Full wwPDB X-ray Structure Validation Report ⓘ

Nov 3, 2022 – 02:22 am GMT

PDB ID	:	7ZOV
Title	:	Crystal structure of Synechocystis halorhodopsin (SyHR), Cl-pumping mode, K state
Authors	:	Kovalev, K.; Bukhdruker, S.; Astashkin, R.; Vaganova, S.; Gordeliy, V.
Deposited on	:	2022-04-26
Resolution	:	1.70 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:

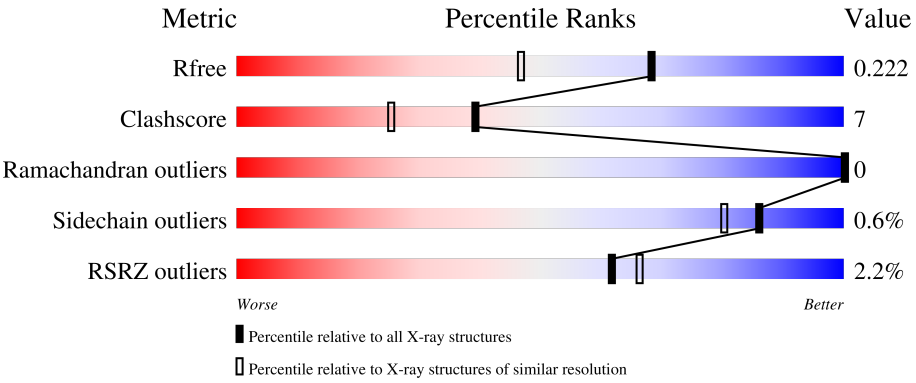
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.31.2
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0267
CCP4	:	7.1.010 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 1.70 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	4298 (1.70-1.70)
Clashscore	141614	4695 (1.70-1.70)
Ramachandran outliers	138981	4610 (1.70-1.70)
Sidechain outliers	138945	4610 (1.70-1.70)
RSRZ outliers	127900	4222 (1.70-1.70)

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	234	2% 84% 12% .

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 2336 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.

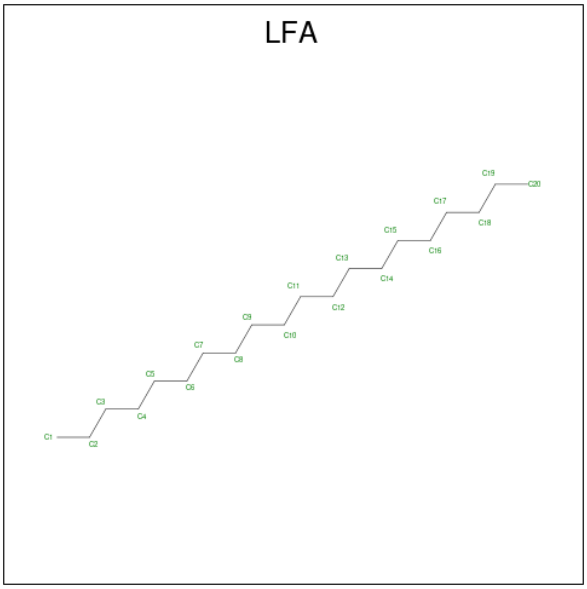
- Molecule 1 is a protein called Synechocystis halorhodopsin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	225	Total	C	N	O	S	0	20	0
			1971	1320	316	326	9			

- Molecule 2 is CHLORIDE ION (three-letter code: CL) (formula: Cl) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 3 is EICOSANE (three-letter code: LFA) (formula: $C_{20}H_{42}$).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	C	0	0
			18	18		
3	A	1	Total	C	0	0
			10	10		

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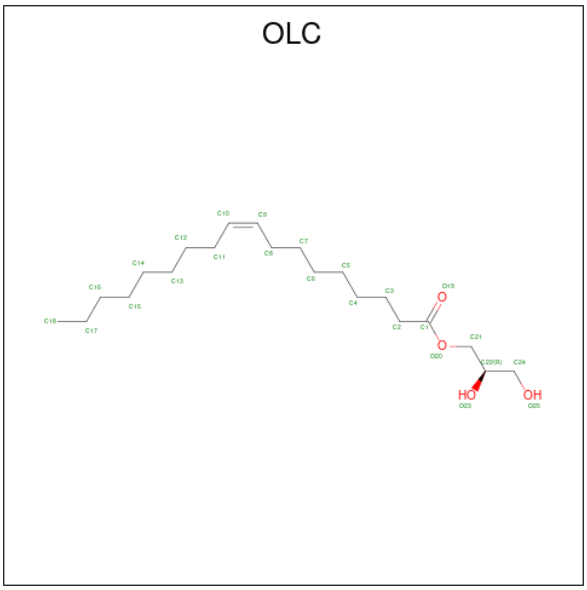
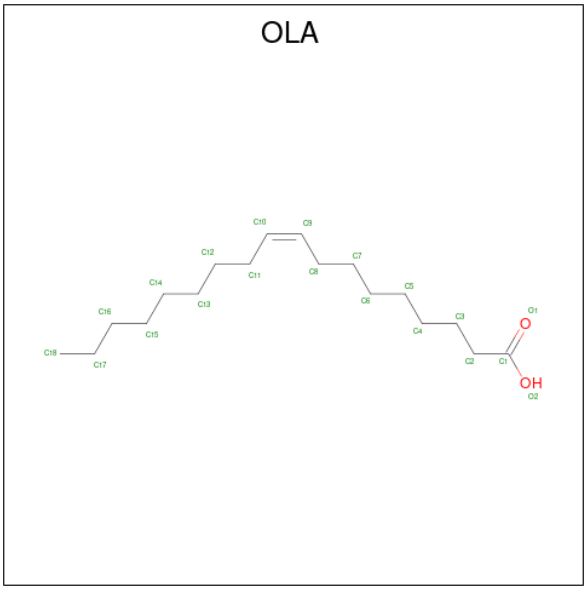
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C 6 6	0	0
3	A	1	Total C 9 9	0	0
3	A	1	Total C 8 8	0	0
3	A	1	Total C 4 4	0	0
3	A	1	Total C 12 12	0	0
3	A	1	Total C 12 12	0	0
3	A	1	Total C 10 10	0	0
3	A	1	Total C 8 8	0	0
3	A	1	Total C 8 8	0	0
3	A	1	Total C 7 7	0	0

- Molecule 4 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
4	A	1	Total C O 20 16 4	0	0

- Molecule 5 is OLEIC ACID (three-letter code: OLA) (formula: $C_{18}H_{34}O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 20 18 2	0	0
5	A	1	Total C O 12 10 2	0	0
5	A	1	Total C O 12 10 2	0	0
5	A	1	Total C O 13 11 2	0	0
5	A	1	Total C O 17 15 2	0	0
5	A	1	Total C O 16 14 2	0	0
5	A	1	Total C O 16 14 2	0	0

- Molecule 6 is water.

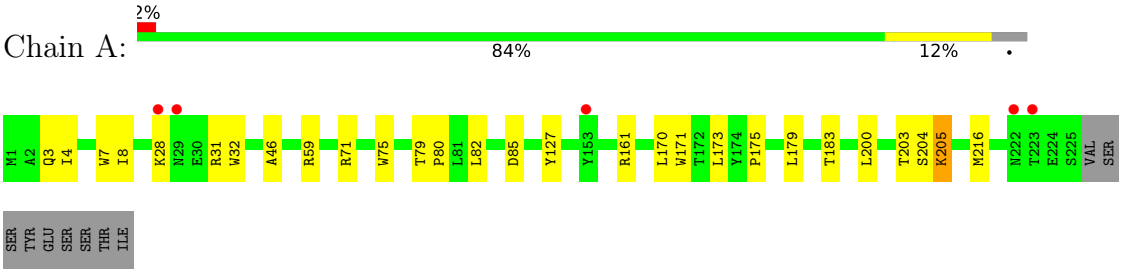
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	125	Total O 126 126	0	6

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: Synechocystis halorhodopsin

Chain A:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 3 2 1	Depositor
Cell constants a, b, c, α, β, γ	61.99Å 61.99Å 109.82Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	19.95 – 1.70 38.39 – 1.70	Depositor EDS
% Data completeness (in resolution range)	98.8 (19.95-1.70) 98.9 (38.39-1.70)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.24 (at 1.70Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.185 , 0.222 0.187 , 0.222	Depositor DCC
R_{free} test set	1417 reflections (5.19%)	wwPDB-VP
Wilson B-factor (Å^2)	18.6	Xtriage
Anisotropy	0.187	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	(Not available) , (Not available)	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.046 for -h,-k,l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	2336	wwPDB-VP
Average B, all atoms (Å^2)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.37% 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: FME, CL, LYR, OLC, LFA, OLA

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	3.95	2/1956 (0.1%)	0.68	4/2662 (0.2%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	28[A]	LYS	CB-CG	123.10	4.84	1.52
1	A	28[B]	LYS	CB-CG	123.10	4.84	1.52

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	28[A]	LYS	CA-CB-CG	-14.73	80.99	113.40
1	A	28[B]	LYS	CA-CB-CG	-14.73	80.99	113.40
1	A	28[A]	LYS	CB-CG-CD	8.29	133.16	111.60
1	A	28[B]	LYS	CB-CG-CD	8.29	133.16	111.60

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	1971	0	2002	33	0
2	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	112	0	209	4	0
4	A	20	0	27	0	0
5	A	106	0	147	3	0
6	A	126	0	0	3	3
All	All	2336	0	2385	34	3

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 7.

All (34) 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:205[B]:LYR:C13	1:A:205[B]:LYR:H9	2.10	0.81
1:A:205[B]:LYR:HG2	1:A:205[B]:LYR:H1	1.62	0.80
1:A:205[A]:LYR:H192	1:A:205[A]:LYR:H9	1.69	0.74
1:A:71:ARG:HD3	1:A:75[B]:TRP:CH2	2.30	0.67
1:A:205[B]:LYR:H1	1:A:205[B]:LYR:CG	2.25	0.65
1:A:205[A]:LYR:H192	1:A:205[A]:LYR:C9	2.26	0.65
1:A:205[B]:LYR:H9	1:A:205[B]:LYR:H132	1.78	0.64
1:A:205[B]:LYR:H9	1:A:205[B]:LYR:H133	1.83	0.60
1:A:82[B]:LEU:HG	1:A:205[B]:LYR:H43	1.83	0.60
1:A:170[B]:LEU:HD21	1:A:203:THR:HG22	1.90	0.54
1:A:31:ARG:NH1	6:A:701:HOH:O	2.12	0.54
1:A:3:GLN:HE21	1:A:7:TRP:HE1	1.58	0.52
1:A:7:TRP:CD1	3:A:610:LFA:H13	2.45	0.52
1:A:82[B]:LEU:O	1:A:85:ASP:HB2	2.11	0.51
1:A:8[B]:ILE:HG23	5:A:619:OLA:H142	1.95	0.49
1:A:161:ARG:HG3	6:A:706:HOH:O	2.13	0.49
1:A:4:ILE:O	1:A:8[A]:ILE:HG12	2.13	0.48
1:A:8[A]:ILE:HG23	5:A:619:OLA:H142	1.94	0.48
1:A:171:TRP:CE2	1:A:205[B]:LYR:H5	2.49	0.48
1:A:205[B]:LYR:CG	1:A:205[B]:LYR:C1	2.94	0.46
3:A:606:LFA:H181	5:A:620:OLA:H10	1.99	0.45
1:A:59:ARG:NH2	6:A:710:HOH:O	2.49	0.44
1:A:46:ALA:HB2	1:A:205[B]:LYR:HE3	1.99	0.44
1:A:32:TRP:CZ2	1:A:216[B]:MET:HG2	2.52	0.44
1:A:205[A]:LYR:H10	1:A:205[A]:LYR:H81	1.91	0.43
1:A:179:LEU:HD23	1:A:179:LEU:HA	1.83	0.43
1:A:175:PRO:HB3	1:A:205[B]:LYR:H161	2.01	0.43
1:A:205[A]:LYR:H9	1:A:205[A]:LYR:H183	2.01	0.42
1:A:82[B]:LEU:HD13	1:A:82[B]:LEU:HA	1.90	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:127:TYR:CD1	1:A:205[A]:LYR:H151	2.55	0.42
1:A:79:THR:N	1:A:80:PRO:HD2	2.35	0.41
1:A:200:LEU:HG	3:A:612:LFA:H161	2.02	0.41
1:A:204[B]:SER:HB3	1:A:205[B]:LYR:H42	2.02	0.41
1:A:173:LEU:HD22	3:A:612:LFA:H202	2.02	0.41

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:809:HOH:O	6:A:809:HOH:O[4_555]	2.10	0.10
6:A:719:HOH:O	6:A:774:HOH:O[2_455]	2.12	0.08
6:A:762:HOH:O	6:A:794:HOH:O[3_555]	2.19	0.01

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	241/234 (103%)	239 (99%)	2 (1%)	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	199/195 (102%)	198 (100%)	1 (0%)	88 83

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	183	THR

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

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

3 non-standard protein/DNA/RNA residues 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	$\#\|Z\|>2$
1	LYR	A	205[B]	1	27,29,30	1.24	2 (7%)	30,37,39	1.30	3 (10%)
1	LYR	A	205[A]	1	27,29,30	1.29	2 (7%)	30,37,39	1.10	2 (6%)
1	FME	A	1	1	8,9,10	0.94	0	7,9,11	0.71	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
1	LYR	A	205[B]	1	-	4/22/40/42	0/1/1/1
1	LYR	A	205[A]	1	-	1/22/40/42	0/1/1/1
1	FME	A	1	1	-	0/7/9/11	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	205[A]	LYR	C7-C80	4.33	1.41	1.35
1	A	205[B]	LYR	C7-C80	3.89	1.40	1.35
1	A	205[B]	LYR	C9-C80	-2.55	1.40	1.45
1	A	205[A]	LYR	C9-C80	-2.46	1.40	1.45

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	205[B]	LYR	C8-C80-C7	-4.46	116.67	122.92
1	A	205[A]	LYR	C8-C80-C7	-3.87	117.50	122.92
1	A	205[B]	LYR	C9-C80-C7	3.67	124.57	118.94
1	A	205[B]	LYR	C1-C2-C3	-2.35	122.46	126.97
1	A	205[A]	LYR	C6-C7-C80	2.18	130.42	127.31

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	205[B]	LYR	C9-C10-C11-C12
1	A	205[B]	LYR	C4-C3-C5-C6
1	A	205[B]	LYR	C2-C3-C5-C6
1	A	205[B]	LYR	C9-C10-C11-C17
1	A	205[A]	LYR	CD-CE-NZ-C1

There are no ring outliers.

2 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	205[B]	LYR	11	0
1	A	205[A]	LYR	5	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 21 ligands modelled in this entry, 1 is monoatomic - leaving 20 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	LFA	A	602	-	17,17,19	0.06	0	16,16,18	0.16	0
5	OLA	A	620	-	15,15,19	0.59	0	15,15,19	0.57	0
5	OLA	A	604	-	19,19,19	0.53	0	19,19,19	0.51	0
3	LFA	A	609	-	7,7,19	0.13	0	6,6,18	0.10	0
3	LFA	A	612	-	11,11,19	0.09	0	10,10,18	0.12	0
3	LFA	A	613	-	9,9,19	0.09	0	8,8,18	0.12	0
5	OLA	A	605	-	11,11,19	0.69	0	11,11,19	0.59	0
3	LFA	A	607	-	5,5,19	0.12	0	4,4,18	0.14	0
3	LFA	A	614	-	7,7,19	0.10	0	6,6,18	0.27	0
3	LFA	A	608	-	8,8,19	0.09	0	7,7,18	0.23	0
3	LFA	A	611	-	11,11,19	0.08	0	10,10,18	0.18	0
3	LFA	A	615	-	7,7,19	0.11	0	6,6,18	0.08	0
5	OLA	A	619	-	16,16,19	0.57	0	16,16,19	0.56	0
5	OLA	A	621	-	15,15,19	0.60	0	15,15,19	0.53	0
3	LFA	A	616	-	6,6,19	0.10	0	5,5,18	0.11	0
4	OLC	A	603	-	19,19,24	0.25	0	20,20,25	0.31	0
5	OLA	A	617	-	11,11,19	0.66	0	11,11,19	0.62	0
3	LFA	A	610	-	3,3,19	0.18	0	2,2,18	0.53	0
3	LFA	A	606	-	9,9,19	0.10	0	8,8,18	0.08	0
5	OLA	A	618	-	12,12,19	0.64	0	12,12,19	0.66	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
3	LFA	A	602	-	-	1/15/15/17	-
5	OLA	A	620	-	-	3/13/13/17	-
5	OLA	A	604	-	-	3/17/17/17	-
3	LFA	A	609	-	-	0/5/5/17	-
3	LFA	A	612	-	-	2/9/9/17	-
3	LFA	A	613	-	-	2/7/7/17	-
5	OLA	A	605	-	-	3/9/9/17	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	LFA	A	607	-	-	0/3/3/17	-
3	LFA	A	614	-	-	1/5/5/17	-
3	LFA	A	608	-	-	2/6/6/17	-
3	LFA	A	611	-	-	1/9/9/17	-
3	LFA	A	615	-	-	1/5/5/17	-
5	OLA	A	619	-	-	4/14/14/17	-
5	OLA	A	621	-	-	6/13/13/17	-
3	LFA	A	616	-	-	0/4/4/17	-
4	OLC	A	603	-	-	3/19/19/24	-
5	OLA	A	617	-	-	0/9/9/17	-
3	LFA	A	610	-	-	0/1/1/17	-
3	LFA	A	606	-	-	0/7/7/17	-
5	OLA	A	618	-	-	3/10/10/17	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (35) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	605	OLA	C1-C2-C3-C4
5	A	604	OLA	C4-C5-C6-C7
5	A	621	OLA	C3-C4-C5-C6
3	A	613	LFA	C2-C3-C4-C5
4	A	603	OLC	C4-C5-C6-C7
3	A	613	LFA	C3-C4-C5-C6
3	A	602	LFA	C5-C6-C7-C8
3	A	608	LFA	C14-C15-C16-C17
5	A	621	OLA	C4-C5-C6-C7
3	A	615	LFA	C14-C15-C16-C17
3	A	608	LFA	C13-C14-C15-C16
3	A	611	LFA	C11-C12-C13-C14
5	A	618	OLA	C7-C8-C9-C10
5	A	618	OLA	O1-C1-C2-C3
5	A	619	OLA	O1-C1-C2-C3
5	A	621	OLA	O1-C1-C2-C3
5	A	618	OLA	O2-C1-C2-C3
5	A	619	OLA	O2-C1-C2-C3
4	A	603	OLC	C11-C10-C9-C8
5	A	621	OLA	C9-C10-C11-C12

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Mol	Chain	Res	Type	Atoms
5	A	604	OLA	O2-C1-C2-C3
5	A	621	OLA	O2-C1-C2-C3
5	A	605	OLA	O1-C1-C2-C3
5	A	605	OLA	O2-C1-C2-C3
5	A	604	OLA	O1-C1-C2-C3
5	A	619	OLA	C7-C8-C9-C10
5	A	620	OLA	O2-C1-C2-C3
3	A	614	LFA	C15-C16-C17-C18
4	A	603	OLC	C5-C6-C7-C8
5	A	620	OLA	O1-C1-C2-C3
3	A	612	LFA	C9-C10-C11-C12
5	A	619	OLA	C6-C7-C8-C9
3	A	612	LFA	C15-C16-C17-C18
5	A	620	OLA	C7-C8-C9-C10
5	A	621	OLA	C7-C8-C9-C10

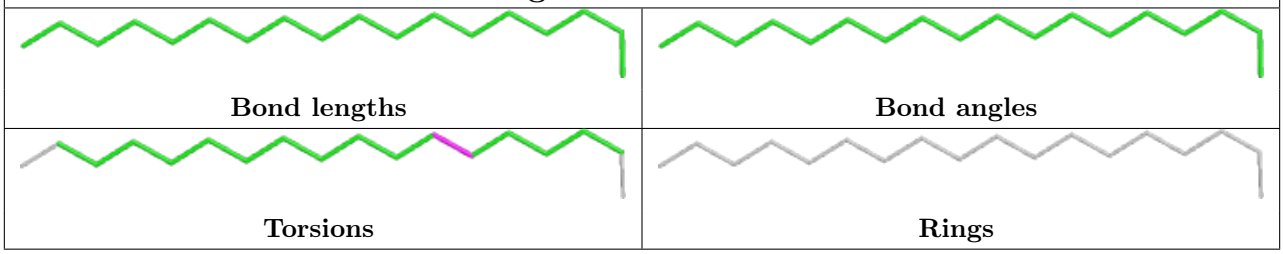
There are no ring outliers.

5 monomers are involved in 6 short contacts:

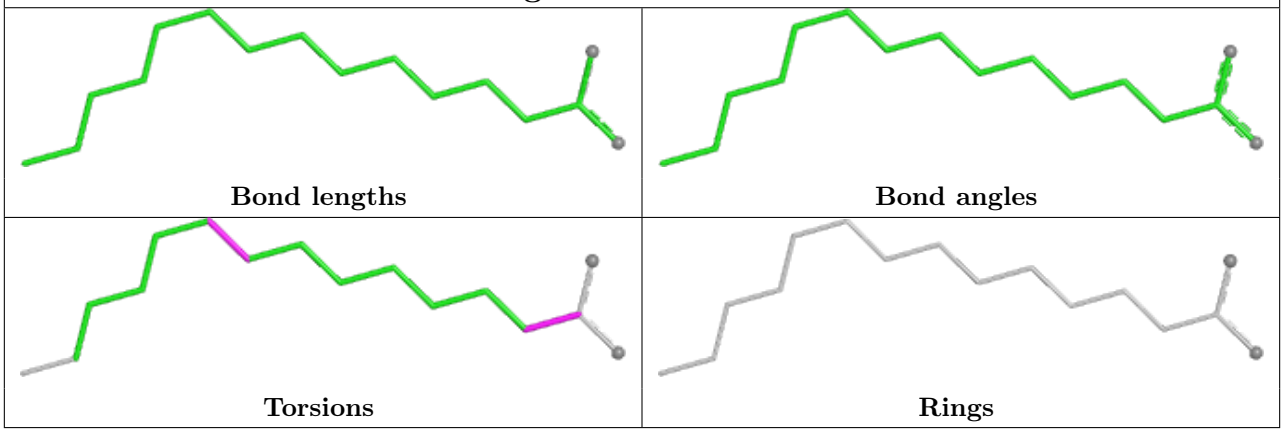
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	620	OLA	1	0
3	A	612	LFA	2	0
5	A	619	OLA	2	0
3	A	610	LFA	1	0
3	A	606	LFA	1	0

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.

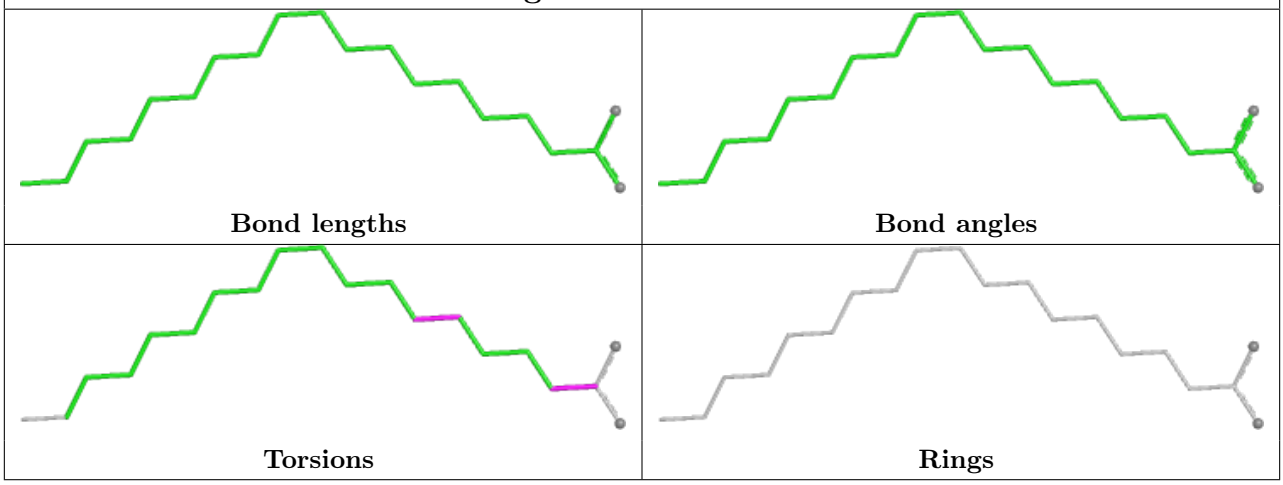
Ligand LFA A 602



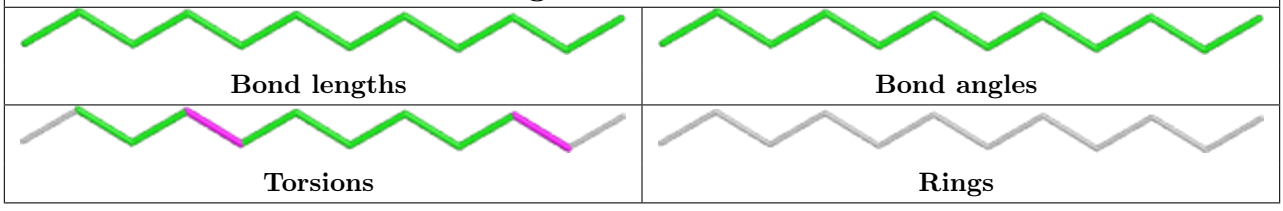
Ligand OLA A 620



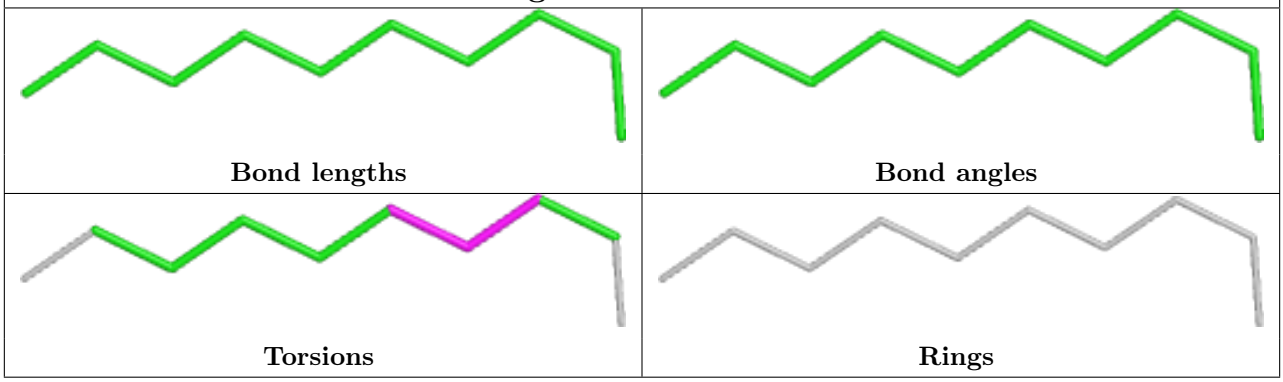
Ligand OLA A 604



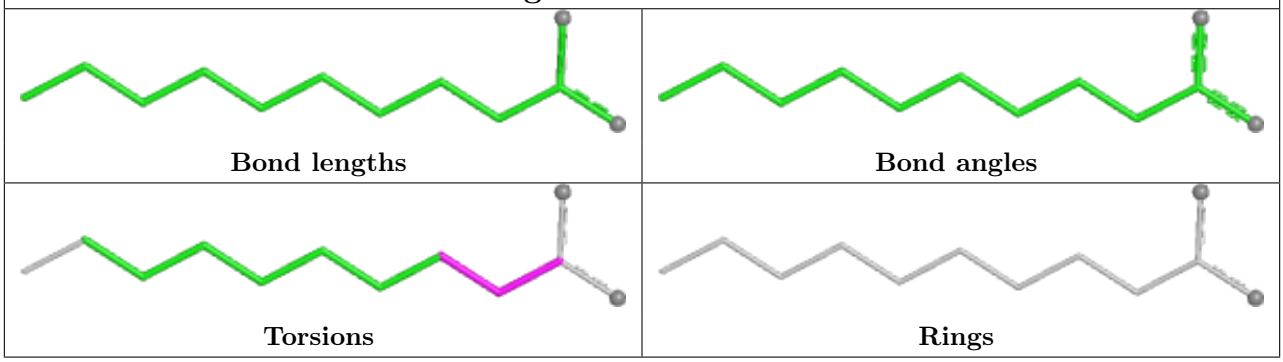
Ligand LFA A 612



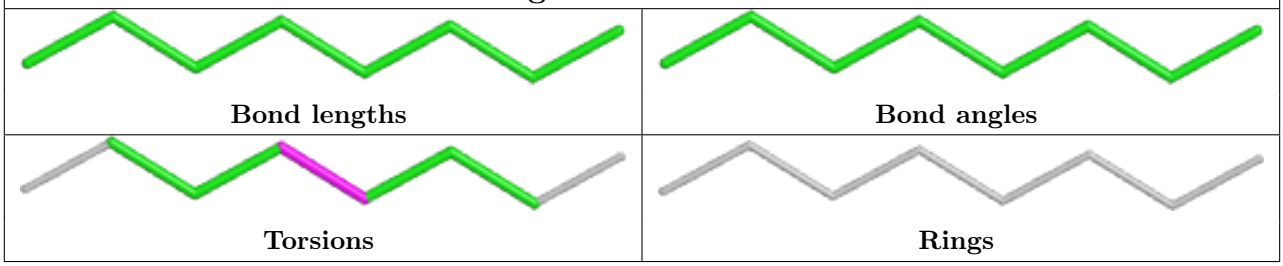
Ligand LFA A 613



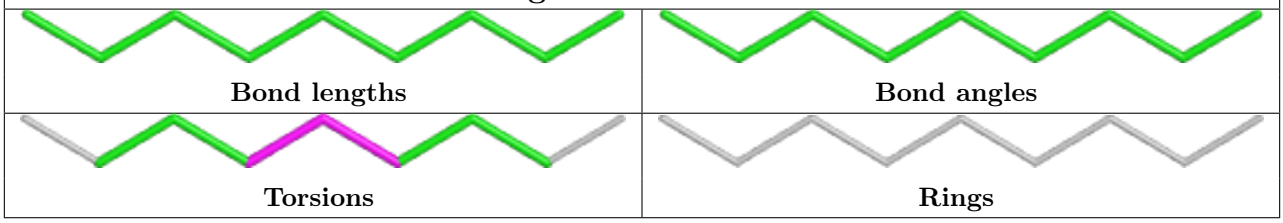
Ligand OLA A 605



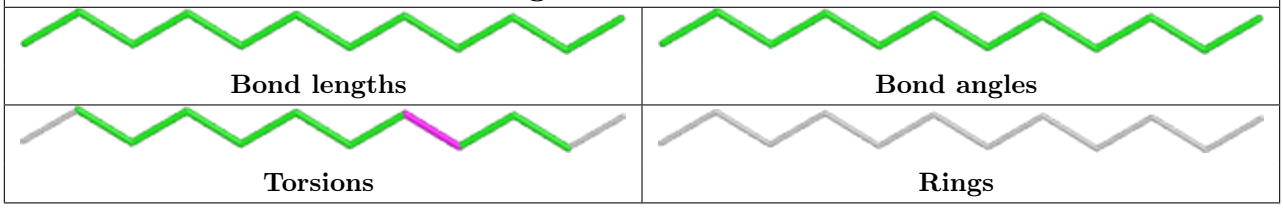
Ligand LFA A 614



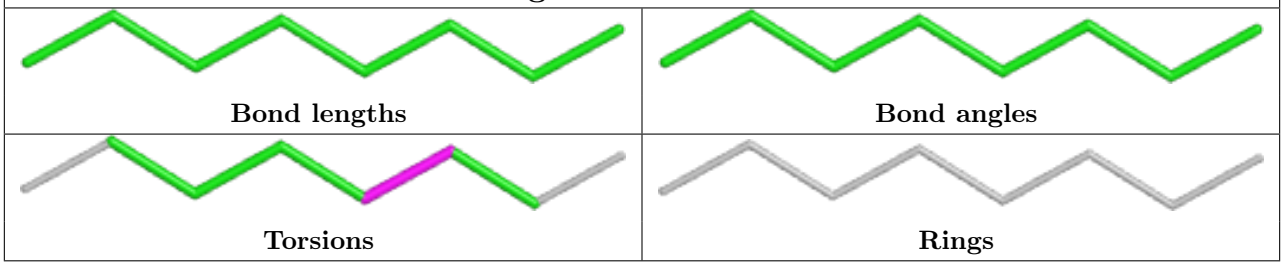
Ligand LFA A 608



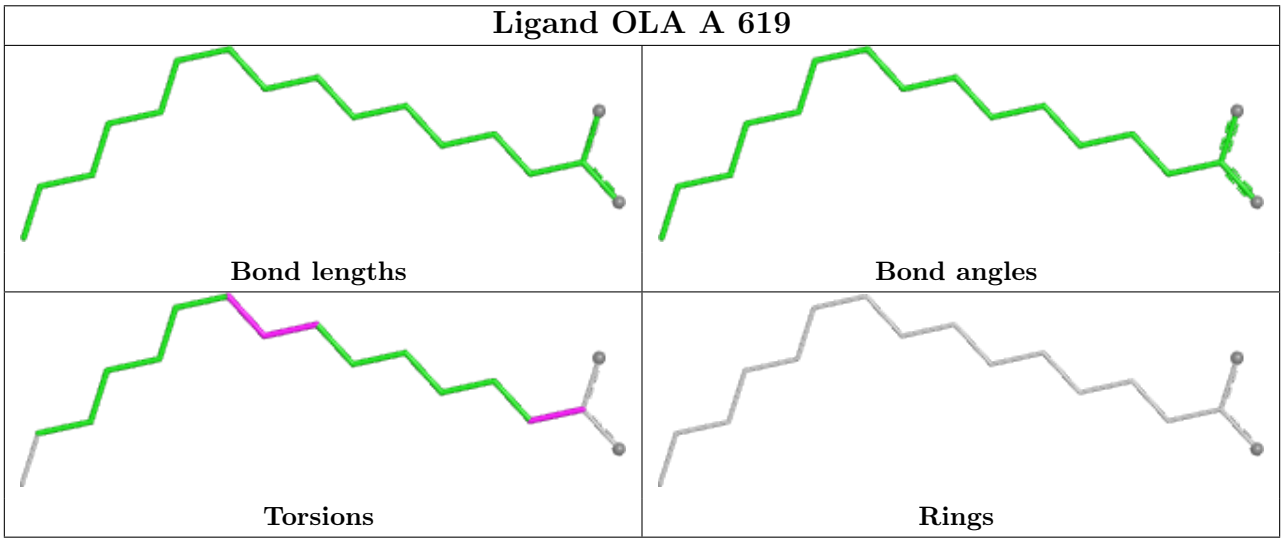
Ligand LFA A 611



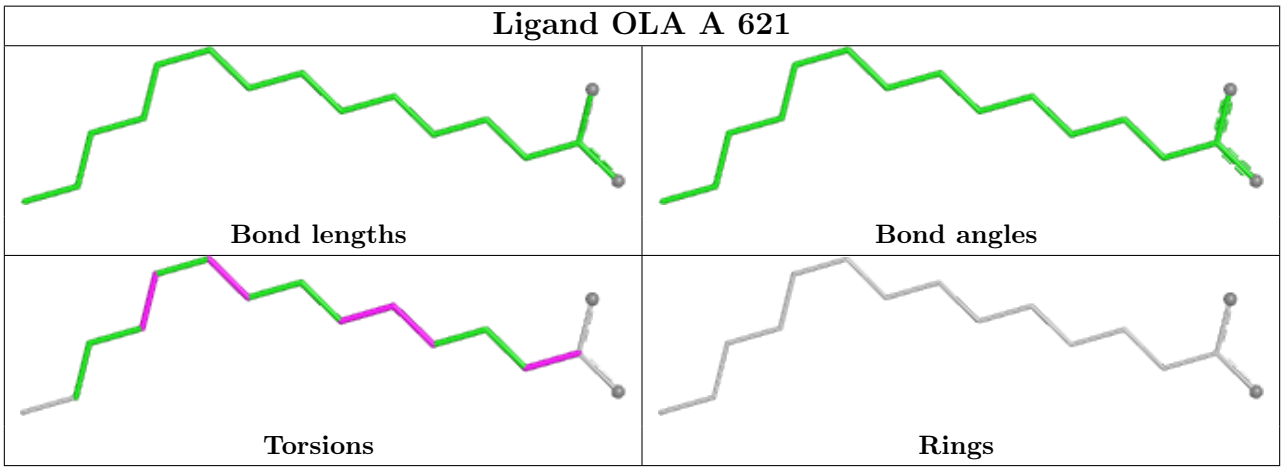
Ligand LFA A 615



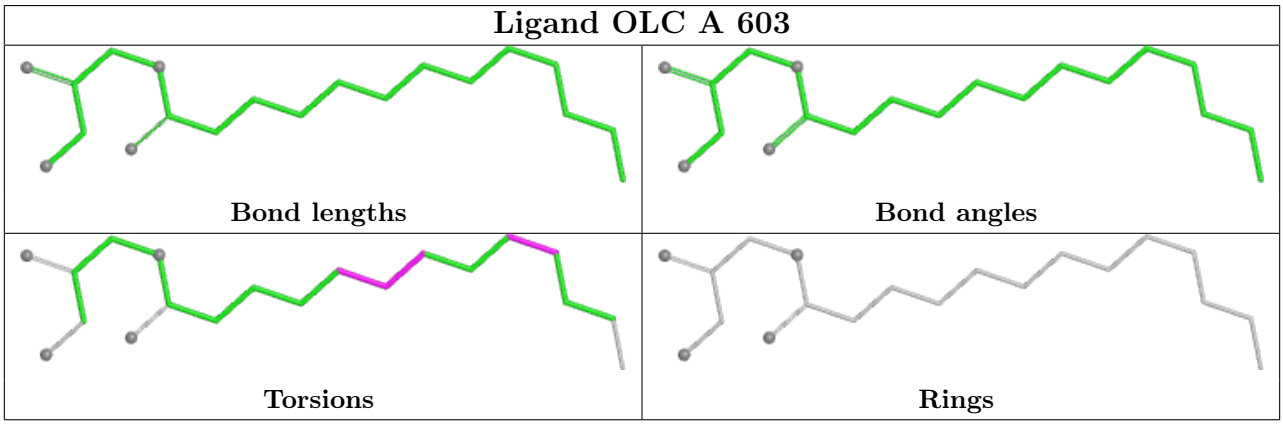
Ligand OLA A 619

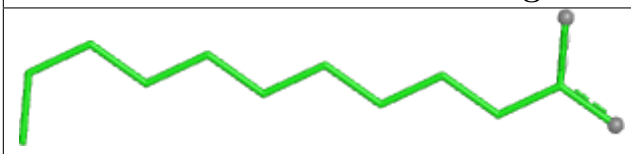
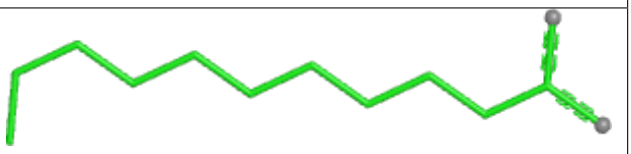
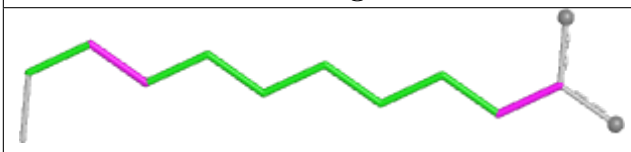
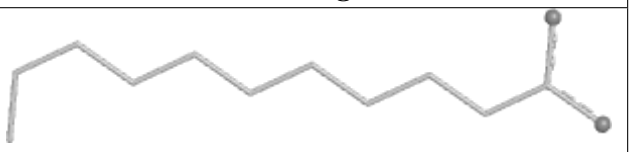


Ligand OLA A 621



Ligand OLC A 603



Ligand OLA A 618	
 Bond lengths	 Bond angles
 Torsions	 Rings

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	223/234 (95%)	0.01	5 (2%)	62 66	13, 17, 33, 54	1 (0%)

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	223	THR	4.7
1	A	222	ASN	4.7
1	A	28[A]	LYS	2.8
1	A	29[A]	ASN	2.2
1	A	153	TYR	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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
1	FME	A	1	10/11	0.92	0.10	24,28,36,37	0
1	LYR	A	205[A]	29/30	0.95	0.12	11,14,17,18	29
1	LYR	A	205[B]	29/30	0.95	0.12	10,14,17,18	29

6.3 Carbohydrates

There are no monosaccharides in this entry.

6.4 Ligands (i)

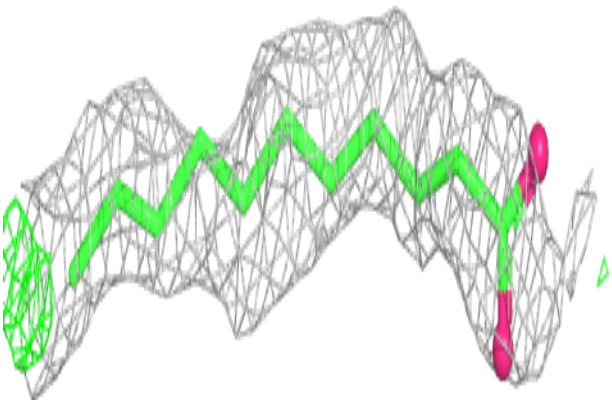
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

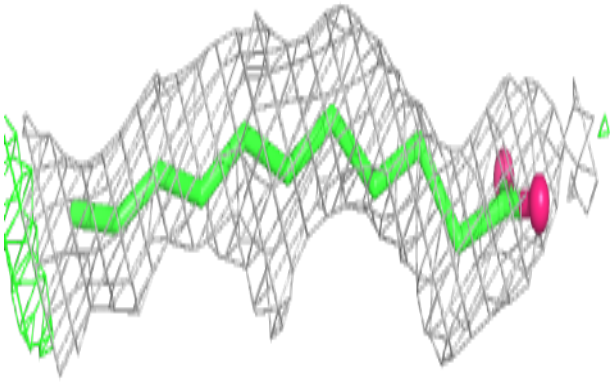
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	LFA	A	607	6/20	0.56	0.27	29,32,38,51	0
5	OLA	A	618	13/20	0.59	0.19	40,51,69,80	0
3	LFA	A	610	4/20	0.62	0.23	31,37,40,43	0
3	LFA	A	614	8/20	0.73	0.16	36,42,53,58	0
3	LFA	A	616	7/20	0.75	0.20	35,40,42,56	0
3	LFA	A	613	10/20	0.78	0.17	34,43,48,55	0
5	OLA	A	605	12/20	0.78	0.16	32,38,51,56	0
3	LFA	A	615	8/20	0.78	0.20	29,43,43,44	0
5	OLA	A	621	16/20	0.78	0.24	38,48,68,80	0
3	LFA	A	608	9/20	0.79	0.18	33,41,56,57	0
5	OLA	A	619	17/20	0.80	0.18	25,38,59,61	0
3	LFA	A	611	12/20	0.80	0.19	28,34,36,40	0
5	OLA	A	617	12/20	0.81	0.19	33,47,60,64	0
5	OLA	A	604	20/20	0.81	0.20	29,36,47,54	0
3	LFA	A	606	10/20	0.83	0.24	24,42,49,52	0
4	OLC	A	603	20/25	0.88	0.22	29,43,57,59	0
3	LFA	A	609	8/20	0.89	0.17	29,33,45,67	0
3	LFA	A	612	12/20	0.90	0.13	26,34,44,46	0
5	OLA	A	620	16/20	0.90	0.18	21,45,55,64	0
3	LFA	A	602	18/20	0.90	0.20	27,31,39,43	0
2	CL	A	601	1/1	1.00	0.07	15,15,15,15	0

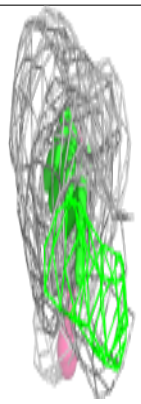
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around OLA A 618:

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

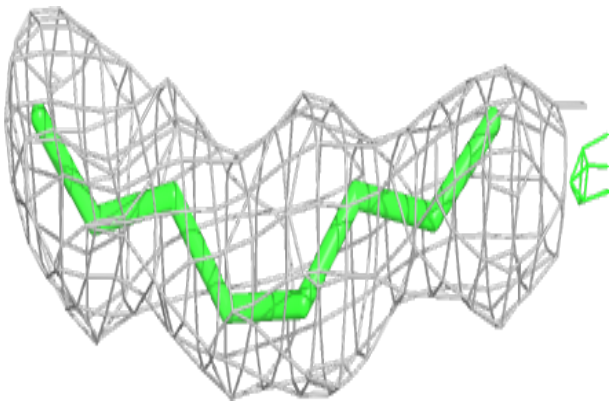


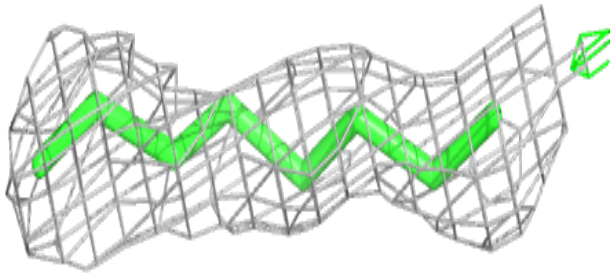


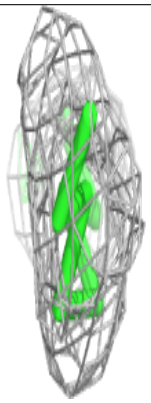


Electron density around LFA A 614:

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

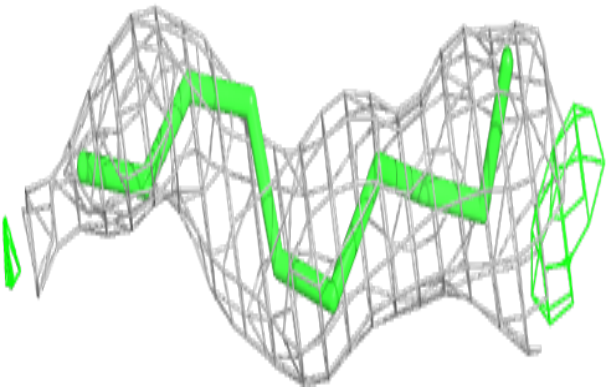


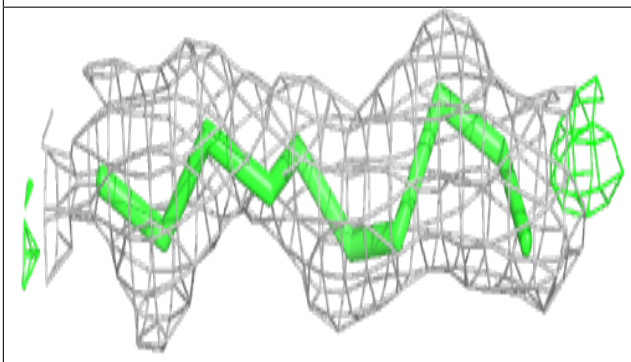


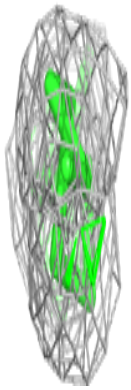


Electron density around LFA A 613:

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

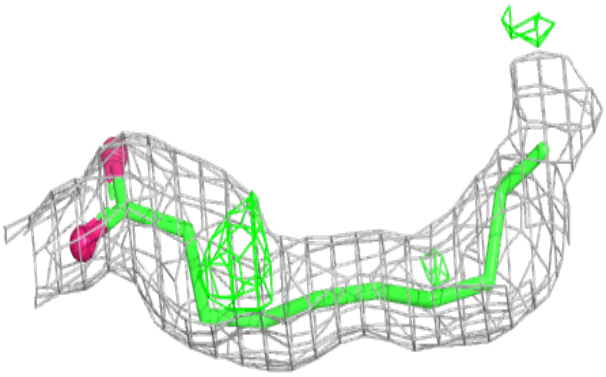


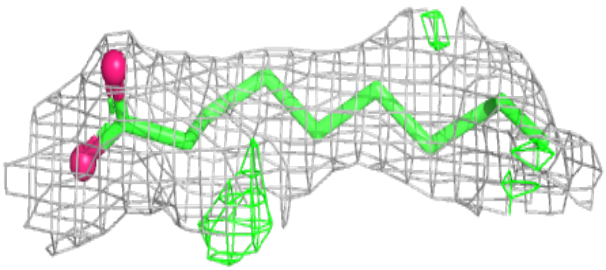


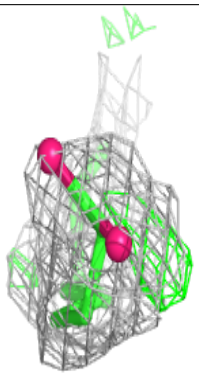


Electron density around OLA A 605:

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

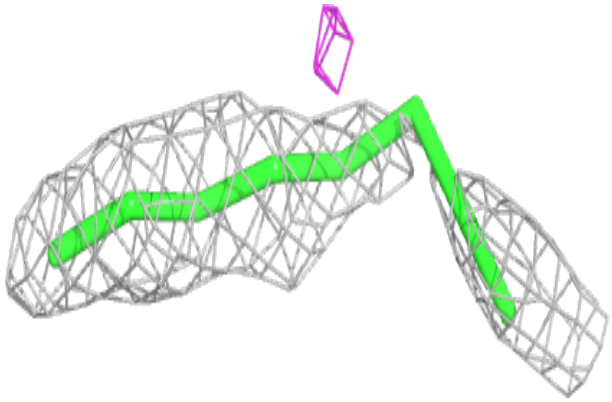


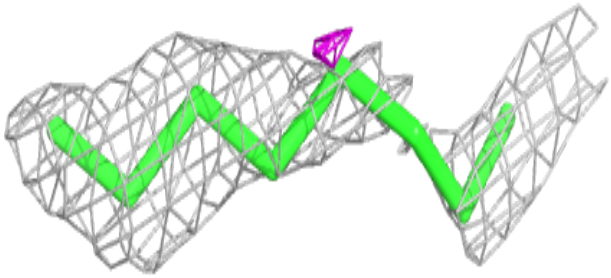


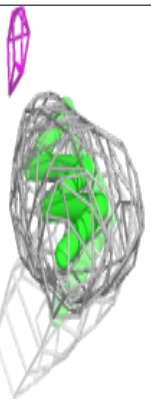


Electron density around LFA A 615:

$2mF_o$-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 621:

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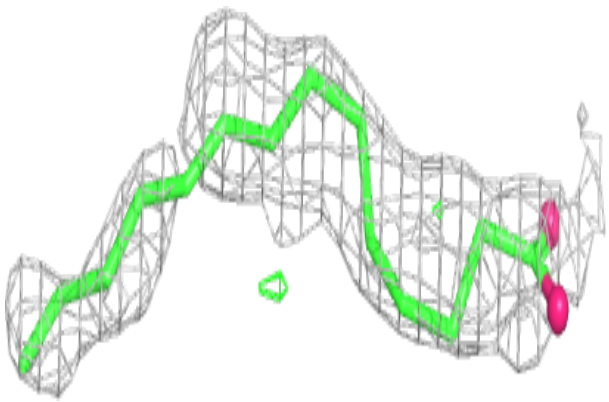
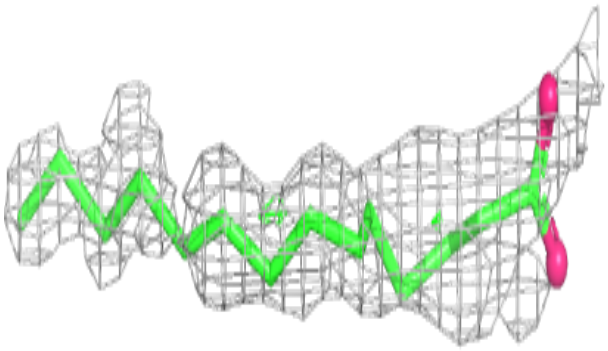
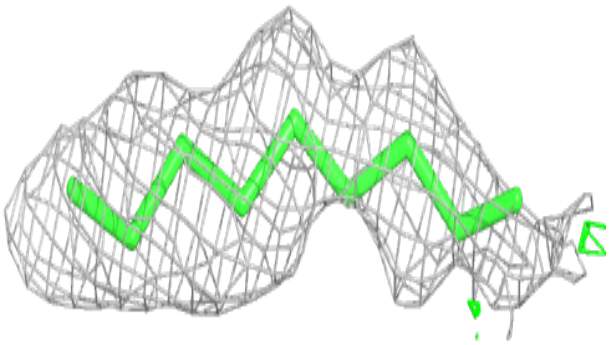
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

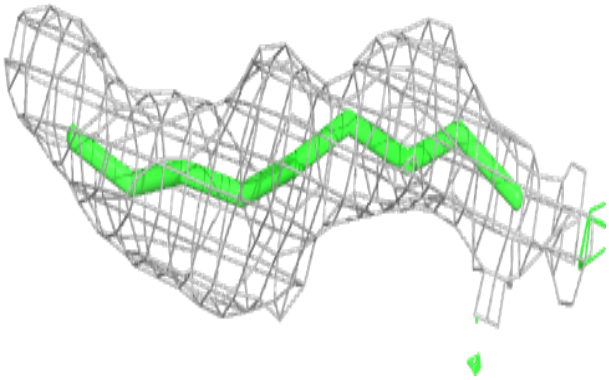


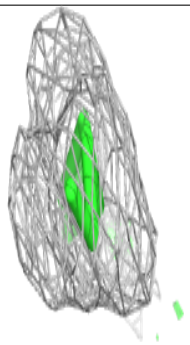


Electron density around LFA A 608:

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

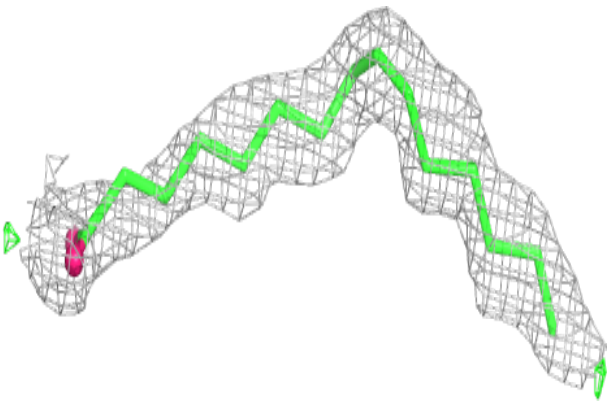


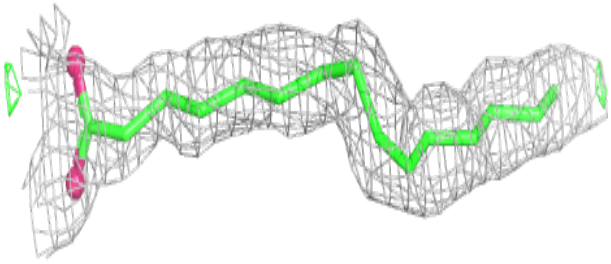




Electron density around OLA A 619:

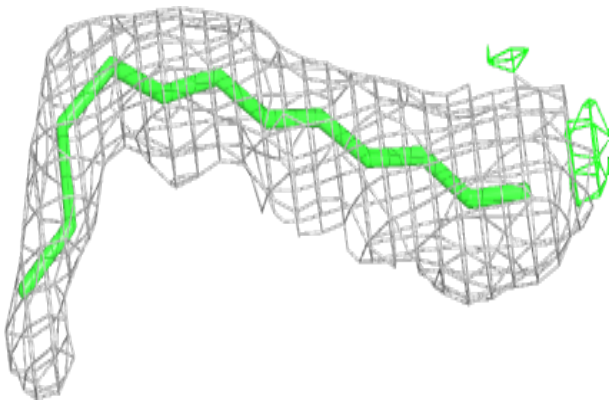
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

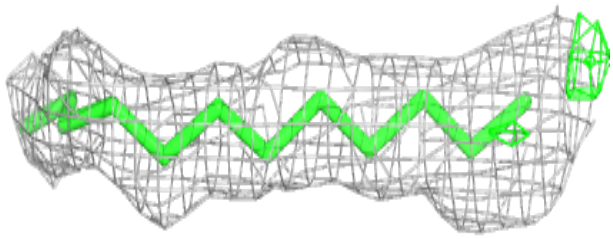


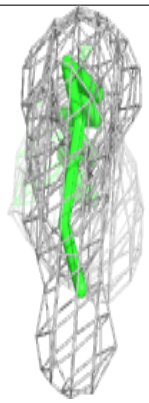


Electron density around LFA A 611:

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

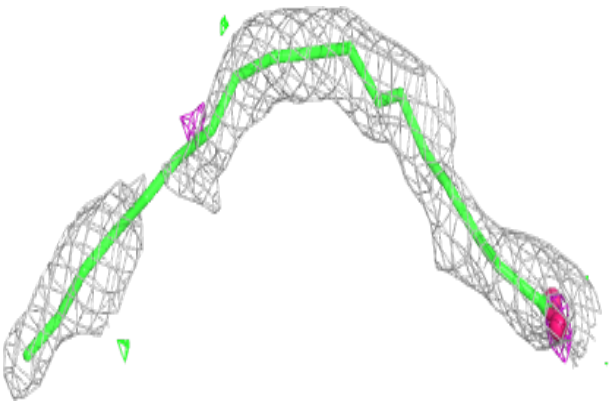


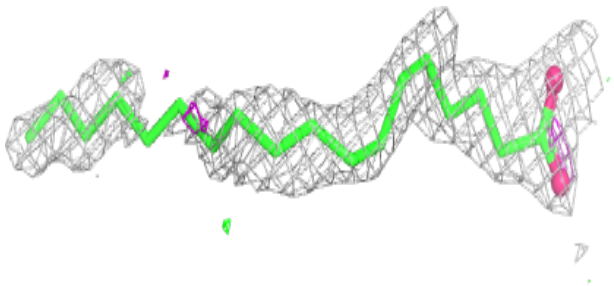


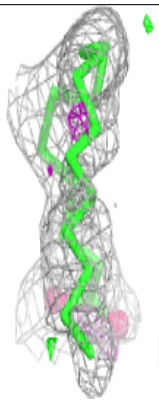


Electron density around OLA A 604:

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

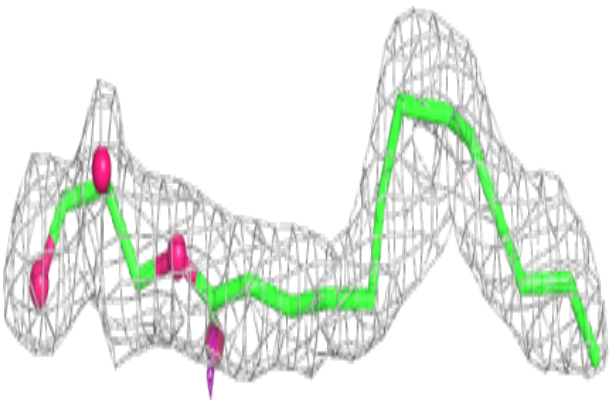


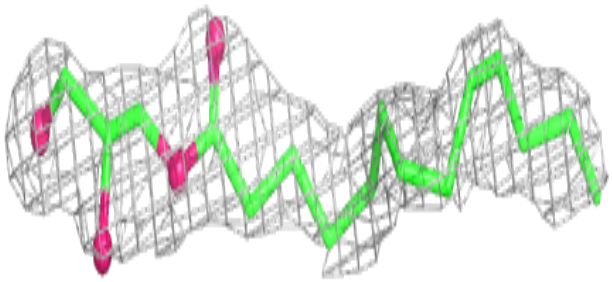


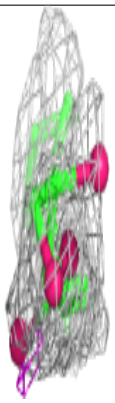


Electron density around OLC A 603:

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

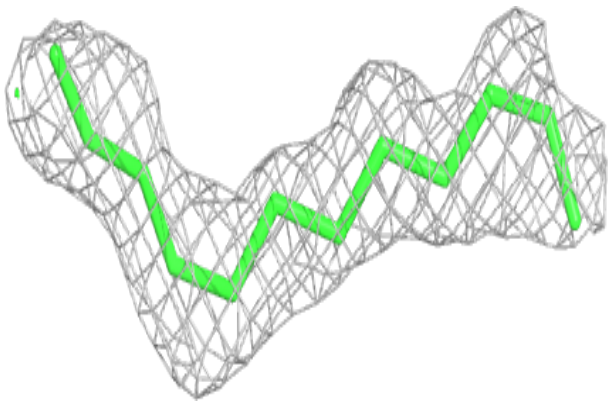


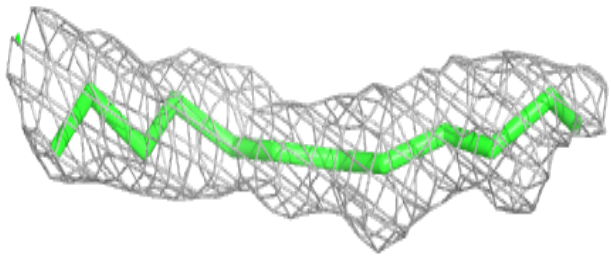


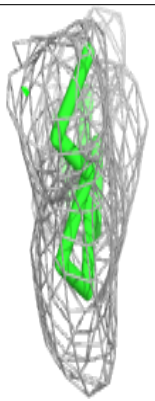


Electron density around LFA A 612:

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

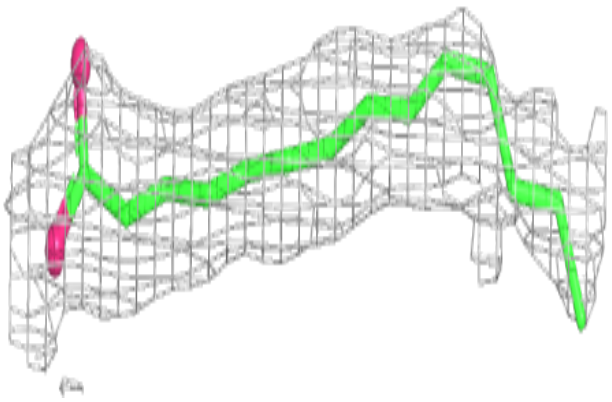


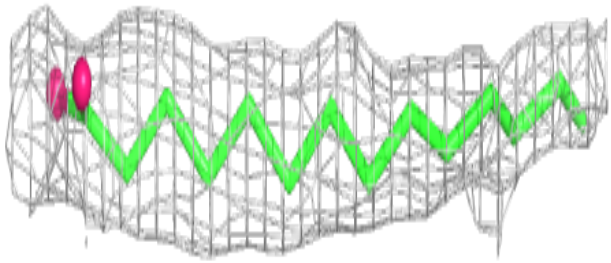


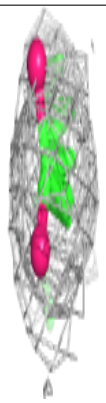


Electron density around OLA A 620:

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

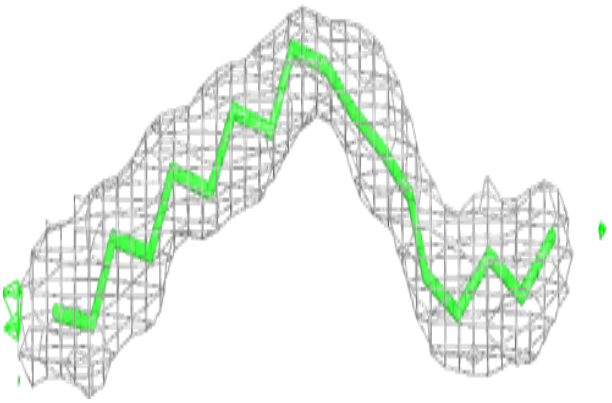


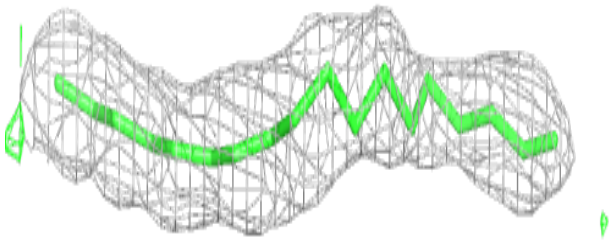


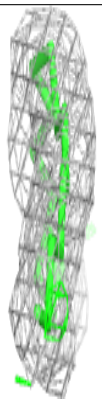


Electron density around LFA A 602:

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

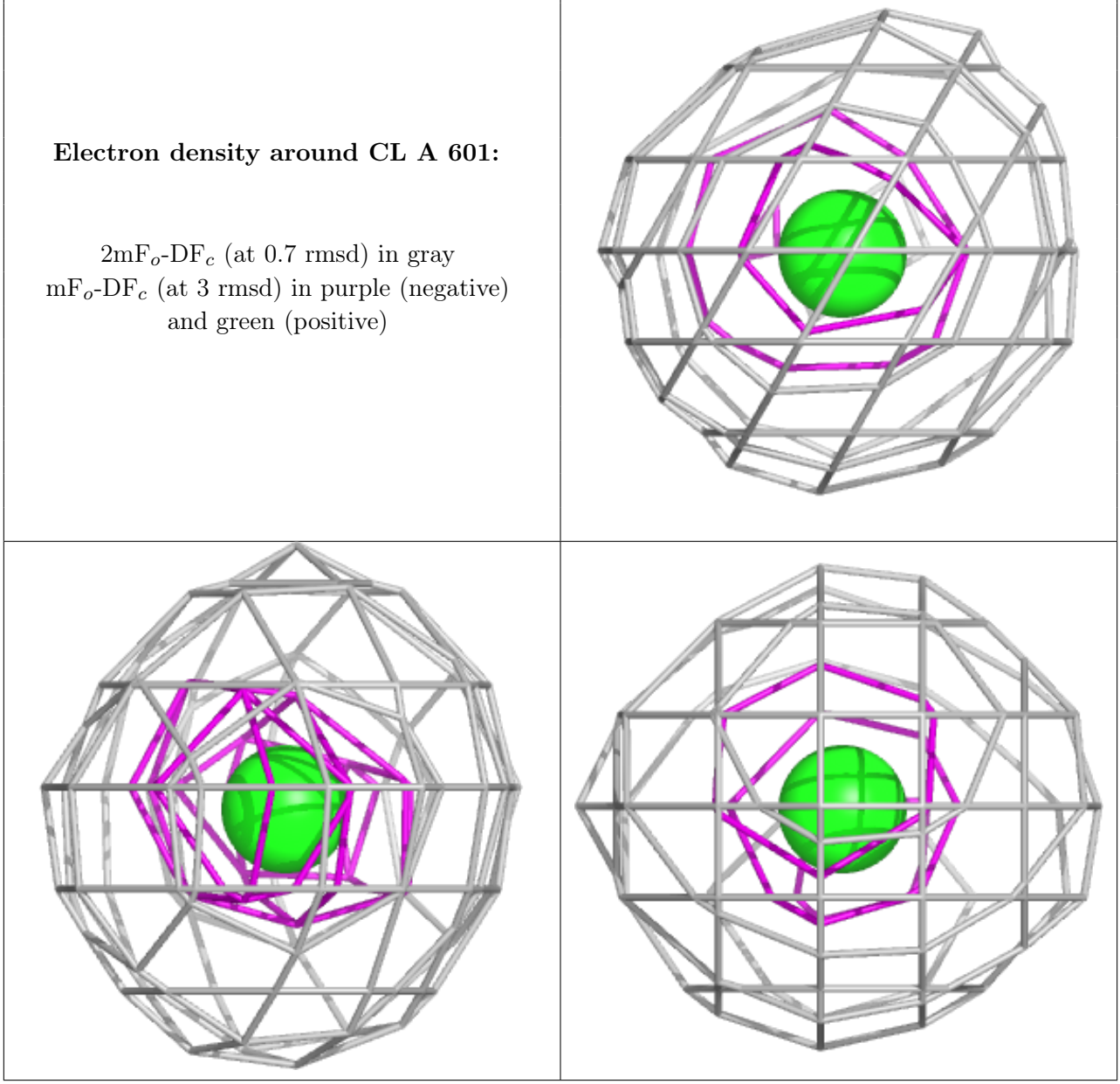






Electron density around CL A 601:

$2mF_o$-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.