Full wwPDB X-ray Structure Validation Report (i)

Jun 16, 2024 – 08:58 PM EDT

PDB ID	:	2WR0
Title	:	Structures of influenza H2 Hemagglutinins
Authors	:	Liu, J.; Stevens, D.; Haire, L.; Coombs, P.; Russell, R.; Gamblin, S.; Skehel, J.
Deposited on	:	2009-08-28
Resolution	:	2.45 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 (i) 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 (i)) were used in the production of this report:

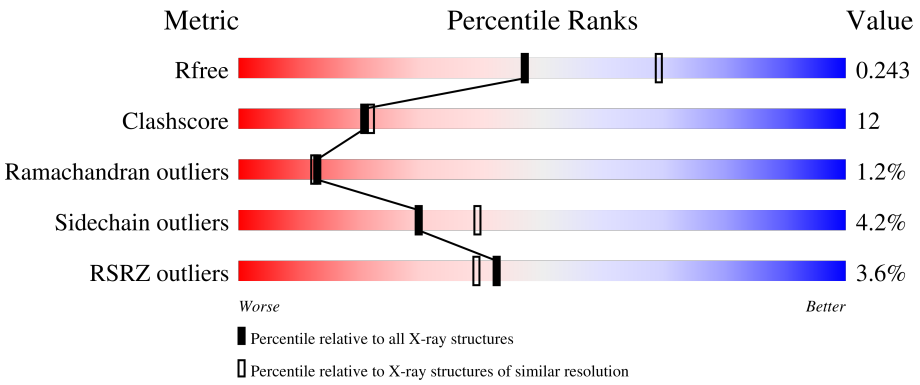
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 2.45 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	1544 (2.48-2.44)
Clashscore	141614	1613 (2.48-2.44)
Ramachandran outliers	138981	1598 (2.48-2.44)
Sidechain outliers	138945	1598 (2.48-2.44)
RSRZ outliers	127900	1523 (2.48-2.44)

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	509	4% 72% 22%
1	B	509	4% 74% 20%
1	C	509	2% 72% 21% 5%
2	D	2	100%
3	E	4	75% 25%

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Mol	Chain	Length	Quality of chain
4	F	4	75% 25%

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
2	NAG	D	2	-	-	-	X
3	NAG	E	1	-	-	-	X
3	BMA	E	3	-	-	-	X
5	NAG	A	1499	-	-	-	X

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 12269 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 HEMAGGLUTININ.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	490	3882	2436	671	753	22	4	0	0
1	B	491	3893	2445	672	754	22	0	0	0
1	C	486	3858	2424	666	746	22	0	0	0

- Molecule 2 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			
2	D	2	28	16	2	10	0	0	0

- Molecule 3 is an oligosaccharide called beta-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.

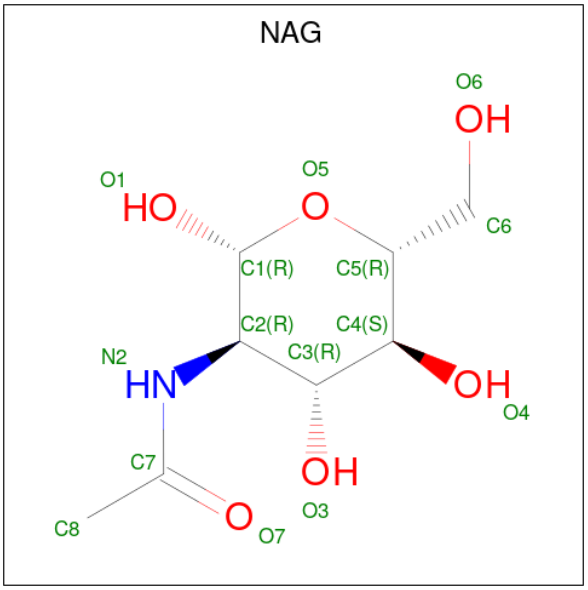
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	E	4	40	23	2	15	0	0	1

- Molecule 4 is an oligosaccharide called 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-gluco

pyranose.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	F	4	50	28	2	20	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
			Total	C	N	O		
5	A	1	14	8	1	5	0	0
			Total	C	N	O		
5	A	1	14	8	1	5	0	0
			Total	C	N	O		
5	C	1	14	8	1	5	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
6	A	154	154	154	0	0
			Total	O		
6	B	160	160	160	0	0

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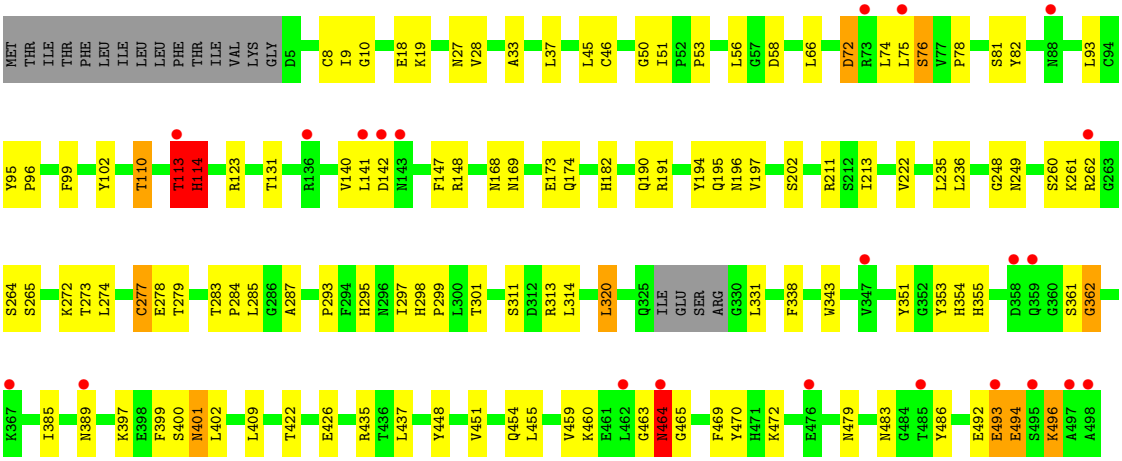
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
6	C	162	162	162	0	0

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.

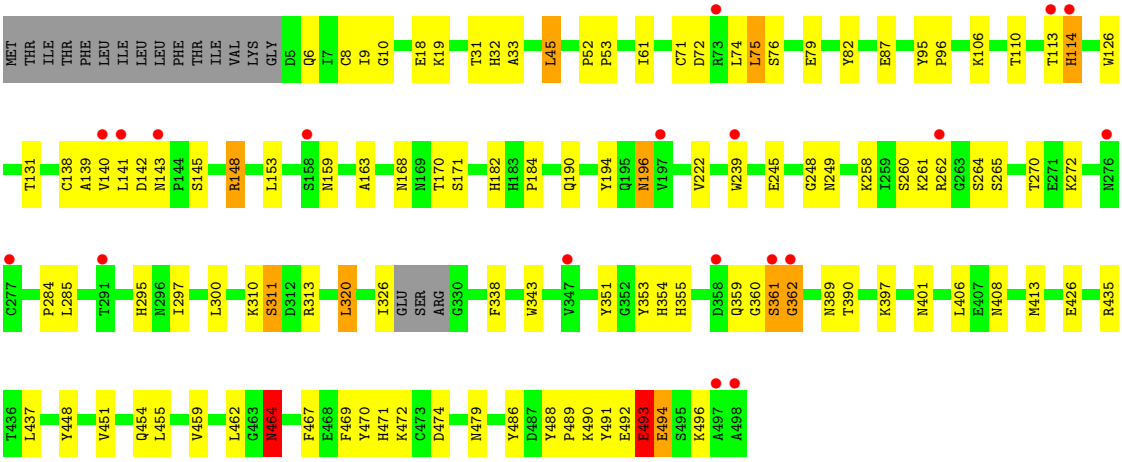
• Molecule 1: HEMAGGLUTININ

Chain A:



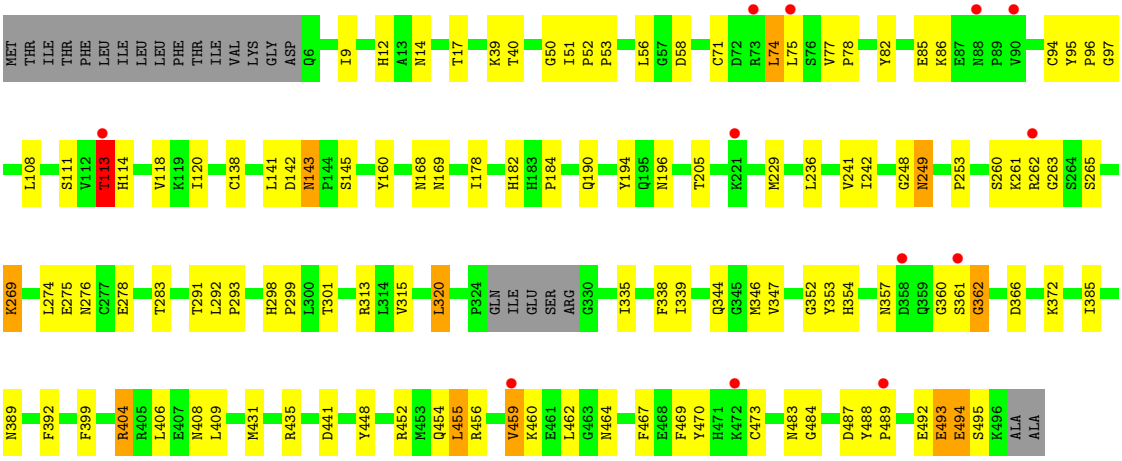
• Molecule 1: HEMAGGLUTININ

Chain B:



• Molecule 1: HEMAGGLUTININ

Chain C:



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

Chain D:

• Molecule 3: beta-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:

• Molecule 4: 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 F:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	68.27Å 140.52Å 198.89Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.99 – 2.45 19.99 – 2.45	Depositor EDS
% Data completeness (in resolution range)	99.8 (19.99-2.45) 99.8 (19.99-2.45)	Depositor EDS
R_{merge}	0.47	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.55 (at 2.44Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.213 , 0.256 0.199 , 0.243	Depositor DCC
R_{free} test set	3590 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	49.2	Xtriage
Anisotropy	0.359	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 48.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	12269	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 2.54% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: MAN, BMA, NAG

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	0.33	0/3968	0.53	2/5372 (0.0%)
1	B	0.33	0/3979	0.52	1/5387 (0.0%)
1	C	0.32	0/3944	0.50	0/5339
All	All	0.33	0/11891	0.52	3/16098 (0.0%)

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

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	114	HIS	N-CA-C	7.46	131.16	111.00
1	B	493	GLU	N-CA-C	5.39	125.56	111.00
1	A	113	THR	C-N-CA	5.02	134.25	121.70

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	113	THR	Peptide

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	3882	0	3740	95	0
1	B	3893	0	3760	98	0
1	C	3858	0	3729	98	0
2	D	28	0	25	4	0
3	E	40	0	33	3	0
4	F	50	0	43	4	0
5	A	28	0	26	7	0
5	C	14	0	13	4	0
6	A	154	0	0	5	0
6	B	160	0	0	5	0
6	C	162	0	0	3	0
All	All	12269	0	11369	285	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 12.

All (285) 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:168:ASN:HD21	2:D:1:NAG:C1	1.67	1.07
1:C:168:ASN:HD21	5:C:1497:NAG:C1	1.69	1.04
1:B:455:LEU:HD13	1:B:459:VAL:HG11	1.56	0.88
1:C:190:GLN:HE22	1:C:249:ASN:HD21	1.21	0.87
1:A:113:THR:HB	1:A:260:SER:HB2	1.57	0.87
1:A:190:GLN:HE22	1:A:249:ASN:HD21	1.19	0.85
1:B:479:ASN:HB3	3:E:1:NAG:H61	1.59	0.83
1:B:190:GLN:HE22	1:B:249:ASN:HD21	1.27	0.80
1:B:110:THR:CG2	1:B:265:SER:H	1.94	0.80
1:B:45:LEU:HD23	1:B:272:LYS:HB2	1.62	0.78
3:E:1:NAG:H3	3:E:1:NAG:H83	1.66	0.77
1:A:168:ASN:HD21	5:A:1500:NAG:C5	1.97	0.76
1:A:141:LEU:N	1:A:142:ASP:HA	2.00	0.76
1:C:483:ASN:ND2	4:F:1:NAG:H83	2.01	0.76
1:B:490:LYS:HD3	1:B:491:TYR:CZ	2.22	0.75
1:A:168:ASN:ND2	5:A:1500:NAG:O5	2.13	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:141:LEU:N	1:C:142:ASP:HA	2.03	0.74
1:A:311:SER:HB3	1:A:426:GLU:OE2	1.88	0.73
1:C:483:ASN:HD21	4:F:1:NAG:C1	2.02	0.72
1:B:113:THR:HB	1:B:114:HIS:HB3	1.72	0.71
1:A:338:PHE:O	1:A:464:ASN:HA	1.91	0.71
1:A:110:THR:HG21	1:A:265:SER:H	1.55	0.70
1:B:492:GLU:HA	1:B:494:GLU:N	2.07	0.70
1:B:168:ASN:ND2	2:D:1:NAG:C1	2.51	0.70
1:B:9:ILE:HD11	1:B:451:VAL:HG21	1.74	0.69
1:A:110:THR:CG2	1:A:265:SER:H	2.05	0.69
1:B:110:THR:HG21	1:B:265:SER:H	1.58	0.69
1:C:248:GLY:C	1:C:249:ASN:HD22	1.95	0.69
1:B:171:SER:HB2	1:B:258:LYS:HD2	1.75	0.69
1:B:338:PHE:O	1:B:464:ASN:HA	1.93	0.68
1:A:400:SER:OG	6:A:2130:HOH:O	2.12	0.68
1:C:262:ARG:HG3	1:C:263:GLY:H	1.58	0.68
1:B:492:GLU:CA	1:B:494:GLU:H	2.09	0.65
1:A:455:LEU:HD13	1:A:459:VAL:HG11	1.79	0.65
1:A:53:PRO:HG3	1:A:82:TYR:CZ	2.32	0.65
1:B:262:ARG:HG2	1:B:262:ARG:O	1.96	0.64
1:B:72:ASP:OD2	1:B:148:ARG:HD2	1.98	0.63
1:B:138:CYS:O	1:B:145:SER:HB3	1.98	0.63
1:A:293:PRO:HG3	1:A:385:ILE:HA	1.79	0.63
1:C:320:LEU:H	1:C:320:LEU:HD23	1.63	0.63
1:C:454:GLN:NE2	1:C:484:GLY:HA2	2.14	0.62
1:B:354:HIS:HA	1:B:362:GLY:O	2.00	0.61
3:E:1:NAG:H3	3:E:1:NAG:C8	2.30	0.61
1:B:311:SER:HB3	1:B:426:GLU:OE2	2.01	0.61
1:C:404:ARG:HG2	1:C:404:ARG:HH11	1.65	0.61
1:A:168:ASN:HD21	5:A:1500:NAG:C1	2.12	0.61
1:A:18:GLU:HG2	1:A:33:ALA:HB3	1.82	0.61
1:A:320:LEU:HD23	1:A:320:LEU:H	1.64	0.61
1:C:9:ILE:HG13	1:C:448:TYR:HA	1.81	0.61
1:A:19:LYS:O	1:A:313:ARG:NH2	2.35	0.60
1:B:470:TYR:O	1:B:496:LYS:HE2	2.02	0.60
1:A:389:ASN:HD21	1:B:310:LYS:HD2	1.67	0.59
1:B:492:GLU:HB3	1:B:494:GLU:HB2	1.82	0.59
1:B:110:THR:HG23	1:B:265:SER:H	1.65	0.59
1:C:12:HIS:HD2	1:C:346:MET:O	1.86	0.59
1:C:58:ASP:HB3	1:C:86:LYS:HD2	1.85	0.59
1:C:459:VAL:HG23	1:C:469:PHE:HA	1.84	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:273:THR:HG23	6:A:2103:HOH:O	2.02	0.59
1:C:399:PHE:CE1	1:C:406:LEU:HG	2.38	0.59
1:A:110:THR:HG23	1:A:265:SER:HB3	1.84	0.58
1:A:272:LYS:HE3	1:A:285:LEU:O	2.04	0.58
1:A:9:ILE:HD11	1:A:451:VAL:HG21	1.86	0.58
1:A:355:HIS:CE1	1:A:362:GLY:HA2	2.38	0.58
1:A:46:CYS:HA	1:A:277:CYS:HB3	1.85	0.58
1:B:113:THR:HB	1:B:114:HIS:CB	2.34	0.57
1:A:248:GLY:C	1:A:249:ASN:HD22	2.06	0.57
1:C:40:THR:HG22	6:C:2015:HOH:O	2.04	0.57
1:A:435:ARG:HH11	1:C:435:ARG:NH1	2.02	0.57
1:A:401:ASN:HD22	1:A:401:ASN:H	1.52	0.57
1:C:492:GLU:O	1:C:494:GLU:N	2.37	0.57
1:B:492:GLU:HB3	1:B:494:GLU:H	1.68	0.57
1:C:78:PRO:O	1:C:114:HIS:HB2	2.05	0.57
1:B:53:PRO:HG3	1:B:82:TYR:CZ	2.40	0.57
1:C:298:HIS:ND1	1:C:299:PRO:HD2	2.21	0.56
1:A:140:VAL:C	1:A:142:ASP:HA	2.26	0.56
1:C:168:ASN:ND2	5:C:1497:NAG:C1	2.54	0.56
1:B:141:LEU:HD12	1:B:141:LEU:O	2.05	0.55
1:C:94:CYS:HG	1:C:138:CYS:HG	1.54	0.55
1:C:357:ASN:HB3	1:C:360:GLY:H	1.72	0.55
1:A:75:LEU:O	1:A:76:SER:HB3	2.07	0.54
1:C:111:SER:HB2	1:C:265:SER:HB2	1.88	0.54
1:B:295:HIS:HD2	1:B:297:ILE:H	1.54	0.54
1:A:454:GLN:NE2	1:A:486:TYR:H	2.06	0.54
1:B:9:ILE:HG13	1:B:448:TYR:HA	1.88	0.54
1:A:8:CYS:O	1:A:353:TYR:HA	2.08	0.54
1:A:95:TYR:CD2	1:A:96:PRO:HD2	2.43	0.54
1:A:463:GLY:O	1:A:464:ASN:ND2	2.41	0.54
1:A:174:GLN:OE1	1:A:235:LEU:HD13	2.08	0.54
1:A:448:TYR:CE1	1:A:465:GLY:HA2	2.42	0.54
1:B:360:GLY:O	1:B:361:SER:HB3	2.06	0.54
1:C:404:ARG:HG2	1:C:404:ARG:NH1	2.20	0.54
1:A:113:THR:N	1:A:260:SER:O	2.38	0.53
1:B:359:GLN:OE1	1:B:474:ASP:HB2	2.07	0.53
1:B:6:GLN:HB2	1:B:467:PHE:O	2.09	0.53
1:C:53:PRO:HD2	1:C:274:LEU:HD22	1.91	0.53
1:B:435:ARG:NE	6:B:2143:HOH:O	2.38	0.53
1:B:494:GLU:OE1	1:B:494:GLU:CA	2.56	0.53
1:B:18:GLU:HG2	1:B:33:ALA:HB3	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:114:HIS:HD2	1:A:173:GLU:OE1	1.91	0.53
1:C:354:HIS:HA	1:C:362:GLY:O	2.09	0.53
1:A:448:TYR:HE1	1:A:465:GLY:HA2	1.74	0.53
1:C:182:HIS:HD2	1:C:194:TYR:OH	1.92	0.53
1:B:494:GLU:OE1	1:B:494:GLU:HA	2.09	0.53
1:B:74:LEU:N	6:B:2030:HOH:O	2.42	0.52
1:C:483:ASN:ND2	4:F:1:NAG:C1	2.71	0.52
1:C:56:LEU:HD23	1:C:74:LEU:HD11	1.92	0.52
1:A:401:ASN:HD22	1:A:401:ASN:N	2.07	0.52
1:B:141:LEU:N	1:B:142:ASP:HA	2.24	0.52
1:A:483:ASN:HD21	5:A:1499:NAG:C1	2.22	0.52
1:A:51:ILE:HB	1:A:81:SER:HB3	1.91	0.52
1:B:113:THR:HG22	1:B:114:HIS:HB2	1.92	0.51
1:A:492:GLU:O	1:A:493:GLU:HB2	2.09	0.51
1:C:14:ASN:HA	1:C:344:GLN:HE22	1.73	0.51
1:C:143:ASN:N	1:C:143:ASN:HD22	2.07	0.51
1:A:493:GLU:O	1:A:494:GLU:CB	2.59	0.51
1:B:459:VAL:HG12	1:B:469:PHE:HA	1.92	0.51
1:A:72:ASP:OD2	1:A:148:ARG:HG3	2.11	0.51
1:B:397:LYS:NZ	1:C:408:ASN:HD21	2.09	0.51
1:B:492:GLU:CB	1:B:494:GLU:H	2.24	0.51
1:C:483:ASN:HD22	4:F:1:NAG:H83	1.76	0.51
1:C:459:VAL:HG21	1:C:467:PHE:HB3	1.93	0.51
1:A:182:HIS:HD2	1:A:194:TYR:OH	1.94	0.50
1:A:272:LYS:HE2	1:A:284:PRO:O	2.11	0.50
1:A:78:PRO:O	1:A:114:HIS:HA	2.11	0.50
1:B:140:VAL:HG12	1:B:141:LEU:HG	1.91	0.50
1:B:320:LEU:HD23	1:B:320:LEU:H	1.76	0.50
1:A:409:LEU:HD21	1:C:409:LEU:HD22	1.94	0.50
1:A:435:ARG:NH1	1:C:435:ARG:HH12	2.10	0.50
1:B:170:THR:HG22	1:B:239:TRP:CZ3	2.46	0.50
1:B:194:TYR:O	1:B:196:ASN:N	2.43	0.50
1:C:50:GLY:N	1:C:278:GLU:OE2	2.37	0.50
1:A:9:ILE:HG13	1:A:448:TYR:HA	1.94	0.49
1:B:140:VAL:HG21	1:B:148:ARG:NH2	2.27	0.49
1:B:96:PRO:HG3	1:B:222:VAL:O	2.12	0.49
1:C:275:GLU:O	1:C:276:ASN:HB3	2.13	0.49
1:B:113:THR:N	1:B:260:SER:O	2.46	0.49
1:A:435:ARG:HH11	1:C:435:ARG:HH12	1.60	0.49
1:B:110:THR:HG23	1:B:265:SER:N	2.28	0.49
1:B:295:HIS:CD2	1:B:297:ILE:H	2.31	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:14:ASN:CA	1:C:344:GLN:HE22	2.26	0.49
1:B:71:CYS:O	1:B:74:LEU:HB2	2.13	0.49
1:A:283:THR:HG22	1:A:301:THR:HG22	1.94	0.49
1:B:488:TYR:HB3	1:B:489:PRO:HD3	1.95	0.49
1:B:492:GLU:HA	1:B:494:GLU:H	1.69	0.49
1:C:454:GLN:HE22	1:C:484:GLY:HA2	1.77	0.49
1:A:464:ASN:N	6:A:2145:HOH:O	2.43	0.48
1:B:471:HIS:CD2	1:B:491:TYR:HB3	2.48	0.48
1:C:182:HIS:O	1:C:184:PRO:HD3	2.13	0.48
1:C:194:TYR:O	1:C:196:ASN:N	2.45	0.48
1:C:492:GLU:C	1:C:494:GLU:H	2.15	0.48
1:A:295:HIS:HD2	1:A:297:ILE:H	1.62	0.48
1:A:169:ASN:HB2	1:A:236:LEU:HD23	1.95	0.48
1:C:182:HIS:CD2	1:C:194:TYR:OH	2.67	0.48
1:B:261:LYS:HB3	1:B:261:LYS:HE3	1.68	0.47
1:C:71:CYS:O	1:C:74:LEU:HB2	2.14	0.47
1:A:422:THR:O	1:A:426:GLU:HG2	2.14	0.47
1:B:140:VAL:HG21	1:B:148:ARG:HH22	1.78	0.47
1:C:361:SER:HB3	1:C:362:GLY:CA	2.44	0.47
1:C:392:PHE:C	1:C:392:PHE:CD2	2.88	0.47
1:B:182:HIS:HD2	1:B:194:TYR:OH	1.97	0.47
1:C:460:LYS:HG3	1:C:470:TYR:CZ	2.49	0.47
1:A:272:LYS:HE3	1:A:285:LEU:C	2.36	0.47
1:C:169:ASN:HB2	1:C:236:LEU:HD23	1.97	0.47
1:A:53:PRO:HD2	1:A:274:LEU:HD22	1.97	0.47
1:B:163:ALA:O	1:B:245:GLU:HA	2.15	0.47
1:A:168:ASN:ND2	5:A:1500:NAG:C1	2.76	0.46
1:C:14:ASN:HB2	6:C:2005:HOH:O	2.15	0.46
1:C:495:SER:HB2	6:C:2152:HOH:O	2.14	0.46
1:C:262:ARG:HG3	1:C:263:GLY:N	2.29	0.46
1:A:248:GLY:O	1:A:249:ASN:HB2	2.16	0.46
1:B:355:HIS:O	1:B:361:SER:HB2	2.15	0.46
1:C:95:TYR:CD2	1:C:96:PRO:HD2	2.50	0.46
1:C:160:TYR:CZ	1:C:248:GLY:HA2	2.50	0.46
1:B:493:GLU:OE2	1:B:496:LYS:NZ	2.46	0.46
1:A:298:HIS:ND1	1:A:299:PRO:HD2	2.30	0.46
1:B:389:ASN:HB3	6:B:2126:HOH:O	2.15	0.46
1:A:19:LYS:HE3	1:A:27:ASN:HB3	1.98	0.46
1:A:46:CYS:CA	1:A:277:CYS:HB3	2.44	0.46
1:C:85:GLU:O	1:C:269:LYS:HA	2.17	0.46
1:C:168:ASN:HD21	5:C:1497:NAG:C2	2.27	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:353:TYR:CE2	1:C:366:ASP:HB2	2.51	0.45
1:C:178:ILE:O	1:C:253:PRO:HG3	2.16	0.45
1:A:191:ARG:O	1:A:195:GLN:HA	2.16	0.45
1:A:479:ASN:HB3	5:A:1499:NAG:H81	1.99	0.45
1:B:182:HIS:O	1:B:184:PRO:HD3	2.16	0.45
1:A:278:GLU:HG3	6:A:2106:HOH:O	2.16	0.45
1:A:472:LYS:HA	1:A:472:LYS:HD3	1.83	0.45
1:B:126:TRP:CG	1:B:153:LEU:HD21	2.52	0.45
1:B:490:LYS:HD3	1:B:491:TYR:CE2	2.51	0.45
1:A:10:GLY:HA3	1:A:343:TRP:CZ3	2.51	0.45
1:C:113:THR:O	1:C:260:SER:HB2	2.17	0.45
1:A:99:PHE:HB3	1:A:102:TYR:HB2	1.99	0.45
1:B:75:LEU:O	1:B:76:SER:HB3	2.17	0.45
1:B:248:GLY:C	1:B:249:ASN:HD22	2.19	0.45
1:B:326:ILE:HG23	6:B:2109:HOH:O	2.15	0.45
1:A:397:LYS:HB2	1:A:399:PHE:CE2	2.52	0.45
1:C:108:LEU:O	1:C:261:LYS:HD2	2.17	0.45
1:C:298:HIS:HA	1:C:299:PRO:HD3	1.86	0.44
1:A:459:VAL:HG12	1:A:469:PHE:HA	2.00	0.44
1:C:313:ARG:CZ	1:C:315:VAL:HG21	2.47	0.44
1:B:95:TYR:CD2	1:B:96:PRO:HD2	2.52	0.44
1:C:293:PRO:HG3	1:C:385:ILE:HA	1.99	0.44
1:B:113:THR:HB	1:B:260:SER:HB2	2.00	0.44
1:C:53:PRO:HG3	1:C:82:TYR:CZ	2.51	0.44
1:A:66:LEU:O	1:A:147:PHE:HB3	2.18	0.44
1:C:97:GLY:HA3	1:C:229:MET:O	2.17	0.44
1:C:261:LYS:NZ	1:C:261:LYS:HB3	2.33	0.44
1:B:464:ASN:HD22	1:B:464:ASN:N	2.16	0.44
1:A:402:LEU:HB2	6:A:2130:HOH:O	2.17	0.44
1:C:138:CYS:O	1:C:145:SER:HB3	2.17	0.43
1:C:205:THR:HG22	1:C:242:ILE:HA	2.00	0.43
1:A:397:LYS:NZ	1:B:408:ASN:HD21	2.16	0.43
1:B:284:PRO:HD3	1:B:300:LEU:O	2.18	0.43
1:B:182:HIS:CD2	1:B:194:TYR:OH	2.71	0.43
1:A:182:HIS:CD2	1:A:194:TYR:OH	2.72	0.43
1:B:355:HIS:O	1:B:361:SER:CB	2.66	0.43
1:A:460:LYS:HE3	1:C:456:ARG:NH2	2.33	0.43
1:A:470:TYR:HB3	1:A:496:LYS:H	1.84	0.43
1:C:409:LEU:HD23	1:C:409:LEU:O	2.18	0.43
1:B:10:GLY:HA3	1:B:343:TRP:CZ3	2.54	0.43
1:C:455:LEU:HD23	1:C:459:VAL:HG11	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:190:GLN:HG2	1:A:197:VAL:HG23	2.01	0.43
1:A:262:ARG:O	1:A:262:ARG:HG2	2.18	0.43
1:B:31:THR:OG1	1:B:32:HIS:CD2	2.72	0.43
1:B:472:LYS:HD3	1:B:472:LYS:HA	1.81	0.43
1:C:283:THR:HG22	1:C:301:THR:HG22	2.00	0.43
1:A:37:LEU:HB2	1:A:314:LEU:HB2	2.01	0.42
1:B:397:LYS:HZ1	1:C:408:ASN:HD21	1.65	0.42
1:C:372:LYS:HA	1:C:372:LYS:HD2	1.89	0.42
1:A:56:LEU:HD23	1:A:56:LEU:HA	1.88	0.42
1:B:19:LYS:O	1:B:313:ARG:NH2	2.52	0.42
1:B:168:ASN:HD21	2:D:1:NAG:C2	2.25	0.42
1:B:492:GLU:OE1	1:B:492:GLU:N	2.52	0.42
1:C:118:VAL:HG23	1:C:120:ILE:HG23	2.01	0.42
1:A:113:THR:HB	1:A:260:SER:CB	2.37	0.42
1:A:493:GLU:O	1:A:494:GLU:HB3	2.19	0.42
6:B:2141:HOH:O	1:C:431:MET:HE3	2.19	0.42
1:B:413:MET:HE2	1:B:413:MET:HB3	1.88	0.42
1:B:462:LEU:HA	1:B:462:LEU:HD12	1.75	0.42
1:C:338:PHE:O	1:C:464:ASN:HA	2.18	0.42
1:A:53:PRO:HG3	1:A:82:TYR:OH	2.19	0.42
1:B:61:ILE:CD1	1:B:106:LYS:HG2	2.50	0.42
1:C:249:ASN:HD22	1:C:249:ASN:N	2.17	0.42
1:C:357:ASN:OD1	1:C:473:CYS:O	2.38	0.42
1:C:494:GLU:HG3	1:C:495:SER:H	1.84	0.42
1:B:10:GLY:HA3	1:B:343:TRP:CH2	2.55	0.42
1:B:272:LYS:HE3	1:B:285:LEU:O	2.20	0.42
1:C:190:GLN:NE2	1:C:249:ASN:HD21	2.01	0.42
1:A:110:THR:CG2	1:A:265:SER:N	2.77	0.42
1:B:72:ASP:OD2	1:B:148:ARG:NH1	2.37	0.42
1:B:454:GLN:NE2	1:B:486:TYR:H	2.17	0.42
1:B:492:GLU:CA	1:B:494:GLU:N	2.72	0.42
1:C:487:ASP:OD1	1:C:489:PRO:HD2	2.20	0.42
1:C:494:GLU:O	1:C:495:SER:C	2.56	0.42
1:B:140:VAL:HG12	1:B:141:LEU:N	2.34	0.42
1:C:338:PHE:CD1	1:C:339:ILE:HG13	2.55	0.42
1:A:235:LEU:HD23	1:A:235:LEU:HA	1.72	0.41
1:B:45:LEU:HD23	1:B:272:LYS:CB	2.42	0.41
1:C:249:ASN:N	1:C:249:ASN:ND2	2.68	0.41
1:C:346:MET:SD	1:C:352:GLY:HA3	2.60	0.41
1:B:492:GLU:CB	1:B:494:GLU:HB2	2.49	0.41
1:A:45:LEU:HA	1:A:45:LEU:HD23	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:94:CYS:SG	1:C:138:CYS:SG	3.10	0.41
1:B:45:LEU:HD21	1:B:270:THR:HG21	2.01	0.41
1:C:52:PRO:HB3	1:C:274:LEU:HD21	2.02	0.41
2:D:2:NAG:H82	2:D:2:NAG:H2	1.90	0.41
1:A:19:LYS:HA	1:A:28:VAL:O	2.20	0.41
1:C:335:ILE:HD12	1:C:441:ASP:HA	2.02	0.41
1:A:261:LYS:HE3	1:A:261:LYS:HB3	1.88	0.41
1:A:483:ASN:ND2	5:A:1499:NAG:C1	2.84	0.41
1:B:8:CYS:O	1:B:353:TYR:HA	2.21	0.41
1:B:139:ALA:HA	1:B:143:ASN:O	2.20	0.41
1:C:276:ASN:O	1:C:276:ASN:CG	2.59	0.41
1:C:488:TYR:HB3	1:C:489:PRO:HD3	2.03	0.41
1:C:292:LEU:HA	1:C:293:PRO:HD3	1.87	0.41
1:A:50:GLY:N	1:A:278:GLU:OE2	2.52	0.40
1:C:241:VAL:HG23	5:C:1497:NAG:H82	2.03	0.40
1:A:96:PRO:HG3	1:A:222:VAL:O	2.21	0.40
1:A:279:THR:OG1	1:A:287:ALA:HB1	2.21	0.40
1:B:79:GLU:HB2	1:B:113:THR:O	2.21	0.40
1:C:51:ILE:HA	1:C:52:PRO:HD3	1.87	0.40
1:A:10:GLY:HA3	1:A:343:TRP:CH2	2.57	0.40
1:A:354:HIS:CE1	1:A:361:SER:HB2	2.56	0.40
1:C:261:LYS:HB3	1:C:261:LYS:HZ2	1.87	0.40
1:C:452:ARG:HB2	1:C:467:PHE:CZ	2.57	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	486/509 (96%)	459 (94%)	20 (4%)	7 (1%)	11 9
1	B	487/509 (96%)	459 (94%)	22 (4%)	6 (1%)	13 12

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	482/509 (95%)	456 (95%)	21 (4%)	5 (1%)	15	16
All	All	1455/1527 (95%)	1374 (94%)	63 (4%)	18 (1%)	13	12

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	75	LEU
1	B	464	ASN
1	B	493	GLU
1	C	113	THR
1	C	493	GLU
1	A	494	GLU
1	B	361	SER
1	B	362	GLY
1	C	362	GLY
1	A	114	HIS
1	A	464	ASN
1	C	75	LEU
1	C	494	GLU
1	A	76	SER
1	A	362	GLY
1	A	496	LYS
1	A	493	GLU
1	B	114	HIS

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	427/447 (96%)	407 (95%)	20 (5%)	26	34
1	B	429/447 (96%)	412 (96%)	17 (4%)	31	41
1	C	426/447 (95%)	409 (96%)	17 (4%)	31	41
All	All	1282/1341 (96%)	1228 (96%)	54 (4%)	30	39

All (54) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	58	ASP
1	A	72	ASP
1	A	74	LEU
1	A	93	LEU
1	A	110	THR
1	A	114	HIS
1	A	123	ARG
1	A	131	THR
1	A	196	ASN
1	A	202	SER
1	A	211	ARG
1	A	213	ILE
1	A	264	SER
1	A	277	CYS
1	A	320	LEU
1	A	331	LEU
1	A	351	TYR
1	A	401	ASN
1	A	437	LEU
1	A	464	ASN
1	B	45	LEU
1	B	52	PRO
1	B	87	GLU
1	B	131	THR
1	B	148	ARG
1	B	159	ASN
1	B	196	ASN
1	B	264	SER
1	B	311	SER
1	B	320	LEU
1	B	351	TYR
1	B	390	THR
1	B	401	ASN
1	B	406	LEU
1	B	437	LEU
1	B	464	ASN
1	B	494	GLU
1	C	17	THR
1	C	39	LYS
1	C	74	LEU
1	C	77	VAL
1	C	113	THR

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Mol	Chain	Res	Type
1	C	143	ASN
1	C	249	ASN
1	C	269	LYS
1	C	291	THR
1	C	320	LEU
1	C	347	VAL
1	C	389	ASN
1	C	404	ARG
1	C	455	LEU
1	C	459	VAL
1	C	462	LEU
1	C	493	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (39) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	32	HIS
1	A	114	HIS
1	A	182	HIS
1	A	249	ASN
1	A	295	HIS
1	A	354	HIS
1	A	389	ASN
1	A	401	ASN
1	A	408	ASN
1	A	454	GLN
1	A	464	ASN
1	B	32	HIS
1	B	159	ASN
1	B	168	ASN
1	B	182	HIS
1	B	243	ASN
1	B	249	ASN
1	B	295	HIS
1	B	325	GLN
1	B	391	GLN
1	B	401	ASN
1	B	408	ASN
1	B	454	GLN
1	B	464	ASN
1	C	12	HIS
1	C	15	ASN

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Mol	Chain	Res	Type
1	C	32	HIS
1	C	91	ASN
1	C	100	ASN
1	C	143	ASN
1	C	168	ASN
1	C	182	HIS
1	C	249	ASN
1	C	344	GLN
1	C	357	ASN
1	C	389	ASN
1	C	408	ASN
1	C	424	ASN
1	C	454	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)

Of 10 monosaccharides modelled in this entry, 9 were used for Mogul analysis.

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	D	1	2	14,14,15	0.55	0	17,19,21	1.43	2 (11%)
2	NAG	D	2	2	14,14,15	0.72	0	17,19,21	1.38	3 (17%)
3	NAG	E	1	3	14,14,15	0.52	0	17,19,21	1.61	4 (23%)
3	NAG	E	2	3	14,14,15	0.69	0	17,19,21	0.88	0
3	BMA	E	3	3	11,11,12	0.60	0	15,15,17	0.39	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	NAG	F	1	4	14,14,15	0.43	0	17,19,21	1.06	1 (5%)
4	NAG	F	2	4	14,14,15	0.59	0	17,19,21	0.80	0
4	BMA	F	3	4	11,11,12	0.66	0	15,15,17	0.52	0
4	MAN	F	4	4	11,11,12	0.76	0	15,15,17	0.74	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
2	NAG	D	1	2	-	3/6/23/26	0/1/1/1
2	NAG	D	2	2	-	4/6/23/26	0/1/1/1
3	NAG	E	1	3	-	5/6/23/26	0/1/1/1
3	NAG	E	2	3	-	4/6/23/26	0/1/1/1
3	BMA	E	3	3	-	2/2/19/22	0/1/1/1
4	NAG	F	1	4	-	2/6/23/26	0/1/1/1
4	NAG	F	2	4	-	4/6/23/26	0/1/1/1
4	BMA	F	3	4	-	0/2/19/22	0/1/1/1
4	MAN	F	4	4	-	1/2/19/22	0/1/1/1

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	1	NAG	C8-C7-N2	3.56	122.02	116.12
2	D	1	NAG	O5-C1-C2	-3.54	105.81	111.29
3	E	1	NAG	C2-N2-C7	3.42	127.48	122.90
2	D	1	NAG	C3-C4-C5	3.14	115.92	110.23
3	E	1	NAG	O7-C7-C8	-2.76	117.13	122.05
2	D	2	NAG	C2-N2-C7	-2.60	119.41	122.90
2	D	2	NAG	C4-C3-C2	-2.28	107.68	111.02
3	E	1	NAG	C4-C3-C2	2.18	114.22	111.02
2	D	2	NAG	O5-C1-C2	-2.07	108.10	111.29
4	F	1	NAG	O5-C1-C2	-2.06	108.11	111.29

There are no chirality outliers.

All (25) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	E	1	NAG	O5-C5-C6-O6
2	D	2	NAG	C4-C5-C6-O6
2	D	2	NAG	O5-C5-C6-O6
2	D	1	NAG	C8-C7-N2-C2
2	D	1	NAG	O7-C7-N2-C2
2	D	2	NAG	C8-C7-N2-C2
2	D	2	NAG	O7-C7-N2-C2
3	E	1	NAG	C8-C7-N2-C2
3	E	1	NAG	O7-C7-N2-C2
3	E	2	NAG	C8-C7-N2-C2
3	E	2	NAG	O7-C7-N2-C2
4	F	1	NAG	C8-C7-N2-C2
4	F	1	NAG	O7-C7-N2-C2
4	F	2	NAG	C8-C7-N2-C2
4	F	2	NAG	O7-C7-N2-C2
4	F	4	MAN	O5-C5-C6-O6
3	E	3	BMA	O5-C5-C6-O6
3	E	2	NAG	C4-C5-C6-O6
3	E	1	NAG	C3-C2-N2-C7
3	E	1	NAG	C4-C5-C6-O6
3	E	2	NAG	O5-C5-C6-O6
4	F	2	NAG	C4-C5-C6-O6
3	E	3	BMA	C4-C5-C6-O6
2	D	1	NAG	C4-C5-C6-O6
4	F	2	NAG	O5-C5-C6-O6

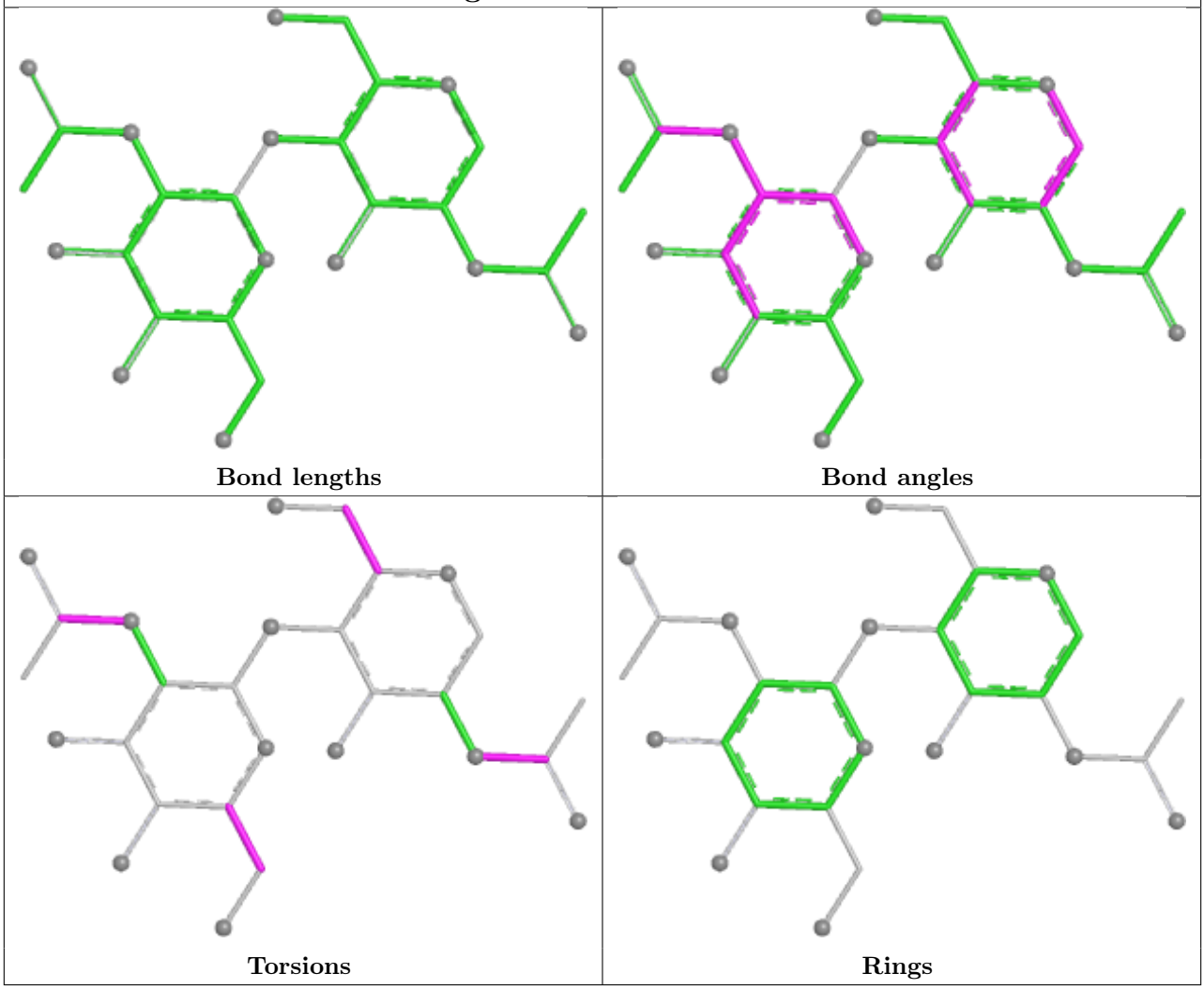
There are no ring outliers.

4 monomers are involved in 11 short contacts:

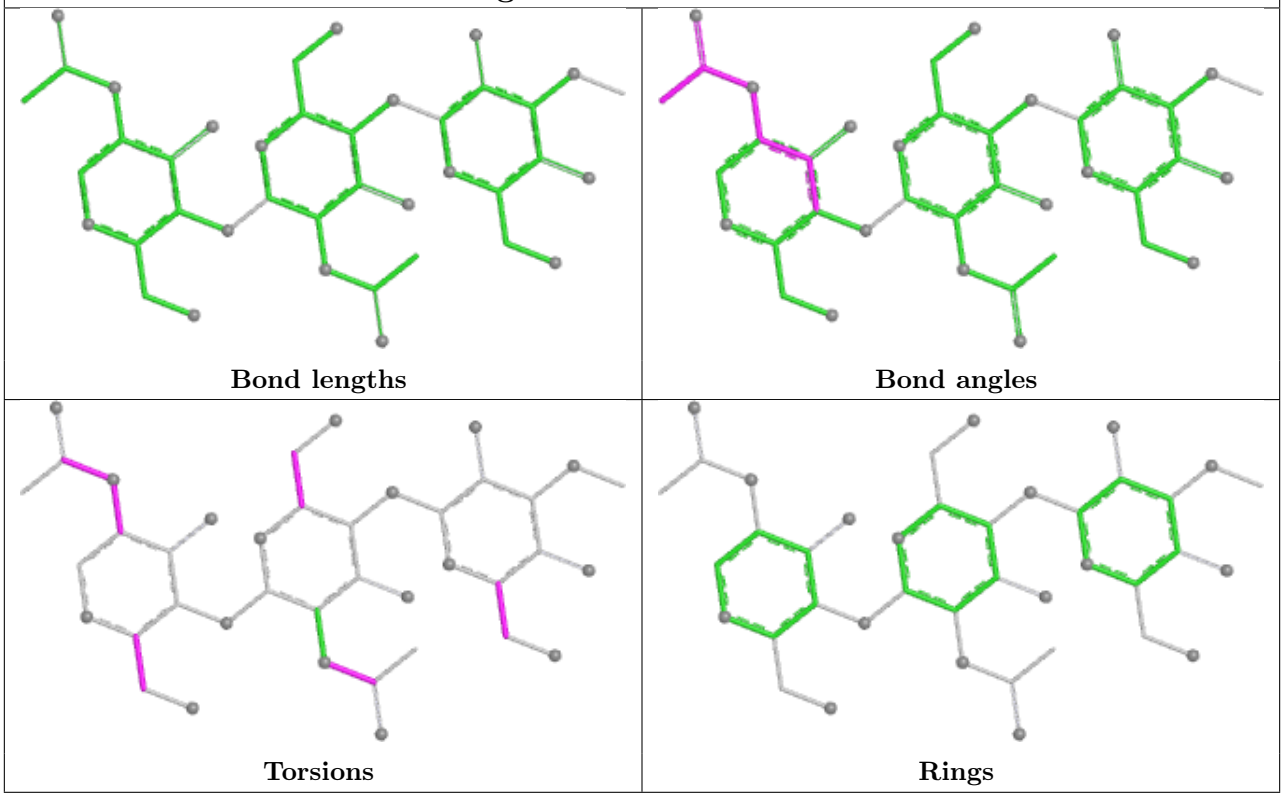
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	F	1	NAG	4	0
2	D	1	NAG	3	0
3	E	1	NAG	3	0
2	D	2	NAG	1	0

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

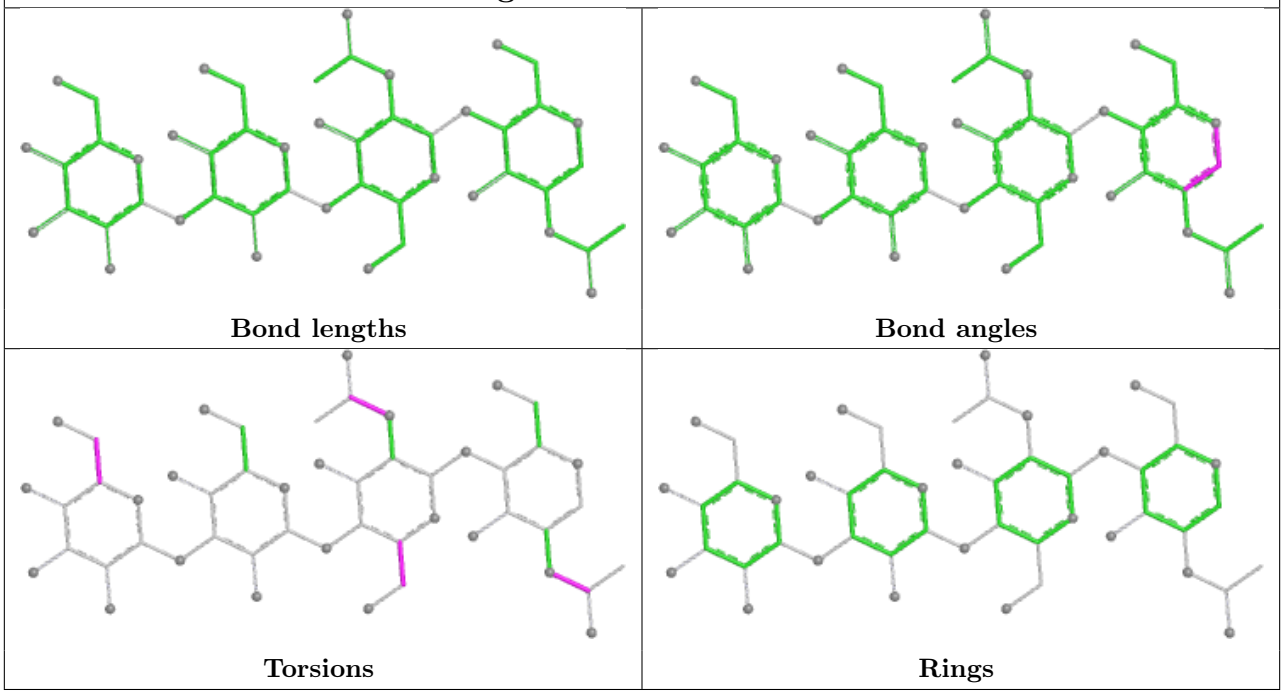
Oligosaccharide Chain D



Oligosaccharide Chain E



Oligosaccharide Chain F



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	$\#\|Z\| > 2$
5	NAG	A	1500	-	14,14,15	0.59	0	17,19,21	0.99	2 (11%)
5	NAG	A	1499	-	14,14,15	0.54	0	17,19,21	1.22	2 (11%)
5	NAG	C	1497	-	14,14,15	0.55	0	17,19,21	1.13	2 (11%)

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	A	1500	-	-	5/6/23/26	0/1/1/1
5	NAG	A	1499	-	-	4/6/23/26	0/1/1/1
5	NAG	C	1497	-	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	1499	NAG	O5-C1-C2	3.39	116.53	111.29
5	A	1500	NAG	C4-C3-C2	2.33	114.44	111.02
5	C	1497	NAG	O5-C1-C2	-2.29	107.74	111.29
5	A	1499	NAG	C1-O5-C5	2.28	115.25	112.19
5	C	1497	NAG	C3-C4-C5	2.26	114.34	110.23
5	A	1500	NAG	C1-O5-C5	2.06	114.95	112.19

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1499	NAG	C1-C2-N2-C7
5	A	1499	NAG	C8-C7-N2-C2
5	A	1499	NAG	O7-C7-N2-C2
5	A	1500	NAG	C1-C2-N2-C7

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Mol	Chain	Res	Type	Atoms
5	A	1500	NAG	C8-C7-N2-C2
5	A	1500	NAG	O7-C7-N2-C2
5	C	1497	NAG	O5-C5-C6-O6
5	A	1500	NAG	O5-C5-C6-O6
5	C	1497	NAG	C4-C5-C6-O6
5	A	1500	NAG	C4-C5-C6-O6
5	A	1499	NAG	O5-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1500	NAG	4	0
5	A	1499	NAG	3	0
5	C	1497	NAG	4	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 (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, 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	490/509 (96%)	-0.04	22 (4%)	33	30	22, 45, 92, 175	1 (0%)
1	B	491/509 (96%)	-0.08	19 (3%)	39	36	26, 44, 82, 159	0
1	C	486/509 (95%)	-0.10	12 (2%)	57	53	28, 46, 79, 131	0
All	All	1467/1527 (96%)	-0.07	53 (3%)	42	39	22, 45, 84, 175	1 (0%)

All (53) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	141	LEU	8.2
1	A	141	LEU	8.1
1	A	262	ARG	4.7
1	A	476	GLU	4.4
1	C	75	LEU	4.3
1	A	495	SER	3.9
1	B	262	ARG	3.9
1	B	276	ASN	3.8
1	C	262	ARG	3.7
1	B	73	ARG	3.5
1	C	361	SER	3.5
1	A	143	ASN	3.4
1	A	497	ALA	3.3
1	A	358	ASP	3.2
1	C	113	THR	3.1
1	B	277	CYS	2.8
1	C	489	PRO	2.8
1	C	358	ASP	2.8
1	A	359	GLN	2.7
1	B	143	ASN	2.7
1	A	389	ASN	2.7
1	B	497	ALA	2.6
1	B	197	VAL	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	88	ASN	2.5
1	A	142	ASP	2.5
1	B	114	HIS	2.5
1	A	464	ASN	2.4
1	C	459	VAL	2.4
1	B	291	THR	2.4
1	A	485	THR	2.4
1	A	367	LYS	2.4
1	C	90	VAL	2.4
1	A	498	ALA	2.4
1	B	113	THR	2.3
1	B	362	GLY	2.3
1	A	462	LEU	2.3
1	B	361	SER	2.2
1	B	358	ASP	2.2
1	C	88	ASN	2.2
1	C	73	ARG	2.2
1	C	221	LYS	2.1
1	B	498	ALA	2.1
1	A	136	ARG	2.1
1	B	239	TRP	2.1
1	A	75	LEU	2.1
1	B	158	SER	2.1
1	A	493	GLU	2.1
1	A	73	ARG	2.1
1	A	113	THR	2.0
1	A	347	VAL	2.0
1	B	347	VAL	2.0
1	B	140	VAL	2.0
1	C	472	LYS	2.0

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

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

6.3 Carbohydrates (i)

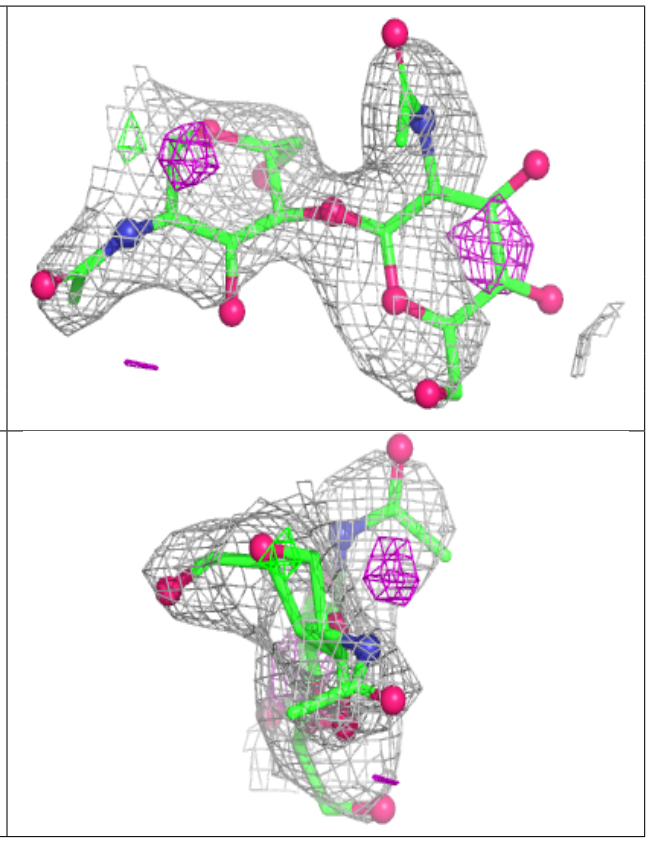
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	NAG	E	1	14/15	0.34	0.43	127,128,129,129	0
3	BMA	E	4	1/12	0.52	0.37	129,129,129,129	0
3	NAG	E	2	14/15	0.61	0.39	127,128,129,129	0
2	NAG	D	2	14/15	0.66	0.54	101,102,102,102	0
3	BMA	E	3	11/12	0.67	0.50	129,129,129,129	0
4	BMA	F	3	11/12	0.72	0.34	82,83,83,83	0
4	MAN	F	4	11/12	0.73	0.34	83,83,83,83	0
2	NAG	D	1	14/15	0.79	0.27	100,101,101,101	0
4	NAG	F	1	14/15	0.87	0.14	83,83,84,84	0
4	NAG	F	2	14/15	0.89	0.23	82,82,83,83	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.

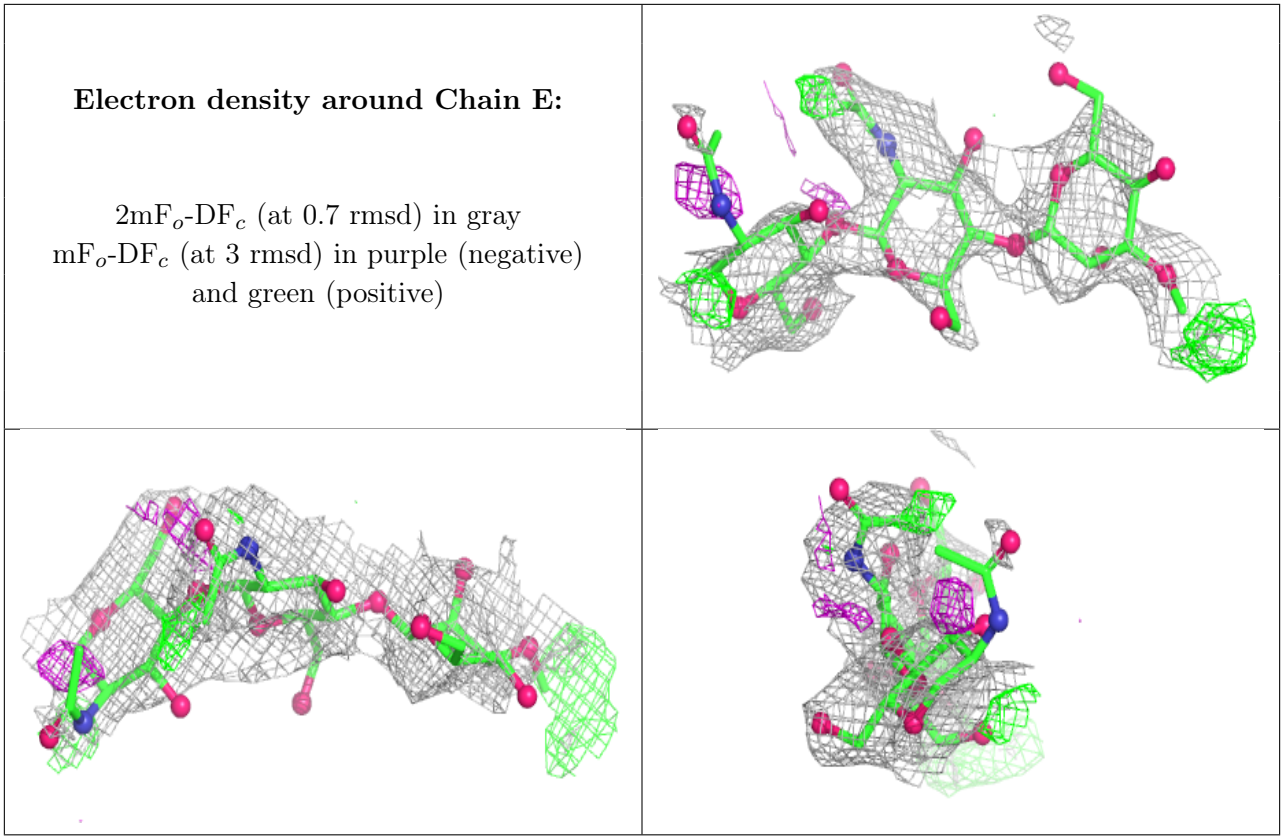
Electron density around Chain D:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative) and green (positive)



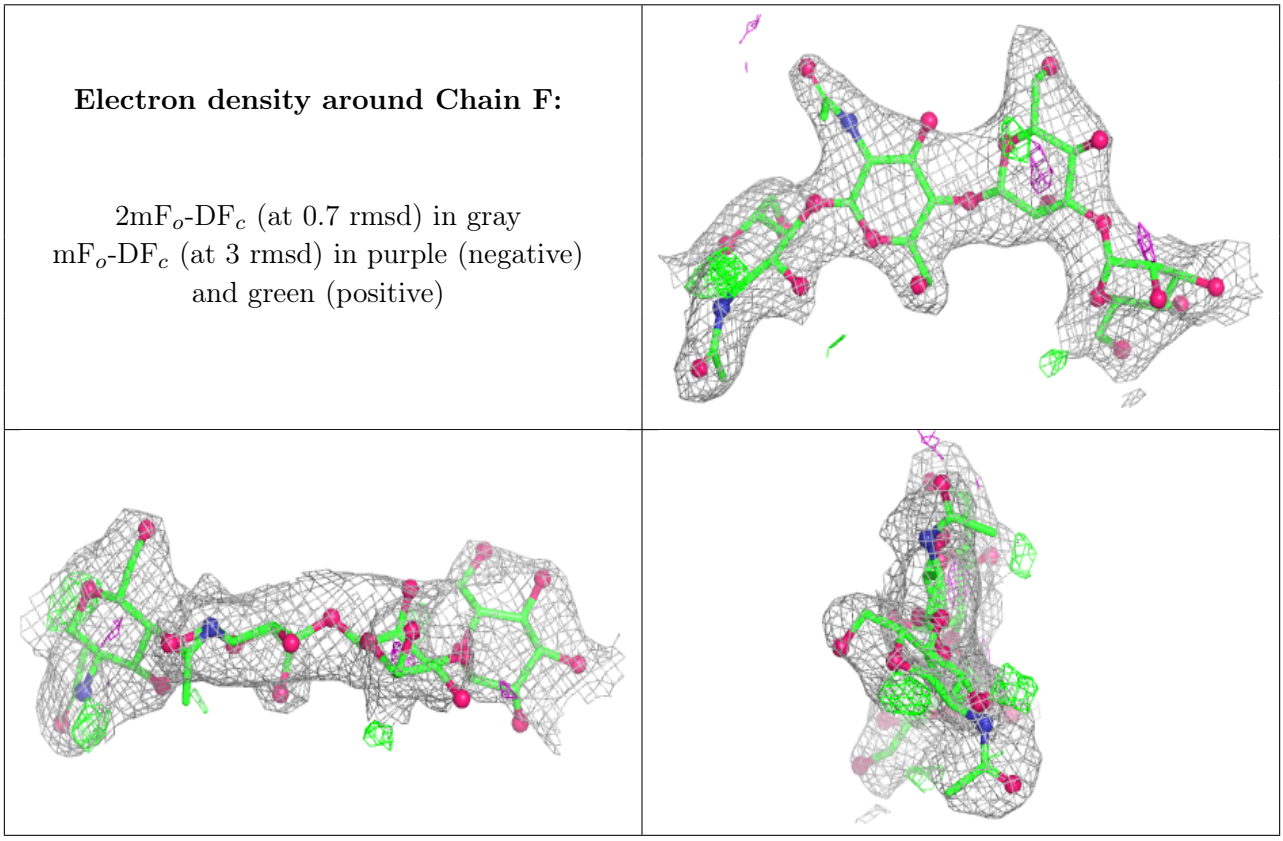
Electron density around Chain E:

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



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)



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
5	NAG	A	1499	14/15	0.37	0.54	149,152,153,153	0
5	NAG	A	1500	14/15	0.73	0.26	58,60,61,61	0
5	NAG	C	1497	14/15	0.85	0.21	63,65,65,65	0

6.5 Other polymers (i)

There are no such residues in this entry.