



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 04:45 PM UTC

PDB ID : 5HRT / pdb_00005hrt
Title : Crystal structure of mouse autotaxin in complex with a DNA aptamer
Authors : Kato, K.; Nishimasu, H.; Morita, J.; Ishitani, R.; Nureki, O.
Deposited on : 2016-01-24
Resolution : 2.00 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	:	4-5-2 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

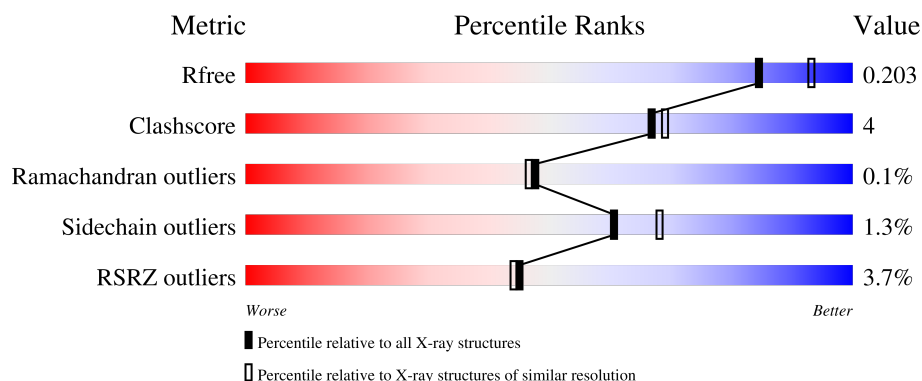
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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 $\leq 5\%$. 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	831	4% 87% 7% 5%
2	B	34	65% 21% 15%
3	C	7	100%
4	D	4	25% 25% 50%

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
10	GOL	A	923	-	-	X	-

2 Entry composition [i](#)

There are 11 unique types of molecules in this entry. The entry contains 7677 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 Ectonucleotide pyrophosphatase/phosphodiesterase family member 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	786	Total	C	N	O	S	0	5	0
			6306	4005	1090	1163	48			

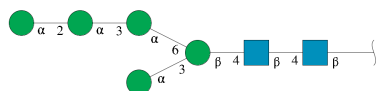
There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	LYS	deletion	UNP Q9R1E6
A	?	-	VAL	deletion	UNP Q9R1E6
A	?	-	GLU	deletion	UNP Q9R1E6
A	?	-	PRO	deletion	UNP Q9R1E6
A	859	SER	-	expression tag	UNP Q9R1E6
A	860	ARG	-	expression tag	UNP Q9R1E6
A	861	GLU	-	expression tag	UNP Q9R1E6
A	862	ASN	-	expression tag	UNP Q9R1E6
A	863	LEU	-	expression tag	UNP Q9R1E6
A	864	TYR	-	expression tag	UNP Q9R1E6
A	865	PHE	-	expression tag	UNP Q9R1E6
A	866	GLN	-	expression tag	UNP Q9R1E6

- Molecule 2 is a DNA chain called modified DNA (34-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	34	Total	C	N	O	P	0	0	0
			712	340	128	211	33			

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[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
3	C	7	Total	C	N	O	0	0	0
			83	46	2	35			

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



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	D	4	Total	C	N	O	0	0	0
			50	28	2	20			

- Molecule 5 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	2	Total	Zn	0	0
			2	2		

- Molecule 6 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	Ca	0	0
			1	1		
6	B	1	Total	Ca	0	0
			1	1		

- Molecule 7 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total	Na	0	0
			1	1		

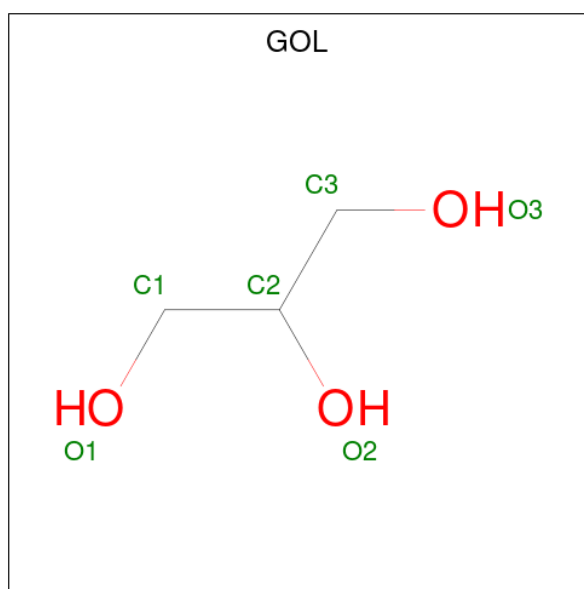
- Molecule 8 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	1	Total Cl 1 1	0	0

- Molecule 9 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	1	Total K 1 1	0	0

- Molecule 10 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



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

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

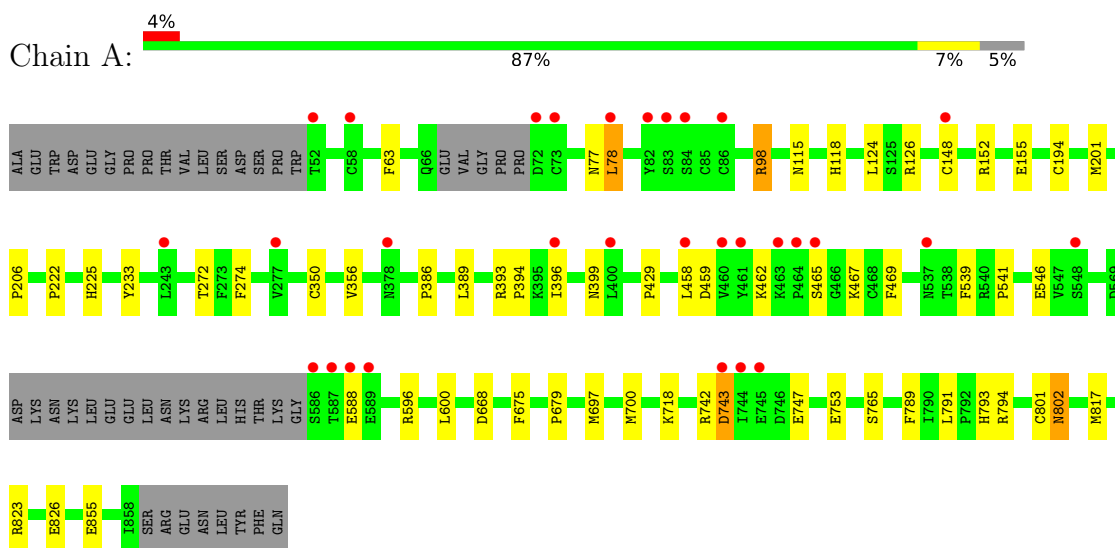
- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	441	Total	O	0	0
			441	441		
11	B	18	Total	O	0	0
			18	18		

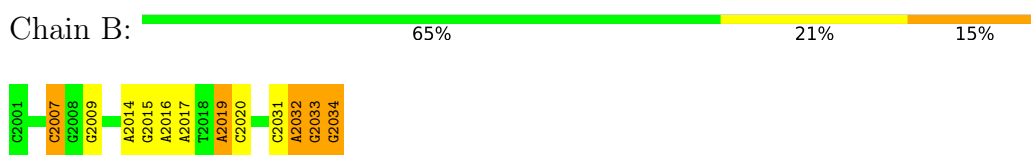
3 Residue-property plots [i](#)

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.

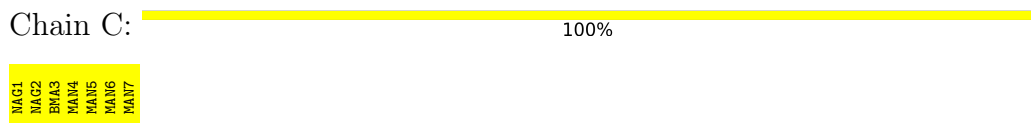
- Molecule 1: Ectonucleotide pyrophosphatase/phosphodiesterase family member 2



- Molecule 2: modified DNA (34-MER)



- Molecule 3: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[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



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





4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	120.06Å 208.76Å 90.04Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.15 – 2.00 45.15 – 2.00	Depositor EDS
% Data completeness (in resolution range)	98.8 (45.15-2.00) 93.2 (45.15-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.44 (at 2.00Å)	Xtriage
Refinement program	PHENIX (1.10_2155: ???)	Depositor
R, R_{free}	0.164 , 0.202 0.166 , 0.203	Depositor DCC
R_{free} test set	1981 reflections (2.61%)	wwPDB-VP
Wilson B-factor (Å ²)	27.6	Xtriage
Anisotropy	0.135	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 51.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.017 for 1/2*h-1/2*k,-3/2*h-1/2*k,-l 0.023 for 1/2*h+1/2*k,3/2*h-1/2*k,-l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	7677	wwPDB-VP
Average B, all atoms (Å ²)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.06% 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: CL, BMA, ZN, A2M, MAN, NA, GOL, OMC, NAG, K, CA, OMG

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	0.80	0/6492	0.84	7/8825 (0.1%)
2	B	0.55	0/564	0.65	0/868
All	All	0.79	0/7056	0.83	7/9693 (0.1%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	742	ARG	CA-C-N	-10.09	105.22	122.67
1	A	742	ARG	C-N-CA	-10.09	105.22	122.67
1	A	194	CYS	CA-CB-SG	-7.13	98.00	114.40
1	A	801	CYS	CA-C-N	-6.05	113.02	123.25
1	A	801	CYS	C-N-CA	-6.05	113.02	123.25
1	A	148	CYS	CA-CB-SG	-5.98	100.64	114.40
1	A	743	ASP	CB-CA-C	5.79	120.46	110.45

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	6306	0	5989	41	0
2	B	712	0	402	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	83	0	70	0	0
4	D	50	0	42	1	0
5	A	2	0	0	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
7	A	1	0	0	0	0
8	A	1	0	0	0	0
9	A	1	0	0	0	0
10	A	60	0	79	11	0
11	A	441	0	0	8	0
11	B	18	0	0	0	0
All	All	7677	0	6582	51	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 4.

All (51) 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)
2:B:2019:A2M:C1'	2:B:2019:A2M:O4'	1.64	1.22
2:B:2032:A2M:C1'	2:B:2032:A2M:O4'	1.65	1.19
1:A:826:GLU:HB3	10:A:923:GOL:H12	1.50	0.91
1:A:546:GLU:OE2	1:A:596:ARG:NH1	2.05	0.90
2:B:2033:OMG:HM22	2:B:2034:OMG:H5'	1.61	0.81
10:A:920:GOL:H32	11:A:1011:HOH:O	1.93	0.69
1:A:855:GLU:OE2	11:A:1001:HOH:O	2.13	0.67
1:A:718:LYS:NZ	11:A:1006:HOH:O	2.27	0.67
1:A:823:ARG:HH12	10:A:923:GOL:H32	1.64	0.63
1:A:206:PRO:HB3	1:A:389:LEU:HD23	1.81	0.63
1:A:789[B]:PHE:CD1	1:A:791:LEU:HG	2.34	0.63
1:A:469:PHE:HE2	2:B:2007:OMC:HM22	1.66	0.60
10:A:923:GOL:H11	11:A:1271:HOH:O	2.01	0.60
1:A:794[C]:ARG:NH2	11:A:1002:HOH:O	2.18	0.58
1:A:429:PRO:HG2	1:A:817:MET:HE3	1.88	0.56
2:B:2016:DA:H2'	2:B:2017:DA:C8	2.43	0.54
1:A:201:MET:HE1	1:A:356:VAL:CG2	2.38	0.53
1:A:600:LEU:HD11	10:A:923:GOL:H2	1.90	0.53
1:A:826:GLU:HB3	10:A:923:GOL:C1	2.31	0.53
1:A:600:LEU:CD1	10:A:923:GOL:H2	2.41	0.50
1:A:700:MET:HA	1:A:793:HIS:NE2	2.26	0.50
1:A:668:ASP:HB2	1:A:753:GLU:HB3	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:823:ARG:NH1	10:A:923:GOL:H32	2.27	0.49
1:A:743:ASP:HB2	1:A:747:GLU:OE2	2.13	0.49
1:A:389:LEU:C	1:A:389:LEU:HD12	2.38	0.49
1:A:546:GLU:OE2	11:A:1003:HOH:O	2.20	0.48
1:A:675:PHE:H	10:A:920:GOL:C3	2.27	0.48
2:B:2031:DC:H2'	2:B:2032:A2M:H8	1.96	0.48
1:A:78:LEU:HD21	1:A:274:PHE:CB	2.44	0.48
1:A:98:ARG:HG3	1:A:115:ASN:ND2	2.28	0.47
1:A:77:ASN:ND2	1:A:272:THR:HG21	2.29	0.47
1:A:539:PHE:O	1:A:541:PRO:HD3	2.14	0.47
1:A:679:PRO:HD2	10:A:920:GOL:H11	1.97	0.46
1:A:393:ARG:HB2	1:A:394:PRO:HD2	1.98	0.46
2:B:2032:A2M:H2'	2:B:2033:OMG:O4'	2.15	0.46
2:B:2031:DC:H2'	2:B:2032:A2M:C8	2.45	0.46
1:A:118:HIS:HD2	11:A:1101:HOH:O	2.00	0.43
1:A:222:PRO:HA	1:A:225:HIS:CE1	2.53	0.43
1:A:233:TYR:HB2	10:A:924:GOL:H2	2.00	0.43
1:A:697:MET:HE2	1:A:697:MET:HB3	1.80	0.43
1:A:126:ARG:HE	1:A:126:ARG:HB3	1.60	0.43
4:D:2:NAG:O3	4:D:3:BMA:O2	2.29	0.43
1:A:78:LEU:HD13	1:A:78:LEU:HA	1.85	0.43
1:A:396:ILE:O	1:A:399:ASN:HB2	2.19	0.43
1:A:77:ASN:HD21	1:A:272:THR:CB	2.32	0.42
1:A:459:ASP:OD2	1:A:462:LYS:N	2.53	0.42
1:A:389:LEU:HD12	1:A:389:LEU:O	2.20	0.41
1:A:155:GLU:O	1:A:350:CYS:HB2	2.20	0.41
1:A:802:ASN:ND2	11:A:1023:HOH:O	2.54	0.41
1:A:765:SER:HB2	1:A:789[B]:PHE:CZ	2.56	0.40
1:A:63:PHE:CE1	1:A:77:ASN:HB3	2.57	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	A	786/831 (95%)	764 (97%)	21 (3%)	1 (0%)	48 46

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	386	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	695/756 (92%)	686 (99%)	9 (1%)	61 68

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	78	LEU
1	A	98	ARG
1	A	124	LEU
1	A	152	ARG
1	A	458	LEU
1	A	465	SER
1	A	467	LYS
1	A	588	GLU
1	A	802	ASN

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	77	ASN
1	A	115	ASN
1	A	484	GLN
1	A	802	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

9 non-standard protein/DNA/RNA residues 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$
2	A2M	B	2014	2	22,25,26	3.63	12 (54%)	30,36,39	2.61	11 (36%)
2	OMG	B	2034	2	23,26,27	2.43	9 (39%)	32,38,41	1.84	11 (34%)
2	OMG	B	2033	2	23,26,27	2.38	8 (34%)	32,38,41	1.51	7 (21%)
2	OMC	B	2020	2	19,22,23	3.14	7 (36%)	25,31,34	0.75	1 (4%)
2	OMC	B	2007	2	19,22,23	2.89	7 (36%)	25,31,34	1.00	2 (8%)
2	A2M	B	2032	2	22,25,26	3.92	11 (50%)	30,36,39	2.23	9 (30%)
2	A2M	B	2019	2	22,25,26	3.82	12 (54%)	30,36,39	2.44	14 (46%)
2	OMG	B	2015	2	23,26,27	2.40	8 (34%)	32,38,41	1.76	8 (25%)
2	OMG	B	2009	2,6	23,26,27	2.21	9 (39%)	32,38,41	1.86	10 (31%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	A2M	B	2014	2	-	1/9/27/28	0/3/3/3
2	OMG	B	2034	2	-	2/9/27/28	0/3/3/3
2	OMG	B	2033	2	-	0/9/27/28	0/3/3/3
2	OMC	B	2020	2	-	2/9/27/28	0/2/2/2
2	OMC	B	2007	2	-	7/9/27/28	0/2/2/2
2	A2M	B	2032	2	-	0/9/27/28	0/3/3/3
2	A2M	B	2019	2	-	0/9/27/28	0/3/3/3
2	OMG	B	2015	2	-	2/9/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	OMG	B	2009	2,6	-	0/9/27/28	0/3/3/3

All (83) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2032	A2M	O4'-C1'	10.05	1.65	1.42
2	B	2019	A2M	O4'-C1'	9.83	1.64	1.42
2	B	2014	A2M	O4'-C1'	9.03	1.62	1.42
2	B	2032	A2M	C2'-C1'	-7.81	1.33	1.53
2	B	2014	A2M	C2'-C1'	-7.33	1.35	1.53
2	B	2032	A2M	O4'-C4'	-7.13	1.29	1.45
2	B	2019	A2M	C2'-C1'	-7.11	1.35	1.53
2	B	2014	A2M	O4'-C4'	-7.02	1.29	1.45
2	B	2020	OMC	C2-N3	6.74	1.49	1.36
2	B	2019	A2M	O4'-C4'	-6.74	1.30	1.45
2	B	2019	A2M	C6-N6	6.67	1.51	1.34
2	B	2032	A2M	C6-N6	6.53	1.50	1.34
2	B	2020	OMC	C4-N3	6.47	1.47	1.34
2	B	2020	OMC	C6-C5	6.46	1.50	1.35
2	B	2034	OMG	C4-N3	6.46	1.49	1.34
2	B	2015	OMG	C4-N3	6.32	1.48	1.34
2	B	2007	OMC	C6-C5	6.30	1.49	1.35
2	B	2033	OMG	C4-N3	6.29	1.48	1.34
2	B	2007	OMC	C2-N3	5.83	1.47	1.36
2	B	2014	A2M	C6-N6	5.67	1.48	1.34
2	B	2007	OMC	C4-N3	5.50	1.45	1.34
2	B	2015	OMG	C2-N3	5.43	1.46	1.33
2	B	2033	OMG	C2-N3	5.22	1.45	1.33
2	B	2034	OMG	C2-N3	5.13	1.45	1.33
2	B	2009	OMG	C2-N3	4.91	1.45	1.33
2	B	2015	OMG	C2-N2	4.86	1.45	1.34
2	B	2034	OMG	C2-N2	4.86	1.45	1.34
2	B	2009	OMG	C4-N3	4.85	1.45	1.34
2	B	2032	A2M	O2'-C2'	4.56	1.53	1.42
2	B	2009	OMG	C2-N2	4.48	1.44	1.34
2	B	2014	A2M	O3'-C3'	-4.48	1.31	1.43
2	B	2033	OMG	C2-N2	4.42	1.44	1.34
2	B	2019	A2M	O2'-C2'	4.37	1.53	1.42
2	B	2032	A2M	O3'-C3'	-4.05	1.32	1.43
2	B	2020	OMC	C6-N1	4.04	1.47	1.38
2	B	2020	OMC	C2-N1	3.92	1.48	1.40
2	B	2020	OMC	C4-N4	3.83	1.43	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2019	A2M	O3'-C3'	-3.80	1.33	1.43
2	B	2007	OMC	C6-N1	3.69	1.46	1.38
2	B	2007	OMC	C4-N4	3.53	1.42	1.33
2	B	2007	OMC	C2-N1	3.51	1.47	1.40
2	B	2007	OMC	O2-C2	-3.50	1.17	1.23
2	B	2014	A2M	O2'-C2'	3.37	1.50	1.42
2	B	2034	OMG	C2-N1	3.19	1.45	1.37
2	B	2033	OMG	C2-N1	3.03	1.45	1.37
2	B	2033	OMG	C5-N7	-2.92	1.33	1.39
2	B	2019	A2M	C3'-C4'	2.91	1.60	1.53
2	B	2034	OMG	C6-N1	2.88	1.44	1.38
2	B	2009	OMG	C6-N1	2.86	1.44	1.38
2	B	2015	OMG	C5-N7	-2.82	1.33	1.39
2	B	2015	OMG	C2-N1	2.79	1.44	1.37
2	B	2033	OMG	C6-N1	2.78	1.44	1.38
2	B	2032	A2M	C5'-C4'	2.77	1.59	1.51
2	B	2009	OMG	C4-N9	-2.73	1.31	1.38
2	B	2009	OMG	C5-N7	-2.71	1.33	1.39
2	B	2014	A2M	C5-N7	-2.70	1.34	1.39
2	B	2019	A2M	C5'-C4'	2.69	1.59	1.51
2	B	2033	OMG	C5-C6	2.68	1.54	1.44
2	B	2020	OMC	O2-C2	-2.67	1.18	1.23
2	B	2032	A2M	C3'-C4'	2.66	1.59	1.53
2	B	2034	OMG	C5-N7	-2.64	1.33	1.39
2	B	2015	OMG	C6-N1	2.63	1.43	1.38
2	B	2019	A2M	C5-N7	-2.62	1.34	1.39
2	B	2009	OMG	O6-C6	-2.62	1.18	1.23
2	B	2015	OMG	C5-C6	2.57	1.54	1.44
2	B	2034	OMG	C5-C6	2.56	1.54	1.44
2	B	2019	A2M	C5-C4	-2.49	1.34	1.39
2	B	2009	OMG	C5-C6	2.45	1.53	1.44
2	B	2014	A2M	C2-N3	2.37	1.38	1.33
2	B	2032	A2M	C5-N7	-2.28	1.34	1.39
2	B	2019	A2M	C2-N3	2.27	1.38	1.33
2	B	2019	A2M	C8-N9	-2.26	1.33	1.37
2	B	2032	A2M	C5-C4	-2.23	1.35	1.39
2	B	2014	A2M	C3'-C4'	2.22	1.58	1.53
2	B	2014	A2M	C8-N7	2.19	1.35	1.31
2	B	2014	A2M	C5-C4	-2.17	1.35	1.39
2	B	2033	OMG	C4-N9	-2.16	1.32	1.38
2	B	2034	OMG	O6-C6	-2.15	1.19	1.23
2	B	2032	A2M	C2-N3	2.13	1.37	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2014	A2M	C5'-C4'	2.09	1.57	1.51
2	B	2015	OMG	C4-N9	-2.08	1.32	1.38
2	B	2034	OMG	C4-N9	-2.04	1.32	1.38
2	B	2009	OMG	C2-N1	2.03	1.42	1.37

All (73) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	2014	A2M	N3-C2-N1	-6.48	118.77	128.58
2	B	2032	A2M	N3-C2-N1	-6.38	118.93	128.58
2	B	2014	A2M	N6-C6-N1	-5.86	105.32	118.38
2	B	2014	A2M	C5-C4-N3	-5.37	119.32	126.72
2	B	2019	A2M	N3-C2-N1	-5.25	120.64	128.58
2	B	2019	A2M	C5-C4-N3	-5.15	119.63	126.72
2	B	2015	OMG	C5-C4-N3	-4.80	120.74	128.39
2	B	2019	A2M	N6-C6-N1	-4.75	107.80	118.38
2	B	2009	OMG	C2-N3-C4	4.62	120.26	112.30
2	B	2032	A2M	C5-C4-N3	-4.41	120.64	126.72
2	B	2034	OMG	C2-N3-C4	4.25	119.61	112.30
2	B	2034	OMG	C5-C4-N3	-4.24	121.64	128.39
2	B	2033	OMG	C5-C4-N3	-4.23	121.66	128.39
2	B	2032	A2M	N6-C6-N1	-4.20	109.03	118.38
2	B	2019	A2M	N9-C8-N7	-4.16	108.03	113.94
2	B	2014	A2M	C2-N3-C4	4.07	121.78	111.83
2	B	2015	OMG	C2-N3-C4	3.98	119.16	112.30
2	B	2014	A2M	C5-C6-N6	3.91	132.96	123.29
2	B	2009	OMG	C5-C4-N3	-3.84	122.27	128.39
2	B	2019	A2M	C5-C6-N6	3.64	132.29	123.29
2	B	2032	A2M	N9-C8-N7	-3.48	109.00	113.94
2	B	2009	OMG	N9-C8-N7	-3.41	107.08	113.40
2	B	2032	A2M	C2-N3-C4	3.36	120.05	111.83
2	B	2019	A2M	C2-N3-C4	3.28	119.85	111.83
2	B	2015	OMG	N9-C8-N7	-3.26	107.36	113.40
2	B	2033	OMG	C2-N3-C4	3.25	117.90	112.30
2	B	2014	A2M	N9-C8-N7	-3.17	109.44	113.94
2	B	2034	OMG	O2'-C2'-C1'	3.16	114.99	108.99
2	B	2032	A2M	C5-C6-N6	3.14	131.05	123.29
2	B	2034	OMG	N9-C8-N7	-3.12	107.61	113.40
2	B	2015	OMG	N9-C4-N3	3.11	132.17	125.95
2	B	2007	OMC	CM2-O2'-C2'	3.10	122.43	114.47
2	B	2019	A2M	C5-N7-C8	3.02	108.20	103.45
2	B	2019	A2M	N3-C4-N9	2.97	132.22	127.17

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	2014	A2M	N3-C4-N9	2.91	132.11	127.17
2	B	2019	A2M	O2'-C2'-C1'	2.80	114.30	108.99
2	B	2032	A2M	N3-C4-N9	2.71	131.77	127.17
2	B	2009	OMG	C2-N1-C6	-2.69	120.23	125.11
2	B	2014	A2M	O4'-C1'-C2'	-2.69	101.95	106.59
2	B	2009	OMG	C6-C5-N7	2.66	135.14	130.29
2	B	2034	OMG	N2-C2-N1	2.65	122.34	116.76
2	B	2015	OMG	C2-N1-C6	-2.64	120.33	125.11
2	B	2019	A2M	C4-C5-N7	-2.57	107.64	110.58
2	B	2014	A2M	C5-C4-N9	2.53	108.57	105.81
2	B	2009	OMG	C5-C6-N1	2.50	119.61	113.25
2	B	2014	A2M	O3'-C3'-C4'	-2.43	104.10	111.08
2	B	2034	OMG	C2-N1-C6	-2.41	120.74	125.11
2	B	2034	OMG	O6-C6-C5	-2.41	120.17	126.53
2	B	2007	OMC	O2'-C2'-C1'	2.41	113.56	108.99
2	B	2019	A2M	C2'-C1'-N9	-2.41	109.79	113.75
2	B	2009	OMG	C8-N7-C5	2.36	108.46	104.26
2	B	2015	OMG	C8-N7-C5	2.30	108.35	104.26
2	B	2009	OMG	C4-C5-N7	-2.29	107.04	110.67
2	B	2033	OMG	C2-N1-C6	-2.26	121.02	125.11
2	B	2033	OMG	O6-C6-C5	-2.25	120.60	126.53
2	B	2014	A2M	C5-N7-C8	2.23	106.96	103.45
2	B	2034	OMG	C5-C6-N1	2.20	118.85	113.25
2	B	2009	OMG	N2-C2-N1	2.19	121.38	116.76
2	B	2032	A2M	C2'-C1'-N9	2.16	117.31	113.75
2	B	2034	OMG	C8-N7-C5	2.16	108.11	104.26
2	B	2020	OMC	O2'-C2'-C1'	2.15	113.07	108.99
2	B	2019	A2M	C5-C4-N9	2.15	108.15	105.81
2	B	2019	A2M	C4-N9-C8	2.13	107.97	105.74
2	B	2019	A2M	C6-C5-C4	2.12	120.08	117.18
2	B	2034	OMG	N9-C4-N3	2.09	130.14	125.95
2	B	2015	OMG	O6-C6-C5	-2.08	121.05	126.53
2	B	2032	A2M	C5-N7-C8	2.07	106.70	103.45
2	B	2033	OMG	N9-C8-N7	-2.04	109.61	113.40
2	B	2033	OMG	N9-C4-N3	2.03	130.02	125.95
2	B	2015	OMG	C5-C6-N1	2.03	118.42	113.25
2	B	2034	OMG	N1-C2-N3	-2.02	119.63	123.32
2	B	2033	OMG	N2-C2-N1	2.01	121.00	116.76
2	B	2009	OMG	C5-C4-N9	2.00	109.24	105.66

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	2007	OMC	C1'-C2'-O2'-CM2
2	B	2015	OMG	C1'-C2'-O2'-CM2
2	B	2007	OMC	C2'-C1'-N1-C6
2	B	2020	OMC	C3'-C4'-C5'-O5'
2	B	2020	OMC	O4'-C4'-C5'-O5'
2	B	2034	OMG	O4'-C4'-C5'-O5'
2	B	2007	OMC	O4'-C4'-C5'-O5'
2	B	2014	A2M	C2'-C1'-N9-C8
2	B	2007	OMC	O4'-C1'-N1-C6
2	B	2007	OMC	C2'-C1'-N1-C2
2	B	2015	OMG	C3'-C4'-C5'-O5'
2	B	2007	OMC	C3'-C4'-C5'-O5'
2	B	2007	OMC	O4'-C1'-N1-C2
2	B	2034	OMG	C3'-C4'-C5'-O5'

There are no ring outliers.

5 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	2034	OMG	1	0
2	B	2033	OMG	2	0
2	B	2007	OMC	1	0
2	B	2032	A2M	4	0
2	B	2019	A2M	1	0

5.5 Carbohydrates

11 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	C	1	3,1	14,14,15	0.77	1 (7%)	17,19,21	1.04	1 (5%)
3	NAG	C	2	3	14,14,15	0.82	1 (7%)	17,19,21	0.80	0
3	BMA	C	3	3	11,11,12	1.41	1 (9%)	15,15,17	1.04	1 (6%)
3	MAN	C	4	3	11,11,12	0.90	0	15,15,17	1.24	2 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	MAN	C	5	3	11,11,12	1.89	3 (27%)	15,15,17	1.03	1 (6%)
3	MAN	C	6	3	11,11,12	1.57	3 (27%)	15,15,17	1.45	2 (13%)
3	MAN	C	7	3	11,11,12	1.49	2 (18%)	15,15,17	0.98	0
4	NAG	D	1	4,1	14,14,15	0.59	0	17,19,21	0.70	0
4	NAG	D	2	4	14,14,15	0.43	0	17,19,21	1.31	2 (11%)
4	BMA	D	3	4	11,11,12	3.87	6 (54%)	15,15,17	3.07	6 (40%)
4	MAN	D	4	4	11,11,12	1.90	4 (36%)	15,15,17	1.28	3 (20%)

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	C	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	C	2	3	-	0/6/23/26	0/1/1/1
3	BMA	C	3	3	-	0/2/19/22	0/1/1/1
3	MAN	C	4	3	-	0/2/19/22	0/1/1/1
3	MAN	C	5	3	-	2/2/19/22	0/1/1/1
3	MAN	C	6	3	-	0/2/19/22	0/1/1/1
3	MAN	C	7	3	-	0/2/19/22	0/1/1/1
4	NAG	D	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	D	2	4	-	0/6/23/26	0/1/1/1
4	BMA	D	3	4	-	2/2/19/22	0/1/1/1
4	MAN	D	4	4	-	2/2/19/22	1/1/1/1

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	3	BMA	O5-C5	8.98	1.60	1.43
4	D	3	BMA	O2-C2	-5.37	1.32	1.43
4	D	3	BMA	C2-C3	-5.06	1.44	1.52
3	C	5	MAN	C2-C3	4.50	1.59	1.52
4	D	4	MAN	C1-C2	4.19	1.62	1.52
3	C	3	BMA	O5-C1	-3.18	1.38	1.43
4	D	3	BMA	O5-C1	3.06	1.48	1.43
4	D	3	BMA	C4-C5	-2.98	1.46	1.53
3	C	7	MAN	C1-C2	2.92	1.59	1.52
3	C	6	MAN	C4-C3	2.91	1.59	1.52
3	C	2	NAG	O5-C1	-2.73	1.39	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	5	MAN	C1-C2	2.73	1.58	1.52
4	D	4	MAN	O5-C1	2.72	1.48	1.43
4	D	4	MAN	O5-C5	2.35	1.48	1.43
3	C	6	MAN	O5-C1	2.33	1.47	1.43
3	C	7	MAN	O4-C4	-2.31	1.37	1.43
4	D	4	MAN	C4-C3	2.29	1.58	1.52
4	D	3	BMA	C4-C3	-2.22	1.46	1.52
3	C	6	MAN	O5-C5	2.18	1.47	1.43
3	C	1	NAG	O5-C1	2.07	1.47	1.43
3	C	5	MAN	C4-C5	2.06	1.57	1.53

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	3	BMA	O2-C2-C3	-6.16	97.38	110.15
4	D	3	BMA	O5-C5-C6	5.69	118.74	107.66
4	D	3	BMA	C1-C2-C3	4.95	116.85	109.64
4	D	3	BMA	C1-O5-C5	4.91	118.77	112.19
3	C	6	MAN	C1-O5-C5	3.74	117.20	112.19
4	D	2	NAG	C1-O5-C5	3.40	116.75	112.19
4	D	3	BMA	C3-C4-C5	-3.35	104.16	110.23
4	D	2	NAG	O4-C4-C3	3.06	117.59	110.38
3	C	4	MAN	C1-O5-C5	3.03	116.24	112.19
3	C	1	NAG	O4-C4-C3	-2.68	104.07	110.38
3	C	3	BMA	C1-O5-C5	2.43	115.44	112.19
4	D	4	MAN	O2-C2-C3	-2.41	105.17	110.15
3	C	6	MAN	O2-C2-C3	-2.38	105.21	110.15
3	C	5	MAN	O3-C3-C2	2.26	114.67	110.05
4	D	4	MAN	O2-C2-C1	2.21	114.28	109.22
4	D	3	BMA	O4-C4-C3	-2.10	105.43	110.38
4	D	4	MAN	C1-C2-C3	-2.07	106.64	109.64
3	C	4	MAN	O2-C2-C3	-2.01	105.99	110.15

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	D	4	MAN	O5-C5-C6-O6
4	D	3	BMA	O5-C5-C6-O6
4	D	4	MAN	C4-C5-C6-O6
3	C	5	MAN	O5-C5-C6-O6
4	D	3	BMA	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
3	C	5	MAN	C4-C5-C6-O6

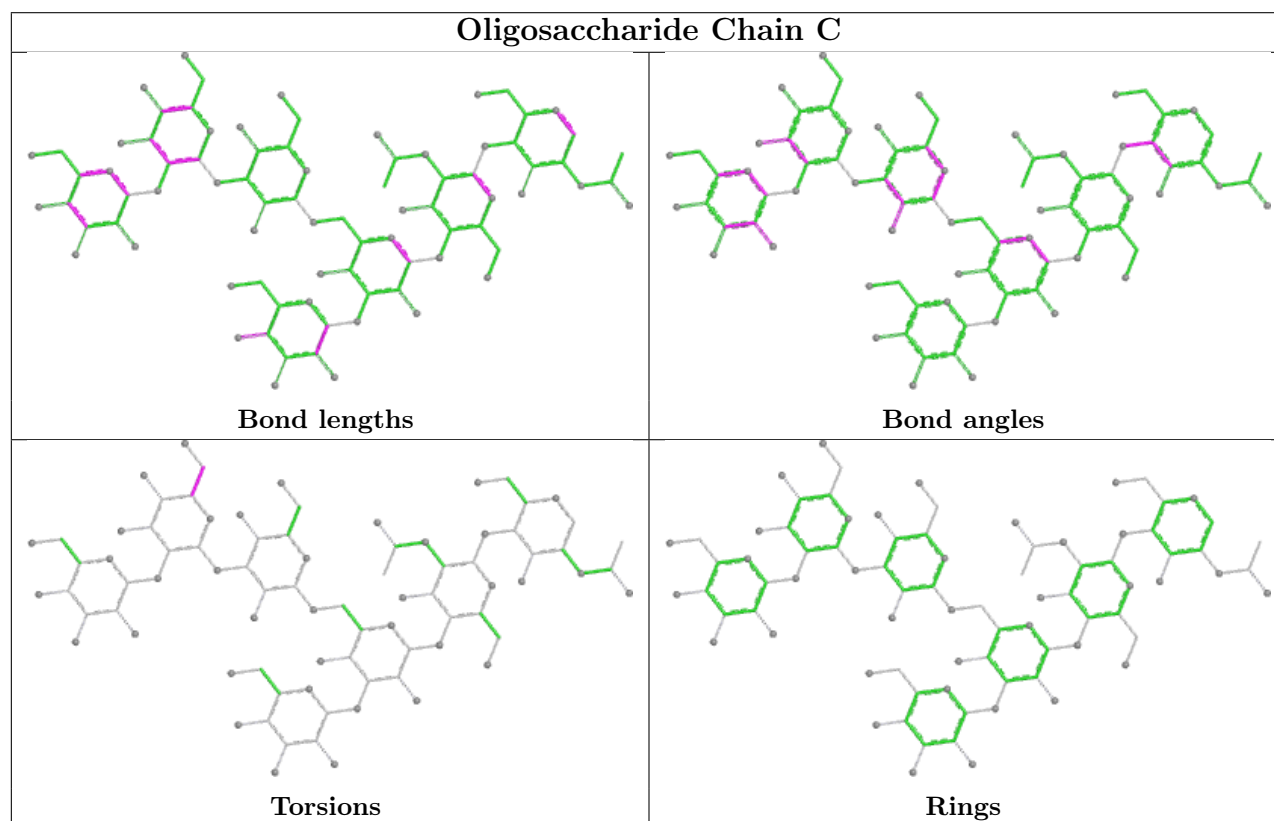
All (1) ring outliers are listed below:

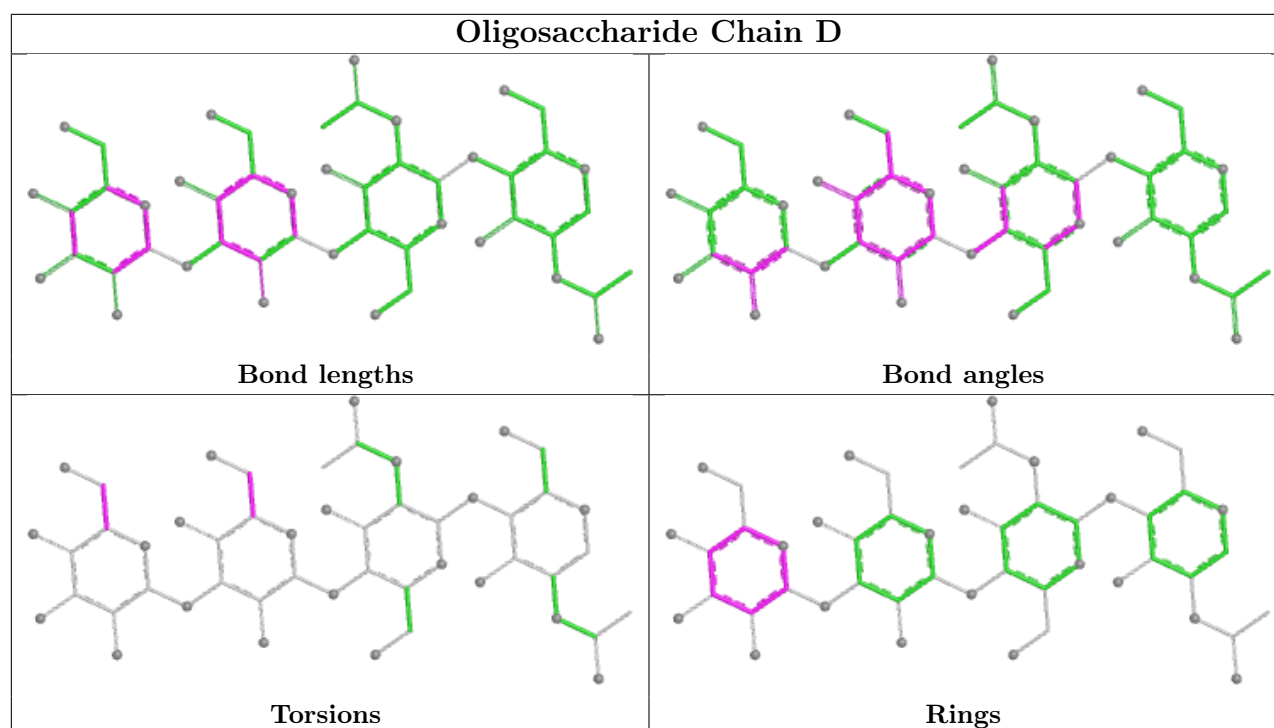
Mol	Chain	Res	Type	Atoms
4	D	4	MAN	C1-C2-C3-C4-C5-O5

2 monomers are involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	2	NAG	1	0
4	D	3	BMA	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](#)

Of 17 ligands modelled in this entry, 7 are monoatomic - leaving 10 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	GOL	A	920	-	5,5,5	0.78	0	5,5,5	1.32	1 (20%)
10	GOL	A	924	-	5,5,5	0.49	0	5,5,5	1.08	0
10	GOL	A	921	-	5,5,5	0.33	0	5,5,5	1.08	0
10	GOL	A	926	-	5,5,5	0.53	0	5,5,5	0.69	0
10	GOL	A	925	-	5,5,5	0.35	0	5,5,5	0.48	0
10	GOL	A	927	-	5,5,5	0.71	0	5,5,5	0.97	0
10	GOL	A	922	-	5,5,5	0.41	0	5,5,5	0.38	0
10	GOL	A	919	-	5,5,5	0.32	0	5,5,5	0.50	0
10	GOL	A	923	-	5,5,5	0.53	0	5,5,5	1.14	0
10	GOL	A	918	-	5,5,5	0.50	0	5,5,5	0.54	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
10	GOL	A	920	-	-	4/4/4/4	-
10	GOL	A	924	-	-	1/4/4/4	-
10	GOL	A	921	-	-	2/4/4/4	-
10	GOL	A	926	-	-	4/4/4/4	-
10	GOL	A	925	-	-	2/4/4/4	-
10	GOL	A	927	-	-	4/4/4/4	-
10	GOL	A	922	-	-	2/4/4/4	-
10	GOL	A	919	-	-	4/4/4/4	-
10	GOL	A	923	-	-	2/4/4/4	-
10	GOL	A	918	-	-	3/4/4/4	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	A	920	GOL	C3-C2-C1	-2.42	102.92	111.80

There are no chirality outliers.

All (28) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	A	918	GOL	O1-C1-C2-C3
10	A	920	GOL	C1-C2-C3-O3
10	A	921	GOL	C1-C2-C3-O3
10	A	921	GOL	O2-C2-C3-O3
10	A	922	GOL	O1-C1-C2-C3
10	A	923	GOL	O1-C1-C2-C3
10	A	925	GOL	C1-C2-C3-O3
10	A	926	GOL	O1-C1-C2-O2
10	A	926	GOL	O1-C1-C2-C3
10	A	926	GOL	C1-C2-C3-O3
10	A	926	GOL	O2-C2-C3-O3
10	A	927	GOL	C1-C2-C3-O3
10	A	918	GOL	C1-C2-C3-O3
10	A	919	GOL	O1-C1-C2-C3
10	A	919	GOL	C1-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
10	A	920	GOL	O1-C1-C2-C3
10	A	927	GOL	O1-C1-C2-C3
10	A	918	GOL	O1-C1-C2-O2
10	A	919	GOL	O1-C1-C2-O2
10	A	920	GOL	O2-C2-C3-O3
10	A	927	GOL	O1-C1-C2-O2
10	A	927	GOL	O2-C2-C3-O3
10	A	920	GOL	O1-C1-C2-O2
10	A	922	GOL	O1-C1-C2-O2
10	A	925	GOL	O2-C2-C3-O3
10	A	919	GOL	O2-C2-C3-O3
10	A	923	GOL	O1-C1-C2-O2
10	A	924	GOL	O1-C1-C2-O2

There are no ring outliers.

3 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	A	920	GOL	3	0
10	A	924	GOL	1	0
10	A	923	GOL	7	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	786/831 (94%)	-0.03	30 (3%) 44 43	10, 30, 67, 96	5 (0%)
2	B	25/34 (73%)	0.23	0 100 100	33, 60, 105, 108	0
All	All	811/865 (93%)	-0.02	30 (3%) 45 44	10, 31, 72, 108	5 (0%)

All (30) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	744	ILE	6.4
1	A	587	THR	4.6
1	A	461	TYR	4.2
1	A	458	LEU	3.9
1	A	464	PRO	3.8
1	A	460	VAL	3.6
1	A	52	THR	3.6
1	A	465	SER	3.4
1	A	586	SER	3.3
1	A	148	CYS	3.2
1	A	745	GLU	3.0
1	A	463	LYS	2.8
1	A	243	LEU	2.7
1	A	400	LEU	2.7
1	A	277	VAL	2.6
1	A	548	SER	2.6
1	A	72	ASP	2.6
1	A	82	TYR	2.5
1	A	588	GLU	2.5
1	A	78	LEU	2.4
1	A	86	CYS	2.4
1	A	73	CYS	2.3
1	A	84	SER	2.3
1	A	396	ILE	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	537	ASN	2.3
1	A	743	ASP	2.2
1	A	58	CYS	2.2
1	A	589	GLU	2.1
1	A	83	SER	2.1
1	A	378	ASN	2.1

6.2 Non-standard residues in protein, DNA, RNA chains [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
2	OMG	B	2034	24/25	0.43	0.20	88,99,102,103	0
2	OMG	B	2033	24/25	0.70	0.17	77,91,96,98	0
2	A2M	B	2019	23/24	0.72	0.16	112,124,129,133	0
2	OMC	B	2020	21/22	0.72	0.19	106,124,132,137	0
2	A2M	B	2032	23/24	0.74	0.16	73,76,86,92	0
2	OMG	B	2015	24/25	0.91	0.10	58,65,75,80	0
2	OMC	B	2007	21/22	0.94	0.10	51,57,70,76	0
2	A2M	B	2014	23/24	0.94	0.11	47,59,68,71	0
2	OMG	B	2009	24/25	0.97	0.08	39,45,50,54	0

6.3 Carbohydrates [i](#)

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

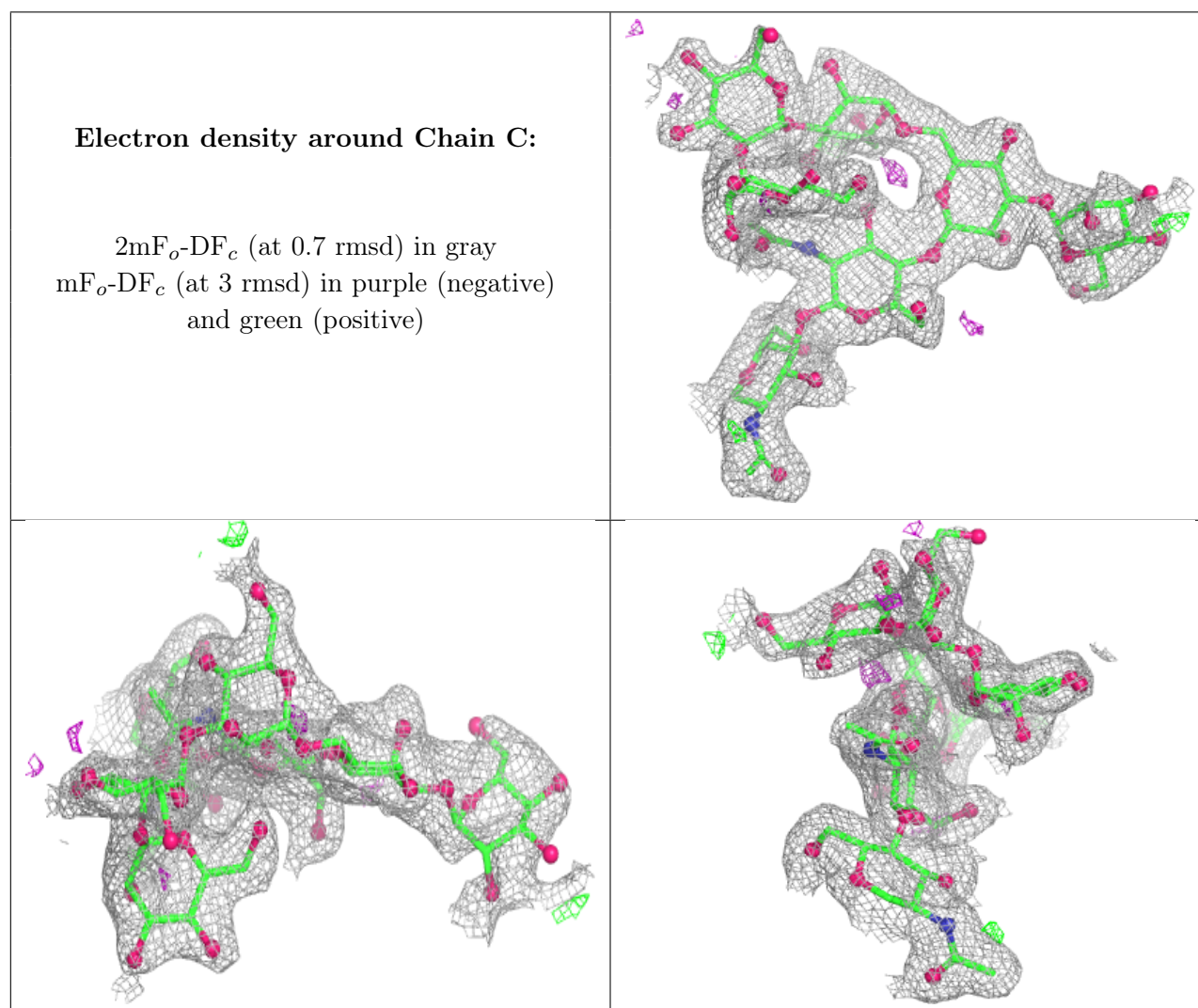
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	MAN	C	7	11/12	0.60	0.15	78,84,85,87	0
4	MAN	D	4	11/12	0.68	0.13	71,73,75,76	0
4	BMA	D	3	11/12	0.82	0.15	45,54,62,68	0
3	MAN	C	5	11/12	0.87	0.16	56,63,67,69	0
3	MAN	C	4	11/12	0.87	0.11	62,63,67,69	0
3	BMA	C	3	11/12	0.88	0.10	52,59,63,70	0
3	MAN	C	6	11/12	0.90	0.12	41,51,54,54	0
4	NAG	D	1	14/15	0.93	0.08	28,34,40,45	0

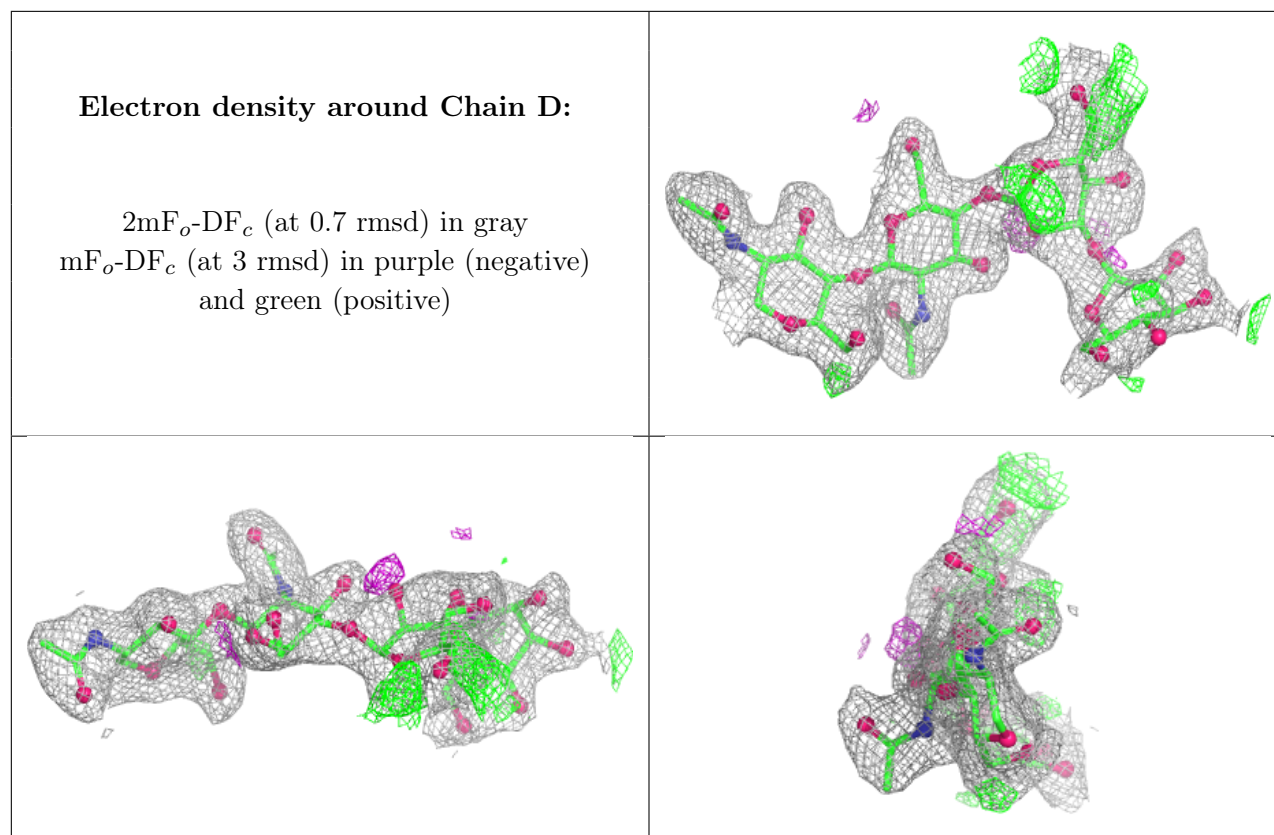
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	NAG	D	2	14/15	0.93	0.10	39,44,51,52	0
3	NAG	C	2	14/15	0.94	0.08	32,35,39,46	0
3	NAG	C	1	14/15	0.97	0.06	20,23,26,29	0

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.





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($\text{\AA}^2$)	Q<0.9
10	GOL	A	922	6/6	0.73	0.13	68,69,70,71	0
10	GOL	A	926	6/6	0.81	0.17	44,56,57,60	0
10	GOL	A	927	6/6	0.85	0.21	52,58,65,67	0
10	GOL	A	918	6/6	0.86	0.16	57,62,63,65	0
10	GOL	A	925	6/6	0.86	0.15	57,61,61,62	0
10	GOL	A	921	6/6	0.87	0.16	60,62,63,64	0
10	GOL	A	919	6/6	0.88	0.14	53,57,59,60	0
10	GOL	A	923	6/6	0.88	0.16	63,66,67,68	0
10	GOL	A	924	6/6	0.88	0.18	56,64,65,65	0
10	GOL	A	920	6/6	0.89	0.15	47,59,62,64	0
6	CA	B	2101	1/1	0.97	0.05	49,49,49,49	0
8	CL	A	916	1/1	0.97	0.07	42,42,42,42	0
7	NA	A	915	1/1	0.98	0.05	30,30,30,30	0
6	CA	A	914	1/1	0.99	0.03	22,22,22,22	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
9	K	A	917	1/1	0.99	0.02	23,23,23,23	0
5	ZN	A	913	1/1	1.00	0.01	25,25,25,25	0
5	ZN	A	912	1/1	1.00	0.01	27,27,27,27	0

6.5 Other polymers [i](#)

There are no such residues in this entry.