



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 6, 2026 – 12:18 PM UTC

PDB ID : 3ULV / pdb_00003ulv
Title : Structure of quaternary complex of human TLR3ecd with three Fabs (Form2)
Authors : Luo, J.; Gilliland, G.L.; Obmolova, O.; Malia, T.; Teplyakov, A.
Deposited on : 2011-11-11
Resolution : 3.52 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

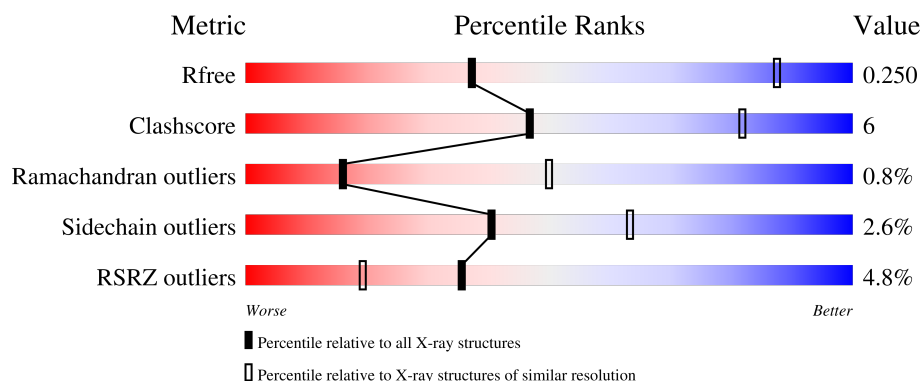
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.52 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.



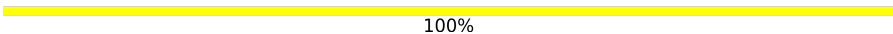
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1025 (3.56-3.48)
Clashscore	190562	1079 (3.56-3.48)
Ramachandran outliers	187476	1052 (3.56-3.48)
Sidechain outliers	187428	1053 (3.56-3.48)
RSRZ outliers	180081	1024 (3.56-3.48)

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	694	
2	L	214	
3	H	225	
4	C	213	
5	D	226	

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Mol	Chain	Length	Quality of chain
6	E	215	 87%12%.
7	F	223	 78%18%..
8	B	2	 100%
8	G	2	 100%
8	I	2	 50%50%
8	K	2	 50%50%
9	J	4	 100%

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 15591 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 Toll-like receptor 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	668	Total	C	N	O	S	0	0	0
			5354	3423	908	1005	18			

There are 13 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	17	ALA	-	cloning artifact	UNP O15455
A	18	ASP	-	cloning artifact	UNP O15455
A	19	LEU	-	cloning artifact	UNP O15455
A	20	GLY	-	cloning artifact	UNP O15455
A	21	SER	-	cloning artifact	UNP O15455
A	703	ALA	-	expression tag	UNP O15455
A	704	SER	-	expression tag	UNP O15455
A	705	HIS	-	expression tag	UNP O15455
A	706	HIS	-	expression tag	UNP O15455
A	707	HIS	-	expression tag	UNP O15455
A	708	HIS	-	expression tag	UNP O15455
A	709	HIS	-	expression tag	UNP O15455
A	710	HIS	-	expression tag	UNP O15455

- Molecule 2 is a protein called Fab15 light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	L	214	Total	C	N	O	S	0	0	0
			1633	1020	273	334	6			

- Molecule 3 is a protein called Fab15 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	H	225	Total	C	N	O	S	0	0	0
			1720	1088	286	337	9			

- Molecule 4 is a protein called Fab12 light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	C	210	Total	C	N	O	S	0	0	0
			1579	987	260	328	4			

- Molecule 5 is a protein called Fab12 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	D	224	Total	C	N	O	S	0	0	0
			1712	1080	294	333	5			

- Molecule 6 is a protein called Fab1068 light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	E	215	Total	C	N	O	S	0	0	0
			1661	1040	279	336	6			

- Molecule 7 is a protein called Fab1068 heavy chain.

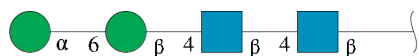
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	F	217	Total	C	N	O	S	0	0	0
			1656	1050	279	320	7			

- Molecule 8 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
8	B	2	Total	C	N	O	0	0	0
			28	16	2	10			
8	G	2	Total	C	N	O	0	0	0
			28	16	2	10			
8	I	2	Total	C	N	O	0	0	0
			28	16	2	10			
8	K	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 9 is an oligosaccharide called 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
9	J	4	Total	C	N	O	0	0	0
			50	28	2	20			

- Molecule 10 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



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	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	A	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 11 is SULFATE ION (CCD ID: SO4) (formula: O_4S).

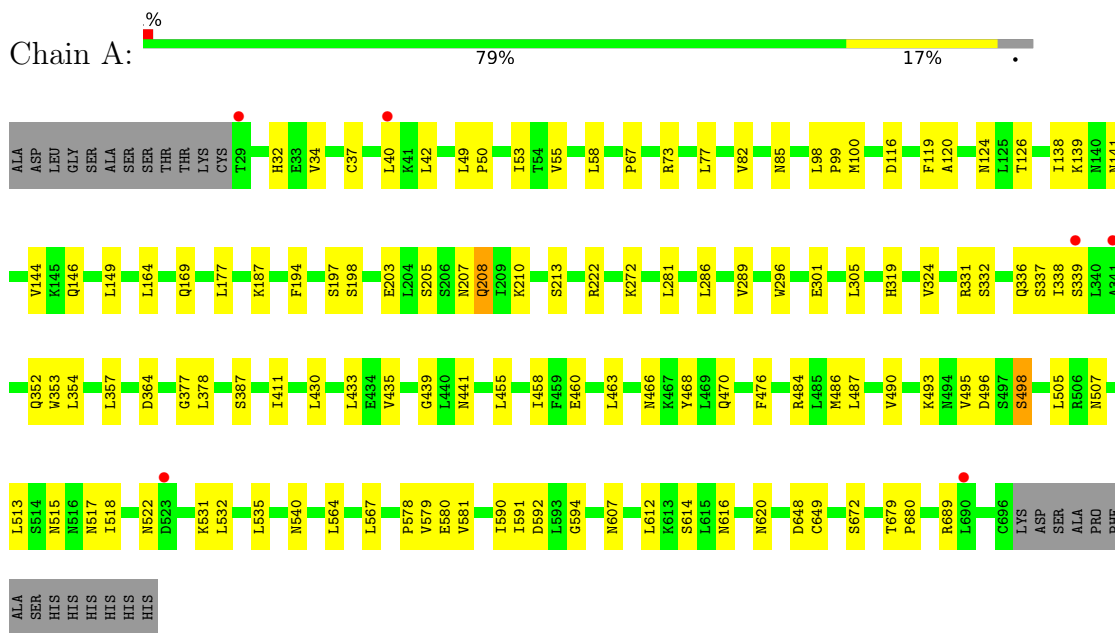


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
11	A	1	Total	O	S	0	0
			5	4	1		
11	A	1	Total	O	S	0	0
			5	4	1		
11	A	1	Total	O	S	0	0
			5	4	1		
11	A	1	Total	O	S	0	0
			5	4	1		
11	E	1	Total	O	S	0	0
			5	4	1		
11	E	1	Total	O	S	0	0
			5	4	1		

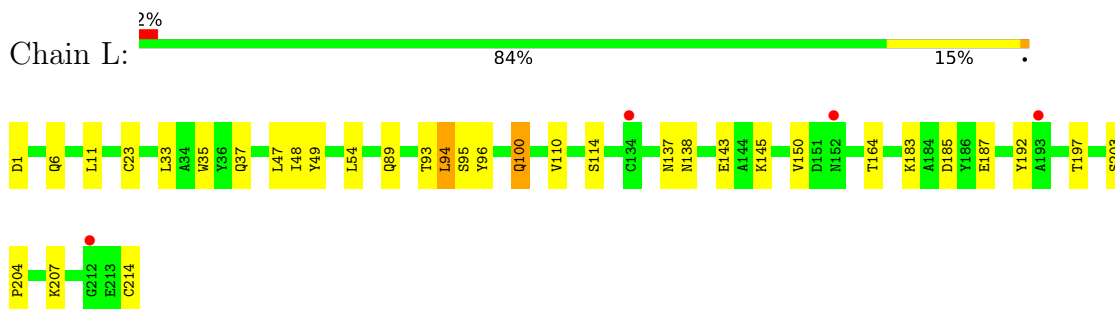
3 Residue-property plots

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.

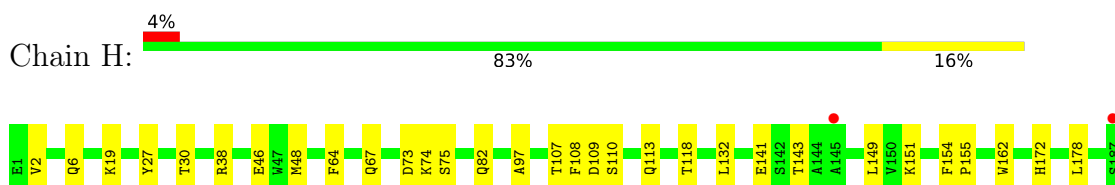
• Molecule 1: Toll-like receptor 3



• Molecule 2: Fab15 light chain

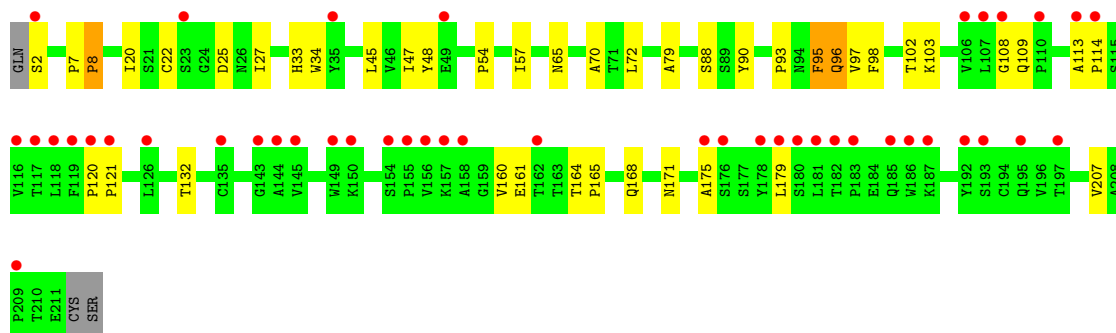
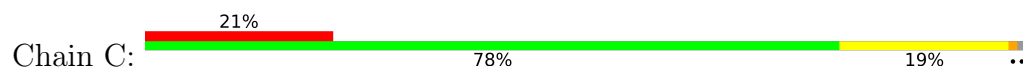


• Molecule 3: Fab15 heavy chain

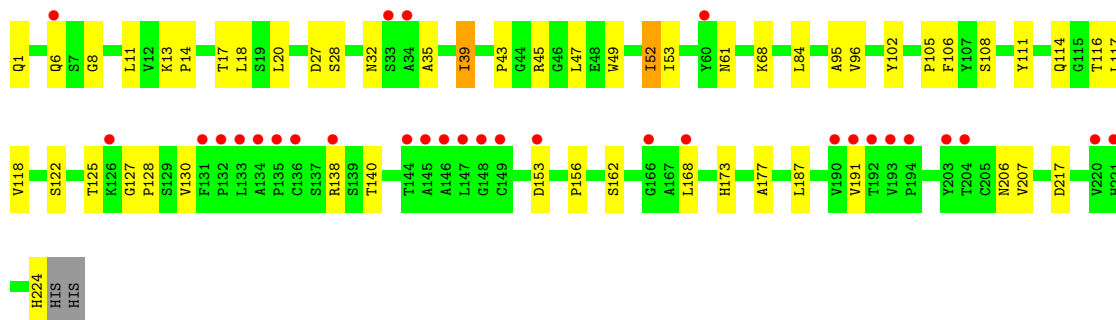
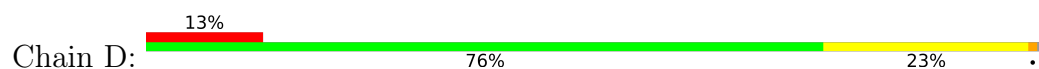




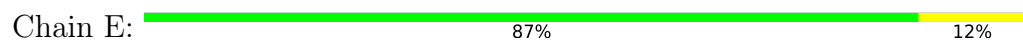
• Molecule 4: Fab12 light chain



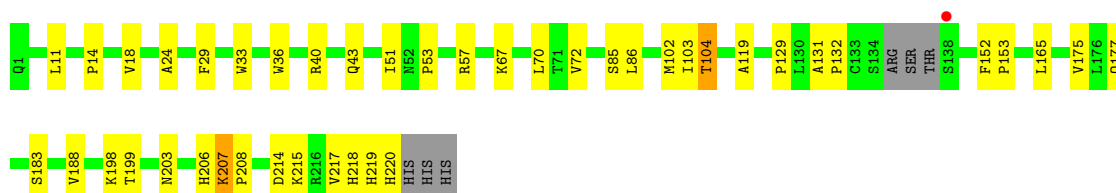
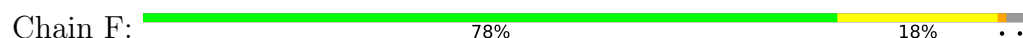
• Molecule 5: Fab12 heavy chain



• Molecule 6: Fab1068 light chain



• Molecule 7: Fab1068 heavy chain



- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain B:  100%

NAG1
NAG2

- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:  100%

NAG1
NAG2

- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I:  50% 50%

NAG1
NAG2

- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K:  50% 50%

NAG1
NAG2

- Molecule 9: 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

Chain J:  100%

NAG1
NAG2
BMA3
MAN4

4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	363.30Å 131.66Å 154.20Å 90.00° 91.35° 90.00°	Depositor
Resolution (Å)	48.45 – 3.52 48.45 – 3.52	Depositor EDS
% Data completeness (in resolution range)	53.5 (48.45-3.52) 53.6 (48.45-3.52)	Depositor EDS
R_{merge}	0.21	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.30 (at 3.48Å)	Xtriage
Refinement program	PHENIX (phenix.refine: dev_896)	Depositor
R, R_{free}	0.231 , 0.253 0.229 , 0.250	Depositor DCC
R_{free} test set	2398 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å ²)	55.7	Xtriage
Anisotropy	0.043	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 88.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.000 for -h,-k,l	Xtriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	15591	wwPDB-VP
Average B, all atoms (Å ²)	70.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.99% 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: SO4, NAG, MAN, 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	0.24	0/5467	0.69	2/7422 (0.0%)
2	L	0.26	0/1666	0.70	0/2259
3	H	0.25	0/1770	0.67	0/2412
4	C	0.28	0/1620	0.79	0/2217
5	D	0.26	0/1759	0.73	1/2405 (0.0%)
6	E	0.26	0/1699	0.71	0/2304
7	F	0.26	0/1699	0.70	0/2320
All	All	0.26	0/15680	0.71	3/21339 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	68	LYS	CB-CA-C	-5.46	110.26	116.54
1	A	498	SER	CA-C-N	-5.27	113.94	120.79
1	A	498	SER	C-N-CA	-5.27	113.94	120.79

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	5354	0	5352	65	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	L	1633	0	1591	16	0
3	H	1720	0	1646	18	0
4	C	1579	0	1501	24	0
5	D	1712	0	1671	28	0
6	E	1661	0	1598	10	0
7	F	1656	0	1626	22	0
8	B	28	0	25	0	0
8	G	28	0	25	0	0
8	I	28	0	25	0	0
8	K	28	0	25	0	0
9	J	50	0	43	3	0
10	A	84	0	78	2	0
11	A	20	0	0	0	0
11	E	10	0	0	0	0
All	All	15591	0	15206	176	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 6.

The worst 5 of 176 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:579:VAL:HG13	1:A:580:GLU:HG2	1.68	0.75
5:D:39:ILE:HG22	5:D:49:TRP:HA	1.74	0.70
1:A:67:PRO:HG2	10:A:802:NAG:HN2	1.59	0.68
1:A:138:ILE:HD12	1:A:164:LEU:HD22	1.75	0.67
1:A:119:PHE:O	1:A:146:GLN:NE2	2.30	0.65

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	666/694 (96%)	609 (91%)	55 (8%)	2 (0%)	36	66
2	L	212/214 (99%)	204 (96%)	6 (3%)	2 (1%)	14	48
3	H	223/225 (99%)	207 (93%)	15 (7%)	1 (0%)	30	62
4	C	208/213 (98%)	193 (93%)	12 (6%)	3 (1%)	9	38
5	D	222/226 (98%)	202 (91%)	17 (8%)	3 (1%)	9	38
6	E	213/215 (99%)	198 (93%)	12 (6%)	3 (1%)	9	38
7	F	213/223 (96%)	192 (90%)	20 (9%)	1 (0%)	24	58
All	All	1957/2010 (97%)	1805 (92%)	137 (7%)	15 (1%)	16	50

5 of 15 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	139	LYS
2	L	143	GLU
7	F	218	HIS
2	L	138	ASN
4	C	93	PRO

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	A	622/644 (97%)	619 (100%)	3 (0%)	81	81
2	L	186/186 (100%)	178 (96%)	8 (4%)	26	51
3	H	194/194 (100%)	188 (97%)	6 (3%)	35	60
4	C	178/181 (98%)	175 (98%)	3 (2%)	53	70
5	D	197/199 (99%)	189 (96%)	8 (4%)	27	53
6	E	188/188 (100%)	179 (95%)	9 (5%)	23	50
7	F	189/195 (97%)	180 (95%)	9 (5%)	23	50
All	All	1754/1787 (98%)	1708 (97%)	46 (3%)	40	63

5 of 46 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	E	11	LEU
6	E	165	THR
6	E	21	ILE
6	E	81	GLU
7	F	57	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 24 such sidechains are listed below:

Mol	Chain	Res	Type
3	H	59	ASN
4	C	198	HIS
4	C	189	HIS
5	D	62	ASN
1	A	520	ASN

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 ⓘ

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	$\# Z > 2$
8	NAG	B	1	8,1	14,14,15	0.50	0	17,19,21	0.85	0
8	NAG	B	2	8	14,14,15	0.46	0	17,19,21	0.64	0
8	NAG	G	1	8,1	14,14,15	0.56	0	17,19,21	0.64	0
8	NAG	G	2	8	14,14,15	0.52	0	17,19,21	0.62	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
8	NAG	I	1	8,1	14,14,15	0.52	0	17,19,21	0.94	1 (5%)
8	NAG	I	2	8	14,14,15	0.55	0	17,19,21	0.63	0
9	NAG	J	1	9,1	14,14,15	0.51	0	17,19,21	0.65	0
9	NAG	J	2	9	14,14,15	0.56	0	17,19,21	0.69	0
9	BMA	J	3	9	11,11,12	0.60	0	15,15,17	0.48	0
9	MAN	J	4	9	11,11,12	0.65	0	15,15,17	1.60	4 (26%)
8	NAG	K	1	8,1	14,14,15	0.46	0	17,19,21	1.20	2 (11%)
8	NAG	K	2	8	14,14,15	0.51	0	17,19,21	0.60	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	NAG	B	1	8,1	-	2/6/23/26	0/1/1/1
8	NAG	B	2	8	-	2/6/23/26	0/1/1/1
8	NAG	G	1	8,1	-	2/6/23/26	0/1/1/1
8	NAG	G	2	8	-	2/6/23/26	0/1/1/1
8	NAG	I	1	8,1	-	3/6/23/26	0/1/1/1
8	NAG	I	2	8	-	3/6/23/26	0/1/1/1
9	NAG	J	1	9,1	-	2/6/23/26	0/1/1/1
9	NAG	J	2	9	-	2/6/23/26	0/1/1/1
9	BMA	J	3	9	-	1/2/19/22	0/1/1/1
9	MAN	J	4	9	-	1/2/19/22	0/1/1/1
8	NAG	K	1	8,1	-	3/6/23/26	0/1/1/1
8	NAG	K	2	8	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	J	4	MAN	C1-C2-C3	3.48	114.71	109.64
9	J	4	MAN	C1-O5-C5	3.33	116.65	112.19
8	K	1	NAG	C1-O5-C5	3.06	116.29	112.19
8	K	1	NAG	O5-C5-C6	2.65	112.82	107.66
8	I	1	NAG	O5-C1-C2	-2.15	107.97	111.29

There are no chirality outliers.

5 of 25 torsion outliers are listed below:

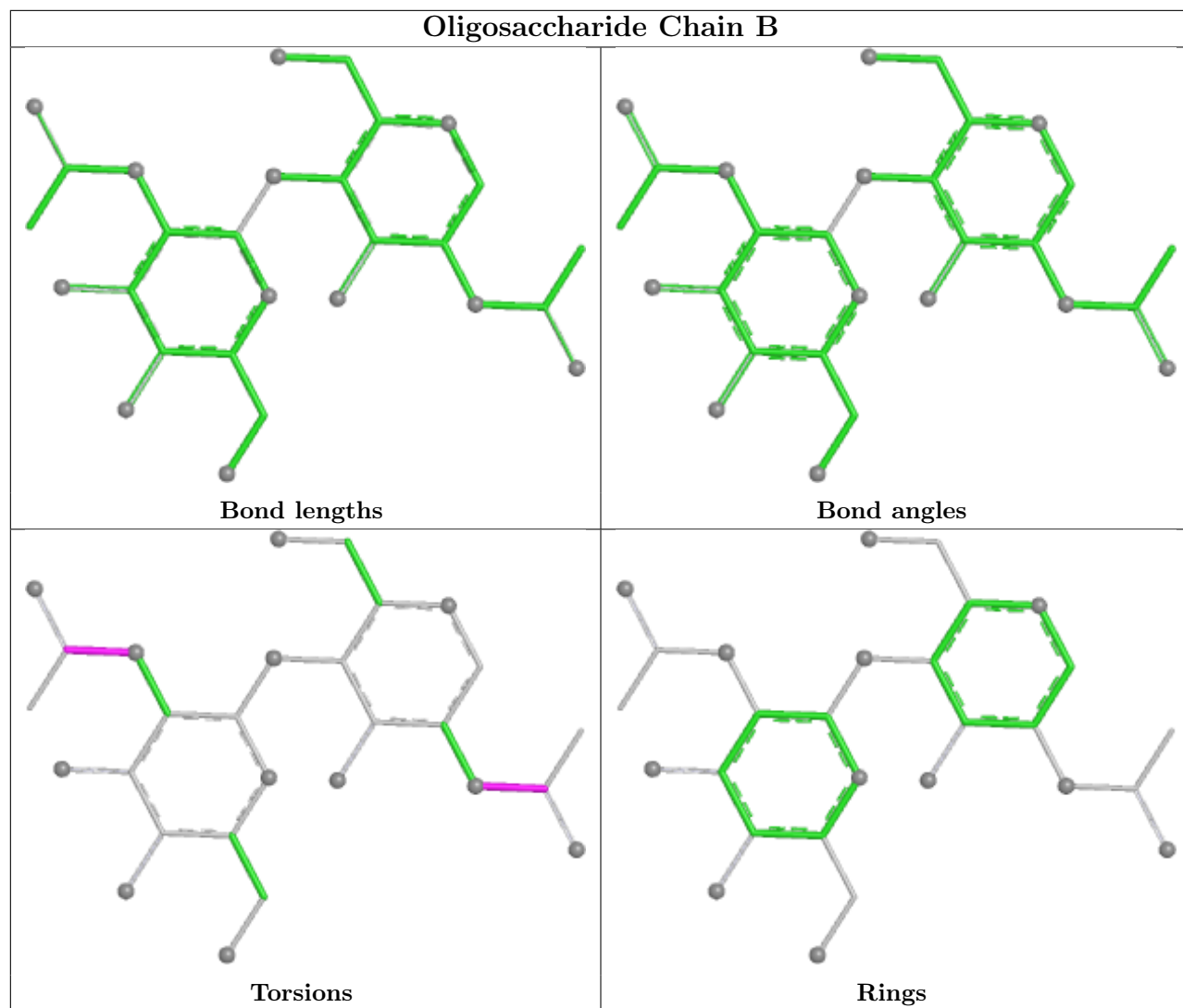
Mol	Chain	Res	Type	Atoms
8	B	1	NAG	C8-C7-N2-C2
8	B	1	NAG	O7-C7-N2-C2
8	B	2	NAG	C8-C7-N2-C2
8	B	2	NAG	O7-C7-N2-C2
8	G	1	NAG	C8-C7-N2-C2

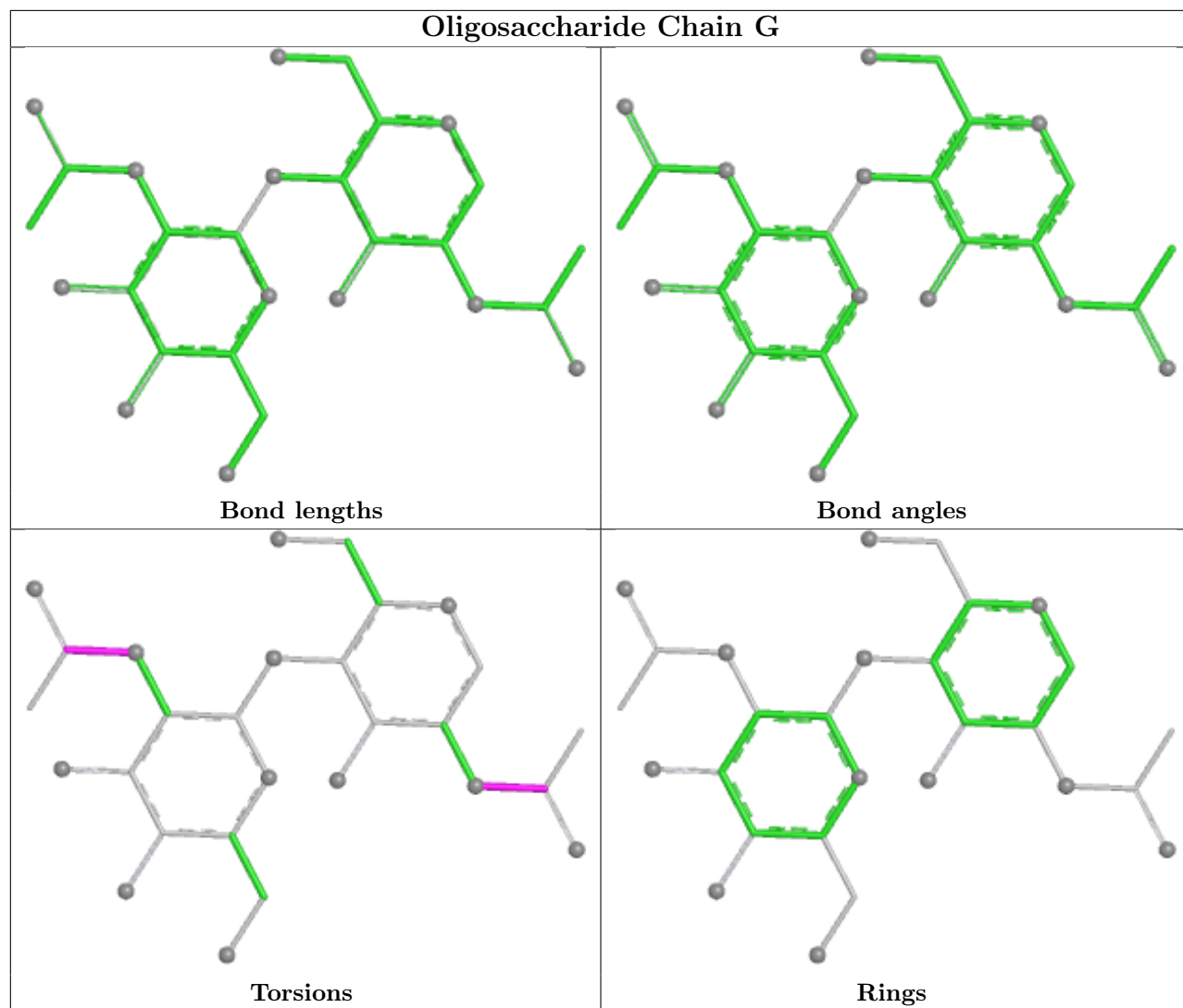
There are no ring outliers.

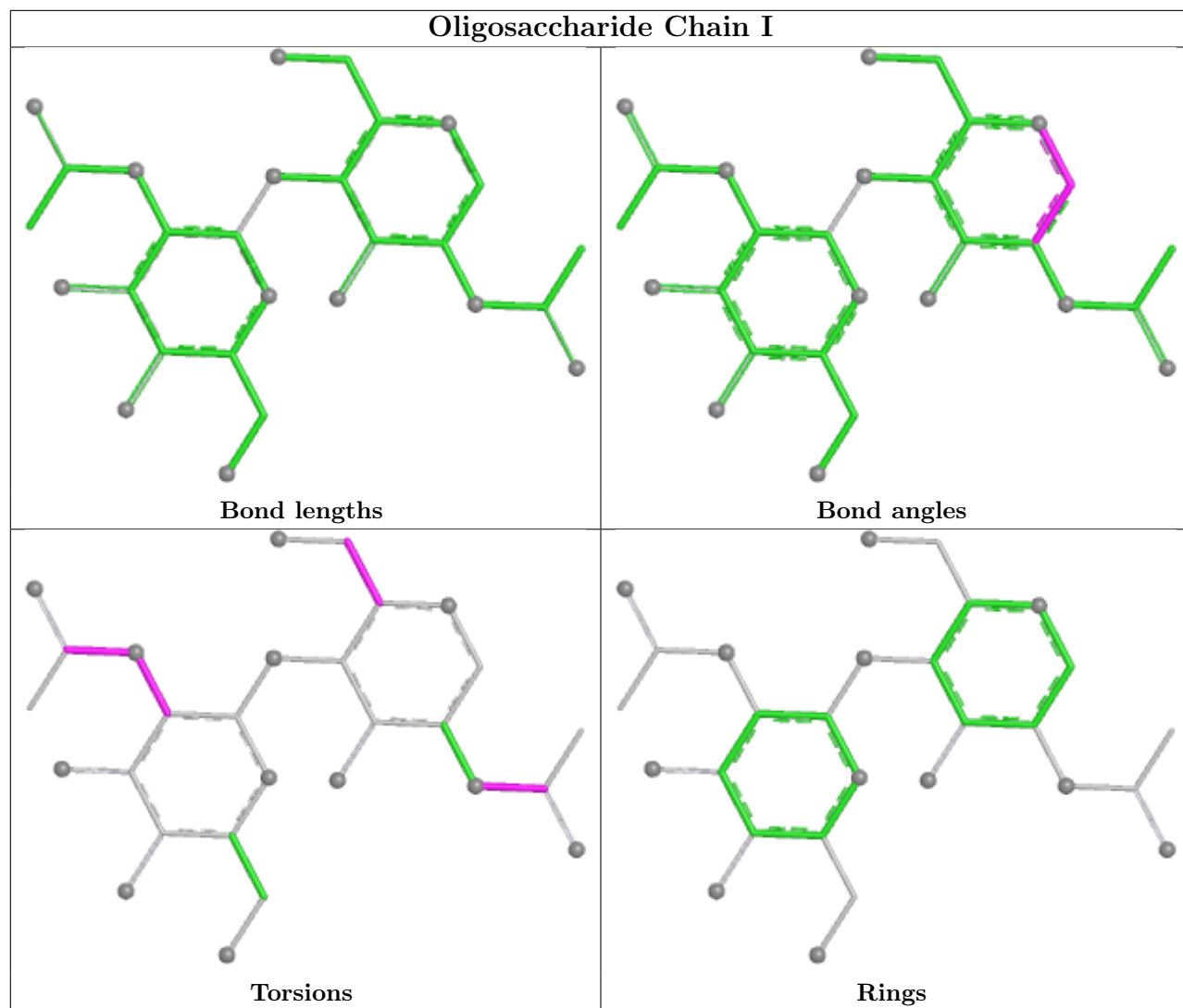
3 monomers are involved in 3 short contacts:

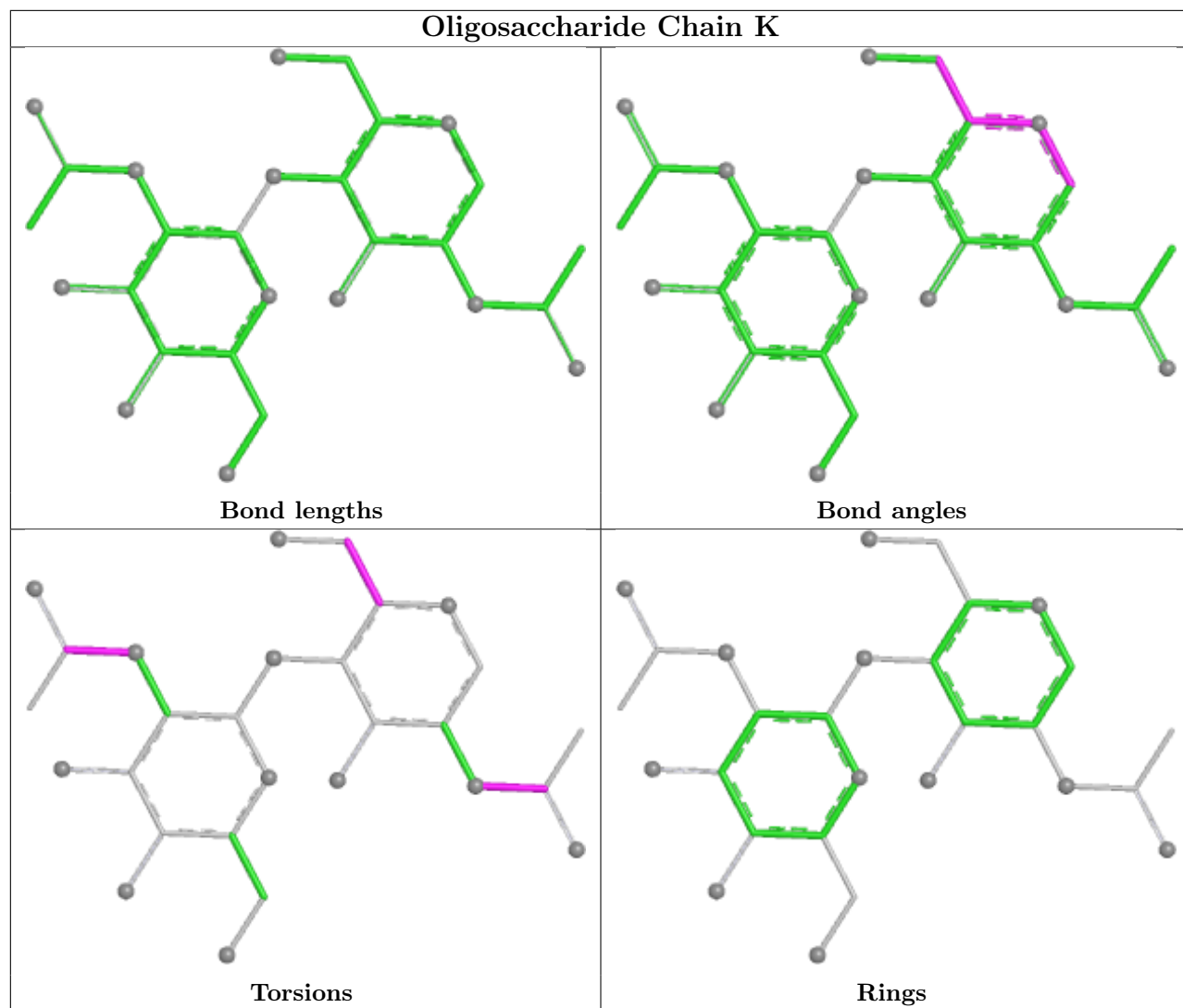
Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	J	1	NAG	2	0
9	J	3	BMA	1	0
9	J	2	NAG	1	0

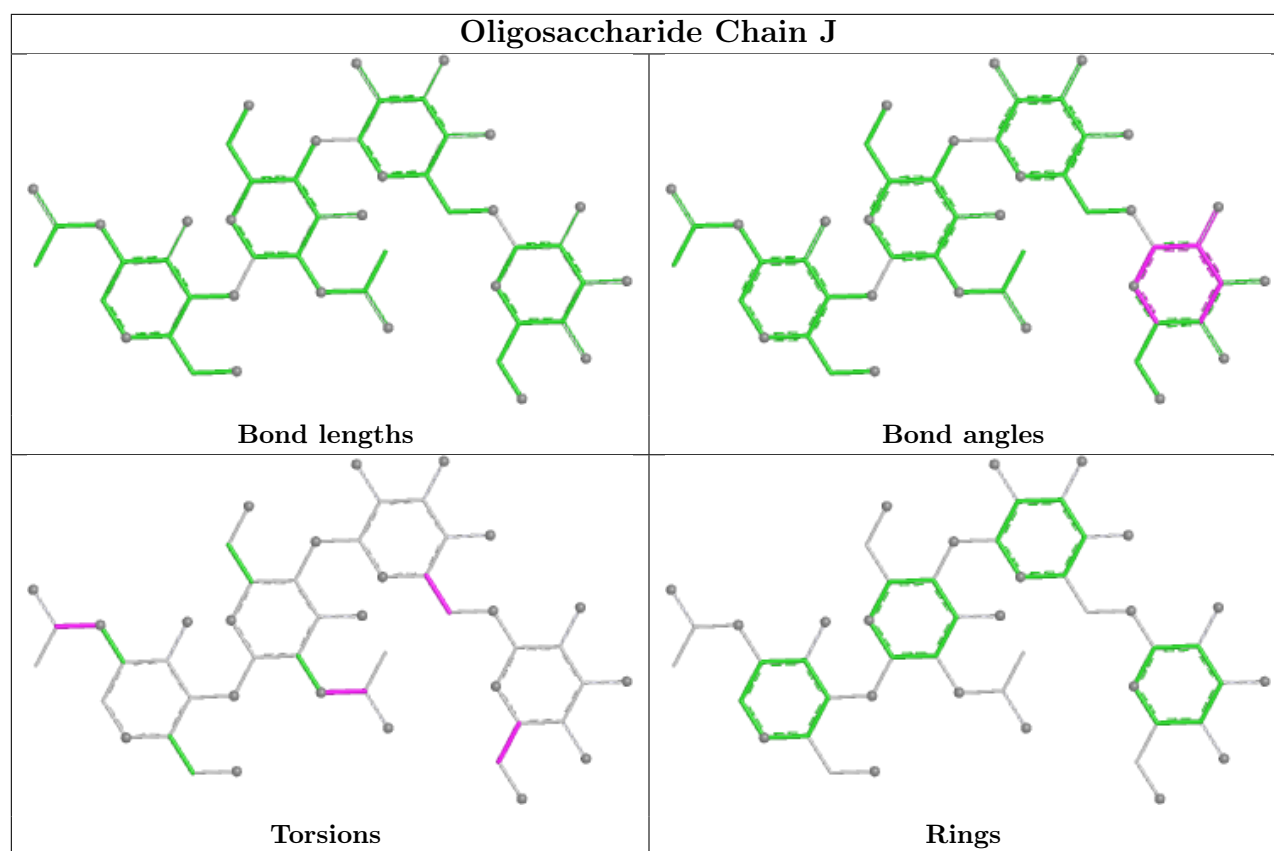
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.











5.6 Ligand geometry [i](#)

12 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	$\# Z > 2$
11	SO4	E	301	-	4,4,4	0.24	0	6,6,6	0.07	0
10	NAG	A	802	1	14,14,15	0.51	0	17,19,21	0.66	0
11	SO4	A	819	-	4,4,4	0.24	0	6,6,6	0.08	0
11	SO4	A	822	-	4,4,4	0.23	0	6,6,6	0.08	0
10	NAG	A	804	1	14,14,15	0.50	0	17,19,21	0.66	0
10	NAG	A	808	1	14,14,15	0.46	0	17,19,21	0.75	0
11	SO4	A	821	-	4,4,4	0.24	0	6,6,6	0.07	0
11	SO4	E	302	-	4,4,4	0.23	0	6,6,6	0.07	0
11	SO4	A	820	-	4,4,4	0.24	0	6,6,6	0.09	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
10	NAG	A	803	1	14,14,15	0.55	0	17,19,21	0.77	0
10	NAG	A	805	1	14,14,15	0.54	0	17,19,21	0.60	0
10	NAG	A	801	1	14,14,15	0.55	0	17,19,21	1.12	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
10	NAG	A	802	1	-	3/6/23/26	0/1/1/1
10	NAG	A	804	1	-	2/6/23/26	0/1/1/1
10	NAG	A	808	1	-	2/6/23/26	0/1/1/1
10	NAG	A	803	1	-	0/6/23/26	0/1/1/1
10	NAG	A	805	1	-	4/6/23/26	0/1/1/1
10	NAG	A	801	1	-	3/6/23/26	0/1/1/1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	A	801	NAG	C1-O5-C5	2.91	116.09	112.19
10	A	801	NAG	O5-C1-C2	2.22	114.72	111.29

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	A	801	NAG	C3-C2-N2-C7
10	A	801	NAG	C8-C7-N2-C2
10	A	801	NAG	O7-C7-N2-C2
10	A	802	NAG	C8-C7-N2-C2
10	A	802	NAG	O7-C7-N2-C2

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	A	802	NAG	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	A	803	NAG	1	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	668/694 (96%)	0.00	6 (0%) 81 56	3, 49, 124, 179	0
2	L	214/214 (100%)	0.09	4 (1%) 66 39	13, 55, 122, 149	0
3	H	225/225 (100%)	0.13	8 (3%) 46 25	11, 57, 168, 189	0
4	C	210/213 (98%)	1.21	45 (21%) 2 3	60, 149, 206, 228	0
5	D	224/226 (99%)	0.95	30 (13%) 7 5	39, 86, 225, 262	0
6	E	215/215 (100%)	-0.17	0 100 100	5, 34, 75, 112	0
7	F	217/223 (97%)	-0.26	1 (0%) 87 67	6, 32, 99, 127	0
All	All	1973/2010 (98%)	0.21	94 (4%) 35 19	3, 56, 181, 262	0

The worst 5 of 94 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	C	158	ALA	8.4
5	D	146	ALA	8.3
5	D	134	ALA	6.6
5	D	132	PRO	6.1
4	C	156	VAL	5.6

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

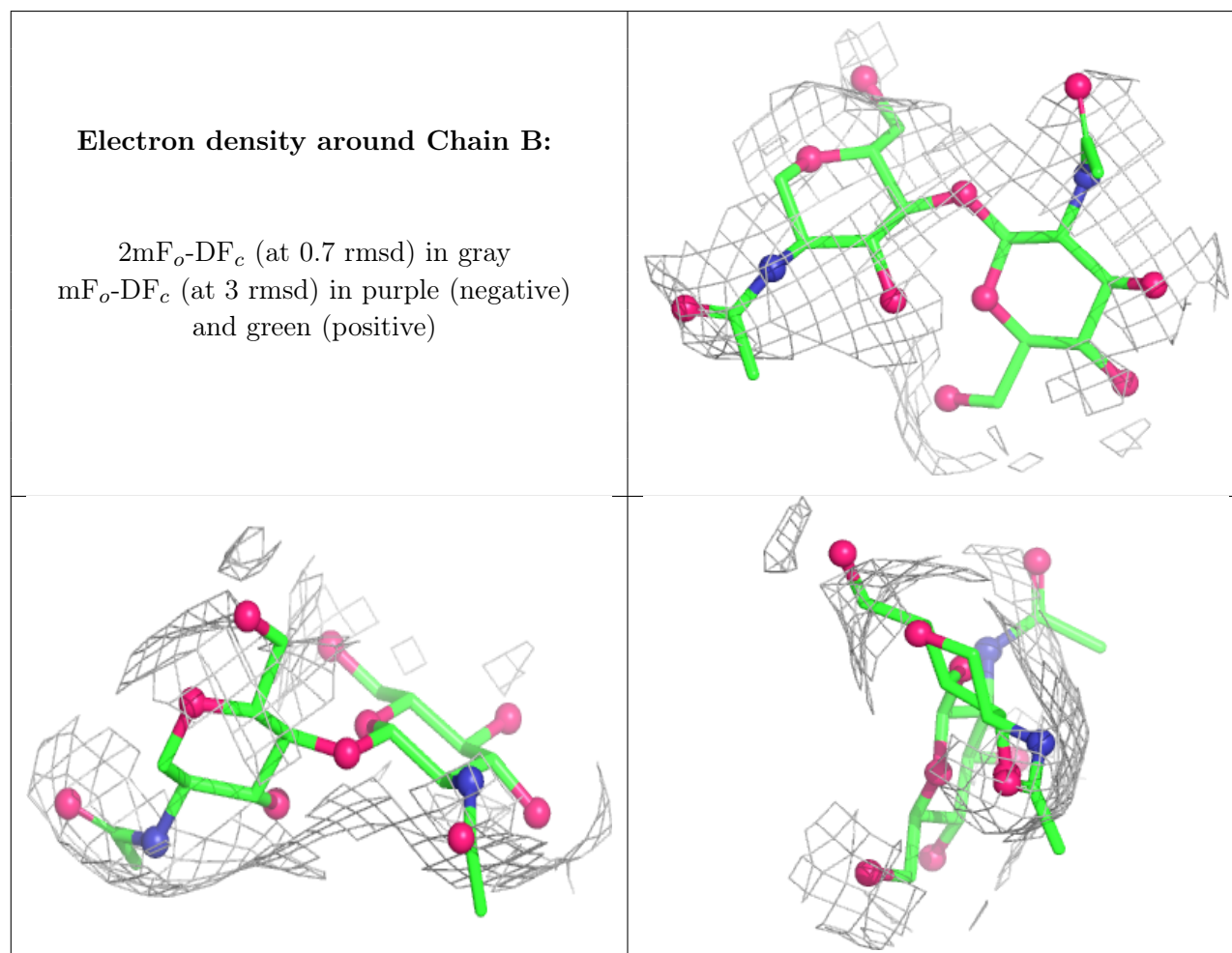
There are no non-standard protein/DNA/RNA residues in this entry.

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.

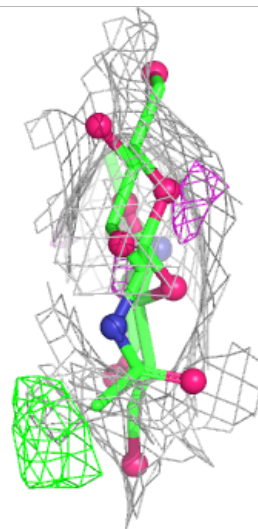
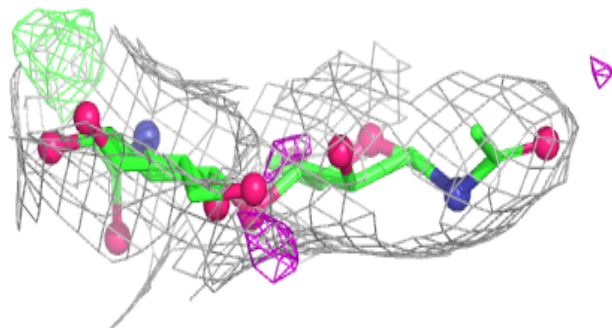
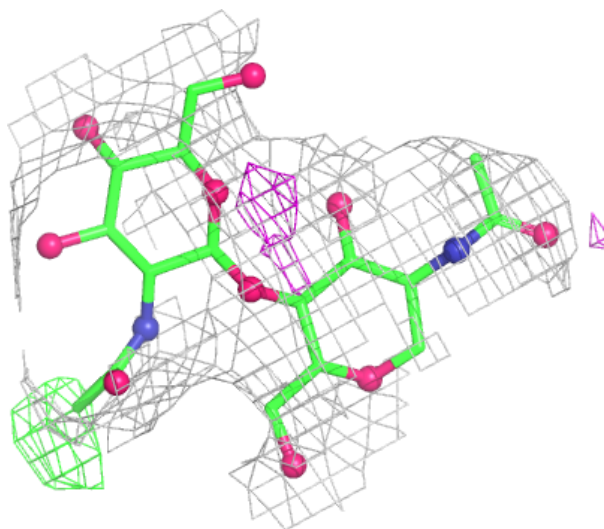
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
8	NAG	B	1	14/15	-	-	69,107,119,120	0
8	NAG	B	2	14/15	-	-	94,118,124,125	0
8	NAG	G	1	14/15	-	-	54,68,103,117	0
8	NAG	G	2	14/15	-	-	74,124,133,137	0
8	NAG	I	2	14/15	0.50	0.14	105,138,158,163	0
9	NAG	J	2	14/15	0.63	0.19	19,62,78,88	0
8	NAG	K	2	14/15	0.83	0.11	77,100,110,112	0
8	NAG	I	1	14/15	0.91	0.09	57,87,103,134	0
9	NAG	J	1	14/15	0.93	0.10	21,36,53,58	0
8	NAG	K	1	14/15	0.95	0.08	28,53,88,110	0
9	BMA	J	3	11/12	-	-	48,92,120,142	0
9	MAN	J	4	11/12	-	-	53,101,116,119	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.



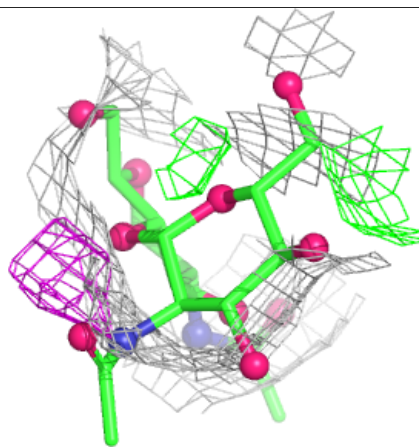
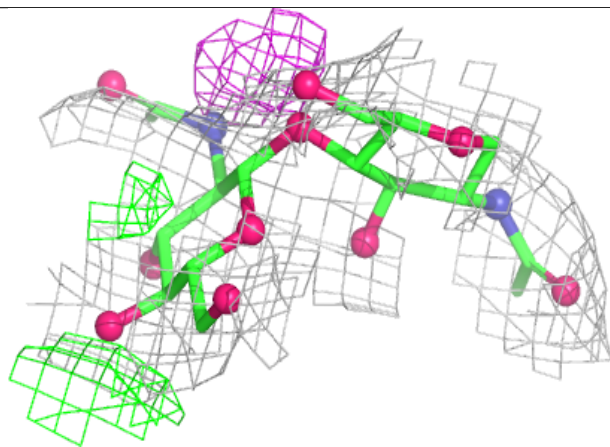
Electron density around Chain G:

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



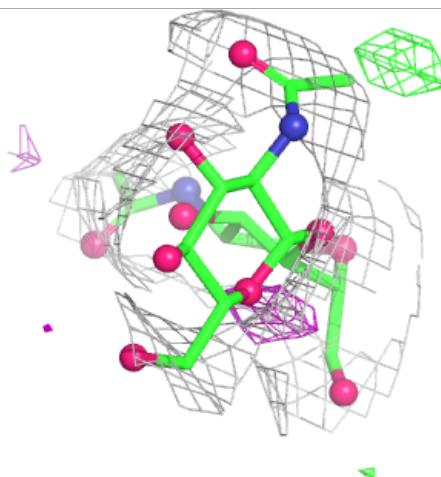
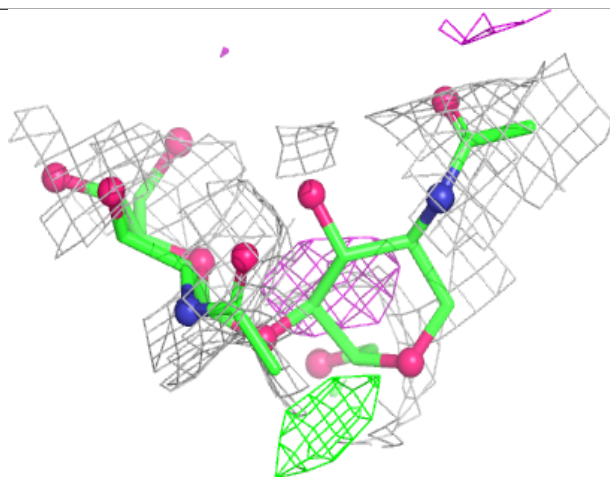
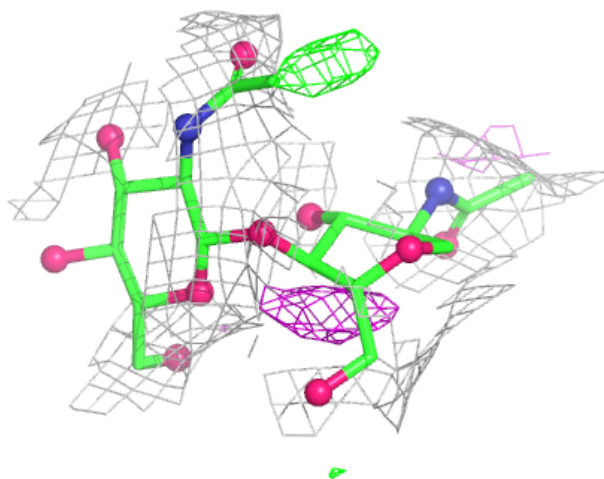
Electron density around Chain I:

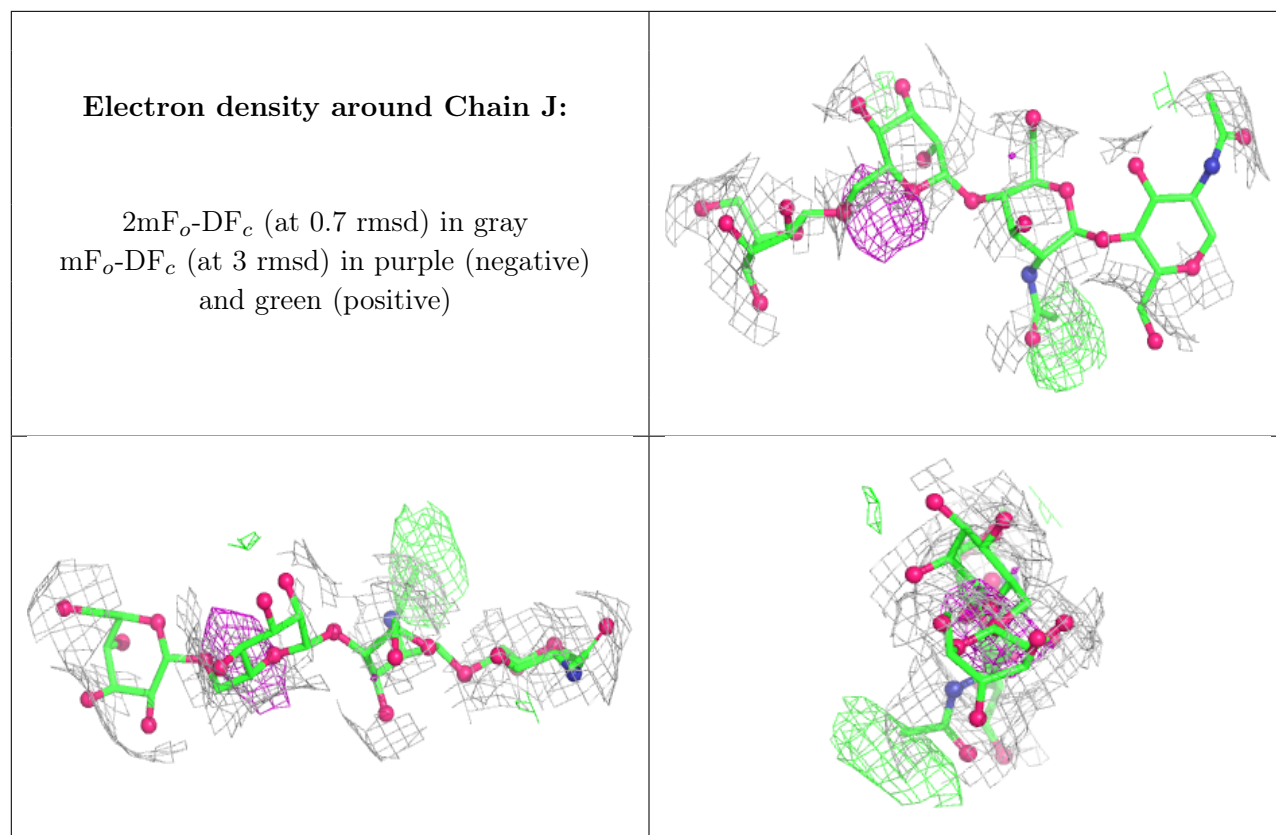
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain K:

$2mF_o-DF_c$ (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
10	NAG	A	802	14/15	0.58	0.13	94,127,144,145	0
10	NAG	A	801	14/15	0.61	0.14	133,166,191,193	0
10	NAG	A	803	14/15	0.64	0.17	105,151,169,172	0
10	NAG	A	804	14/15	0.77	0.11	57,96,102,111	0
11	SO4	A	822	5/5	0.78	0.30	93,94,115,128	0
10	NAG	A	808	14/15	0.84	0.11	47,76,88,88	0
10	NAG	A	805	14/15	0.86	0.09	66,87,107,107	0
11	SO4	E	302	5/5	0.88	0.11	60,84,100,102	0
11	SO4	A	821	5/5	0.89	0.14	69,82,105,113	0
11	SO4	E	301	5/5	0.94	0.11	38,47,69,72	0
11	SO4	A	819	5/5	0.97	0.09	26,28,45,50	0
11	SO4	A	820	5/5	0.97	0.12	27,29,36,37	0

6.5 Other polymers [i](#)

There are no such residues in this entry.