



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 05:09 PM UTC

PDB ID : 3V7M / pdb_00003v7m
Title : Crystal structure of monoclonal human anti-Rhesus D Fc IgG1 T125(YB2/0) in the presence of Zn²⁺
Authors : Menez, R.; Stura, E.A.; Bourel, D.; Siberil, S.; Jorieux, S.; De Romeuf, C.; Ducancel, F.; Fridman, W.H.; Teillaud, J.L.
Deposited on : 2011-12-21
Resolution : 2.02 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

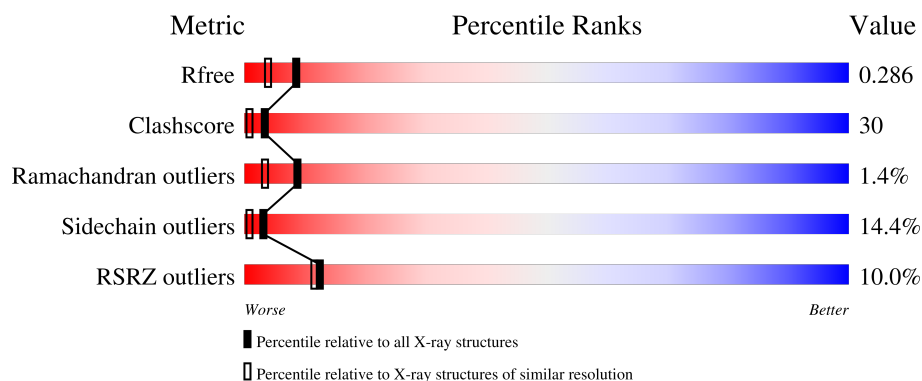
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.02 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	13299 (2.04-2.00)
Clashscore	190562	1022 (2.02-2.02)
Ramachandran outliers	187476	1014 (2.02-2.02)
Sidechain outliers	187428	1014 (2.02-2.02)
RSRZ outliers	180081	13314 (2.04-2.00)

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	209	10% 57% 33% 9%
2	B	8	75% 25%

2 Entry composition [i](#)

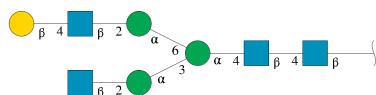
There are 6 unique types of molecules in this entry. The entry contains 1935 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Ig gamma-1 chain C region.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	209	Total	C	N	O	S	0	0	0
			1669	1061	281	321	6			

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

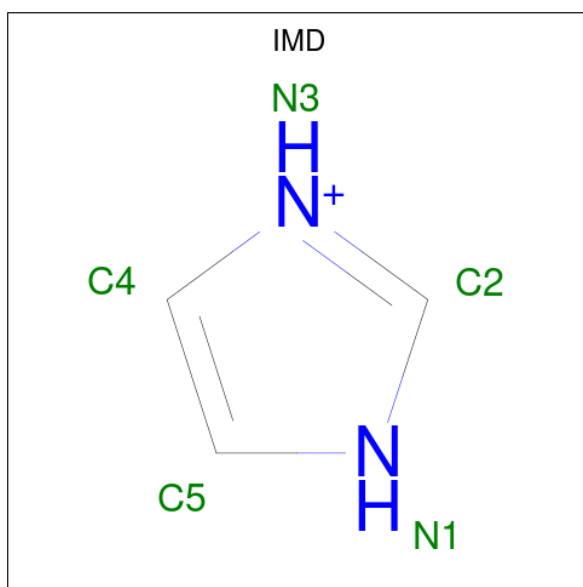


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	8	Total	C	N	O	0	0	0
			100	56	4	40			

- Molecule 3 is ZINC ION (CCD ID: ZN) (formula: Zn).

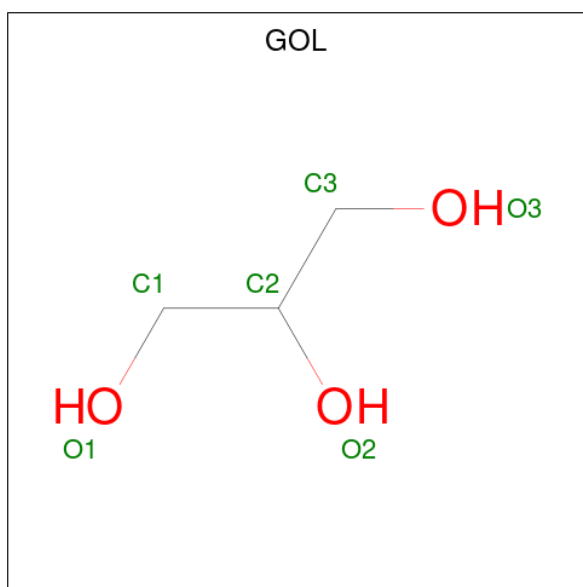
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	3	Total	Zn	0	0
			3	3		

- Molecule 4 is IMIDAZOLE (CCD ID: IMD) (formula: C₃H₅N₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	N	0	0
			5	3	2		
4	A	1	Total	C	N	0	0
			5	3	2		
4	A	1	Total	C	N	0	0
			5	3	2		

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



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

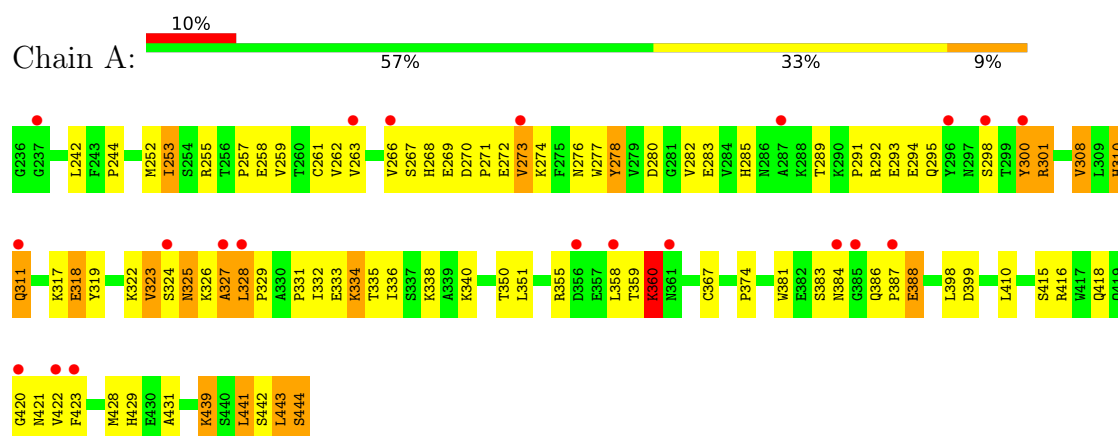
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	142	Total 142	O 142	0	0

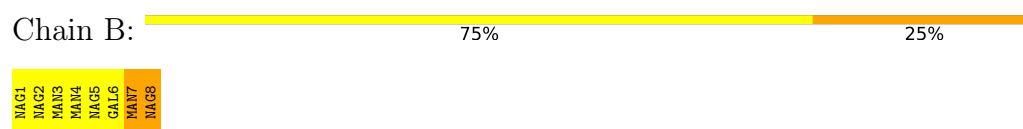
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Ig gamma-1 chain C region



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



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	50.22Å 147.75Å 75.54Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.24 – 2.02 40.24 – 2.02	Depositor EDS
% Data completeness (in resolution range)	100.0 (40.24-2.02) 93.4 (40.24-2.02)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	0.06	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.93 (at 2.01Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.234 , 0.286 0.238 , 0.286	Depositor DCC
R_{free} test set	884 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	39.4	Xtriage
Anisotropy	0.140	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 45.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	1935	wwPDB-VP
Average B, all atoms (Å ²)	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.14% 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: GAL, GOL, ZN, NAG, MAN, IMD

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	1.36	7/1715 (0.4%)	1.26	4/2335 (0.2%)

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	258	GLU	CA-C	-6.40	1.44	1.52
1	A	310	HIS	C-O	-6.28	1.16	1.24
1	A	311	GLN	C-O	-5.84	1.17	1.24
1	A	259	VAL	N-CA	-5.72	1.39	1.46
1	A	278	TYR	CA-C	5.56	1.59	1.52
1	A	311	GLN	CA-C	-5.54	1.45	1.52
1	A	311	GLN	CB-CG	-5.37	1.36	1.52

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	360	LYS	N-CA-C	6.24	118.90	109.41
1	A	410	LEU	CA-C-N	-5.34	115.34	122.72
1	A	410	LEU	C-N-CA	-5.34	115.34	122.72
1	A	273	VAL	N-CA-C	5.04	115.91	108.45

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1669	0	1633	102	0
2	B	100	0	85	2	0
3	A	3	0	0	0	0
4	A	15	0	13	7	0
5	A	6	0	8	2	0
6	A	142	0	0	19	0
All	All	1935	0	1739	107	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 30.

All (107) 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:324:SER:HB2	6:A:742:HOH:O	1.29	1.30
1:A:253:ILE:H	1:A:253:ILE:CD1	1.47	1.20
1:A:386:GLN:CG	1:A:387:PRO:HD2	1.72	1.20
1:A:386:GLN:HG3	6:A:727:HOH:O	1.41	1.17
1:A:253:ILE:HD12	1:A:253:ILE:N	1.59	1.15
1:A:386:GLN:HG2	1:A:387:PRO:CD	1.87	1.03
1:A:415:SER:HA	6:A:654:HOH:O	1.58	1.02
1:A:274:LYS:HB3	6:A:742:HOH:O	1.60	0.99
1:A:271:PRO:HB2	1:A:292:ARG:NH2	1.78	0.98
5:A:515:GOL:H31	6:A:736:HOH:O	1.64	0.98
1:A:253:ILE:H	1:A:253:ILE:HD12	0.78	0.94
1:A:271:PRO:HB2	1:A:292:ARG:HH21	1.36	0.90
1:A:443:LEU:O	1:A:444:SER:HB2	1.69	0.90
1:A:388:GLU:OE2	1:A:423:PHE:HE2	1.57	0.88
1:A:429:HIS:HD2	1:A:431:ALA:H	1.19	0.87
1:A:386:GLN:HG2	1:A:387:PRO:HD2	0.91	0.84
1:A:268:HIS:HD2	6:A:728:HOH:O	1.59	0.84
1:A:270:ASP:HB3	1:A:326:LYS:HG3	1.59	0.83
1:A:388:GLU:OE2	1:A:423:PHE:CE2	2.32	0.82
1:A:429:HIS:CD2	1:A:431:ALA:H	1.96	0.82
1:A:271:PRO:C	1:A:292:ARG:HH22	1.87	0.82
1:A:398:LEU:C	1:A:398:LEU:HD23	2.05	0.82
2:B:7:MAN:H4	2:B:8:NAG:C1	2.10	0.82
1:A:350:THR:HB	1:A:441:LEU:HG	1.62	0.81
1:A:272:GLU:HA	1:A:292:ARG:HH12	1.46	0.80
1:A:398:LEU:HD23	1:A:399:ASP:N	1.97	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:272:GLU:O	1:A:325:ASN:ND2	2.20	0.73
1:A:271:PRO:CB	1:A:292:ARG:NH2	2.54	0.71
1:A:276:ASN:HD22	1:A:322:LYS:HD2	1.56	0.70
1:A:268:HIS:O	1:A:271:PRO:HG3	1.92	0.69
1:A:263:VAL:HG21	1:A:323:VAL:HG11	1.74	0.69
1:A:386:GLN:CG	1:A:387:PRO:CD	2.61	0.69
1:A:311:GLN:HG2	6:A:689:HOH:O	1.93	0.68
1:A:308:VAL:HG22	1:A:319:TYR:CZ	2.29	0.68
1:A:268:HIS:NE2	1:A:298:SER:O	2.27	0.67
5:A:515:GOL:C3	6:A:736:HOH:O	2.30	0.66
1:A:384:ASN:HB3	6:A:731:HOH:O	1.95	0.65
1:A:310:HIS:CD2	4:A:513:IMD:H2	2.30	0.65
1:A:311:GLN:HA	1:A:311:GLN:OE1	1.96	0.64
1:A:443:LEU:O	1:A:444:SER:CB	2.44	0.64
1:A:398:LEU:C	1:A:398:LEU:CD2	2.72	0.61
1:A:311:GLN:OE1	4:A:513:IMD:N3	2.33	0.61
1:A:386:GLN:N	6:A:726:HOH:O	2.34	0.60
1:A:271:PRO:O	1:A:292:ARG:NH2	2.34	0.60
1:A:274:LYS:HE2	6:A:742:HOH:O	2.01	0.60
1:A:252:MET:HG3	1:A:428:MET:CE	2.32	0.59
1:A:267:SER:O	1:A:271:PRO:HB3	2.02	0.59
1:A:294:GLU:N	6:A:741:HOH:O	2.35	0.59
1:A:262:VAL:HG21	6:A:680:HOH:O	2.03	0.58
1:A:398:LEU:CD2	1:A:399:ASP:O	2.51	0.58
1:A:271:PRO:C	1:A:292:ARG:NH2	2.59	0.58
1:A:252:MET:HG3	1:A:428:MET:HE3	1.84	0.58
1:A:253:ILE:CD1	1:A:253:ILE:N	2.28	0.57
1:A:374:PRO:O	1:A:429:HIS:HE1	1.88	0.56
1:A:311:GLN:OE1	1:A:311:GLN:CA	2.48	0.56
1:A:318:GLU:HG2	1:A:335:THR:HG21	1.88	0.56
1:A:384:ASN:CB	6:A:731:HOH:O	2.53	0.56
1:A:334:LYS:HZ2	1:A:334:LYS:HA	1.72	0.54
1:A:384:ASN:HD22	1:A:421:ASN:HD22	1.54	0.54
1:A:333:GLU:O	1:A:334:LYS:NZ	2.40	0.53
1:A:283:GLU:OE2	1:A:285:HIS:HE1	1.92	0.53
1:A:418:GLN:C	1:A:420:GLY:H	2.17	0.52
1:A:257:PRO:HG2	1:A:308:VAL:HG12	1.91	0.52
1:A:268:HIS:CD2	1:A:298:SER:O	2.63	0.52
1:A:423:PHE:O	1:A:441:LEU:N	2.37	0.52
1:A:383:SER:O	1:A:384:ASN:C	2.53	0.52
1:A:244:PRO:HD3	1:A:336:ILE:HD11	1.92	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:359:THR:HG22	1:A:359:THR:O	2.10	0.50
4:A:514:IMD:C2	6:A:676:HOH:O	2.60	0.50
1:A:253:ILE:HD11	4:A:514:IMD:H4	1.95	0.49
1:A:420:GLY:HA3	6:A:725:HOH:O	2.12	0.49
1:A:418:GLN:C	1:A:420:GLY:N	2.71	0.49
1:A:283:GLU:OE2	1:A:285:HIS:CE1	2.67	0.48
1:A:398:LEU:HD23	1:A:399:ASP:O	2.12	0.48
1:A:252:MET:HE3	1:A:428:MET:SD	2.54	0.47
1:A:334:LYS:HA	1:A:334:LYS:NZ	2.28	0.47
1:A:266:VAL:CG1	1:A:300:TYR:HB2	2.45	0.47
1:A:285:HIS:HB3	4:A:512:IMD:C2	2.45	0.46
1:A:295:GLN:NE2	1:A:301:ARG:HG2	2.29	0.46
1:A:335:THR:HG22	1:A:336:ILE:N	2.31	0.46
1:A:384:ASN:ND2	1:A:421:ASN:HD22	2.14	0.45
1:A:269:GLU:C	1:A:271:PRO:HD3	2.42	0.44
1:A:270:ASP:HB2	1:A:327:ALA:HB2	1.99	0.44
1:A:317:LYS:NZ	6:A:658:HOH:O	2.48	0.44
1:A:360:LYS:NZ	6:A:713:HOH:O	2.50	0.44
1:A:278:TYR:N	1:A:278:TYR:CD2	2.86	0.44
1:A:318:GLU:HG2	1:A:335:THR:CG2	2.48	0.44
1:A:386:GLN:HB2	6:A:726:HOH:O	2.17	0.43
2:B:7:MAN:C4	2:B:8:NAG:C1	2.84	0.43
1:A:268:HIS:HE1	1:A:294:GLU:OE1	2.01	0.43
1:A:328:LEU:HD11	1:A:332:ILE:HD11	2.00	0.42
1:A:266:VAL:HG12	1:A:300:TYR:O	2.18	0.42
1:A:324:SER:OG	1:A:331:PRO:HB3	2.20	0.42
1:A:285:HIS:HB3	4:A:512:IMD:H2	2.02	0.42
1:A:310:HIS:NE2	4:A:513:IMD:H2	2.34	0.42
1:A:252:MET:HG3	1:A:428:MET:HE1	2.02	0.41
1:A:262:VAL:O	1:A:262:VAL:HG23	2.19	0.41
1:A:276:ASN:HB2	1:A:322:LYS:HB3	2.02	0.41
1:A:308:VAL:HG22	1:A:319:TYR:OH	2.18	0.41
1:A:439:LYS:HA	1:A:439:LYS:HD2	1.68	0.41
1:A:367:CYS:HB2	1:A:381:TRP:CZ2	2.56	0.41
1:A:388:GLU:OE2	1:A:423:PHE:CD2	2.70	0.41
1:A:308:VAL:HG22	1:A:319:TYR:CE2	2.55	0.41
1:A:261:CYS:HB2	1:A:277:TRP:CH2	2.56	0.41
1:A:326:LYS:H	1:A:326:LYS:HG2	1.59	0.41
1:A:338:LYS:HE3	1:A:338:LYS:HB3	1.96	0.40
1:A:280:ASP:OD1	1:A:317:LYS:HD3	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	207/209 (99%)	191 (92%)	13 (6%)	3 (1%)	9 3

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	327	ALA
1	A	291	PRO
1	A	329	PRO

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	194/194 (100%)	166 (86%)	28 (14%)	3 1

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	242	LEU
1	A	253	ILE
1	A	255	ARG
1	A	273	VAL
1	A	282	VAL
1	A	289	THR
1	A	293	GLU
1	A	300	TYR

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Mol	Chain	Res	Type
1	A	301	ARG
1	A	308	VAL
1	A	318	GLU
1	A	323	VAL
1	A	325	ASN
1	A	328	LEU
1	A	334	LYS
1	A	340	LYS
1	A	351	LEU
1	A	355	ARG
1	A	358	LEU
1	A	360	LYS
1	A	388	GLU
1	A	416	ARG
1	A	422	VAL
1	A	439	LYS
1	A	441	LEU
1	A	442	SER
1	A	443	LEU
1	A	444	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	276	ASN
1	A	342	GLN
1	A	386	GLN
1	A	389	ASN
1	A	419	GLN
1	A	421	ASN
1	A	429	HIS
1	A	434	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 ⓘ

8 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$
2	NAG	B	1	2,1	14,14,15	0.64	0	17,19,21	1.21	1 (5%)
2	NAG	B	2	2	14,14,15	0.57	0	17,19,21	2.09	5 (29%)
2	MAN	B	3	2	11,11,12	0.79	0	15,15,17	2.44	4 (26%)
2	MAN	B	4	2	11,11,12	0.79	0	15,15,17	1.51	3 (20%)
2	NAG	B	5	2	14,14,15	0.98	1 (7%)	17,19,21	1.63	6 (35%)
2	GAL	B	6	2	11,11,12	1.04	1 (9%)	15,15,17	0.93	1 (6%)
2	MAN	B	7	2	11,11,12	0.59	0	15,15,17	2.17	5 (33%)
2	NAG	B	8	2	14,14,15	0.88	1 (7%)	17,19,21	2.48	5 (29%)

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	NAG	B	1	2,1	-	2/6/23/26	0/1/1/1
2	NAG	B	2	2	-	1/6/23/26	0/1/1/1
2	MAN	B	3	2	-	0/2/19/22	0/1/1/1
2	MAN	B	4	2	-	1/2/19/22	0/1/1/1
2	NAG	B	5	2	-	0/6/23/26	0/1/1/1
2	GAL	B	6	2	-	2/2/19/22	0/1/1/1
2	MAN	B	7	2	-	2/2/19/22	0/1/1/1
2	NAG	B	8	2	-	0/6/23/26	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	6	GAL	O5-C1	-2.62	1.39	1.43
2	B	5	NAG	O5-C1	-2.46	1.39	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	8	NAG	C1-C2	2.45	1.55	1.52

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	3	MAN	C1-O5-C5	6.87	121.39	112.19
2	B	8	NAG	C1-O5-C5	6.54	120.95	112.19
2	B	7	MAN	C1-O5-C5	5.90	120.09	112.19
2	B	8	NAG	O5-C1-C2	5.49	119.78	111.29
2	B	2	NAG	C4-C3-C2	-4.57	104.32	111.02
2	B	3	MAN	O3-C3-C2	-3.79	102.31	110.05
2	B	2	NAG	C2-N2-C7	-3.54	118.16	122.90
2	B	2	NAG	C1-O5-C5	3.50	116.88	112.19
2	B	1	NAG	C1-O5-C5	3.27	116.57	112.19
2	B	5	NAG	C1-C2-N2	3.25	115.56	110.43
2	B	4	MAN	O2-C2-C3	-3.25	103.42	110.15
2	B	2	NAG	O4-C4-C5	2.75	116.09	109.32
2	B	7	MAN	O4-C4-C5	2.67	115.90	109.32
2	B	3	MAN	C2-C3-C4	-2.60	106.29	110.86
2	B	8	NAG	C4-C3-C2	-2.55	107.29	111.02
2	B	2	NAG	C1-C2-N2	2.52	114.41	110.43
2	B	7	MAN	C2-C3-C4	-2.51	106.45	110.86
2	B	4	MAN	C1-O5-C5	2.48	115.52	112.19
2	B	7	MAN	O2-C2-C1	2.44	114.80	109.22
2	B	3	MAN	O5-C1-C2	2.43	116.58	110.79
2	B	8	NAG	C3-C4-C5	-2.42	105.84	110.23
2	B	5	NAG	C1-O5-C5	-2.23	109.20	112.19
2	B	8	NAG	O7-C7-C8	-2.21	118.12	122.05
2	B	5	NAG	O3-C3-C2	-2.09	105.06	109.40
2	B	6	GAL	O3-C3-C4	-2.09	105.46	110.38
2	B	5	NAG	C3-C4-C5	2.08	114.00	110.23
2	B	4	MAN	C6-C5-C4	-2.08	107.91	113.02
2	B	5	NAG	O5-C1-C2	-2.06	108.10	111.29
2	B	5	NAG	O7-C7-C8	-2.04	118.42	122.05
2	B	7	MAN	C1-C2-C3	2.04	112.61	109.64

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	6	GAL	O5-C5-C6-O6
2	B	7	MAN	O5-C5-C6-O6

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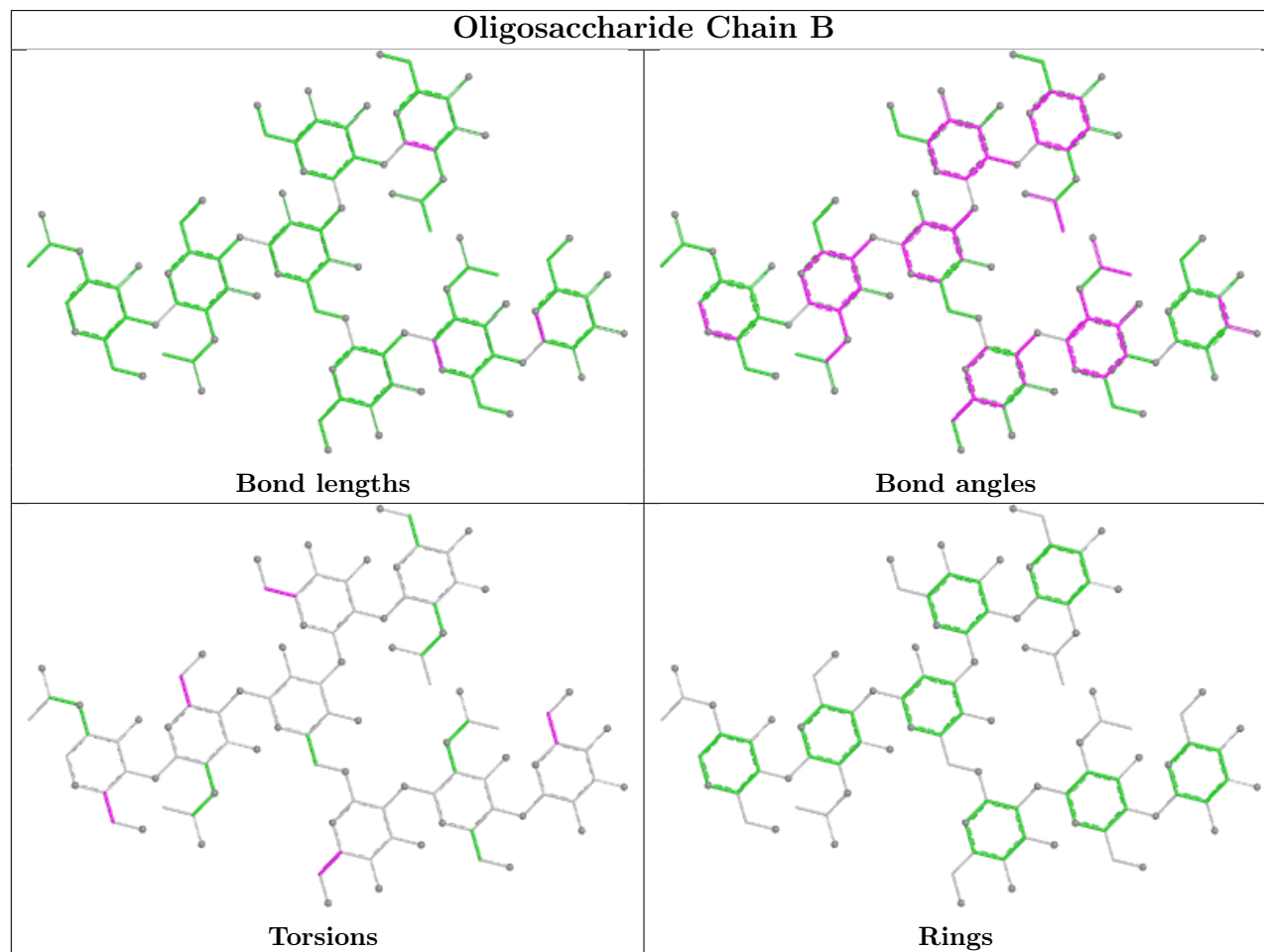
Mol	Chain	Res	Type	Atoms
2	B	6	GAL	C4-C5-C6-O6
2	B	7	MAN	C4-C5-C6-O6
2	B	1	NAG	C4-C5-C6-O6
2	B	2	NAG	O5-C5-C6-O6
2	B	1	NAG	O5-C5-C6-O6
2	B	4	MAN	C4-C5-C6-O6

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	7	MAN	2	0
2	B	8	NAG	2	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

Of 7 ligands modelled in this entry, 3 are monoatomic - leaving 4 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	$\# Z > 2$
5	GOL	A	515	-	5,5,5	0.62	0	5,5,5	1.47	1 (20%)
4	IMD	A	512	3	5,5,5	0.66	0	5,5,5	0.34	0
4	IMD	A	513	3	5,5,5	0.73	0	5,5,5	0.72	0
4	IMD	A	514	3	5,5,5	0.76	0	5,5,5	0.21	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
5	GOL	A	515	-	-	2/4/4/4	-
4	IMD	A	512	3	-	-	0/1/1/1
4	IMD	A	513	3	-	-	0/1/1/1
4	IMD	A	514	3	-	-	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	515	GOL	O1-C1-C2	-2.43	99.45	110.38

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	515	GOL	O1-C1-C2-C3
5	A	515	GOL	O1-C1-C2-O2

There are no ring outliers.

4 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	515	GOL	2	0
4	A	512	IMD	2	0
4	A	513	IMD	3	0
4	A	514	IMD	2	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	209/209 (100%)	0.69	21 (10%) 12 11	20, 45, 72, 82	1 (0%)

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	327	ALA	3.4
1	A	328	LEU	3.4
1	A	324	SER	3.2
1	A	311	GLN	3.2
1	A	298	SER	3.1
1	A	422	VAL	2.6
1	A	287	ALA	2.4
1	A	237	GLY	2.4
1	A	387	PRO	2.4
1	A	273	VAL	2.4
1	A	296	TYR	2.3
1	A	361	ASN	2.3
1	A	266	VAL	2.2
1	A	356	ASP	2.2
1	A	300	TYR	2.2
1	A	423	PHE	2.2
1	A	263	VAL	2.2
1	A	420	GLY	2.1
1	A	358	LEU	2.1
1	A	385	GLY	2.1
1	A	384	ASN	2.0

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

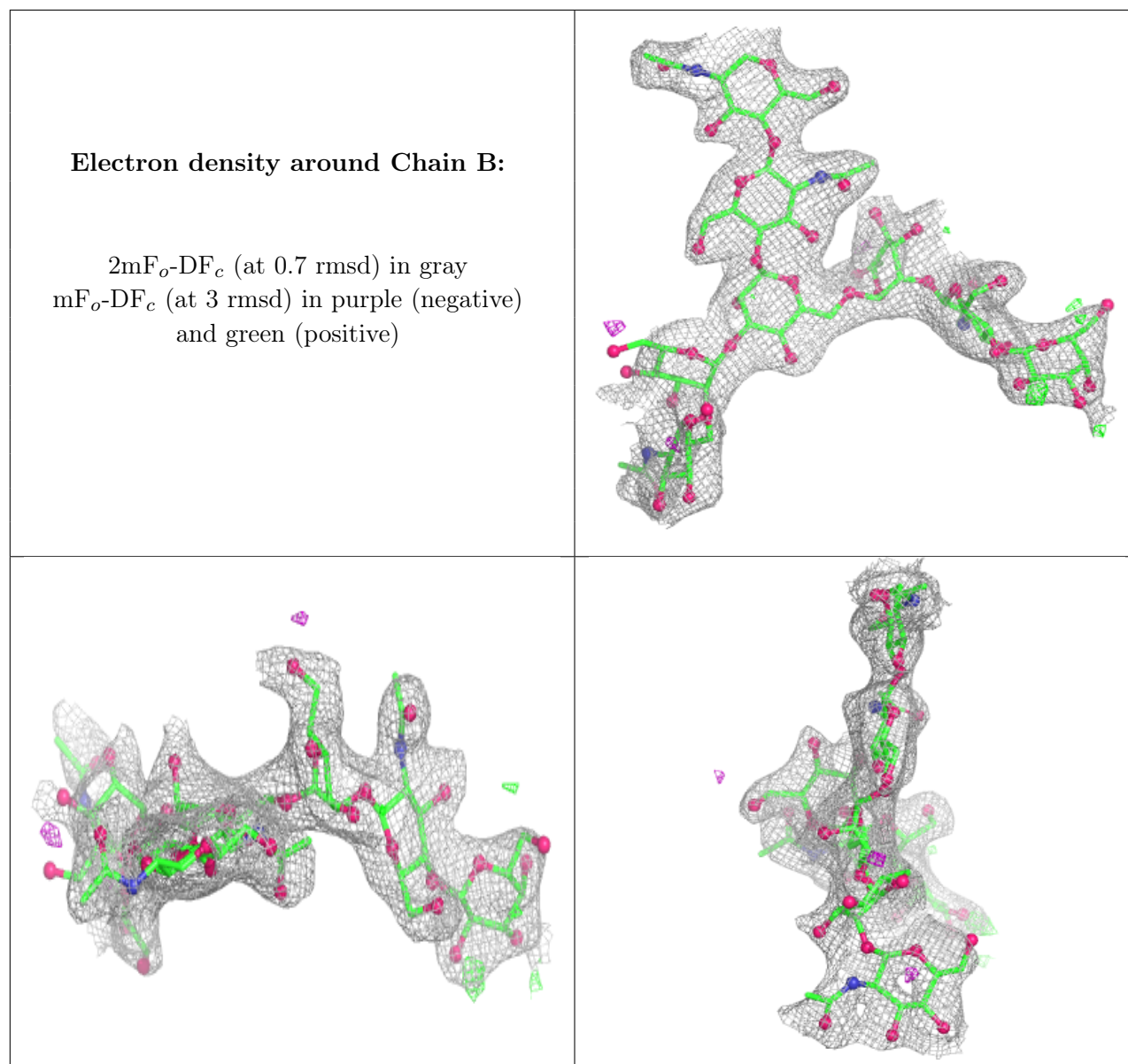
There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates ⓘ

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	MAN	B	7	11/12	0.61	0.16	86,91,94,95	0
2	NAG	B	8	14/15	0.62	0.15	97,99,100,100	0
2	GAL	B	6	11/12	0.82	0.20	48,50,54,56	11
2	NAG	B	1	14/15	0.83	0.11	72,74,76,78	0
2	MAN	B	4	11/12	0.87	0.12	53,57,61,63	0
2	NAG	B	5	14/15	0.88	0.11	51,54,55,57	0
2	NAG	B	2	14/15	0.89	0.12	61,69,71,71	0
2	MAN	B	3	11/12	0.93	0.09	52,68,72,79	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
4	IMD	A	513	5/5	0.84	0.24	29,30,33,34	5
5	GOL	A	515	6/6	0.86	0.22	28,31,33,33	0
4	IMD	A	514	5/5	0.87	0.27	30,36,37,39	5
4	IMD	A	512	5/5	0.89	0.09	41,46,50,50	0
3	ZN	A	511	1/1	0.91	0.13	48,48,48,48	1

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	ZN	A	510	1/1	0.98	0.04	63,63,63,63	0
3	ZN	A	509	1/1	0.98	0.03	38,38,38,38	0

6.5 Other polymers [i](#)

There are no such residues in this entry.