



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 11:06 PM UTC

PDB ID : 5DHH / pdb_00005dhh
Title : The crystal structure of nociceptin/orphanin FQ peptide receptor (NOP) in complex with SB-612111 (PSI Community Target)
Authors : Miller, R.L.; Thompson, A.A.; Trapella, C.; Guerrini, R.; Malfacini, D.; Patel, N.; Han, G.W.; Cherezov, V.; Calo, G.; Katritch, V.; Stevens, R.C.; GPCR Network (GPCR)
Deposited on : 2015-08-31
Resolution : 3.00 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

The following versions of software and data (see [references](#) ①) 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

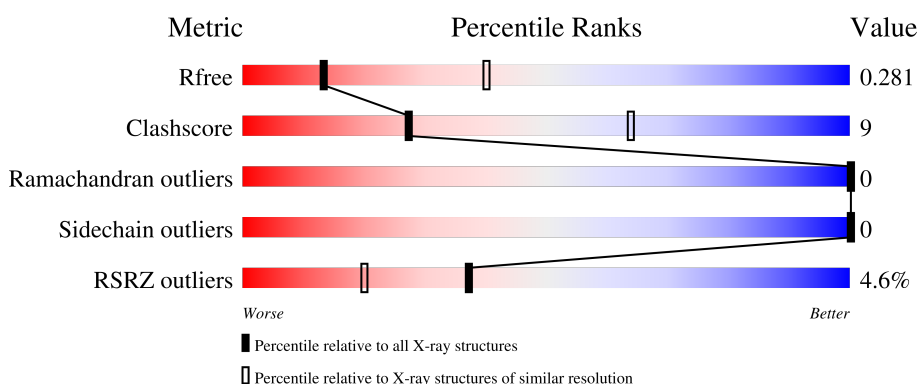
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	2672 (3.00-3.00)
Clashscore	190562	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)
RSRZ outliers	180081	2671 (3.00-3.00)

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	424	3% 54% 13% 33%
1	B	424	4% 71% 21% 9%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 5172 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Soluble cytochrome b562,Nociceptin receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	282	Total	C	N	O	S	0	0	0
			2142	1407	354	364	17			
1	B	387	Total	C	N	O	S	0	0	0
			2885	1874	483	508	20			

There are 48 discrepancies between the modelled and reference sequences:

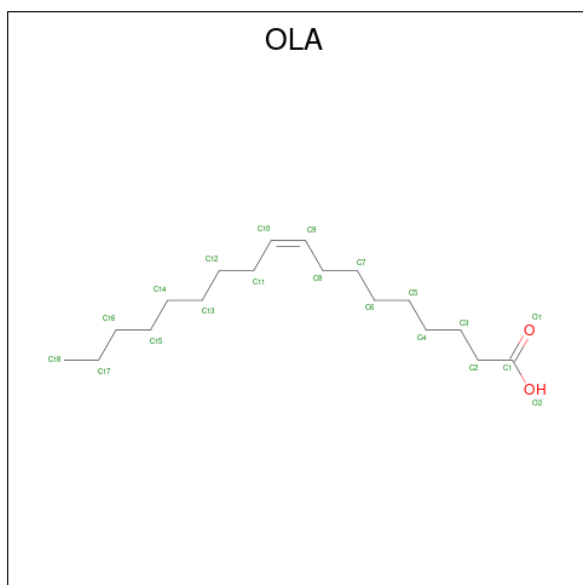
Chain	Residue	Modelled	Actual	Comment	Reference
A	-73	ASP	-	expression tag	UNP P0ABE7
A	-72	TYR	-	expression tag	UNP P0ABE7
A	-71	LYS	-	expression tag	UNP P0ABE7
A	-70	ASP	-	expression tag	UNP P0ABE7
A	-69	ASP	-	expression tag	UNP P0ABE7
A	-68	ASP	-	expression tag	UNP P0ABE7
A	-67	ASP	-	expression tag	UNP P0ABE7
A	-66	GLY	-	expression tag	UNP P0ABE7
A	-65	ALA	-	expression tag	UNP P0ABE7
A	-64	PRO	-	expression tag	UNP P0ABE7
A	-57	TRP	MET	engineered mutation	UNP P0ABE7
A	38	ILE	HIS	engineered mutation	UNP P0ABE7
A	42	LEU	ARG	engineered mutation	UNP P0ABE7
A	340	GLY	-	expression tag	UNP P41146
A	341	ARG	-	expression tag	UNP P41146
A	342	PRO	-	expression tag	UNP P41146
A	343	LEU	-	expression tag	UNP P41146
A	344	GLU	-	expression tag	UNP P41146
A	345	VAL	-	expression tag	UNP P41146
A	346	LEU	-	expression tag	UNP P41146
A	347	PHE	-	expression tag	UNP P41146
A	348	GLN	-	expression tag	UNP P41146
A	349	GLY	-	expression tag	UNP P41146
A	350	PRO	-	expression tag	UNP P41146
B	991	ASP	-	expression tag	UNP P0ABE7

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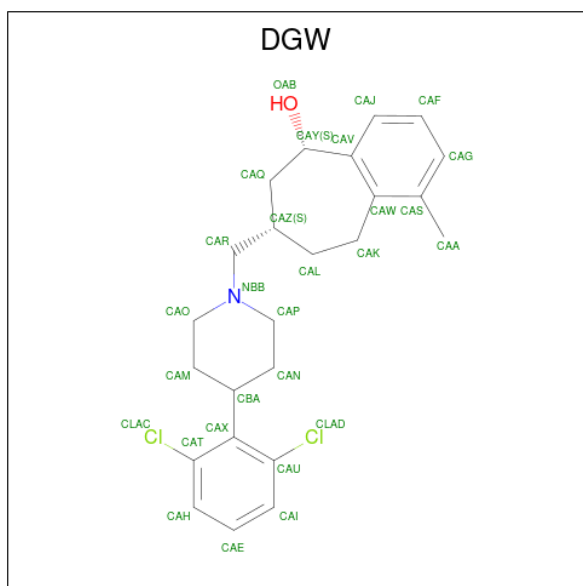
Chain	Residue	Modelled	Actual	Comment	Reference
B	992	TYR	-	expression tag	UNP P0ABE7
B	993	LYS	-	expression tag	UNP P0ABE7
B	994	ASP	-	expression tag	UNP P0ABE7
B	995	ASP	-	expression tag	UNP P0ABE7
B	996	ASP	-	expression tag	UNP P0ABE7
B	997	ASP	-	expression tag	UNP P0ABE7
B	998	GLY	-	expression tag	UNP P0ABE7
B	999	ALA	-	expression tag	UNP P0ABE7
B	1000	PRO	-	expression tag	UNP P0ABE7
B	1007	TRP	MET	engineered mutation	UNP P0ABE7
B	1102	ILE	HIS	engineered mutation	UNP P0ABE7
B	1106	LEU	ARG	engineered mutation	UNP P0ABE7
B	1404	GLY	-	expression tag	UNP P41146
B	1405	ARG	-	expression tag	UNP P41146
B	1406	PRO	-	expression tag	UNP P41146
B	1407	LEU	-	expression tag	UNP P41146
B	1408	GLU	-	expression tag	UNP P41146
B	1409	VAL	-	expression tag	UNP P41146
B	1410	LEU	-	expression tag	UNP P41146
B	1411	PHE	-	expression tag	UNP P41146
B	1412	GLN	-	expression tag	UNP P41146
B	1413	GLY	-	expression tag	UNP P41146
B	1414	PRO	-	expression tag	UNP P41146

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



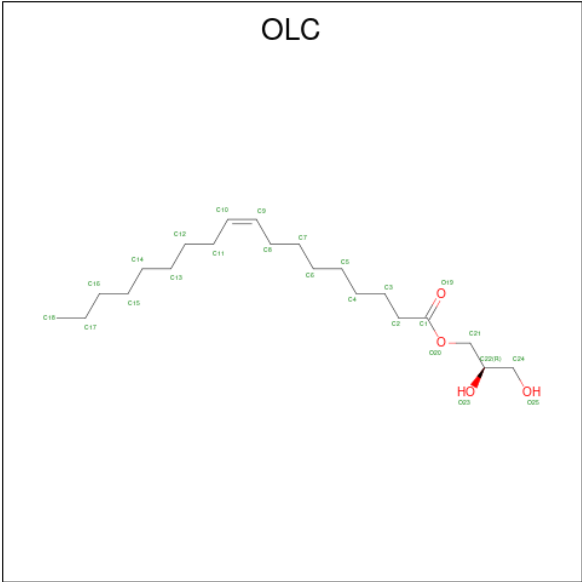
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			12	10	2		
2	A	1	Total	C	O	0	0
			8	6	2		
2	A	1	Total	C	O	0	0
			17	15	2		
2	A	1	Total	C	O	0	0
			11	9	2		
2	A	1	Total	C	O	0	0
			12	10	2		
2	B	1	Total	C	O	0	0
			10	8	2		
2	B	1	Total	C	O	0	0
			7	5	2		

- Molecule 3 is (5S,7S)-7-{[4-(2,6-dichlorophenyl)piperidin-1-yl]methyl}-1-methyl-6,7,8,9-tetrahydro-5H-benzo[7]annulen-5-ol (CCD ID: DGW) (formula: C₂₄H₂₉Cl₂NO).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	Cl	N	O	0	0
			28	24	2	1	1		
3	B	1	Total	C	Cl	N	O	0	0
			28	24	2	1	1		

- Molecule 4 is (2R)-2,3-dihydroxypropyl (9Z)-octadec-9-enoate (CCD ID: OLC) (formula: C₂₁H₄₀O₄).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total	C	O	0	0
			12	8	4		

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	42.30Å 168.94Å 65.47Å 90.00° 103.50° 90.00°	Depositor
Resolution (Å)	29.84 – 3.00 29.84 – 3.00	Depositor EDS
% Data completeness (in resolution range)	92.9 (29.84-3.00) 84.3 (29.84-3.00)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.27 (at 3.00Å)	Xtriage
Refinement program	PHENIX (1.10_2142: ???)	Depositor
R, R_{free}	0.240 , 0.279 0.243 , 0.281	Depositor DCC
R_{free} test set	827 reflections (3.21%)	wwPDB-VP
Wilson B-factor (Å ²)	54.6	Xtriage
Anisotropy	0.316	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 69.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	5172	wwPDB-VP
Average B, all atoms (Å ²)	67.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.20% 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: OLA, OLC, DGW

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	0.17	0/2187	0.41	0/2986
1	B	0.18	0/2941	0.41	0/4018
All	All	0.18	0/5128	0.41	0/7004

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	2142	0	2193	37	0
1	B	2885	0	2865	54	0
2	A	60	0	76	5	0
2	B	17	0	18	0	0
3	A	28	0	29	2	0
3	B	28	0	29	3	0
4	B	12	0	13	0	0
All	All	5172	0	5223	95	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 9.

All (95) 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:1216:ILE:HG13	1:B:1302:MET:HE3	1.69	0.75
1:A:47:PRO:HD2	1:A:50:LEU:HD12	1.68	0.74
1:A:175:TRP:CE3	1:A:175:TRP:CH2	2.74	0.73
1:B:1281:ILE:HD12	1:B:1348:LEU:HD11	1.73	0.70
1:B:1104:LYS:HE3	1:B:1105:TYR:CZ	2.26	0.70
1:B:1146:MET:HE2	1:B:1146:MET:HA	1.74	0.69
1:B:1315:SER:N	1:B:1319:ASP:OD2	2.27	0.68
1:B:1391:LYS:O	1:B:1395:ARG:HG2	1.92	0.68
1:A:149:TYR:HD1	1:A:238:MET:HG3	1.60	0.66
1:B:1110:LEU:HD21	1:B:1366:ARG:HG3	1.79	0.66
1:B:1053:PRO:O	1:B:1062:ARG:NH1	2.31	0.64
3:A:1206:DGW:H5	3:A:1206:DGW:CLAD	2.37	0.61
1:B:1041:GLN:NE2	1:B:1062:ARG:O	2.34	0.60
1:B:1188:LYS:NZ	1:B:1253:GLY:O	2.35	0.59
1:A:109:THR:HG22	2:A:1203:OLA:H132	1.84	0.59
1:B:1315:SER:OG	1:B:1316:ARG:N	2.34	0.59
1:A:46:LEU:HD11	1:A:302:ARG:HG3	1.86	0.57
3:B:1503:DGW:CLAD	3:B:1503:DGW:H10	2.42	0.57
1:A:109:THR:HG22	2:A:1203:OLA:H111	1.87	0.56
1:A:329:CYS:HA	1:A:332:LYS:HG2	1.86	0.56
1:B:1257:VAL:H	1:B:1262:ILE:HG22	1.69	0.56
1:B:1271:PRO:HG2	1:B:1274:TYR:HB3	1.88	0.56
1:A:80:THR:HG21	1:A:82:MET:HG3	1.87	0.55
1:B:1161:ASP:HB3	1:B:1376:SER:HB3	1.88	0.55
1:B:1370:ALA:O	1:B:1374:VAL:HG23	2.07	0.55
1:A:61:VAL:HG13	1:A:313:CYS:HB3	1.89	0.54
1:B:1097:THR:O	1:B:1101:TYR:HB2	2.08	0.54
1:B:1199:PHE:CE2	1:B:1245:VAL:HG11	2.43	0.53
2:A:1202:OLA:H51	2:A:1204:OLA:H31	1.91	0.53
1:B:1187:CYS:HB2	1:B:1255:ALA:HB2	1.91	0.53
1:B:1047:LYS:HD2	1:B:1105:TYR:HA	1.89	0.52
1:B:1045:PRO:HG2	1:B:1048:LEU:HD12	1.91	0.52
1:B:1280:ALA:HB2	1:B:1351:GLY:HA3	1.92	0.52
1:A:163:THR:HG22	1:A:165:SER:H	1.75	0.51
1:B:1081:GLU:OE1	1:B:1083:LYS:NZ	2.44	0.51
1:A:147:ASP:OD2	1:A:162:ARG:NH1	2.44	0.51
1:B:1195:TYR:CD1	1:B:1249:VAL:HG11	2.45	0.51
1:B:1161:ASP:HA	1:B:1164:VAL:HG22	1.92	0.50
1:A:102:LEU:O	1:A:105:PRO:HD2	2.12	0.49
1:B:1240:ALA:O	1:B:1243:SER:OG	2.23	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:105:PRO:O	1:A:109:THR:HG23	2.13	0.49
1:A:256:ARG:HE	1:A:260:ARG:NH1	2.11	0.49
1:B:1050:ASP:OD1	1:B:1051:LYS:N	2.46	0.48
1:B:1041:GLN:HE22	1:B:1066:ASP:CG	2.22	0.48
1:B:1164:VAL:O	1:B:1167:THR:HB	2.12	0.48
1:A:192:GLN:NE2	1:A:192:GLN:HA	2.28	0.48
1:B:1328:LEU:HD13	1:B:1386:LEU:HB2	1.96	0.47
1:A:140:THR:O	1:A:144:MET:HG3	2.15	0.47
1:B:1369:THR:HG21	3:B:1503:DGW:H30	1.96	0.47
1:A:80:THR:OG1	1:A:81:LYS:N	2.47	0.47
1:B:1167:THR:HG22	1:B:1171:GLN:HE21	1.80	0.47
1:A:109:THR:CG2	2:A:1203:OLA:H132	2.44	0.47
1:B:1135:LEU:O	1:B:1139:VAL:HG13	2.15	0.46
1:B:1177:LEU:HD12	1:B:1181:PRO:HG3	1.96	0.46
1:A:279:VAL:HG12	3:A:1206:DGW:CLAC	2.52	0.46
1:B:1221:ARG:O	1:B:1225:VAL:HG23	2.15	0.46
1:A:100:VAL:O	1:A:103:THR:OG1	2.28	0.46
1:B:1187:CYS:CB	1:B:1255:ALA:HB2	2.46	0.46
1:A:135:PHE:CZ	1:A:223:SER:HB3	2.51	0.45
1:A:118:PHE:HB3	1:A:122:LEU:HD22	1.99	0.45
1:A:308:GLY:O	1:A:311:ASN:HB3	2.17	0.45
1:A:85:ALA:HB3	1:A:162:ARG:NH1	2.32	0.45
1:A:128:ALA:HB2	1:A:186:ALA:HB2	1.99	0.45
1:B:1218:HIS:O	1:B:1222:ALA:HB2	2.16	0.44
1:B:1360:THR:O	1:B:1364:ILE:HG12	2.16	0.44
1:A:82:MET:HE3	1:A:325:ASN:HD22	1.82	0.44
1:B:1161:ASP:O	1:B:1165:LEU:HG	2.18	0.44
1:A:329:CYS:HA	1:A:332:LYS:HE3	1.98	0.44
1:B:1033:MET:HE1	1:B:1094:LEU:HD13	1.99	0.44
1:A:187:ILE:HG12	2:A:1204:OLA:H22	1.99	0.44
1:A:51:LYS:HB3	1:A:112:LEU:HD23	2.00	0.43
1:A:79:HIS:O	1:A:79:HIS:ND1	2.51	0.43
1:B:1199:PHE:CZ	1:B:1287:SER:HB3	2.53	0.43
1:B:1319:ASP:HB2	1:B:1322:LEU:HD12	2.00	0.43
1:B:1003:LEU:HD12	1:B:1043:ALA:HB3	2.01	0.42
1:B:1198:MET:HE1	1:B:1340:TRP:CE3	2.53	0.42
1:B:1142:ARG:HG3	1:B:1143:HIS:ND1	2.35	0.42
1:B:1392:ALA:O	1:B:1395:ARG:HB2	2.20	0.42
1:B:1166:LEU:O	1:B:1169:PRO:HD2	2.20	0.42
1:B:1242:ALA:O	1:B:1246:GLY:N	2.53	0.42
1:B:1119:VAL:HG21	1:B:1176:LEU:HG	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:55:VAL:HG21	1:A:112:LEU:HG	2.02	0.41
1:A:84:THR:O	1:A:88:ILE:HG12	2.18	0.41
1:A:310:VAL:O	1:A:314:LEU:HG	2.19	0.41
1:A:83:LYS:O	1:A:164:SER:HB3	2.21	0.41
1:B:1142:ARG:HG2	1:B:1142:ARG:HH21	1.85	0.41
1:B:1244:VAL:O	1:B:1248:PRO:HG2	2.20	0.41
1:A:219:ILE:O	1:A:223:SER:OG	2.36	0.41
1:A:224:PHE:O	1:A:228:VAL:HG23	2.20	0.41
1:A:193:VAL:HA	1:A:197:GLU:O	2.20	0.41
1:B:1130:LEU:HD11	1:B:1166:LEU:HD23	2.01	0.41
1:B:1165:LEU:HD23	1:B:1165:LEU:HA	1.82	0.41
1:B:1131:LEU:O	1:B:1135:LEU:HB2	2.20	0.41
3:B:1503:DGW:H26	3:B:1503:DGW:H28	1.54	0.41
1:B:1136:VAL:HG13	1:B:1390:PHE:CE1	2.56	0.40

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	278/424 (66%)	269 (97%)	9 (3%)	0	100	100
1	B	379/424 (89%)	367 (97%)	12 (3%)	0	100	100
All	All	657/848 (78%)	636 (97%)	21 (3%)	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	229/355 (64%)	229 (100%)	0	100	100
1	B	293/355 (82%)	293 (100%)	0	100	100
All	All	522/710 (74%)	522 (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 (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	133	ASN
1	A	325	ASN
1	B	1171	GLN
1	B	1350	GLN
1	B	1375	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 ⓘ

10 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	OLA	A	1201	-	11,11,19	0.64	0	11,11,19	1.12	1 (9%)
2	OLA	B	1501	-	9,9,19	0.67	0	9,9,19	1.26	2 (22%)
2	OLA	A	1205	-	11,11,19	0.67	0	11,11,19	1.20	1 (9%)
2	OLA	B	1502	-	6,6,19	0.80	0	6,6,19	1.47	1 (16%)
3	DGW	B	1503	-	30,31,31	2.74	3 (10%)	35,44,44	1.57	5 (14%)
2	OLA	A	1203	-	16,16,19	0.54	0	16,16,19	0.91	0
2	OLA	A	1202	-	7,7,19	0.76	0	7,7,19	1.31	1 (14%)
4	OLC	B	1504	-	11,11,24	1.33	1 (9%)	12,12,25	1.40	2 (16%)
2	OLA	A	1204	-	10,10,19	0.69	0	10,10,19	1.29	1 (10%)
3	DGW	A	1206	-	30,31,31	2.81	3 (10%)	35,44,44	1.69	8 (22%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	OLA	A	1201	-	-	5/9/9/17	-
2	OLA	B	1501	-	-	4/7/7/17	-
2	OLA	A	1205	-	-	8/9/9/17	-
2	OLA	B	1502	-	-	1/4/4/17	-
3	DGW	B	1503	-	-	1/8/31/31	0/4/4/4
2	OLA	A	1203	-	-	6/14/14/17	-
2	OLA	A	1202	-	-	1/5/5/17	-
4	OLC	B	1504	-	-	2/11/11/24	-
2	OLA	A	1204	-	-	4/8/8/17	-
3	DGW	A	1206	-	-	1/8/31/31	0/4/4/4

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1206	DGW	CAK-CAW	-13.32	1.38	1.51
3	B	1503	DGW	CAK-CAW	-12.86	1.39	1.51
3	B	1503	DGW	CAA-CAS	-5.59	1.40	1.51
3	A	1206	DGW	CAA-CAS	-5.47	1.40	1.51
4	B	1504	OLC	O20-C1	4.23	1.45	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1503	DGW	CAX-CBA	-4.22	1.40	1.52
3	A	1206	DGW	CAX-CBA	-3.81	1.41	1.52

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1206	DGW	CAZ-CAR-NBB	4.21	120.74	114.06
3	A	1206	DGW	CAX-CAU-CLAD	4.16	125.49	120.54
3	B	1503	DGW	CAX-CAU-CLAD	3.98	125.28	120.54
3	B	1503	DGW	CAU-CAX-CAT	3.87	119.28	114.92
4	B	1504	OLC	O20-C1-C2	3.54	122.64	111.83
3	B	1503	DGW	CAQ-CAZ-CAR	-3.46	105.06	110.14
3	A	1206	DGW	CAU-CAX-CAT	3.27	118.60	114.92
3	B	1503	DGW	CAK-CAW-CAV	3.13	130.18	121.83
3	A	1206	DGW	CAK-CAW-CAV	2.97	129.76	121.83
3	A	1206	DGW	CAQ-CAZ-CAR	-2.95	105.81	110.14
3	B	1503	DGW	CAI-CAU-CAX	-2.37	119.24	122.38
2	B	1502	OLA	O2-C1-C2	2.22	121.01	114.00
3	A	1206	DGW	CAI-CAU-CAX	-2.22	119.44	122.38
4	B	1504	OLC	O20-C1-O19	-2.21	118.09	123.63
2	A	1204	OLA	C3-C2-C1	-2.20	108.77	114.51
2	B	1501	OLA	O2-C1-C2	2.14	120.75	114.00
2	B	1501	OLA	C3-C2-C1	-2.14	108.93	114.51
2	A	1205	OLA	O2-C1-C2	2.11	120.67	114.00
3	A	1206	DGW	CAO-NBB-CAR	-2.07	105.61	111.35
2	A	1201	OLA	O2-C1-C2	2.07	120.53	114.00
3	A	1206	DGW	CAP-CAN-CBA	-2.06	108.59	111.00
2	A	1202	OLA	O2-C1-C2	2.05	120.47	114.00

There are no chirality outliers.

All (33) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	1504	OLC	O20-C21-C22-C24
2	A	1201	OLA	C1-C2-C3-C4
2	B	1502	OLA	C1-C2-C3-C4
2	A	1205	OLA	C1-C2-C3-C4
2	B	1501	OLA	C1-C2-C3-C4
4	B	1504	OLC	O20-C21-C22-O23
2	A	1204	OLA	C1-C2-C3-C4
2	A	1204	OLA	C2-C3-C4-C5
2	A	1204	OLA	C4-C5-C6-C7

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Mol	Chain	Res	Type	Atoms
2	A	1201	OLA	C4-C5-C6-C7
2	A	1203	OLA	C11-C12-C13-C14
2	A	1205	OLA	C3-C4-C5-C6
2	A	1201	OLA	C5-C6-C7-C8
2	A	1205	OLA	C5-C6-C7-C8
2	A	1201	OLA	C3-C4-C5-C6
2	A	1205	OLA	C6-C7-C8-C9
2	A	1203	OLA	C5-C6-C7-C8
2	A	1204	OLA	C6-C7-C8-C9
2	A	1202	OLA	C2-C3-C4-C5
2	B	1501	OLA	C3-C4-C5-C6
2	A	1201	OLA	C7-C8-C9-C10
2	B	1501	OLA	C4-C5-C6-C7
2	A	1203	OLA	C10-C11-C12-C13
2	B	1501	OLA	C5-C6-C7-C8
2	A	1205	OLA	C7-C8-C9-C10
2	A	1203	OLA	C9-C10-C11-C12
3	A	1206	DGW	NBB-CAR-CAZ-CAQ
3	B	1503	DGW	NBB-CAR-CAZ-CAQ
2	A	1203	OLA	C11-C10-C9-C8
2	A	1205	OLA	O1-C1-C2-C3
2	A	1203	OLA	C3-C4-C5-C6
2	A	1205	OLA	C4-C5-C6-C7
2	A	1205	OLA	O2-C1-C2-C3

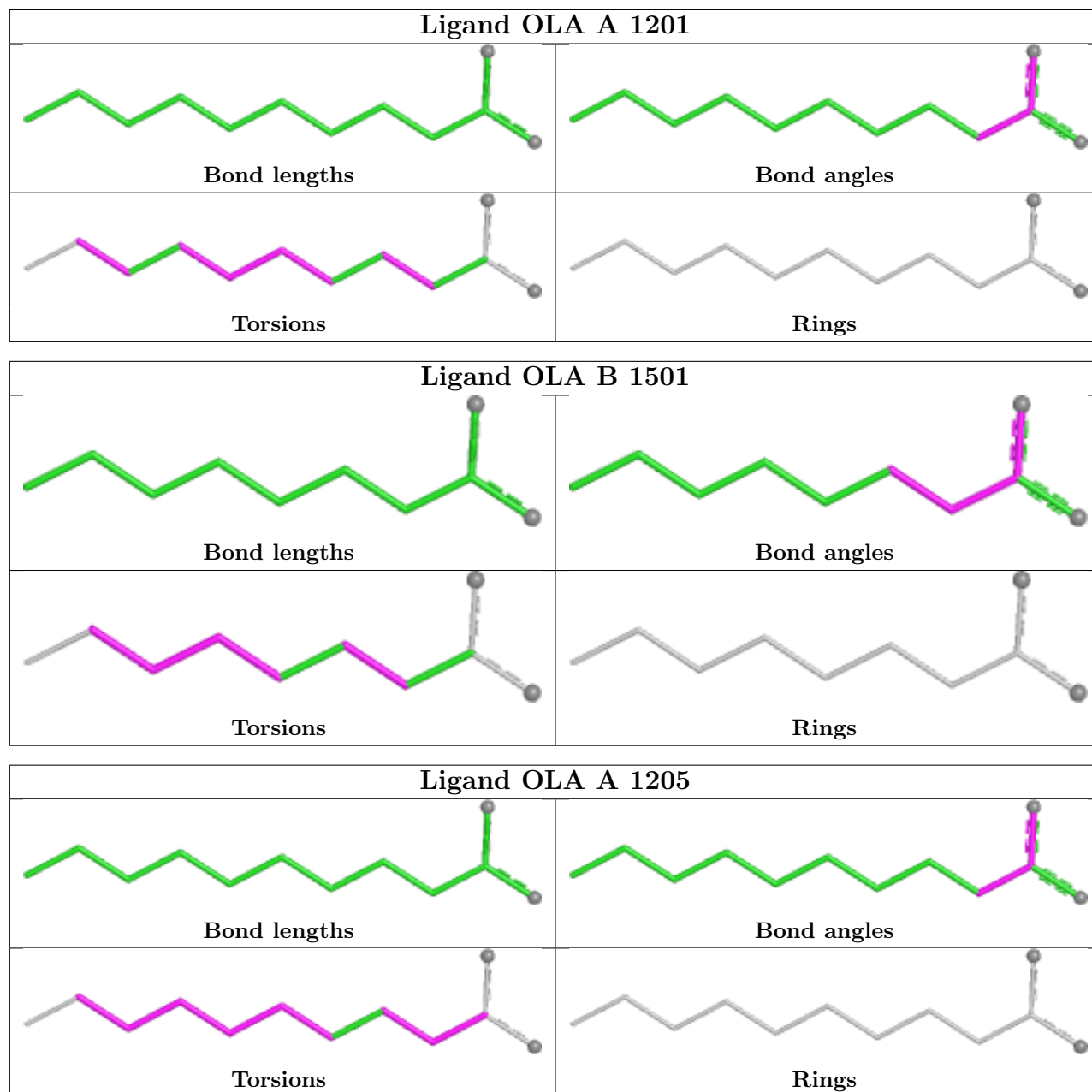
There are no ring outliers.

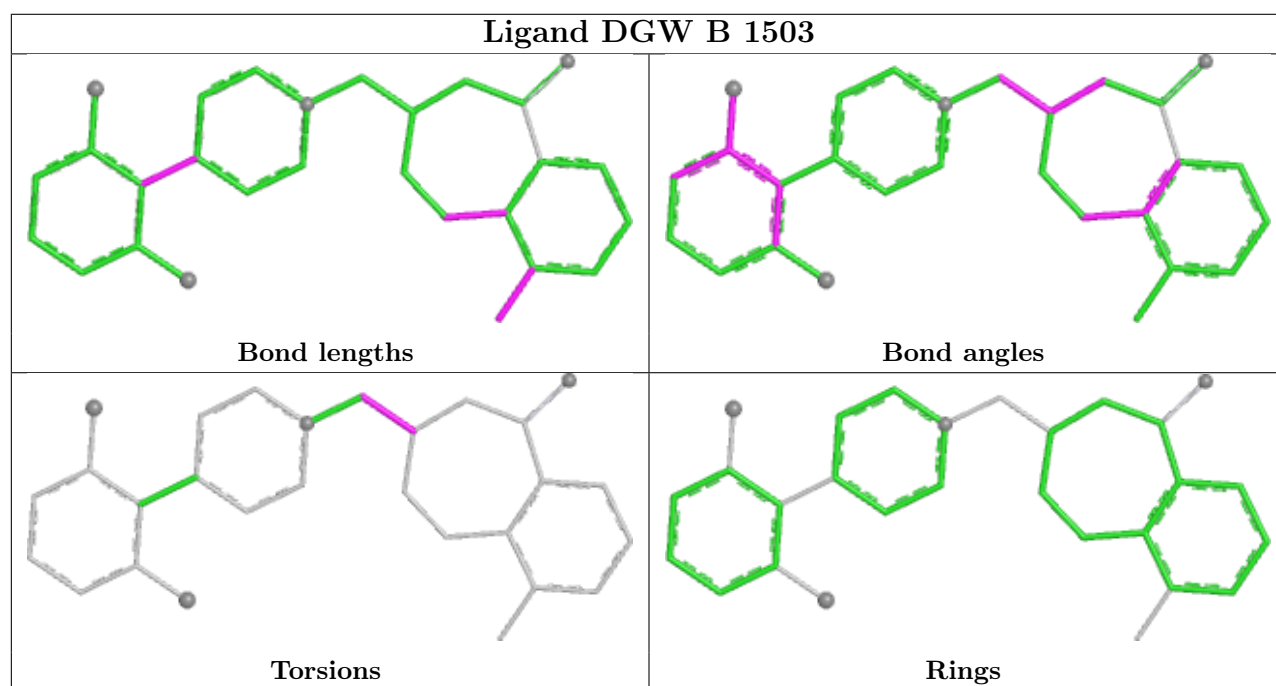
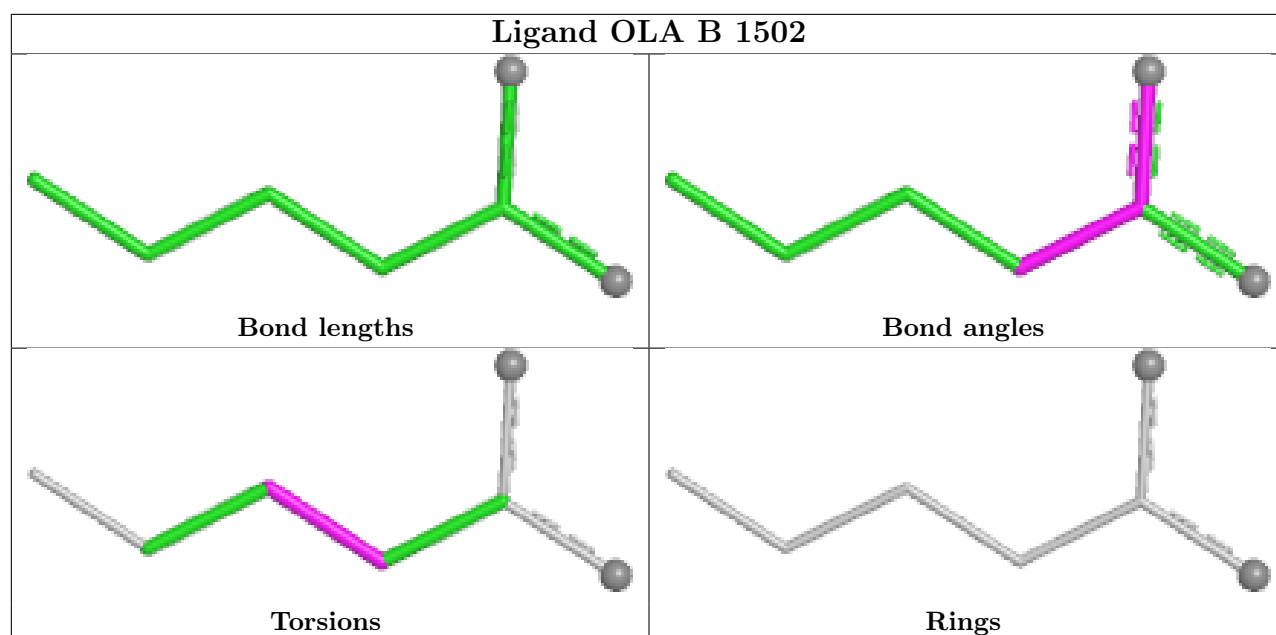
5 monomers are involved in 10 short contacts:

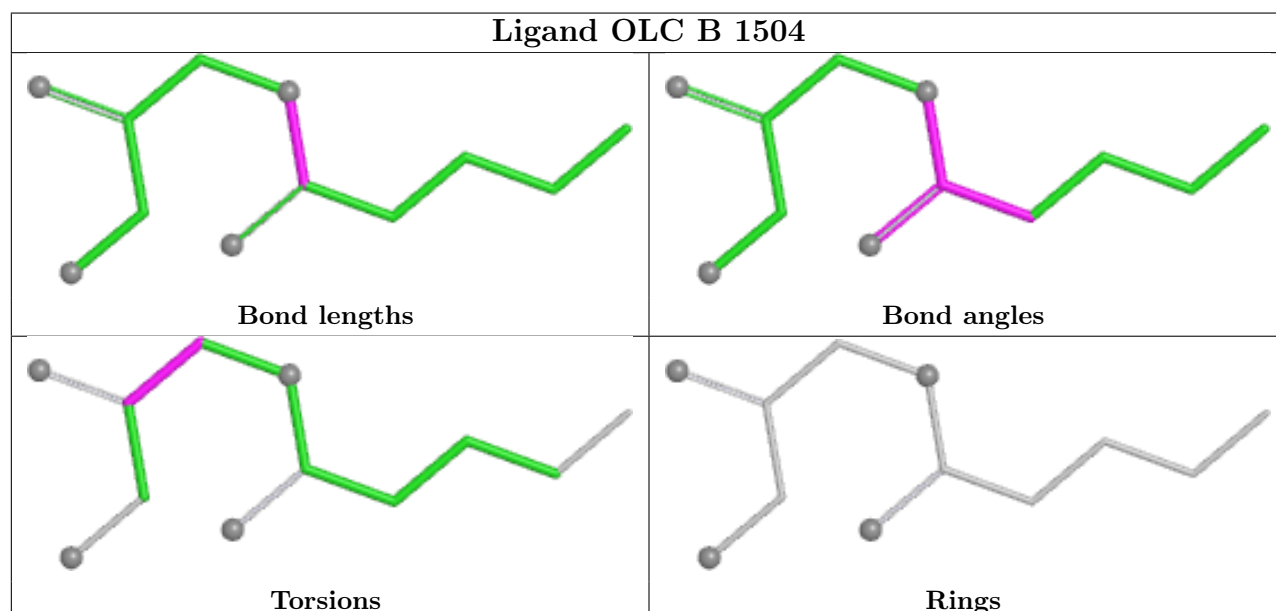
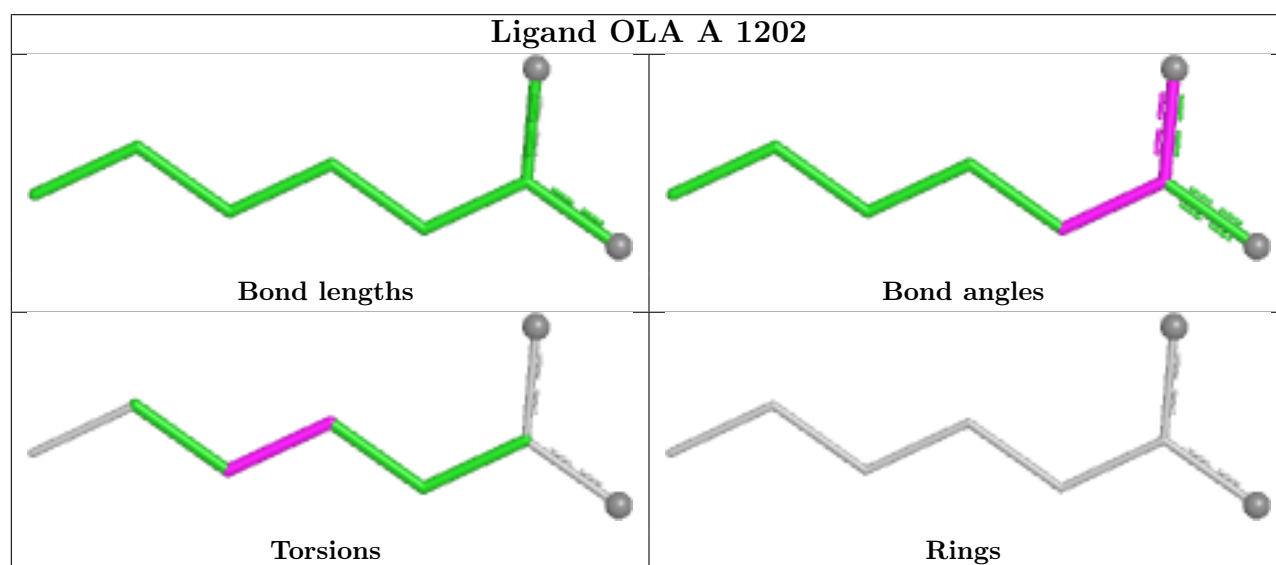
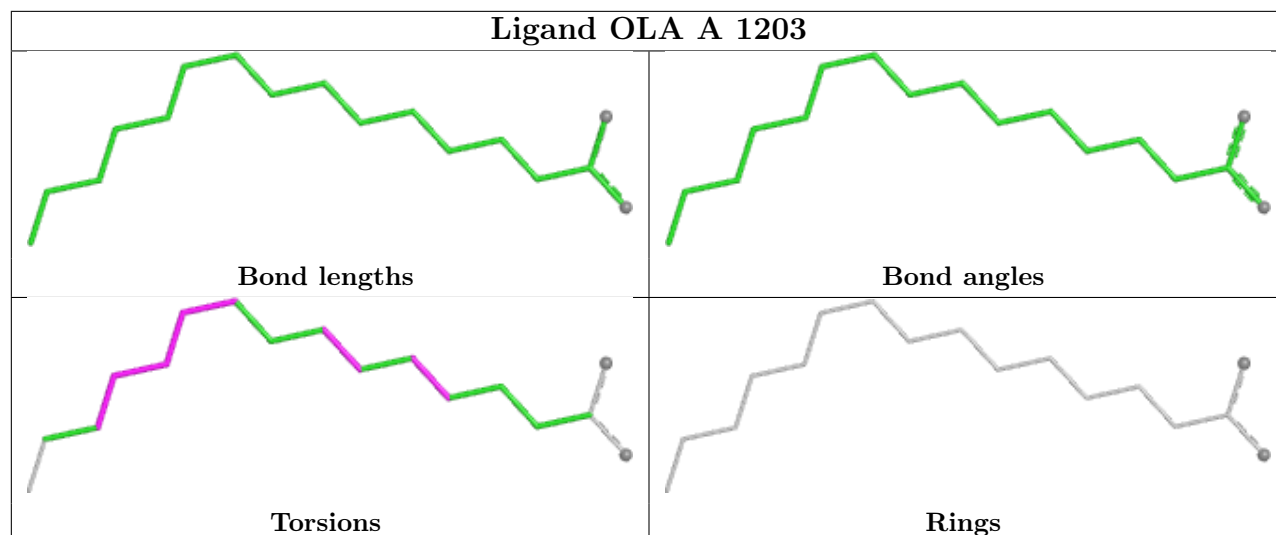
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	1503	DGW	3	0
2	A	1203	OLA	3	0
2	A	1202	OLA	1	0
2	A	1204	OLA	2	0
3	A	1206	DGW	2	0

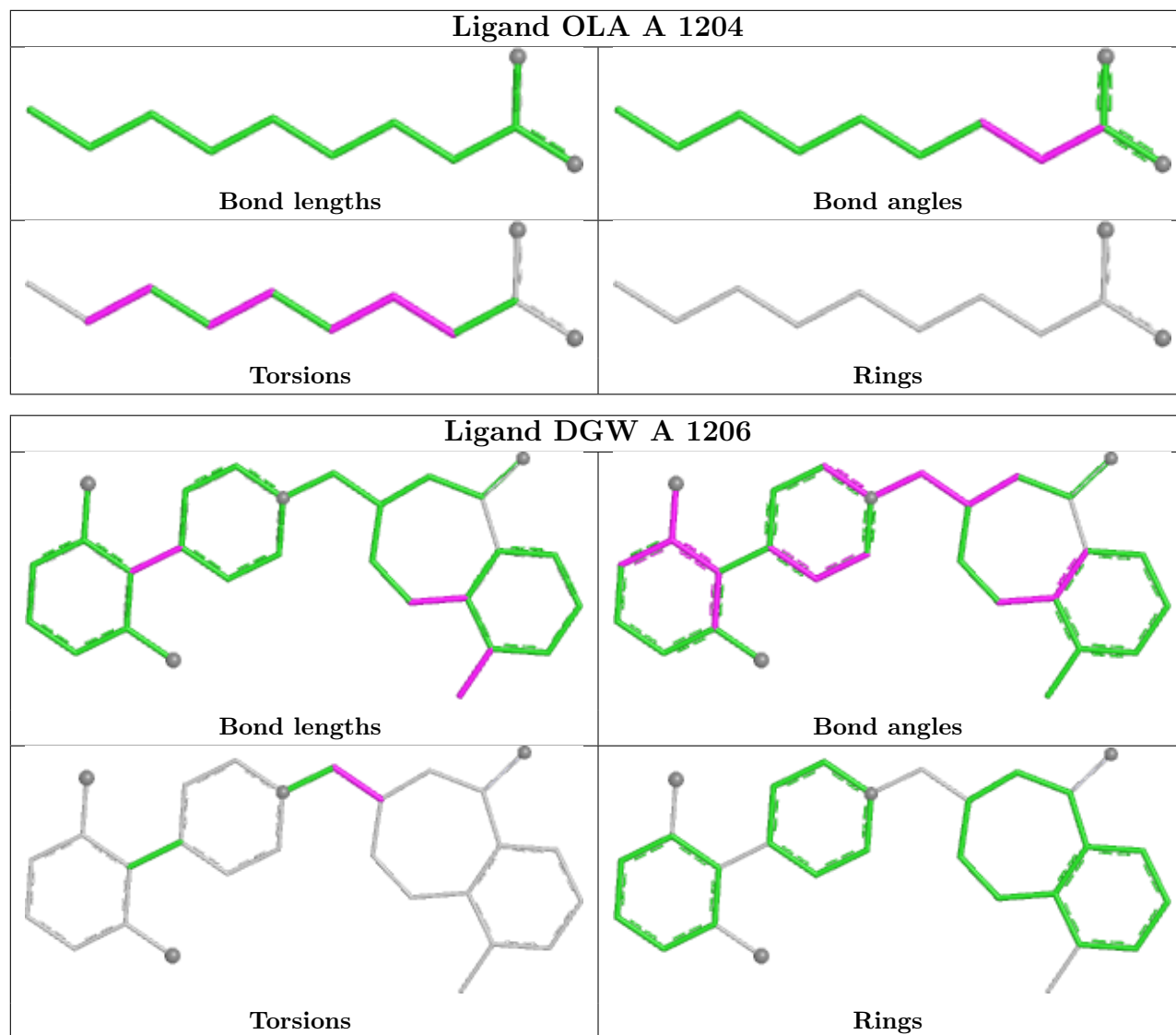
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

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









5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

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	282/424 (66%)	0.34	14 (4%) 34 18	30, 54, 124, 175	0
1	B	387/424 (91%)	0.40	17 (4%) 39 21	27, 65, 117, 166	0
All	All	669/848 (78%)	0.37	31 (4%) 37 20	27, 61, 121, 175	0

All (31) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	195	ASP	6.3
1	B	1220	ILE	4.8
1	A	251	SER	3.6
1	B	1356	PRO	3.5
1	B	1308	GLY	3.3
1	A	250	GLY	3.3
1	B	1099	ASN	3.2
1	A	263	ARG	3.1
1	B	1108	ALA	3.0
1	B	1101	TYR	3.0
1	B	1315	SER	2.9
1	B	1144	THR	2.9
1	A	197	GLU	2.9
1	A	45	PHE	2.7
1	B	1017	ILE	2.7
1	A	80	THR	2.6
1	B	1257	VAL	2.6
1	B	1103	GLN	2.6
1	B	1050	ASP	2.6
1	B	1269	PRO	2.4
1	A	252	ARG	2.4
1	A	331	ARG	2.4
1	B	1270	THR	2.3
1	B	1018	GLU	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	1260	GLU	2.3
1	A	194	GLU	2.3
1	A	245	VAL	2.2
1	B	1319	ASP	2.2
1	A	193	VAL	2.1
1	A	243	ARG	2.1
1	A	196	GLU	2.1

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 [i](#)

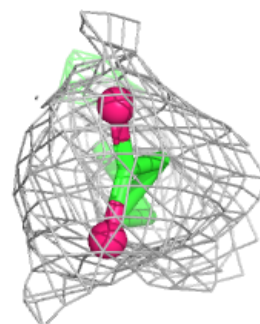
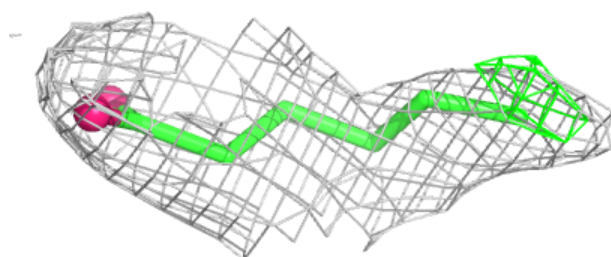
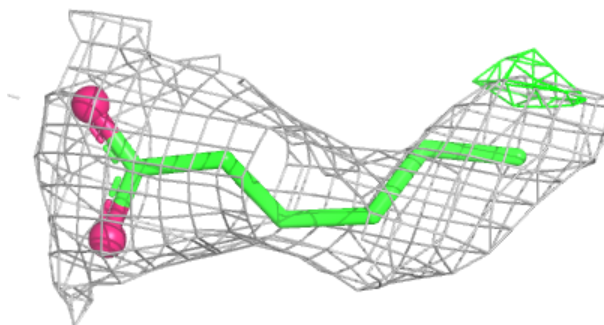
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	OLA	A	1202	8/20	0.70	0.24	76,80,86,91	0
2	OLA	B	1502	7/20	0.75	0.19	47,58,64,65	0
2	OLA	B	1501	10/20	0.76	0.17	35,57,74,74	0
2	OLA	A	1205	12/20	0.80	0.14	45,53,70,75	0
3	DGW	B	1503	28/28	0.87	0.19	47,62,116,150	0
3	DGW	A	1206	28/28	0.89	0.15	42,55,95,104	0
2	OLA	A	1203	17/20	0.89	0.15	42,64,84,85	0
2	OLA	A	1204	11/20	0.90	0.14	40,47,55,62	0
2	OLA	A	1201	12/20	0.92	0.14	60,70,78,79	0
4	OLC	B	1504	12/25	0.92	0.13	42,59,66,69	0

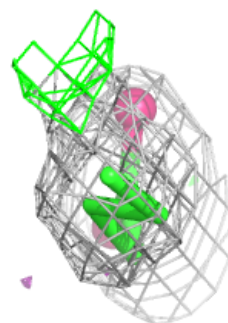
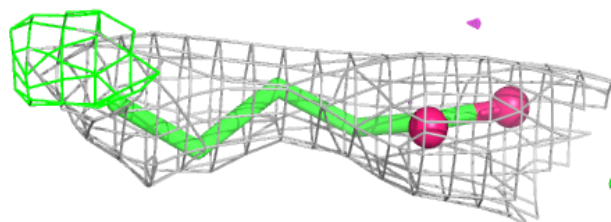
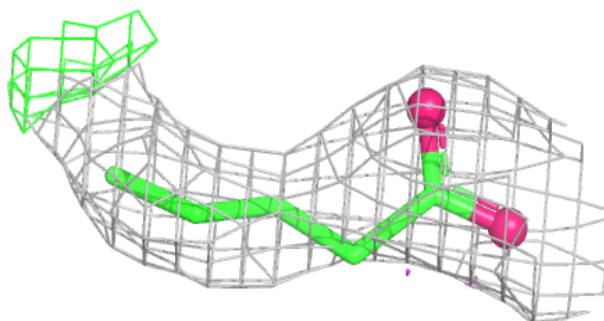
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around OLA A 1202:

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

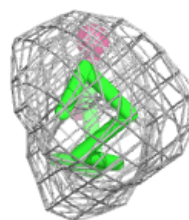
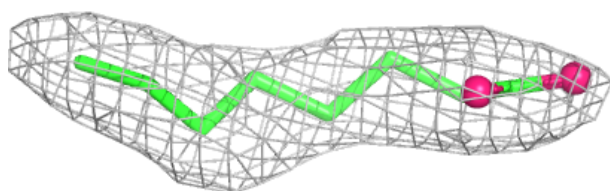
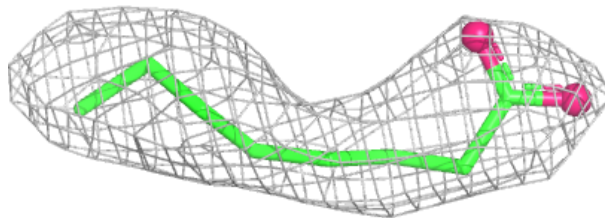
**Electron density around OLA B 1502:**

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

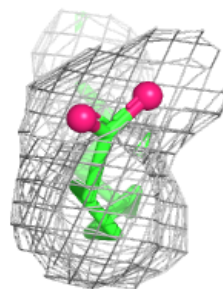
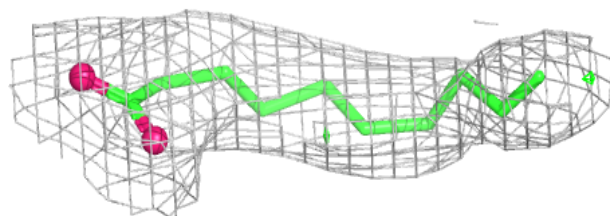


Electron density around OLA B 1501:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

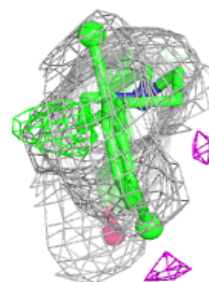
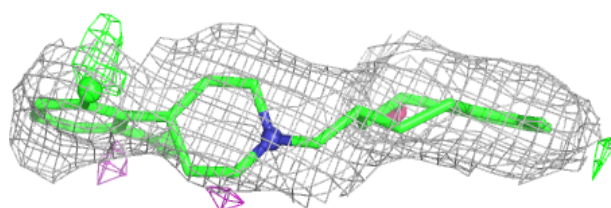
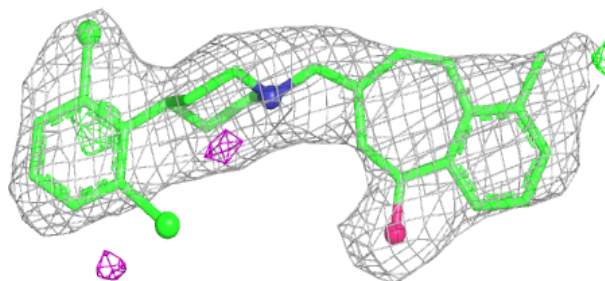
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and green (positive)

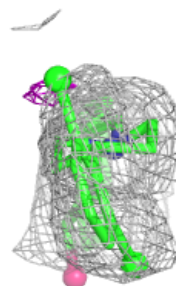
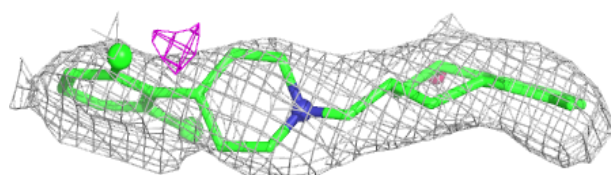
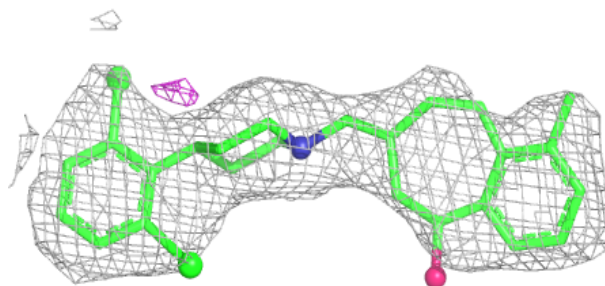


Electron density around DGW B 1503:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

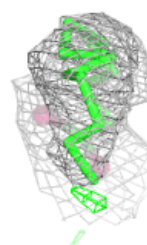
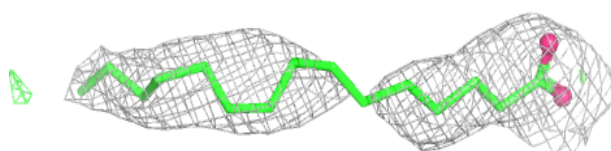
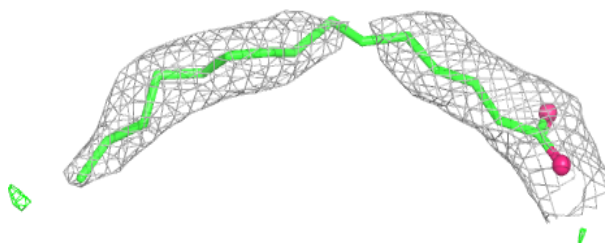
**Electron density around DGW A 1206:**

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and green (positive)

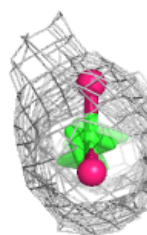
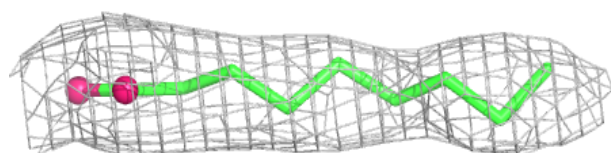
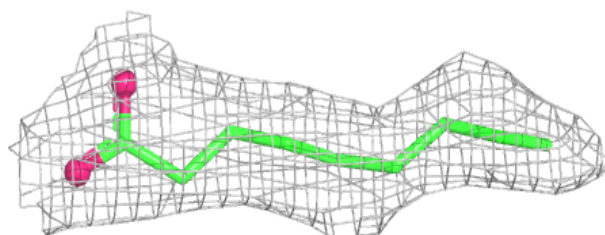


Electron density around OLA A 1203:

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and green (positive)

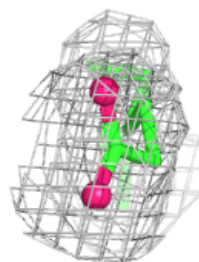
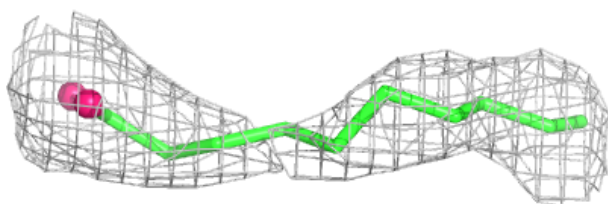
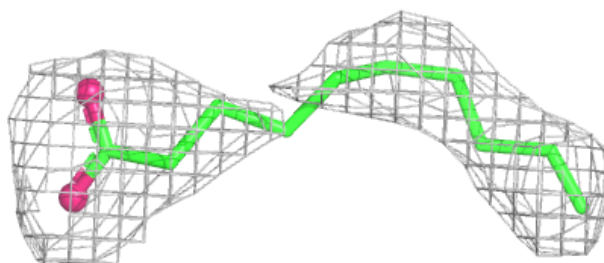
**Electron density around OLA A 1204:**

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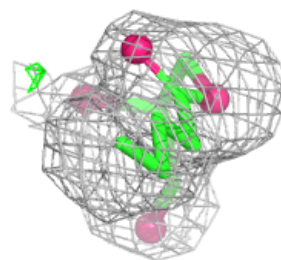
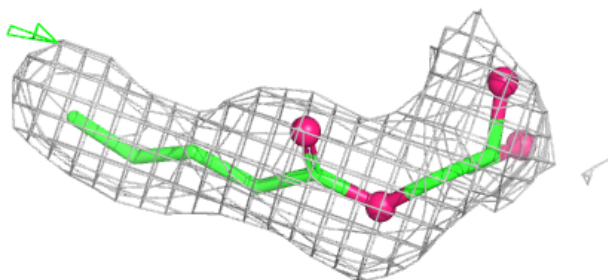
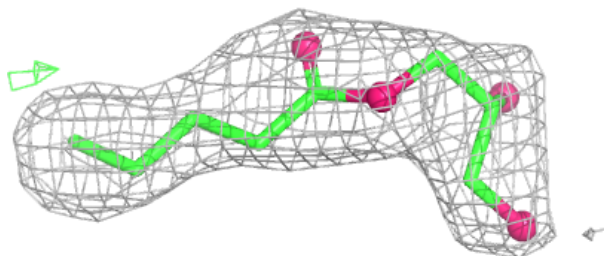


Electron density around OLA A 1201:

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

**Electron density around OLC B 1504:**

$2mF_o-DF_c$ (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.