Full wwPDB X-ray Structure Validation Report (i)

Dec 7, 2023 – 08:08 am GMT

PDB ID	:	6RZ5
Title	:	XFEL crystal structure of the human cysteinyl leukotriene receptor 1 in complex with zafirlukast
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Deposited on	:	2019-06-12
Resolution	:	2.53 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 (i) 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 (1)) were used in the production of this report:

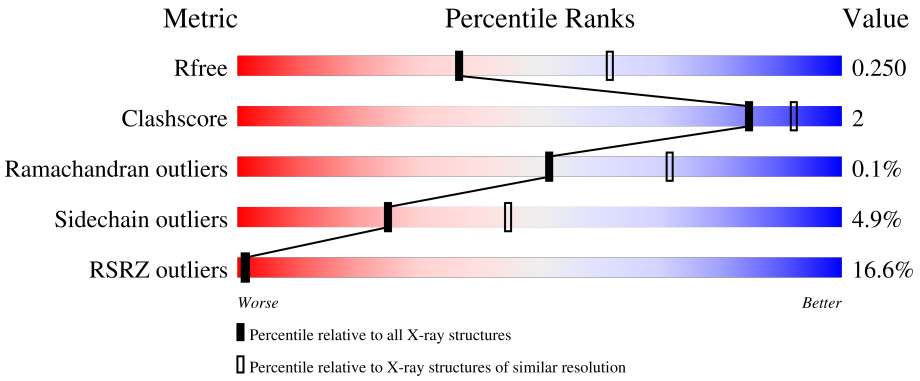
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)

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 2.53 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	5743 (2.54-2.50)
Clashscore	141614	6463 (2.54-2.50)
Ramachandran outliers	138981	6335 (2.54-2.50)
Sidechain outliers	138945	6337 (2.54-2.50)
RSRZ outliers	127900	5630 (2.54-2.50)

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 <=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	423	13% 81% 5% • 13%
1	B	423	17% 84% 6% • 9%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

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
3	OLC	B	2010	-	X	-	-
4	OLA	B	2013	-	-	-	X

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 6138 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.

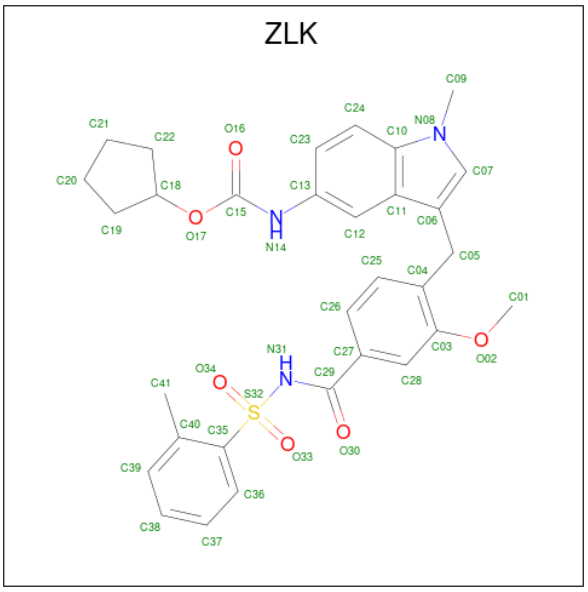
- Molecule 1 is a protein called Cysteinyl leukotriene receptor 1,Soluble cytochrome b562,Cysteinyl leukotriene receptor 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	369	Total	C	N	O	S	0	1	0
			2719	1781	437	477	24			
1	B	385	Total	C	N	O	S	0	2	0
			2837	1851	462	499	25			

There are 18 discrepancies between the modelled and reference sequences:

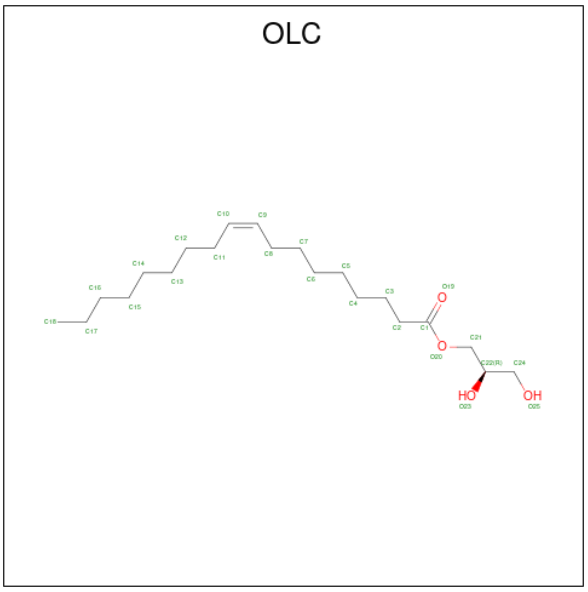
Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP Q9Y271
A	-1	GLY	-	expression tag	UNP Q9Y271
A	0	THR	-	expression tag	UNP Q9Y271
A	1000	SER	-	linker	UNP Q9Y271
A	1007	TRP	MET	conflict	UNP P0ABE7
A	1102	ILE	HIS	conflict	UNP P0ABE7
A	1106	LEU	-	linker	UNP P0ABE7
A	?	SER	-	linker	UNP P0ABE7
A	?	GLY	-	linker	UNP P0ABE7
B	-2	GLY	-	expression tag	UNP Q9Y271
B	-1	GLY	-	expression tag	UNP Q9Y271
B	0	THR	-	expression tag	UNP Q9Y271
B	1000	SER	-	linker	UNP Q9Y271
B	1007	TRP	MET	conflict	UNP P0ABE7
B	1102	ILE	HIS	conflict	UNP P0ABE7
B	1106	LEU	-	linker	UNP P0ABE7
B	?	SER	-	linker	UNP P0ABE7
B	?	GLY	-	linker	UNP P0ABE7

- Molecule 2 is zafirlukast (three-letter code: ZLK) (formula: $C_{31}H_{33}N_3O_6S$) (labeled as "Ligand of Interest" by depositor).



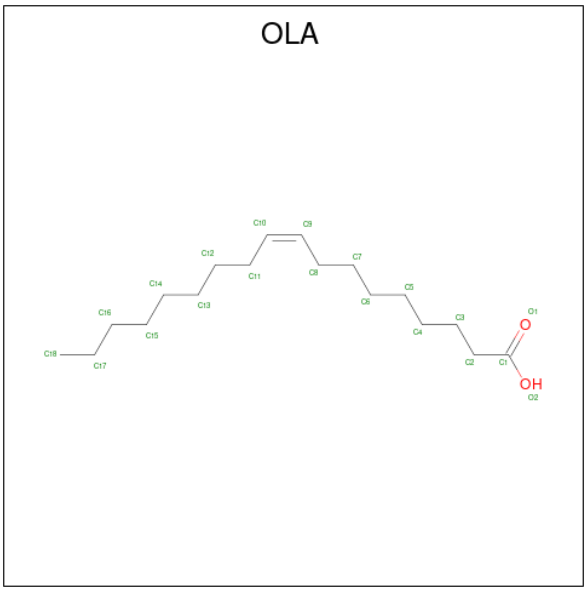
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			41	31	3	6	1		
2	B	1	Total	C	N	O	S	0	0
			41	31	3	6	1		
2	B	1	Total	C	N	O	S	0	0
			41	31	3	6	1		

- 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 C 9 9	0	0
3	A	1	Total C 17 17	0	0
3	A	1	Total C 11 11	0	0
3	A	1	Total C 8 8	0	0
3	A	1	Total C 12 12	0	0
3	A	1	Total C O 16 12 4	0	0
3	A	1	Total C 9 9	0	0
3	A	1	Total C 7 7	0	0
3	B	1	Total C 8 8	0	0
3	B	1	Total C 9 9	0	0
3	B	1	Total C 10 10	0	0
3	B	1	Total C 10 10	0	0
3	B	1	Total C 10 10	0	0
3	B	1	Total C 10 10	0	0
3	B	1	Total C 7 7	0	0
3	B	1	Total C O 23 19 4	0	0
3	B	1	Total C O 7 5 2	0	0

- Molecule 4 is OLEIC ACID (three-letter code: OLA) (formula: $C_{18}H_{34}O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 11 9 2	0	0
4	A	1	Total C O 13 11 2	0	0
4	A	1	Total C O 8 6 2	0	0
4	A	1	Total C O 19 17 2	0	0
4	A	1	Total C O 7 5 2	0	0
4	A	1	Total C O 7 5 2	0	0
4	A	1	Total C O 20 18 2	0	0
4	A	1	Total C O 13 11 2	0	0
4	A	1	Total C 6 6	0	0
4	A	1	Total C O 20 18 2	0	0
4	A	1	Total C O 14 12 2	0	0
4	B	1	Total C O 12 10 2	0	0
4	B	1	Total C O 10 8 2	0	0
4	B	1	Total C O 16 14 2	0	0

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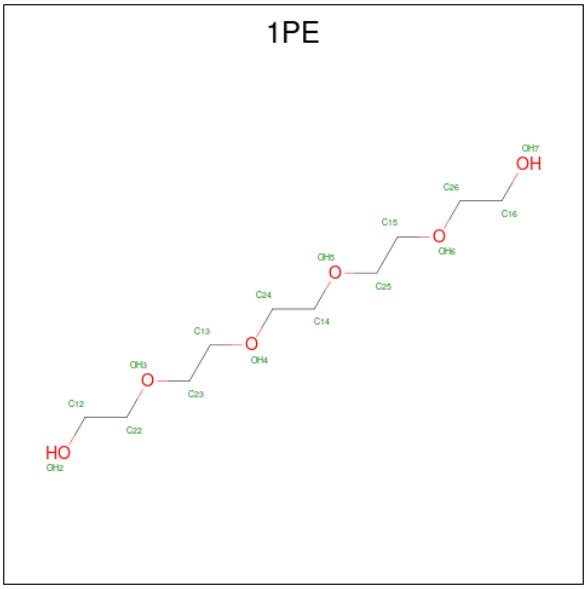
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total C O 9 7 2	0	0
4	B	1	Total C O 11 9 2	0	0
4	B	1	Total C O 20 18 2	0	0
4	B	1	Total C O 18 16 2	0	0
4	B	1	Total C O 20 18 2	0	0

- Molecule 5 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: $C_{10}H_{22}O_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 10 6 4	0	0

- Molecule 6 is SODIUM ION (three-letter code: NA) (formula: Na).

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

- Molecule 7 is water.

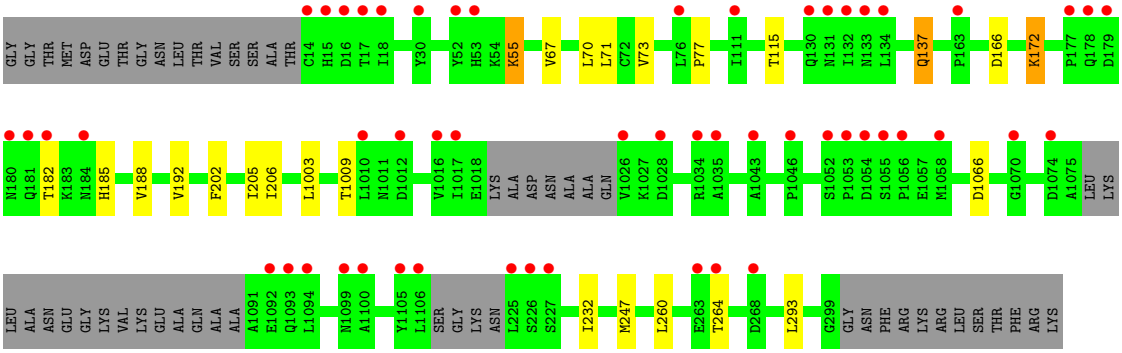
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	5	Total O 5 5	0	0
7	B	5	Total O 5 5	0	0

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.

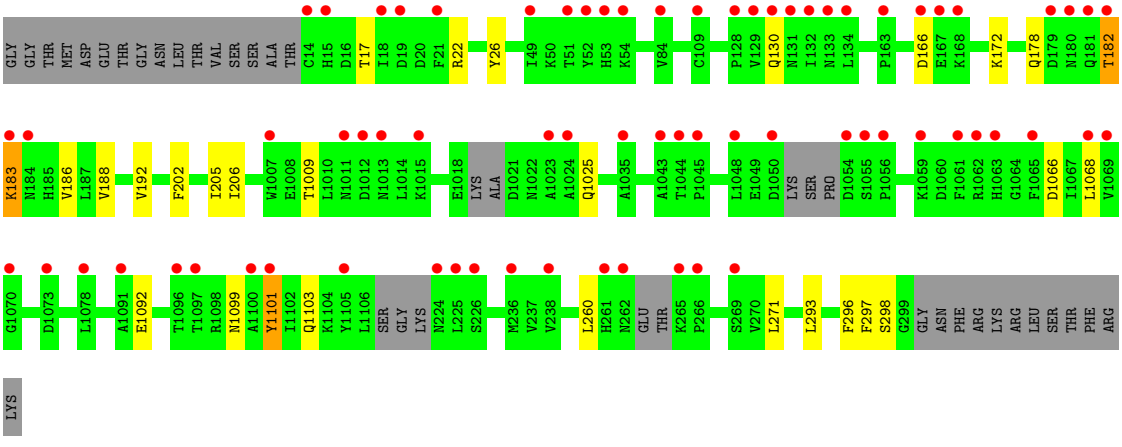
• Molecule 1: Cysteinyl leukotriene receptor 1,Soluble cytochrome b562,Cysteinyl leukotriene receptor 1

Chain A:



• Molecule 1: Cysteinyl leukotriene receptor 1,Soluble cytochrome b562,Cysteinyl leukotriene receptor 1

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	41.59Å 68.58Å 87.39Å 76.31° 76.68° 81.21°	Depositor
Resolution (Å)	19.84 – 2.53 19.84 – 2.53	Depositor EDS
% Data completeness (in resolution range)	99.7 (19.84-2.53) 99.7 (19.84-2.53)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.16 (at 2.53Å)	Xtriage
Refinement program	BUSTER 2.10.3	Depositor
R, R_{free}	0.189 , 0.223 0.215 , 0.250	Depositor DCC
R_{free} test set	1508 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	61.6	Xtriage
Anisotropy	0.354	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 127.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	6138	wwPDB-VP
Average B, all atoms (Å^2)	92.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.85% of the height of the origin peak. No significant pseudotranslation is detected.*

[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.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 1PE, OLC, NA, OLA, ZLK

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	0.51	0/2784	0.63	0/3807
1	B	0.52	0/2901	0.63	0/3960
All	All	0.51	0/5685	0.63	0/7767

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	2719	0	2514	13	0
1	B	2837	0	2602	10	0
2	A	41	0	0	0	0
2	B	82	0	0	0	0
3	A	89	0	130	0	0
3	B	94	0	129	2	0
4	A	138	0	184	6	0
4	B	116	0	165	3	0
5	A	10	0	13	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	A	5	0	0	0	0
7	B	5	0	0	0	0
All	All	6138	0	5737	27	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 (27) 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:185[A]:HIS:HB2	4:A:2014:OLA:H32	1.68	0.76
1:A:55:LYS:O	1:A:137:GLN:HG2	1.92	0.70
1:B:182:THR:HG21	1:B:260:LEU:HD13	1.80	0.63
1:B:1099:ASN:HA	1:B:1103:GLN:HB2	1.83	0.60
1:B:296:PHE:HB3	4:B:2013:OLA:H41	1.84	0.59
3:B:2004:OLC:H6A	3:B:2006:OLC:H11	1.89	0.54
1:A:185[B]:HIS:HB2	4:A:2014:OLA:H32	1.88	0.54
1:A:67:VAL:HG11	4:A:2013:OLA:H62	1.92	0.51
1:B:1101:TYR:N	1:B:1101:TYR:CD2	2.79	0.51
1:B:293:LEU:HD22	1:B:297:PHE:HE2	1.76	0.51
1:A:232:ILE:HD11	4:A:2012:OLA:H42	1.92	0.50
1:A:70:LEU:HA	1:A:73:VAL:HG22	1.93	0.49
1:A:166:ASP:HB3	1:A:172:LYS:HD2	1.94	0.49
1:B:22:ARG:O	1:B:26:TYR:HB2	2.14	0.47
1:A:202:PHE:HE2	1:A:247:MET:HE2	1.80	0.47
4:A:2019:OLA:H10	4:B:2016:OLA:H182	1.96	0.46
4:B:2011:OLA:H32	4:B:2014:OLA:H31	1.97	0.46
4:A:2019:OLA:H41	3:B:2010:OLC:H3A	1.99	0.44
1:B:188:VAL:O	1:B:192:VAL:HG23	2.18	0.44
1:A:202:PHE:CE2	1:A:247:MET:HE2	2.52	0.44
1:A:115:THR:HA	1:A:205:ILE:HD11	2.01	0.43
1:A:73:VAL:O	1:A:77:PRO:HD3	2.19	0.42
1:B:202:PHE:O	1:B:206:ILE:HG12	2.20	0.41
1:A:188:VAL:O	1:A:192:VAL:HG23	2.19	0.41
1:B:166:ASP:HB3	1:B:172:LYS:HE3	2.02	0.41
1:A:202:PHE:O	1:A:206:ILE:HG12	2.20	0.41
1:B:182:THR:CG2	1:B:260:LEU:HD13	2.50	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	362/423 (86%)	350 (97%)	12 (3%)	0	100 100
1	B	377/423 (89%)	368 (98%)	8 (2%)	1 (0%)	41 59
All	All	739/846 (87%)	718 (97%)	20 (3%)	1 (0%)	51 71

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	183	LYS

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	265/375 (71%)	254 (96%)	11 (4%)	30 51
1	B	269/375 (72%)	254 (94%)	15 (6%)	21 38
All	All	534/750 (71%)	508 (95%)	26 (5%)	25 45

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	55	LYS
1	A	71	LEU
1	A	137	GLN
1	A	172	LYS
1	A	182	THR

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Mol	Chain	Res	Type
1	A	1003	LEU
1	A	1009	THR
1	A	1066	ASP
1	A	260	LEU
1	A	264	THR
1	A	293	LEU
1	B	17	THR
1	B	130	GLN
1	B	178	GLN
1	B	182	THR
1	B	183	LYS
1	B	186	VAL
1	B	205	ILE
1	B	1009	THR
1	B	1025	GLN
1	B	1066	ASP
1	B	1068	LEU
1	B	1092	GLU
1	B	1101	TYR
1	B	271	LEU
1	B	298	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	137	GLN
1	B	130	GLN
1	B	1041	GLN
1	B	1099	ASN

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)

Of 42 ligands modelled in this entry, 2 are monoatomic - leaving 40 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	$\#\|Z\| > 2$
2	ZLK	B	2019	-	41,45,45	2.26	20 (48%)	58,65,65	2.50	13 (22%)
3	OLC	B	2009	-	22,22,24	0.68	1 (4%)	23,23,25	1.07	1 (4%)
4	OLA	A	2016	-	19,19,19	0.49	0	19,19,19	0.85	0
3	OLC	A	2004	-	10,10,24	0.41	0	9,9,25	0.50	0
4	OLA	A	2019	-	19,19,19	0.51	0	19,19,19	0.66	0
3	OLC	B	2002	-	7,7,24	0.37	0	6,6,25	0.62	0
4	OLA	A	2011	-	12,12,19	0.66	0	12,12,19	0.68	0
3	OLC	A	2002	-	8,8,24	0.41	0	7,7,25	0.53	0
3	OLC	A	2007	-	15,15,24	0.74	0	16,16,25	1.00	1 (6%)
4	OLA	A	2017	-	12,12,19	0.64	0	12,12,19	0.85	0
4	OLA	B	2018	-	19,19,19	0.53	0	19,19,19	0.66	0
5	1PE	A	2021	-	9,9,15	0.48	0	8,8,14	0.23	0
3	OLC	A	2005	-	7,7,24	0.45	0	6,6,25	0.39	0
4	OLA	B	2014	-	8,8,19	0.72	0	8,8,19	0.93	0
4	OLA	B	2011	-	11,11,19	0.70	0	11,11,19	0.90	0
3	OLC	B	2006	-	9,9,24	0.46	0	8,8,25	0.43	0
3	OLC	B	2010	-	6,6,24	2.45	2 (33%)	6,6,25	1.34	1 (16%)
3	OLC	A	2008	-	8,8,24	0.44	0	7,7,25	0.46	0
3	OLC	B	2005	-	9,9,24	0.44	0	8,8,25	0.51	0
4	OLA	B	2013	-	15,15,19	0.58	0	15,15,19	0.61	0
3	OLC	A	2009	-	6,6,24	0.30	0	5,5,25	0.66	0
2	ZLK	B	2001	-	41,45,45	2.43	20 (48%)	58,65,65	2.44	16 (27%)
3	OLC	B	2008	-	6,6,24	0.34	0	5,5,25	0.72	0
4	OLA	A	2014	-	6,6,19	0.81	0	6,6,19	0.93	0
3	OLC	B	2003	-	8,8,24	0.53	0	7,7,25	0.64	0
3	OLC	A	2003	-	16,16,24	0.43	0	15,15,25	0.59	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	OLA	B	2016	-	19,19,19	0.52	0	19,19,19	0.70	0
4	OLA	B	2012	-	9,9,19	0.73	0	9,9,19	0.78	0
4	OLA	A	2018	-	5,5,19	0.45	0	2,4,19	0.85	0
3	OLC	B	2004	-	9,9,24	0.41	0	8,8,25	0.62	0
3	OLC	B	2007	-	9,9,24	0.47	0	8,8,25	0.48	0
4	OLA	A	2015	-	6,6,19	0.84	0	6,6,19	1.08	0
3	OLC	A	2006	-	11,11,24	0.46	0	9,10,25	0.69	0
4	OLA	A	2013	-	18,18,19	0.59	0	18,18,19	0.59	0
4	OLA	A	2020	-	13,13,19	0.68	0	12,13,19	0.56	0
2	ZLK	A	2001	-	41,45,45	2.32	23 (56%)	58,65,65	2.46	17 (29%)
4	OLA	B	2017	-	17,17,19	0.54	0	17,17,19	0.76	0
4	OLA	B	2015	-	10,10,19	0.66	0	10,10,19	0.91	0
4	OLA	A	2012	-	7,7,19	0.76	0	7,7,19	0.96	0
4	OLA	A	2010	-	10,10,19	0.67	0	10,10,19	0.74	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	ZLK	B	2019	-	-	9/29/36/36	0/5/5/5
3	OLC	B	2009	-	-	13/22/22/24	-
4	OLA	A	2016	-	-	11/17/17/17	-
3	OLC	A	2004	-	-	2/8/8/24	-
4	OLA	A	2019	-	-	12/17/17/17	-
3	OLC	B	2002	-	-	1/5/5/24	-
4	OLA	A	2011	-	-	6/10/10/17	-
3	OLC	A	2002	-	-	4/6/6/24	-
3	OLC	A	2007	-	-	11/15/15/24	-
4	OLA	A	2017	-	-	7/10/10/17	-
4	OLA	B	2018	-	-	12/17/17/17	-
5	1PE	A	2021	-	-	4/7/7/13	-
3	OLC	A	2005	-	-	2/5/5/24	-
4	OLA	B	2014	-	-	5/6/6/17	-
4	OLA	B	2011	-	-	4/9/9/17	-
3	OLC	B	2006	-	-	3/7/7/24	-
3	OLC	B	2010	-	-	4/4/4/24	-
3	OLC	A	2008	-	-	3/6/6/24	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	OLC	B	2005	-	-	4/7/7/24	-
4	OLA	B	2013	-	-	10/13/13/17	-
3	OLC	A	2009	-	-	4/4/4/24	-
2	ZLK	B	2001	-	-	1/29/36/36	0/5/5/5
3	OLC	B	2008	-	-	2/4/4/24	-
4	OLA	A	2014	-	-	3/4/4/17	-
3	OLC	B	2003	-	-	3/6/6/24	-
3	OLC	A	2003	-	-	9/14/14/24	-
4	OLA	B	2016	-	-	7/17/17/17	-
4	OLA	B	2012	-	-	6/7/7/17	-
4	OLA	A	2018	-	-	2/3/3/17	-
3	OLC	B	2004	-	-	5/7/7/24	-
3	OLC	B	2007	-	-	4/7/7/24	-
4	OLA	A	2015	-	-	2/4/4/17	-
3	OLC	A	2006	-	-	5/9/9/24	-
4	OLA	A	2013	-	-	11/16/16/17	-
4	OLA	A	2020	-	-	3/11/11/17	-
2	ZLK	A	2001	-	-	2/29/36/36	0/5/5/5
4	OLA	B	2017	-	-	10/15/15/17	-
4	OLA	B	2015	-	-	5/8/8/17	-
4	OLA	A	2012	-	-	5/5/5/17	-
4	OLA	A	2010	-	-	6/8/8/17	-

All (66) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2001	ZLK	C29-N31	5.63	1.45	1.39
2	B	2001	ZLK	C15-N14	5.50	1.47	1.36
2	A	2001	ZLK	C15-N14	5.32	1.47	1.36
2	B	2019	ZLK	C15-N14	4.78	1.45	1.36
2	A	2001	ZLK	C29-N31	4.71	1.44	1.39
3	B	2010	OLC	O19-C1	4.65	1.37	1.22
2	B	2001	ZLK	O17-C15	4.49	1.43	1.35
2	B	2019	ZLK	C29-N31	4.29	1.44	1.39
2	A	2001	ZLK	O17-C15	4.02	1.42	1.35
2	B	2019	ZLK	O17-C15	3.80	1.41	1.35
2	B	2019	ZLK	C20-C19	-3.49	1.37	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2001	ZLK	C20-C19	-3.47	1.37	1.51
2	A	2001	ZLK	C03-C04	3.45	1.45	1.40
3	B	2010	OLC	O20-C1	-3.45	1.19	1.30
2	A	2001	ZLK	C20-C19	-3.31	1.38	1.51
2	B	2019	ZLK	O33-S32	3.31	1.47	1.43
2	B	2001	ZLK	C13-N14	3.21	1.48	1.41
2	B	2019	ZLK	C41-C40	3.12	1.57	1.51
2	A	2001	ZLK	C41-C40	3.10	1.57	1.51
2	B	2001	ZLK	C41-C40	3.08	1.57	1.51
2	B	2019	ZLK	C05-C04	3.07	1.58	1.52
2	B	2001	ZLK	C35-S32	3.02	1.81	1.77
2	A	2001	ZLK	C27-C29	3.02	1.56	1.50
2	B	2019	ZLK	C27-C29	2.94	1.56	1.50
2	B	2001	ZLK	S32-N31	2.87	1.70	1.64
2	B	2019	ZLK	C19-C18	2.86	1.66	1.52
2	A	2001	ZLK	C19-C18	2.86	1.66	1.52
2	B	2001	ZLK	C27-C29	2.85	1.56	1.50
2	B	2001	ZLK	C19-C18	2.84	1.66	1.52
2	B	2019	ZLK	C13-N14	2.75	1.47	1.41
2	B	2001	ZLK	C26-C25	2.74	1.43	1.38
2	A	2001	ZLK	C22-C18	-2.74	1.37	1.52
2	A	2001	ZLK	O02-C03	2.73	1.41	1.37
2	B	2001	ZLK	C22-C18	-2.73	1.37	1.52
2	B	2001	ZLK	C03-C04	2.71	1.44	1.40
2	A	2001	ZLK	O30-C29	-2.68	1.17	1.23
2	B	2019	ZLK	C22-C18	-2.65	1.38	1.52
2	B	2019	ZLK	C26-C25	2.64	1.43	1.38
2	B	2019	ZLK	O30-C29	-2.59	1.18	1.23
2	A	2001	ZLK	S32-N31	2.56	1.69	1.64
2	B	2001	ZLK	O02-C03	2.53	1.41	1.37
2	A	2001	ZLK	C26-C25	2.52	1.43	1.38
2	B	2001	ZLK	O33-S32	2.47	1.46	1.43
2	B	2001	ZLK	C26-C27	2.44	1.43	1.39
2	B	2001	ZLK	C28-C03	2.38	1.43	1.38
2	A	2001	ZLK	C05-C04	2.38	1.56	1.52
2	B	2001	ZLK	C07-N08	-2.34	1.34	1.38
2	B	2019	ZLK	S32-N31	2.33	1.69	1.64
2	A	2001	ZLK	O34-S32	2.32	1.46	1.43
2	A	2001	ZLK	O33-S32	2.26	1.46	1.43
2	B	2019	ZLK	C28-C03	2.26	1.42	1.38
3	B	2009	OLC	O20-C1	2.25	1.39	1.33
2	B	2001	ZLK	O30-C29	-2.24	1.18	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	2001	ZLK	C28-C03	2.22	1.42	1.38
2	A	2001	ZLK	C21-C22	2.21	1.61	1.51
2	B	2019	ZLK	O34-S32	2.18	1.46	1.43
2	B	2019	ZLK	O16-C15	-2.16	1.17	1.21
2	A	2001	ZLK	C07-N08	-2.16	1.35	1.38
2	B	2019	ZLK	C23-C13	2.14	1.42	1.39
2	A	2001	ZLK	C26-C27	2.10	1.42	1.39
2	B	2019	ZLK	C26-C27	2.04	1.42	1.39
2	A	2001	ZLK	C35-S32	2.04	1.80	1.77
2	A	2001	ZLK	O17-C18	-2.03	1.41	1.46
2	A	2001	ZLK	C13-N14	2.02	1.45	1.41
2	B	2019	ZLK	C35-S32	2.01	1.80	1.77
2	B	2001	ZLK	C21-C22	2.00	1.60	1.51

All (49) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	2001	ZLK	O34-S32-O33	-13.41	103.06	119.55
2	B	2019	ZLK	O34-S32-O33	-12.27	104.47	119.55
2	B	2001	ZLK	O34-S32-O33	-11.91	104.91	119.55
2	B	2019	ZLK	O17-C15-N14	7.76	118.92	109.07
2	B	2001	ZLK	O17-C15-N14	6.47	117.28	109.07
2	B	2001	ZLK	C29-N31-S32	-5.61	116.12	123.36
2	B	2019	ZLK	C29-N31-S32	-5.53	116.22	123.36
2	A	2001	ZLK	O02-C03-C04	4.79	122.64	115.97
2	A	2001	ZLK	O17-C15-N14	4.45	114.72	109.07
2	B	2019	ZLK	O02-C03-C04	4.03	121.59	115.97
2	B	2001	ZLK	O02-C03-C04	3.99	121.52	115.97
2	A	2001	ZLK	O34-S32-C35	3.93	114.13	107.66
2	B	2001	ZLK	C25-C04-C03	3.31	122.74	118.37
2	B	2019	ZLK	C18-O17-C15	3.24	121.12	116.48
2	A	2001	ZLK	C29-N31-S32	-3.22	119.20	123.36
2	B	2019	ZLK	O33-S32-C35	3.14	112.83	107.66
2	B	2019	ZLK	O16-C15-N14	-3.12	119.32	126.11
2	B	2001	ZLK	C27-C29-N31	3.05	119.78	116.09
2	B	2019	ZLK	O34-S32-C35	3.03	112.64	107.66
2	A	2001	ZLK	C05-C04-C25	-3.03	115.48	120.46
3	B	2009	OLC	O20-C1-C2	2.94	121.14	111.91
2	B	2001	ZLK	C35-S32-N31	2.90	109.47	106.06
2	B	2019	ZLK	O02-C03-C28	-2.87	119.17	124.12
2	A	2001	ZLK	C39-C40-C35	2.87	119.45	116.27
2	B	2001	ZLK	C39-C40-C35	2.84	119.42	116.27

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	2001	ZLK	C25-C04-C03	2.83	122.11	118.37
2	B	2019	ZLK	C39-C40-C35	2.77	119.34	116.27
2	B	2001	ZLK	O16-C15-N14	-2.76	120.10	126.11
2	A	2001	ZLK	O02-C03-C28	-2.76	119.37	124.12
3	A	2007	OLC	O20-C1-C2	2.65	120.22	111.91
2	A	2001	ZLK	C01-O02-C03	2.59	121.44	117.53
2	A	2001	ZLK	C35-S32-N31	2.52	109.03	106.06
2	B	2001	ZLK	C26-C25-C04	-2.51	118.08	121.39
2	B	2001	ZLK	C05-C04-C25	-2.51	116.34	120.46
2	B	2001	ZLK	C28-C03-C04	-2.40	117.90	120.48
2	B	2001	ZLK	C18-O17-C15	2.40	119.92	116.48
2	A	2001	ZLK	C26-C27-C28	2.36	122.03	119.24
2	A	2001	ZLK	C26-C25-C04	-2.35	118.29	121.39
2	A	2001	ZLK	C28-C03-C04	-2.32	117.99	120.48
2	A	2001	ZLK	C41-C40-C35	-2.25	121.95	124.16
2	A	2001	ZLK	O33-S32-C35	2.23	111.34	107.66
3	B	2010	OLC	O20-C1-C2	2.17	121.00	114.03
2	B	2001	ZLK	C36-C35-C40	-2.15	119.19	121.17
2	B	2001	ZLK	O34-S32-C35	2.15	111.20	107.66
2	B	2019	ZLK	C27-C29-N31	2.15	118.69	116.09
2	B	2019	ZLK	C13-N14-C15	-2.14	122.84	126.36
2	A	2001	ZLK	O16-C15-N14	-2.11	121.51	126.11
2	B	2019	ZLK	C25-C26-C27	-2.08	118.36	120.78
2	B	2001	ZLK	O02-C03-C28	-2.07	120.56	124.12

There are no chirality outliers.

All (222) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	2019	ZLK	N14-C15-O17-C18
2	B	2019	ZLK	O16-C15-O17-C18
2	B	2019	ZLK	C19-C18-O17-C15
3	A	2007	OLC	C21-C22-C24-O25
3	B	2007	OLC	C10-C11-C12-C13
3	B	2009	OLC	C21-C22-C24-O25
3	A	2007	OLC	O19-C1-O20-C21
3	A	2007	OLC	C2-C1-O20-C21
5	A	2021	1PE	OH4-C13-C23-OH3
3	B	2009	OLC	C2-C1-O20-C21
4	A	2014	OLA	C1-C2-C3-C4
3	B	2009	OLC	O20-C21-C22-C24
3	B	2009	OLC	O19-C1-O20-C21

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Mol	Chain	Res	Type	Atoms
3	B	2009	OLC	O20-C21-C22-O23
3	B	2010	OLC	C1-C2-C3-C4
4	A	2013	OLA	C1-C2-C3-C4
4	A	2019	OLA	C1-C2-C3-C4
4	B	2014	OLA	C1-C2-C3-C4
4	B	2015	OLA	C1-C2-C3-C4
4	B	2017	OLA	C1-C2-C3-C4
4	A	2017	OLA	C1-C2-C3-C4
3	A	2007	OLC	C1-C2-C3-C4
4	B	2018	OLA	C1-C2-C3-C4
5	A	2021	1PE	OH2-C12-C22-OH3
4	B	2013	OLA	C10-C11-C12-C13
4	A	2016	OLA	C1-C2-C3-C4
3	A	2003	OLC	C11-C12-C13-C14
4	A	2011	OLA	C3-C4-C5-C6
4	A	2016	OLA	C12-C13-C14-C15
4	A	2017	OLA	C4-C5-C6-C7
4	A	2016	OLA	C3-C4-C5-C6
4	B	2018	OLA	C14-C15-C16-C17
3	A	2004	OLC	C5-C6-C7-C8
3	B	2009	OLC	C12-C13-C14-C15
4	A	2019	OLA	C13-C14-C15-C16
3	A	2003	OLC	C4-C5-C6-C7
3	A	2007	OLC	C3-C4-C5-C6
3	B	2003	OLC	C4-C5-C6-C7
3	B	2009	OLC	C4-C5-C6-C7
4	A	2012	OLA	C2-C3-C4-C5
4	B	2013	OLA	C3-C4-C5-C6
3	A	2007	OLC	C4-C5-C6-C7
4	A	2013	OLA	C12-C13-C14-C15
3	B	2003	OLC	C6-C7-C8-C9
4	A	2013	OLA	C10-C11-C12-C13
4	A	2016	OLA	C6-C7-C8-C9
4	A	2012	OLA	C1-C2-C3-C4
3	A	2003	OLC	C13-C14-C15-C16
3	A	2007	OLC	C5-C6-C7-C8
4	B	2017	OLA	C2-C3-C4-C5
4	A	2011	OLA	C5-C6-C7-C8
4	B	2018	OLA	C3-C4-C5-C6
3	A	2003	OLC	C3-C4-C5-C6
2	B	2019	ZLK	O17-C15-N14-C13
4	A	2013	OLA	C4-C5-C6-C7

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Mol	Chain	Res	Type	Atoms
3	B	2009	OLC	O23-C22-C24-O25
3	A	2007	OLC	C2-C3-C4-C5
4	A	2013	OLA	C2-C3-C4-C5
4	A	2016	OLA	C13-C14-C15-C16
3	A	2002	OLC	C6-C7-C8-C9
3	B	2005	OLC	C6-C7-C8-C9
4	B	2018	OLA	C4-C5-C6-C7
4	A	2019	OLA	C11-C12-C13-C14
4	A	2020	OLA	C3-C4-C5-C6
4	A	2019	OLA	C14-C15-C16-C17
4	B	2017	OLA	C3-C4-C5-C6
4	A	2020	OLA	C9-C10-C11-C12
4	B	2017	OLA	C10-C11-C12-C13
3	A	2006	OLC	C13-C14-C15-C16
4	A	2011	OLA	C2-C3-C4-C5
4	B	2018	OLA	C13-C14-C15-C16
4	B	2016	OLA	C5-C6-C7-C8
4	A	2013	OLA	C13-C14-C15-C16
4	A	2013	OLA	C5-C6-C7-C8
4	A	2016	OLA	C4-C5-C6-C7
4	A	2017	OLA	C3-C4-C5-C6
3	A	2009	OLC	C4-C5-C6-C7
4	B	2011	OLA	C3-C4-C5-C6
3	B	2007	OLC	C6-C7-C8-C9
4	B	2016	OLA	C11-C12-C13-C14
3	B	2009	OLC	C5-C6-C7-C8
3	A	2007	OLC	C6-C7-C8-C9
4	A	2019	OLA	C10-C11-C12-C13
4	B	2018	OLA	C6-C7-C8-C9
3	B	2005	OLC	C4-C5-C6-C7
4	B	2016	OLA	C1-C2-C3-C4
4	A	2012	OLA	C3-C4-C5-C6
3	A	2009	OLC	C2-C3-C4-C5
4	A	2010	OLA	C6-C7-C8-C9
4	A	2019	OLA	C2-C3-C4-C5
4	B	2012	OLA	C5-C6-C7-C8
3	B	2007	OLC	C4-C5-C6-C7
4	B	2013	OLA	C11-C12-C13-C14
4	B	2017	OLA	C13-C14-C15-C16
2	B	2019	ZLK	C03-C04-C05-C06
4	B	2013	OLA	C1-C2-C3-C4
4	B	2016	OLA	C15-C16-C17-C18

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Mol	Chain	Res	Type	Atoms
2	B	2019	ZLK	C29-N31-S32-O34
4	B	2011	OLA	C2-C3-C4-C5
4	B	2017	OLA	C12-C13-C14-C15
3	A	2002	OLC	C10-C11-C12-C13
3	A	2008	OLC	C6-C7-C8-C9
3	B	2004	OLC	C10-C11-C12-C13
3	B	2005	OLC	C10-C11-C12-C13
3	A	2003	OLC	C14-C15-C16-C17
3	B	2010	OLC	C2-C3-C4-C5
3	B	2009	OLC	C13-C14-C15-C16
3	A	2007	OLC	O23-C22-C24-O25
4	B	2015	OLA	C6-C7-C8-C9
3	B	2002	OLC	C6-C7-C8-C9
3	A	2006	OLC	C15-C16-C17-C18
3	B	2006	OLC	C11-C12-C13-C14
4	B	2012	OLA	C4-C5-C6-C7
4	A	2013	OLA	C14-C15-C16-C17
2	B	2019	ZLK	C25-C04-C05-C06
3	B	2006	OLC	C5-C6-C7-C8
4	A	2018	OLA	C7-C8-C9-C10
4	B	2018	OLA	C15-C16-C17-C18
4	A	2013	OLA	C6-C7-C8-C9
3	A	2006	OLC	C14-C15-C16-C17
3	A	2003	OLC	C5-C6-C7-C8
5	A	2021	1PE	C23-C13-OH4-C24
3	A	2009	OLC	C5-C6-C7-C8
4	B	2013	OLA	C2-C3-C4-C5
3	A	2003	OLC	C2-C3-C4-C5
4	A	2019	OLA	C5-C6-C7-C8
4	A	2017	OLA	C2-C3-C4-C5
4	A	2016	OLA	C11-C12-C13-C14
3	B	2007	OLC	C5-C6-C7-C8
3	B	2003	OLC	C3-C4-C5-C6
3	A	2003	OLC	C12-C13-C14-C15
2	B	2019	ZLK	C40-C35-S32-O34
3	B	2004	OLC	C5-C6-C7-C8
3	B	2008	OLC	C5-C6-C7-C8
4	A	2017	OLA	C5-C6-C7-C8
4	B	2012	OLA	C1-C2-C3-C4
4	A	2016	OLA	C14-C15-C16-C17
3	A	2003	OLC	C9-C10-C11-C12
2	B	2001	ZLK	C40-C35-S32-O33

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Mol	Chain	Res	Type	Atoms
4	B	2013	OLA	C6-C7-C8-C9
4	B	2018	OLA	C12-C13-C14-C15
4	B	2015	OLA	C2-C3-C4-C5
4	A	2016	OLA	O2-C1-C2-C3
4	A	2017	OLA	O1-C1-C2-C3
4	B	2015	OLA	O1-C1-C2-C3
3	B	2010	OLC	O19-C1-C2-C3
3	A	2005	OLC	C6-C7-C8-C9
3	A	2002	OLC	C7-C8-C9-C10
4	A	2019	OLA	C7-C8-C9-C10
4	B	2014	OLA	O2-C1-C2-C3
4	B	2018	OLA	O1-C1-C2-C3
3	B	2010	OLC	O20-C1-C2-C3
4	B	2014	OLA	O1-C1-C2-C3
4	B	2014	OLA	C2-C3-C4-C5
4	A	2014	OLA	O1-C1-C2-C3
4	A	2015	OLA	O2-C1-C2-C3
4	A	2011	OLA	C4-C5-C6-C7
4	B	2018	OLA	C10-C11-C12-C13
4	A	2013	OLA	O1-C1-C2-C3
4	A	2015	OLA	O1-C1-C2-C3
3	B	2005	OLC	C7-C8-C9-C10
4	A	2013	OLA	O2-C1-C2-C3
4	A	2017	OLA	O2-C1-C2-C3
4	A	2019	OLA	O2-C1-C2-C3
4	A	2019	OLA	O1-C1-C2-C3
4	B	2011	OLA	O2-C1-C2-C3
2	B	2019	ZLK	O16-C15-N14-C13
4	A	2014	OLA	O2-C1-C2-C3
4	B	2015	OLA	O2-C1-C2-C3
4	B	2018	OLA	O2-C1-C2-C3
4	A	2012	OLA	O2-C1-C2-C3
4	B	2014	OLA	C3-C4-C5-C6
4	A	2012	OLA	O1-C1-C2-C3
4	B	2012	OLA	O1-C1-C2-C3
4	A	2016	OLA	O1-C1-C2-C3
4	B	2011	OLA	O1-C1-C2-C3
3	B	2006	OLC	C7-C8-C9-C10
4	B	2012	OLA	O2-C1-C2-C3
3	A	2002	OLC	C9-C10-C11-C12
4	A	2016	OLA	C15-C16-C17-C18
4	B	2017	OLA	O1-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
3	A	2009	OLC	C3-C4-C5-C6
4	B	2017	OLA	C6-C7-C8-C9
3	A	2006	OLC	C7-C8-C9-C10
4	A	2018	OLA	C9-C10-C11-C12
3	B	2004	OLC	C4-C5-C6-C7
4	B	2017	OLA	O2-C1-C2-C3
4	A	2010	OLA	C4-C5-C6-C7
3	A	2008	OLC	C9-C10-C11-C12
3	A	2008	OLC	C7-C8-C9-C10
4	A	2019	OLA	C9-C10-C11-C12
4	A	2020	OLA	C7-C8-C9-C10
2	A	2001	ZLK	C22-C18-O17-C15
4	B	2016	OLA	O2-C1-C2-C3
3	B	2008	OLC	C6-C7-C8-C9
4	A	2010	OLA	O2-C1-C2-C3
3	B	2004	OLC	C7-C8-C9-C10
4	B	2017	OLA	C9-C10-C11-C12
3	B	2009	OLC	C6-C7-C8-C9
4	B	2013	OLA	O2-C1-C2-C3
3	A	2006	OLC	C11-C12-C13-C14
4	B	2016	OLA	O1-C1-C2-C3
4	A	2010	OLA	O1-C1-C2-C3
3	B	2009	OLC	C9-C10-C11-C12
4	B	2018	OLA	C7-C8-C9-C10
4	B	2013	OLA	O1-C1-C2-C3
4	B	2013	OLA	C9-C10-C11-C12
4	A	2010	OLA	C5-C6-C7-C8
4	B	2012	OLA	C3-C4-C5-C6
3	B	2004	OLC	C9-C10-C11-C12
4	A	2019	OLA	C15-C16-C17-C18
4	B	2016	OLA	C9-C10-C11-C12
4	B	2013	OLA	C7-C8-C9-C10
4	A	2011	OLA	O2-C1-C2-C3
3	A	2007	OLC	O20-C1-C2-C3
5	A	2021	1PE	OH5-C14-C24-OH4
3	A	2005	OLC	C9-C10-C11-C12
4	A	2011	OLA	O1-C1-C2-C3
2	A	2001	ZLK	C40-C35-S32-O33
4	A	2010	OLA	C1-C2-C3-C4
3	B	2009	OLC	O20-C1-C2-C3
3	A	2004	OLC	C11-C12-C13-C14

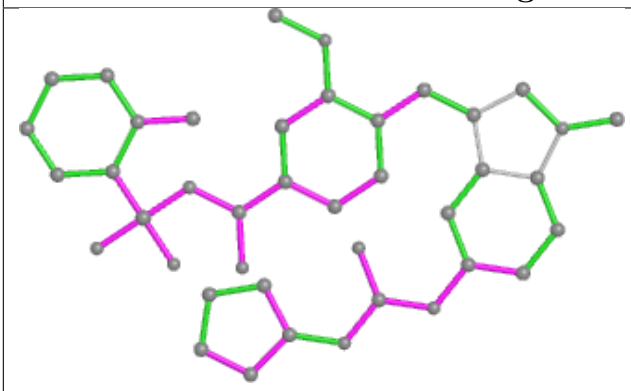
There are no ring outliers.

11 monomers are involved in 9 short contacts:

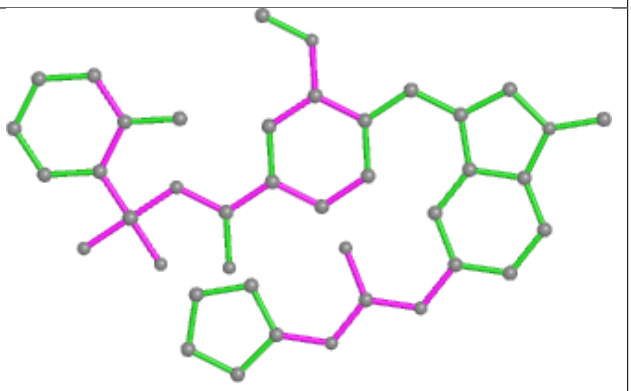
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	2019	OLA	2	0
4	B	2014	OLA	1	0
4	B	2011	OLA	1	0
3	B	2006	OLC	1	0
3	B	2010	OLC	1	0
4	B	2013	OLA	1	0
4	A	2014	OLA	2	0
4	B	2016	OLA	1	0
3	B	2004	OLC	1	0
4	A	2013	OLA	1	0
4	A	2012	OLA	1	0

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 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.

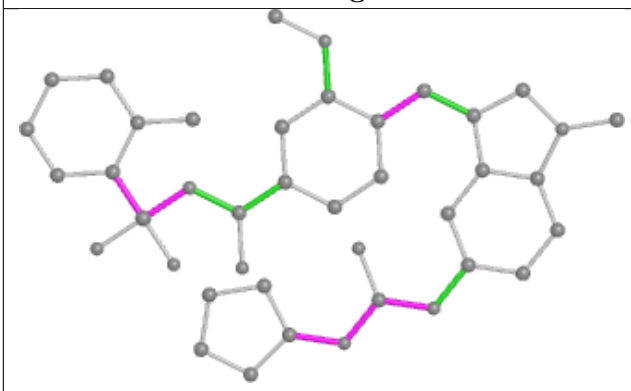
Ligand ZLK B 2019



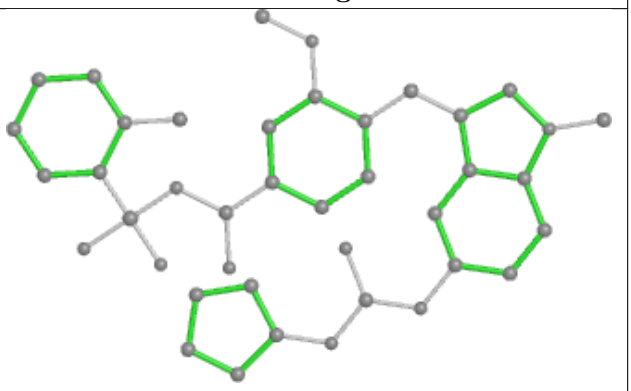
Bond lengths



Bond angles

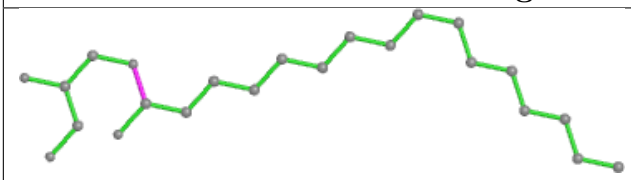


Torsions

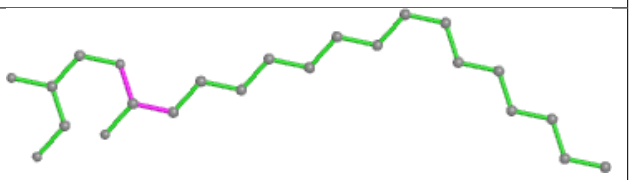


Rings

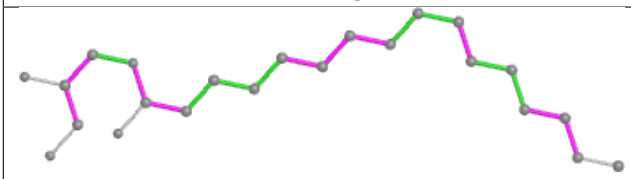
Ligand OLC B 2009



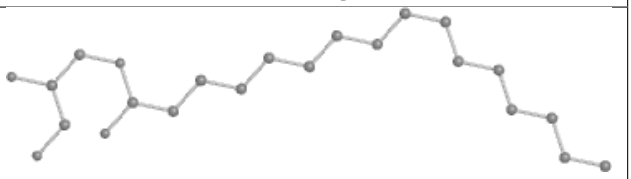
Bond lengths



Bond angles

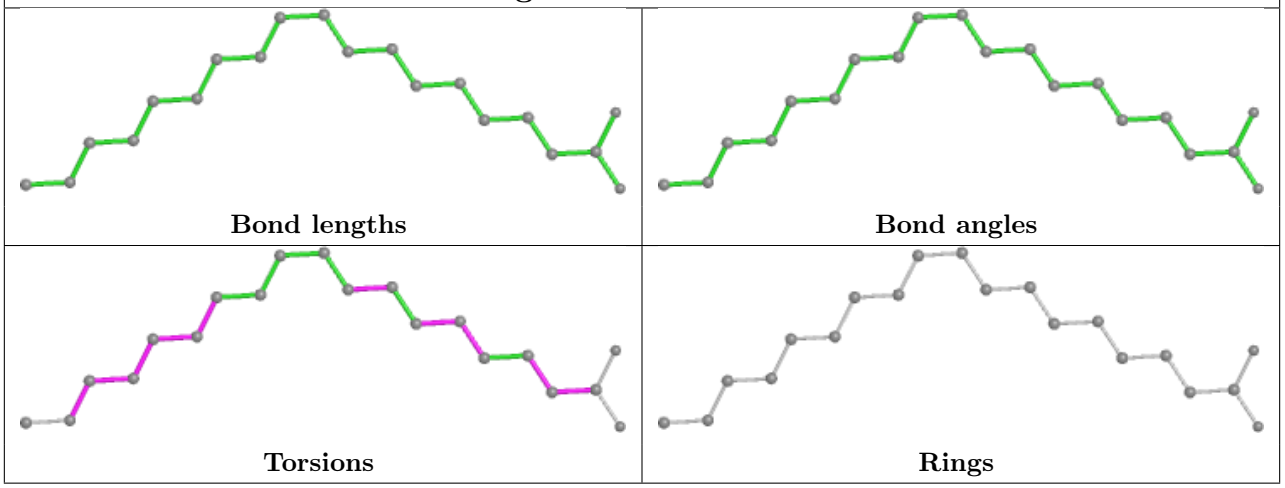


Torsions

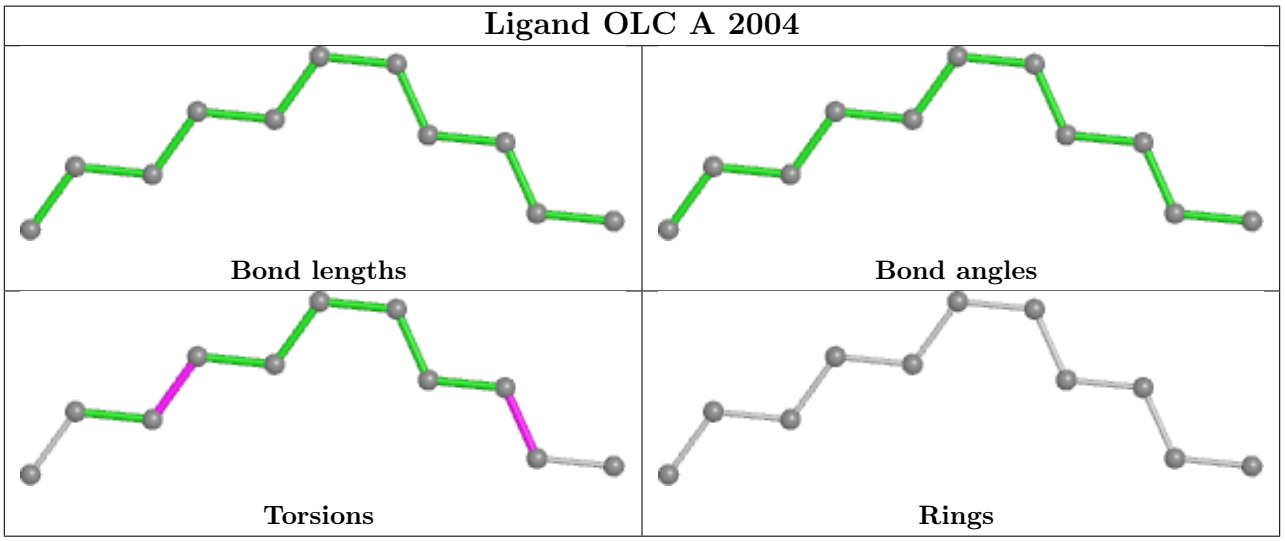


Rings

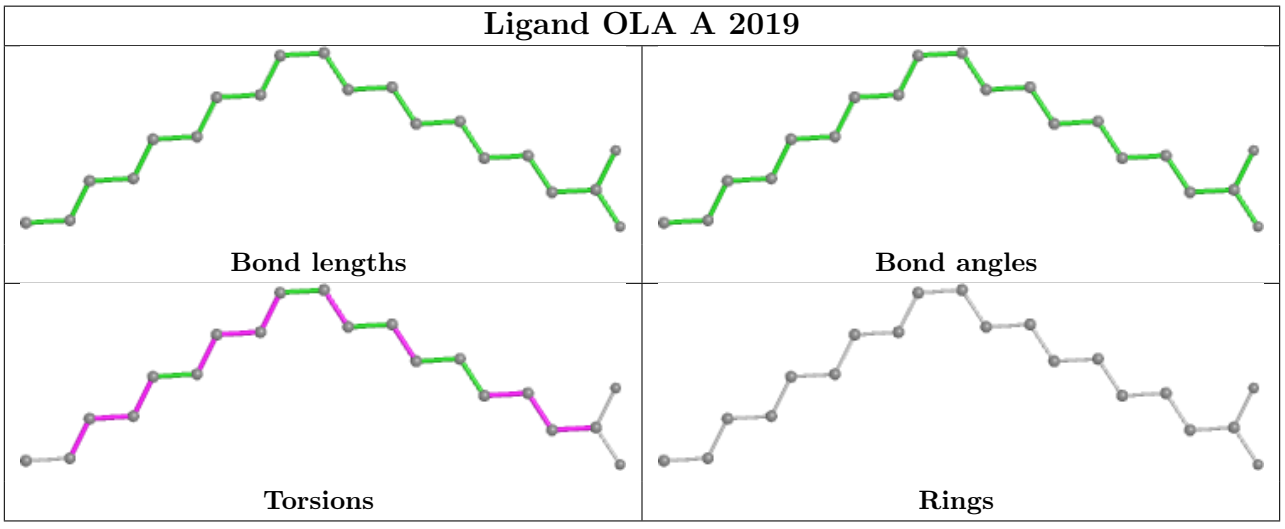
Ligand OLA A 2016



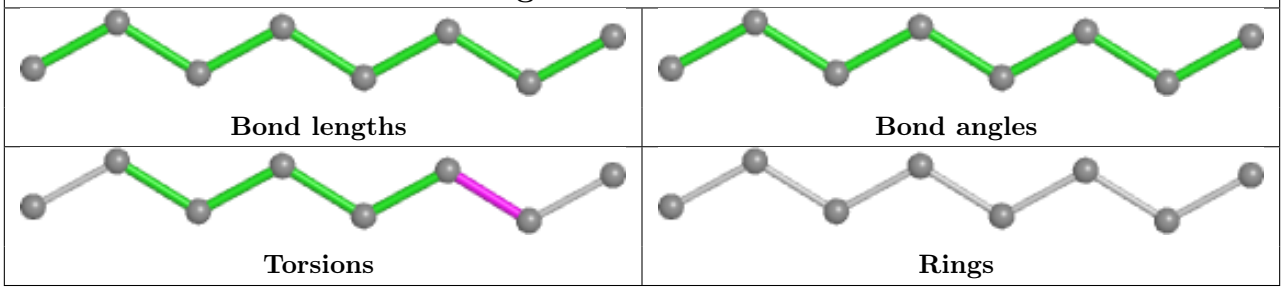
Ligand OLC A 2004



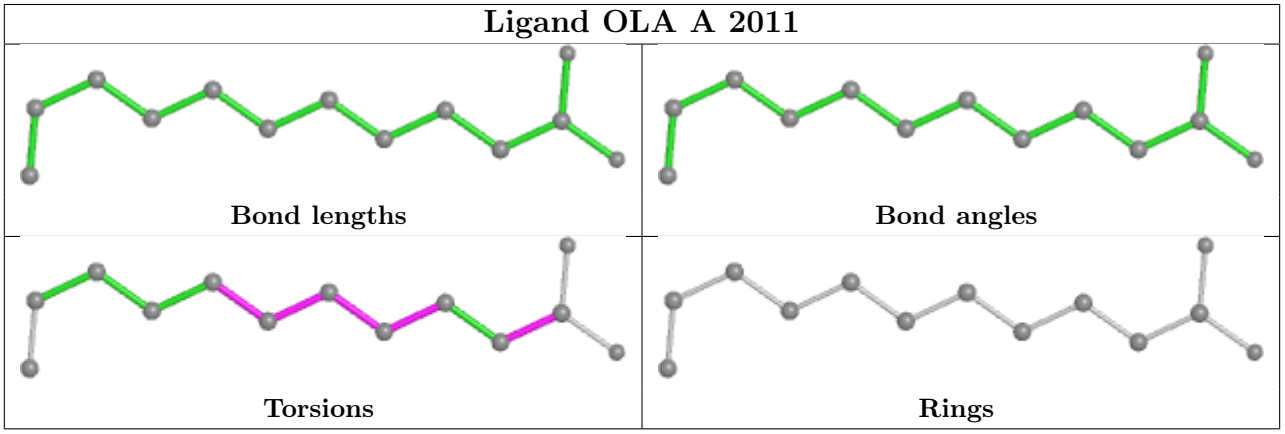
Ligand OLA A 2019



Ligand OLC B 2002



Ligand OLA A 2011



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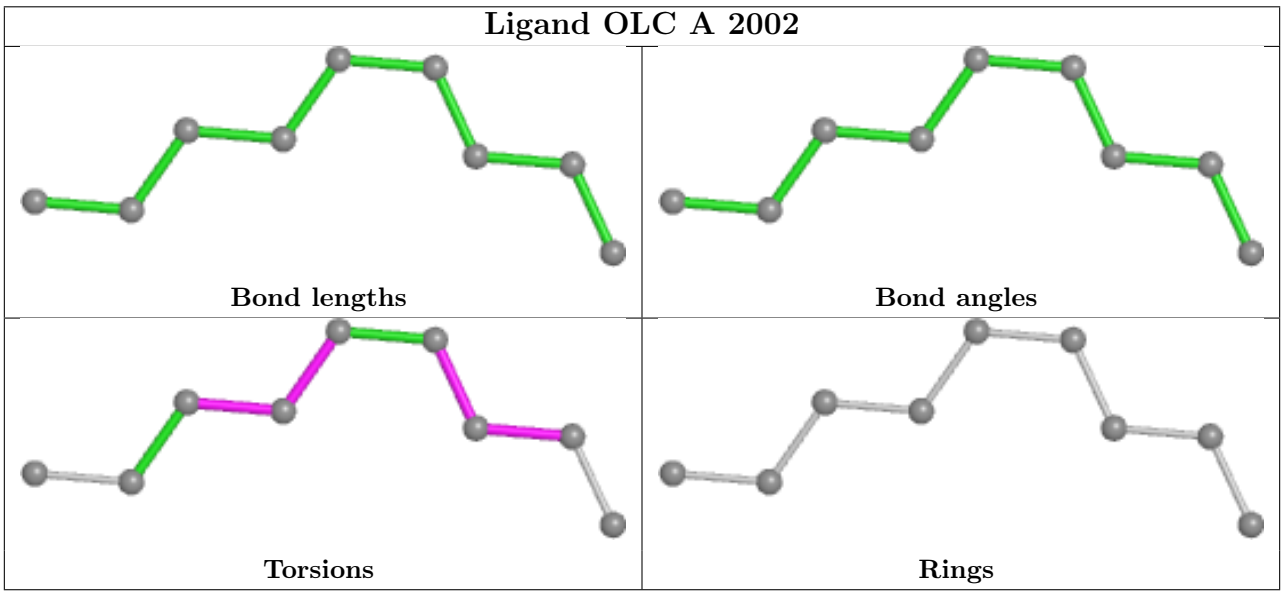
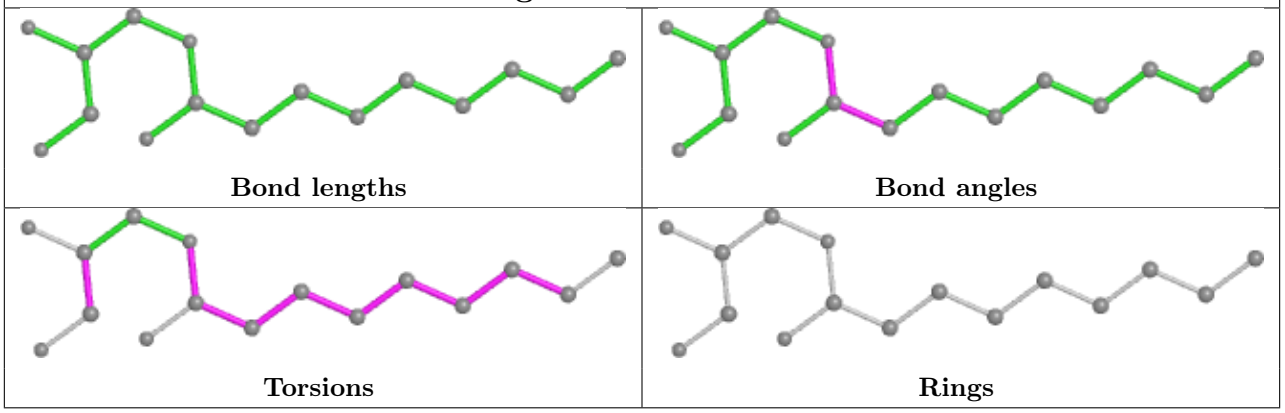
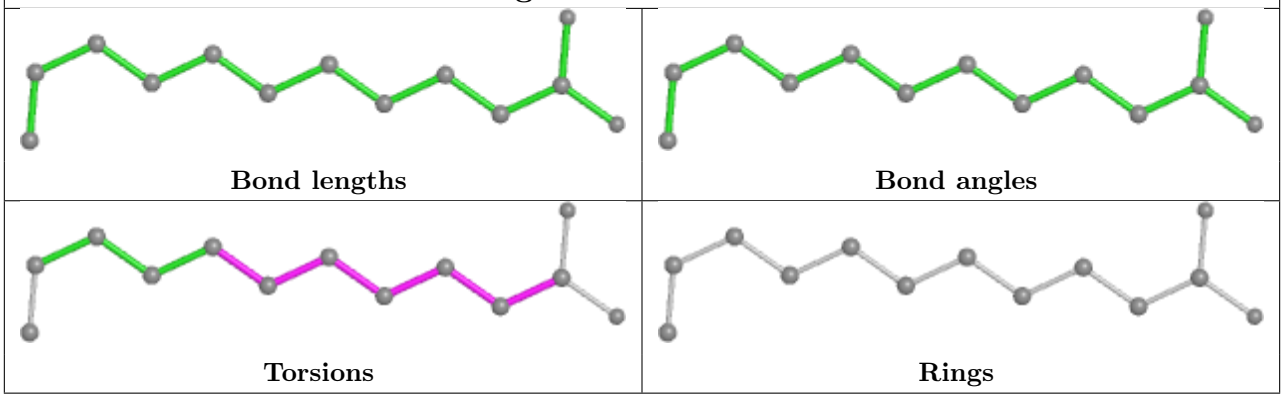


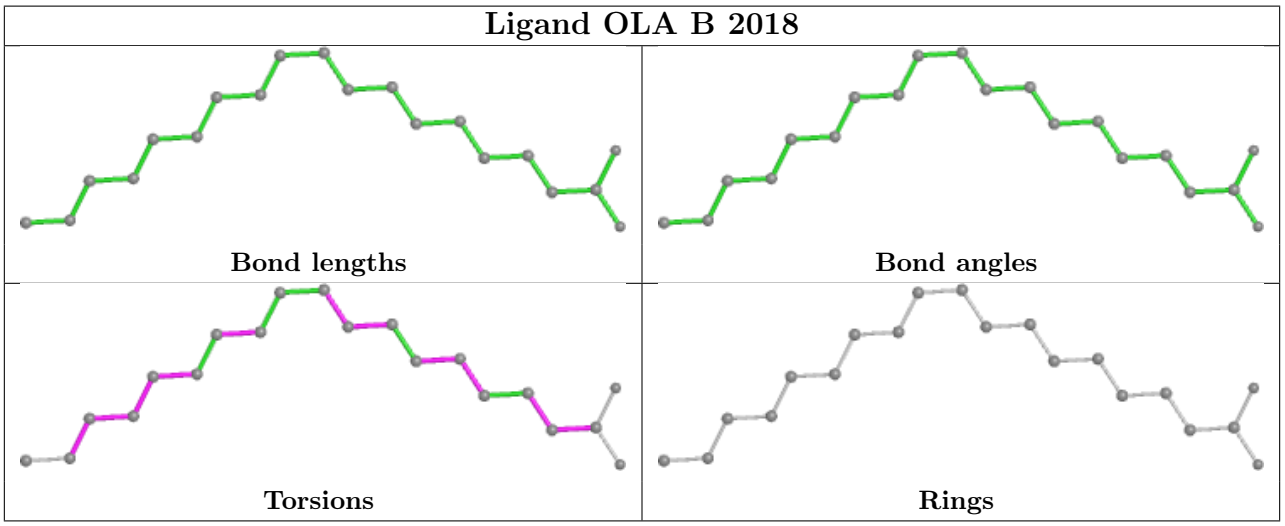
Ligand OLC A 2007



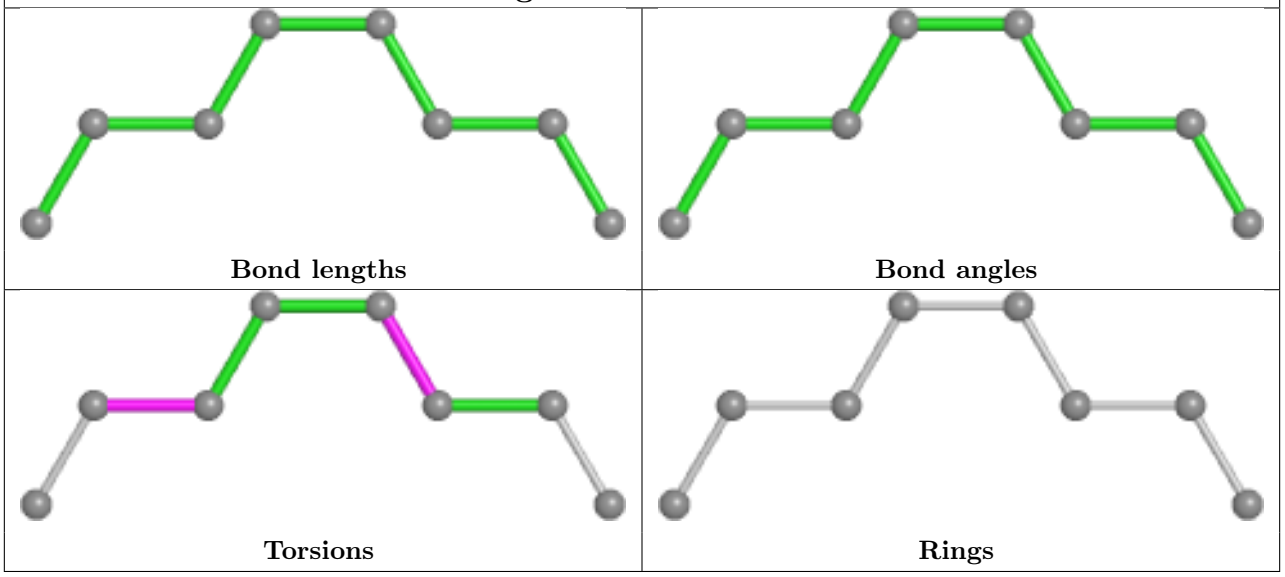
Ligand OLA A 2017



Ligand OLA B 2018

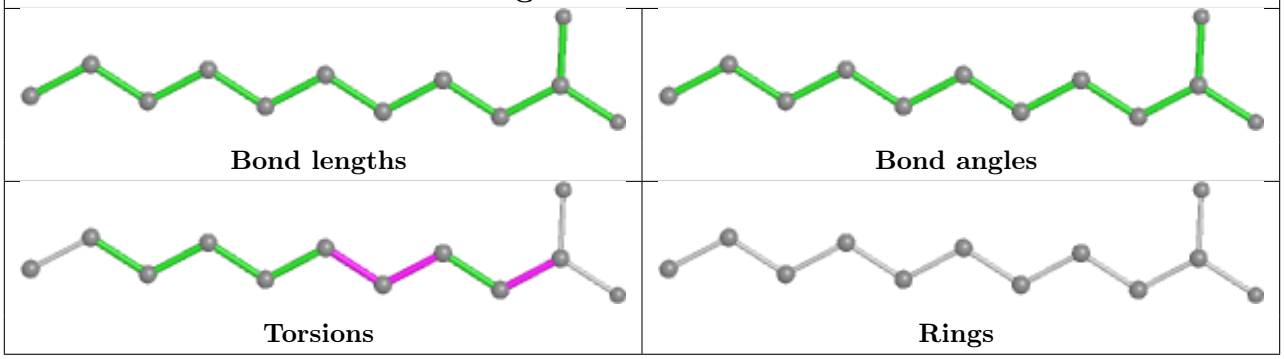


Ligand OLC A 2005



Ligand OLA B 2014

Ligand OLA B 2011



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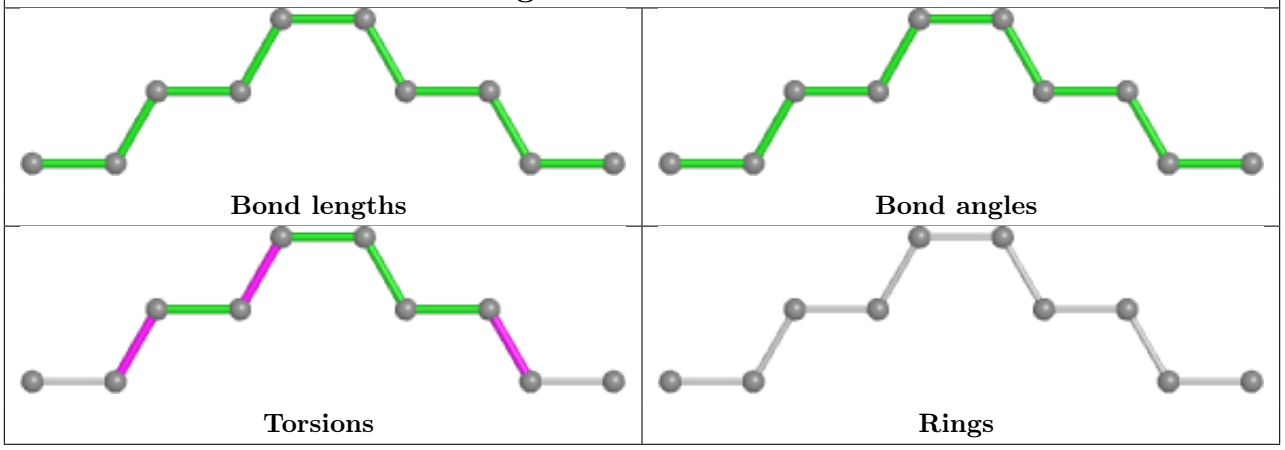
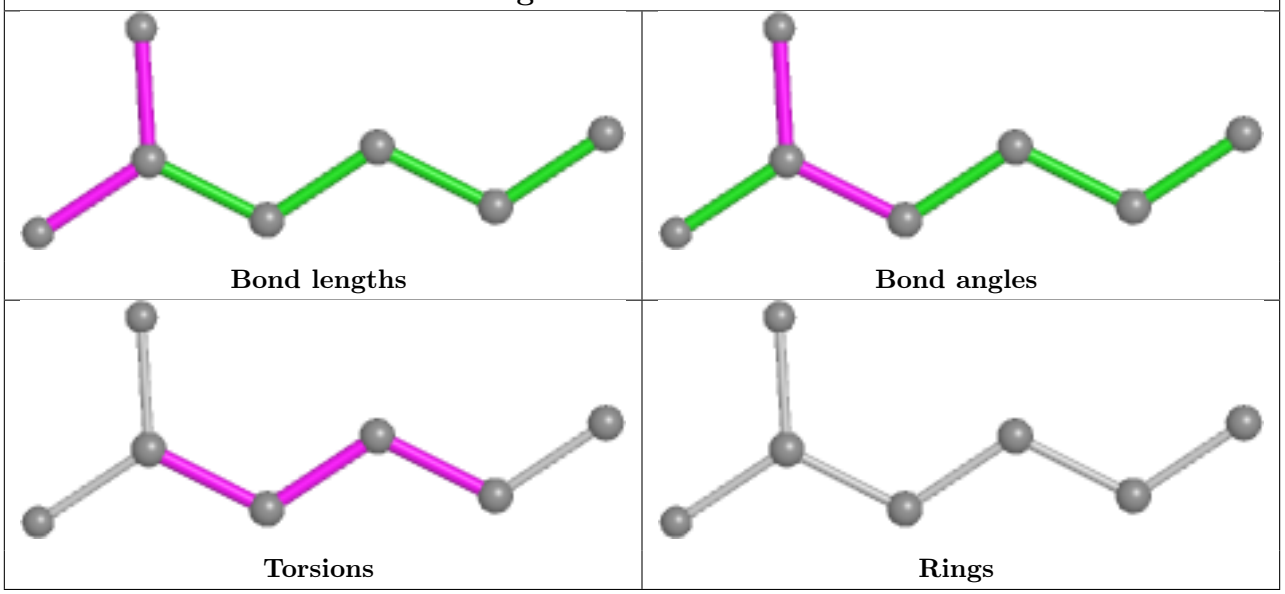
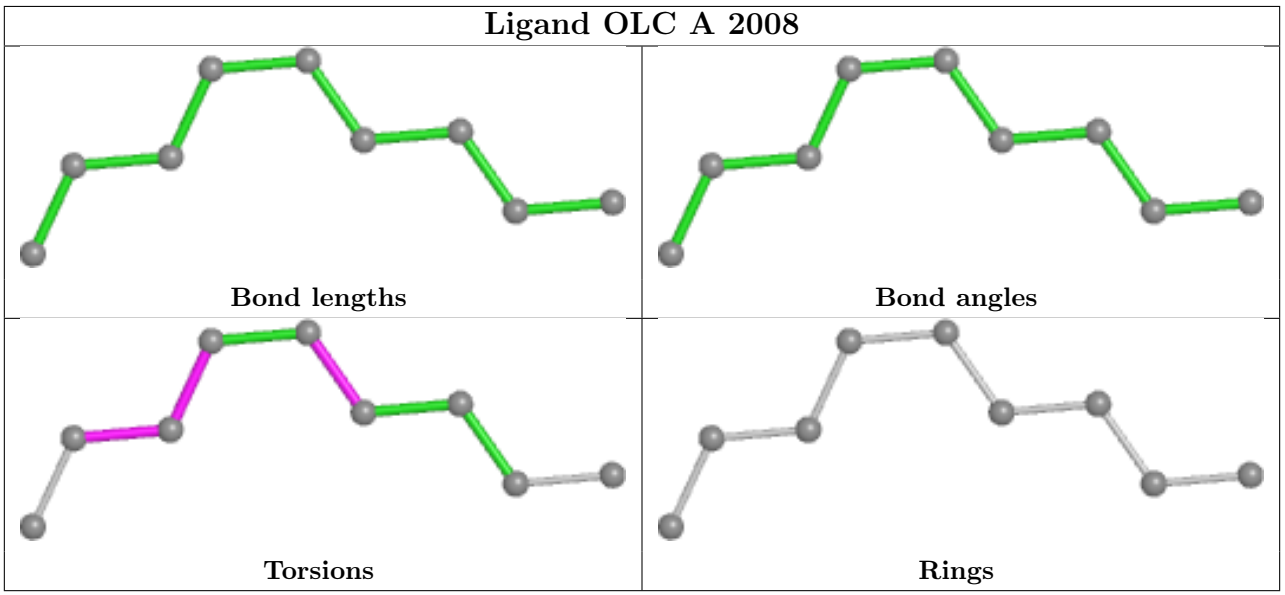


Ligand OLC B 2010



Ligand OLC A 2008



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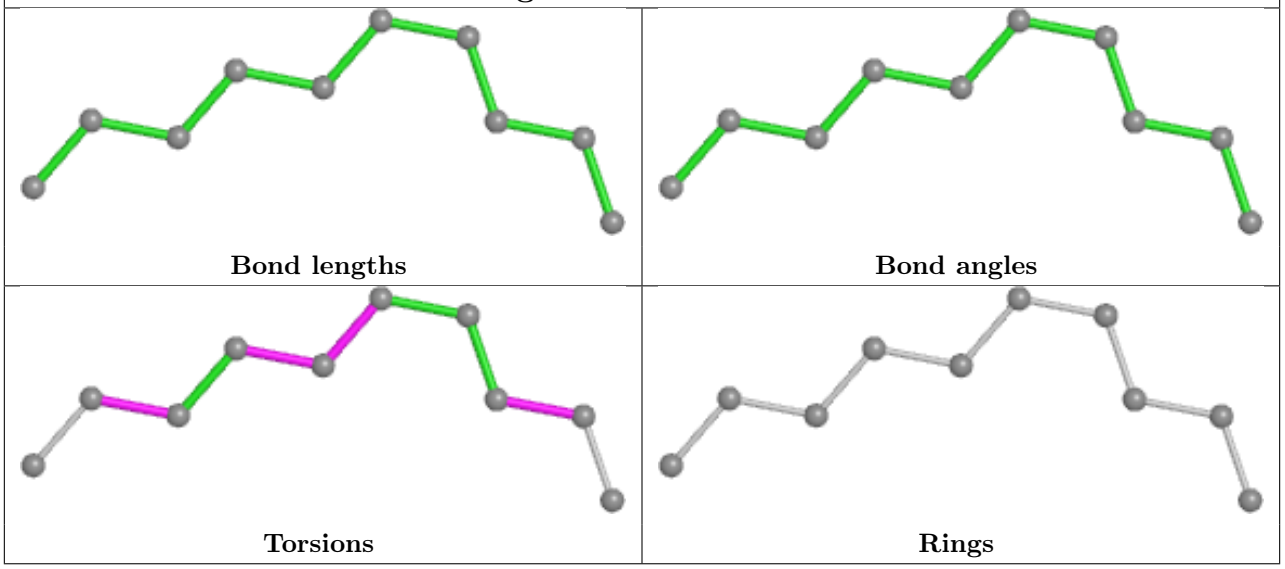
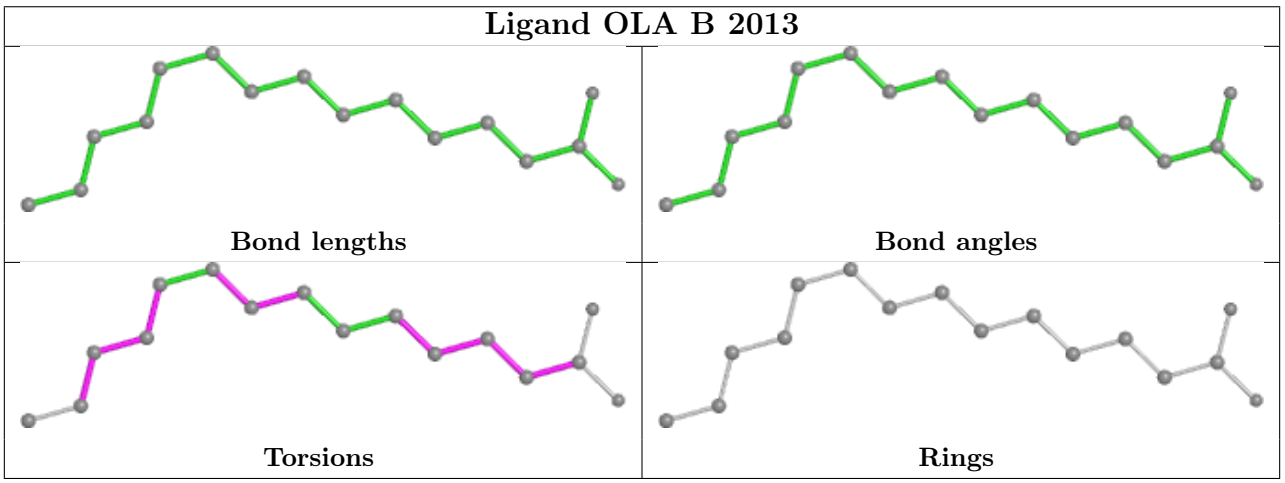


Ligand OLA B 2013



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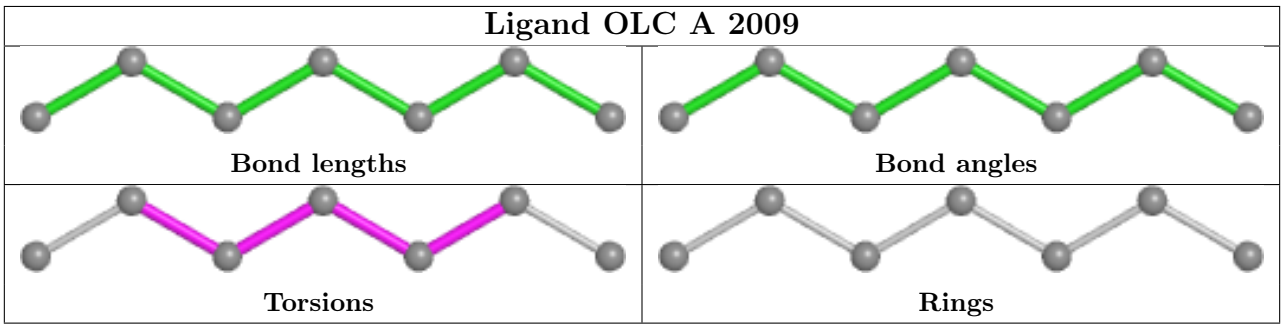

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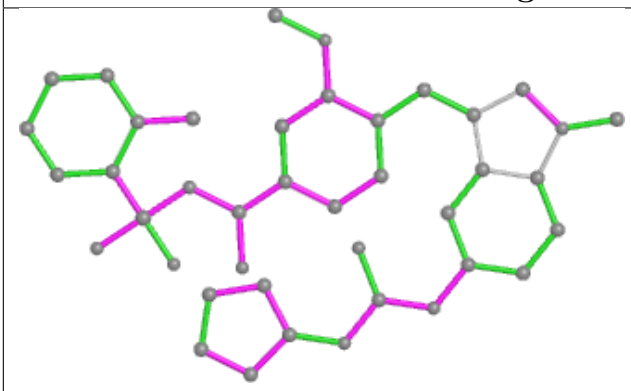
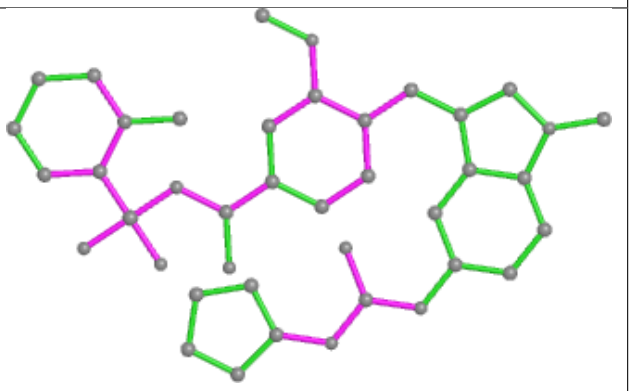
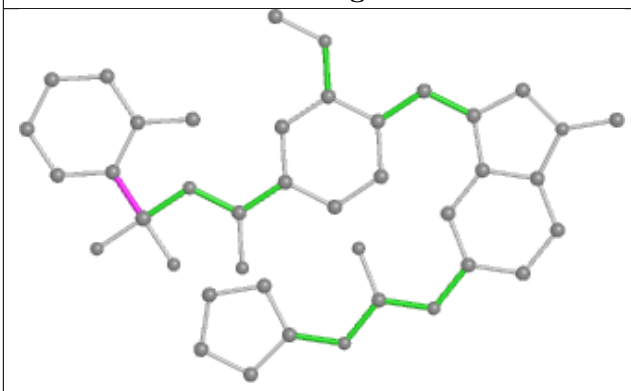


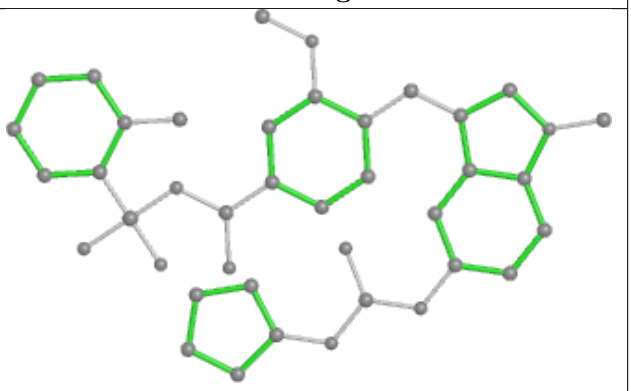
Bond lengths



Bond angles

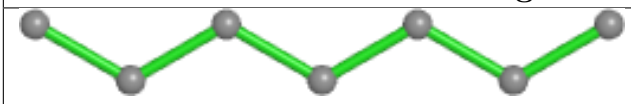


Torsions

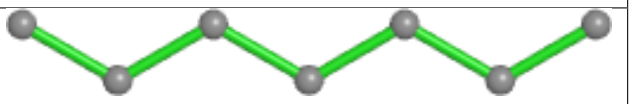


Rings

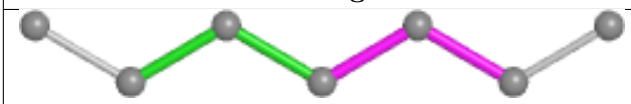
Ligand OLC B 2008



Bond lengths



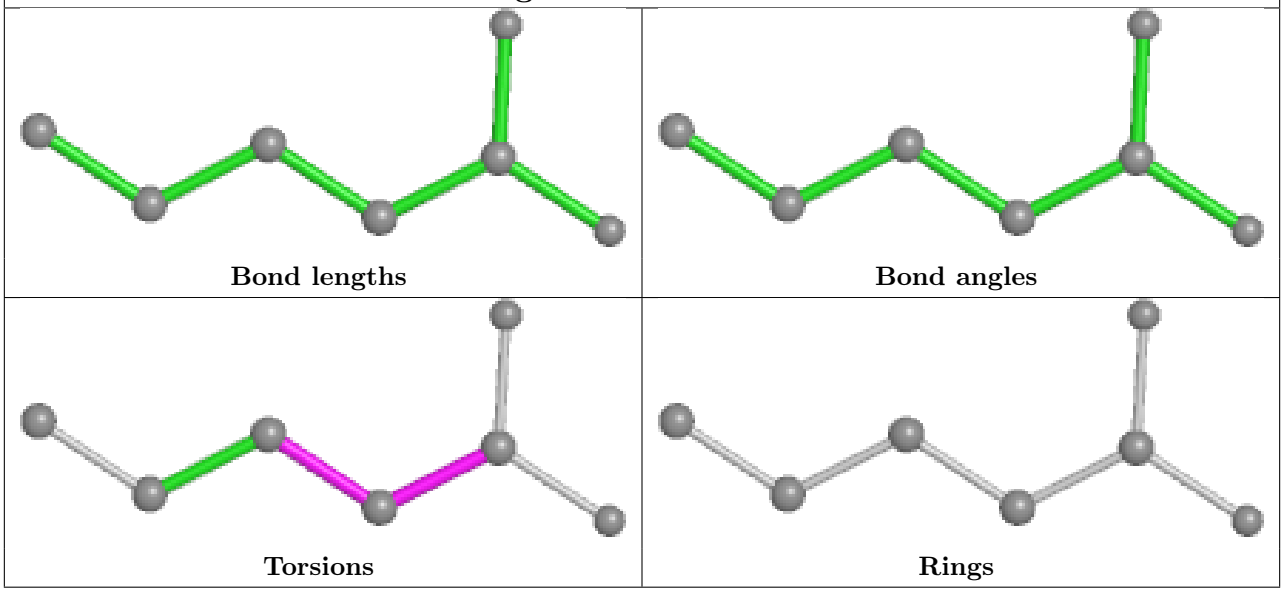
Bond angles



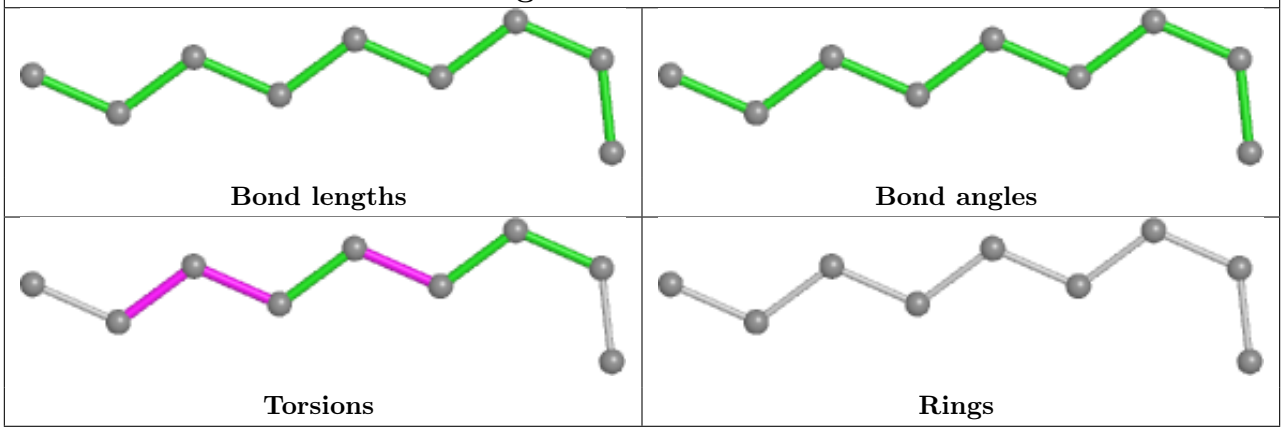
Torsions

Rings

Ligand OLA A 2014



Ligand OLC B 2003



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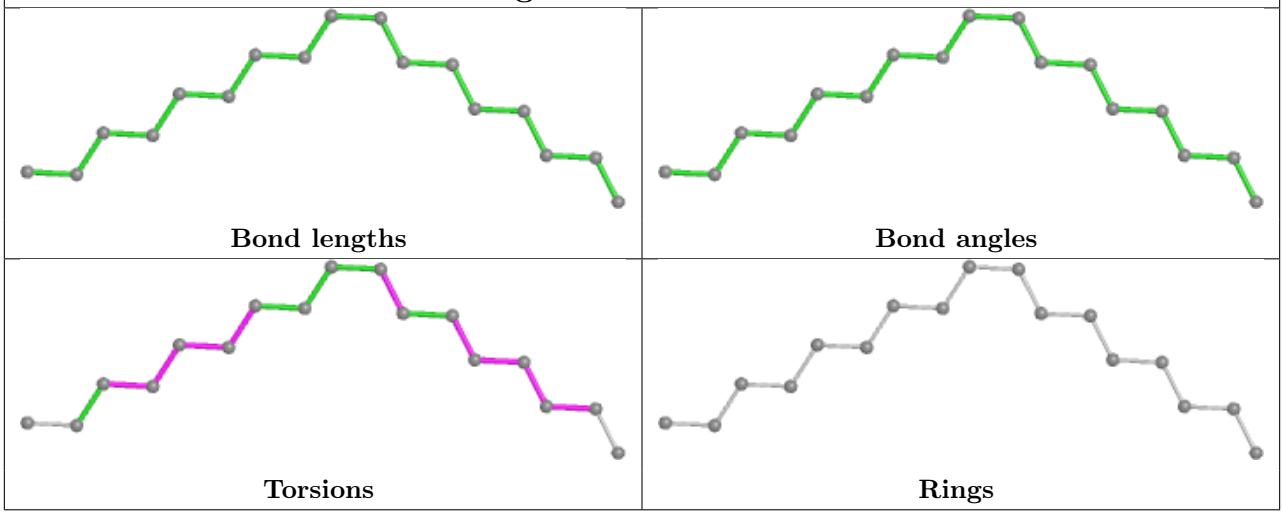
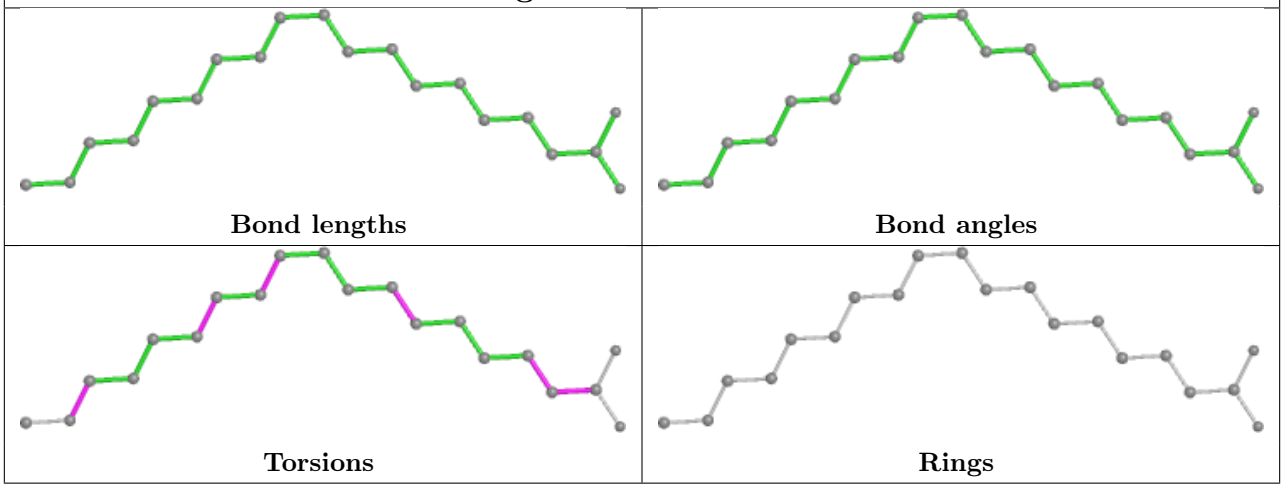
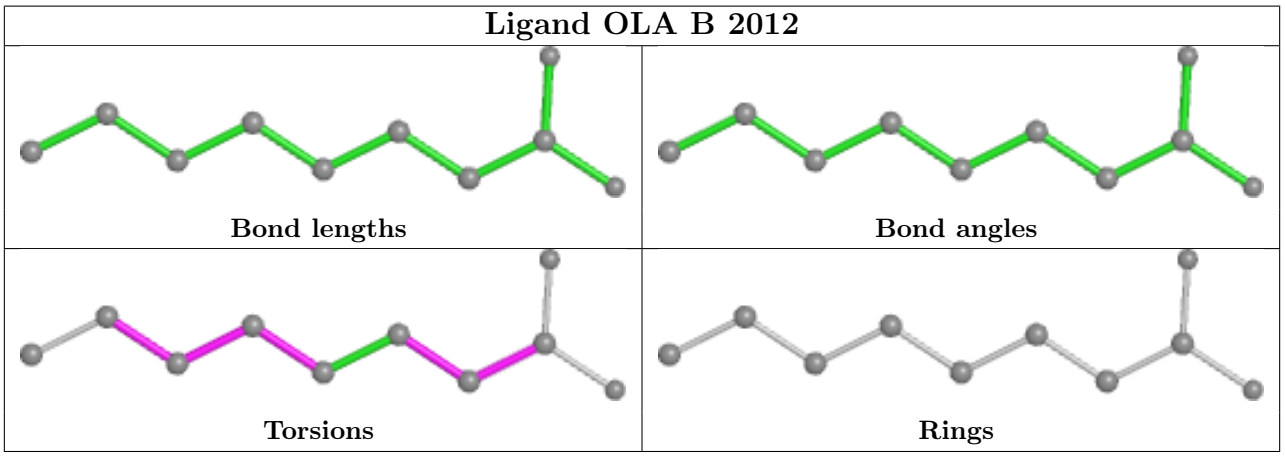


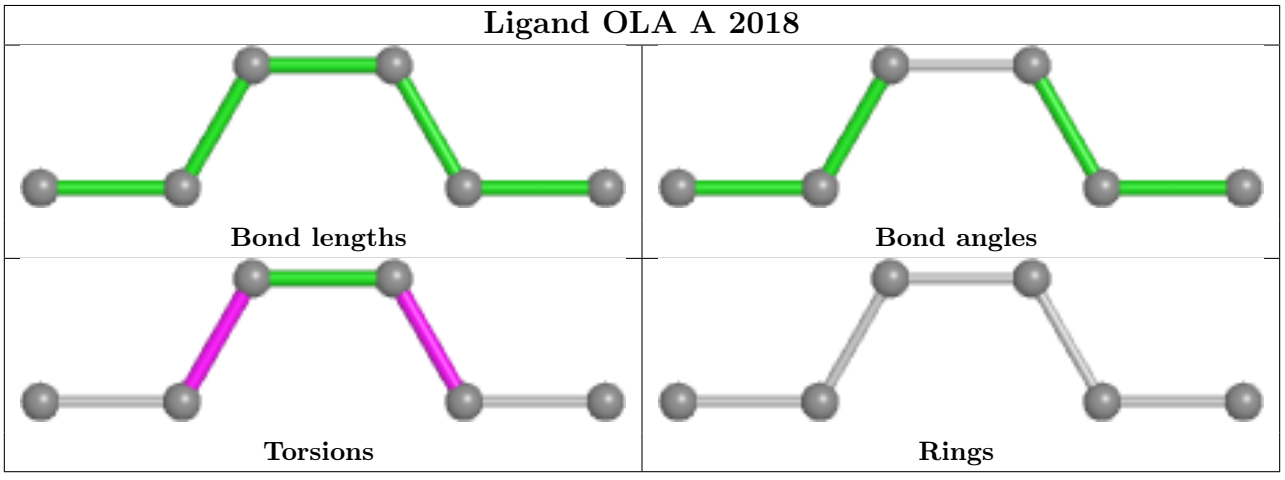
Ligand OLA B 2016



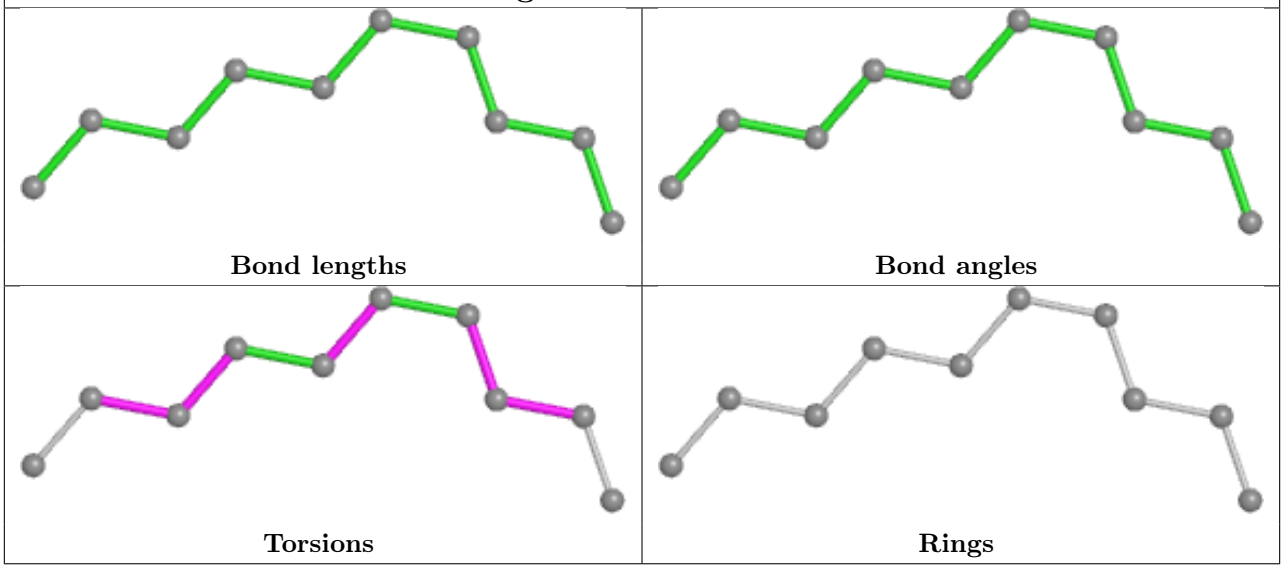
Ligand OLA B 2012



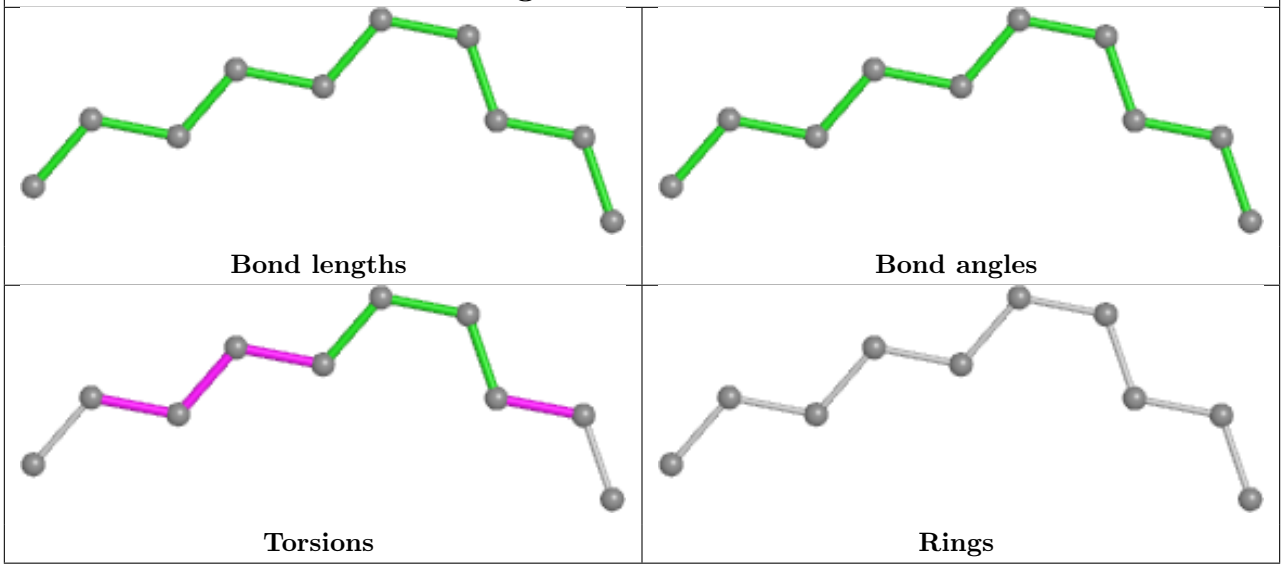
Ligand OLA A 2018



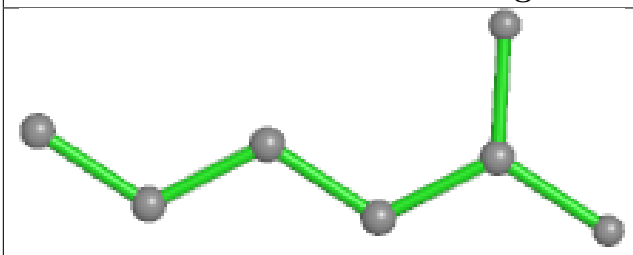
Ligand OLC B 2004



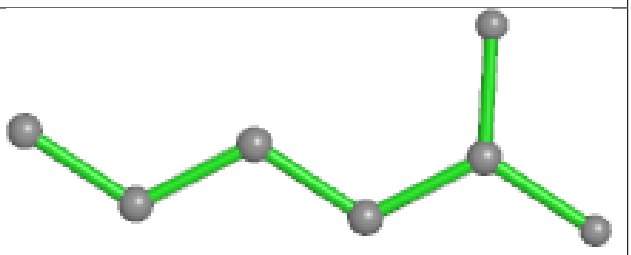
Ligand OLC B 2007



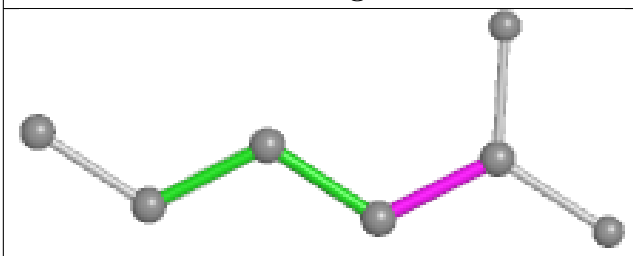
Ligand OLA A 2015



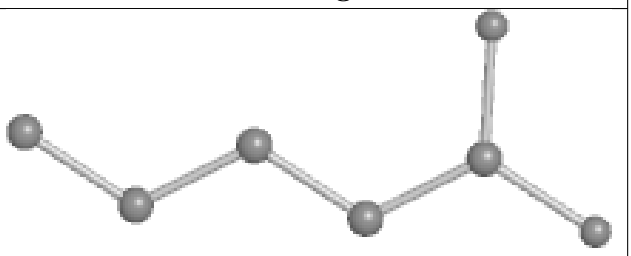
Bond lengths



Bond angles

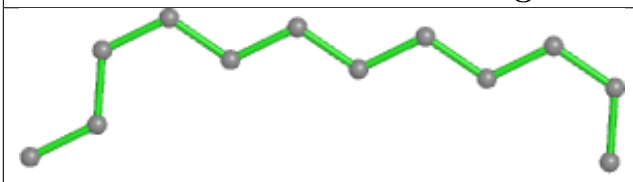


Torsions

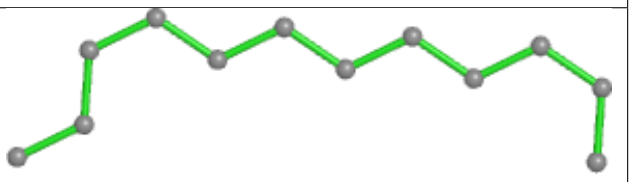


Rings

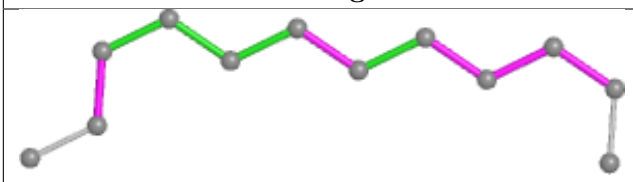
Ligand OLC A 2006



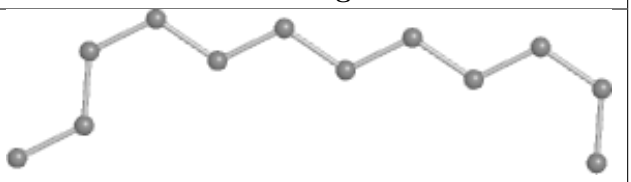
Bond lengths



Bond angles

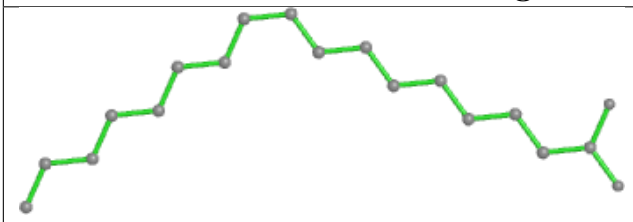


Torsions

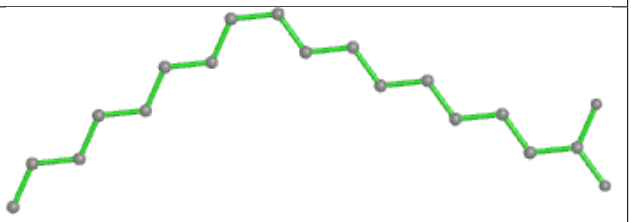


Rings

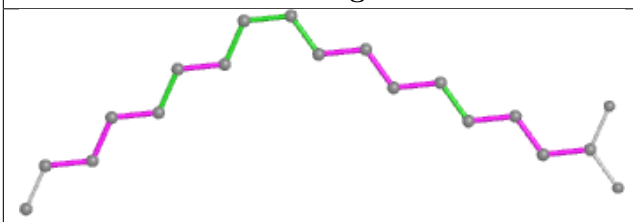
Ligand OLA A 2013



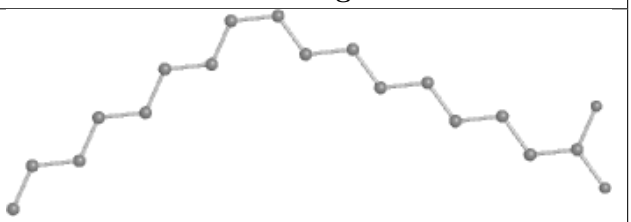
Bond lengths



Bond angles

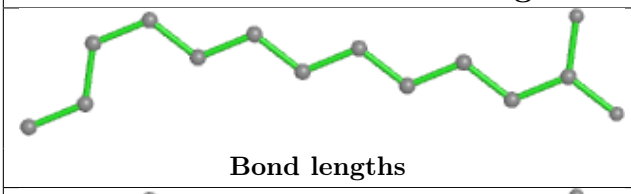


Torsions

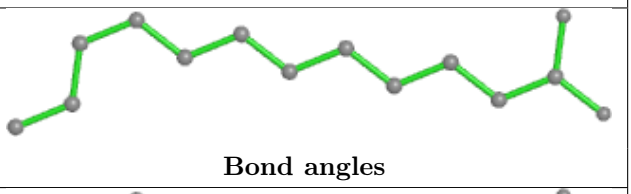


Rings

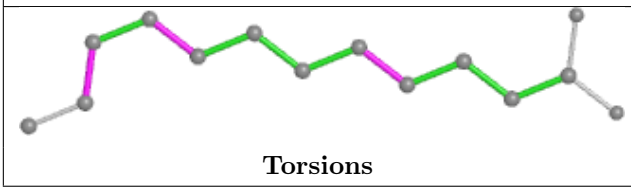
Ligand OLA A 2020



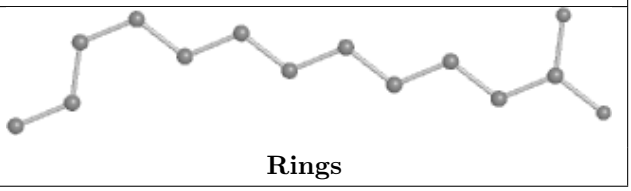
Bond lengths



Bond angles

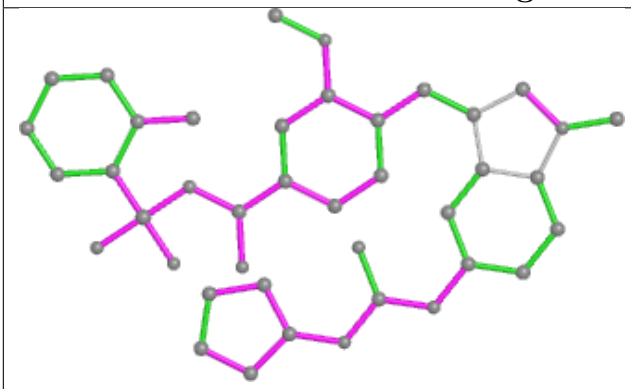


Torsions

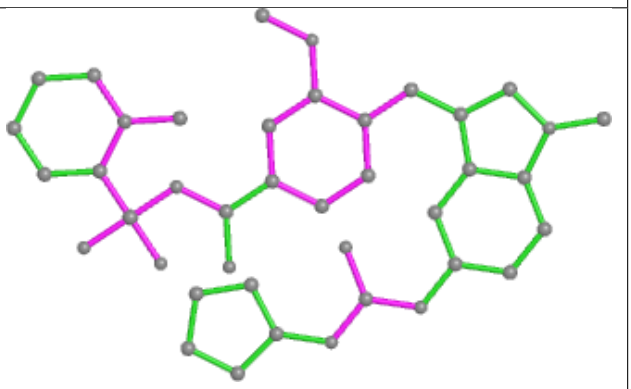


Rings

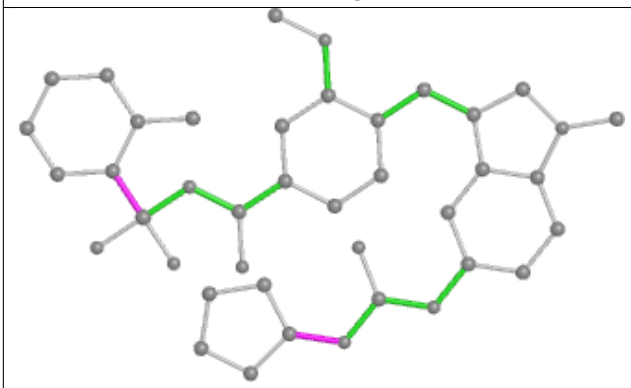
Ligand ZLK A 2001



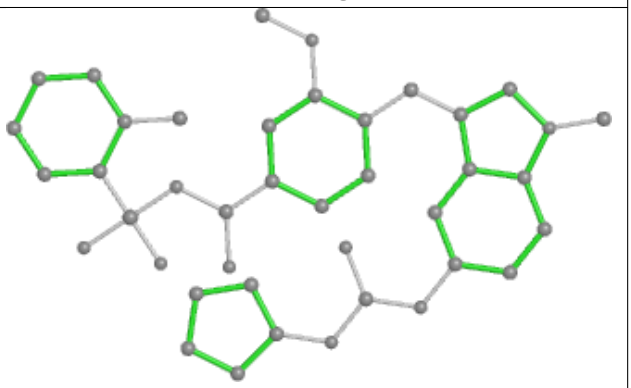
Bond lengths



Bond angles

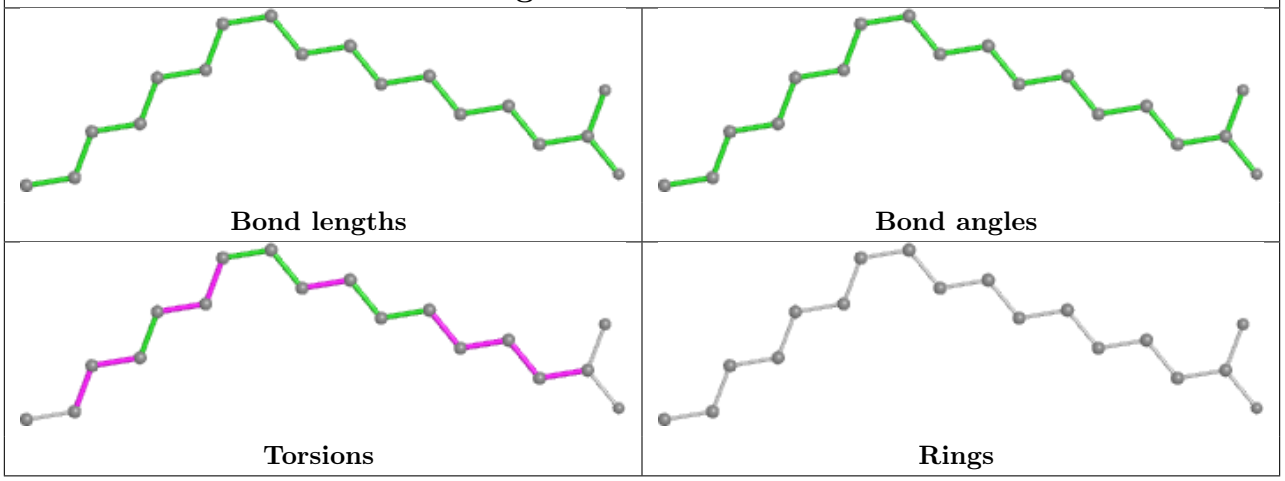


Torsions

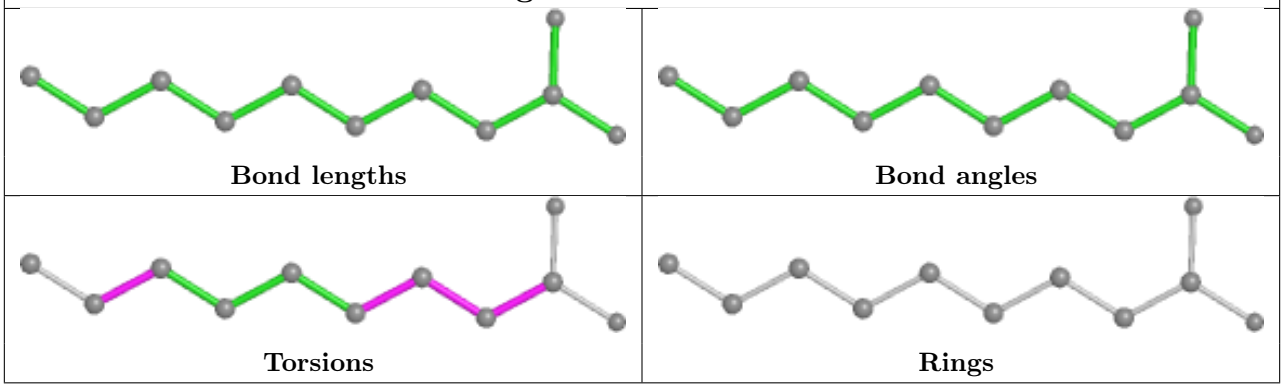


Rings

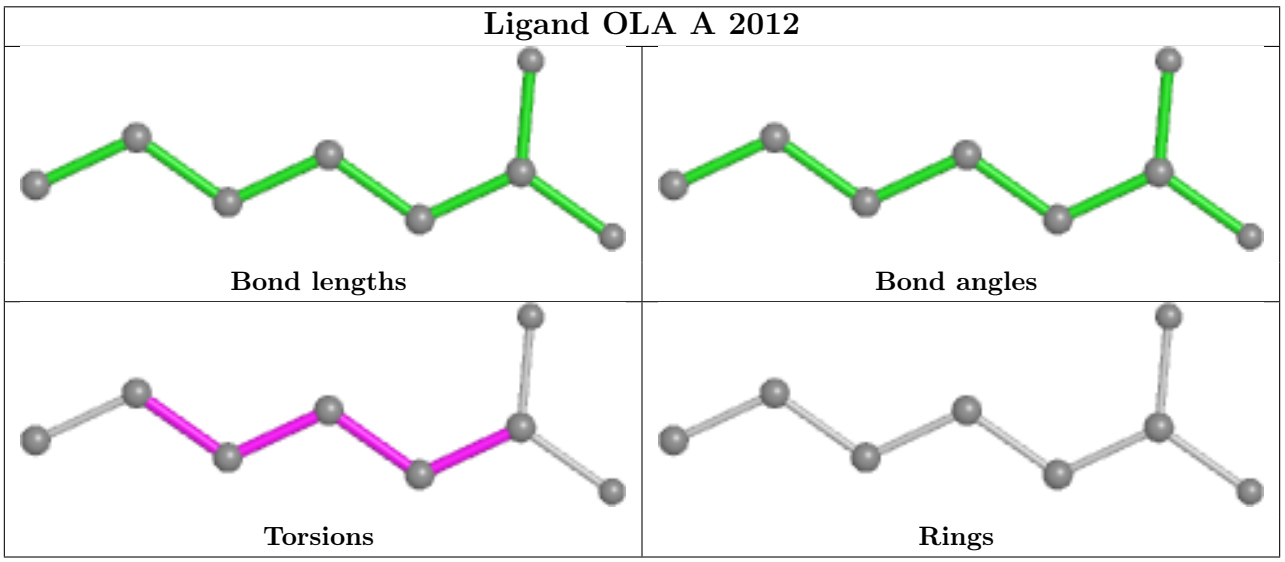
Ligand OLA B 2017

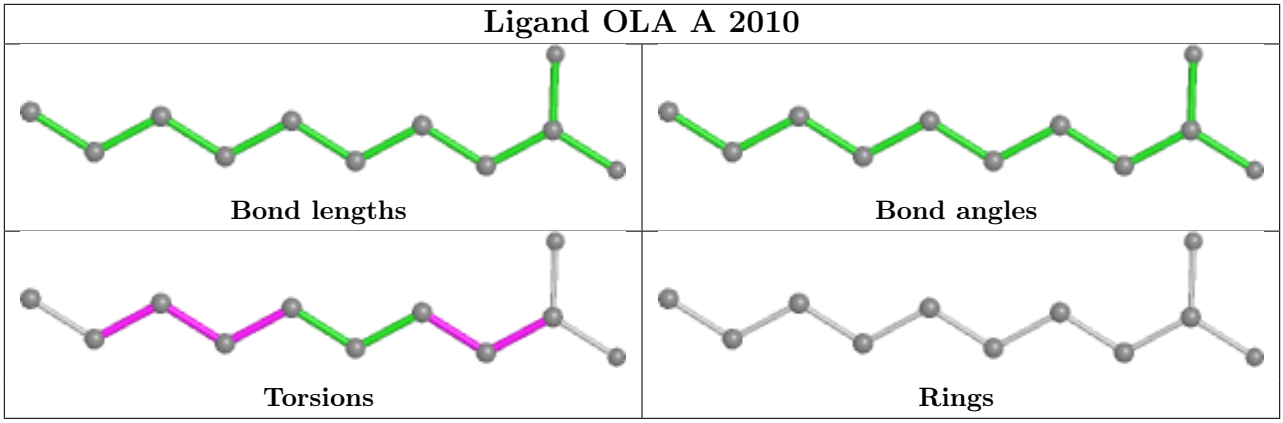


Ligand OLA B 2015



Ligand OLA A 2012





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, 95^{th} 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	369/423 (87%)	0.70	54 (14%) 2 2	47, 81, 157, 171	0
1	B	385/423 (91%)	0.90	71 (18%) 1 1	49, 93, 154, 179	0
All	All	754/846 (89%)	0.80	125 (16%) 1 1	47, 87, 155, 179	0

All (125) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	1056	PRO	6.9
1	B	131	ASN	6.8
1	B	132	ILE	6.6
1	A	1056	PRO	6.4
1	B	1011	ASN	6.0
1	A	1070	GLY	6.0
1	B	53	HIS	5.9
1	A	1058	MET	5.9
1	A	14	CYS	5.8
1	B	133	ASN	5.7
1	A	52	TYR	5.5
1	B	1101	TYR	5.4
1	B	179	ASP	5.4
1	A	225	LEU	5.3
1	B	226	SER	5.3
1	B	1070	GLY	5.2
1	A	177	PRO	5.2
1	B	224	ASN	5.2
1	A	1052	SER	4.9
1	A	182	THR	4.8
1	B	1043	ALA	4.7
1	B	180	ASN	4.7
1	B	1096	THR	4.7
1	A	180	ASN	4.7

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Mol	Chain	Res	Type	RSRZ
1	B	52	TYR	4.5
1	B	1062	ARG	4.3
1	B	134	LEU	4.3
1	A	179	ASP	4.3
1	B	184	ASN	4.1
1	B	225	LEU	4.0
1	A	226	SER	4.0
1	B	1097	THR	3.9
1	B	1073	ASP	3.9
1	A	227	SER	3.8
1	A	1053	PRO	3.7
1	B	1050	ASP	3.7
1	A	15	HIS	3.7
1	B	54	LYS	3.7
1	B	49	ILE	3.6
1	B	1091	ALA	3.6
1	A	1092	GLU	3.6
1	A	1093	GLN	3.5
1	B	1035	ALA	3.5
1	B	1044	THR	3.5
1	B	18	ILE	3.4
1	B	163	PRO	3.4
1	B	1059	LYS	3.4
1	A	181	GLN	3.4
1	A	1105	TYR	3.3
1	B	1063	HIS	3.3
1	B	182	THR	3.2
1	B	130	GLN	3.2
1	B	266	PRO	3.2
1	B	51	THR	3.2
1	B	1100	ALA	3.1
1	B	1023	ALA	3.1
1	A	1012	ASP	3.1
1	A	130	GLN	3.1
1	A	18	ILE	3.1
1	B	1015	LYS	3.1
1	A	1035	ALA	3.0
1	B	1024	ALA	3.0
1	B	129	VAL	3.0
1	A	1026	VAL	2.9
1	B	1045	PRO	2.9
1	A	16	ASP	2.9

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Mol	Chain	Res	Type	RSRZ
1	B	15	HIS	2.9
1	B	21	PHE	2.9
1	B	1061	PHE	2.9
1	B	1054	ASP	2.9
1	A	17	THR	2.9
1	B	14	CYS	2.9
1	B	1065	PHE	2.9
1	B	167	GLU	2.9
1	B	166	ASP	2.8
1	B	1012	ASP	2.8
1	B	269	SER	2.8
1	A	1046	PRO	2.8
1	B	183	LYS	2.7
1	B	1078	LEU	2.7
1	B	1007	TRP	2.7
1	B	128	PRO	2.7
1	B	1105	TYR	2.7
1	A	178	GLN	2.7
1	A	184	ASN	2.7
1	B	181	GLN	2.6
1	A	1034	ARG	2.6
1	A	1054	ASP	2.6
1	A	263	GLU	2.5
1	B	262	ASN	2.5
1	A	1028	ASP	2.5
1	B	109	CYS	2.4
1	A	264	THR	2.4
1	A	133	ASN	2.4
1	A	1016	VAL	2.4
1	B	1055	SER	2.4
1	A	1055	SER	2.4
1	A	53	HIS	2.4
1	A	1010	LEU	2.4
1	B	1013	ASN	2.4
1	B	19	ASP	2.3
1	A	1106	LEU	2.3
1	B	168	LYS	2.3
1	B	1068	LEU	2.2
1	A	30	TYR	2.2
1	B	261	HIS	2.2
1	A	134	LEU	2.2
1	A	163	PRO	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	1069	VAL	2.2
1	A	1043	ALA	2.2
1	A	268	ASP	2.2
1	B	265	LYS	2.1
1	A	1100	ALA	2.1
1	B	84	VAL	2.1
1	B	236	MET	2.1
1	B	238	VAL	2.1
1	A	132	ILE	2.1
1	A	1094	LEU	2.1
1	A	1099	ASN	2.1
1	A	1017	ILE	2.1
1	A	131	ASN	2.0
1	A	111	ILE	2.0
1	A	76	LEU	2.0
1	B	1048	LEU	2.0
1	A	1074	ASP	2.0

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, 95^{th} 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
4	OLA	B	2013	16/20	0.60	0.41	109,114,120,121	0
3	OLC	A	2003	17/25	0.65	0.28	73,96,100,100	0
4	OLA	B	2016	20/20	0.65	0.32	80,87,106,106	0
4	OLA	A	2010	11/20	0.69	0.26	93,96,109,110	0
4	OLA	A	2012	8/20	0.72	0.30	85,88,98,100	0
3	OLC	B	2010	7/25	0.74	0.31	102,106,112,114	0

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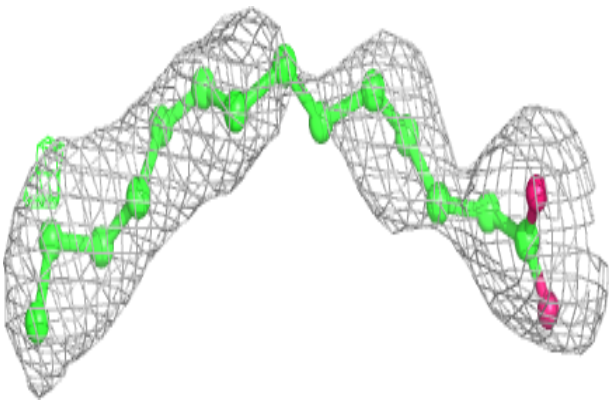
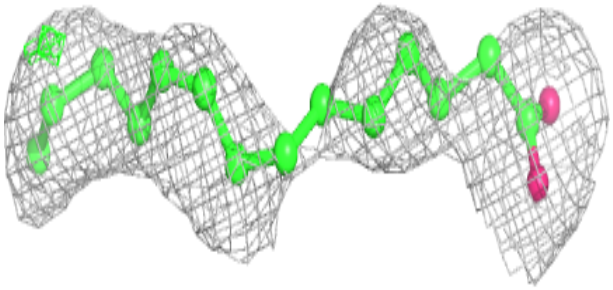
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	OLA	A	2019	20/20	0.74	0.21	97,104,120,121	0
4	OLA	A	2016	20/20	0.76	0.22	88,93,110,110	0
4	OLA	B	2015	11/20	0.77	0.26	95,101,110,112	0
4	OLA	A	2020	14/20	0.78	0.27	73,78,91,93	0
4	OLA	A	2014	7/20	0.78	0.23	92,96,105,108	0
4	OLA	B	2017	18/20	0.79	0.26	79,98,112,114	0
4	OLA	A	2011	13/20	0.80	0.19	102,112,120,121	0
4	OLA	A	2015	7/20	0.80	0.31	76,83,94,94	0
4	OLA	A	2013	19/20	0.80	0.26	86,95,101,101	0
3	OLC	B	2009	23/25	0.81	0.31	81,84,101,101	0
4	OLA	B	2018	20/20	0.81	0.24	120,122,131,131	0
3	OLC	B	2002	8/25	0.82	0.15	79,80,82,82	0
5	1PE	A	2021	10/16	0.83	0.30	111,112,114,114	0
3	OLC	A	2007	16/25	0.85	0.33	84,96,118,119	0
3	OLC	A	2004	11/25	0.85	0.25	55,63,74,74	0
3	OLC	B	2005	10/25	0.85	0.21	90,95,97,97	0
4	OLA	A	2017	13/20	0.85	0.17	99,106,114,114	0
3	OLC	A	2002	9/25	0.86	0.21	80,81,84,84	0
4	OLA	B	2011	12/20	0.86	0.17	90,94,103,104	0
3	OLC	A	2006	12/25	0.86	0.14	91,96,97,97	0
3	OLC	B	2004	10/25	0.86	0.23	87,89,91,91	0
3	OLC	A	2008	9/25	0.87	0.15	75,78,81,81	0
3	OLC	B	2006	10/25	0.88	0.16	111,112,114,115	0
3	OLC	B	2008	7/25	0.88	0.15	83,84,85,85	0
3	OLC	B	2003	9/25	0.88	0.17	95,95,97,97	0
4	OLA	B	2012	10/20	0.89	0.21	87,96,105,105	0
3	OLC	B	2007	10/25	0.91	0.17	75,76,79,79	0
4	OLA	B	2014	9/20	0.92	0.14	87,90,96,97	0
3	OLC	A	2005	8/25	0.92	0.15	77,77,78,78	0
3	OLC	A	2009	7/25	0.92	0.30	70,71,78,80	0
4	OLA	A	2018	6/20	0.93	0.22	69,70,72,72	0
2	ZLK	B	2019	41/41	0.93	0.25	53,63,72,77	41
2	ZLK	A	2001	41/41	0.98	0.14	41,55,65,69	0
2	ZLK	B	2001	41/41	0.98	0.18	48,56,61,63	0
6	NA	A	2022	1/1	0.99	0.25	54,54,54,54	0
6	NA	B	2020	1/1	0.99	0.13	53,53,53,53	0

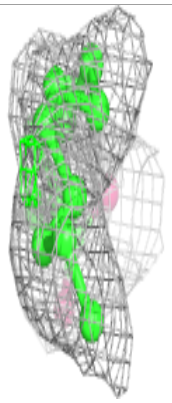
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around OLA B 2013:

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

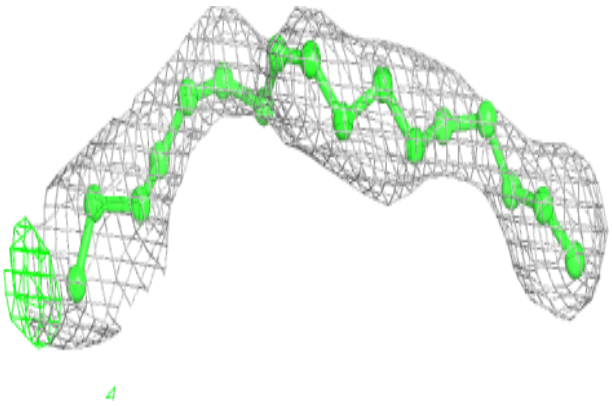


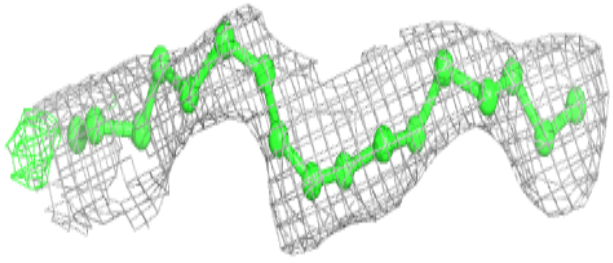


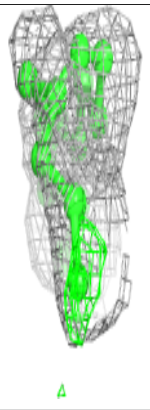


Electron density around OLC A 2003:

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

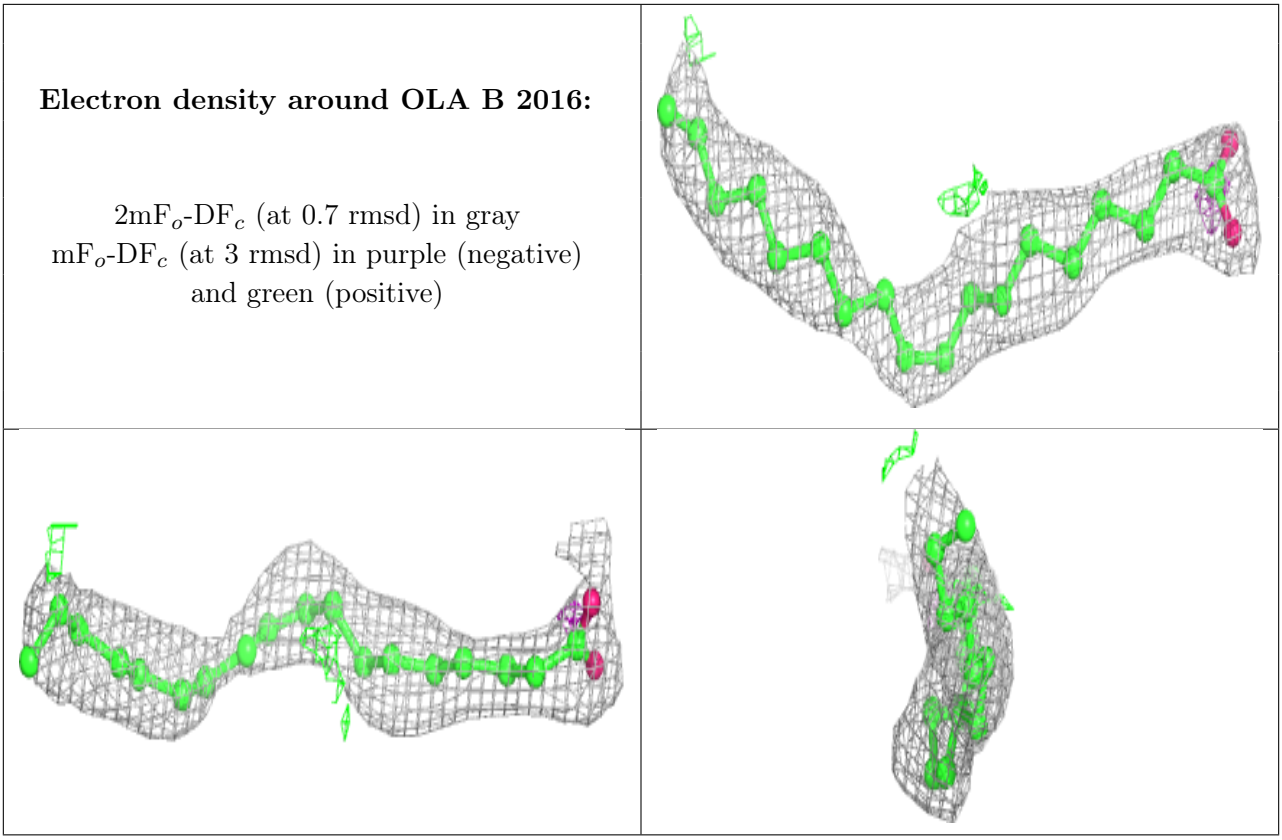






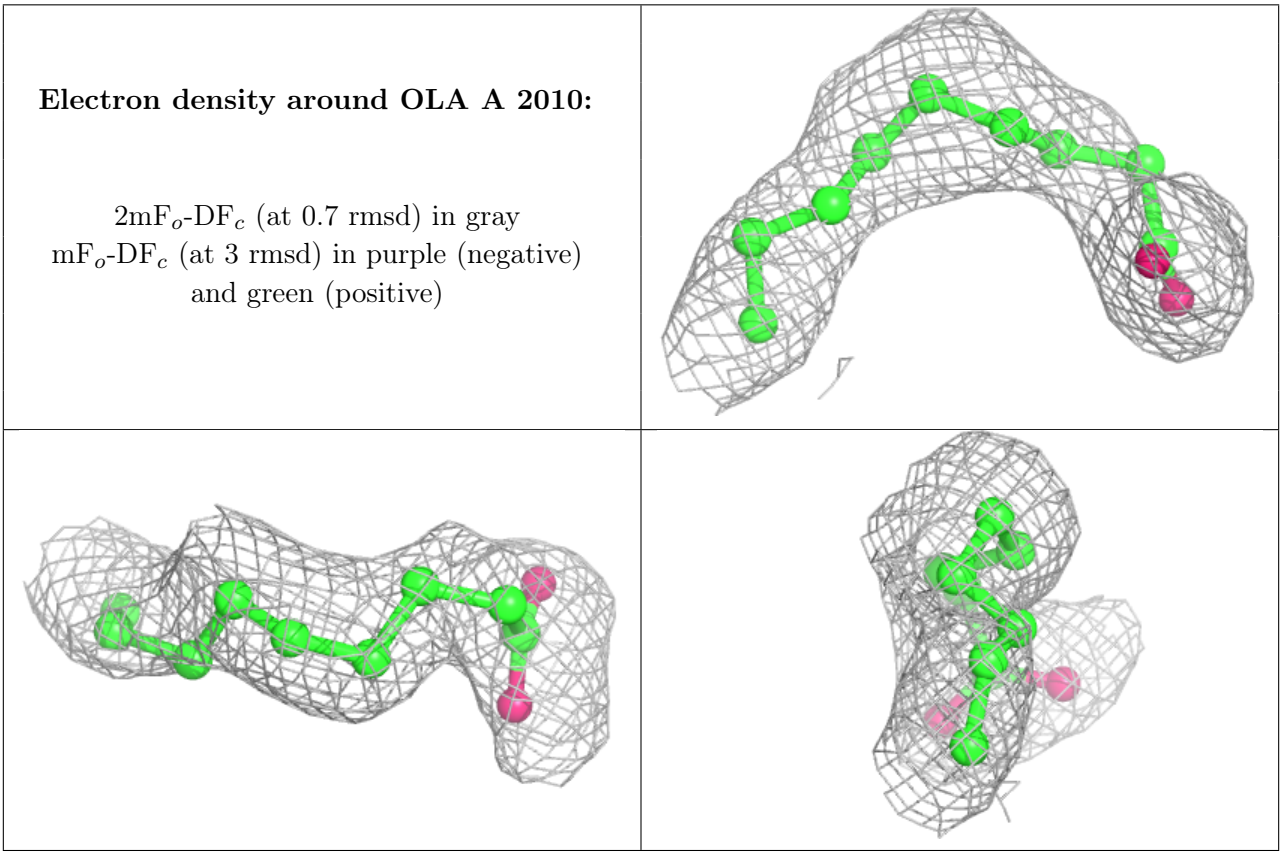
Electron density around OLA B 2016:

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



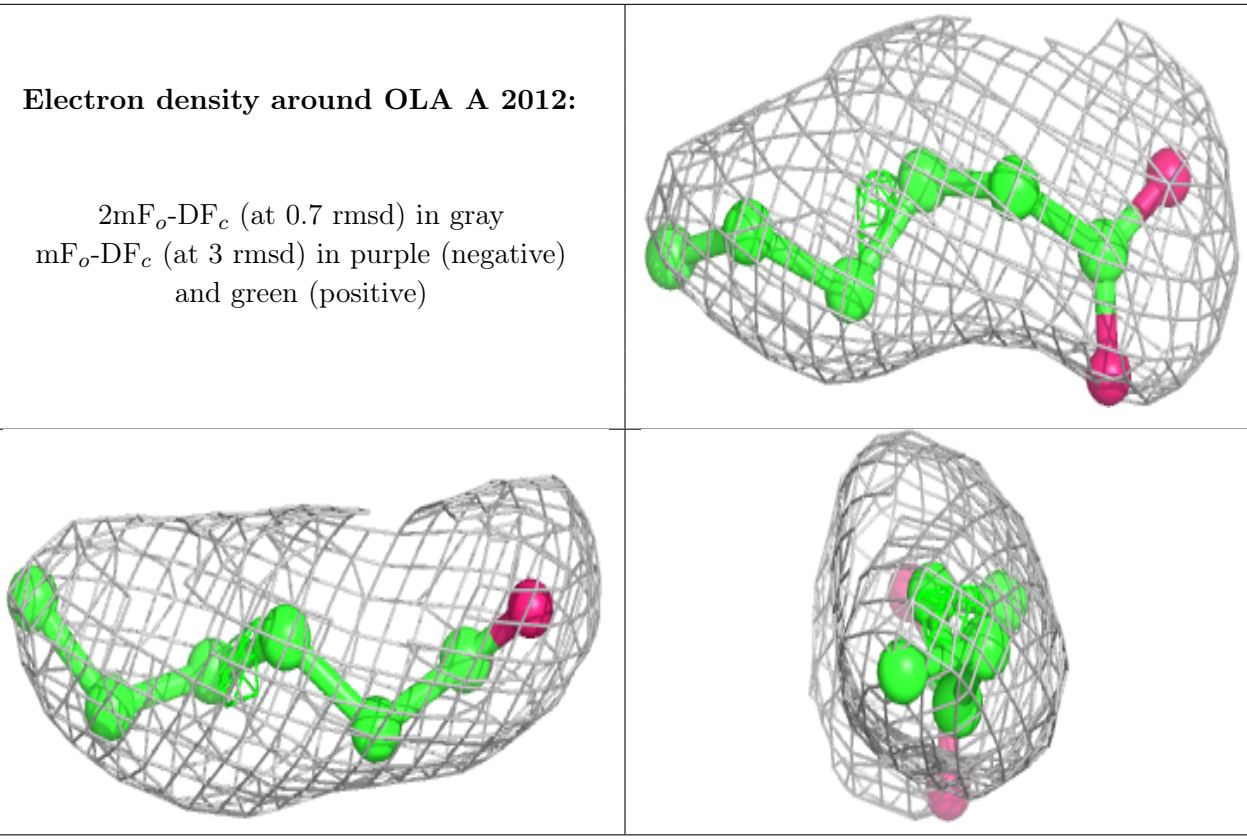
Electron density around OLA A 2010:

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



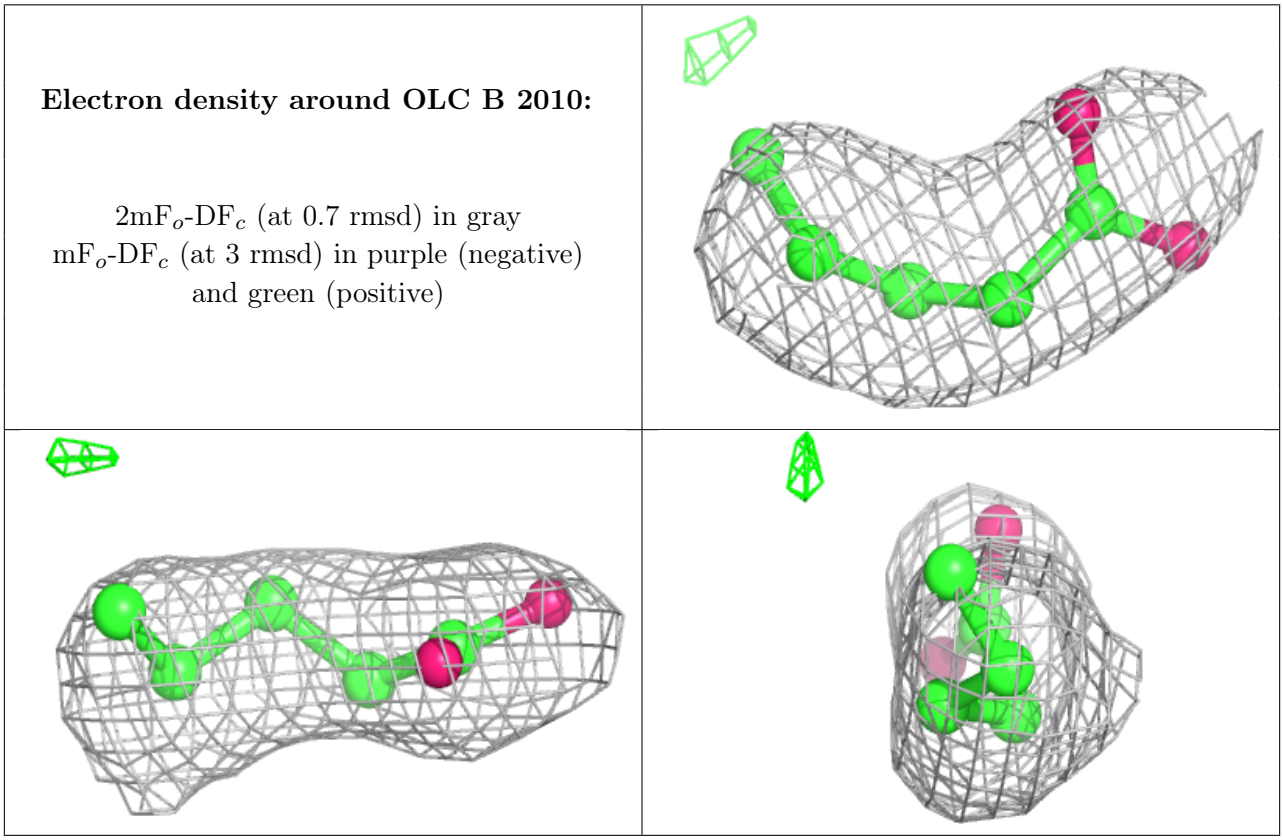
Electron density around OLA A 2012:

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



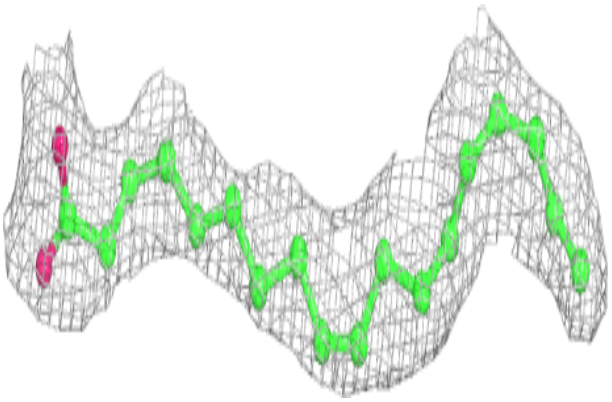
Electron density around OLC B 2010:

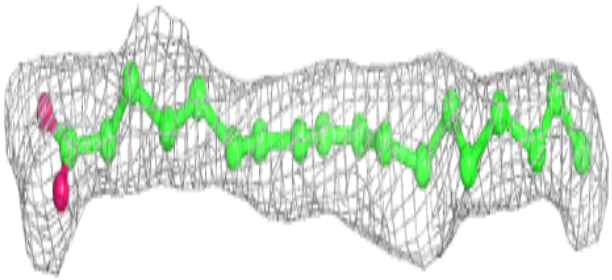
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

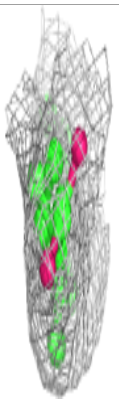


Electron density around OLA A 2019:

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

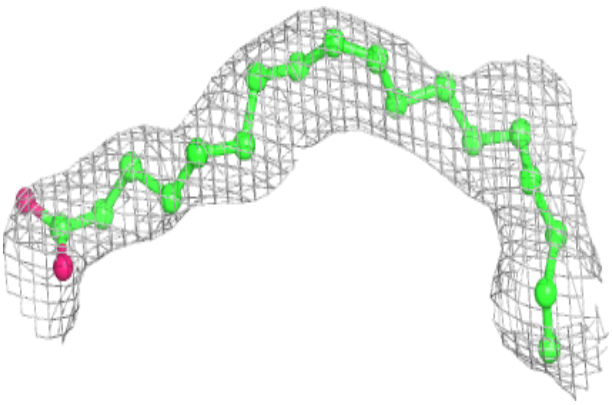


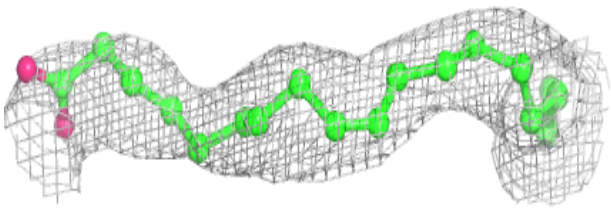


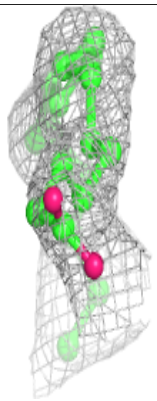


Electron density around OLA A 2016:

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

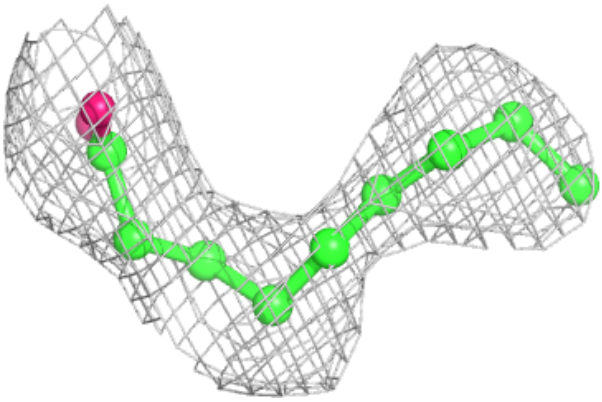


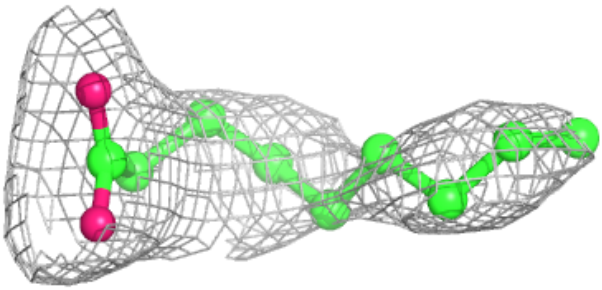


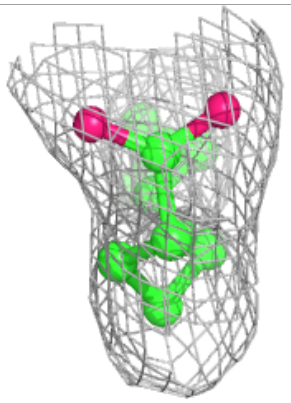


Electron density around OLA B 2015:

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

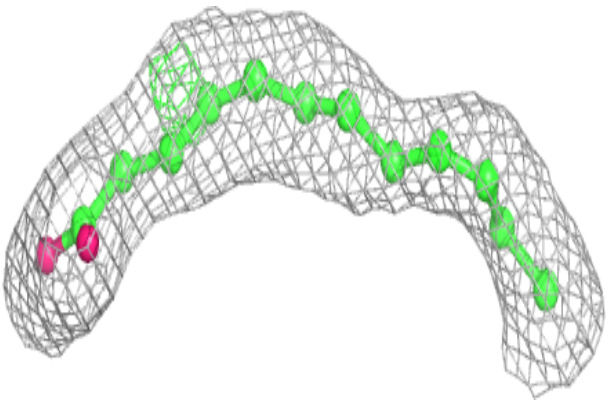


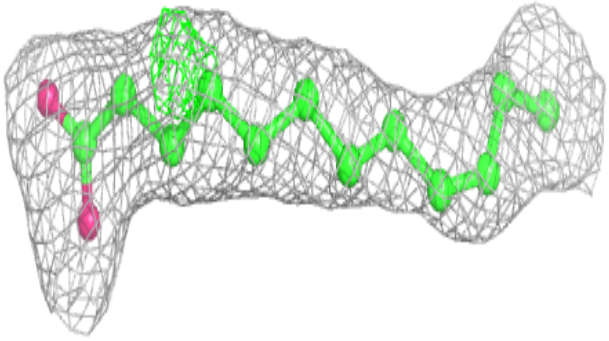


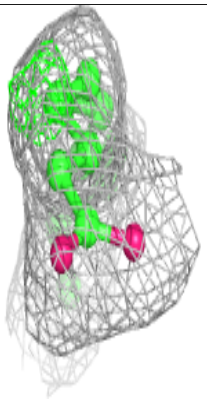


Electron density around OLA A 2020:

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

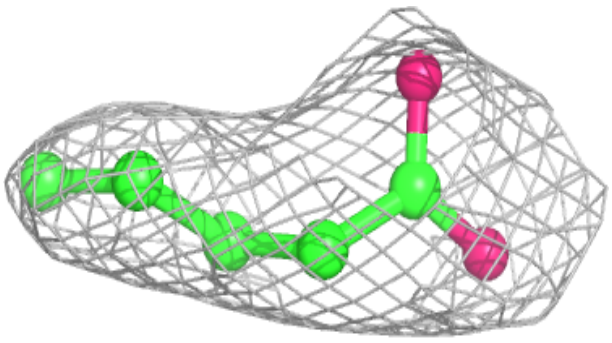


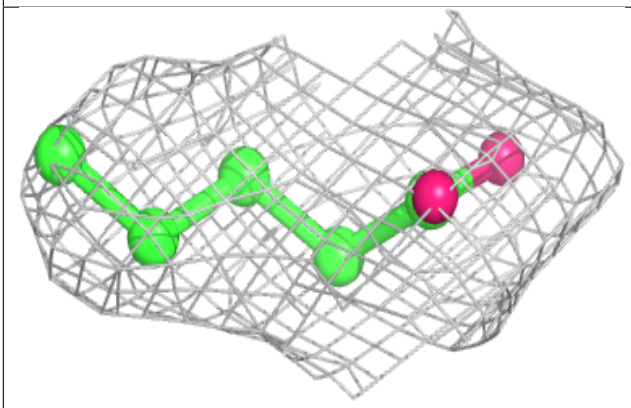


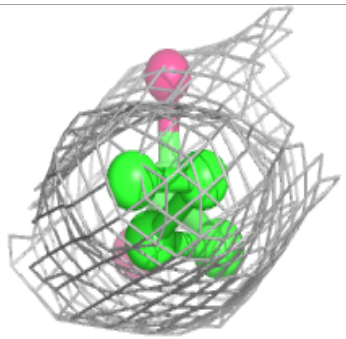


Electron density around OLA A 2014:

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

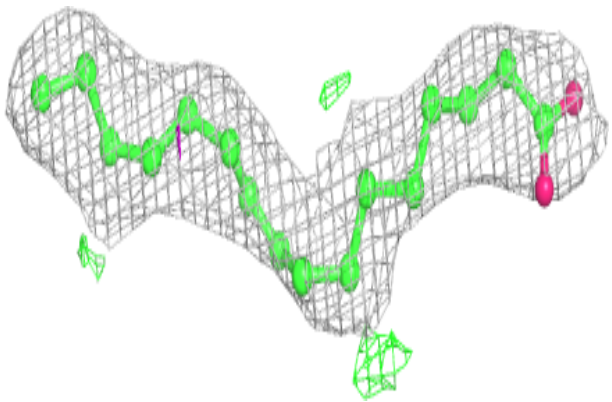


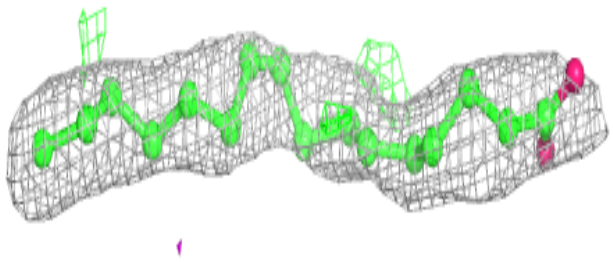


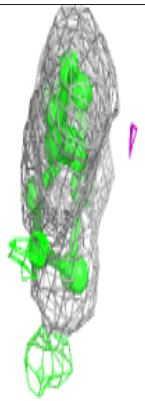


Electron density around OLA B 2017:

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

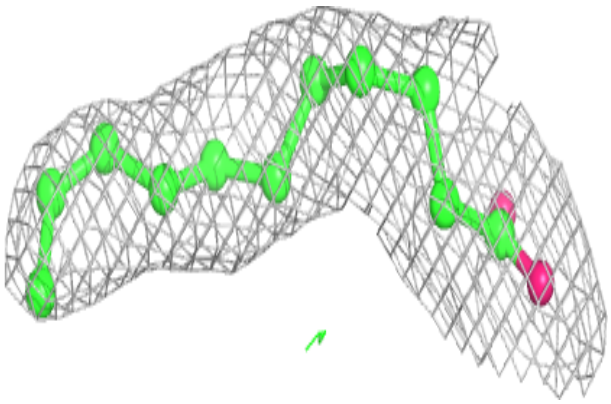


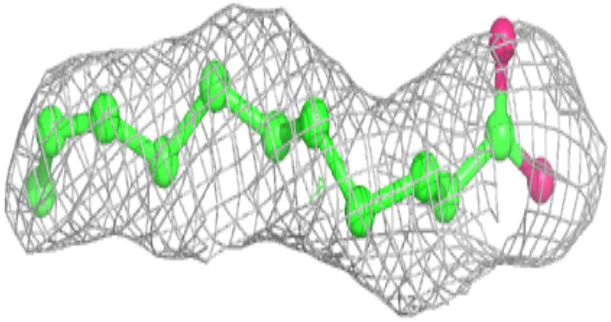


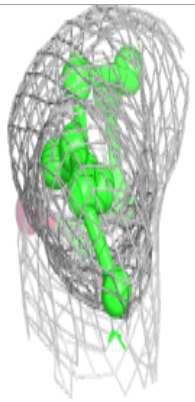


Electron density around OLA A 2011:

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

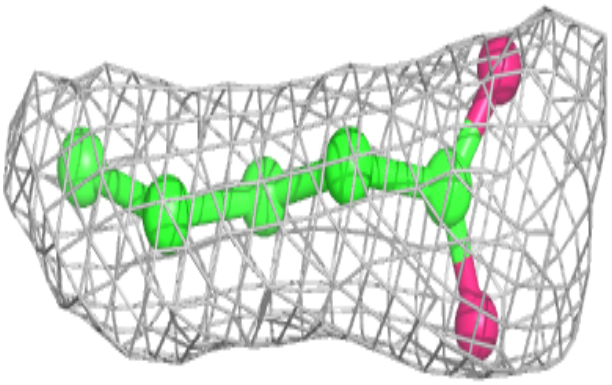


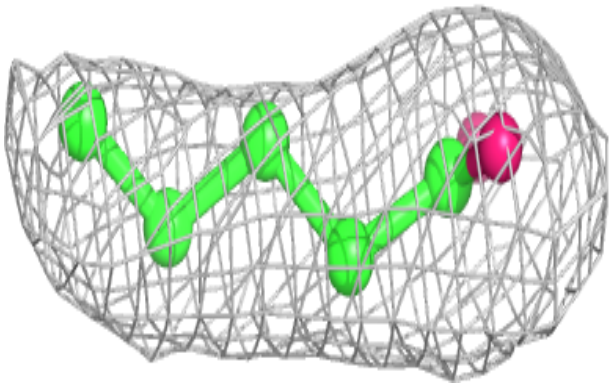


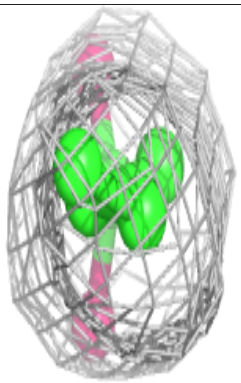


Electron density around OLA A 2015:

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

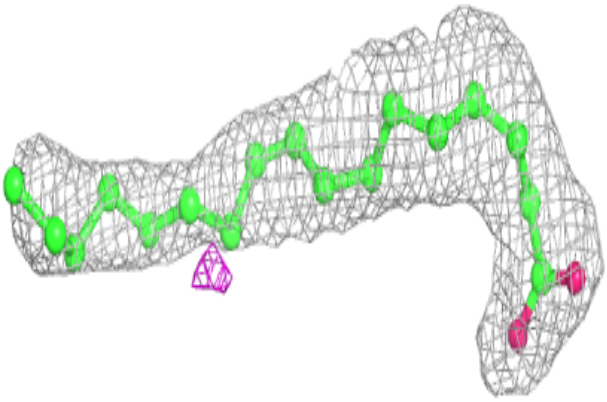


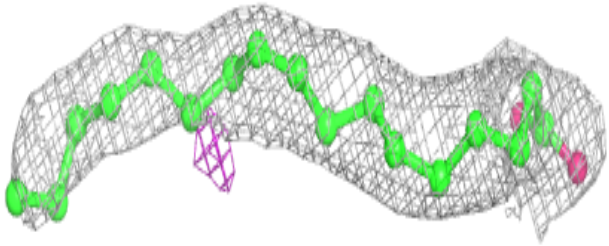


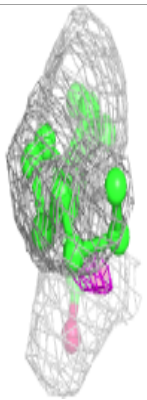


Electron density around OLA A 2013:

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

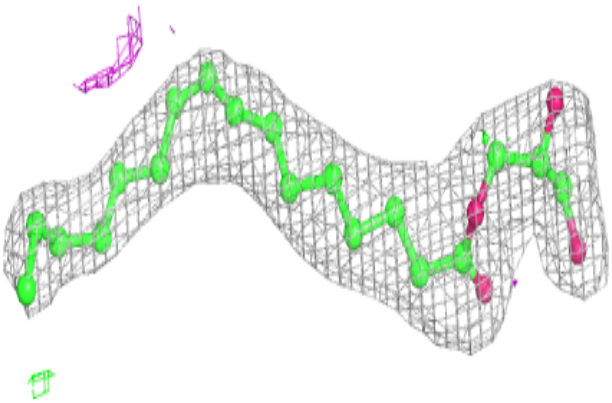


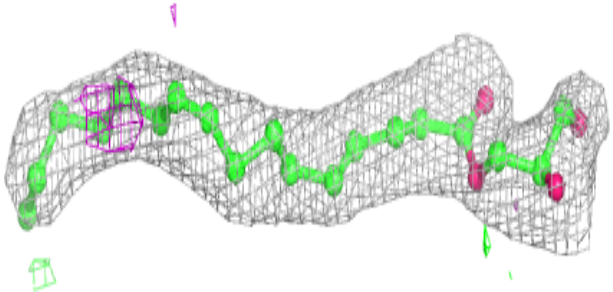


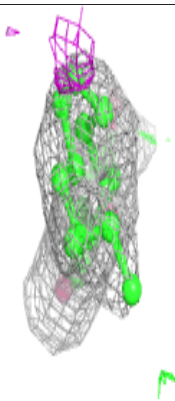


Electron density around OLC B 2009:

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

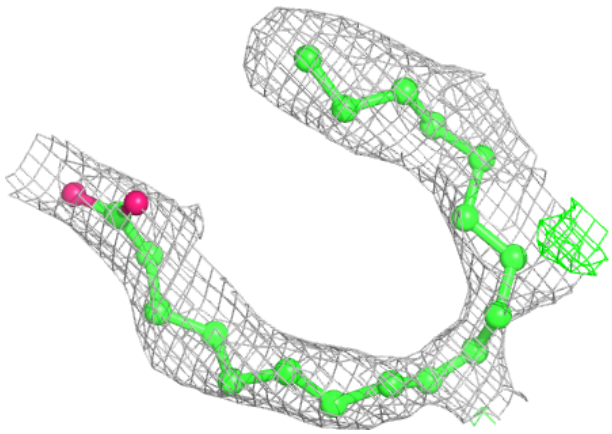


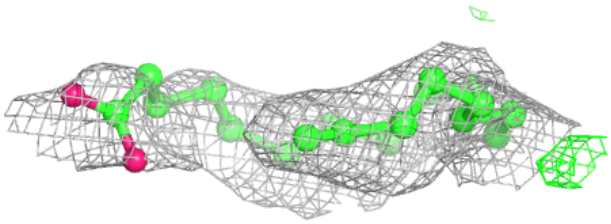




Electron density around OLA B 2018:

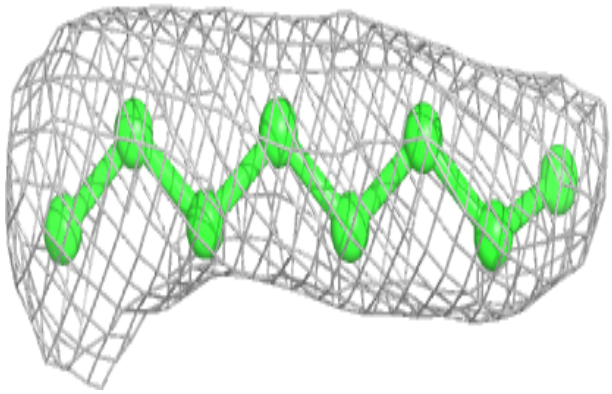
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

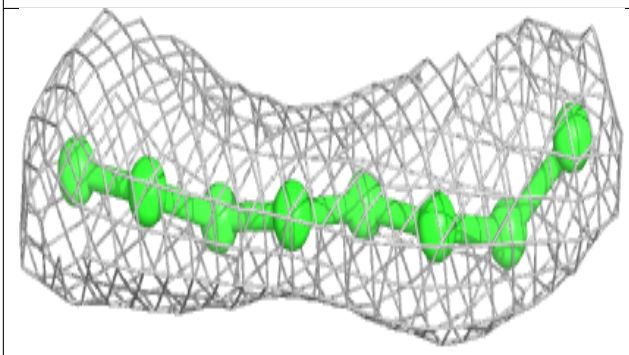


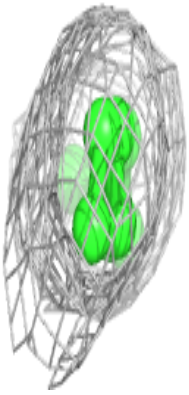


Electron density around OLC B 2002:

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

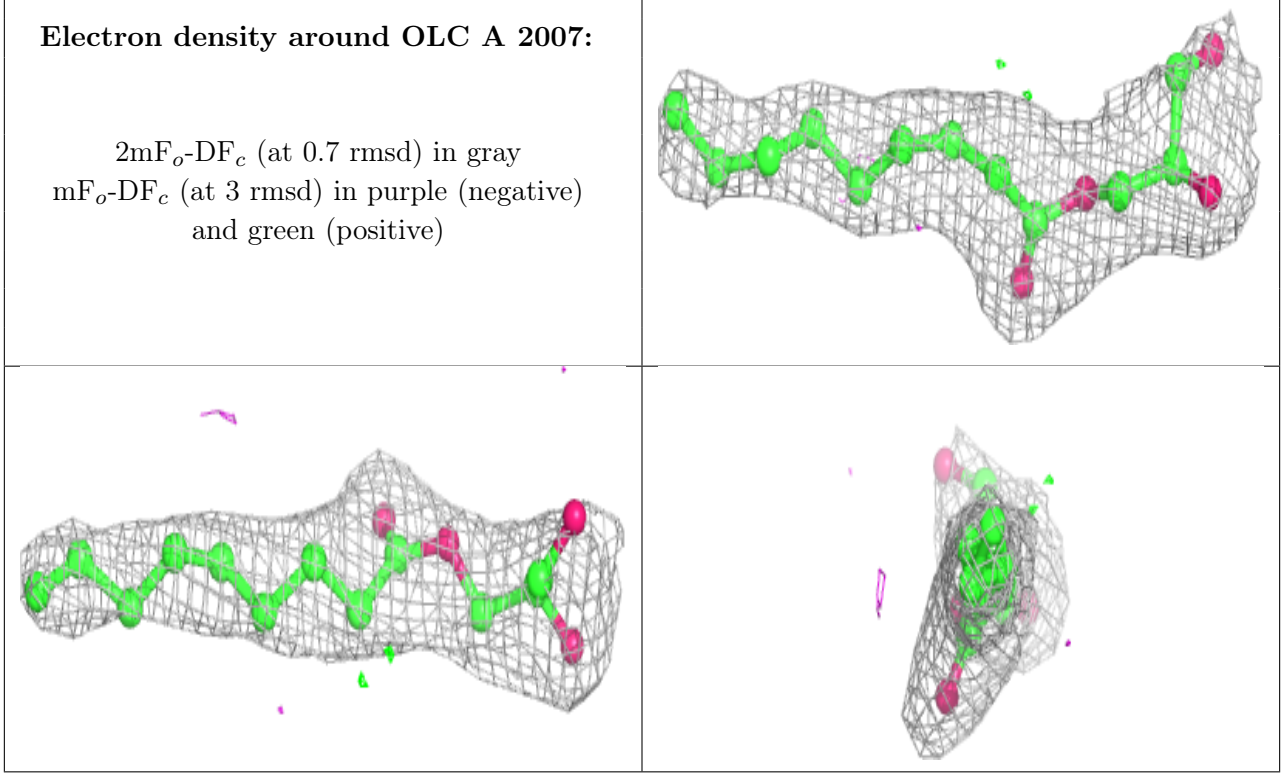






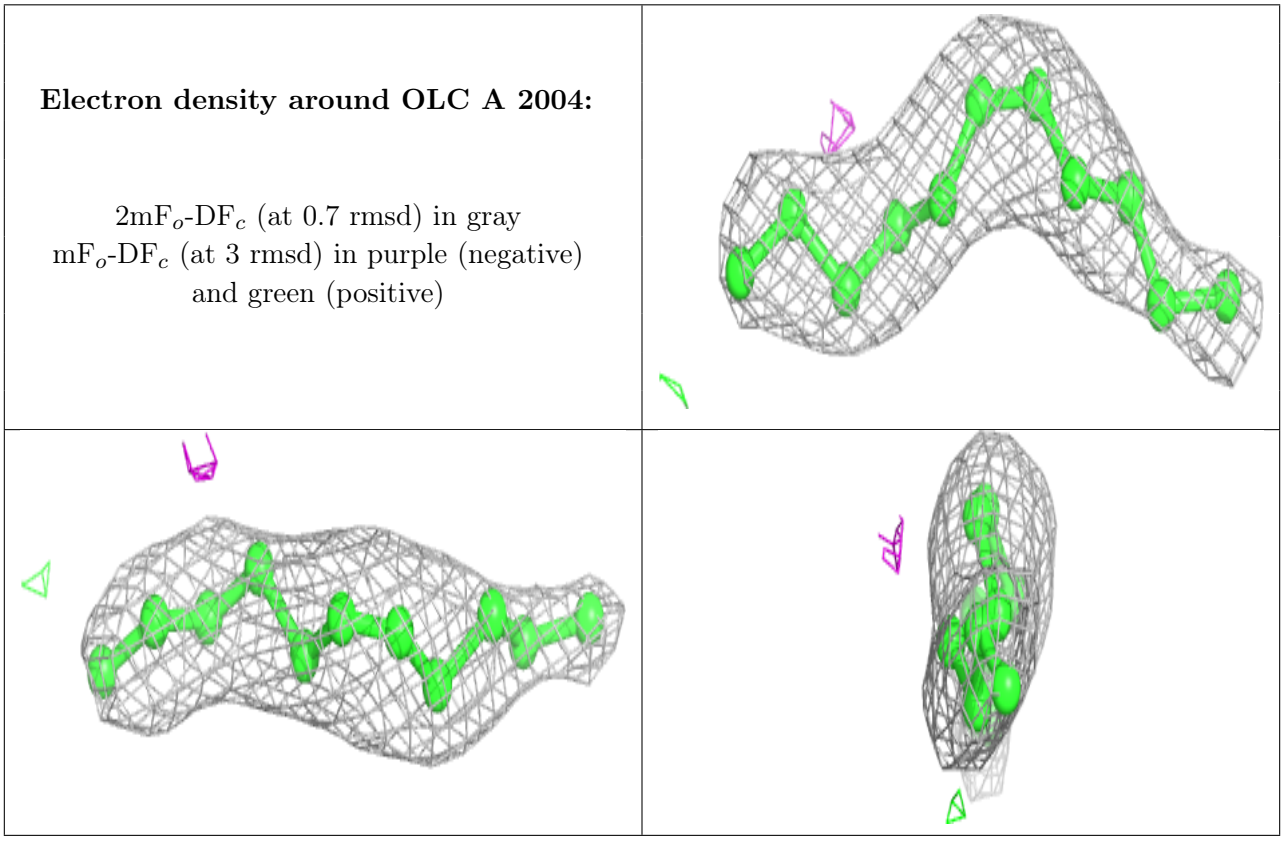
Electron density around OLC A 2007:

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



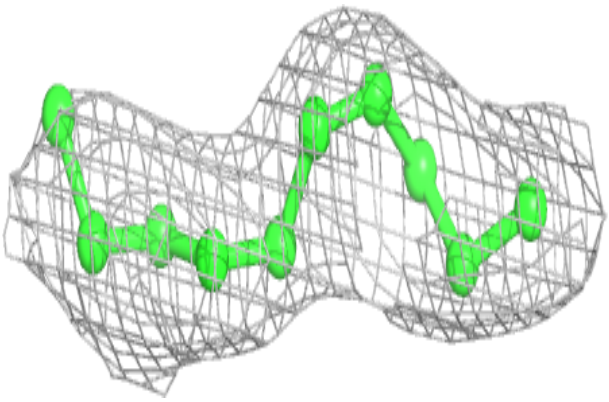
Electron density around OLC A 2004:

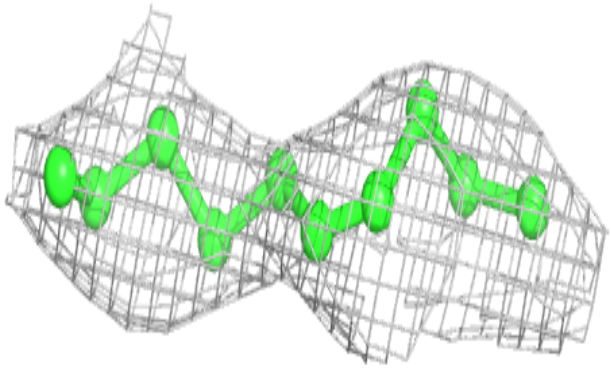
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

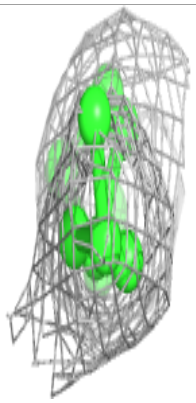


Electron density around OLC B 2005:

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

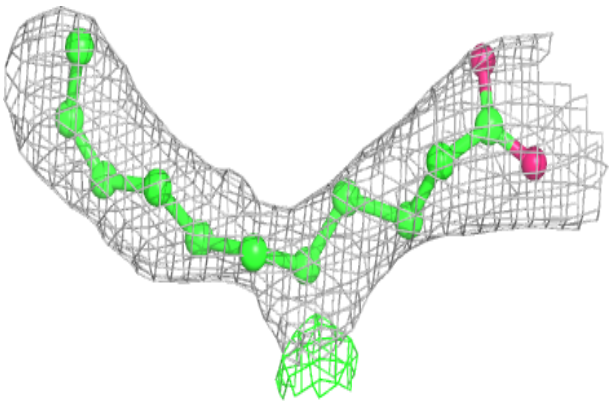


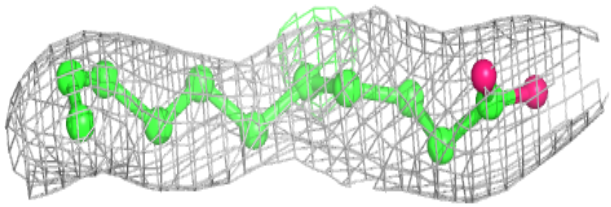


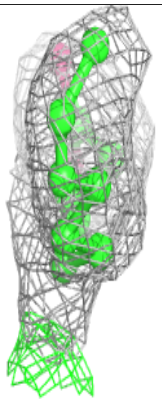


Electron density around OLA A 2017:

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

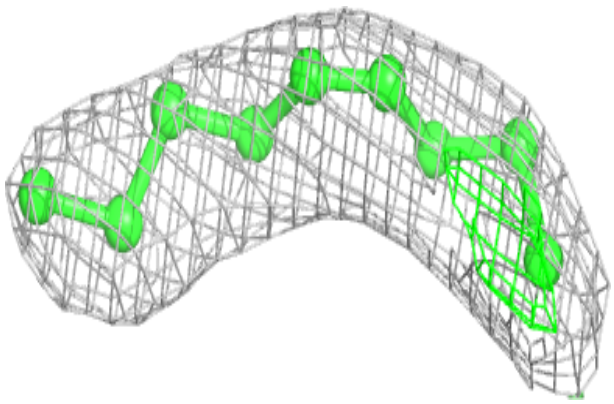


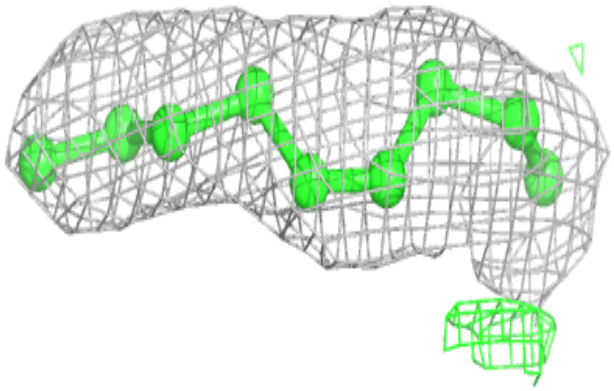


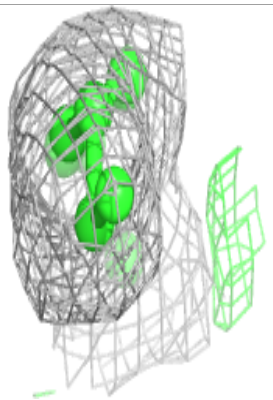


Electron density around OLC A 2002:

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

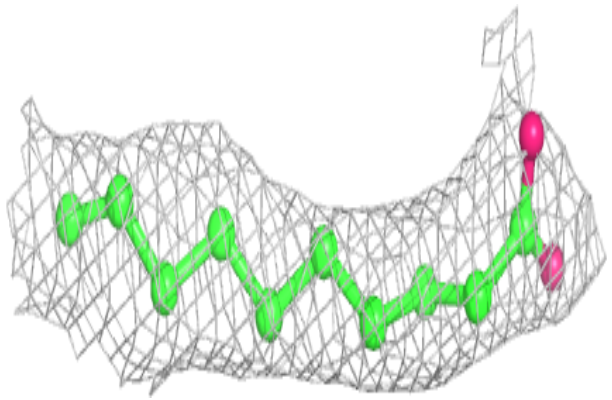


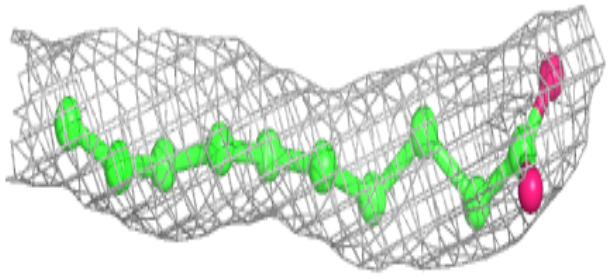


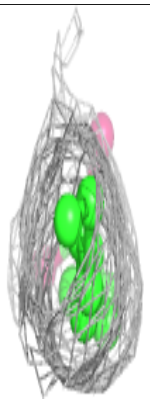


Electron density around OLA B 2011:

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

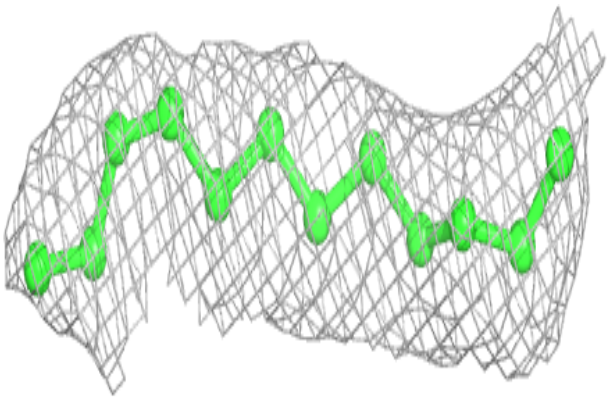


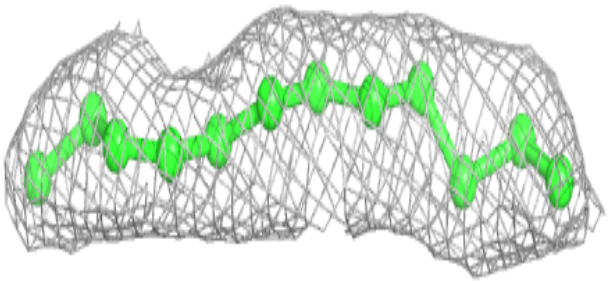


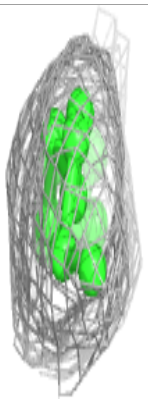


Electron density around OLC A 2006:

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

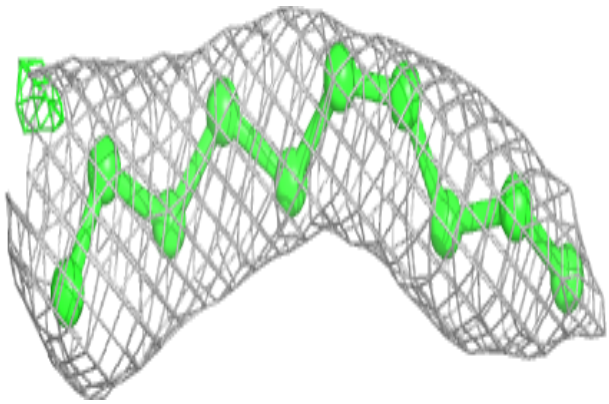


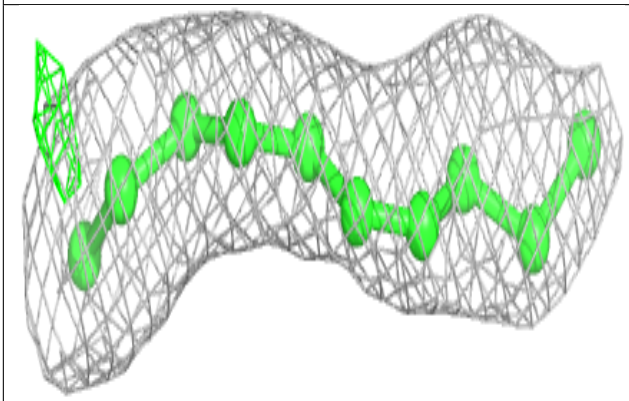


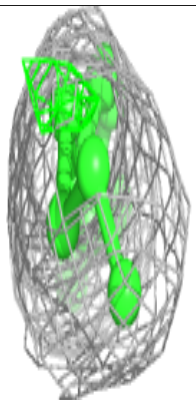


Electron density around OLC B 2004:

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

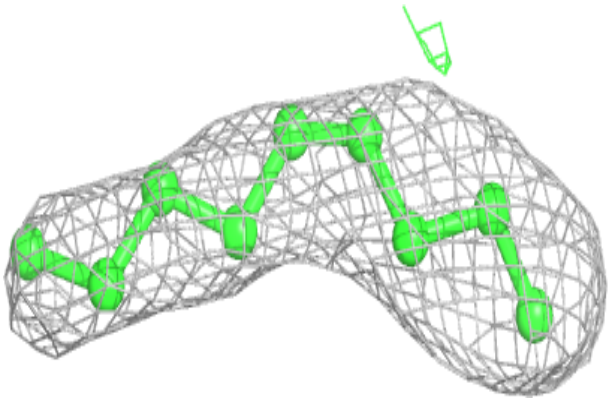


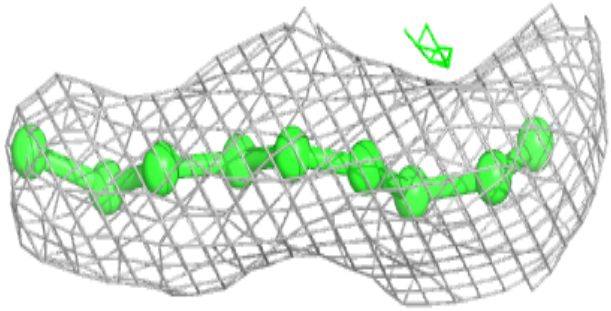


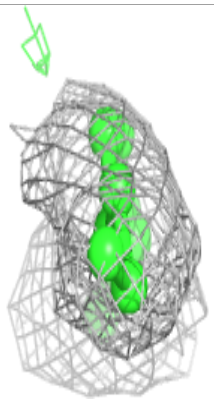


Electron density around OLC A 2008:

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

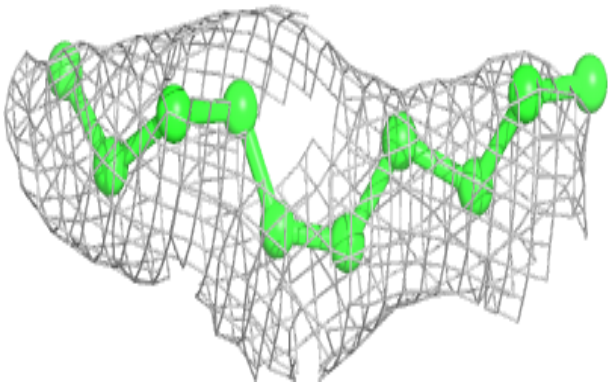


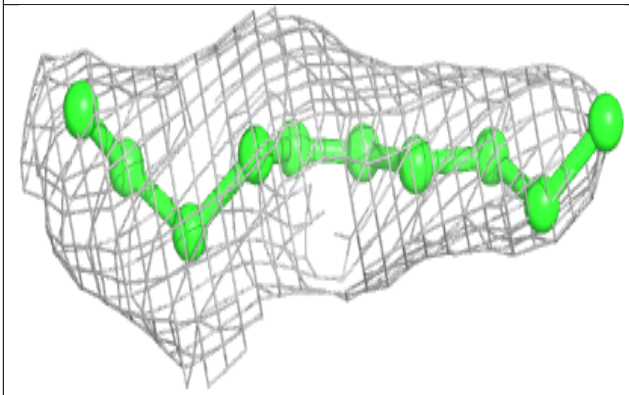


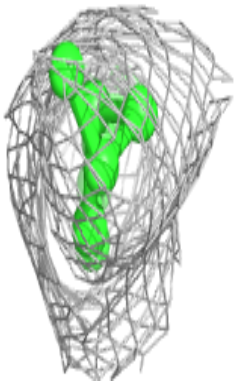


Electron density around OLC B 2006:

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

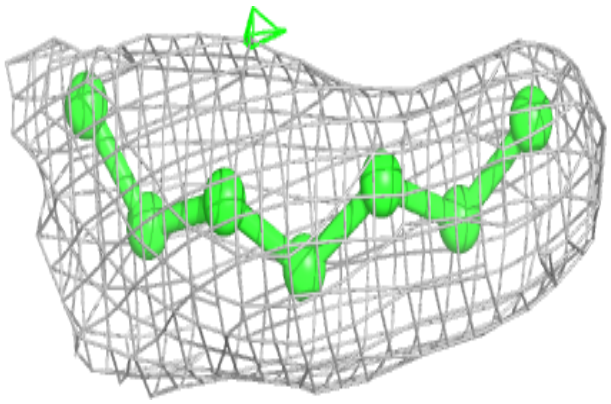


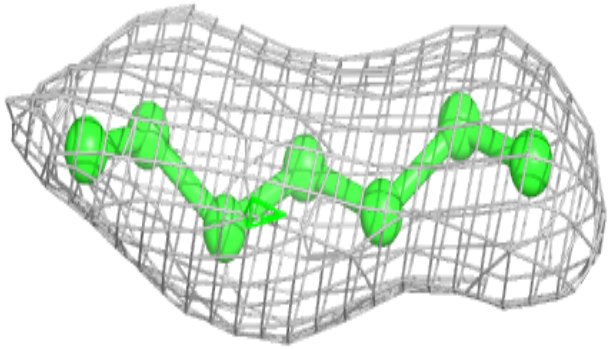


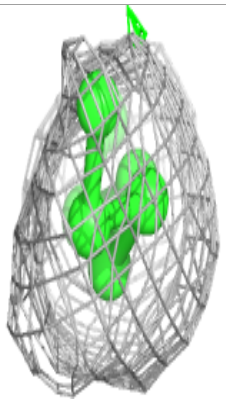


Electron density around OLC B 2008:

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

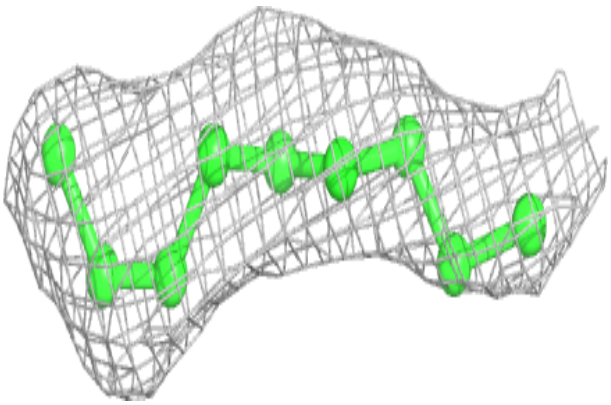


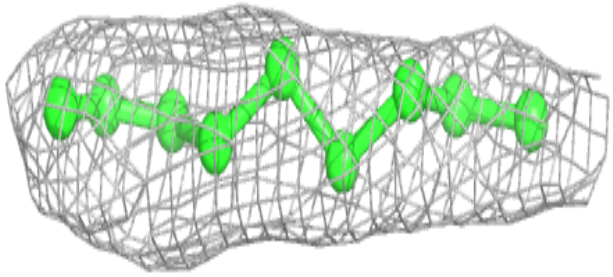


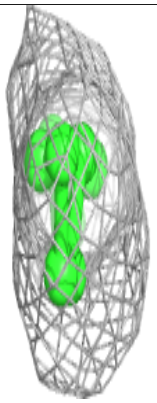


Electron density around OLC B 2003:

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

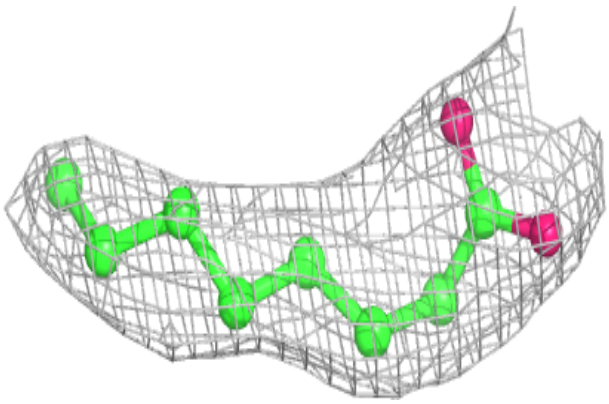


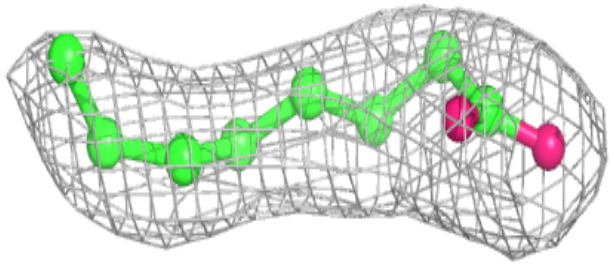


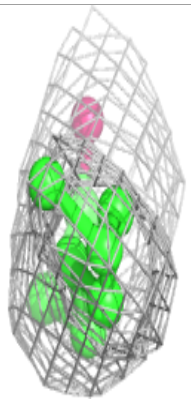


Electron density around OLA B 2012:

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

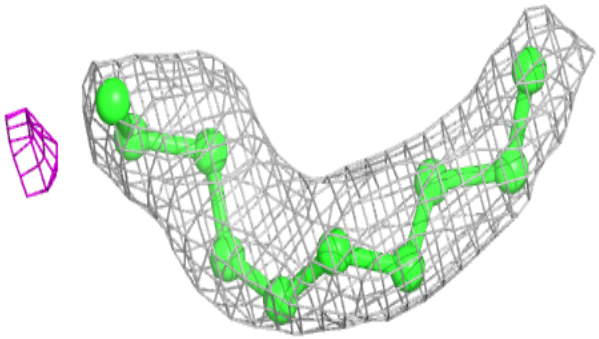


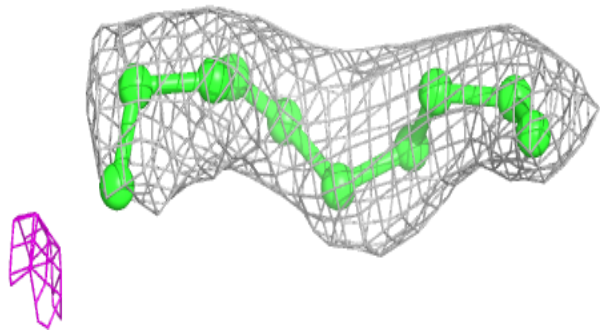


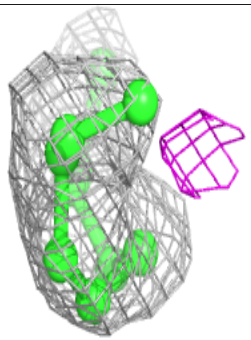


Electron density around OLC B 2007:

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

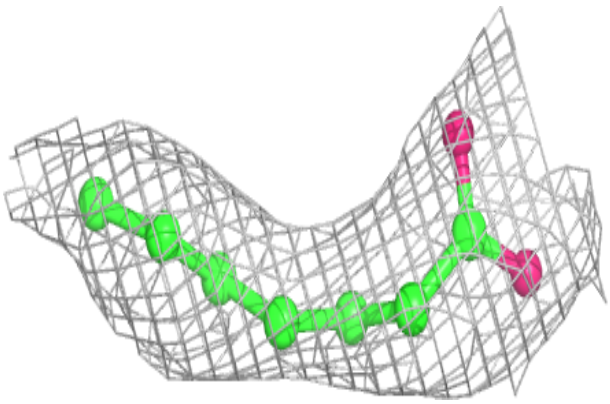


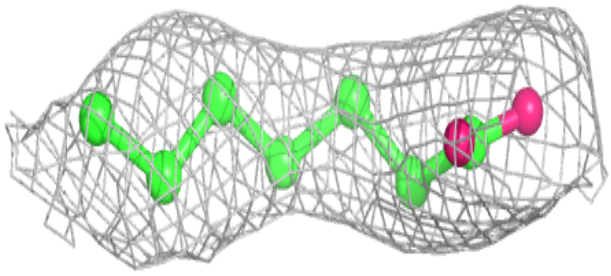


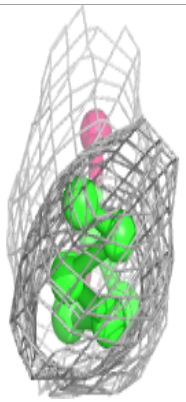


Electron density around OLA B 2014:

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

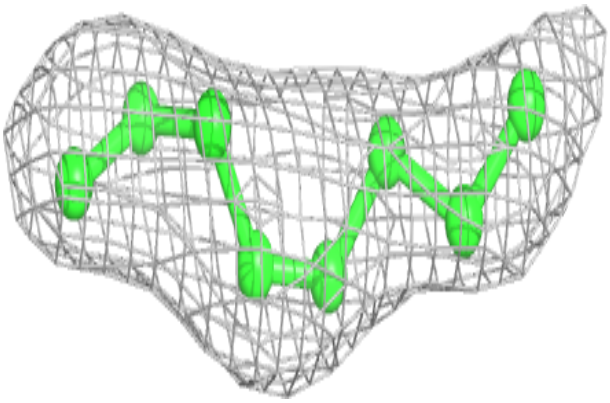


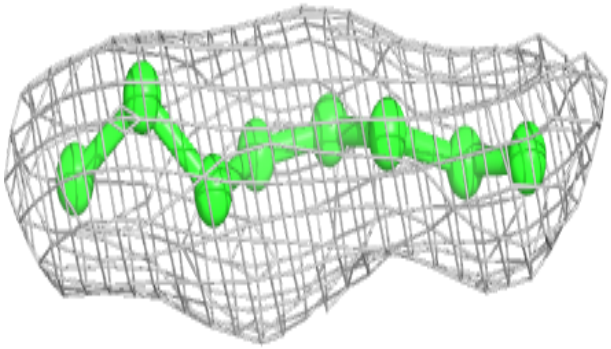


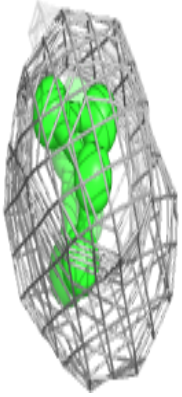


Electron density around OLC A 2005:

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

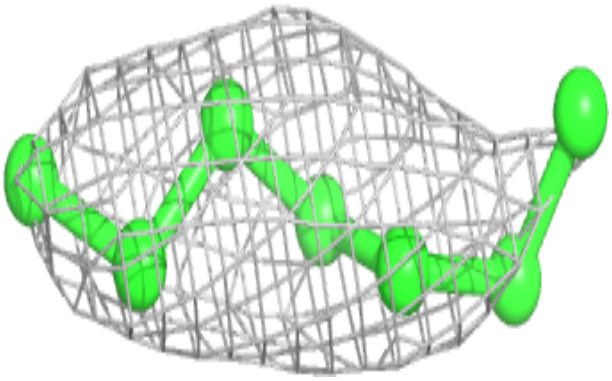


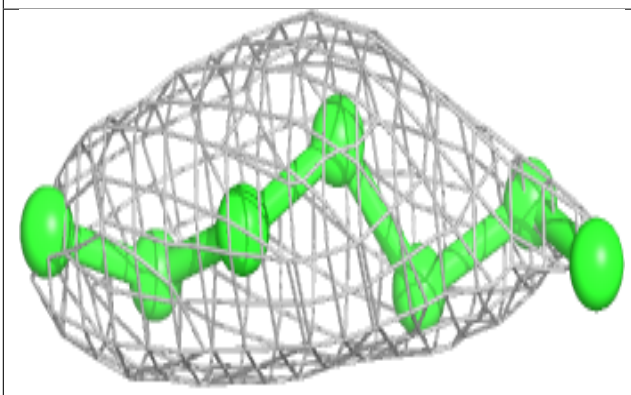


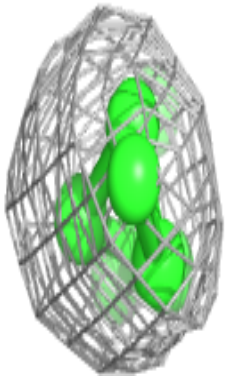


Electron density around OLC A 2009:

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

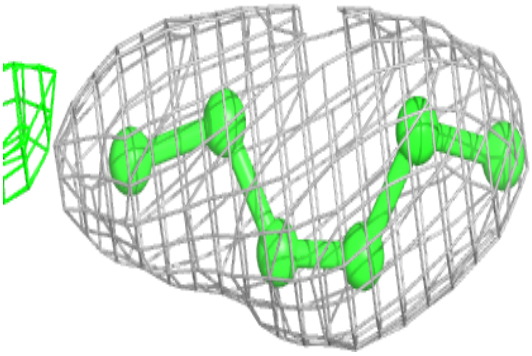


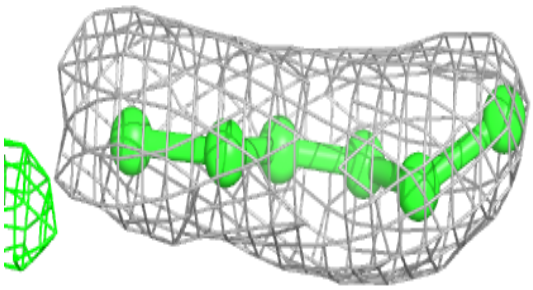


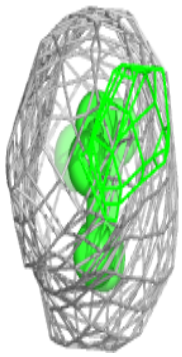


Electron density around OLA A 2018:

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

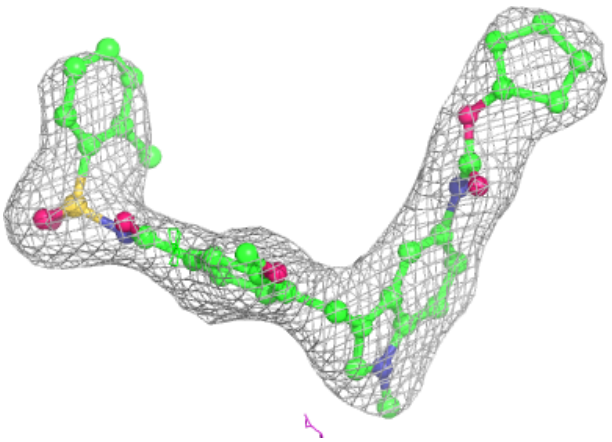


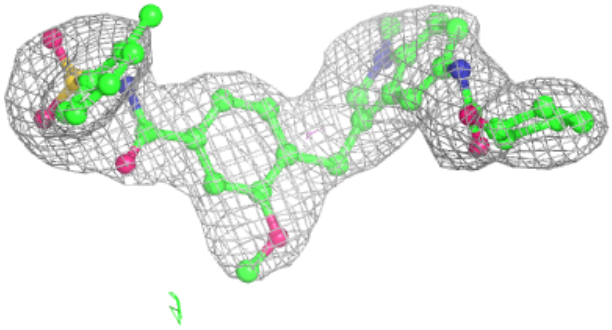


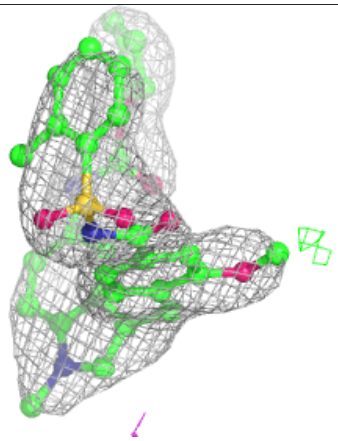


Electron density around ZLK B 2019:

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

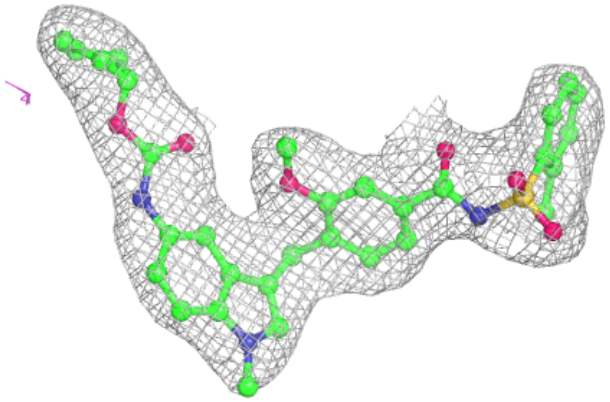


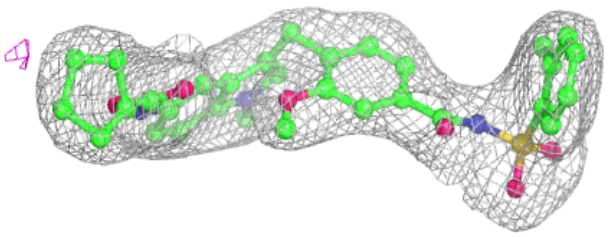


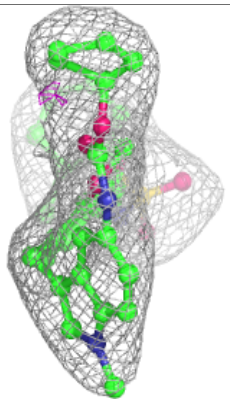


Electron density around ZLK A 2001:

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

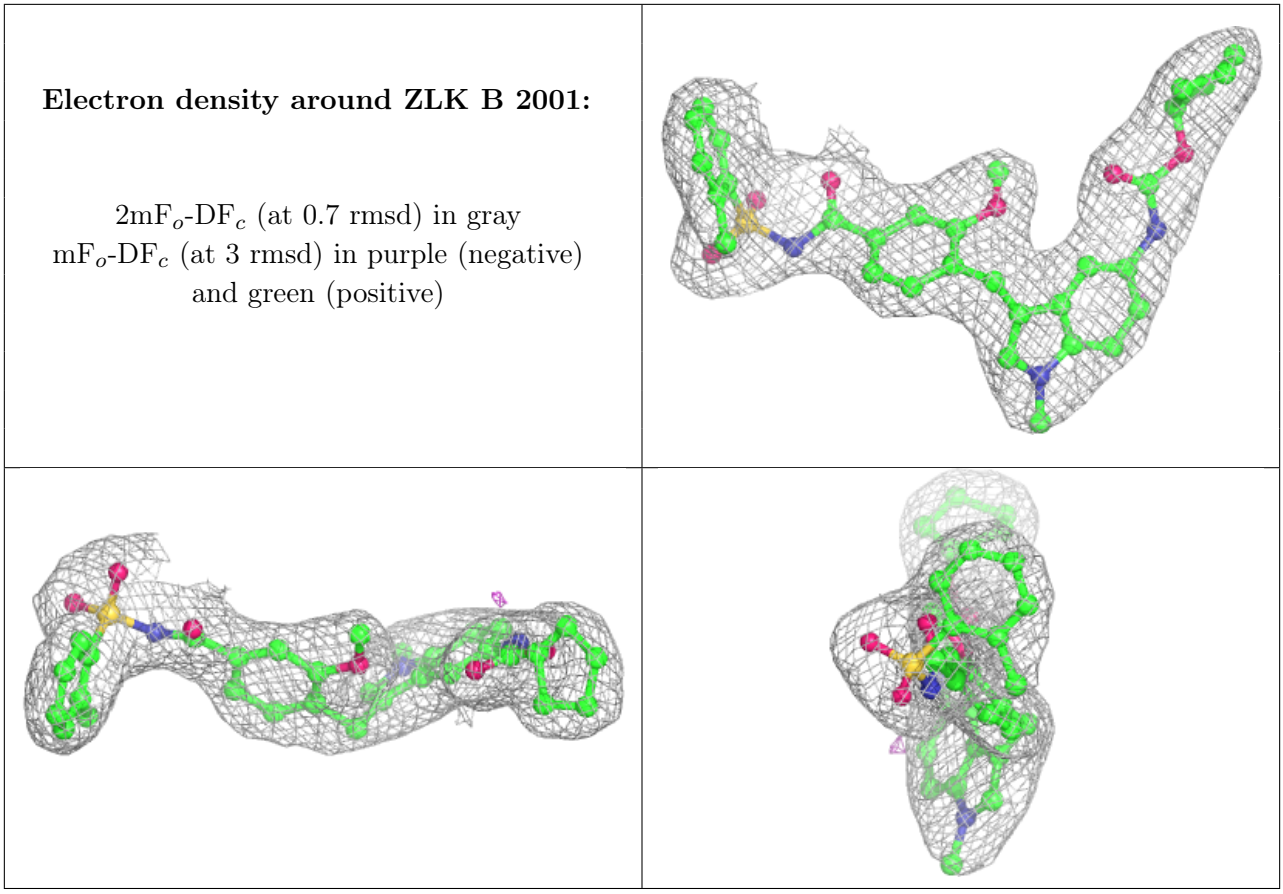






Electron density around ZLK B 2001:

$2mF_o$-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

There are no such residues in this entry.