



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 01:08 AM UTC

PDB ID : 5YQZ / pdb_00005yqz
Title : Structure of the glucagon receptor in complex with a glucagon analogue
Authors : Zhang, H.; Qiao, A.; Yang, L.; VAN EPS, N.; Frederiksen, K.; Yang, D.; Dai, A.; Cai, X.; Zhang, H.; Yi, C.; Can, C.; He, L.; Yang, H.; Lau, J.; Ernst, O.; Hanson, M.; Stevens, R.; Wang, M.; Seedtz-Runge, S.; Jiang, H.; Zhao, Q.; Wu, B.
Deposited on : 2017-11-08
Resolution : 3.00 Å(reported)

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

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A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

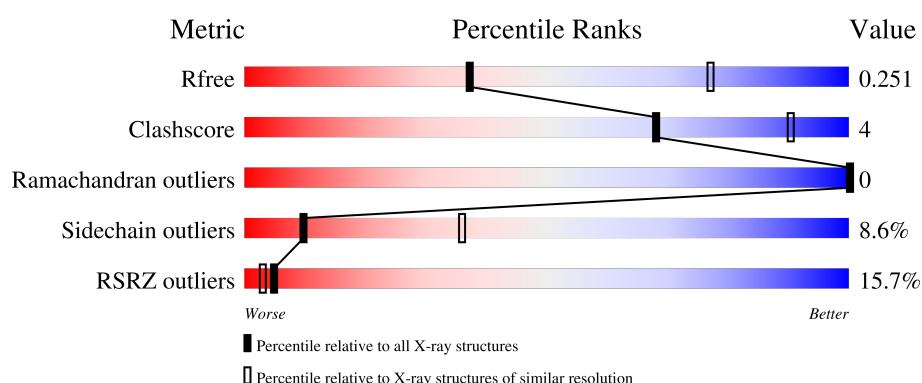
1 Overall quality at a glance

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	R	575	15% 82% 14% ••
2	P	28	18% 89% 11%
3	A	2	100%
3	B	2	100%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 4710 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 Glucagon receptor,Endolysin,Glucagon receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	R	558	Total	C	N	O	S	0	0	0
			4328	2808	747	750	23			

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	24	GLY	-	expression tag	UNP P47871
R	25	ALA	-	expression tag	UNP P47871
R	26	PRO	-	expression tag	UNP P47871
R	173	ALA	ARG	engineered mutation	UNP P47871
R	1053	THR	CYS	engineered mutation	UNP D9IEF7
R	1096	ALA	CYS	engineered mutation	UNP D9IEF7
R	433	GLU	-	expression tag	UNP P47871
R	434	PHE	-	expression tag	UNP P47871
R	435	LEU	-	expression tag	UNP P47871
R	436	GLU	-	expression tag	UNP P47871
R	437	VAL	-	expression tag	UNP P47871
R	438	LEU	-	expression tag	UNP P47871
R	439	PHE	-	expression tag	UNP P47871
R	440	GLN	-	expression tag	UNP P47871

- Molecule 2 is a protein called Glucagon analogue.

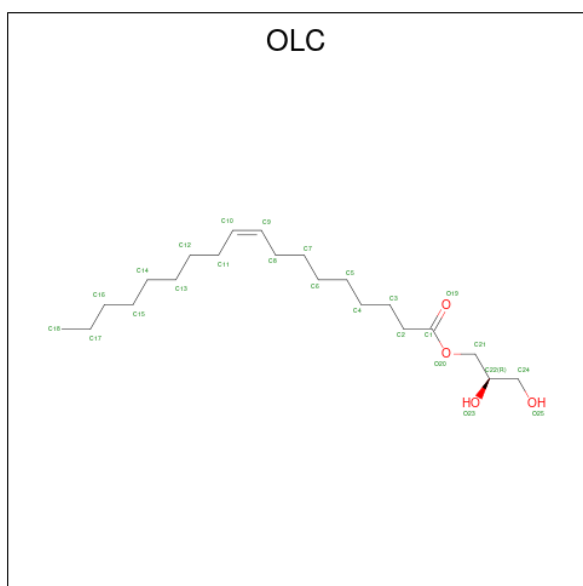
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	P	28	Total	C	N	O	0	0	0
			236	150	40	46			

- Molecule 3 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	A	2	Total	C	N	O	0	0	0
			28	16	2	10			
3	B	2	Total	C	N	O	0	0	0
			28	16	2	10			

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



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	R	1	Total	C	O	0	0	
			14	10	4			
4	R	1	Total	C	O	0	0	
			13	9	4			
4	R	1	Total	C	O	0	0	
			12	8	4			
4	R	1	Total	C	O	0	0	
			19	15	4			
4	R	1	Total	C	O	0	0	
			14	10	4			
4	R	1	Total	C	O	0	0	
			13	9	4			

- Molecule 5 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).

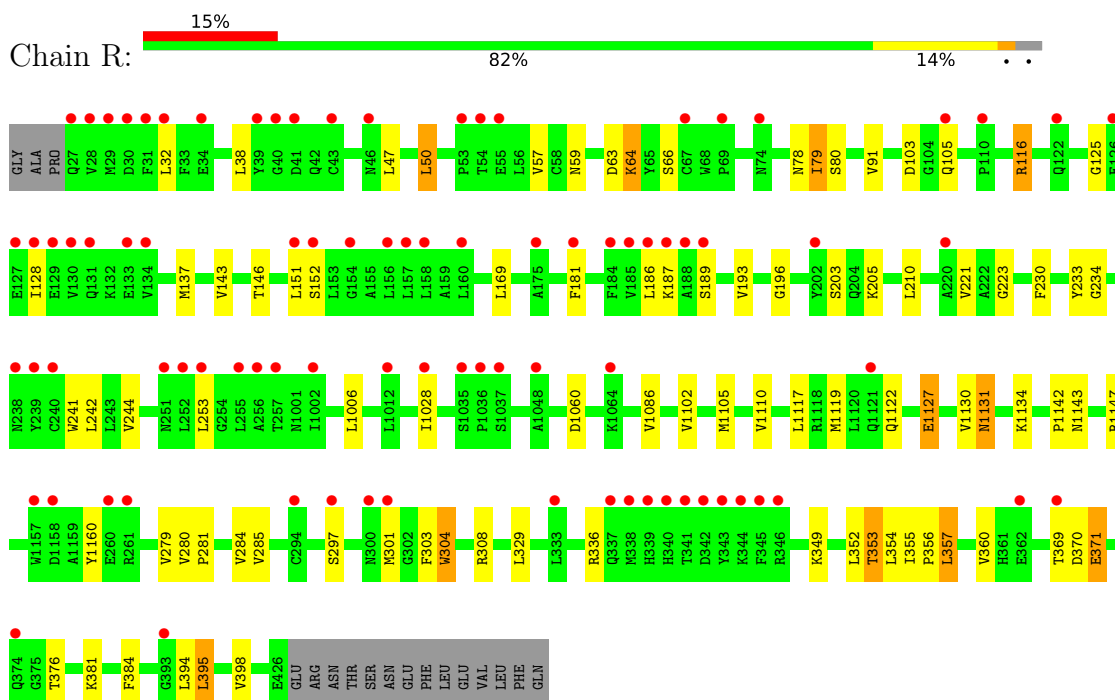


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	R	1	Total	O	P	0	0
			5	4	1		

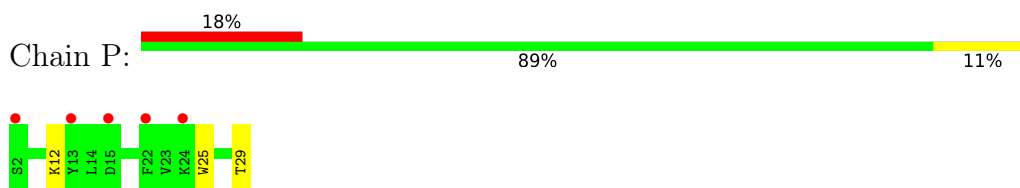
3 Residue-property plots [i](#)

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

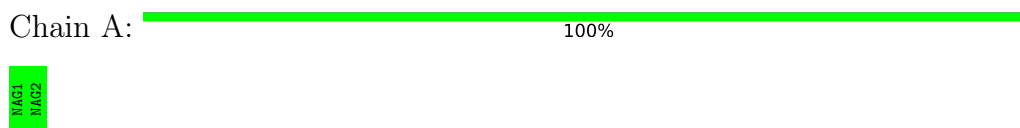
- Molecule 1: Glucagon receptor,Endolysin,Glucagon receptor



- Molecule 2: Glucagon analogue



- Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain B:

100%

MAG1
MAG2

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	60.12Å 108.79Å 216.25Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.59 – 3.00 48.59 – 3.00	Depositor EDS
% Data completeness (in resolution range)	92.4 (48.59-3.00) 92.3 (48.59-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.26 (at 2.91Å)	Xtriage
Refinement program	BUSTER 2.10.2	Depositor
R, R_{free}	0.232 , 0.261 (Not available) , 0.251	Depositor DCC
R_{free} test set	1406 reflections (4.36%)	wwPDB-VP
Wilson B-factor (Å ²)	106.5	Xtriage
Anisotropy	0.052	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.24 , 65.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.89	EDS
Total number of atoms	4710	wwPDB-VP
Average B, all atoms (Å ²)	129.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.74% 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: OLC, NAG, PO4

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	R	0.79	1/4438 (0.0%)	1.45	26/6041 (0.4%)
2	P	0.70	0/241	1.46	0/324
All	All	0.78	1/4679 (0.0%)	1.45	26/6365 (0.4%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	R	280	VAL	CA-C	5.39	1.58	1.52

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	R	59	ASN	OD1-CG-ND2	-7.01	115.59	122.60
1	R	59	ASN	CB-CG-ND2	5.98	125.37	116.40
1	R	223	GLY	CA-C-N	5.96	128.58	120.54
1	R	223	GLY	C-N-CA	5.96	128.58	120.54
1	R	91	VAL	CA-C-N	5.79	129.50	120.82
1	R	91	VAL	C-N-CA	5.79	129.50	120.82
1	R	384	PHE	CA-CB-CG	5.68	119.48	113.80
1	R	284	VAL	CA-C-N	5.47	127.45	120.56
1	R	284	VAL	C-N-CA	5.47	127.45	120.56
1	R	105	GLN	CA-C-N	5.41	128.78	120.82
1	R	105	GLN	C-N-CA	5.41	128.78	120.82
1	R	103	ASP	CA-CB-CG	5.40	118.00	112.60
1	R	1142	PRO	CA-C-N	5.28	127.61	120.65
1	R	1142	PRO	C-N-CA	5.28	127.61	120.65
1	R	303	PHE	CA-C-N	5.27	127.34	120.28
1	R	303	PHE	C-N-CA	5.27	127.34	120.28
1	R	181	PHE	CA-CB-CG	5.21	119.01	113.80
1	R	376	THR	N-CA-C	-5.14	107.14	113.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	R	234	GLY	CA-C-N	5.14	127.23	120.60
1	R	234	GLY	C-N-CA	5.14	127.23	120.60
1	R	398	VAL	N-CA-CB	5.12	117.13	110.57
1	R	353	THR	N-CA-C	-5.12	106.72	113.12
1	R	336	ARG	CA-C-N	5.09	127.52	120.29
1	R	336	ARG	C-N-CA	5.09	127.52	120.29
1	R	304	TRP	CA-C-N	5.02	128.64	120.60
1	R	304	TRP	C-N-CA	5.02	128.64	120.60

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	R	4328	0	4175	32	0
2	P	236	0	224	4	0
3	A	28	0	25	0	0
3	B	28	0	25	0	0
4	R	85	0	102	4	0
5	R	5	0	0	0	0
All	All	4710	0	4551	33	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 4.

All (33) 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:R:1102:VAL:HG12	1:R:1110:VAL:HG21	1.53	0.90
1:R:349:LYS:O	1:R:353:THR:HG23	1.79	0.81
1:R:253:LEU:HD21	1:R:329:LEU:HG	1.79	0.64
1:R:66:SER:HB2	1:R:79:ILE:HD11	1.82	0.60
1:R:143:VAL:HA	4:R:1209:OLC:H2	1.81	0.60
1:R:233:TYR:HA	1:R:279:VAL:HG21	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:152:SER:HB2	1:R:394:LEU:H	1.70	0.56
1:R:125:GLY:HA2	1:R:128:ILE:HD12	1.89	0.54
1:R:371:GLU:HB2	1:R:381:LYS:HD2	1.89	0.53
1:R:1147:ARG:HB3	1:R:1160:TYR:CZ	2.44	0.53
1:R:143:VAL:HG12	4:R:1209:OLC:H24A	1.91	0.52
1:R:146:THR:HG21	4:R:1209:OLC:H2A	1.93	0.51
1:R:64:LYS:HE2	2:P:29:THR:HG23	1.93	0.51
2:P:25:TRP:O	2:P:29:THR:HG22	2.12	0.50
1:R:356:PRO:O	1:R:360:VAL:HG23	2.14	0.48
1:R:241:TRP:CE3	1:R:244:VAL:HG21	2.49	0.48
1:R:353:THR:O	1:R:357:LEU:HB2	2.14	0.48
1:R:1086:VAL:HG11	1:R:1117:LEU:HB3	1.95	0.47
1:R:47:LEU:HA	1:R:50:LEU:HD12	1.98	0.46
1:R:186:LEU:HD11	1:R:230:PHE:HD1	1.81	0.45
1:R:1131:ASN:HA	1:R:1134:LYS:HB2	2.00	0.44
1:R:64:LYS:NZ	2:P:29:THR:HG23	2.33	0.43
1:R:63:ASP:OD2	1:R:116:ARG:HD3	2.18	0.43
1:R:196:GLY:HA3	4:R:1207:OLC:H21A	1.99	0.43
1:R:304:TRP:CD1	1:R:308:ARG:HD2	2.54	0.42
1:R:1127:GLU:O	1:R:1130:VAL:HG22	2.19	0.42
1:R:189:SER:O	1:R:193:VAL:HG23	2.20	0.42
1:R:354:LEU:HD12	1:R:395:LEU:HD13	2.02	0.41
1:R:1119:MET:HA	1:R:1122:GLN:HB2	2.02	0.41
1:R:281:PRO:O	1:R:285:VAL:HG23	2.21	0.41
1:R:64:LYS:CE	2:P:29:THR:HG23	2.51	0.41
1:R:1105:MET:HE3	1:R:1105:MET:HB3	1.94	0.41
1:R:297:SER:HB3	1:R:301:MET:HG3	2.04	0.40

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	R	556/575 (97%)	521 (94%)	35 (6%)	0	100	100
2	P	26/28 (93%)	26 (100%)	0	0	100	100
All	All	582/603 (96%)	547 (94%)	35 (6%)	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	R	345/493 (70%)	314 (91%)	31 (9%)	9	34
2	P	26/26 (100%)	25 (96%)	1 (4%)	29	63
All	All	371/519 (72%)	339 (91%)	32 (9%)	10	36

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	R	32	LEU
1	R	38	LEU
1	R	50	LEU
1	R	57	VAL
1	R	64	LYS
1	R	78	ASN
1	R	79	ILE
1	R	80	SER
1	R	116	ARG
1	R	137	MET
1	R	151	LEU
1	R	169	LEU
1	R	187	LYS
1	R	203	SER
1	R	205	LYS
1	R	210	LEU
1	R	221	VAL
1	R	242	LEU

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Mol	Chain	Res	Type
1	R	1006	LEU
1	R	1028	ILE
1	R	1060	ASP
1	R	1127	GLU
1	R	1131	ASN
1	R	1143	ASN
1	R	352	LEU
1	R	355	ILE
1	R	357	LEU
1	R	369	THR
1	R	370	ASP
1	R	371	GLU
1	R	395	LEU
2	P	12	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	R	1115	ASN
1	R	1121	GLN
1	R	1139	ASN
1	R	374	GLN
1	R	392	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

4 monosaccharides 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	$\# Z > 2$
3	NAG	A	1	3,1	14,14,15	0.68	0	17,19,21	0.75	0
3	NAG	A	2	3	14,14,15	0.29	0	17,19,21	0.55	0
3	NAG	B	1	3,1	14,14,15	0.55	0	17,19,21	0.70	0
3	NAG	B	2	3	14,14,15	0.45	0	17,19,21	0.78	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
3	NAG	A	1	3,1	-	4/6/23/26	0/1/1/1
3	NAG	A	2	3	-	2/6/23/26	0/1/1/1
3	NAG	B	1	3,1	-	4/6/23/26	0/1/1/1
3	NAG	B	2	3	-	4/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

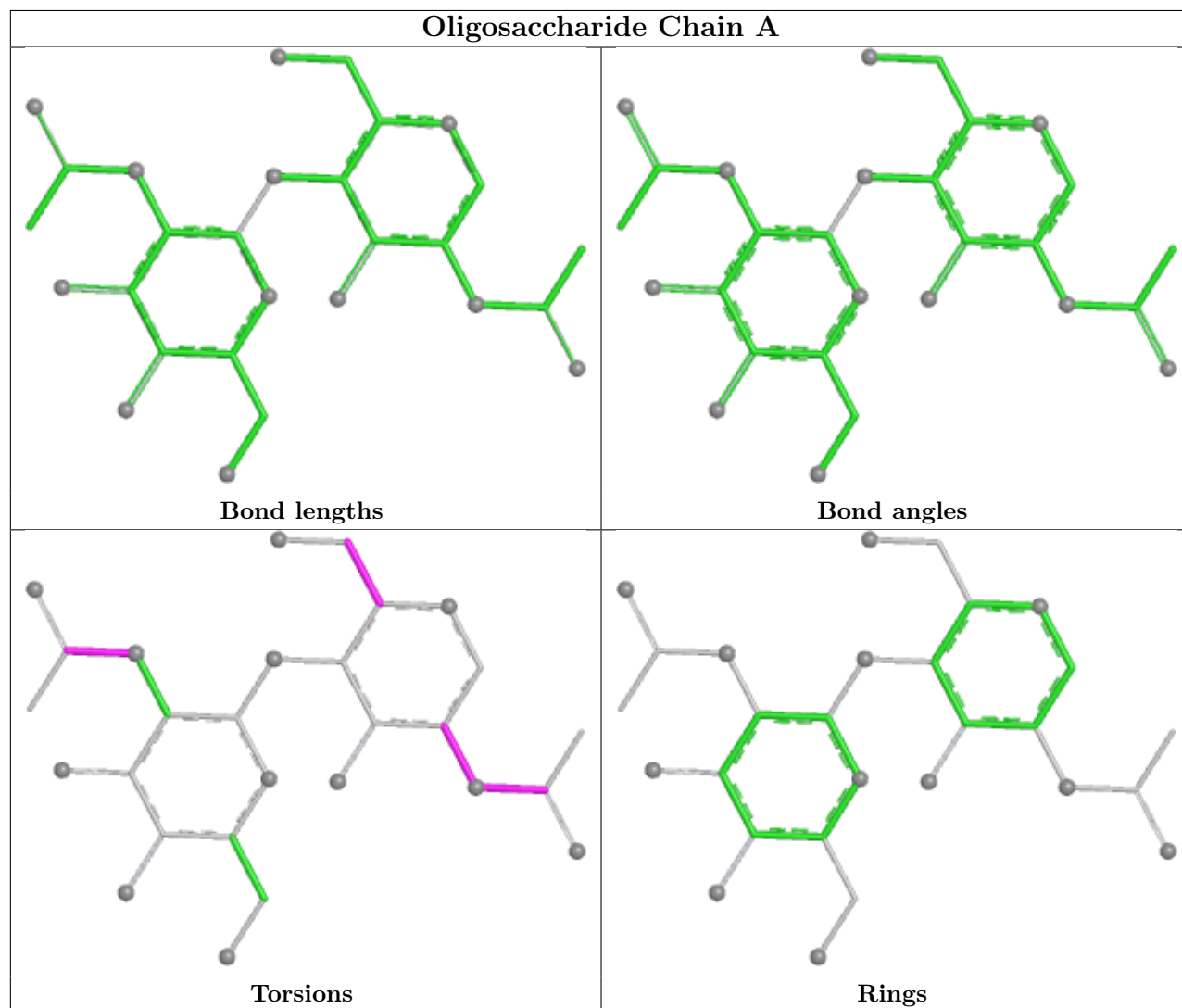
All (14) torsion outliers are listed below:

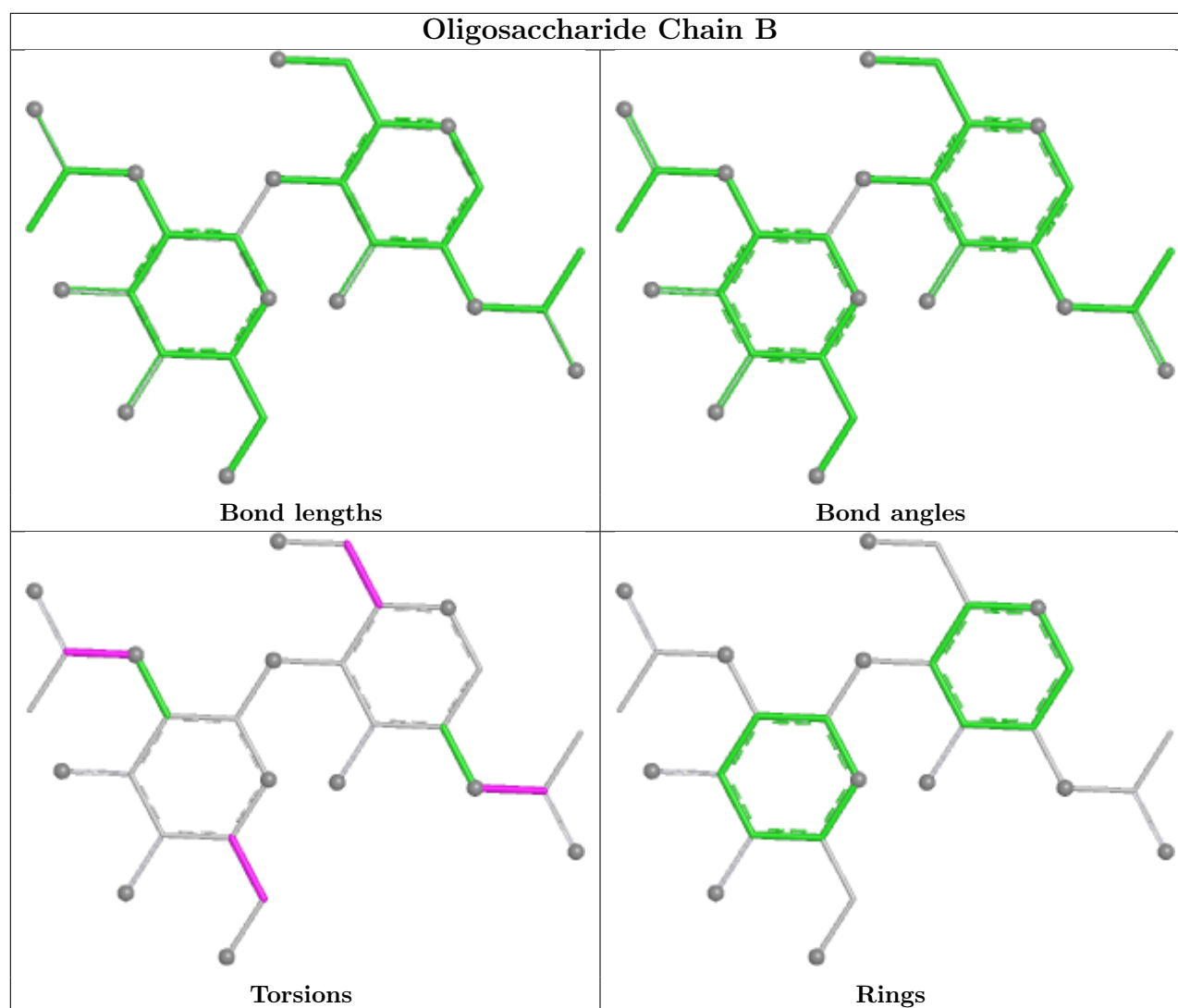
Mol	Chain	Res	Type	Atoms
3	A	1	NAG	C1-C2-N2-C7
3	A	1	NAG	C8-C7-N2-C2
3	A	1	NAG	O7-C7-N2-C2
3	B	1	NAG	C8-C7-N2-C2
3	B	1	NAG	O7-C7-N2-C2
3	B	2	NAG	C8-C7-N2-C2
3	B	2	NAG	O7-C7-N2-C2
3	B	1	NAG	O5-C5-C6-O6
3	B	1	NAG	C4-C5-C6-O6
3	B	2	NAG	O5-C5-C6-O6
3	A	1	NAG	O5-C5-C6-O6
3	A	2	NAG	C8-C7-N2-C2
3	B	2	NAG	C4-C5-C6-O6
3	A	2	NAG	O7-C7-N2-C2

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.





5.6 Ligand geometry [i](#)

7 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	OLC	R	1206	-	12,12,24	0.67	0	13,13,25	0.95	0
4	OLC	R	1208	-	18,18,24	1.17	1 (5%)	19,19,25	0.81	0
4	OLC	R	1210	-	12,12,24	0.77	0	13,13,25	0.66	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	OLC	R	1207	-	11,11,24	0.76	0	12,12,25	0.65	0
4	OLC	R	1205	-	13,13,24	0.80	0	14,14,25	0.72	0
4	OLC	R	1209	-	13,13,24	0.78	0	14,14,25	0.73	0
5	PO4	R	1211	-	4,4,4	2.06	2 (50%)	6,6,6	0.47	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	OLC	R	1206	-	-	8/12/12/24	-
4	OLC	R	1208	-	-	9/18/18/24	-
4	OLC	R	1210	-	-	9/12/12/24	-
4	OLC	R	1207	-	-	3/11/11/24	-
4	OLC	R	1205	-	-	6/13/13/24	-
4	OLC	R	1209	-	-	5/13/13/24	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	R	1208	OLC	C9-C10	4.07	1.54	1.31
5	R	1211	PO4	P-O1	2.23	1.55	1.50
5	R	1211	PO4	P-O3	2.02	1.60	1.54

There are no bond angle outliers.

There are no chirality outliers.

All (40) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	R	1206	OLC	O20-C21-C22-C24
4	R	1206	OLC	O20-C21-C22-O23
4	R	1207	OLC	O20-C21-C22-C24
4	R	1210	OLC	C21-C22-C24-O25
4	R	1209	OLC	O19-C1-O20-C21
4	R	1209	OLC	C2-C1-O20-C21
4	R	1207	OLC	O20-C21-C22-O23
4	R	1210	OLC	O20-C21-C22-O23
4	R	1208	OLC	C2-C1-O20-C21

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Mol	Chain	Res	Type	Atoms
4	R	1208	OLC	O19-C1-O20-C21
4	R	1205	OLC	O20-C21-C22-O23
4	R	1208	OLC	C1-C2-C3-C4
4	R	1205	OLC	O20-C21-C22-C24
4	R	1206	OLC	C21-C22-C24-O25
4	R	1208	OLC	C21-C22-C24-O25
4	R	1208	OLC	C3-C4-C5-C6
4	R	1209	OLC	C2-C3-C4-C5
4	R	1210	OLC	O19-C1-O20-C21
4	R	1210	OLC	C2-C1-O20-C21
4	R	1205	OLC	C2-C1-O20-C21
4	R	1210	OLC	C1-C2-C3-C4
4	R	1205	OLC	O19-C1-O20-C21
4	R	1206	OLC	O23-C22-C24-O25
4	R	1210	OLC	O23-C22-C24-O25
4	R	1206	OLC	O19-C1-O20-C21
4	R	1206	OLC	C2-C1-O20-C21
4	R	1208	OLC	O23-C22-C24-O25
4	R	1208	OLC	C2-C3-C4-C5
4	R	1207	OLC	C2-C3-C4-C5
4	R	1205	OLC	C2-C3-C4-C5
4	R	1208	OLC	C9-C10-C11-C12
4	R	1209	OLC	O20-C21-C22-O23
4	R	1208	OLC	C4-C5-C6-C7
4	R	1205	OLC	C21-C22-C24-O25
4	R	1210	OLC	C3-C4-C5-C6
4	R	1206	OLC	C2-C3-C4-C5
4	R	1210	OLC	O20-C21-C22-C24
4	R	1209	OLC	O20-C21-C22-C24
4	R	1206	OLC	O20-C1-C2-C3
4	R	1210	OLC	C2-C3-C4-C5

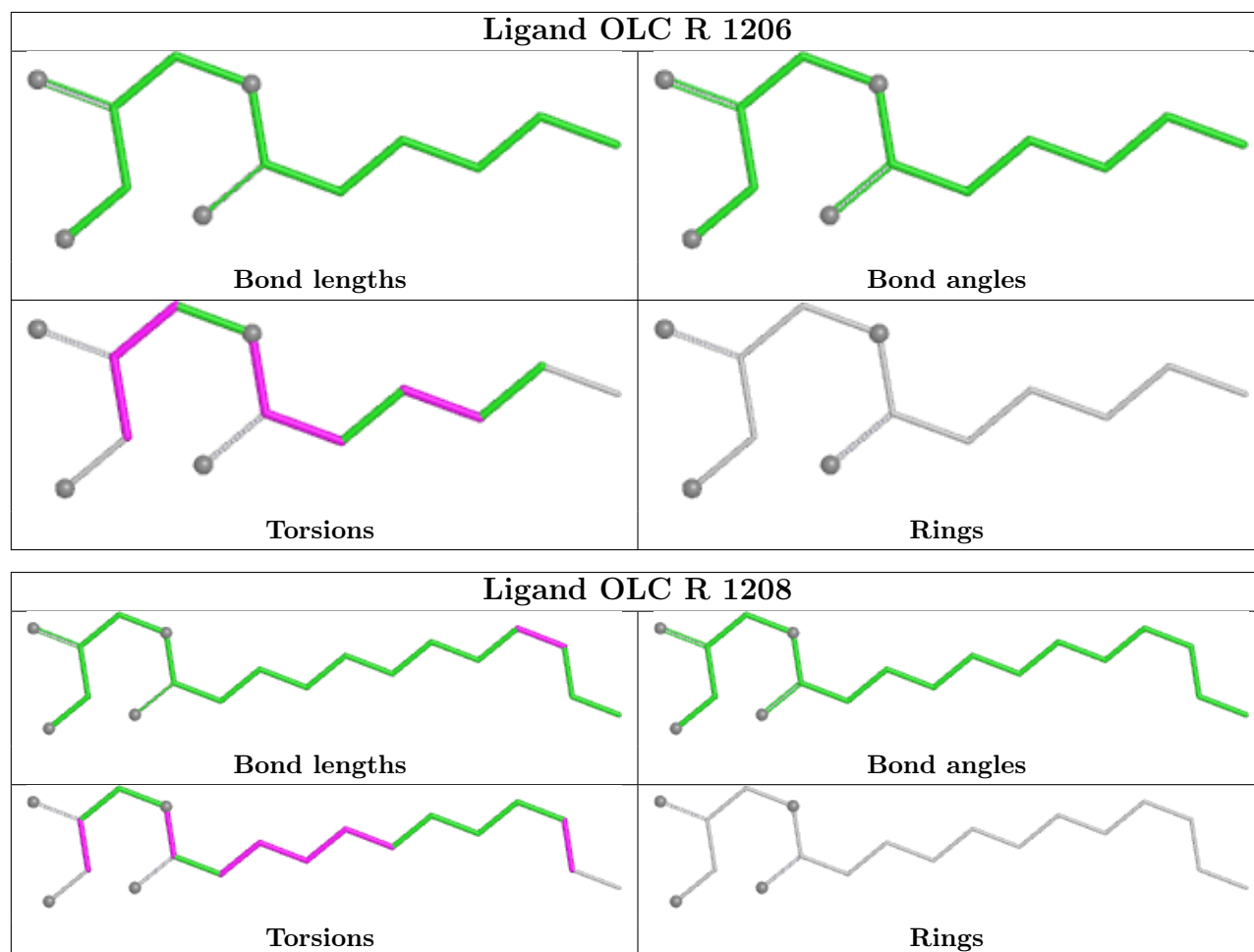
There are no ring outliers.

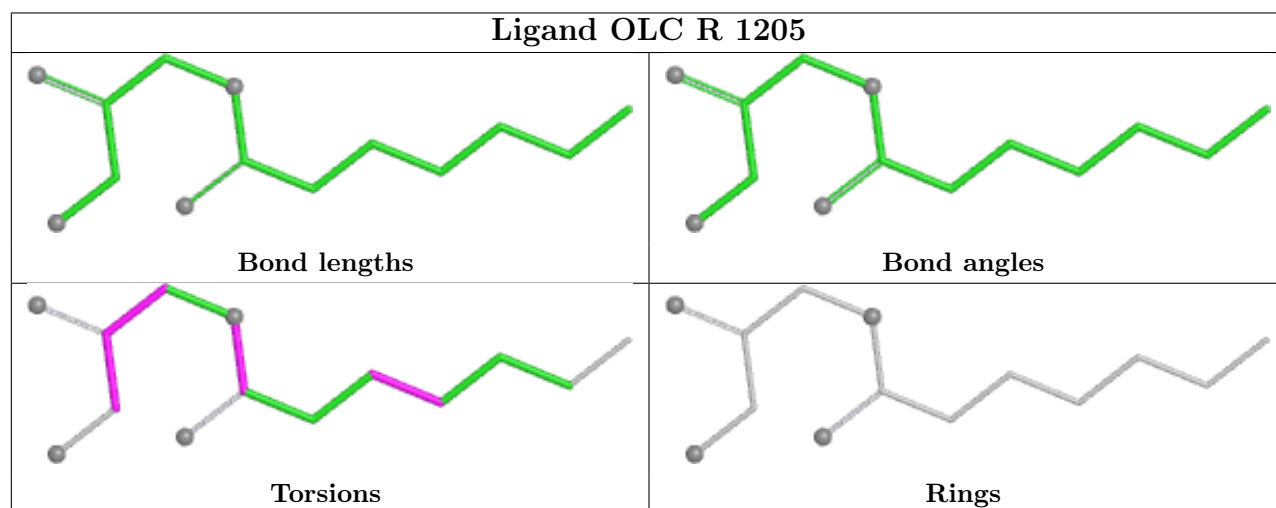
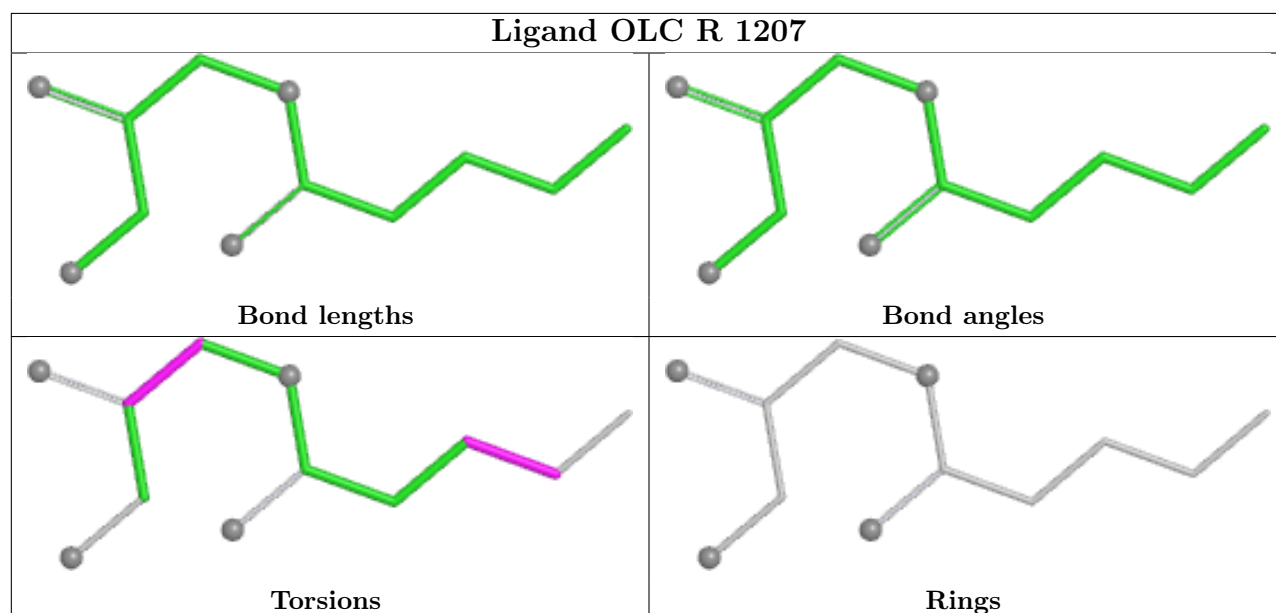
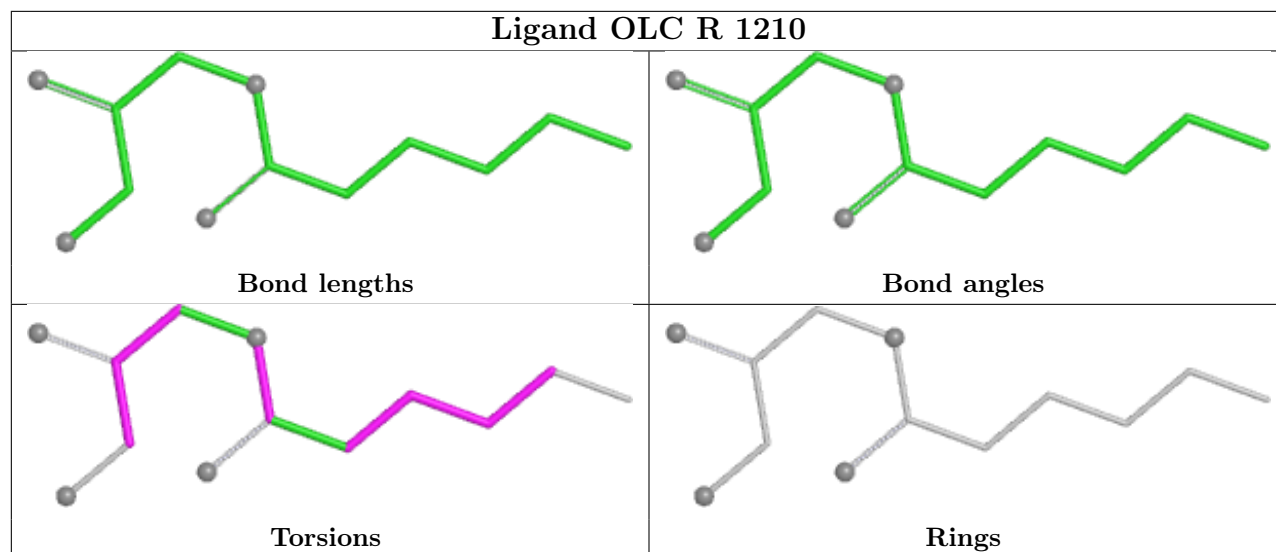
2 monomers are involved in 4 short contacts:

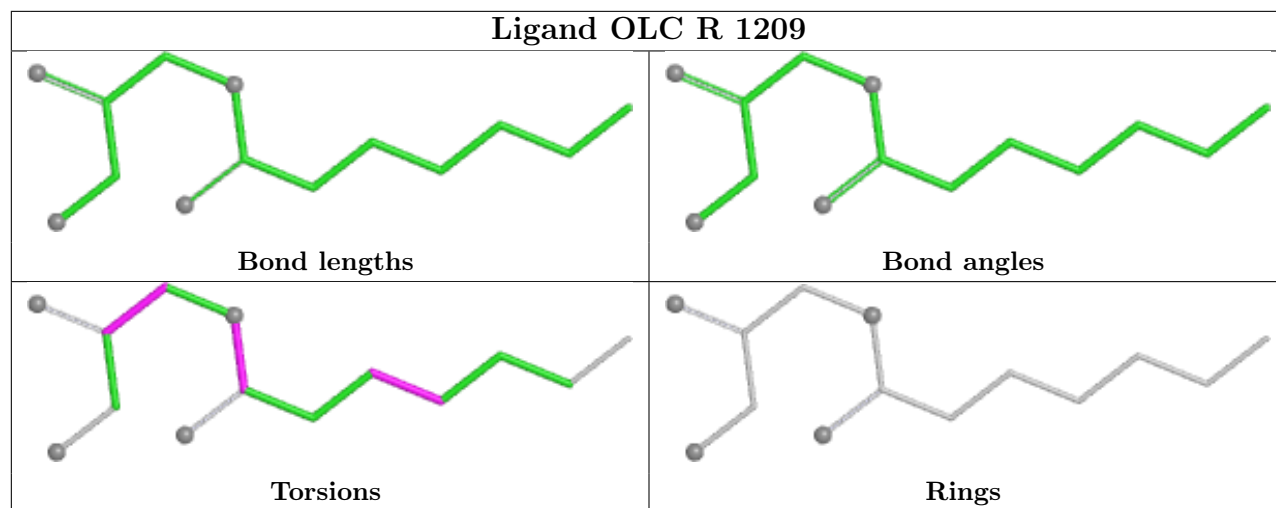
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	R	1207	OLC	1	0
4	R	1209	OLC	3	0

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

also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	R	558/575 (97%)	0.83	87 (15%) 5 3	79, 125, 219, 247	0
2	P	28/28 (100%)	1.07	5 (17%) 3 2	86, 111, 136, 170	0
All	All	586/603 (97%)	0.84	92 (15%) 5 3	79, 124, 218, 247	0

All (92) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	R	131	GLN	9.3
1	R	260	GLU	6.8
1	R	30	ASP	6.6
1	R	255	LEU	6.6
1	R	342	ASP	6.3
1	R	338	MET	6.2
1	R	344	LYS	5.5
1	R	333	LEU	5.5
1	R	129	GLU	5.0
1	R	39	TYR	4.8
1	R	127	GLU	4.8
1	R	54	THR	4.8
1	R	27	GLN	4.8
1	R	297	SER	4.6
1	R	156	LEU	4.4
1	R	43	CYS	4.3
1	R	341	THR	4.2
2	P	15	ASP	4.1
1	R	202	TYR	4.1
1	R	29	MET	4.1
1	R	130	VAL	4.0
1	R	343	TYR	3.9
1	R	257	THR	3.9
1	R	41	ASP	3.9

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Mol	Chain	Res	Type	RSRZ
1	R	345	PHE	3.8
1	R	128	ILE	3.8
1	R	369	THR	3.8
1	R	252	LEU	3.7
1	R	34	GLU	3.6
1	R	374	GLN	3.6
1	R	1035	SER	3.6
1	R	184	PHE	3.5
1	R	151	LEU	3.5
1	R	239	TYR	3.5
1	R	185	VAL	3.4
1	R	105	GLN	3.3
1	R	362	GLU	3.3
2	P	2	SER	3.3
1	R	220	ALA	3.2
2	P	13	TYR	3.2
1	R	300	ASN	3.2
1	R	46	ASN	3.1
1	R	1036	PRO	3.1
1	R	126	GLU	3.1
1	R	1158	ASP	3.1
1	R	157	LEU	3.0
1	R	256	ALA	3.0
2	P	24	LYS	3.0
1	R	340	HIS	3.0
1	R	1157	TRP	2.9
1	R	238	ASN	2.9
1	R	133	GLU	2.9
1	R	188	ALA	2.9
1	R	187	LYS	2.8
1	R	1037	SER	2.8
1	R	337	GLN	2.8
1	R	160	LEU	2.8
2	P	22	PHE	2.7
1	R	251	ASN	2.7
1	R	240	CYS	2.7
1	R	28	VAL	2.7
1	R	1012	LEU	2.7
1	R	339	HIS	2.7
1	R	31	PHE	2.6
1	R	55	GLU	2.6
1	R	67	CYS	2.6

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Mol	Chain	Res	Type	RSRZ
1	R	154	GLY	2.6
1	R	40	GLY	2.5
1	R	186	LEU	2.5
1	R	110	PRO	2.5
1	R	74	ASN	2.5
1	R	1064	LYS	2.4
1	R	253	LEU	2.4
1	R	1121	GLN	2.4
1	R	134	VAL	2.4
1	R	1028	ILE	2.4
1	R	294	CYS	2.4
1	R	301	MET	2.4
1	R	122	GLN	2.4
1	R	152	SER	2.4
1	R	1048	ALA	2.3
1	R	158	LEU	2.3
1	R	32	LEU	2.3
1	R	189	SER	2.2
1	R	261	ARG	2.2
1	R	69	PRO	2.1
1	R	1002	ILE	2.1
1	R	393	GLY	2.1
1	R	175	ALA	2.1
1	R	346	ARG	2.0
1	R	181	PHE	2.0
1	R	53	PRO	2.0

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

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

6.3 Carbohydrates [i](#)

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.

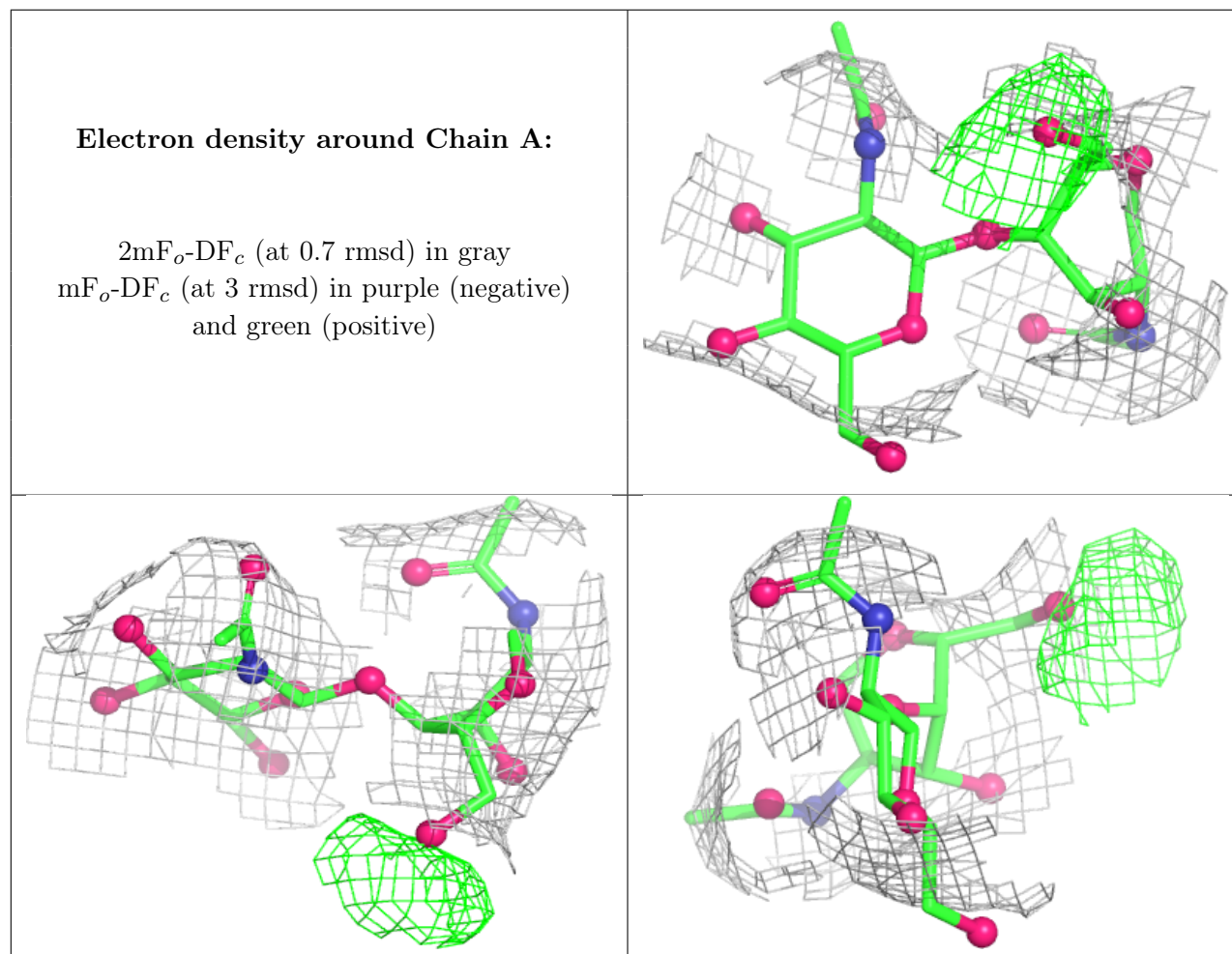
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	NAG	A	1	14/15	-	-	204,206,209,211	0
3	NAG	A	2	14/15	-	-	211,214,215,215	0

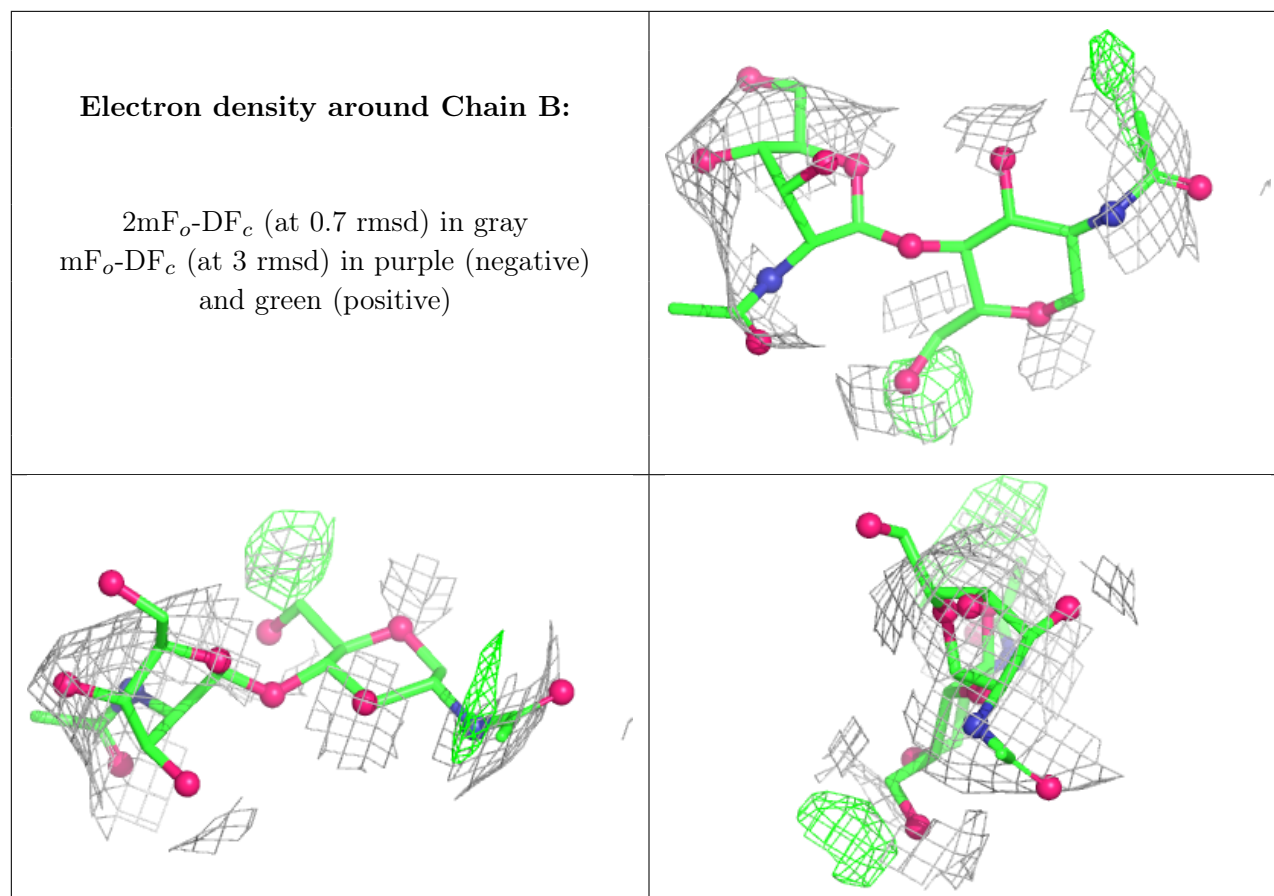
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	NAG	B	1	14/15	-	-	206,210,213,217	0
3	NAG	B	2	14/15	-	-	220,223,223,224	0

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.





6.4 Ligands [i](#)

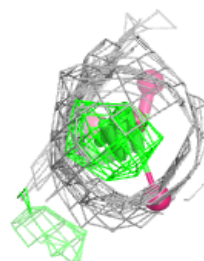
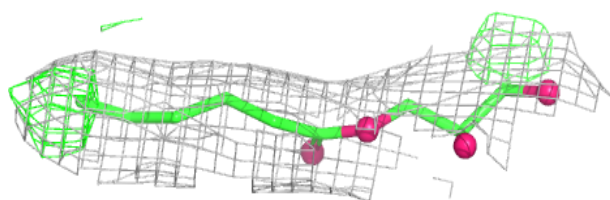
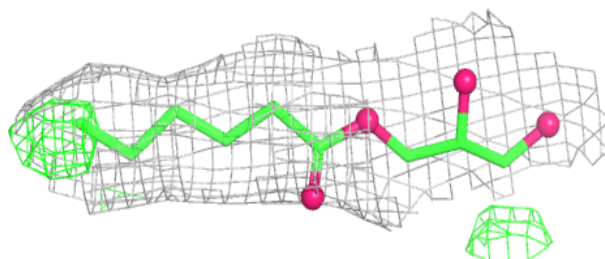
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	OLC	R	1210	13/25	0.64	0.20	115,134,143,144	0
5	PO4	R	1211	5/5	0.76	0.10	215,215,215,215	0
4	OLC	R	1209	14/25	0.79	0.20	128,144,149,150	0
4	OLC	R	1205	14/25	0.84	0.27	99,117,127,130	0
4	OLC	R	1208	19/25	0.87	0.23	123,148,174,175	0
4	OLC	R	1206	13/25	0.87	0.25	127,141,144,145	0
4	OLC	R	1207	12/25	0.88	0.16	109,123,134,134	0

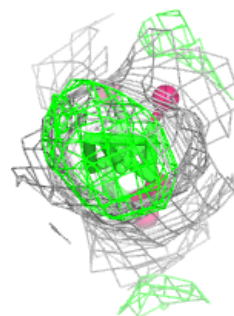
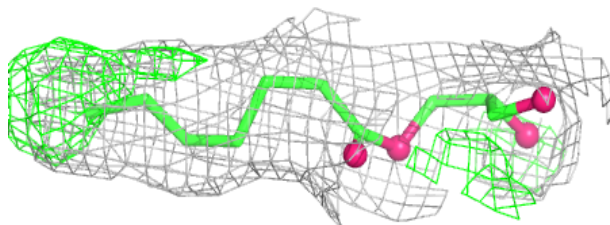
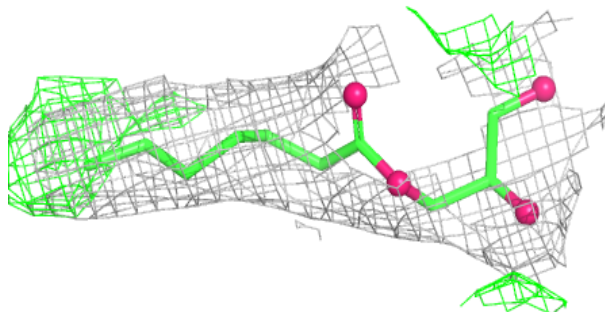
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around OLC R 1210:

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

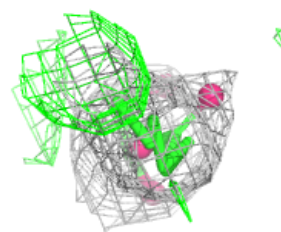
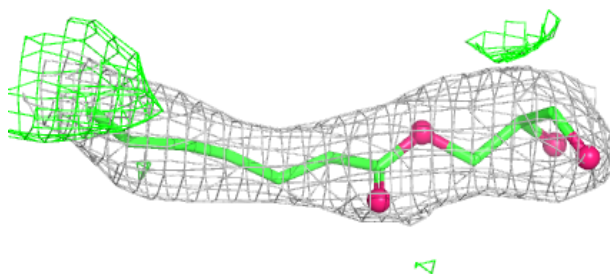
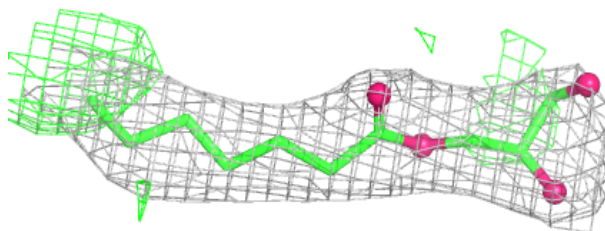
**Electron density around OLC R 1209:**

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

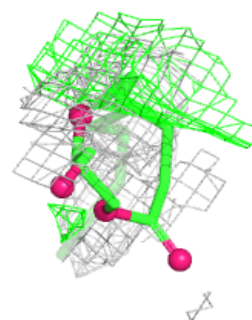
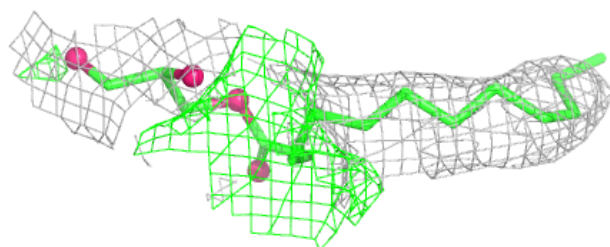
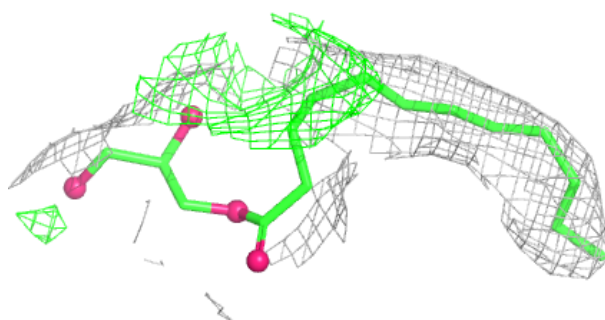


Electron density around OLC R 1205:

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

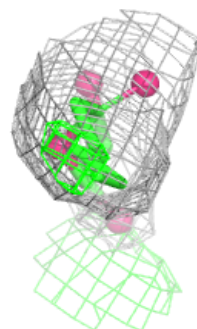
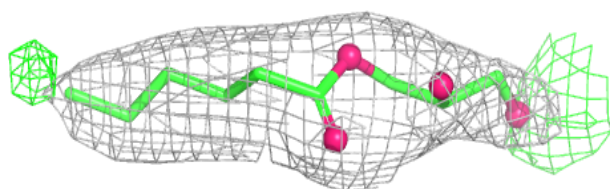
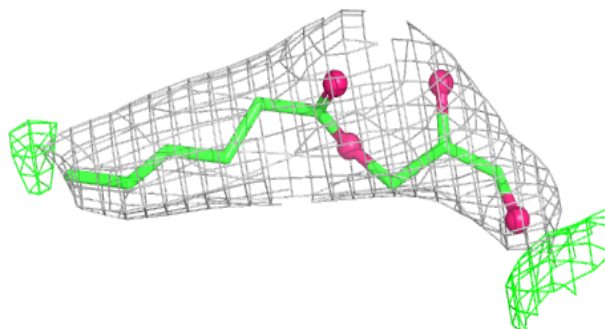
**Electron density around OLC R 1208:**

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

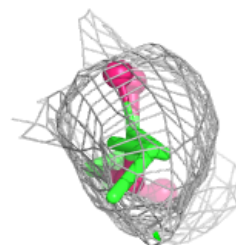
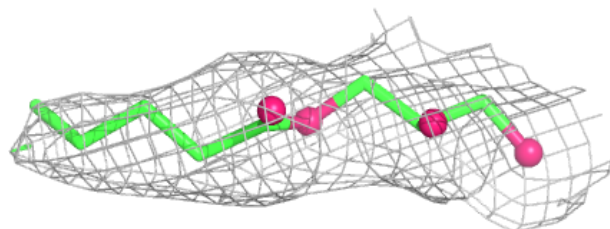
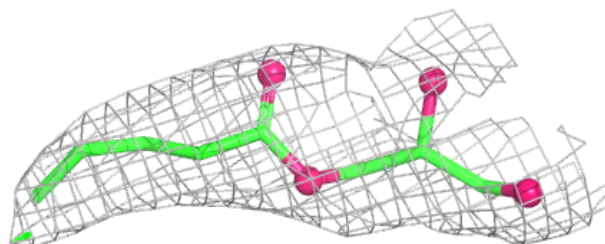


Electron density around OLC R 1206:

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

**Electron density around OLC R 1207:**

$2mF_o-DF_c$ (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.