Full wwPDB X-ray Structure Validation Report ⓘ

Oct 28, 2024 – 04:35 am GMT

PDB ID	:	6Q7J
Title	:	GH3 exo-beta-xylosidase (XlnD) in complex with xylobiose aziridine activity based probe
Authors	:	Davies, G.J.; Rowland, R.J.; Wu, L.; Moroz, O.; Blagova, E.
Deposited on	:	2018-12-13
Resolution	:	2.14 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 ⓘ) were used in the production of this report:

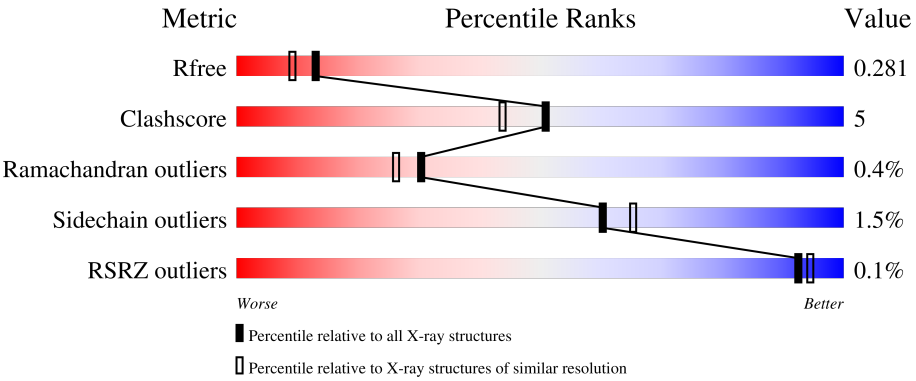
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.14 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}	164625	3336 (2.16-2.12)
Clashscore	180529	3585 (2.16-2.12)
Ramachandran outliers	177936	3554 (2.16-2.12)
Sidechain outliers	177891	3553 (2.16-2.12)
RSRZ outliers	164620	3337 (2.16-2.12)

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	785	85% 13%
1	B	785	87% 11%
2	C	10	30% 60% 10%
3	D	2	100%
4	E	9	22% 78%

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
7	EDO	A	921	-	-	X	-

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 12811 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.

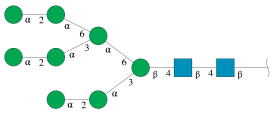
- Molecule 1 is a protein called Exo-1,4-beta-xylosidase xlnD.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	769	Total	C	N	O	S	0	3	0
			5863	3704	966	1177	16			
1	A	770	Total	C	N	O	S	0	0	0
			5861	3703	972	1170	16			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	19	PCA	-	expression tag	UNP Q5BAS1
A	19	PCA	-	expression tag	UNP Q5BAS1

- Molecule 2 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

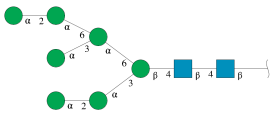


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	10	Total	C	N	O	0	0	0
			115	64	2	49			

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

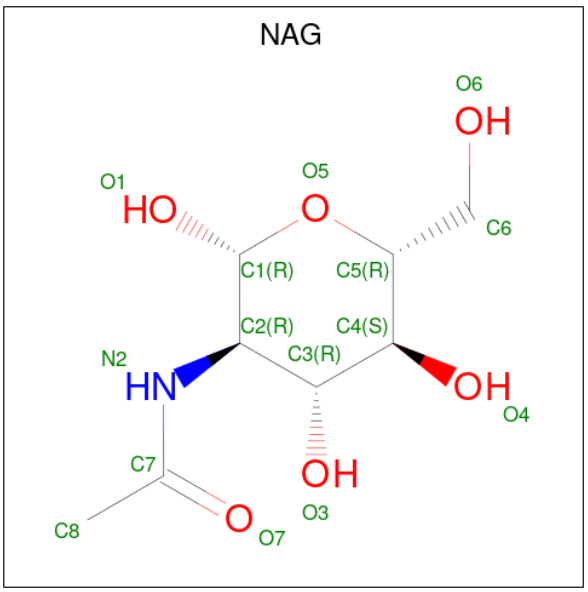
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
3	D	2	Total C N O 28 16 2 10	0	0	0

- Molecule 4 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
4	E	9	Total C N O 105 58 2 45	0	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total C N O 14 8 1 5	0	0
5	B	1	Total C N O 14 8 1 5	0	0
5	B	1	Total C N O 14 8 1 5	0	0

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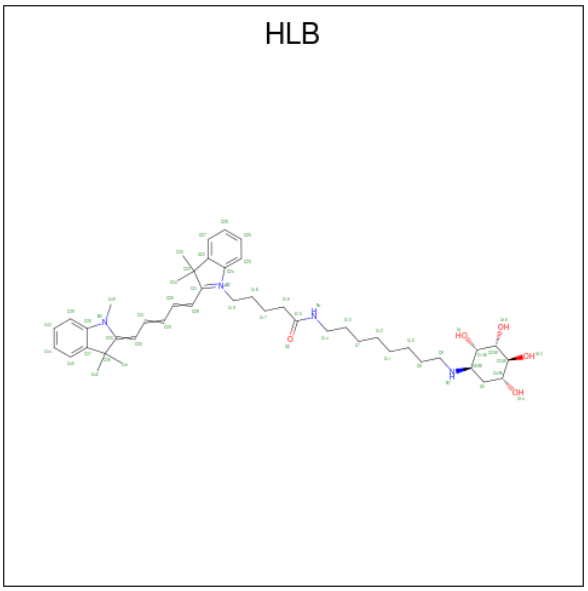
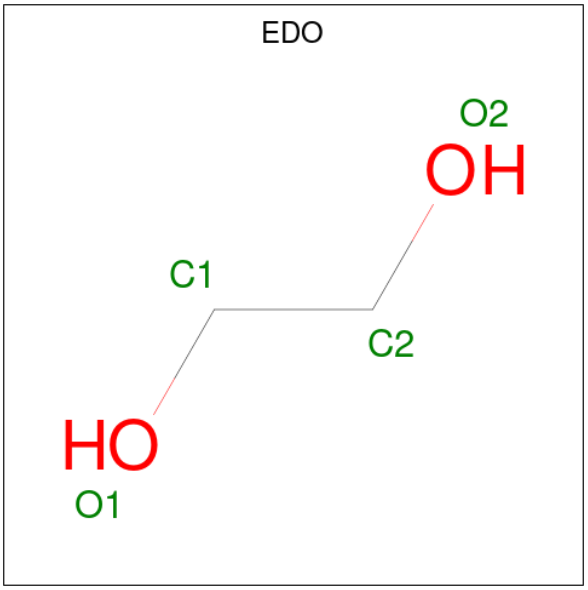
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	B	1	Total 14	C 8	N 1	O 5	0	0
5	B	1	Total 14	C 8	N 1	O 5	0	0
5	B	1	Total 14	C 8	N 1	O 5	0	0
5	B	1	Total 14	C 8	N 1	O 5	0	0
5	B	1	Total 14	C 8	N 1	O 5	0	0
5	B	1	Total 14	C 8	N 1	O 5	0	0
5	A	1	Total 14	C 8	N 1	O 5	0	0
5	A	1	Total 14	C 8	N 1	O 5	0	0
5	A	1	Total 14	C 8	N 1	O 5	0	0
5	A	1	Total 14	C 8	N 1	O 5	0	0
5	A	1	Total 14	C 8	N 1	O 5	0	0
5	A	1	Total 14	C 8	N 1	O 5	0	0
5	A	1	Total 14	C 8	N 1	O 5	0	0
5	A	1	Total 14	C 8	N 1	O 5	0	0
5	A	1	Total 14	C 8	N 1	O 5	0	0

- Molecule 6 is 5-[3,3-dimethyl-2-[5-(1,3,3-trimethylindol-2-ylidene)penta-1,3-dienyl]indol-1-ium-1-yl]- {N}-[8-[[(1 {R},2 {S},3 {S},4 {S},5 {R})-2,3,4,5-tetrakis(oxidanyl)cyclohexyl]amino]octyl]pentanamide (three-letter code: HLB) (formula: $C_{45}H_{65}N_4O_5$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	B	1	Total	C	N	O	0	0
			15	11	1	3		
6	A	1	Total	C	N	O	0	0
			15	11	1	3		

- Molecule 7 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	B	1	Total	C	O		0	0
			4	2	2			
7	B	1	Total	C	O		0	0
			4	2	2			

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C O 4 2 2	0	0
7	A	1	Total C O 4 2 2	0	0

- Molecule 8 is water.

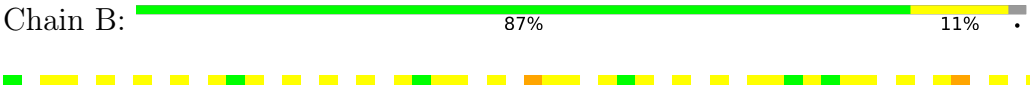
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	273	Total O 273 273	0	0
8	A	268	Total O 268 268	0	0

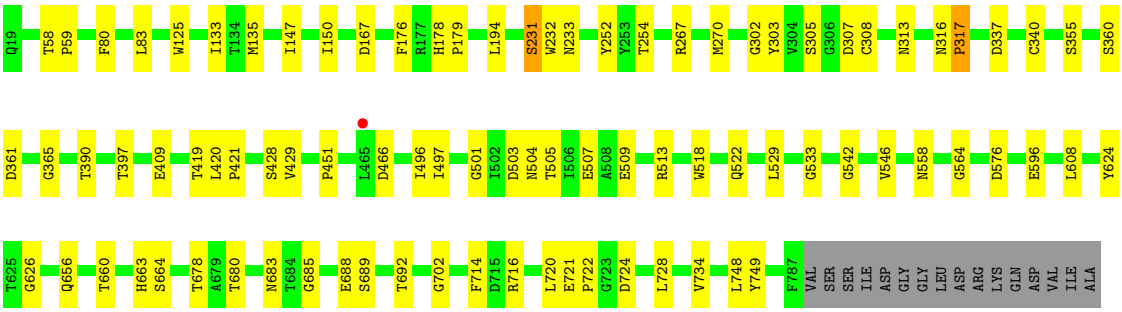
3 Residue-property plots (i)

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

• Molecule 1: Exo-1,4-beta-xylosidase xlnD

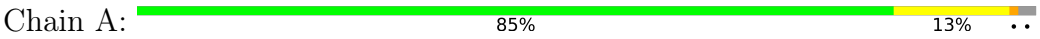
Chain B:

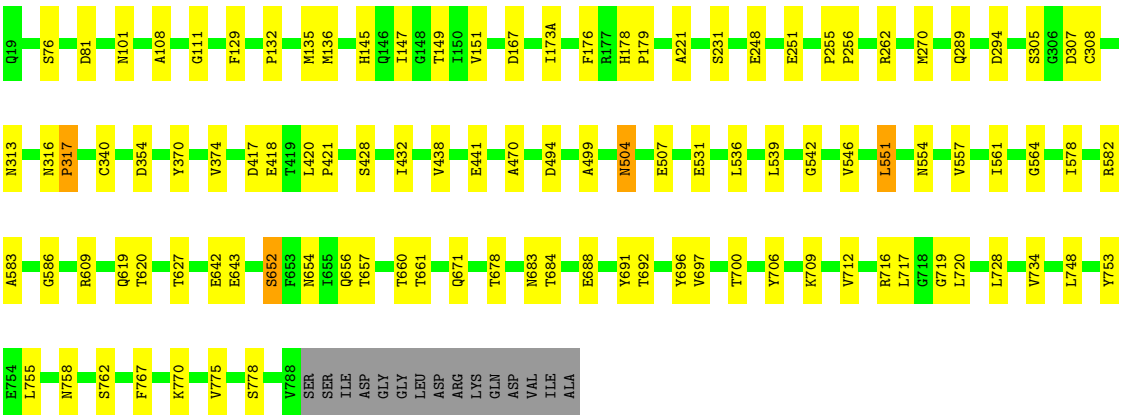




• Molecule 1: Exo-1,4-beta-xylosidase xlnD

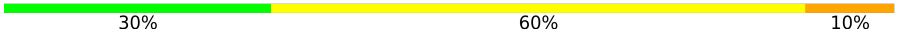
Chain A:

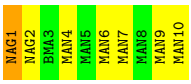




• Molecule 2: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

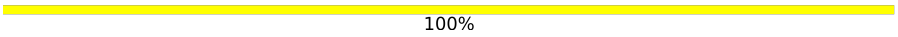
Chain C:





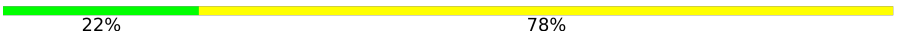
• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:



• Molecule 4: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	70.40Å 91.58Å 245.06Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.26 – 2.14 46.26 – 2.14	Depositor EDS
% Data completeness (in resolution range)	99.9 (46.26-2.14) 99.9 (46.26-2.14)	Depositor EDS
R_{merge}	0.26	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.73 (at 2.14Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.196 , 0.268 0.210 , 0.281	Depositor DCC
R_{free} test set	4444 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	39.4	Xtriage
Anisotropy	0.239	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 28.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	12811	wwPDB-VP
Average B, all atoms (Å^2)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.32% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: HLB, MAN, EDO, PCA, NAG, BMA

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	0.73	1/6001 (0.0%)	0.84	1/8206 (0.0%)
1	B	0.73	1/6002 (0.0%)	0.84	0/8215
All	All	0.73	2/12003 (0.0%)	0.84	1/16421 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	307	ASP	CG-OD2	9.20	1.46	1.25
1	B	307	ASP	CG-OD2	9.13	1.46	1.25

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	317	PRO	N-CA-CB	-5.37	96.69	102.60

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	5861	0	5502	62	0
1	B	5863	0	5480	60	0
2	C	115	0	94	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	28	0	25	0	0
4	E	105	0	88	0	0
5	A	126	0	117	1	0
5	B	126	0	117	0	0
6	A	15	0	0	0	0
6	B	15	0	0	0	0
7	A	8	0	12	9	0
7	B	8	0	12	2	0
8	A	268	0	0	4	0
8	B	273	0	0	2	0
All	All	12811	0	11447	120	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 5.

All (120) 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:355:SER:HB2	1:A:775:VAL:HG23	1.46	0.98
1:B:135:MET:CE	1:B:147:ILE:HG21	1.96	0.95
1:B:501:GLY:H	1:B:522[B]:GLN:HE22	1.33	0.77
1:A:778:SER:N	7:A:921:EDO:O1	2.17	0.74
1:B:509:GLU:OE1	8:B:1001:HOH:O	2.07	0.73
1:B:135:MET:HE3	1:B:147:ILE:HG21	1.70	0.73
1:B:503:ASP:OD1	1:B:505:THR:OG1	2.08	0.71
1:A:554:ASN:O	1:A:557:VAL:HG22	1.92	0.69
1:A:657:THR:O	1:A:661:THR:HG23	1.93	0.68
1:B:734:VAL:CG1	1:B:748:LEU:HD11	2.25	0.66
1:A:778:SER:H	7:A:921:EDO:HO1	1.43	0.66
1:A:697:VAL:HG13	1:A:712:VAL:HG11	1.80	0.63
1:B:716:ARG:HD3	2:C:1:NAG:H83	1.79	0.63
1:A:619:GLN:O	1:A:620:THR:OG1	2.16	0.61
1:A:542:GLY:O	1:A:564:GLY:HA2	2.01	0.61
1:A:504:ASN:HA	1:A:507:GLU:O	2.01	0.60
1:A:697:VAL:HG12	1:A:755:LEU:HD23	1.86	0.58
1:A:697:VAL:HG13	1:A:712:VAL:CG1	2.34	0.57
1:B:178:HIS:ND1	1:B:179:PRO:HD2	2.19	0.56
1:A:136:MET:HA	1:A:136:MET:HE3	1.87	0.56
1:B:664:SER:N	7:B:923:EDO:H22	2.21	0.56
1:A:697:VAL:CG1	1:A:712:VAL:HG11	2.35	0.56
1:A:734:VAL:CG1	1:A:748:LEU:HD11	2.36	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:361:ASP:OD1	7:A:921:EDO:C1	2.55	0.55
1:B:683:ASN:ND2	1:B:720:LEU:O	2.38	0.55
1:B:542:GLY:O	1:B:564:GLY:HA2	2.06	0.54
1:A:583:ALA:HB1	8:A:1157:HOH:O	2.06	0.54
1:B:692:THR:HG22	1:B:716:ARG:HG3	1.89	0.54
1:B:420:LEU:HA	1:B:421:PRO:C	2.29	0.53
1:B:501:GLY:H	1:B:522[A]:GLN:HE22	1.57	0.53
1:A:696:TYR:CG	1:A:709:LYS:HD2	2.44	0.53
1:B:361:ASP:OD1	7:A:921:EDO:H12	2.09	0.52
1:A:313:ASN:HA	1:A:316:ASN:O	2.10	0.52
1:B:308:CYS:HA	1:B:340:CYS:O	2.10	0.51
1:A:561:ILE:HD12	1:A:578:ILE:HD11	1.92	0.51
1:A:683:ASN:ND2	1:A:720:LEU:O	2.42	0.51
1:B:702:GLY:HA2	1:B:749:TYR:CD1	2.46	0.51
1:A:417:ASP:O	1:A:418:GLU:CB	2.58	0.51
1:A:270:MET:HA	1:A:305:SER:O	2.11	0.50
1:A:438:VAL:HB	1:A:441:GLU:HB2	1.93	0.50
1:A:692:THR:HG22	1:A:716:ARG:HG3	1.94	0.50
1:A:654:ASN:HA	1:A:770:LYS:O	2.11	0.50
1:A:173(A):ILE:HD11	1:A:221:ALA:HB1	1.94	0.50
1:A:289:GLN:NE2	8:A:1003:HOH:O	2.30	0.49
1:A:132:PRO:HA	1:A:135:MET:HE3	1.94	0.49
1:A:643:GLU:HB2	1:A:762:SER:OG	2.11	0.49
1:B:429:VAL:CG2	1:B:497:ILE:HG12	2.42	0.49
1:B:409:GLU:OE2	2:C:1:NAG:H2	2.13	0.49
1:B:496:ILE:HG21	1:B:529:LEU:HD22	1.94	0.48
1:A:531:GLU:O	1:A:531:GLU:HG3	2.13	0.48
1:B:231:SER:O	1:B:232:TRP:C	2.52	0.48
1:A:108:ALA:HB1	1:A:151:VAL:HG11	1.94	0.48
1:A:642:GLU:HB2	1:A:684:THR:HG21	1.95	0.48
1:A:81:ASP:HB3	5:A:914:NAG:H82	1.95	0.48
1:B:596:GLU:HA	1:B:596:GLU:OE1	2.14	0.48
1:A:700:THR:O	1:A:706:TYR:CE1	2.67	0.47
1:A:678:THR:HA	1:A:728:LEU:O	2.14	0.47
1:A:688:GLU:OE1	1:A:719:GLY:HA2	2.14	0.47
1:B:361:ASP:OD1	7:A:921:EDO:H11	2.15	0.47
1:A:697:VAL:HG12	1:A:755:LEU:CD2	2.44	0.47
1:A:420:LEU:HA	1:A:421:PRO:C	2.33	0.47
1:A:145:HIS:O	1:A:149:THR:HG23	2.14	0.47
1:B:194:LEU:CD2	1:B:714:PHE:CD2	2.98	0.47
1:B:232:TRP:CE3	1:B:233:ASN:HB2	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:652:SER:OG	1:A:770:LYS:HE2	2.15	0.46
1:B:678:THR:HA	1:B:728:LEU:O	2.15	0.46
1:B:518:TRP:N	1:B:546:VAL:HG22	2.31	0.46
1:B:125:TRP:CE3	1:B:451:PRO:HB3	2.51	0.45
1:B:624:TYR:CZ	1:B:626:GLY:HA3	2.51	0.45
1:A:248:GLU:HA	1:A:251:GLU:HG2	1.98	0.45
1:A:691:TYR:HD2	1:A:717:LEU:HD12	1.81	0.45
1:B:504:ASN:HA	1:B:507:GLU:O	2.16	0.45
1:B:313:ASN:HA	1:B:316:ASN:O	2.16	0.45
1:B:360:SER:CB	7:A:921:EDO:H22	2.47	0.45
1:A:778:SER:N	7:A:921:EDO:HO1	2.08	0.44
1:B:656:GLN:O	1:B:660:THR:HG23	2.17	0.44
1:B:361:ASP:CG	7:A:921:EDO:H11	2.37	0.44
1:A:551:LEU:O	1:A:557:VAL:HG21	2.17	0.44
1:A:642:GLU:HA	8:A:1030:HOH:O	2.16	0.44
1:A:370:TYR:O	1:A:374:VAL:HG23	2.17	0.44
1:A:656:GLN:O	1:A:660:THR:HG23	2.18	0.44
1:A:262:ARG:NH2	1:A:671:GLN:HE21	2.16	0.44
1:B:150:ILE:HG23	1:B:397:THR:HB	2.00	0.44
1:A:753:TYR:HB2	1:A:767:PHE:CE1	2.53	0.44
1:B:419:THR:CB	1:B:558:ASN:OD1	2.66	0.43
1:B:135:MET:HE1	1:B:147:ILE:HG21	1.88	0.43
1:A:428:SER:O	1:A:494:ASP:HB2	2.19	0.43
1:A:536:LEU:HD23	1:A:557:VAL:HG12	2.00	0.43
1:B:252:TYR:CG	1:B:608:LEU:HD11	2.53	0.43
1:A:289:GLN:NE2	1:A:294:ASP:OD1	2.51	0.43
1:B:135:MET:CE	1:B:147:ILE:HD13	2.49	0.43
1:B:270:MET:HA	1:B:305:SER:O	2.19	0.43
1:B:303:TYR:HA	1:B:337:ASP:OD2	2.18	0.43
1:B:316:ASN:HA	1:B:317:PRO:HA	1.75	0.43
1:B:663:HIS:CE1	1:A:76:SER:HA	2.54	0.43
1:B:685:GLY:O	1:B:722:PRO:HB3	2.19	0.43
1:A:178:HIS:ND1	1:A:179:PRO:HD2	2.34	0.42
1:A:308:CYS:HA	1:A:340:CYS:O	2.19	0.42
1:B:179:PRO:O	1:B:513:ARG:NH2	2.49	0.42
1:A:643:GLU:OE1	1:A:762:SER:OG	2.23	0.42
1:B:178:HIS:CG	1:B:179:PRO:HD2	2.54	0.42
1:B:80:PHE:O	1:B:83:LEU:HB3	2.19	0.42
1:B:721:GLU:O	1:B:724:ASP:HB2	2.19	0.42
1:A:111:GLY:HA2	1:A:151:VAL:HG22	2.02	0.42
1:A:432:ILE:HA	1:A:470:ALA:O	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:716:ARG:CD	2:C:1:NAG:H83	2.48	0.42
1:A:251:GLU:OE2	1:A:609:ARG:NH1	2.43	0.42
1:B:194:LEU:HD23	1:B:714:PHE:CD2	2.55	0.41
1:A:129:PHE:CE2	1:A:147:ILE:HG12	2.54	0.41
1:B:267:ARG:O	1:B:302:GLY:HA2	2.20	0.41
1:A:582:ARG:HB3	8:A:1114:HOH:O	2.19	0.41
1:B:58:THR:HB	1:B:59:PRO:CD	2.50	0.41
1:B:664:SER:O	7:B:923:EDO:H22	2.20	0.41
1:A:499:ALA:HA	1:A:539:LEU:HB2	2.03	0.41
1:B:688:GLU:HG2	1:B:689:SER:N	2.35	0.41
1:A:255:PRO:HB2	1:A:256:PRO:HD3	2.02	0.41
1:B:135:MET:HE2	1:B:147:ILE:HD13	2.03	0.41
1:B:390:THR:HA	8:B:1077:HOH:O	2.21	0.41
1:B:360:SER:HB3	7:A:921:EDO:H22	2.03	0.40
1:B:337:ASP:HB3	1:B:365:GLY:HA2	2.02	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	768/785 (98%)	718 (94%)	47 (6%)	3 (0%)	30	26
1	B	770/785 (98%)	724 (94%)	43 (6%)	3 (0%)	30	26
All	All	1538/1570 (98%)	1442 (94%)	90 (6%)	6 (0%)	30	26

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	231	SER
1	A	231	SER
1	A	758	ASN

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Mol	Chain	Res	Type
1	B	533	GLY
1	A	586	GLY
1	B	254	THR

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	620/647 (96%)	610 (98%)	10 (2%)	58	63
1	B	620/647 (96%)	612 (99%)	8 (1%)	65	70
All	All	1240/1294 (96%)	1222 (98%)	18 (2%)	60	65

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	133	ILE
1	B	167	ASP
1	B	176	PHE
1	B	317	PRO
1	B	428	SER
1	B	466	ASP
1	B	576	ASP
1	B	680	THR
1	A	101	ASN
1	A	167	ASP
1	A	176	PHE
1	A	317	PRO
1	A	354	ASP
1	A	504	ASN
1	A	546	VAL
1	A	551	LEU
1	A	627	THR
1	A	652	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
1	PCA	A	19	1	7,8,9	0.47	0	9,10,12	0.92	0
1	PCA	B	19	1	7,8,9	0.52	0	9,10,12	1.01	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	PCA	A	19	1	-	0/0/11/13	0/1/1/1
1	PCA	B	19	1	-	0/0/11/13	0/1/1/1

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 (i)

21 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	$\#\|Z\| > 2$
2	NAG	C	1	2,1	14,14,15	0.53	0	17,19,21	1.20	1 (5%)
2	MAN	C	10	2	11,11,12	0.55	0	15,15,17	1.48	2 (13%)
2	NAG	C	2	2	14,14,15	0.46	0	17,19,21	1.27	2 (11%)
2	BMA	C	3	2	11,11,12	0.52	0	15,15,17	1.11	0
2	MAN	C	4	2	11,11,12	0.53	0	15,15,17	1.25	3 (20%)
2	MAN	C	5	2	11,11,12	0.38	0	15,15,17	0.75	0
2	MAN	C	6	2	11,11,12	0.56	0	15,15,17	1.30	2 (13%)
2	MAN	C	7	2	11,11,12	0.36	0	15,15,17	1.61	3 (20%)
2	MAN	C	8	2	11,11,12	0.44	0	15,15,17	0.96	0
2	MAN	C	9	2	10,10,12	0.62	0	14,14,17	1.73	2 (14%)
3	NAG	D	1	3,1	14,14,15	0.52	0	17,19,21	1.56	3 (17%)
3	NAG	D	2	3	14,14,15	0.57	0	17,19,21	1.49	2 (11%)
4	NAG	E	1	4,1	14,14,15	0.70	0	17,19,21	1.50	1 (5%)
4	NAG	E	2	4	14,14,15	0.67	0	17,19,21	1.46	2 (11%)
4	BMA	E	3	4	11,11,12	0.65	0	15,15,17	1.31	1 (6%)
4	MAN	E	4	4	11,11,12	0.94	1 (9%)	15,15,17	1.12	1 (6%)
4	MAN	E	5	4	11,11,12	0.55	0	15,15,17	1.11	0
4	MAN	E	6	4	11,11,12	0.58	0	15,15,17	1.04	1 (6%)
4	MAN	E	7	4	11,11,12	0.38	0	15,15,17	1.03	0
4	MAN	E	8	4	11,11,12	0.74	0	15,15,17	1.18	1 (6%)
4	MAN	E	9	4	11,11,12	0.47	0	15,15,17	1.07	1 (6%)

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	NAG	C	1	2,1	-	1/6/23/26	0/1/1/1
2	MAN	C	10	2	-	1/2/19/22	0/1/1/1
2	NAG	C	2	2	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	BMA	C	3	2	-	0/2/19/22	0/1/1/1
2	MAN	C	4	2	-	0/2/19/22	0/1/1/1
2	MAN	C	5	2	-	1/2/19/22	0/1/1/1
2	MAN	C	6	2	-	2/2/19/22	0/1/1/1
2	MAN	C	7	2	-	2/2/19/22	0/1/1/1
2	MAN	C	8	2	-	0/2/19/22	0/1/1/1
2	MAN	C	9	2	-	-	0/1/1/1
3	NAG	D	1	3,1	-	1/6/23/26	0/1/1/1
3	NAG	D	2	3	-	2/6/23/26	0/1/1/1
4	NAG	E	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	E	2	4	-	0/6/23/26	0/1/1/1
4	BMA	E	3	4	-	0/2/19/22	0/1/1/1
4	MAN	E	4	4	-	0/2/19/22	0/1/1/1
4	MAN	E	5	4	-	0/2/19/22	0/1/1/1
4	MAN	E	6	4	-	2/2/19/22	0/1/1/1
4	MAN	E	7	4	-	0/2/19/22	0/1/1/1
4	MAN	E	8	4	-	2/2/19/22	0/1/1/1
4	MAN	E	9	4	-	2/2/19/22	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	4	MAN	C2-C3	2.31	1.55	1.52

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	2	NAG	C1-O5-C5	4.27	117.98	112.19
2	C	9	MAN	O5-C5-C6	4.19	116.35	107.33
4	E	1	NAG	C1-C2-N2	-3.86	103.90	110.49
2	C	7	MAN	C2-C3-C4	-3.51	104.82	110.89
2	C	6	MAN	O5-C1-C2	-3.37	105.56	110.77
3	D	1	NAG	C1-O5-C5	3.20	116.53	112.19
2	C	10	MAN	O4-C4-C3	-3.20	102.94	110.35
3	D	2	NAG	O4-C4-C5	3.05	116.87	109.30
4	E	3	BMA	C1-O5-C5	3.04	116.31	112.19
4	E	8	MAN	O2-C2-C1	2.90	115.08	109.15
4	E	2	NAG	C1-C2-N2	2.83	115.32	110.49
2	C	2	NAG	O4-C4-C5	-2.74	102.50	109.30
4	E	2	NAG	O5-C5-C6	2.69	111.41	107.20
2	C	10	MAN	C1-C2-C3	-2.60	106.47	109.67

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	6	MAN	O5-C1-C2	-2.53	106.86	110.77
4	E	9	MAN	O5-C1-C2	-2.44	107.01	110.77
3	D	1	NAG	C8-C7-N2	-2.43	111.98	116.10
2	C	7	MAN	O2-C2-C3	-2.40	105.33	110.14
2	C	4	MAN	O5-C5-C6	2.38	110.94	107.20
2	C	4	MAN	O6-C6-C5	-2.37	103.17	111.29
2	C	6	MAN	C1-O5-C5	2.35	115.37	112.19
2	C	9	MAN	C6-C5-C4	-2.29	108.84	113.07
2	C	7	MAN	O4-C4-C5	2.26	114.90	109.30
2	C	1	NAG	O3-C3-C4	-2.19	105.28	110.35
3	D	1	NAG	O5-C5-C6	-2.14	103.85	107.20
2	C	4	MAN	O3-C3-C2	-2.14	105.89	109.99
4	E	4	MAN	O5-C1-C2	-2.13	107.48	110.77
2	C	2	NAG	C2-N2-C7	2.05	125.81	122.90

There are no chirality outliers.

All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	2	NAG	O5-C5-C6-O6
4	E	9	MAN	O5-C5-C6-O6
4	E	8	MAN	C4-C5-C6-O6
2	C	6	MAN	C4-C5-C6-O6
4	E	8	MAN	O5-C5-C6-O6
3	D	2	NAG	C4-C5-C6-O6
2	C	7	MAN	O5-C5-C6-O6
2	C	6	MAN	O5-C5-C6-O6
2	C	7	MAN	C4-C5-C6-O6
4	E	9	MAN	C4-C5-C6-O6
2	C	10	MAN	O5-C5-C6-O6
2	C	1	NAG	C3-C2-N2-C7
4	E	6	MAN	C4-C5-C6-O6
2	C	5	MAN	O5-C5-C6-O6
4	E	6	MAN	O5-C5-C6-O6
3	D	1	NAG	C4-C5-C6-O6

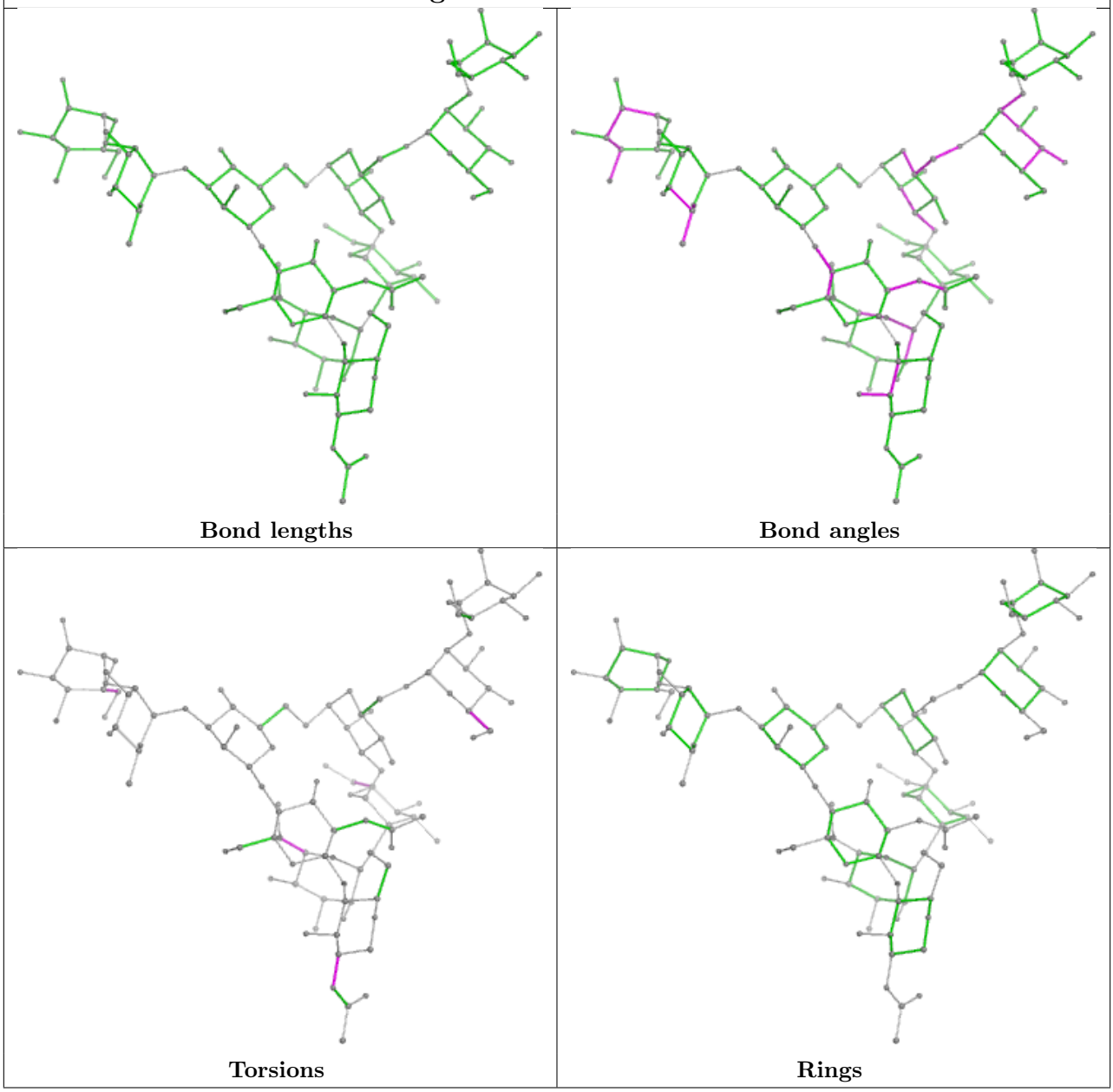
There are no ring outliers.

1 monomer is involved in 3 short contacts:

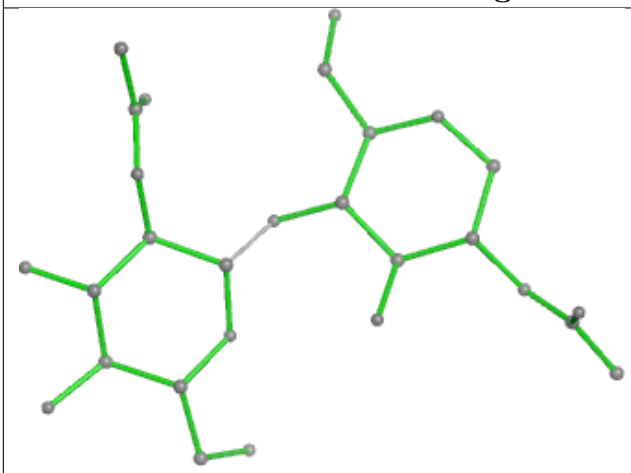
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1	NAG	3	0

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

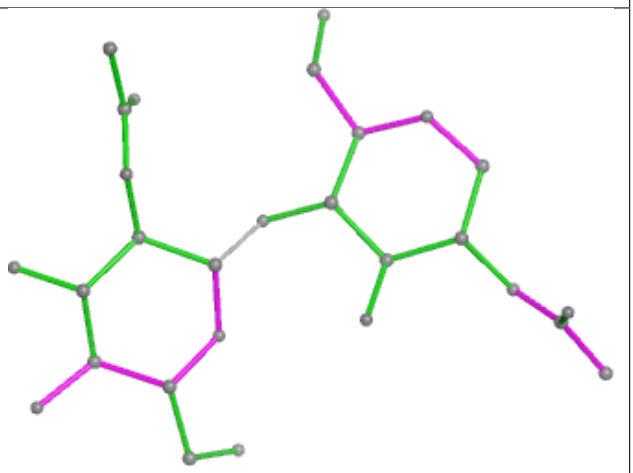
Oligosaccharide Chain C



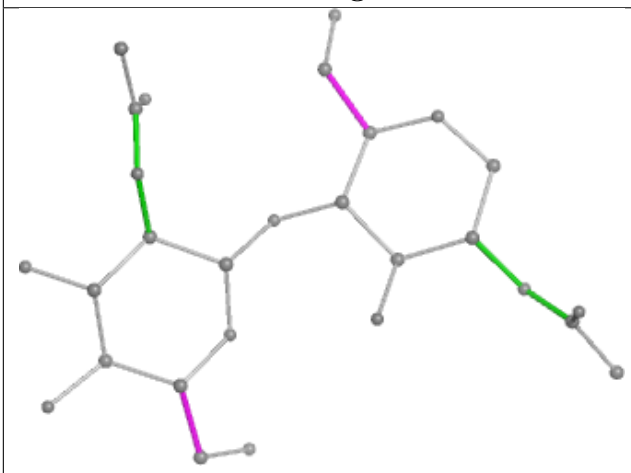
Oligosaccharide Chain D



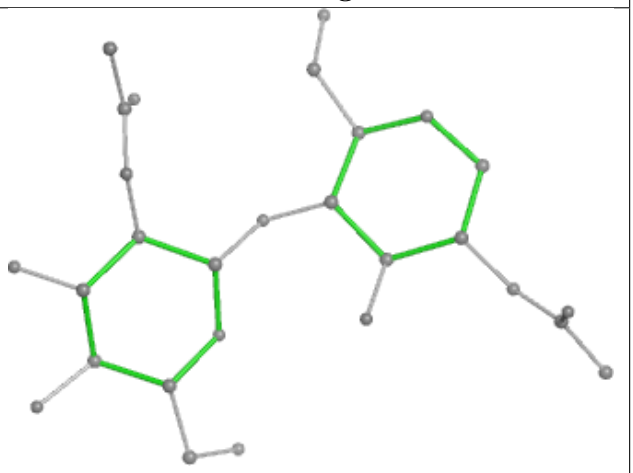
Bond lengths



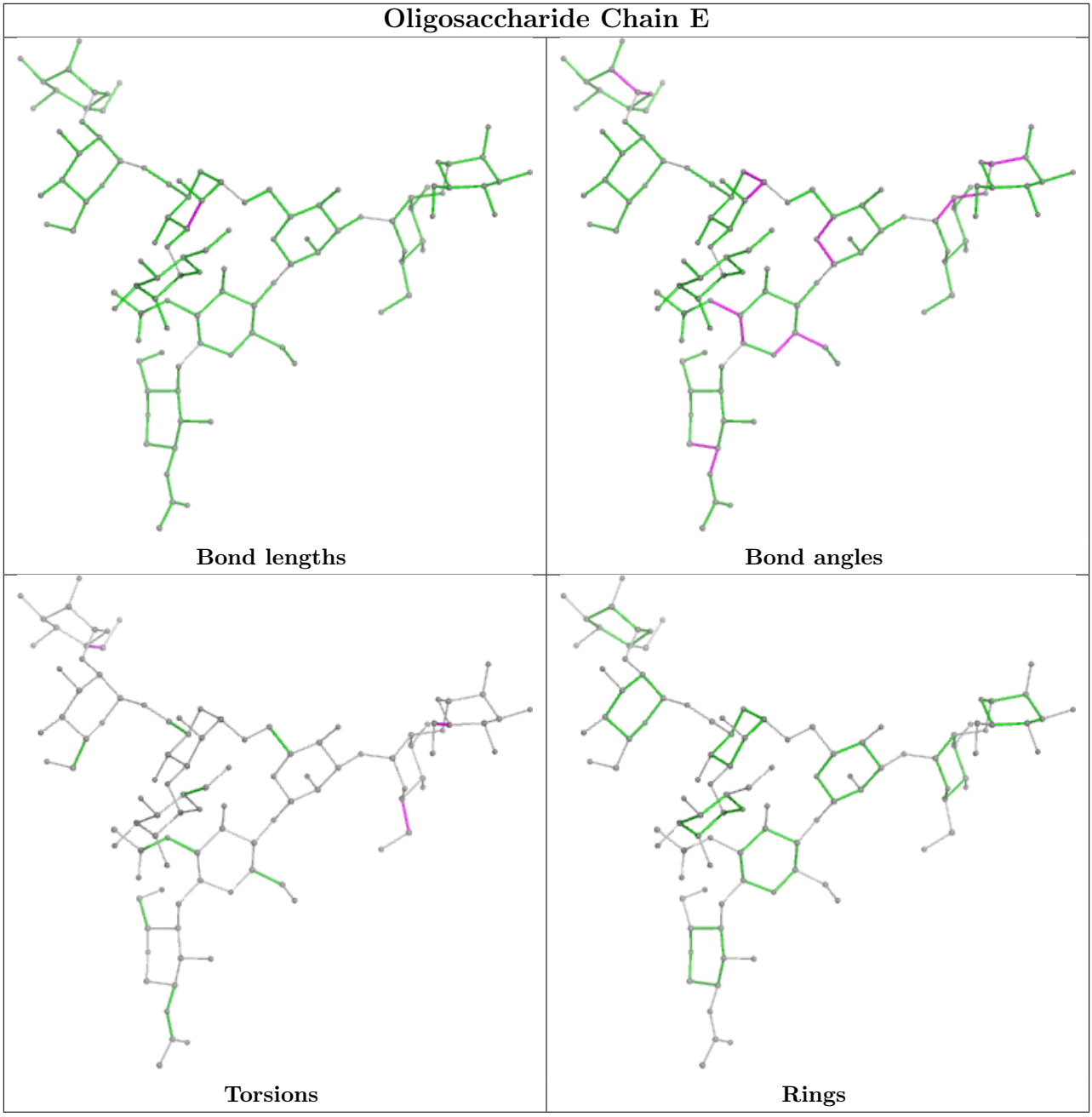
Bond angles



Torsions



Rings



5.6 Ligand geometry (i)

24 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
5	NAG	B	919	1	14,14,15	0.39	0	17,19,21	1.19	1 (5%)
5	NAG	B	913	1	14,14,15	0.47	0	17,19,21	1.14	1 (5%)
7	EDO	A	920	-	3,3,3	0.44	0	2,2,2	0.42	0
5	NAG	A	903	1	14,14,15	0.44	0	17,19,21	1.34	3 (17%)
5	NAG	A	918	1	14,14,15	0.54	0	17,19,21	1.66	4 (23%)
5	NAG	B	920	1	14,14,15	0.59	0	17,19,21	1.26	2 (11%)
5	NAG	A	902	1	14,14,15	0.58	0	17,19,21	1.20	2 (11%)
5	NAG	A	916	1	14,14,15	0.41	0	17,19,21	1.15	2 (11%)
5	NAG	B	901	1	14,14,15	0.59	0	17,19,21	1.07	1 (5%)
6	HLB	A	919	1	15,15,58	0.60	0	19,19,82	1.81	4 (21%)
7	EDO	B	923	-	3,3,3	0.18	0	2,2,2	0.23	0
5	NAG	A	914	1	14,14,15	0.54	0	17,19,21	1.81	4 (23%)
7	EDO	A	921	-	3,3,3	0.21	0	2,2,2	0.62	0
5	NAG	A	917	1	14,14,15	0.49	0	17,19,21	1.45	2 (11%)
6	HLB	B	922	1	15,15,58	0.66	0	19,19,82	1.79	2 (10%)
5	NAG	A	915	1	14,14,15	0.48	0	17,19,21	1.66	5 (29%)
5	NAG	B	921	1	14,14,15	0.57	0	17,19,21	1.11	2 (11%)
5	NAG	B	912	1	14,14,15	0.34	0	17,19,21	1.02	1 (5%)
5	NAG	B	914	1	14,14,15	0.42	0	17,19,21	1.50	3 (17%)
5	NAG	A	901	1	14,14,15	0.80	1 (7%)	17,19,21	1.35	4 (23%)
5	NAG	B	915	1	14,14,15	0.63	0	17,19,21	1.64	5 (29%)
5	NAG	A	913	1	14,14,15	0.46	0	17,19,21	1.08	0
5	NAG	B	918	1	14,14,15	0.33	0	17,19,21	0.96	0
7	EDO	B	924	-	3,3,3	0.13	0	2,2,2	0.17	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
5	NAG	B	919	1	-	0/6/23/26	0/1/1/1
5	NAG	B	913	1	-	2/6/23/26	0/1/1/1
7	EDO	A	920	-	-	0/1/1/1	-
5	NAG	A	903	1	-	0/6/23/26	0/1/1/1
5	NAG	A	918	1	-	1/6/23/26	0/1/1/1
5	NAG	B	920	1	-	2/6/23/26	0/1/1/1
5	NAG	A	902	1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	A	916	1	-	2/6/23/26	0/1/1/1
5	NAG	B	901	1	-	0/6/23/26	0/1/1/1
6	HLB	A	919	1	-	4/6/22/88	0/1/1/5
7	EDO	B	923	-	-	0/1/1/1	-
5	NAG	A	914	1	-	0/6/23/26	0/1/1/1
7	EDO	A	921	-	-	0/1/1/1	-
5	NAG	A	917	1	-	0/6/23/26	0/1/1/1
6	HLB	B	922	1	-	4/6/22/88	0/1/1/5
5	NAG	A	915	1	-	2/6/23/26	0/1/1/1
5	NAG	B	921	1	-	0/6/23/26	0/1/1/1
5	NAG	B	912	1	-	2/6/23/26	0/1/1/1
5	NAG	B	914	1	-	3/6/23/26	0/1/1/1
5	NAG	A	901	1	-	0/6/23/26	0/1/1/1
5	NAG	B	915	1	-	0/6/23/26	0/1/1/1
5	NAG	A	913	1	-	0/6/23/26	0/1/1/1
5	NAG	B	918	1	-	1/6/23/26	0/1/1/1
7	EDO	B	924	-	-	1/1/1/1	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	901	NAG	O5-C1	-2.18	1.40	1.43

All (48) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	B	922	HLB	C2-C1-C6	-5.83	105.32	112.53
6	A	919	HLB	C2-C1-C6	-5.39	105.87	112.53
5	A	914	NAG	C1-O5-C5	4.74	118.61	112.19
5	B	913	NAG	O5-C5-C6	3.83	113.21	107.20
5	B	914	NAG	C1-O5-C5	3.54	116.98	112.19
5	A	918	NAG	O5-C5-C6	3.45	112.61	107.20
5	B	915	NAG	C1-O5-C5	3.34	116.72	112.19
5	A	918	NAG	C2-N2-C7	3.07	127.28	122.90
5	A	918	NAG	C1-C2-N2	3.04	115.68	110.49
5	B	915	NAG	O4-C4-C3	-3.03	103.34	110.35
6	B	922	HLB	C4-C3-C2	-3.03	107.32	110.92
5	A	915	NAG	C3-C4-C5	-2.99	104.90	110.24
5	B	919	NAG	C1-C2-N2	2.88	115.41	110.49
5	A	915	NAG	C2-N2-C7	-2.82	118.89	122.90
5	B	914	NAG	C6-C5-C4	2.82	119.60	113.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	A	919	HLB	C4-C3-C2	-2.81	107.58	110.92
5	A	914	NAG	O5-C5-C4	-2.81	103.99	110.83
5	A	917	NAG	C1-O5-C5	2.76	115.93	112.19
6	A	919	HLB	C4-C5-C6	2.76	115.94	112.53
5	B	921	NAG	C2-N2-C7	2.74	126.80	122.90
5	A	903	NAG	O5-C5-C6	2.71	111.45	107.20
5	B	914	NAG	O5-C5-C4	-2.65	104.38	110.83
5	A	901	NAG	O7-C7-N2	2.60	126.74	121.95
5	B	901	NAG	O5-C5-C6	2.60	111.28	107.20
5	A	903	NAG	C1-C2-N2	-2.57	106.09	110.49
5	A	914	NAG	O5-C5-C6	2.56	111.22	107.20
5	B	915	NAG	O5-C5-C6	2.53	111.17	107.20
5	A	915	NAG	O5-C1-C2	-2.48	107.37	111.29
5	A	918	NAG	O5-C5-C4	-2.47	104.81	110.83
5	A	916	NAG	O3-C3-C2	-2.46	104.38	109.47
5	A	914	NAG	O3-C3-C2	-2.41	104.49	109.47
5	A	902	NAG	C4-C3-C2	-2.40	107.50	111.02
5	A	917	NAG	O4-C4-C5	2.31	115.03	109.30
5	A	901	NAG	O5-C5-C6	2.28	110.78	107.20
5	A	915	NAG	C1-O5-C5	2.27	115.26	112.19
5	A	901	NAG	O7-C7-C8	-2.24	117.90	122.06
5	A	901	NAG	C2-N2-C7	2.23	126.07	122.90
5	B	920	NAG	C4-C3-C2	2.22	114.27	111.02
5	B	915	NAG	C3-C4-C5	2.21	114.18	110.24
5	B	920	NAG	C3-C4-C5	2.19	114.15	110.24
5	B	912	NAG	O3-C3-C2	-2.19	104.94	109.47
5	A	903	NAG	C2-N2-C7	2.18	126.01	122.90
6	A	919	HLB	C5-C6-C1	-2.18	109.21	111.13
5	A	902	NAG	O5-C1-C2	-2.10	107.98	111.29
5	B	915	NAG	O3-C3-C2	-2.09	105.14	109.47
5	A	915	NAG	O4-C4-C3	2.09	115.18	110.35
5	A	916	NAG	C2-N2-C7	2.03	125.79	122.90
5	B	921	NAG	O5-C5-C4	-2.01	105.94	110.83

There are no chirality outliers.

All (26) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	919	HLB	C1-C6-N7-C8
5	B	914	NAG	O5-C5-C6-O6
5	A	916	NAG	C4-C5-C6-O6
5	A	916	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
5	A	915	NAG	O5-C5-C6-O6
5	A	918	NAG	C1-C2-N2-C7
5	A	915	NAG	C4-C5-C6-O6
5	B	914	NAG	C4-C5-C6-O6
5	B	913	NAG	O5-C5-C6-O6
7	B	924	EDO	O1-C1-C2-O2
5	B	918	NAG	O5-C5-C6-O6
6	B	922	HLB	C1-C6-N7-C8
5	B	913	NAG	C4-C5-C6-O6
5	A	902	NAG	C4-C5-C6-O6
5	B	912	NAG	C4-C5-C6-O6
5	A	902	NAG	O5-C5-C6-O6
6	B	922	HLB	C11-C10-C9-C8
5	B	920	NAG	O5-C5-C6-O6
6	A	919	HLB	C9-C10-C11-C12
5	B	920	NAG	C4-C5-C6-O6
5	B	912	NAG	O5-C5-C6-O6
6	A	919	HLB	C11-C10-C9-C8
5	B	914	NAG	C3-C2-N2-C7
6	B	922	HLB	N7-C8-C9-C10
6	B	922	HLB	C5-C6-N7-C8
6	A	919	HLB	C5-C6-N7-C8

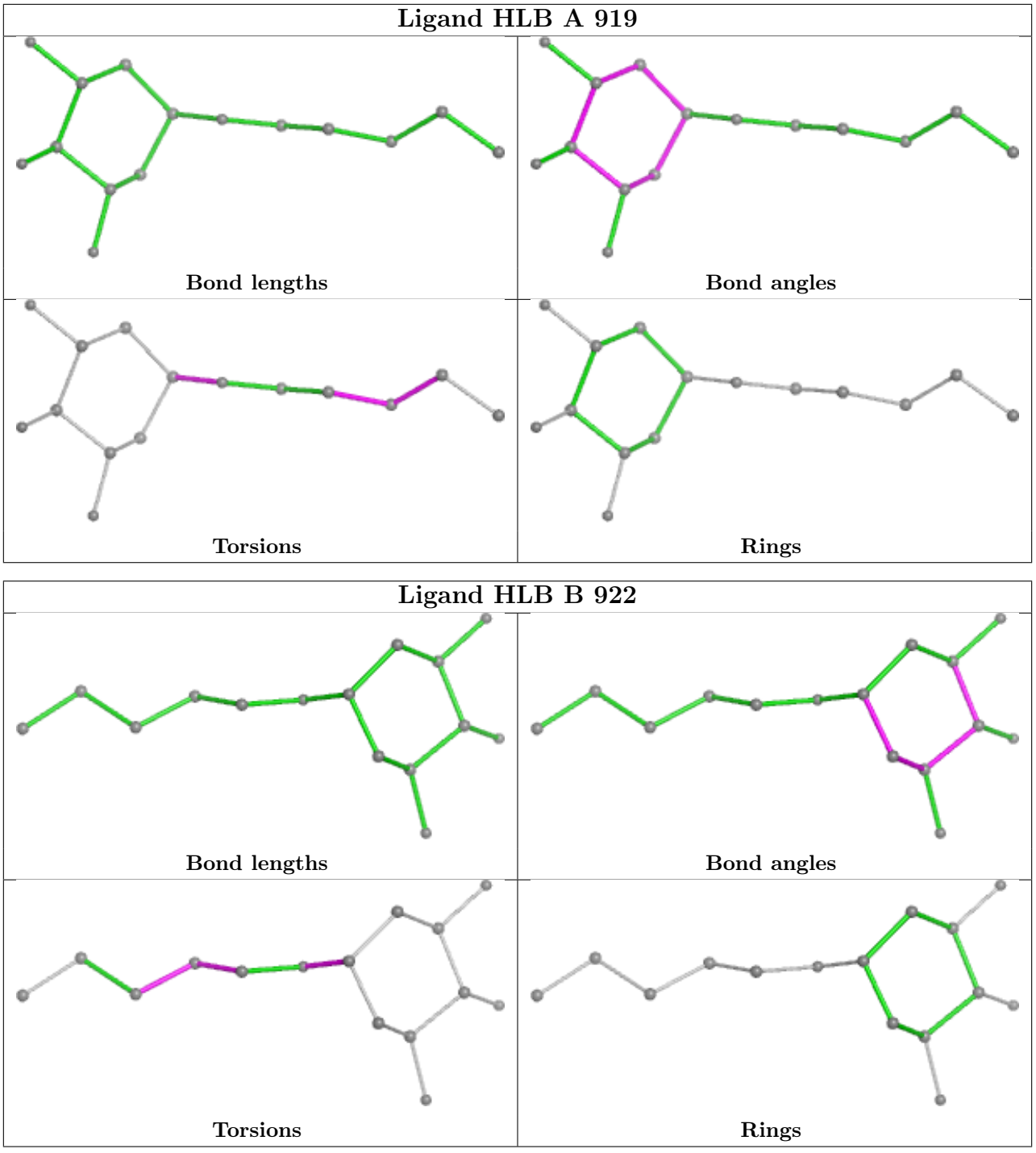
There are no ring outliers.

3 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	B	923	EDO	2	0
5	A	914	NAG	1	0
7	A	921	EDO	9	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.



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, 95^{th} 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	769/785 (97%)	-0.12	0 100 100	32, 49, 72, 87	14 (1%)
1	B	768/785 (97%)	-0.21	1 (0%) 92 94	20, 47, 71, 90	8 (1%)
All	All	1537/1570 (97%)	-0.17	1 (0%) 92 94	20, 48, 71, 90	22 (1%)

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	465	LEU	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, 95^{th} 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	PCA	B	19	8/9	0.94	0.06	37,40,44,45	0
1	PCA	A	19	8/9	0.95	0.06	40,41,43,44	0

6.3 Carbohydrates

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, 95^{th} 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	MAN	E	9	11/12	0.53	0.12	92,98,103,104	0
2	MAN	C	10	11/12	0.55	0.12	94,107,110,110	0

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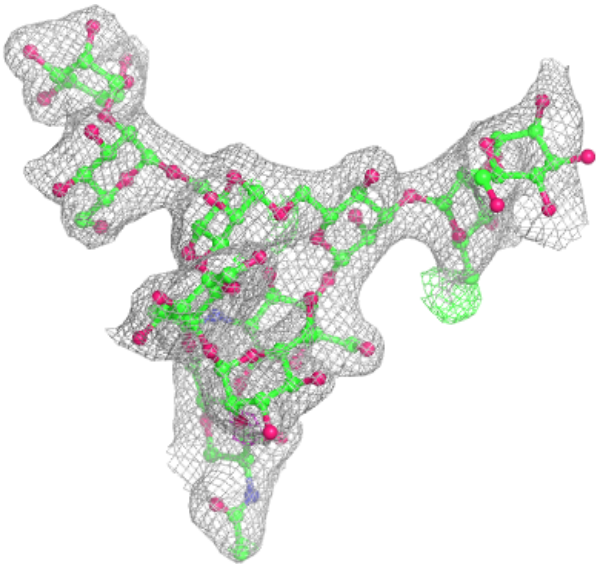
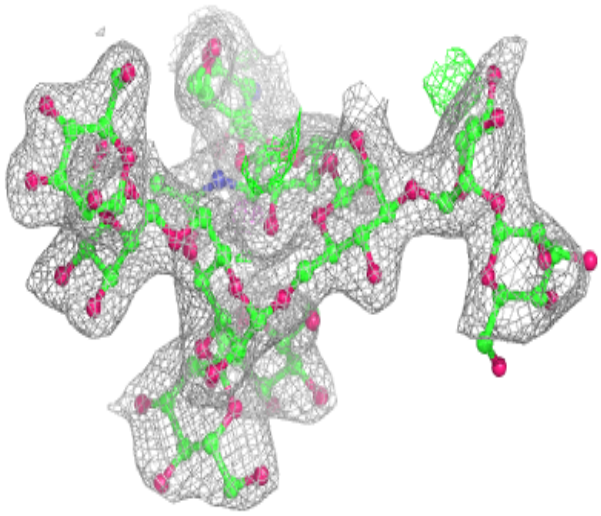
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	NAG	D	2	14/15	0.75	0.10	78,92,98,99	0
2	MAN	C	6	11/12	0.81	0.10	78,89,95,98	0
4	MAN	E	7	11/12	0.82	0.09	70,84,91,92	0
3	NAG	D	1	14/15	0.82	0.09	59,74,84,87	0
2	MAN	C	9	10/12	0.84	0.09	60,70,75,89	0
4	NAG	E	2	14/15	0.87	0.09	62,65,76,77	0
4	MAN	E	4	11/12	0.87	0.08	58,74,80,81	0
4	MAN	E	8	11/12	0.89	0.08	63,70,83,89	0
4	MAN	E	6	11/12	0.90	0.07	63,75,76,81	0
2	MAN	C	5	11/12	0.90	0.07	64,74,82,88	0
2	NAG	C	1	14/15	0.91	0.08	42,49,59,59	0
4	MAN	E	5	11/12	0.91	0.07	61,66,73,74	0
4	BMA	E	3	11/12	0.91	0.07	66,68,70,79	0
4	NAG	E	1	14/15	0.92	0.08	48,54,63,73	0
2	MAN	C	7	11/12	0.93	0.06	48,50,56,57	0
2	MAN	C	8	11/12	0.93	0.06	42,55,57,59	0
2	MAN	C	4	11/12	0.93	0.06	50,59,65,69	0
2	NAG	C	2	14/15	0.95	0.07	52,56,61,62	0
2	BMA	C	3	11/12	0.96	0.05	46,52,55,61	0

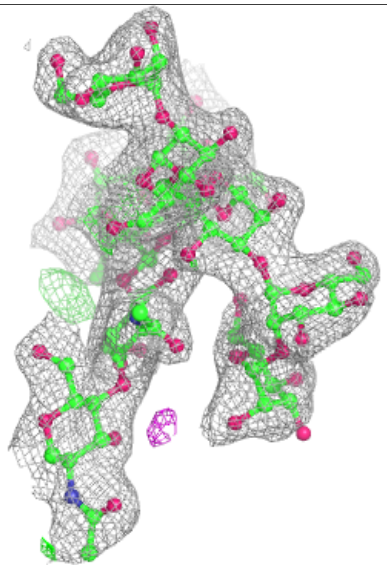
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around Chain C:

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

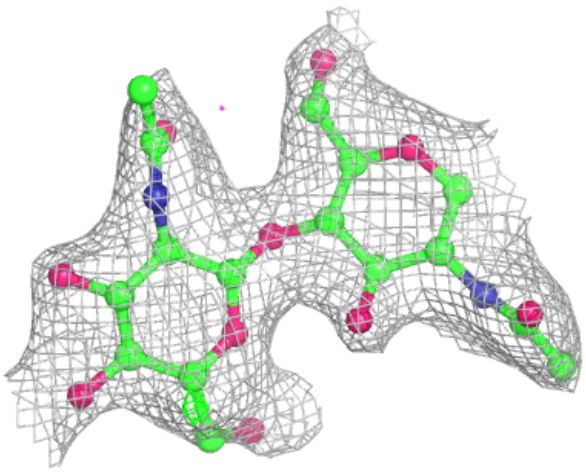


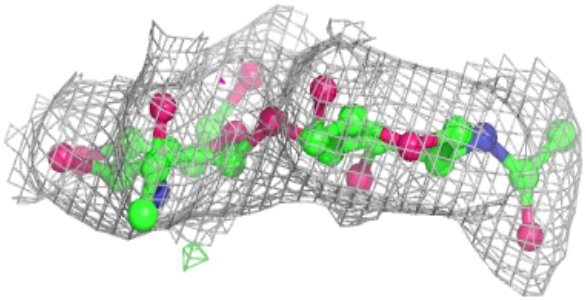


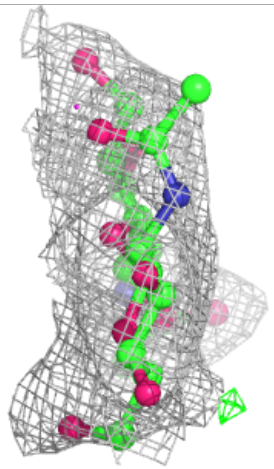


Electron density around Chain D:

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

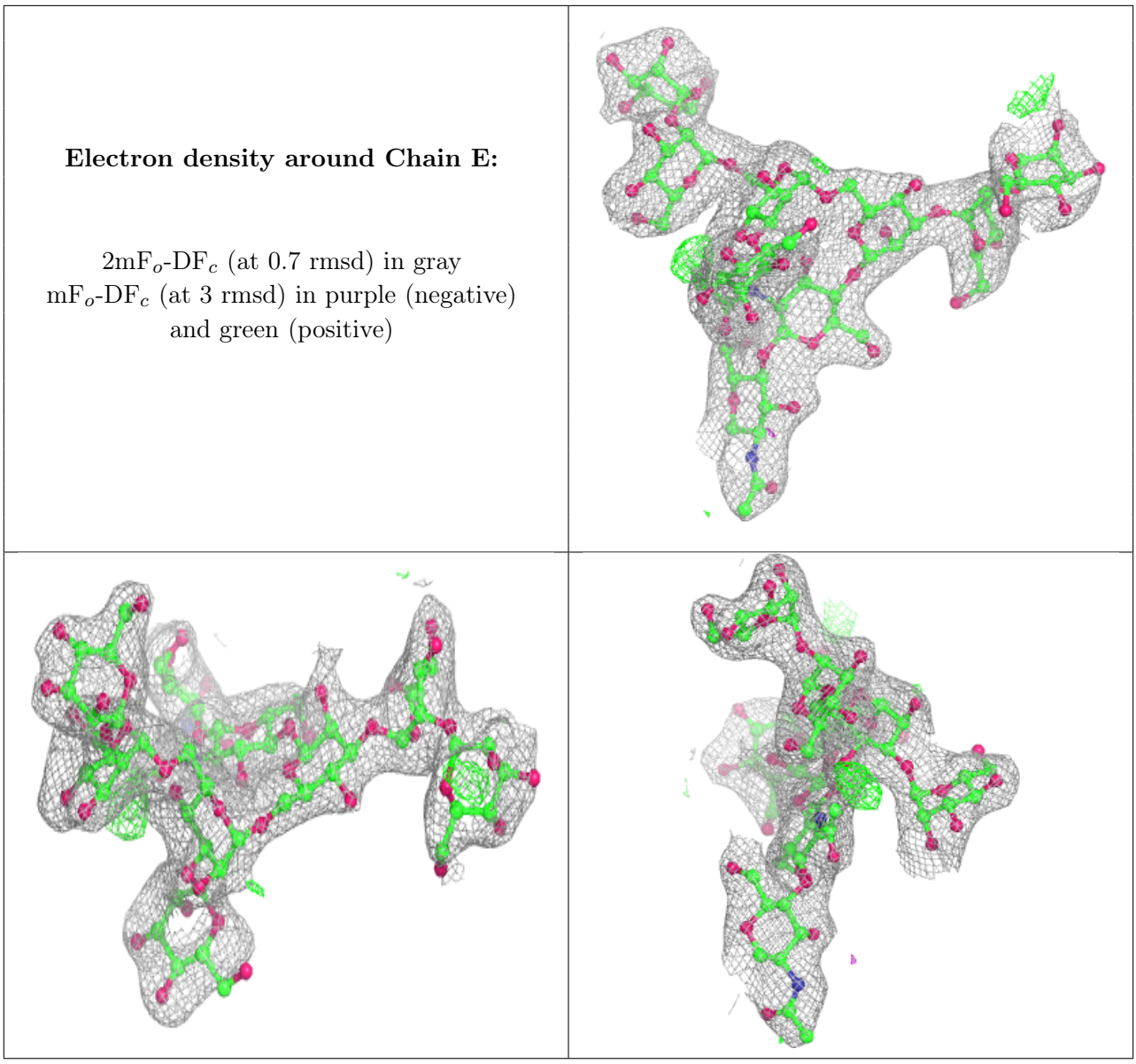






Electron density around Chain E:

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



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, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	NAG	B	921	14/15	0.60	0.12	80,104,115,128	0
5	NAG	A	913	14/15	0.73	0.09	80,87,92,97	0
5	NAG	A	918	14/15	0.74	0.10	77,86,97,99	0
5	NAG	B	920	14/15	0.76	0.10	67,83,91,91	0
5	NAG	B	919	14/15	0.76	0.09	76,83,93,97	0

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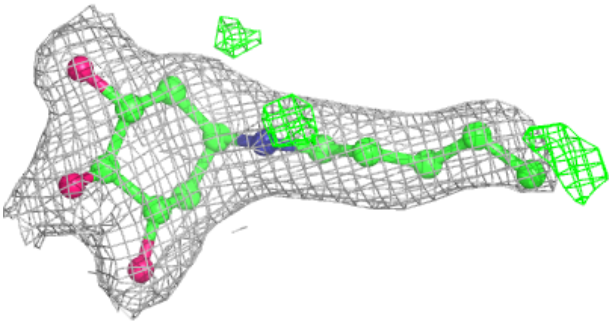
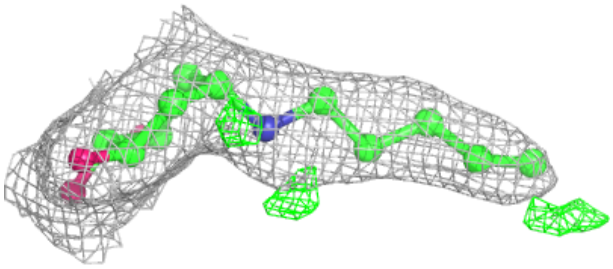
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	NAG	A	915	14/15	0.77	0.12	52,81,87,92	0
5	NAG	B	914	14/15	0.78	0.11	68,75,94,98	0
5	NAG	A	916	14/15	0.79	0.11	73,79,92,97	0
5	NAG	B	918	14/15	0.80	0.10	68,77,85,89	0
7	EDO	B	924	4/4	0.80	0.17	54,60,61,63	0
5	NAG	A	917	14/15	0.83	0.08	54,67,72,72	0
5	NAG	B	915	14/15	0.84	0.10	57,63,68,70	0
5	NAG	A	914	14/15	0.86	0.10	53,68,74,74	0
5	NAG	B	912	14/15	0.90	0.08	56,63,69,69	0
7	EDO	B	923	4/4	0.91	0.10	59,65,65,67	0
7	EDO	A	921	4/4	0.91	0.14	37,41,41,44	0
5	NAG	A	903	14/15	0.93	0.07	44,51,59,61	0
7	EDO	A	920	4/4	0.93	0.09	40,41,41,45	0
5	NAG	B	901	14/15	0.93	0.07	49,55,59,60	0
5	NAG	A	902	14/15	0.94	0.07	51,57,61,62	0
5	NAG	A	901	14/15	0.95	0.06	43,46,49,49	0
6	HLB	A	919	15/54	0.95	0.08	31,35,50,55	0
5	NAG	B	913	14/15	0.95	0.06	41,46,50,54	0
6	HLB	B	922	15/54	0.97	0.06	31,34,56,59	0

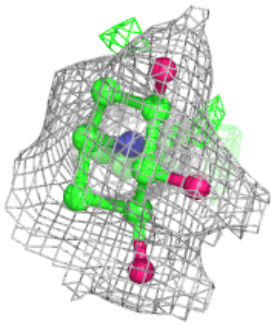
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around HLB A 919:

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

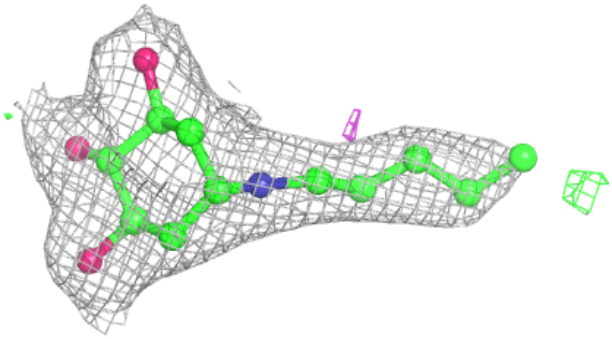


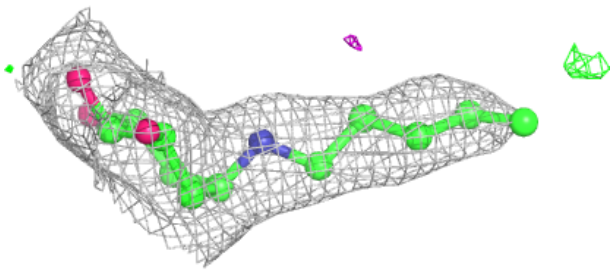


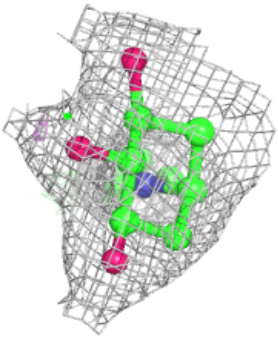


Electron density around HLB B 922:

$2mF_o$-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.