



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 23, 2024 – 05:15 AM EDT

PDB ID : 5NM2  
Title : A2A Adenosine receptor cryo structure  
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Deposited on : 2017-04-05  
Resolution : 1.95 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](mailto: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>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.37.1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

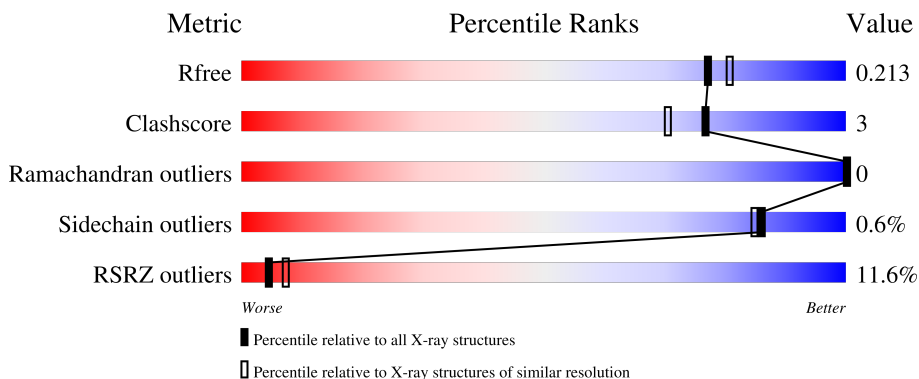
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.95 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	4310 (1.96-1.92)
Clashscore	141614	1023 (1.94-1.94)
Ramachandran outliers	138981	1007 (1.94-1.94)
Sidechain outliers	138945	1007 (1.94-1.94)
RSRZ outliers	127900	4250 (1.96-1.92)

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  $\geq 3$ , 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	433	

## 2 Entry composition i

There are 8 unique types of molecules in this entry. The entry contains 7573 atoms, of which 3875 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 Adenosine receptor A2a,Soluble cytochrome b562,Adenosine receptor A2a.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	388	6475	2070	3304	531	546	24	0	44	0

There are 33 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-8	ASP	-	expression tag	UNP P29274
A	-7	TYR	-	expression tag	UNP P29274
A	-6	LYS	-	expression tag	UNP P29274
A	-5	ASP	-	expression tag	UNP P29274
A	-4	ASP	-	expression tag	UNP P29274
A	-3	ASP	-	expression tag	UNP P29274
A	-2	ASP	-	expression tag	UNP P29274
A	-1	GLY	-	expression tag	UNP P29274
A	0	ALA	-	expression tag	UNP P29274
A	1	PRO	-	expression tag	UNP P29274
A	54	LEU	ALA	engineered mutation	UNP P29274
A	88	ALA	THR	engineered mutation	UNP P29274
A	107	ALA	ARG	engineered mutation	UNP P29274
A	122	ALA	LYS	engineered mutation	UNP P29274
A	154	ALA	ASN	engineered mutation	UNP P29274
A	202	ALA	LEU	engineered mutation	UNP P29274
A	1007	TRP	MET	conflict	UNP P0ABE7
A	1102	ILE	HIS	conflict	UNP P0ABE7
A	1106	LEU	-	linker	UNP P0ABE7
A	235	ALA	LEU	engineered mutation	UNP P29274
A	239	ALA	VAL	engineered mutation	UNP P29274
A	277	ALA	SER	engineered mutation	UNP P29274
A	318	ALA	-	expression tag	UNP P29274
A	319	HIS	-	expression tag	UNP P29274
A	320	HIS	-	expression tag	UNP P29274
A	321	HIS	-	expression tag	UNP P29274

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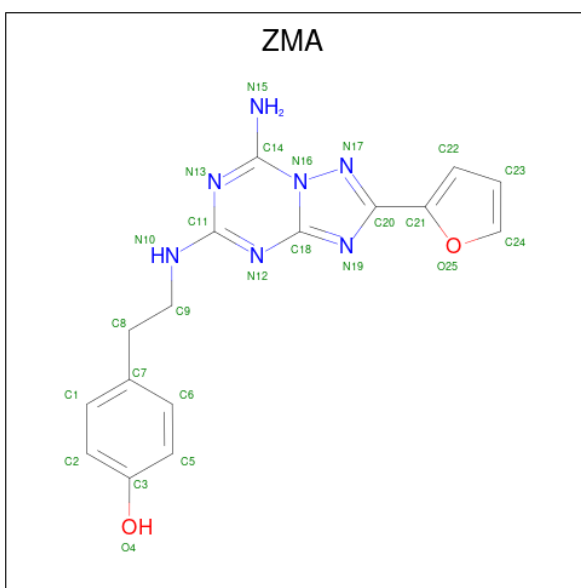
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Chain	Residue	Modelled	Actual	Comment	Reference
A	322	HIS	-	expression tag	UNP P29274
A	323	HIS	-	expression tag	UNP P29274
A	324	HIS	-	expression tag	UNP P29274
A	325	HIS	-	expression tag	UNP P29274
A	326	HIS	-	expression tag	UNP P29274
A	327	HIS	-	expression tag	UNP P29274
A	328	HIS	-	expression tag	UNP P29274

- Molecule 2 is SODIUM ION (three-letter code: NA) (formula: Na).

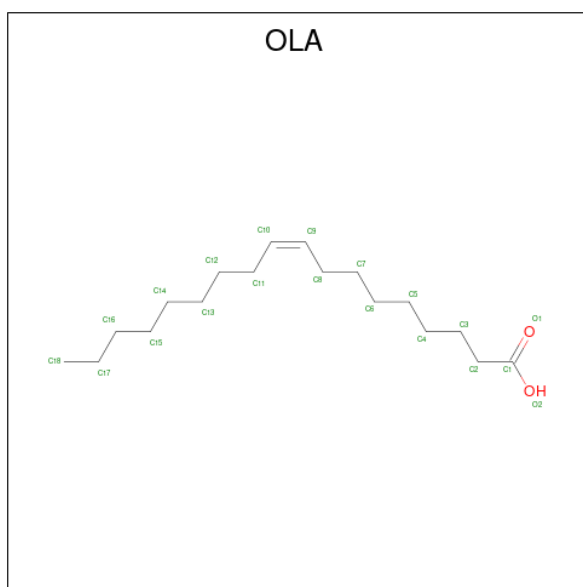
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Na 1 1	0	0

- Molecule 3 is 4-{2-[(7-amino-2-furan-2-yl)[1,2,4]triazolo[1,5-a][1,3,5]triazin-5-yl)amino]ethyl} phenol (three-letter code: ZMA) (formula: C<sub>16</sub>H<sub>15</sub>N<sub>7</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C H N O 40 16 15 7 2	0	0

- Molecule 4 is OLEIC ACID (three-letter code: OLA) (formula: C<sub>18</sub>H<sub>34</sub>O<sub>2</sub>).



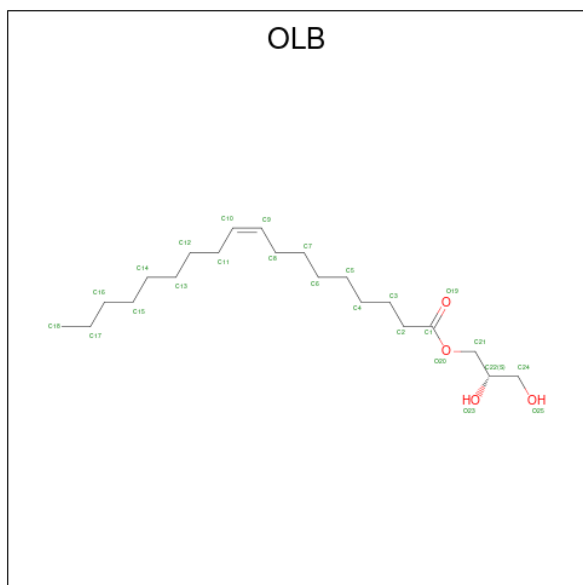
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	H	O	0	0
			53	18	33	2		
4	A	1	Total	C	H	O	0	0
			37	13	22	2		
4	A	1	Total	C	H	O	0	0
			21	7	12	2		
4	A	1	Total	C	H	O	0	0
			46	16	28	2		
4	A	1	Total	C	H	O	0	0
			37	13	22	2		
4	A	1	Total	C	H	O	0	0
			28	10	16	2		
4	A	1	Total	C	H		0	0
			19	7	12			
4	A	1	Total	C	H	O	0	0
			49	17	30	2		
4	A	1	Total	C			0	0
			10	10				
4	A	1	Total	C	H		0	0
			20	7	13			
4	A	1	Total	C	H	O	0	0
			43	15	26	2		
4	A	1	Total	C	H	O	0	0
			26	9	15	2		
4	A	1	Total	C	H		0	0
			37	13	24			
4	A	1	Total	C	H	O	0	0
			43	15	26	2		

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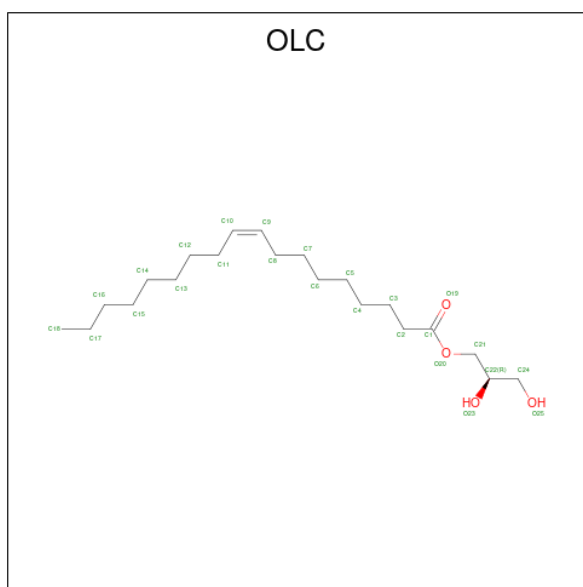
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
4	A	1	28	10	16	2	0	0

- Molecule 5 is (2S)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (three-letter code: OLB) (formula: C<sub>21</sub>H<sub>40</sub>O<sub>4</sub>).



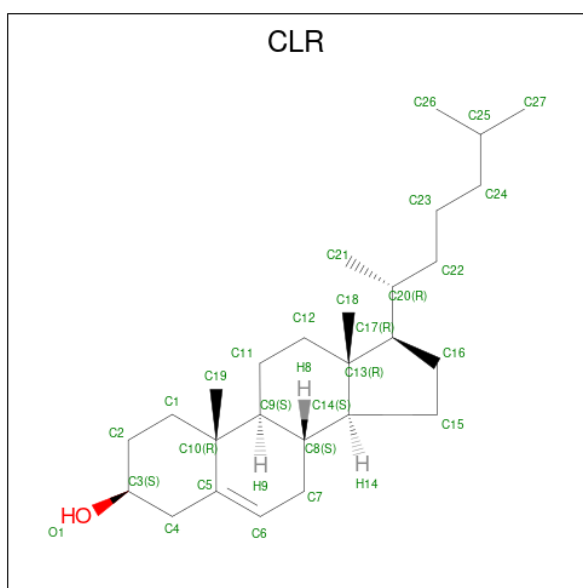
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
5	A	1	46	15	27	4	0	0
5	A	1	49	16	29	4	0	0

- Molecule 6 is (2R)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (three-letter code: OLC) (formula: C<sub>21</sub>H<sub>40</sub>O<sub>4</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total	C	H	O	0	0
			65	21	40	4		
6	A	1	Total	C	H	O	0	0
			46	15	27	4		

- Molecule 7 is CHOLESTEROL (three-letter code: CLR) (formula:  $C_{27}H_{46}O$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	A	1	Total	C	H	O	0	0
			74	27	46	1		
7	A	1	Total	C	H	O	0	0
			74	27	46	1		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
7	A	1	74	27	46	1	0	0

- Molecule 8 is water.

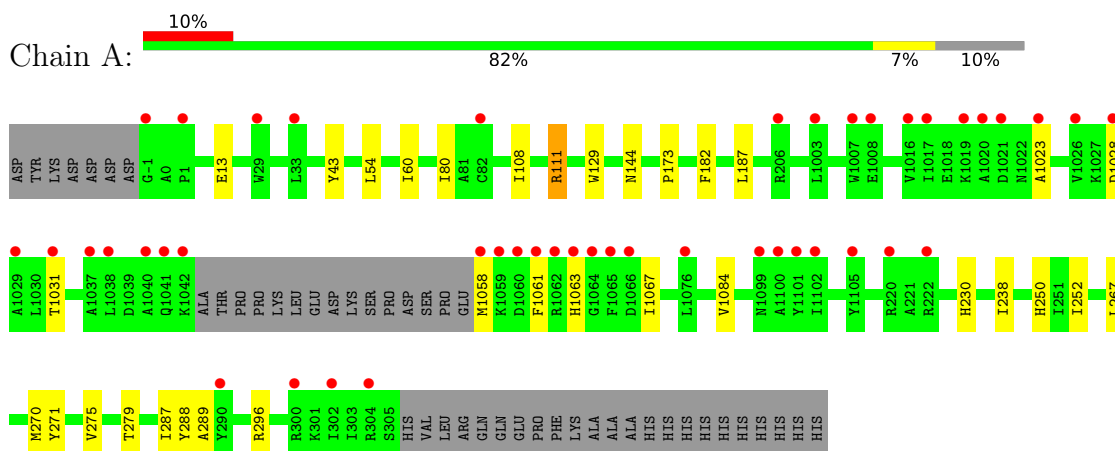
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
8	A	132	132	132	0	0



### 3 Residue-property plots [i](#)

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

- Molecule 1: Adenosine receptor A2a,Soluble cytochrome b562,Adenosine receptor A2a



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	39.43Å 179.60Å 139.85Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	41.37 – 1.95 44.90 – 1.95	Depositor EDS
% Data completeness (in resolution range)	87.5 (41.37-1.95) 87.5 (44.90-1.95)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.19 (at 1.95Å)	Xtrriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, $R_{free}$	0.175 , 0.212 0.175 , 0.213	Depositor DCC
$R_{free}$ test set	1589 reflections (4.91%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	34.1	Xtrriage
Anisotropy	0.232	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 64.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	7573	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	54.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.55% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: OLA, OLB, OLC, ZMA, NA, CLR

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	0.62	0/3405	0.63	0/4628

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	3171	3304	3130	20	0
2	A	1	0	0	0	0
3	A	25	15	15	1	0
4	A	202	295	287	2	0
5	A	39	56	52	0	0
6	A	44	67	65	4	0
7	A	84	138	138	1	0
8	A	132	0	0	3	0
All	All	3698	3875	3687	22	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 3.

All (22) 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)
4:A:1203:OLA:O1	8:A:1301:HOH:O	2.04	0.74
1:A:1058:MET:N	8:A:1302:HOH:O	2.27	0.68
1:A:250:HIS:CE1	3:A:1202:ZMA:H24	2.40	0.56
1:A:275[B]:VAL:O	1:A:279[B]:THR:HG23	2.09	0.53
1:A:1028:ASP:O	1:A:1031[A]:THR:OG1	2.26	0.52
1:A:238[B]:ILE:HD11	1:A:287:ILE:HB	1.91	0.51
1:A:13:GLU:HB3	1:A:60:ILE:HG23	1.94	0.50
1:A:80[A]:ILE:HD11	7:A:1222:CLR:H182	1.96	0.48
1:A:43:TYR:CD2	6:A:1221:OLC:H24A	2.49	0.48
1:A:182:PHE:CE1	1:A:187[B]:LEU:HG	2.50	0.47
1:A:108:ILE:HB	1:A:111:ARG:HG3	1.96	0.46
1:A:230:HIS:CD2	8:A:1322:HOH:O	2.69	0.45
1:A:267[A]:LEU:HD11	1:A:271:TYR:HE2	1.81	0.44
1:A:129:TRP:NE1	6:A:1221:OLC:H7	2.34	0.43
1:A:54:LEU:HD11	6:A:1221:OLC:H10	2.01	0.43
1:A:252:ILE:HG21	1:A:270:MET:SD	2.60	0.42
1:A:238[A]:ILE:CD1	1:A:288:TYR:CE1	3.03	0.42
1:A:144:ASN:HA	1:A:173:PRO:HD3	2.02	0.42
4:A:1203:OLA:H152	6:A:1220:OLC:H13	2.01	0.41
1:A:1023:ALA:CA	1:A:1084:VAL:HG22	2.51	0.41
1:A:1063:HIS:O	1:A:1067:ILE:HG13	2.21	0.41
1:A:289:ALA:O	1:A:296:ARG:HD3	2.21	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	428/433 (99%)	425 (99%)	3 (1%)	0	<b>100</b> <b>100</b>

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	352/353 (100%)	350 (99%)	2 (1%)	<a href="#">86</a> <a href="#">85</a>

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

Mol	Chain	Res	Type
1	A	111	ARG
1	A	1061	PHE

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

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

Of 24 ligands modelled in this entry, 1 is monoatomic - leaving 23 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$
7	CLR	A	1222	-	31,31,31	0.38	0	48,48,48	0.50	0
4	OLA	A	1211	-	9,9,19	1.01	1 (11%)	8,8,19	0.68	0
7	CLR	A	1224	-	31,31,31	0.27	0	48,48,48	0.47	0
7	CLR	A	1223	-	31,31,31	0.24	0	48,48,48	0.44	0
4	OLA	A	1214	-	10,10,19	0.72	0	10,10,19	1.16	2 (20%)
5	OLB	A	1219	-	19,19,24	0.99	1 (5%)	20,20,25	1.27	1 (5%)
4	OLA	A	1205	-	8,8,19	0.68	0	8,8,19	1.35	2 (25%)
4	OLA	A	1208	-	11,11,19	1.00	1 (9%)	11,11,19	1.22	1 (9%)
4	OLA	A	1217	-	11,11,19	1.11	1 (9%)	11,11,19	0.84	0
4	OLA	A	1215	-	12,12,19	0.90	1 (8%)	11,11,19	0.25	0
6	OLC	A	1220	-	24,24,24	0.82	2 (8%)	25,25,25	1.31	5 (20%)
4	OLA	A	1216	-	16,16,19	0.89	1 (6%)	16,16,19	1.13	2 (12%)
4	OLA	A	1210	-	18,18,19	0.79	1 (5%)	18,18,19	1.07	2 (11%)
4	OLA	A	1207	-	14,14,19	0.91	1 (7%)	14,14,19	0.89	0
4	OLA	A	1203	-	19,19,19	0.84	1 (5%)	19,19,19	0.86	1 (5%)
4	OLA	A	1213	-	16,16,19	0.85	1 (6%)	16,16,19	1.14	2 (12%)
4	OLA	A	1206	-	17,17,19	0.82	1 (5%)	17,17,19	1.13	3 (17%)
4	OLA	A	1212	-	6,6,19	0.31	0	5,5,19	0.38	0
3	ZMA	A	1202	-	21,28,28	0.97	3 (14%)	20,39,39	1.63	3 (15%)
6	OLC	A	1221	-	18,18,24	0.98	1 (5%)	18,19,25	1.33	3 (16%)
4	OLA	A	1204	-	14,14,19	0.86	1 (7%)	14,14,19	1.10	0
4	OLA	A	1209	-	6,6,19	0.36	0	5,5,19	0.19	0
5	OLB	A	1218	-	18,18,24	1.04	2 (11%)	18,19,25	1.20	1 (5%)

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
7	CLR	A	1222	-	-	0/10/68/68	0/4/4/4
4	OLA	A	1211	-	-	5/7/7/17	-
7	CLR	A	1224	-	-	2/10/68/68	0/4/4/4
7	CLR	A	1223	-	-	2/10/68/68	0/4/4/4
4	OLA	A	1214	-	-	5/8/8/17	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	OLB	A	1219	-	-	9/19/19/24	-
4	OLA	A	1205	-	-	1/6/6/17	-
4	OLA	A	1208	-	-	6/9/9/17	-
4	OLA	A	1217	-	-	5/9/9/17	-
4	OLA	A	1215	-	-	4/10/10/17	-
6	OLC	A	1220	-	-	8/24/24/24	-
4	OLA	A	1216	-	-	6/14/14/17	-
4	OLA	A	1210	-	-	5/16/16/17	-
4	OLA	A	1207	-	-	6/12/12/17	-
4	OLA	A	1203	-	-	8/17/17/17	-
4	OLA	A	1213	-	-	7/14/14/17	-
4	OLA	A	1206	-	-	9/15/15/17	-
4	OLA	A	1212	-	-	1/4/4/17	-
3	ZMA	A	1202	-	-	0/6/10/10	0/4/4/4
6	OLC	A	1221	-	-	6/18/18/24	-
4	OLA	A	1204	-	-	6/12/12/17	-
4	OLA	A	1209	-	-	2/4/4/17	-
5	OLB	A	1218	-	-	7/18/18/24	-

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1221	OLC	O20-C1	3.08	1.42	1.33
5	A	1219	OLB	O20-C1	3.04	1.42	1.33
4	A	1215	OLA	C10-C9	2.93	1.48	1.31
4	A	1211	OLA	C9-C10	2.92	1.48	1.28
4	A	1217	OLA	C10-C9	2.91	1.48	1.28
4	A	1213	OLA	C10-C9	2.90	1.48	1.31
4	A	1216	OLA	C10-C9	2.83	1.48	1.31
4	A	1203	OLA	C10-C9	2.79	1.47	1.31
4	A	1207	OLA	C10-C9	2.73	1.47	1.31
4	A	1208	OLA	C10-C9	2.73	1.47	1.28
6	A	1220	OLC	O20-C1	2.72	1.41	1.33
4	A	1206	OLA	C10-C9	2.67	1.47	1.31
4	A	1210	OLA	C10-C9	2.62	1.47	1.31
3	A	1202	ZMA	C20-N19	2.62	1.39	1.34
4	A	1204	OLA	C10-C9	2.56	1.46	1.31
5	A	1218	OLB	O20-C21	-2.51	1.39	1.45
5	A	1218	OLB	O19-C1	-2.43	1.15	1.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1202	ZMA	C23-C22	2.19	1.48	1.39
6	A	1220	OLC	O20-C21	-2.14	1.40	1.45
3	A	1202	ZMA	C22-C21	-2.03	1.34	1.42

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1202	ZMA	N15-C14-N16	5.44	121.63	117.97
5	A	1219	OLB	O20-C1-C2	3.84	123.96	111.91
5	A	1218	OLB	O20-C1-C2	3.37	122.48	111.91
6	A	1220	OLC	O20-C1-C2	3.09	121.61	111.91
4	A	1216	OLA	C3-C2-C1	-3.09	106.69	114.47
4	A	1213	OLA	O2-C1-C2	2.80	123.04	114.03
6	A	1221	OLC	C5-C6-C7	-2.67	100.85	114.42
4	A	1214	OLA	O2-C1-O1	-2.62	116.77	123.30
4	A	1206	OLA	O2-C1-C2	2.60	122.39	114.03
4	A	1210	OLA	O2-C1-C2	2.58	122.33	114.03
6	A	1220	OLC	C4-C5-C6	-2.52	101.62	114.42
6	A	1221	OLC	O20-C1-C2	2.46	119.62	111.91
4	A	1206	OLA	C3-C2-C1	-2.39	108.46	114.47
3	A	1202	ZMA	C9-C8-C7	-2.36	107.41	112.87
4	A	1214	OLA	O2-C1-C2	2.32	121.47	114.03
4	A	1210	OLA	C3-C2-C1	-2.25	108.81	114.47
4	A	1213	OLA	O2-C1-O1	-2.22	117.77	123.30
4	A	1205	OLA	O2-C1-O1	-2.21	117.79	123.30
4	A	1205	OLA	O2-C1-C2	2.20	121.11	114.03
6	A	1221	OLC	C4-C3-C2	-2.18	105.36	113.19
4	A	1206	OLA	O2-C1-O1	-2.15	117.94	123.30
6	A	1220	OLC	O19-C1-C2	-2.15	115.36	123.73
6	A	1220	OLC	C4-C3-C2	-2.15	105.47	113.19
4	A	1216	OLA	O2-C1-C2	2.12	120.86	114.03
6	A	1220	OLC	C3-C2-C1	-2.07	106.09	113.62
4	A	1208	OLA	O2-C1-C2	2.01	120.50	114.03
4	A	1203	OLA	O2-C1-C2	2.01	120.50	114.03
3	A	1202	ZMA	C22-C23-C24	-2.00	105.80	112.92

There are no chirality outliers.

All (110) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1213	OLA	C11-C10-C9-C8
4	A	1216	OLA	C11-C10-C9-C8

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Mol	Chain	Res	Type	Atoms
5	A	1218	OLB	C21-C22-C24-O25
5	A	1218	OLB	O23-C22-C24-O25
5	A	1219	OLB	C10-C11-C12-C13
5	A	1219	OLB	O19-C1-O20-C21
5	A	1219	OLB	C2-C1-O20-C21
4	A	1206	OLA	C11-C10-C9-C8
4	A	1210	OLA	C11-C10-C9-C8
4	A	1217	OLA	C1-C2-C3-C4
4	A	1203	OLA	C1-C2-C3-C4
4	A	1207	OLA	C1-C2-C3-C4
4	A	1208	OLA	C1-C2-C3-C4
4	A	1214	OLA	C3-C4-C5-C6
4	A	1204	OLA	C5-C6-C7-C8
4	A	1203	OLA	C3-C4-C5-C6
4	A	1215	OLA	C12-C13-C14-C15
7	A	1224	CLR	C22-C23-C24-C25
6	A	1220	OLC	C11-C12-C13-C14
6	A	1220	OLC	C12-C13-C14-C15
4	A	1211	OLA	C10-C11-C12-C13
4	A	1208	OLA	C4-C5-C6-C7
4	A	1214	OLA	C4-C5-C6-C7
5	A	1219	OLB	C3-C4-C5-C6
6	A	1220	OLC	C5-C6-C7-C8
4	A	1204	OLA	C3-C4-C5-C6
4	A	1213	OLA	C2-C3-C4-C5
4	A	1216	OLA	C3-C4-C5-C6
6	A	1220	OLC	C14-C15-C16-C17
7	A	1223	CLR	C23-C24-C25-C26
4	A	1203	OLA	C11-C12-C13-C14
4	A	1203	OLA	C4-C5-C6-C7
4	A	1206	OLA	C4-C5-C6-C7
4	A	1209	OLA	C3-C4-C5-C6
5	A	1219	OLB	C6-C7-C8-C9
4	A	1214	OLA	C5-C6-C7-C8
4	A	1207	OLA	C3-C4-C5-C6
4	A	1211	OLA	C11-C12-C13-C14
4	A	1207	OLA	C4-C5-C6-C7
7	A	1223	CLR	C23-C24-C25-C27
4	A	1217	OLA	C2-C3-C4-C5
5	A	1218	OLB	C2-C3-C4-C5
4	A	1217	OLA	C4-C5-C6-C7
4	A	1206	OLA	C3-C4-C5-C6

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Mol	Chain	Res	Type	Atoms
6	A	1221	OLC	C2-C3-C4-C5
6	A	1220	OLC	C10-C11-C12-C13
4	A	1208	OLA	C3-C4-C5-C6
4	A	1213	OLA	C12-C13-C14-C15
4	A	1203	OLA	C11-C10-C9-C8
4	A	1203	OLA	C2-C3-C4-C5
4	A	1206	OLA	C2-C3-C4-C5
4	A	1214	OLA	C6-C7-C8-C9
6	A	1221	OLC	C6-C7-C8-C9
4	A	1215	OLA	C11-C10-C9-C8
6	A	1221	OLC	C2-C1-O20-C21
4	A	1206	OLA	C5-C6-C7-C8
4	A	1215	OLA	C14-C15-C16-C17
6	A	1221	OLC	O19-C1-O20-C21
4	A	1210	OLA	C11-C12-C13-C14
5	A	1218	OLB	C3-C4-C5-C6
4	A	1206	OLA	C6-C7-C8-C9
5	A	1219	OLB	C7-C8-C9-C10
6	A	1221	OLC	C9-C10-C11-C12
4	A	1210	OLA	C5-C6-C7-C8
4	A	1216	OLA	C11-C12-C13-C14
5	A	1219	OLB	C5-C6-C7-C8
7	A	1224	CLR	C23-C24-C25-C27
4	A	1210	OLA	C3-C4-C5-C6
6	A	1220	OLC	C4-C5-C6-C7
4	A	1205	OLA	C3-C4-C5-C6
4	A	1204	OLA	C11-C10-C9-C8
4	A	1211	OLA	C12-C13-C14-C15
4	A	1209	OLA	C1-C2-C3-C4
5	A	1218	OLB	C9-C10-C11-C12
4	A	1217	OLA	C3-C4-C5-C6
4	A	1203	OLA	C15-C16-C17-C18
5	A	1218	OLB	O19-C1-O20-C21
4	A	1212	OLA	C6-C7-C8-C9
4	A	1216	OLA	O2-C1-C2-C3
5	A	1219	OLB	C9-C10-C11-C12
4	A	1217	OLA	C7-C8-C9-C10
4	A	1214	OLA	C2-C3-C4-C5
4	A	1207	OLA	C11-C10-C9-C8
4	A	1208	OLA	C7-C8-C9-C10
4	A	1216	OLA	O1-C1-C2-C3
4	A	1206	OLA	O1-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
4	A	1207	OLA	C5-C6-C7-C8
4	A	1204	OLA	O1-C1-C2-C3
4	A	1206	OLA	O2-C1-C2-C3
4	A	1216	OLA	C9-C10-C11-C12
4	A	1215	OLA	C10-C11-C12-C13
4	A	1211	OLA	C9-C10-C11-C12
5	A	1218	OLB	C2-C1-O20-C21
4	A	1206	OLA	C9-C10-C11-C12
4	A	1210	OLA	C7-C8-C9-C10
6	A	1220	OLC	C7-C8-C9-C10
4	A	1213	OLA	C7-C8-C9-C10
4	A	1204	OLA	C9-C10-C11-C12
4	A	1208	OLA	O2-C1-C2-C3
6	A	1221	OLC	C5-C6-C7-C8
6	A	1220	OLC	C9-C10-C11-C12
4	A	1211	OLA	C15-C16-C17-C18
4	A	1204	OLA	O2-C1-C2-C3
4	A	1208	OLA	O1-C1-C2-C3
4	A	1207	OLA	C7-C8-C9-C10
4	A	1213	OLA	C9-C10-C11-C12
5	A	1219	OLB	O23-C22-C24-O25
4	A	1213	OLA	O1-C1-C2-C3
4	A	1203	OLA	C9-C10-C11-C12
4	A	1213	OLA	O2-C1-C2-C3

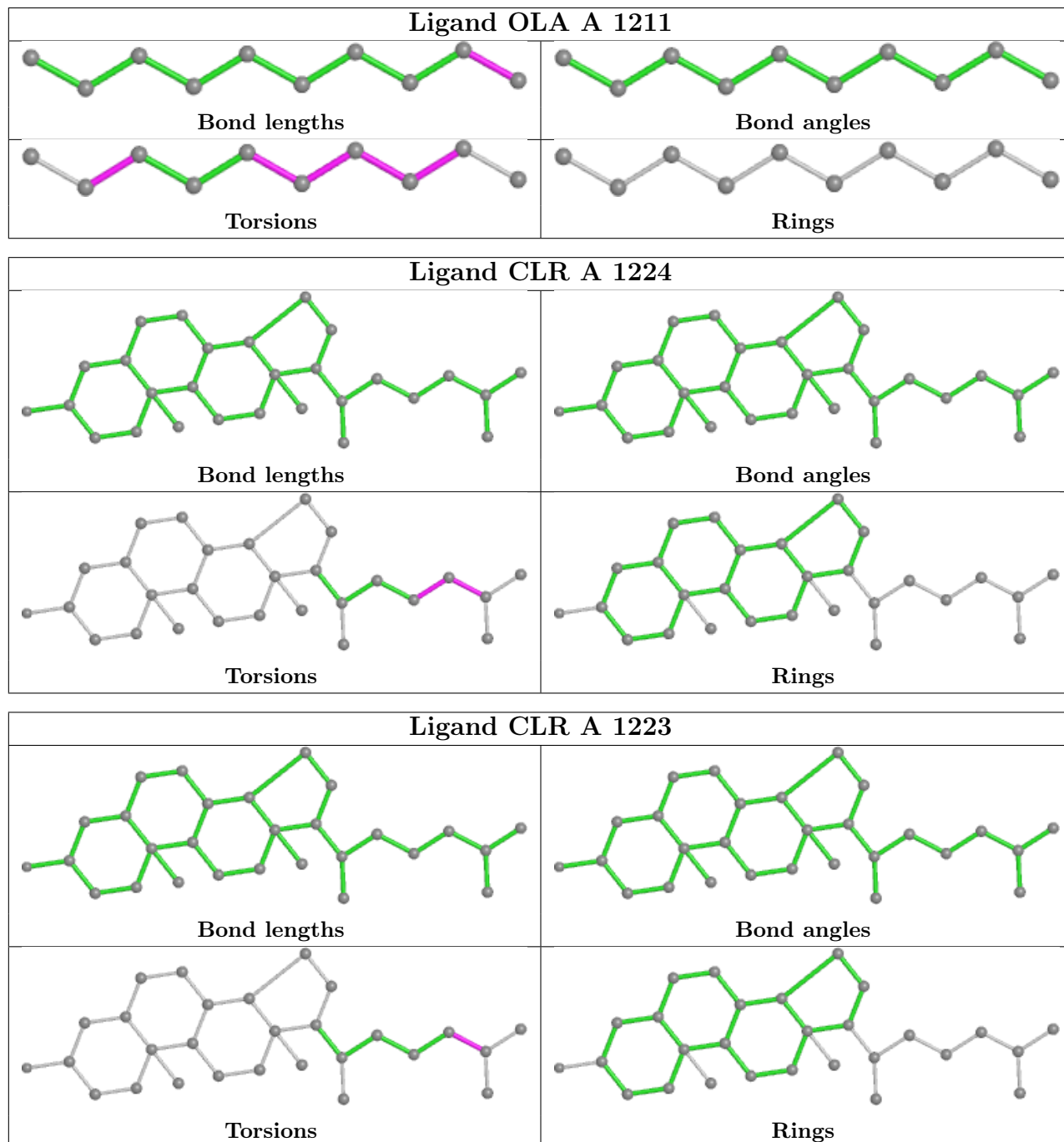
There are no ring outliers.

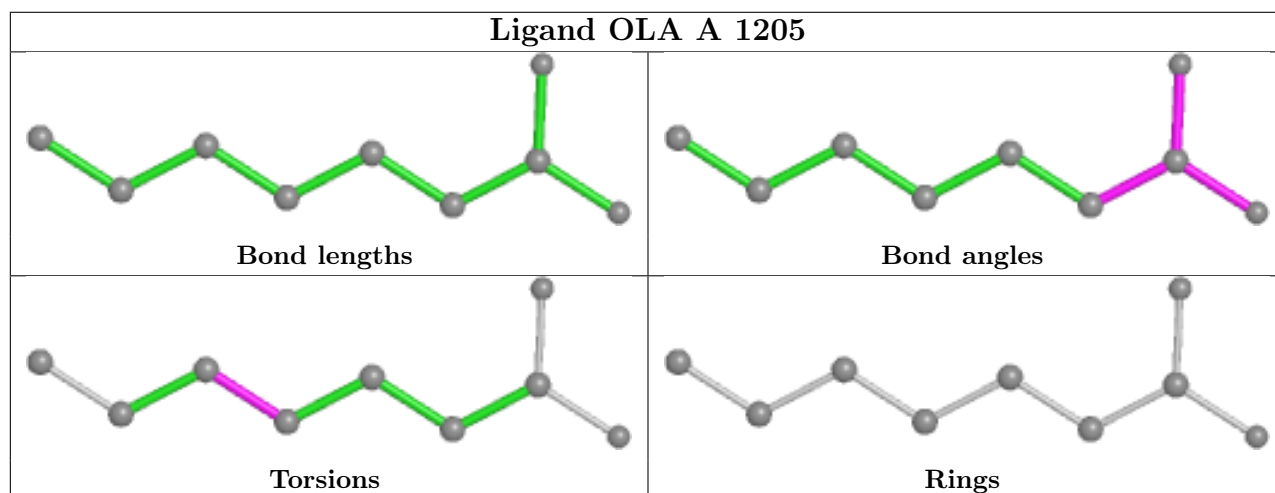
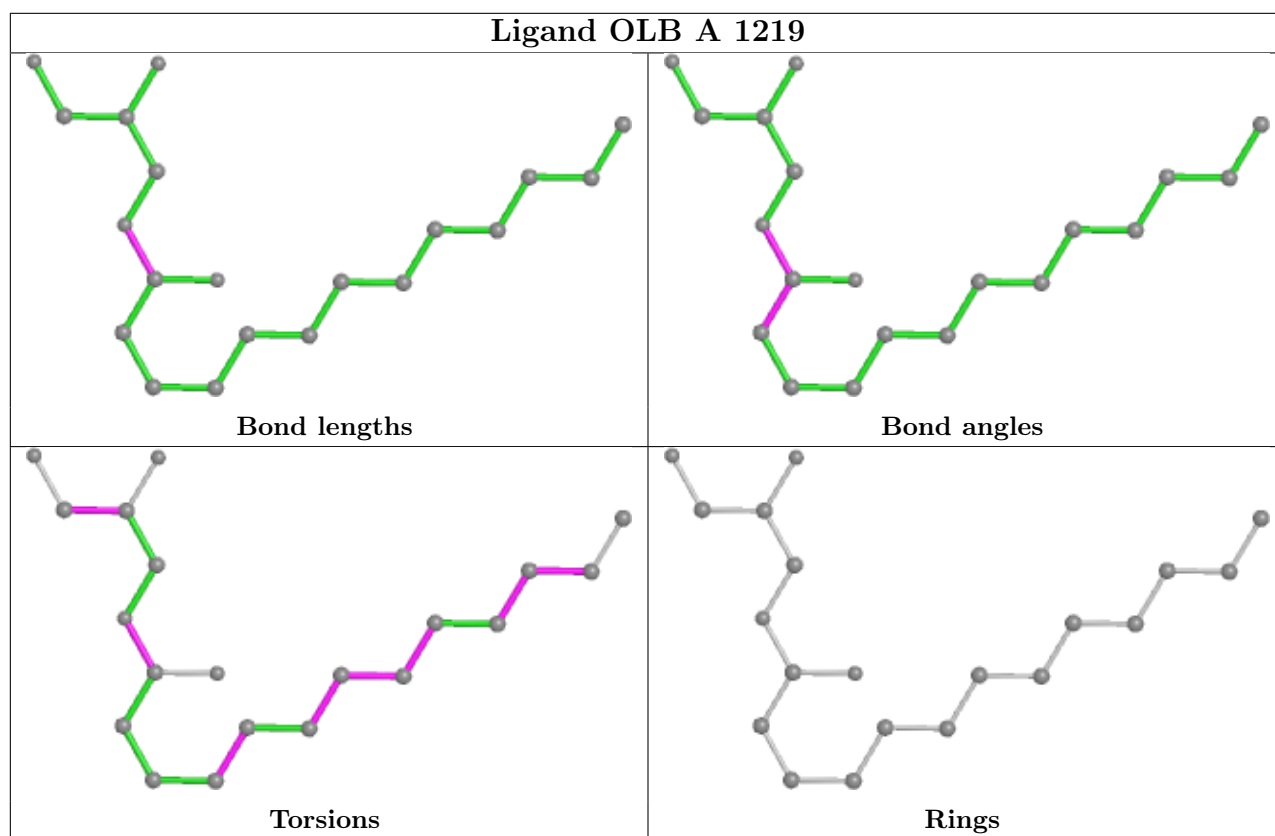
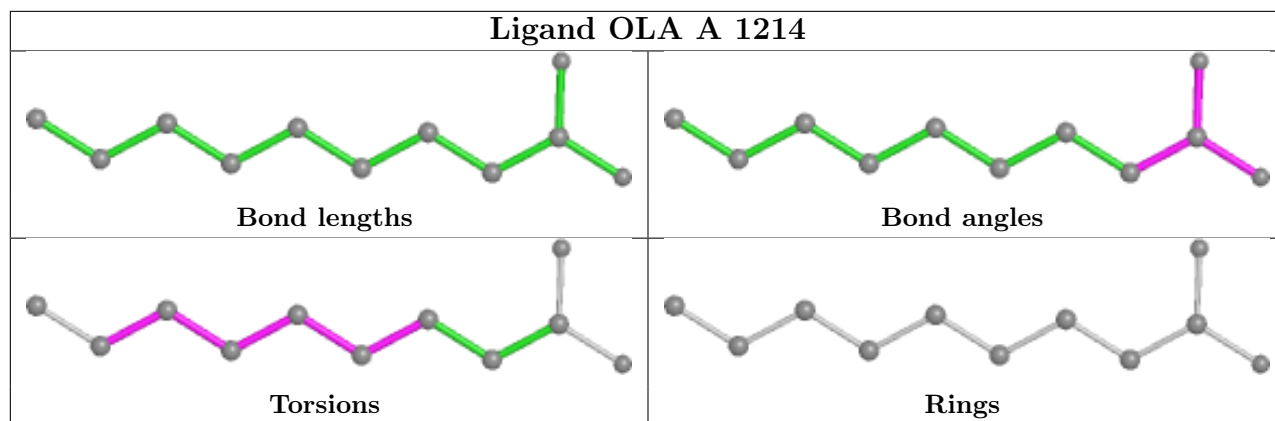
5 monomers are involved in 7 short contacts:

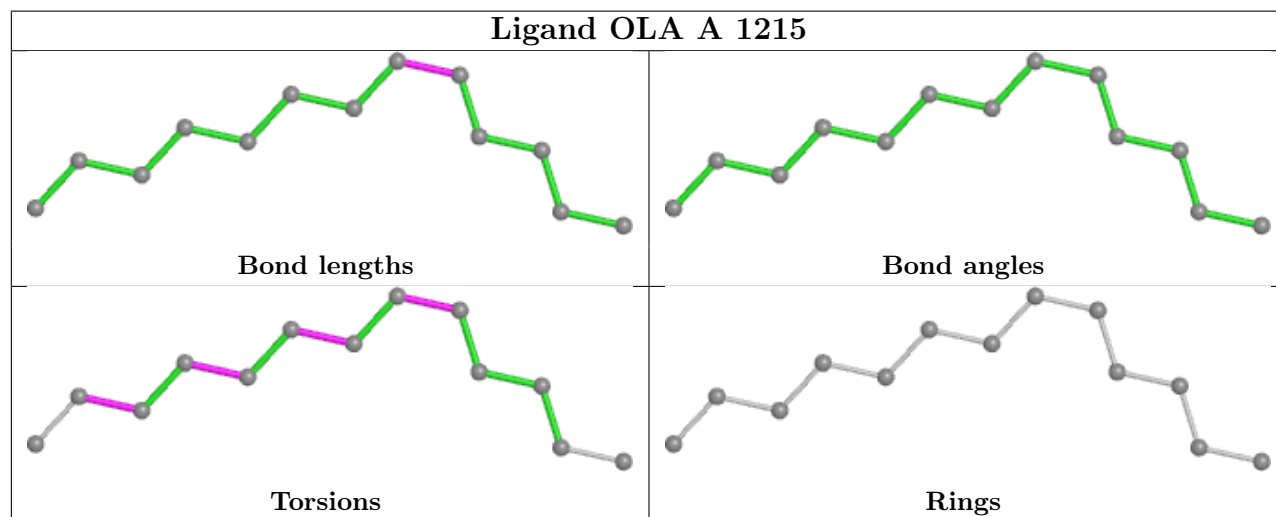
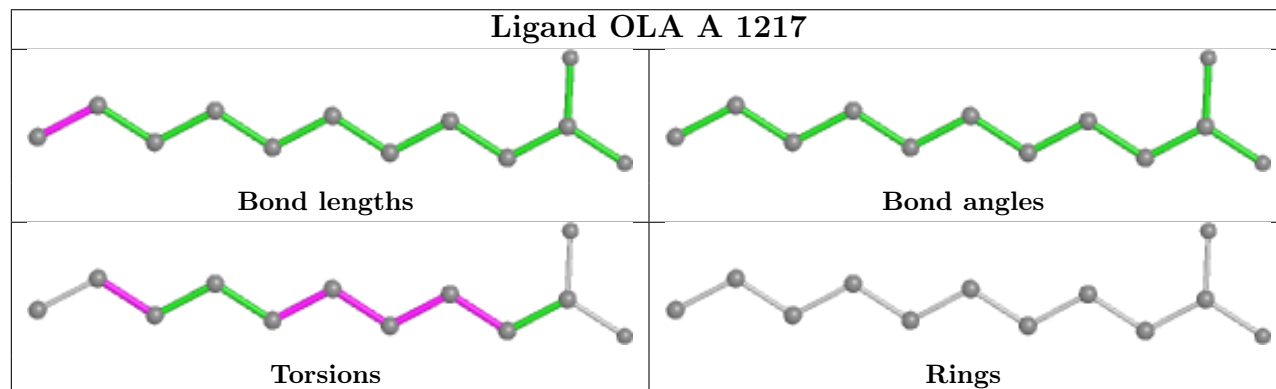
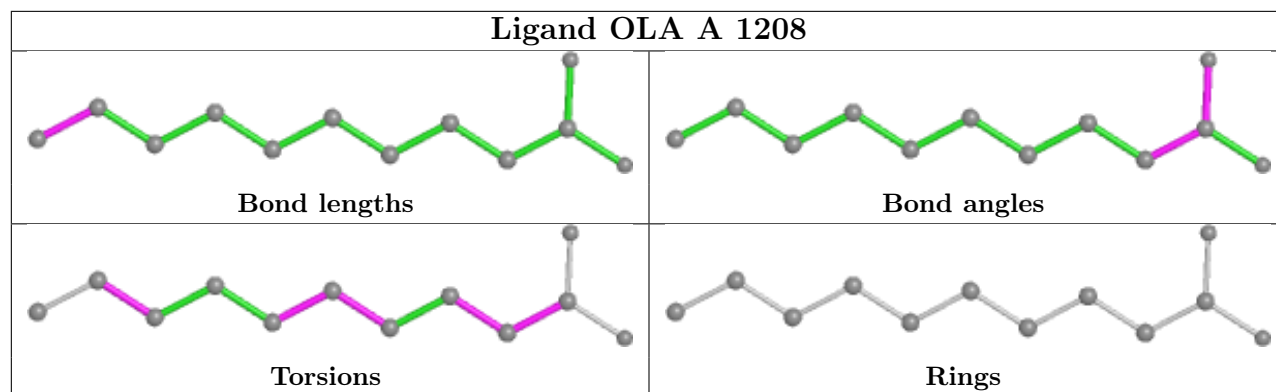
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	1222	CLR	1	0
6	A	1220	OLC	1	0
4	A	1203	OLA	2	0
3	A	1202	ZMA	1	0
6	A	1221	OLC	3	0

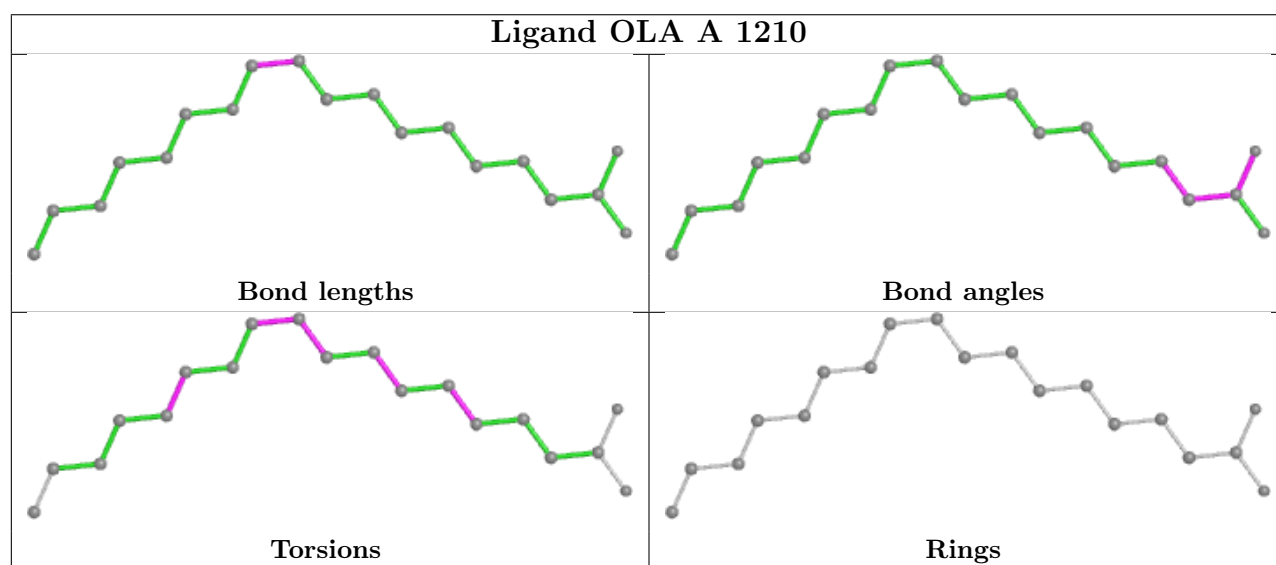
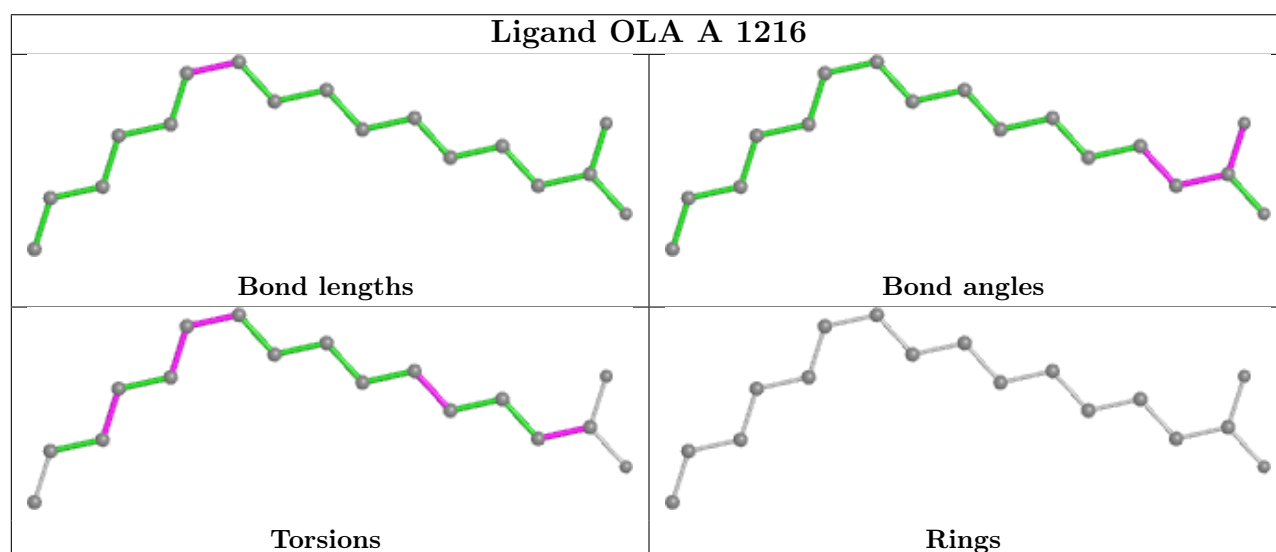
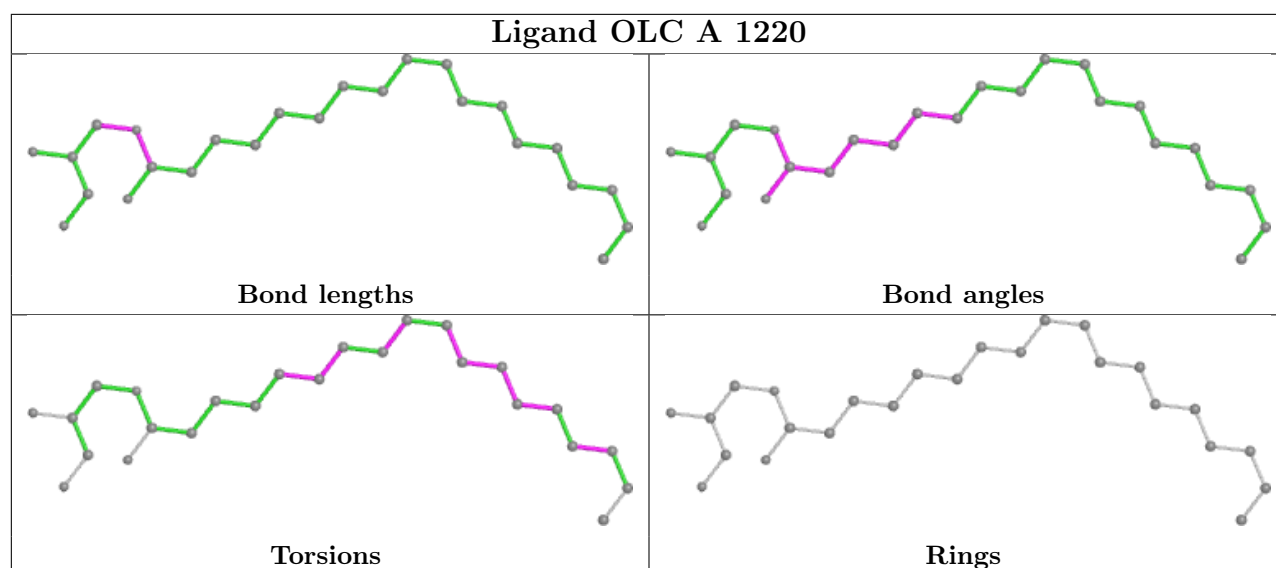
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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

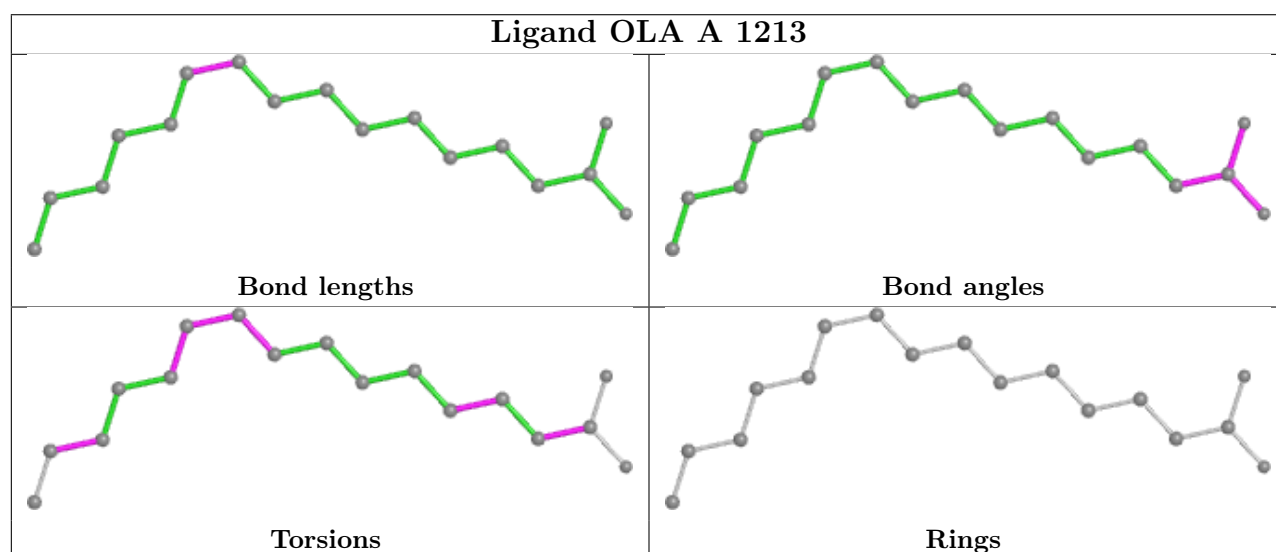
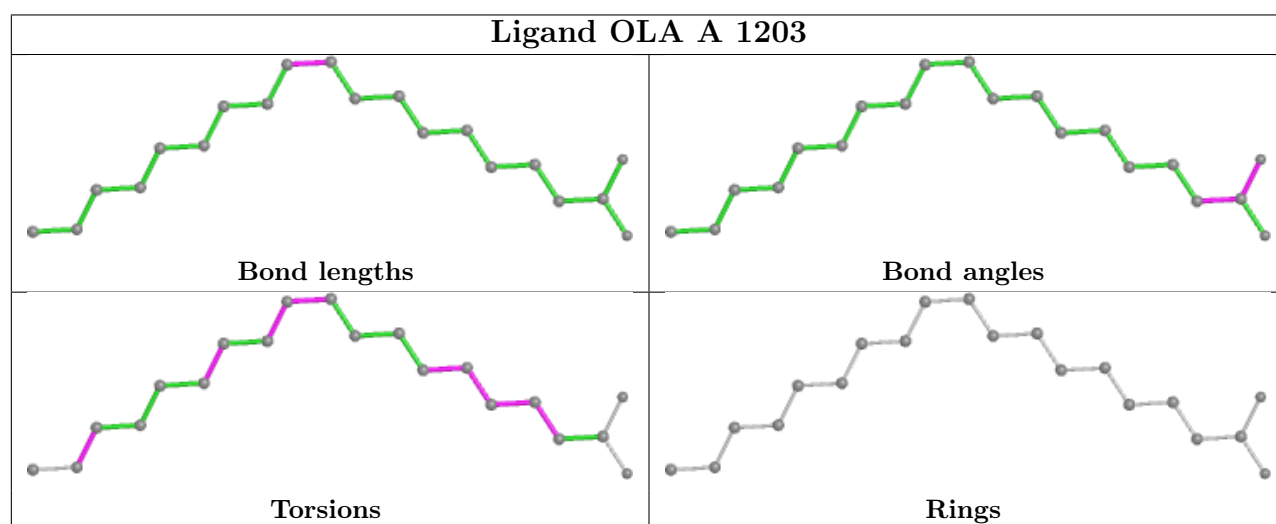
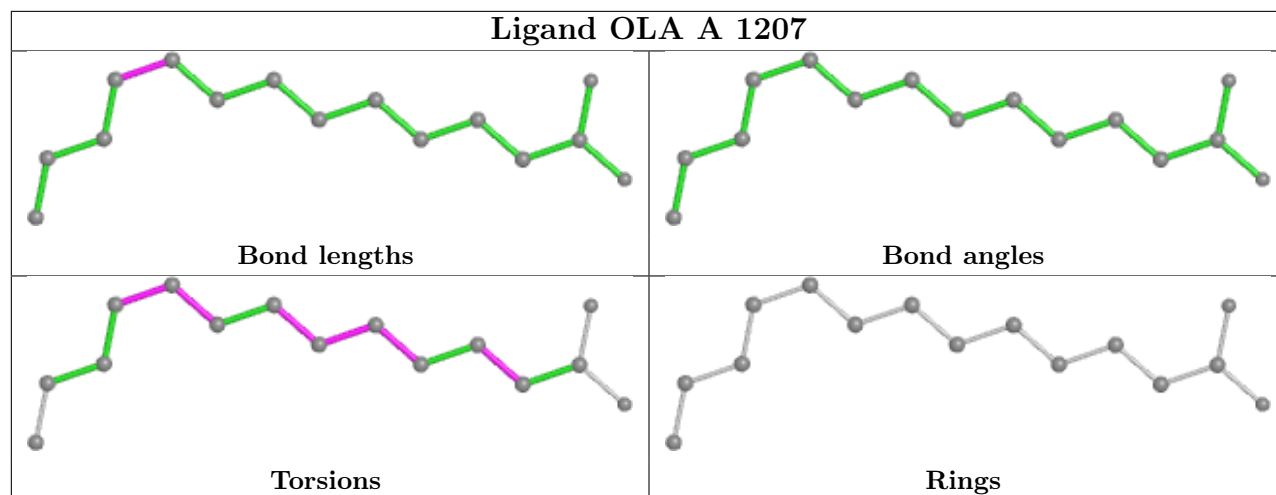
in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers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



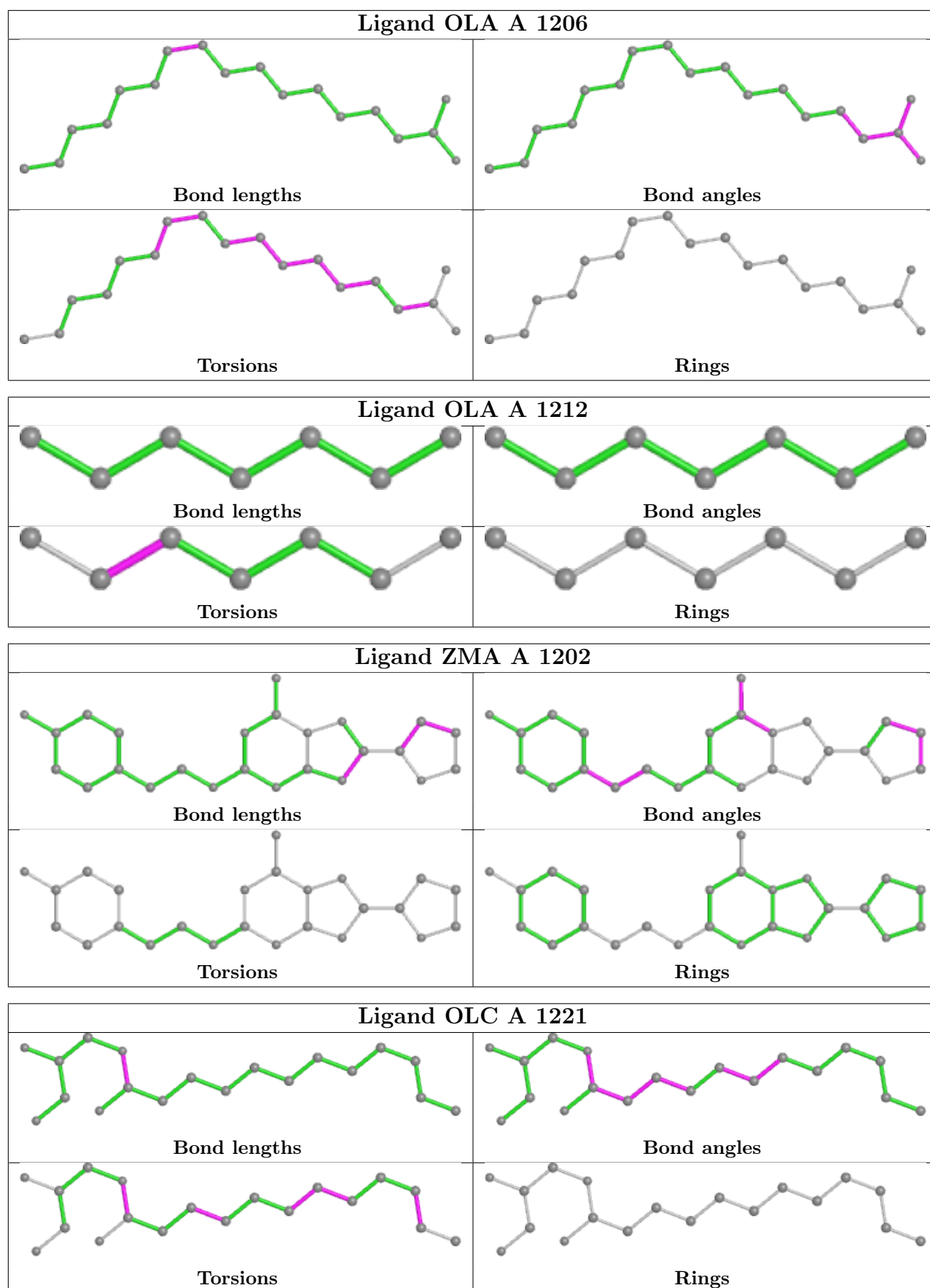


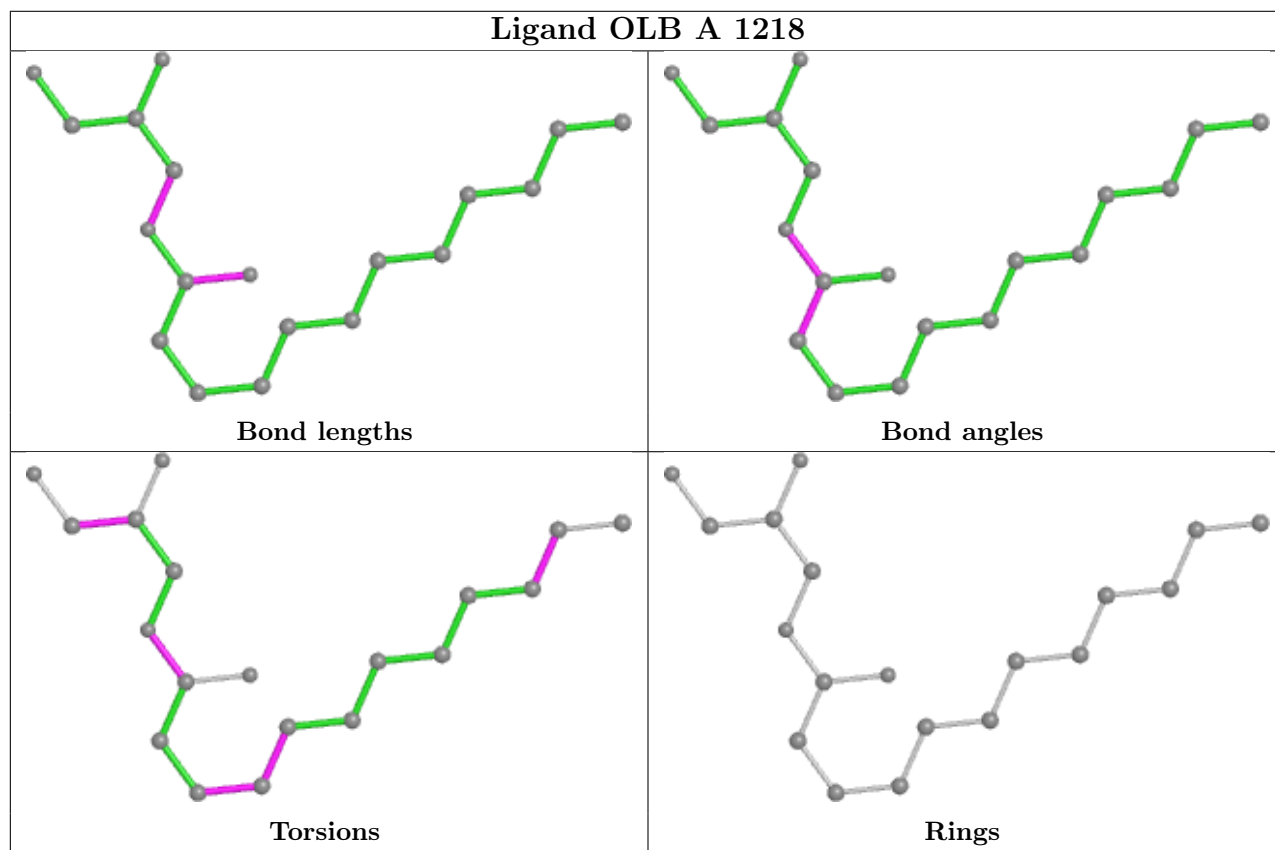
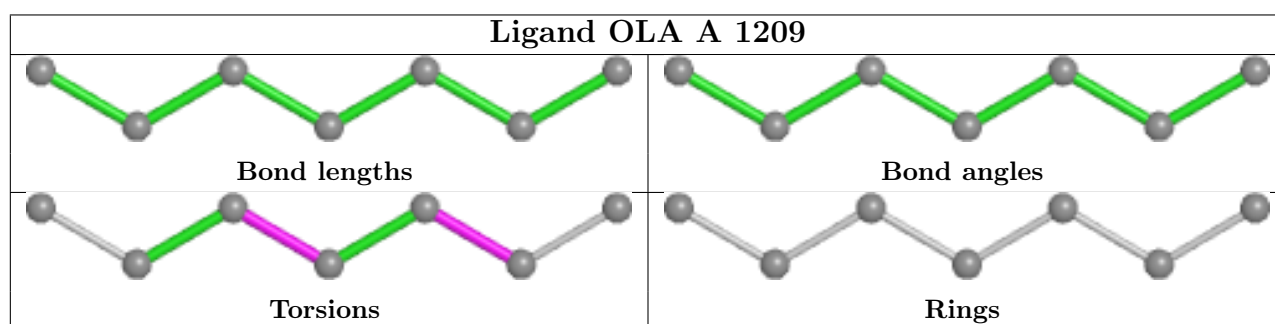
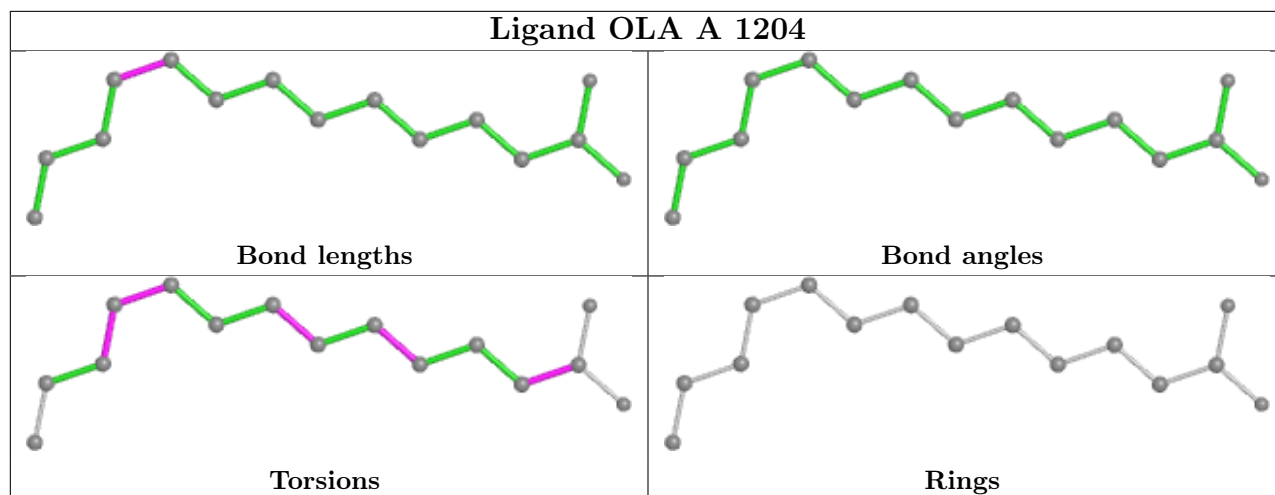












## 5.7 Other polymers [i](#)

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

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	388/433 (89%)	0.84	45 (11%) <b>4</b> <b>7</b>	24, 41, 85, 131	0

All (45) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1061	PHE	9.9
1	A	1059	LYS	9.1
1	A	1058	MET	9.0
1	A	1062	ARG	7.8
1	A	1101	TYR	5.1
1	A	1021	ASP	5.0
1	A	1060	ASP	4.8
1	A	1026	VAL	4.7
1	A	1065	PHE	4.2
1	A	1020	ALA	3.8
1	A	1063	HIS	3.8
1	A	1100	ALA	3.7
1	A	29	TRP	3.6
1	A	1019	LYS	3.5
1	A	1076[A]	LEU	3.4
1	A	1038	LEU	3.4
1	A	1016	VAL	3.3
1	A	1028	ASP	3.3
1	A	220	ARG	3.3
1	A	1003	LEU	3.2
1	A	304	ARG	3.2
1	A	1066	ASP	3.2
1	A	302	ILE	3.2
1	A	1037	ALA	2.9
1	A	1102	ILE	2.9
1	A	1041	GLN	2.9
1	A	1007	TRP	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	1040	ALA	2.8
1	A	-1	GLY	2.7
1	A	1023	ALA	2.6
1	A	1105	TYR	2.5
1	A	1064	GLY	2.4
1	A	290	TYR	2.3
1	A	1031[A]	THR	2.3
1	A	206	ARG	2.3
1	A	1042	LYS	2.3
1	A	82	CYS	2.3
1	A	1008	GLU	2.2
1	A	1	PRO	2.2
1	A	33	LEU	2.1
1	A	300[A]	ARG	2.1
1	A	1017	ILE	2.1
1	A	222	ARG	2.1
1	A	1029	ALA	2.1
1	A	1099	ASN	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> 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
4	OLA	A	1217	12/20	0.61	0.20	63,82,97,99	0
4	OLA	A	1210	19/20	0.66	0.30	58,78,93,94	0
4	OLA	A	1209	7/20	0.70	0.25	59,74,87,87	0
5	OLB	A	1219	20/25	0.75	0.25	54,79,100,105	0
4	OLA	A	1206	18/20	0.78	0.18	60,77,90,91	0

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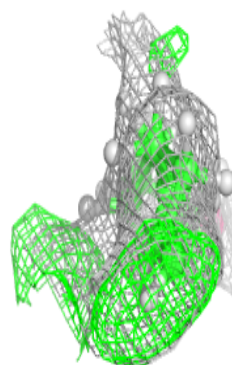
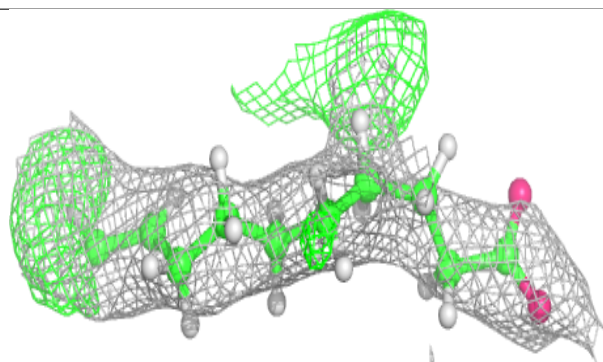
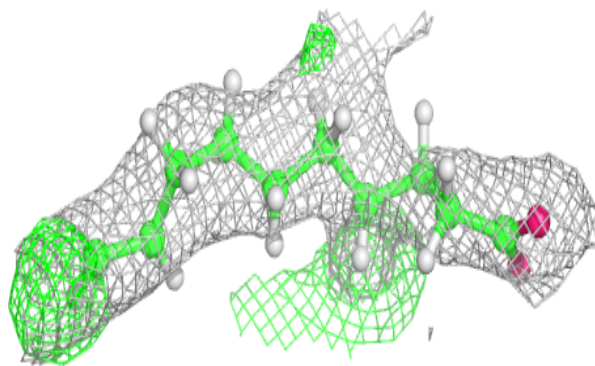
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	OLA	A	1214	11/20	0.79	0.30	43,56,74,74	26
4	OLA	A	1215	13/20	0.79	0.22	56,72,83,84	0
6	OLC	A	1221	19/25	0.83	0.20	46,67,91,94	0
4	OLA	A	1216	17/20	0.85	0.20	44,63,90,94	0
4	OLA	A	1204	15/20	0.85	0.18	63,77,87,91	0
4	OLA	A	1213	17/20	0.86	0.33	45,61,76,85	43
4	OLA	A	1212	7/20	0.87	0.30	64,78,87,89	0
4	OLA	A	1207	15/20	0.87	0.15	61,77,93,93	0
6	OLC	A	1220	25/25	0.89	0.24	39,71,95,110	65
4	OLA	A	1208	12/20	0.89	0.23	40,60,90,92	28
4	OLA	A	1211	10/20	0.90	0.29	49,57,65,67	0
4	OLA	A	1203	20/20	0.90	0.20	44,67,84,86	0
4	OLA	A	1205	9/20	0.91	0.20	51,66,80,83	0
5	OLB	A	1218	19/25	0.92	0.26	45,67,92,96	0
2	NA	A	1201	1/1	0.94	0.09	44,44,44,44	0
7	CLR	A	1224	28/28	0.94	0.12	26,38,108,116	0
7	CLR	A	1223	28/28	0.95	0.11	32,41,69,81	0
7	CLR	A	1222	28/28	0.95	0.12	31,43,92,99	0
3	ZMA	A	1202	25/25	0.97	0.15	22,29,74,89	0

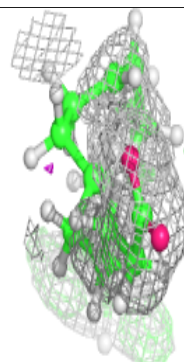
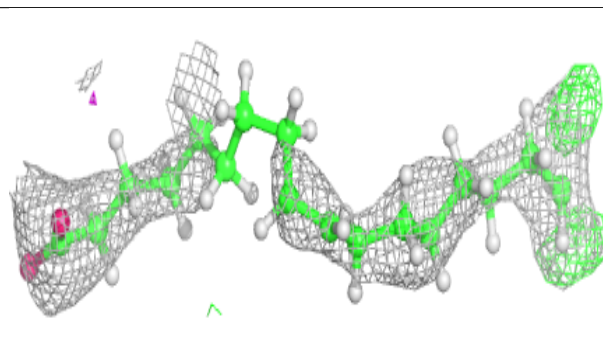
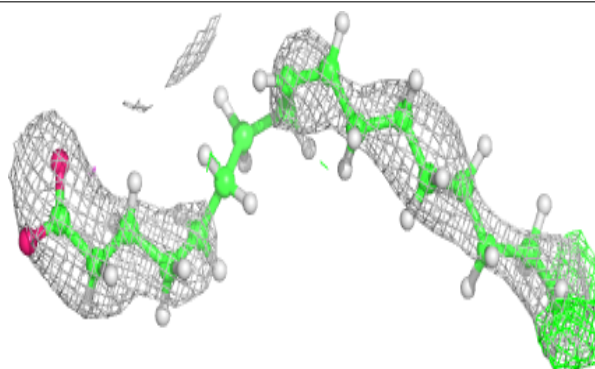
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around OLA A 1217:**

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

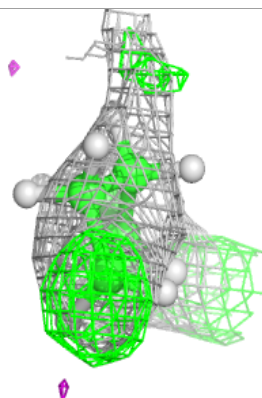
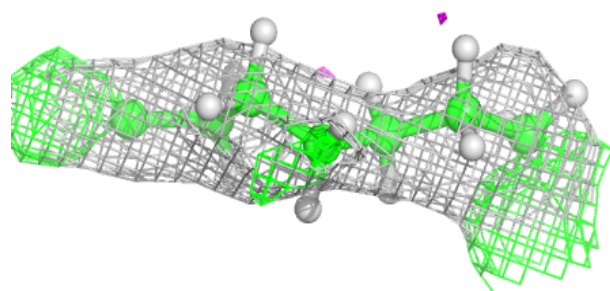
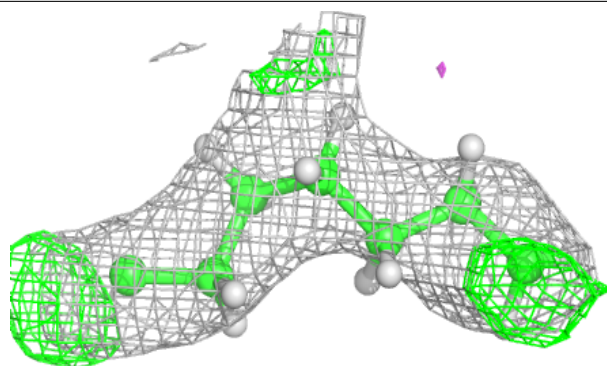
**Electron density around OLA A 1210:**

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

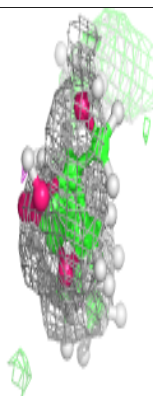
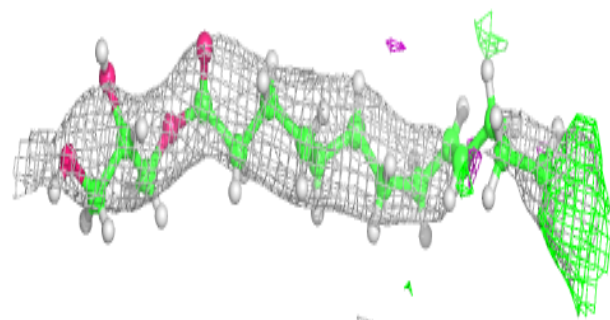
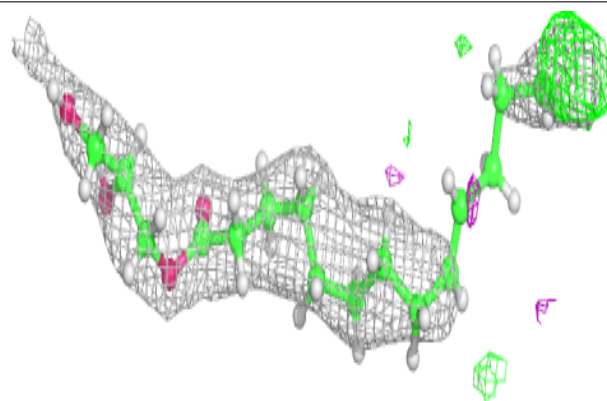


**Electron density around OLA A 1209:**

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

**Electron density around OLB A 1219:**

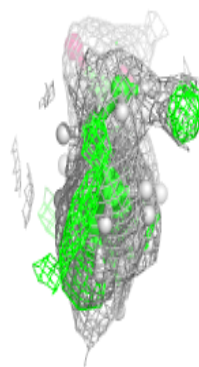
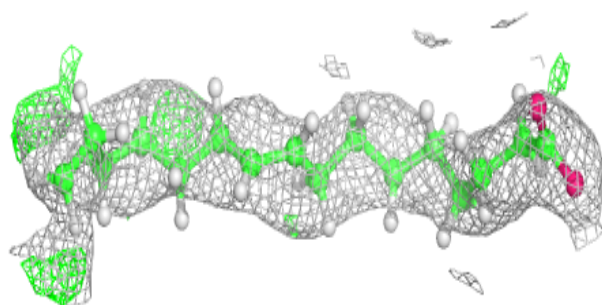
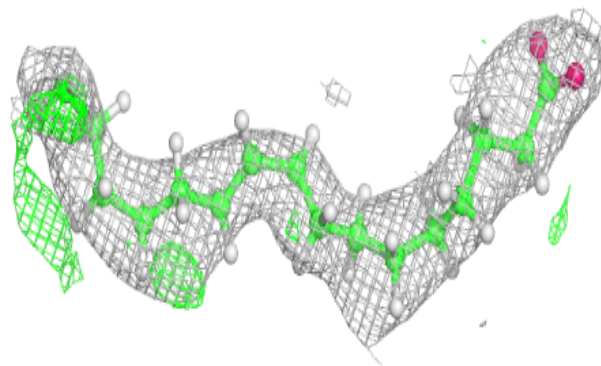
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



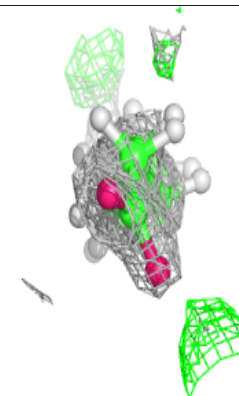
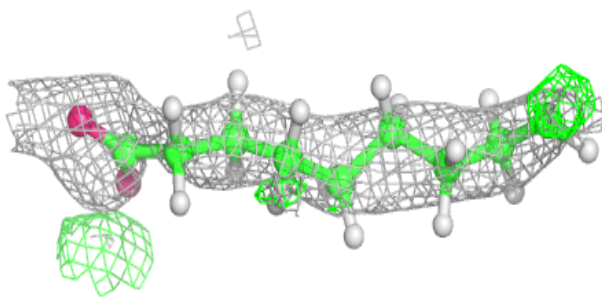
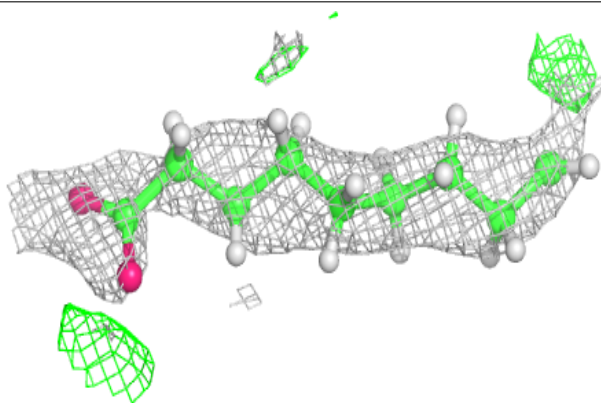


**Electron density around OLA A 1206:**

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

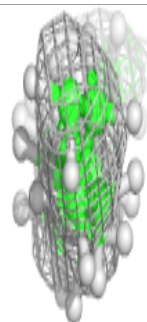
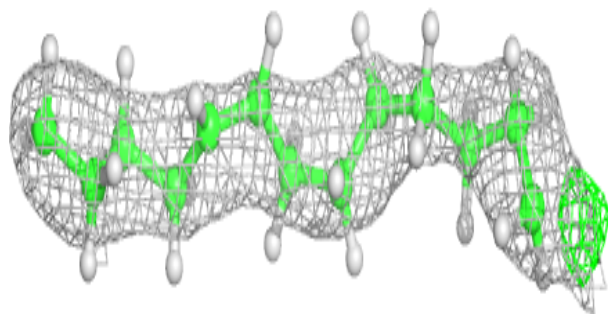
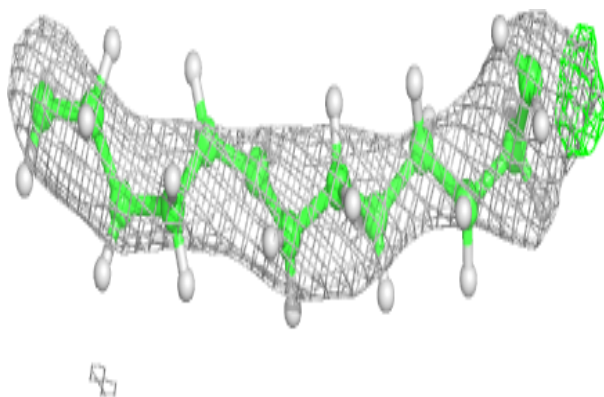
**Electron density around OLA A 1214:**

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

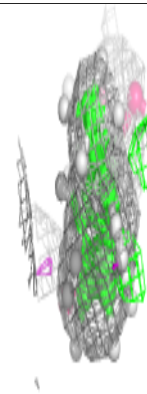
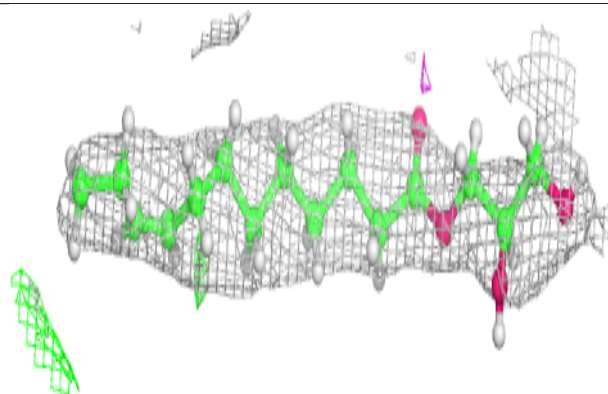
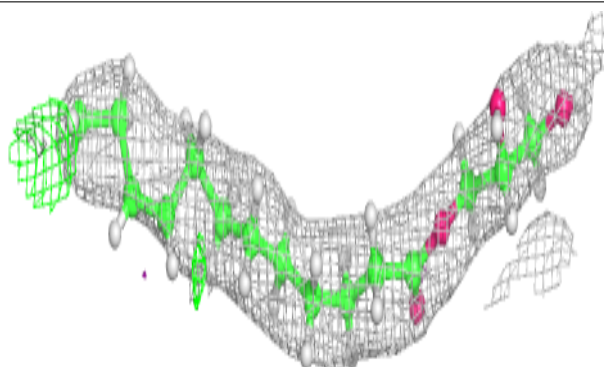


**Electron density around OLA A 1215:**

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

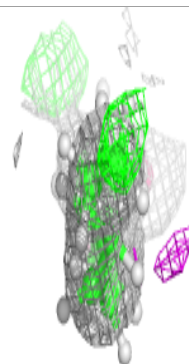
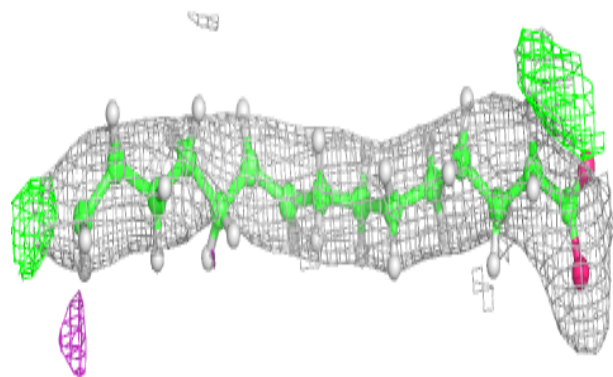
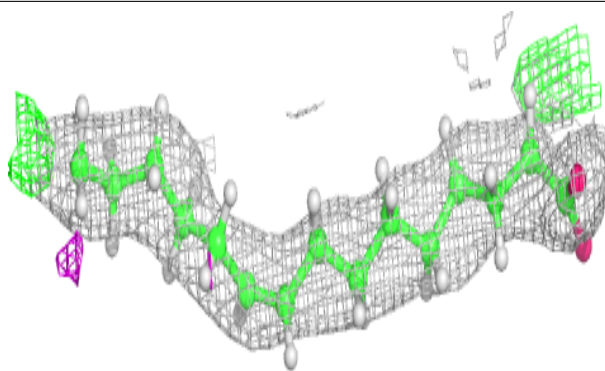
**Electron density around OLC A 1221:**

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

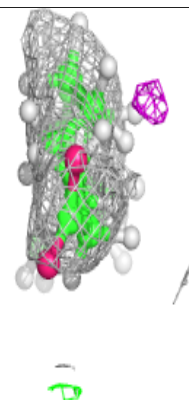
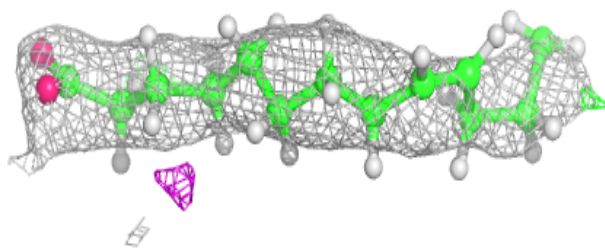
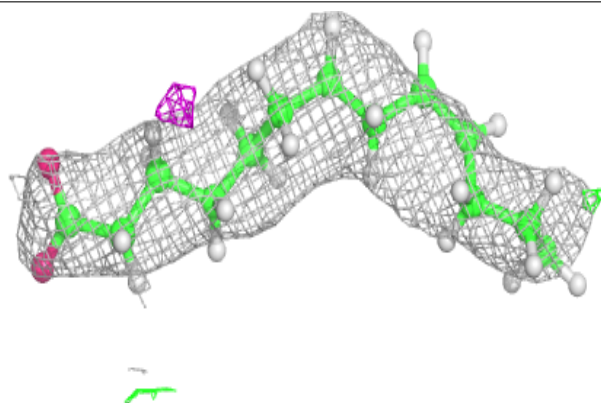


**Electron density around OLA A 1216:**

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

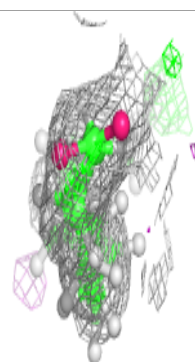
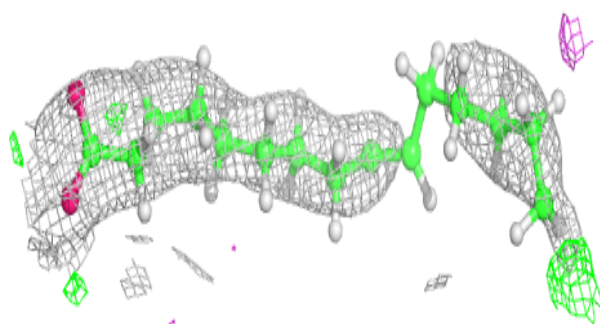
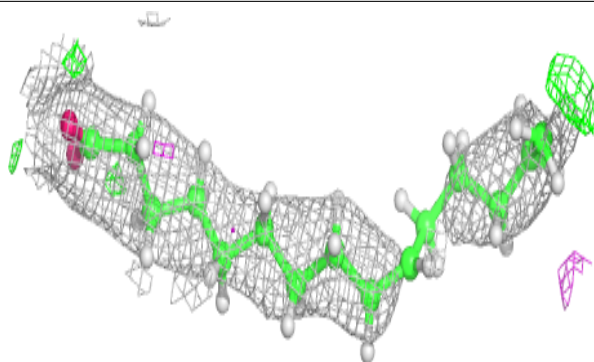
**Electron density around OLA A 1204:**

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

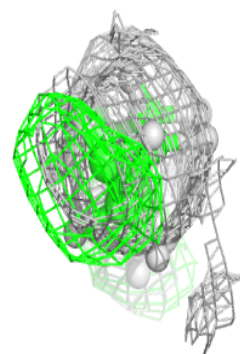
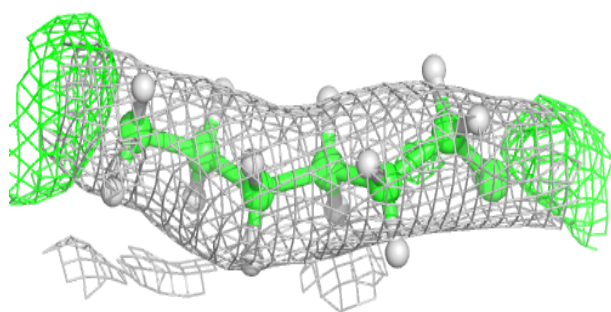
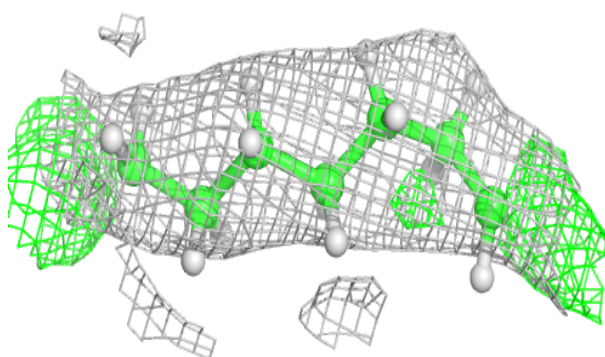


**Electron density around OLA A 1213:**

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

**Electron density around OLA A 1212:**

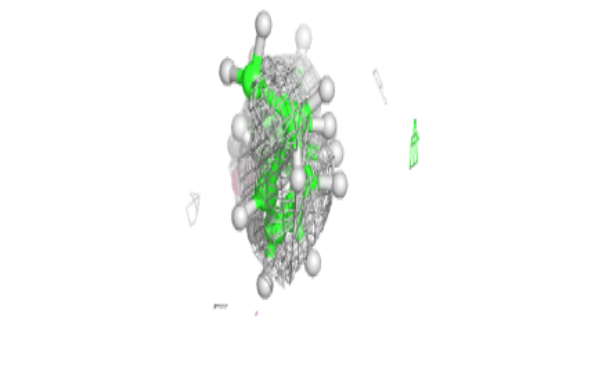
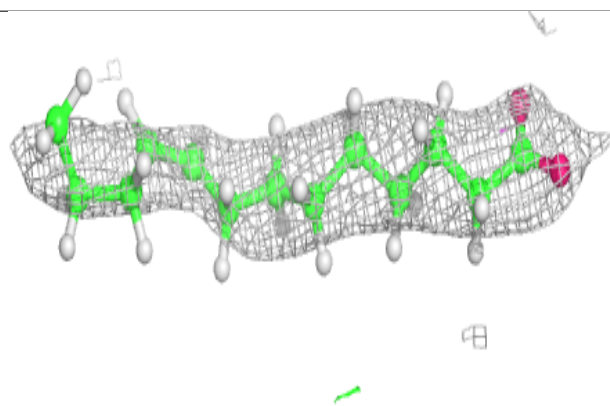
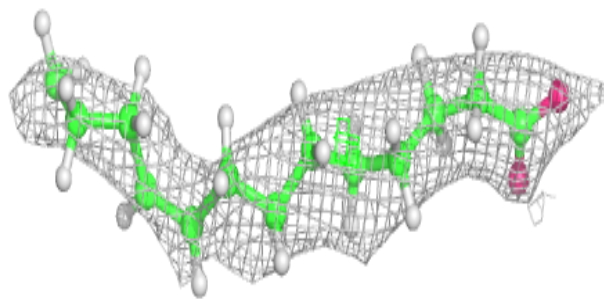
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



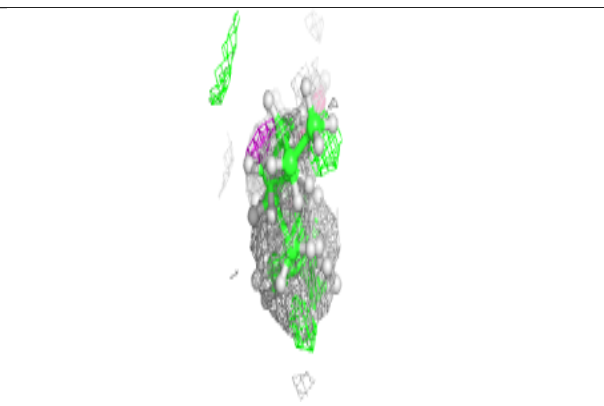
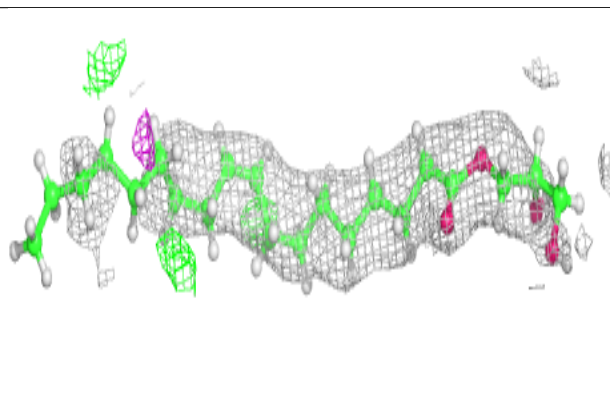
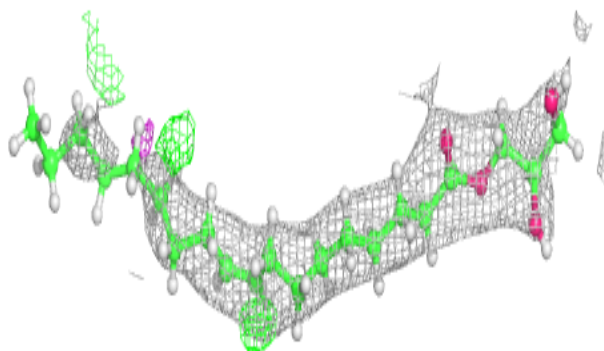


**Electron density around OLA A 1207:**

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

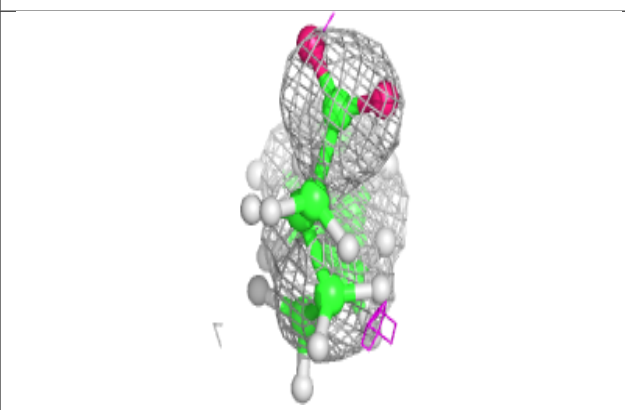
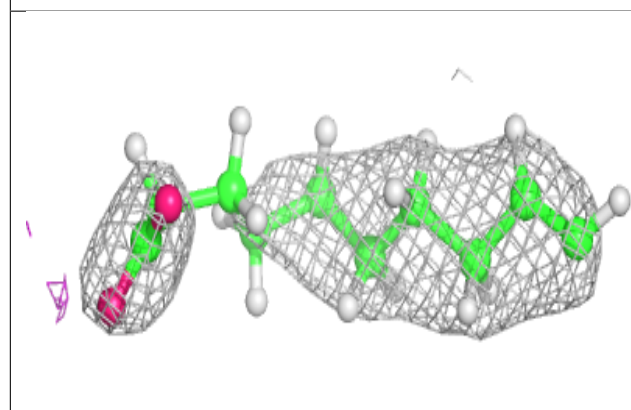
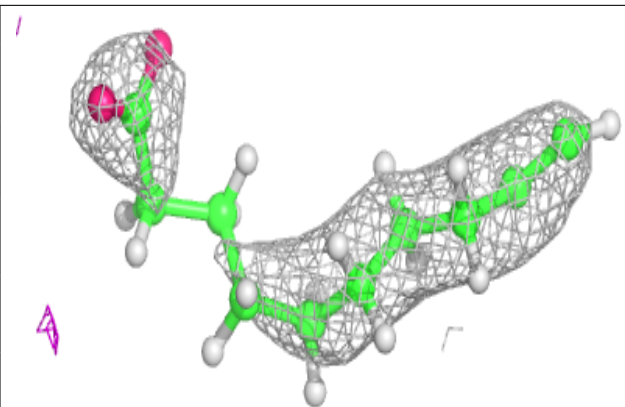
**Electron density around OLC A 1220:**

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

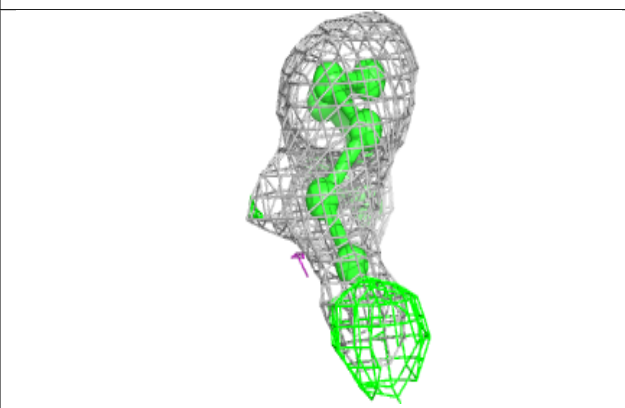
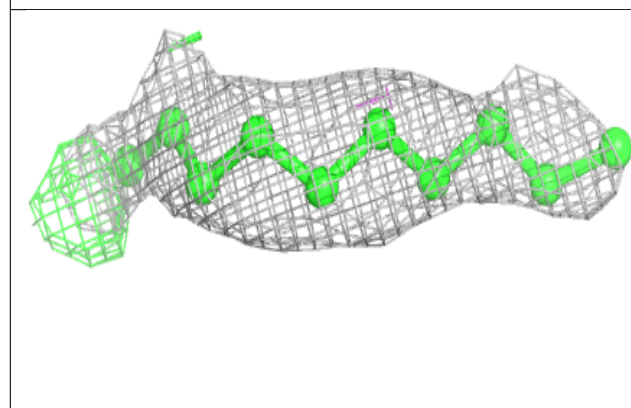
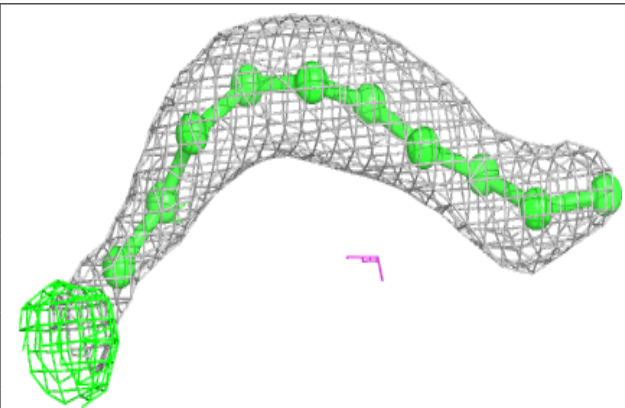


**Electron density around OLA A 1208:**

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

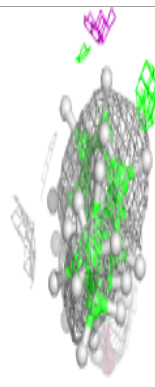
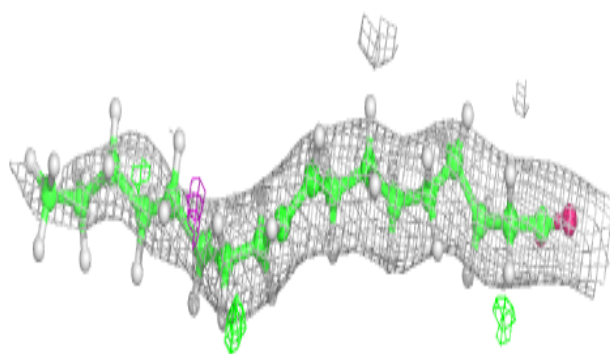
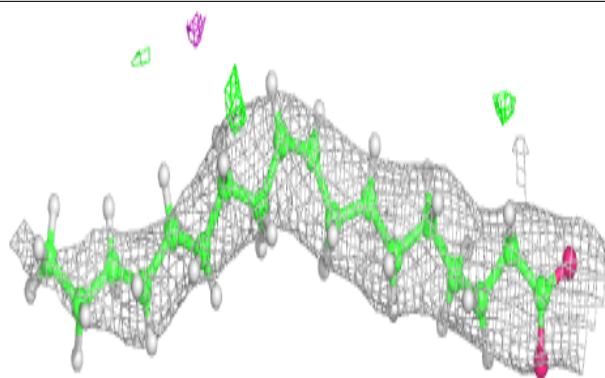
**Electron density around OLA A 1211:**

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

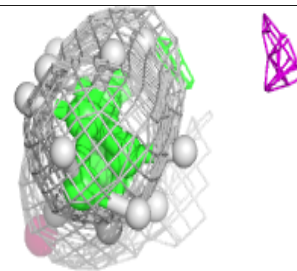
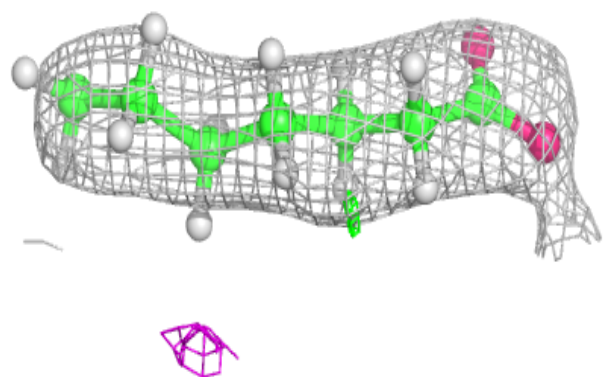
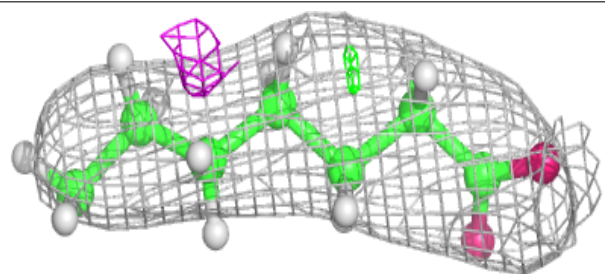


**Electron density around OLA A 1203:**

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

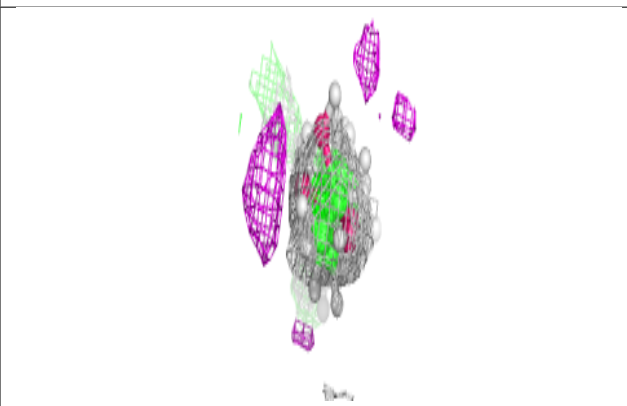
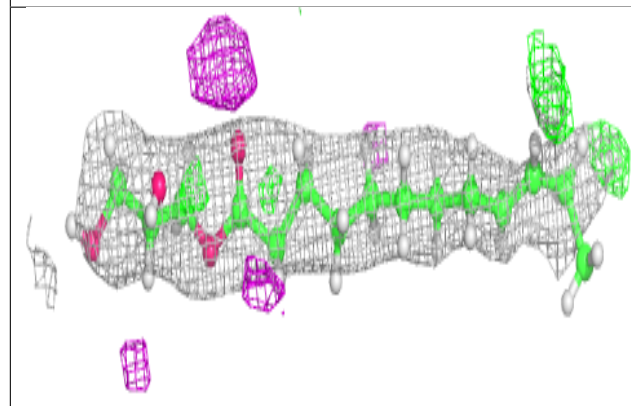
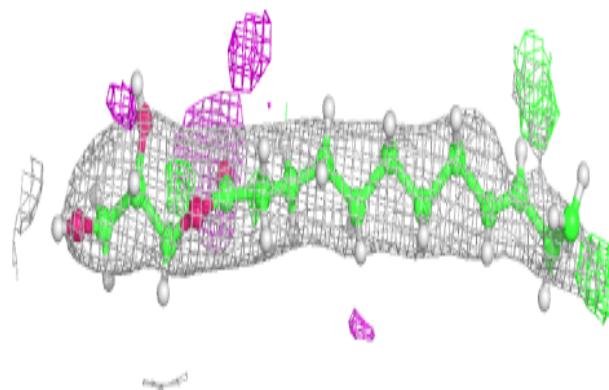
**Electron density around OLA A 1205:**

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

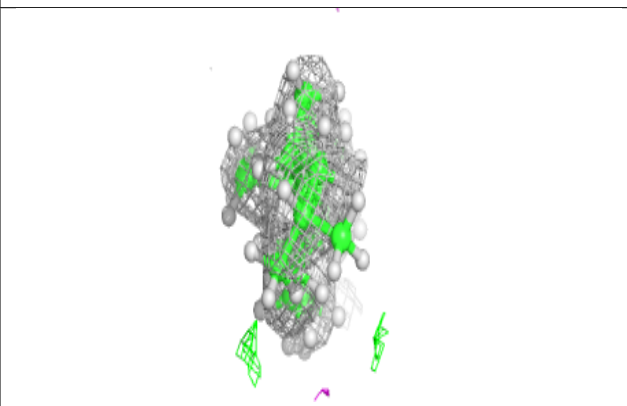
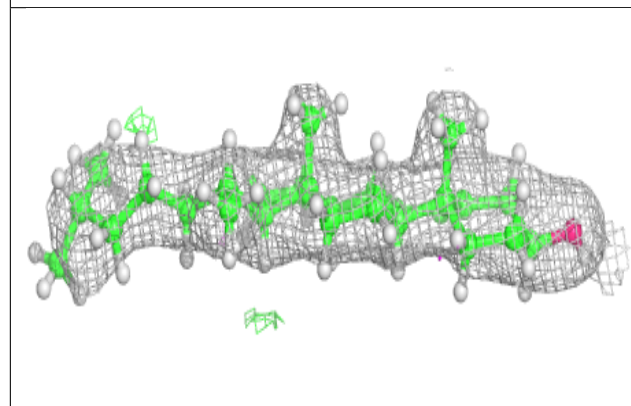
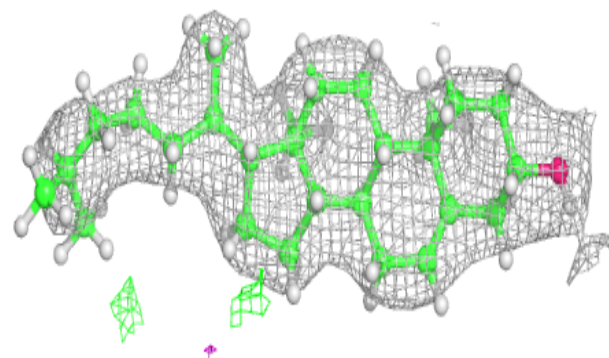


**Electron density around OLB A 1218:**

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

**Electron density around CLR A 1224:**

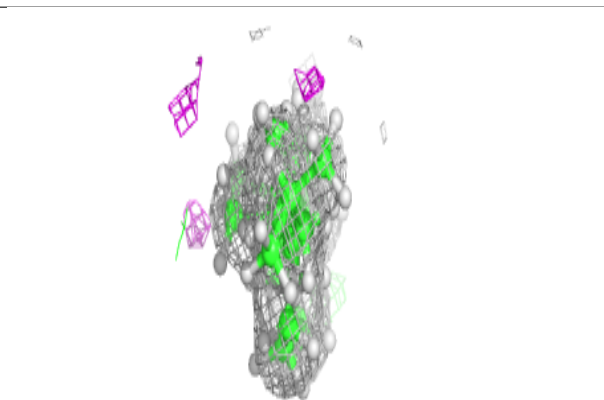
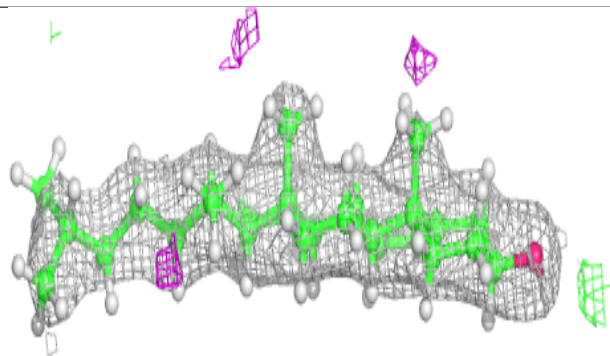
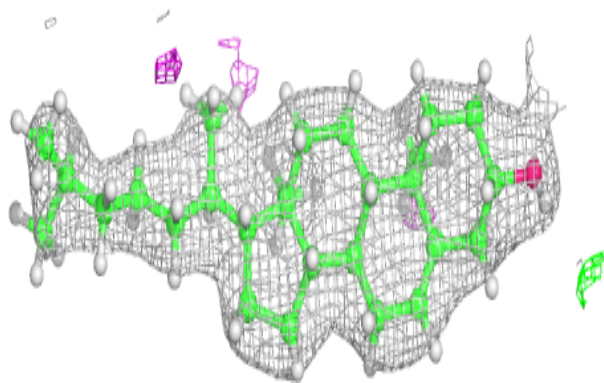
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



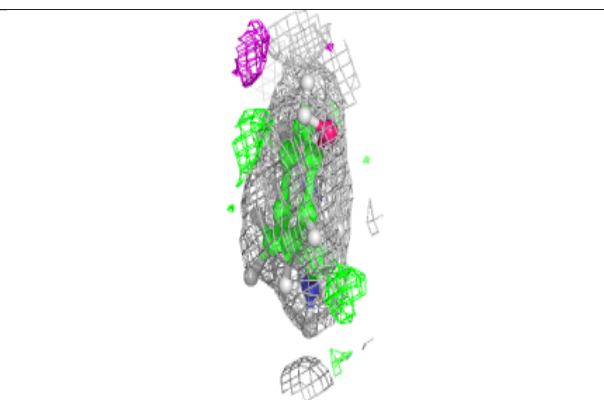
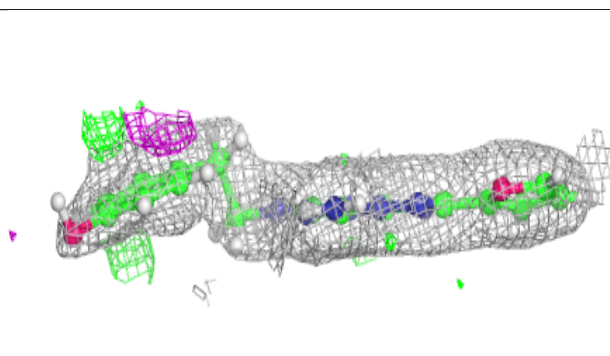
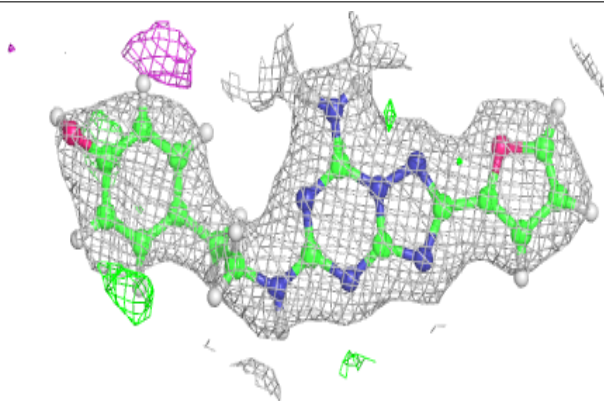


**Electron density around CLR A 1223:**

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

**Electron density around ZMA 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)



## 6.5 Other polymers [i](#)

There are no such residues in this entry.