



wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 22, 2020 – 09:23 AM BST

PDB ID : 5Z0B
Title : Crystal structure of plasma-derived human serum albumin
Authors : Park, J.; Kim, M.-S.; Shin, D.H.
Deposited on : 2017-12-19
Resolution : 2.17 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The 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 : 2.13.1
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) : 2.13.1

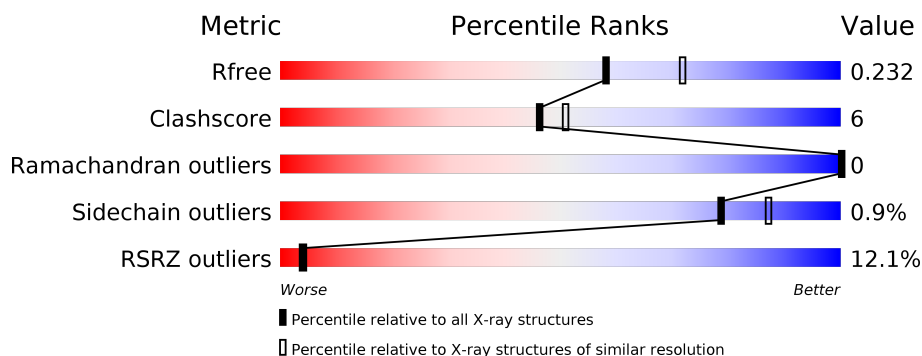
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.17 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	6864 (2.20-2.16)
Clashscore	141614	7689 (2.20-2.16)
Ramachandran outliers	138981	7564 (2.20-2.16)
Sidechain outliers	138945	7564 (2.20-2.16)
RSRZ outliers	127900	6738 (2.20-2.16)

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 on 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	585	<div> <div>10%</div> <div>87%</div> <div>12%</div> <div>.</div> </div>
1	B	585	<div> <div>12%</div> <div>88%</div> <div>11%</div> <div>.</div> </div>
1	C	585	<div> <div>14%</div> <div>78%</div> <div>13%</div> <div>9%</div> </div>

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	PLM	B	604	-	-	X	-
6	SO4	C	609	-	-	X	-

2 Entry composition [i](#)

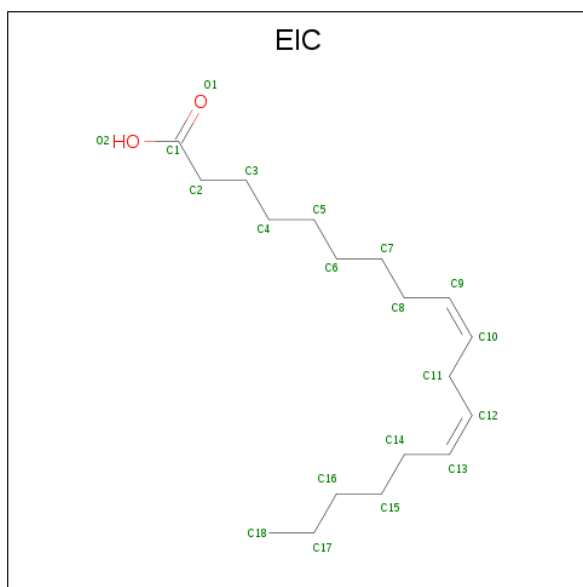
There are 11 unique types of molecules in this entry. The entry contains 14517 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Serum albumin.

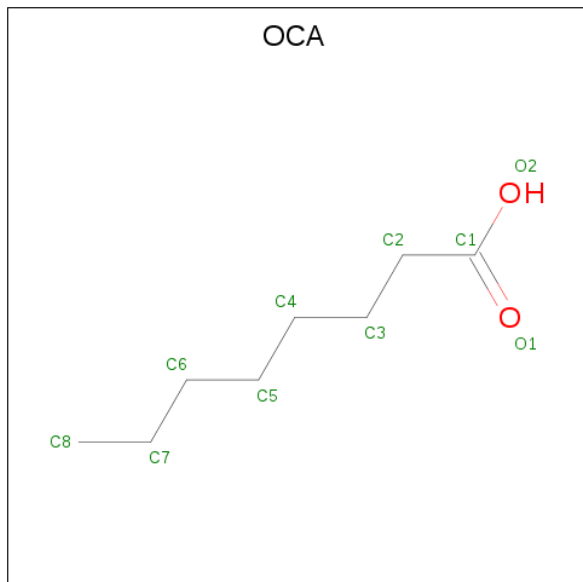
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	581	Total	C	N	O	S	0	0	0
			4621	2917	780	883	41			
1	B	581	Total	C	N	O	S	0	1	0
			4629	2922	783	883	41			
1	C	532	Total	C	N	O	S	0	2	0
			4272	2697	730	808	37			

- Molecule 2 is LINOLEIC ACID (three-letter code: EIC) (formula: $C_{18}H_{32}O_2$) (labeled as "Ligand of Interest" by author).



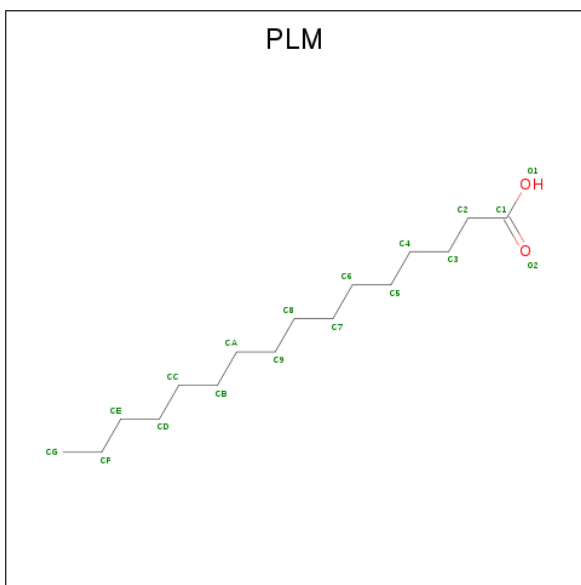
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			20	18	2		
2	B	1	Total	C	O	0	0
			20	18	2		
2	C	1	Total	C	O	0	0
			20	18	2		

- Molecule 3 is OCTANOIC ACID (CAPRYLIC ACID) (three-letter code: OCA) (formula: $C_8H_{16}O_2$) (labeled as "Ligand of Interest" by author).



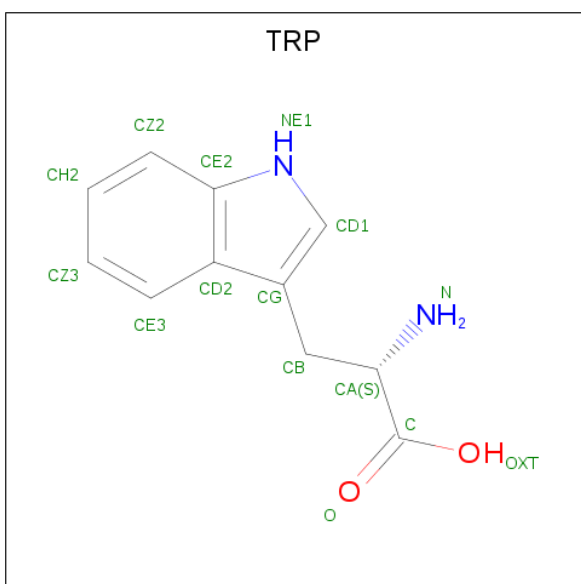
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			10	8	2		
3	A	1	Total	C	O	0	0
			10	8	2		
3	B	1	Total	C	O	0	0
			10	8	2		
3	C	1	Total	C	O	0	0
			10	8	2		
3	C	1	Total	C	O	0	0
			10	8	2		

- Molecule 4 is PALMITIC ACID (three-letter code: PLM) (formula: $C_{16}H_{32}O_2$) (labeled as "Ligand of Interest" by author).



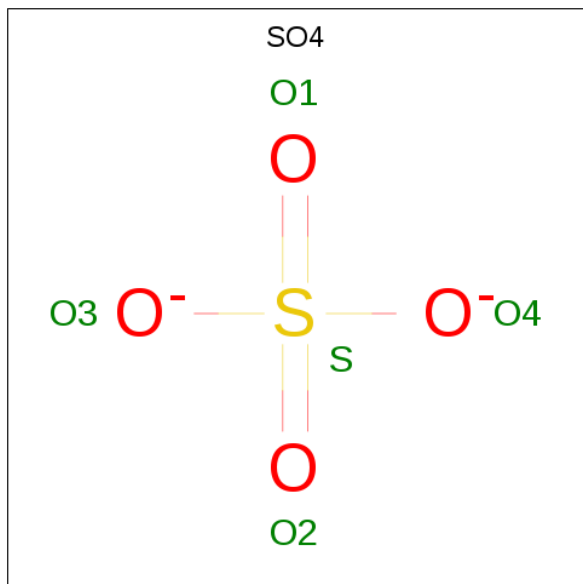
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			18	16	2		
4	B	1	Total	C	O	0	0
			18	16	2		
4	B	1	Total	C	O	0	0
			18	16	2		
4	C	1	Total	C	O	0	0
			18	16	2		

- Molecule 5 is TRYPTOPHAN (three-letter code: TRP) (formula: $C_{11}H_{12}N_2O_2$) (labeled as "Ligand of Interest" by author).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			15	11	2	2		
5	B	1	Total	C	N	O	0	0
			15	11	2	2		
5	C	1	Total	C	N	O	0	0
			15	11	2	2		

- Molecule 6 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



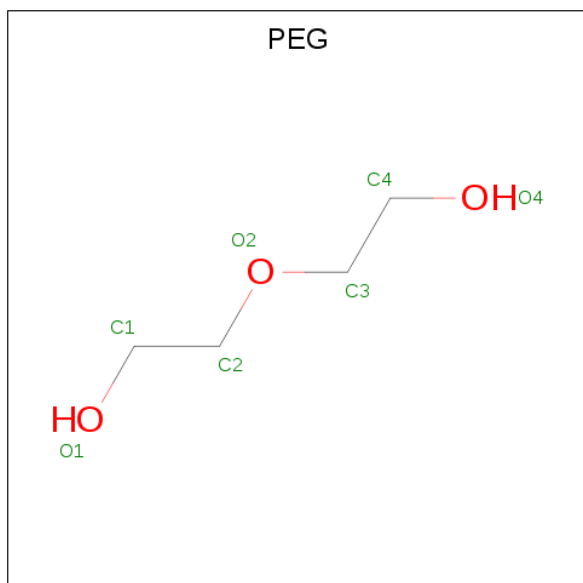
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	A	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	B	1	Total	O	S	0	0
			5	4	1		
6	C	1	Total	O	S	0	0
			5	4	1		
6	C	1	Total	O	S	0	0
			5	4	1		
6	C	1	Total	O	S	0	0
			5	4	1		
6	C	1	Total	O	S	0	0
			5	4	1		

- Molecule 7 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C₄H₁₀O₃).



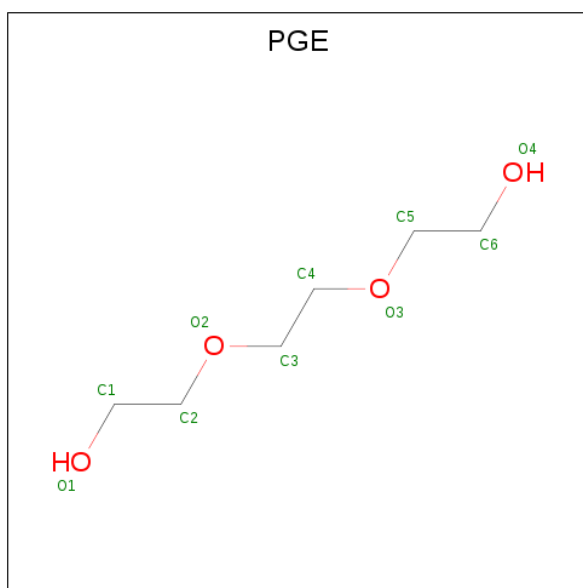
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			7	4	3		

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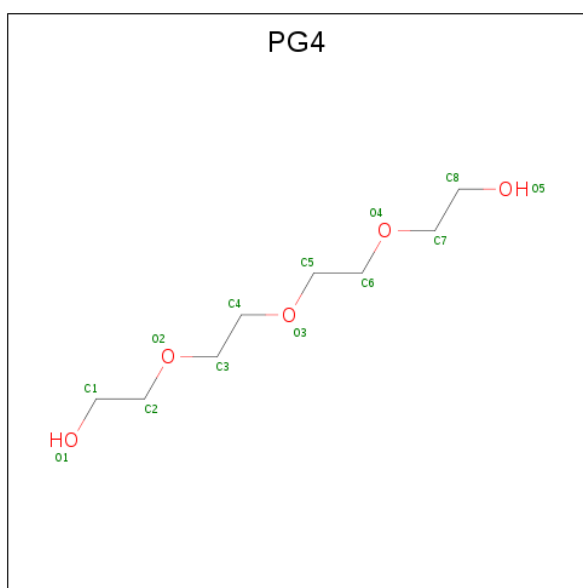
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			7	4	3		
7	A	1	Total	C	O	0	0
			7	4	3		
7	B	1	Total	C	O	0	0
			7	4	3		
7	B	1	Total	C	O	0	0
			7	4	3		
7	B	1	Total	C	O	0	0
			7	4	3		
7	B	1	Total	C	O	0	0
			7	4	3		
7	B	1	Total	C	O	0	0
			7	4	3		
7	B	1	Total	C	O	0	0
			7	4	3		
7	C	1	Total	C	O	0	0
			7	4	3		
7	C	1	Total	C	O	0	0
			7	4	3		
7	C	1	Total	C	O	0	0
			7	4	3		

- Molecule 8 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: $C_6H_{14}O_4$).



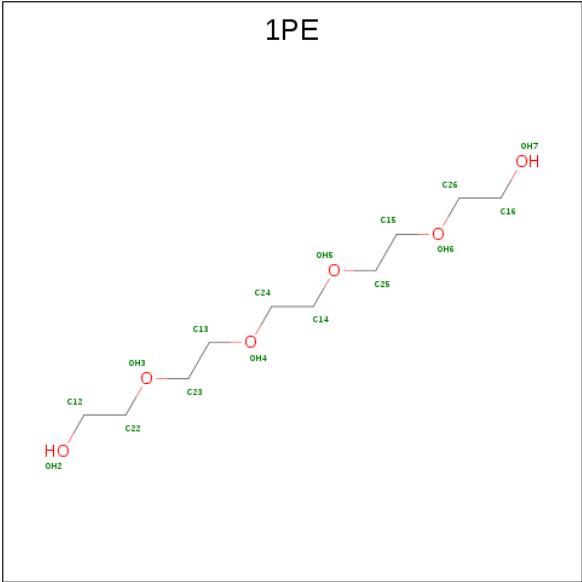
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	A	1	Total	C	O	0	0
			10	6	4		
8	B	1	Total	C	O	0	0
			10	6	4		
8	B	1	Total	C	O	0	0
			10	6	4		
8	C	1	Total	C	O	0	0
			10	6	4		

- Molecule 9 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	A	1	Total	C	O	0	0
			13	8	5		
9	A	1	Total	C	O	0	0
			13	8	5		
9	B	1	Total	C	O	0	0
			13	8	5		
9	C	1	Total	C	O	0	0
			13	8	5		
9	C	1	Total	C	O	0	0
			13	8	5		

- Molecule 10 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: $C_{10}H_{22}O_6$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
10	B	1	Total	C	O	0	0
			16	10	6		

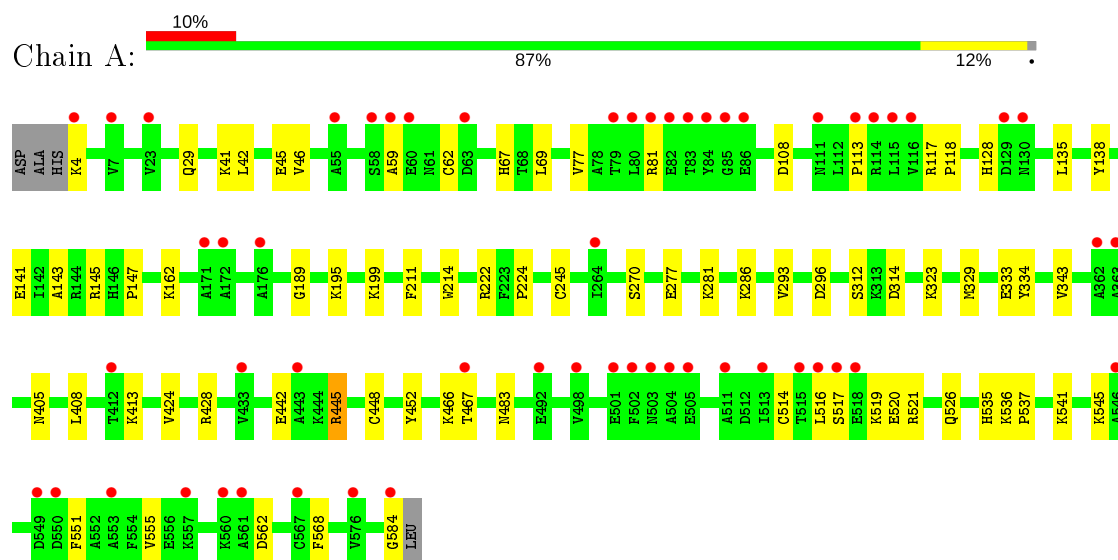
- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	143	Total	O	0	0
			143	143		
11	B	176	Total	O	0	0
			176	176		
11	C	142	Total	O	0	0
			142	142		

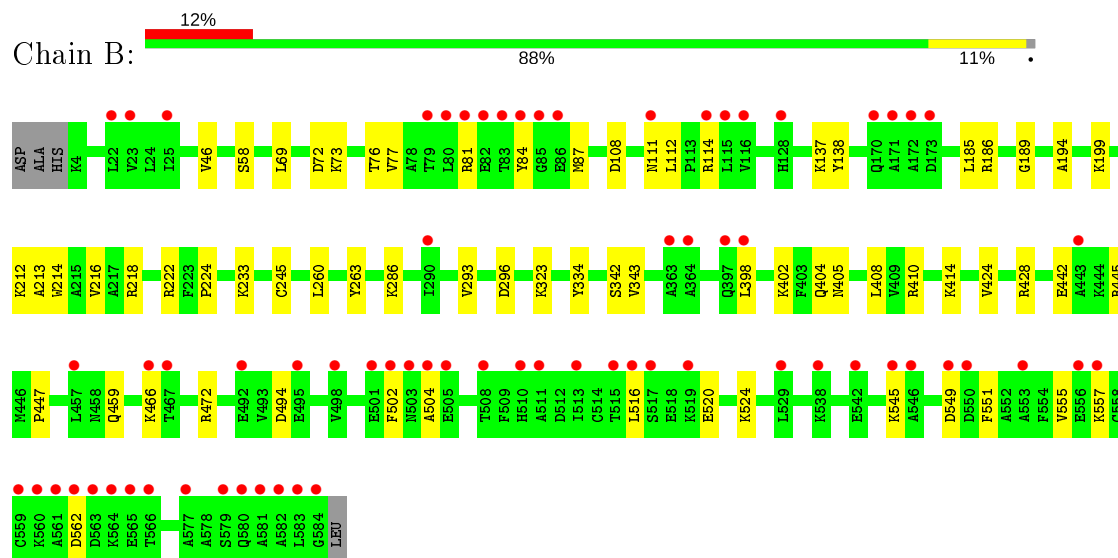
3 Residue-property plots

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

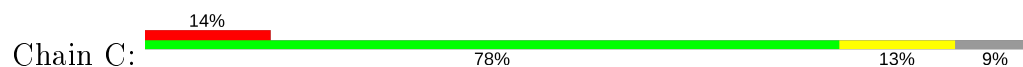
• Molecule 1: Serum albumin

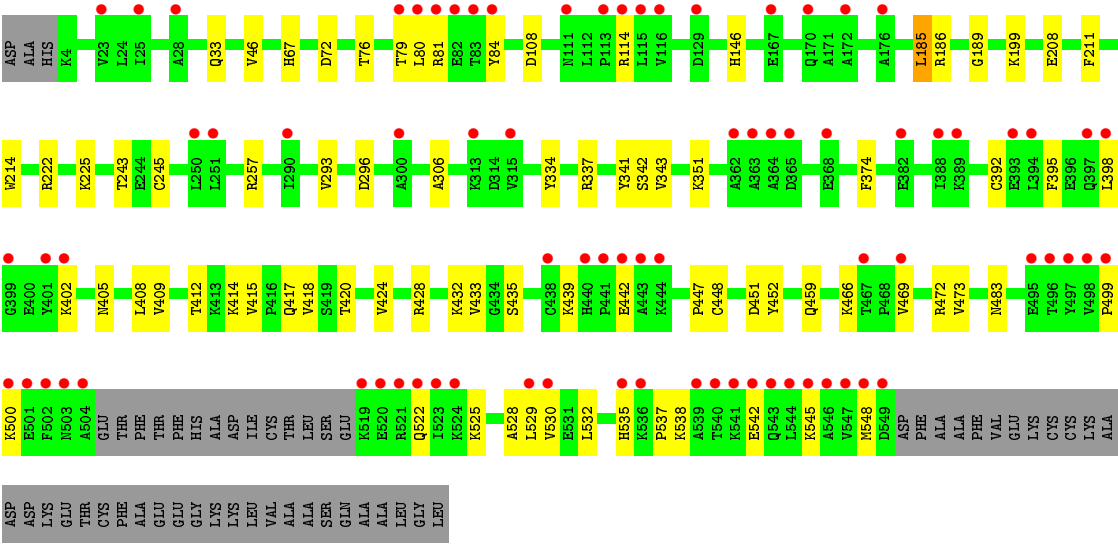


• Molecule 1: Serum albumin



• Molecule 1: Serum albumin





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	203.58Å 113.47Å 86.81Å 90.00° 104.88° 90.00°	Depositor
Resolution (Å)	19.78 – 2.17 19.78 – 2.17	Depositor EDS
% Data completeness (in resolution range)	96.2 (19.78-2.17) 96.2 (19.78-2.17)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.05	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.85 (at 2.17Å)	Xtriage
Refinement program	PHENIX 1.16_3549	Depositor
R, R_{free}	0.183 , 0.232 0.183 , 0.232	Depositor DCC
R_{free} test set	4822 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	35.9	Xtriage
Anisotropy	0.169	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 62.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	14517	wwPDB-VP
Average B, all atoms (Å ²)	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.98% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: CSO, PGE, OCA, EIC, 1PE, PG4, SO4, PLM, PEG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.39	0/4702	0.50	0/6339
1	B	0.40	0/4713	0.52	0/6353
1	C	0.39	0/4349	0.51	0/5861
All	All	0.39	0/13764	0.51	0/18553

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	4621	0	4545	53	0
1	B	4629	0	4558	50	0
1	C	4272	0	4225	65	0
2	A	20	0	31	5	0
2	B	20	0	31	3	0
2	C	20	0	31	7	0
3	A	20	0	30	2	0
3	B	10	0	15	3	0
3	C	20	0	30	2	0
4	A	18	0	31	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	36	0	62	15	0
4	C	18	0	31	6	0
5	A	15	0	9	1	0
5	B	15	0	9	1	0
5	C	15	0	9	0	0
6	A	40	0	0	0	0
6	B	35	0	0	0	0
6	C	20	0	0	3	0
7	A	21	0	30	2	0
7	B	49	0	70	3	0
7	C	21	0	30	3	0
8	A	10	0	14	1	0
8	B	20	0	28	4	0
8	C	10	0	14	1	0
9	A	26	0	36	2	0
9	B	13	0	18	0	0
9	C	26	0	36	1	0
10	B	16	0	22	2	0
11	A	143	0	0	2	0
11	B	176	0	0	6	1
11	C	142	0	0	4	0
All	All	14517	0	13945	177	1

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 6.

The worst 5 of 177 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:405:ASN:HA	1:B:408:LEU:HD12	1.70	0.74
1:C:189:GLY:HA3	4:C:603:PLM:H72	1.69	0.73
1:B:69:LEU:HB3	3:B:602:OCA:H72	1.71	0.70
1:B:77:VAL:HG13	1:B:81:ARG:HD2	1.74	0.70
1:A:77:VAL:HG13	1:A:81:ARG:HD2	1.73	0.68

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:B:1052:HOH:O	11:B:1126:HOH:O[4_545]	2.17	0.03

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	578/585 (99%)	565 (98%)	13 (2%)	0	100	100
1	B	579/585 (99%)	569 (98%)	10 (2%)	0	100	100
1	C	529/585 (90%)	515 (97%)	14 (3%)	0	100	100
All	All	1686/1755 (96%)	1649 (98%)	37 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	507/510 (99%)	501 (99%)	6 (1%)	71	81
1	B	508/510 (100%)	505 (99%)	3 (1%)	86	92
1	C	471/510 (92%)	467 (99%)	4 (1%)	81	89
All	All	1486/1530 (97%)	1473 (99%)	13 (1%)	78	87

5 of 13 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	562	ASP
1	B	245	CYS
1	C	185	LEU
1	A	514	CYS
1	C	67	HIS

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

Mol	Chain	Res	Type
1	C	67	HIS
1	C	440	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

3 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
1	CSO	C	34	1	3,6,7	0.89	0	0,6,8	0.00	-
1	CSO	A	34	1	3,6,7	0.89	0	0,6,8	0.00	-
1	CSO	B	34	1	3,6,7	0.89	0	0,6,8	0.00	-

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
1	CSO	C	34	1	-	0/1/5/7	-
1	CSO	A	34	1	-	0/1/5/7	-
1	CSO	B	34	1	-	0/1/5/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

57 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	$\# Z > 2$
4	PLM	B	603	-	14,17,17	0.26	0	13,17,17	1.10	0
6	SO4	A	610	-	4,4,4	0.16	0	6,6,6	0.09	0
2	EIC	A	601	-	16,19,19	0.56	0	15,19,19	0.45	0
3	OCA	B	602	-	6,9,9	0.30	0	5,9,9	0.52	0
6	SO4	A	612	-	4,4,4	0.13	0	6,6,6	0.12	0
5	TRP	A	605	-	12,16,16	0.65	0	12,22,22	0.84	0
7	PEG	C	615	-	6,6,6	0.50	0	5,5,5	0.33	0
6	SO4	A	607	-	4,4,4	0.15	0	6,6,6	0.17	0
7	PEG	B	616	-	6,6,6	0.49	0	5,5,5	0.31	0
7	PEG	B	621	-	6,6,6	0.50	0	5,5,5	0.39	0
6	SO4	B	608	-	4,4,4	0.14	0	6,6,6	0.14	0
6	SO4	B	610	-	4,4,4	0.14	0	6,6,6	0.12	0
6	SO4	A	606	-	4,4,4	0.15	0	6,6,6	0.19	0
7	PEG	C	613	-	6,6,6	0.47	0	5,5,5	0.48	0
7	PEG	A	617	-	6,6,6	0.43	0	5,5,5	0.37	0
9	PG4	A	616	-	12,12,12	0.50	0	11,11,11	0.28	0
6	SO4	A	611	-	4,4,4	1.45	0	6,6,6	0.42	0
7	PEG	C	610	-	6,6,6	0.45	0	5,5,5	0.33	0
6	SO4	C	606	-	4,4,4	0.19	0	6,6,6	0.34	0
9	PG4	C	612	-	12,12,12	0.51	0	11,11,11	0.31	0
6	SO4	B	612	-	4,4,4	0.39	0	6,6,6	0.05	0
6	SO4	B	606	-	4,4,4	0.10	0	6,6,6	0.16	0
8	PGE	C	611	-	9,9,9	0.50	0	8,8,8	0.31	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	TRP	C	605	-	12,16,16	0.67	0	12,22,22	0.88	0
9	PG4	C	614	-	12,12,12	0.49	0	11,11,11	0.47	0
7	PEG	B	613	-	6,6,6	0.53	0	5,5,5	0.42	0
7	PEG	B	614	-	6,6,6	0.54	0	5,5,5	0.33	0
4	PLM	A	603	-	14,17,17	0.13	0	13,17,17	0.10	0
7	PEG	A	619	-	6,6,6	0.46	0	5,5,5	0.46	0
6	SO4	C	608	-	4,4,4	0.15	0	6,6,6	0.13	0
3	OCA	A	604	-	6,9,9	0.34	0	5,9,9	0.15	0
2	EIC	C	601	-	16,19,19	0.51	0	15,19,19	0.40	0
6	SO4	A	613	-	4,4,4	0.15	0	6,6,6	0.12	0
9	PG4	A	618	-	12,12,12	0.55	0	11,11,11	0.40	0
7	PEG	B	620	-	6,6,6	0.49	0	5,5,5	0.20	0
5	TRP	B	605	-	12,16,16	0.69	0	12,22,22	0.81	0
6	SO4	B	611	-	4,4,4	0.20	0	6,6,6	0.20	0
6	SO4	A	609	-	4,4,4	0.14	0	6,6,6	0.18	0
4	PLM	B	604	-	14,17,17	0.55	0	13,17,17	0.25	0
3	OCA	A	602	-	6,9,9	0.19	0	5,9,9	0.15	0
3	OCA	C	602	-	6,9,9	0.11	0	5,9,9	0.76	0
8	PGE	A	615	-	9,9,9	0.50	0	8,8,8	0.23	0
6	SO4	C	609	-	4,4,4	0.19	0	6,6,6	0.21	0
10	1PE	B	622	-	15,15,15	0.53	0	14,14,14	0.41	0
7	PEG	B	619	-	6,6,6	0.47	0	5,5,5	0.30	0
9	PG4	B	618	-	12,12,12	0.51	0	11,11,11	0.28	0
6	SO4	B	607	-	4,4,4	0.13	0	6,6,6	0.16	0
3	OCA	C	604	-	6,9,9	0.05	0	5,9,9	0.32	0
8	PGE	B	615	-	9,9,9	0.49	0	8,8,8	0.29	0
7	PEG	A	614	-	6,6,6	0.50	0	5,5,5	0.29	0
8	PGE	B	623	-	9,9,9	0.52	0	8,8,8	0.50	0
6	SO4	B	609	-	4,4,4	0.14	0	6,6,6	0.15	0
2	EIC	B	601	-	16,19,19	0.59	0	15,19,19	0.54	0
7	PEG	B	617	-	6,6,6	0.43	0	5,5,5	0.33	0
6	SO4	C	607	-	4,4,4	0.13	0	6,6,6	0.34	0
4	PLM	C	603	-	14,17,17	0.28	0	13,17,17	0.99	0
6	SO4	A	608	-	4,4,4	0.15	0	6,6,6	0.19	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	PLM	B	603	-	-	7/13/15/15	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	EIC	A	601	-	-	9/15/17/17	-
3	OCA	B	602	-	-	1/5/7/7	-
7	PEG	B	614	-	-	3/4/4/4	-
4	PLM	B	604	-	-	13/13/15/15	-
5	TRP	A	605	-	-	1/3/8/8	0/2/2/2
7	PEG	C	615	-	-	2/4/4/4	-
3	OCA	A	604	-	-	4/5/7/7	-
7	PEG	B	616	-	-	2/4/4/4	-
7	PEG	B	621	-	-	2/4/4/4	-
7	PEG	B	620	-	-	1/4/4/4	-
7	PEG	C	613	-	-	1/4/4/4	-
7	PEG	A	617	-	-	3/4/4/4	-
9	PG4	A	616	-	-	4/10/10/10	-
7	PEG	C	610	-	-	2/4/4/4	-
9	PG4	C	612	-	-	6/10/10/10	-
8	PGE	C	611	-	-	2/7/7/7	-
5	TRP	C	605	-	-	1/3/8/8	0/2/2/2
9	PG4	C	614	-	-	5/10/10/10	-
7	PEG	B	613	-	-	2/4/4/4	-
4	PLM	C	603	-	-	8/13/15/15	-
4	PLM	A	603	-	-	10/13/15/15	-
7	PEG	A	619	-	-	3/4/4/4	-
2	EIC	C	601	-	-	12/15/17/17	-
9	PG4	A	618	-	-	6/10/10/10	-
5	TRP	B	605	-	-	2/3/8/8	0/2/2/2
8	PGE	A	615	-	-	3/7/7/7	-
3	OCA	A	602	-	-	3/5/7/7	-
3	OCA	C	602	-	-	1/5/7/7	-
10	1PE	B	622	-	-	5/13/13/13	-
7	PEG	B	619	-	-	4/4/4/4	-
3	OCA	C	604	-	-	5/5/7/7	-
8	PGE	B	615	-	-	5/7/7/7	-
9	PG4	B	618	-	-	0/10/10/10	-
8	PGE	B	623	-	-	4/7/7/7	-
2	EIC	B	601	-	-	11/15/17/17	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	PEG	B	617	-	-	2/4/4/4	-
7	PEG	A	614	-	-	4/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 159 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	EIC	C1-C2-C3-C4
2	A	601	EIC	C10-C11-C12-C13
4	B	604	PLM	C1-C2-C3-C4
5	A	605	TRP	CA-CB-CG-CD1
3	A	604	OCA	C1-C2-C3-C4

There are no ring outliers.

28 monomers are involved in 70 short contacts:

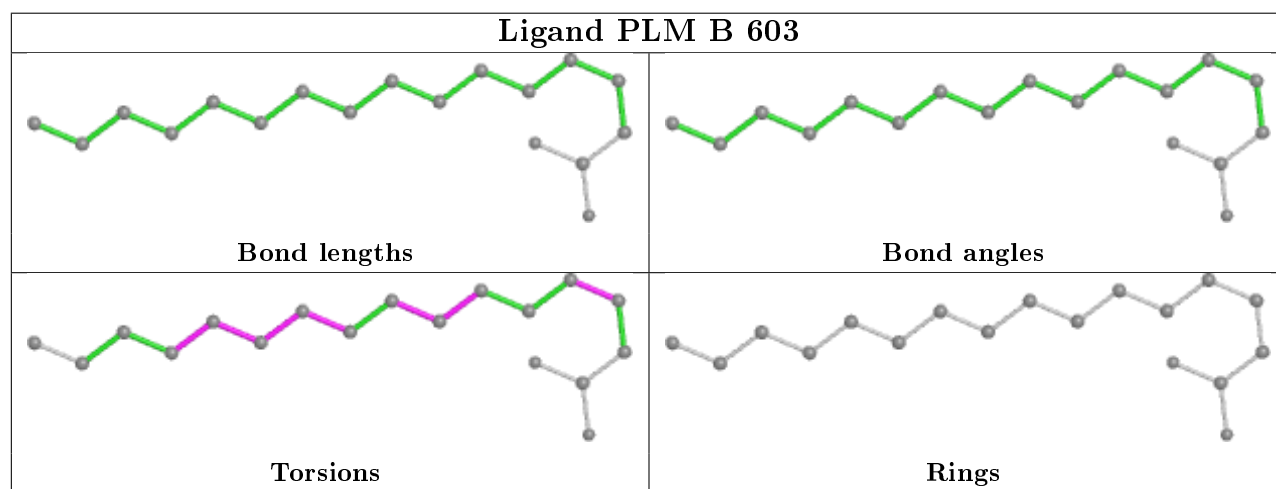
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	603	PLM	6	0
2	A	601	EIC	5	0
3	B	602	OCA	3	0
5	A	605	TRP	1	0
7	C	615	PEG	1	0
7	A	617	PEG	1	0
7	C	610	PEG	2	0
8	C	611	PGE	1	0
9	C	614	PG4	1	0
7	B	613	PEG	1	0
4	A	603	PLM	3	0
7	A	619	PEG	1	0
6	C	608	SO4	1	0
2	C	601	EIC	7	0
9	A	618	PG4	2	0
7	B	620	PEG	1	0
5	B	605	TRP	1	0
4	B	604	PLM	9	0
3	A	602	OCA	2	0
3	C	602	OCA	1	0
8	A	615	PGE	1	0

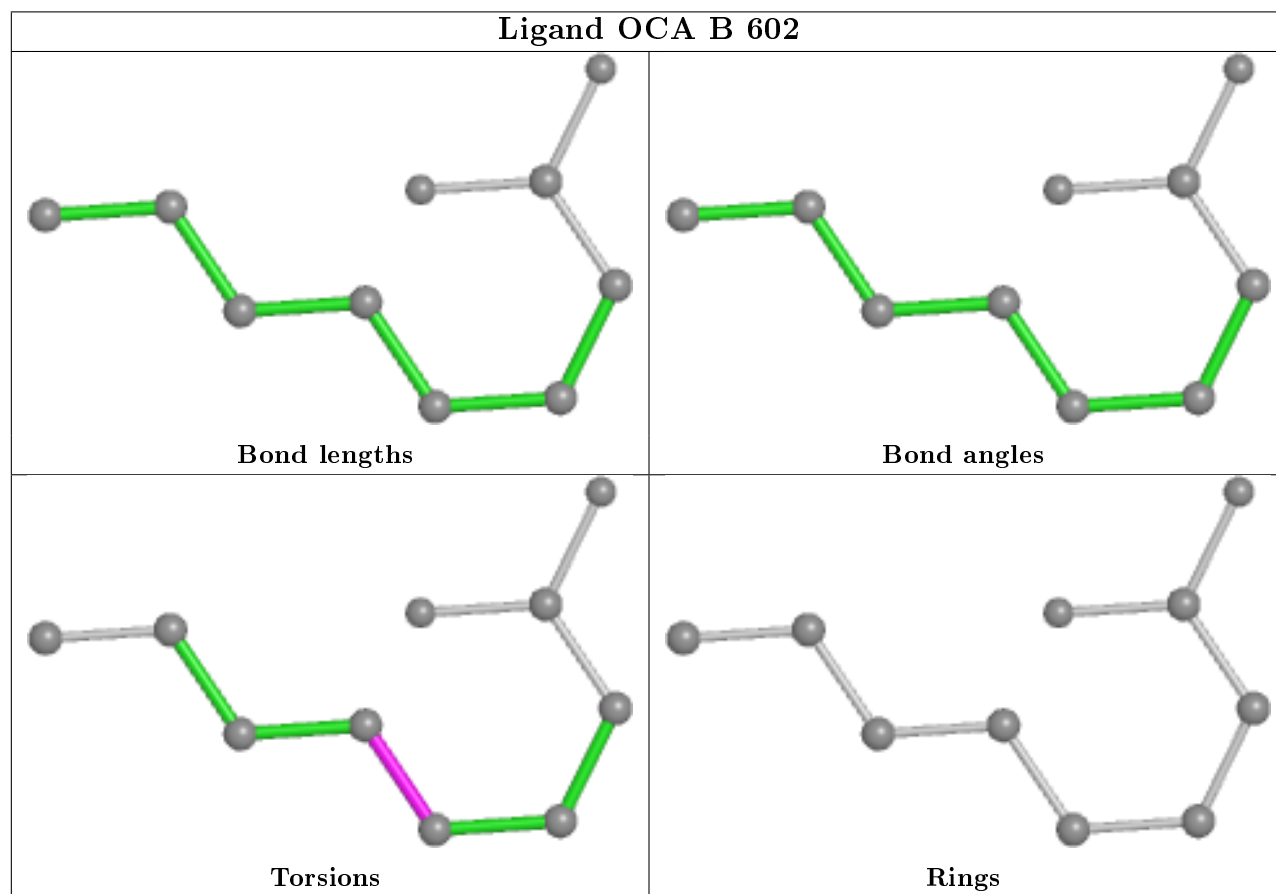
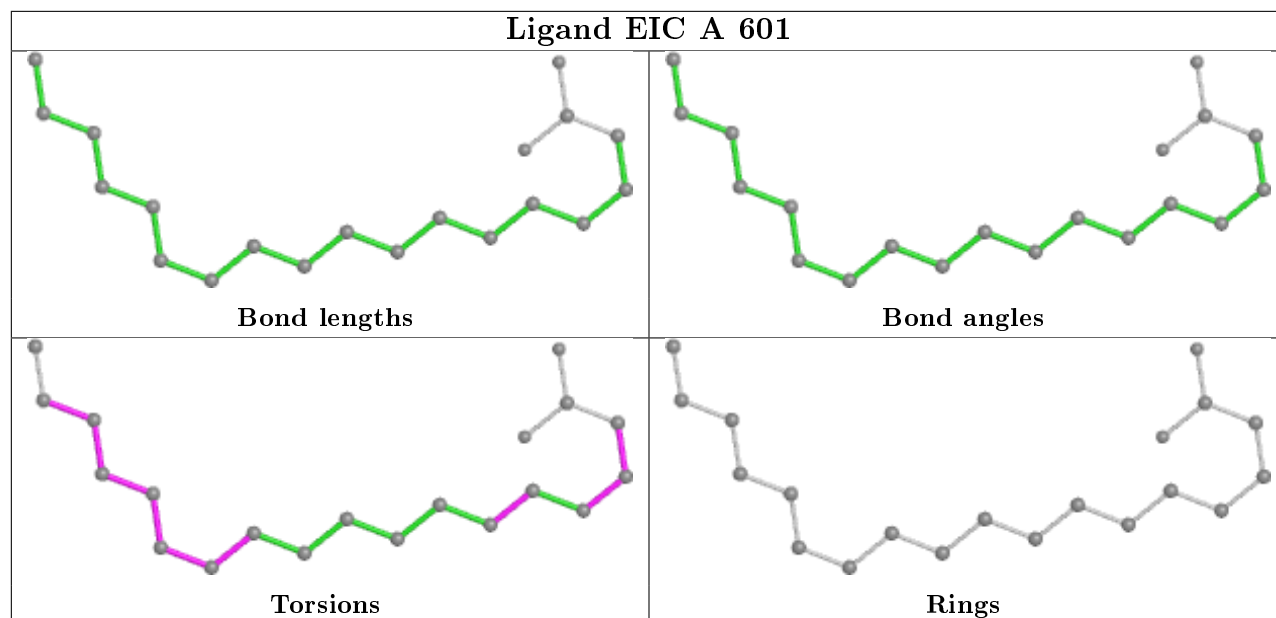
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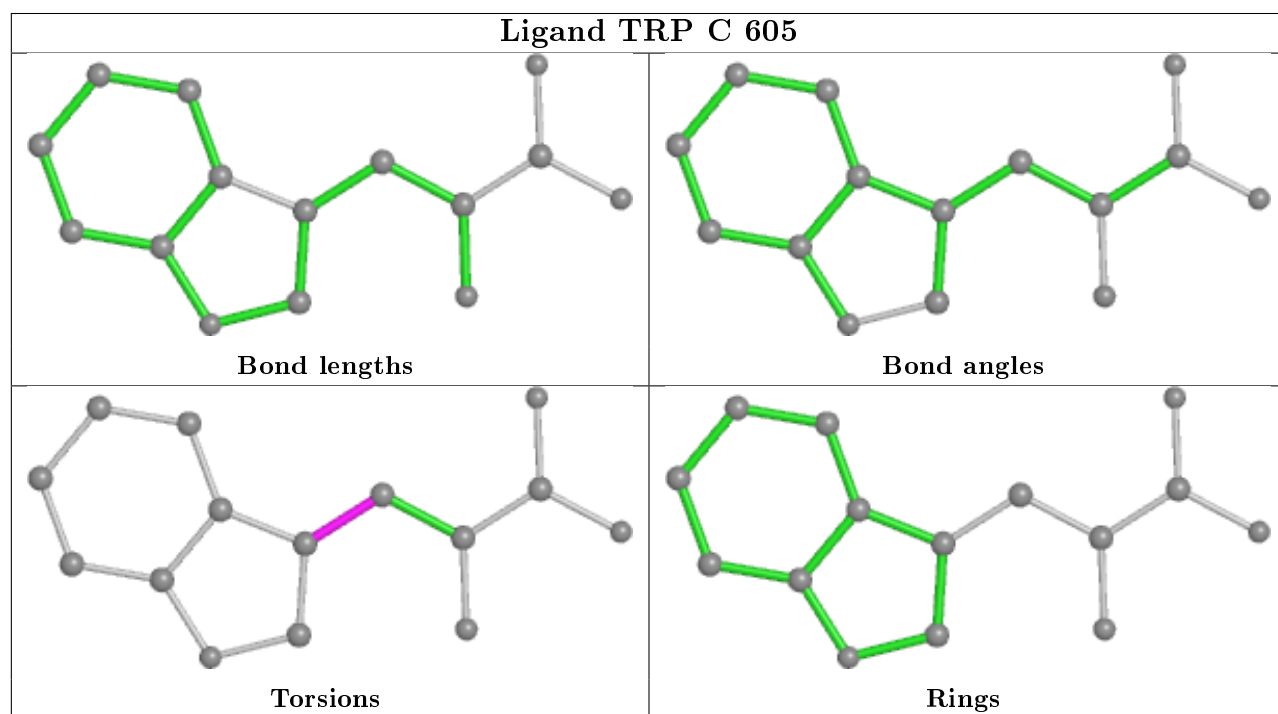
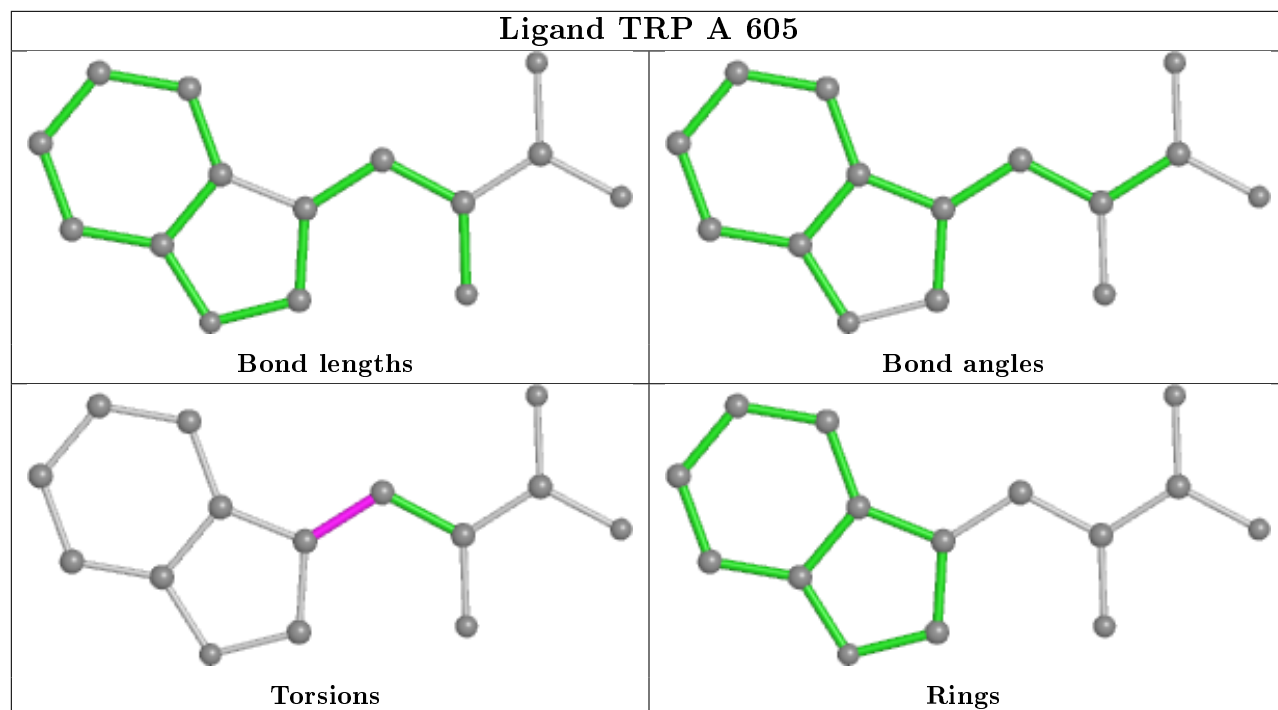
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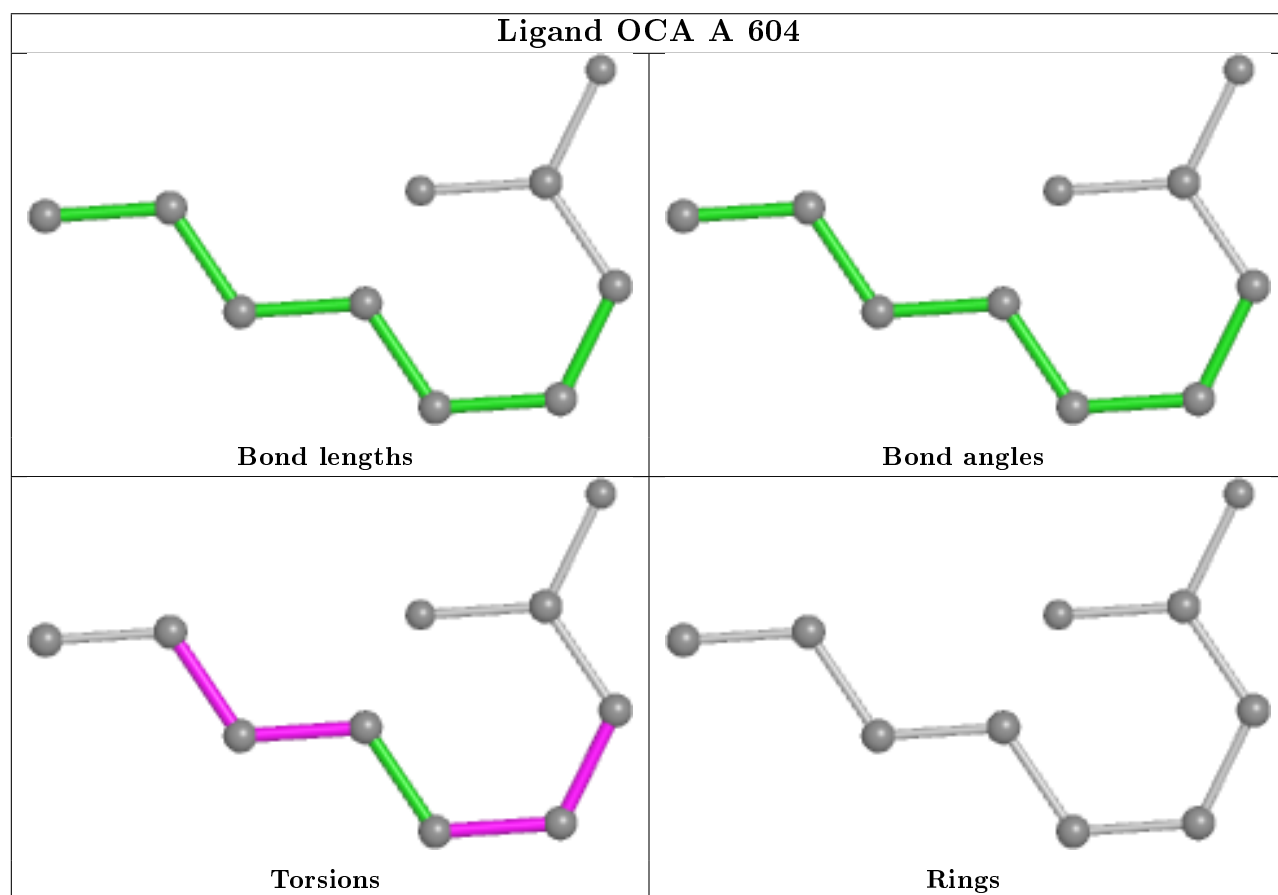
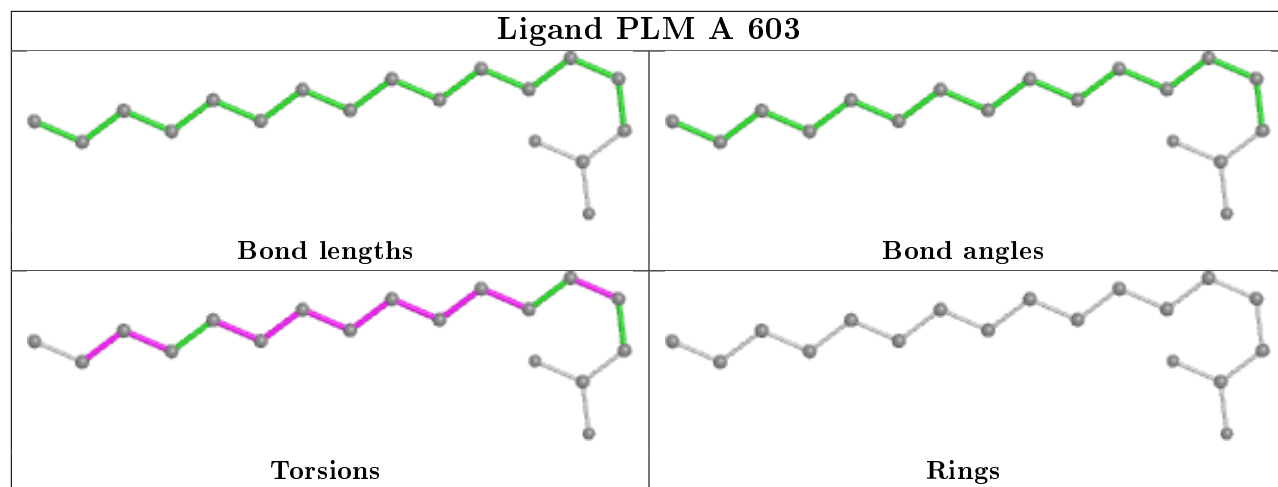
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	C	609	SO4	2	0
10	B	622	1PE	2	0
3	C	604	OCA	1	0
8	B	615	PGE	4	0
2	B	601	EIC	3	0
7	B	617	PEG	1	0
4	C	603	PLM	6	0

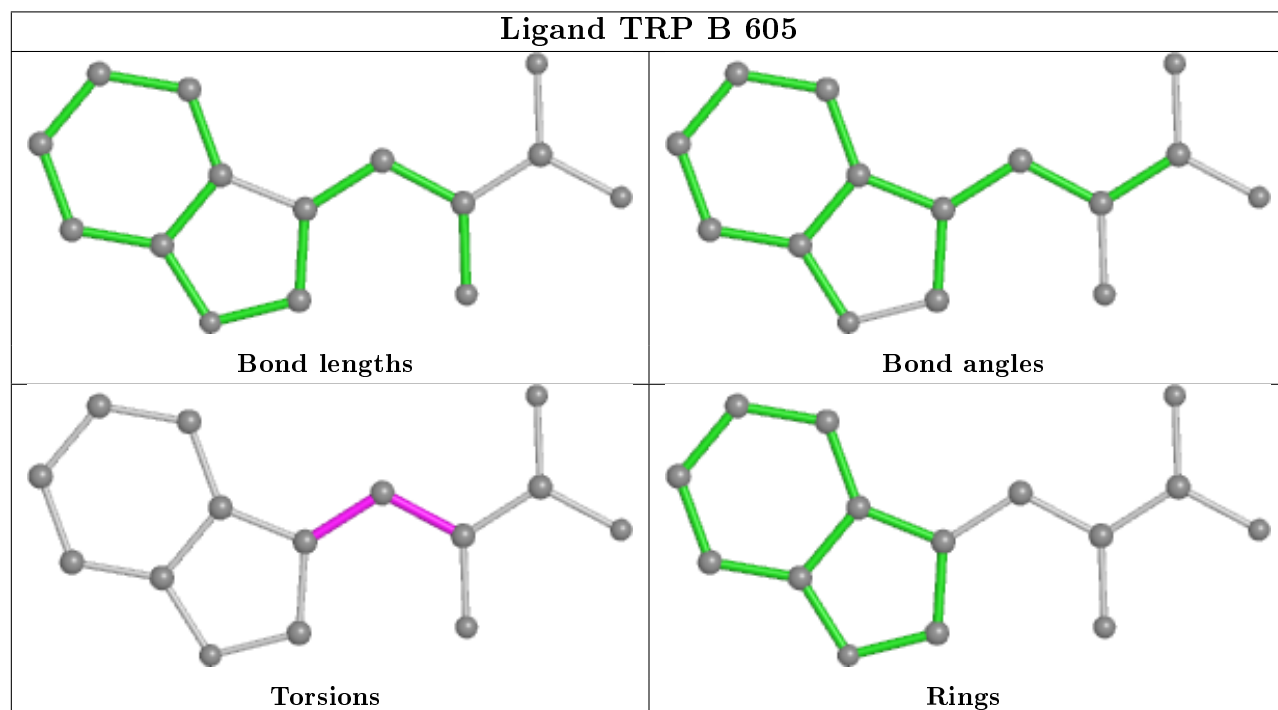
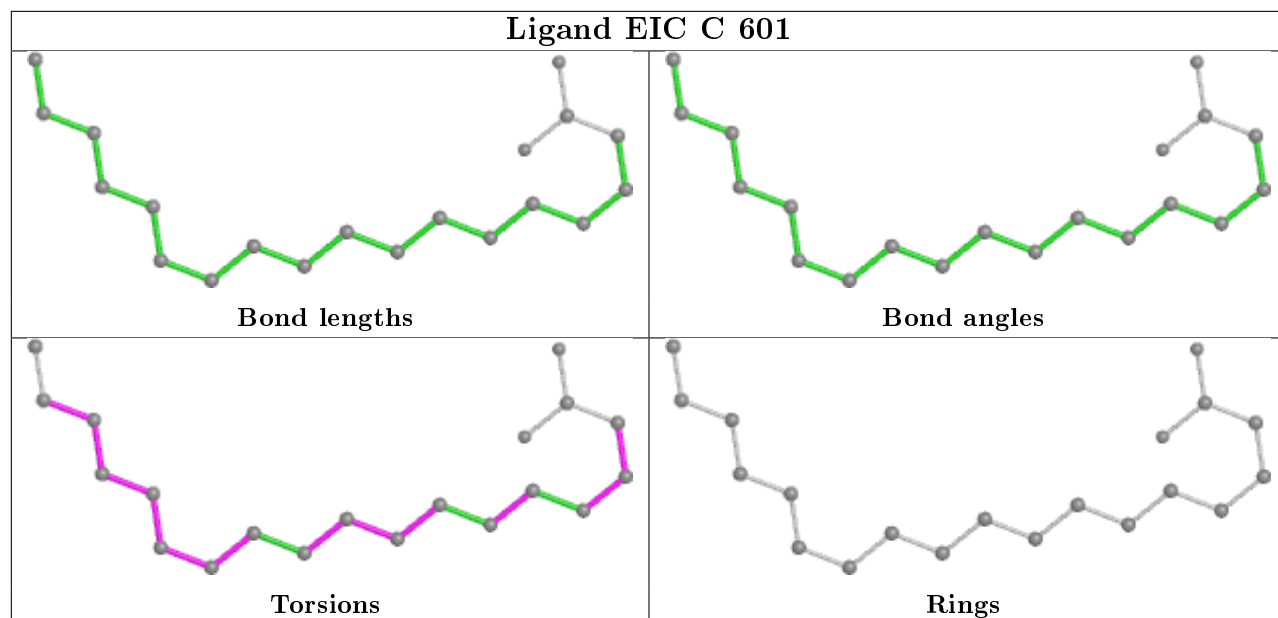
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

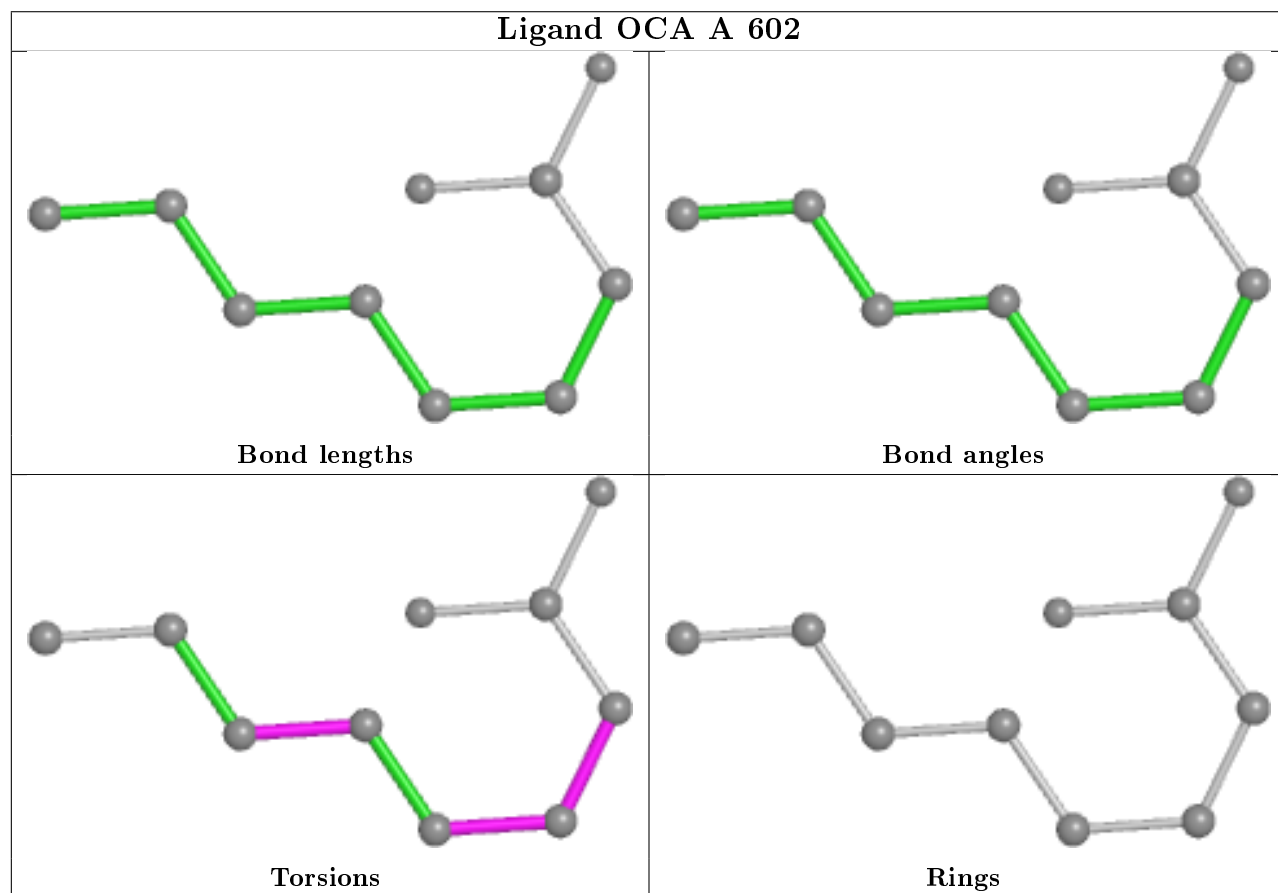
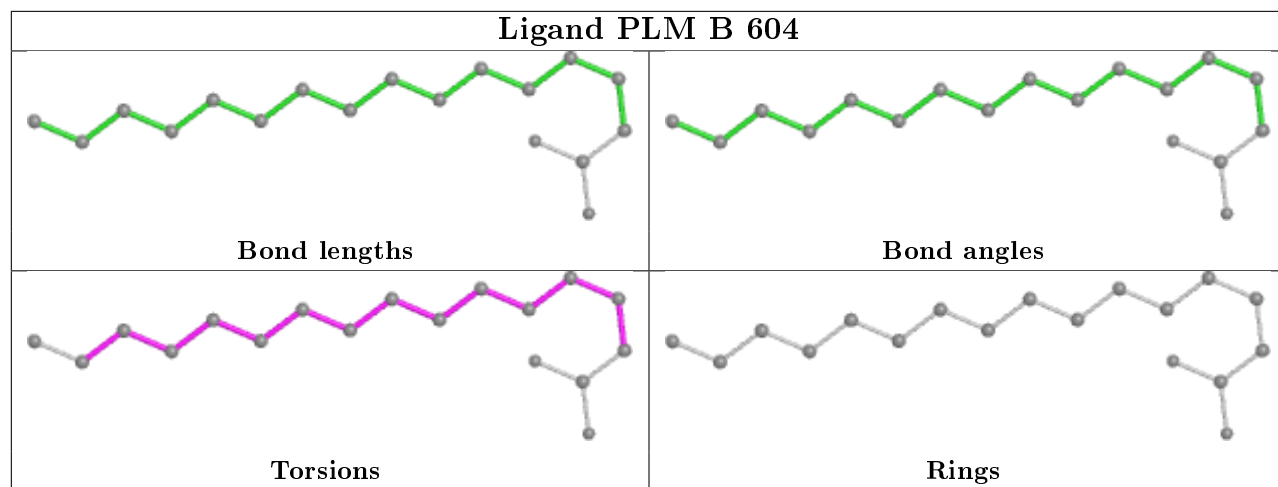


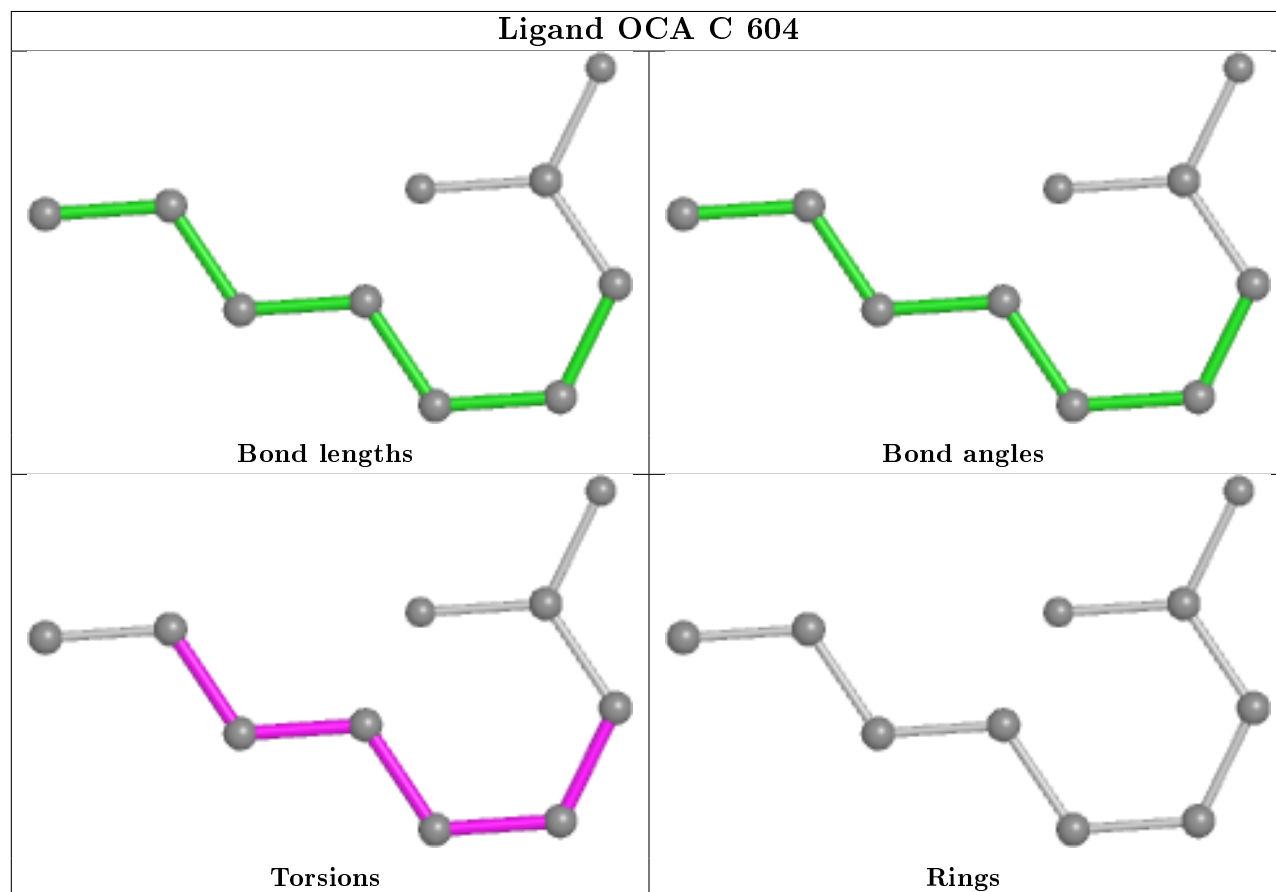
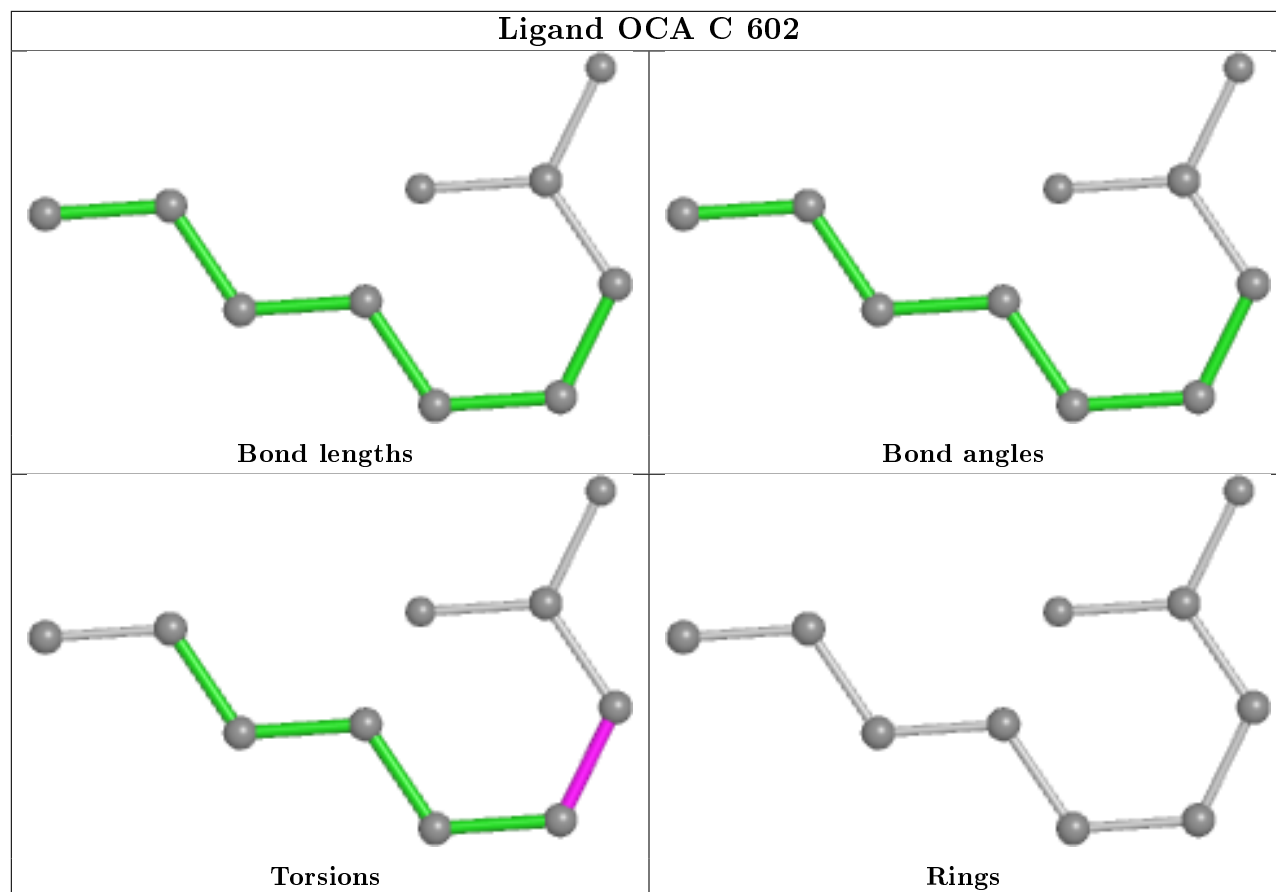


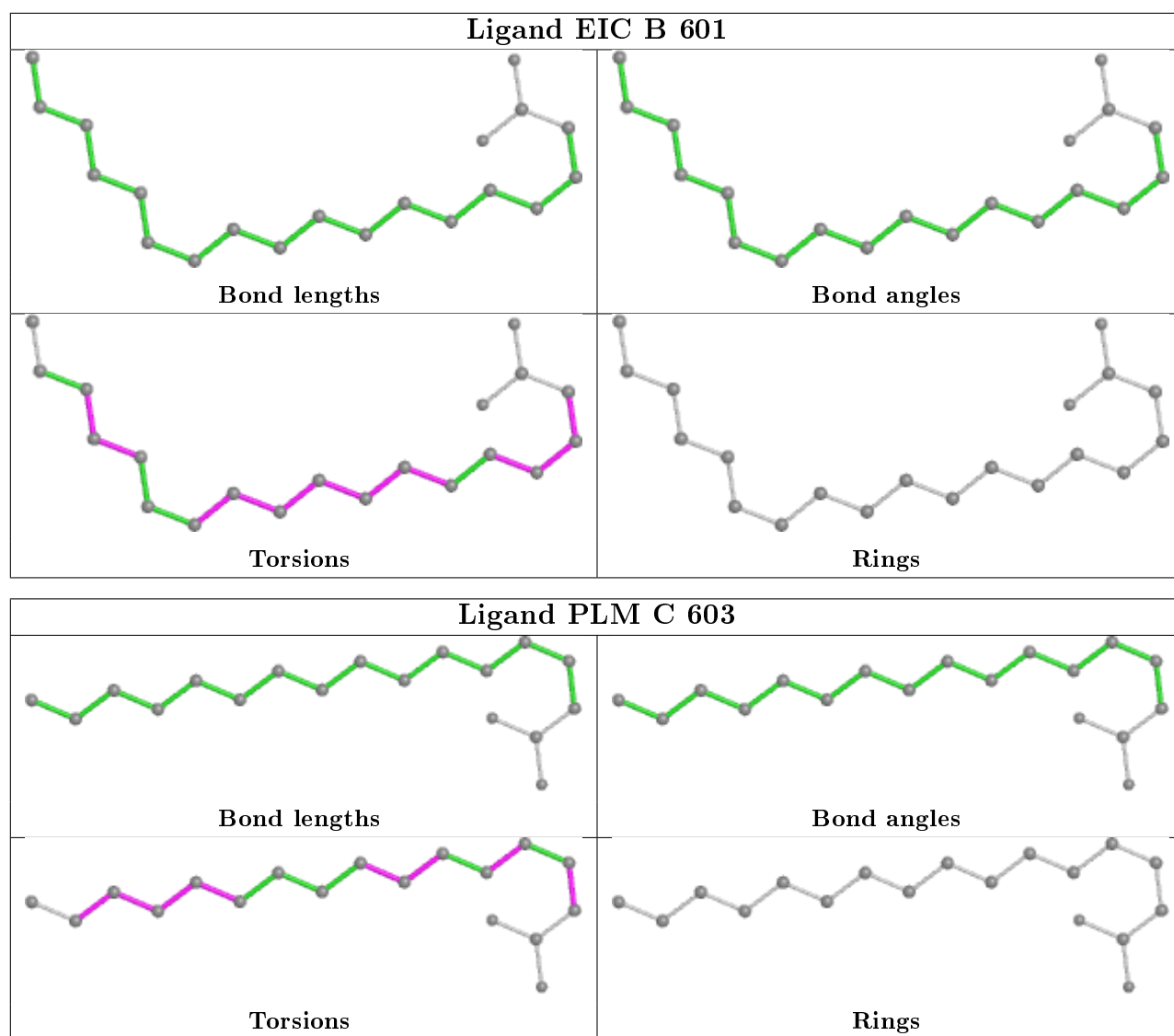












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	580/585 (99%)	0.52	56 (9%) 7 8	27, 43, 78, 100	0
1	B	580/585 (99%)	0.54	70 (12%) 4 4	26, 40, 89, 102	0
1	C	531/585 (90%)	0.77	79 (14%) 2 2	28, 43, 89, 122	0
All	All	1691/1755 (96%)	0.60	205 (12%) 4 4	26, 42, 85, 122	0

The worst 5 of 205 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	547	VAL	10.1
1	C	502	PHE	9.7
1	C	497	TYR	8.0
1	C	504	ALA	7.7
1	A	515	THR	7.4

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

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
1	CSO	A	34	7/8	0.84	0.15	38,40,47,48	0
1	CSO	C	34	7/8	0.91	0.13	32,34,41,48	0
1	CSO	B	34	7/8	0.91	0.12	34,38,45,59	0

6.3 Carbohydrates [i](#)

There are no monosaccharides 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
8	PGE	C	611	10/10	0.70	0.18	43,57,64,66	0
4	PLM	A	603	18/18	0.76	0.27	41,54,74,77	0
7	PEG	B	620	7/7	0.77	0.18	63,65,72,74	0
4	PLM	C	603	18/18	0.79	0.24	38,54,76,81	0
7	PEG	B	613	7/7	0.81	0.17	48,53,55,60	0
3	OCA	C	604	10/10	0.81	0.19	30,38,60,63	0
4	PLM	B	603	18/18	0.82	0.24	40,48,76,76	0
3	OCA	A	602	10/10	0.83	0.35	36,46,59,60	0
9	PG4	A	616	13/13	0.83	0.17	42,49,54,55	0
6	SO4	B	609	5/5	0.84	0.41	61,70,78,84	0
2	EIC	C	601	20/20	0.85	0.21	28,45,86,87	0
7	PEG	C	613	7/7	0.85	0.13	50,53,58,62	0
7	PEG	A	614	7/7	0.85	0.18	40,52,60,60	0
8	PGE	B	623	10/10	0.86	0.14	39,46,53,57	0
7	PEG	B	617	7/7	0.86	0.21	45,54,60,63	0
4	PLM	B	604	18/18	0.87	0.18	26,45,58,63	0
9	PG4	C	614	13/13	0.87	0.13	37,46,54,54	0
2	EIC	A	601	20/20	0.87	0.19	28,38,71,71	0
7	PEG	B	614	7/7	0.88	0.15	45,56,65,65	0
3	OCA	B	602	10/10	0.88	0.34	32,38,45,59	0
2	EIC	B	601	20/20	0.89	0.17	26,37,56,62	0
3	OCA	A	604	10/10	0.89	0.22	29,35,46,53	0
7	PEG	B	621	7/7	0.90	0.16	51,55,58,61	0
7	PEG	C	615	7/7	0.90	0.12	51,53,57,58	0
8	PGE	B	615	10/10	0.91	0.25	30,43,46,46	0
7	PEG	C	610	7/7	0.91	0.17	40,48,56,59	0
8	PGE	A	615	10/10	0.91	0.21	43,50,60,62	0
7	PEG	B	619	7/7	0.91	0.19	47,53,59,62	0
6	SO4	C	608	5/5	0.91	0.15	67,71,72,86	0
6	SO4	A	613	5/5	0.92	0.24	79,82,92,94	0
6	SO4	B	610	5/5	0.92	0.16	72,72,76,81	0
10	1PE	B	622	16/16	0.92	0.14	28,40,54,60	0
6	SO4	A	609	5/5	0.92	0.21	67,70,72,72	0
6	SO4	A	610	5/5	0.93	0.43	63,67,75,79	0
6	SO4	B	608	5/5	0.93	0.19	78,79,80,82	0
7	PEG	A	619	7/7	0.93	0.12	39,48,54,60	0
3	OCA	C	602	10/10	0.93	0.31	29,34,49,53	0

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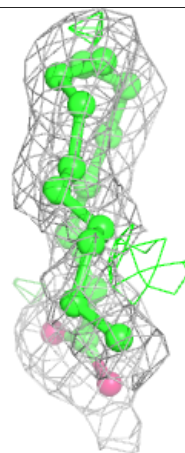
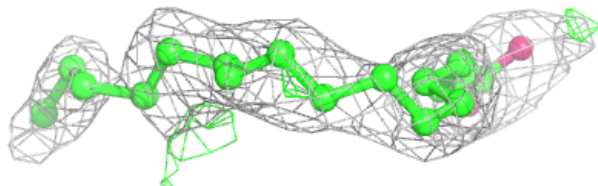
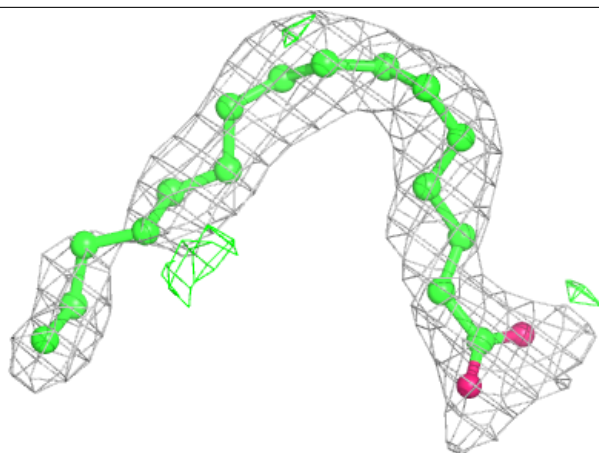
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
7	PEG	B	616	7/7	0.94	0.12	36,43,58,64	0
9	PG4	A	618	13/13	0.94	0.11	34,41,52,53	0
5	TRP	C	605	15/15	0.94	0.13	59,63,70,72	0
6	SO4	A	612	5/5	0.94	0.39	70,73,75,85	0
9	PG4	B	618	13/13	0.94	0.15	28,43,69,70	0
6	SO4	B	607	5/5	0.94	0.14	54,66,68,72	0
7	PEG	A	617	7/7	0.95	0.12	42,43,51,56	0
6	SO4	A	607	5/5	0.95	0.11	40,46,56,69	0
6	SO4	A	611	5/5	0.95	0.14	31,36,44,51	0
6	SO4	A	606	5/5	0.95	0.14	58,65,75,78	0
9	PG4	C	612	13/13	0.95	0.11	37,45,51,54	0
5	TRP	A	605	15/15	0.96	0.12	29,33,60,66	0
5	TRP	B	605	15/15	0.97	0.16	28,31,60,67	0
6	SO4	B	612	5/5	0.97	0.20	79,80,88,93	0
6	SO4	C	607	5/5	0.97	0.10	36,41,58,69	0
6	SO4	A	608	5/5	0.97	0.11	51,55,64,69	0
6	SO4	C	609	5/5	0.98	0.20	58,60,66,71	0
6	SO4	B	606	5/5	0.98	0.09	35,36,52,58	0
6	SO4	C	606	5/5	0.99	0.08	35,37,41,42	0
6	SO4	B	611	5/5	0.99	0.07	28,35,36,39	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.

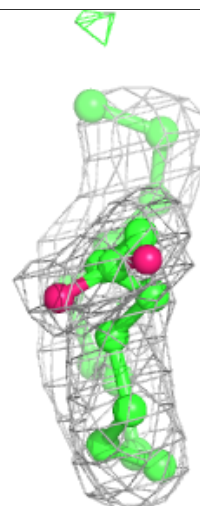
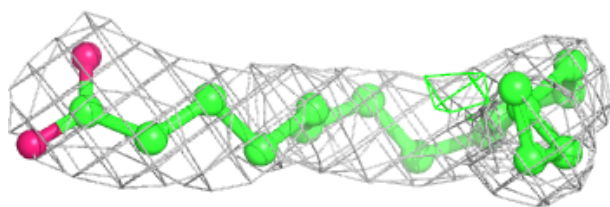
Electron density around PLM A 603:

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



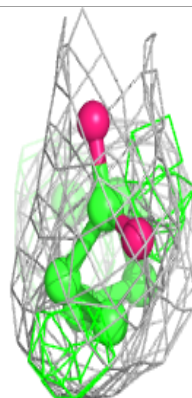
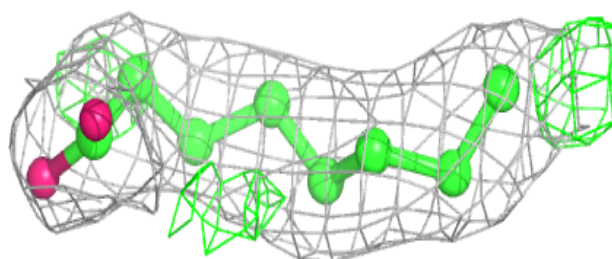
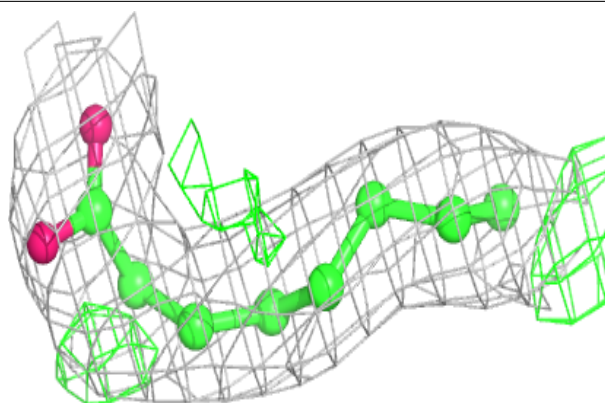
Electron density around PLM C 603:

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



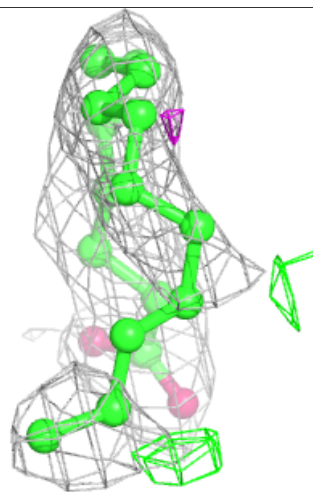
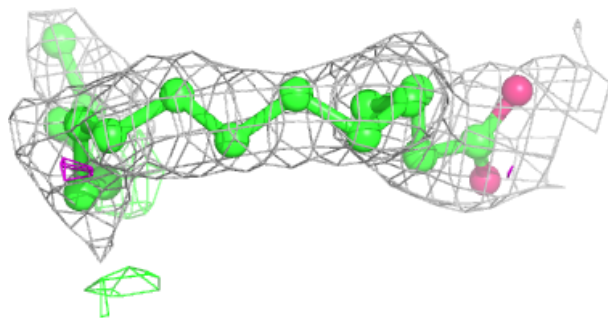
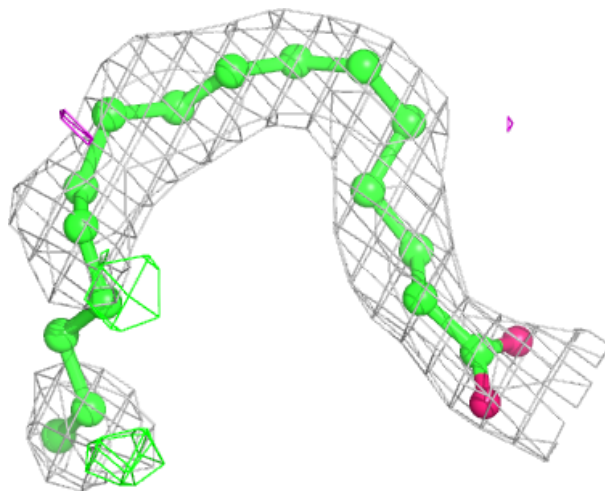
Electron density around OCA C 604:

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



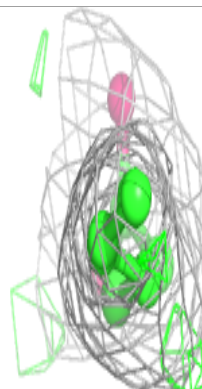
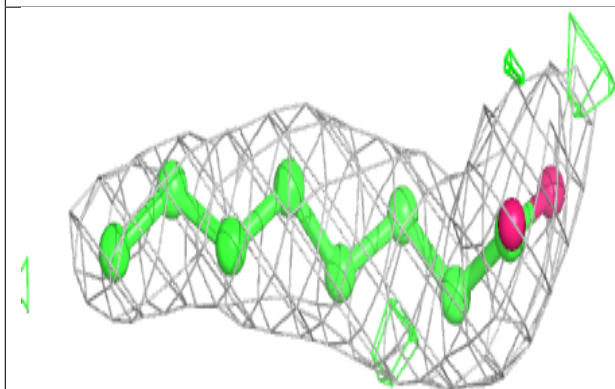
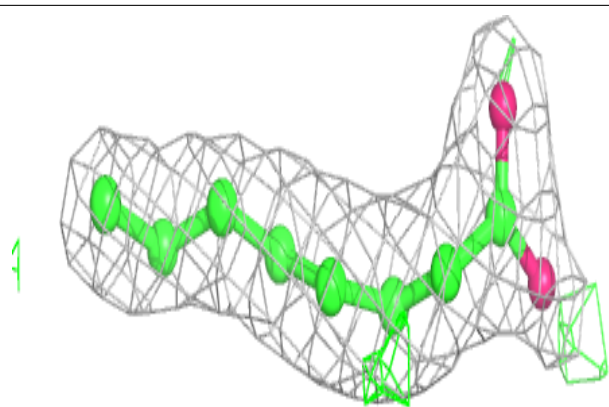
Electron density around PLM B 603:

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



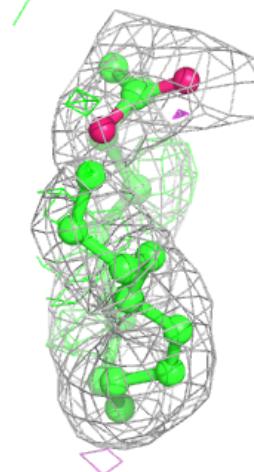
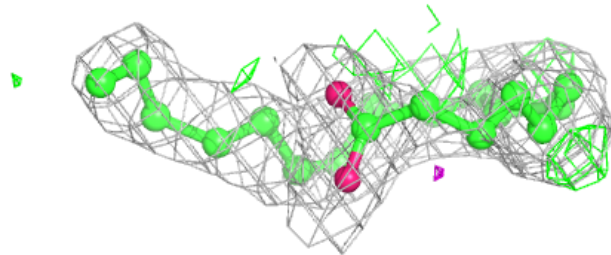
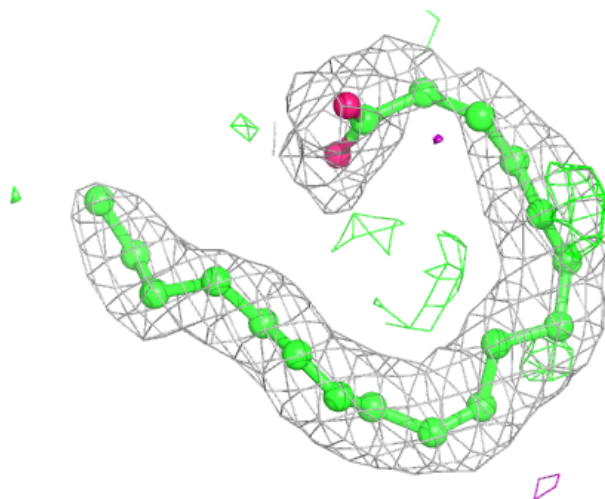
Electron density around OCA A 602:

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



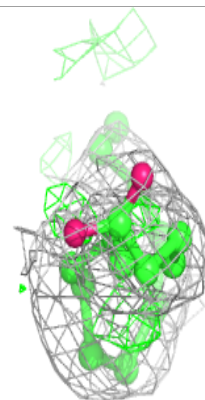
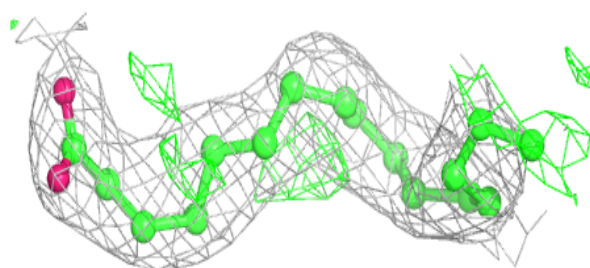
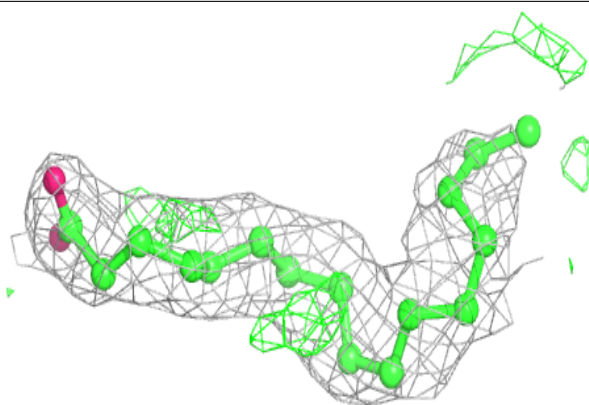
Electron density around EIC C 601:

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



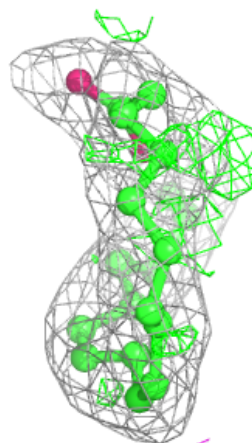
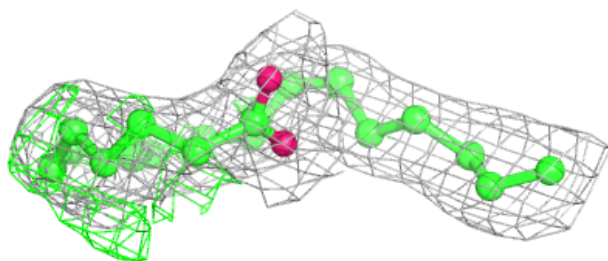
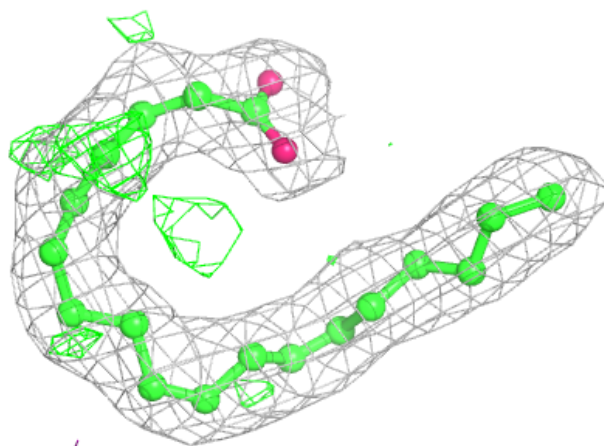
Electron density around PLM B 604:

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



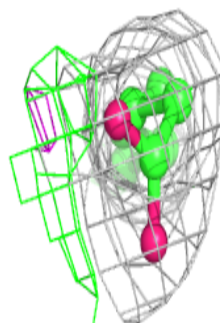
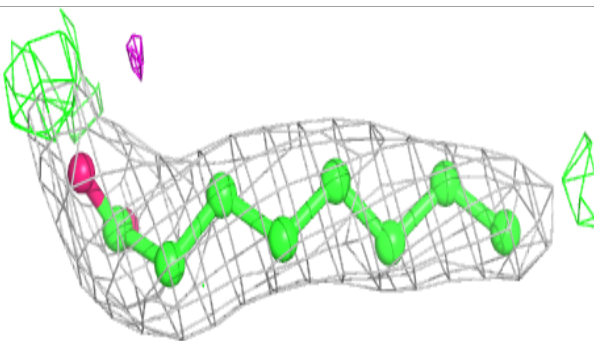
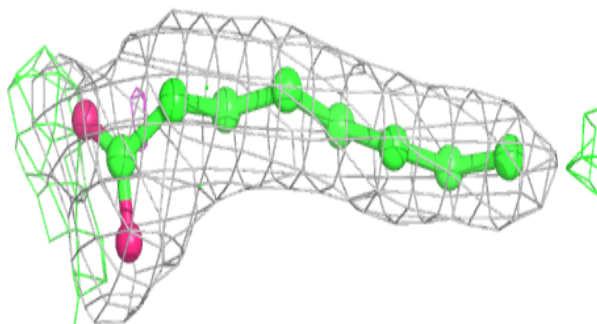
Electron density around EIC A 601:

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

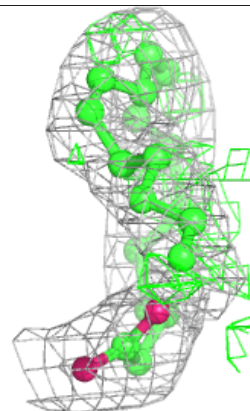
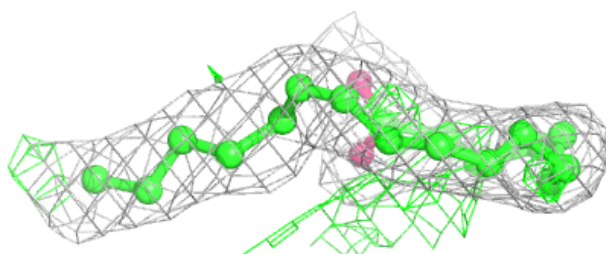
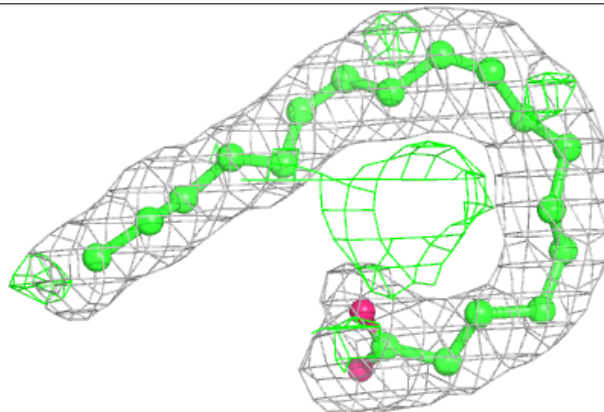


Electron density around OCA B 602:

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

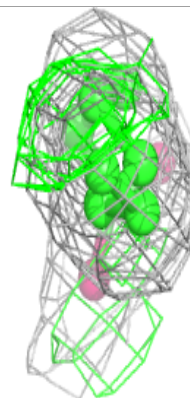
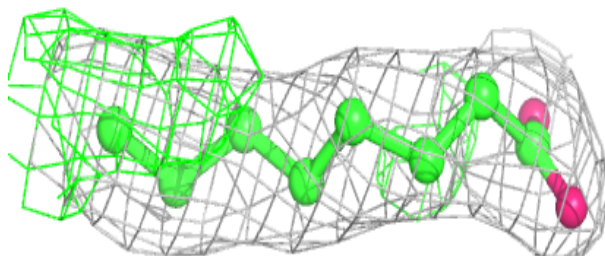
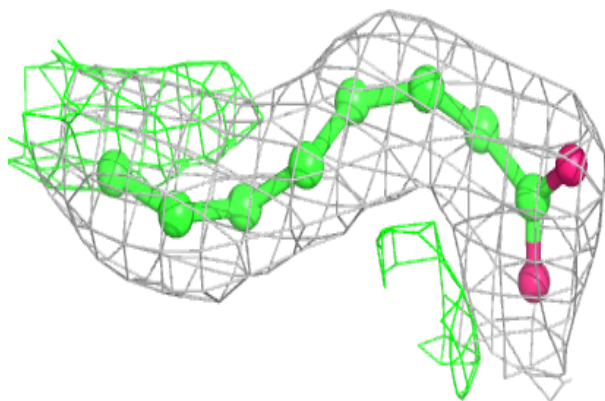
**Electron density around EIC B 601:**

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

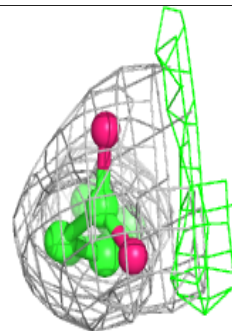
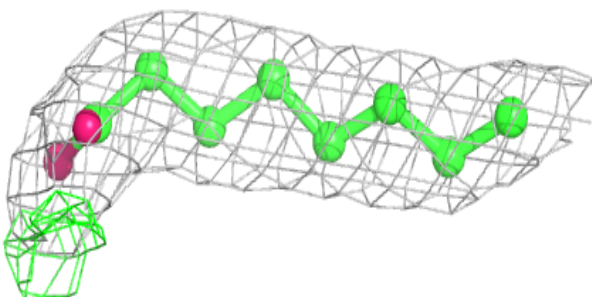
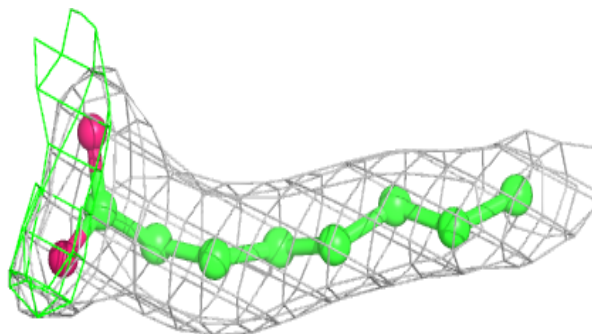


Electron density around OCA A 604:

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

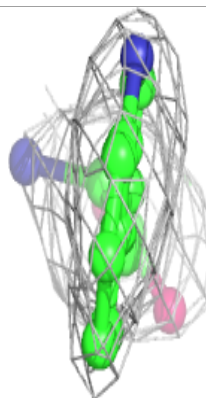
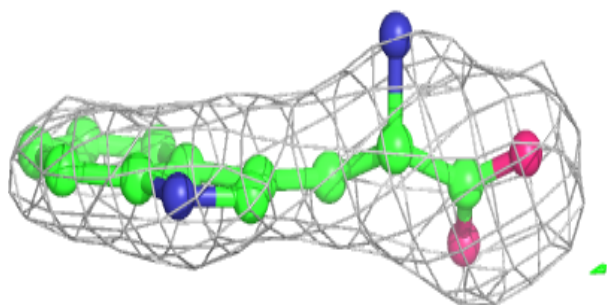
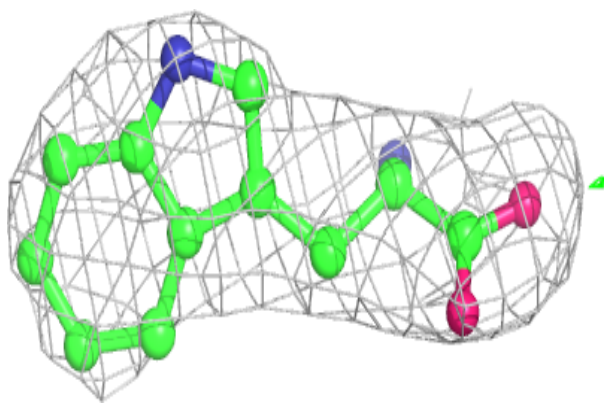
**Electron density around OCA C 602:**

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

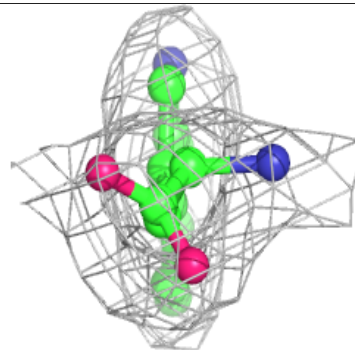
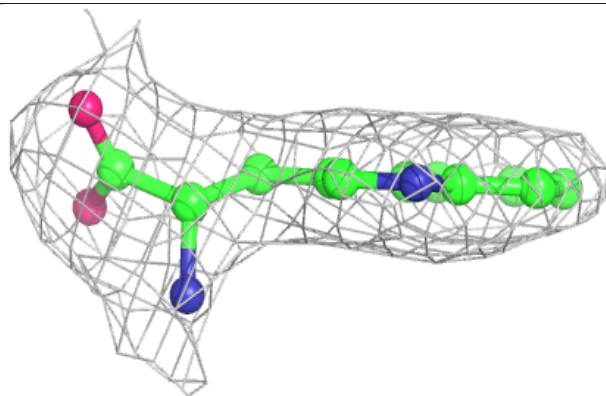
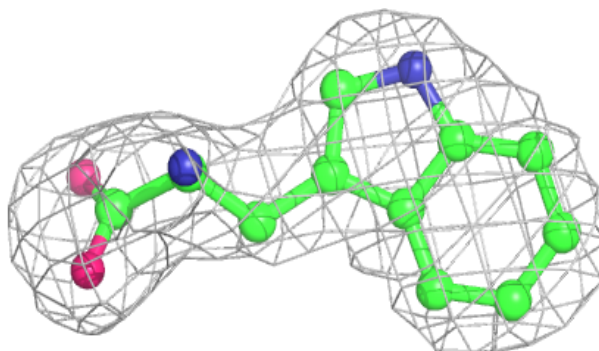


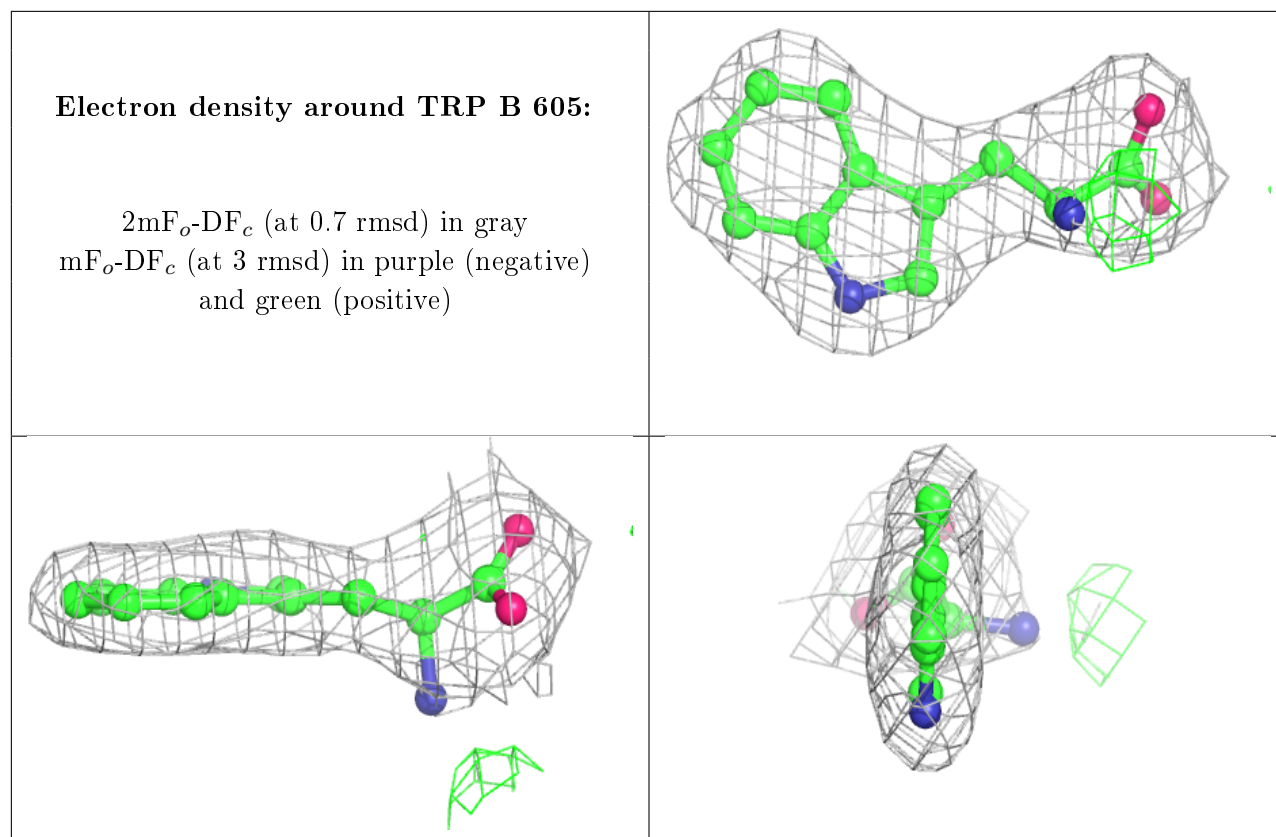
Electron density around TRP C 605:

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

**Electron density around TRP A 605:**

$2mF_o-DF_c$ (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.