



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 19, 2024 – 11:47 AM EDT

PDB ID : 4Z7N
Title : Integrin alphaIIbeta3 in complex with AGDV peptide
Authors : Lin, F.-Y.; Zhu, J.; Springer, T.A.
Deposited on : 2015-04-07
Resolution : 2.60 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) : 1.20.1
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.003 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

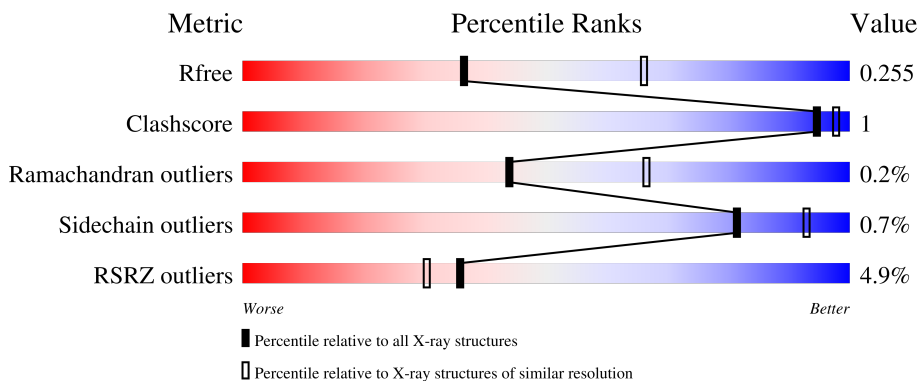
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

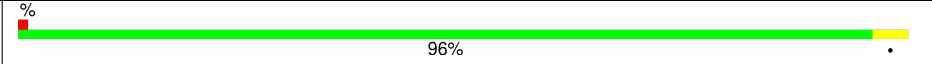
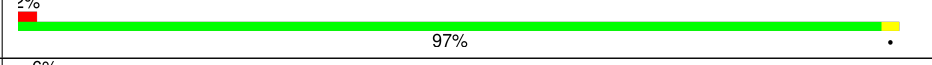
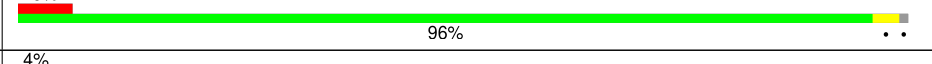
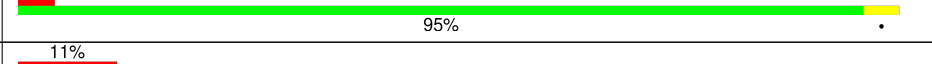
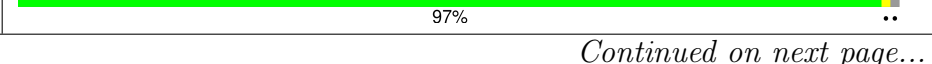
The reported resolution of this entry is 2.60 Å.

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	3775 (2.60-2.60)
Clashscore	180529	4181 (2.60-2.60)
Ramachandran outliers	177936	4129 (2.60-2.60)
Sidechain outliers	177891	4129 (2.60-2.60)
RSRZ outliers	164620	3775 (2.60-2.60)

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	455	 96%
1	C	455	 97%
2	B	469	 96%
2	D	469	 95%
3	E	219	 97%

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Mol	Chain	Length	Quality of chain
3	H	219	<p>6% 97%</p>
4	F	214	<p>13% 98%</p>
4	L	214	<p>2% 97%</p>
5	G	4	<p>50% 100%</p>
5	J	4	<p>50% 100%</p>
6	I	5	<p>60% 40%</p>
7	K	2	<p>100%</p>
7	N	2	<p>100%</p>
8	M	4	<p>75% 25%</p>

2 Entry composition

There are 15 unique types of molecules in this entry. The entry contains 41957 atoms, of which 20198 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	H	N	O	S			
1	A	455	Total	C	H	N	O	S	1	2	0
			6839	2223	3341	602	665	8			
1	C	453	Total	C	H	N	O	S	0	0	0
			6782	2207	3308	598	661	8			

- Molecule 2 is a protein called Integrin beta-3.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
2	B	464	Total	C	H	N	O	S	4	0	0
			7075	2229	3496	611	706	33			
2	D	469	Total	C	H	N	O	S	10	0	0
			7140	2248	3528	617	713	34			

- Molecule 3 is a protein called Monoclonal antibody 10E5 heavy chain.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
3	E	216	Total	C	H	N	O	S	0	0	0
			3242	1041	1600	266	329	6			
3	H	216	Total	C	H	N	O	S	0	0	0
			3242	1041	1600	266	329	6			

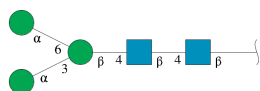
- Molecule 4 is a protein called Monoclonal antibody 10E5 light chain.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
4	F	214	Total	C	H	N	O	S	1	0	0
			3190	1019	1553	268	341	9			
4	L	214	Total	C	H	N	O	S	0	0	0
			3190	1019	1553	268	341	9			

- Molecule 5 is a protein called Tetrapeptide ALA-GLY-ASP-VAL.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	G	4	Total	C	H	N	O	0	0	0
			45	14	20	4	7			
5	J	4	Total	C	H	N	O	0	0	0
			45	14	20	4	7			

- Molecule 6 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]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
6	I	5	Total	C	H	N	O	0	0	0
			113	34	52	2	25			

- Molecule 7 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
7	K	2	Total	C	H	N	O	0	0	0
			53	16	25	2	10			
7	N	2	Total	C	H	N	O	0	0	0
			53	16	25	2	10			

- Molecule 8 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-glucopyranose.

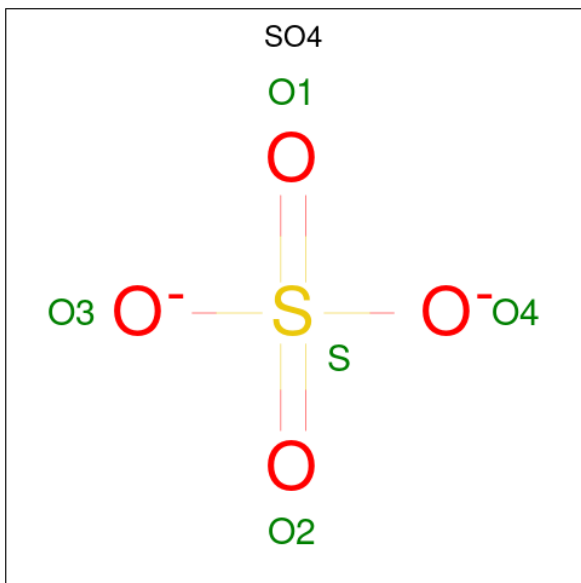


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	M	4	Total	C	H	N	O	0	0	0
			93	28	43	2	20			

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

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

- Molecule 10 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



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

- Molecule 11 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
11	A	1	14	3	8	3	0	0

- Molecule 12 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Mn		
12	B	3	3	3	0	0
12	D	3	3	3	0	0

- Molecule 13 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	H	N			O
13	B	1	27	8	13	1	5	0	0
13	D	1	27	8	13	1	5	0	0

- Molecule 14 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Cl		
14	C	1	1	1	0	0

- Molecule 15 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
15	A	319	319	319	0	0
15	B	144	144	144	0	0
15	C	123	123	123	0	0
15	D	75	75	75	0	0
15	E	9	9	9	0	0
15	F	9	9	9	0	0

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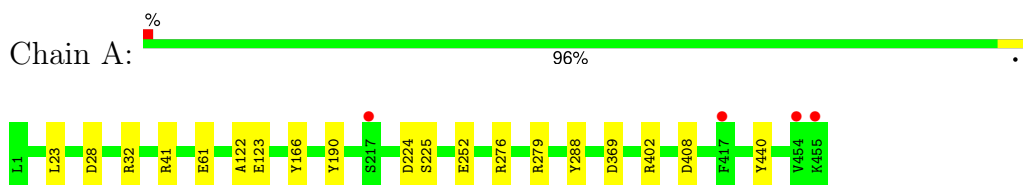
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
15	H	16	Total O 16 16	0	0
15	L	28	Total O 28 28	0	0
15	G	5	Total O 5 5	0	0
15	J	4	Total O 4 4	0	0

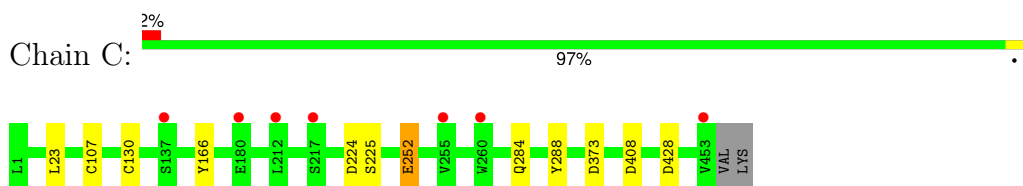
3 Residue-property plots [i](#)

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.

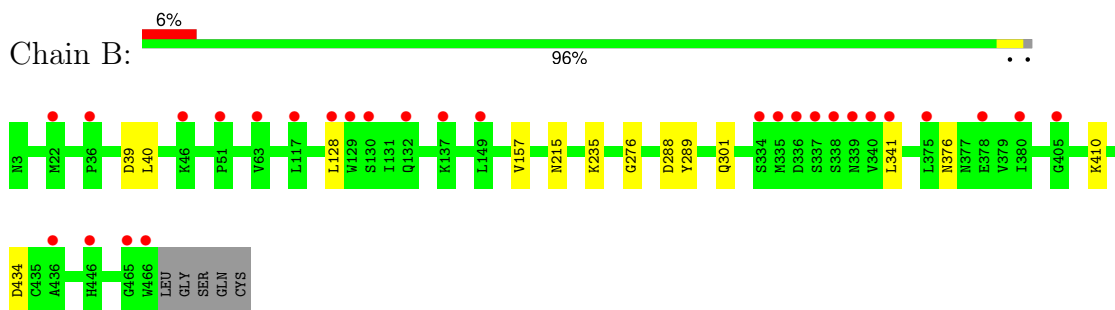
- Molecule 1: Integrin alpha-IIb



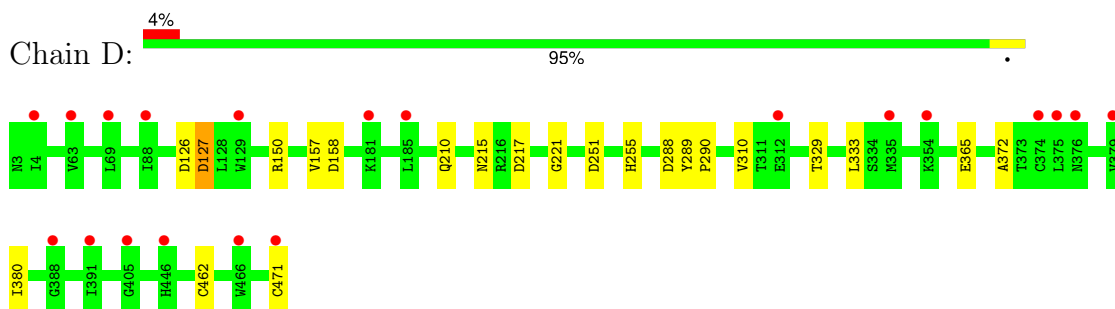
- Molecule 1: Integrin alpha-IIb



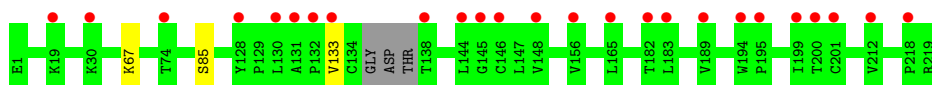
- Molecule 2: Integrin beta-3



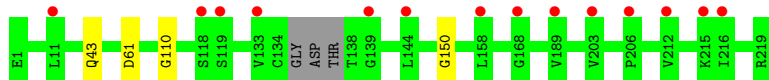
- Molecule 2: Integrin beta-3



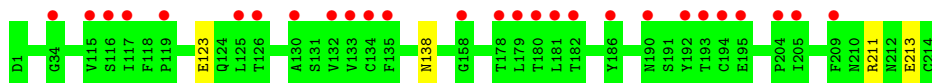
- Molecule 3: Monoclonal antibody 10E5 heavy chain



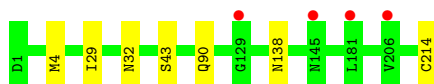
- Molecule 3: Monoclonal antibody 10E5 heavy chain



- Molecule 4: Monoclonal antibody 10E5 light chain



- Molecule 4: Monoclonal antibody 10E5 light chain



- Molecule 5: Tetrapeptide ALA-GLY-ASP-VAL



- Molecule 5: Tetrapeptide ALA-GLY-ASP-VAL



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





- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K:  100%



- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain N:  100%



- Molecule 8: 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 M:  75% 25%



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	256.88Å 144.37Å 104.64Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.19 – 2.60 49.19 – 2.60	Depositor EDS
% Data completeness (in resolution range)	95.9 (49.19-2.60) 84.1 (49.19-2.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.55 (at 2.61Å)	Xtrriage
Refinement program	PHENIX (1.10pre_2104: ???)	Depositor
R, R_{free}	0.230 , 0.253 0.232 , 0.255	Depositor DCC
R_{free} test set	2000 reflections (1.69%)	wwPDB-VP
Wilson B-factor (Å ²)	50.6	Xtrriage
Anisotropy	0.449	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 68.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	41957	wwPDB-VP
Average B, all atoms (Å ²)	105.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.25% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, CA, GOL, MN, NAG, MAN, CL, 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	A	0.30	0/3600	0.44	0/4905
1	C	0.27	0/3570	0.43	0/4865
2	B	0.25	0/3645	0.43	0/4942
2	D	0.25	0/3678	0.41	0/4986
3	E	0.25	0/1684	0.44	0/2305
3	H	0.25	0/1684	0.43	0/2305
4	F	0.24	0/1673	0.41	0/2269
4	L	0.24	0/1673	0.42	0/2269
5	G	0.19	0/24	0.45	0/30
5	J	0.21	0/24	0.37	0/30
All	All	0.26	0/21255	0.43	0/28906

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
2	B	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	341	LEU	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	3498	3341	3341	13	0
1	C	3474	3308	3308	7	0
2	B	3579	3496	3496	5	0
2	D	3612	3528	3527	12	0
3	E	1642	1600	1600	1	0
3	H	1642	1600	1600	3	0
4	F	1637	1553	1553	2	0
4	L	1637	1553	1553	3	0
5	G	25	20	20	0	0
5	J	25	20	20	0	0
6	I	61	52	52	0	0
7	K	28	25	25	0	0
7	N	28	25	25	0	0
8	M	50	43	43	0	0
9	A	4	0	0	0	0
9	C	4	0	0	0	0
10	A	20	0	0	0	0
10	C	15	0	0	0	0
10	L	5	0	0	0	0
11	A	6	8	8	0	0
12	B	3	0	0	0	0
12	D	3	0	0	0	0
13	B	14	13	13	4	0
13	D	14	13	13	0	0
14	C	1	0	0	0	0
15	A	319	0	0	9	1
15	B	144	0	0	1	0
15	C	123	0	0	4	1
15	D	75	0	0	6	0
15	E	9	0	0	0	0
15	F	9	0	0	0	0
15	G	5	0	0	0	0
15	H	16	0	0	1	0
15	J	4	0	0	0	0
15	L	28	0	0	0	0
All	All	21759	20198	20197	49	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 1.

All (49) 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:A:276:ARG:NH1	15:A:604:HOH:O	2.17	0.78
1:A:369:ASP:OD2	15:A:601:HOH:O	2.02	0.77
2:B:235:LYS:NZ	2:B:276:GLY:O	2.24	0.71
1:C:408:ASP:OD2	15:C:601:HOH:O	2.10	0.69
1:A:276:ARG:NH1	15:A:612:HOH:O	2.26	0.69
13:B:2004:NAG:H83	13:B:2004:NAG:H3	1.73	0.69
1:C:428:ASP:OD2	15:C:602:HOH:O	2.14	0.64
2:D:462:CYS:SG	2:D:471:CYS:N	2.71	0.64
1:C:373:ASP:O	15:C:603:HOH:O	2.14	0.63
1:A:402:ARG:O	15:A:602:HOH:O	2.15	0.63
1:A:369:ASP:CG	15:A:601:HOH:O	2.37	0.61
1:C:284:GLN:OE1	15:C:604:HOH:O	2.17	0.57
1:A:190:TYR:O	15:A:606:HOH:O	2.18	0.56
1:A:408:ASP:OD2	15:A:605:HOH:O	2.17	0.56
13:B:2004:NAG:H3	13:B:2004:NAG:C8	2.37	0.55
1:C:252:GLU:N	1:C:252:GLU:OE2	2.39	0.55
2:D:288:ASP:OD1	2:D:289:TYR:N	2.40	0.55
1:A:440:TYR:OH	15:A:603:HOH:O	2.16	0.55
2:D:210:GLN:OE1	15:D:2101:HOH:O	2.18	0.54
4:F:211:ARG:O	4:F:213:GLU:N	2.41	0.53
13:B:2004:NAG:H83	13:B:2004:NAG:C3	2.41	0.51
1:C:224:ASP:OD1	1:C:225:SER:N	2.41	0.51
2:B:288:ASP:OD1	2:B:289:TYR:N	2.40	0.50
2:B:410:LYS:NZ	2:B:434:ASP:OD2	2.44	0.49
2:D:221:GLY:O	15:D:2102:HOH:O	2.19	0.49
3:H:61:ASP:OD1	15:H:301:HOH:O	2.19	0.49
2:D:217:ASP:OD2	2:D:255:HIS:NE2	2.43	0.49
4:F:123:GLU:OE1	4:F:123:GLU:N	2.43	0.48
2:D:290:PRO:O	15:D:2103:HOH:O	2.20	0.48
2:D:372:ALA:O	2:D:380:ILE:N	2.47	0.47
3:H:43:GLN:OE1	3:H:43:GLN:N	2.46	0.46
2:D:310:VAL:O	2:D:333:LEU:N	2.44	0.46
1:C:107:CYS:HA	1:C:130:CYS:HA	1.98	0.46
3:E:67:LYS:NZ	3:E:85:SER:O	2.50	0.44
1:A:122:ALA:O	1:A:123:GLU:HB2	2.18	0.44
4:L:4:MET:HE1	4:L:90:GLN:HB3	2.01	0.43
2:D:251:ASP:OD2	15:D:2104:HOH:O	2.21	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:41:ARG:NH2	15:A:634:HOH:O	2.44	0.42
1:A:224:ASP:OD1	1:A:225:SER:N	2.43	0.42
2:D:126:ASP:OD1	2:D:127:ASP:N	2.52	0.42
1:A:28:ASP:OD1	1:A:32:ARG:N	2.49	0.42
13:B:2004:NAG:C8	13:B:2004:NAG:C3	2.95	0.42
1:A:276:ARG:HD2	1:A:279:ARG:HB2	2.02	0.41
4:L:29:ILE:O	4:L:32:ASN:ND2	2.48	0.41
2:D:150:ARG:NH1	15:D:2111:HOH:O	2.45	0.41
2:B:301:GLN:NE2	15:B:2109:HOH:O	2.35	0.41
2:B:39:ASP:OD1	2:B:40:LEU:N	2.46	0.41
3:H:110:GLY:O	4:L:43:SER:OG	2.29	0.40
2:D:329:THR:N	15:D:2108:HOH:O	2.49	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)
15:A:605:HOH:O	15:C:632:HOH:O[1_554]	2.13	0.07

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	455/455 (100%)	434 (95%)	21 (5%)	0	100	100
1	C	451/455 (99%)	432 (96%)	19 (4%)	0	100	100
2	B	462/469 (98%)	438 (95%)	23 (5%)	1 (0%)	44	66
2	D	467/469 (100%)	445 (95%)	21 (4%)	1 (0%)	44	66
3	E	212/219 (97%)	197 (93%)	14 (7%)	1 (0%)	25	47
3	H	212/219 (97%)	202 (95%)	9 (4%)	1 (0%)	25	47
4	F	212/214 (99%)	202 (95%)	9 (4%)	1 (0%)	25	47

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	L	212/214 (99%)	205 (97%)	6 (3%)	1 (0%)	25	47
5	G	2/4 (50%)	2 (100%)	0	0	100	100
5	J	2/4 (50%)	2 (100%)	0	0	100	100
All	All	2687/2722 (99%)	2559 (95%)	122 (4%)	6 (0%)	44	66

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	E	133	VAL
2	B	157	VAL
4	L	138	ASN
2	D	157	VAL
4	F	138	ASN
3	H	150	GLY

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	365/363 (101%)	360 (99%)	5 (1%)	62	82
1	C	361/363 (99%)	357 (99%)	4 (1%)	70	86
2	B	411/415 (99%)	408 (99%)	3 (1%)	81	93
2	D	415/415 (100%)	411 (99%)	4 (1%)	73	88
3	E	187/189 (99%)	187 (100%)	0	100	100
3	H	187/189 (99%)	187 (100%)	0	100	100
4	F	188/188 (100%)	188 (100%)	0	100	100
4	L	188/188 (100%)	187 (100%)	1 (0%)	86	95
5	G	2/2 (100%)	2 (100%)	0	100	100
5	J	2/2 (100%)	2 (100%)	0	100	100
All	All	2306/2314 (100%)	2289 (99%)	17 (1%)	81	93

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

Mol	Chain	Res	Type
1	A	23	LEU
1	A	61	GLU
1	A	166	TYR
1	A	252	GLU
1	A	288	TYR
2	B	128	LEU
2	B	215	ASN
2	B	376	ASN
1	C	23	LEU
1	C	166	TYR
1	C	252	GLU
1	C	288	TYR
2	D	127	ASP
2	D	158	ASP
2	D	215	ASN
2	D	365	GLU
4	L	214	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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](#)

13 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	I	1	6,2	14,14,15	0.31	0	17,19,21	0.44	0
6	NAG	I	2	6	14,14,15	0.21	0	17,19,21	0.44	0
6	BMA	I	3	6	11,11,12	0.77	0	15,15,17	0.71	0
6	MAN	I	4	6	11,11,12	0.67	0	15,15,17	1.01	2 (13%)
6	MAN	I	5	6	11,11,12	0.67	0	15,15,17	0.99	2 (13%)
7	NAG	K	1	2,7	14,14,15	0.32	0	17,19,21	0.36	0
7	NAG	K	2	7	14,14,15	0.24	0	17,19,21	0.42	0
8	NAG	M	1	2,8	14,14,15	0.26	0	17,19,21	0.43	0
8	NAG	M	2	8	14,14,15	0.23	0	17,19,21	0.42	0
8	BMA	M	3	8	11,11,12	0.58	0	15,15,17	0.69	0
8	MAN	M	4	8	11,11,12	0.71	0	15,15,17	0.96	2 (13%)
7	NAG	N	1	2,7	14,14,15	0.40	0	17,19,21	0.36	0
7	NAG	N	2	7	14,14,15	0.23	0	17,19,21	0.44	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	NAG	I	1	6,2	-	0/6/23/26	0/1/1/1
6	NAG	I	2	6	-	2/6/23/26	0/1/1/1
6	BMA	I	3	6	-	0/2/19/22	0/1/1/1
6	MAN	I	4	6	-	2/2/19/22	0/1/1/1
6	MAN	I	5	6	-	1/2/19/22	0/1/1/1
7	NAG	K	1	2,7	-	3/6/23/26	0/1/1/1
7	NAG	K	2	7	-	1/6/23/26	0/1/1/1
8	NAG	M	1	2,8	-	0/6/23/26	0/1/1/1
8	NAG	M	2	8	-	0/6/23/26	0/1/1/1
8	BMA	M	3	8	-	2/2/19/22	0/1/1/1
8	MAN	M	4	8	-	0/2/19/22	0/1/1/1
7	NAG	N	1	2,7	-	2/6/23/26	0/1/1/1
7	NAG	N	2	7	-	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(°)	Ideal(°)
6	I	4	MAN	O2-C2-C3	-2.33	105.33	110.15
6	I	5	MAN	C1-O5-C5	2.32	115.30	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	M	4	MAN	O2-C2-C3	-2.24	105.52	110.15
6	I	5	MAN	O2-C2-C3	-2.18	105.65	110.15
8	M	4	MAN	C1-O5-C5	2.13	115.05	112.19
6	I	4	MAN	C1-O5-C5	2.10	115.00	112.19

There are no chirality outliers.

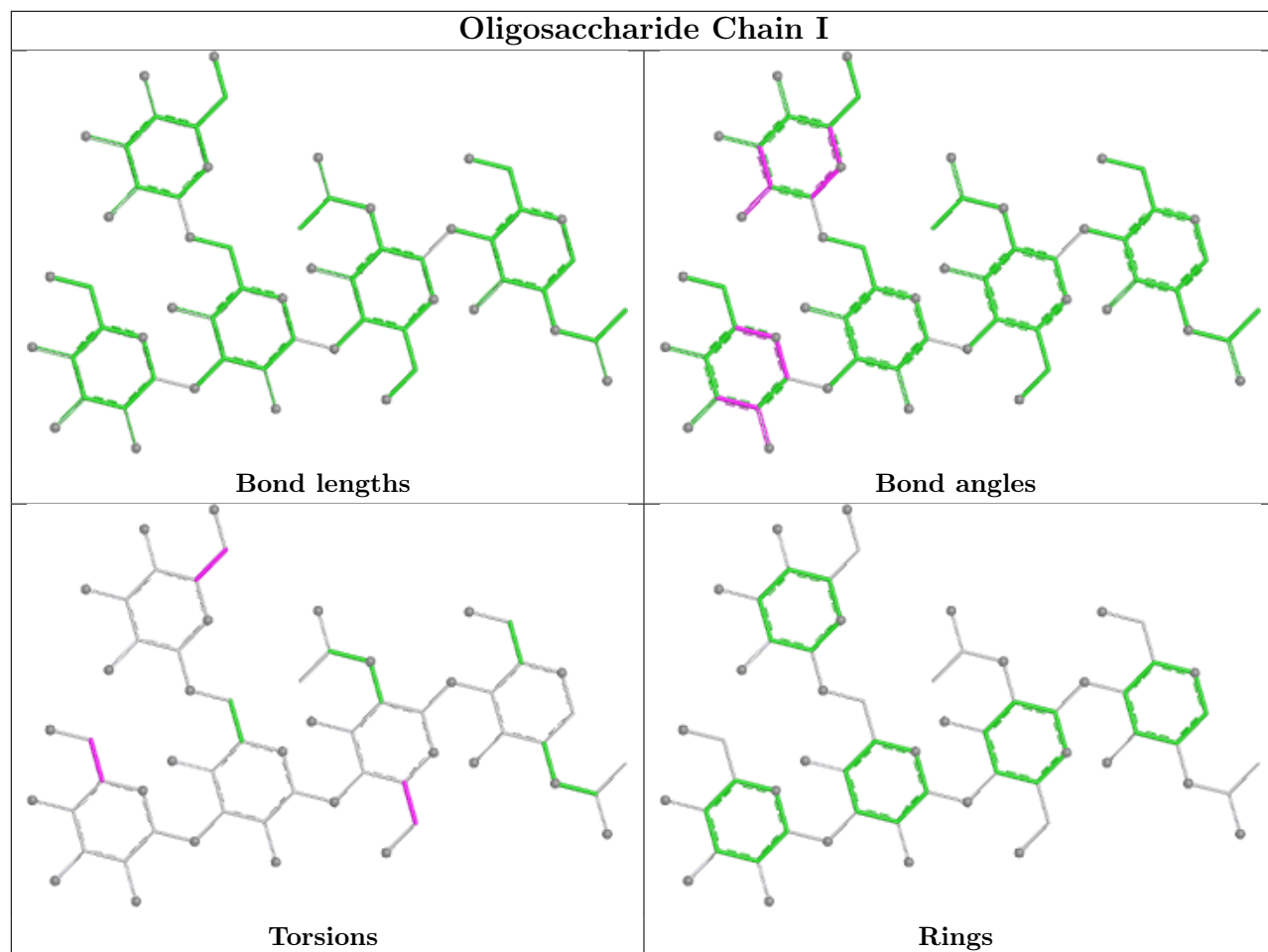
All (15) torsion outliers are listed below:

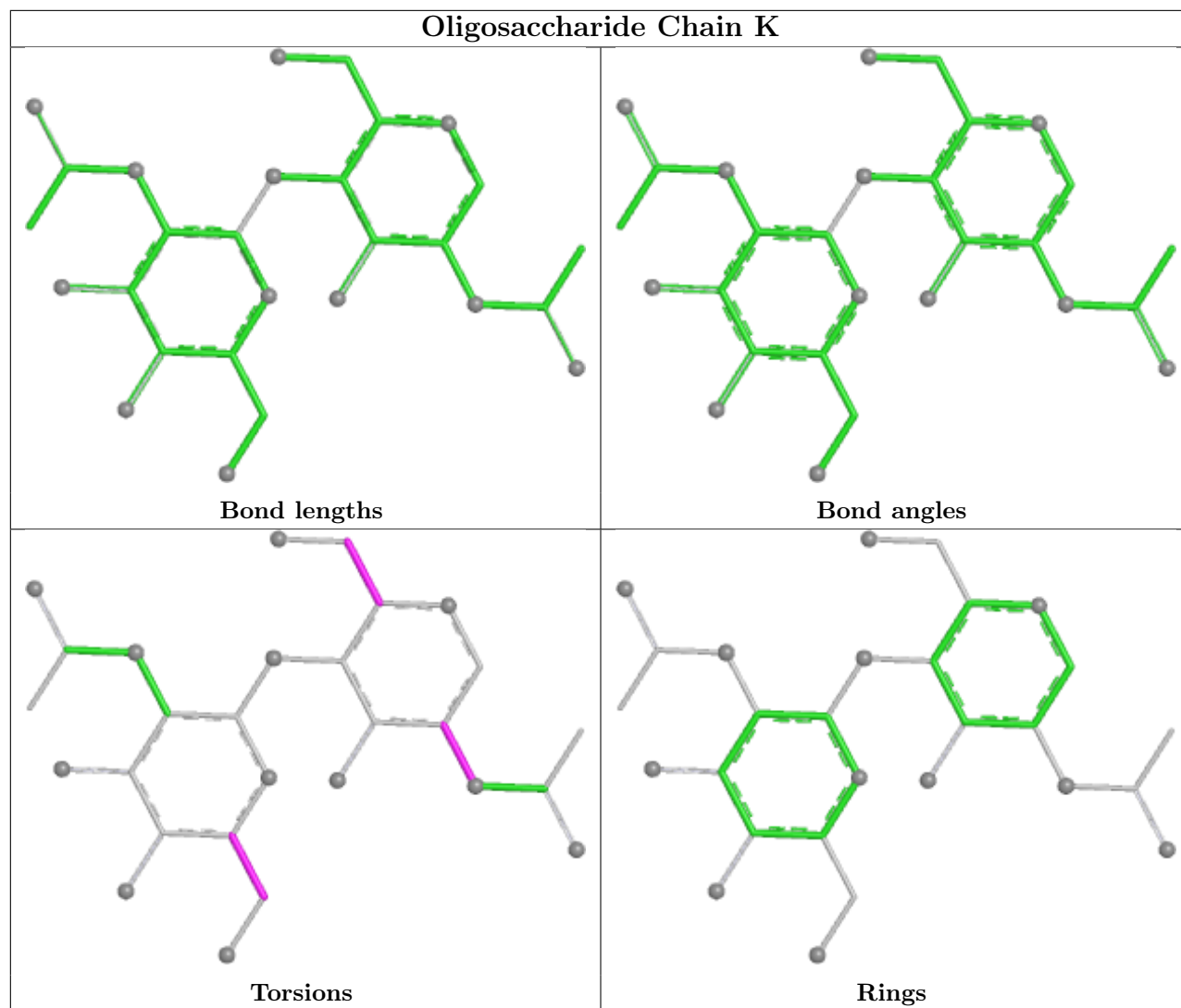
Mol	Chain	Res	Type	Atoms
7	N	2	NAG	O5-C5-C6-O6
7	N	1	NAG	O5-C5-C6-O6
6	I	4	MAN	C4-C5-C6-O6
6	I	4	MAN	O5-C5-C6-O6
8	M	3	BMA	O5-C5-C6-O6
7	N	1	NAG	C4-C5-C6-O6
8	M	3	BMA	C4-C5-C6-O6
7	N	2	NAG	C4-C5-C6-O6
7	K	1	NAG	O5-C5-C6-O6
6	I	5	MAN	O5-C5-C6-O6
7	K	1	NAG	C4-C5-C6-O6
7	K	2	NAG	O5-C5-C6-O6
7	K	1	NAG	C1-C2-N2-C7
6	I	2	NAG	C4-C5-C6-O6
6	I	2	NAG	O5-C5-C6-O6

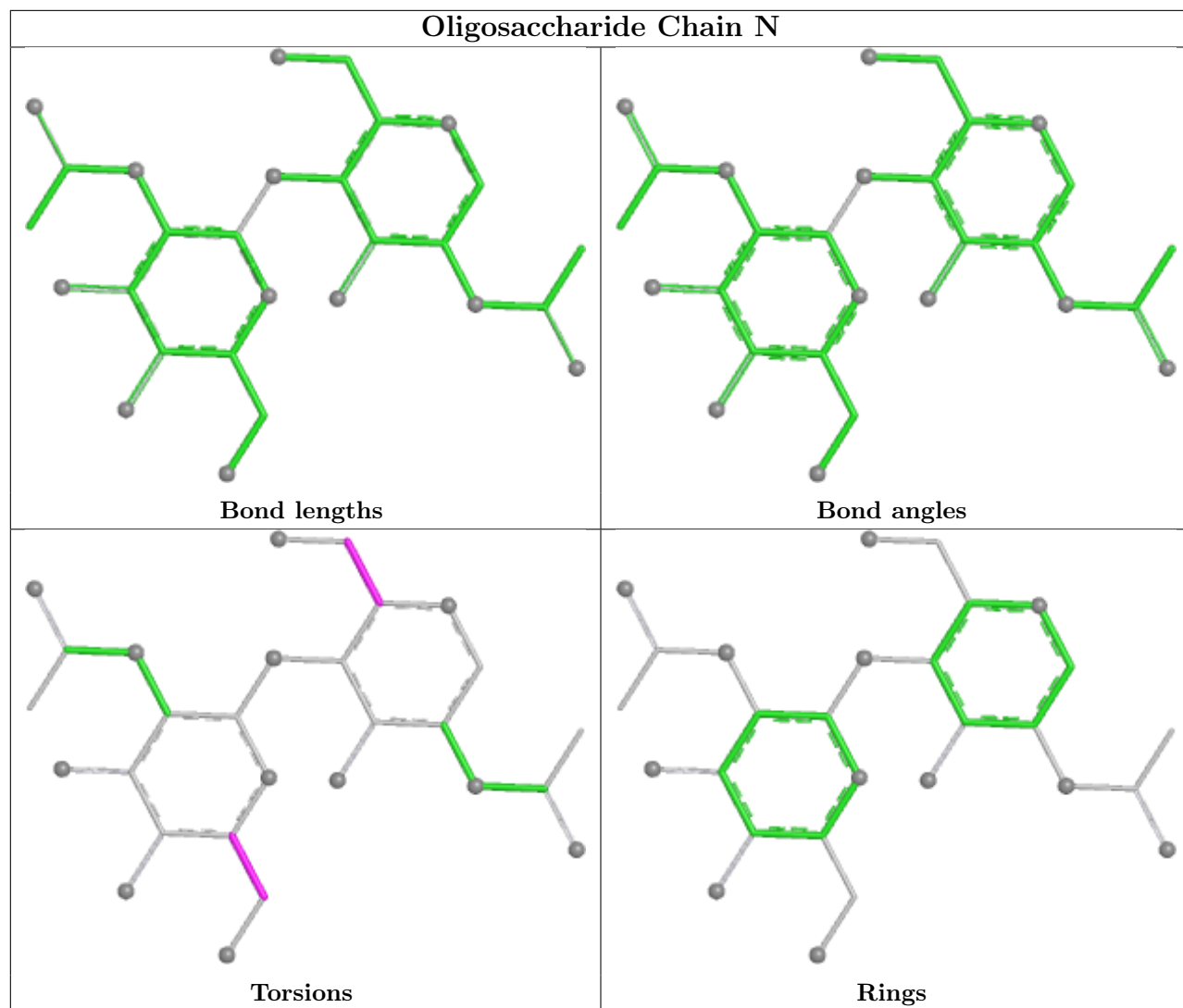
There are no ring outliers.

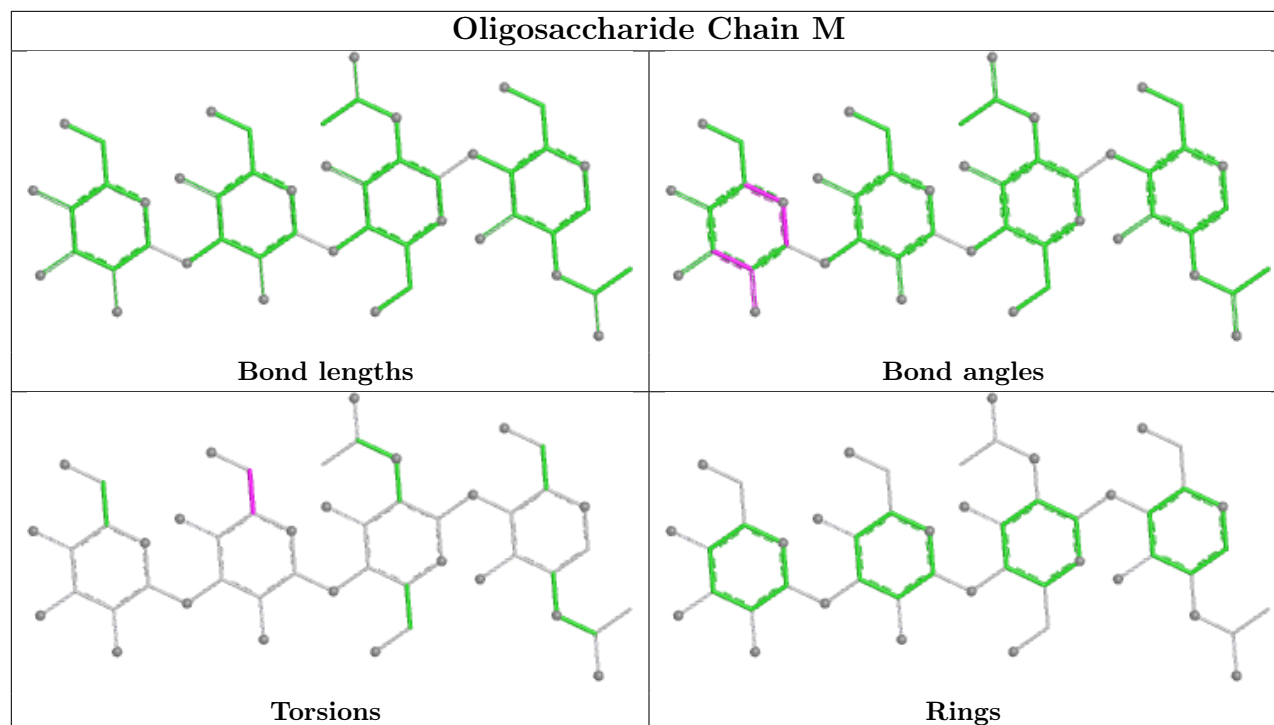
No monomer is involved in short contacts.

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 26 ligands modelled in this entry, 15 are monoatomic - leaving 11 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	$\# Z > 2$
10	SO4	C	501	-	4,4,4	0.23	0	6,6,6	0.06	0
10	SO4	A	506	-	4,4,4	0.23	0	6,6,6	0.07	0
10	SO4	C	507	-	4,4,4	0.23	0	6,6,6	0.08	0
10	SO4	A	505	-	4,4,4	0.24	0	6,6,6	0.08	0
11	GOL	A	509	-	5,5,5	0.42	0	5,5,5	0.27	0
13	NAG	B	2004	2	14,14,15	0.45	0	17,19,21	1.48	3 (17%)
13	NAG	D	2004	2	14,14,15	0.25	0	17,19,21	0.39	0
10	SO4	L	301	-	4,4,4	0.23	0	6,6,6	0.07	0
10	SO4	A	507	-	4,4,4	0.22	0	6,6,6	0.06	0
10	SO4	A	508	-	4,4,4	0.23	0	6,6,6	0.06	0
10	SO4	C	508	-	4,4,4	0.24	0	6,6,6	0.09	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
13	NAG	D	2004	2	-	0/6/23/26	0/1/1/1
11	GOL	A	509	-	-	0/4/4/4	-
13	NAG	B	2004	2	-	5/6/23/26	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
13	B	2004	NAG	C2-N2-C7	4.26	128.60	122.90
13	B	2004	NAG	C1-O5-C5	2.69	115.79	112.19
13	B	2004	NAG	C1-C2-N2	2.08	113.71	110.43

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
13	B	2004	NAG	O5-C5-C6-O6
13	B	2004	NAG	C4-C5-C6-O6
13	B	2004	NAG	C8-C7-N2-C2
13	B	2004	NAG	O7-C7-N2-C2
13	B	2004	NAG	C3-C2-N2-C7

There are no ring outliers.

1 monomer is involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
13	B	2004	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

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	455/455 (100%)	0.06	4 (0%) 81 77	41, 63, 93, 185	3 (0%)
1	C	453/455 (99%)	0.33	7 (1%) 71 67	56, 84, 115, 152	0
2	B	464/469 (98%)	0.56	28 (6%) 29 23	51, 97, 173, 204	1 (0%)
2	D	469/469 (100%)	0.66	20 (4%) 40 34	55, 107, 160, 199	1 (0%)
3	E	216/219 (98%)	1.01	25 (11%) 11 8	93, 148, 241, 268	0
3	H	216/219 (98%)	0.77	14 (6%) 26 21	75, 124, 172, 199	0
4	F	214/214 (100%)	0.99	27 (12%) 9 7	101, 149, 239, 274	1 (0%)
4	L	214/214 (100%)	0.57	4 (1%) 66 61	75, 110, 136, 173	0
5	G	4/4 (100%)	1.21	2 (50%) 0 0	58, 68, 72, 76	0
5	J	4/4 (100%)	2.29	2 (50%) 0 0	86, 88, 88, 92	0
All	All	2709/2722 (99%)	0.55	133 (4%) 36 30	41, 100, 187, 274	6 (0%)

All (133) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	454	VAL	6.0
5	J	408	ALA	4.9
1	A	455	LYS	3.9
4	F	194	CYS	3.7
2	B	466	TRP	3.7
2	B	130	SER	3.7
4	F	135	PHE	3.6
2	B	375	LEU	3.5
3	E	144	LEU	3.5
1	C	217	SER	3.4
1	C	453	VAL	3.4
2	B	340	VAL	3.4
3	H	133	VAL	3.4

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Mol	Chain	Res	Type	RSRZ
2	B	334	SER	3.3
2	D	471	CYS	3.3
2	B	129	TRP	3.2
3	E	146	CYS	3.2
2	B	335	MET	3.1
3	H	11	LEU	3.1
1	A	217	SER	3.1
2	D	335	MET	3.1
3	E	148	VAL	3.0
2	D	446	HIS	3.0
4	F	179	LEU	3.0
4	F	178	THR	3.0
2	D	375	LEU	3.0
2	B	149	LEU	2.9
4	F	209	PHE	2.9
2	D	466	TRP	2.9
3	E	138	THR	2.9
2	B	339	ASN	2.9
2	D	376	ASN	2.9
3	H	216	ILE	2.9
4	F	181	LEU	2.8
5	J	411	VAL	2.8
2	B	137	LYS	2.8
4	F	193	THR	2.8
2	D	181	LYS	2.7
2	B	128	LEU	2.7
4	F	205	ILE	2.7
3	H	118	SER	2.7
3	E	199	ILE	2.7
1	C	255	VAL	2.7
3	E	145	GLY	2.7
3	E	212	VAL	2.6
2	D	354	LYS	2.6
3	E	133	VAL	2.6
1	C	212	LEU	2.6
3	E	189	VAL	2.6
3	H	203	VAL	2.6
4	F	204	PRO	2.6
3	E	30	LYS	2.5
5	G	408	ALA	2.5
3	E	195	PRO	2.5
3	E	131	ALA	2.5

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Mol	Chain	Res	Type	RSRZ
4	F	126	THR	2.5
4	F	180	THR	2.5
3	H	189	VAL	2.5
2	B	338	SER	2.5
3	H	119	SER	2.5
3	H	212	VAL	2.4
4	F	115	VAL	2.4
4	F	134	CYS	2.4
4	F	133	VAL	2.4
1	C	137	SER	2.4
2	B	63	VAL	2.4
4	F	132	VAL	2.4
2	D	391	ILE	2.4
4	F	117	ILE	2.4
4	L	145	ASN	2.4
4	F	119	PRO	2.4
2	B	117	LEU	2.3
3	H	144	LEU	2.3
2	B	51	PRO	2.3
4	L	206	VAL	2.3
2	B	337	SER	2.3
2	B	405	GLY	2.3
3	H	139	GLY	2.3
3	E	182	THR	2.3
3	E	183	LEU	2.3
3	E	201	CYS	2.3
3	H	158	LEU	2.3
4	F	125	LEU	2.3
4	F	158	GLY	2.3
4	F	190	ASN	2.3
4	F	195	GLU	2.3
4	F	186	TYR	2.3
2	D	379	VAL	2.3
4	F	130	ALA	2.3
2	D	69	LEU	2.2
3	E	130	LEU	2.2
3	H	215	LYS	2.2
1	C	260	TRP	2.2
2	D	185	LEU	2.2
4	F	182	THR	2.2
1	A	417	PHE	2.2
3	E	128	TYR	2.2

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Mol	Chain	Res	Type	RSRZ
2	B	378	GLU	2.2
5	G	411	VAL	2.2
3	E	19	LYS	2.2
2	B	46	LYS	2.2
2	B	446	HIS	2.2
2	B	22	MET	2.1
4	L	129	GLY	2.1
4	F	116	SER	2.1
2	D	63	VAL	2.1
2	D	129	TRP	2.1
3	E	156	VAL	2.1
4	L	181	LEU	2.1
4	F	34	GLY	2.1
3	E	218	PRO	2.1
2	B	380	ILE	2.1
2	D	405	GLY	2.1
3	H	168	GLY	2.1
3	E	74	THR	2.1
3	H	206	PRO	2.1
2	D	4	ILE	2.1
2	B	341	LEU	2.1
2	B	436	ALA	2.1
2	B	465	GLY	2.1
2	B	36	PRO	2.0
3	E	132	PRO	2.0
3	E	200	THR	2.0
2	D	312	GLU	2.0
2	D	374	CYS	2.0
2	B	336	ASP	2.0
3	E	165	LEU	2.0
2	D	388	GLY	2.0
3	E	194	TRP	2.0
1	C	180	GLU	2.0
4	F	192	TYR	2.0
2	B	132	GLN	2.0
2	D	88	ILE	2.0

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 [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(Å ²)	Q<0.9
13	NAG	B	2004	14/15	0.38	0.15	72,92,108,110	0
13	NAG	D	2004	14/15	0.51	0.15	70,91,107,107	0
10	SO4	C	501	5/5	0.68	0.20	134,134,135,137	0
10	SO4	L	301	5/5	0.71	0.12	123,123,124,125	0
10	SO4	C	507	5/5	0.76	0.12	124,125,126,131	0
11	GOL	A	509	6/6	0.76	0.17	70,84,91,94	0
10	SO4	C	508	5/5	0.78	0.12	108,116,120,122	0
12	MN	D	2002	1/1	0.84	0.12	247,247,247,247	0
10	SO4	A	508	5/5	0.85	0.17	99,103,110,111	0
10	SO4	A	505	5/5	0.87	0.20	125,126,127,132	0
10	SO4	A	507	5/5	0.90	0.11	102,102,102,108	0
10	SO4	A	506	5/5	0.90	0.14	110,113,114,115	0
14	CL	C	502	1/1	0.92	0.19	95,95,95,95	0
12	MN	D	2003	1/1	0.93	0.10	143,143,143,143	0
12	MN	D	2001	1/1	0.97	0.10	109,109,109,109	0
12	MN	B	2002	1/1	0.97	0.09	145,145,145,145	0
12	MN	B	2003	1/1	0.97	0.07	65,65,65,65	0
9	CA	A	504	1/1	0.98	0.04	53,53,53,53	0
9	CA	C	503	1/1	0.98	0.06	141,141,141,141	0
9	CA	C	504	1/1	0.98	0.05	123,123,123,123	0
9	CA	A	503	1/1	0.98	0.04	53,53,53,53	0
9	CA	A	501	1/1	0.99	0.04	84,84,84,84	0
12	MN	B	2001	1/1	0.99	0.04	46,46,46,46	0
9	CA	A	502	1/1	0.99	0.02	46,46,46,46	0
9	CA	C	505	1/1	0.99	0.03	73,73,73,73	0
9	CA	C	506	1/1	0.99	0.04	75,75,75,75	0

6.5 Other polymers [i](#)

There are no such residues in this entry.