



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 04:18 PM UTC

PDB ID : 8DU3 / pdb_00008du3
Title : Crystal structure of A2AAR-StaR2-bRIL in complex with compound 21a
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Deposited on : 2022-07-26
Resolution : 2.50 Å(reported)

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

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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

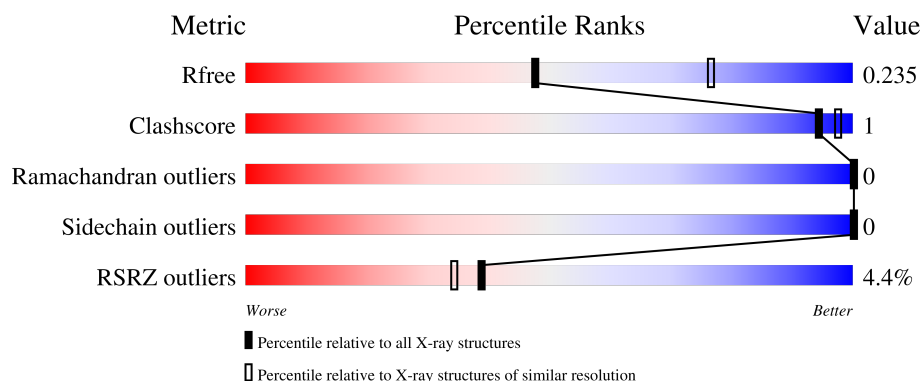
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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	447	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 3466 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 Adenosine receptor A2a, soluble cytochrome b562 chimera, Soluble cytochrome b562, Adenosine receptor A2a.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	390	Total	C	N	O	S	0	0	0
			2984	1946	496	521	21			

There are 48 discrepancies between the modelled and reference sequences:

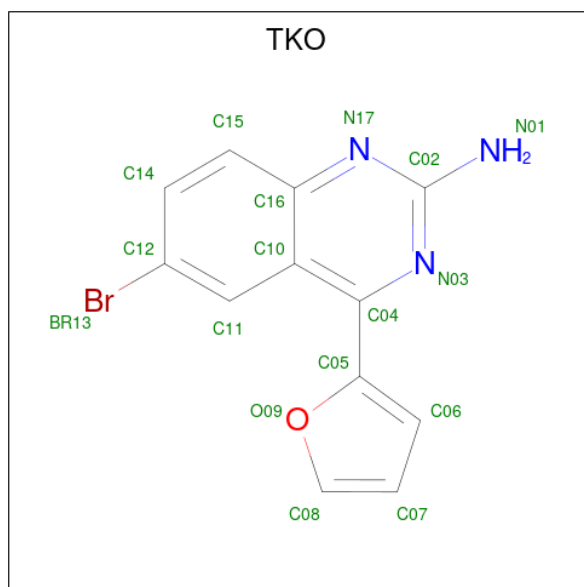
Chain	Residue	Modelled	Actual	Comment	Reference
A	-24	MET	-	initiating methionine	UNP P29274
A	-23	LYS	-	expression tag	UNP P29274
A	-22	THR	-	expression tag	UNP P29274
A	-21	ILE	-	expression tag	UNP P29274
A	-20	ILE	-	expression tag	UNP P29274
A	-19	ALA	-	expression tag	UNP P29274
A	-18	LEU	-	expression tag	UNP P29274
A	-17	SER	-	expression tag	UNP P29274
A	-16	TYR	-	expression tag	UNP P29274
A	-15	ILE	-	expression tag	UNP P29274
A	-14	PHE	-	expression tag	UNP P29274
A	-13	CYS	-	expression tag	UNP P29274
A	-12	LEU	-	expression tag	UNP P29274
A	-11	VAL	-	expression tag	UNP P29274
A	-10	PHE	-	expression tag	UNP P29274
A	-9	ALA	-	expression tag	UNP P29274
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

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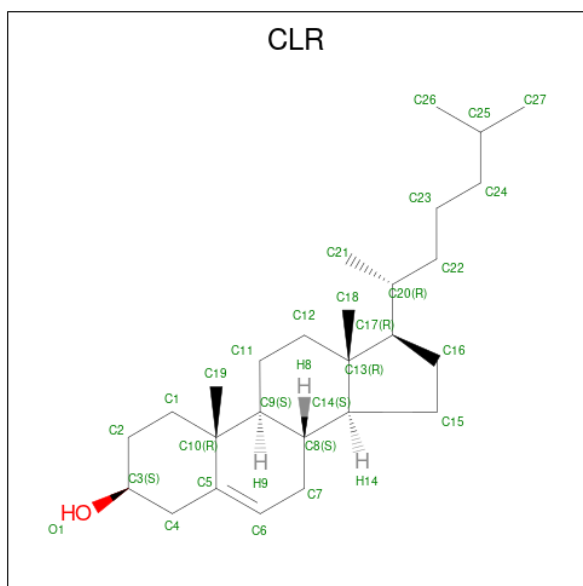
Chain	Residue	Modelled	Actual	Comment	Reference
A	54	LEU	ALA	engineered mutation	UNP P29274
A	88	ALA	THR	engineered mutation	UNP P29274
A	107	ALA	ARG	engineered mutation	UNP P29274
A	122	ALA	LYS	engineered mutation	UNP P29274
A	154	ALA	ASN	engineered mutation	UNP P29274
A	202	ALA	LEU	engineered mutation	UNP P29274
A	1007	TRP	MET	engineered mutation	UNP P0ABE7
A	1102	ILE	HIS	engineered mutation	UNP P0ABE7
A	1106	LEU	ARG	engineered mutation	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	317	HIS	-	expression tag	UNP P29274
A	318	HIS	-	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
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

- Molecule 2 is (4M)-6-bromo-4-(furan-2-yl)quinazolin-2-amine (CCD ID: TKO) (formula: $C_{12}H_8BrN_3O$) (labeled as "Ligand of Interest" by depositor).



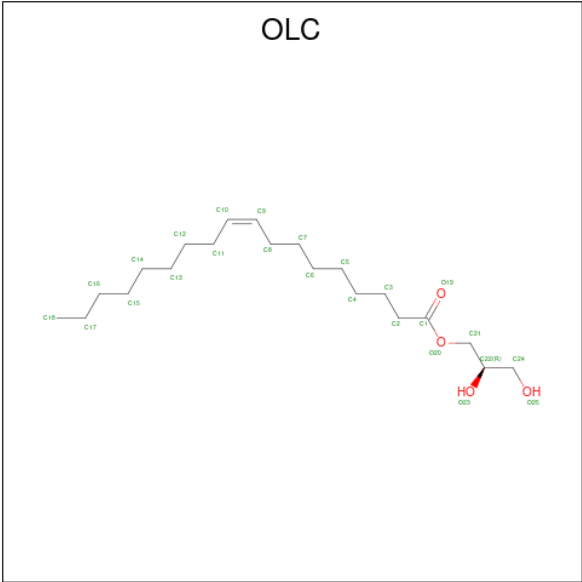
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	Br	C	N	O	0	0
			17	1	12	3	1		

- Molecule 3 is CHOLESTEROL (CCD ID: CLR) (formula: $C_{27}H_{46}O$).



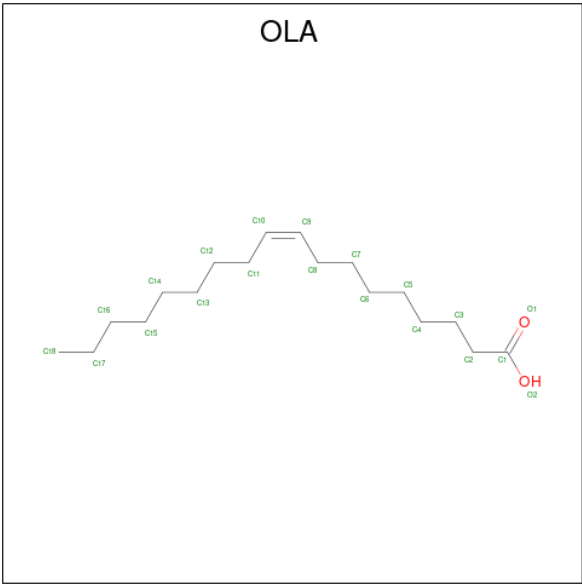
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			28	27	1		
3	A	1	Total	C	O	0	0
			28	27	1		
3	A	1	Total	C	O	0	0
			28	27	1		

- Molecule 4 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
4	A	1	Total	C	O	0	0
			23	19	4		
4	A	1	Total	C	O	0	0
			16	12	4		
4	A	1	Total	C	O	0	0
			21	17	4		
4	A	1	Total	C	O	0	0
			20	16	4		

- Molecule 5 is OLEIC ACID (CCD ID: OLA) (formula: C₁₈H₃₄O₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 18 16 2	0	0
5	A	1	Total C O 20 18 2	0	0
5	A	1	Total C O 11 9 2	0	0
5	A	1	Total C O 9 7 2	0	0
5	A	1	Total C O 20 18 2	0	0
5	A	1	Total C O 20 18 2	0	0
5	A	1	Total C 11 11	0	0
5	A	1	Total C O 8 6 2	0	0
5	A	1	Total C O 7 5 2	0	0
5	A	1	Total C 11 11	0	0
5	A	1	Total C O 20 18 2	0	0
5	A	1	Total C O 11 9 2	0	0
5	A	1	Total C O 20 18 2	0	0
5	A	1	Total C O 17 15 2	0	0
5	A	1	Total C O 13 11 2	0	0
5	A	1	Total C O 20 18 2	0	0
5	A	1	Total C 14 14	0	0

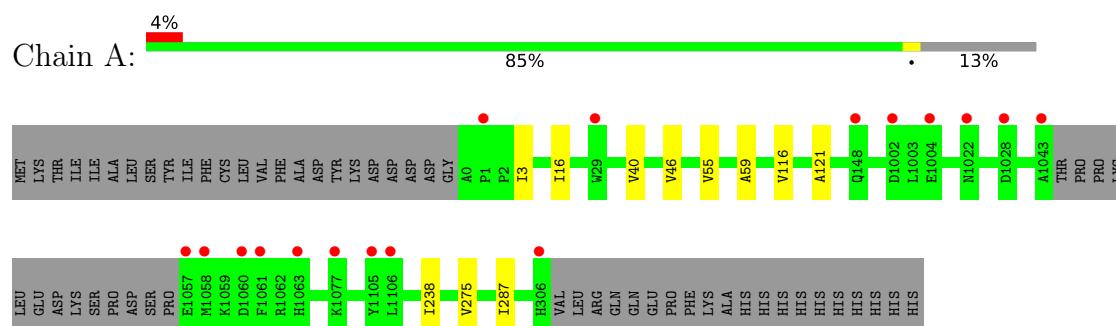
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	51	Total O 51 51	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 chimera, 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, α , β , γ	39.60Å 179.80Å 141.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	42.83 – 2.50 42.83 – 2.50	Depositor EDS
% Data completeness (in resolution range)	98.9 (42.83-2.50) 98.9 (42.83-2.50)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.24 (at 2.51Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.189 , 0.232 0.196 , 0.235	Depositor DCC
R_{free} test set	981 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å ²)	42.4	Xtriage
Anisotropy	0.096	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 57.2	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	0.94	EDS
Total number of atoms	3466	wwPDB-VP
Average B, all atoms (Å ²)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.83% 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

5.1 Standard geometry

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

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	0.10	0/3049	0.22	0/4155

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

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	2984	0	3008	7	0
2	A	17	0	0	0	0
3	A	84	0	138	2	0
4	A	80	0	110	1	0
5	A	250	0	370	1	0
6	A	51	0	0	0	0
All	All	3466	0	3626	9	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 1.

All (9) 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:40:VAL:HG11	1:A:116:VAL:CG1	2.43	0.49
1:A:40:VAL:HG13	1:A:121:ALA:HB2	1.97	0.47
3:A:3004:CLR:H212	3:A:3004:CLR:H121	1.97	0.46
1:A:238:ILE:HD11	1:A:287:ILE:HB	1.97	0.45
1:A:3:ILE:HD11	5:A:3023:OLA:O2	2.17	0.45
1:A:55:VAL:HA	1:A:59:ALA:HB3	1.98	0.44
3:A:3003:CLR:H212	3:A:3003:CLR:H121	2.00	0.44
1:A:16:ILE:HD11	1:A:275:VAL:HG13	2.00	0.42
1:A:46:VAL:HG11	4:A:3006:OLC:H3A	2.01	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	386/447 (86%)	384 (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	307/367 (84%)	307 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

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	157	GLN
1	A	181	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

25 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
5	OLA	A	3020	-	10,10,19	0.75	0	10,10,19	1.07	1 (10%)
5	OLA	A	3011	-	10,10,19	0.75	0	10,10,19	1.06	1 (10%)
3	CLR	A	3002	-	31,31,31	0.59	0	48,48,48	0.77	1 (2%)
5	OLA	A	3013	-	19,19,19	0.60	0	19,19,19	0.81	1 (5%)
5	OLA	A	3010	-	19,19,19	0.61	0	19,19,19	0.82	0
3	CLR	A	3003	-	31,31,31	0.59	0	48,48,48	0.89	1 (2%)
2	TKO	A	3001	-	19,19,19	2.84	6 (31%)	26,27,27	1.44	4 (15%)
5	OLA	A	3019	-	19,19,19	0.58	0	19,19,19	0.86	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	OLA	A	3017	-	6,6,19	0.94	0	6,6,19	1.30	1 (16%)
4	OLC	A	3006	-	15,15,24	0.74	0	16,16,25	1.06	0
5	OLA	A	3016	-	7,7,19	0.95	0	7,7,19	1.24	1 (14%)
5	OLA	A	3021	-	19,19,19	0.56	0	19,19,19	0.90	0
5	OLA	A	3014	-	19,19,19	0.61	0	19,19,19	0.81	0
5	OLA	A	3012	-	8,8,19	0.83	0	8,8,19	1.15	1 (12%)
5	OLA	A	3009	-	17,17,19	0.62	0	17,17,19	0.87	1 (5%)
5	OLA	A	3022	-	16,16,19	0.62	0	16,16,19	0.87	1 (6%)
4	OLC	A	3005	-	22,22,24	0.68	0	23,23,25	0.87	0
3	CLR	A	3004	-	31,31,31	0.59	0	48,48,48	0.92	3 (6%)
5	OLA	A	3024	-	19,19,19	0.59	0	19,19,19	0.87	1 (5%)
4	OLC	A	3008	-	19,19,24	0.67	0	20,20,25	0.99	1 (5%)
4	OLC	A	3007	-	20,20,24	0.67	0	21,21,25	0.96	1 (4%)
5	OLA	A	3015	-	10,10,19	0.29	0	9,9,19	0.61	0
5	OLA	A	3018	-	10,10,19	0.28	0	9,9,19	0.61	0
5	OLA	A	3025	-	13,13,19	0.27	0	12,12,19	0.49	0
5	OLA	A	3023	-	12,12,19	0.71	0	12,12,19	1.08	1 (8%)

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
5	OLA	A	3020	-	-	4/8/8/17	-
5	OLA	A	3011	-	-	4/8/8/17	-
3	CLR	A	3002	-	-	4/10/68/68	0/4/4/4
5	OLA	A	3013	-	-	7/17/17/17	-
5	OLA	A	3010	-	-	8/17/17/17	-
3	CLR	A	3003	-	-	2/10/68/68	0/4/4/4
2	TKO	A	3001	-	-	3/4/4/4	0/3/3/3
5	OLA	A	3019	-	-	9/17/17/17	-
5	OLA	A	3017	-	-	0/4/4/17	-
4	OLC	A	3006	-	-	7/15/15/24	-
5	OLA	A	3016	-	-	2/5/5/17	-
5	OLA	A	3021	-	-	7/17/17/17	-
5	OLA	A	3014	-	-	10/17/17/17	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	OLA	A	3012	-	-	1/6/6/17	-
5	OLA	A	3009	-	-	11/15/15/17	-
5	OLA	A	3022	-	-	6/14/14/17	-
4	OLC	A	3005	-	-	7/22/22/24	-
3	CLR	A	3004	-	-	2/10/68/68	0/4/4/4
5	OLA	A	3024	-	-	7/17/17/17	-
4	OLC	A	3008	-	-	8/19/19/24	-
4	OLC	A	3007	-	-	8/20/20/24	-
5	OLA	A	3015	-	-	4/8/8/17	-
5	OLA	A	3018	-	-	6/8/8/17	-
5	OLA	A	3025	-	-	7/11/11/17	-
5	OLA	A	3023	-	-	4/10/10/17	-

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	3001	TKO	C04-C05	7.73	1.53	1.46
2	A	3001	TKO	C02-N03	5.14	1.44	1.35
2	A	3001	TKO	C02-N01	4.66	1.43	1.33
2	A	3001	TKO	C04-C10	3.79	1.47	1.43
2	A	3001	TKO	BR13-C12	3.05	1.96	1.90
2	A	3001	TKO	C16-N17	2.04	1.40	1.37

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	3001	TKO	N17-C02-N03	-3.47	122.80	127.21
2	A	3001	TKO	C04-C10-C16	3.38	117.06	115.57
2	A	3001	TKO	C04-N03-C02	3.00	119.98	117.03
3	A	3004	CLR	C7-C8-C9	2.85	113.02	109.72
3	A	3004	CLR	C4-C5-C10	2.52	119.65	116.42
2	A	3001	TKO	C10-C04-N03	-2.44	120.31	122.19
3	A	3004	CLR	C4-C5-C6	-2.40	117.32	120.57
5	A	3016	OLA	O2-C1-C2	2.27	121.18	114.00
5	A	3017	OLA	O2-C1-C2	2.24	121.09	114.00
4	A	3008	OLC	C3-C2-C1	-2.22	105.55	113.69
3	A	3002	CLR	C4-C5-C6	-2.18	117.61	120.57
5	A	3022	OLA	O2-C1-C2	2.14	120.75	114.00
5	A	3009	OLA	O2-C1-C2	2.12	120.68	114.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	3003	CLR	C4-C5-C6	-2.11	117.71	120.57
5	A	3024	OLA	O2-C1-C2	2.10	120.62	114.00
4	A	3007	OLC	C3-C2-C1	-2.08	106.06	113.69
5	A	3020	OLA	O2-C1-C2	2.08	120.57	114.00
5	A	3019	OLA	O2-C1-C2	2.05	120.46	114.00
5	A	3013	OLA	O2-C1-C2	2.04	120.43	114.00
5	A	3023	OLA	O2-C1-C2	2.02	120.40	114.00
5	A	3011	OLA	O2-C1-C2	2.01	120.36	114.00
5	A	3012	OLA	O2-C1-C2	2.01	120.36	114.00

There are no chirality outliers.

All (138) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	3001	TKO	C10-C04-C05-C06
4	A	3005	OLC	O20-C21-C22-C24
4	A	3006	OLC	O20-C21-C22-C24
4	A	3006	OLC	O20-C21-C22-O23
4	A	3008	OLC	O20-C21-C22-O23
4	A	3008	OLC	C2-C1-O20-C21
3	A	3002	CLR	C21-C20-C22-C23
4	A	3008	OLC	O19-C1-O20-C21
4	A	3007	OLC	C2-C1-O20-C21
5	A	3019	OLA	C6-C7-C8-C9
4	A	3007	OLC	O19-C1-O20-C21
4	A	3005	OLC	O20-C21-C22-O23
5	A	3024	OLA	C1-C2-C3-C4
5	A	3022	OLA	C1-C2-C3-C4
4	A	3008	OLC	O20-C21-C22-C24
4	A	3007	OLC	O20-C21-C22-O23
5	A	3020	OLA	C2-C3-C4-C5
5	A	3022	OLA	C4-C5-C6-C7
5	A	3021	OLA	C11-C12-C13-C14
5	A	3014	OLA	C3-C4-C5-C6
5	A	3019	OLA	C3-C4-C5-C6
5	A	3019	OLA	C10-C11-C12-C13
5	A	3025	OLA	C10-C11-C12-C13
4	A	3007	OLC	C3-C4-C5-C6
4	A	3008	OLC	C4-C5-C6-C7
4	A	3007	OLC	C5-C6-C7-C8
5	A	3024	OLA	C12-C13-C14-C15
5	A	3013	OLA	C12-C13-C14-C15

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Mol	Chain	Res	Type	Atoms
5	A	3019	OLA	C4-C5-C6-C7
5	A	3019	OLA	C2-C3-C4-C5
5	A	3015	OLA	C10-C11-C12-C13
5	A	3022	OLA	C6-C7-C8-C9
5	A	3010	OLA	C11-C12-C13-C14
4	A	3006	OLC	C4-C5-C6-C7
5	A	3014	OLA	C5-C6-C7-C8
5	A	3011	OLA	C5-C6-C7-C8
5	A	3018	OLA	C12-C13-C14-C15
4	A	3008	OLC	C6-C7-C8-C9
5	A	3023	OLA	C5-C6-C7-C8
4	A	3005	OLC	C6-C7-C8-C9
5	A	3009	OLA	C11-C12-C13-C14
5	A	3025	OLA	C12-C13-C14-C15
5	A	3010	OLA	C3-C4-C5-C6
5	A	3013	OLA	C2-C3-C4-C5
5	A	3022	OLA	C2-C3-C4-C5
5	A	3012	OLA	C3-C4-C5-C6
5	A	3015	OLA	C12-C13-C14-C15
4	A	3006	OLC	C6-C7-C8-C9
4	A	3005	OLC	C2-C3-C4-C5
5	A	3021	OLA	C14-C15-C16-C17
5	A	3025	OLA	C4-C5-C6-C7
5	A	3014	OLA	C12-C13-C14-C15
4	A	3005	OLC	C1-C2-C3-C4
5	A	3010	OLA	C14-C15-C16-C17
5	A	3024	OLA	C3-C4-C5-C6
5	A	3025	OLA	C5-C6-C7-C8
5	A	3019	OLA	C15-C16-C17-C18
4	A	3006	OLC	C1-C2-C3-C4
4	A	3005	OLC	C5-C6-C7-C8
5	A	3016	OLA	C3-C4-C5-C6
5	A	3016	OLA	C1-C2-C3-C4
5	A	3020	OLA	C5-C6-C7-C8
5	A	3009	OLA	C12-C13-C14-C15
5	A	3024	OLA	C14-C15-C16-C17
3	A	3003	CLR	C20-C22-C23-C24
5	A	3009	OLA	C10-C11-C12-C13
5	A	3025	OLA	C14-C15-C16-C17
5	A	3018	OLA	C13-C14-C15-C16
5	A	3018	OLA	C14-C15-C16-C17
5	A	3023	OLA	C2-C3-C4-C5

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Mol	Chain	Res	Type	Atoms
3	A	3002	CLR	C23-C24-C25-C26
3	A	3002	CLR	C23-C24-C25-C27
5	A	3011	OLA	C2-C3-C4-C5
5	A	3021	OLA	C7-C8-C9-C10
5	A	3015	OLA	C11-C12-C13-C14
2	A	3001	TKO	C10-C04-C05-O09
5	A	3013	OLA	C14-C15-C16-C17
3	A	3004	CLR	C23-C24-C25-C26
5	A	3014	OLA	C15-C16-C17-C18
5	A	3015	OLA	C7-C8-C9-C10
5	A	3018	OLA	C7-C8-C9-C10
5	A	3019	OLA	C14-C15-C16-C17
4	A	3008	OLC	C1-C2-C3-C4
4	A	3008	OLC	C9-C10-C11-C12
5	A	3013	OLA	C9-C10-C11-C12
3	A	3004	CLR	C23-C24-C25-C27
5	A	3025	OLA	C13-C14-C15-C16
5	A	3021	OLA	C4-C5-C6-C7
5	A	3023	OLA	C3-C4-C5-C6
5	A	3009	OLA	C5-C6-C7-C8
5	A	3010	OLA	O1-C1-C2-C3
5	A	3009	OLA	C3-C4-C5-C6
5	A	3023	OLA	C6-C7-C8-C9
5	A	3010	OLA	O2-C1-C2-C3
5	A	3009	OLA	C9-C10-C11-C12
5	A	3024	OLA	O1-C1-C2-C3
5	A	3025	OLA	C7-C8-C9-C10
5	A	3013	OLA	C6-C7-C8-C9
5	A	3014	OLA	C10-C11-C12-C13
5	A	3019	OLA	C7-C8-C9-C10
5	A	3020	OLA	C6-C7-C8-C9
5	A	3014	OLA	O1-C1-C2-C3
5	A	3024	OLA	O2-C1-C2-C3
5	A	3013	OLA	O2-C1-C2-C3
4	A	3005	OLC	C9-C10-C11-C12
5	A	3014	OLA	C7-C8-C9-C10
5	A	3019	OLA	C11-C12-C13-C14
5	A	3013	OLA	O1-C1-C2-C3
4	A	3007	OLC	C6-C7-C8-C9
5	A	3018	OLA	C10-C11-C12-C13
5	A	3009	OLA	O2-C1-C2-C3
4	A	3007	OLC	C9-C10-C11-C12

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Mol	Chain	Res	Type	Atoms
5	A	3010	OLA	C9-C10-C11-C12
5	A	3021	OLA	C9-C10-C11-C12
5	A	3022	OLA	C7-C8-C9-C10
5	A	3022	OLA	C9-C10-C11-C12
5	A	3021	OLA	O2-C1-C2-C3
5	A	3021	OLA	O1-C1-C2-C3
5	A	3018	OLA	C9-C10-C11-C12
5	A	3024	OLA	C7-C8-C9-C10
5	A	3009	OLA	O1-C1-C2-C3
5	A	3009	OLA	C4-C5-C6-C7
5	A	3010	OLA	C7-C8-C9-C10
5	A	3014	OLA	C9-C10-C11-C12
5	A	3014	OLA	O2-C1-C2-C3
5	A	3010	OLA	C15-C16-C17-C18
4	A	3007	OLC	C7-C8-C9-C10
5	A	3009	OLA	C7-C8-C9-C10
3	A	3002	CLR	C17-C20-C22-C23
5	A	3009	OLA	C13-C14-C15-C16
5	A	3011	OLA	O2-C1-C2-C3
3	A	3003	CLR	C22-C23-C24-C25
4	A	3006	OLC	O20-C1-C2-C3
2	A	3001	TKO	N03-C04-C05-O09
5	A	3014	OLA	C13-C14-C15-C16
4	A	3006	OLC	O19-C1-C2-C3
5	A	3011	OLA	O1-C1-C2-C3
5	A	3020	OLA	O2-C1-C2-C3

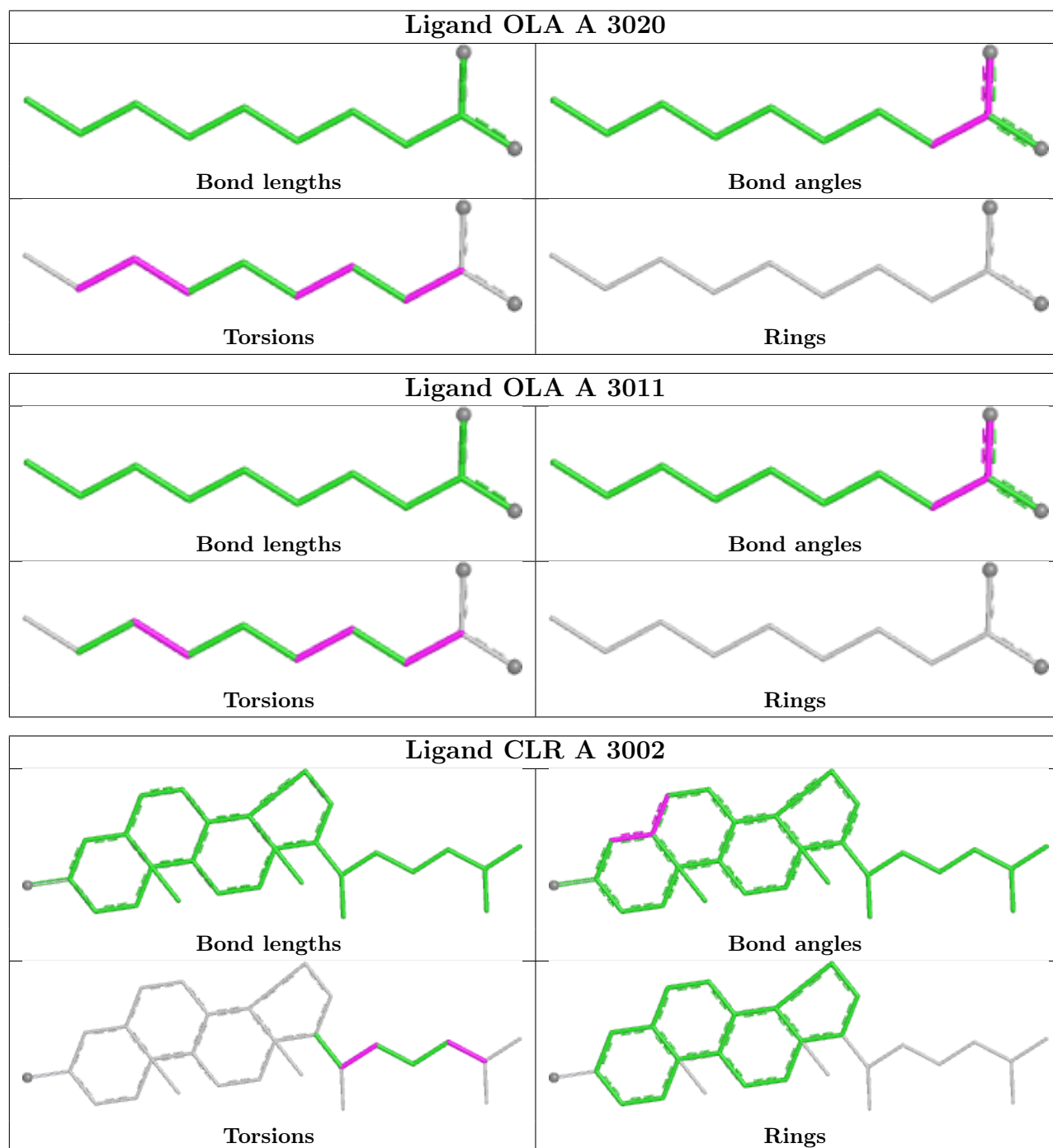
There are no ring outliers.

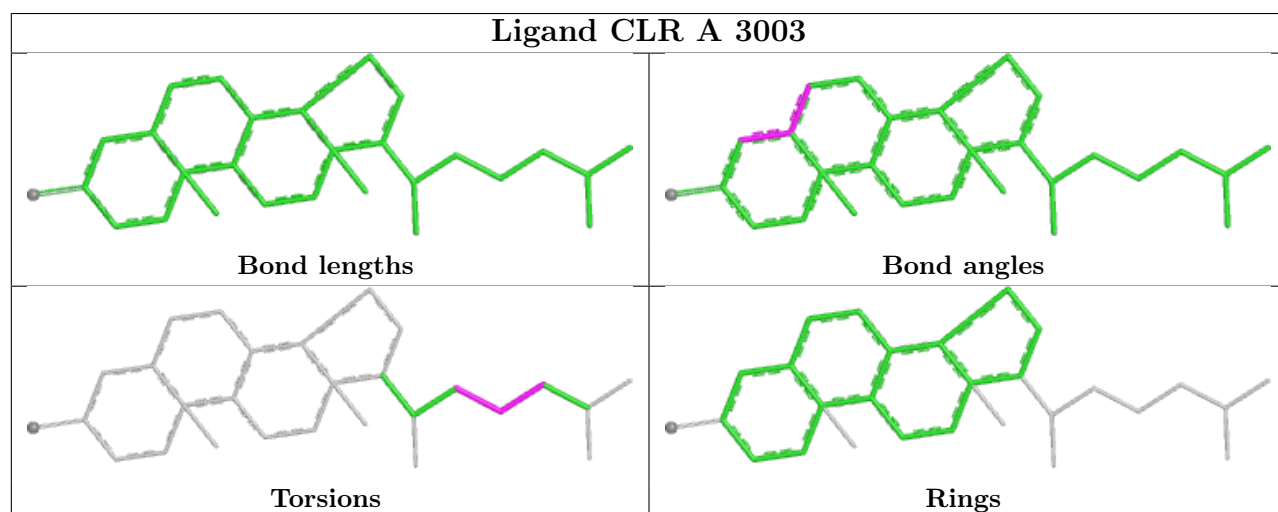
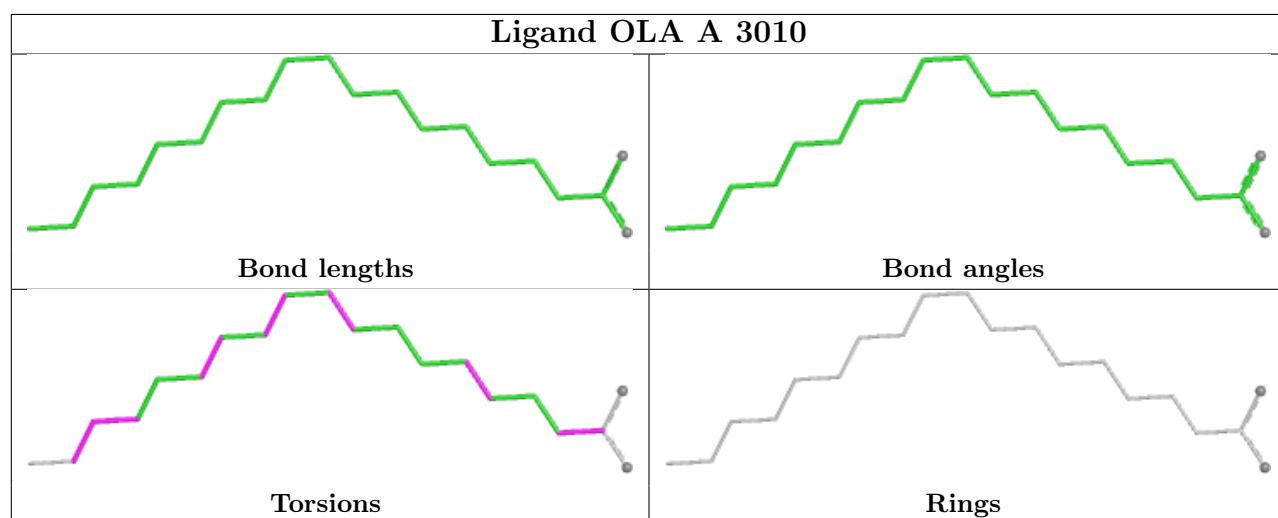
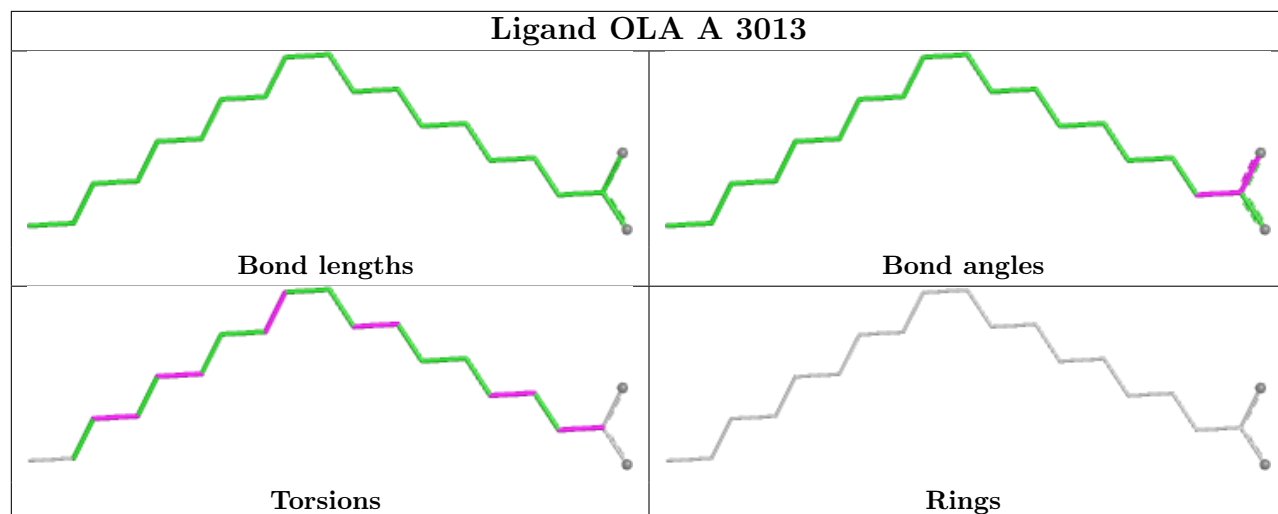
4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	3003	CLR	1	0
4	A	3006	OLC	1	0
3	A	3004	CLR	1	0
5	A	3023	OLA	1	0

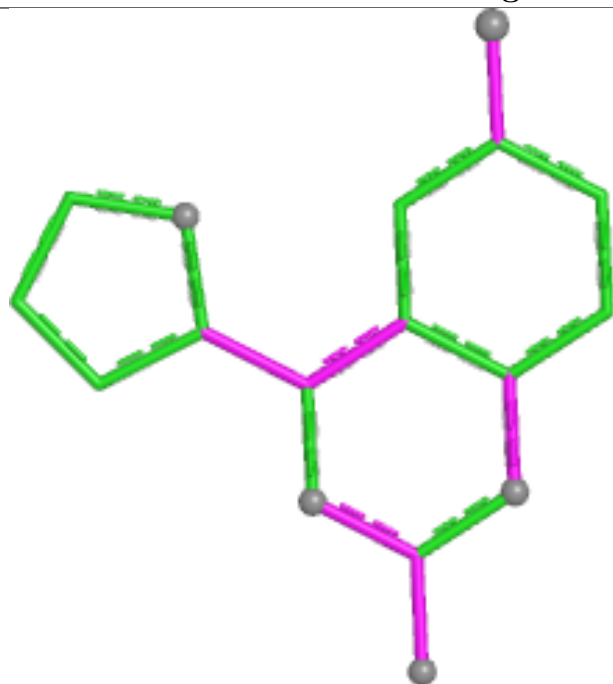
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

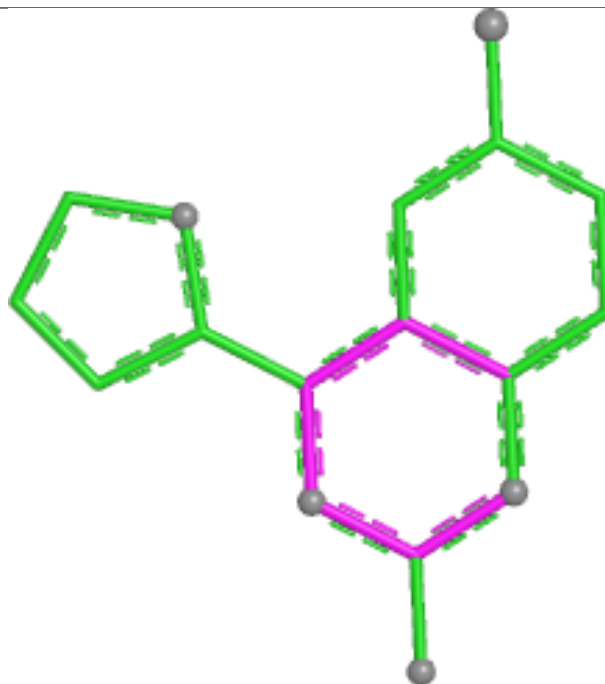




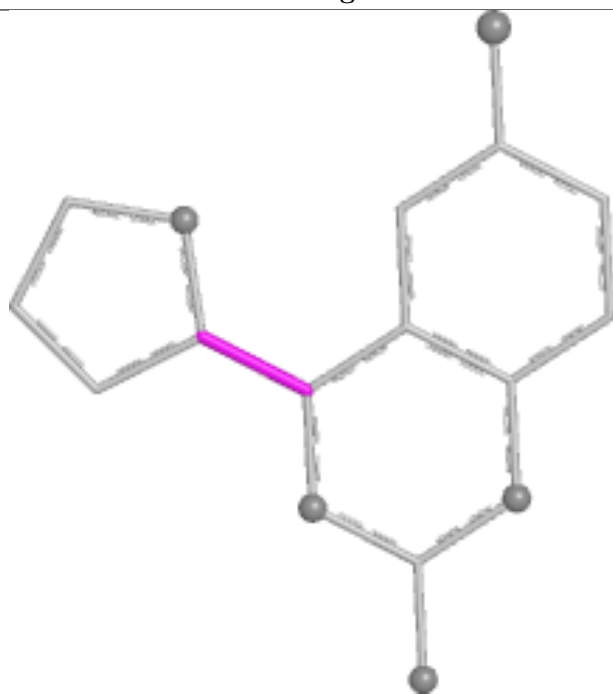
Ligand TKO A 3001



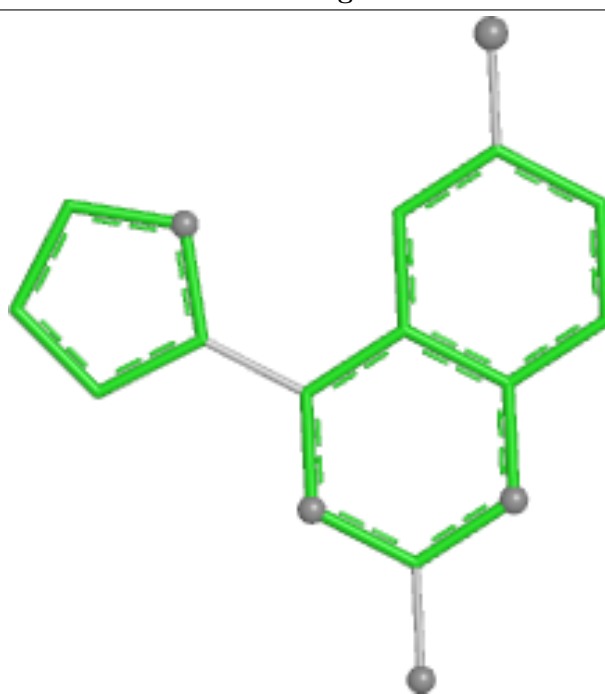
Bond lengths



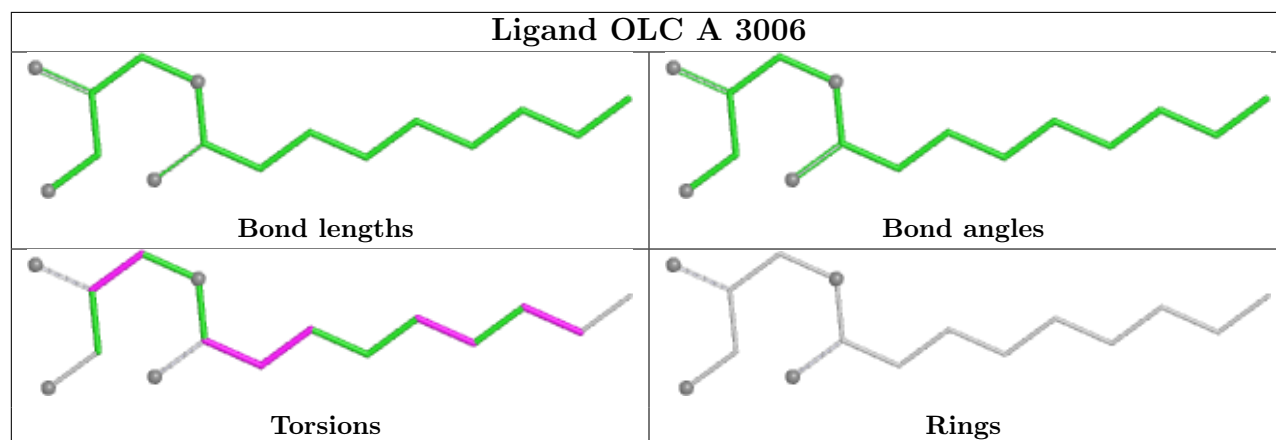
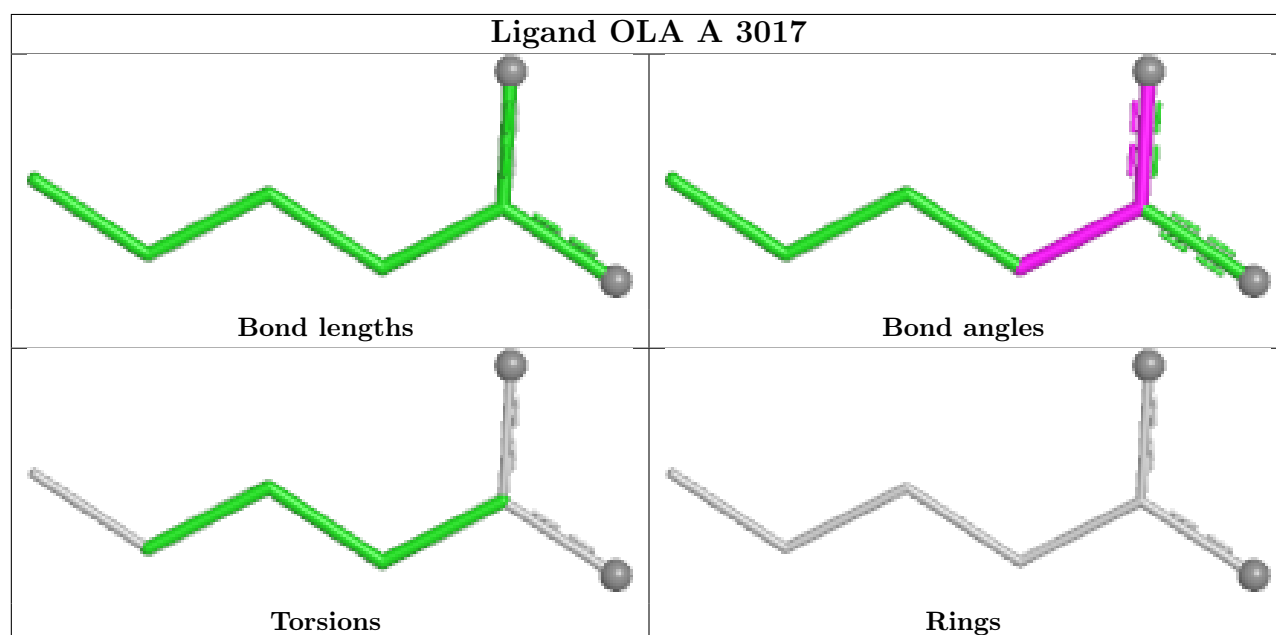
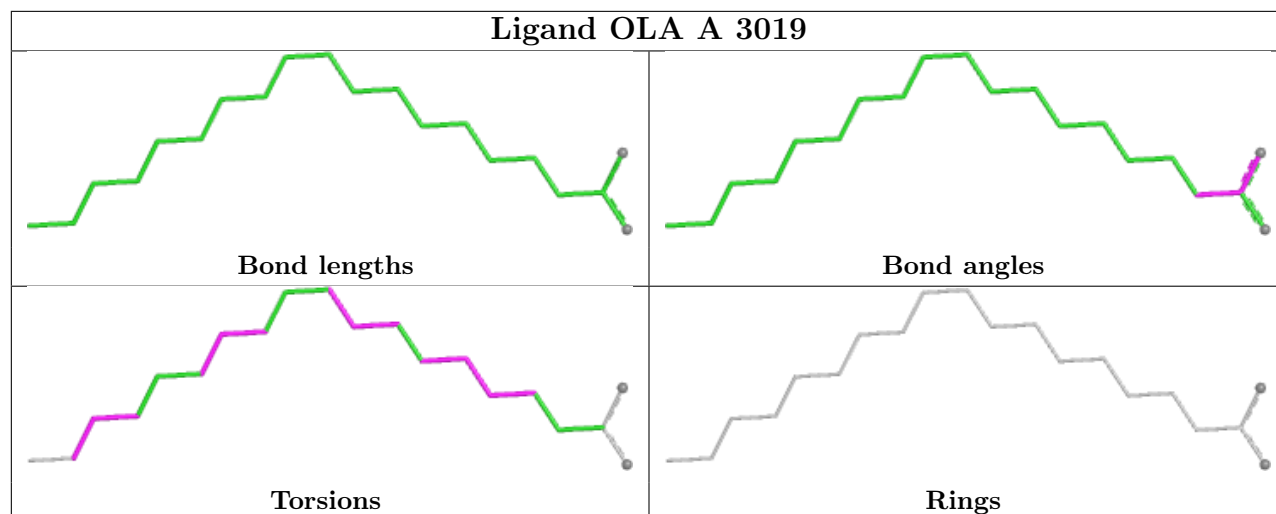
Bond angles

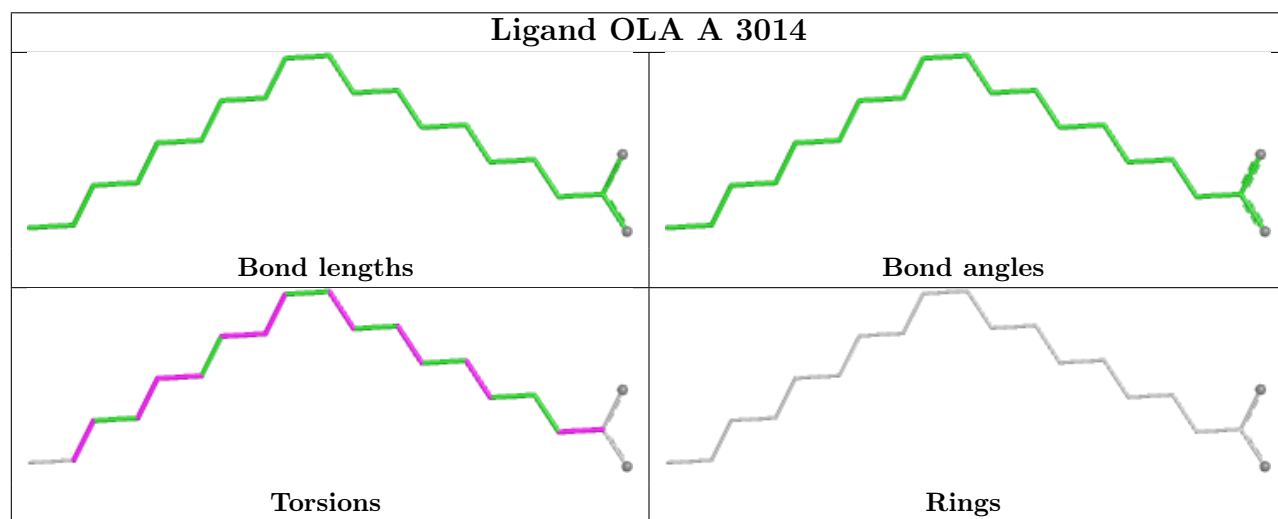
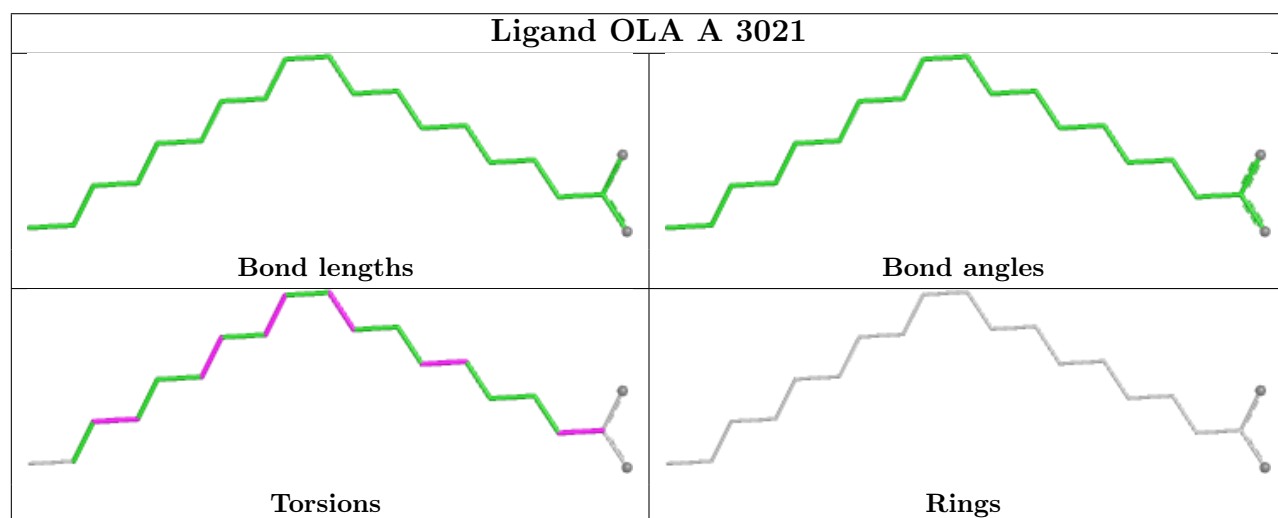
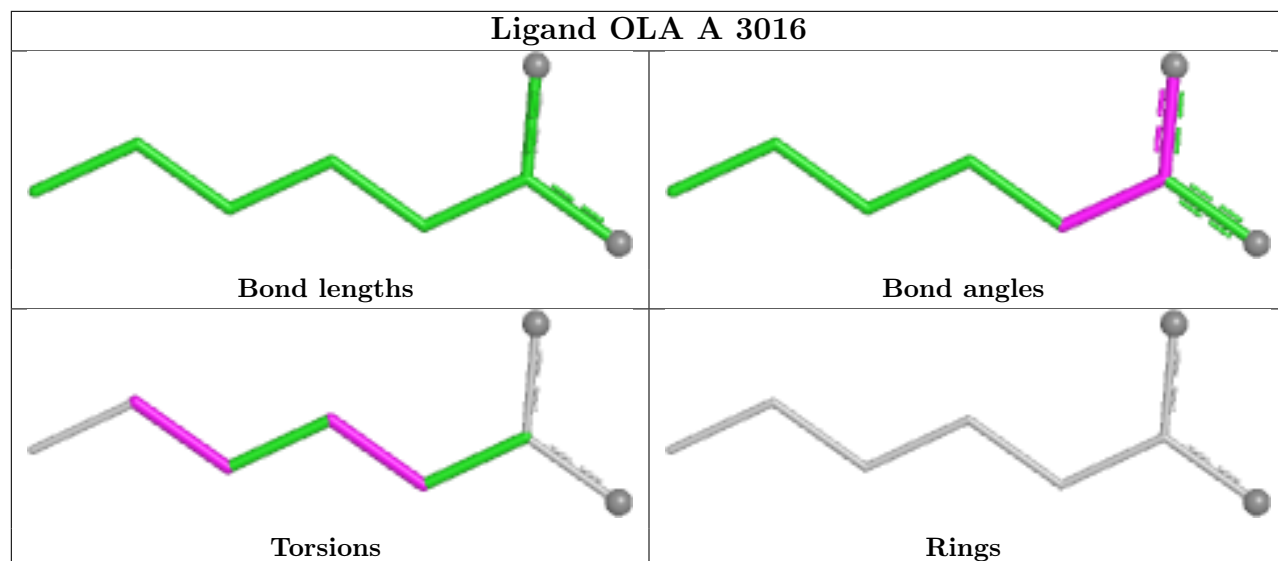


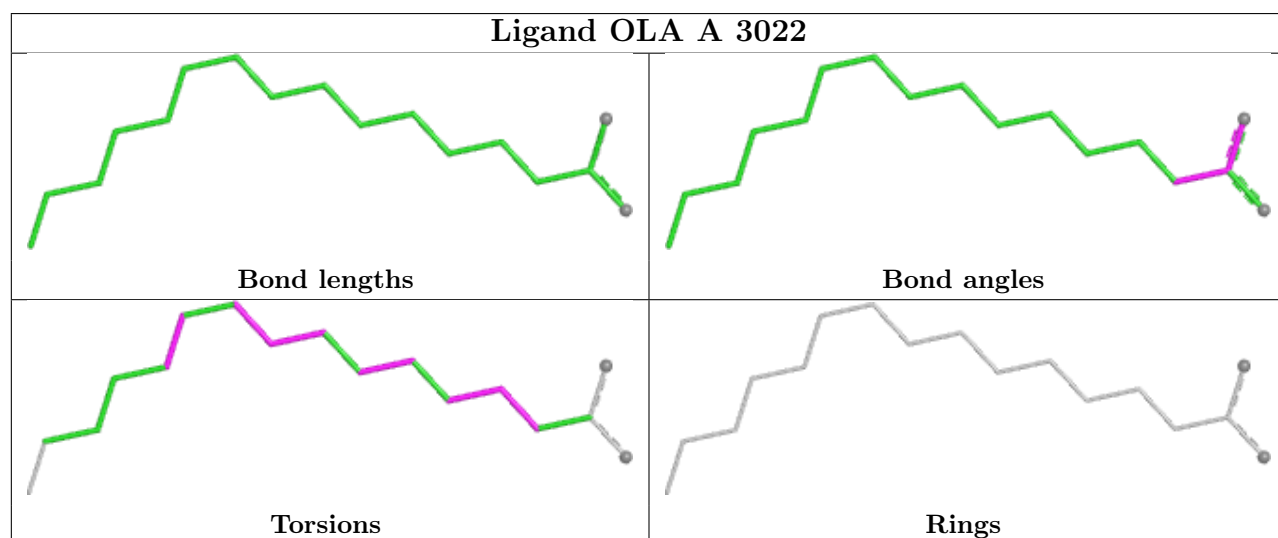
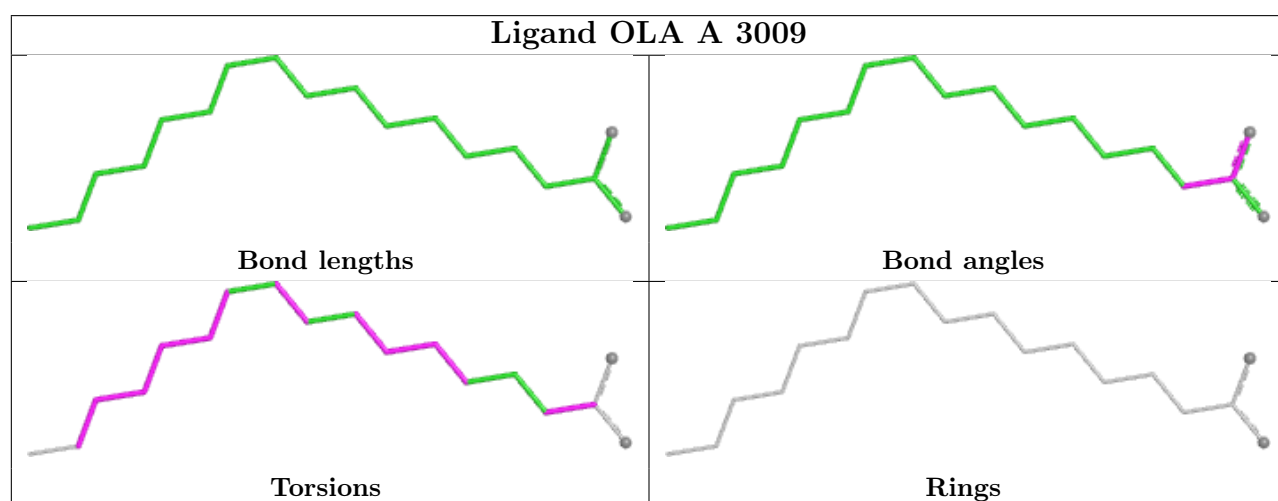
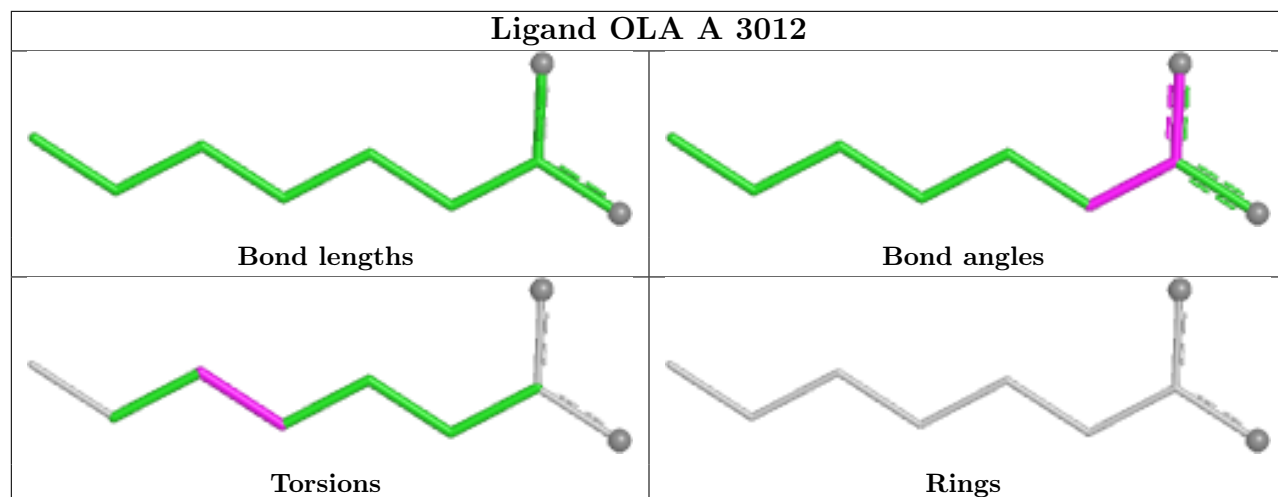
Torsions

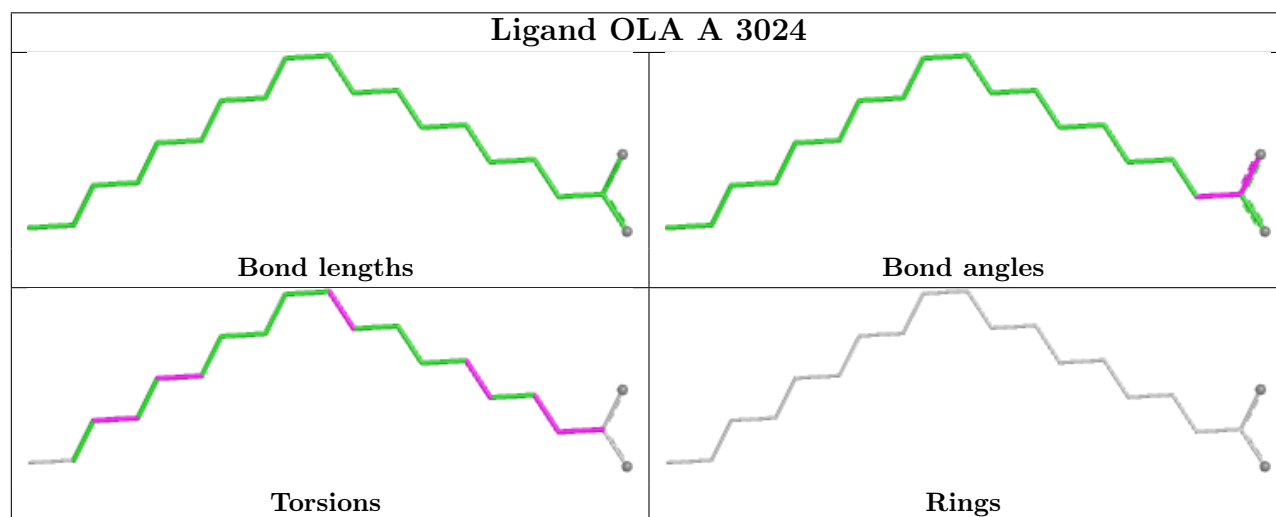
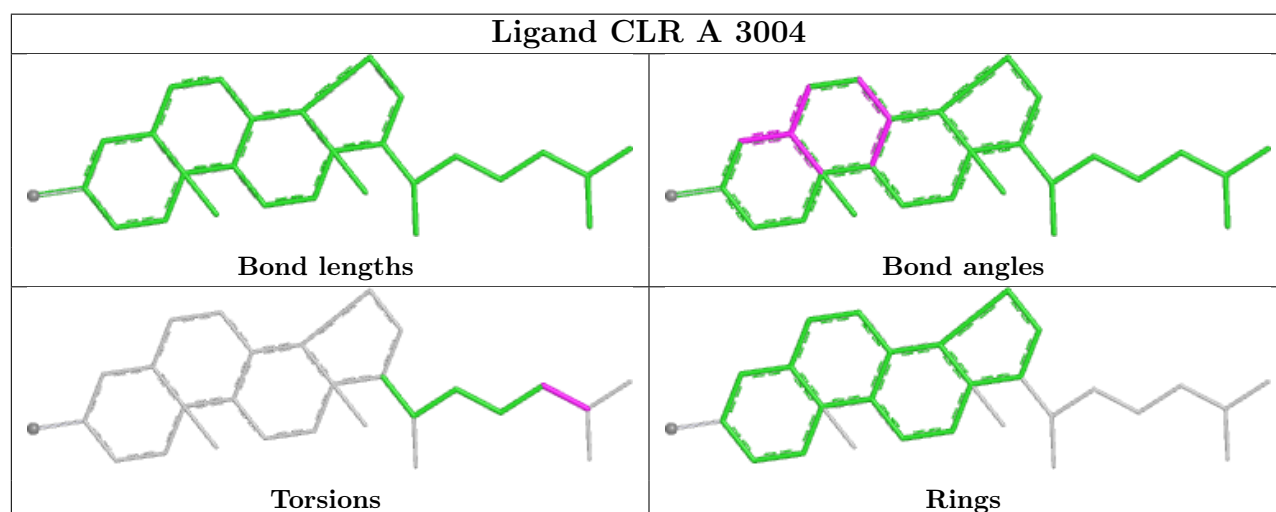
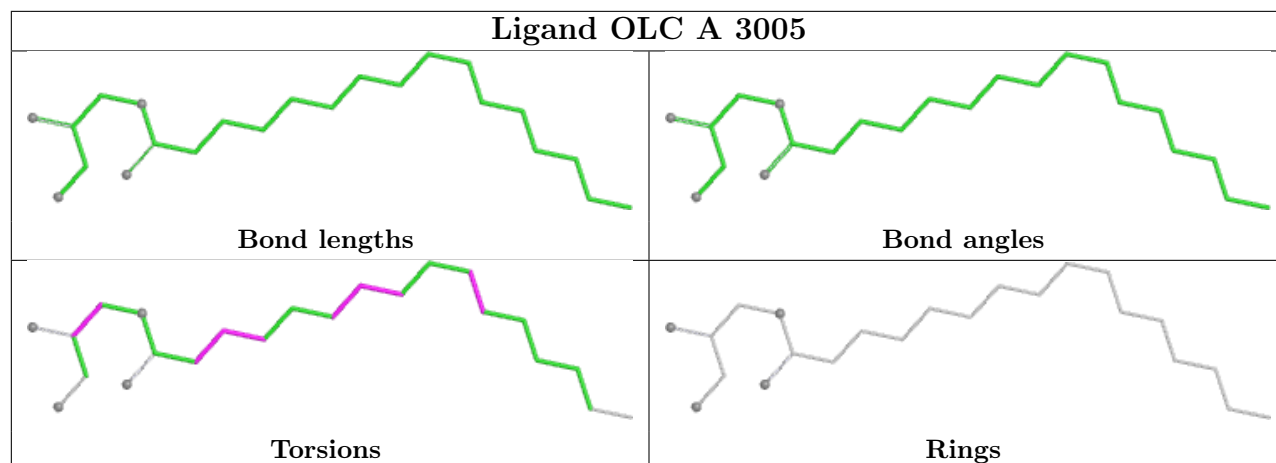


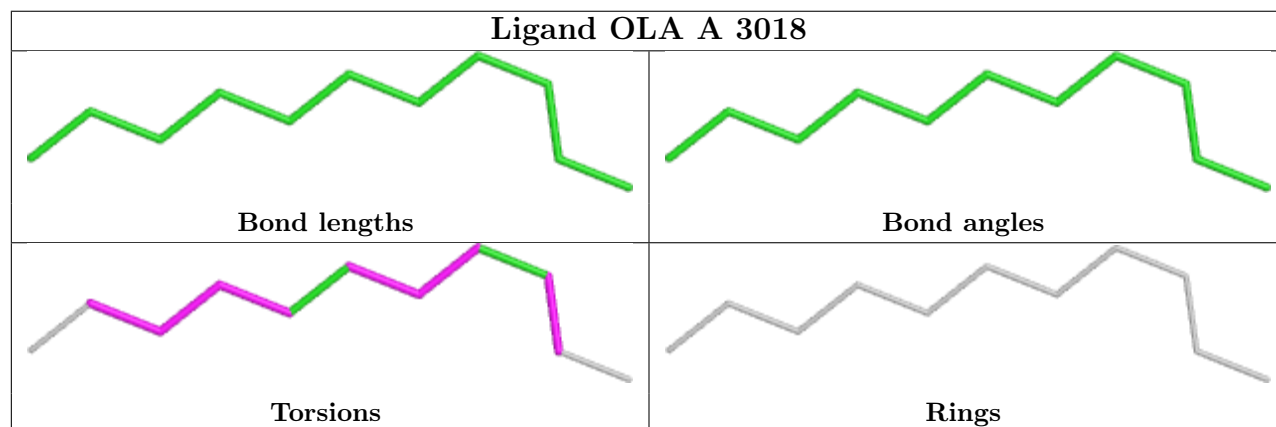
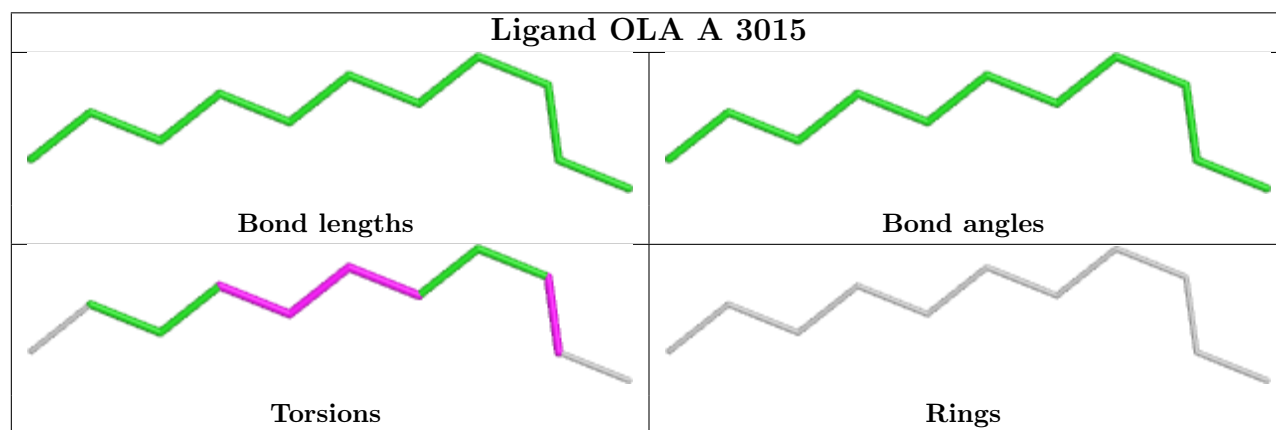
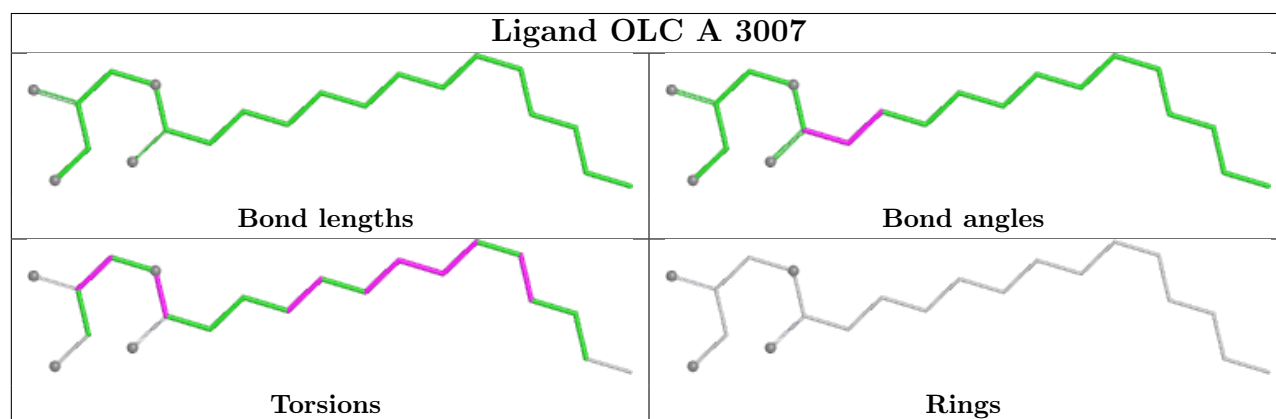
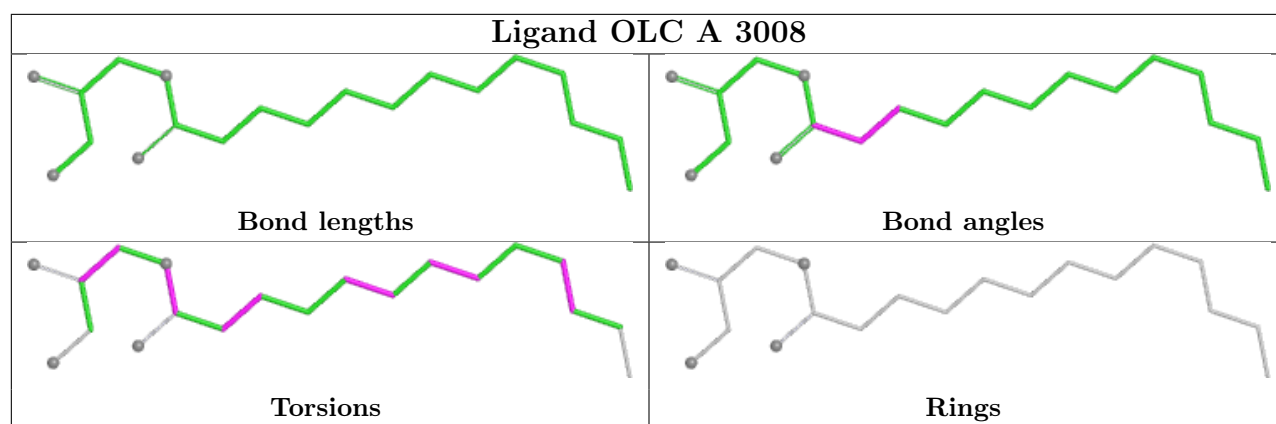
Rings

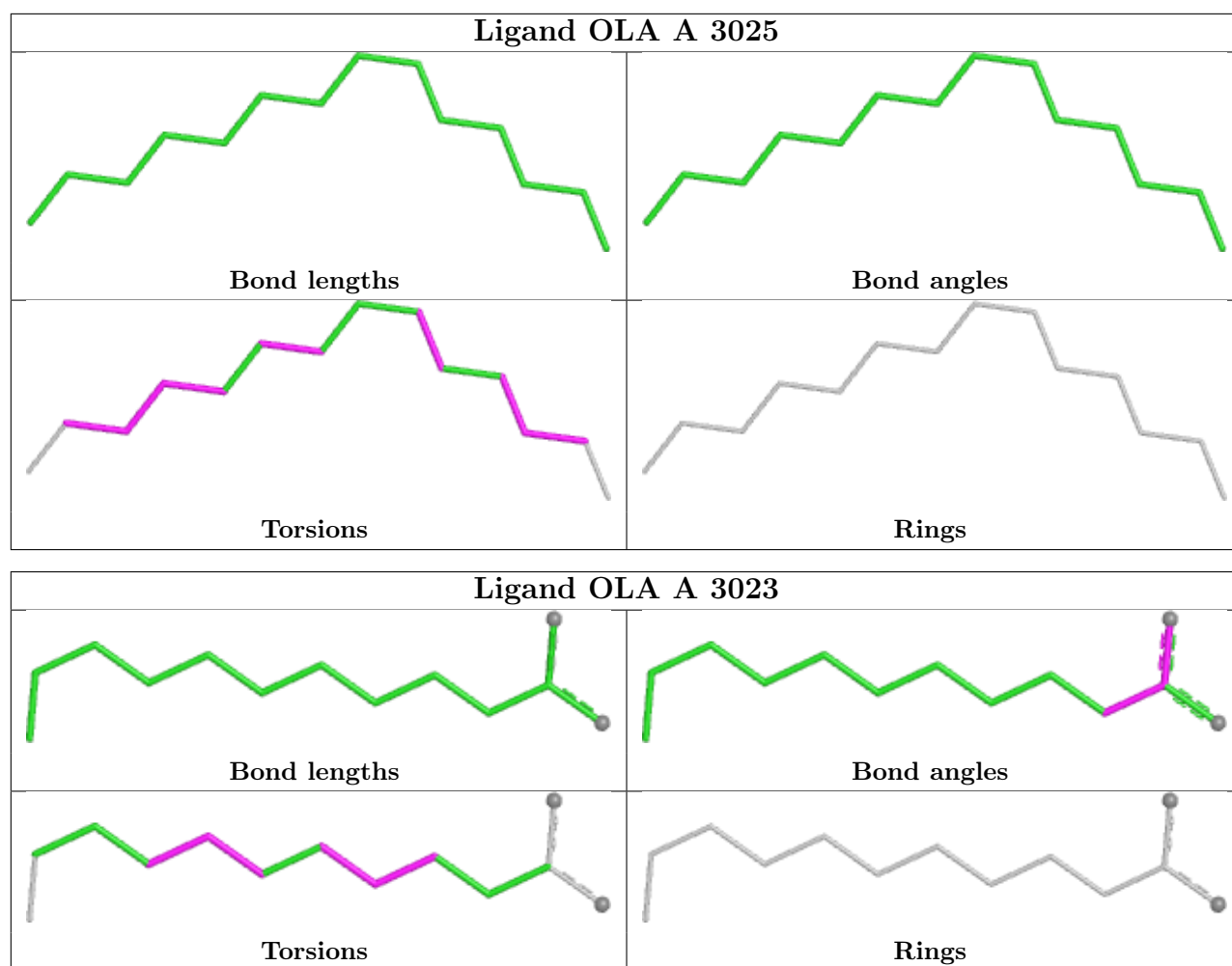












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [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	390/447 (87%)	0.16	17 (4%) 39 34	27, 47, 90, 143	0

All (17) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1061	PHE	4.7
1	A	1060	ASP	3.9
1	A	1057	GLU	3.5
1	A	1043	ALA	2.8
1	A	1058	MET	2.7
1	A	1002	ASP	2.4
1	A	148	GLN	2.4
1	A	306	HIS	2.4
1	A	1022	ASN	2.4
1	A	1105	TYR	2.3
1	A	1106	LEU	2.1
1	A	1028	ASP	2.1
1	A	1077	LYS	2.1
1	A	1	PRO	2.1
1	A	1063	HIS	2.1
1	A	1004	GLU	2.1
1	A	29	TRP	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 oligosaccharides in this entry.

6.4 Ligands ⓘ

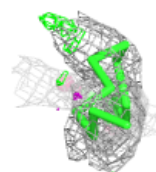
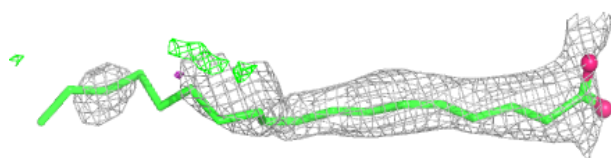
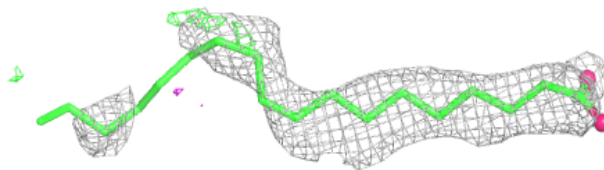
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	OLA	A	3021	20/20	0.72	0.19	48,77,88,90	0
5	OLA	A	3011	11/20	0.73	0.19	61,64,87,88	0
5	OLA	A	3023	13/20	0.76	0.17	50,56,79,82	0
5	OLA	A	3024	20/20	0.76	0.22	57,72,84,85	0
5	OLA	A	3016	8/20	0.78	0.17	58,61,64,68	0
5	OLA	A	3018	11/20	0.79	0.19	51,56,70,75	0
5	OLA	A	3014	20/20	0.80	0.19	50,65,80,81	0
5	OLA	A	3013	20/20	0.80	0.17	49,56,70,74	0
4	OLC	A	3007	21/25	0.81	0.18	34,59,70,81	0
5	OLA	A	3019	20/20	0.82	0.16	51,59,73,73	0
4	OLC	A	3008	20/25	0.83	0.20	48,55,76,81	0
5	OLA	A	3012	9/20	0.84	0.15	42,50,60,72	0
5	OLA	A	3009	18/20	0.84	0.18	46,59,76,77	0
4	OLC	A	3005	23/25	0.84	0.15	44,56,76,83	0
5	OLA	A	3010	20/20	0.85	0.15	43,59,73,75	0
5	OLA	A	3022	17/20	0.85	0.16	48,57,70,71	0
5	OLA	A	3015	11/20	0.86	0.15	38,51,63,68	0
5	OLA	A	3017	7/20	0.87	0.16	60,71,73,74	0
4	OLC	A	3006	16/25	0.88	0.14	43,60,80,89	0
5	OLA	A	3025	14/20	0.88	0.14	40,49,63,63	0
5	OLA	A	3020	11/20	0.89	0.11	41,46,62,67	0
3	CLR	A	3003	28/28	0.92	0.09	36,43,55,59	0
3	CLR	A	3002	28/28	0.93	0.10	40,47,53,62	0
3	CLR	A	3004	28/28	0.94	0.09	41,47,61,67	0
2	TKO	A	3001	17/17	0.97	0.07	25,33,44,69	0

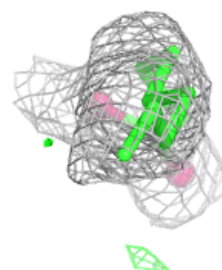
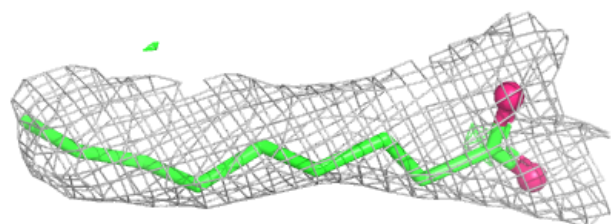
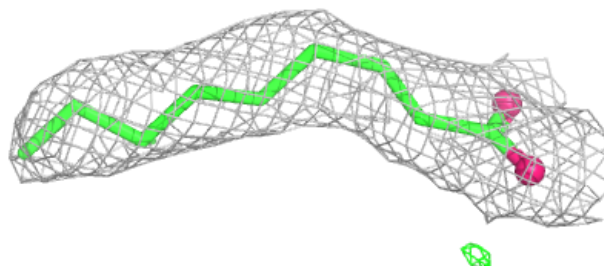
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around OLA A 3021:

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

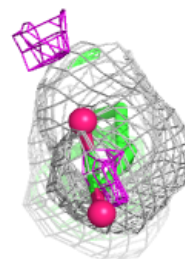
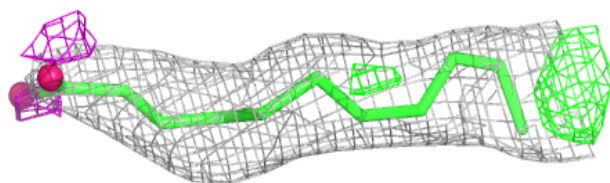
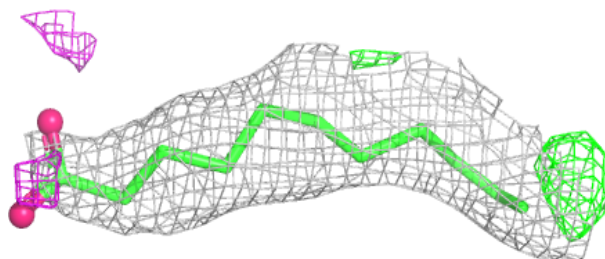
**Electron density around OLA A 3011:**

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

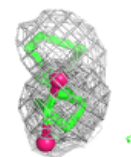
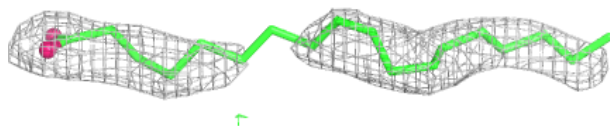
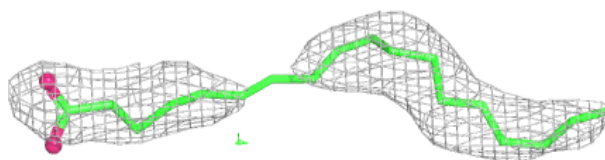


Electron density around OLA A 3023:

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

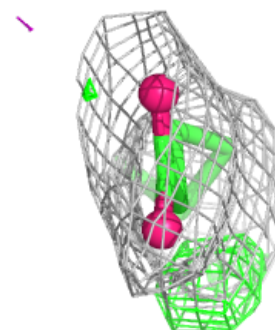
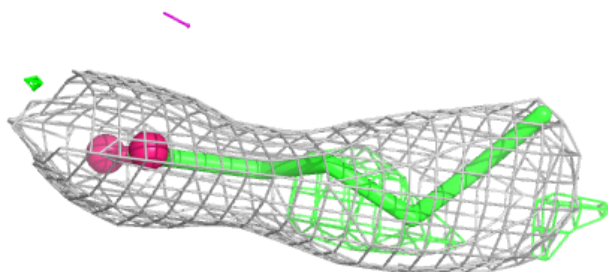
**Electron density around OLA A 3024:**

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

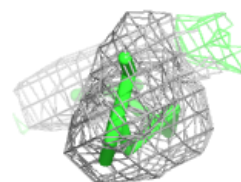
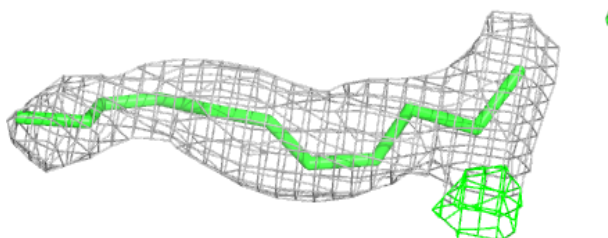
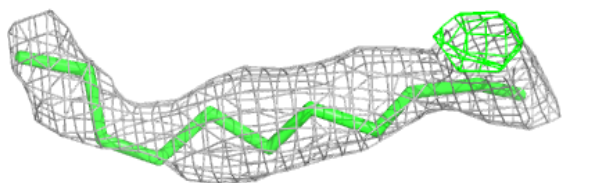


Electron density around OLA A 3016:

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

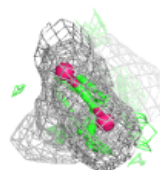
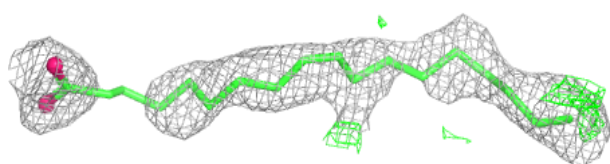
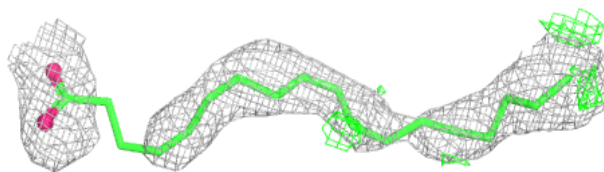
**Electron density around OLA A 3018:**

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

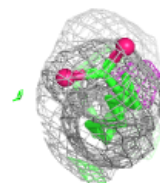
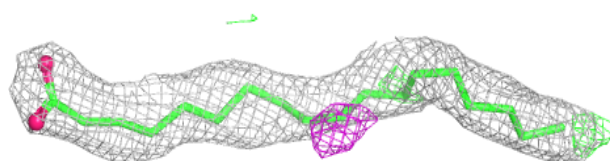
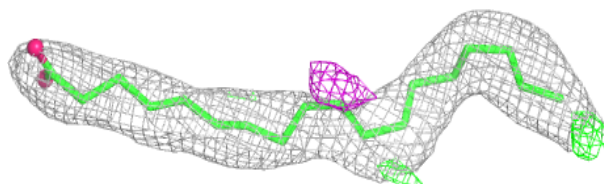


Electron density around OLA A 3014:

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

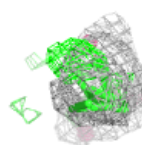
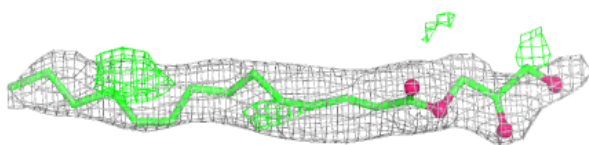
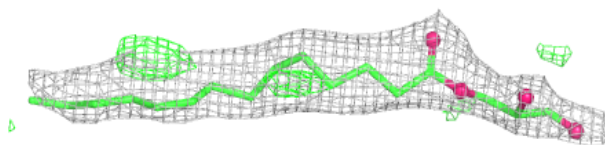
**Electron density around OLA A 3013:**

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

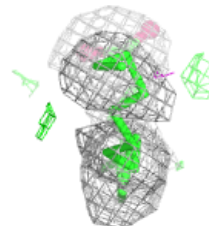
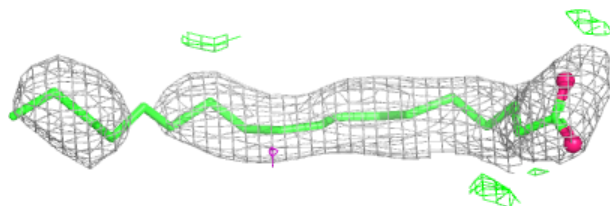
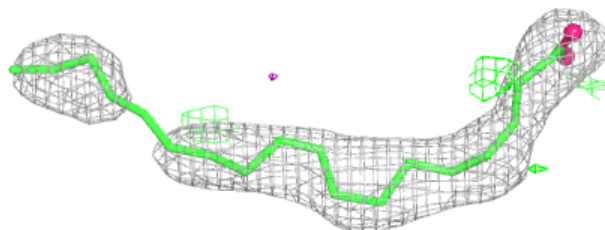


Electron density around OLC A 3007:

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

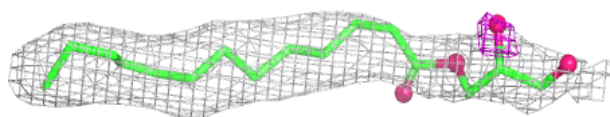
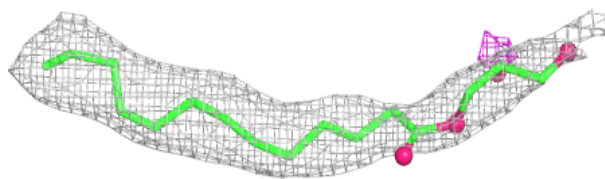
**Electron density around OLA A 3019:**

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

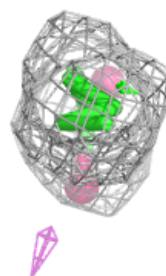
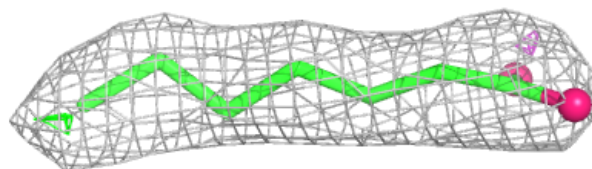
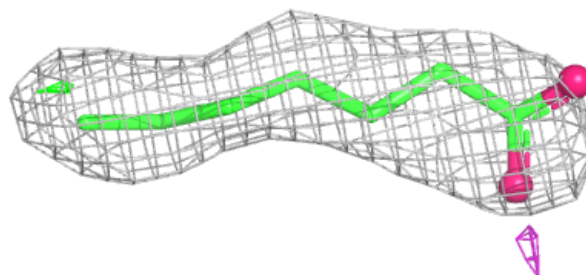


Electron density around OLC A 3008:

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

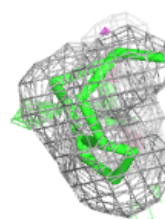
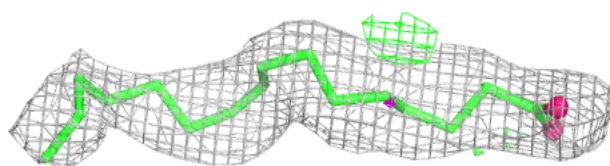
**Electron density around OLA A 3012:**

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

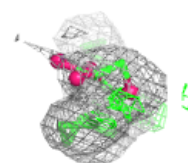
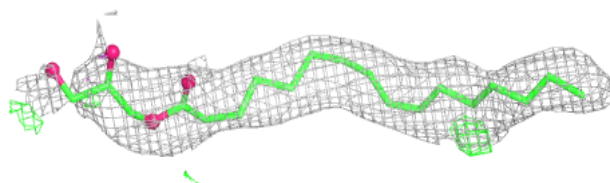
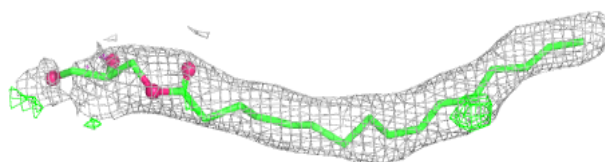


Electron density around OLA A 3009:

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

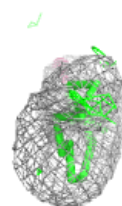
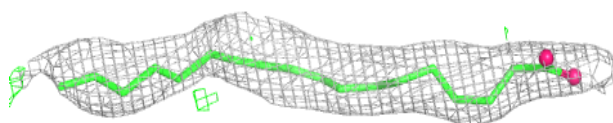
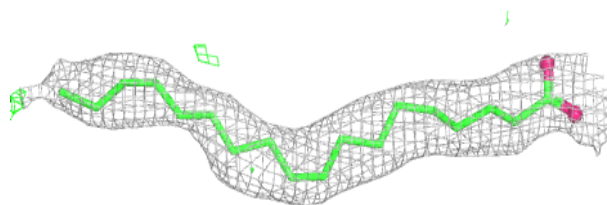
**Electron density around OLC A 3005:**

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

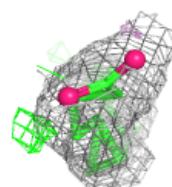
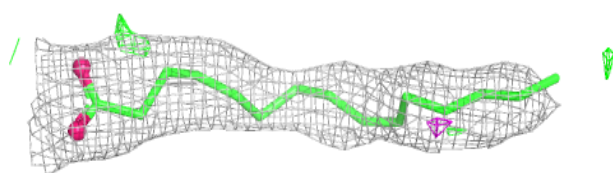
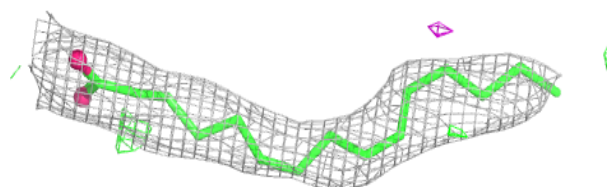


Electron density around OLA A 3010:

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

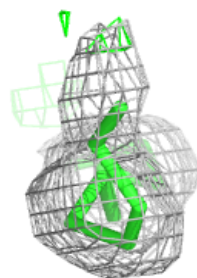
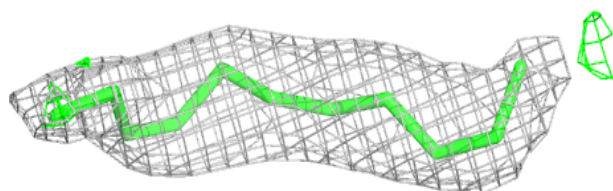
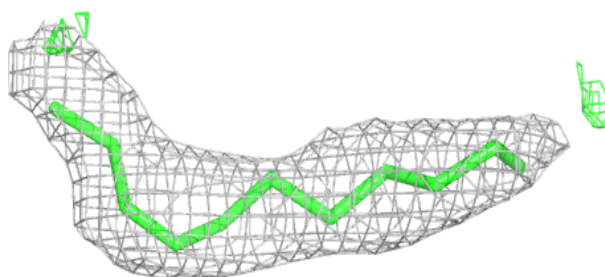
**Electron density around OLA A 3022:**

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

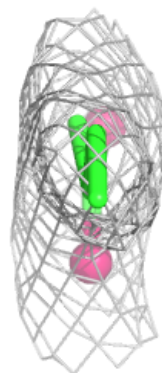
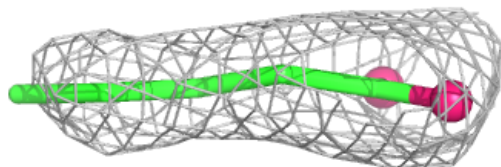
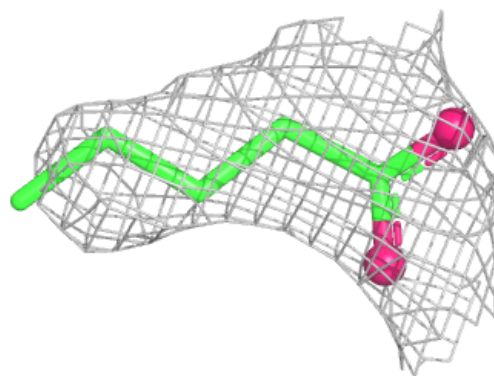


Electron density around OLA A 3015:

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

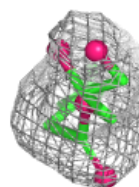
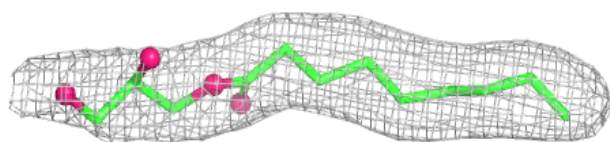
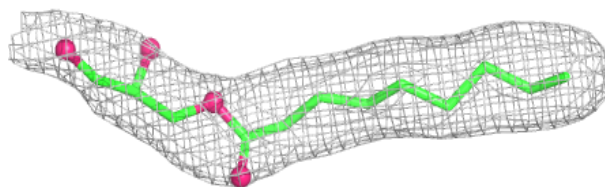
**Electron density around OLA A 3017:**

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

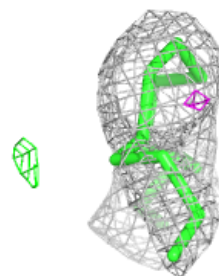
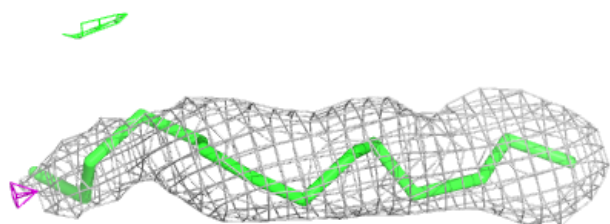
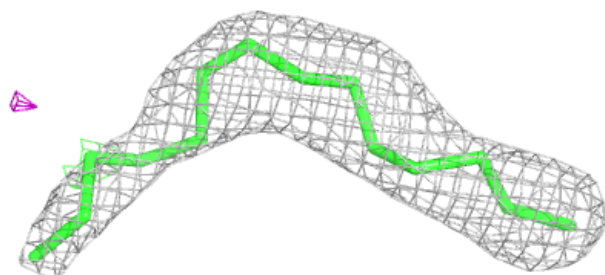


Electron density around OLC A 3006:

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

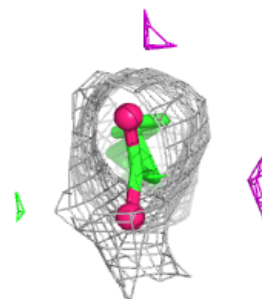
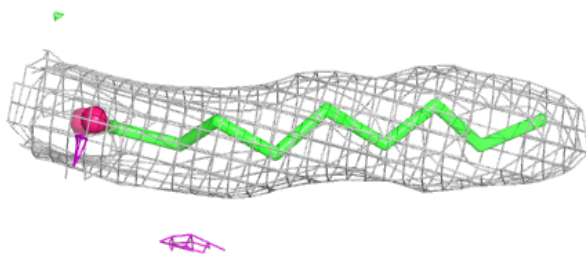
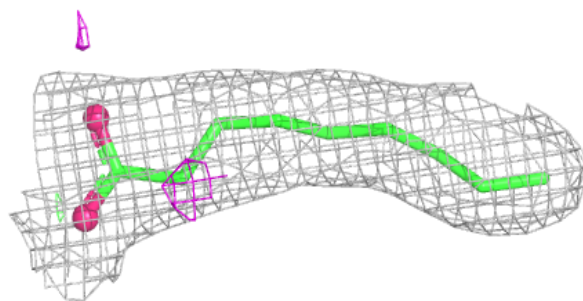
**Electron density around OLA A 3025:**

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

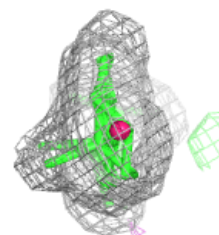
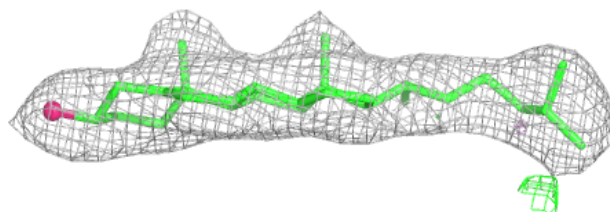
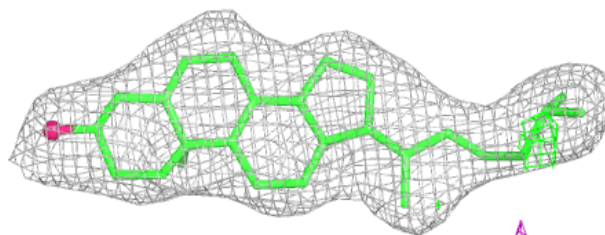


Electron density around OLA A 3020:

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

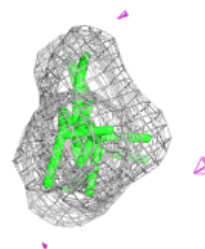
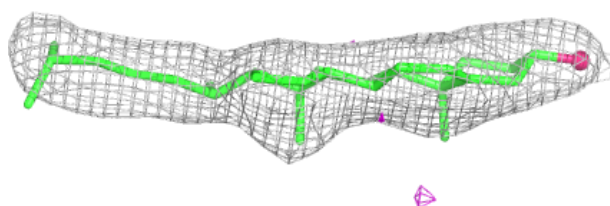
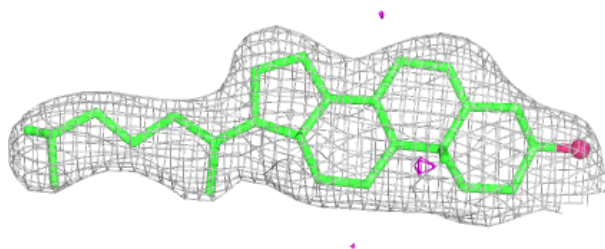
**Electron density around CLR A 3003:**

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

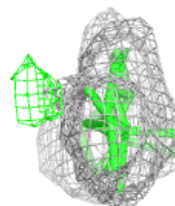
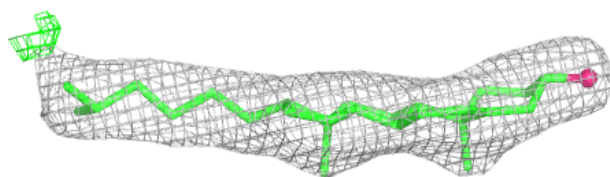
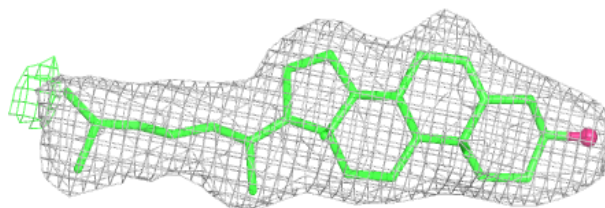


Electron density around CLR A 3002:

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

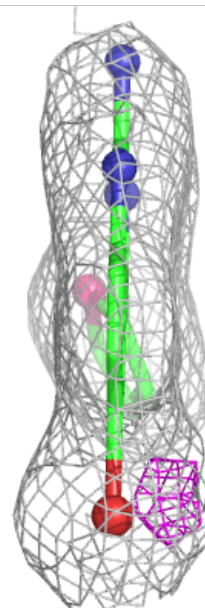
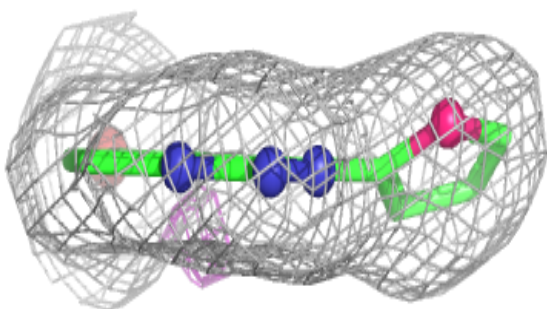
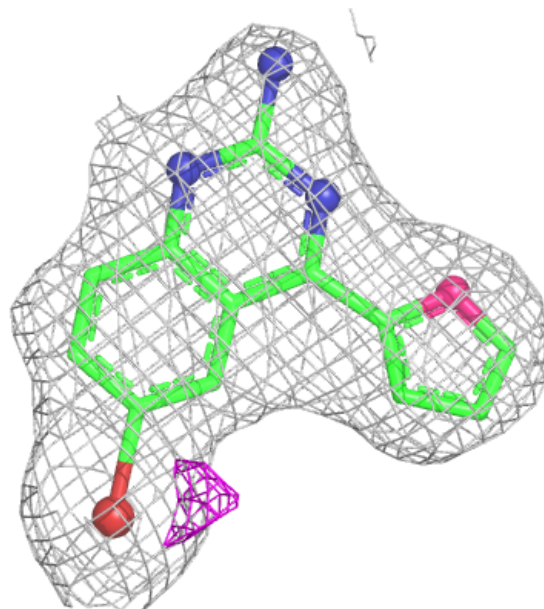
**Electron density around CLR A 3004:**

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



Electron density around TKO A 3001:

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



6.5 Other polymers ⓘ

There are no such residues in this entry.