WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

Feb 23, 2026 – 10:15 AM EST

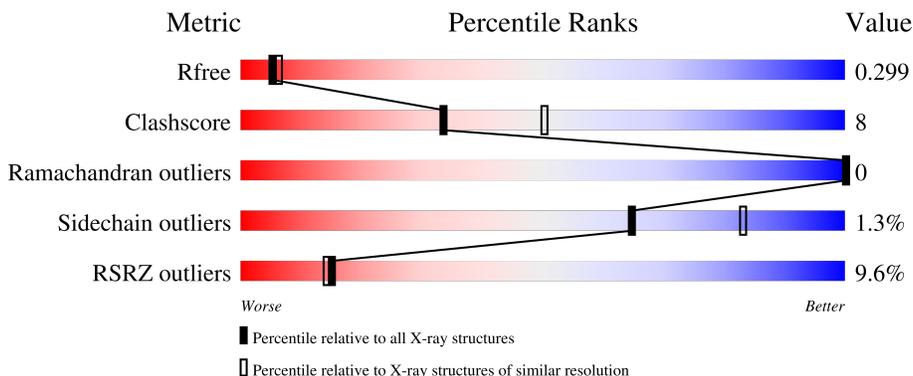|		
PDB ID	:	1OKY / pdb_000010ky
Title	:	X-ray structure of the Bacteroides fragilis Nramp/MntH divalent transition metal transporter WT in an inward-open, state
Authors	:	Ray, S.; Gaudet, R.
Deposited on	:	2026-01-26
Resolution	:	2.48 Å(reported)

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 2.48 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		0.299
Clashscore		8
Ramachandran outliers		0
Sidechain outliers		1.3%
RSRZ outliers		9.6%

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}	164625	7106 (2.50-2.46)
Clashscore	180529	7991 (2.50-2.46)
Ramachandran outliers	177936	7888 (2.50-2.46)
Sidechain outliers	177891	7890 (2.50-2.46)
RSRZ outliers	164620	7106 (2.50-2.46)

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	416	9% / 76% 13% 10%
1	B	416	8% / 76% 14% 10%

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 6507 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.
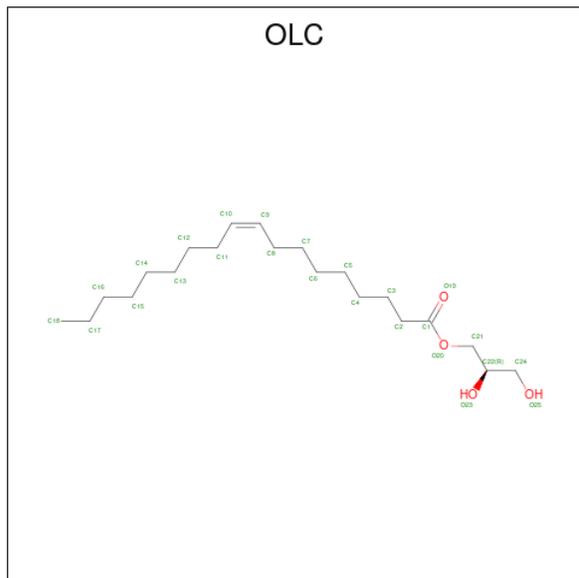
- Molecule 1 is a protein called Divalent metal cation transporter.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	374	Total 2831	C 1883	N 433	O 500	S 15	0	0	0
1	B	375	Total 2832	C 1883	N 433	O 501	S 15	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2	MET	-	initiating methionine	UNP A0A0K6BUR1
A	3	HIS	-	expression tag	UNP A0A0K6BUR1
A	4	HIS	-	expression tag	UNP A0A0K6BUR1
A	5	HIS	-	expression tag	UNP A0A0K6BUR1
A	6	HIS	-	expression tag	UNP A0A0K6BUR1
A	7	HIS	-	expression tag	UNP A0A0K6BUR1
A	8	HIS	-	expression tag	UNP A0A0K6BUR1
A	9	HIS	-	expression tag	UNP A0A0K6BUR1
A	10	HIS	-	expression tag	UNP A0A0K6BUR1
A	11	ALA	-	expression tag	UNP A0A0K6BUR1
A	12	HIS	-	expression tag	UNP A0A0K6BUR1
A	13	MET	-	expression tag	UNP A0A0K6BUR1
B	2	MET	-	initiating methionine	UNP A0A0K6BUR1
B	3	HIS	-	expression tag	UNP A0A0K6BUR1
B	4	HIS	-	expression tag	UNP A0A0K6BUR1
B	5	HIS	-	expression tag	UNP A0A0K6BUR1
B	6	HIS	-	expression tag	UNP A0A0K6BUR1
B	7	HIS	-	expression tag	UNP A0A0K6BUR1
B	8	HIS	-	expression tag	UNP A0A0K6BUR1
B	9	HIS	-	expression tag	UNP A0A0K6BUR1
B	10	HIS	-	expression tag	UNP A0A0K6BUR1
B	11	ALA	-	expression tag	UNP A0A0K6BUR1
B	12	HIS	-	expression tag	UNP A0A0K6BUR1
B	13	MET	-	expression tag	UNP A0A0K6BUR1

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

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 24	C 20	O 4	0	0
2	A	1	Total 16	C 12	O 4	0	0
2	A	1	Total 16	C 16		0	0
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 10	C 10		0	0
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 23	C 19	O 4	0	0
2	A	1	Total 13	C 13		0	0
2	A	1	Total 16	C 16		0	0
2	A	1	Total 11	C 11		0	0
2	A	1	Total 13	C 13		0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 9	C 9		0	0
2	A	1	Total 11	C 11		0	0
2	A	1	Total 8	C 8		0	0
2	A	1	Total 7	C 7		0	0
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 13	C 13		0	0
2	A	1	Total 20	C 16	O 4	0	0
2	A	1	Total 15	C 15		0	0
2	A	1	Total 21	C 17	O 4	0	0
2	B	1	Total 12	C 12		0	0
2	B	1	Total 20	C 16	O 4	0	0
2	B	1	Total 25	C 21	O 4	0	0
2	B	1	Total 21	C 17	O 4	0	0
2	B	1	Total 19	C 15	O 4	0	0
2	B	1	Total 22	C 18	O 4	0	0
2	B	1	Total 22	C 18	O 4	0	0
2	B	1	Total 13	C 13		0	0
2	B	1	Total 17	C 17		0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total 16	C 12	O 4	0	0
2	B	1	Total 13	C 9	O 4	0	0
2	B	1	Total 10	C 10		0	0
2	B	1	Total 8	C 8		0	0
2	B	1	Total 15	C 15		0	0
2	B	1	Total 13	C 9	O 4	0	0
2	B	1	Total 5	C 5		0	0
2	B	1	Total 16	C 16		0	0
2	B	1	Total 13	C 13		0	0
2	B	1	Total 25	C 21	O 4	0	0
2	B	1	Total 25	C 21	O 4	0	0
2	B	1	Total 18	C 18		0	0
2	B	1	Total 7	C 7		0	0
2	B	1	Total 8	C 8		0	0

- Molecule 3 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: $C_4H_{10}O_3$).

PEG
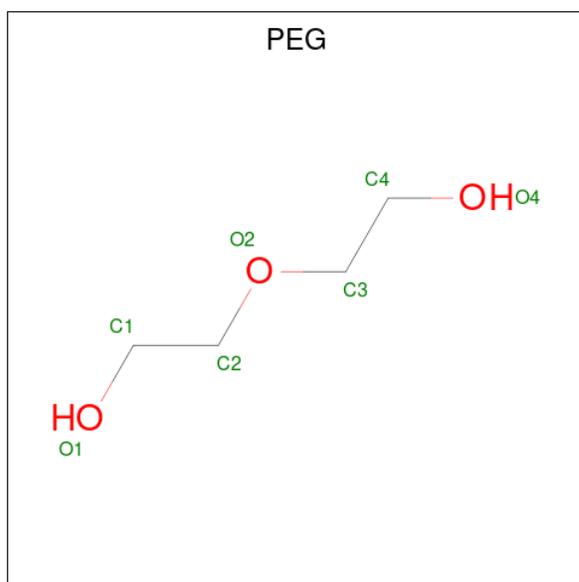
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 6	C 4	O 2	0	0
3	A	1	Total 6	C 4	O 2	0	0
3	B	1	Total 6	C 4	O 2	0	0

• Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	23	Total 23	O 23	0	0
4	B	19	Total 19	O 19	0	0

3 Residue-property plots ⓘ

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

• Molecule 1: Divalent metal cation transporter

• Molecule 1: Divalent metal cation transporter

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 2 21	Depositor
Cell constants a, b, c, α, β, γ	69.12Å 102.27Å 119.22Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.14 – 2.48	Depositor
	45.14 – 2.48	EDS
% Data completeness	99.5 (45.14-2.48)	Depositor
(in resolution range)	99.6 (45.14-2.48)	EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.09 (at 2.48Å)	Xtriage
Refinement program	PHENIX 2.0_5936	Depositor
R, R_{free}	0.259 , 0.298	Depositor
	0.260 , 0.299	DCC
R_{free} test set	2000 reflections (6.51%)	wwPDB-VP
Wilson B-factor (Å^2)	46.1	Xtriage
Anisotropy	0.418	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 60.7	EDS
L-test for twinning[2]	$< |L| > = 0.56, < L^2 > = 0.40$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	6507	wwPDB-VP
Average B, all atoms (Å^2)	62.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 49.22 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 7.6996e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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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.

5 Model quality (i)

5.1 Standard geometry (i)

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

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	0.08	0/2893	0.21	0/3941
1	B	0.08	0/2894	0.21	0/3944
All	All	0.08	0/5787	0.21	0/7885

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2831	0	2945	42	0
1	B	2832	0	2936	40	0
2	A	421	0	665	30	0
2	B	363	0	558	26	0
3	A	12	0	14	1	0
3	B	6	0	7	1	0
4	A	23	0	0	0	0
4	B	19	0	0	0	0
All	All	6507	0	7125	103	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 8.

The worst 5 of 103 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:159:ILE:HG23	1:B:302:MET:HB3	1.70	0.72
1:A:159:ILE:HG23	1:A:302:MET:HB3	1.71	0.72
3:A:522:PEG:H31	1:B:353:GLY:HA3	1.72	0.69
1:B:194:PRO:HG3	2:B:519:OLC:H4	1.75	0.69
2:A:519:OLC:H11A	2:A:520:OLC:H6A	1.76	0.68

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 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	370/416 (89%)	366 (99%)	4 (1%)	0	100	100
1	B	371/416 (89%)	364 (98%)	7 (2%)	0	100	100
All	All	741/832 (89%)	730 (98%)	11 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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

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

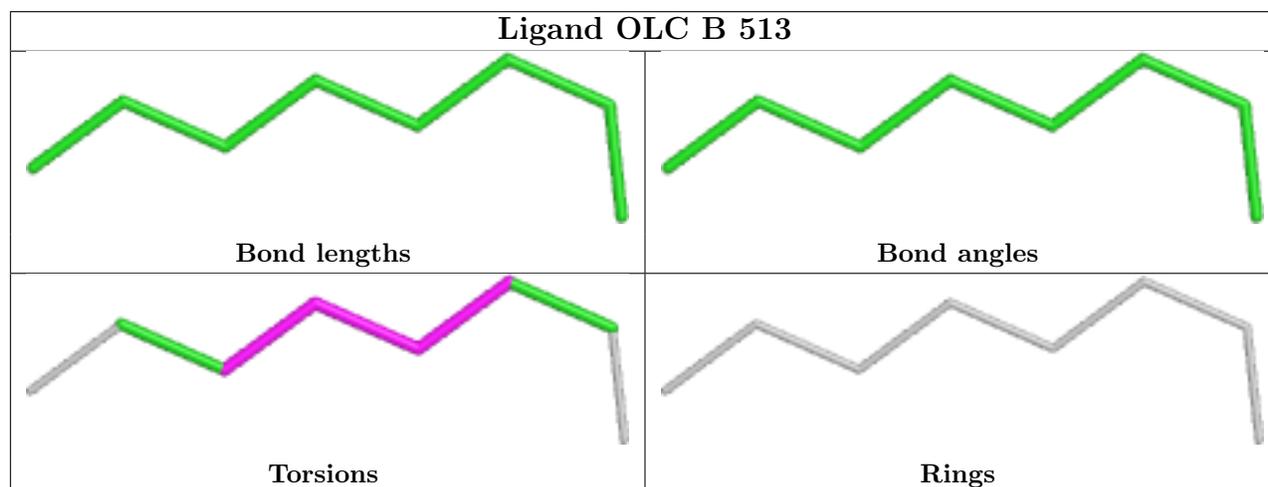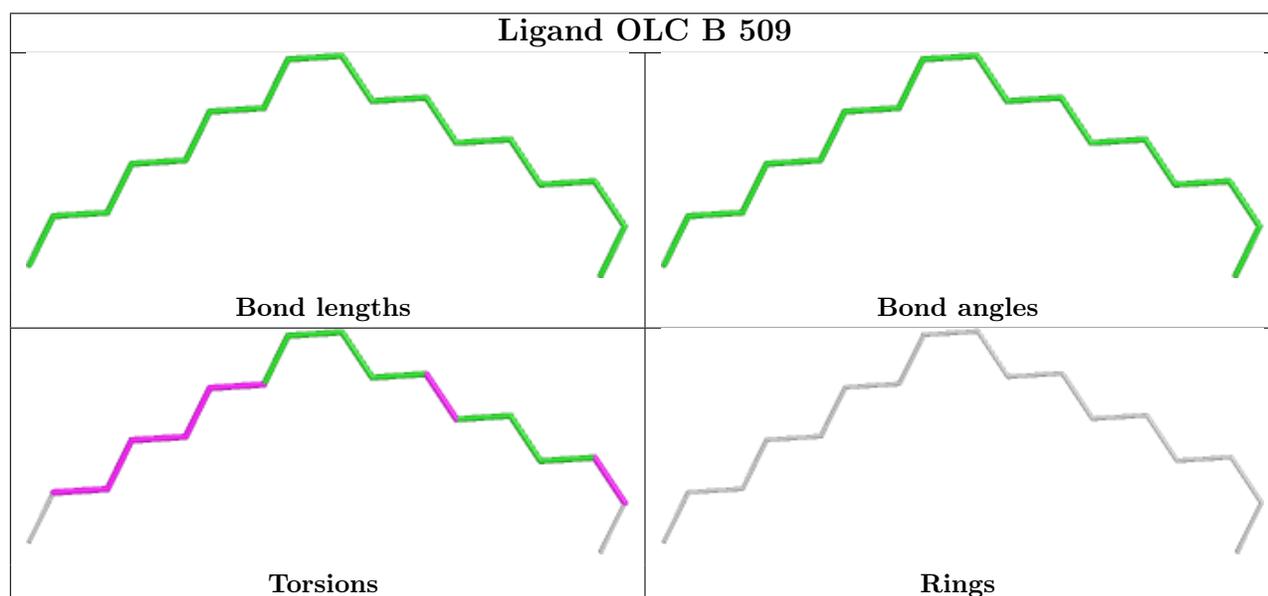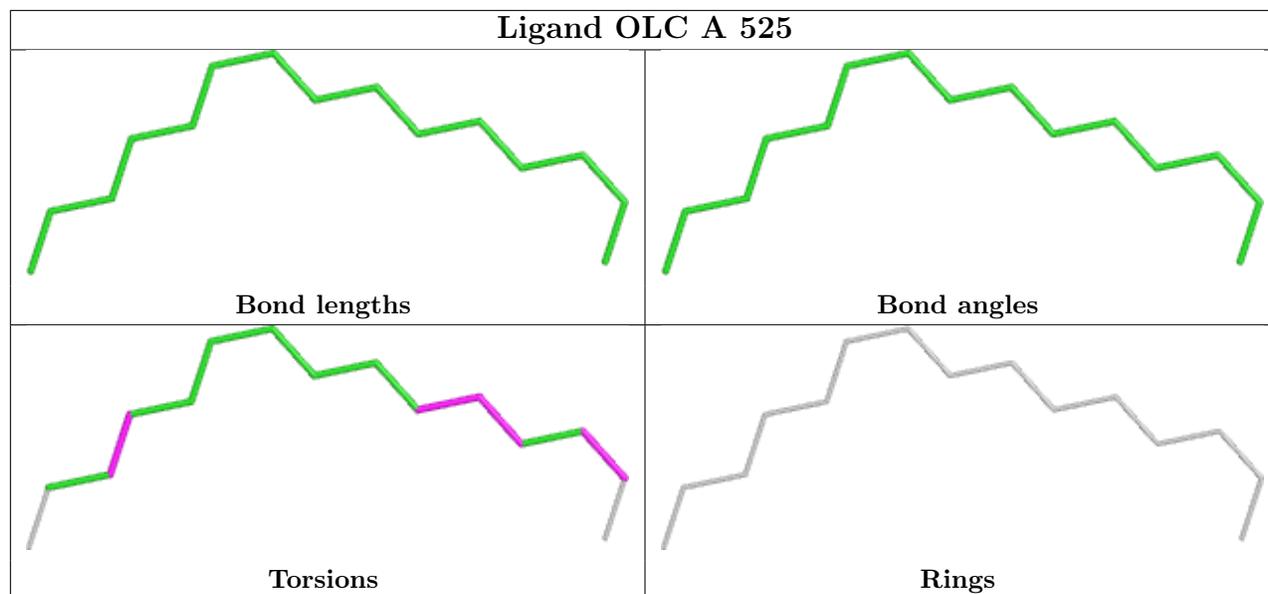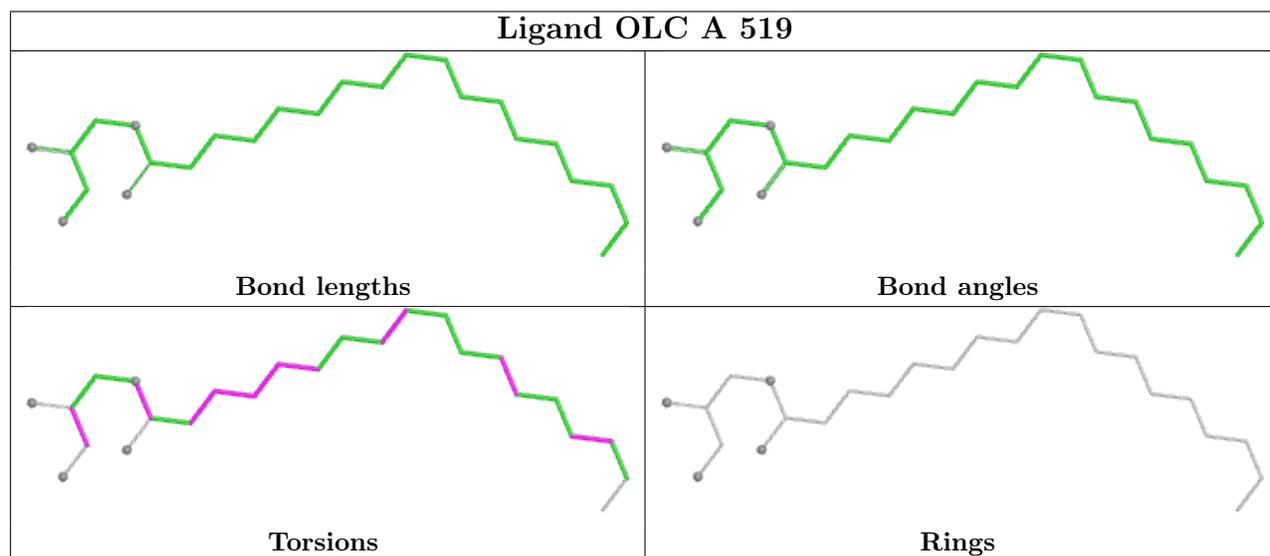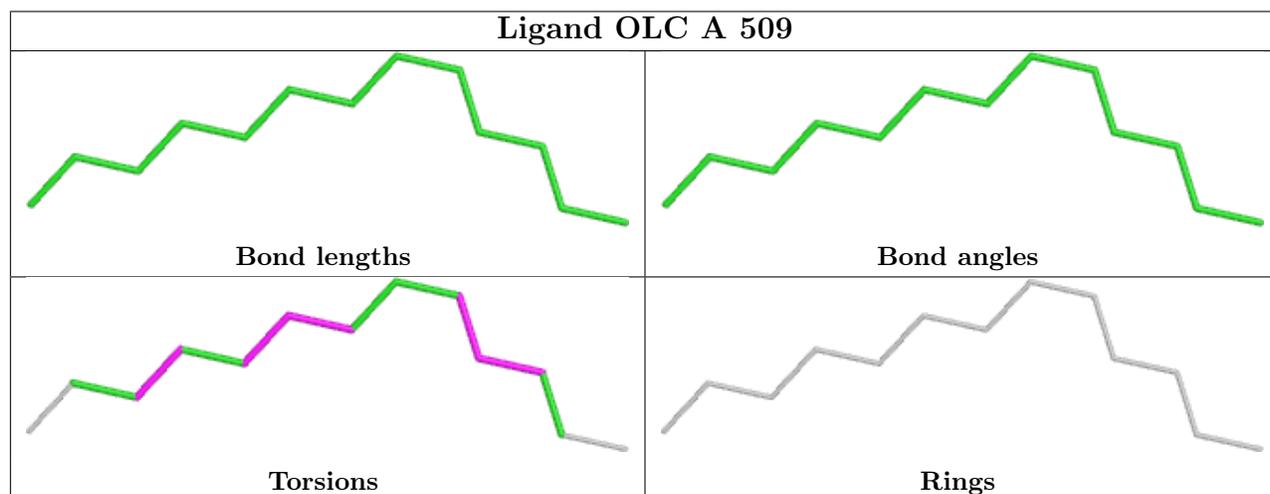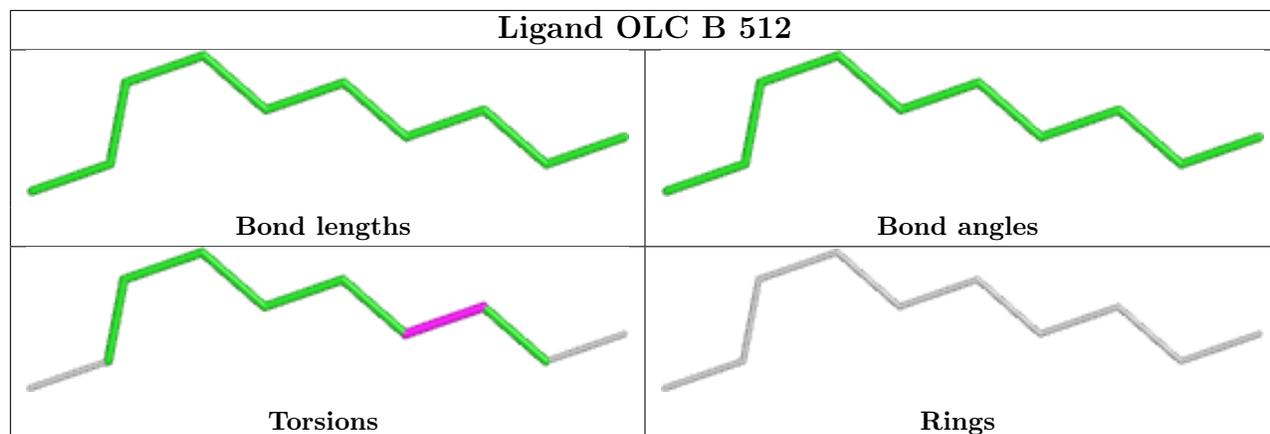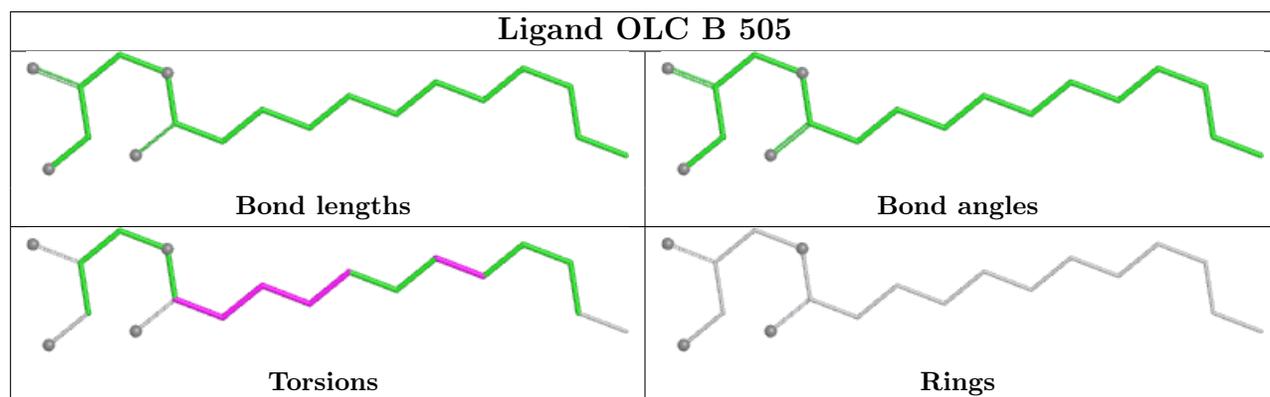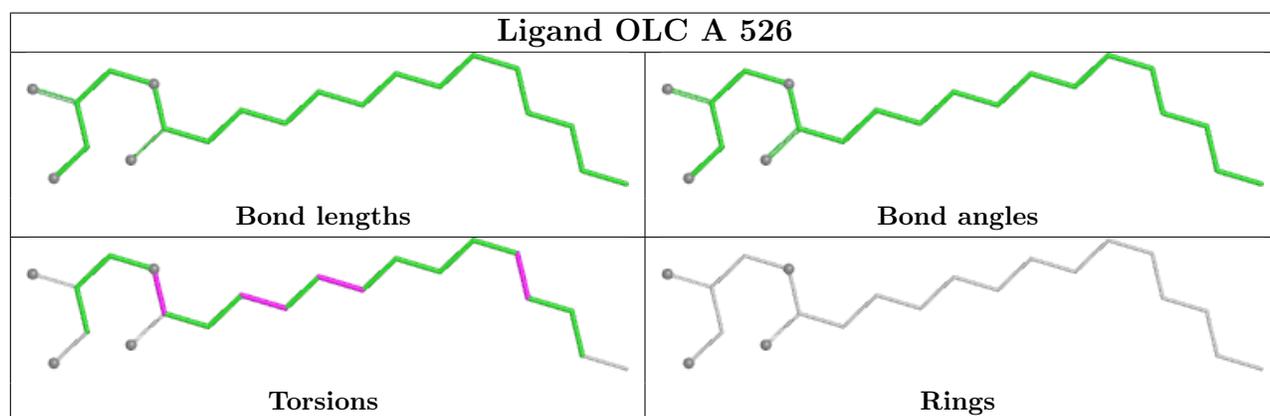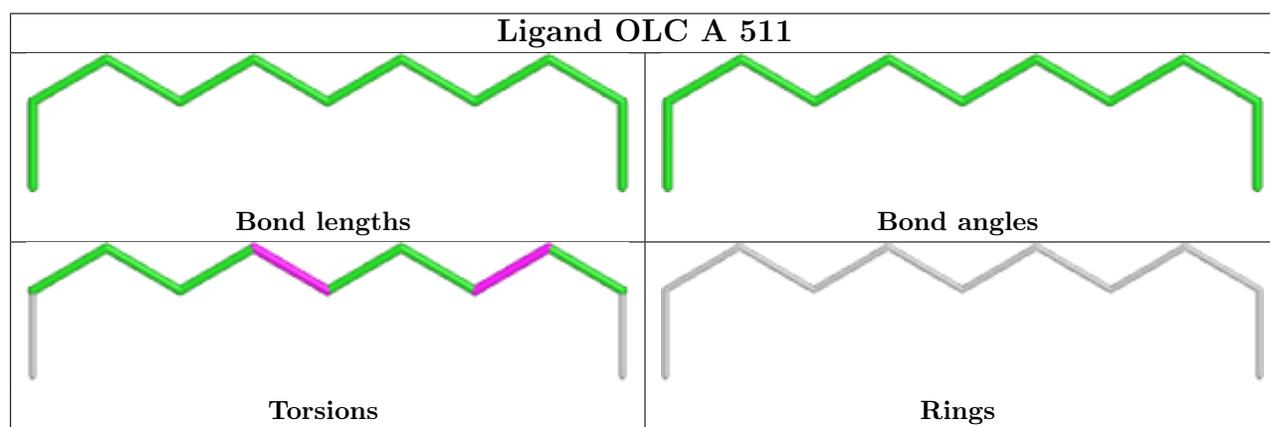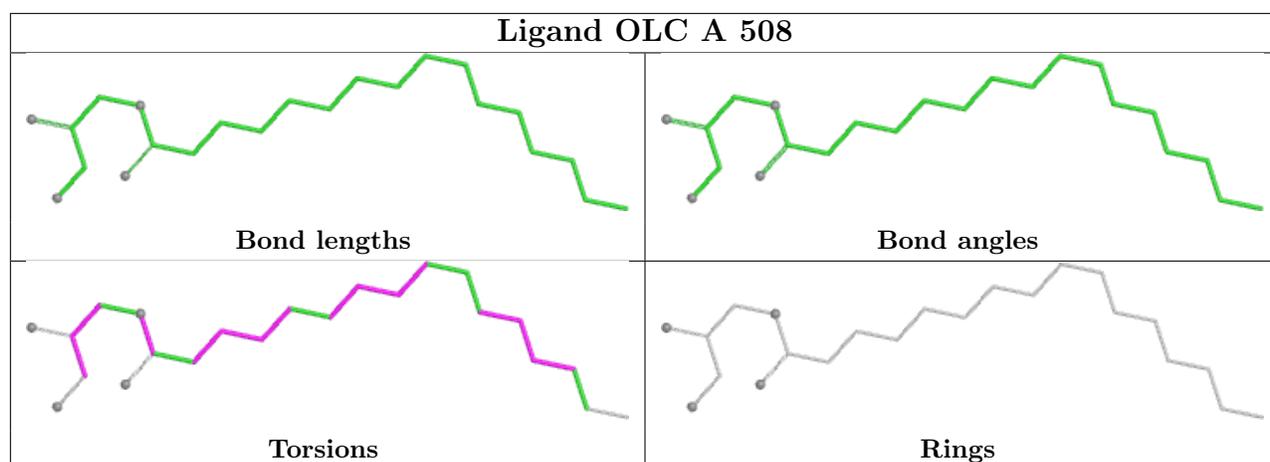| Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	309/350 (88%)	307 (99%)	2 (1%)	84	93

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	308/350 (88%)	302 (98%)	6 (2%)	52	74
All	All	617/700 (88%)	609 (99%)	8 (1%)	65	83

5 of 8 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	329	ILE
1	B	219	GLU
1	B	84	CYS
1	B	79	ILE
1	B	93	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 7 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	377	GLN
1	A	392	ASN
1	B	328	HIS
1	B	72	HIS
1	A	335	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

50 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	OLC	B	522	-	6,6,24	0.27	0	5,5,25	0.12	0
2	OLC	A	525	-	14,14,24	0.23	0	13,13,25	0.27	0
2	OLC	B	509	-	16,16,24	0.22	0	15,15,25	0.26	0
2	OLC	B	513	-	7,7,24	0.26	0	6,6,25	0.20	0
3	PEG	A	523	-	5,5,6	0.32	0	4,4,5	0.21	0
2	OLC	B	512	-	9,9,24	0.31	0	8,8,25	0.28	0
2	OLC	B	516	-	4,4,24	0.27	0	3,3,25	0.28	0
2	OLC	A	509	-	12,12,24	0.23	0	11,11,25	0.29	0
2	OLC	A	519	-	24,24,24	0.34	0	25,25,25	0.37	0
2	OLC	A	508	-	22,22,24	0.33	0	23,23,25	0.49	0
2	OLC	A	511	-	10,10,24	0.27	0	9,9,25	0.18	0
2	OLC	A	526	-	20,20,24	0.36	0	21,21,25	0.41	0
2	OLC	B	505	-	18,18,24	0.40	0	19,19,25	0.41	0
2	OLC	B	510	-	15,15,24	0.39	0	16,16,25	0.41	0
2	OLC	A	512	-	12,12,24	0.24	0	11,11,25	0.29	0
2	OLC	B	504	-	20,20,24	0.37	0	21,21,25	0.44	0
2	OLC	B	514	-	14,14,24	0.24	0	13,13,25	0.26	0
3	PEG	B	524	-	5,5,6	0.32	0	4,4,5	0.20	0
2	OLC	B	507	-	21,21,24	0.36	0	22,22,25	0.40	0
2	OLC	A	507	-	24,24,24	0.33	0	25,25,25	0.38	0
2	OLC	A	505	-	9,9,24	0.27	0	8,8,25	0.22	0
2	OLC	B	519	-	24,24,24	0.33	0	25,25,25	0.41	0
3	PEG	A	522	-	5,5,6	0.31	0	4,4,5	0.18	0
2	OLC	B	506	-	21,21,24	0.35	0	22,22,25	0.41	0
2	OLC	B	511	-	12,12,24	0.43	0	13,13,25	0.54	0
2	OLC	A	516	-	10,10,24	0.27	0	9,9,25	0.21	0
2	OLC	B	502	-	19,19,24	0.37	0	20,20,25	0.37	0
2	OLC	A	503	-	15,15,24	0.22	0	14,14,25	0.27	0
2	OLC	A	515	-	8,8,24	0.23	0	7,7,25	0.17	0
2	OLC	B	503	-	24,24,24	0.34	0	25,25,25	0.42	0
2	OLC	A	521	-	12,12,24	0.25	0	11,11,25	0.24	0
2	OLC	A	514	-	24,24,24	0.33	0	25,25,25	0.41	0
2	OLC	A	502	-	15,15,24	0.39	0	16,16,25	0.47	0
2	OLC	A	504	-	24,24,24	0.35	0	25,25,25	0.35	0
2	OLC	B	518	-	12,12,24	0.25	0	11,11,25	0.27	0
2	OLC	B	520	-	24,24,24	0.35	0	25,25,25	0.39	0
2	OLC	A	520	-	24,24,24	0.34	0	25,25,25	0.43	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	OLC	B	521	-	17,17,24	0.22	0	16,16,25	0.26	0
2	OLC	B	523	-	7,7,24	0.27	0	6,6,25	0.17	0
2	OLC	B	501	-	11,11,24	0.30	0	10,10,25	0.26	0
2	OLC	A	506	-	24,24,24	0.35	0	25,25,25	0.42	0
2	OLC	A	510	-	15,15,24	0.23	0	14,14,25	0.25	0
2	OLC	A	517	-	7,7,24	0.26	0	6,6,25	0.26	0
2	OLC	A	524	-	19,19,24	0.37	0	20,20,25	0.42	0
2	OLC	A	513	-	24,24,24	0.33	0	25,25,25	0.44	0
2	OLC	B	515	-	12,12,24	0.42	0	13,13,25	0.58	0
2	OLC	A	501	-	23,23,24	0.34	0	24,24,25	0.36	0
2	OLC	A	518	-	6,6,24	0.26	0	5,5,25	0.14	0
2	OLC	B	508	-	12,12,24	0.24	0	11,11,25	0.30	0
2	OLC	B	517	-	15,15,24	0.23	0	14,14,25	0.27	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	OLC	B	522	-	-	1/4/4/24	-
2	OLC	A	525	-	-	4/12/12/24	-
2	OLC	B	509	-	-	7/14/14/24	-
2	OLC	B	513	-	-	3/5/5/24	-
3	PEG	A	523	-	-	1/3/3/4	-
2	OLC	B	512	-	-	1/7/7/24	-
2	OLC	B	516	-	-	0/2/2/24	-
2	OLC	A	509	-	-	5/10/10/24	-
2	OLC	A	519	-	-	11/24/24/24	-
2	OLC	A	508	-	-	15/22/22/24	-
2	OLC	A	511	-	-	2/8/8/24	-
2	OLC	A	526	-	-	5/20/20/24	-
2	OLC	B	505	-	-	5/18/18/24	-
2	OLC	B	510	-	-	7/15/15/24	-
2	OLC	A	512	-	-	4/10/10/24	-
2	OLC	B	504	-	-	9/20/20/24	-
2	OLC	B	514	-	-	6/12/12/24	-
3	PEG	B	524	-	-	1/3/3/4	-
2	OLC	B	507	-	-	7/21/21/24	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	OLC	A	507	-	-	3/24/24/24	-
2	OLC	A	505	-	-	3/7/7/24	-
2	OLC	B	519	-	-	8/24/24/24	-
3	PEG	A	522	-	-	1/3/3/4	-
2	OLC	B	506	-	-	8/21/21/24	-
2	OLC	B	511	-	-	4/12/12/24	-
2	OLC	A	516	-	-	4/8/8/24	-
2	OLC	B	502	-	-	7/19/19/24	-
2	OLC	A	503	-	-	7/13/13/24	-
2	OLC	A	515	-	-	2/6/6/24	-
2	OLC	B	503	-	-	12/24/24/24	-
2	OLC	A	521	-	-	3/10/10/24	-
2	OLC	A	514	-	-	12/24/24/24	-
2	OLC	A	502	-	-	7/15/15/24	-
2	OLC	A	504	-	-	9/24/24/24	-
2	OLC	B	518	-	-	4/10/10/24	-
2	OLC	B	520	-	-	9/24/24/24	-
2	OLC	A	520	-	-	10/24/24/24	-
2	OLC	B	521	-	-	8/15/15/24	-
2	OLC	B	523	-	-	3/5/5/24	-
2	OLC	B	501	-	-	1/9/9/24	-
2	OLC	A	506	-	-	4/24/24/24	-
2	OLC	A	510	-	-	3/13/13/24	-
2	OLC	A	517	-	-	3/5/5/24	-
2	OLC	A	524	-	-	10/19/19/24	-
2	OLC	A	513	-	-	8/24/24/24	-
2	OLC	B	515	-	-	1/12/12/24	-
2	OLC	A	501	-	-	10/23/23/24	-
2	OLC	A	518	-	-	4/4/4/24	-
2	OLC	B	508	-	-	4/10/10/24	-
2	OLC	B	517	-	-	4/13/13/24	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 270 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	508	OLC	C2-C1-O20-C21
2	A	508	OLC	O19-C1-O20-C21
2	A	514	OLC	O20-C21-C22-C24
2	A	514	OLC	O20-C21-C22-O23
2	A	517	OLC	C10-C11-C12-C13

There are no ring outliers.

33 monomers are involved in 55 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	525	OLC	3	0
2	B	509	OLC	1	0
2	A	509	OLC	3	0
2	A	519	OLC	4	0
2	A	508	OLC	3	0
2	A	511	OLC	2	0
2	B	505	OLC	1	0
2	B	510	OLC	2	0
2	B	504	OLC	3	0
2	B	514	OLC	1	0
3	B	524	PEG	1	0
2	B	507	OLC	2	0
2	B	519	OLC	6	0
3	A	522	PEG	1	0
2	B	506	OLC	2	0
2	B	511	OLC	2	0
2	A	516	OLC	3	0
2	A	515	OLC	1	0
2	B	503	OLC	1	0
2	A	521	OLC	3	0
2	A	514	OLC	2	0
2	A	504	OLC	5	0
2	B	520	OLC	1	0
2	A	520	OLC	3	0
2	B	521	OLC	2	0
2	B	501	OLC	1	0
2	A	510	OLC	1	0
2	A	517	OLC	1	0
2	A	524	OLC	3	0
2	A	513	OLC	1	0
2	A	501	OLC	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	518	OLC	1	0
2	B	517	OLC	3	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 522

Ligand OLC A 525

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 509

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 513

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 512

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 509

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 519

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 508

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 511

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 526

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 505

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 510

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 512

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 504

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 514

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 507

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 507

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 505

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 519

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 506

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 511

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 516

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 502

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 503

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 515

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 503

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 521

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 514

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 502

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 504

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 518

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 520

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 520

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 521

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 523

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 501

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 506

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 510

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 517

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 524

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 513

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 515

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 501

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 518

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 508

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC B 517

Bond lengths

Bond angles

Torsions

Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6　Fit of model and data ⓘ

6.1　Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB($Å^2$)	Q<0.9
1	A	374/416 (89%)	0.64	38 (10%)	13	13	35, 50, 116, 327	0
1	B	375/416 (90%)	0.64	34 (9%)	16	15	37, 51, 122, 335	0
All	All	749/832 (90%)	0.64	72 (9%)	15	14	35, 51, 119, 335	0

The worst 5 of 72 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	32	VAL	5.7
1	A	34	VAL	5.6
1	A	148	PHE	4.8
1	A	32	VAL	4.6
1	B	148	PHE	4.4

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

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

6.3　Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4　Ligands ⓘ

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

WORLDWIDE
wwPDB
PROTEIN DATA BANK

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	OLC	A	516	11/25	0.52	0.25	56,62,71,72	0
2	OLC	A	519	25/25	0.52	0.22	57,68,80,81	0
2	OLC	B	502	20/25	0.58	0.20	78,91,102,107	0
2	OLC	A	520	25/25	0.59	0.19	51,73,81,88	0
2	OLC	B	506	22/25	0.65	0.19	50,72,84,87	0
3	PEG	A	522	6/7	0.65	0.30	53,58,64,65	0
2	OLC	B	519	25/25	0.66	0.19	45,59,70,74	0
2	OLC	B	520	25/25	0.67	0.18	60,73,82,93	0
2	OLC	B	509	17/25	0.68	0.20	56,79,85,88	0
2	OLC	B	517	16/25	0.69	0.23	66,73,78,80	0
2	OLC	A	513	25/25	0.69	0.18	42,70,87,91	0
2	OLC	A	515	9/25	0.69	0.25	55,62,66,67	0
2	OLC	B	516	5/25	0.69	0.26	64,69,71,73	0
2	OLC	A	525	15/25	0.70	0.22	53,72,77,78	0
2	OLC	B	507	22/25	0.70	0.19	52,74,88,89	0
2	OLC	A	504	25/25	0.71	0.20	41,64,71,75	0
2	OLC	A	526	21/25	0.71	0.19	65,86,94,102	0
2	OLC	B	518	13/25	0.71	0.21	56,61,70,79	0
2	OLC	B	504	21/25	0.72	0.20	51,61,72,75	0
2	OLC	A	506	25/25	0.72	0.18	49,60,70,80	0
2	OLC	A	511	11/25	0.73	0.24	51,61,67,70	0
2	OLC	B	503	25/25	0.73	0.19	59,70,76,84	0
2	OLC	A	502	16/25	0.73	0.17	64,73,83,84	0
2	OLC	B	521	18/25	0.74	0.20	45,70,76,79	0
2	OLC	B	508	13/25	0.74	0.21	48,61,73,74	0
2	OLC	B	512	10/25	0.75	0.17	49,62,68,96	0
2	OLC	B	515	13/25	0.75	0.16	56,66,77,80	0
2	OLC	B	523	8/25	0.75	0.20	51,54,65,74	0
2	OLC	A	524	20/25	0.75	0.17	53,61,74,76	0
2	OLC	A	510	16/25	0.76	0.17	48,67,77,79	0
2	OLC	A	501	24/25	0.76	0.18	61,73,75,78	0
2	OLC	A	509	13/25	0.76	0.21	48,59,74,78	0
3	PEG	B	524	6/7	0.76	0.22	50,53,55,62	0
2	OLC	A	521	13/25	0.77	0.22	60,69,78,80	0
2	OLC	A	508	23/25	0.77	0.15	61,71,95,98	0
2	OLC	A	514	25/25	0.77	0.18	56,73,87,90	0
2	OLC	B	510	16/25	0.77	0.17	46,56,66,66	0
2	OLC	A	507	25/25	0.77	0.15	44,58,71,74	0
2	OLC	A	503	16/25	0.78	0.19	54,60,77,96	0
2	OLC	B	514	15/25	0.78	0.18	42,55,64,65	0
2	OLC	A	512	13/25	0.78	0.20	64,67,76,79	0
3	PEG	A	523	6/7	0.79	0.18	66,72,75,78	0
2	OLC	B	505	19/25	0.80	0.15	61,68,75,77	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	OLC	B	522	7/25	0.80	0.20	56,60,63,63	0
2	OLC	A	517	8/25	0.83	0.15	51,61,65,67	0
2	OLC	B	511	13/25	0.83	0.15	71,76,83,84	0
2	OLC	A	518	7/25	0.85	0.17	50,57,63,67	0
2	OLC	B	513	8/25	0.85	0.16	52,60,63,66	0
2	OLC	B	501	12/25	0.85	0.20	59,68,78,80	0
2	OLC	A	505	10/25	0.89	0.12	43,46,50,55	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.
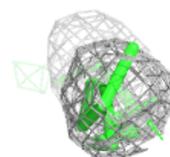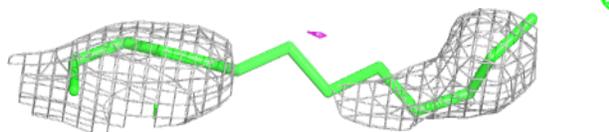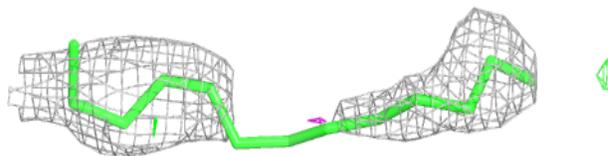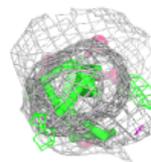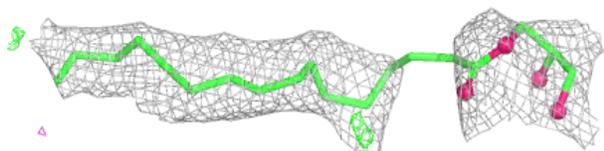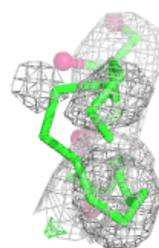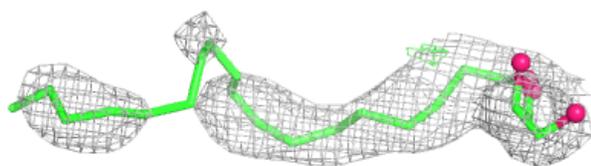

Electron density around OLC A 516:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)
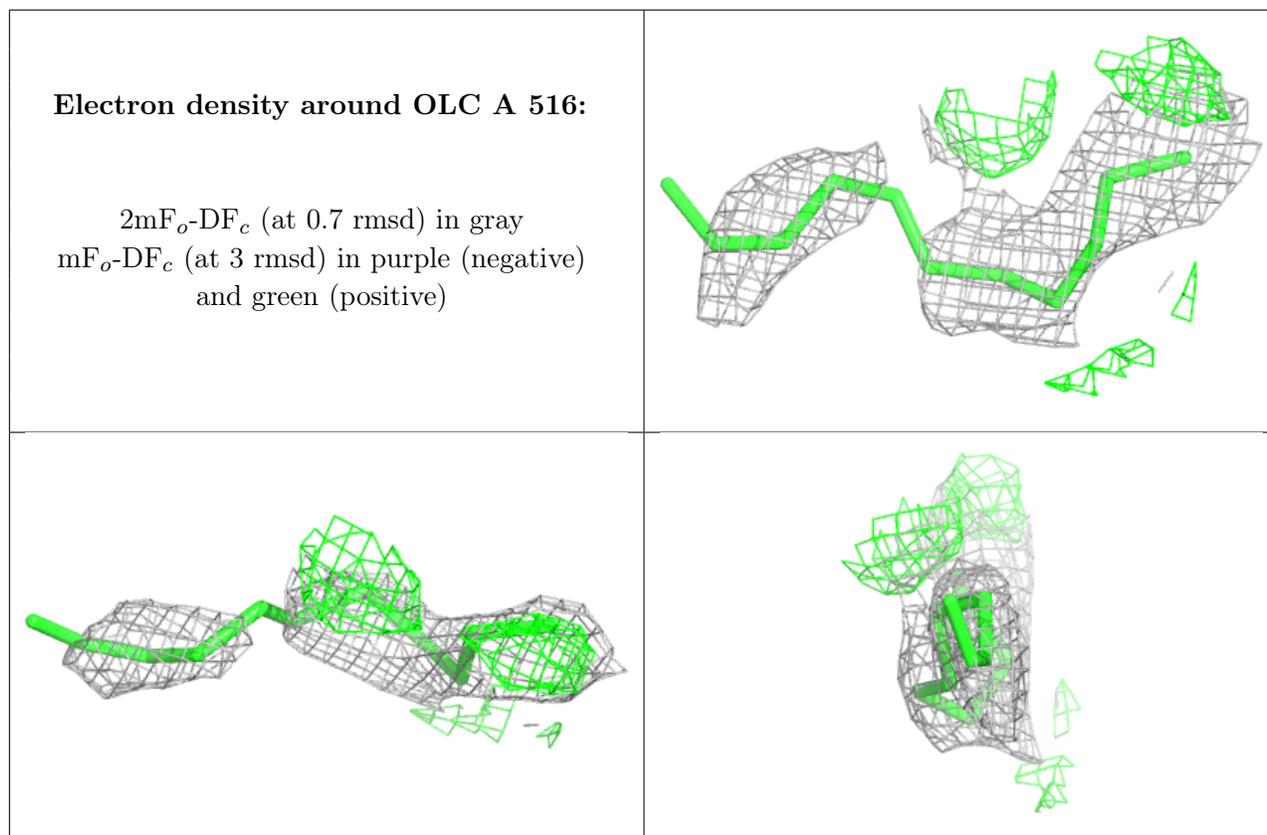
Electron density around OLC A 519:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
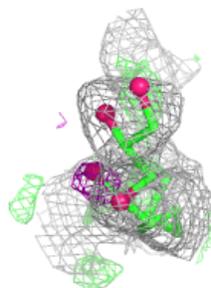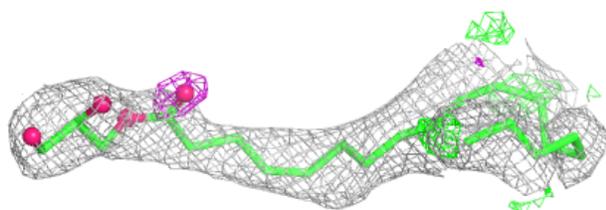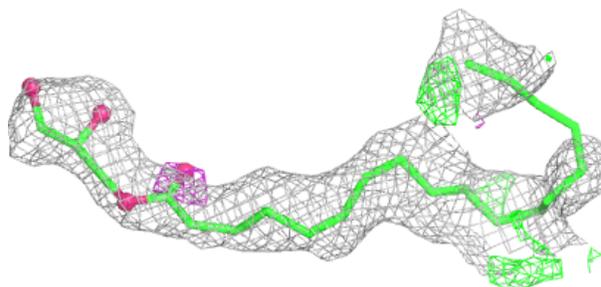
Electron density around OLC B 502:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
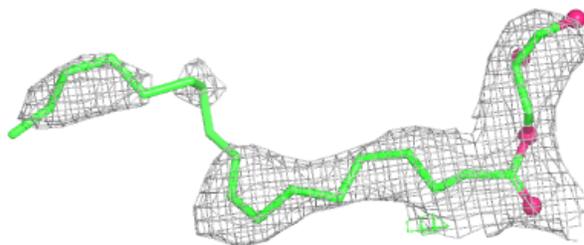and green (positive)

Electron density around OLC A 520:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
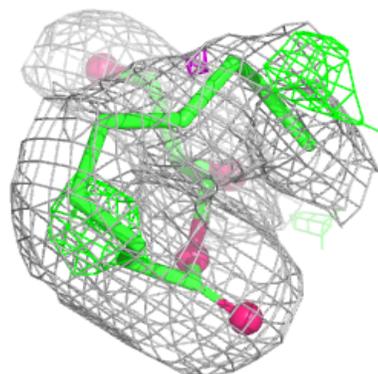mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
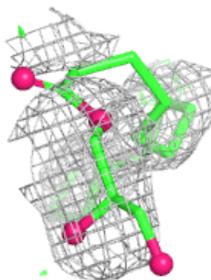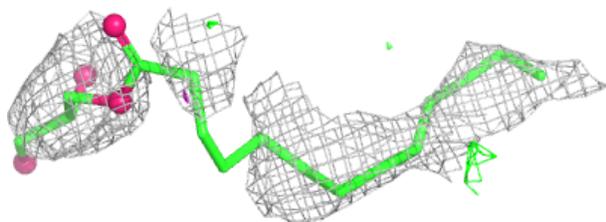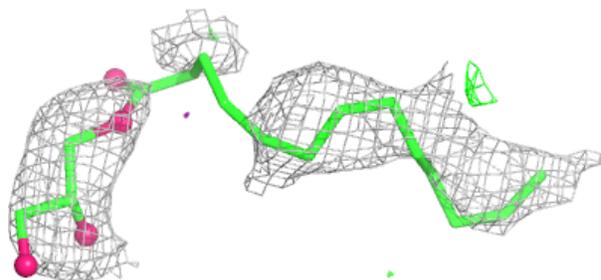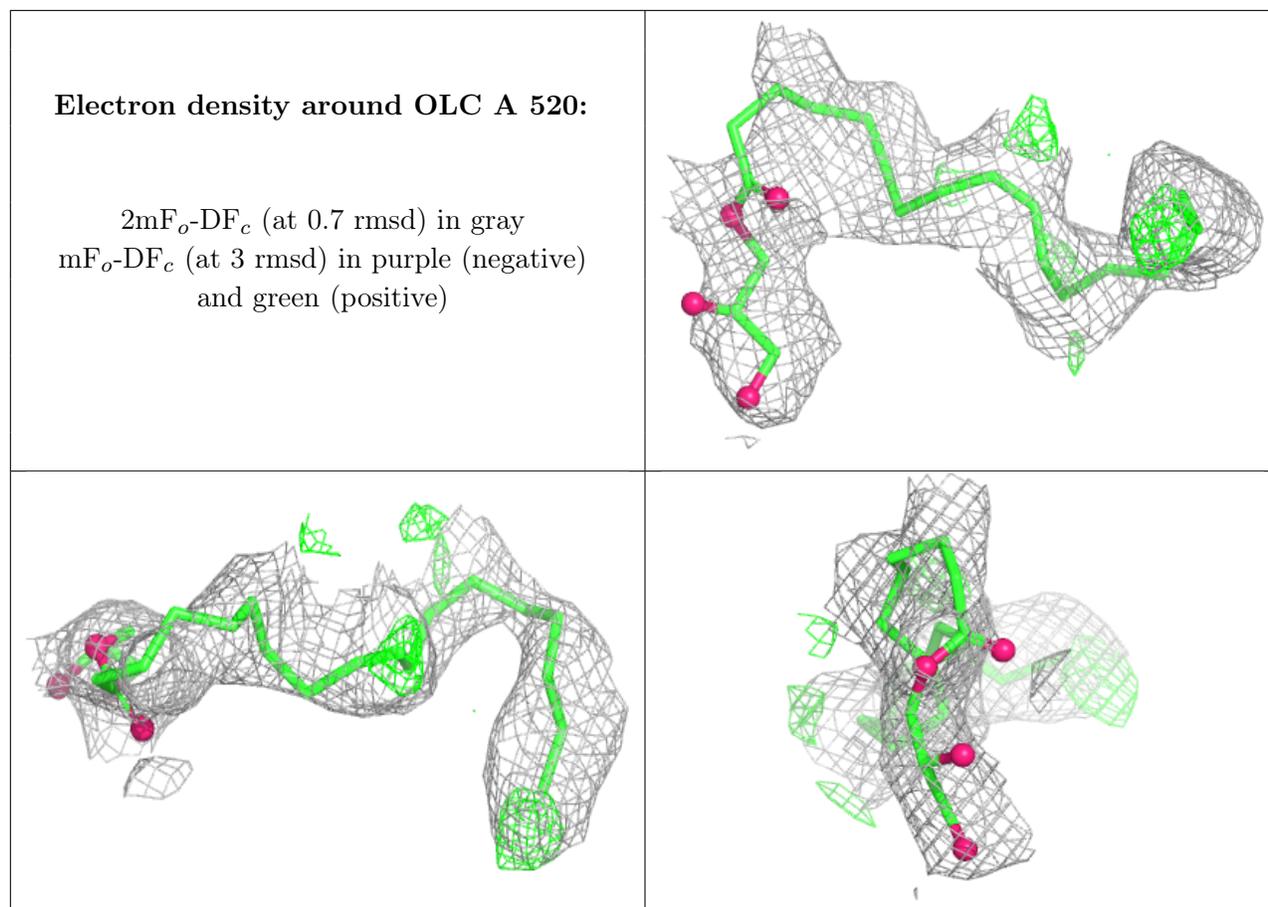
Electron density around OLC B 506:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
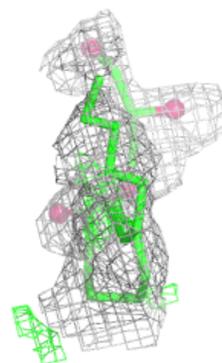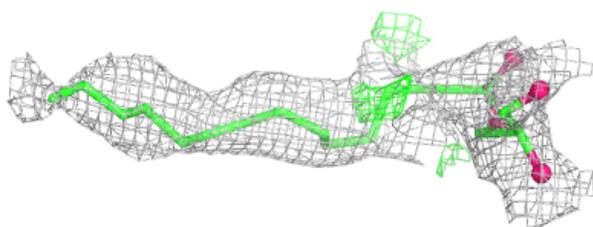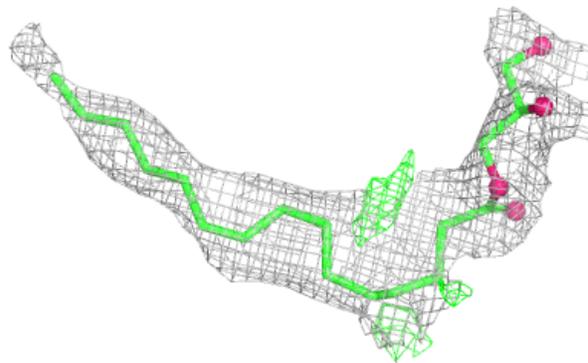
Electron density around OLC B 519:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
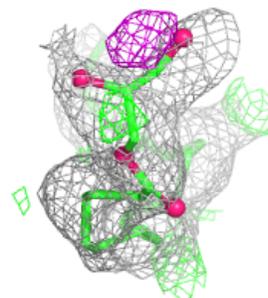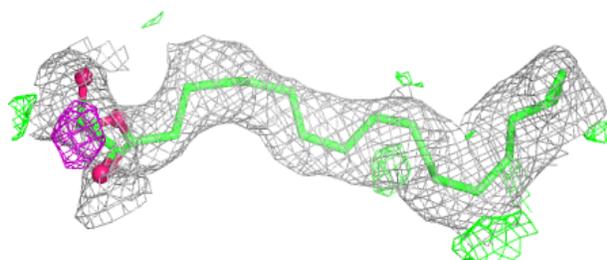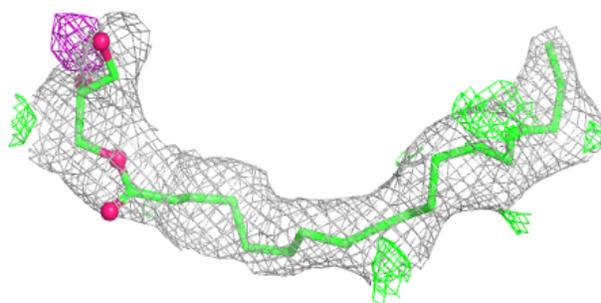
Electron density around OLC B 520:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
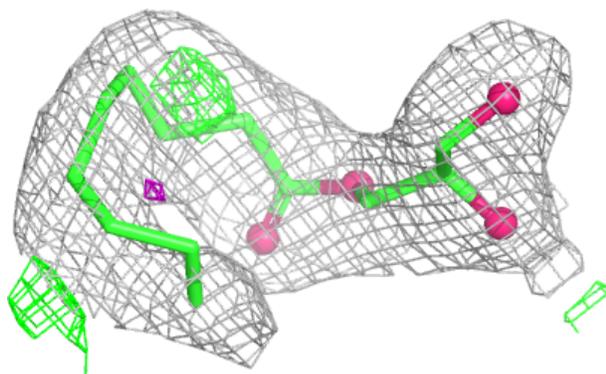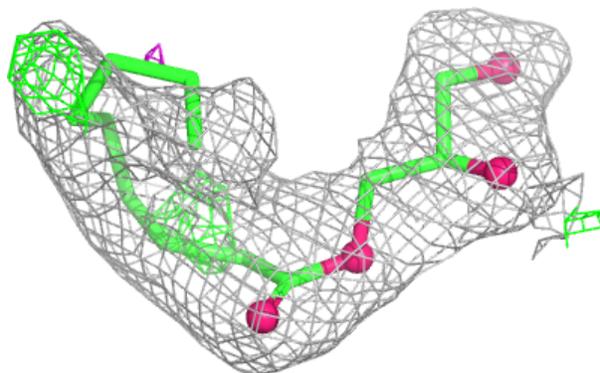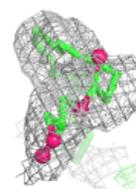mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
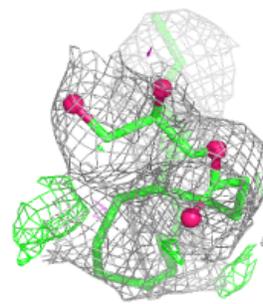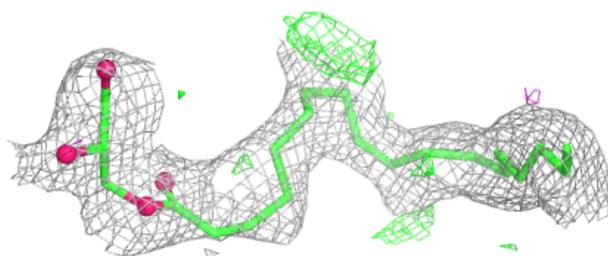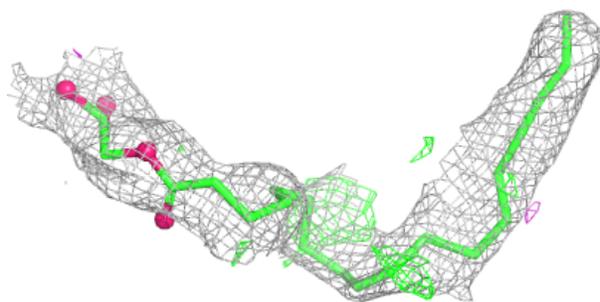
Electron density around OLC B 509:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
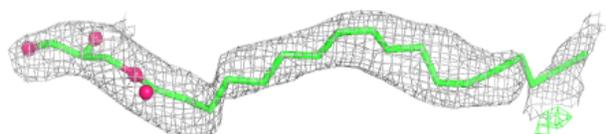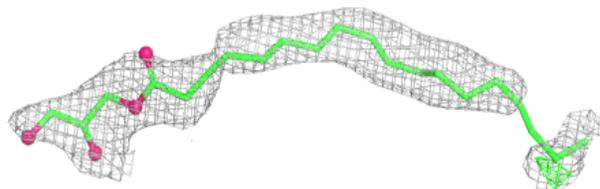and green (positive)
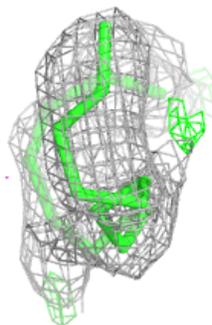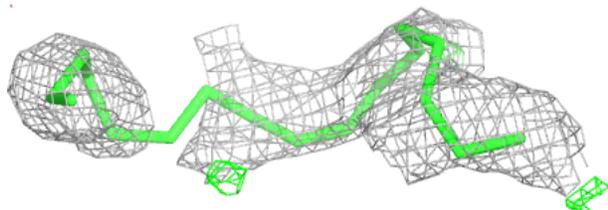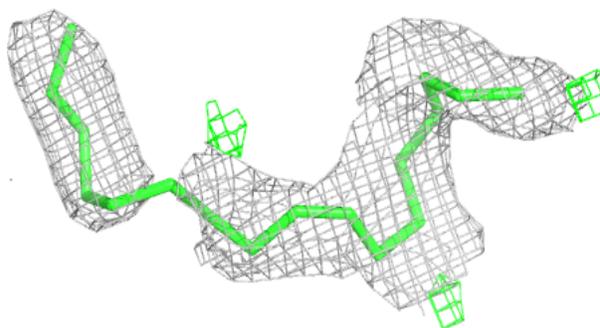
Electron density around OLC B 517:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
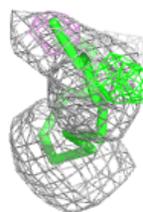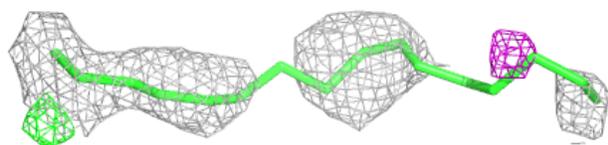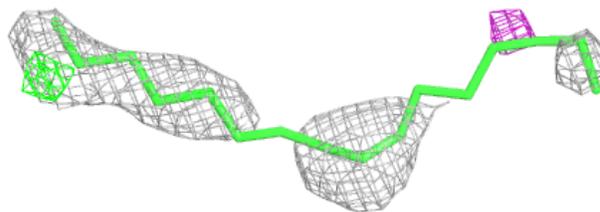
Electron density around OLC A 513:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
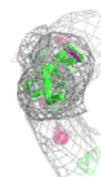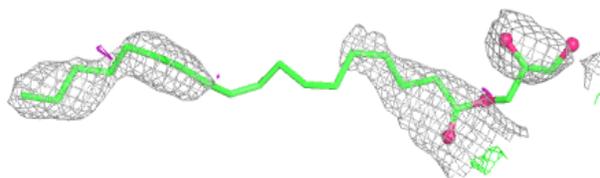
Electron density around OLC A 515:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
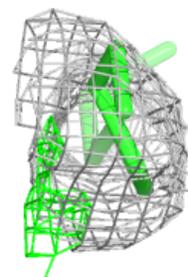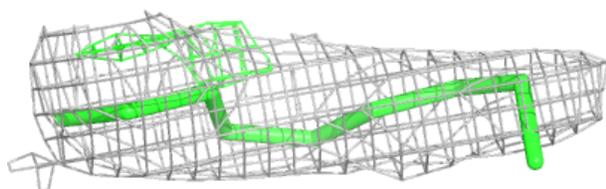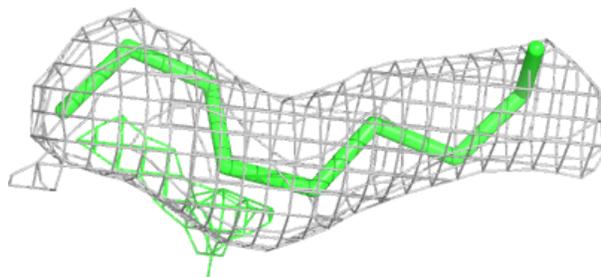
Electron density around OLC A 525:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
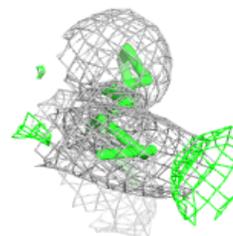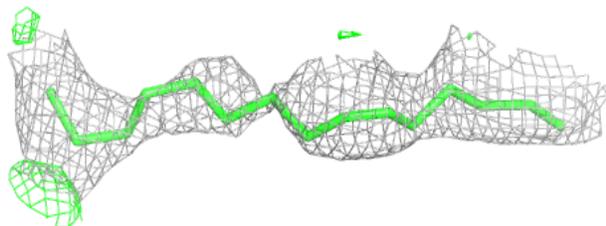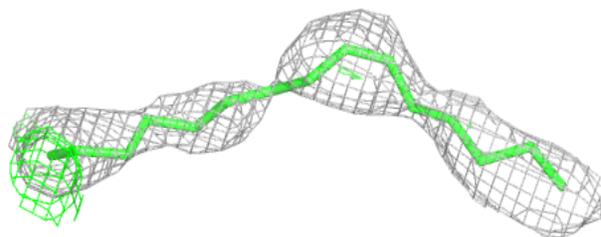
Electron density around OLC B 507:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
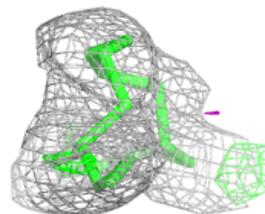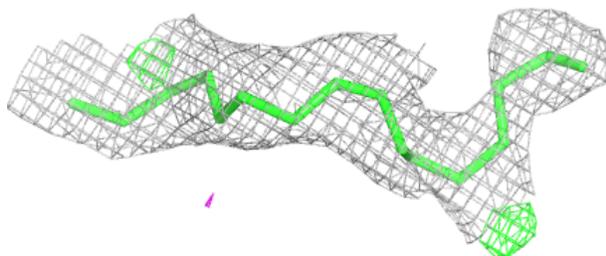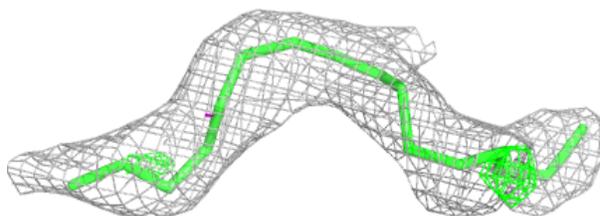mF_o-DF_c (at 3 rmsd) in purple (negative)
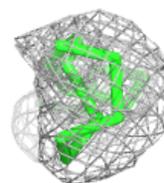and green (positive)
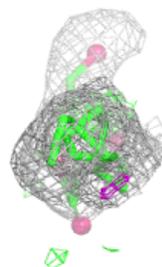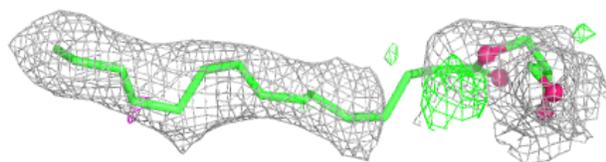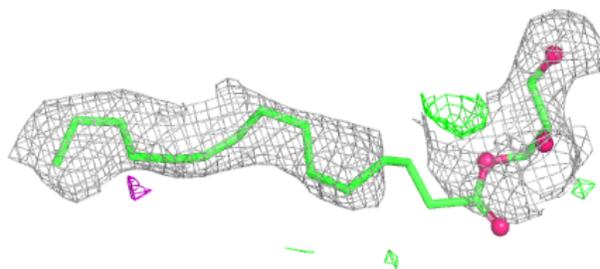
Electron density around OLC A 504:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
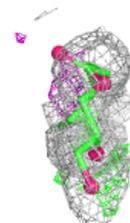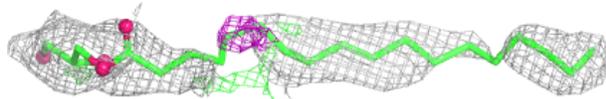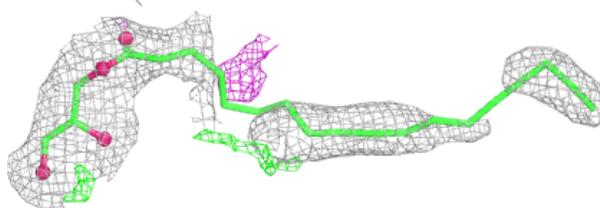
Electron density around OLC A 526:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
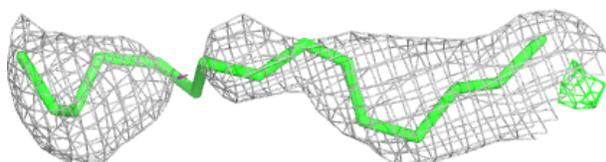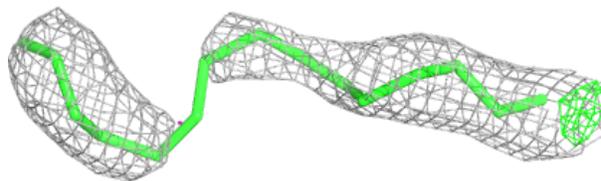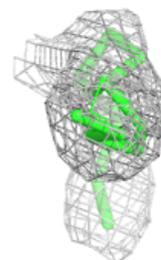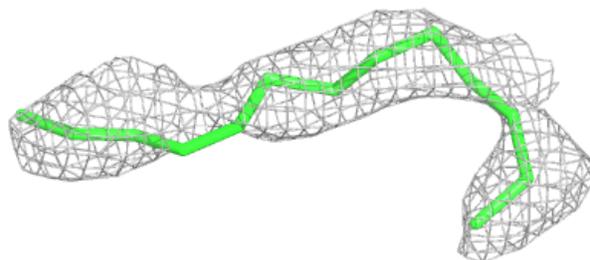and green (positive)
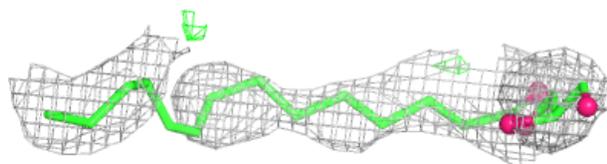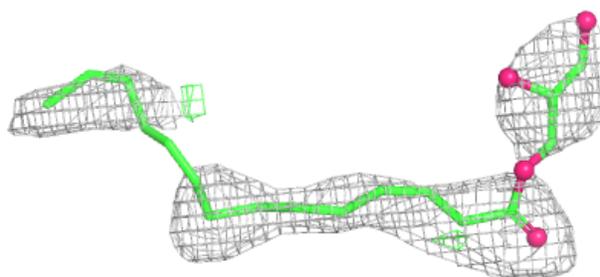
Electron density around OLC B 518:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
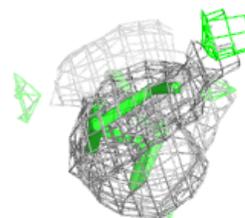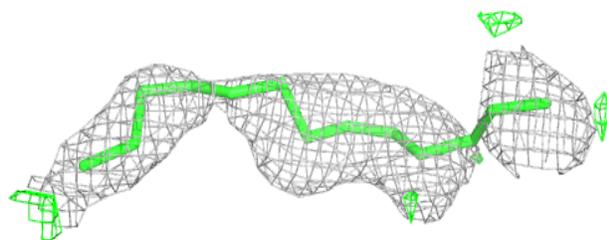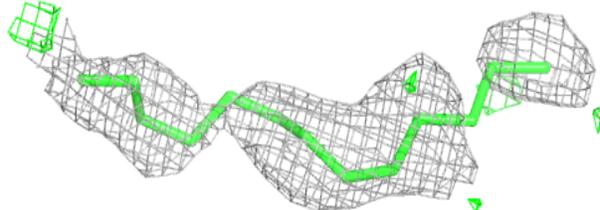
Electron density around OLC B 504:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
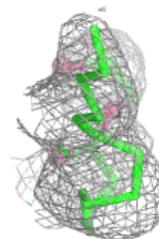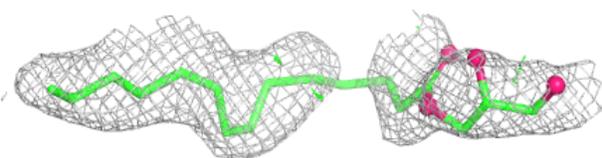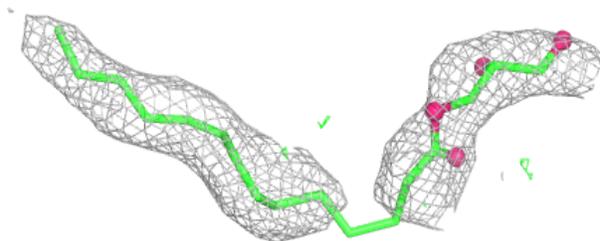
Electron density around OLC A 506:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
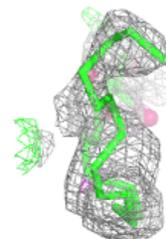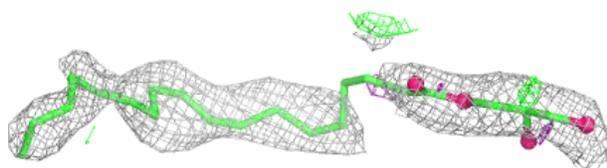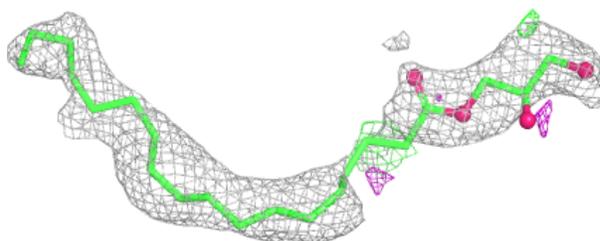
Electron density around OLC A 511:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
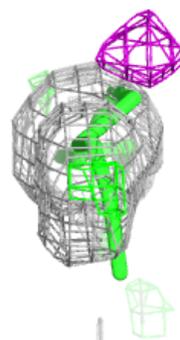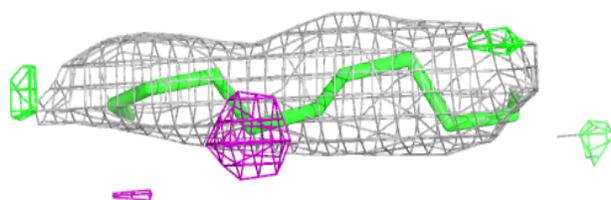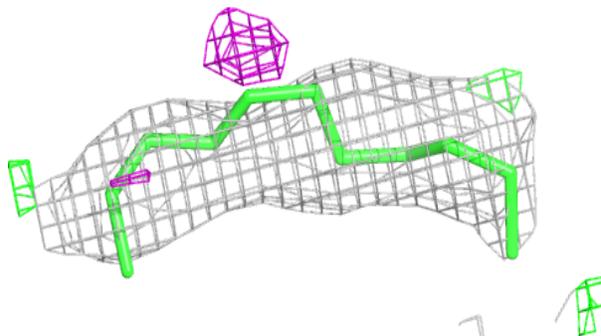
Electron density around OLC B 503:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
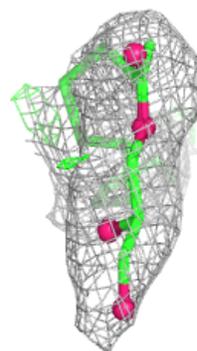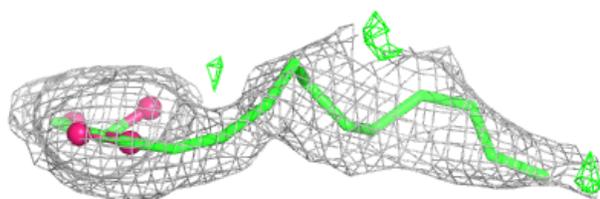$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
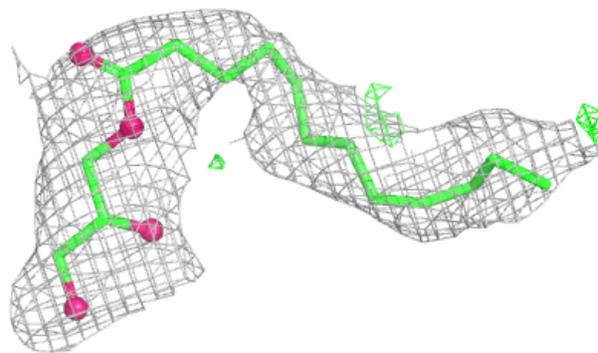and green (positive)
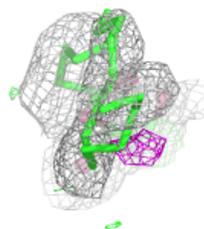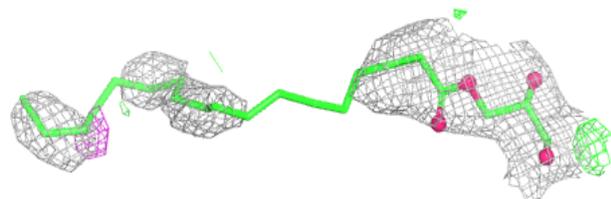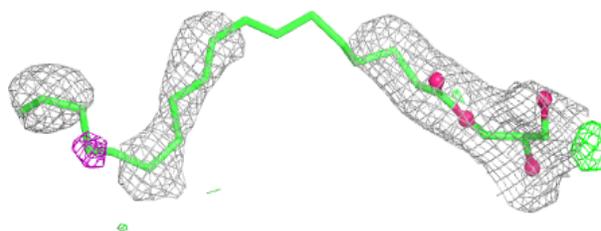
Electron density around OLC A 502:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
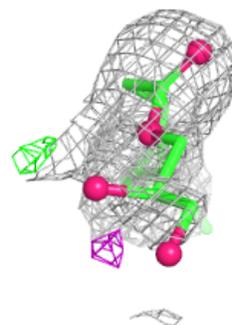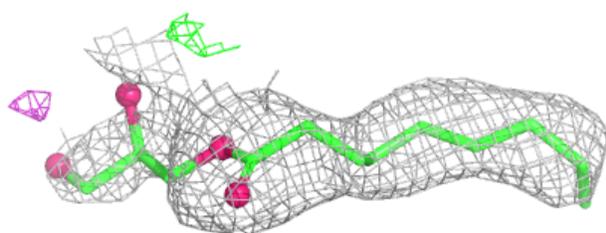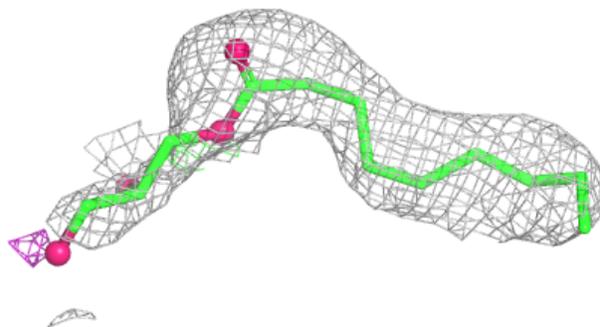
Electron density around OLC B 521:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
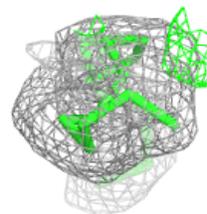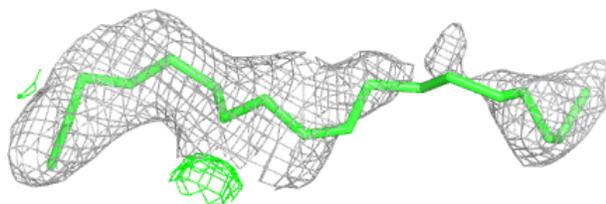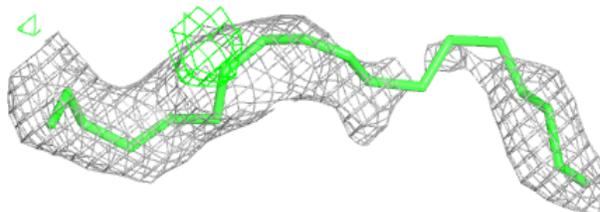
Electron density around OLC B 508:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
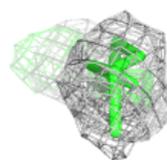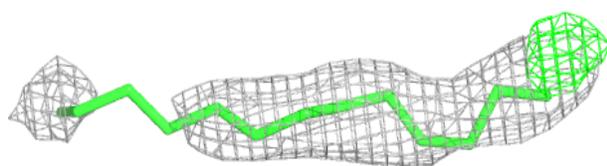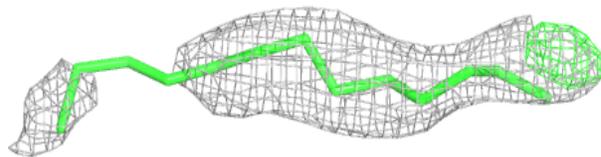
Electron density around OLC B 512:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
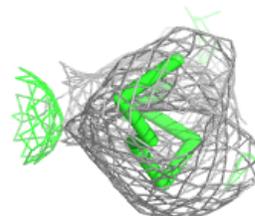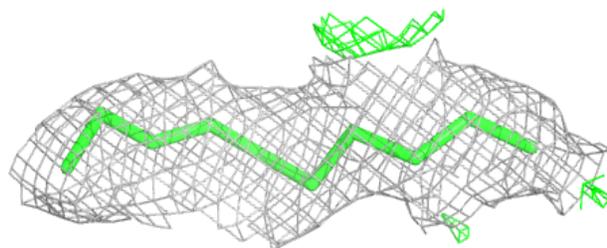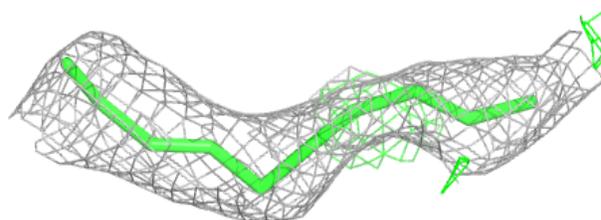
Electron density around OLC B 515:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
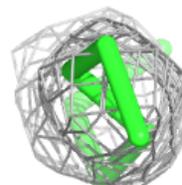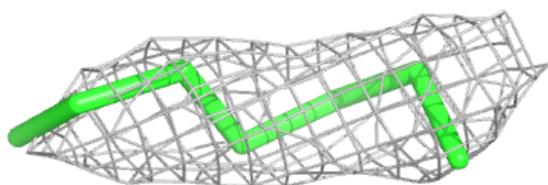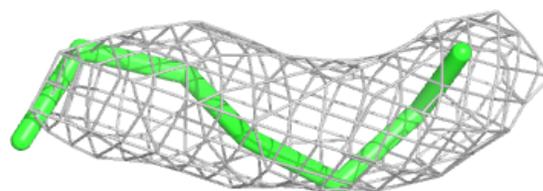mF_o-DF_c (at 3 rmsd) in purple (negative)
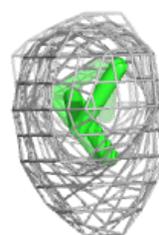and green (positive)
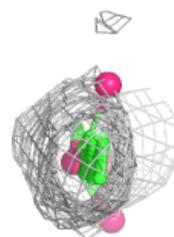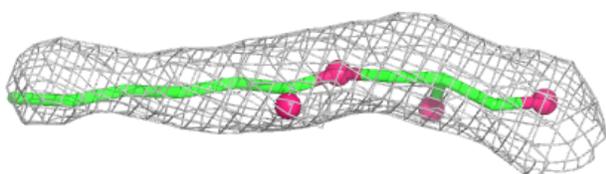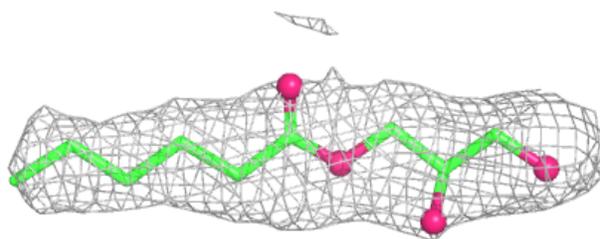
Electron density around OLC B 523:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
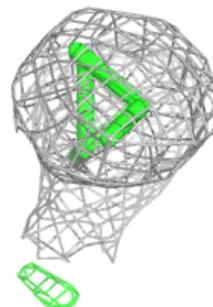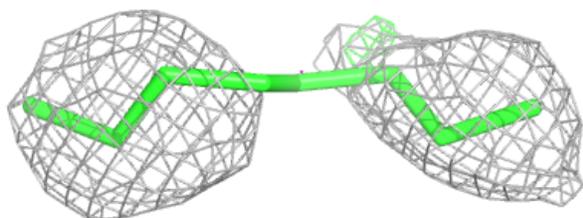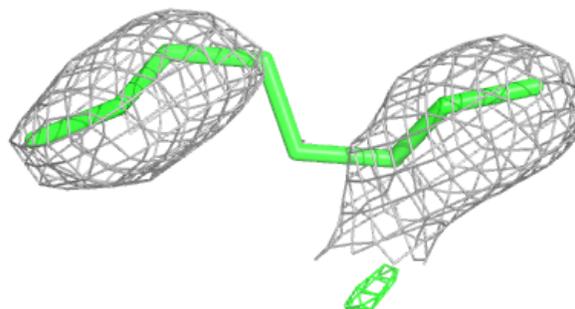
Electron density around OLC A 524:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
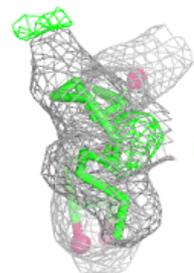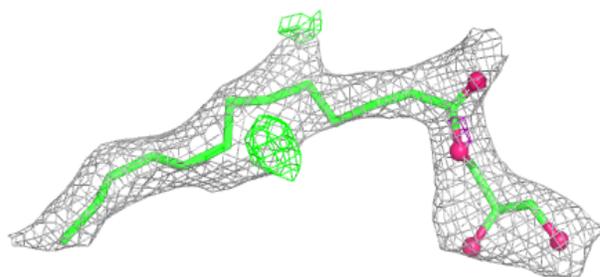
Electron density around OLC A 510:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
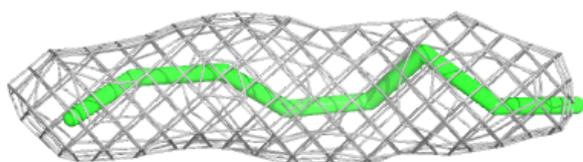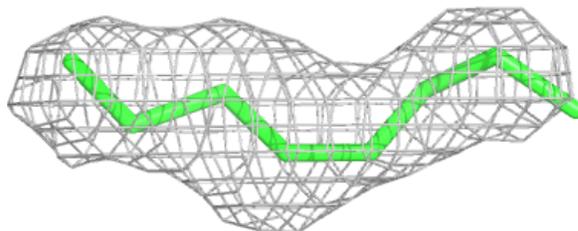$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
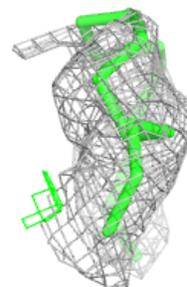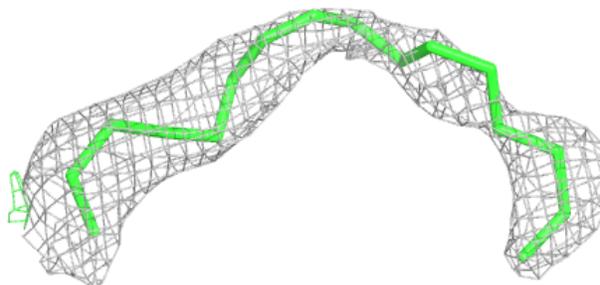
Electron density around OLC A 501:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
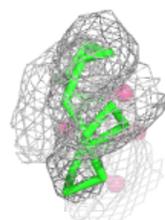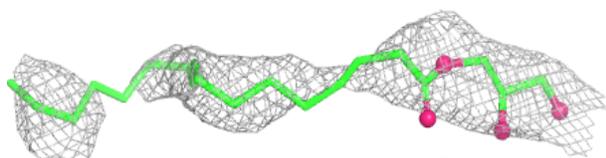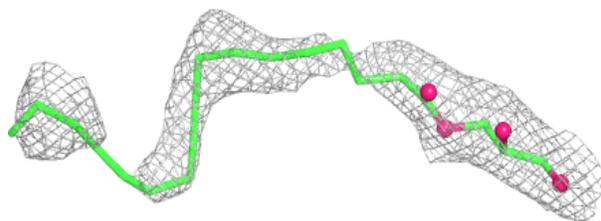
Electron density around OLC A 509:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
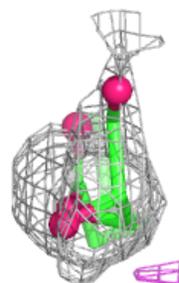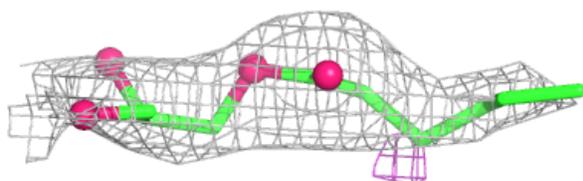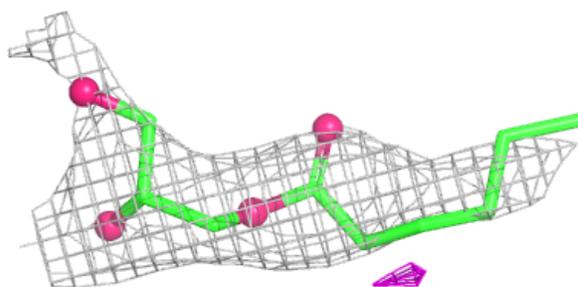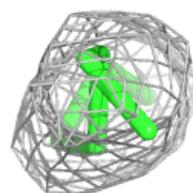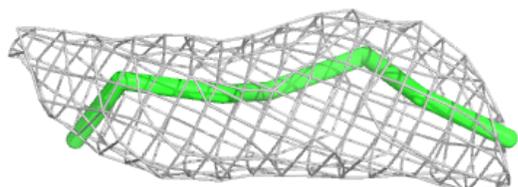and green (positive)
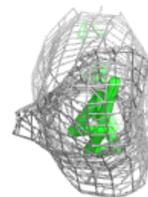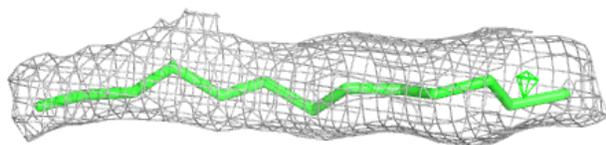
Electron density around OLC A 521:

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

Electron density around OLC A 508:

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

Electron density around OLC A 514:

$2mF_o\text{-}DF_c$ (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 510:

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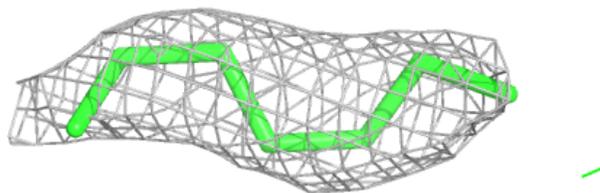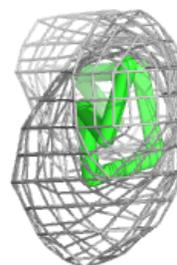and green (positive)

Electron density around OLC A 507:

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 503:

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 514:

$2mF_o\text{-}DF_c$ (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 512:

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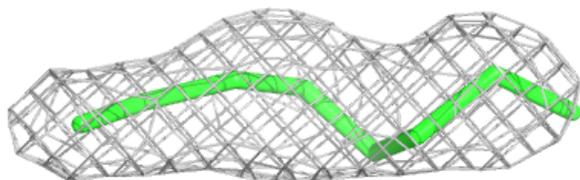$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around OLC B 505:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
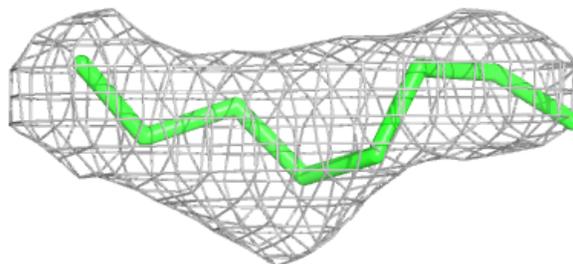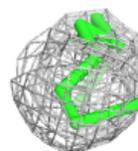mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around OLC B 522:

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 517:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
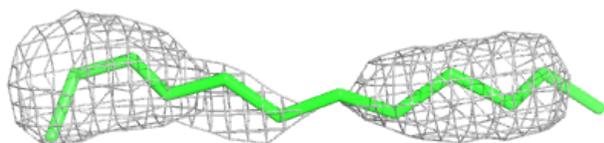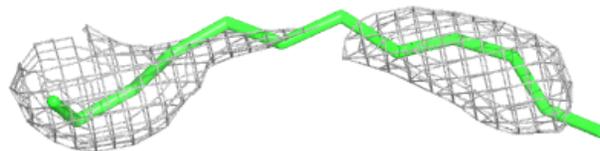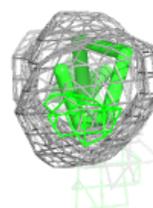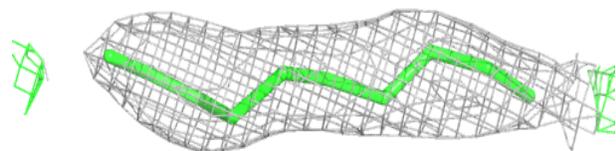and green (positive)

Electron density around OLC B 511:

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 518:

$2mF_o\text{-}DF_c$ (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 513:

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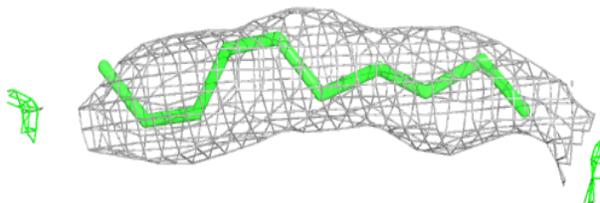and green (positive)

Electron density around OLC B 501:

$2mF_o\text{-}DF_c$ (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 505:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.