WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Sep 18, 2023 – 05:51 PM EDT

PDB ID	:	5CAY
Title	:	Envelope glycoprotein gp120 core from HIV type 2 bound to the first two domains of human soluble CD4 receptor
Authors	:	Davenport, Y.W.; Bjorkman, P.J.
Deposited on	:	2015-06-30
Resolution	:	3.00 Å(reported)

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1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.00 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Rfree		0.285
Clashscore		9
Ramachandran outliers		0.4%
Sidechain outliers		6.1%
RSRZ outliers		2.4%

Worse *Better*

▉ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
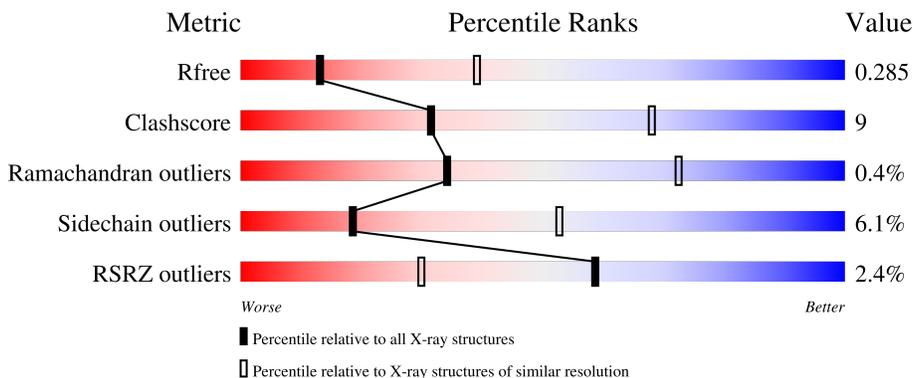
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	G	345	70% 18% · 10%
2	B	190	63% 15% · 21%
3	A	2	50% 50%
4	C	3	33% 67%

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
5	NAG	B	201	-	-	-	X

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 3859 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 Envelope glycoprotein gp120 core from ST strain of HIV-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	G	311	Total 2536	C 1608	N 439	O 470	S 19	0	0	0

- Molecule 2 is a protein called T-cell surface glycoprotein CD4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	150	Total 1172	C 737	N 205	O 226	S 4	0	1	0

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	0	MET	-	initiating methionine	UNP P01730
B	184	HIS	-	expression tag	UNP P01730
B	185	HIS	-	expression tag	UNP P01730
B	186	HIS	-	expression tag	UNP P01730
B	187	HIS	-	expression tag	UNP P01730
B	188	HIS	-	expression tag	UNP P01730
B	189	HIS	-	expression tag	UNP P01730

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

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

- Molecule 4 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-b

eta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	C	3	Total 39	C 22	N 2	O 15	0	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).
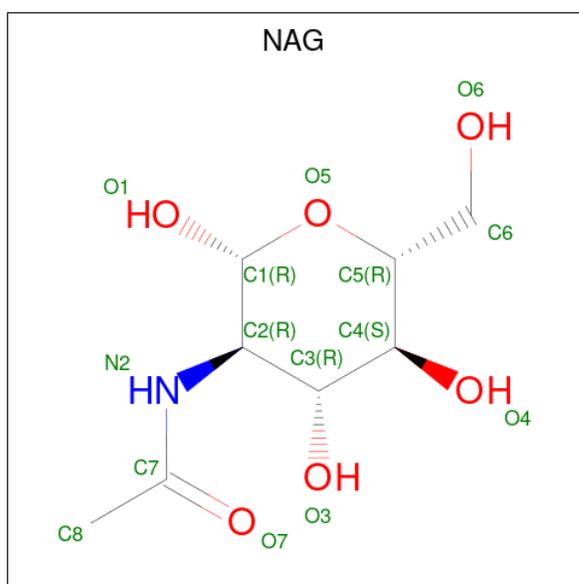
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	G	1	Total 14	C 8	N 1	O 5	0	0
5	G	1	Total 14	C 8	N 1	O 5	0	0
5	G	1	Total 14	C 8	N 1	O 5	0	0
5	G	1	Total 14	C 8	N 1	O 5	0	0
5	G	1	Total 14	C 8	N 1	O 5	0	0
5	B	1	Total 14	C 8	N 1	O 5	0	0

3 Residue-property plots ⓘ

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: Envelope glycoprotein gp120 core from ST strain of HIV-2
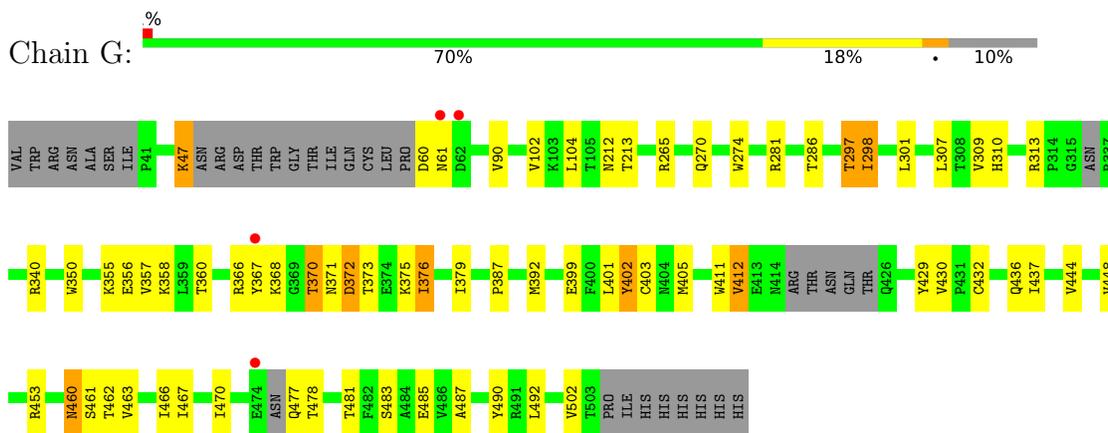
• Molecule 2: T-cell surface glycoprotein CD4
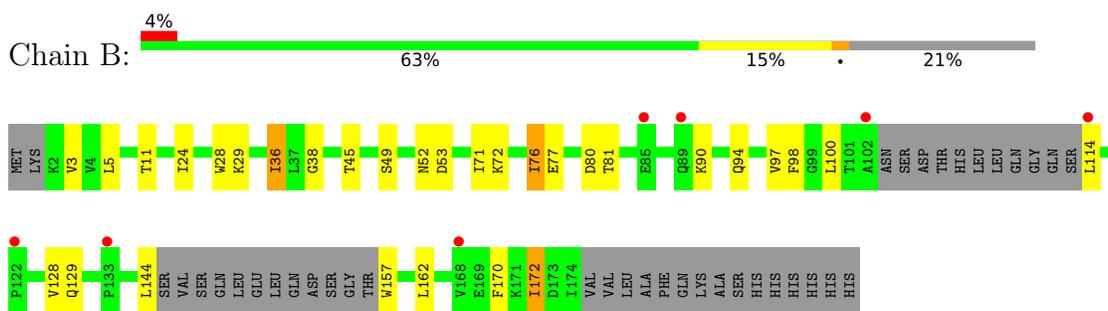
• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

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

NAG1 NAG2 BMA3

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	94.28Å 100.22Å 199.14Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	99.57 – 3.00 35.32 – 3.00	Depositor EDS
% Data completeness (in resolution range)	99.1 (99.57-3.00) 99.2 (35.32-3.00)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.57 (at 3.00Å)	Xtriage
Refinement program	REFMAC 5.8.0123	Depositor
R, R_{free}	0.231 , 0.287 0.238 , 0.285	Depositor DCC
R_{free} test set	1721 reflections (9.00%)	wwPDB-VP
Wilson B-factor (Å^2)	86.2	Xtriage
Anisotropy	0.575	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 73.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	3859	wwPDB-VP
Average B, all atoms (Å^2)	103.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.77% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< \|L\| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$|Z|$ >5	RMSZ	#$|Z|$ >5
1	G	0.59	1/2602 (0.0%)	0.76	1/3534 (0.0%)
2	B	0.41	0/1186	0.66	0/1595
All	All	0.54	1/3788 (0.0%)	0.73	1/5129 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	G	402	TYR	CE1-CZ	-7.02	1.29	1.38

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	370	THR	N-CA-C	8.81	134.80	111.00

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	G	2536	0	2402	50	0
2	B	1172	0	1191	18	0
3	A	28	0	25	1	0
4	C	39	0	34	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	14	0	13	2	0
5	G	70	0	65	0	0
All	All	3859	0	3730	68	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 9.

All (68) 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:G:60:ASP:N	1:G:61:ASN:CB	1.91	1.32
1:G:60:ASP:N	1:G:61:ASN:HB3	1.01	1.30
1:G:212:ASN:HD21	5:B:201:NAG:C1	1.48	1.25
1:G:47:LYS:HD2	1:G:60:ASP:N	1.59	1.16
1:G:212:ASN:ND2	5:B:201:NAG:C1	2.18	1.07
1:G:340:ARG:NH2	1:G:436:GLN:OE1	1.95	0.98
1:G:370:THR:HG22	1:G:372:ASP:H	1.32	0.91
2:B:129:GLN:HE21	2:B:162:LEU:HD11	1.39	0.85
1:G:47:LYS:CD	1:G:60:ASP:N	2.39	0.85
1:G:60:ASP:N	1:G:61:ASN:CA	2.55	0.69
1:G:212:ASN:OD1	1:G:213:THR:N	2.23	0.69
1:G:460:ASN:HD22	1:G:460:ASN:N	1.90	0.68
1:G:47:LYS:HD2	1:G:60:ASP:CA	2.23	0.67
1:G:60:ASP:HB3	1:G:61:ASN:HA	1.81	0.62
1:G:437:ILE:HG13	1:G:448:VAL:HG22	1.82	0.61
1:G:411:TRP:O	1:G:412:VAL:HG22	2.00	0.61
1:G:298:ILE:HD13	1:G:492:LEU:HD22	1.84	0.60
2:B:11:THR:HG22	2:B:72:LYS:HA	1.84	0.59
1:G:371:ASN:ND2	1:G:373:THR:O	2.34	0.59
1:G:411:TRP:CD1	1:G:412:VAL:HG13	2.38	0.59
2:B:128:VAL:HG13	2:B:144:LEU:HD13	1.85	0.59
2:B:3:VAL:HG12	2:B:94:GLN:HB3	1.86	0.57
2:B:36:ILE:HG22	2:B:49:SER:CB	2.34	0.57
1:G:274:TRP:HB2	1:G:392:MET:HG3	1.87	0.57
1:G:403:CYS:HA	1:G:432:CYS:HA	1.87	0.56
2:B:100:LEU:HD12	2:B:170:PHE:CG	2.43	0.54
2:B:28:TRP:HB3	2:B:36:ILE:HD11	1.90	0.54
1:G:467:ILE:HG22	1:G:483:SER:HB3	1.90	0.54
1:G:90:VAL:HG11	1:G:490:TYR:CZ	2.44	0.53
1:G:401:LEU:CD1	1:G:401:LEU:N	2.72	0.53
1:G:460:ASN:N	1:G:460:ASN:ND2	2.56	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:47:LYS:CE	1:G:60:ASP:N	2.72	0.52
1:G:309:VAL:HG23	1:G:463:VAL:CG2	2.40	0.52
1:G:367:TYR:N	1:G:368:LYS:HA	2.24	0.51
1:G:313:ARG:NH2	1:G:453:ARG:O	2.43	0.51
1:G:401:LEU:N	1:G:401:LEU:HD12	2.24	0.51
2:B:76:ILE:HD13	2:B:77:GLU:OE1	2.10	0.50
1:G:429:TYR:C	1:G:430:VAL:HG13	2.32	0.50
2:B:71:ILE:HD12	2:B:71:ILE:N	2.27	0.50
1:G:307:LEU:HD22	1:G:350:TRP:CD2	2.47	0.49
2:B:38:GLY:O	2:B:45:THR:HG22	2.13	0.48
1:G:301:LEU:HD21	1:G:466:ILE:HG12	1.95	0.48
1:G:265:ARG:HD2	1:G:281:ARG:HD3	1.96	0.48
1:G:307:LEU:HD22	1:G:350:TRP:CE2	2.49	0.48
1:G:376:ILE:HG12	1:G:478:THR:CG2	2.44	0.47
1:G:387:PRO:HB2	1:G:402:TYR:HE2	1.79	0.47
1:G:392:MET:CB	1:G:405:MET:HE3	2.45	0.46
2:B:129:GLN:HE21	2:B:162:LEU:CD1	2.20	0.46
1:G:370:THR:HG22	1:G:372:ASP:N	2.14	0.45
2:B:36:ILE:HG22	2:B:49:SER:OG	2.16	0.45
2:B:157:TRP:HA	2:B:172:ILE:HG22	1.98	0.45
1:G:392:MET:HB3	1:G:405:MET:HE3	1.99	0.45
2:B:90:LYS:NZ	3:A:2:NAG:H81	2.32	0.44
2:B:24:ILE:C	2:B:24:ILE:HD12	2.39	0.43
1:G:485:GLU:O	1:G:487:ALA:N	2.48	0.42
1:G:379:ILE:HB	1:G:481:THR:HG22	2.01	0.42
1:G:375:LYS:O	1:G:477:GLN:N	2.53	0.42
1:G:356:GLU:O	1:G:360:THR:HG23	2.20	0.41
1:G:376:ILE:CD1	1:G:478:THR:HG23	2.50	0.41
1:G:309:VAL:HG23	1:G:463:VAL:HG21	2.03	0.41
1:G:376:ILE:HD13	1:G:478:THR:HG23	2.03	0.41
1:G:358:LYS:HD3	1:G:376:ILE:HG23	2.03	0.41
1:G:286:THR:OG1	1:G:360:THR:HG21	2.21	0.41
2:B:76:ILE:HA	2:B:97:VAL:HG13	2.02	0.41
2:B:157:TRP:HA	2:B:172:ILE:CG2	2.50	0.41
1:G:399:GLU:O	1:G:401:LEU:CD1	2.69	0.40
2:B:80:ASP:OD1	2:B:81:THR:N	2.54	0.40
1:G:297:THR:HG21	1:G:470:ILE:HG12	2.02	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	G	301/345 (87%)	279 (93%)	21 (7%)	1 (0%)	41	76
2	B	144/190 (76%)	131 (91%)	12 (8%)	1 (1%)	22	60
All	All	445/535 (83%)	410 (92%)	33 (7%)	2 (0%)	34	72

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	53	ASP
1	G	412	VAL

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	G	275/310 (89%)	258 (94%)	17 (6%)	18	52
2	B	134/172 (78%)	126 (94%)	8 (6%)	19	53
All	All	409/482 (85%)	384 (94%)	25 (6%)	18	53

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	47	LYS
1	G	102	VAL
1	G	104	LEU
1	G	270	GLN

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Mol	Chain	Res	Type
1	G	297	THR
1	G	298	ILE
1	G	310	HIS
1	G	355	LYS
1	G	357	VAL
1	G	366	ARG
1	G	372	ASP
1	G	376	ILE
1	G	444	VAL
1	G	460	ASN
1	G	461	SER
1	G	462	THR
1	G	502	VAL
2	B	5	LEU
2	B	29	LYS
2	B	36	ILE
2	B	52	ASN
2	B	76	ILE
2	B	98	PHE
2	B	114	LEU
2	B	172	ILE

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

Mol	Chain	Res	Type
1	G	270	GLN
1	G	310	HIS
1	G	460	ASN
2	B	129	GLN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

5 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
3	NAG	A	1	1,3	14,14,15	0.57	0	17,19,21	1.61	2 (11%)
3	NAG	A	2	3	14,14,15	0.36	0	17,19,21	1.52	2 (11%)
4	NAG	C	1	1,4	14,14,15	0.45	0	17,19,21	1.30	1 (5%)
4	NAG	C	2	4	14,14,15	0.47	0	17,19,21	2.17	3 (17%)
4	BMA	C	3	4	11,11,12	0.36	0	15,15,17	0.87	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	A	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	A	2	3	-	4/6/23/26	0/1/1/1
4	NAG	C	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	C	2	4	-	2/6/23/26	0/1/1/1
4	BMA	C	3	4	-	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	2	NAG	C1-O5-C5	7.43	122.26	112.19
3	A	1	NAG	C4-C3-C2	5.01	118.36	111.02
3	A	2	NAG	C2-N2-C7	3.59	128.01	122.90
3	A	2	NAG	C8-C7-N2	3.57	122.15	116.10
4	C	1	NAG	C1-O5-C5	3.55	117.00	112.19
3	A	1	NAG	C3-C4-C5	3.12	115.80	110.24
4	C	2	NAG	C3-C4-C5	2.60	114.88	110.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	2	NAG	O5-C1-C2	2.09	114.58	111.29

There are no chirality outliers.

All (8) torsion outliers are listed below:

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

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	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 A

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain C
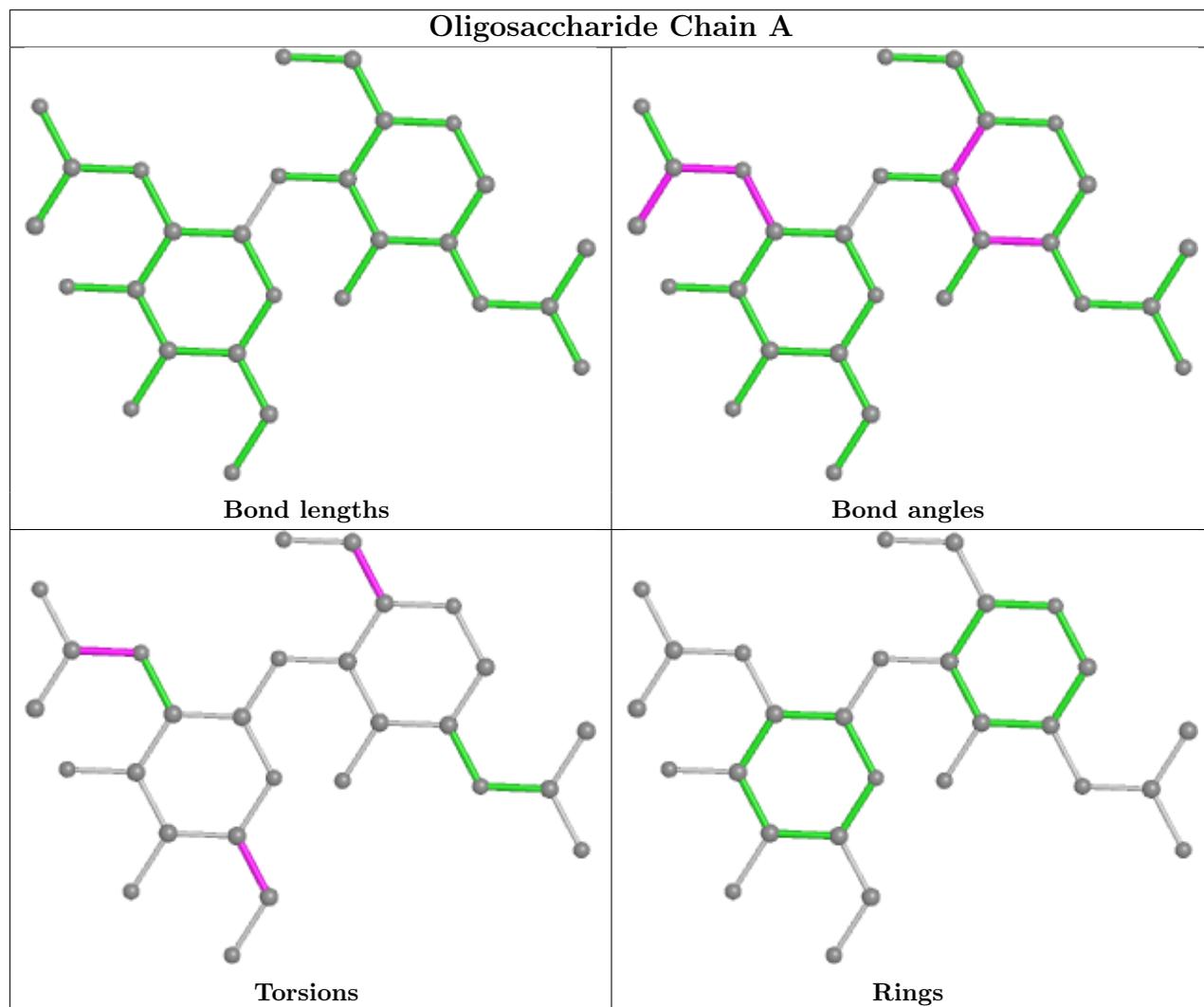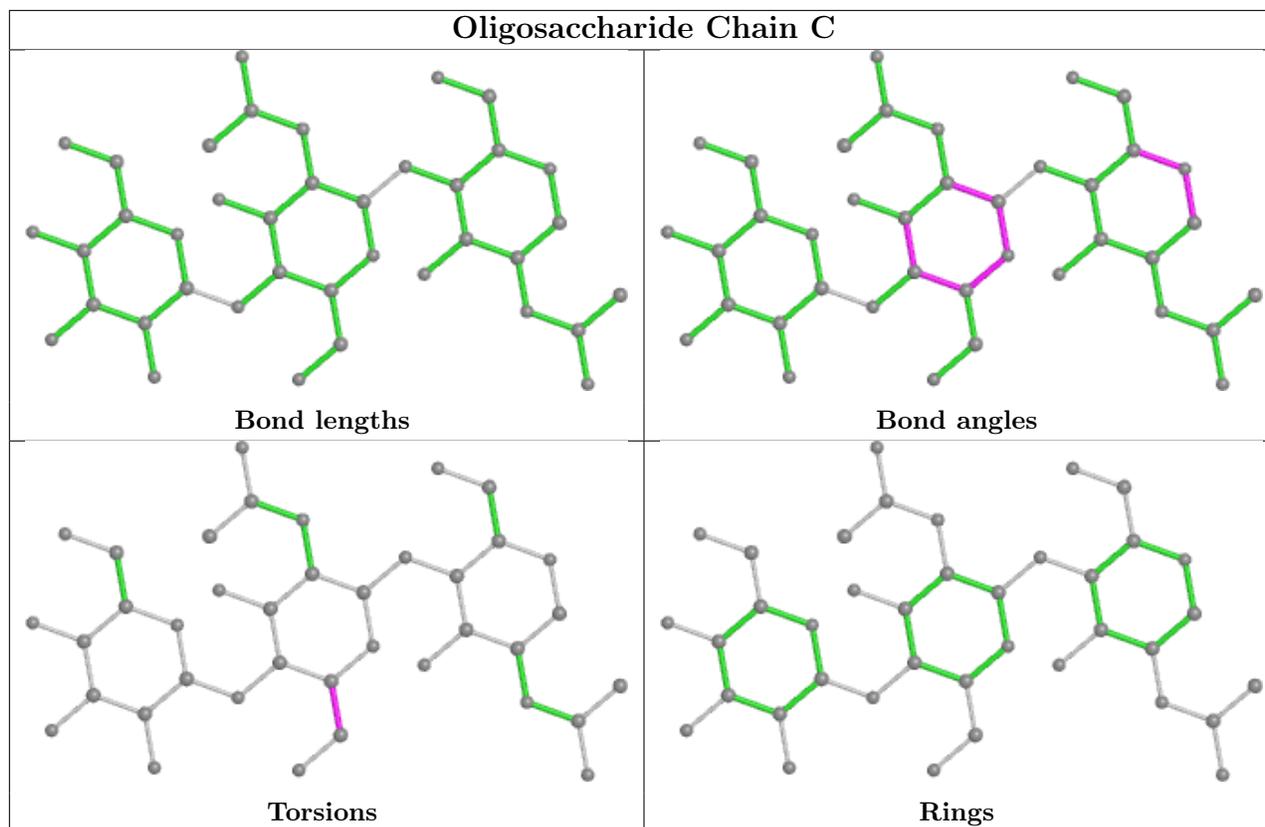
5.6 Ligand geometry ⓘ

6 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	G	604	1	14,14,15	0.32	0	17,19,21	1.07	1 (5%)
5	NAG	G	610	1	14,14,15	0.41	0	17,19,21	1.08	1 (5%)
5	NAG	G	601	1	14,14,15	0.41	0	17,19,21	1.30	2 (11%)
5	NAG	G	608	1	14,14,15	0.39	0	17,19,21	1.01	1 (5%)
5	NAG	G	609	1	14,14,15	0.48	0	17,19,21	0.99	1 (5%)
5	NAG	B	201	-	14,14,15	0.43	0	17,19,21	0.76	1 (5%)

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	G	604	1	-	2/6/23/26	0/1/1/1
5	NAG	G	610	1	-	0/6/23/26	0/1/1/1
5	NAG	G	601	1	-	3/6/23/26	0/1/1/1
5	NAG	G	608	1	-	2/6/23/26	0/1/1/1
5	NAG	G	609	1	-	1/6/23/26	0/1/1/1
5	NAG	B	201	-	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	G	610	NAG	C1-O5-C5	3.60	117.07	112.19
5	G	604	NAG	O5-C1-C2	-2.85	106.79	111.29
5	G	601	NAG	C1-O5-C5	2.74	115.90	112.19
5	G	601	NAG	O5-C1-C2	-2.55	107.26	111.29
5	G	608	NAG	C4-C3-C2	2.31	114.40	111.02
5	G	609	NAG	C2-N2-C7	2.18	126.01	122.90
5	B	201	NAG	O5-C5-C6	2.04	110.41	107.20

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	G	604	NAG	O5-C5-C6-O6
5	G	604	NAG	C4-C5-C6-O6
5	G	608	NAG	C4-C5-C6-O6
5	G	608	NAG	O5-C5-C6-O6
5	G	601	NAG	C4-C5-C6-O6
5	G	601	NAG	O5-C5-C6-O6
5	G	601	NAG	C3-C2-N2-C7
5	G	609	NAG	C3-C2-N2-C7

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	201	NAG	2	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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	G	311/345 (90%)	-0.17	4 (1%)	77	51	67, 91, 129, 155	1 (0%)
2	B	150/190 (78%)	0.31	7 (4%)	31	11	74, 116, 156, 185	0
All	All	461/535 (86%)	-0.02	11 (2%)	59	30	67, 101, 141, 185	1 (0%)

All (11) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	122	PRO	3.7
1	G	61	ASN	3.2
1	G	474	GLU	2.8
2	B	114	LEU	2.6
1	G	62	ASP	2.6
1	G	367	TYR	2.5
2	B	168	VAL	2.5
2	B	89	GLN	2.4
2	B	133	PRO	2.3
2	B	102	ALA	2.3
2	B	85	GLU	2.1

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

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

6.3 Carbohydrates ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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	BMA	C	3	11/12	0.83	0.16	103,104,106,107	0
3	NAG	A	2	14/15	0.88	0.23	121,126,130,131	0
3	NAG	A	1	14/15	0.91	0.16	101,109,115,118	0
4	NAG	C	2	14/15	0.93	0.15	88,93,97,100	0
4	NAG	C	1	14/15	0.96	0.13	78,83,86,86	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.
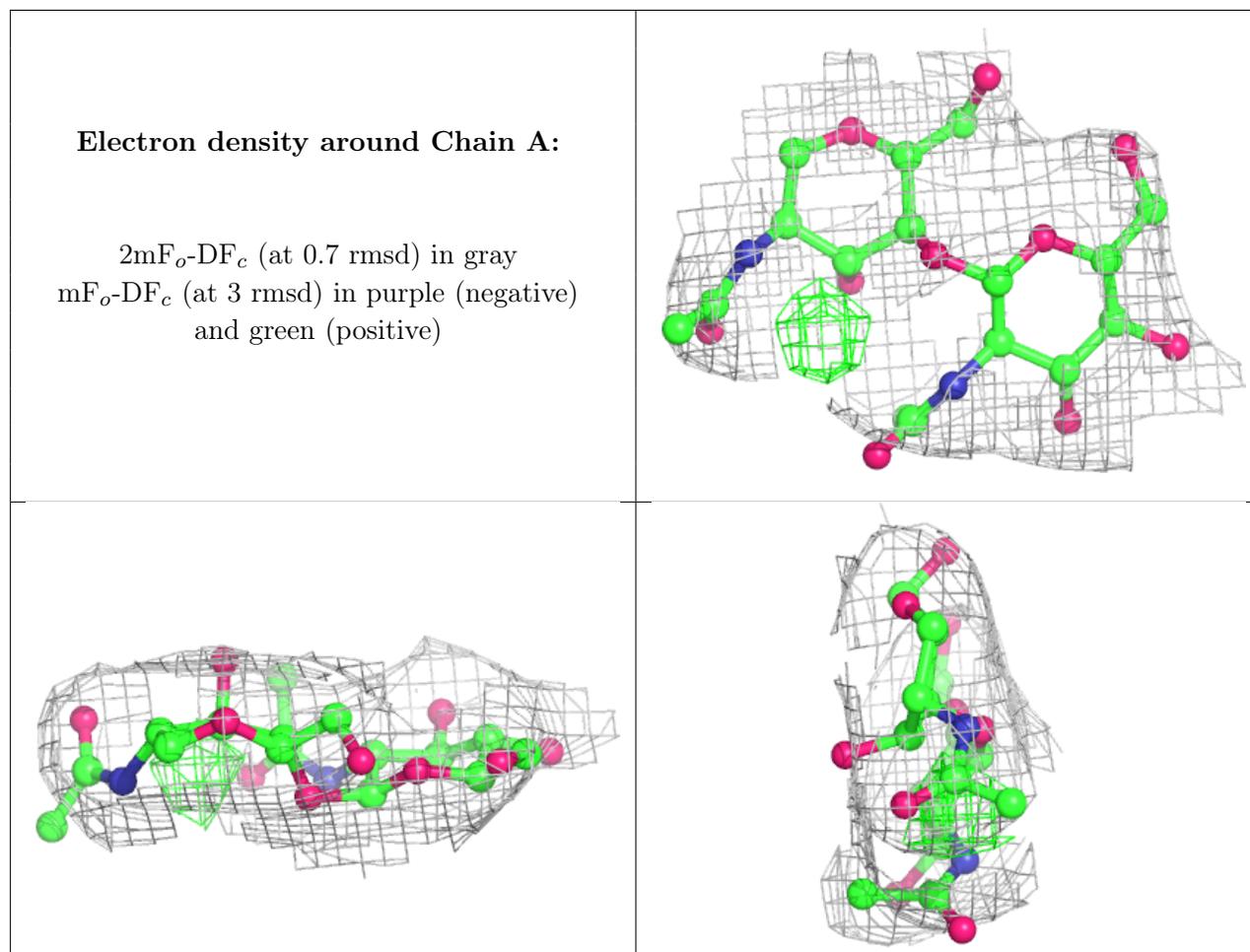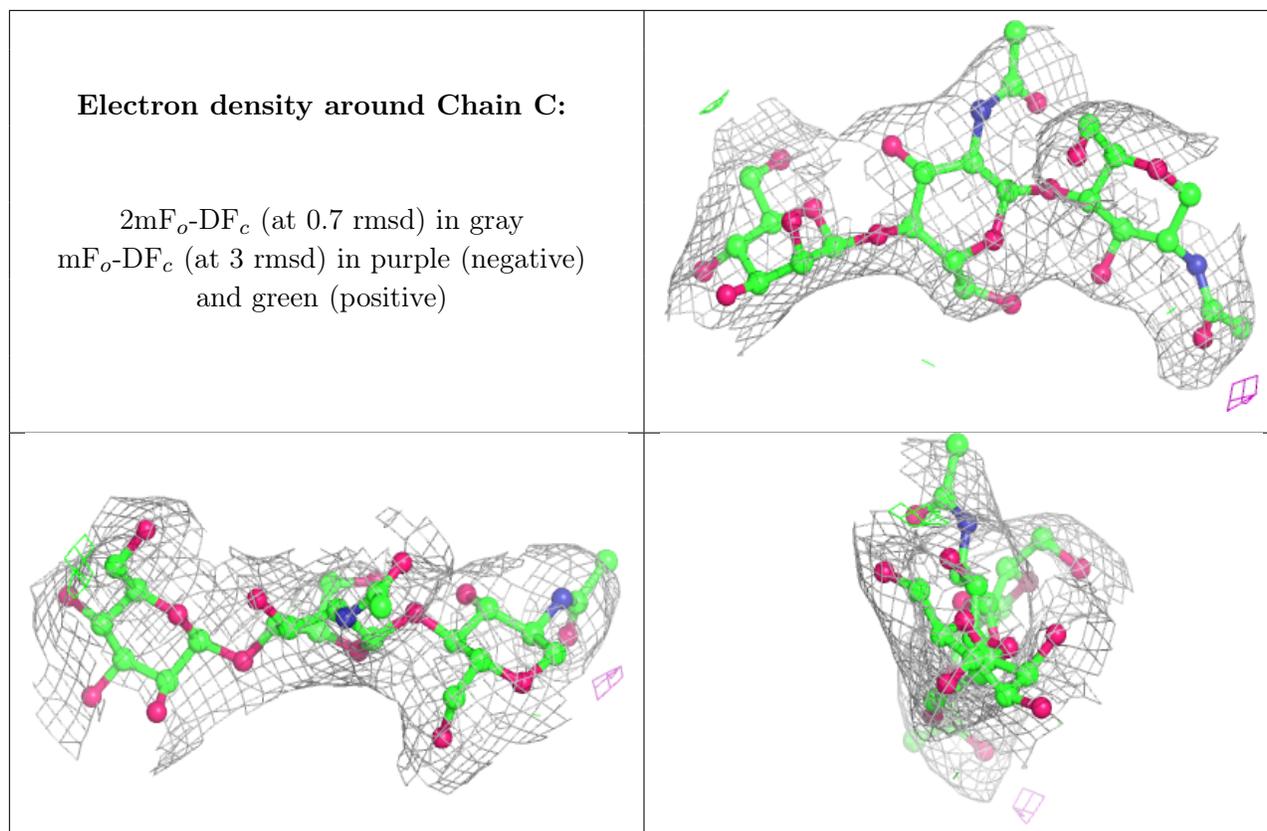
Electron density around Chain A:

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

Electron density around Chain C:

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

6.4 Ligands ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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	B	201	14/15	0.65	0.42	115,123,127,129	0
5	NAG	G	601	14/15	0.85	0.34	105,113,117,119	0
5	NAG	G	609	14/15	0.89	0.45	118,126,129,131	0
5	NAG	G	610	14/15	0.91	0.37	94,100,102,103	0
5	NAG	G	608	14/15	0.91	0.18	92,97,102,103	0
5	NAG	G	604	14/15	0.95	0.12	78,81,85,86	0

6.5 Other polymers ⓘ

There are no such residues in this entry.