WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Nov 26, 2024 – 02:04 PM EST

PDB ID	:	8TF5
Title	:	Crystal structure of orphan G protein-coupled receptor 6, pseudoapo form
Authors	:	Barekatain, M.; Johansson, L.; Lam, J.H.; Sadybekov, A.V.; Han, G.W.; Popov, P.; Russo, J.; Bliesath, J.; Brice, N.; Beresford, M.; Carlson, L.; Saika-tendu, K.S.; Sun, H.; Murphy, S.; Monenschein, H.; Schiffer, H.H.; Lutomski, C.; Robinson, C.V.; Liu, Z.; Hua, T.; Katritch, V.; Cherezov, V.
Deposited on	:	2023-07-07
Resolution	:	2.10 Å(reported)

The following versions of software and data (see references ①) were used in the production of this report:

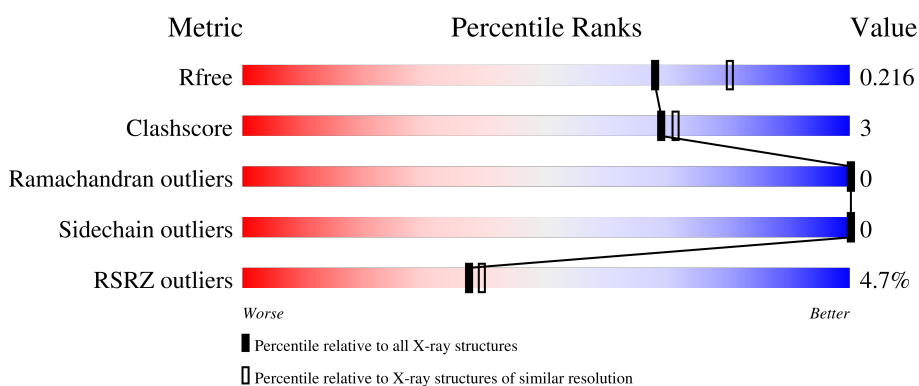|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

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 2.10 Å.

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

Metric	Percentile Ranks	Value
Rfree		0.216
Clashscore		3
Ramachandran outliers		0
Sidechain outliers		0
RSRZ outliers		4.7%

Worse — *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	6234 (2.10-2.10)
Clashscore	180529	6893 (2.10-2.10)
Ramachandran outliers	177936	6839 (2.10-2.10)
Sidechain outliers	177891	6840 (2.10-2.10)
RSRZ outliers	164620	6234 (2.10-2.10)

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

Mol	Chain	Length	Quality of chain
1	A	436	4%　77%　6%　17%

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 3312 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 G-protein coupled receptor 6,Soluble cytochrome b562 chimera,Soluble cytochrome b562,G-protein coupled receptor 6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	364	Total 2851	C 1865	N 482	O 491	S 13	0	11	0

There are 37 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	32	MET	-	initiating methionine	UNP P46095
A	33	LYS	-	expression tag	UNP P46095
A	34	THR	-	expression tag	UNP P46095
A	35	ILE	-	expression tag	UNP P46095
A	36	ILE	-	expression tag	UNP P46095
A	37	ALA	-	expression tag	UNP P46095
A	38	LEU	-	expression tag	UNP P46095
A	39	SER	-	expression tag	UNP P46095
A	40	TYR	-	expression tag	UNP P46095
A	41	ILE	-	expression tag	UNP P46095
A	42	PHE	-	expression tag	UNP P46095
A	43	CYS	-	expression tag	UNP P46095
A	44	LEU	-	expression tag	UNP P46095
A	45	VAL	-	expression tag	UNP P46095
A	46	PHE	-	expression tag	UNP P46095
A	47	ALA	-	expression tag	UNP P46095
A	123	LEU	CYS	engineered mutation	UNP P46095
A	173	PRO	ALA	engineered mutation	UNP P46095
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	900	ALA	-	linker	UNP P0ABE7
A	279	ARG	GLY	engineered mutation	UNP P46095
A	291	CYS	SER	engineered mutation	UNP P46095
A	320	LEU	TYR	engineered mutation	UNP P46095
A	345	ASP	CYS	engineered mutation	UNP P46095

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Chain	Residue	Modelled	Actual	Comment	Reference
A	363	GLU	-	expression tag	UNP P46095
A	364	PHE	-	expression tag	UNP P46095
A	365	HIS	-	expression tag	UNP P46095
A	366	HIS	-	expression tag	UNP P46095
A	367	HIS	-	expression tag	UNP P46095
A	368	HIS	-	expression tag	UNP P46095
A	369	HIS	-	expression tag	UNP P46095
A	370	HIS	-	expression tag	UNP P46095
A	371	HIS	-	expression tag	UNP P46095
A	372	HIS	-	expression tag	UNP P46095
A	373	HIS	-	expression tag	UNP P46095

- Molecule 2 is (2R)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (three-letter code: OLC) (formula: $C_{21}H_{40}O_4$) (labeled as "Ligand of Interest" by depositor).

OLC
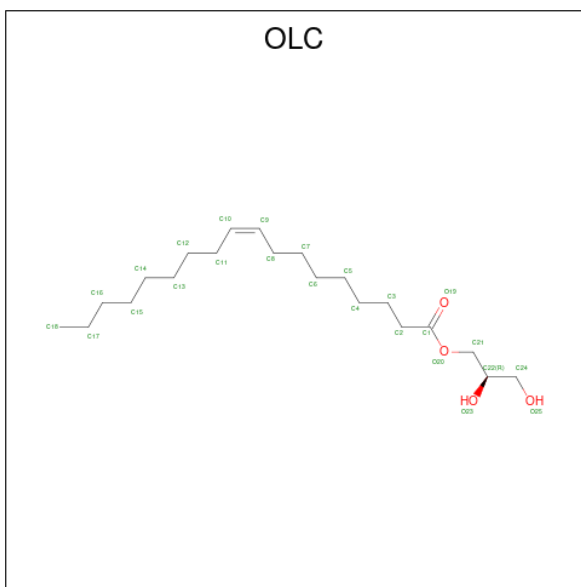
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 16	C 12	O 4	0	0
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 25	C 21	O 4	0	0
2	A	1	Total 25	C 21	O 4	0	0

- Molecule 3 is 2,5,8,11,14,17-HEXAOXANONADECAN-19-OL (three-letter code: P15) (formula: $C_{13}H_{28}O_7$) (labeled as "Ligand of Interest" by depositor).


P15
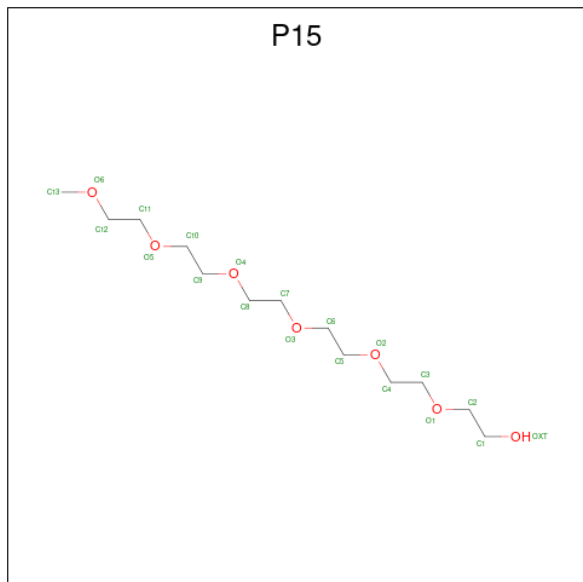
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			20	13	7		
3	A	1	Total	C	O	0	0
			14	9	5		

- Molecule 4 is OLEIC ACID (three-letter code: OLA) (formula: $C_{18}H_{34}O_2$) (labeled as "Ligand of Interest" by depositor).

OLA
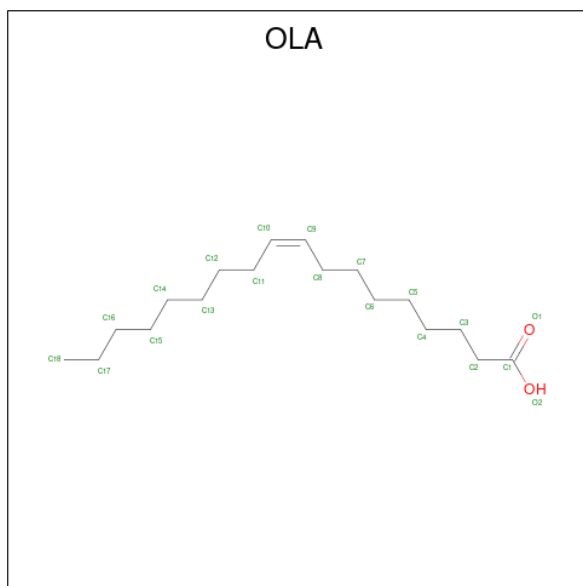
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total 20	C 18	O 2	0	0
4	A	1	Total 20	C 18	O 2	0	0
4	A	1	Total 20	C 18	O 2	0	0
4	A	1	Total 20	C 18	O 2	0	0
4	A	1	Total 20	C 18	O 2	0	0
4	A	1	Total 20	C 18	O 2	0	0
4	A	1	Total 13	C 13		0	0
4	A	1	Total 14	C 12	O 2	0	0
4	A	1	Total 9	C 9		0	0
4	A	1	Total 20	C 18	O 2	0	0
4	A	1	Total 20	C 18	O 2	0	0
4	A	1	Total 13	C 11	O 2	0	0

- Molecule 5 is CHOLESTEROL (three-letter code: CLR) (formula: $C_{27}H_{46}O$).
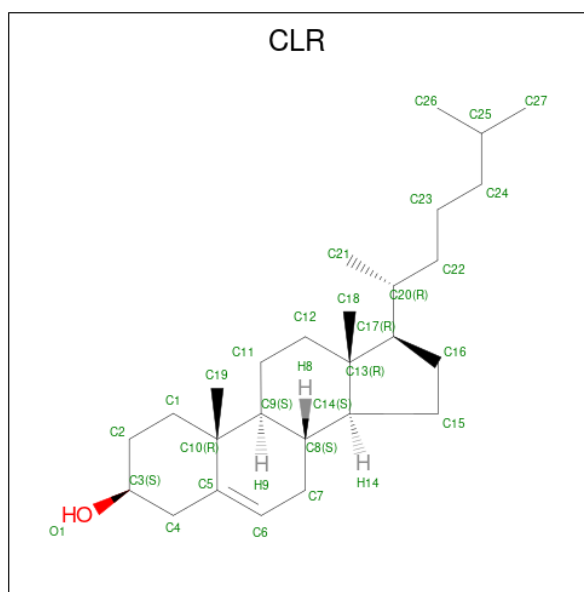
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total 28	C 27	O 1	0	0

• Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	74	Total 74	O 74	0	0

3 Residue-property plots ⓘ

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

• Molecule 1: G-protein coupled receptor 6,Soluble cytochrome b562 chimera,Soluble cytochrome b562,G-protein coupled receptor 6
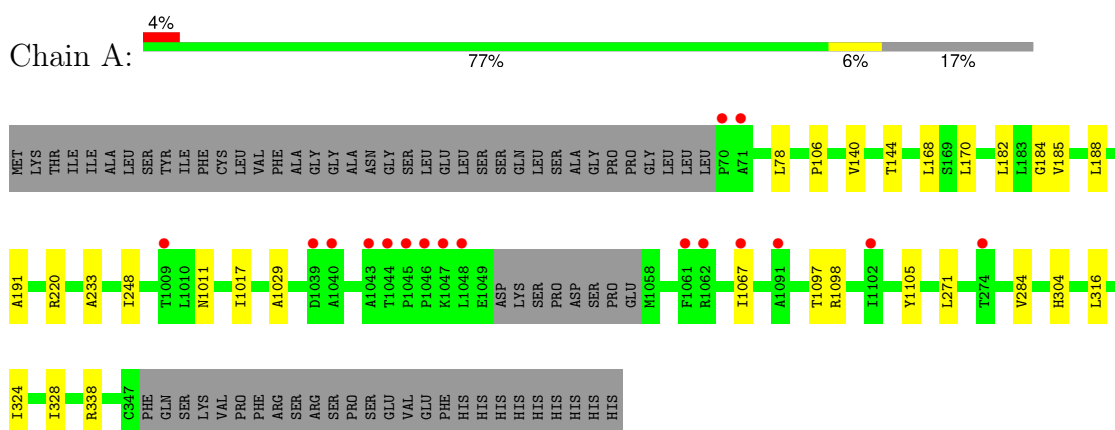
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	57.03Å 96.87Å 97.56Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.44 – 2.10 29.44 – 2.10	Depositor EDS
% Data completeness (in resolution range)	96.0 (29.44-2.10) 96.0 (29.44-2.10)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.63 (at 2.10Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.184 , 0.214 0.190 , 0.216	Depositor DCC
R_{free} test set	1736 reflections (5.41%)	wwPDB-VP
Wilson B-factor (Å^2)	40.5	Xtriage
Anisotropy	0.301	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 61.7	EDS
L-test for twinning[2]	$<\|L\|>$ = 0.48, $<L^2>$ = 0.32	Xtriage
Estimated twinning fraction	0.006 for -h,l,k	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	3312	wwPDB-VP
Average B, all atoms (Å^2)	54.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.99% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $<\|L\|>$, $<L^2>$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: OLC, YCM, OLA, CLR, P15

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	0.26	0/2934	0.46	0/4005

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	2851	0	2973	21	0
2	A	116	0	181	5	0
3	A	34	0	45	2	0
4	A	209	0	338	3	0
5	A	28	0	46	1	0
6	A	74	0	0	1	0
All	All	3312	0	3583	23	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (23) 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:184:GLY:C	2:A:1201:OLC:H21	2.20	0.61
1:A:185[A]:VAL:HG23	2:A:1201:OLC:H22	1.83	0.59
1:A:78[B]:LEU:HD23	1:A:316:LEU:HD22	1.84	0.59
1:A:324:ILE:HG22	1:A:328[B]:ILE:HD12	1.84	0.59
1:A:233:ALA:HB1	4:A:1213:OLA:H131	1.89	0.55
1:A:324:ILE:HG22	1:A:328[B]:ILE:CD1	2.37	0.54
1:A:188:LEU:HB2	2:A:1201:OLC:H2A	1.90	0.54
1:A:1011:ASN:OD1	1:A:1098:ARG:NH1	2.40	0.52
1:A:338[B]:ARG:HG2	3:A:1205:P15:H21	1.93	0.50
1:A:140:VAL:O	1:A:144:THR:HG23	2.11	0.50
1:A:191:ALA:HA	4:A:1216:OLA:H152	1.94	0.48
1:A:106:PRO:HB3	1:A:185[A]:VAL:HG21	1.96	0.47
1:A:233:ALA:CB	4:A:1213:OLA:H131	2.43	0.47
5:A:1220:CLR:H212	5:A:1220:CLR:H121	1.96	0.47
1:A:220[A]:ARG:NH2	1:A:304:HIS:O	2.49	0.46
1:A:168:LEU:HD12	2:A:1201:OLC:H24	1.98	0.46
1:A:182:LEU:O	1:A:185[B]:VAL:HG12	2.17	0.45
1:A:1017[B]:ILE:HD11	1:A:1029:ALA:HB3	1.98	0.44
1:A:1067:ILE:HD11	1:A:1097:THR:HG23	2.00	0.43
2:A:1201:OLC:H21A	6:A:1362:HOH:O	2.17	0.43
1:A:1105:TYR:CZ	1:A:271:LEU:HD11	2.55	0.41
1:A:284:VAL:HG12	3:A:1203:P15:H22	2.02	0.41
1:A:170:LEU:CD1	1:A:248:ILE:HG23	2.50	0.41

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	370/436 (85%)	363 (98%)	7 (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	299/356 (84%)	299 (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. There are no such sidechains identified.

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

1 non-standard protein/DNA/RNA residue is 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	YCM	A	249	1	7,9,10	1.09	0	5,10,12	0.57	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
1	YCM	A	249	1	-	0/6/8/10	-

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 oligosaccharides in this entry.

5.6　Ligand geometry ⓘ

20 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
2	OLC	A	1212	-	24,24,24	0.61	0	25,25,25	0.99	1 (4%)
4	OLA	A	1204	-	19,19,19	0.61	0	19,19,19	0.80	1 (5%)
4	OLA	A	1218	-	19,19,19	0.58	0	19,19,19	0.85	0
4	OLA	A	1208	-	19,19,19	0.55	0	19,19,19	0.93	1 (5%)
4	OLA	A	1213	-	12,12,19	0.24	0	11,11,19	0.55	0
4	OLA	A	1206	-	19,19,19	0.58	0	19,19,19	0.81	0
4	OLA	A	1215	-	13,13,19	0.68	0	13,13,19	1.02	1 (7%)
3	P15	A	1203	-	19,19,19	0.53	0	18,18,18	0.30	0
2	OLC	A	1214	-	24,24,24	0.63	0	25,25,25	0.88	0
4	OLA	A	1217	-	19,19,19	0.59	0	19,19,19	0.78	1 (5%)
2	OLC	A	1201	-	15,15,24	0.88	0	16,16,25	1.04	2 (12%)
5	CLR	A	1220	-	31,31,31	0.59	0	48,48,48	0.76	2 (4%)
4	OLA	A	1210	-	19,19,19	0.59	0	19,19,19	0.82	1 (5%)
2	OLC	A	1211	-	24,24,24	0.60	0	25,25,25	0.95	1 (4%)
4	OLA	A	1209	-	19,19,19	0.58	0	19,19,19	0.82	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
4	OLA	A	1219	-	12,12,19	0.71	0	12,12,19	1.05	1 (8%)
3	P15	A	1205	-	13,13,19	0.53	0	12,12,18	0.23	0
4	OLA	A	1216	-	8,8,19	0.23	0	7,7,19	0.55	0
4	OLA	A	1207	-	19,19,19	0.58	0	19,19,19	0.85	1 (5%)
2	OLC	A	1202	-	24,24,24	0.59	0	25,25,25	0.97	2 (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
2	OLC	A	1212	-	-	7/24/24/24	-
4	OLA	A	1204	-	-	5/17/17/17	-
4	OLA	A	1218	-	-	6/17/17/17	-
4	OLA	A	1208	-	-	6/17/17/17	-
4	OLA	A	1213	-	-	1/10/10/17	-
4	OLA	A	1206	-	-	4/17/17/17	-
4	OLA	A	1215	-	-	3/11/11/17	-
3	P15	A	1203	-	-	5/17/17/17	-
2	OLC	A	1214	-	-	5/24/24/24	-
4	OLA	A	1217	-	-	3/17/17/17	-
2	OLC	A	1201	-	-	5/15/15/24	-
5	CLR	A	1220	-	-	0/10/68/68	0/4/4/4
4	OLA	A	1210	-	-	7/17/17/17	-
2	OLC	A	1211	-	-	6/24/24/24	-
4	OLA	A	1209	-	-	7/17/17/17	-
4	OLA	A	1219	-	-	5/10/10/17	-
3	P15	A	1205	-	-	4/11/11/17	-
4	OLA	A	1216	-	-	4/6/6/17	-
4	OLA	A	1207	-	-	2/17/17/17	-
2	OLC	A	1202	-	-	3/24/24/24	-

There are no bond length outliers.

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	1212	OLC	C3-C2-C1	-2.25	105.44	113.69
2	A	1202	OLC	C3-C2-C1	-2.19	105.68	113.69
5	A	1220	CLR	C4-C5-C10	2.18	119.21	116.42
4	A	1204	OLA	O2-C1-C2	2.17	120.86	114.00
2	A	1201	OLC	C3-C2-C1	-2.17	105.75	113.69
4	A	1208	OLA	O2-C1-C2	2.14	120.77	114.00
5	A	1220	CLR	C4-C5-C6	-2.12	117.69	120.57
2	A	1211	OLC	C3-C2-C1	-2.10	105.98	113.69
4	A	1219	OLA	O2-C1-C2	2.07	120.55	114.00
4	A	1215	OLA	O2-C1-C2	2.03	120.42	114.00
4	A	1210	OLA	O2-C1-C2	2.02	120.39	114.00
4	A	1217	OLA	O2-C1-C2	2.02	120.39	114.00
4	A	1209	OLA	O2-C1-C2	2.02	120.38	114.00
2	A	1201	OLC	O20-C1-O19	-2.02	118.58	123.63
2	A	1202	OLC	O20-C1-O19	-2.01	118.60	123.63
4	A	1207	OLA	O2-C1-C2	2.01	120.34	114.00

There are no chirality outliers.

All (88) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1211	OLC	C21-C22-C24-O25
2	A	1212	OLC	O20-C21-C22-C24
2	A	1201	OLC	O19-C1-O20-C21
2	A	1202	OLC	O19-C1-O20-C21
2	A	1202	OLC	C2-C1-O20-C21
2	A	1201	OLC	C2-C1-O20-C21
2	A	1212	OLC	O20-C21-C22-O23
2	A	1212	OLC	C2-C1-O20-C21
3	A	1203	P15	O5-C10-C9-O4
4	A	1219	OLA	C1-C2-C3-C4
2	A	1214	OLC	C1-C2-C3-C4
2	A	1212	OLC	O19-C1-O20-C21
2	A	1211	OLC	C2-C1-O20-C21
2	A	1201	OLC	C21-C22-C24-O25
2	A	1214	OLC	C21-C22-C24-O25
3	A	1205	P15	O3-C7-C8-O4
4	A	1216	OLA	C12-C13-C14-C15
4	A	1219	OLA	C5-C6-C7-C8
2	A	1201	OLC	O23-C22-C24-O25
2	A	1211	OLC	O23-C22-C24-O25
2	A	1214	OLC	O23-C22-C24-O25
4	A	1208	OLA	C11-C12-C13-C14

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Mol	Chain	Res	Type	Atoms
4	A	1218	OLA	C4-C5-C6-C7
4	A	1209	OLA	C12-C13-C14-C15
4	A	1210	OLA	C3-C4-C5-C6
2	A	1211	OLC	O19-C1-O20-C21
4	A	1206	OLA	C6-C7-C8-C9
4	A	1209	OLA	C4-C5-C6-C7
4	A	1216	OLA	C10-C11-C12-C13
4	A	1208	OLA	C6-C7-C8-C9
4	A	1218	OLA	C15-C16-C17-C18
4	A	1210	OLA	C15-C16-C17-C18
4	A	1208	OLA	C14-C15-C16-C17
2	A	1212	OLC	O23-C22-C24-O25
4	A	1209	OLA	C1-C2-C3-C4
3	A	1205	P15	O1-C3-C4-O2
4	A	1218	OLA	C12-C13-C14-C15
2	A	1212	OLC	C10-C11-C12-C13
4	A	1210	OLA	C13-C14-C15-C16
4	A	1213	OLA	C12-C13-C14-C15
4	A	1218	OLA	C11-C12-C13-C14
3	A	1205	P15	OXT-C1-C2-O1
2	A	1201	OLC	C2-C3-C4-C5
3	A	1203	P15	C1-C2-O1-C3
4	A	1215	OLA	C6-C7-C8-C9
2	A	1202	OLC	C3-C4-C5-C6
2	A	1211	OLC	O20-C21-C22-O23
4	A	1209	OLA	C11-C12-C13-C14
3	A	1203	P15	O2-C5-C6-O3
4	A	1208	OLA	C15-C16-C17-C18
4	A	1204	OLA	C5-C6-C7-C8
4	A	1219	OLA	C7-C8-C9-C10
4	A	1204	OLA	C6-C7-C8-C9
4	A	1210	OLA	C9-C10-C11-C12
3	A	1205	P15	C4-C3-O1-C2
4	A	1216	OLA	C11-C12-C13-C14
4	A	1215	OLA	C9-C10-C11-C12
4	A	1210	OLA	C4-C5-C6-C7
4	A	1204	OLA	O1-C1-C2-C3
4	A	1204	OLA	O2-C1-C2-C3
4	A	1215	OLA	C7-C8-C9-C10
4	A	1208	OLA	C2-C3-C4-C5
4	A	1217	OLA	C7-C8-C9-C10
4	A	1217	OLA	C9-C10-C11-C12

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Mol	Chain	Res	Type	Atoms
2	A	1212	OLC	C12-C13-C14-C15
4	A	1206	OLA	C10-C11-C12-C13
4	A	1209	OLA	C13-C14-C15-C16
4	A	1209	OLA	O1-C1-C2-C3
4	A	1219	OLA	O2-C1-C2-C3
4	A	1210	OLA	O2-C1-C2-C3
4	A	1210	OLA	O1-C1-C2-C3
2	A	1211	OLC	O20-C21-C22-C24
4	A	1206	OLA	O2-C1-C2-C3
4	A	1208	OLA	C7-C8-C9-C10
2	A	1214	OLC	C7-C8-C9-C10
4	A	1207	OLA	C7-C8-C9-C10
4	A	1207	OLA	C9-C10-C11-C12
4	A	1218	OLA	C9-C10-C11-C12
4	A	1219	OLA	O1-C1-C2-C3
4	A	1217	OLA	C10-C11-C12-C13
4	A	1216	OLA	C13-C14-C15-C16
4	A	1206	OLA	O1-C1-C2-C3
4	A	1209	OLA	O2-C1-C2-C3
2	A	1214	OLC	C5-C6-C7-C8
3	A	1203	P15	O1-C3-C4-O2
4	A	1218	OLA	C7-C8-C9-C10
3	A	1203	P15	C5-C6-O3-C7
4	A	1204	OLA	C14-C15-C16-C17

There are no ring outliers.

6 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1213	OLA	2	0
3	A	1203	P15	1	0
2	A	1201	OLC	5	0
5	A	1220	CLR	1	0
3	A	1205	P15	1	0
4	A	1216	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 then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be

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

Ligand OLC A 1212

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1204

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1218

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1208

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1213

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1206

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1215

Bond lengths

Bond angles

Torsions

Rings

Ligand P15 A 1203

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 1214

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1217

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 1201

Bond lengths

Bond angles

Torsions

Rings

Ligand CLR A 1220

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1210

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 1211

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1209

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1219

Bond lengths

Bond angles

Torsions

Rings

Ligand P15 A 1205

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1216

Bond lengths

Bond angles

Torsions

Rings

Ligand OLA A 1207

Bond lengths

Bond angles

Torsions

Rings

Ligand OLC A 1202

Bond lengths

Bond angles

Torsions

Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	363/436 (83%)	0.26	17 (4%)	37	39	21, 41, 86, 144	11 (3%)

All (17) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1046	PRO	4.0
1	A	71	ALA	3.7
1	A	1048	LEU	3.7
1	A	70	PRO	3.5
1	A	1040	ALA	3.4
1	A	1045	PRO	3.0
1	A	1043	ALA	2.8
1	A	1067	ILE	2.6
1	A	1091	ALA	2.5
1	A	1102	ILE	2.4
1	A	1061	PHE	2.3
1	A	1062	ARG	2.3
1	A	1039	ASP	2.2
1	A	1044	THR	2.1
1	A	1047	LYS	2.1
1	A	1009	THR	2.0
1	A	274	THR	2.0

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

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	YCM	A	249	10/11	0.85	0.16	35,57,88,94	0

6.3 Carbohydrates ⓘ

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
3	P15	A	1205	14/20	0.55	0.20	64,94,116,119	0
4	OLA	A	1207	20/20	0.75	0.17	54,80,94,98	0
4	OLA	A	1215	14/20	0.75	0.16	69,80,92,95	0
2	OLC	A	1201	16/25	0.76	0.19	43,58,66,95	0
2	OLC	A	1211	25/25	0.78	0.18	54,75,92,105	0
2	OLC	A	1202	25/25	0.78	0.21	50,80,101,110	0
3	P15	A	1203	20/20	0.81	0.18	48,64,90,94	0
2	OLC	A	1214	25/25	0.81	0.17	56,78,100,116	0
4	OLA	A	1209	20/20	0.82	0.20	54,76,92,95	0
4	OLA	A	1219	13/20	0.82	0.21	63,72,90,91	0
4	OLA	A	1206	20/20	0.83	0.19	49,69,88,91	0
4	OLA	A	1217	20/20	0.84	0.14	70,82,92,94	0
2	OLC	A	1212	25/25	0.84	0.17	40,82,102,119	0
4	OLA	A	1204	20/20	0.85	0.19	49,56,84,84	0
4	OLA	A	1208	20/20	0.85	0.17	53,65,83,89	0
4	OLA	A	1216	9/20	0.86	0.17	48,59,76,79	0
4	OLA	A	1218	20/20	0.87	0.17	52,64,89,97	0
4	OLA	A	1210	20/20	0.88	0.17	42,60,70,78	0
4	OLA	A	1213	13/20	0.89	0.15	41,51,73,74	0
5	CLR	A	1220	28/28	0.95	0.07	28,33,39,42	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 P15 A 1205:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
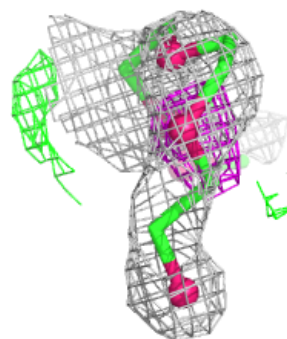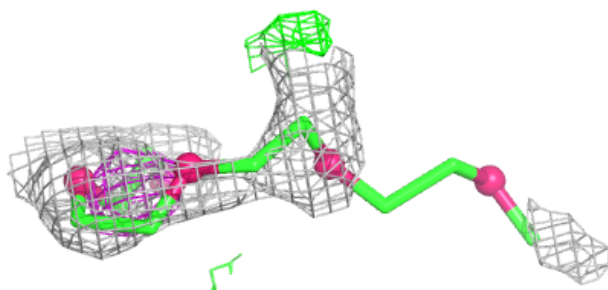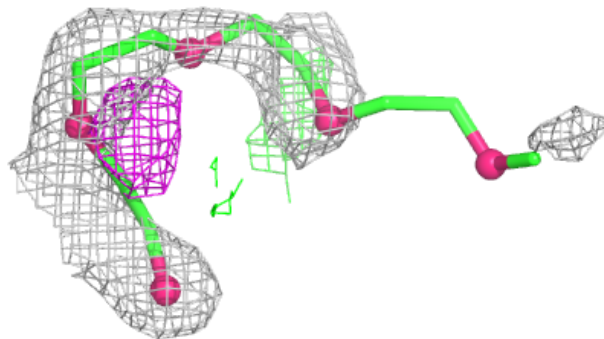
Electron density around OLA A 1207:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
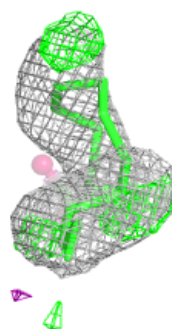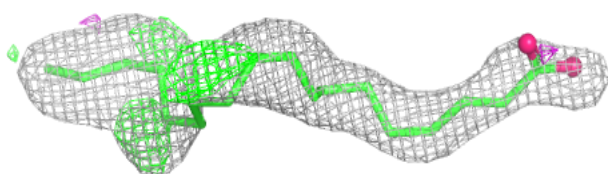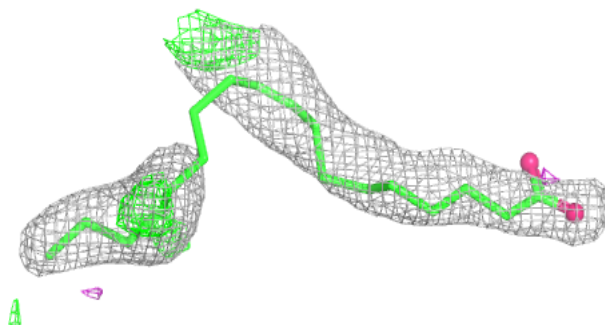mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
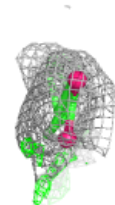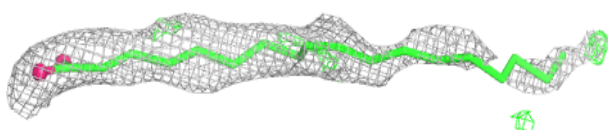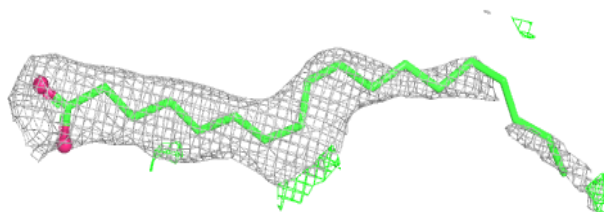
Electron density around OLA A 1215:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
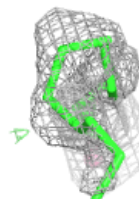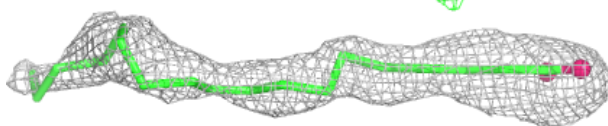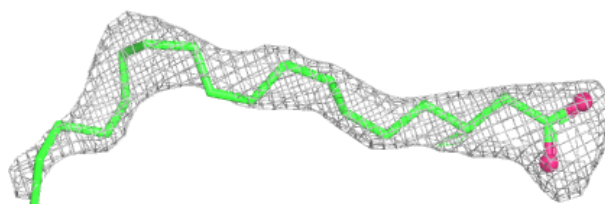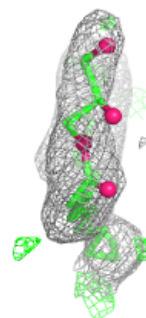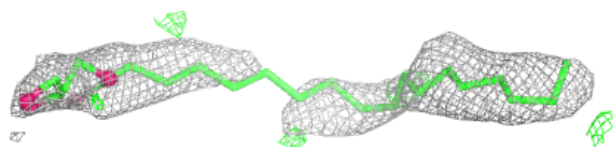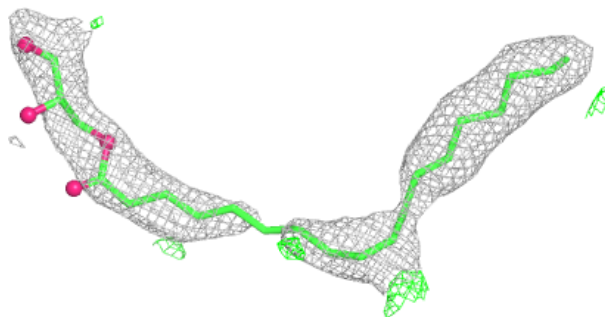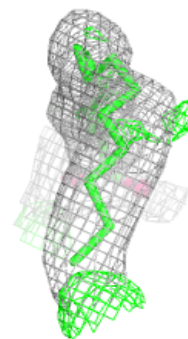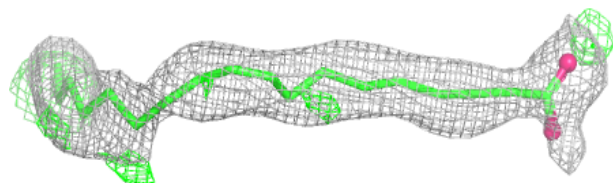mF_o-DF_c (at 3 rmsd) in purple (negative)
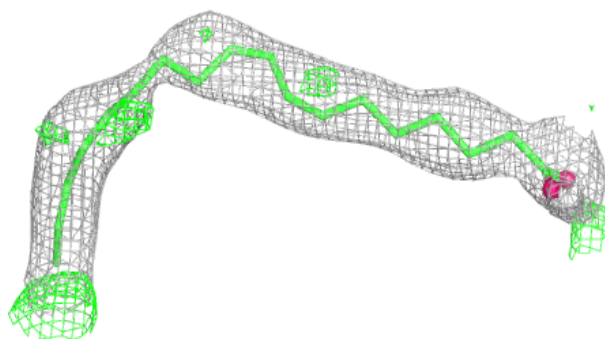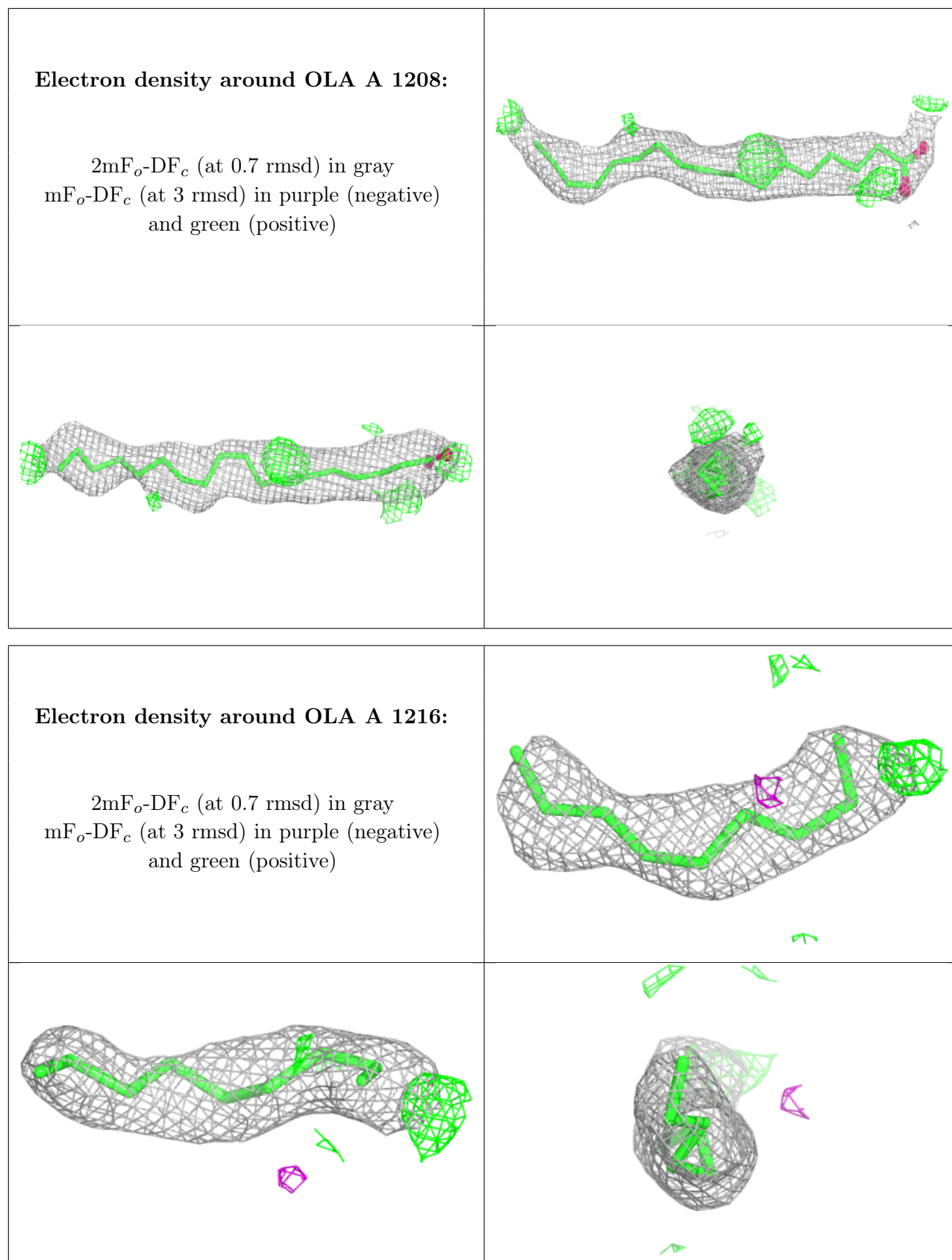and green (positive)
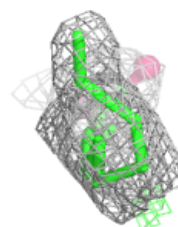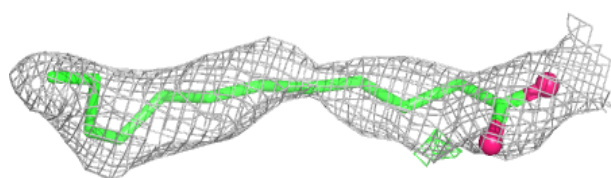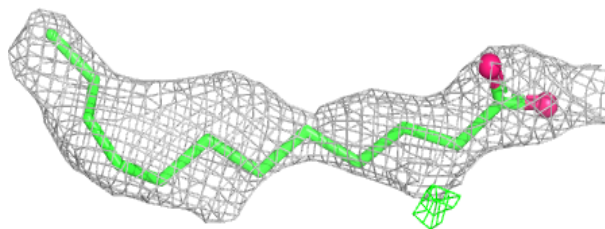
Electron density around OLC A 1201:
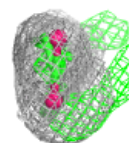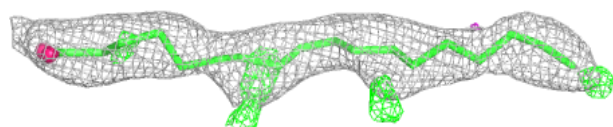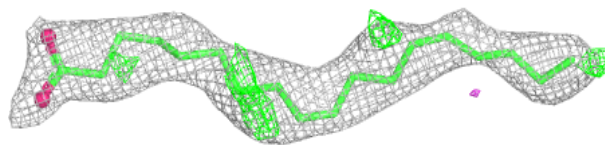
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
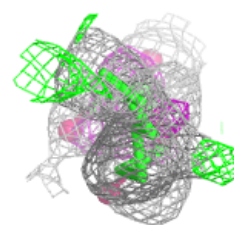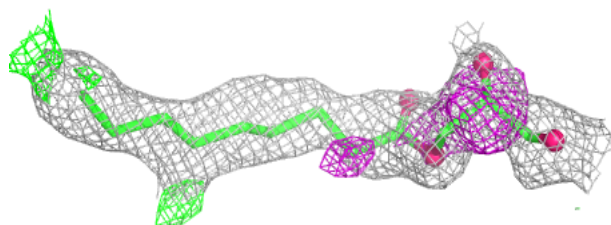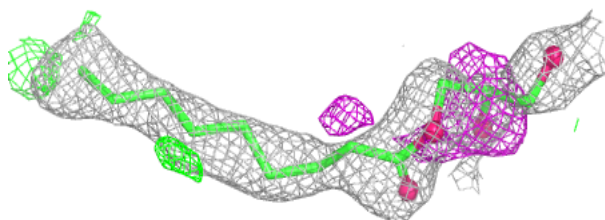
Electron density around OLC A 1211:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
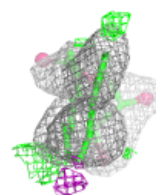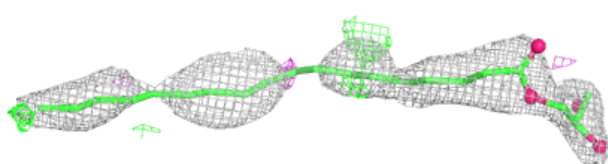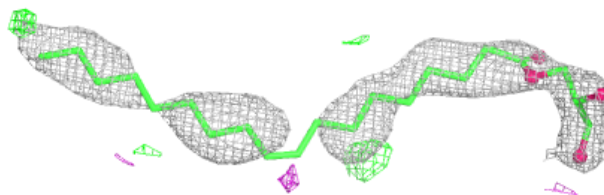
Electron density around OLC A 1202:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
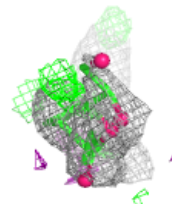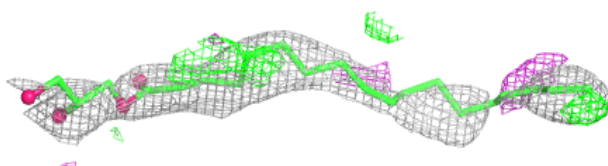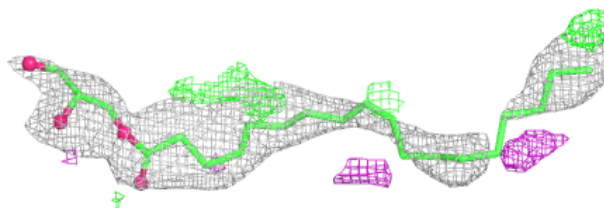
Electron density around P15 A 1203:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
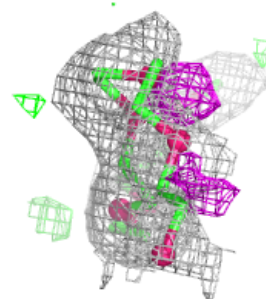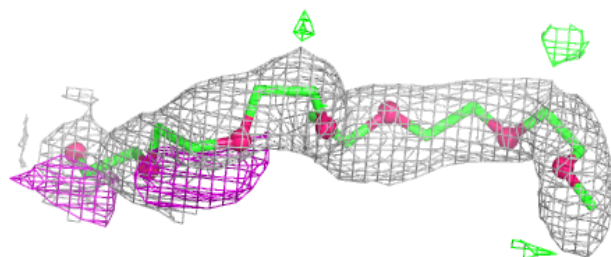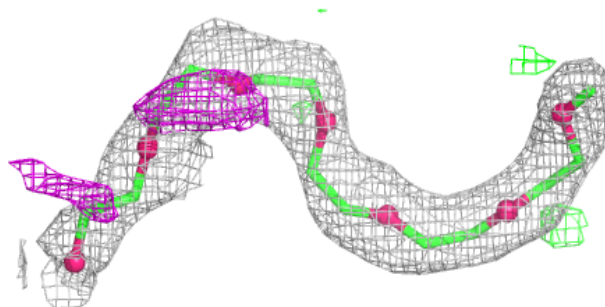
Electron density around OLC A 1214:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
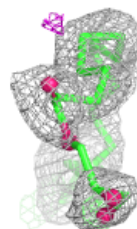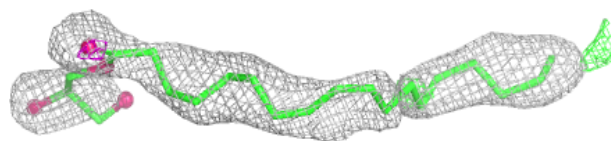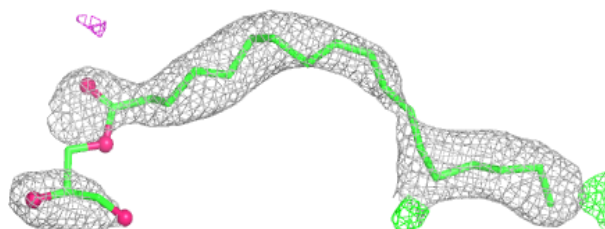
Electron density around OLA A 1209:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
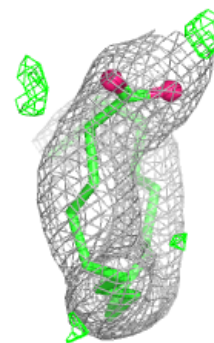mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
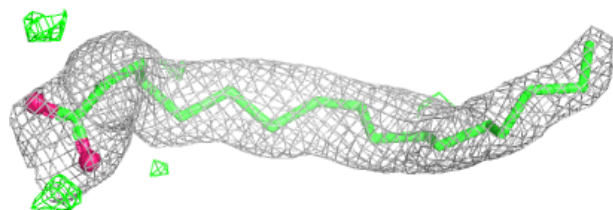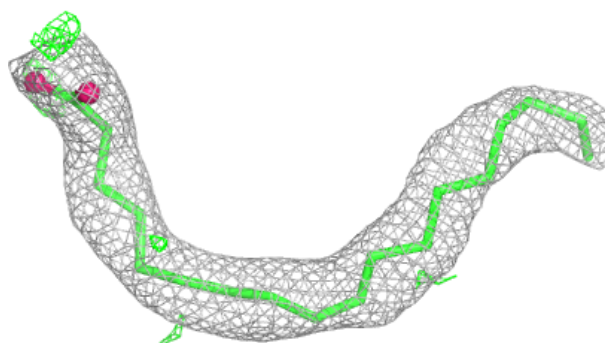and green (positive)
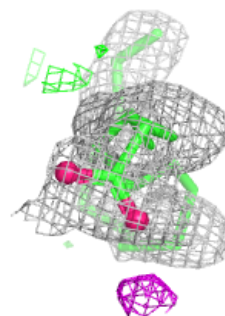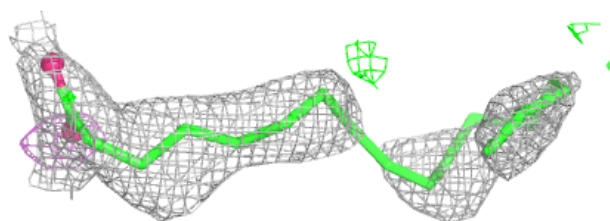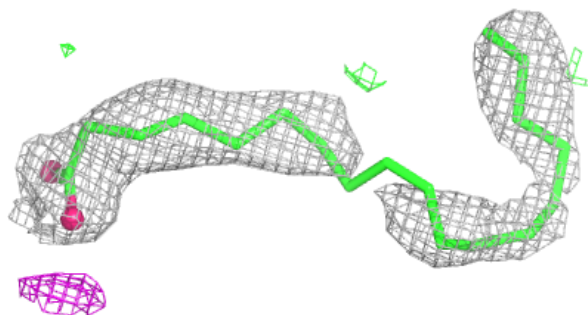
Electron density around OLA A 1219:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
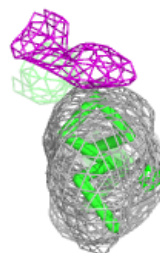and green (positive)
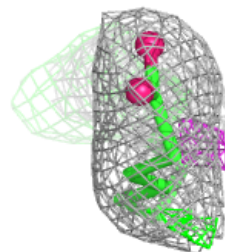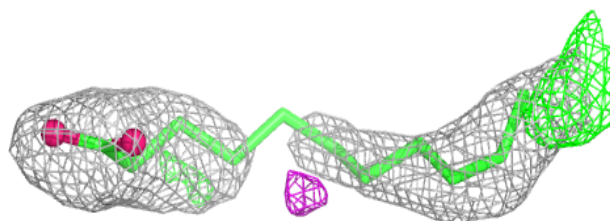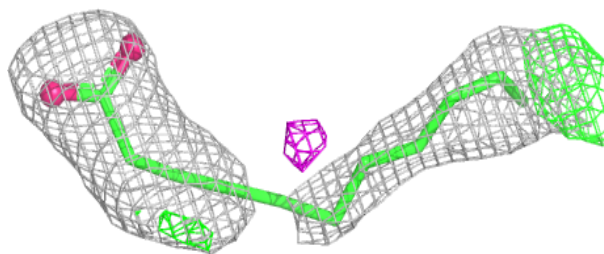
Electron density around OLA A 1206:

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

Electron density around OLA A 1217:

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

Electron density around OLC A 1212:

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

Electron density around OLA A 1204:

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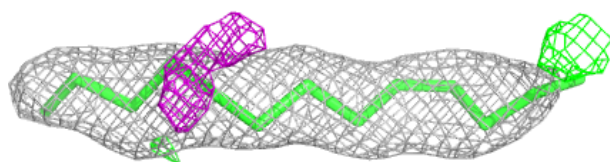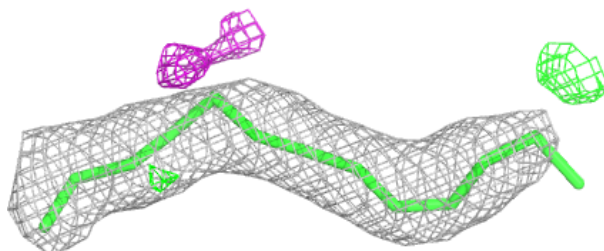and green (positive)

Electron density around OLA A 1208:

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

Electron density around OLA A 1216:

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

Electron density around OLA A 1218:

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

Electron density around OLA A 1210:

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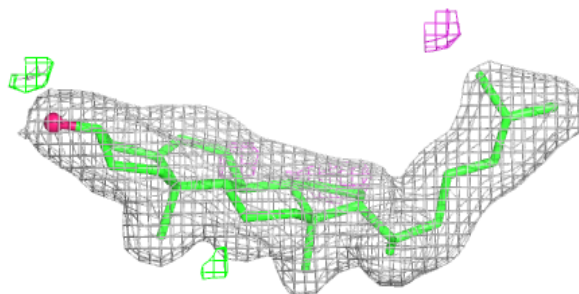and green (positive)

Electron density around OLA A 1213:

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

Electron density around CLR A 1220:

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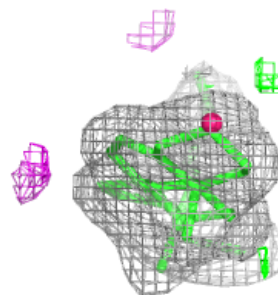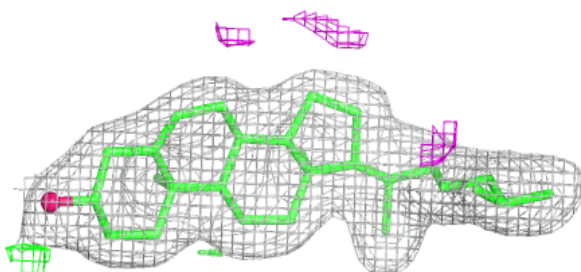
6.5 Other polymers (i)

There are no such residues in this entry.