



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 25, 2023 – 02:08 AM EDT

PDB ID : 3D7W
Title : Mistletoe Lectin I in Complex with Zeatin
Authors : Meyer, A.; Rypniewski, W.; Szymanski, M.; Voelter, W.; Barciszewski, J.; Betzel, C.
Deposited on : 2008-05-22
Resolution : 2.49 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 : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

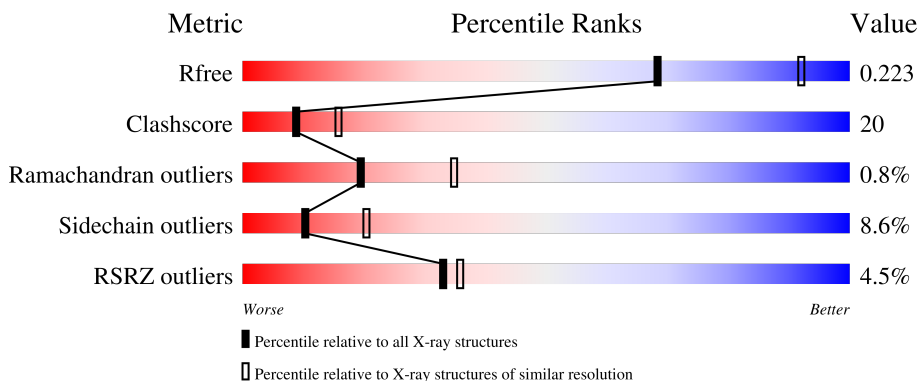
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION


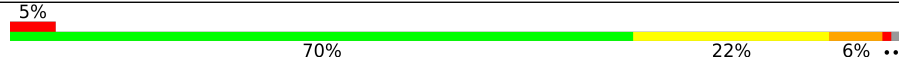


The reported resolution of this entry is 2.49 Å.

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}	130704	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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

Mol	Chain	Length	Quality of chain
1	A	254	 4% 74% 18% 6%
2	B	265	 5% 70% 22% 6%
3	C	2	 50% 50%
3	D	2	 100%

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
3	NAG	C	2	-	-	-	X
3	NAG	D	2	-	-	-	X
7	ZEA	B	701[A]	-	-	X	-
8	ZEZ	B	702[B]	-	-	X	-

2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 4382 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 Beta-galactoside-specific lectin 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	249	1945	1228	330	383	4	0	3	0

There are 27 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	8	THR	VAL	SEE REMARK 999	UNP P81446
A	9	ASP	THR	SEE REMARK 999	UNP P81446
A	10	GLN	HIS	SEE REMARK 999	UNP P81446
A	19	SER	ARG	SEE REMARK 999	UNP P81446
A	36	ASN	GLU	SEE REMARK 999	UNP P81446
A	45	VAL	ILE	SEE REMARK 999	UNP P81446
A	49	GLU	ASP	SEE REMARK 999	UNP P81446
A	50	GLY	ALA	SEE REMARK 999	UNP P81446
A	61	ALA	GLU	SEE REMARK 999	UNP P81446
A	65	THR	SER	SEE REMARK 999	UNP P81446
A	81	GLU	GLN	SEE REMARK 999	UNP P81446
A	84	ASN	ASP	SEE REMARK 999	UNP P81446
A	90	SER	ARG	SEE REMARK 999	UNP P81446
A	94	ALA	ARG	SEE REMARK 999	UNP P81446
A	99	GLN	HIS	SEE REMARK 999	UNP P81446
A	100	ASP	LEU	SEE REMARK 999	UNP P81446
A	102	SER	THR	SEE REMARK 999	UNP P81446
A	106	SER	ARG	SEE REMARK 999	UNP P81446
A	109	GLN	LEU	SEE REMARK 999	UNP P81446
A	148	GLN	SER	SEE REMARK 999	UNP P81446
A	150	LYS	ARG	SEE REMARK 999	UNP P81446
A	208	HIS	GLN	SEE REMARK 999	UNP P81446
A	219	ALA	ARG	SEE REMARK 999	UNP P81446
A	223	ALA	PRO	SEE REMARK 999	UNP P81446
A	226	VAL	ASN	SEE REMARK 999	UNP P81446
A	227	ILE	PHE	SEE REMARK 999	UNP P81446
A	233	ILE	VAL	SEE REMARK 999	UNP P81446

- Molecule 2 is a protein called Beta-galactoside-specific lectin 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	262	2005	1244	353	396	12	0	1	0

There are 2 discrepancies between the modelled and reference sequences:

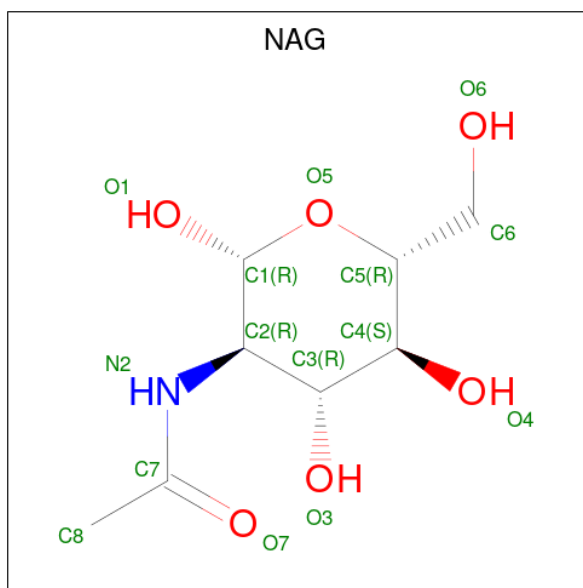
Chain	Residue	Modelled	Actual	Comment	Reference
B	511	MET	-	SEE REMARK 999	UNP P81446
B	512	THR	-	SEE REMARK 999	UNP P81446

- 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
			Total	C	N	O			
3	C	2	28	16	2	10	0	0	0
3	D	2	28	16	2	10	0	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



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

- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



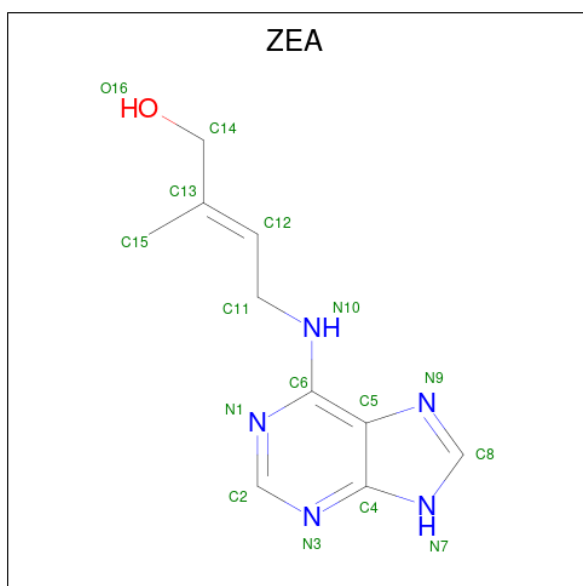
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



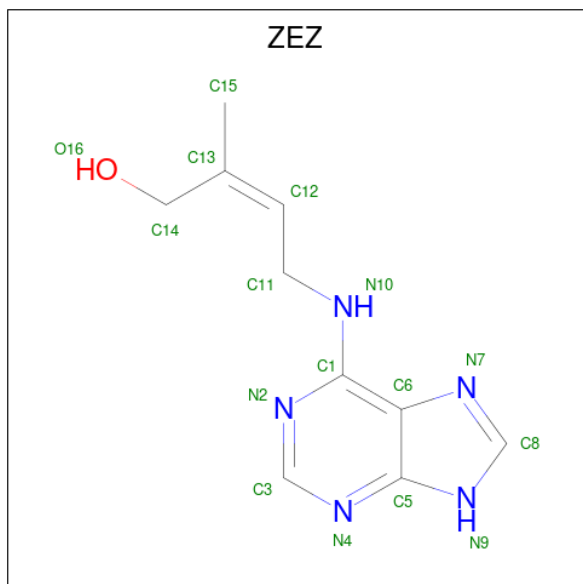
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			6	3	3		
6	A	1	Total	C	O	0	0
			6	3	3		
6	B	1	Total	C	O	0	0
			6	3	3		
6	B	1	Total	C	O	0	0
			6	3	3		

- Molecule 7 is (2E)-2-methyl-4-(9H-purin-6-ylamino)but-2-en-1-ol (three-letter code: ZEA) (formula: C₁₀H₁₃N₅O).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
7	B	1	16	10	5	1	0	1

- Molecule 8 is (2Z)-2-methyl-4-(9H-purin-6-ylamino)but-2-en-1-ol (three-letter code: ZEZ) (formula: C₁₀H₁₃N₅O).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
8	B	1	16	10	5	1	0	1

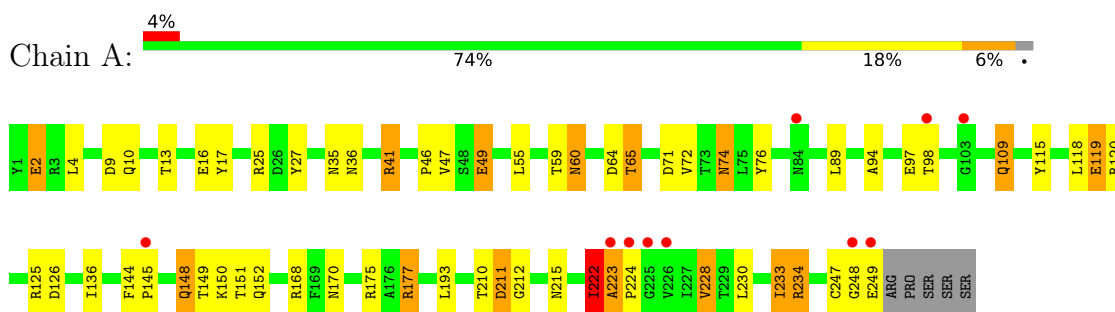
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
9	A	97	97	97	0	0
9	B	185	185	185	0	0

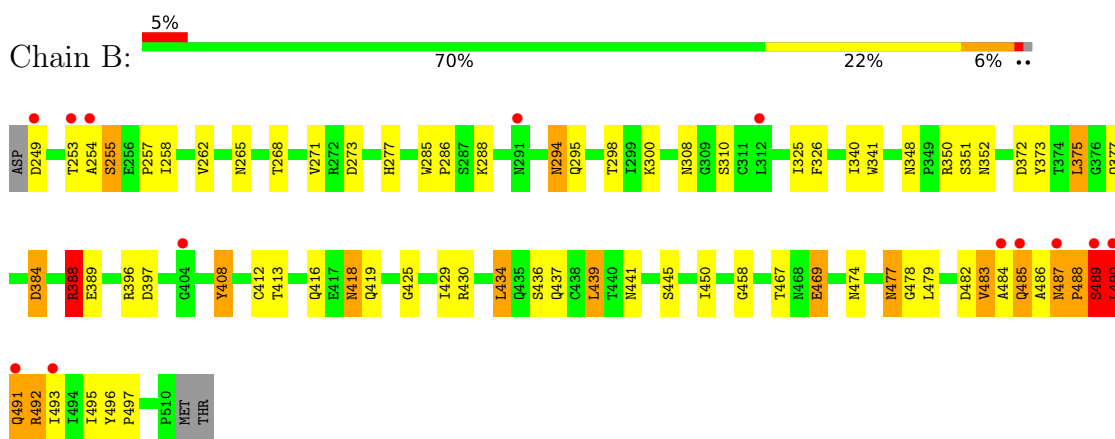
3 Residue-property plots [i](#)

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: Beta-galactoside-specific lectin 1



- Molecule 2: Beta-galactoside-specific lectin 1



- 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



MAG1
MAG2

4 Data and refinement statistics

Property	Value	Source
Space group	P 65 2 2	Depositor
Cell constants a, b, c, α , β , γ	106.64Å 106.64Å 311.67Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	10.00 – 2.49 19.85 – 2.49	Depositor EDS
% Data completeness (in resolution range)	100.0 (10.00-2.49) 99.9 (19.85-2.49)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.06 (at 2.50Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.182 , 0.224 0.182 , 0.223	Depositor DCC
R_{free} test set	1884 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å ²)	48.4	Xtrriage
Anisotropy	0.372	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 57.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	4382	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.11% 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: NAG, SO4, GOL, ZEA, ZEZ

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	1.02	0/1983	0.98	6/2702 (0.2%)
2	B	1.06	3/2044 (0.1%)	1.02	9/2789 (0.3%)
All	All	1.04	3/4027 (0.1%)	1.00	15/5491 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
2	B	0	4
All	All	0	5

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	489	SER	CB-OG	8.33	1.53	1.42
2	B	489	SER	N-CA	6.67	1.59	1.46
2	B	469	GLU	CG-CD	5.71	1.60	1.51

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	211	ASP	CB-CG-OD1	9.12	126.50	118.30
1	A	211	ASP	CB-CG-OD2	-7.62	111.44	118.30
2	B	384	ASP	CB-CG-OD2	6.74	124.37	118.30
2	B	388	ARG	NE-CZ-NH2	-6.45	117.07	120.30
1	A	234	ARG	NE-CZ-NH1	-6.37	117.11	120.30
2	B	492	ARG	N-CA-C	-6.35	93.87	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	273[A]	ASP	CB-CG-OD2	5.82	123.54	118.30
2	B	273[B]	ASP	CB-CG-OD2	5.82	123.54	118.30
1	A	177	ARG	NE-CZ-NH1	5.82	123.21	120.30
2	B	350	ARG	NE-CZ-NH2	-5.82	117.39	120.30
2	B	396	ARG	NE-CZ-NH2	-5.68	117.46	120.30
1	A	222	ILE	CG1-CB-CG2	-5.60	99.08	111.40
2	B	350	ARG	NE-CZ-NH1	5.51	123.05	120.30
1	A	118	LEU	CB-CG-CD2	-5.41	101.80	111.00
2	B	384	ASP	CB-CG-OD1	-5.06	113.75	118.30

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	247	CYS	Peptide
2	B	483	VAL	Peptide
2	B	488	PRO	Peptide
2	B	490	LEU	Peptide
2	B	491	GLN	Peptide

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	1945	0	1902	54	0
2	B	2005	0	1938	103	0
3	C	28	0	26	5	0
3	D	28	0	26	2	0
4	A	14	0	13	1	0
4	B	14	0	13	3	0
5	A	10	0	0	2	0
6	A	12	0	16	1	0
6	B	12	0	16	3	0
7	B	16	0	13	6	0
8	B	16	0	13	8	0
9	A	97	0	0	10	1
9	B	185	0	0	5	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	4382	0	3976	162	1

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 20.

All (162) 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)
2:B:308:ASN:HD21	4:B:600:NAG:C1	1.22	1.53
2:B:485:GLN:HG2	2:B:486:ALA:CB	1.42	1.50
2:B:485:GLN:CG	2:B:486:ALA:HB2	1.44	1.47
2:B:484:ALA:HB1	2:B:492:ARG:O	1.30	1.22
1:A:223:ALA:CB	1:A:224:PRO:HD3	1.79	1.13
2:B:488:PRO:HB2	2:B:489:SER:CB	1.81	1.11
1:A:223:ALA:HB1	1:A:224:PRO:HD3	1.11	1.10
2:B:488:PRO:HB2	2:B:489:SER:HB2	1.13	1.10
2:B:488:PRO:CB	2:B:489:SER:HB2	1.95	0.97
2:B:288:LYS:H	2:B:295:GLN:HE22	1.07	0.96
2:B:265:ASN:HD22	2:B:430:ARG:HH22	1.13	0.96
2:B:416:GLN:HE21	2:B:418:ASN:HD21	1.15	0.94
3:D:1:NAG:HO4	3:D:2:NAG:C1	1.71	0.94
2:B:408:TYR:HD2	2:B:491:GLN:HB3	1.29	0.93
2:B:484:ALA:H	2:B:485:GLN:C	1.72	0.93
1:A:234:ARG:HH21	7:B:701[A]:ZEA:H153	1.34	0.92
2:B:477:ASN:HD22	2:B:479:LEU:H	1.16	0.91
2:B:258:ILE:HD12	2:B:298:THR:OG1	1.71	0.90
1:A:223:ALA:CB	1:A:224:PRO:CD	2.50	0.89
1:A:223:ALA:HB1	1:A:224:PRO:CD	2.02	0.89
1:A:13:THR:O	9:A:748:HOH:O	1.91	0.88
2:B:477:ASN:ND2	2:B:479:LEU:H	1.72	0.88
2:B:490:LEU:N	2:B:491:GLN:HA	1.89	0.88
2:B:474:ASN:HD22	2:B:477:ASN:H	1.22	0.88
2:B:408:TYR:CD2	2:B:491:GLN:HB3	2.09	0.87
2:B:434:LEU:HD12	2:B:436:SER:H	1.41	0.85
1:A:222:ILE:HD13	1:A:228:VAL:HB	1.55	0.85
3:C:1:NAG:HO4	3:C:2:NAG:C1	1.91	0.83
2:B:484:ALA:CB	2:B:492:ARG:O	2.22	0.80
2:B:490:LEU:H	2:B:491:GLN:HG2	1.48	0.78
6:B:650:GOL:H32	9:B:853:HOH:O	1.83	0.76
2:B:489:SER:C	2:B:491:GLN:HA	2.04	0.76
2:B:258:ILE:HD13	2:B:258:ILE:N	2.03	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:441:ASN:HD22	2:B:495:ILE:HD13	1.52	0.73
1:A:9:ASP:HA	1:A:136:ILE:HD11	1.70	0.73
8:B:702[B]:ZEE:H11	8:B:702[B]:ZEE:O16	1.90	0.71
2:B:288:LYS:NZ	2:B:294:ASN:HD21	1.88	0.71
2:B:388:ARG:HG3	8:B:702[B]:ZEE:N7	2.05	0.71
2:B:388:ARG:HG3	7:B:701[A]:ZEA:N9	2.05	0.71
2:B:425:GLY:HA2	8:B:702[B]:ZEE:H15A	1.73	0.71
2:B:425:GLY:HA2	7:B:701[A]:ZEA:H142	1.73	0.71
2:B:490:LEU:N	2:B:491:GLN:HG2	2.08	0.68
2:B:485:GLN:CB	2:B:486:ALA:HB2	2.22	0.68
2:B:445:SER:HB3	9:B:833:HOH:O	1.93	0.68
2:B:484:ALA:H	2:B:485:GLN:CA	2.08	0.67
1:A:119:GLU:OE1	1:A:125:ARG:HD3	1.96	0.65
2:B:288:LYS:H	2:B:295:GLN:NE2	1.86	0.65
2:B:477:ASN:HD22	2:B:477:ASN:C	2.00	0.64
2:B:288:LYS:N	2:B:295:GLN:HE22	1.89	0.64
2:B:434:LEU:HG	2:B:437:GLN:HG2	1.78	0.64
2:B:484:ALA:N	2:B:485:GLN:CA	2.60	0.64
2:B:288:LYS:HZ1	2:B:294:ASN:HD21	1.46	0.64
2:B:467:THR:HB	2:B:469:GLU:OE1	1.98	0.64
1:A:234:ARG:HH21	8:B:702[B]:ZEE:H14A	1.63	0.64
2:B:265:ASN:ND2	2:B:430:ARG:HH22	1.89	0.63
2:B:258:ILE:CD1	2:B:298:THR:HG23	2.28	0.63
2:B:474:ASN:ND2	2:B:477:ASN:H	1.96	0.63
1:A:25:ARG:HH12	1:A:170:ASN:HD21	1.45	0.63
2:B:375:LEU:HD22	2:B:458:GLY:HA2	1.80	0.62
1:A:71:ASP:HB3	1:A:74:ASN:HD21	1.64	0.62
2:B:450:ILE:HD12	2:B:493:ILE:HG22	1.81	0.62
2:B:257:PRO:C	2:B:258:ILE:HD13	2.20	0.62
2:B:384:ASP:HB3	2:B:388:ARG:HH12	1.65	0.62
1:A:2:GLU:HG3	1:A:27:TYR:CE2	2.35	0.61
2:B:485:GLN:HG2	2:B:486:ALA:HB2	0.67	0.61
2:B:308:ASN:ND2	4:B:600:NAG:O5	2.20	0.61
2:B:489:SER:N	2:B:490:LEU:HB2	2.16	0.60
2:B:483:VAL:HA	2:B:484:ALA:HB2	1.82	0.60
2:B:408:TYR:HD2	2:B:491:GLN:CB	2.08	0.60
2:B:429:ILE:CG2	2:B:439:LEU:HD22	2.32	0.60
2:B:485:GLN:HG2	2:B:486:ALA:HB3	1.70	0.60
2:B:373:TYR:HE1	3:C:1:NAG:H81	1.67	0.59
5:A:661:SO4:O4	2:B:249:ASP:N	2.36	0.59
1:A:248:GLY:HA2	1:A:249:GLU:C	2.23	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:372:ASP:H	2:B:377:GLN:HE22	1.51	0.58
1:A:60:ASN:HD21	1:A:64:ASP:H	1.50	0.58
1:A:215:ASN:HD21	2:B:257:PRO:HD3	1.69	0.58
1:A:212:GLY:HA2	1:A:233:ILE:HG23	1.85	0.58
1:A:149:THR:HA	1:A:152:GLN:HE21	1.68	0.57
3:C:1:NAG:H3	3:C:1:NAG:H83	1.84	0.57
1:A:215:ASN:ND2	2:B:255:SER:HB3	2.18	0.57
2:B:388:ARG:HG2	7:B:701[A]:ZEA:H10	1.69	0.57
2:B:388:ARG:HG2	8:B:702[B]:ZEE:HN10	1.69	0.57
2:B:348:ASN:ND2	2:B:351:SER:H	2.02	0.57
2:B:352:ASN:ND2	9:B:859:HOH:O	2.39	0.56
2:B:408:TYR:CD2	2:B:491:GLN:CB	2.86	0.56
2:B:486:ALA:H	2:B:487:ASN:CA	2.19	0.56
1:A:148:GLN:HG2	9:A:730:HOH:O	2.07	0.55
1:A:150:LYS:CD	9:A:754:HOH:O	2.55	0.55
1:A:148:GLN:HB3	1:A:151:THR:H	1.72	0.55
2:B:388:ARG:HG2	8:B:702[B]:ZEE:N10	2.21	0.54
2:B:388:ARG:HG2	7:B:701[A]:ZEA:N10	2.21	0.54
2:B:434:LEU:HD11	2:B:436:SER:HB2	1.90	0.54
2:B:341:TRP:CZ2	3:C:2:NAG:C8	2.91	0.54
1:A:115:TYR:O	1:A:119:GLU:HB2	2.07	0.54
2:B:413:THR:H	2:B:419:GLN:HE22	1.56	0.54
1:A:150:LYS:HD3	9:A:754:HOH:O	2.09	0.52
1:A:74:ASN:ND2	1:A:76:TYR:H	2.07	0.52
1:A:16:GLU:N	9:A:748:HOH:O	2.42	0.52
1:A:211:ASP:OD2	2:B:340:ILE:HD12	2.09	0.52
2:B:341:TRP:CZ2	3:C:2:NAG:H82	2.44	0.52
1:A:27:TYR:CD1	1:A:27:TYR:O	2.63	0.51
2:B:258:ILE:CD1	2:B:298:THR:OG1	2.53	0.51
2:B:262:VAL:HG22	2:B:268:THR:HG22	1.91	0.51
1:A:27:TYR:CD1	1:A:27:TYR:C	2.84	0.51
1:A:222:ILE:CD1	1:A:228:VAL:HB	2.33	0.51
1:A:41:ARG:HG2	9:A:663:HOH:O	2.10	0.51
2:B:416:GLN:HG2	2:B:418:ASN:ND2	2.26	0.51
1:A:223:ALA:HB3	1:A:224:PRO:CD	2.39	0.50
2:B:308:ASN:HD22	4:B:600:NAG:C1	2.10	0.50
1:A:65:THR:HG22	9:A:662:HOH:O	2.10	0.49
2:B:258:ILE:HD12	2:B:298:THR:CB	2.43	0.49
2:B:326:PHE:CZ	6:B:650:GOL:H11	2.47	0.49
1:A:168:ARG:HH12	6:A:652:GOL:H32	1.76	0.49
1:A:60:ASN:ND2	1:A:64:ASP:H	2.09	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:35:ASN:O	1:A:36:ASN:HB2	2.13	0.49
1:A:47:VAL:HG11	1:A:94:ALA:O	2.13	0.48
1:A:119:GLU:OE1	5:A:660:SO4:O2	2.31	0.48
2:B:488:PRO:HB2	2:B:489:SER:CA	2.41	0.48
2:B:412:CYS:HA	2:B:419:GLN:HE22	1.79	0.48
2:B:486:ALA:N	2:B:487:ASN:O	2.47	0.48
2:B:372:ASP:H	2:B:377:GLN:NE2	2.11	0.47
1:A:234:ARG:NH2	7:B:701[A]:ZEA:H153	2.15	0.47
2:B:258:ILE:HD11	2:B:298:THR:HG23	1.97	0.47
1:A:46:PRO:O	1:A:49:GLU:HB2	2.15	0.47
1:A:60:ASN:C	1:A:60:ASN:HD22	2.17	0.46
2:B:486:ALA:H	2:B:487:ASN:HB3	1.80	0.46
2:B:482:ASP:O	2:B:484:ALA:HA	2.15	0.46
1:A:59:THR:HA	1:A:64:ASP:O	2.16	0.45
2:B:434:LEU:HD12	2:B:434:LEU:C	2.37	0.45
2:B:484:ALA:N	2:B:485:GLN:HA	2.28	0.45
2:B:487:ASN:OD1	2:B:488:PRO:O	2.34	0.45
2:B:477:ASN:ND2	2:B:477:ASN:C	2.68	0.45
2:B:496:TYR:CD2	2:B:497:PRO:HD2	2.52	0.44
1:A:234:ARG:HE	8:B:702[B]:ZEE:H14A	1.83	0.44
1:A:109:GLN:H	1:A:109:GLN:HG2	1.50	0.44
6:B:650:GOL:C3	9:B:853:HOH:O	2.55	0.44
4:A:500:NAG:H83	4:A:500:NAG:O3	2.18	0.43
2:B:416:GLN:HE21	2:B:418:ASN:ND2	1.97	0.43
1:A:210:THR:O	1:A:211:ASP:HB2	2.19	0.43
2:B:429:ILE:HG21	2:B:439:LEU:HD22	2.00	0.43
1:A:126:ASP:HB3	1:A:193:LEU:HD11	2.01	0.43
2:B:271:VAL:HB	2:B:294:ASN:HB2	2.00	0.42
2:B:418:ASN:C	2:B:418:ASN:HD22	2.22	0.42
3:D:1:NAG:O4	3:D:2:NAG:O5	2.04	0.42
1:A:144:PHE:HA	1:A:145:PRO:HD3	1.79	0.41
2:B:477:ASN:HD22	2:B:478:GLY:N	2.18	0.41
2:B:300:LYS:HE3	2:B:300:LYS:HB3	1.92	0.41
2:B:277:HIS:HB3	9:B:860:HOH:O	2.19	0.41
1:A:71:ASP:HB3	1:A:74:ASN:ND2	2.35	0.41
2:B:285:TRP:CD1	2:B:286:PRO:HD2	2.56	0.41
2:B:477:ASN:HD22	2:B:479:LEU:N	1.99	0.41
2:B:490:LEU:N	2:B:491:GLN:CA	2.73	0.41
1:A:9:ASP:HB2	9:A:733:HOH:O	2.21	0.41
2:B:310:SER:HB3	2:B:325:ILE:HG13	2.01	0.41
1:A:25:ARG:HH22	1:A:170:ASN:ND2	2.19	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:65:THR:CG2	9:A:662:HOH:O	2.68	0.40
1:A:17:TYR:N	9:A:748:HOH:O	1.59	0.40
1:A:74:ASN:HD22	1:A:74:ASN:C	2.23	0.40
1:A:193:LEU:HD23	1:A:193:LEU:HA	1.92	0.40
2:B:425:GLY:CA	8:B:702[B]:ZYZ:H15A	2.47	0.40
2:B:348:ASN:HD22	2:B:351:SER:CB	2.35	0.40

All (1) 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)
9:A:754:HOH:O	9:B:781:HOH:O[6_554]	2.02	0.18

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	249/254 (98%)	236 (95%)	12 (5%)	1 (0%)	34	54
2	B	261/265 (98%)	245 (94%)	13 (5%)	3 (1%)	14	26
All	All	510/519 (98%)	481 (94%)	25 (5%)	4 (1%)	19	35

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	223	ALA
2	B	254	ALA
2	B	489	SER
2	B	487	ASN

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	213/216 (99%)	190 (89%)	23 (11%)	6	12
2	B	220/222 (99%)	206 (94%)	14 (6%)	17	33
All	All	433/438 (99%)	396 (92%)	37 (8%)	10	21

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	GLU
1	A	4	LEU
1	A	10	GLN
1	A	41	ARG
1	A	49	GLU
1	A	55	LEU
1	A	60	ASN
1	A	65	THR
1	A	72	VAL
1	A	74	ASN
1	A	89	LEU
1	A	97	GLU
1	A	98	THR
1	A	109	GLN
1	A	119	GLU
1	A	120	ARG
1	A	148	GLN
1	A	175[A]	ARG
1	A	177	ARG
1	A	222	ILE
1	A	228	VAL
1	A	230	LEU
1	A	233	ILE
2	B	253	THR
2	B	255	SER
2	B	294	ASN
2	B	375	LEU

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Mol	Chain	Res	Type
2	B	388	ARG
2	B	389	GLU
2	B	397	ASP
2	B	408	TYR
2	B	418	ASN
2	B	434	LEU
2	B	439	LEU
2	B	477	ASN
2	B	485	GLN
2	B	490	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	60	ASN
1	A	74	ASN
1	A	85	GLN
1	A	109	GLN
1	A	152	GLN
1	A	161	GLN
1	A	170	ASN
1	A	215	ASN
2	B	265	ASN
2	B	294	ASN
2	B	295	GLN
2	B	308	ASN
2	B	348	ASN
2	B	377	GLN
2	B	418	ASN
2	B	419	GLN
2	B	462	GLN
2	B	474	ASN
2	B	477	ASN

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	C	1	3,2	14,14,15	1.05	1 (7%)	17,19,21	2.56	7 (41%)
3	NAG	C	2	3	14,14,15	0.57	0	17,19,21	0.66	0
3	NAG	D	1	3,2	14,14,15	1.25	1 (7%)	17,19,21	1.41	5 (29%)
3	NAG	D	2	3	14,14,15	0.47	0	17,19,21	2.56	6 (35%)

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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	C	1	3,2	-	3/6/23/26	0/1/1/1
3	NAG	C	2	3	-	2/6/23/26	0/1/1/1
3	NAG	D	1	3,2	-	1/6/23/26	0/1/1/1
3	NAG	D	2	3	-	3/6/23/26	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	1	NAG	O5-C1	-2.49	1.39	1.43
3	C	1	NAG	O7-C7	2.45	1.28	1.23

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	2	NAG	C1-O5-C5	7.92	122.93	112.19
3	C	1	NAG	O3-C3-C4	-4.82	99.20	110.35
3	C	1	NAG	C2-N2-C7	4.67	129.55	122.90
3	C	1	NAG	O5-C5-C6	3.90	113.33	107.20
3	D	2	NAG	C2-N2-C7	-3.60	117.77	122.90
3	D	2	NAG	O5-C5-C4	3.38	119.06	110.83
3	C	1	NAG	C1-O5-C5	3.29	116.65	112.19
3	C	1	NAG	C8-C7-N2	2.80	120.84	116.10
3	D	2	NAG	C3-C4-C5	2.65	114.97	110.24
3	D	2	NAG	C6-C5-C4	-2.57	106.97	113.00
3	D	1	NAG	C3-C4-C5	-2.44	105.89	110.24
3	D	1	NAG	O5-C5-C6	2.34	110.87	107.20
3	D	1	NAG	C4-C3-C2	-2.29	107.67	111.02
3	D	1	NAG	O5-C5-C4	-2.23	105.40	110.83
3	C	1	NAG	O4-C4-C5	2.23	114.82	109.30
3	C	1	NAG	O5-C5-C4	-2.16	105.56	110.83
3	D	2	NAG	C4-C3-C2	2.12	114.13	111.02
3	D	1	NAG	C1-O5-C5	-2.12	109.32	112.19

There are no chirality outliers.

All (9) torsion outliers are listed below:

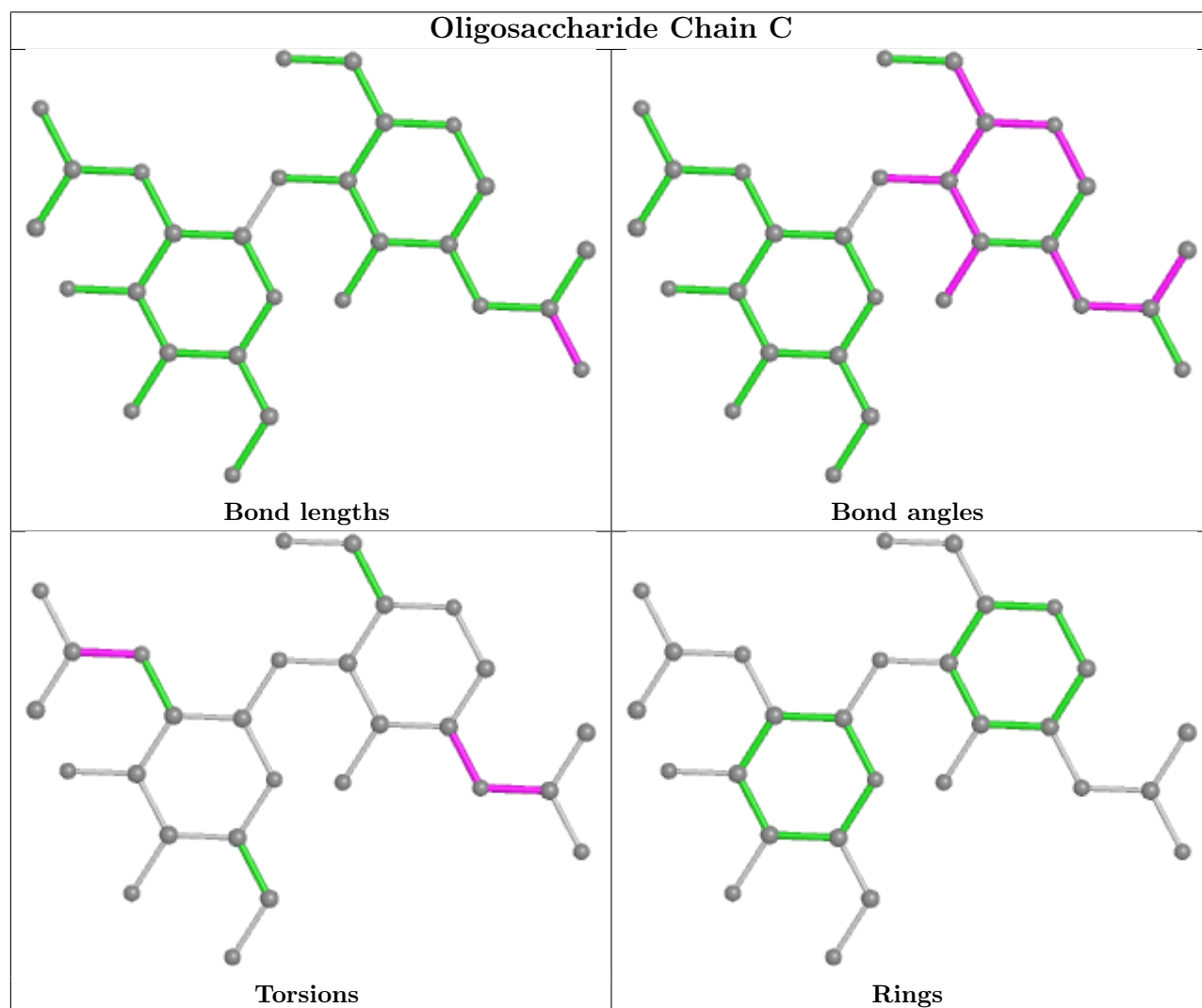
Mol	Chain	Res	Type	Atoms
3	D	2	NAG	C8-C7-N2-C2
3	D	2	NAG	O7-C7-N2-C2
3	C	2	NAG	C8-C7-N2-C2
3	C	2	NAG	O7-C7-N2-C2
3	C	1	NAG	C8-C7-N2-C2
3	C	1	NAG	O7-C7-N2-C2
3	D	2	NAG	C4-C5-C6-O6
3	D	1	NAG	C4-C5-C6-O6
3	C	1	NAG	C3-C2-N2-C7

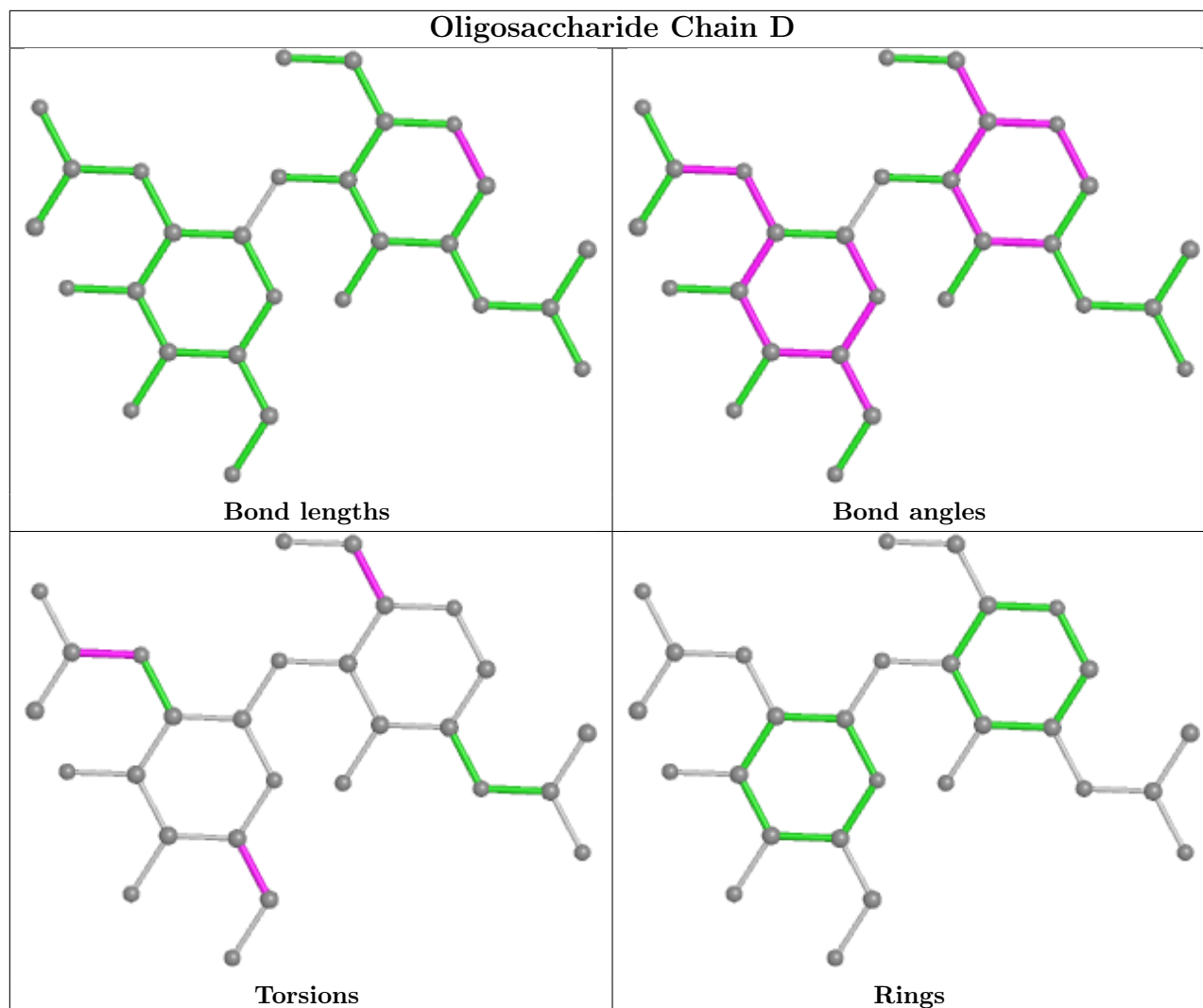
There are no ring outliers.

4 monomers are involved in 7 short contacts:

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

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





5.6 Ligand geometry [i](#)

10 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
5	SO4	A	660	-	4,4,4	0.14	0	6,6,6	0.71	0
6	GOL	A	648	-	5,5,5	0.47	0	5,5,5	0.56	0
6	GOL	A	652	-	5,5,5	0.42	0	5,5,5	0.78	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	NAG	A	500	1	14,14,15	1.41	2 (14%)	17,19,21	2.55	6 (35%)
4	NAG	B	600	2	14,14,15	1.01	1 (7%)	17,19,21	2.30	6 (35%)
5	SO4	A	661	-	4,4,4	0.16	0	6,6,6	0.23	0
6	GOL	B	650	-	5,5,5	0.94	0	5,5,5	1.22	0
8	ZEZ	B	702[B]	-	13,17,17	0.98	0	8,22,22	3.26	6 (75%)
7	ZEA	B	701[A]	-	13,17,17	0.99	0	8,22,22	3.09	5 (62%)
6	GOL	B	651	-	5,5,5	0.59	0	5,5,5	0.60	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
6	GOL	A	648	-	-	0/4/4/4	-
6	GOL	A	652	-	-	0/4/4/4	-
4	NAG	A	500	1	-	4/6/23/26	0/1/1/1
4	NAG	B	600	2	-	2/6/23/26	0/1/1/1
6	GOL	B	650	-	-	3/4/4/4	-
8	ZEZ	B	702[B]	-	-	2/8/8/8	0/2/2/2
7	ZEA	B	701[A]	-	-	0/8/8/8	0/2/2/2
6	GOL	B	651	-	-	0/4/4/4	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	500	NAG	C1-C2	4.35	1.58	1.52
4	B	600	NAG	C4-C5	2.33	1.57	1.53
4	A	500	NAG	C3-C2	2.30	1.57	1.52

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	600	NAG	C2-N2-C7	-6.25	114.01	122.90
4	A	500	NAG	C1-O5-C5	5.34	119.43	112.19
7	B	701[A]	ZEA	N3-C2-N1	-4.71	121.32	128.68
8	B	702[B]	ZEZ	N4-C3-N2	-4.71	121.32	128.68
4	A	500	NAG	C3-C4-C5	-4.65	101.95	110.24
4	A	500	NAG	O5-C5-C6	4.28	113.91	107.20
7	B	701[A]	ZEA	C2-N1-C6	4.22	120.21	116.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	B	702[B]	ZEZ	C3-N2-C1	4.22	120.21	116.59
7	B	701[A]	ZEA	C2-N3-C4	3.67	122.06	113.45
8	B	702[B]	ZEZ	C3-N4-C5	3.67	122.06	113.45
7	B	701[A]	ZEA	C4-C5-N9	-3.64	105.61	109.40
8	B	702[B]	ZEZ	C5-C6-N7	-3.64	105.61	109.40
4	B	600	NAG	C4-C3-C2	-3.58	105.78	111.02
4	A	500	NAG	O3-C3-C2	3.56	116.83	109.47
7	B	701[A]	ZEA	C12-C11-N10	-3.06	100.76	112.83
8	B	702[B]	ZEZ	C12-C11-N10	-3.06	100.76	112.83
4	A	500	NAG	C8-C7-N2	3.03	121.23	116.10
4	B	600	NAG	O3-C3-C4	3.03	117.35	110.35
8	B	702[B]	ZEZ	C15-C13-C12	-2.99	116.01	123.68
4	A	500	NAG	O4-C4-C5	2.55	115.63	109.30
4	B	600	NAG	C8-C7-N2	2.50	120.33	116.10
4	B	600	NAG	O4-C4-C5	2.16	114.66	109.30
4	B	600	NAG	O4-C4-C3	2.08	115.16	110.35

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	500	NAG	C8-C7-N2-C2
4	A	500	NAG	O7-C7-N2-C2
8	B	702[B]	ZEZ	C15-C13-C14-O16
4	A	500	NAG	O5-C5-C6-O6
4	A	500	NAG	C4-C5-C6-O6
4	B	600	NAG	C8-C7-N2-C2
6	B	650	GOL	O1-C1-C2-O2
6	B	650	GOL	O1-C1-C2-C3
4	B	600	NAG	O7-C7-N2-C2
8	B	702[B]	ZEZ	C12-C13-C14-O16
6	B	650	GOL	C1-C2-C3-O3

There are no ring outliers.

8 monomers are involved in 24 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	660	SO4	1	0
6	A	652	GOL	1	0
4	A	500	NAG	1	0
4	B	600	NAG	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	661	SO4	1	0
6	B	650	GOL	3	0
8	B	702[B]	ZEZ	8	0
7	B	701[A]	ZEA	6	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	249/254 (98%)	-0.14	10 (4%) 38 41	32, 45, 71, 84	0
2	B	262/265 (98%)	-0.13	13 (4%) 28 30	26, 38, 63, 90	1 (0%)
All	All	511/519 (98%)	-0.14	23 (4%) 33 36	26, 42, 70, 90	1 (0%)

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	224	PRO	5.1
1	A	225	GLY	4.8
1	A	248	GLY	4.3
2	B	489	SER	4.2
1	A	249	GLU	4.0
2	B	487	ASN	3.9
2	B	491	GLN	3.4
2	B	253	THR	3.4
1	A	226	VAL	3.3
2	B	493	ILE	3.2
2	B	249	ASP	3.0
1	A	84	ASN	2.9
2	B	485	GLN	2.8
1	A	98	THR	2.6
2	B	254	ALA	2.5
2	B	404	GLY	2.5
2	B	490	LEU	2.4
1	A	223	ALA	2.4
2	B	291	ASN	2.3
2	B	312	LEU	2.3
1	A	103	GLY	2.2
1	A	145	PRO	2.2
2	B	484	ALA	2.2

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

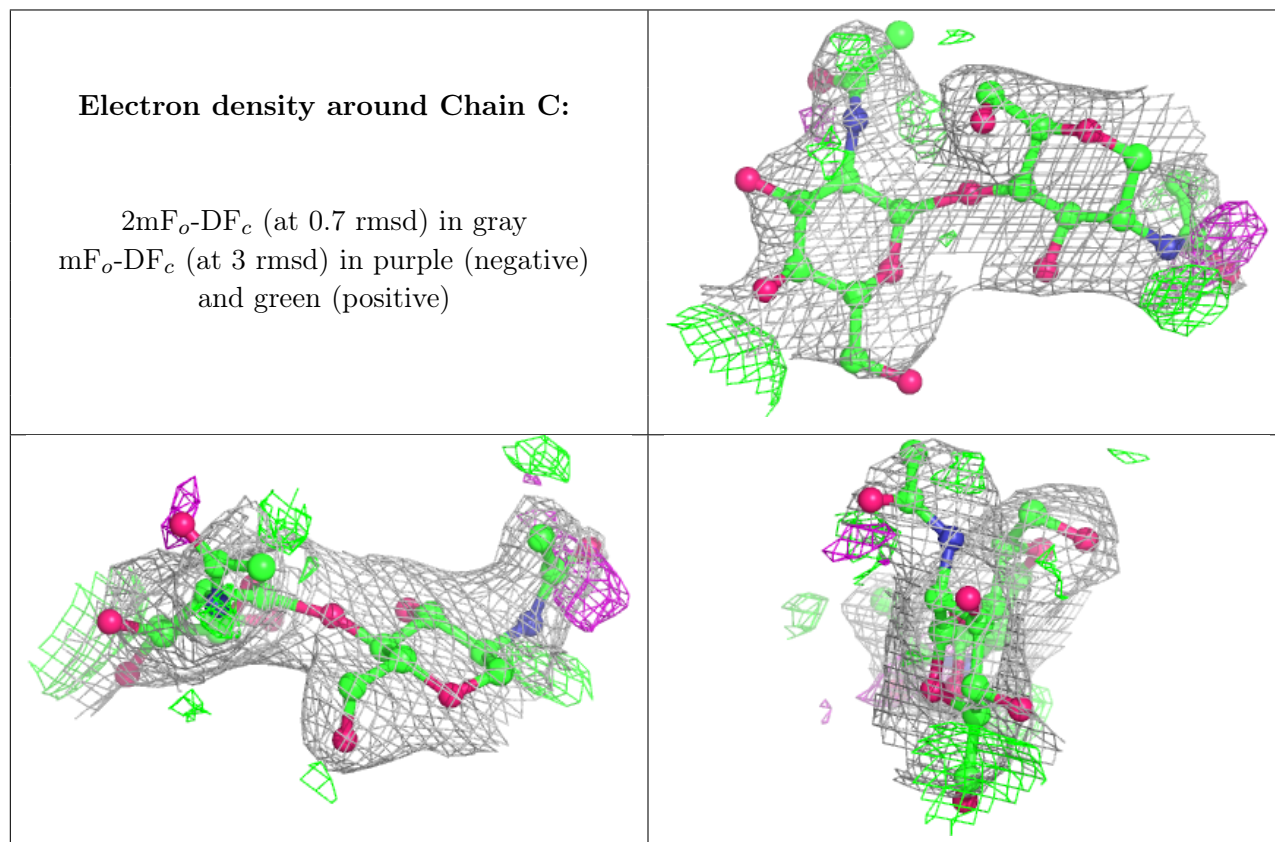
There are no non-standard protein/DNA/RNA residues in this entry.

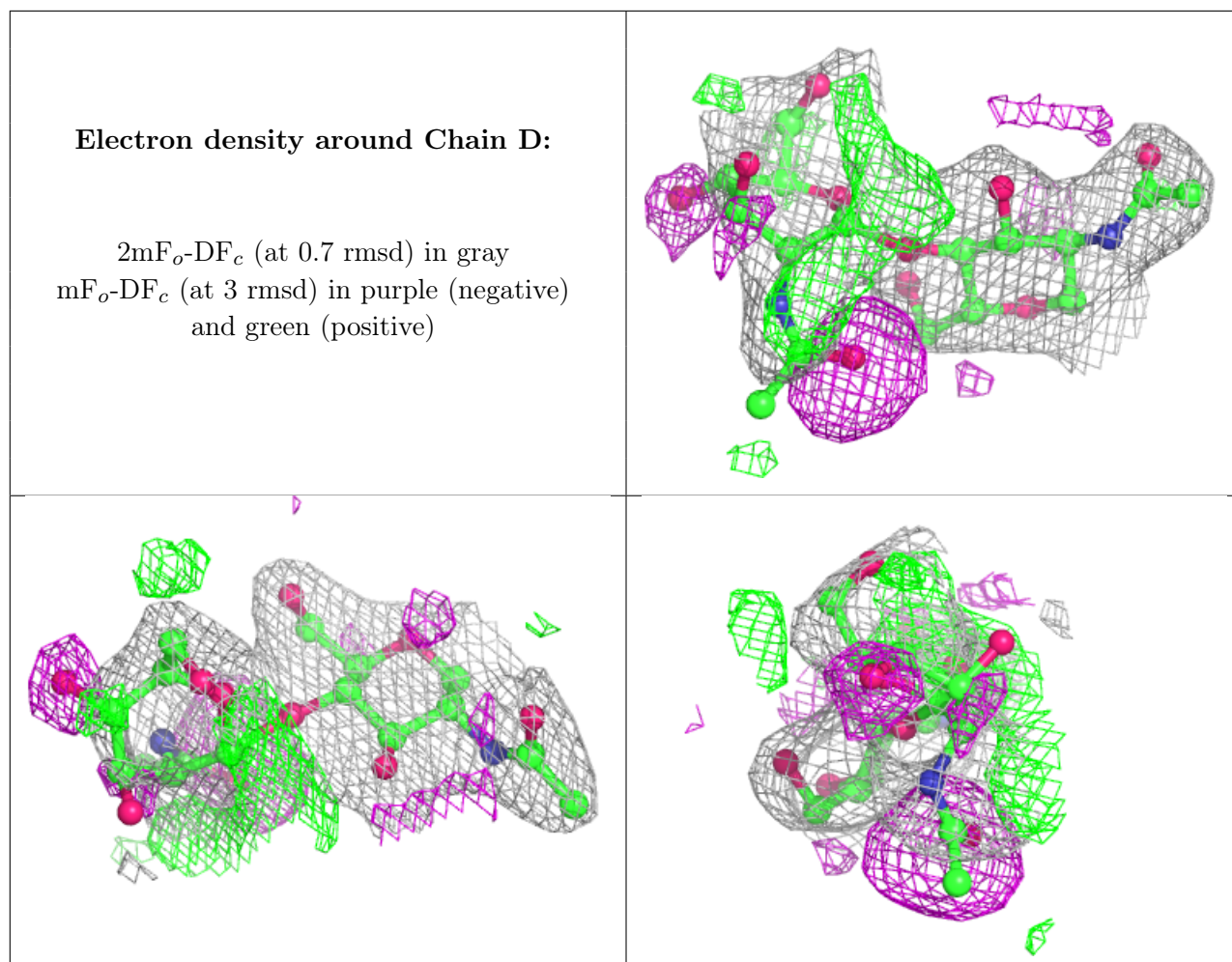
6.3 Carbohydrates [i](#)

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	D	2	14/15	0.71	0.44	71,89,93,93	0
3	NAG	C	2	14/15	0.77	0.42	83,95,99,100	0
3	NAG	C	1	14/15	0.95	0.16	43,52,57,58	0
3	NAG	D	1	14/15	0.97	0.12	33,37,42,44	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	NAG	B	600	14/15	0.68	0.35	68,87,89,90	0
8	ZEZ	B	702[B]	16/16	0.69	0.39	38,51,53,54	16
7	ZEA	B	701[A]	16/16	0.73	0.35	27,51,53,54	16
4	NAG	A	500	14/15	0.86	0.32	89,94,102,104	0
6	GOL	B	650	6/6	0.88	0.19	35,46,53,55	0
6	GOL	A	652	6/6	0.93	0.14	61,68,68,73	0
5	SO4	A	661	5/5	0.94	0.51	121,122,122,123	0
5	SO4	A	660	5/5	0.95	0.18	71,73,77,79	0
6	GOL	A	648	6/6	0.95	0.15	48,52,54,57	0
6	GOL	B	651	6/6	0.96	0.14	38,41,47,51	0

6.5 Other polymers [i](#)

There are no such residues in this entry.