



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 25, 2024 – 05:19 PM EST

PDB ID : 2VDO
Title : Integrin AlphaIIbBeta3 Headpiece Bound to Fibrinogen Gamma chain peptide,
HHLGGAKQAGDV
Authors : Springer, T.A.; Zhu, J.; Xiao, T.
Deposited on : 2007-10-10
Resolution : 2.51 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 : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.21
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.004 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.40

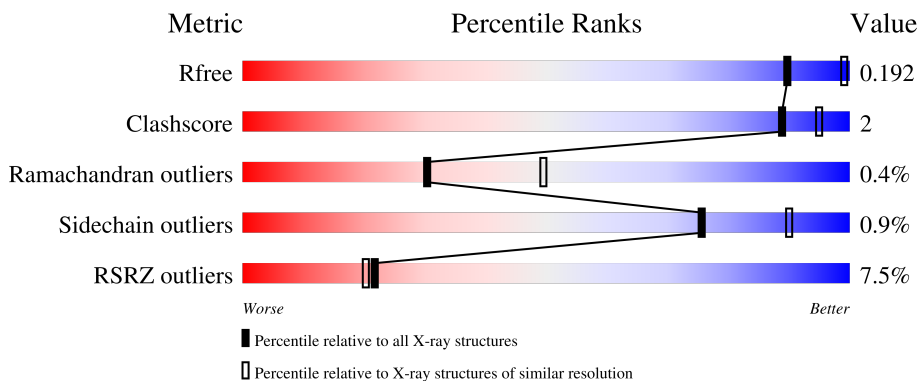
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.51 Å.

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




Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	5504 (2.50-2.50)
Clashscore	180529	6282 (2.50-2.50)
Ramachandran outliers	177936	6191 (2.50-2.50)
Sidechain outliers	177891	6193 (2.50-2.50)
RSRZ outliers	164620	5504 (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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	452	 2% 96%
2	B	461	 15% 92% 6%
3	C	12	 50% 83% 17%
4	H	221	 5% 95%
5	L	214	 3% 95% 5%
6	D	5	 40% 60%

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Mol	Chain	Length	Quality of chain
7	E	7	

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
6	MAN	D	4	X	-	-	-
6	MAN	D	5	X	-	-	-
7	MAN	E	3	X	-	-	-
7	MAN	E	5	X	-	-	-
7	MAN	E	6	X	-	-	-

2 Entry composition

There are 12 unique types of molecules in this entry. The entry contains 11786 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 INTEGRIN ALPHA-IIB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	452	3528	2240	615	665	8	0	9	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	282	GLY	ALA	conflict	UNP P08514

- Molecule 2 is a protein called INTEGRIN BETA-3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	455	3577	2235	606	703	33	0	12	0

- Molecule 3 is a protein called FIBRINOGEN, GAMMA POLYPEPTIDE.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	C	12	84	50	18	16	0	0	0

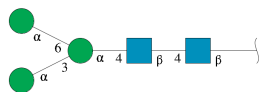
- Molecule 4 is a protein called MONOCLONAL ANTIBODY 10E5 HEAVY CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	H	219	1678	1064	270	338	6	0	3	0

- Molecule 5 is a protein called MONOCLONAL ANTIBODY 10E5 LIGHT CHAIN.

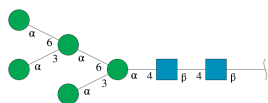
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	L	214	1671	1042	272	346	11	0	7	0

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



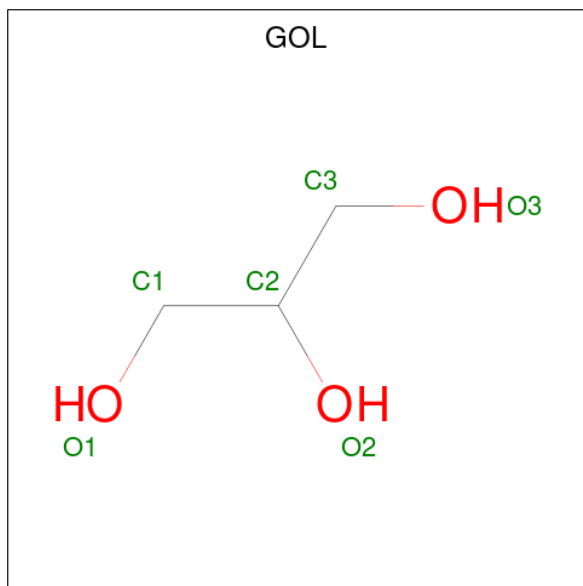
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
6	D	5	61	34	2	25	0	0	0

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-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			
7	E	7	83	46	2	35	0	0	0

- Molecule 8 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).

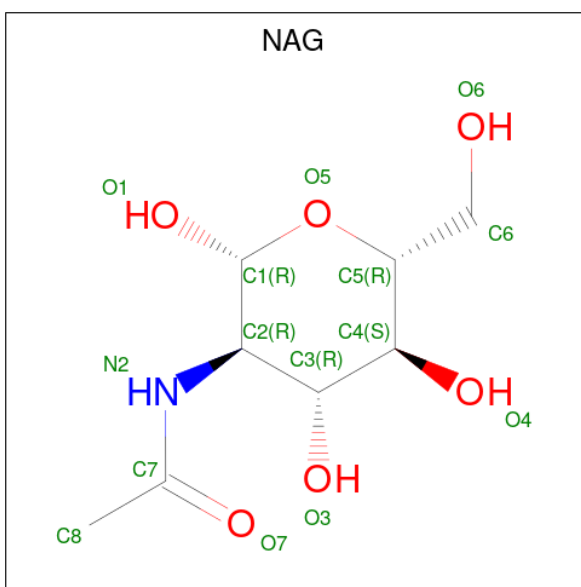


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	A	1	Total	C	O	0	0
			6	3	3		
8	B	1	Total	C	O	0	0
			6	3	3		

- Molecule 9 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	4	Total	Ca	0	0
			4	4		
9	B	2	Total	Ca	0	0
			2	2		

- Molecule 10 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



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

- Molecule 11 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	B	1	Total Mg 1 1	0	0

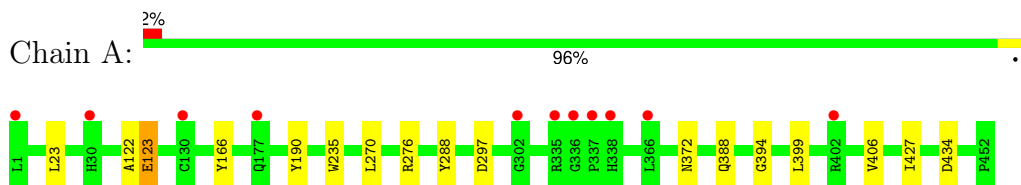
- Molecule 12 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	393	Total O 393 393	0	0
12	B	208	Total O 208 208	0	0
12	C	14	Total O 14 14	0	0
12	H	205	Total O 205 205	0	0
12	L	223	Total O 223 223	0	0

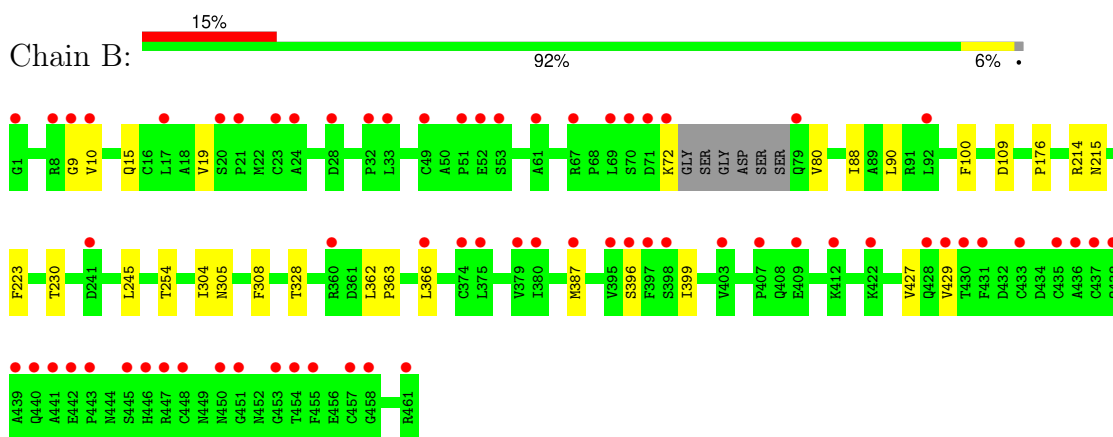
3 Residue-property plots [i](#)

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. 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. 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.

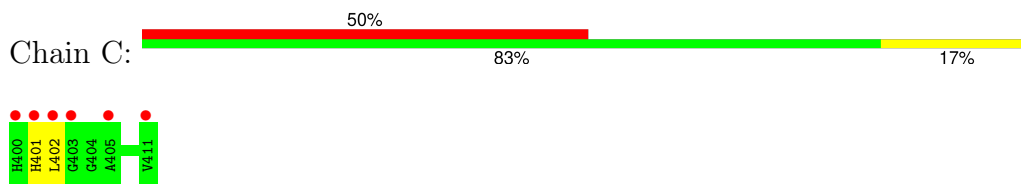
- Molecule 1: INTEGRIN ALPHA-IIB



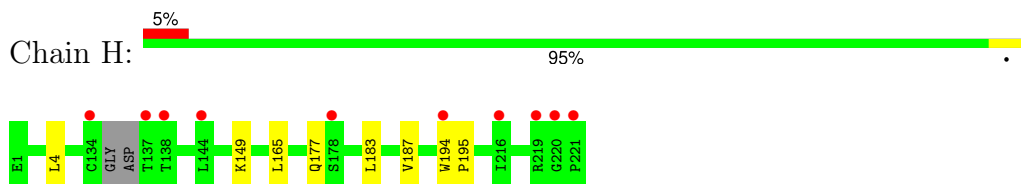
- Molecule 2: INTEGRIN BETA-3



- Molecule 3: FIBRINOGEN, GAMMA POLYPEPTIDE



- Molecule 4: MONOCLONAL ANTIBODY 10E5 HEAVY CHAIN



- Molecule 5: MONOCLONAL ANTIBODY 10E5 LIGHT CHAIN





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



- Molecule 7: α -D-mannopyranose-(1-3)-[α -D-mannopyranose-(1-6)] α -D-mannopyranose-(1-6)-[α -D-mannopyranose-(1-3)] α -D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



4 Data and refinement statistics

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α , β , γ	148.33Å 148.33Å 176.57Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	46.13 – 2.51 46.13 – 2.51	Depositor EDS
% Data completeness (in resolution range)	97.3 (46.13-2.51) 97.1 (46.13-2.51)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.83 (at 2.51Å)	Xtrriage
Refinement program	REFMAC 5.3.0037	Depositor
R, R_{free}	0.148 , 0.190 0.152 , 0.192	Depositor DCC
R_{free} test set	3805 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å ²)	47.2	Xtrriage
Anisotropy	0.062	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 50.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.021 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	11786	wwPDB-VP
Average B, all atoms (Å ²)	65.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.94% 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: MAN, GOL, CA, MG, 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	0.35	0/3640	0.55	0/4957
2	B	0.33	0/3661	0.49	0/4960
3	C	0.41	0/85	0.56	0/111
4	H	0.33	0/1730	0.52	0/2369
5	L	0.36	0/1733	0.55	0/2349
All	All	0.34	0/10849	0.53	0/14746

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3528	0	3374	10	0
2	B	3577	0	3512	13	0
3	C	84	0	77	0	0
4	H	1678	0	1637	9	0
5	L	1671	0	1599	12	0
6	D	61	0	52	0	0
7	E	83	0	70	0	0
8	A	6	0	8	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	B	6	0	7	0	0
9	A	4	0	0	0	0
9	B	2	0	0	0	0
10	A	28	0	26	0	0
10	B	14	0	13	0	0
11	B	1	0	0	0	0
12	A	393	0	0	0	0
12	B	208	0	0	0	0
12	C	14	0	0	0	0
12	H	205	0	0	0	0
12	L	223	0	0	1	0
All	All	11786	0	10375	39	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 2.

All (39) 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)
4:H:177[B]:GLN:OE1	5:L:160[B]:LEU:HD11	1.09	1.23
4:H:177[B]:GLN:OE1	5:L:160[B]:LEU:CD1	1.97	1.12
2:B:88[B]:ILE:HD11	2:B:427:VAL:HG22	1.78	0.66
1:A:235:TRP:CZ2	1:A:270:LEU:HD11	2.33	0.64
4:H:177[B]:GLN:CD	5:L:160[B]:LEU:HD21	2.21	0.60
5:L:136:LEU:HD12	5:L:136:LEU:N	2.21	0.54
4:H:177[B]:GLN:OE1	5:L:160[B]:LEU:CG	2.55	0.54
2:B:230:THR:HG23	2:B:304:ILE:HD12	1.89	0.53
2:B:308:PHE:CE2	2:B:328:THR:HG21	2.44	0.53
5:L:48:ILE:HD13	5:L:54:LEU:HD12	1.91	0.53
1:A:235:TRP:HZ2	1:A:270:LEU:HD11	1.72	0.53
2:B:399:ILE:N	2:B:399:ILE:HD12	2.25	0.52
5:L:48:ILE:CD1	5:L:54:LEU:HD12	2.40	0.51
5:L:105[B]:GLU:HG3	5:L:173:TYR:OH	2.11	0.51
1:A:394:GLY:HA2	1:A:399:LEU:HD23	1.92	0.50
2:B:245:LEU:HD23	2:B:305:ASN:HB2	1.92	0.50
4:H:165:LEU:CD2	4:H:187:VAL:HG21	2.41	0.49
1:A:270:LEU:HD23	1:A:276[A]:ARG:HA	1.95	0.49
1:A:122:ALA:O	1:A:123:GLU:HB2	2.12	0.48
5:L:122:SER:O	5:L:126:THR:HG23	2.13	0.48
1:A:270:LEU:HD23	1:A:276[B]:ARG:HA	1.95	0.48
2:B:90:LEU:HD11	2:B:100:PHE:CE2	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:H:165:LEU:HD21	4:H:187:VAL:HG21	1.97	0.46
5:L:45:MET:HE3	12:L:4065:HOH:O	2.15	0.45
2:B:366:LEU:HD11	2:B:429:VAL:HG21	1.99	0.45
2:B:223:PHE:CZ	2:B:254:THR:HG21	2.53	0.43
1:A:122:ALA:O	1:A:123:GLU:CB	2.67	0.42
1:A:388:GLN:NE2	1:A:406:VAL:HG11	2.34	0.42
2:B:72:LYS:NZ	2:B:109:ASP:OD1	2.52	0.42
1:A:427:ILE:HG22	1:A:434:ASP:OD1	2.20	0.42
4:H:177[B]:GLN:NE2	5:L:160[B]:LEU:HD21	2.34	0.42
2:B:15:GLN:O	2:B:19:VAL:HG23	2.20	0.41
2:B:176:PRO:HB2	2:B:214:ARG:HB3	2.03	0.41
4:H:4:LEU:HD12	4:H:4:LEU:N	2.35	0.41
2:B:88[B]:ILE:CD1	2:B:427:VAL:HG22	2.49	0.41
4:H:194:TRP:CG	4:H:195:PRO:HA	2.55	0.41
2:B:362:LEU:HD12	2:B:363:PRO:HD2	2.03	0.40
5:L:4:MET:HE2	5:L:90:GLN:HB3	2.03	0.40
1:A:297:ASP:O	1:A:372:ASN:HB2	2.22	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	458/452 (101%)	446 (97%)	11 (2%)	1 (0%)	44	64
2	B	460/461 (100%)	438 (95%)	19 (4%)	3 (1%)	19	35
3	C	10/12 (83%)	6 (60%)	3 (30%)	1 (10%)	0	0
4	H	218/221 (99%)	214 (98%)	4 (2%)	0	100	100
5	L	220/214 (103%)	215 (98%)	5 (2%)	0	100	100
All	All	1366/1360 (100%)	1319 (97%)	42 (3%)	5 (0%)	30	49

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	123	GLU
2	B	9[A]	GLY
2	B	80	VAL
3	C	402	LEU
2	B	10	VAL

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	368/360 (102%)	364 (99%)	4 (1%)	70 87
2	B	414/409 (101%)	410 (99%)	4 (1%)	73 88
3	C	7/7 (100%)	6 (86%)	1 (14%)	2 5
4	H	192/190 (101%)	190 (99%)	2 (1%)	73 88
5	L	196/188 (104%)	196 (100%)	0	100 100
All	All	1177/1154 (102%)	1166 (99%)	11 (1%)	75 90

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	23	LEU
1	A	166	TYR
1	A	190	TYR
1	A	288	TYR
2	B	215	ASN
2	B	387[A]	MET
2	B	387[B]	MET
2	B	396	SER
3	C	401	HIS
4	H	149	LYS
4	H	183	LEU

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

Mol	Chain	Res	Type
1	A	388	GLN
2	B	316	ASN
2	B	342	GLN
2	B	428	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](#)

12 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
6	NAG	D	1	6,2	14,14,15	0.58	0	17,19,21	0.82	1 (5%)
6	NAG	D	2	6	14,14,15	0.68	0	17,19,21	0.97	1 (5%)
6	MAN	D	3	6	11,11,12	0.71	0	15,15,17	1.98	4 (26%)
6	MAN	D	4	6	11,11,12	0.67	0	15,15,17	0.65	0
6	MAN	D	5	6	11,11,12	0.60	0	15,15,17	0.78	0
7	NAG	E	1	7,2	14,14,15	0.64	0	17,19,21	0.89	1 (5%)
7	NAG	E	2	7	14,14,15	0.52	0	17,19,21	0.78	0
7	MAN	E	3	7	11,11,12	0.62	0	15,15,17	0.71	0
7	MAN	E	4	7	11,11,12	0.59	0	15,15,17	1.73	3 (20%)
7	MAN	E	5	7	11,11,12	0.56	0	15,15,17	0.72	0
7	MAN	E	6	7	11,11,12	0.68	0	15,15,17	1.15	1 (6%)
7	MAN	E	7	7	11,11,12	0.62	0	15,15,17	0.63	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. '2' means no outliers of that kind were identified.

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

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	E	4	MAN	O3-C3-C2	4.79	119.83	110.05
6	D	3	MAN	C1-O5-C5	4.14	117.73	112.19
6	D	3	MAN	C1-C2-C3	3.82	115.20	109.64
6	D	3	MAN	O5-C5-C6	3.43	114.35	107.66
7	E	6	MAN	C3-C4-C5	2.82	115.34	110.23
7	E	4	MAN	C1-O5-C5	2.59	115.66	112.19
6	D	3	MAN	C2-C3-C4	2.33	114.95	110.86
6	D	2	NAG	C4-C3-C2	2.26	114.33	111.02
7	E	4	MAN	C2-C3-C4	-2.18	107.02	110.86
7	E	1	NAG	O5-C1-C2	-2.15	107.97	111.29
6	D	1	NAG	O5-C1-C2	-2.08	108.08	111.29

All (5) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
6	D	4	MAN	C1
6	D	5	MAN	C1
7	E	3	MAN	C1
7	E	5	MAN	C1
7	E	6	MAN	C1

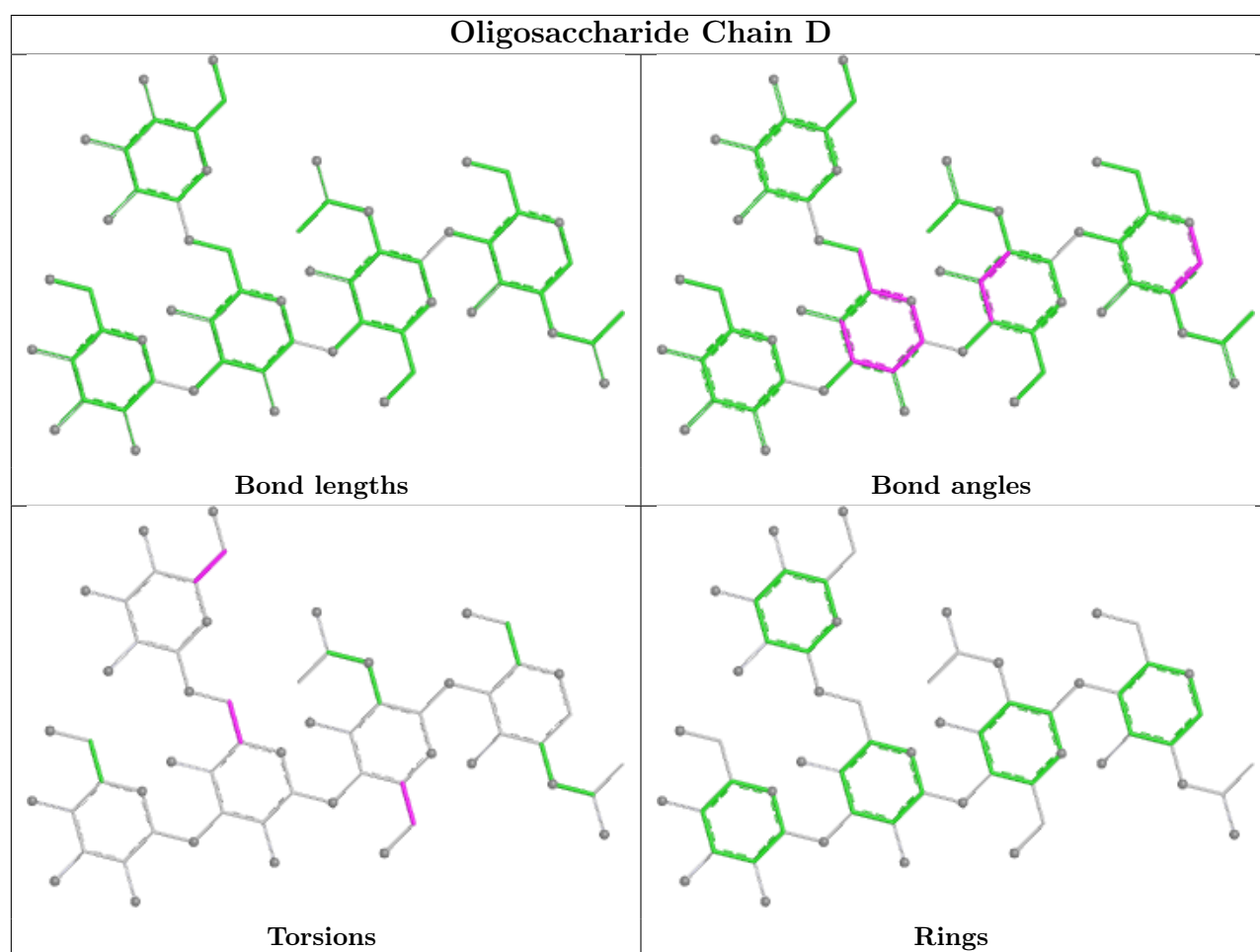
All (10) torsion outliers are listed below:

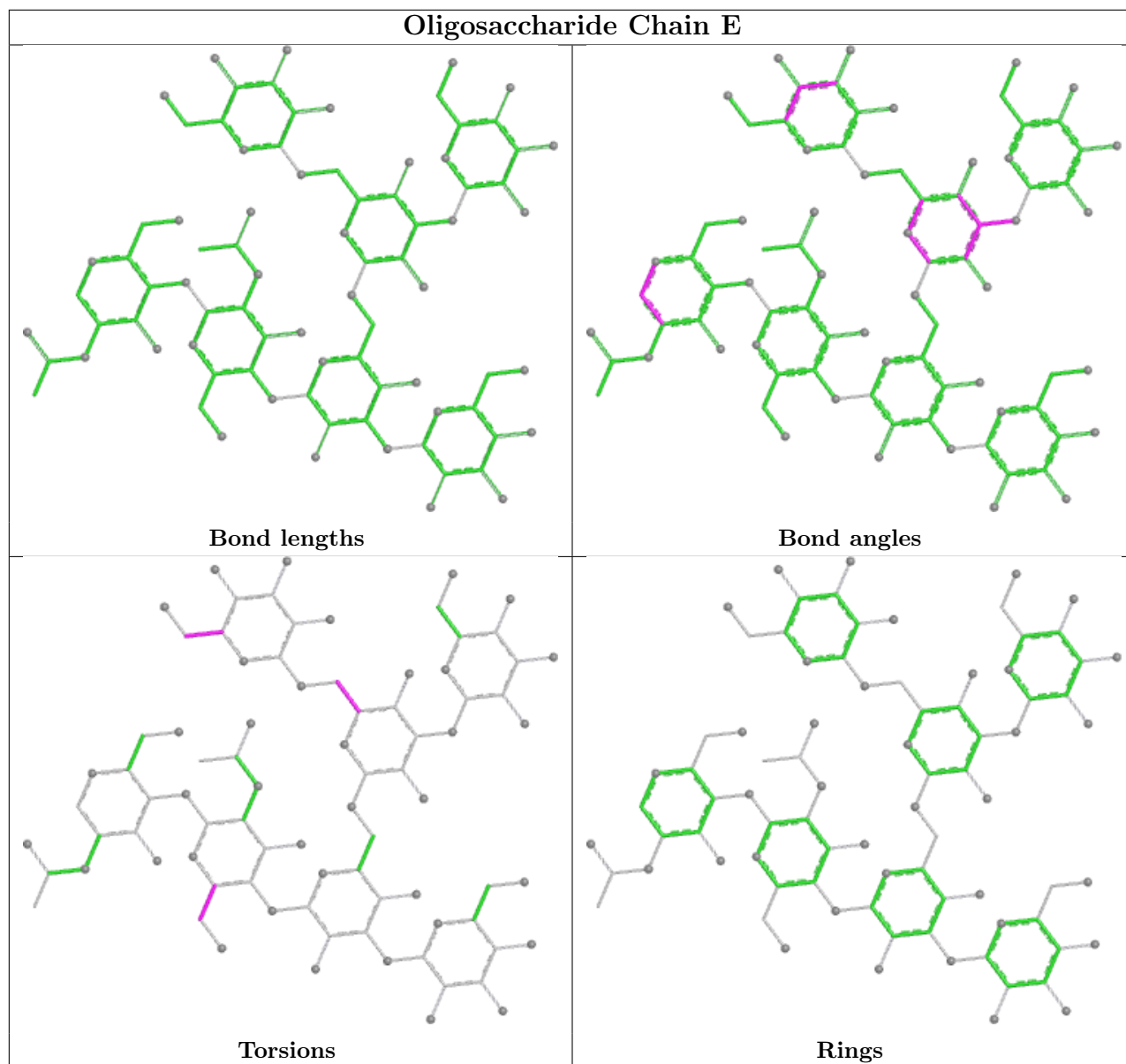
Mol	Chain	Res	Type	Atoms
6	D	3	MAN	C4-C5-C6-O6
6	D	3	MAN	O5-C5-C6-O6
6	D	5	MAN	O5-C5-C6-O6
6	D	5	MAN	C4-C5-C6-O6
7	E	6	MAN	C4-C5-C6-O6
7	E	6	MAN	O5-C5-C6-O6
7	E	2	NAG	O5-C5-C6-O6
7	E	2	NAG	C4-C5-C6-O6
7	E	4	MAN	C4-C5-C6-O6
6	D	2	NAG	C4-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

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](#)

Of 12 ligands modelled in this entry, 7 are monoatomic - leaving 5 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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
8	GOL	A	1453	-	5,5,5	0.48	0	5,5,5	0.11	0
10	NAG	A	3015	-	14,14,15	0.46	0	17,19,21	0.63	0
8	GOL	B	1462	9	5,5,5	0.40	0	5,5,5	0.31	0
10	NAG	B	3099	2	14,14,15	0.42	0	17,19,21	1.03	1 (5%)
10	NAG	A	3249	-	14,14,15	0.50	0	17,19,21	0.66	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
8	GOL	A	1453	-	-	1/4/4/4	-
10	NAG	A	3015	-	-	0/6/23/26	0/1/1/1
8	GOL	B	1462	9	-	0/4/4/4	-
10	NAG	B	3099	2	-	2/6/23/26	0/1/1/1
10	NAG	A	3249	-	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	B	3099	NAG	O5-C1-C2	-2.70	107.11	111.29

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	B	3099	NAG	O5-C5-C6-O6
10	B	3099	NAG	C4-C5-C6-O6
8	A	1453	GOL	O1-C1-C2-O2

There are no ring outliers.

No monomer is involved in short contacts.

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](#)

Warning: The R factor obtained from EDS is 0.2262, which does not match the depositor's R factor of 0.148. Please interpret the results in this section carefully.

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	452/452 (100%)	0.34	11 (2%) 59 56	28, 58, 76, 102	9 (1%)
2	B	455/461 (98%)	0.97	67 (14%) 7 7	29, 67, 102, 113	11 (2%)
3	C	12/12 (100%)	2.39	6 (50%) 0 0	48, 69, 133, 141	0
4	H	219/221 (99%)	0.47	10 (4%) 38 35	41, 59, 81, 119	4 (1%)
5	L	214/214 (100%)	0.47	7 (3%) 49 46	27, 58, 72, 109	8 (3%)
All	All	1352/1360 (99%)	0.61	101 (7%) 22 20	27, 60, 95, 141	32 (2%)

All (101) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	H	221	PRO	6.0
2	B	441	ALA	6.0
2	B	72	LYS	6.0
3	C	400	HIS	5.1
3	C	402	LEU	4.9
2	B	10	VAL	4.4
2	B	457	CYS	4.3
1	A	1	LEU	4.1
2	B	9[A]	GLY	4.0
1	A	335[A]	ARG	3.9
2	B	395	VAL	3.9
2	B	458	GLY	3.9
3	C	401	HIS	3.8
5	L	100	GLY	3.7
2	B	453	GLY	3.6
4	H	137	THR	3.5
2	B	379	VAL	3.4
2	B	1	GLY	3.3

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Mol	Chain	Res	Type	RSRZ
2	B	398	SER	3.3
2	B	437	CYS	3.3
2	B	461	ARG	3.3
2	B	397	PHE	3.3
2	B	387[A]	MET	3.2
2	B	446	HIS	3.2
5	L	212	ASN	3.2
2	B	454	THR	3.1
2	B	455	PHE	3.1
3	C	403	GLY	3.1
1	A	337[A]	PRO	3.0
2	B	52	GLU	3.0
2	B	69	LEU	3.0
2	B	440	GLN	2.9
2	B	436	ALA	2.9
2	B	8[A]	ARG	2.9
2	B	53	SER	2.9
4	H	138	THR	2.9
2	B	439	ALA	2.8
2	B	61	ALA	2.7
3	C	405	ALA	2.7
2	B	24	ALA	2.7
1	A	402[A]	ARG	2.7
5	L	126	THR	2.6
2	B	32	PRO	2.6
4	H	144	LEU	2.6
1	A	336	GLY	2.6
2	B	429	VAL	2.5
4	H	220	GLY	2.5
4	H	134	CYS	2.5
2	B	445	SER	2.5
2	B	442	GLU	2.5
1	A	30	HIS	2.4
2	B	374	CYS	2.4
4	H	194	TRP	2.4
1	A	338	HIS	2.4
5	L	211	ARG	2.4
5	L	101	GLY	2.4
2	B	375	LEU	2.4
2	B	49	CYS	2.4
2	B	51	PRO	2.4
2	B	20	SER	2.4

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Mol	Chain	Res	Type	RSRZ
5	L	104	LEU	2.3
2	B	28	ASP	2.3
2	B	366	LEU	2.3
2	B	450	ASN	2.3
2	B	23	CYS	2.3
2	B	443	PRO	2.2
4	H	216	ILE	2.2
2	B	433	CYS	2.2
2	B	241[A]	ASP	2.2
2	B	403	VAL	2.2
2	B	33	LEU	2.2
2	B	92	LEU	2.2
2	B	422	LYS	2.2
3	C	411	VAL	2.2
1	A	177[A]	GLN	2.2
2	B	428	GLN	2.2
2	B	412[A]	LYS	2.2
2	B	451	GLY	2.1
2	B	360	ARG	2.1
2	B	447	ARG	2.1
2	B	430	THR	2.1
2	B	448	CYS	2.1
4	H	178	SER	2.1
5	L	213	GLU	2.1
4	H	219	ARG	2.1
1	A	302	GLY	2.1
2	B	71	ASP	2.1
2	B	21	PRO	2.1
2	B	396	SER	2.1
1	A	130	CYS	2.1
2	B	435	CYS	2.1
2	B	380	ILE	2.1
2	B	431	PHE	2.0
2	B	79	GLN	2.0
2	B	70	SER	2.0
1	A	366	LEU	2.0
2	B	17	LEU	2.0
2	B	67	ARG	2.0
2	B	407	PRO	2.0
2	B	409	GLU	2.0
2	B	438	GLN	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](#)

SUGAR-RSR INFOmissingINFO

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(\AA^2)	Q<0.9
10	NAG	A	3249	14/15	0.54	0.23	102,103,104,105	14
10	NAG	A	3015	14/15	0.60	0.32	93,97,99,99	14
10	NAG	B	3099	14/15	0.62	0.22	105,112,117,118	0
8	GOL	A	1453	6/6	0.89	0.17	65,72,76,79	0
8	GOL	B	1462	6/6	0.93	0.18	72,72,73,74	0
9	CA	A	2006	1/1	0.98	0.09	70,70,70,70	0
9	CA	A	2005	1/1	0.98	0.16	61,61,61,61	0
11	MG	B	2001	1/1	0.98	0.17	30,30,30,30	0
9	CA	A	2007	1/1	0.99	0.12	65,65,65,65	0
9	CA	B	2002	1/1	0.99	0.15	50,50,50,50	0
9	CA	A	2004	1/1	1.00	0.10	67,67,67,67	0
9	CA	B	2003	1/1	1.00	0.17	41,41,41,41	0

6.5 Other polymers [i](#)

There are no such residues in this entry.