	2.7
1	B	90	LEU	2.6
1	A	4	ILE	2.4
1	A	34	GLY	2.4
1	B	89	VAL	2.3
1	C	2	ASP	2.3
1	A	84	ARG	2.2
1	C	34	GLY	2.1

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 monosaccharides in this entry.

6.4 Ligands [i](#)

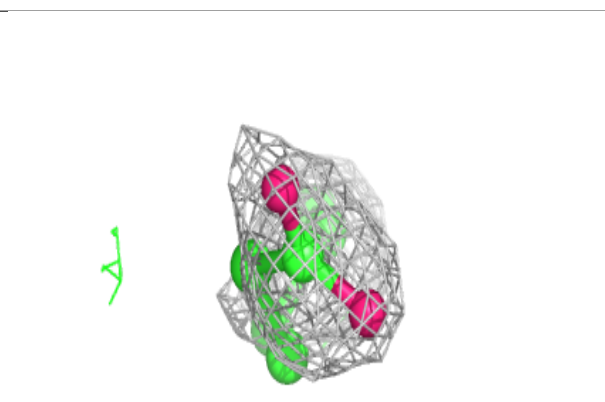
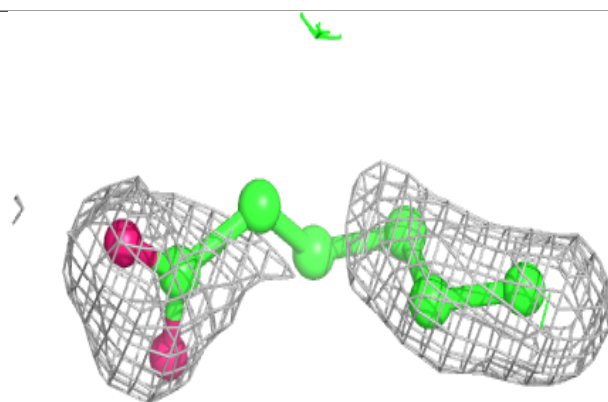
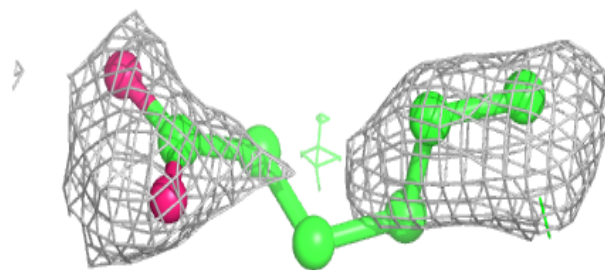
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	OLA	B	207	8/20	0.57	0.32	60,74,78,81	0
3	OLB	B	211	22/25	0.67	0.24	36,56,73,74	0
3	OLB	A	204	25/25	0.69	0.27	37,43,48,49	25
2	OLA	B	206	15/20	0.69	0.19	50,58,76,77	0
2	OLA	B	204	20/20	0.73	0.26	46,58,68,73	0
2	OLA	B	202	20/20	0.74	0.25	42,57,77,81	0
2	OLA	A	202	20/20	0.76	0.23	35,53,79,79	0
2	OLA	C	202	20/20	0.78	0.32	40,54,62,71	0
2	OLA	A	201	20/20	0.80	0.20	40,47,58,65	0
2	OLA	B	208	8/20	0.82	0.18	48,54,57,59	0
2	OLA	B	203	14/20	0.83	0.17	38,46,57,59	0
5	OLC	B	209	25/25	0.84	0.21	37,53,60,60	0
5	OLC	B	210	16/25	0.85	0.22	49,60,68,77	0
2	OLA	A	203	7/20	0.86	0.24	40,45,58,60	0
4	SO4	C	201	5/5	0.88	0.23	51,55,60,67	5
2	OLA	B	205	9/20	0.89	0.14	48,52,55,56	0
4	SO4	B	201	5/5	0.94	0.16	51,53,66,74	0

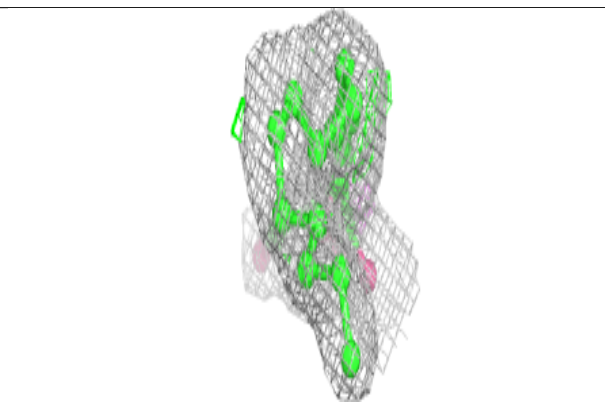
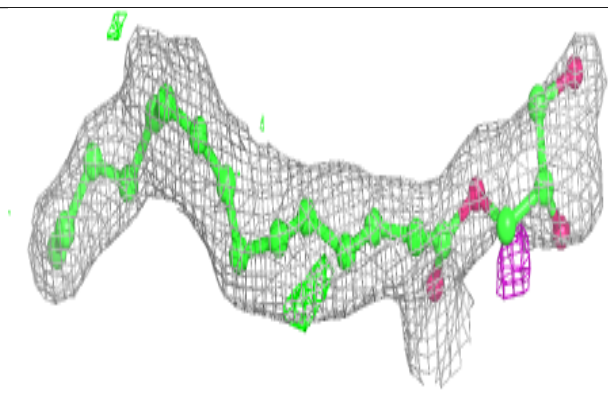
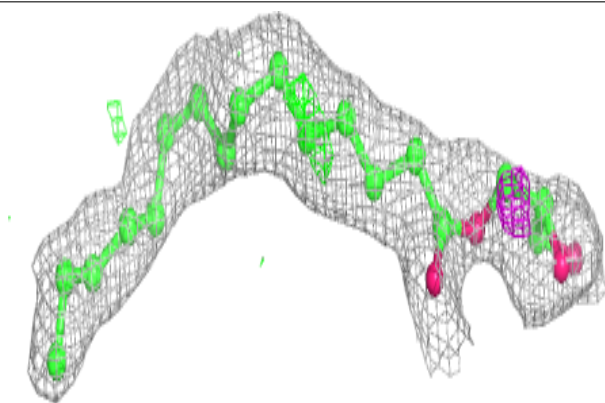
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around OLA B 207:

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

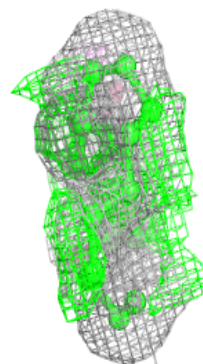
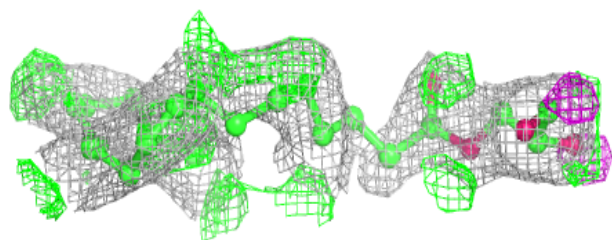
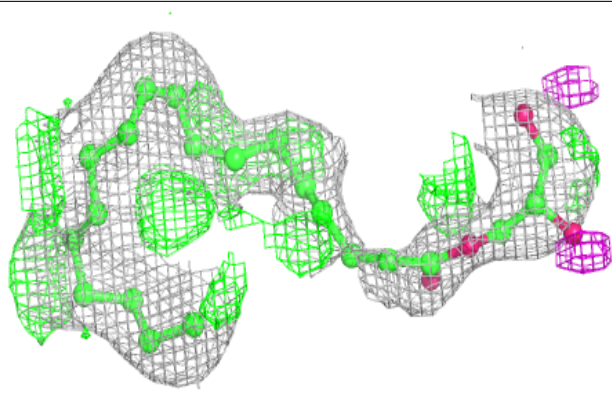
**Electron density around OLB B 211:**

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

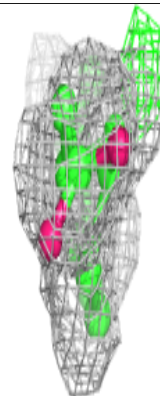
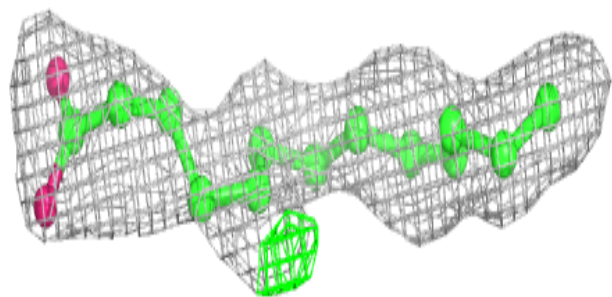
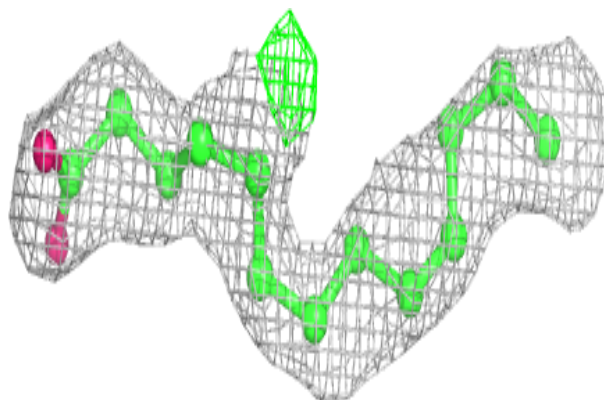


Electron density around OLB A 204:

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

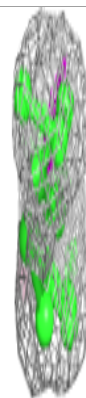
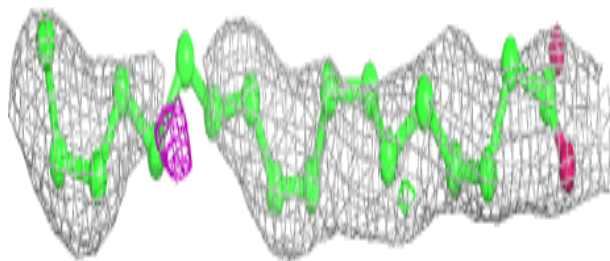
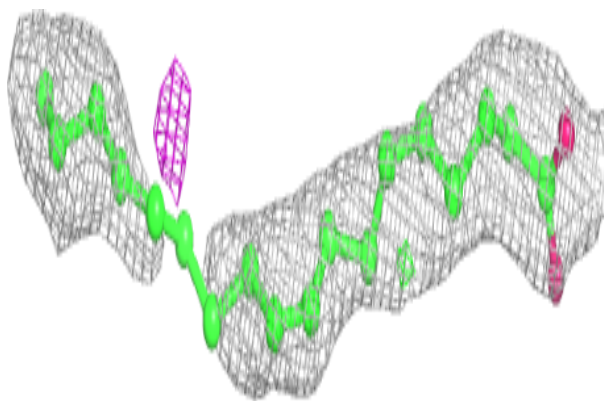
**Electron density around OLA B 206:**

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

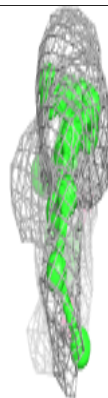
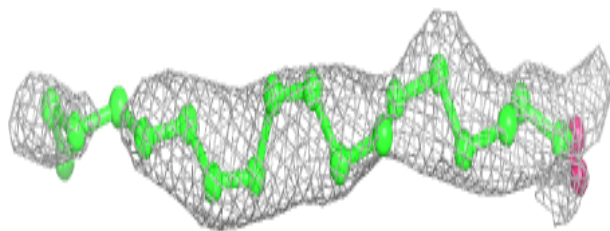
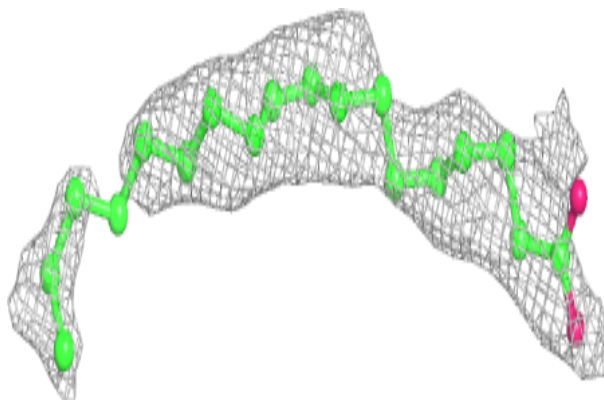


Electron density around OLA B 204:

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

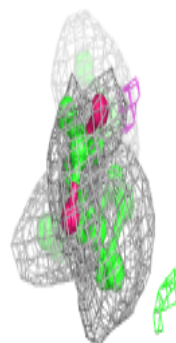
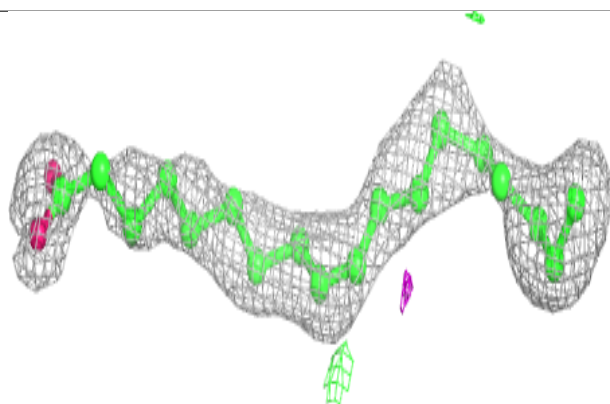
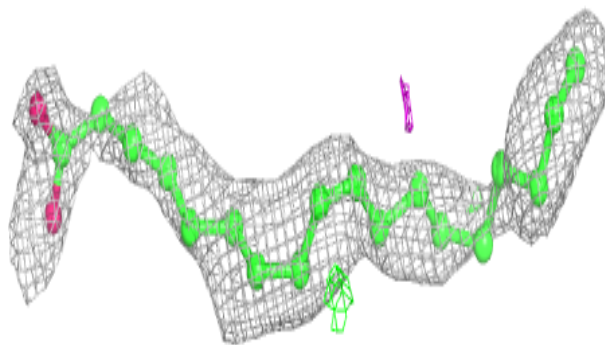
**Electron density around OLA B 202:**

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

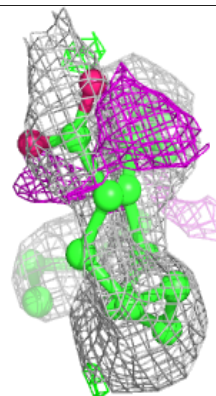
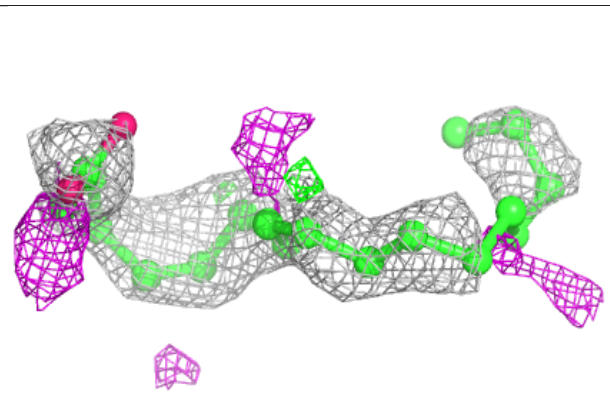
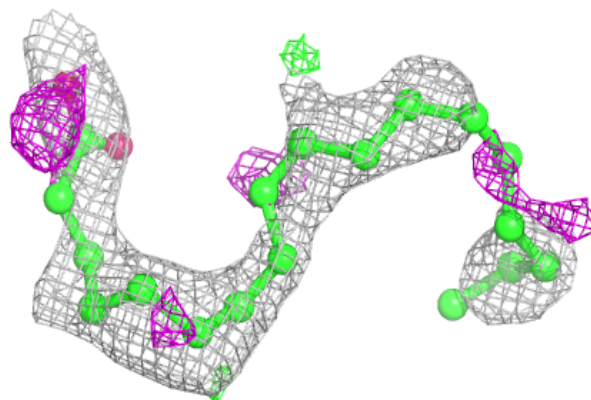


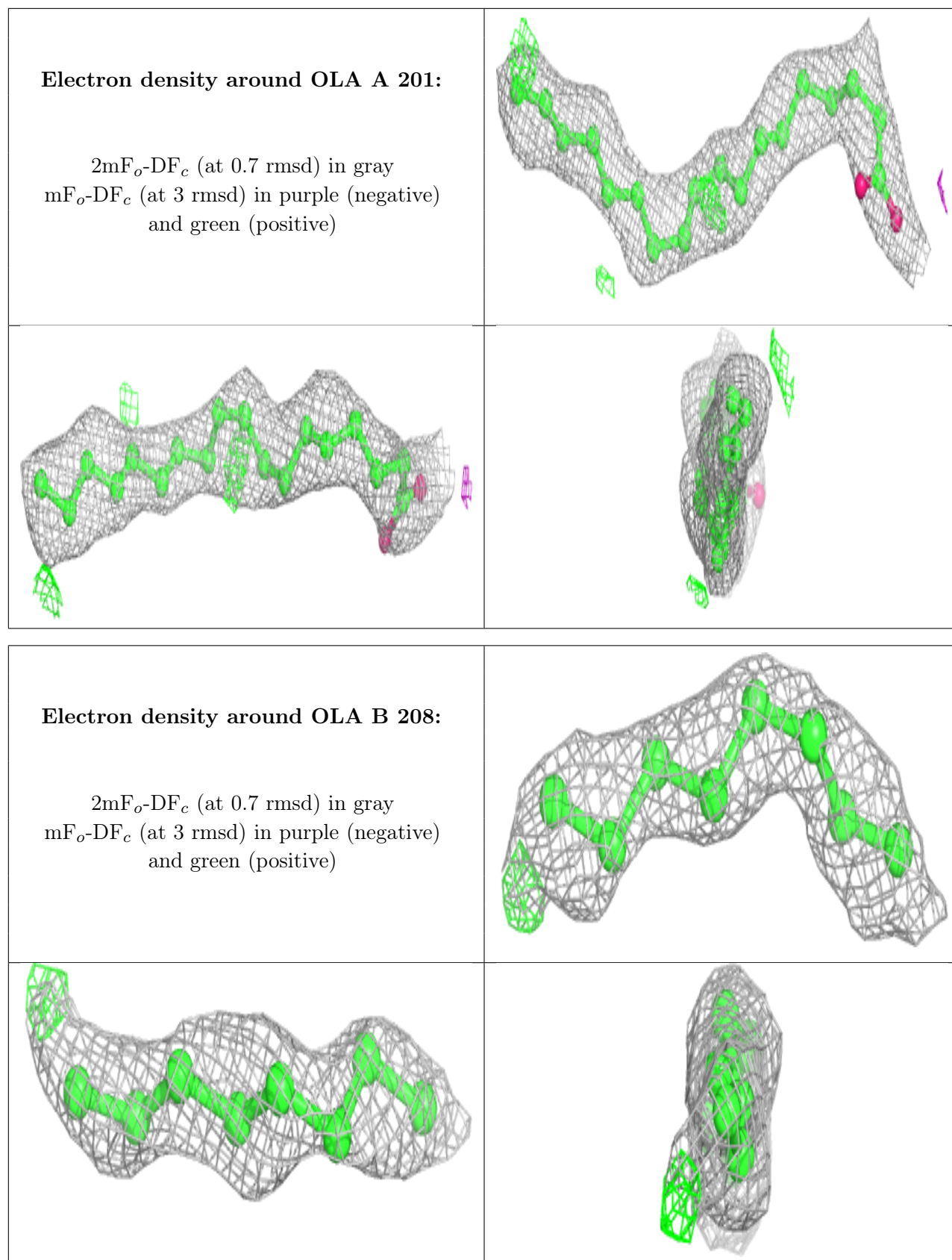
Electron density around OLA A 202:

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

**Electron density around OLA C 202:**

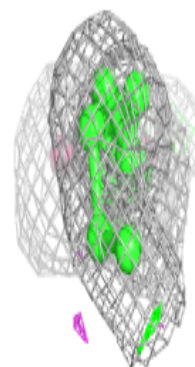
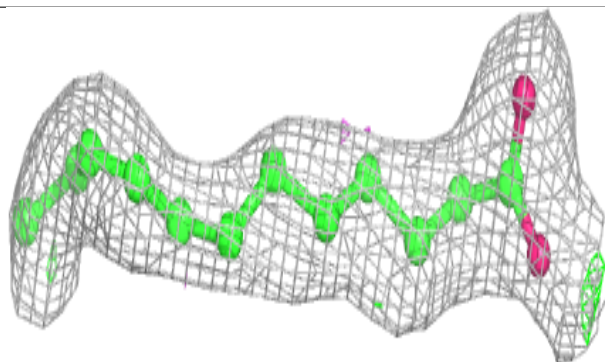
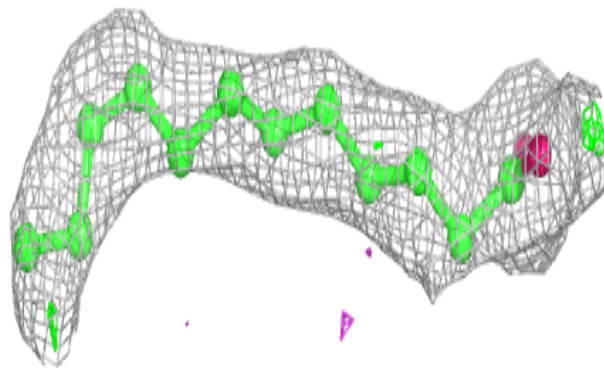
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



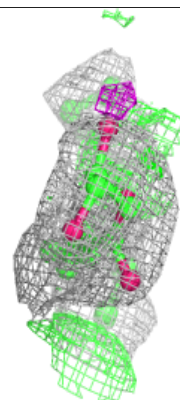
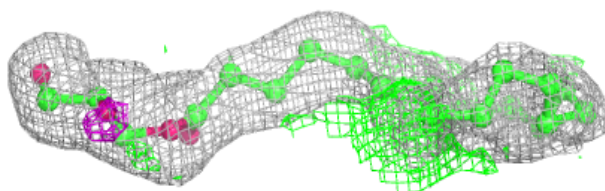
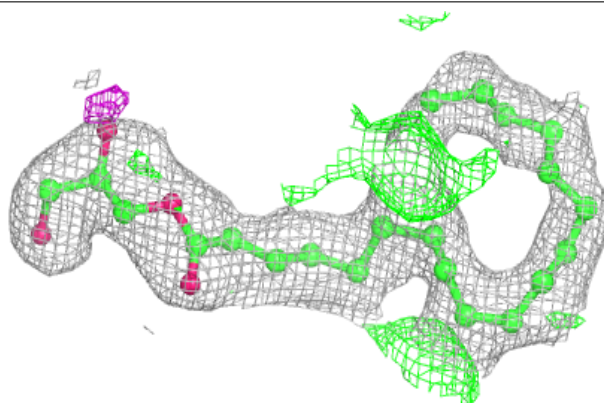


Electron density around OLA B 203:

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

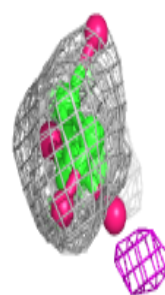
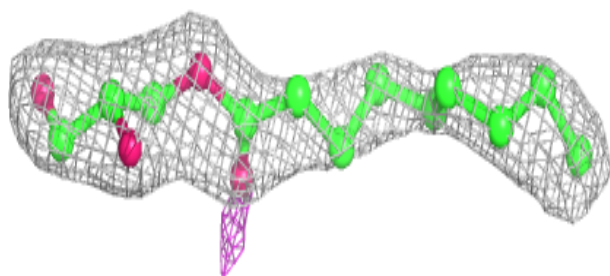
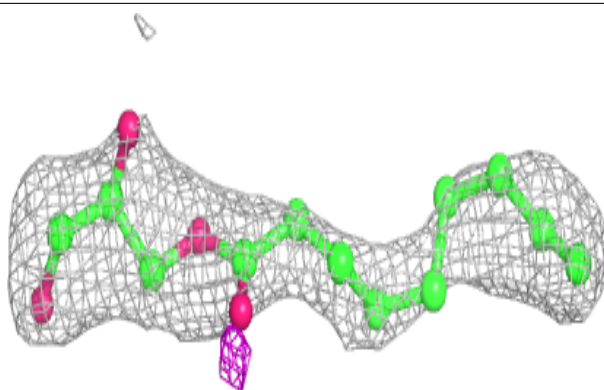
**Electron density around OLC B 209:**

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

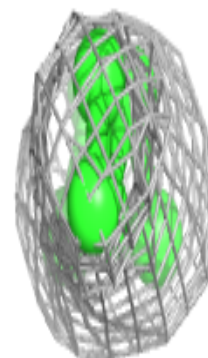
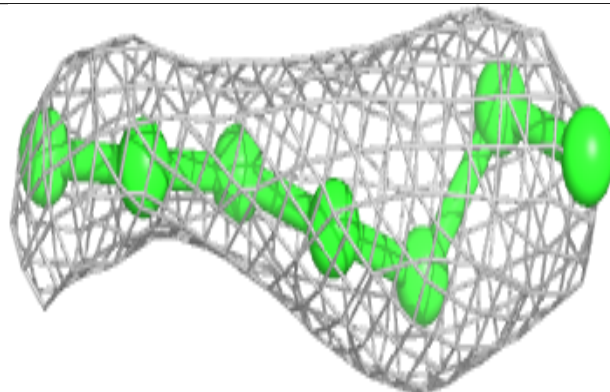
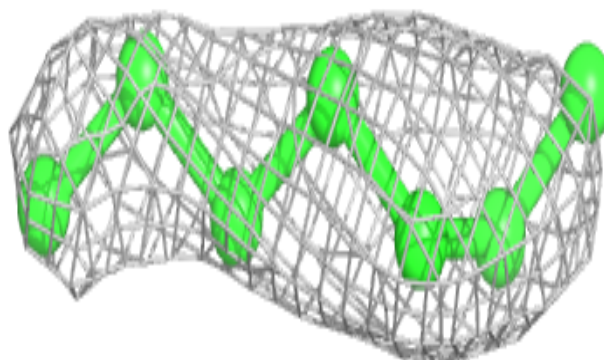


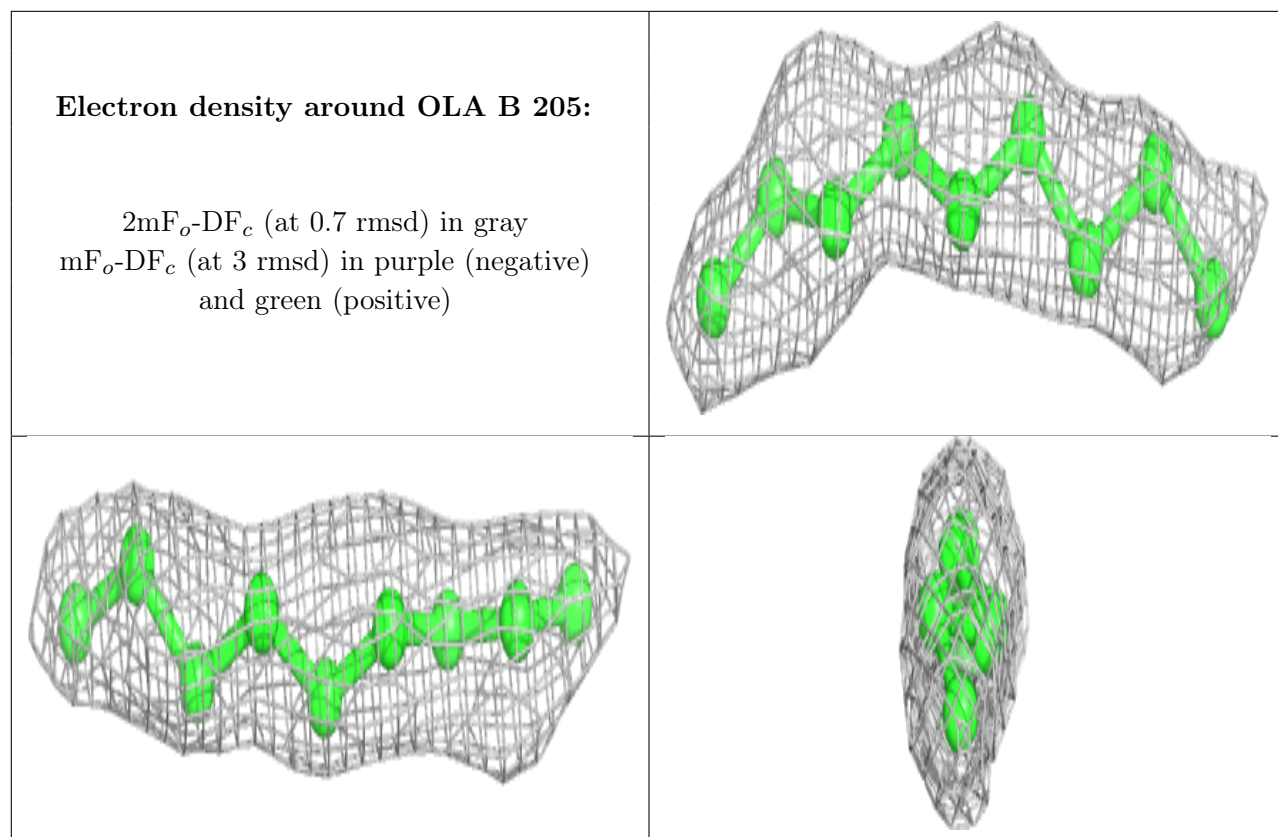
Electron density around OLC B 210:

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

**Electron density around OLA A 203:**

$2mF_o-DF_c$ (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.