



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 03:13 PM GMT

PDB ID : 4BWC
Title : X-ray structure of a phospholipase B like protein 1 from bovine kidneys
Authors : Repo, H.; Kuokkanen, E.; Oksanen, E.; Goldman, A.; Heikinheimo, P.
Deposited on : 2013-07-01
Resolution : 1.89 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

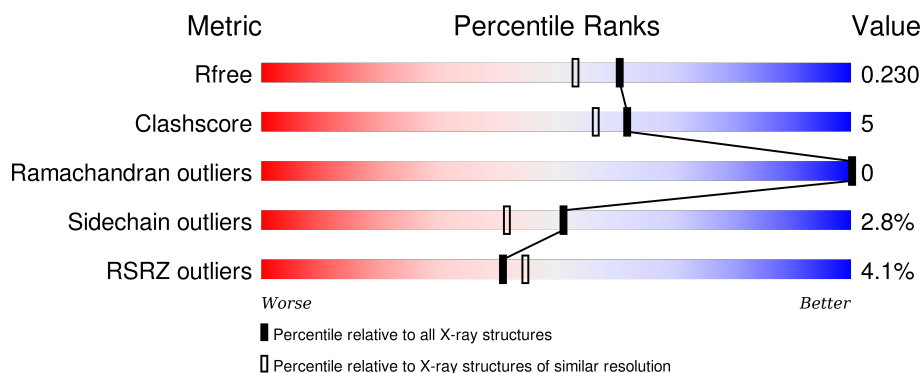
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.89 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}	91344	4755 (1.90-1.90)
Clashscore	102246	5398 (1.90-1.90)
Ramachandran outliers	100387	5338 (1.90-1.90)
Sidechain outliers	100360	5339 (1.90-1.90)
RSRZ outliers	91569	4766 (1.90-1.90)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	170	<div> <div>10%</div> <div>85%</div> <div>14%</div> </div>
2	B	321	<div> <div>%</div> <div>86%</div> <div>13%</div> </div>

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
3	NAG	B	1285	-	-	-	X
4	P4G	A	1206	-	-	-	X
5	NAG	B	1503	-	-	-	X

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 4334 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 PHOSPHOLIPASE B-LIKE 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	170	Total	C	N	O	S	0	0	0
			1376	893	226	250	7			

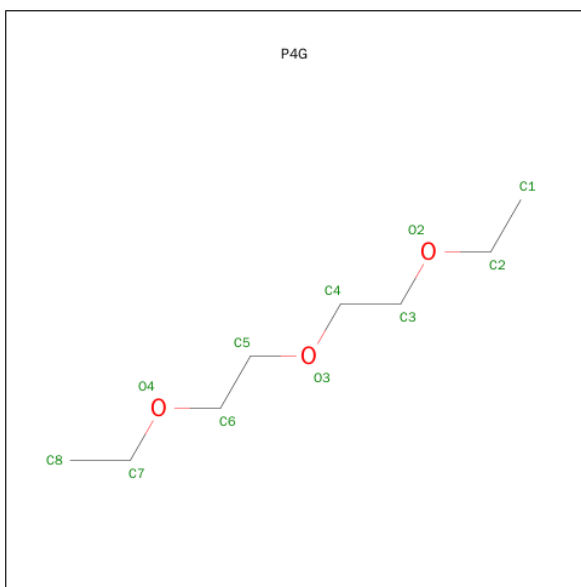
- Molecule 2 is a protein called PHOSPHOLIPASE B-LIKE 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	321	Total	C	N	O	S	0	2	0
			2631	1699	431	487	14			

- Molecule 3 is a polymer of unknown type called SUGAR (2-MER).

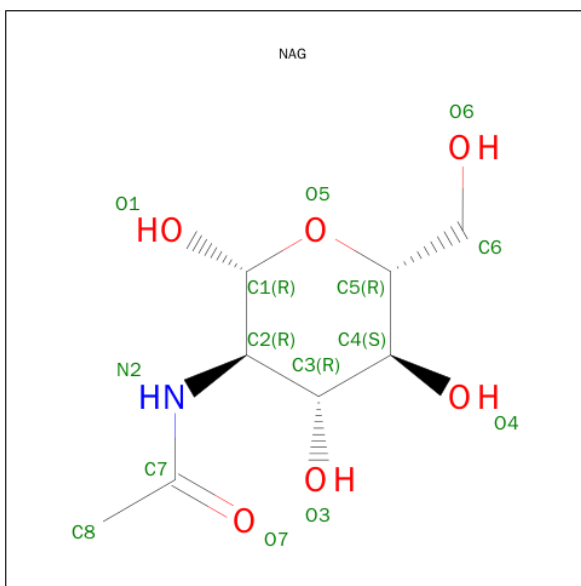
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	2	Total	C	N	O	0	0
			28	16	2	10		
3	B	2	Total	C	N	O	0	0
			28	16	2	10		
3	B	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 4 is 1-ETHOXY-2-(2-ETHOXYETHOXY)ETHANE (three-letter code: P4G) (formula: C₈H₁₈O₃).



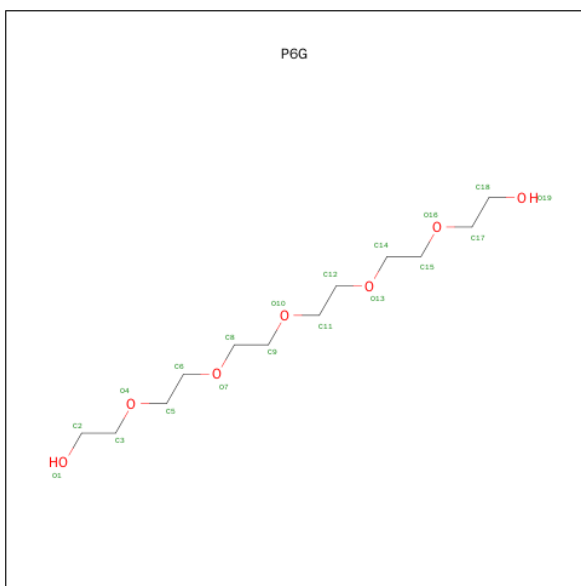
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			11	8	3		

- Molecule 5 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

- Molecule 6 is HEXAETHYLENE GLYCOL (three-letter code: P6G) (formula: $C_{12}H_{26}O_7$).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	1	Total	C	O	0
			19	12	7	

- Molecule 7 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	B	1	Total	Cl	0	0
			1	1		

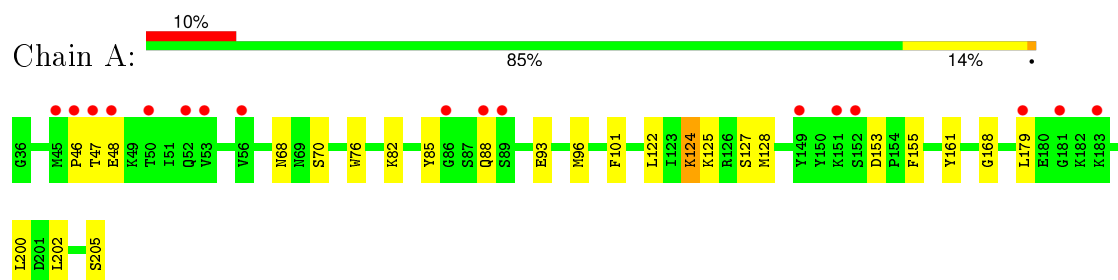
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	50	Total	O	0	0
			50	50		
8	B	134	Total	O	0	0
			134	134		

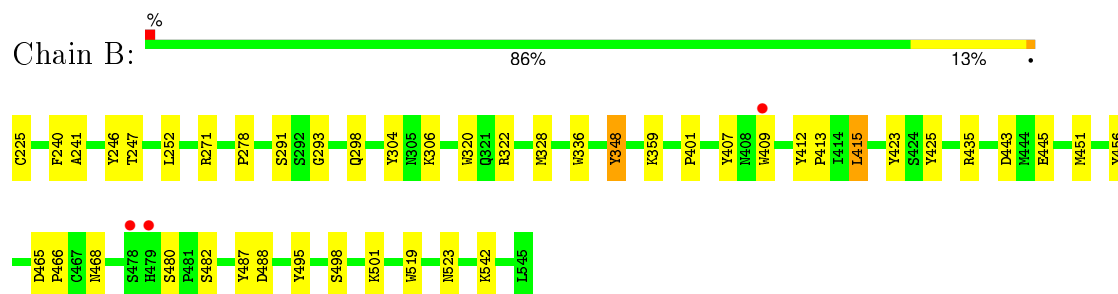
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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 ($\text{RSRZ} > 2$). 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: PHOSPHOLIPASE B-LIKE 1



• Molecule 2: PHOSPHOLIPASE B-LIKE 1



4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α , β , γ	97.37Å 97.37Å 140.94Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	46.98 – 1.89 46.98 – 1.89	Depositor EDS
% Data completeness (in resolution range)	99.8 (46.98-1.89) 99.8 (46.98-1.89)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.75 (at 1.88Å)	Xtriage
Refinement program	REFMAC 5.6.0117	Depositor
R, R_{free}	0.188 , 0.231 0.187 , 0.230	Depositor DCC
R_{free} test set	3126 reflections (5.28%)	DCC
Wilson B-factor (Å ²)	28.7	Xtriage
Anisotropy	0.040	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 51.0	EDS
Estimated twinning fraction	0.027 for -h,-k,l	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 62605 reflections	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	4334	wwPDB-VP
Average B, all atoms (Å ²)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.71% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: P4G, OCS, NAG, P6G, CL

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	1.01	0/1412	0.91	1/1909 (0.1%)
2	B	1.27	6/2705 (0.2%)	1.10	5/3673 (0.1%)
All	All	1.19	6/4117 (0.1%)	1.04	6/5582 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	320	TRP	CD2-CE2	7.95	1.50	1.41
2	B	409	TRP	CD2-CE2	6.44	1.49	1.41
2	B	425	TYR	CE2-CZ	5.66	1.46	1.38
2	B	519	TRP	CD2-CE2	5.64	1.48	1.41
2	B	482	SER	CB-OG	-5.27	1.35	1.42
2	B	336	TRP	CD2-CE2	5.02	1.47	1.41

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	443	ASP	CB-CG-OD1	9.29	126.67	118.30
2	B	322	ARG	NE-CZ-NH2	-6.57	117.02	120.30
2	B	435	ARG	NE-CZ-NH1	6.37	123.49	120.30
1	A	122	LEU	CB-CG-CD2	-5.95	100.89	111.00
2	B	328	MET	CG-SD-CE	-5.86	90.82	100.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	246	TYR	CB-CG-CD2	-5.36	117.79	121.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	76	TRP	Peptide

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	1376	0	1356	22	0
2	B	2631	0	2551	21	0
3	A	28	0	25	1	0
3	B	56	0	50	1	0
4	A	11	0	18	0	0
5	B	28	0	26	1	0
6	B	19	0	26	3	0
7	B	1	0	0	0	0
8	A	50	0	0	2	0
8	B	134	0	0	2	0
All	All	4334	0	4052	44	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 5.

All (44) 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:124:LYS:H	1:A:128:MET:CE	1.90	0.85
2:B:304:TYR:CD2	2:B:415:LEU:HD11	2.17	0.79
2:B:225:OCS:OD1	2:B:225:OCS:N	2.15	0.78
2:B:498:SER:HA	6:B:1546:P6G:H122	1.68	0.75
1:A:127:SER:HB3	8:A:2031:HOH:O	1.88	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:124:LYS:H	1:A:128:MET:HE1	1.54	0.70
1:A:124:LYS:H	1:A:128:MET:HE3	1.57	0.69
1:A:125:LYS:H	1:A:128:MET:CE	2.04	0.69
2:B:304:TYR:CD2	2:B:415:LEU:CD1	2.78	0.67
2:B:445:GLU:OE2	8:B:2107:HOH:O	2.14	0.65
2:B:304:TYR:CG	2:B:415:LEU:HD11	2.31	0.65
1:A:93:GLU:H	1:A:93:GLU:CD	2.02	0.64
2:B:495:TYR:CE1	6:B:1546:P6G:H21	2.37	0.60
1:A:125:LYS:H	1:A:128:MET:HE3	1.67	0.59
2:B:523:ASN:HD22	5:B:1503:NAG:H83	1.70	0.56
1:A:125:LYS:N	1:A:128:MET:CE	2.70	0.55
3:B:1343:NAG:H62	3:B:1345:NAG:C1	2.38	0.54
1:A:85:TYR:O	8:A:2002:HOH:O	2.19	0.53
1:A:124:LYS:N	1:A:128:MET:HE3	2.22	0.52
2:B:252:LEU:O	2:B:278:PRO:HD3	2.11	0.50
1:A:124:LYS:N	1:A:128:MET:CE	2.68	0.50
1:A:96:MET:HG3	1:A:161:TYR:HB3	1.95	0.48
1:A:48:GLU:H	1:A:48:GLU:CD	2.17	0.48
1:A:68:ASN:HD22	3:A:1048:NAG:C7	2.26	0.48
2:B:501:LYS:HG2	2:B:542:LYS:HB3	1.97	0.46
1:A:46:PRO:HG3	1:A:88:GLN:OE1	2.15	0.46
2:B:293:GLY:HA2	6:B:1546:P6G:H111	1.98	0.45
2:B:241:ALA:CB	2:B:451:MET:HG3	2.46	0.45
2:B:271:ARG:HB3	2:B:291:SER:HB3	1.99	0.44
1:A:48:GLU:OE1	1:A:48:GLU:N	2.43	0.44
1:A:202:LEU:O	1:A:205:SER:HB2	2.18	0.43
1:A:101:PHE:HA	1:A:168:GLY:O	2.19	0.43
2:B:412:TYR:N	2:B:413:PRO:CD	2.82	0.43
1:A:47:THR:HB	1:A:48:GLU:OE1	2.19	0.42
2:B:488:ASP:C	2:B:488:ASP:OD1	2.58	0.42
2:B:401:PRO:HG2	2:B:407:TYR:HA	2.01	0.42
2:B:415:LEU:HD22	2:B:423:TYR:CE2	2.54	0.42
1:A:125:LYS:N	1:A:128:MET:HE2	2.33	0.42
1:A:153:ASP:OD2	1:A:155:PHE:HB3	2.20	0.42
2:B:465:ASP:HB3	2:B:468:ASN:HB2	2.03	0.41
2:B:348:TYR:HD1	2:B:348:TYR:HA	1.81	0.41
2:B:456:TYR:CG	2:B:466:PRO:HA	2.55	0.40
2:B:359:LYS:HE2	8:B:2044:HOH:O	2.21	0.40
1:A:200:LEU:HA	1:A:200:LEU:HD23	1.76	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	168/170 (99%)	166 (99%)	2 (1%)	0	100	100
2	B	321/321 (100%)	303 (94%)	18 (6%)	0	100	100
All	All	489/491 (100%)	469 (96%)	20 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	144/144 (100%)	140 (97%)	4 (3%)	51	41
2	B	289/287 (101%)	281 (97%)	8 (3%)	51	41
All	All	433/431 (100%)	421 (97%)	12 (3%)	51	41

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	70	SER
1	A	82	LYS
1	A	124	LYS
1	A	179	LEU
2	B	240	PHE
2	B	247	THR
2	B	298	GLN
2	B	306	LYS

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Mol	Chain	Res	Type
2	B	348	TYR
2	B	415	LEU
2	B	480	SER
2	B	487	TYR

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

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

1 non-standard protein/DNA/RNA residue is 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	OCS	B	225	2	7,8,9	4.15	2 (28%)	7,11,13	3.11	4 (57%)

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	OCS	B	225	2	-	0/4/7/9	0/0/0/0

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	225	OCS	CB-SG	-7.00	1.67	1.77
2	B	225	OCS	OD2-SG	8.24	1.67	1.46

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	225	OCS	OD2-SG-OD1	-4.65	100.78	111.61
2	B	225	OCS	CB-CA-C	-3.41	102.13	111.46
2	B	225	OCS	OD3-SG-OD1	-2.66	103.80	113.48
2	B	225	OCS	OD2-SG-OD3	4.48	122.03	111.61

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	225	OCS	1	0

5.5 Carbohydrates ⓘ

6 carbohydrates 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	A	1048	1,3	14,14,15	1.24	1 (7%)	15,19,21	1.87	5 (33%)
3	NAG	A	1049	3	14,14,15	0.75	1 (7%)	15,19,21	2.31	6 (40%)
3	NAG	B	1285	3,2	14,14,15	0.66	0	15,19,21	1.65	4 (26%)
3	NAG	B	1286	3	14,14,15	0.78	1 (7%)	15,19,21	1.68	3 (20%)
3	NAG	B	1343	3,2	14,14,15	0.74	0	15,19,21	2.11	7 (46%)
3	NAG	B	1345	3	14,14,15	0.64	0	15,19,21	1.37	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	A	1048	1,3	-	0/6/23/26	0/1/1/1
3	NAG	A	1049	3	-	0/6/23/26	0/1/1/1
3	NAG	B	1285	3,2	-	0/6/23/26	0/1/1/1
3	NAG	B	1286	3	-	0/6/23/26	0/1/1/1
3	NAG	B	1343	3,2	-	0/6/23/26	0/1/1/1
3	NAG	B	1345	3	-	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)
3	A	1048	NAG	O5-C1	-3.41	1.38	1.43
3	A	1049	NAG	C1-C2	2.21	1.55	1.52
3	B	1286	NAG	C1-C2	2.24	1.55	1.52

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1049	NAG	C3-C4-C5	-5.10	101.31	110.20
3	A	1048	NAG	O7-C7-C8	-3.98	114.77	122.06
3	B	1343	NAG	C6-C5-C4	-3.87	103.46	113.02
3	A	1049	NAG	C3-C2-N2	-3.54	102.08	110.56
3	B	1343	NAG	O4-C4-C3	-3.20	103.14	110.34
3	B	1285	NAG	O3-C3-C4	-3.10	103.35	110.34
3	A	1048	NAG	O3-C3-C4	-3.06	103.45	110.34
3	B	1343	NAG	O7-C7-C8	-2.98	116.59	122.06
3	B	1343	NAG	O6-C6-C5	-2.93	101.64	111.33
3	B	1286	NAG	O3-C3-C4	-2.11	105.58	110.34
3	B	1285	NAG	C1-O5-C5	-2.06	109.63	112.25
3	B	1345	NAG	C4-C3-C2	2.02	114.37	111.23
3	B	1343	NAG	C3-C4-C5	2.02	113.72	110.20
3	B	1285	NAG	O4-C4-C5	2.04	114.66	109.24
3	A	1049	NAG	O4-C4-C5	2.08	114.75	109.24
3	A	1049	NAG	O5-C5-C6	2.10	111.90	107.35
3	A	1048	NAG	C3-C2-N2	2.16	115.74	110.56
3	A	1048	NAG	O4-C4-C5	2.18	115.03	109.24
3	B	1343	NAG	C1-O5-C5	2.26	115.12	112.25
3	B	1345	NAG	O5-C5-C6	2.29	112.31	107.35
3	A	1048	NAG	O7-C7-N2	2.34	126.63	121.86
3	A	1049	NAG	O3-C3-C2	2.39	113.85	109.11
3	B	1286	NAG	O5-C5-C6	2.40	112.53	107.35
3	B	1343	NAG	C8-C7-N2	2.48	120.86	116.11
3	B	1345	NAG	C2-N2-C7	2.60	126.38	123.04
3	B	1285	NAG	C3-C2-N2	2.72	117.07	110.56

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1286	NAG	C4-C3-C2	3.97	117.40	111.23
3	A	1049	NAG	C2-N2-C7	4.16	128.38	123.04

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1048	NAG	1	0
3	B	1343	NAG	1	0
3	B	1345	NAG	1	0

5.6 Ligand geometry [i](#)

Of 5 ligands modelled in this entry, 1 is 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	$\# Z > 2$
4	P4G	A	1206	-	10,10,10	0.79	0	9,9,9	0.94	0
5	NAG	B	1388	2	14,14,15	0.99	1 (7%)	15,19,21	2.43	4 (26%)
5	NAG	B	1503	2	14,14,15	0.68	0	15,19,21	1.85	4 (26%)
6	P6G	B	1546	-	18,18,18	0.72	0	17,17,17	0.87	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
4	P4G	A	1206	-	-	0/8/8/8	0/0/0/0
5	NAG	B	1388	2	-	0/6/23/26	0/1/1/1
5	NAG	B	1503	2	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	P6G	B	1546	-	-	0/16/16/16	0/0/0/0

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	1388	NAG	C1-C2	3.08	1.56	1.52

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	1388	NAG	C3-C4-C5	-6.64	98.62	110.20
5	B	1503	NAG	C4-C3-C2	-3.02	106.53	111.23
5	B	1388	NAG	O6-C6-C5	-2.26	103.87	111.33
5	B	1503	NAG	O7-C7-C8	-2.08	118.24	122.06
5	B	1388	NAG	C2-N2-C7	2.71	126.53	123.04
5	B	1503	NAG	C8-C7-N2	2.83	121.53	116.11
5	B	1388	NAG	O5-C5-C6	3.33	114.55	107.35
5	B	1503	NAG	C1-O5-C5	4.66	118.17	112.25

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	1503	NAG	1	0
6	B	1546	P6G	3	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	170/170 (100%)	0.26	17 (10%) 9 10	24, 38, 63, 81	0
2	B	320/321 (99%)	-0.22	3 (0%) 85 87	18, 27, 44, 61	0
All	All	490/491 (99%)	-0.06	20 (4%) 41 45	18, 31, 53, 81	0

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	179	LEU	4.4
1	A	47	THR	4.2
1	A	149	TYR	3.4
1	A	56	VAL	3.3
1	A	89	SER	3.0
1	A	46	PRO	2.8
1	A	53	VAL	2.8
1	A	181	GLY	2.7
2	B	479	HIS	2.7
1	A	151	LYS	2.6
1	A	50	THR	2.6
1	A	183	LYS	2.5
1	A	48	GLU	2.4
1	A	86	GLY	2.3
2	B	478	SER	2.2
1	A	88	GLN	2.1
1	A	152	SER	2.1
1	A	45	MET	2.1
2	B	409	TRP	2.0
1	A	52	GLN	2.0

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

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
2	OCS	B	225	9/10	0.97	0.09	-	22,27,46,50	0

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
3	NAG	B	1285	14/15	0.93	0.19	2.42	44,52,59,65	0
3	NAG	A	1048	14/15	0.96	0.11	1.04	42,51,57,65	0
3	NAG	A	1049	14/15	0.85	0.30	-	71,83,96,99	0
3	NAG	B	1343	14/15	0.94	0.10	-	39,47,57,75	0
3	NAG	B	1345	14/15	0.80	0.45	-	64,100,111,115	0
3	NAG	B	1286	14/15	0.85	0.43	-	64,78,81,94	0

6.4 Ligands ⓘ

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
5	NAG	B	1503	14/15	0.64	0.40	22.36	75,86,102,104	0
4	P4G	A	1206	11/11	0.75	0.32	3.41	57,65,79,90	0
6	P6G	B	1546	19/19	0.89	0.14	1.04	45,53,72,75	0
7	CL	B	1547	1/1	1.00	0.07	-	32,32,32,32	1
5	NAG	B	1388	14/15	0.88	0.17	-	43,52,60,72	0

6.5 Other polymers [i](#)

There are no such residues in this entry.