wwPDB X-ray Structure Validation Summary Report (i)

Nov 7, 2023 – 03:29 am GMT

PDB ID	:	6FMS
Title	:	IMISX-EP of Se-LspA
Authors	:	Huang, C.-Y.; Olieric, V.; Howe, N.; Warshamanage, R.; Weinert, T.; Panepucci, E.; Vogeley, L.; Basu, S.; Diederichs, K.; Caffrey, M.; Wang, M.
Deposited on	:	2018-02-02
Resolution	:	3.00 Å(reported)

The following versions of software and data (see references (i)) were used in the production of this report:

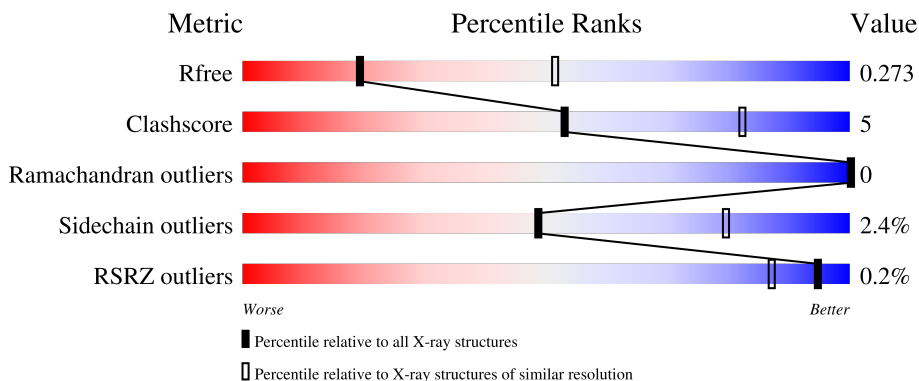|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Rfree		0.273
Clashscore		5
Ramachandran outliers		0
Sidechain outliers		2.4%
RSRZ outliers		0.2%

Worse — *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	OLC	C	204	-	-	-	X
3	OLC	C	205	-	-	-	X
3	OLC	D	201	-	-	-	X

2　Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 5466 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 Lipoprotein signal peptidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	157	Total	C	N	O	Se	0	1	0
			1261	847	202	208	4			
1	B	157	Total	C	N	O	Se	0	0	0
			1241	836	194	207	4			
1	C	149	Total	C	N	O	Se	0	0	0
			1189	801	189	195	4			
1	D	149	Total	C	N	O	Se	0	0	0
			1179	795	185	195	4			

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-18	GLY	-	expression tag	UNP Q9HVM5
A	-17	SER	-	expression tag	UNP Q9HVM5
A	-16	SER	-	expression tag	UNP Q9HVM5
A	-15	HIS	-	expression tag	UNP Q9HVM5
A	-14	HIS	-	expression tag	UNP Q9HVM5
A	-13	HIS	-	expression tag	UNP Q9HVM5
A	-12	HIS	-	expression tag	UNP Q9HVM5
A	-11	HIS	-	expression tag	UNP Q9HVM5
A	-10	HIS	-	expression tag	UNP Q9HVM5
A	-9	SER	-	expression tag	UNP Q9HVM5
A	-8	SER	-	expression tag	UNP Q9HVM5
A	-7	GLY	-	expression tag	UNP Q9HVM5
A	-6	LEU	-	expression tag	UNP Q9HVM5
A	-5	VAL	-	expression tag	UNP Q9HVM5
A	-4	PRO	-	expression tag	UNP Q9HVM5
A	-3	ARG	-	expression tag	UNP Q9HVM5
A	-2	GLY	-	expression tag	UNP Q9HVM5
A	-1	SER	-	expression tag	UNP Q9HVM5
A	0	HIS	-	expression tag	UNP Q9HVM5
A	1	MSE	-	expression tag	UNP Q9HVM5
B	-18	GLY	-	expression tag	UNP Q9HVM5

W O R L D W I D E
PDB
PROTEIN DATA BANK

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-17	SER	-	expression tag	UNP Q9HVM5
B	-16	SER	-	expression tag	UNP Q9HVM5
B	-15	HIS	-	expression tag	UNP Q9HVM5
B	-14	HIS	-	expression tag	UNP Q9HVM5
B	-13	HIS	-	expression tag	UNP Q9HVM5
B	-12	HIS	-	expression tag	UNP Q9HVM5
B	-11	HIS	-	expression tag	UNP Q9HVM5
B	-10	HIS	-	expression tag	UNP Q9HVM5
B	-9	SER	-	expression tag	UNP Q9HVM5
B	-8	SER	-	expression tag	UNP Q9HVM5
B	-7	GLY	-	expression tag	UNP Q9HVM5
B	-6	LEU	-	expression tag	UNP Q9HVM5
B	-5	VAL	-	expression tag	UNP Q9HVM5
B	-4	PRO	-	expression tag	UNP Q9HVM5
B	-3	ARG	-	expression tag	UNP Q9HVM5
B	-2	GLY	-	expression tag	UNP Q9HVM5
B	-1	SER	-	expression tag	UNP Q9HVM5
B	0	HIS	-	expression tag	UNP Q9HVM5
B	1	MSE	-	expression tag	UNP Q9HVM5
C	-18	GLY	-	expression tag	UNP Q9HVM5
C	-17	SER	-	expression tag	UNP Q9HVM5
C	-16	SER	-	expression tag	UNP Q9HVM5
C	-15	HIS	-	expression tag	UNP Q9HVM5
C	-14	HIS	-	expression tag	UNP Q9HVM5
C	-13	HIS	-	expression tag	UNP Q9HVM5
C	-12	HIS	-	expression tag	UNP Q9HVM5
C	-11	HIS	-	expression tag	UNP Q9HVM5
C	-10	HIS	-	expression tag	UNP Q9HVM5
C	-9	SER	-	expression tag	UNP Q9HVM5
C	-8	SER	-	expression tag	UNP Q9HVM5
C	-7	GLY	-	expression tag	UNP Q9HVM5
C	-6	LEU	-	expression tag	UNP Q9HVM5
C	-5	VAL	-	expression tag	UNP Q9HVM5
C	-4	PRO	-	expression tag	UNP Q9HVM5
C	-3	ARG	-	expression tag	UNP Q9HVM5
C	-2	GLY	-	expression tag	UNP Q9HVM5
C	-1	SER	-	expression tag	UNP Q9HVM5
C	0	HIS	-	expression tag	UNP Q9HVM5
C	1	MSE	-	expression tag	UNP Q9HVM5
D	-18	GLY	-	expression tag	UNP Q9HVM5
D	-17	SER	-	expression tag	UNP Q9HVM5
D	-16	SER	-	expression tag	UNP Q9HVM5

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-15	HIS	-	expression tag	UNP Q9HVM5
D	-14	HIS	-	expression tag	UNP Q9HVM5
D	-13	HIS	-	expression tag	UNP Q9HVM5
D	-12	HIS	-	expression tag	UNP Q9HVM5
D	-11	HIS	-	expression tag	UNP Q9HVM5
D	-10	HIS	-	expression tag	UNP Q9HVM5
D	-9	SER	-	expression tag	UNP Q9HVM5
D	-8	SER	-	expression tag	UNP Q9HVM5
D	-7	GLY	-	expression tag	UNP Q9HVM5
D	-6	LEU	-	expression tag	UNP Q9HVM5
D	-5	VAL	-	expression tag	UNP Q9HVM5
D	-4	PRO	-	expression tag	UNP Q9HVM5
D	-3	ARG	-	expression tag	UNP Q9HVM5
D	-2	GLY	-	expression tag	UNP Q9HVM5
D	-1	SER	-	expression tag	UNP Q9HVM5
D	0	HIS	-	expression tag	UNP Q9HVM5
D	1	MSE	-	expression tag	UNP Q9HVM5

- Molecule 2 is a protein called Globomycin.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	E	5	Total	C	N	O	0	0	0
			46	32	5	9			
2	F	5	Total	C	N	O	0	0	0
			46	32	5	9			
2	G	5	Total	C	N	O	0	0	0
			46	32	5	9			
2	H	5	Total	C	N	O	0	0	0
			46	32	5	9			

- Molecule 3 is (2R)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (three-letter code: OLC) (formula: $C_{21}H_{40}O_4$).

OLC

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 10	C 6	O 4	0	0
3	A	1	Total 11	C 7	O 4	0	0
3	A	1	Total 22	C 18	O 4	0	0
3	A	1	Total 25	C 21	O 4	0	0
3	A	1	Total 25	C 21	O 4	0	0
3	B	1	Total 13	C 9	O 4	0	0
3	B	1	Total 25	C 21	O 4	0	0
3	B	1	Total 25	C 21	O 4	0	0
3	B	1	Total 20	C 16	O 4	0	0
3	B	1	Total 14	C 10	O 4	0	0
3	B	1	Total 10	C 6	O 4	0	0
3	C	1	Total 15	C 11	O 4	0	0
3	C	1	Total 13	C 9	O 4	0	0
3	C	1	Total 25	C 21	O 4	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total 21	C 17	O 4	0	0
3	C	1	Total 25	C 21	O 4	0	0
3	D	1	Total 13	C 9	O 4	0	0
3	D	1	Total 12	C 8	O 4	0	0
3	E	1	Total 25	C 21	O 4	0	0
3	F	1	Total 16	C 12	O 4	0	0
3	G	1	Total 19	C 15	O 4	0	0
3	H	1	Total 18	C 14	O 4	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	4	Total 4	O 4	0	0
4	C	1	Total 1	O 1	0	0
4	D	4	Total 4	O 4	0	0
4	H	1	Total 1	O 1	0	0

SEQUENCE-PLOTS INFOmissingINFO

3   Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	112.75Å　110.13Å　85.99Å 90.00°　　97.08°　　90.00°	Depositor
Resolution (Å)	46.27　–　3.00 46.27　–　3.00	Depositor EDS
% Data completeness (in resolution range)	99.0 (46.27-3.00) 92.9 (46.27-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.36 (at 3.01Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.228　,　0.271 0.230　,　0.273	Depositor DCC
R_{free} test set	1049 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	79.4	Xtriage
Anisotropy	0.224	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 70.0	EDS
L-test for twinning[2]	$< |L| > = 0.47, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	5466	wwPDB-VP
Average B, all atoms (Å^2)	81.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 17.92% of the height of the origin peak. No significant pseudotranslation is detected.*

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

4 Model quality ⓘ

4.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: IIL, MLE, ALO, OLC, 5BV

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	0.24	0/1296	0.39	0/1766
1	B	0.27	0/1276	0.44	0/1743
1	C	0.24	0/1222	0.40	0/1667
1	D	0.24	0/1212	0.41	0/1656
2	E	0.17	0/5	0.45	0/5
2	F	0.16	0/5	0.46	0/5
2	G	0.24	0/5	0.47	0/5
2	H	0.16	0/5	0.20	0/5
All	All	0.25	0/5026	0.41	0/6852

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	E	0	1
2	H	0	1
All	All	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	E	204	ALO	Mainchain
2	H	204	ALO	Mainchain

4.2   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	1261	0	1264	8	0
1	B	1241	0	1229	18	0
1	C	1189	0	1191	14	0
1	D	1179	0	1169	16	0
2	E	46	0	35	1	0
2	F	46	0	34	2	0
2	G	46	0	35	0	0
2	H	46	0	35	2	0
3	A	93	0	131	4	0
3	B	107	0	148	3	0
3	C	99	0	143	6	0
3	D	25	0	28	0	0
3	E	25	0	40	0	0
3	F	16	0	21	1	0
3	G	19	0	25	0	0
3	H	18	0	23	1	0
4	A	4	0	0	0	0
4	C	1	0	0	0	0
4	D	4	0	0	0	0
4	H	1	0	0	0	0
All	All	5466	0	5551	59	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 5.

The worst 5 of 59 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:B:8:GLY:O	1:B:9:ARG:NH2	2.21	0.74
1:A:34:LEU:HD21	1:A:40:ILE:HG13	1.75	0.68
1:C:110:LEU:HB3	3:C:203:OLC:H10	1.77	0.67
1:D:23:ASP:OD2	1:D:27:LYS:NZ	2.27	0.66
1:D:95:GLU:HB3	1:D:98:LEU:HD13	1.82	0.62

There are no symmetry-related clashes.

4.3   Torsion angles ⓘ

4.3.1   Protein backbone ⓘ

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	156/188 (83%)	150 (96%)	6 (4%)	0	100	100
1	B	155/188 (82%)	142 (92%)	13 (8%)	0	100	100
1	C	147/188 (78%)	142 (97%)	5 (3%)	0	100	100
1	D	147/188 (78%)	140 (95%)	7 (5%)	0	100	100
2	E	1/5 (20%)	1 (100%)	0	0	100	100
2	F	1/5 (20%)	1 (100%)	0	0	100	100
2	G	1/5 (20%)	1 (100%)	0	0	100	100
2	H	1/5 (20%)	0	1 (100%)	0	100	100
All	All	609/772 (79%)	577 (95%)	32 (5%)	0	100	100

There are no Ramachandran outliers to report.

4.3.2   Protein sidechains ⓘ

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

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	129/149 (87%)	128 (99%)	1 (1%)	81	93
1	B	126/149 (85%)	121 (96%)	5 (4%)	31	68
1	C	121/149 (81%)	119 (98%)	2 (2%)	60	85
1	D	119/149 (80%)	115 (97%)	4 (3%)	37	72
2	E	1/1 (100%)	1 (100%)	0	100	100
2	F	1/1 (100%)	1 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	G	1/1 (100%)	1 (100%)	0	100	100
2	H	1/1 (100%)	1 (100%)	0	100	100
All	All	499/600 (83%)	487 (98%)	12 (2%)	49	79

5 of 12 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	158	PHE
1	D	23	ASP
1	D	156	ASP
1	D	36	MSE
1	B	121	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	54	ASN

4.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

12 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	$\#|Z| > 2$
2	ALO	G	204	2	5,6,7	0.72	0	6,7,9	1.39	1 (16%)
2	MLE	F	201	2	7,8,9	0.75	0	6,9,11	0.82	0
2	IIL	H	202	2	6,7,8	0.57	0	5,8,10	1.47	1 (20%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	ALO	F	204	2	5,6,7	0.70	0	6,7,9	1.34	1 (16%)
2	MLE	H	201	2	7,8,9	0.75	0	6,9,11	0.92	1 (16%)
2	IIL	F	202	2	6,7,8	0.60	0	5,8,10	1.24	1 (20%)
2	IIL	E	202	2	6,7,8	0.56	0	5,8,10	1.44	1 (20%)
2	MLE	G	201	2	7,8,9	0.75	0	6,9,11	0.88	1 (16%)
2	IIL	G	202	2	6,7,8	0.58	0	5,8,10	1.29	1 (20%)
2	ALO	E	204	2	5,6,7	0.69	0	6,7,9	1.51	1 (16%)
2	MLE	E	201	2	7,8,9	0.75	0	6,9,11	0.88	1 (16%)
2	ALO	H	204	2	5,6,7	0.72	0	6,7,9	1.30	1 (16%)

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	ALO	G	204	2	-	0/5/6/8	-
2	MLE	F	201	2	-	2/5/8/10	-
2	IIL	H	202	2	-	1/7/8/10	-
2	ALO	F	204	2	-	0/5/6/8	-
2	MLE	H	201	2	-	1/5/8/10	-
2	IIL	F	202	2	-	3/7/8/10	-
2	IIL	E	202	2	-	2/7/8/10	-
2	MLE	G	201	2	-	0/5/8/10	-
2	IIL	G	202	2	-	1/7/8/10	-
2	ALO	E	204	2	-	0/5/6/8	-
2	MLE	E	201	2	-	1/5/8/10	-
2	ALO	H	204	2	-	4/5/6/8	-

There are no bond length outliers.

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	H	202	IIL	CB-CA-C	-3.24	107.88	112.83
2	E	202	IIL	CB-CA-C	-3.13	108.05	112.83
2	E	204	ALO	CB-CA-C	-3.07	106.87	111.77
2	G	202	IIL	CB-CA-C	-2.76	108.62	112.83
2	F	202	IIL	CB-CA-C	-2.67	108.74	112.83

There are no chirality outliers.

5 of 15 torsion outliers are listed below:

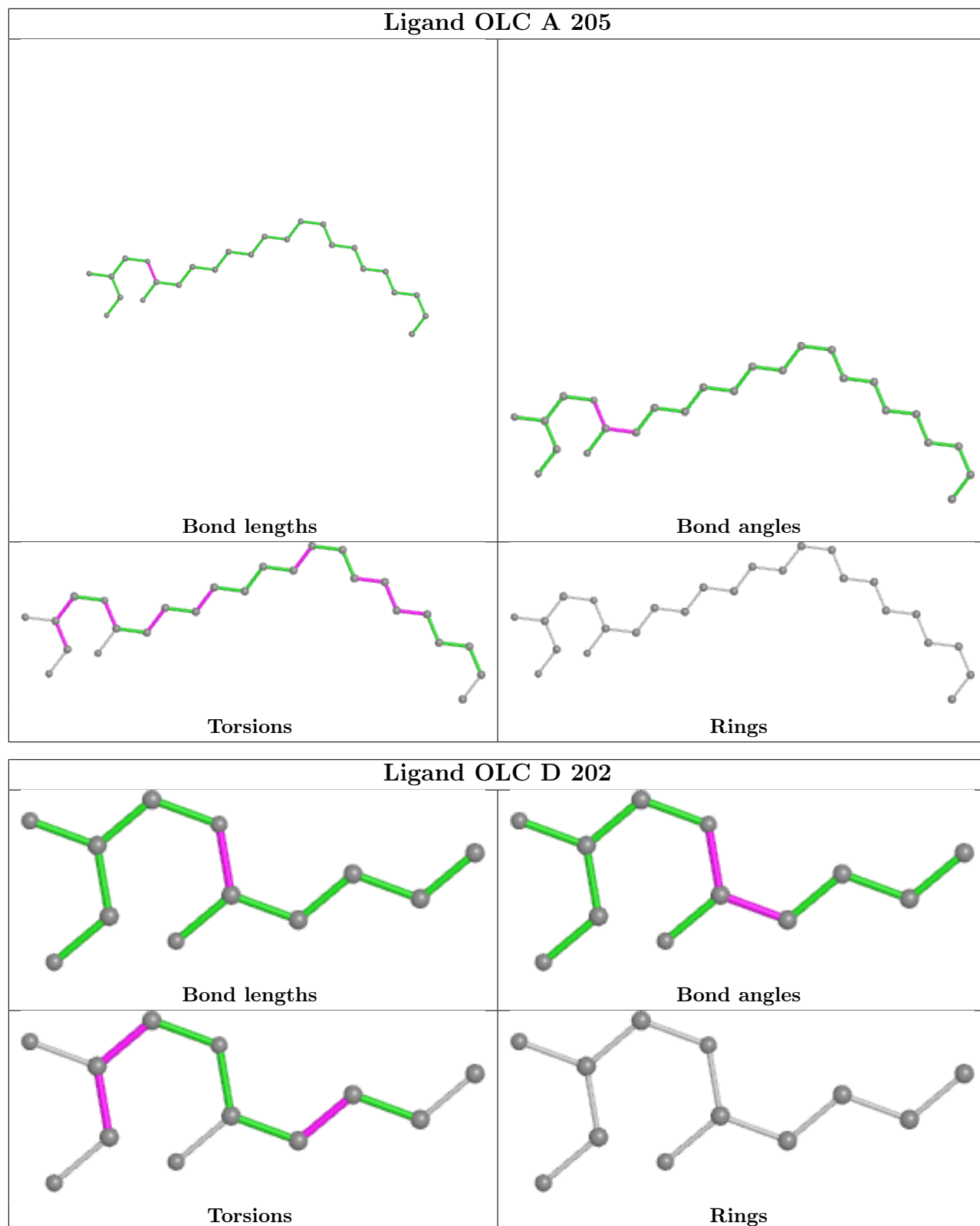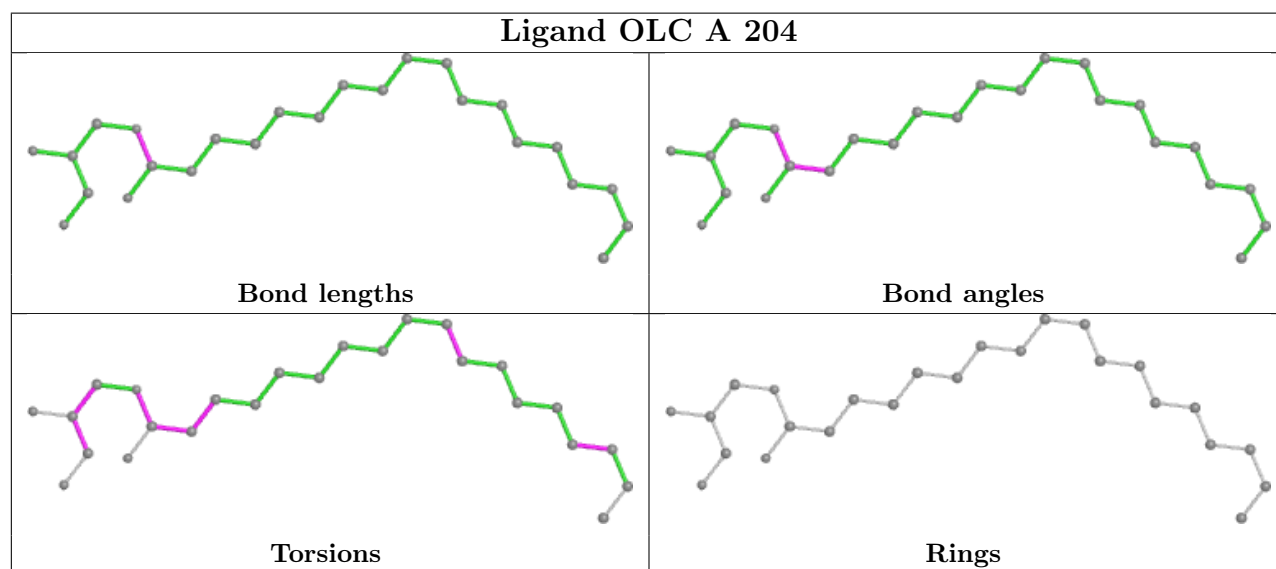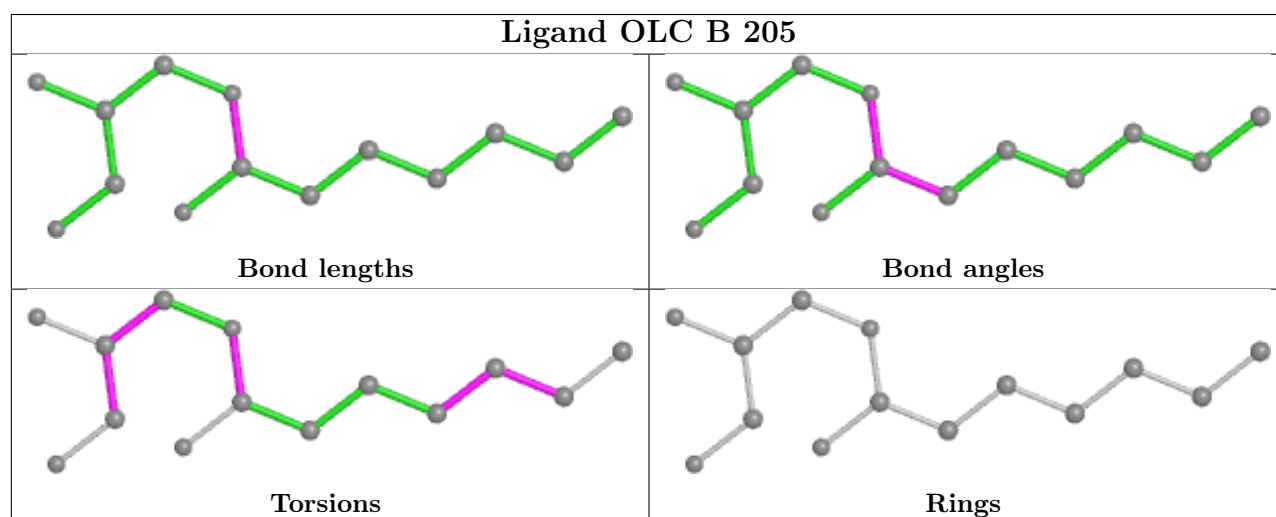| Mol	Chain	Res	Type	Atoms
2	F	201	MLE	N-CA-CB-CG
2	F	201	MLE	C-CA-CB-CG
2	E	202	IIL	C-CA-CB-CG1
2	H	204	ALO	C-CA-CB-CG2
2	H	204	ALO	O-C-CA-CB

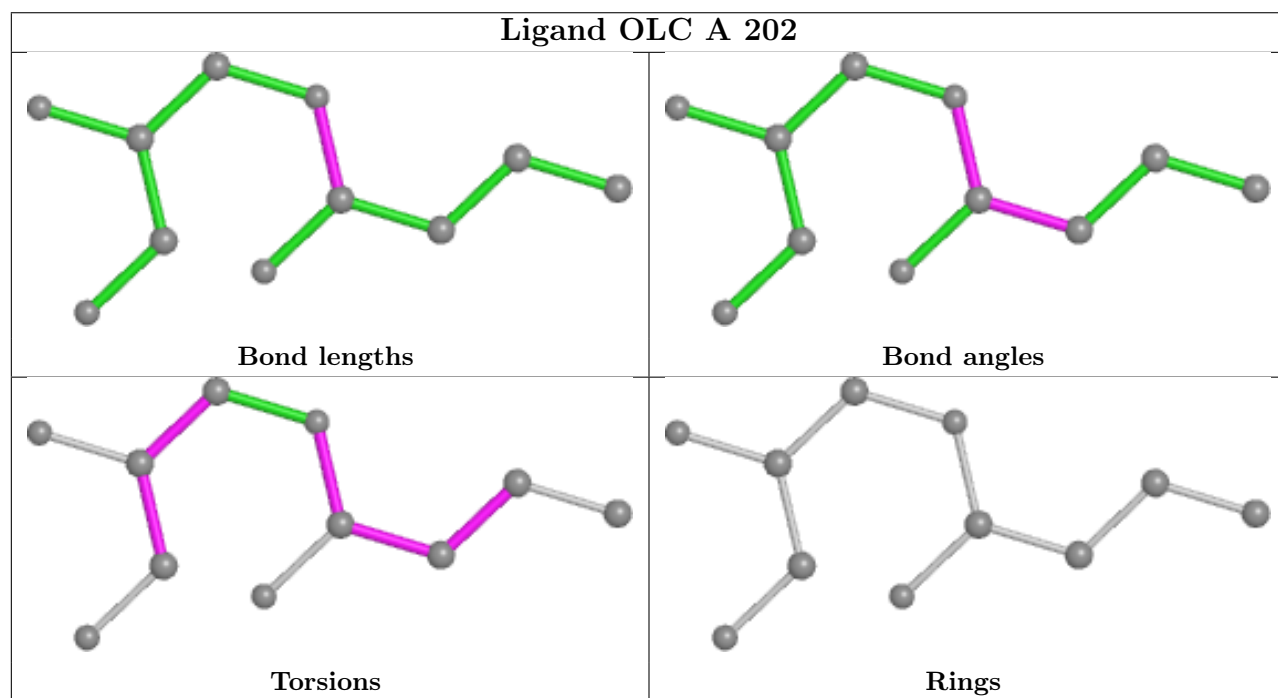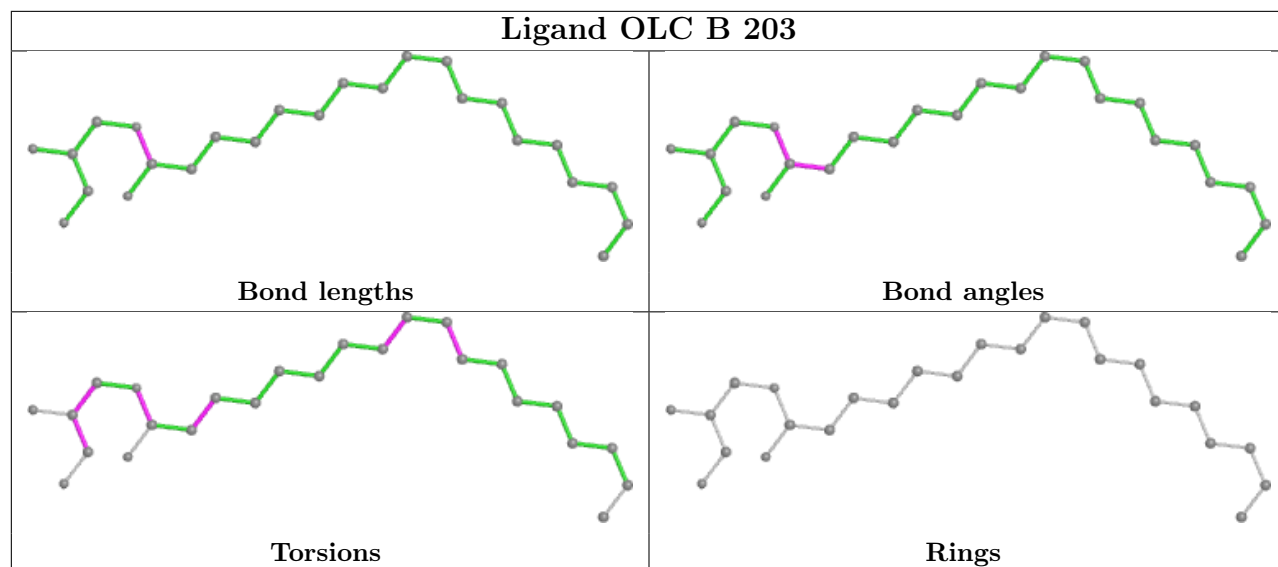There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	201	MLE	1	0
2	H	201	MLE	1	0
2	F	202	IIL	1	0
2	H	204	ALO	1	0

4.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

4.6 Ligand geometry ⓘ

22 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
3	OLC	B	202	-	24,24,24	0.68	1 (4%)	25,25,25	1.00	1 (4%)
3	OLC	C	204	-	20,20,24	0.74	1 (5%)	21,21,25	0.98	1 (4%)
3	OLC	A	205	-	24,24,24	0.67	1 (4%)	25,25,25	0.95	1 (4%)
3	OLC	D	202	-	11,11,24	0.98	1 (9%)	12,12,25	1.04	1 (8%)
3	OLC	H	301	-	17,17,24	0.82	1 (5%)	18,18,25	1.05	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
3	OLC	B	205	-	13,13,24	0.91	1 (7%)	14,14,25	1.07	1 (7%)
3	OLC	A	201	-	9,9,24	1.06	1 (11%)	10,10,25	1.26	1 (10%)
3	OLC	A	204	-	24,24,24	0.68	1 (4%)	25,25,25	0.96	1 (4%)
3	OLC	B	203	-	24,24,24	0.69	1 (4%)	25,25,25	0.95	1 (4%)
3	OLC	A	202	-	10,10,24	1.03	1 (10%)	11,11,25	1.17	1 (9%)
3	OLC	D	201	-	12,12,24	0.94	1 (8%)	13,13,25	1.09	1 (7%)
3	OLC	G	301	-	18,18,24	0.79	1 (5%)	18,19,25	1.00	1 (5%)
3	OLC	A	203	-	21,21,24	0.74	1 (4%)	22,22,25	0.96	1 (4%)
3	OLC	C	203	-	24,24,24	0.68	1 (4%)	25,25,25	0.98	1 (4%)
3	OLC	B	206	-	9,9,24	1.07	1 (11%)	10,10,25	1.28	1 (10%)
3	OLC	F	301	-	15,15,24	0.83	1 (6%)	16,16,25	1.06	1 (6%)
3	OLC	C	201	-	14,14,24	0.87	1 (7%)	15,15,25	1.05	1 (6%)
3	OLC	E	301	-	24,24,24	0.67	1 (4%)	25,25,25	0.99	1 (4%)
3	OLC	B	201	-	12,12,24	0.94	1 (8%)	13,13,25	1.10	1 (7%)
3	OLC	B	204	-	19,19,24	0.76	1 (5%)	20,20,25	0.96	1 (5%)
3	OLC	C	202	-	12,12,24	0.94	1 (8%)	13,13,25	1.08	1 (7%)
3	OLC	C	205	-	24,24,24	0.68	1 (4%)	25,25,25	0.91	1 (4%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	OLC	B	202	-	-	7/24/24/24	-
3	OLC	C	204	-	-	7/20/20/24	-
3	OLC	A	205	-	-	12/24/24/24	-
3	OLC	D	202	-	-	5/11/11/24	-
3	OLC	H	301	-	-	8/17/17/24	-
3	OLC	B	205	-	-	8/13/13/24	-
3	OLC	A	201	-	-	3/9/9/24	-
3	OLC	A	204	-	-	11/24/24/24	-
3	OLC	B	203	-	-	8/24/24/24	-
3	OLC	A	202	-	-	9/10/10/24	-
3	OLC	D	201	-	-	9/12/12/24	-
3	OLC	G	301	-	-	9/18/18/24	-

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WORLDWIDE PDB
PROTEIN DATA BANK

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	OLC	A	203	-	-	10/21/21/24	-
3	OLC	C	203	-	-	13/24/24/24	-
3	OLC	B	206	-	-	6/9/9/24	-
3	OLC	F	301	-	-	7/15/15/24	-
3	OLC	C	201	-	-	6/14/14/24	-
3	OLC	E	301	-	-	6/24/24/24	-
3	OLC	B	201	-	-	3/12/12/24	-
3	OLC	B	204	-	-	6/19/19/24	-
3	OLC	C	202	-	-	8/12/12/24	-
3	OLC	C	205	-	-	13/24/24/24	-

The worst 5 of 22 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	203	OLC	O20-C1	2.70	1.41	1.33
3	B	203	OLC	O20-C1	2.67	1.41	1.33
3	B	201	OLC	O20-C1	2.67	1.41	1.33
3	C	204	OLC	O20-C1	2.66	1.41	1.33
3	B	205	OLC	O20-C1	2.66	1.41	1.33

The worst 5 of 22 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	206	OLC	O20-C1-C2	3.29	120.01	111.38
3	A	201	OLC	O20-C1-C2	3.29	120.00	111.38
3	B	202	OLC	O20-C1-C2	2.88	120.94	111.91
3	A	202	OLC	O20-C1-C2	2.76	120.57	111.91
3	B	201	OLC	O20-C1-C2	2.74	120.52	111.91

There are no chirality outliers.

5 of 174 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	201	OLC	C21-C22-C24-O25
3	A	202	OLC	C21-C22-C24-O25
3	A	202	OLC	O20-C21-C22-C24
3	A	202	OLC	O20-C21-C22-O23
3	A	204	OLC	C21-C22-C24-O25

There are no ring outliers.

10 monomers are involved in 15 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	202	OLC	1	0
3	C	204	OLC	1	0
3	H	301	OLC	1	0
3	B	205	OLC	1	0
3	A	204	OLC	4	0
3	C	203	OLC	4	0
3	B	206	OLC	2	0
3	F	301	OLC	1	0
3	C	201	OLC	1	0
3	C	205	OLC	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 OLC B 202

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC C 204

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 205

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC D 202

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC H 301

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 205

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 204

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 203

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 202

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC D 201

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC G 301

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 203

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC C 203

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 206

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC F 301

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC C 201

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC E 301

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 201

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 204

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC C 202

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC C 205

Bond lengths

Bond angles

Torsions

Rings

4.7 Other polymers ⓘ

There are no such residues in this entry.

4.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

5 Fit of model and data ⓘ

5.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	153/188 (81%)	-0.51	0	100	100	54, 69, 105, 130	0
1	B	153/188 (81%)	-0.41	1 (0%)	87	69	50, 81, 117, 137	0
1	C	145/188 (77%)	-0.46	0	100	100	50, 70, 114, 138	0
1	D	145/188 (77%)	-0.43	0	100	100	59, 79, 118, 127	0
2	E	1/5 (20%)	-0.46	0	100	100	64, 64, 64, 64	0
2	F	1/5 (20%)	-0.33	0	100	100	77, 77, 77, 77	0
2	G	1/5 (20%)	-0.73	0	100	100	64, 64, 64, 64	0
2	H	1/5 (20%)	-0.77	0	100	100	85, 85, 85, 85	0
All	All	600/772 (77%)	-0.45	1 (0%)	95	87	50, 73, 116, 138	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	56	GLY	2.8

5.2 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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	MLE	F	201	9/10	0.94	0.27	67,86,92,95	0
2	MLE	H	201	9/10	0.94	0.25	56,80,88,88	0
2	ALO	F	204	7/8	0.94	0.17	65,77,82,100	0
2	MLE	E	201	9/10	0.95	0.24	43,57,64,66	0
2	ALO	G	204	7/8	0.95	0.19	63,66,76,86	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å²)	Q<0.9
2	ALO	H	204	7/8	0.95	0.14	76,82,87,102	0
2	MLE	G	201	9/10	0.96	0.21	58,64,75,83	0
2	IIL	F	202	8/9	0.96	0.18	67,74,82,88	0
2	ALO	E	204	7/8	0.96	0.21	58,62,69,81	0
2	IIL	G	202	8/9	0.97	0.20	61,64,70,72	0
2	IIL	H	202	8/9	0.97	0.20	74,84,87,88	0
2	IIL	E	202	8/9	0.97	0.25	46,54,68,74	0

5.3 Carbohydrates (i)

There are no monosaccharides in this entry.

5.4 Ligands (i)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å²)	Q<0.9
3	OLC	G	301	19/25	0.68	0.36	67,98,117,120	0
3	OLC	C	204	21/25	0.74	0.44	73,99,116,122	0
3	OLC	B	201	13/25	0.77	0.35	86,101,109,125	0
3	OLC	C	203	25/25	0.78	0.39	69,90,106,115	0
3	OLC	D	201	13/25	0.79	0.46	69,97,116,123	0
3	OLC	C	205	25/25	0.79	0.55	69,92,122,132	0
3	OLC	B	205	14/25	0.82	0.30	74,92,113,123	0
3	OLC	D	202	12/25	0.82	0.42	70,100,126,139	0
3	OLC	B	203	25/25	0.82	0.28	75,90,100,108	0
3	OLC	A	202	11/25	0.83	0.37	42,100,110,116	0
3	OLC	B	202	25/25	0.83	0.42	57,88,105,110	0
3	OLC	A	204	25/25	0.84	0.29	80,91,105,111	0
3	OLC	A	205	25/25	0.84	0.36	58,98,117,120	0
3	OLC	A	201	10/25	0.85	0.50	77,97,106,107	0
3	OLC	B	206	10/25	0.87	0.27	78,87,90,93	0
3	OLC	C	201	15/25	0.87	0.35	69,81,99,100	0
3	OLC	H	301	18/25	0.87	0.40	68,85,100,109	0
3	OLC	C	202	13/25	0.89	0.41	75,86,94,95	0
3	OLC	B	204	20/25	0.89	0.36	64,88,102,112	0
3	OLC	A	203	22/25	0.90	0.34	69,85,98,105	0
3	OLC	E	301	25/25	0.91	0.31	66,87,98,112	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	OLC	F	301	16/25	0.94	0.38	58,81,90,104	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 OLC G 301:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)
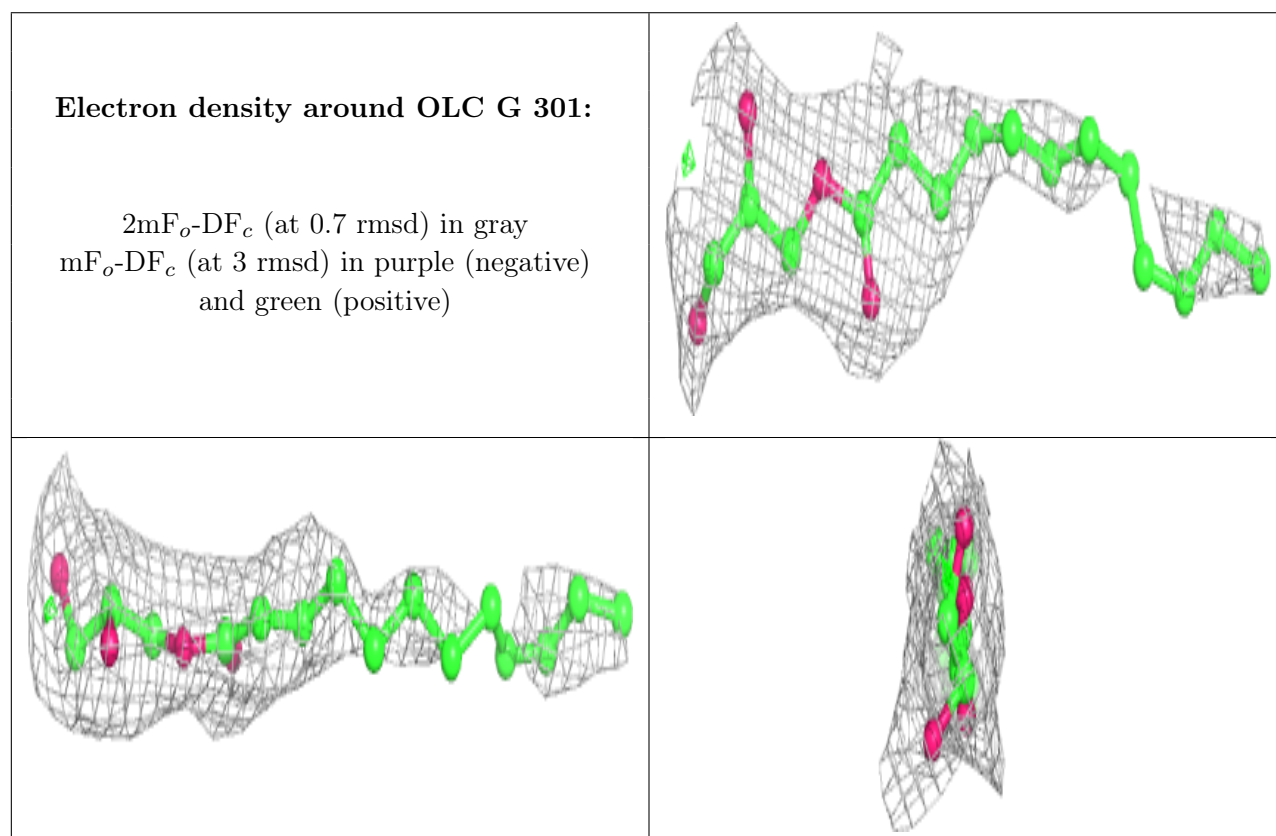
Electron density around OLC C 204:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
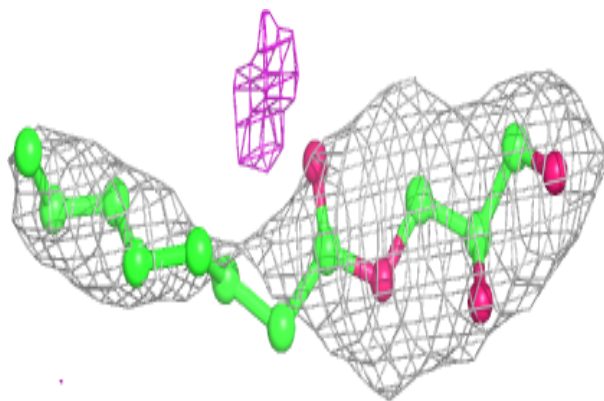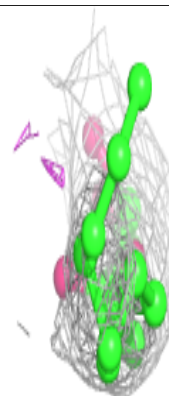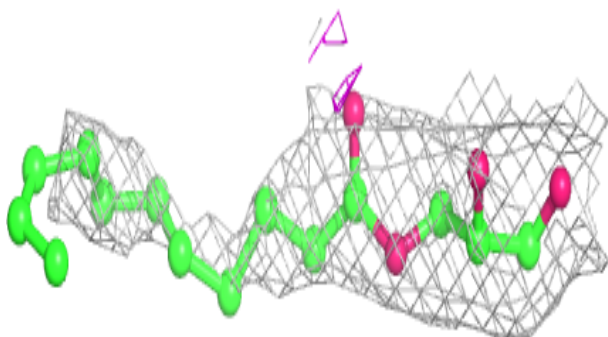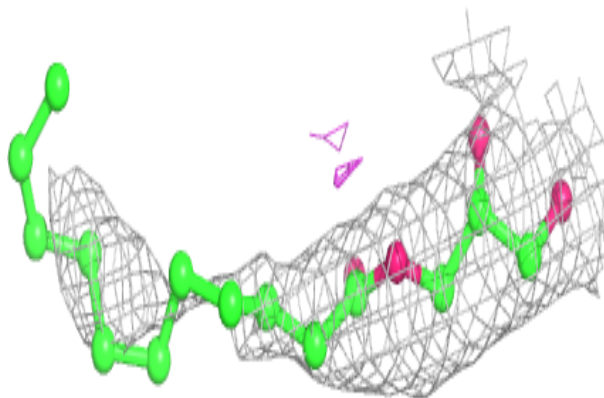and green (positive)
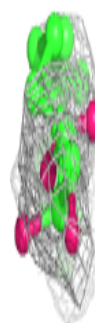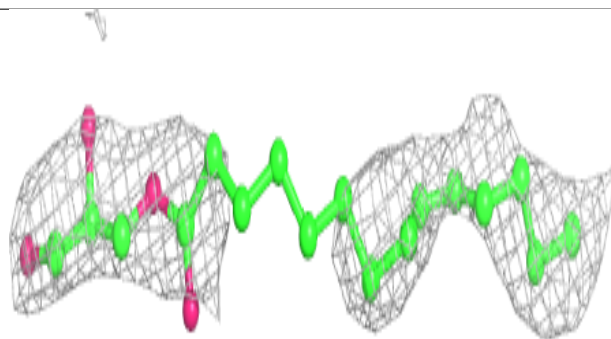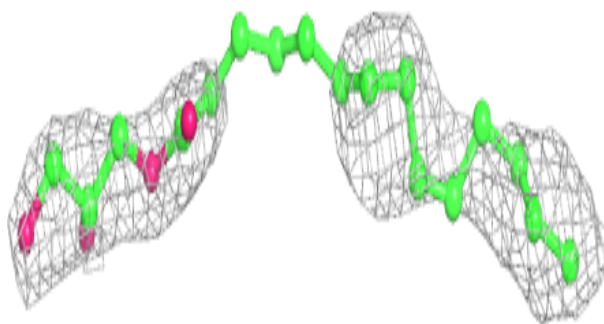
Electron density around OLC B 201:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
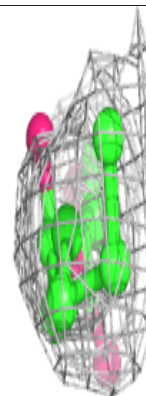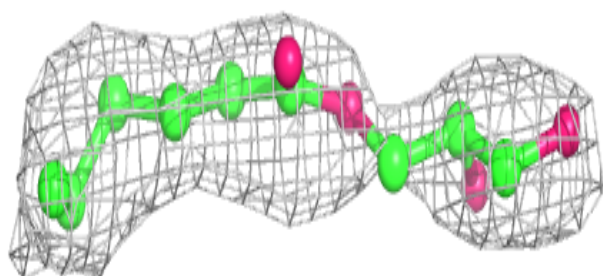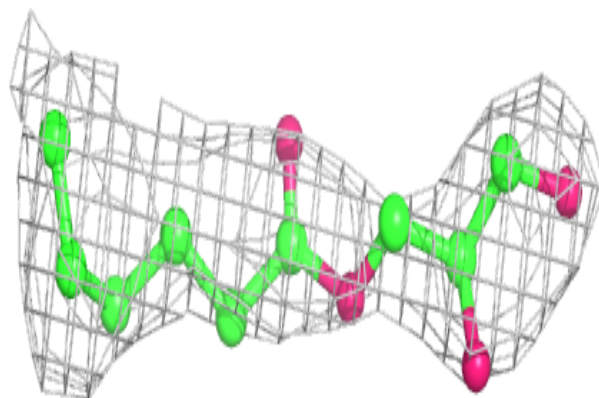
Electron density around OLC C 203:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
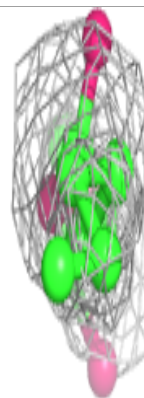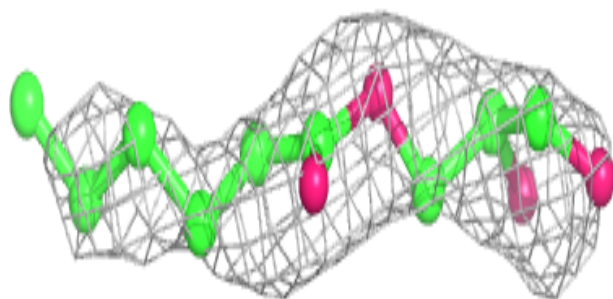and green (positive)
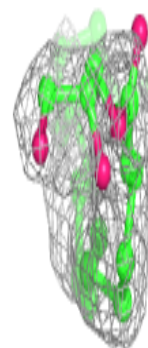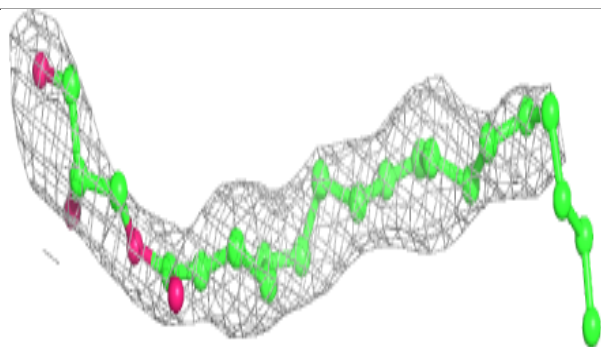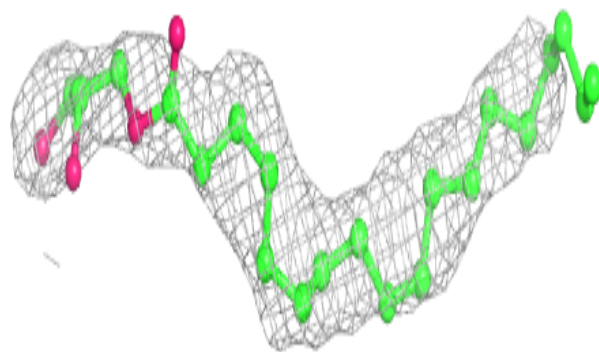
Electron density around OLC D 201:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
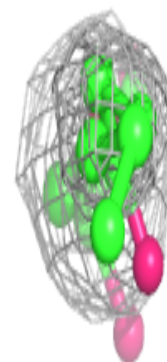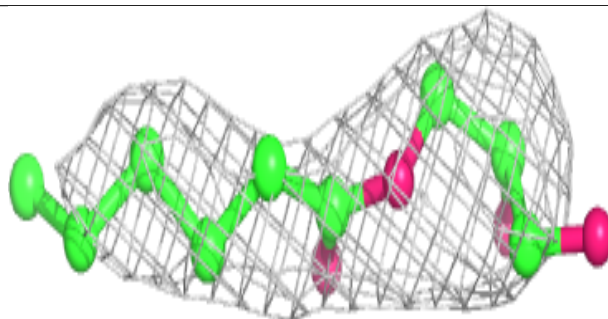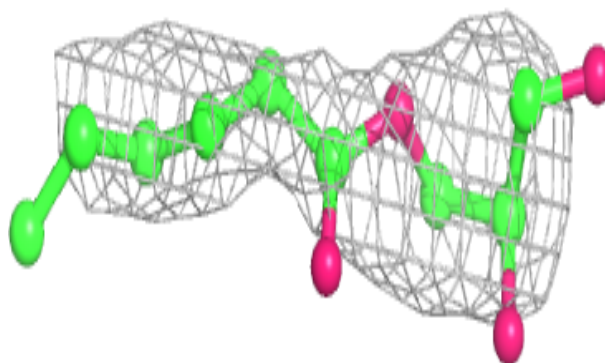
Electron density around OLC C 205:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
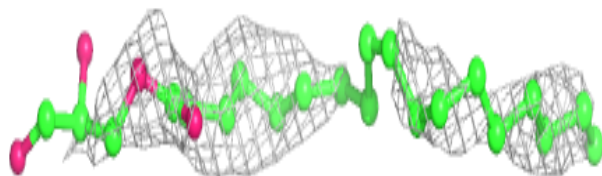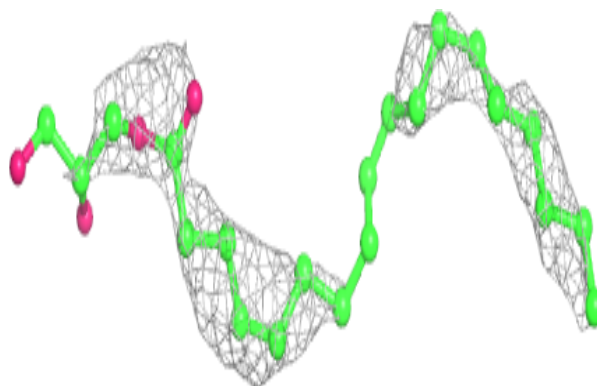
Electron density around OLC B 205:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
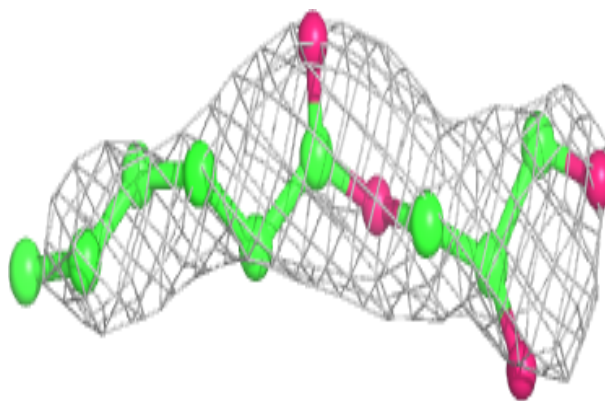$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
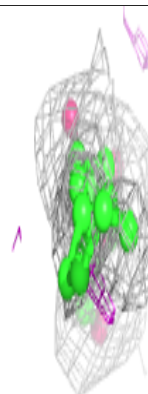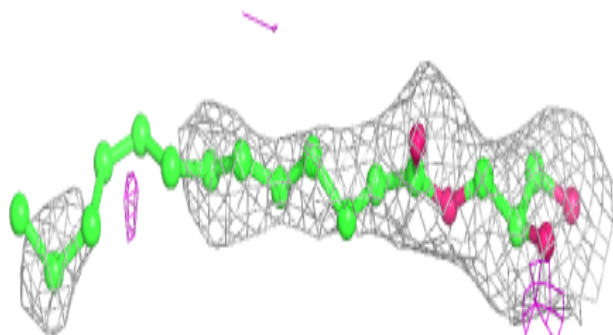and green (positive)
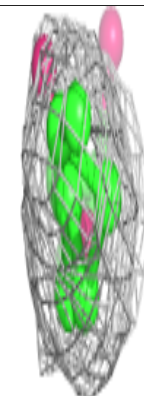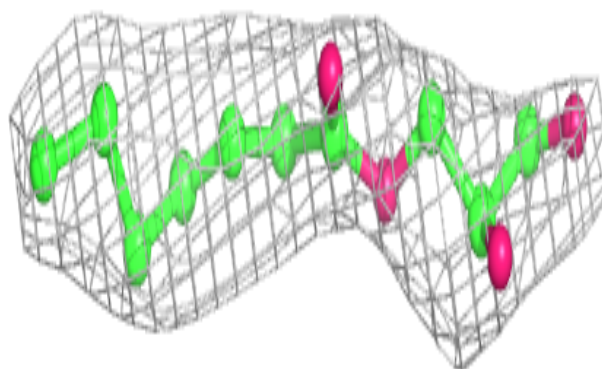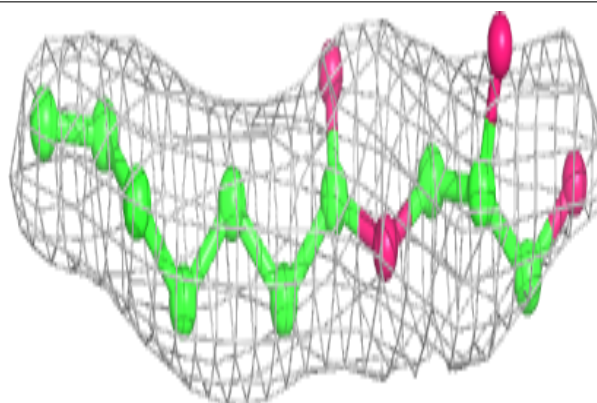
Electron density around OLC D 202:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
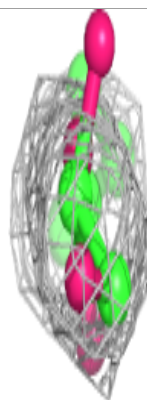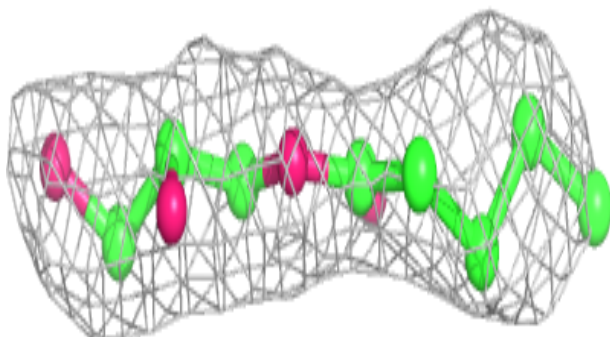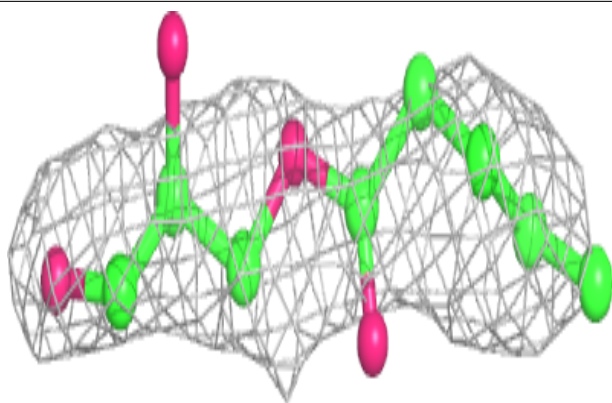
Electron density around OLC B 203:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
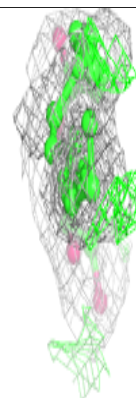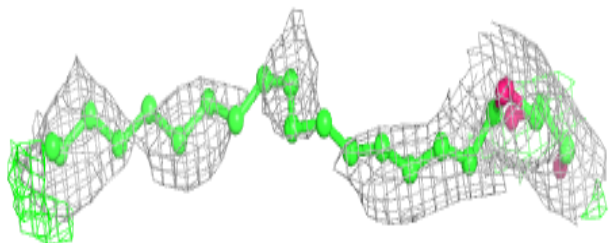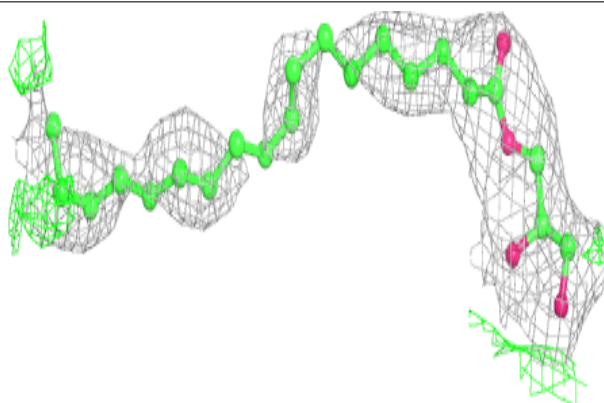
Electron density around OLC A 202:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
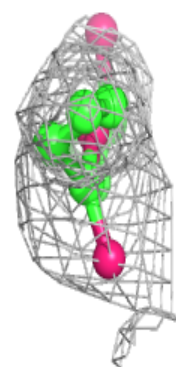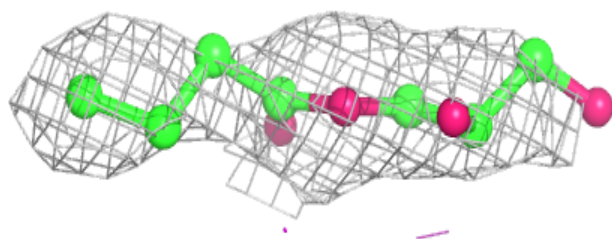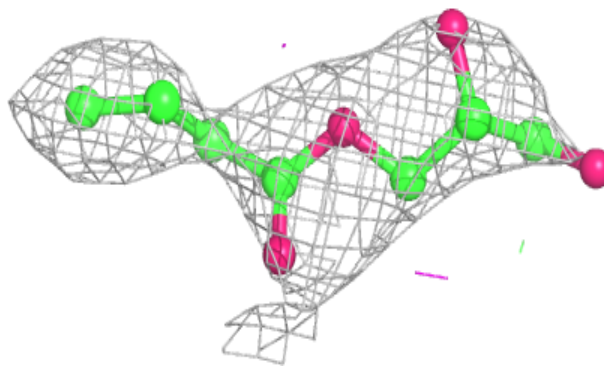
Electron density around OLC B 202:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
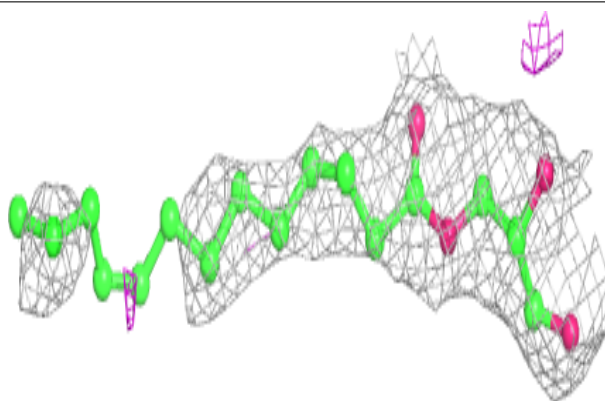$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
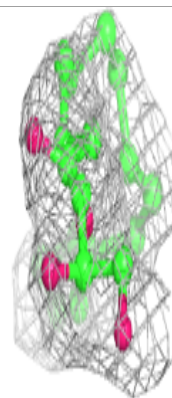and green (positive)
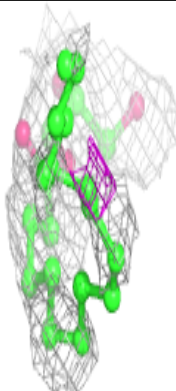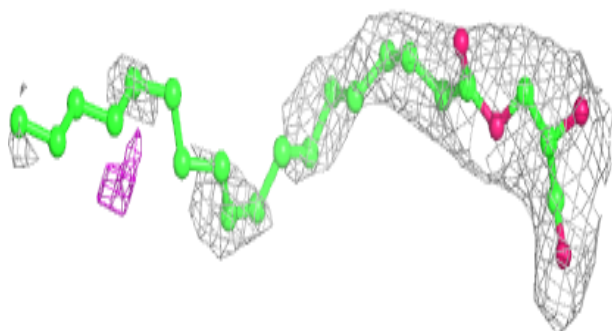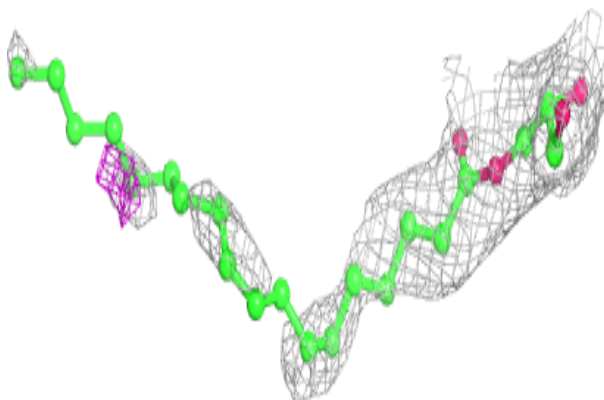
Electron density around OLC A 204:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
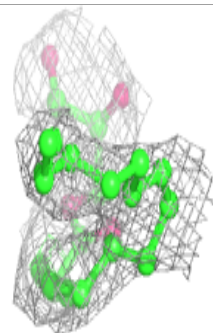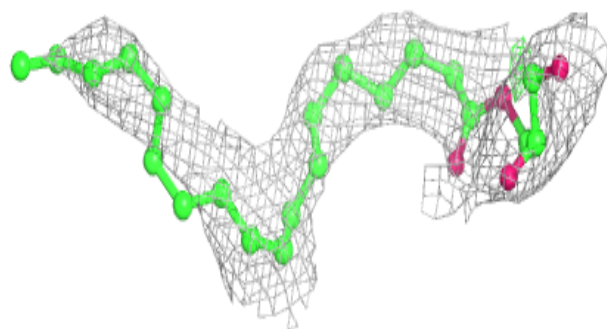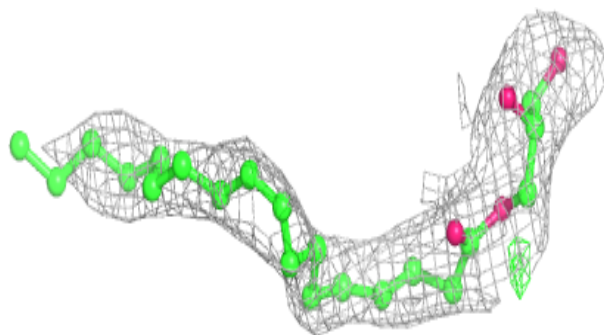
Electron density around OLC A 205:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
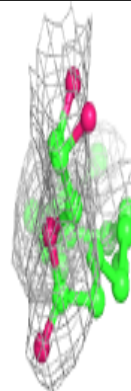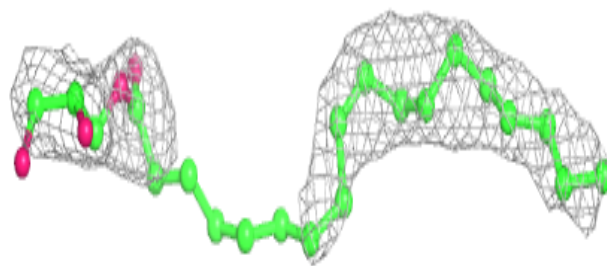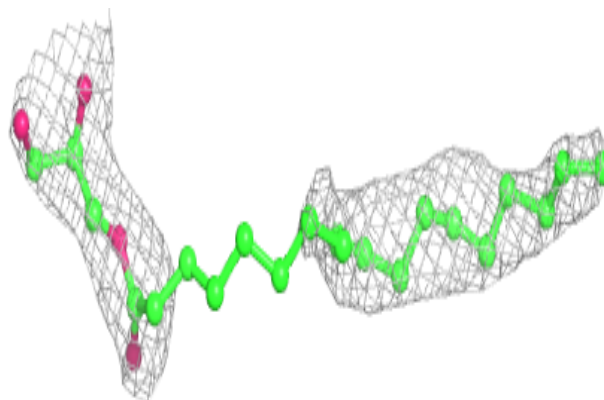
Electron density around OLC A 201:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
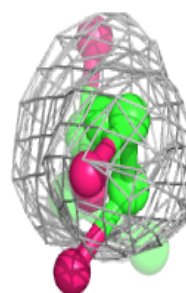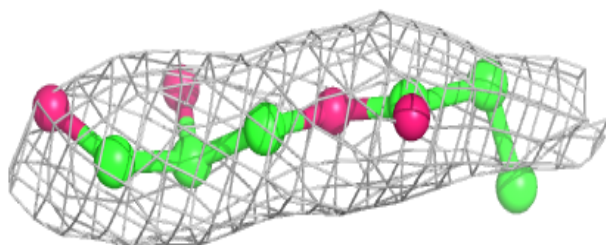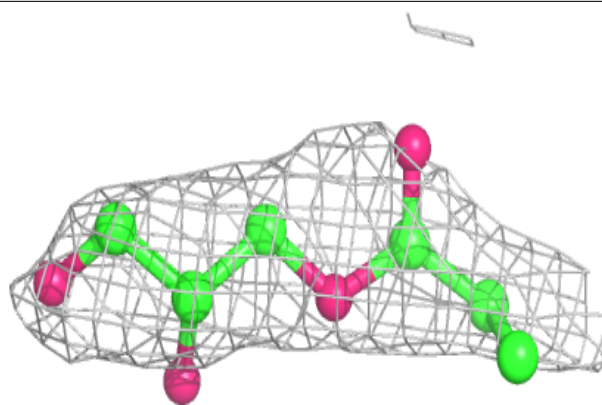
Electron density around OLC B 206:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
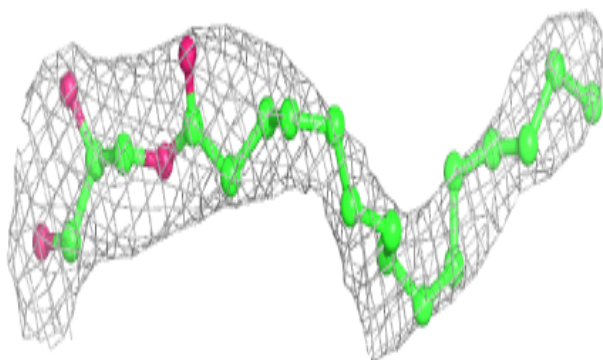mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
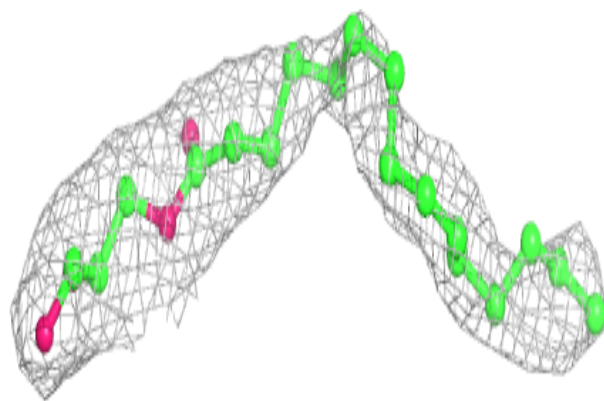and green (positive)
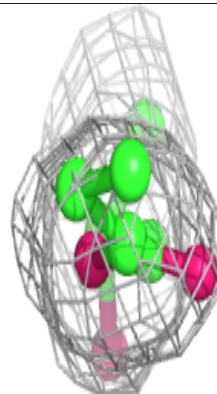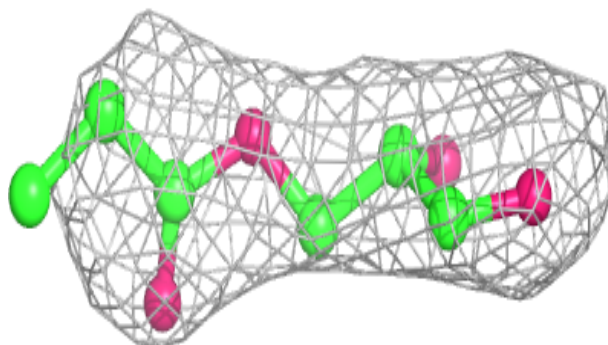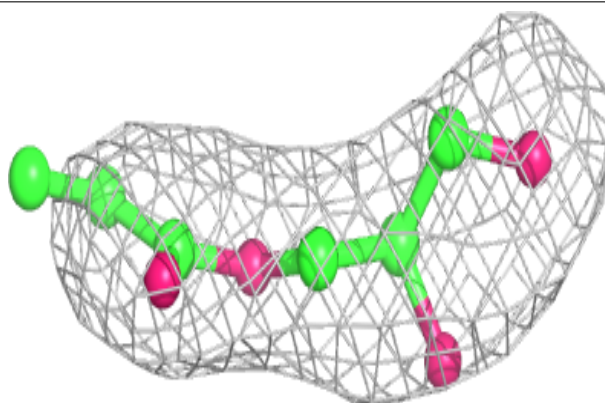
Electron density around OLC C 201:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
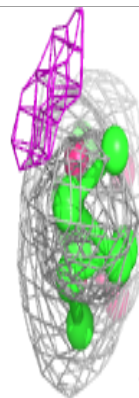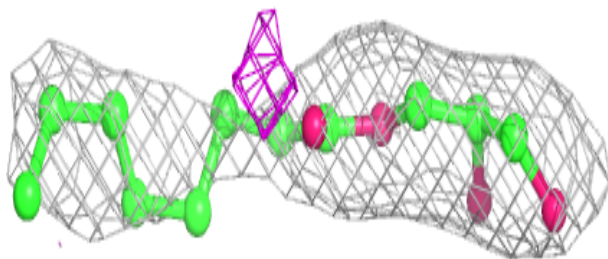
Electron density around OLC H 301:

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

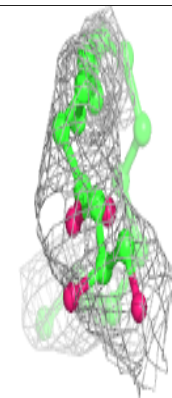**Electron density around OLC C 202:**

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

Electron density around OLC B 204:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
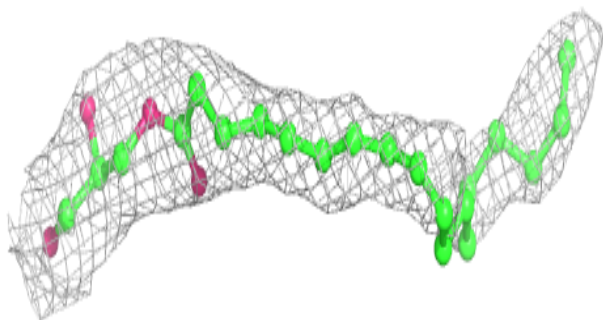mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
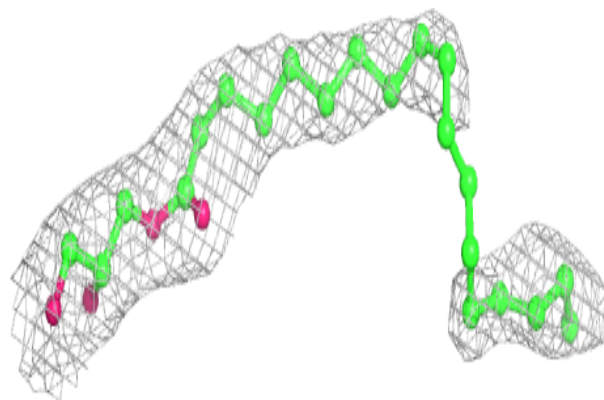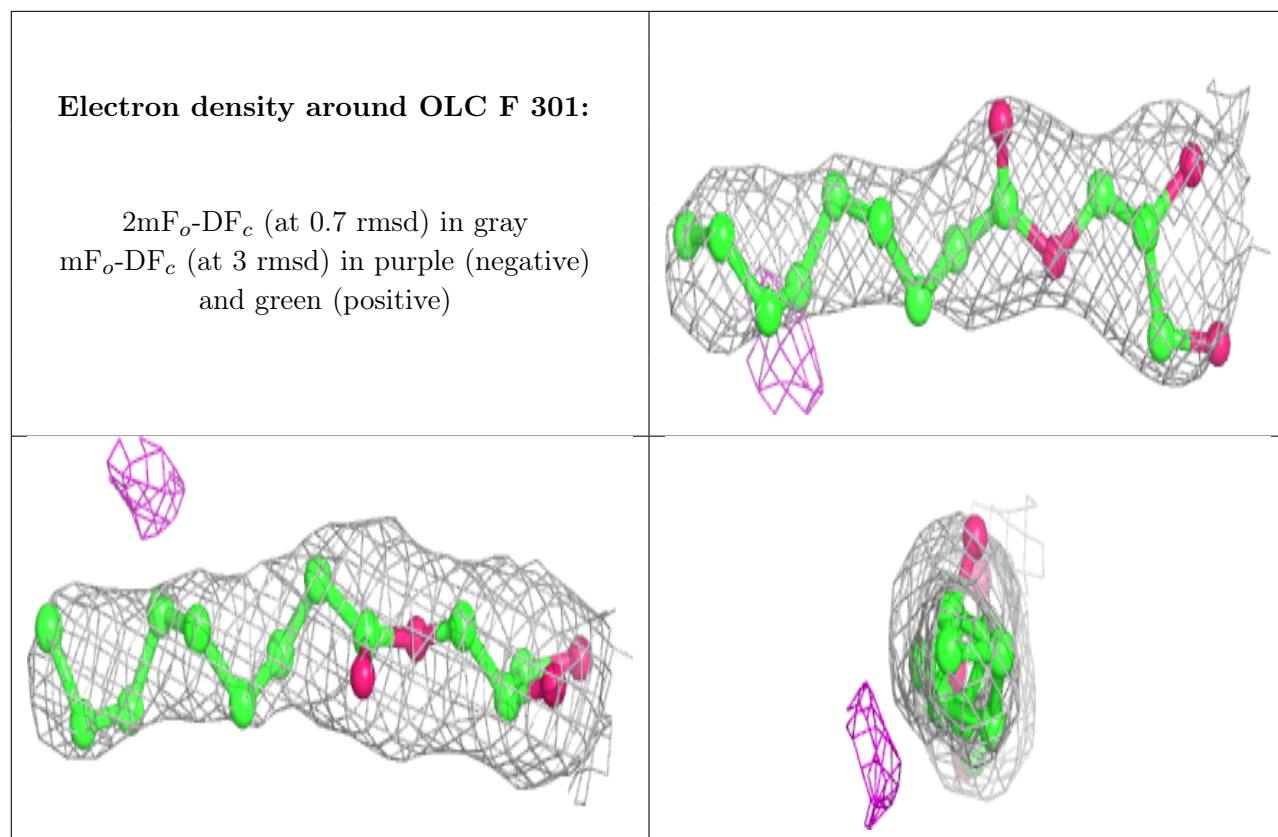
Electron density around OLC A 203:

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

Electron density around OLC E 301:

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

Electron density around OLC F 301:

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

5.5 Other polymers ⓘ

There are no such residues in this entry.