



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 16, 2026 – 08:43 PM JST

PDB ID : 9JLX / pdb\_00009jlx  
Title : Crystal structure of GH57 family amylopullulanase from Aquifex aeolicus mutant D352N in complex with maltoheptaose  
Authors : Zhu, Z.M.; Wang, W.W.; Li, M.J.; Xu, Q.; Zhou, H.; Huang, L.Q.; Wang, Q.S.; Yu, F.  
Deposited on : 2024-09-19  
Resolution : 1.83 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](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 2.0  
EDS : 3.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.48.1

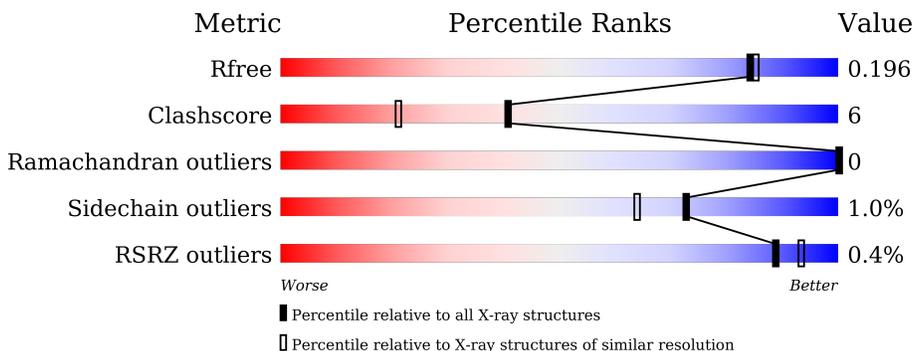
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.83 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.



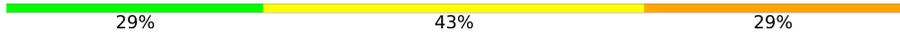
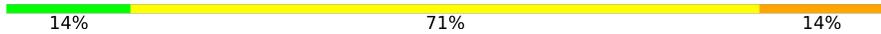
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	164625	1150 (1.84-1.84)
Clashscore	180529	1248 (1.84-1.84)
Ramachandran outliers	177936	1240 (1.84-1.84)
Sidechain outliers	177891	1240 (1.84-1.84)
RSRZ outliers	164620	1149 (1.84-1.84)

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  $\geq 3$ , 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	477	
1	B	477	
1	C	477	
1	D	477	
2	E	6	

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Mol	Chain	Length	Quality of chain
3	F	7	 29% 43% 29%
3	G	7	 14% 71% 14%
3	H	7	 43% 29% 29%

## 2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 17905 atoms, of which 48 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 Glycoside hydrolase family 57 N-terminal domain-containing protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	477	4083	2674	652	747	10	0	3	0
1	B	477	4052	2651	649	742	10	0	0	0
1	C	477	4052	2651	649	742	10	0	0	0
1	D	477	4052	2651	649	742	10	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	352	ASN	ASP	engineered mutation	UNP O66934
B	352	ASN	ASP	engineered mutation	UNP O66934
C	352	ASN	ASP	engineered mutation	UNP O66934
D	352	ASN	ASP	engineered mutation	UNP O66934

- Molecule 2 is an oligosaccharide called alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose.



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	Trace
			Total	O			
2	E	6	66	30	0	0	0

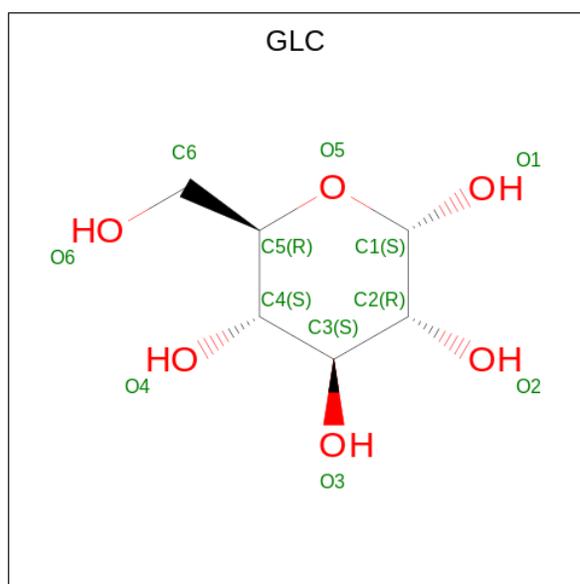
- Molecule 3 is an oligosaccharide called alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose.

)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose.



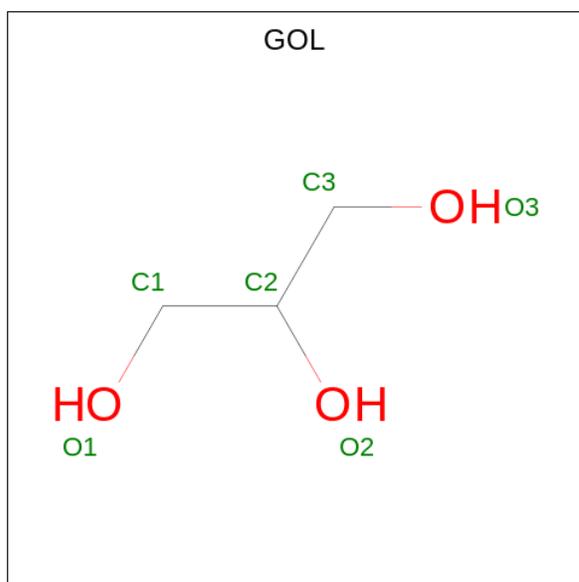
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	H	O			
3	F	7	90	42	12	36	0	0	0
3	G	7	90	42	12	36	0	0	0
3	H	7	90	42	12	36	0	0	0

- Molecule 4 is alpha-D-glucopyranose (CCD ID: GLC) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
4	A	1	24	6	12	6	0	0

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 6 3 3	0	0
5	D	1	Total C O 6 3 3	0	0

- Molecule 6 is water.

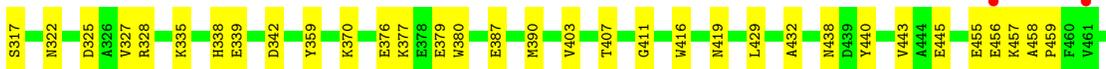
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	398	Total O 398 398	0	0
6	B	323	Total O 323 323	0	0
6	C	337	Total O 337 337	0	0
6	D	236	Total O 236 236	0	0





- Molecule 1: Glycoside hydrolase family 57 N-terminal domain-containing protein

Chain D: 85% 14%



- Molecule 2: alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose

Chain E: 33% 33% 33%



- Molecule 3: alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose

Chain F: 29% 43% 29%



- Molecule 3: alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose

Chain G: 14% 71% 14%



- Molecule 3: alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose

Chain H: 43% 29% 29%



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	40.83Å 61.46Å 195.70Å 84.00° 89.08° 89.20°	Depositor
Resolution (Å)	24.61 – 1.83 24.61 – 1.83	Depositor EDS
% Data completeness (in resolution range)	95.4 (24.61-1.83) 95.4 (24.61-1.83)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.82 (at 1.83Å)	Xtrriage
Refinement program	PHENIX (1.13_2998: ???)	Depositor
R, $R_{free}$	0.160 , 0.202 0.158 , 0.196	Depositor DCC
$R_{free}$ test set	7732 reflections (4.63%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	25.0	Xtrriage
Anisotropy	0.309	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.40 , 52.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.031 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	17905	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	25.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.04% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: GOL, GLC

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	0.35	0/4198	0.52	0/5677
1	B	0.30	0/4165	0.46	0/5633
1	C	0.30	0/4165	0.49	0/5633
1	D	0.39	0/4165	0.48	1/5633 (0.0%)
All	All	0.34	0/16693	0.49	1/22576 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	455	GLU	N-CA-C	-5.39	101.21	109.41

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	4083	0	4010	51	0
1	B	4052	0	3989	55	0
1	C	4052	0	3989	54	0
1	D	4052	0	3989	48	0
2	E	66	0	55	3	0
3	F	78	12	66	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	G	78	12	66	3	0
3	H	78	12	66	4	0
4	A	12	12	11	4	0
5	A	6	0	7	1	0
5	D	6	0	8	0	0
6	A	398	0	0	11	2
6	B	323	0	0	12	0
6	C	337	0	0	18	3
6	D	236	0	0	6	0
All	All	17857	48	16256	209	4

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (209) 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:473:ARG:NH2	6:B:503:HOH:O	1.85	1.06
1:B:390:MET:HA	1:B:390:MET:HE2	1.32	1.06
1:B:274:MET:HG3	1:B:390:MET:HE3	1.44	1.00
1:B:90:GLU:OE1	6:B:502:HOH:O	1.81	0.95
1:D:287:GLU:OE1	6:D:601:HOH:O	1.87	0.93
1:B:145:LYS:NZ	6:B:501:HOH:O	1.81	0.93
1:C:144:ARG:NE	6:C:503:HOH:O	2.00	0.93
1:C:208:ASN:OD1	6:C:501:HOH:O	1.84	0.92
1:B:93:GLU:OE1	6:B:504:HOH:O	1.87	0.90
1:C:387:GLU:HG3	6:C:502:HOH:O	1.72	0.87
1:C:251:TYR:OH	6:C:502:HOH:O	1.89	0.85
1:B:96:ILE:HG23	1:B:117:MET:HE1	1.56	0.85
1:C:218:LYS:NZ	6:C:506:HOH:O	2.13	0.81
1:B:149:ASP:OD1	6:B:505:HOH:O	1.99	0.80
1:B:279:GLU:HG2	1:B:283:LYS:HE2	1.63	0.80
1:C:181:ARG:NH1	6:C:508:HOH:O	2.17	0.78
1:B:160:GLU:OE2	6:B:506:HOH:O	2.03	0.77
1:B:469:ARG:O	1:B:473:ARG:HG2	1.85	0.76
1:C:439:ASP:OD2	6:C:504:HOH:O	2.02	0.76
1:C:401:GLU:OE1	6:C:505:HOH:O	2.04	0.76
1:D:1:MET:HE3	1:D:3:LYS:HD3	1.69	0.75
1:D:342:ASP:OD1	6:D:602:HOH:O	2.05	0.73
1:A:24[A]:GLU:OE2	1:A:73:LYS:HG3	1.89	0.72
1:B:164:TYR:OH	6:B:507:HOH:O	2.07	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:274:MET:HG3	1:B:390:MET:CE	2.19	0.72
1:A:335:LYS:HE3	6:A:916:HOH:O	1.89	0.72
1:A:342:ASP:OD2	6:A:602:HOH:O	2.07	0.71
1:A:373:SER:O	1:A:377:LYS:HG2	1.90	0.71
1:B:186:GLU:HG2	1:D:377:LYS:O	1.91	0.71
1:D:72:ALA:C	1:D:73:LYS:HD2	2.17	0.70
1:C:29:TRP:CD2	3:G:5:GLC:H2	2.27	0.70
1:A:29:TRP:CD2	2:E:4:GLC:H2	2.26	0.70
1:A:2:LYS:HD2	6:A:746:HOH:O	1.92	0.69
1:D:29:TRP:CD2	3:H:5:GLC:H2	2.28	0.69
1:C:71:LYS:HG3	1:C:71:LYS:O	1.92	0.69
1:C:457:LYS:HE3	1:C:462:GLU:OE1	1.94	0.68
1:A:462:GLU:H	1:A:462:GLU:CD	2.03	0.67
1:A:24[A]:GLU:CD	1:A:73:LYS:HG3	2.20	0.66
1:B:390:MET:HA	1:B:390:MET:CE	2.17	0.66
1:A:228:GLU:OE1	6:A:604:HOH:O	2.13	0.66
1:C:279:GLU:O	1:C:283:LYS:HG2	1.96	0.65
1:D:73:LYS:HD2	1:D:73:LYS:N	2.10	0.65
1:B:457:LYS:NZ	1:B:462:GLU:OE2	2.30	0.65
1:D:251:TYR:HE1	1:D:390:MET:SD	2.20	0.64
1:B:328:ARG:NH1	6:B:508:HOH:O	2.18	0.64
1:D:251:TYR:OH	1:D:387:GLU:HA	1.98	0.64
1:C:288:ARG:O	1:C:288:ARG:HG2	1.99	0.62
1:B:312:ASP:OD1	3:F:1:GLC:H1	2.00	0.62
1:C:469:ARG:NH1	6:C:512:HOH:O	2.26	0.61
1:C:176:THR:O	1:C:179:ILE:HG22	2.00	0.61
1:B:424:GLU:HA	1:B:427:LYS:HE2	1.81	0.61
1:B:390:MET:HE2	1:B:390:MET:CA	2.20	0.61
1:B:282:LEU:HG	1:B:289:ALA:HB1	1.82	0.60
1:A:101:LEU:HD13	1:A:459:PRO:HG2	1.84	0.60
1:A:251:TYR:OH	1:A:387:GLU:HA	2.03	0.59
1:C:435:LYS:O	1:C:437:LYS:HD2	2.02	0.59
3:H:6:GLC:H61	3:H:7:GLC:C5	2.32	0.59
1:B:415:LYS:HE2	1:B:451:TRP:CE2	2.38	0.58
1:A:391:ARG:NH2	6:A:607:HOH:O	2.37	0.58
1:D:438:ASN:OD1	1:D:440:TYR:HB2	2.04	0.58
1:A:293:LEU:HD22	1:A:396:LYS:HB2	1.85	0.58
1:B:29:TRP:CD2	3:F:5:GLC:H2	2.39	0.57
1:C:228:GLU:HG3	6:C:769:HOH:O	2.04	0.57
1:D:197:TYR:CE1	1:D:443:VAL:HG22	2.39	0.57
1:C:335:LYS:HE2	1:C:339:GLU:OE1	2.03	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:79:ALA:HB3	6:C:653:HOH:O	2.04	0.57
1:B:47:ASP:OD1	1:D:335:LYS:NZ	2.36	0.57
1:D:322:ASN:ND2	6:D:604:HOH:O	2.25	0.57
1:B:27:LEU:HG	1:B:463:VAL:HG11	1.87	0.56
1:C:251:TYR:OH	1:C:387:GLU:HA	2.04	0.56
1:B:362:GLU:OE1	6:B:509:HOH:O	2.18	0.56
1:C:117:MET:HE2	1:C:117:MET:HA	1.88	0.56
1:A:115:GLU:O	1:A:119:LYS:HD3	2.05	0.56
1:B:431:GLU:OE1	1:B:435:LYS:NZ	2.39	0.55
1:C:120:GLU:HA	1:C:120:GLU:OE2	2.07	0.54
1:A:109:ARG:NH1	1:A:361:GLU:OE2	2.28	0.54
1:B:274:MET:CG	1:B:390:MET:HE3	2.29	0.54
1:D:1:MET:HE1	1:D:379:GLU:O	2.07	0.54
1:B:366:PRO:O	1:B:370:LYS:HG3	2.07	0.54
1:C:27:LEU:HG	1:C:463:VAL:HG11	1.89	0.54
1:A:2:LYS:O	1:A:338:HIS:HE1	1.91	0.53
4:A:501:GLC:O3	2:E:1:GLC:C1	2.57	0.53
1:B:145:LYS:HD3	6:B:610:HOH:O	2.08	0.53
1:D:335:LYS:HE2	1:D:339:GLU:OE1	2.08	0.53
1:B:144:ARG:O	1:B:148:LYS:HE2	2.09	0.53
1:B:148:LYS:HE2	1:B:148:LYS:HA	1.91	0.53
1:A:40:ASP:HB3	5:A:502:GOL:H12	1.92	0.52
1:D:218:LYS:HA	6:D:732:HOH:O	2.09	0.52
1:B:197:TYR:CE1	1:B:443:VAL:HG22	2.44	0.52
1:A:148:LYS:HD3	6:A:665:HOH:O	2.10	0.52
1:B:336:LYS:NZ	1:B:339:GLU:OE2	2.42	0.52
1:B:6:LEU:O	1:B:383:THR:HA	2.10	0.52
1:A:116:LEU:HA	1:A:119:LYS:HZ2	1.75	0.52
1:B:394:ASP:OD1	1:B:394:ASP:N	2.39	0.52
1:C:78:GLU:O	1:C:82:LYS:HG3	2.10	0.52
1:B:135:LEU:HD11	1:B:166:LEU:HG	1.93	0.51
1:A:111:GLU:OE1	1:A:114:ARG:NH1	2.44	0.50
1:A:333:ARG:HG3	6:A:782:HOH:O	2.10	0.50
1:A:24[A]:GLU:OE2	1:A:73:LYS:HE3	2.11	0.50
1:A:24[B]:GLU:HG2	1:A:73:LYS:HG3	1.93	0.50
3:H:6:GLC:H61	3:H:7:GLC:O5	2.12	0.49
1:C:29:TRP:CG	3:G:5:GLC:H2	2.47	0.49
1:A:431:GLU:HG2	6:A:735:HOH:O	2.12	0.49
1:C:275:LEU:C	1:C:275:LEU:HD12	2.37	0.49
1:C:420:LYS:HA	1:C:420:LYS:HE2	1.94	0.49
1:B:251:TYR:OH	1:B:387:GLU:HA	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:469:ARG:NH1	6:B:503:HOH:O	2.46	0.49
1:C:111:GLU:OE2	1:C:155:ARG:NH1	2.47	0.48
1:C:324:GLU:HG3	6:C:693:HOH:O	2.12	0.48
1:D:432:ALA:HB2	1:D:472:VAL:HG13	1.96	0.48
1:C:219:ILE:HB	1:C:220:PRO:HD2	1.96	0.48
1:A:211:TYR:OH	1:A:219:ILE:HG12	2.13	0.48
1:A:232:LYS:HD3	1:A:442:LEU:HD11	1.96	0.48
1:C:462:GLU:H	1:C:462:GLU:CD	2.22	0.47
1:A:76[B]:PHE:HZ	1:A:460:PHE:CE1	2.32	0.47
1:B:120:GLU:H	1:B:120:GLU:CD	2.19	0.47
1:C:39:TYR:CE1	1:C:175:LYS:HG3	2.50	0.47
1:D:469:ARG:HH11	1:D:469:ARG:HG2	1.79	0.47
1:C:336:LYS:HG3	6:C:507:HOH:O	2.13	0.47
1:B:214:THR:O	1:B:217:VAL:HG12	2.14	0.47
1:A:224:VAL:CG1	1:A:434:LYS:HG2	2.45	0.47
1:A:312:ASP:OD1	4:A:501:GLC:H1	2.15	0.47
1:B:100:LYS:HG3	1:B:117:MET:HE2	1.97	0.47
1:A:34:ALA:HB1	6:A:628:HOH:O	2.14	0.47
1:D:2:LYS:HG3	1:D:338:HIS:NE2	2.30	0.46
1:B:200:LEU:HD11	1:B:416:TRP:CG	2.51	0.46
1:D:197:TYR:CZ	1:D:443:VAL:HG22	2.50	0.46
1:C:101:LEU:HD13	1:C:459:PRO:HG2	1.98	0.46
1:C:1:MET:HE3	6:C:541:HOH:O	2.14	0.46
1:C:1:MET:N	6:C:523:HOH:O	2.48	0.46
1:A:27:LEU:HG	1:A:463:VAL:HG11	1.97	0.45
1:D:458:ALA:HB1	1:D:459:PRO:HD2	1.97	0.45
1:A:121:LYS:HA	1:A:121:LYS:HE3	1.99	0.45
1:B:458:ALA:O	1:B:461:VAL:HG12	2.17	0.45
1:D:277:THR:OG1	1:D:281:ILE:HD12	2.17	0.45
1:D:327:VAL:HG21	1:D:370:LYS:HG3	1.98	0.45
1:D:469:ARG:HG2	1:D:469:ARG:NH1	2.32	0.45
1:D:114:ARG:NE	6:D:613:HOH:O	2.49	0.45
1:C:365:ILE:HB	1:C:366:PRO:HD3	1.98	0.45
1:D:29:TRP:CG	3:H:5:GLC:H2	2.52	0.45
1:A:425:TYR:HB3	1:A:450:PHE:CE2	2.52	0.44
1:D:109:ARG:HG3	1:D:114:ARG:NH2	2.32	0.44
1:D:282:LEU:HB2	1:D:305:PHE:CD2	2.52	0.44
1:D:298:ARG:O	1:D:300:LEU:HG	2.17	0.44
1:D:176:THR:O	1:D:179:ILE:HG22	2.17	0.44
1:A:370:LYS:HB3	1:A:370:LYS:NZ	2.33	0.44
1:A:218:LYS:NZ	1:A:218:LYS:HB3	2.32	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:419:ASN:OD1	1:D:419:ASN:C	2.61	0.44
1:A:200:LEU:HD11	1:A:416:TRP:CG	2.53	0.44
1:D:325:ASP:OD2	6:D:603:HOH:O	2.21	0.44
1:B:80:ILE:HG21	1:B:135:LEU:HG	2.00	0.44
1:C:198:HIS:N	1:C:199:PRO:CD	2.81	0.44
1:B:43:ALA:HA	1:B:179:ILE:HD11	1.99	0.44
1:C:293:LEU:HD23	1:C:398:GLU:HB2	2.00	0.44
1:A:224:VAL:HG11	1:A:434:LYS:HG2	1.99	0.43
1:D:380:TRP:CD1	1:D:380:TRP:H	2.35	0.43
1:D:106:PRO:HD2	1:D:359:TYR:HA	2.01	0.43
1:B:215:PRO:HB3	6:B:602:HOH:O	2.18	0.43
1:A:328:ARG:NH1	6:A:624:HOH:O	2.50	0.43
1:C:238:LYS:HE3	6:C:525:HOH:O	2.19	0.43
1:C:282:LEU:HB2	1:C:305:PHE:CD2	2.53	0.43
1:C:409:PHE:HD2	3:G:2:GLC:O2	2.01	0.43
1:C:2:LYS:NZ	1:C:341:VAL:O	2.49	0.43
1:A:407:THR:O	1:A:411:GLY:HA2	2.19	0.43
1:B:407:THR:O	1:B:411:GLY:HA2	2.18	0.43
1:A:306:ARG:HH22	4:A:501:GLC:C1	2.31	0.43
1:C:84:PRO:HA	1:C:87:LEU:HD12	2.00	0.43
1:A:52:LEU:O	1:A:189:GLY:HA3	2.19	0.43
1:A:29:TRP:CG	2:E:4:GLC:H2	2.54	0.42
1:C:420:LYS:HA	1:C:420:LYS:CE	2.49	0.42
1:D:19:GLU:OE2	1:D:21:TYR:N	2.49	0.42
1:D:313:LEU:HA	1:D:317:SER:HB3	2.01	0.42
1:A:3:LYS:HE3	1:A:379:GLU:O	2.19	0.42
1:A:25:TYR:OH	1:A:66:GLU:OE1	2.36	0.42
1:D:325:ASP:OD1	1:D:328:ARG:NH2	2.52	0.42
1:D:407:THR:O	1:D:411:GLY:HA2	2.20	0.42
1:B:283:LYS:HD3	1:B:289:ALA:HB3	2.01	0.42
1:C:68:ALA:O	1:C:174:LYS:HE2	2.19	0.42
1:D:432:ALA:CB	1:D:472:VAL:HG13	2.49	0.42
1:C:6:LEU:O	1:C:383:THR:HA	2.19	0.42
1:A:306:ARG:NH2	4:A:501:GLC:O1	2.51	0.42
1:C:119:LYS:NZ	6:C:528:HOH:O	2.53	0.42
1:C:198:HIS:N	1:C:199:PRO:HD3	2.35	0.42
1:D:200:LEU:HD11	1:D:416:TRP:CG	2.54	0.42
1:C:42:PRO:HG3	1:C:180:TYR:CZ	2.55	0.42
1:A:275:LEU:HD12	1:A:275:LEU:C	2.45	0.41
1:D:49:GLU:N	1:D:376:GLU:OE2	2.51	0.41
1:D:275:LEU:HD12	1:D:275:LEU:C	2.45	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:84:PRO:HG2	1:C:128:LEU:HG	2.02	0.41
1:D:205:LEU:O	1:D:227:ARG:NH1	2.50	0.41
1:A:282:LEU:HB2	1:A:305:PHE:CD1	2.55	0.41
1:B:198:HIS:N	1:B:199:PRO:CD	2.83	0.41
1:D:285:SER:HB3	1:D:403:VAL:HA	2.01	0.41
1:B:197:TYR:CZ	1:B:443:VAL:HG22	2.56	0.41
1:D:26:LEU:HD13	1:D:466:LYS:HD3	2.03	0.41
1:A:380:TRP:CD1	1:A:380:TRP:H	2.39	0.41
1:B:276:ALA:HA	1:B:304:PHE:O	2.21	0.41
1:C:188:LYS:HE3	6:C:677:HOH:O	2.21	0.41
1:D:429:LEU:HD21	1:D:445:GLU:HG2	2.03	0.41
1:B:198:HIS:CE1	1:B:255:PRO:HB3	2.56	0.40
1:C:195:PRO:HD2	1:C:255:PRO:HD3	2.03	0.40
1:A:6:LEU:O	1:A:383:THR:HA	2.21	0.40
1:B:73:LYS:HA	1:B:73:LYS:HD3	1.82	0.40
1:D:198:HIS:N	1:D:199:PRO:CD	2.85	0.40
1:A:81:ARG:NE	6:A:601:HOH:O	2.00	0.40
1:B:213:THR:HG21	1:B:411:GLY:O	2.21	0.40
1:C:116:LEU:HD22	1:C:126:GLU:HB3	2.01	0.40
1:A:282:LEU:HD11	1:A:289:ALA:HB1	2.04	0.40
1:D:276:ALA:HA	1:D:304:PHE:O	2.21	0.40

All (4) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:603:HOH:O	6:A:814:HOH:O[1_545]	1.82	0.38
6:C:742:HOH:O	6:C:821:HOH:O[1_455]	1.91	0.29
6:C:724:HOH:O	6:C:797:HOH:O[1_545]	1.98	0.22
6:A:900:HOH:O	6:C:800:HOH:O[1_665]	2.14	0.06

## 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	478/477 (100%)	471 (98%)	7 (2%)	0	100	100
1	B	475/477 (100%)	468 (98%)	7 (2%)	0	100	100
1	C	475/477 (100%)	467 (98%)	8 (2%)	0	100	100
1	D	475/477 (100%)	466 (98%)	9 (2%)	0	100	100
All	All	1903/1908 (100%)	1872 (98%)	31 (2%)	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	440/437 (101%)	435 (99%)	5 (1%)	70	60
1	B	437/437 (100%)	433 (99%)	4 (1%)	75	67
1	C	437/437 (100%)	435 (100%)	2 (0%)	86	83
1	D	437/437 (100%)	431 (99%)	6 (1%)	62	50
All	All	1751/1748 (100%)	1734 (99%)	17 (1%)	73	64

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	119	LYS
1	A	120	GLU
1	A	121	LYS
1	A	456	GLU
1	B	1	MET
1	B	120	GLU
1	B	145	LYS
1	B	322	ASN
1	C	286	VAL
1	C	462	GLU

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Mol	Chain	Res	Type
1	D	1	MET
1	D	2	LYS
1	D	3	LYS
1	D	286	VAL
1	D	456	GLU
1	D	457	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	134	ASN
1	B	216	ASN
1	B	476	GLN
1	D	476	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](#)

27 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	GLC	E	1	2	11,11,12	0.57	0	15,15,17	1.57	3 (20%)
2	GLC	E	2	2	11,11,12	0.55	0	15,15,17	0.94	0
2	GLC	E	3	2	11,11,12	0.66	0	15,15,17	0.92	1 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	GLC	E	4	2	11,11,12	0.58	0	15,15,17	1.12	2 (13%)
2	GLC	E	5	2	11,11,12	0.60	0	15,15,17	0.85	0
2	GLC	E	6	2	11,11,12	0.56	0	15,15,17	1.02	1 (6%)
3	GLC	F	1	3	12,12,12	0.85	0	17,17,17	2.04	2 (11%)
3	GLC	F	2	3	11,11,12	0.69	0	15,15,17	1.61	3 (20%)
3	GLC	F	3	3	11,11,12	0.58	0	15,15,17	1.15	1 (6%)
3	GLC	F	4	3	11,11,12	0.57	0	15,15,17	0.68	0
3	GLC	F	5	3	11,11,12	0.59	0	15,15,17	1.32	2 (13%)
3	GLC	F	6	3	11,11,12	0.75	0	15,15,17	0.89	0
3	GLC	F	7	3	11,11,12	0.65	0	15,15,17	1.17	1 (6%)
3	GLC	G	1	3	12,12,12	0.51	0	17,17,17	1.37	4 (23%)
3	GLC	G	2	3	11,11,12	0.38	0	15,15,17	1.02	0
3	GLC	G	3	3	11,11,12	0.61	0	15,15,17	1.04	1 (6%)
3	GLC	G	4	3	11,11,12	0.52	0	15,15,17	0.84	0
3	GLC	G	5	3	11,11,12	0.65	0	15,15,17	1.08	2 (13%)
3	GLC	G	6	3	11,11,12	0.59	0	15,15,17	0.93	1 (6%)
3	GLC	G	7	3	11,11,12	0.72	0	15,15,17	1.28	1 (6%)
3	GLC	H	1	3	12,12,12	0.50	0	17,17,17	1.48	5 (29%)
3	GLC	H	2	3	11,11,12	0.38	0	15,15,17	0.96	0
3	GLC	H	3	3	11,11,12	0.35	0	15,15,17	0.81	0
3	GLC	H	4	3	11,11,12	0.42	0	15,15,17	0.81	0
3	GLC	H	5	3	11,11,12	0.53	0	15,15,17	1.07	1 (6%)
3	GLC	H	6	3	11,11,12	0.64	0	15,15,17	0.81	0
3	GLC	H	7	3	11,11,12	0.61	0	15,15,17	1.22	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	GLC	E	1	2	-	2/2/19/22	0/1/1/1
2	GLC	E	2	2	-	0/2/19/22	0/1/1/1
2	GLC	E	3	2	-	0/2/19/22	0/1/1/1
2	GLC	E	4	2	-	0/2/19/22	0/1/1/1
2	GLC	E	5	2	-	0/2/19/22	0/1/1/1
2	GLC	E	6	2	-	0/2/19/22	0/1/1/1
3	GLC	F	1	3	-	0/2/22/22	0/1/1/1
3	GLC	F	2	3	-	2/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GLC	F	3	3	-	0/2/19/22	0/1/1/1
3	GLC	F	4	3	-	0/2/19/22	0/1/1/1
3	GLC	F	5	3	-	0/2/19/22	0/1/1/1
3	GLC	F	6	3	-	2/2/19/22	0/1/1/1
3	GLC	F	7	3	-	2/2/19/22	0/1/1/1
3	GLC	G	1	3	-	2/2/22/22	0/1/1/1
3	GLC	G	2	3	-	1/2/19/22	0/1/1/1
3	GLC	G	3	3	-	0/2/19/22	0/1/1/1
3	GLC	G	4	3	-	0/2/19/22	0/1/1/1
3	GLC	G	5	3	-	0/2/19/22	0/1/1/1
3	GLC	G	6	3	-	0/2/19/22	0/1/1/1
3	GLC	G	7	3	-	2/2/19/22	0/1/1/1
3	GLC	H	1	3	-	2/2/22/22	0/1/1/1
3	GLC	H	2	3	-	2/2/19/22	0/1/1/1
3	GLC	H	3	3	-	1/2/19/22	0/1/1/1
3	GLC	H	4	3	-	0/2/19/22	0/1/1/1
3	GLC	H	5	3	-	0/2/19/22	0/1/1/1
3	GLC	H	6	3	-	0/2/19/22	0/1/1/1
3	GLC	H	7	3	-	2/2/19/22	0/1/1/1

There are no bond length outliers.

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	1	GLC	O5-C1-C2	6.51	121.90	110.28
3	F	3	GLC	C1-O5-C5	3.66	117.16	112.19
3	F	2	GLC	O4-C4-C5	-3.57	100.43	109.30
3	H	5	GLC	C1-O5-C5	3.33	116.70	112.19
3	F	2	GLC	C1-C2-C3	-3.21	105.72	109.67
3	G	3	GLC	C1-O5-C5	3.18	116.50	112.19
3	H	7	GLC	C1-C2-C3	3.18	113.57	109.67
3	G	7	GLC	O5-C1-C2	-3.13	105.93	110.77
3	H	1	GLC	O3-C3-C2	-2.96	103.52	110.35
2	E	1	GLC	O5-C5-C6	2.88	111.71	107.20
3	G	6	GLC	O5-C1-C2	-2.79	106.47	110.77
2	E	6	GLC	O5-C1-C2	-2.78	106.48	110.77
2	E	1	GLC	O5-C1-C2	-2.74	106.54	110.77
2	E	4	GLC	C1-O5-C5	2.69	115.83	112.19
2	E	4	GLC	O5-C1-C2	-2.62	106.73	110.77
3	G	1	GLC	O4-C4-C3	2.61	116.37	110.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	H	1	GLC	O4-C4-C5	-2.57	102.92	109.30
3	G	1	GLC	O4-C4-C5	-2.55	102.95	109.30
3	F	2	GLC	C2-C3-C4	-2.45	106.66	110.89
3	H	1	GLC	C1-O5-C5	2.43	118.24	113.66
3	G	5	GLC	O5-C1-C2	-2.39	107.09	110.77
3	F	1	GLC	C1-O5-C5	2.37	118.13	113.66
3	F	5	GLC	C1-O5-C5	2.36	115.38	112.19
3	G	1	GLC	O3-C3-C2	-2.32	104.98	110.35
3	F	7	GLC	C1-C2-C3	-2.30	106.84	109.67
2	E	1	GLC	O2-C2-C1	-2.28	104.48	109.15
3	G	5	GLC	C1-O5-C5	2.16	115.11	112.19
2	E	3	GLC	C1-O5-C5	2.15	115.10	112.19
3	F	5	GLC	O5-C1-C2	-2.07	107.57	110.77
3	H	1	GLC	O5-C1-C2	2.06	113.96	110.28
3	H	1	GLC	O4-C4-C3	2.05	115.09	110.35
3	G	1	GLC	O3-C3-C4	2.00	114.98	110.35

There are no chirality outliers.

All (20) torsion outliers are listed below:

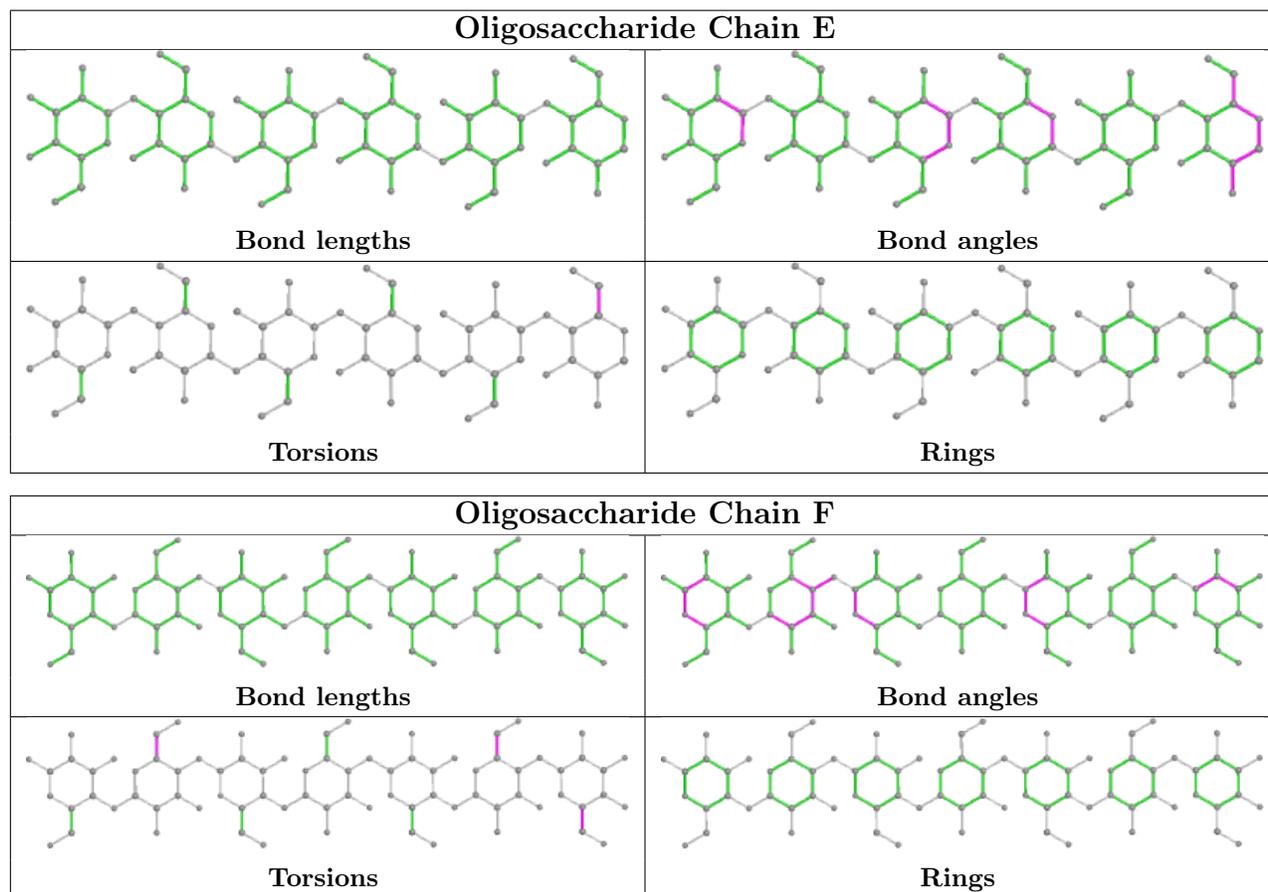
Mol	Chain	Res	Type	Atoms
3	F	2	GLC	O5-C5-C6-O6
3	G	7	GLC	O5-C5-C6-O6
3	H	7	GLC	O5-C5-C6-O6
3	G	7	GLC	C4-C5-C6-O6
3	F	2	GLC	C4-C5-C6-O6
2	E	1	GLC	C4-C5-C6-O6
3	F	7	GLC	O5-C5-C6-O6
3	F	6	GLC	O5-C5-C6-O6
3	H	7	GLC	C4-C5-C6-O6
3	H	2	GLC	C4-C5-C6-O6
2	E	1	GLC	O5-C5-C6-O6
3	F	6	GLC	C4-C5-C6-O6
3	G	1	GLC	O5-C5-C6-O6
3	F	7	GLC	C4-C5-C6-O6
3	G	1	GLC	C4-C5-C6-O6
3	H	2	GLC	O5-C5-C6-O6
3	G	2	GLC	C4-C5-C6-O6
3	H	1	GLC	O5-C5-C6-O6
3	H	1	GLC	C4-C5-C6-O6
3	H	3	GLC	C4-C5-C6-O6

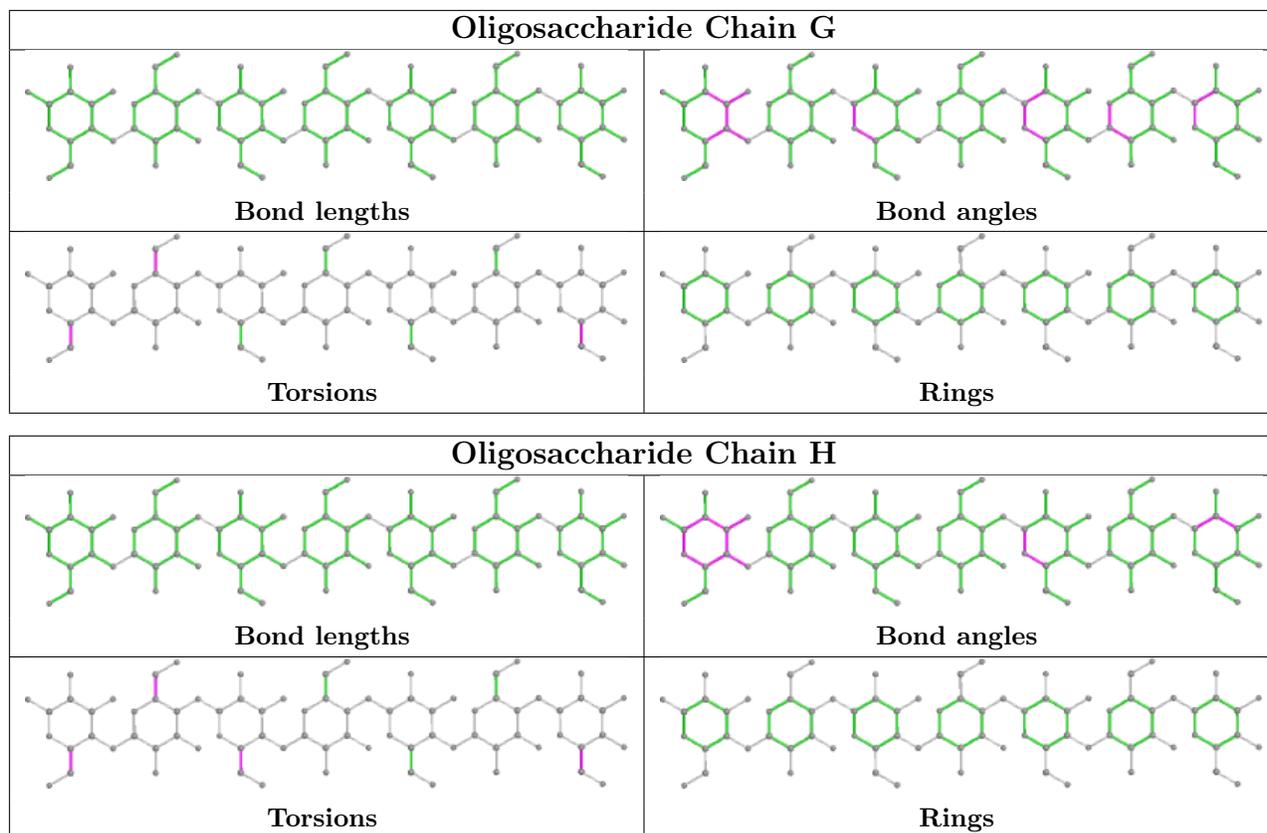
There are no ring outliers.

9 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	H	5	GLC	2	0
3	H	6	GLC	2	0
3	F	5	GLC	1	0
3	H	7	GLC	2	0
3	G	5	GLC	2	0
2	E	1	GLC	1	0
2	E	4	GLC	2	0
3	G	2	GLC	1	0
3	F	1	GLC	1	0

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





## 5.6 Ligand geometry [i](#)

3 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	GLC	A	501	-	12,12,12	0.87	0	17,17,17	2.02	1 (5%)
5	GOL	D	501	-	5,5,5	0.81	0	5,5,5	1.22	1 (20%)
5	GOL	A	502	-	5,5,5	0.97	0	5,5,5	1.16	1 (20%)

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	GLC	A	501	-	-	0/2/22/22	0/1/1/1
5	GOL	D	501	-	-	0/4/4/4	-
5	GOL	A	502	-	-	2/4/4/4	-

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	501	GLC	O5-C1-C2	7.42	123.52	110.28
5	D	501	GOL	C3-C2-C1	-2.33	102.67	111.70
5	A	502	GOL	C3-C2-C1	-2.10	103.56	111.70

There are no chirality outliers.

All (2) torsion outliers are listed below:

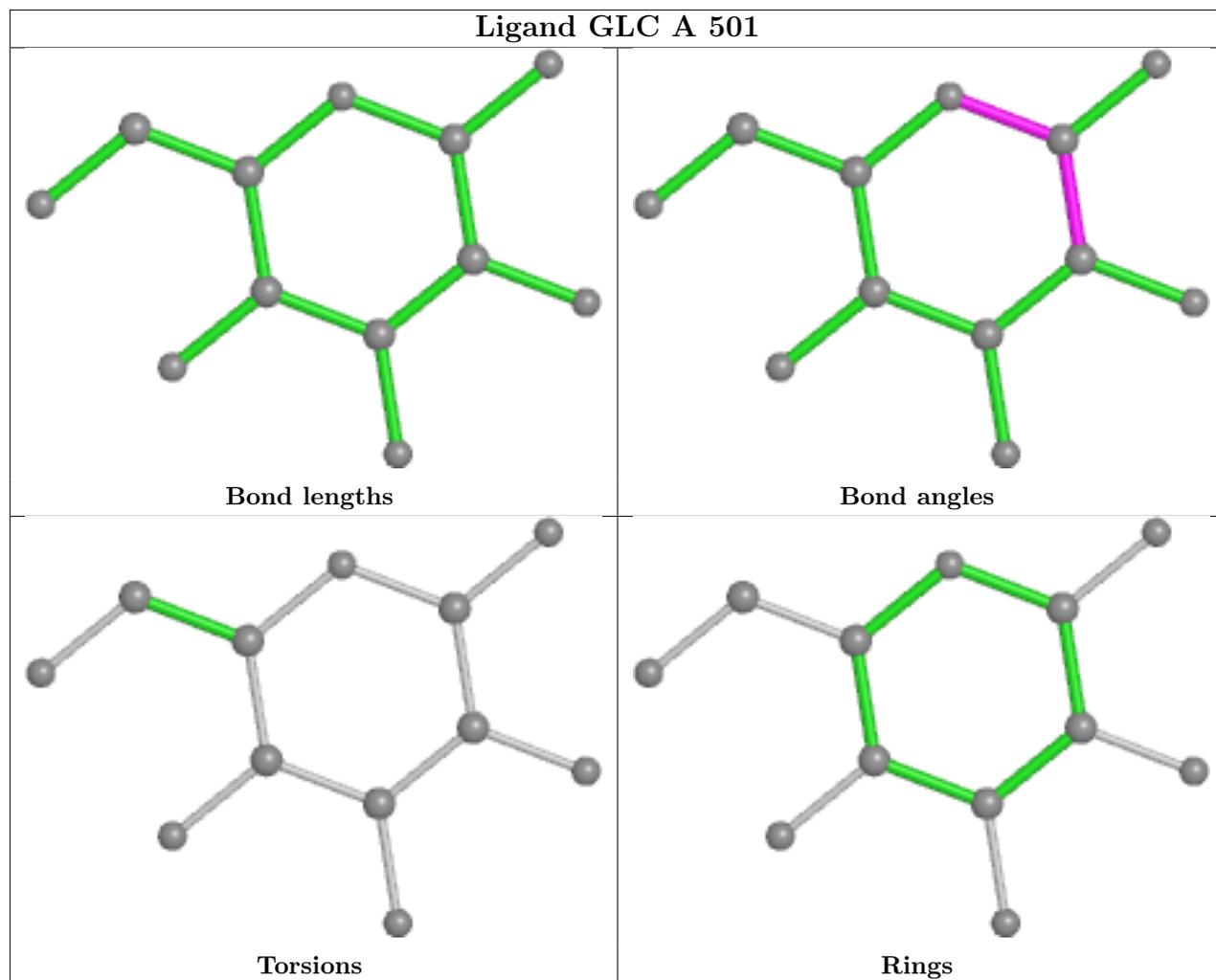
Mol	Chain	Res	Type	Atoms
5	A	502	GOL	O1-C1-C2-O2
5	A	502	GOL	O1-C1-C2-C3

There are no ring outliers.

2 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	501	GLC	4	0
5	A	502	GOL	1	0

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



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	477/477 (100%)	-0.83	3 (0%) 85 91	8, 17, 38, 68	3 (0%)
1	B	477/477 (100%)	-0.70	1 (0%) 92 95	12, 23, 42, 63	0
1	C	477/477 (100%)	-0.71	2 (0%) 89 93	9, 20, 44, 78	0
1	D	477/477 (100%)	-0.49	2 (0%) 89 93	13, 29, 52, 78	0
All	All	1908/1908 (100%)	-0.68	8 (0%) 89 93	8, 22, 45, 78	3 (0%)

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	288	ARG	3.7
1	C	289	ALA	3.6
1	A	316[A]	PHE	3.0
1	B	1	MET	3.0
1	A	1	MET	2.5
1	A	120	GLU	2.4
1	D	461	VAL	2.3
1	D	456	GLU	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](#)

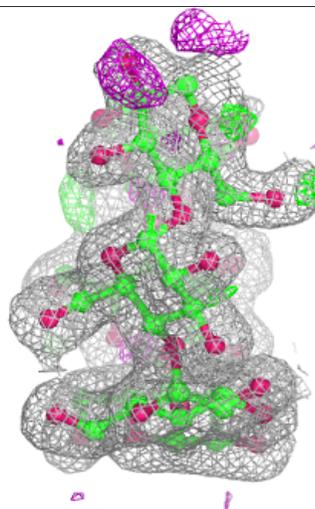
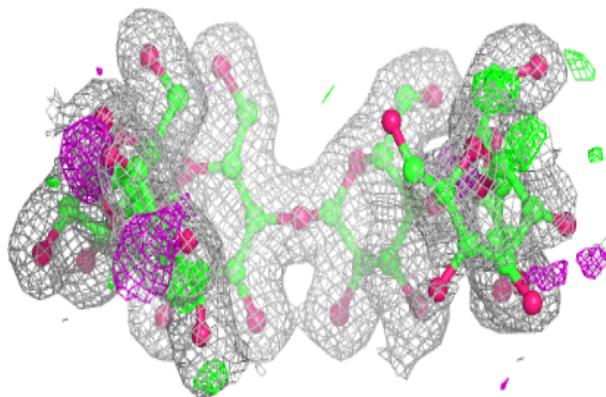
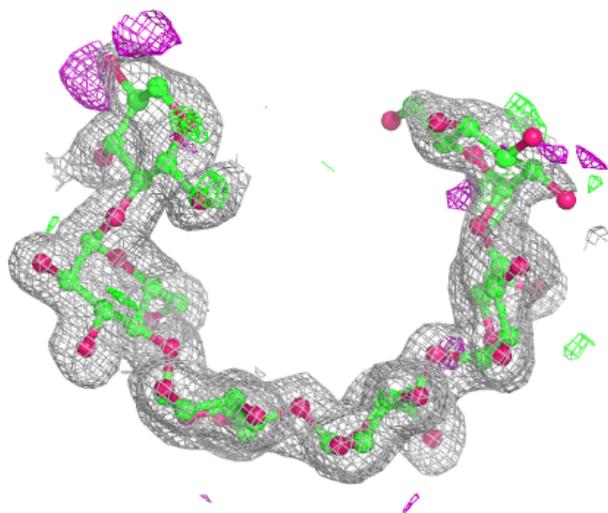
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 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
3	GLC	H	7	11/12	0.52	0.13	63,72,75,76	0
3	GLC	G	7	11/12	0.55	0.14	66,74,80,82	0
3	GLC	F	7	11/12	0.65	0.11	62,66,76,78	0
2	GLC	E	6	11/12	0.71	0.15	67,76,80,84	0
3	GLC	G	1	12/12	0.82	0.16	20,20,20,20	0
3	GLC	H	1	12/12	0.85	0.17	20,20,20,20	0
3	GLC	F	1	12/12	0.87	0.11	30,42,53,62	0
2	GLC	E	1	11/12	0.90	0.09	13,22,30,41	0
3	GLC	G	6	11/12	0.91	0.08	24,27,46,46	0
3	GLC	F	2	11/12	0.91	0.10	15,35,42,47	0
3	GLC	F	6	11/12	0.93	0.07	17,24,39,46	0
3	GLC	H	2	11/12	0.94	0.07	16,24,35,39	0
3	GLC	H	6	11/12	0.94	0.06	28,33,40,54	0
3	GLC	G	2	11/12	0.94	0.07	14,20,29,32	0
2	GLC	E	5	11/12	0.95	0.06	15,20,30,49	0
3	GLC	H	3	11/12	0.96	0.04	11,14,17,18	0
2	GLC	E	4	11/12	0.96	0.05	10,11,15,16	0
3	GLC	F	5	11/12	0.96	0.05	11,13,15,17	0
3	GLC	H	5	11/12	0.97	0.04	12,15,22,24	0
3	GLC	G	5	11/12	0.97	0.04	11,12,20,21	0
3	GLC	F	4	11/12	0.97	0.04	9,12,15,16	0
3	GLC	G	4	11/12	0.98	0.04	8,11,14,16	0
2	GLC	E	3	11/12	0.98	0.03	5,8,10,11	0
3	GLC	H	4	11/12	0.98	0.05	9,12,17,19	0
2	GLC	E	2	11/12	0.98	0.04	5,8,11,13	0
3	GLC	F	3	11/12	0.98	0.04	9,12,15,17	0
3	GLC	G	3	11/12	0.98	0.03	7,9,12,13	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.

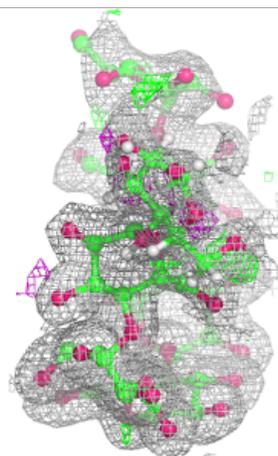
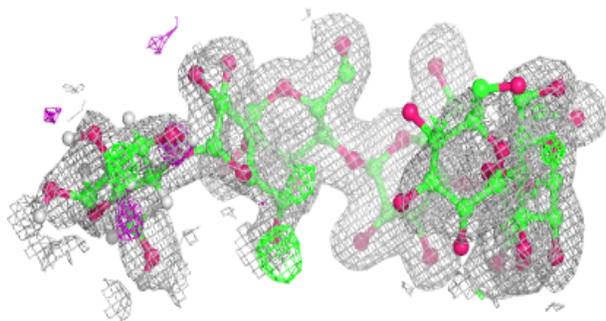
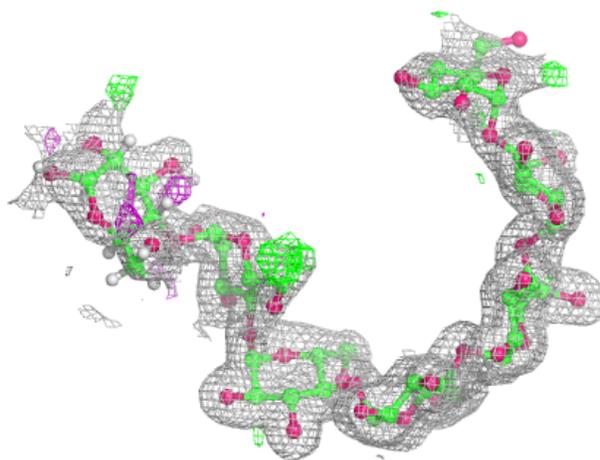
**Electron density around Chain E:**

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



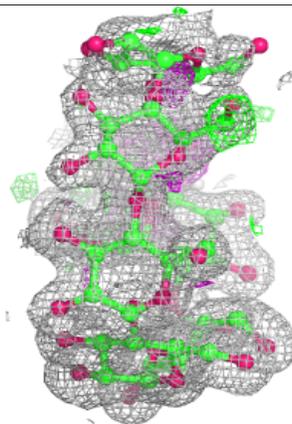
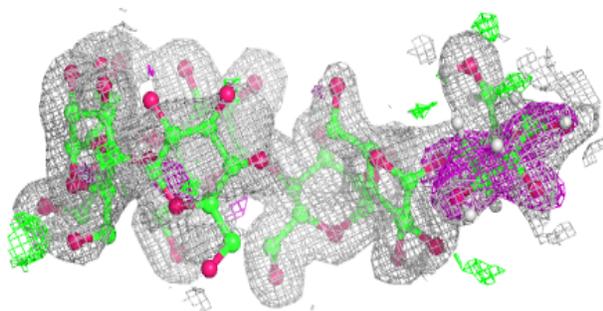
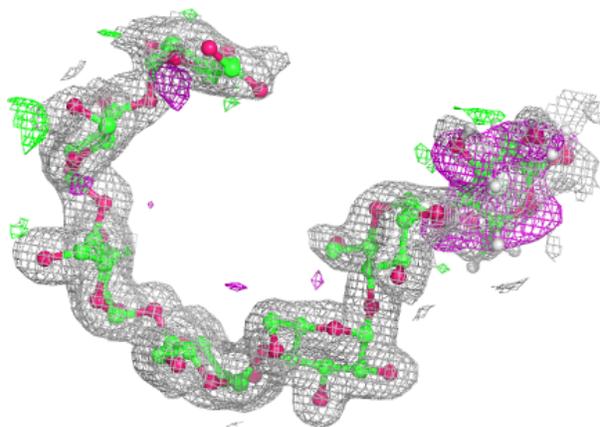
**Electron density around Chain F:**

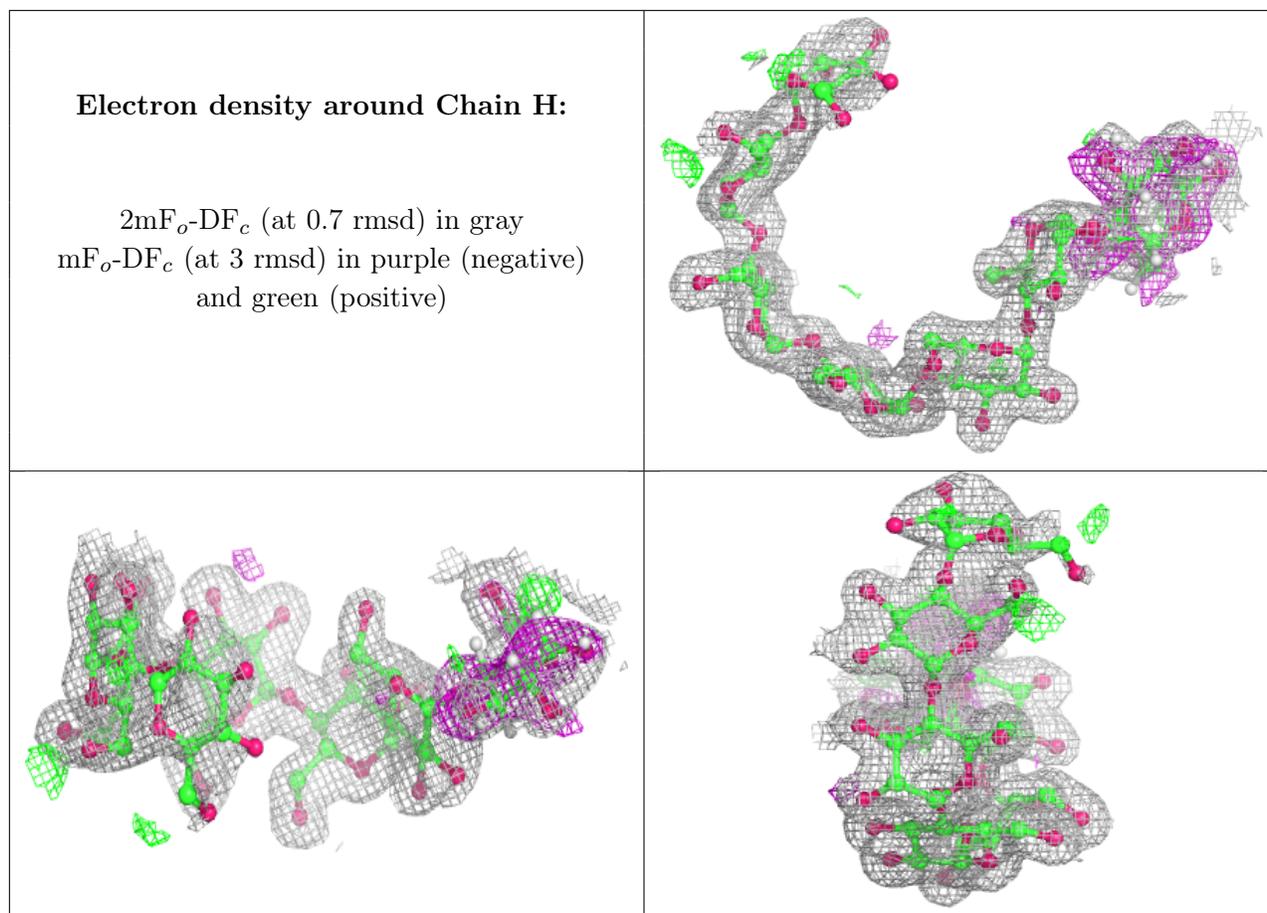
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around Chain G:**

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



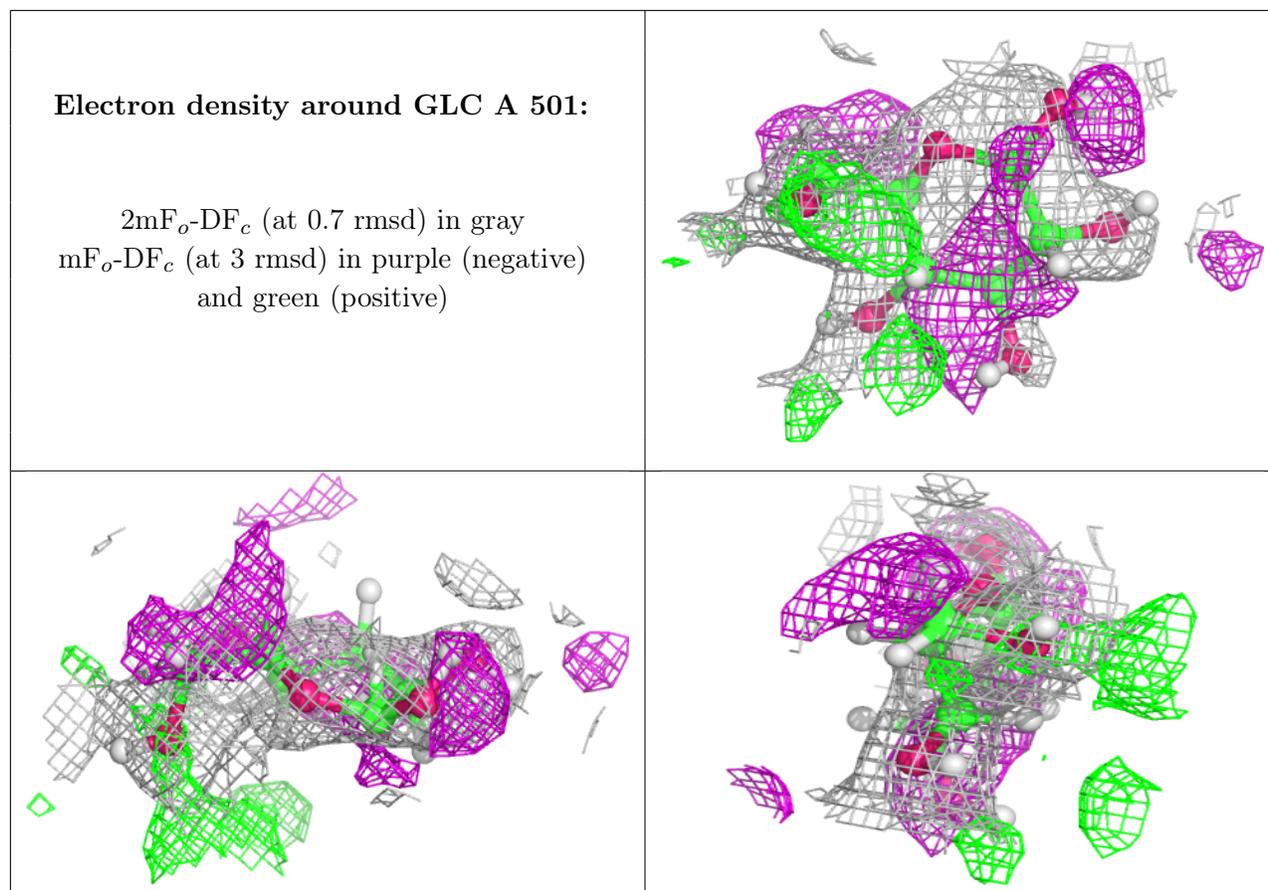


## 6.4 Ligands [i](#)

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
4	GLC	A	501	12/12	0.80	0.14	27,47,58,66	0
5	GOL	A	502	6/6	0.93	0.11	11,17,26,29	0
5	GOL	D	501	6/6	0.94	0.08	18,25,28,30	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.



## 6.5 Other polymers [i](#)

There are no such residues in this entry.