



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 01:08 PM UTC

PDB ID : 4N6H / pdb_00004n6h
Title : 1.8 Å Structure of the human delta opioid 7TM receptor (PSI Community Target)
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Deposited on : 2013-10-12
Resolution : 1.80 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

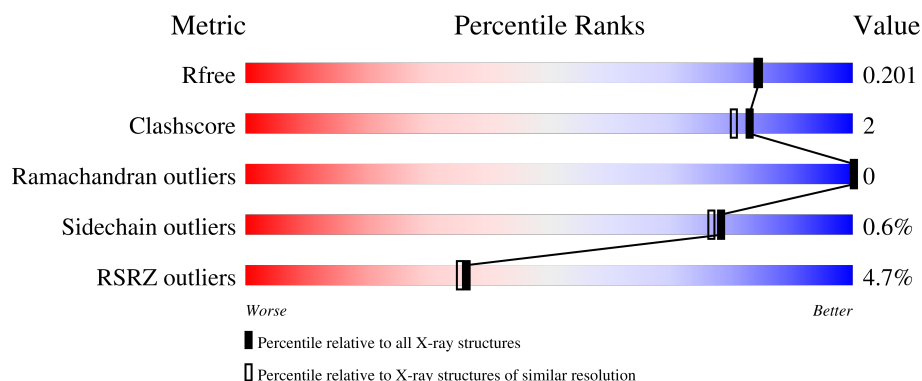
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	7662 (1.80-1.80)
Clashscore	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)
RSRZ outliers	180081	7663 (1.80-1.80)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	414	5% 93% 6%

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 3582 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.

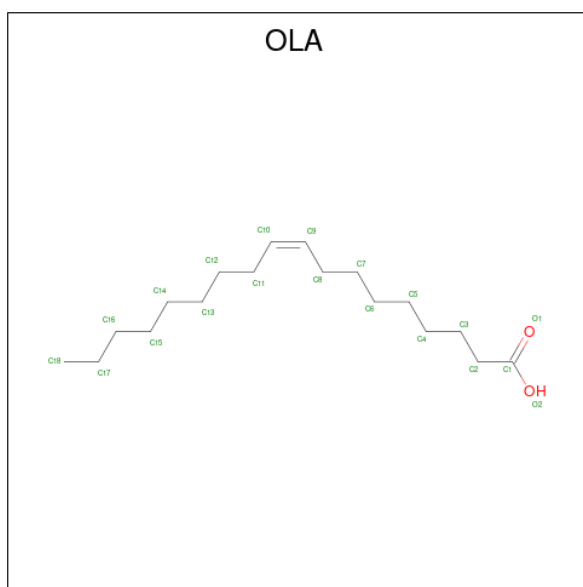
- Molecule 1 is a protein called Soluble cytochrome b562, Delta-type opioid receptor chimeric protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	408	Total	C	N	O	S	0	8	0
			3140	2060	511	542	27			

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	996	GLY	-	expression tag	UNP P0ABE7
A	997	GLY	-	expression tag	UNP P0ABE7
A	998	THR	-	expression tag	UNP P0ABE7
A	999	THR	-	expression tag	UNP P0ABE7
A	1000	MET	-	expression tag	UNP P0ABE7
A	1007	TRP	MET	engineered mutation	UNP P0ABE7
A	1102	ILE	HIS	engineered mutation	UNP P0ABE7
A	1106	LEU	ARG	engineered mutation	UNP P0ABE7
A	37	SER	PRO	engineered mutation	UNP P41143

- Molecule 2 is OLEIC ACID (CCD ID: OLA) (formula: C₁₈H₃₄O₂).



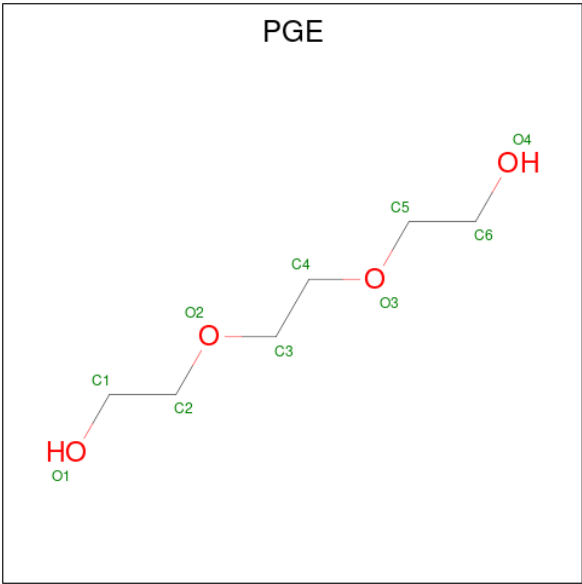
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			19	17	2		
2	A	1	Total	C	O	0	0
			20	18	2		
2	A	1	Total	C	O	0	0
			15	13	2		
2	A	1	Total	C	O	0	0
			20	18	2		
2	A	1	Total	C	O	0	0
			20	18	2		
2	A	1	Total	C	O	0	0
			9	7	2		
2	A	1	Total	C	O	0	0
			13	11	2		
2	A	1	Total	C	O	0	0
			11	9	2		
2	A	1	Total	C	O	0	0
			13	11	2		
2	A	1	Total	C	O	0	0
			14	12	2		
2	A	1	Total	C	O	0	0
			13	11	2		
2	A	1	Total	C	O	0	0
			8	6	2		

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



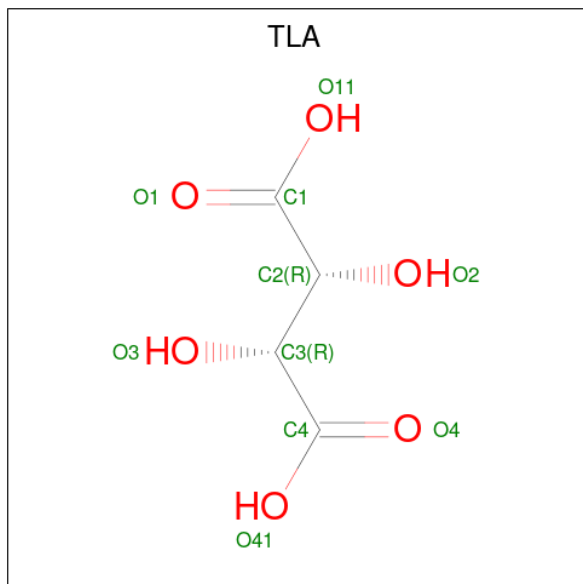
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			13	9	4		
3	A	1	Total	C	O	0	0
			18	14	4		
3	A	1	Total	C	O	0	0
			16	12	4		
3	A	1	Total	C	O	0	0
			22	18	4		
3	A	1	Total	C	O	0	0
			25	21	4		

- Molecule 4 is TRIETHYLENE GLYCOL (CCD ID: PGE) (formula: C₆H₁₄O₄).



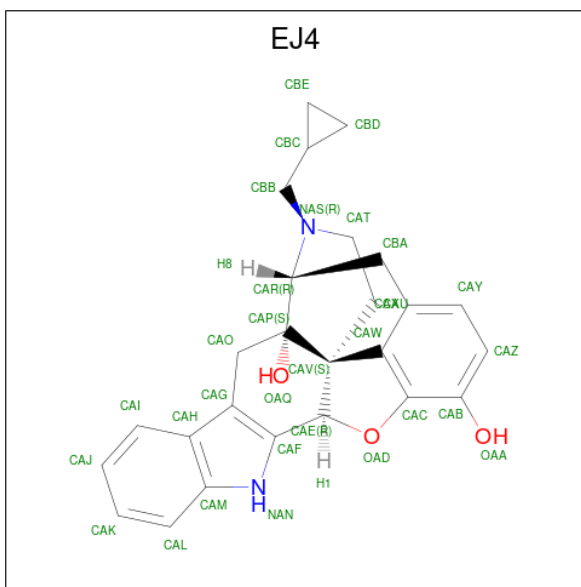
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			10	6	4		
4	A	1	Total	C	O	0	0
			10	6	4		
4	A	1	Total	C	O	0	0
			10	6	4		

- Molecule 5 is L(+)-TARTARIC ACID (CCD ID: TLA) (formula: $C_4H_6O_6$).



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

- Molecule 6 is (4bS,8R,8aS,14bR)-7-(cyclopropylmethyl)-5,6,7,8,14,14b-hexahydro-4,8-methano[1]benzofuro[2,3-a]pyrido[4,3-b]carbazole-1,8a(9H)-diol (CCD ID: EJ4) (formula: $C_{26}H_{26}N_2O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total	C	N	O	0	0
			31	26	2	3		

- Molecule 7 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total	Na	0	0
			1	1		

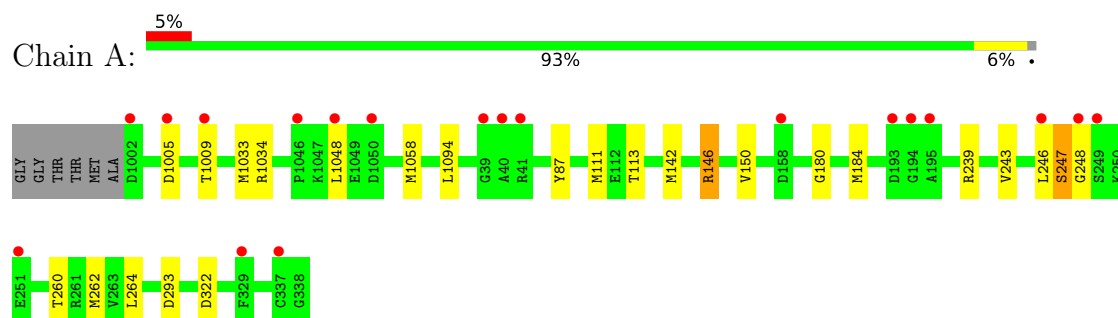
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	101	Total	O	0	0
			101	101		

3 Residue-property plots [i](#)

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

- Molecule 1: Soluble cytochrome b562, Delta-type opioid receptor chimeric protein



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	86.23Å 72.85Å 84.41Å 90.00° 107.48° 90.00°	Depositor
Resolution (Å)	29.70 – 1.80 29.70 – 1.80	Depositor EDS
% Data completeness (in resolution range)	98.3 (29.70-1.80) 98.3 (29.70-1.80)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.49 (at 1.80Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.172 , 0.190 0.183 , 0.201	Depositor DCC
R_{free} test set	2303 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å ²)	29.6	Xtriage
Anisotropy	0.277	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 60.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	3582	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.22% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: NA, EJ4, PGE, TLA, OLC, OLA

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.79	0/3218	0.87	1/4384 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	180	GLY	N-CA-C	5.66	119.49	112.64

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	3140	0	3200	17	0
2	A	175	0	245	0	0
3	A	94	0	130	2	0
4	A	30	0	42	0	0
5	A	10	0	4	0	0
6	A	31	0	26	0	0
7	A	1	0	0	0	0
8	A	101	0	0	1	0
All	All	3582	0	3647	17	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (17) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:247:SER:OG	1:A:248:GLY:N	2.24	0.70
1:A:1034:ARG:HD2	8:A:1335:HOH:O	1.95	0.67
1:A:184[B]:MET:HE3	3:A:1223:OLC:H2A	1.80	0.63
1:A:87:TYR:CB	1:A:142[A]:MET:HG2	2.29	0.63
1:A:87:TYR:HB3	1:A:142[A]:MET:CG	2.30	0.61
1:A:150:VAL:HG12	1:A:239:ARG:HG2	1.85	0.57
1:A:243[A]:VAL:HG21	1:A:246:LEU:HD23	1.88	0.54
1:A:1005:ASP:O	1:A:1009:THR:HG23	2.10	0.51
1:A:184[B]:MET:SD	3:A:1223:OLC:H6A	2.51	0.50
1:A:111:MET:HG2	1:A:113:THR:HG22	1.93	0.50
1:A:243[A]:VAL:CG2	1:A:246:LEU:HD23	2.46	0.45
1:A:262:MET:SD	1:A:322:ASP:HB2	2.57	0.45
1:A:260:THR:O	1:A:264:LEU:HG	2.18	0.44
1:A:146:ARG:HD3	1:A:260:THR:HA	1.99	0.43
1:A:1033:MET:HE1	1:A:1094:LEU:HD13	2.02	0.42
1:A:293:ASP:OD2	1:A:293:ASP:C	2.64	0.41
1:A:1048:LEU:HD23	1:A:1058:MET:SD	2.61	0.41

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	414/414 (100%)	412 (100%)	2 (0%)	0	100 100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	323/348 (93%)	321 (99%)	2 (1%)	78	77

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	146	ARG
1	A	247	SER

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

Mol	Chain	Res	Type
1	A	1013	ASN
1	A	1071	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 23 ligands modelled in this entry, 1 is monoatomic - leaving 22 for Mogul analysis.

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	OLA	A	1204	-	19,19,19	0.50	0	19,19,19	0.79	1 (5%)
4	PGE	A	1221	-	9,9,9	0.56	0	8,8,8	0.22	0
2	OLA	A	1202	-	19,19,19	0.55	0	19,19,19	0.62	0
2	OLA	A	1203	-	14,14,19	0.56	0	14,14,19	0.83	0
2	OLA	A	1201	-	18,18,19	0.64	0	18,18,19	0.52	0
3	OLC	A	1212	-	15,15,24	1.10	1 (6%)	16,16,25	0.94	1 (6%)
3	OLC	A	1222	-	21,21,24	0.81	1 (4%)	22,22,25	0.89	1 (4%)
5	TLA	A	1218	-	9,9,9	1.02	1 (11%)	12,12,12	1.25	2 (16%)
3	OLC	A	1207	-	12,12,24	1.37	1 (8%)	13,13,25	1.15	1 (7%)
4	PGE	A	1213	-	9,9,9	0.44	0	8,8,8	0.28	0
2	OLA	A	1209	-	12,12,19	0.66	0	12,12,19	0.69	0
2	OLA	A	1205	-	19,19,19	0.54	0	19,19,19	0.73	0
4	PGE	A	1214	-	9,9,9	0.47	0	8,8,8	0.34	0
6	EJ4	A	1219	-	37,38,38	3.12	18 (48%)	57,63,63	2.29	17 (29%)
2	OLA	A	1215	-	13,13,19	0.64	0	13,13,19	0.85	0
2	OLA	A	1217	-	7,7,19	0.76	0	7,7,19	1.10	0
2	OLA	A	1210	-	10,10,19	0.65	0	10,10,19	0.71	0
2	OLA	A	1216	-	12,12,19	0.64	0	12,12,19	0.89	0
3	OLC	A	1208	-	17,17,24	1.24	1 (5%)	18,18,25	1.11	2 (11%)
3	OLC	A	1223	-	24,24,24	0.95	1 (4%)	25,25,25	0.87	1 (4%)
2	OLA	A	1211	-	12,12,19	0.69	0	12,12,19	0.85	0
2	OLA	A	1206	-	8,8,19	0.77	0	8,8,19	0.92	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	OLA	A	1204	-	-	7/17/17/17	-
4	PGE	A	1221	-	-	4/7/7/7	-
2	OLA	A	1202	-	-	10/17/17/17	-
2	OLA	A	1203	-	-	5/12/12/17	-
2	OLA	A	1201	-	-	12/16/16/17	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	OLC	A	1212	-	-	6/15/15/24	-
3	OLC	A	1222	-	-	3/21/21/24	-
5	TLA	A	1218	-	-	0/12/12/12	-
3	OLC	A	1207	-	-	5/12/12/24	-
4	PGE	A	1213	-	-	3/7/7/7	-
2	OLA	A	1209	-	-	4/10/10/17	-
2	OLA	A	1205	-	-	8/17/17/17	-
4	PGE	A	1214	-	-	3/7/7/7	-
6	EJ4	A	1219	-	-	0/4/60/60	0/1/8/8
2	OLA	A	1215	-	-	5/11/11/17	-
2	OLA	A	1217	-	-	2/5/5/17	-
2	OLA	A	1210	-	-	2/8/8/17	-
2	OLA	A	1216	-	-	3/10/10/17	-
3	OLC	A	1208	-	-	8/17/17/24	-
3	OLC	A	1223	-	-	15/24/24/24	-
2	OLA	A	1211	-	-	4/10/10/17	-
2	OLA	A	1206	-	-	4/6/6/17	-

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1219	EJ4	OAD-CAE	10.27	1.63	1.46
6	A	1219	EJ4	CAH-CAM	-5.36	1.34	1.41
6	A	1219	EJ4	CAO-CAG	-5.35	1.44	1.50
6	A	1219	EJ4	CBA-CAR	-5.17	1.46	1.55
6	A	1219	EJ4	OAQ-CAP	4.81	1.51	1.43
3	A	1208	OLC	O20-C1	4.71	1.47	1.33
3	A	1207	OLC	O20-C1	4.54	1.46	1.33
6	A	1219	EJ4	CBA-CAX	-4.54	1.42	1.51
6	A	1219	EJ4	CAH-CAG	-4.39	1.36	1.44
3	A	1223	OLC	O20-C1	4.29	1.45	1.33
3	A	1212	OLC	O20-C1	4.01	1.45	1.33
6	A	1219	EJ4	CAR-NAS	4.00	1.52	1.48
6	A	1219	EJ4	CAF-NAN	-3.48	1.34	1.38
6	A	1219	EJ4	CAP-CAV	3.44	1.58	1.53
6	A	1219	EJ4	CAM-NAN	-3.29	1.32	1.38
3	A	1222	OLC	O20-C1	3.10	1.42	1.33
6	A	1219	EJ4	CAV-CAW	-2.63	1.45	1.50
6	A	1219	EJ4	CAF-CAG	2.50	1.39	1.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1219	EJ4	CAX-CAW	-2.41	1.35	1.39
6	A	1219	EJ4	CAL-CAM	-2.34	1.35	1.39
6	A	1219	EJ4	CAI-CAH	-2.25	1.36	1.39
6	A	1219	EJ4	CAZ-CAY	2.07	1.42	1.38
6	A	1219	EJ4	CAT-NAS	2.03	1.50	1.47
5	A	1218	TLA	O41-C4	-2.00	1.24	1.30

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	1219	EJ4	OAD-CAE-CAV	-8.44	99.57	104.88
6	A	1219	EJ4	CAG-CAF-NAN	-5.40	105.38	110.22
6	A	1219	EJ4	CAW-CAV-CAE	4.78	103.00	98.46
6	A	1219	EJ4	CAP-CAR-NAS	4.01	109.19	105.41
6	A	1219	EJ4	CAX-CBA-CAR	3.98	120.72	114.33
6	A	1219	EJ4	CBA-CAR-NAS	-3.87	111.50	115.63
6	A	1219	EJ4	CAP-CAV-CAE	-3.72	115.28	118.08
6	A	1219	EJ4	OAD-CAC-CAB	3.50	132.25	126.14
6	A	1219	EJ4	CAV-CAW-CAC	3.42	112.34	109.23
3	A	1208	OLC	O20-C1-C2	3.24	121.71	111.83
6	A	1219	EJ4	CAV-CAW-CAX	-3.08	122.41	126.22
6	A	1219	EJ4	CAM-NAN-CAF	2.97	111.09	108.53
6	A	1219	EJ4	CAT-CAU-CAV	2.84	114.66	111.62
3	A	1207	OLC	O20-C1-C2	2.83	120.47	111.83
5	A	1218	TLA	O41-C4-C3	2.78	121.03	113.31
6	A	1219	EJ4	CBB-NAS-CAR	2.71	118.64	113.51
6	A	1219	EJ4	CAB-CAC-CAW	-2.64	117.75	120.97
6	A	1219	EJ4	CAT-NAS-CAR	-2.56	106.55	111.14
3	A	1223	OLC	O20-C1-C2	2.55	119.61	111.83
6	A	1219	EJ4	OAD-CAC-CAW	-2.48	109.93	112.80
2	A	1204	OLA	C3-C2-C1	-2.29	108.53	114.51
3	A	1212	OLC	O20-C1-C2	2.28	118.79	111.83
3	A	1222	OLC	O20-C1-O19	-2.20	118.13	123.63
3	A	1208	OLC	O20-C1-O19	-2.18	118.18	123.63
5	A	1218	TLA	O41-C4-O4	-2.14	119.24	124.08
6	A	1219	EJ4	CAU-CAV-CAP	-2.05	107.77	109.38

There are no chirality outliers.

All (113) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1212	OLC	C21-C22-C24-O25

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Mol	Chain	Res	Type	Atoms
3	A	1212	OLC	O23-C22-C24-O25
3	A	1223	OLC	O20-C21-C22-O23
3	A	1208	OLC	O19-C1-O20-C21
3	A	1208	OLC	C2-C1-O20-C21
3	A	1212	OLC	O20-C21-C22-C24
3	A	1212	OLC	O20-C21-C22-O23
2	A	1205	OLA	C1-C2-C3-C4
4	A	1221	PGE	O3-C5-C6-O4
4	A	1213	PGE	O2-C3-C4-O3
3	A	1223	OLC	C2-C1-O20-C21
2	A	1209	OLA	C1-C2-C3-C4
3	A	1208	OLC	C21-C22-C24-O25
3	A	1222	OLC	C21-C22-C24-O25
3	A	1223	OLC	C21-C22-C24-O25
4	A	1214	PGE	O1-C1-C2-O2
4	A	1221	PGE	O2-C3-C4-O3
3	A	1208	OLC	C4-C5-C6-C7
3	A	1223	OLC	O19-C1-O20-C21
4	A	1213	PGE	O3-C5-C6-O4
2	A	1203	OLA	C4-C5-C6-C7
3	A	1207	OLC	O20-C21-C22-O23
2	A	1201	OLA	C4-C5-C6-C7
2	A	1201	OLA	C12-C13-C14-C15
3	A	1208	OLC	C3-C4-C5-C6
3	A	1223	OLC	O20-C21-C22-C24
2	A	1205	OLA	C2-C3-C4-C5
2	A	1205	OLA	C3-C4-C5-C6
3	A	1223	OLC	C2-C3-C4-C5
2	A	1202	OLA	C2-C3-C4-C5
2	A	1202	OLA	C6-C7-C8-C9
2	A	1201	OLA	C3-C4-C5-C6
2	A	1204	OLA	C13-C14-C15-C16
4	A	1213	PGE	O1-C1-C2-O2
4	A	1221	PGE	O1-C1-C2-O2
3	A	1208	OLC	O23-C22-C24-O25
3	A	1208	OLC	C6-C7-C8-C9
3	A	1207	OLC	C2-C3-C4-C5
2	A	1201	OLA	C6-C7-C8-C9
2	A	1209	OLA	C6-C7-C8-C9
3	A	1223	OLC	C12-C13-C14-C15
3	A	1223	OLC	C3-C4-C5-C6
2	A	1210	OLA	C5-C6-C7-C8

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Mol	Chain	Res	Type	Atoms
2	A	1206	OLA	C2-C3-C4-C5
2	A	1216	OLA	C2-C3-C4-C5
3	A	1223	OLC	C11-C12-C13-C14
2	A	1201	OLA	C11-C12-C13-C14
4	A	1214	PGE	O2-C3-C4-O3
2	A	1202	OLA	C3-C4-C5-C6
2	A	1211	OLA	C2-C3-C4-C5
2	A	1205	OLA	C12-C13-C14-C15
3	A	1212	OLC	C5-C6-C7-C8
2	A	1205	OLA	C13-C14-C15-C16
2	A	1211	OLA	C6-C7-C8-C9
3	A	1223	OLC	C4-C5-C6-C7
3	A	1223	OLC	C15-C16-C17-C18
2	A	1217	OLA	C3-C4-C5-C6
3	A	1222	OLC	O23-C22-C24-O25
2	A	1215	OLA	C4-C5-C6-C7
4	A	1214	PGE	C1-C2-O2-C3
2	A	1216	OLA	C4-C5-C6-C7
4	A	1221	PGE	C6-C5-O3-C4
3	A	1207	OLC	C2-C1-O20-C21
2	A	1203	OLA	C2-C3-C4-C5
2	A	1201	OLA	C2-C3-C4-C5
3	A	1207	OLC	O19-C1-O20-C21
2	A	1202	OLA	C11-C12-C13-C14
2	A	1201	OLA	C13-C14-C15-C16
3	A	1223	OLC	C1-C2-C3-C4
2	A	1203	OLA	C10-C11-C12-C13
2	A	1204	OLA	C15-C16-C17-C18
2	A	1216	OLA	C7-C8-C9-C10
3	A	1222	OLC	C12-C13-C14-C15
2	A	1202	OLA	C12-C13-C14-C15
2	A	1215	OLA	C9-C10-C11-C12
2	A	1201	OLA	C10-C11-C12-C13
2	A	1209	OLA	C5-C6-C7-C8
2	A	1204	OLA	C12-C13-C14-C15
2	A	1205	OLA	C7-C8-C9-C10
2	A	1215	OLA	C3-C4-C5-C6
2	A	1209	OLA	C4-C5-C6-C7
2	A	1211	OLA	O1-C1-C2-C3
2	A	1215	OLA	O1-C1-C2-C3
2	A	1202	OLA	O1-C1-C2-C3
2	A	1215	OLA	O2-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
2	A	1202	OLA	C15-C16-C17-C18
2	A	1211	OLA	O2-C1-C2-C3
3	A	1223	OLC	O23-C22-C24-O25
2	A	1202	OLA	C9-C10-C11-C12
2	A	1202	OLA	O2-C1-C2-C3
2	A	1204	OLA	O2-C1-C2-C3
2	A	1201	OLA	C7-C8-C9-C10
2	A	1204	OLA	O1-C1-C2-C3
3	A	1207	OLC	O20-C21-C22-C24
2	A	1206	OLA	C3-C4-C5-C6
2	A	1201	OLA	O1-C1-C2-C3
3	A	1223	OLC	C7-C8-C9-C10
3	A	1212	OLC	C4-C5-C6-C7
3	A	1223	OLC	C9-C10-C11-C12
3	A	1208	OLC	O20-C21-C22-O23
2	A	1201	OLA	O2-C1-C2-C3
2	A	1203	OLA	C9-C10-C11-C12
2	A	1203	OLA	C7-C8-C9-C10
2	A	1204	OLA	C7-C8-C9-C10
2	A	1204	OLA	C2-C3-C4-C5
2	A	1210	OLA	C2-C3-C4-C5
2	A	1206	OLA	O1-C1-C2-C3
2	A	1205	OLA	O1-C1-C2-C3
2	A	1205	OLA	O2-C1-C2-C3
2	A	1206	OLA	O2-C1-C2-C3
2	A	1217	OLA	C2-C3-C4-C5
2	A	1202	OLA	C13-C14-C15-C16
2	A	1201	OLA	C9-C10-C11-C12

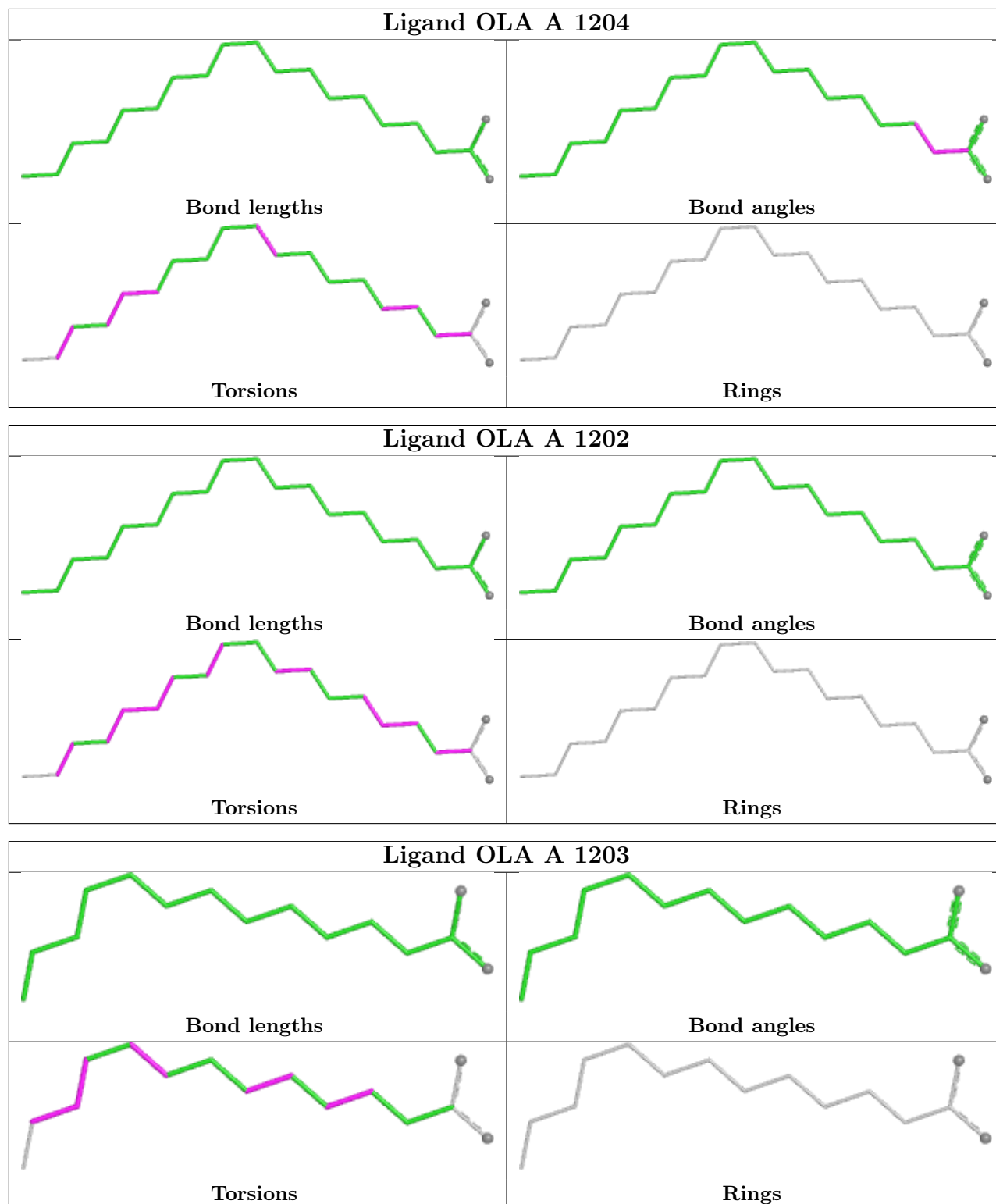
There are no ring outliers.

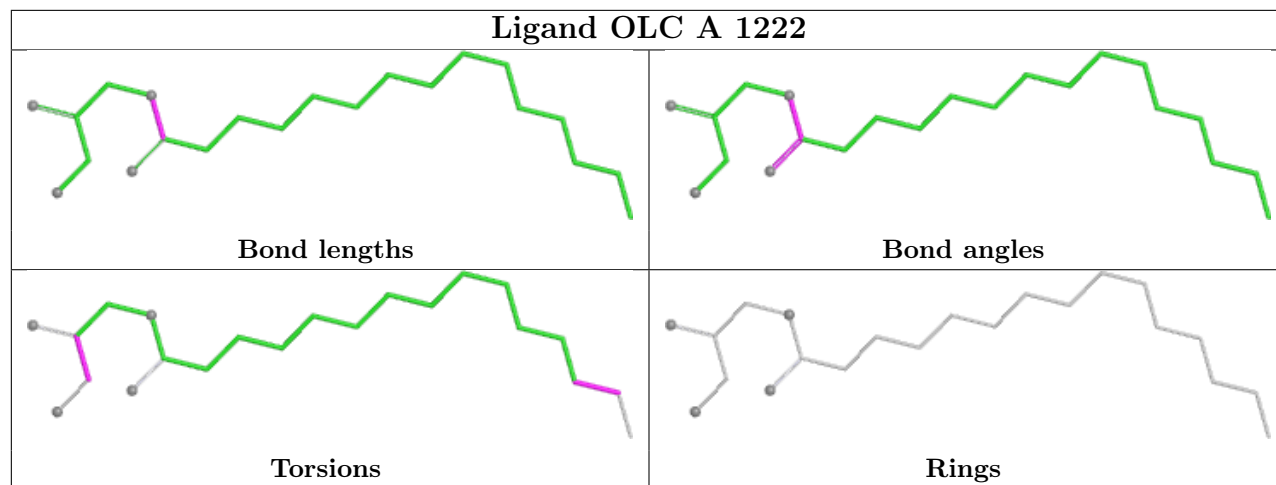
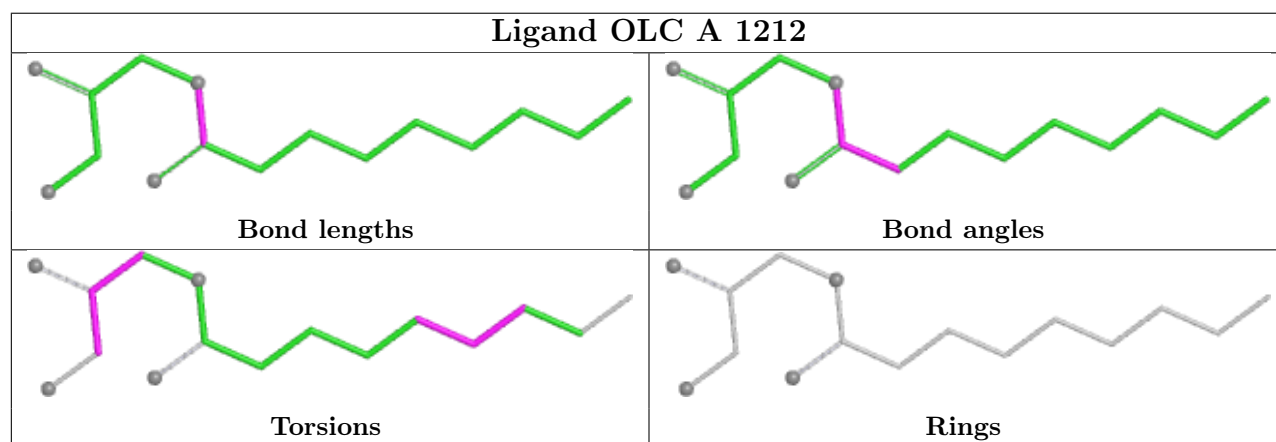
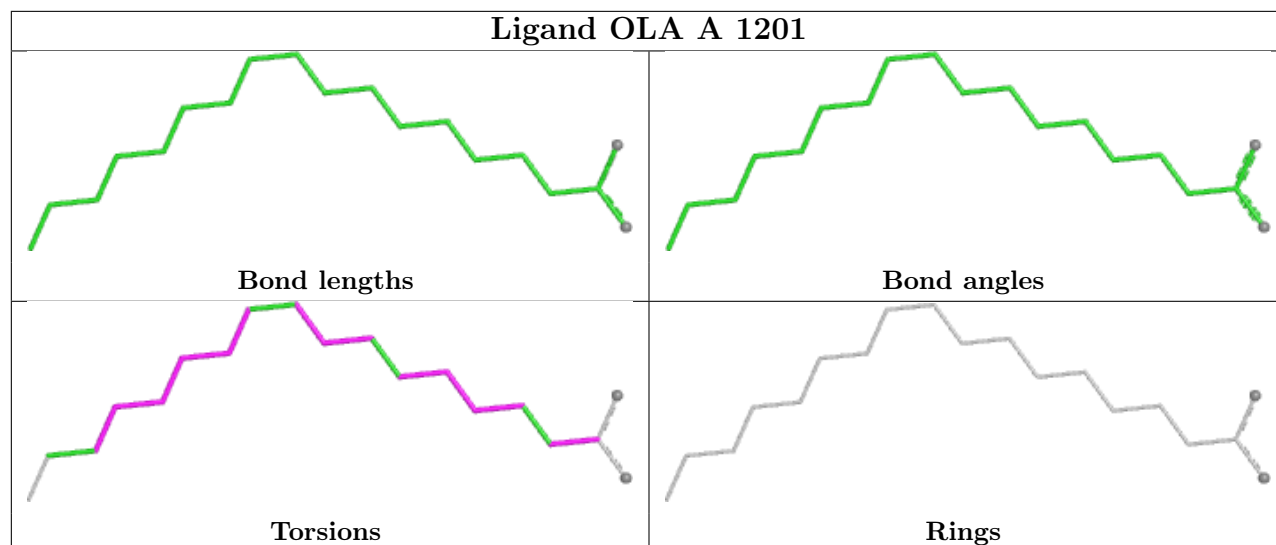
1 monomer is involved in 2 short contacts:

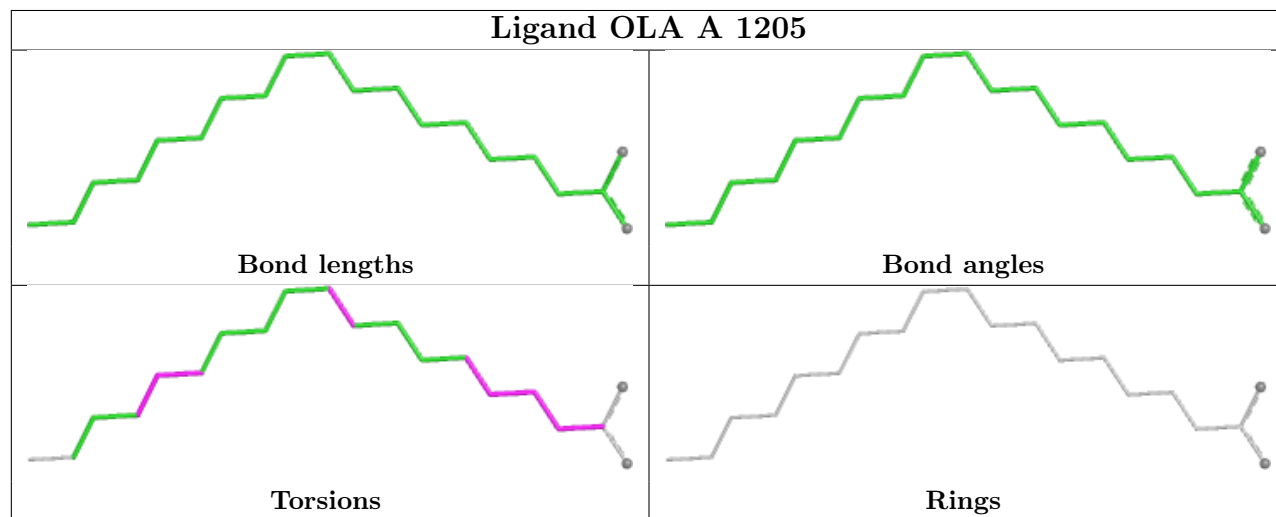
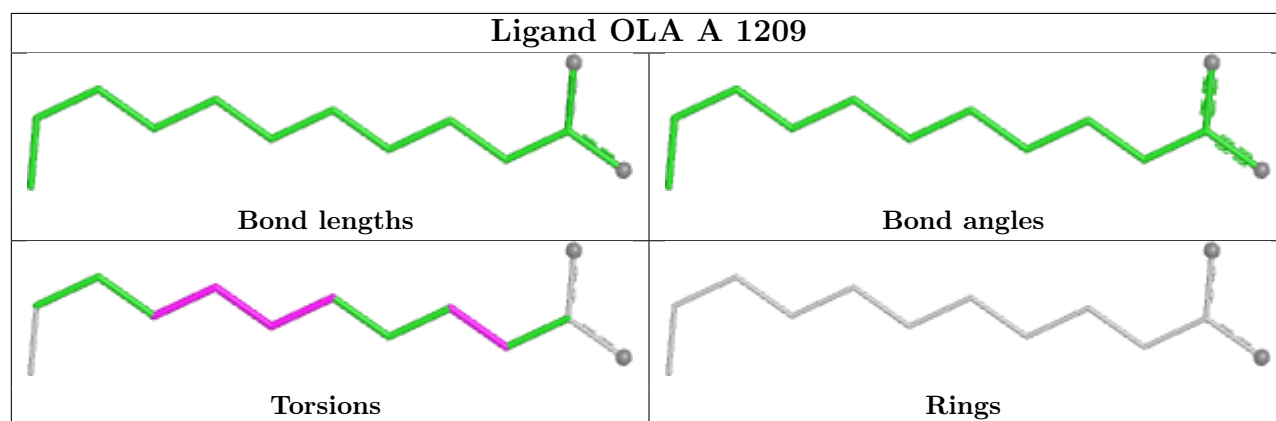
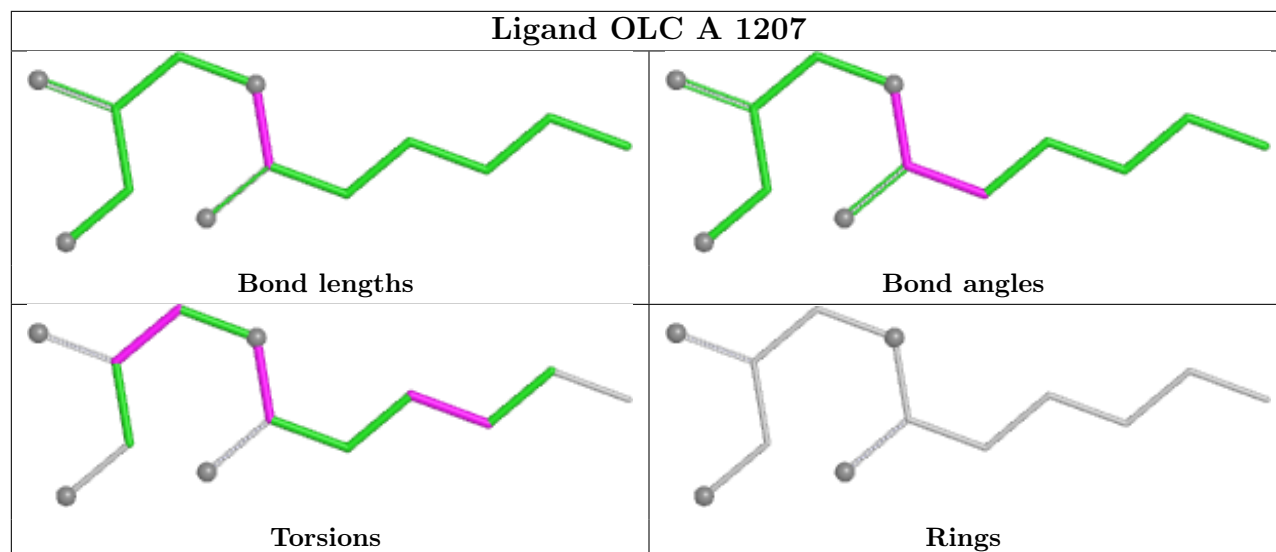
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1223	OLC	2	0

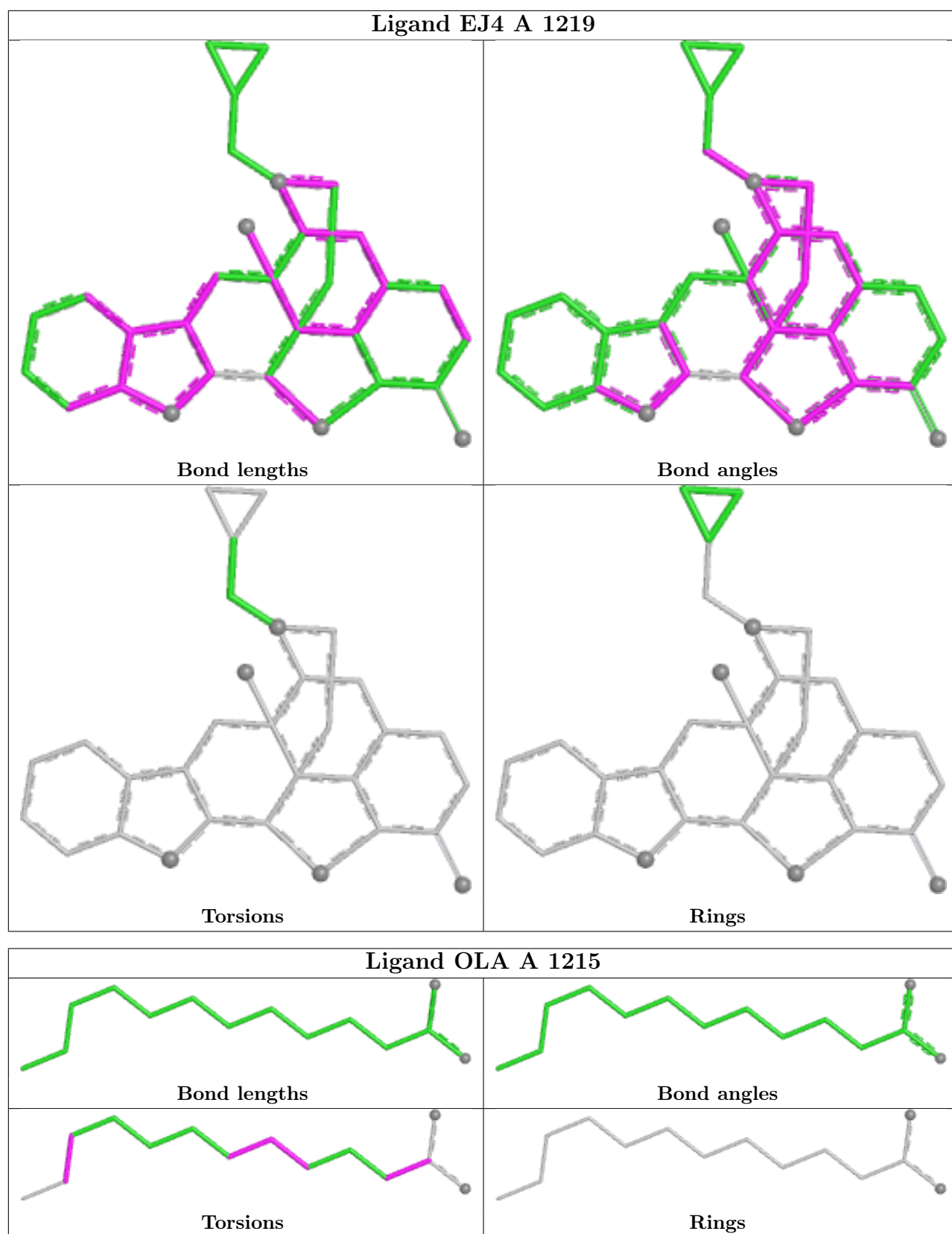
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring

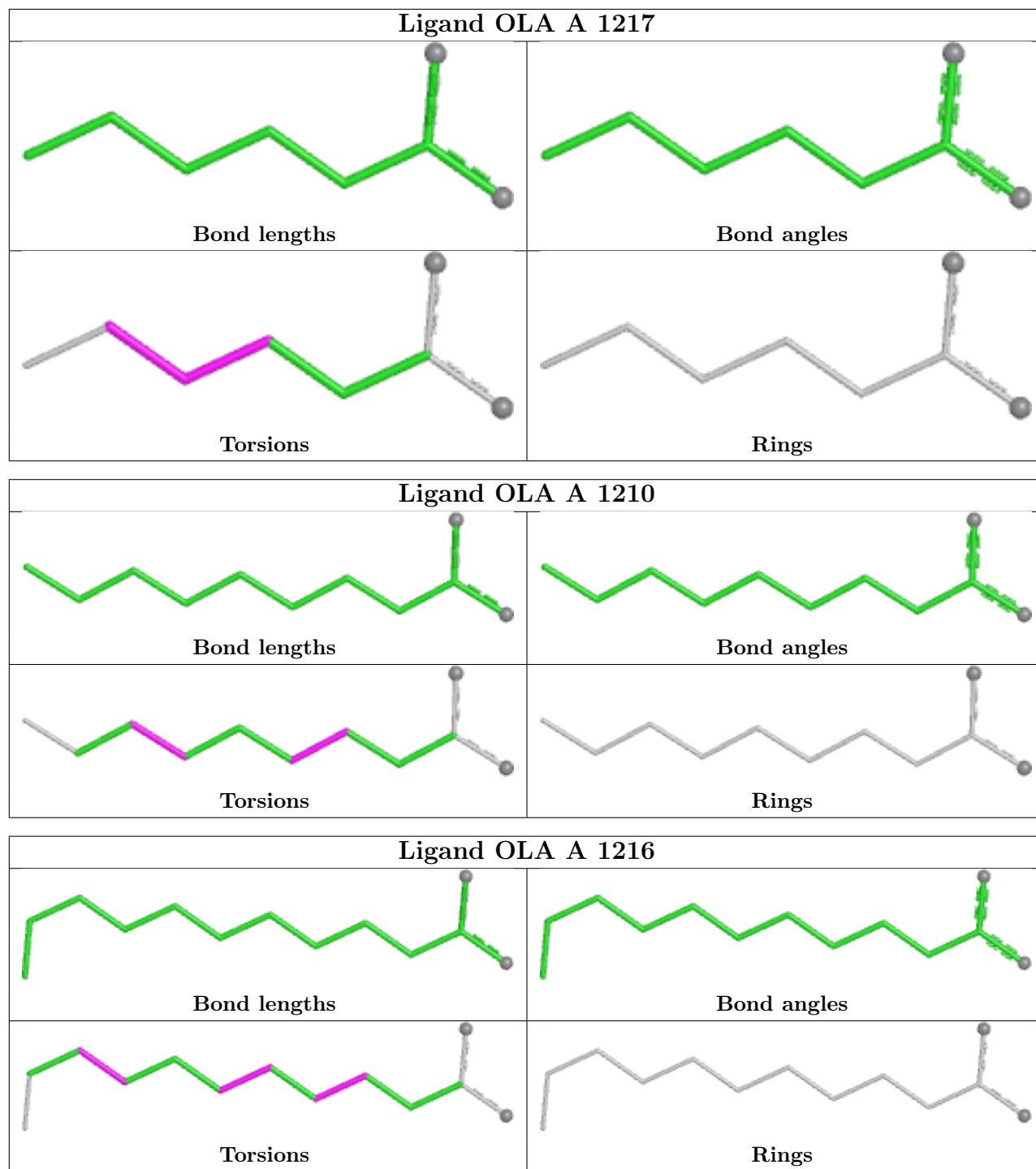
in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

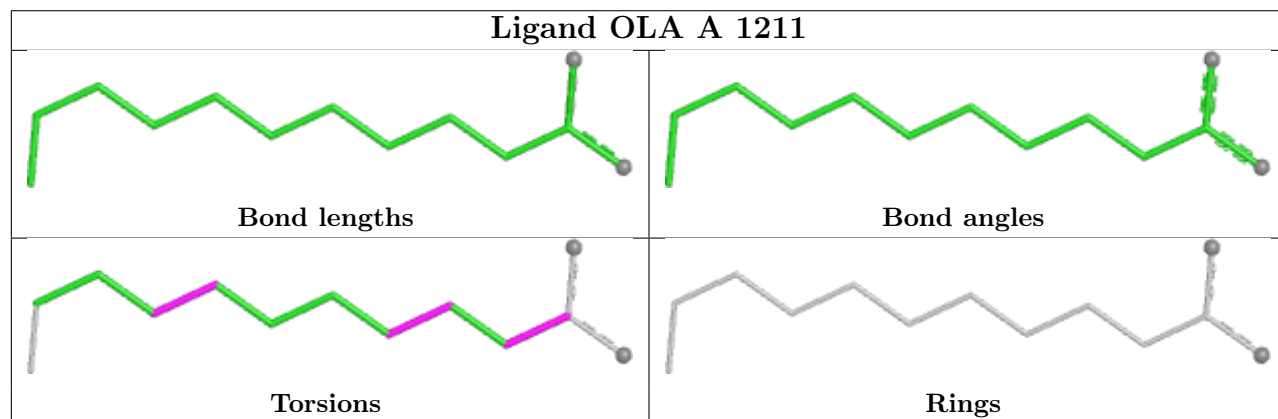
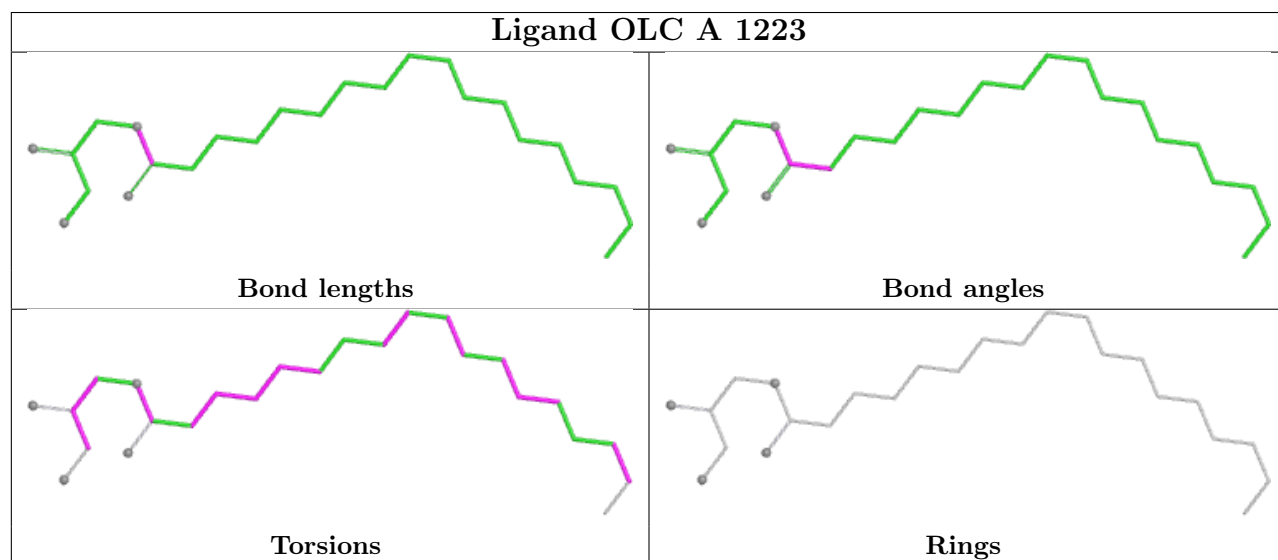
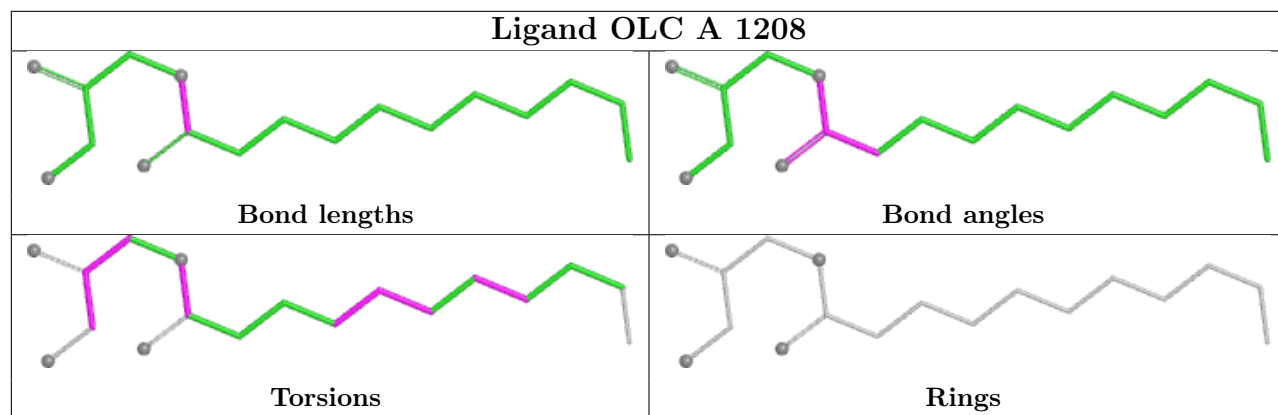


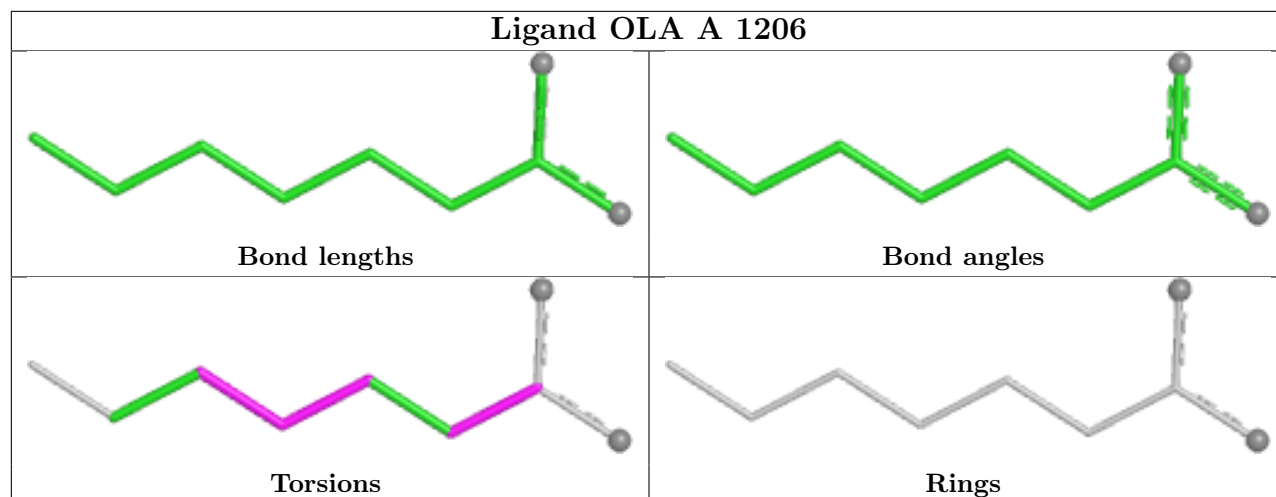












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	408/414 (98%)	0.34	19 (4%) 36 35	13, 34, 61, 80	8 (1%)

All (19) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	251	GLU	4.0
1	A	39	GLY	3.4
1	A	329	PHE	3.2
1	A	1002	ASP	3.1
1	A	1050	ASP	2.8
1	A	1048	LEU	2.8
1	A	158	ASP	2.7
1	A	249	SER	2.7
1	A	40	ALA	2.6
1	A	246	LEU	2.6
1	A	195	ALA	2.4
1	A	194	GLY	2.4
1	A	1009	THR	2.3
1	A	41	ARG	2.3
1	A	337	CYS	2.3
1	A	1005	ASP	2.2
1	A	1046	PRO	2.1
1	A	193	ASP	2.1
1	A	248	GLY	2.0

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

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

6.3 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

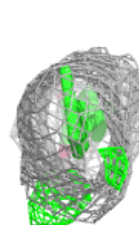
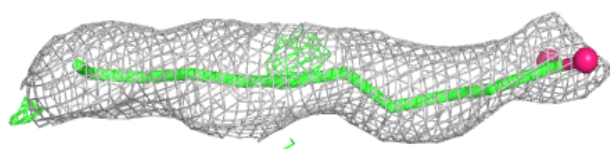
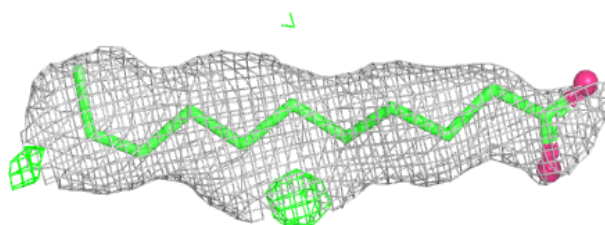
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	OLA	A	1216	13/20	0.73	0.15	75,77,88,90	0
5	TLA	A	1218	10/10	0.78	0.13	35,50,58,59	0
2	OLA	A	1215	14/20	0.79	0.15	66,74,83,86	0
2	OLA	A	1217	8/20	0.80	0.21	72,75,85,85	0
2	OLA	A	1211	13/20	0.80	0.15	65,68,77,80	0
2	OLA	A	1210	11/20	0.81	0.14	75,81,89,95	0
2	OLA	A	1202	20/20	0.81	0.17	57,62,84,85	0
2	OLA	A	1209	13/20	0.81	0.16	65,81,91,92	0
3	OLC	A	1212	16/25	0.82	0.14	56,68,72,76	0
2	OLA	A	1205	20/20	0.82	0.15	60,69,74,80	0
2	OLA	A	1203	15/20	0.83	0.18	69,76,86,88	0
4	PGE	A	1214	10/10	0.84	0.15	58,68,80,83	0
3	OLC	A	1208	18/25	0.85	0.15	65,71,75,78	0
3	OLC	A	1207	13/25	0.86	0.14	50,58,68,74	0
2	OLA	A	1206	9/20	0.87	0.15	48,59,62,63	0
3	OLC	A	1223	25/25	0.87	0.14	49,58,61,62	0
2	OLA	A	1201	19/20	0.88	0.16	48,57,69,70	0
2	OLA	A	1204	20/20	0.88	0.16	55,63,70,77	0
4	PGE	A	1221	10/10	0.89	0.12	59,63,69,71	0
3	OLC	A	1222	22/25	0.90	0.10	33,42,53,61	0
4	PGE	A	1213	10/10	0.92	0.10	55,59,62,66	0
6	EJ4	A	1219	31/31	0.95	0.07	22,25,29,31	0
7	NA	A	1220	1/1	0.98	0.06	26,26,26,26	0

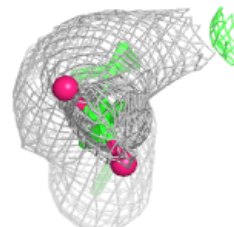
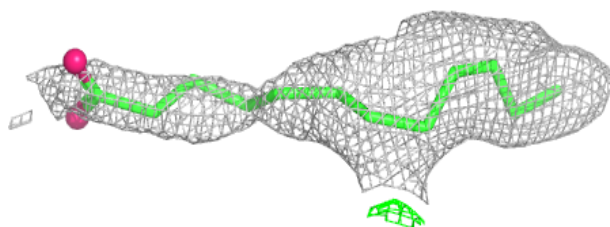
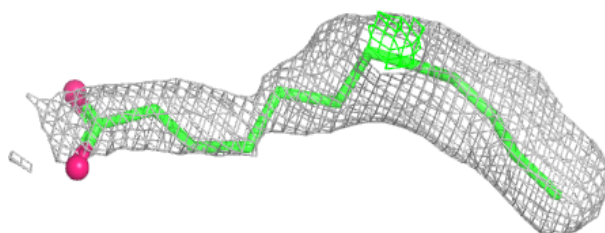
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around OLA A 1216:

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

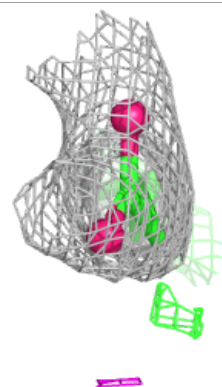
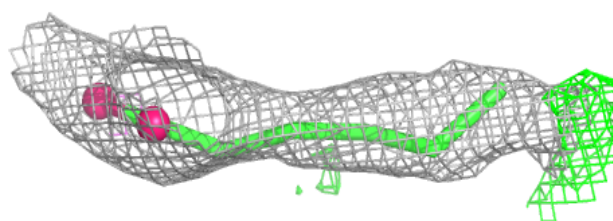
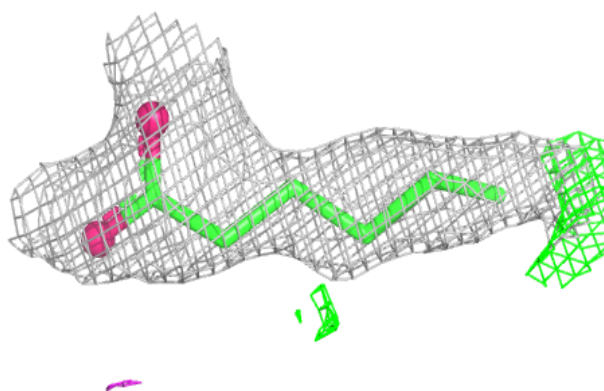
**Electron density around OLA A 1215:**

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

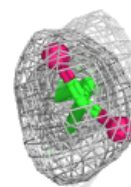
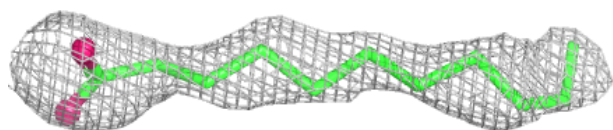
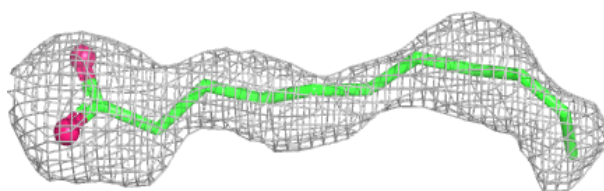


Electron density around OLA A 1217:

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

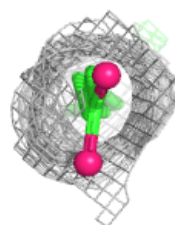
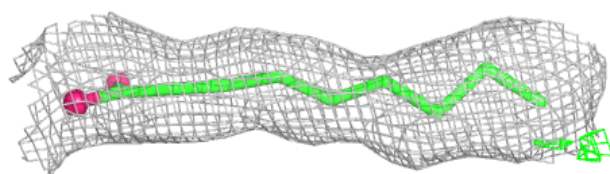
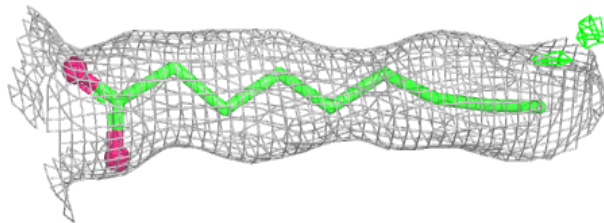
**Electron density around OLA A 1211:**

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

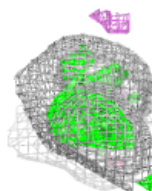
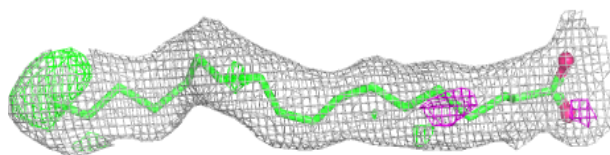
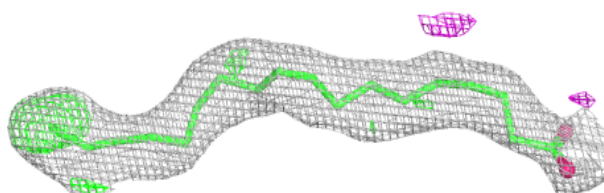


Electron density around OLA A 1210:

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

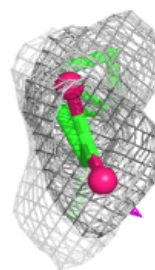
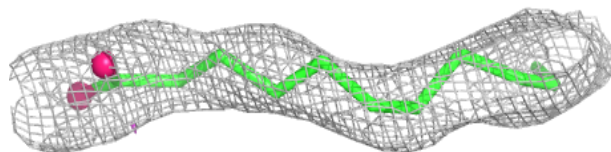
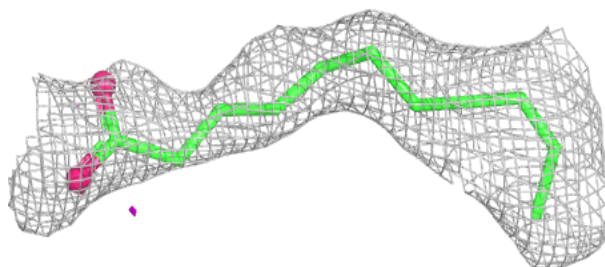
**Electron density around OLA A 1202:**

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

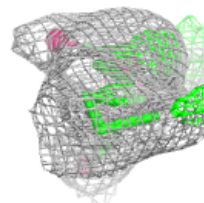
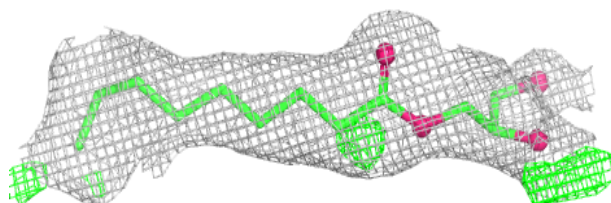
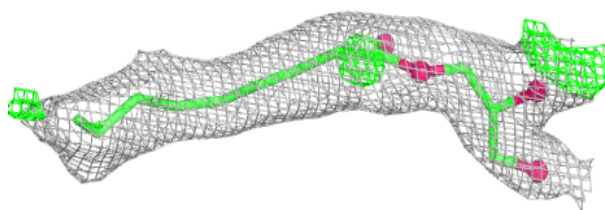


Electron density around OLA A 1209:

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

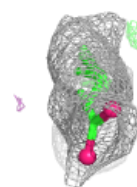
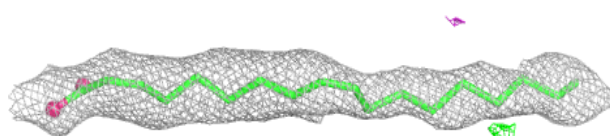
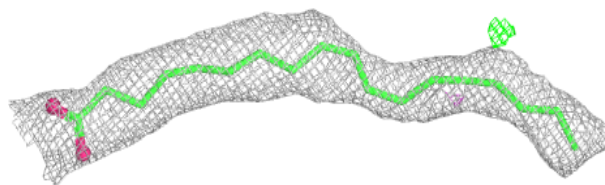
**Electron density around OLC A 1212:**

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

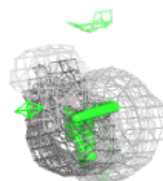
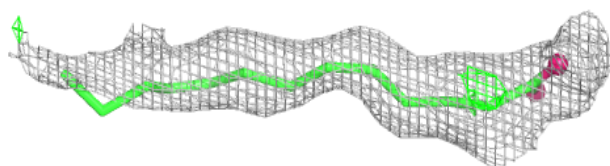
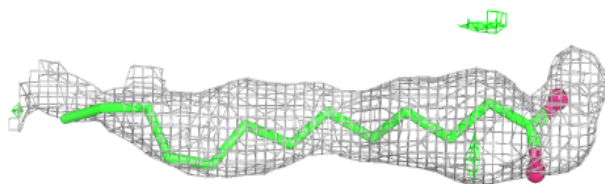


Electron density around OLA A 1205:

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

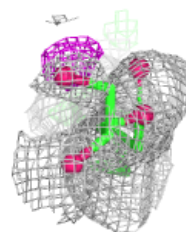
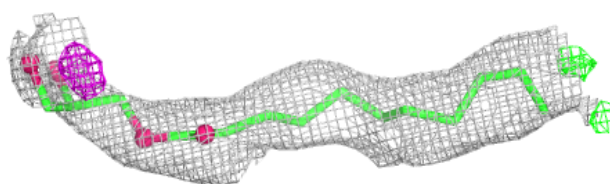
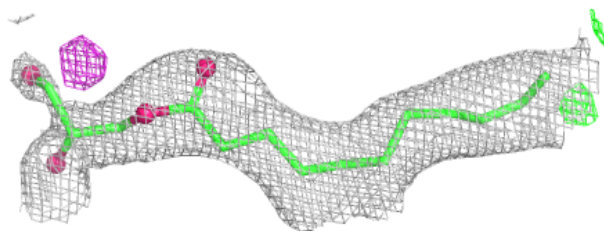
**Electron density around OLA A 1203:**

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

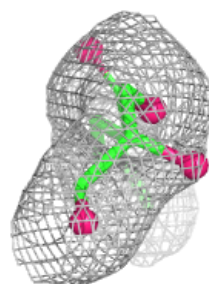
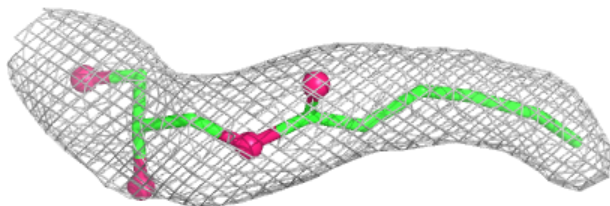
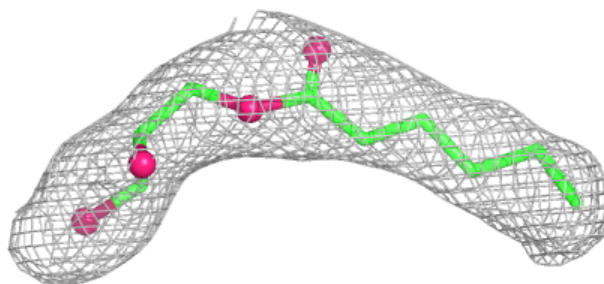


Electron density around OLC A 1208:

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

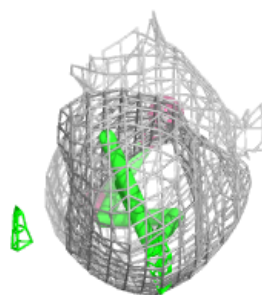
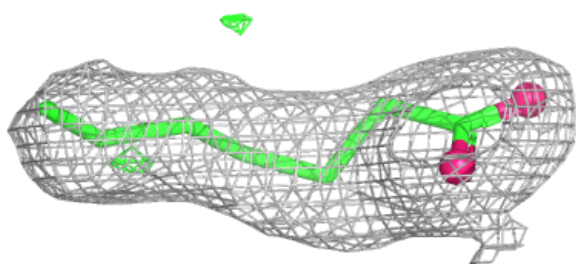
**Electron density around OLC A 1207:**

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

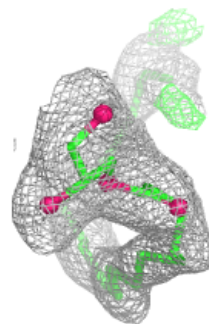
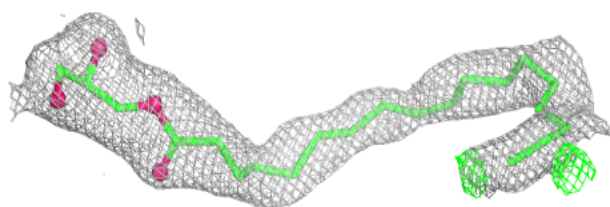
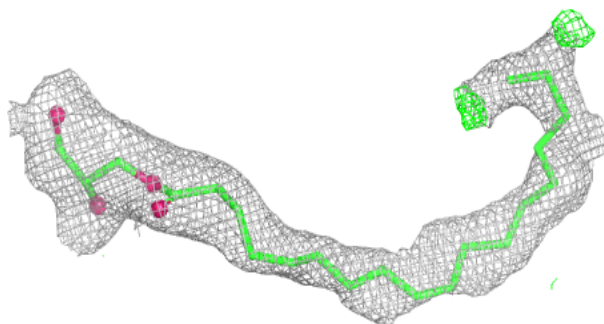


Electron density around OLA A 1206:

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

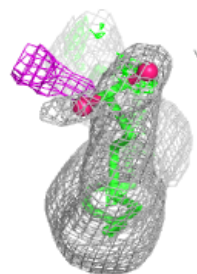
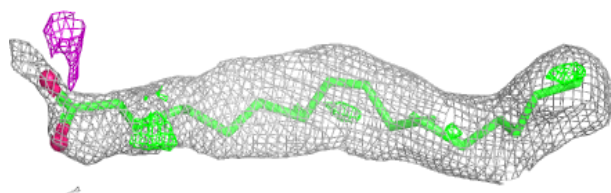
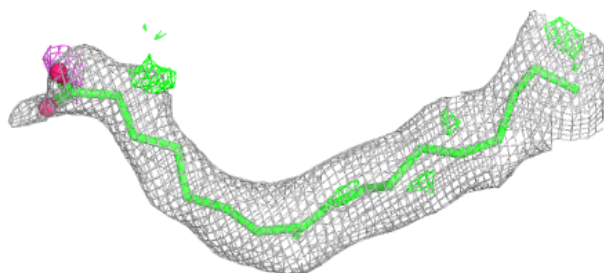
**Electron density around OLC A 1223:**

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

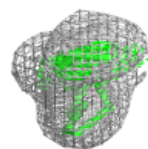
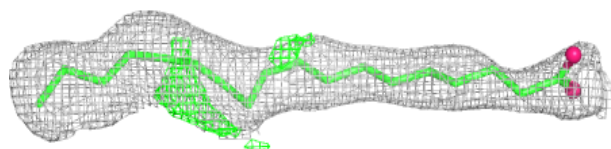
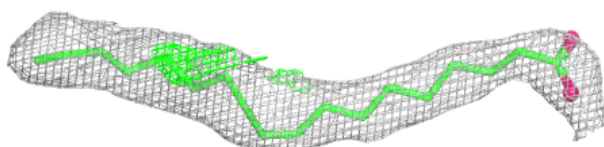


Electron density around OLA A 1201:

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

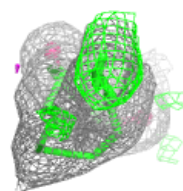
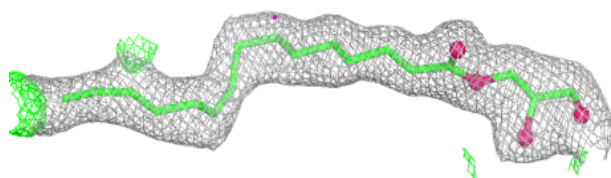
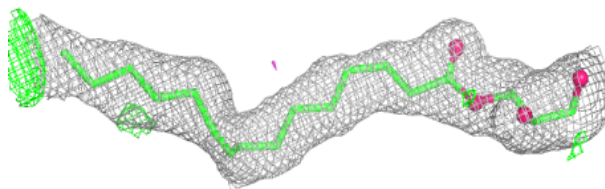
**Electron density around OLA A 1204:**

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

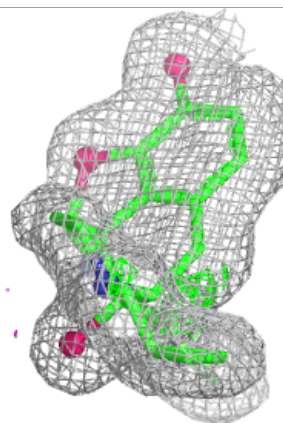
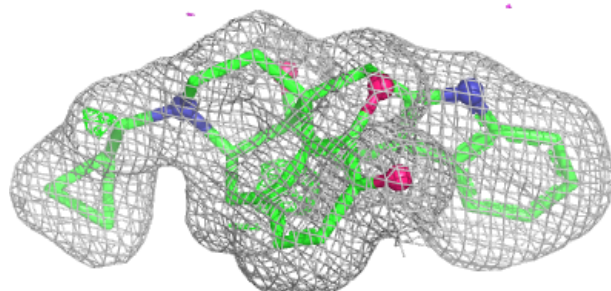
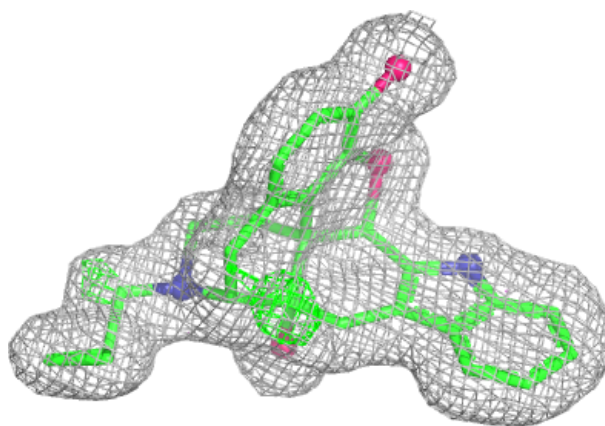


Electron density around OLC A 1222:

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

**Electron density around EJ4 A 1219:**

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



6.5 Other polymers [i](#)

There are no such residues in this entry.