



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 12, 2026 – 12:10 PM EDT

PDB ID : 9NMW / pdb\_00009nmw  
Title : TCR156 S30Ealpha S32Qalpha bound to HLA A\*02:01-PAP  
Authors : Jude, K.M.; Chen, X.; Garcia, K.C.  
Deposited on : 2025-03-04  
Resolution : 2.11 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](mailto: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>.

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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)  
Xtrriage (Phenix) : 2.0  
EDS : 3.0  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
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) : 2.48.1

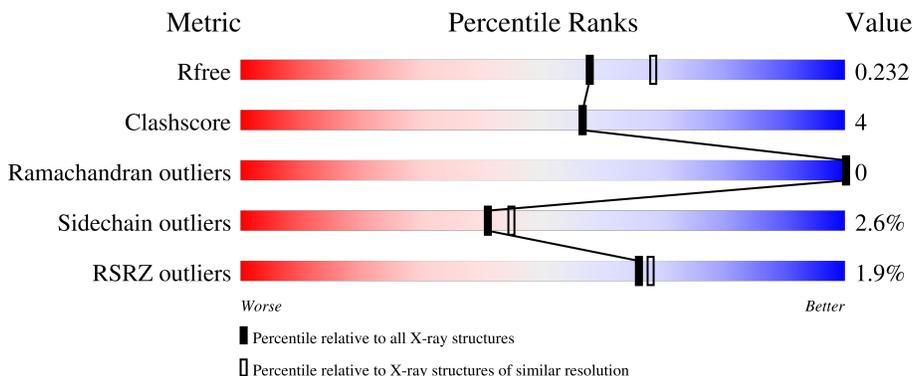
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.11 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	164625	7689 (2.14-2.10)
Clashscore	180529	8431 (2.14-2.10)
Ramachandran outliers	177936	8366 (2.14-2.10)
Sidechain outliers	177891	8367 (2.14-2.10)
RSRZ outliers	164620	7689 (2.14-2.10)

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  $\geq 3$ , 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	279	 3% 85% 13% ..
2	B	100	 84% 15% .
3	C	9	 89% 11%
4	D	255	 2% 67% 9% . 23%
5	E	307	 70% 7% 22%

## 2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 6908 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 HLA class I histocompatibility antigen, A alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	276	2261	1413	413	426	9	0	1	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	MET	-	initiating methionine	UNP A5I8L1

- Molecule 2 is a protein called Beta-2-microglobulin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	100	837	533	141	159	4	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	0	MET	-	initiating methionine	UNP P61769

- Molecule 3 is a protein called Prostatic acid phosphatase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	9	66	40	10	14	2	0	0	0

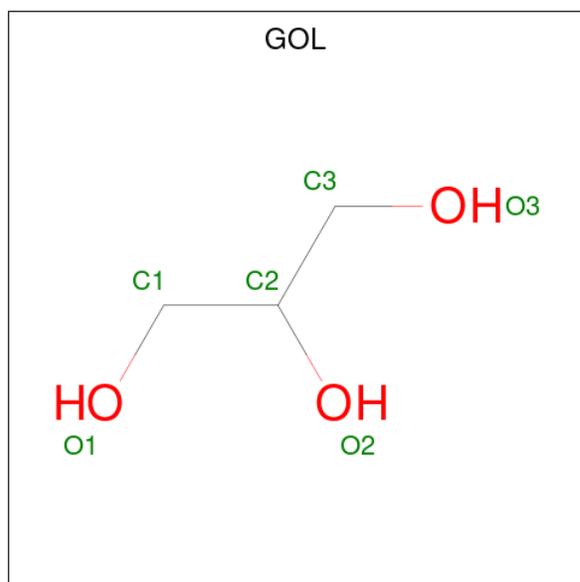
- Molecule 4 is a protein called TCR156 alpha chain S30E S32Q.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	D	197	1551	966	260	316	9	0	1	0

- Molecule 5 is a protein called TCR156 beta chain.

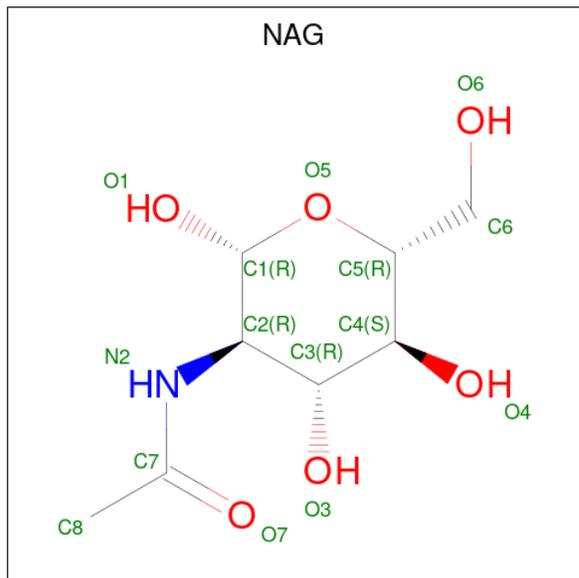
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	E	240	1910	1205	332	368	5	0	1	0

- Molecule 6 is GLYCEROL (CCD ID: GOL) (formula:  $C_3H_8O_3$ ).



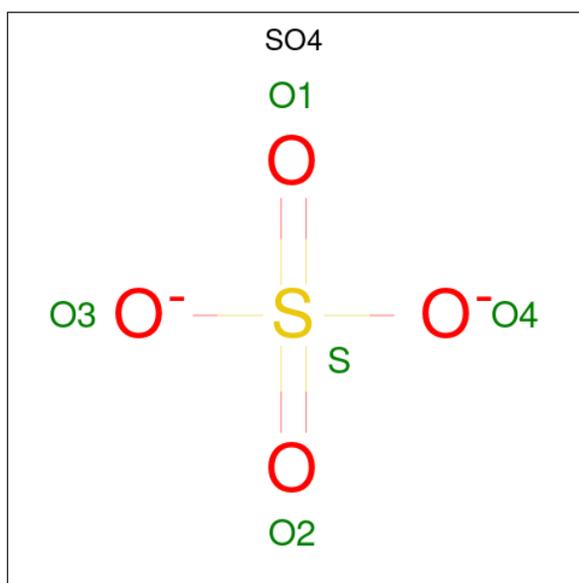
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
6	A	1	6	3	3	0	0
6	A	1	6	3	3	0	0
6	A	1	6	3	3	0	0
6	A	1	6	3	3	0	0
6	A	1	6	3	3	0	0
6	A	1	6	3	3	0	0
6	A	1	6	3	3	0	0
6	B	1	6	3	3	0	0
6	B	1	6	3	3	0	0
6	B	1	6	3	3	0	0
6	D	1	6	3	3	0	0
6	D	1	6	3	3	0	0

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula:  $C_8H_{15}NO_6$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
7	D	1	Total 14	C 8	N 1	O 5	0	0
7	D	1	Total 14	C 8	N 1	O 5	0	0
7	E	1	Total 14	C 8	N 1	O 5	0	0

- Molecule 8 is SULFATE ION (CCD ID: SO4) (formula:  $O_4S$ ).

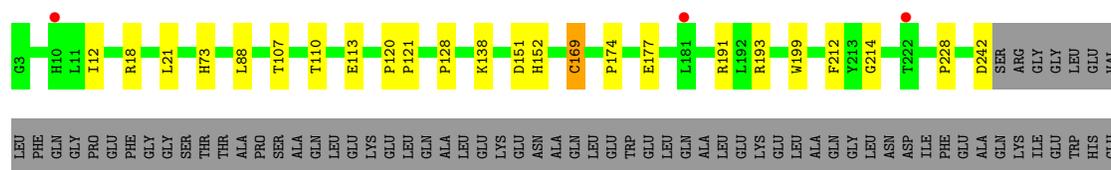


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	D	1	Total	O	S	0	0
			5	4	1		

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	59	Total	O	0	0
			59	59		
9	B	27	Total	O	0	0
			27	27		
9	C	5	Total	O	0	0
			5	5		
9	D	37	Total	O	0	0
			37	37		
9	E	42	Total	O	0	0
			42	42		





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	226.01Å 46.63Å 92.55Å 90.00° 96.08° 90.00°	Depositor
Resolution (Å)	46.02 – 2.11 46.02 – 2.11	Depositor EDS
% Data completeness (in resolution range)	98.7 (46.02-2.11) 86.0 (46.02-2.11)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	0.41 (at 2.10Å)	Xtrriage
Refinement program	PHENIX 1.21.2_5419	Depositor
R, $R_{free}$	0.194 , 0.232 0.194 , 0.232	Depositor DCC
$R_{free}$ test set	2407 reflections (4.27%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	41.1	Xtrriage
Anisotropy	0.479	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 43.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	6908	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	69.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.62% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: NAG, GOL, SO4

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	0.16	0/2330	0.33	0/3164
2	B	0.19	0/860	0.39	0/1162
3	C	0.18	0/65	0.33	0/85
4	D	0.16	0/1586	0.34	0/2147
5	E	0.16	0/1963	0.33	0/2673
All	All	0.16	0/6804	0.34	0/9231

There are no bond length outliers.

There are no bond angle outliers.

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	2261	0	2116	24	0
2	B	837	0	803	11	0
3	C	66	0	72	1	0
4	D	1551	0	1465	16	0
5	E	1910	0	1816	13	0
6	A	36	0	48	2	0
6	B	18	0	24	3	0
6	D	12	0	16	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	D	28	0	26	0	0
7	E	14	0	13	1	0
8	D	5	0	0	0	0
9	A	59	0	0	2	0
9	B	27	0	0	0	0
9	C	5	0	0	0	0
9	D	37	0	0	0	0
9	E	42	0	0	0	0
All	All	6908	0	6399	59	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 (59) 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)
4:D:149:ASP:HB2	4:D:176:LYS:HE2	1.67	0.74
1:A:250:PRO:HG2	1:A:253:GLN:HB2	1.80	0.64
1:A:227:ASP:HB3	1:A:248:VAL:HG12	1.80	0.63
4:D:25:TYR:O	4:D:70:GLN:NE2	2.30	0.63
4:D:163:MET:HE1	5:E:138:LYS:HE3	1.79	0.63
4:D:141:ASN:H	4:D:189:ILE:HD11	1.67	0.59
2:B:64:LEU:HD11	6:B:201:GOL:H31	1.85	0.57
5:E:120:PRO:HD3	5:E:228:PRO:HB3	1.88	0.56
4:D:193:ASP:OD1	4:D:193:ASP:N	2.38	0.55
4:D:13:VAL:HG22	4:D:17:ALA:HB3	1.89	0.54
1:A:220:ASP:N	1:A:256:ARG:O	2.32	0.54
1:A:118:TYR:HD2	6:A:301:GOL:H31	1.71	0.54
5:E:151:ASP:HB2	5:E:174:PRO:HG2	1.90	0.54
5:E:12:ILE:HD12	5:E:214:GLY:HA2	1.89	0.53
4:D:23:CYS:HB3	4:D:72:VAL:HG13	1.91	0.52
5:E:110:THR:OG1	5:E:152:HIS:NE2	2.35	0.50
1:A:117:ALA:HB2	2:B:60:TRP:CE2	2.46	0.50
1:A:14[B]:ARG:HD2	1:A:19:GLU:O	2.13	0.48
2:B:22:PHE:CE2	2:B:69:GLU:HG2	2.48	0.48
2:B:24:ASN:HB3	2:B:65:LEU:HD11	1.95	0.48
1:A:74:HIS:CD2	1:A:97:ARG:HH21	2.31	0.48
1:A:146:LYS:NZ	9:A:410:HOH:O	2.48	0.47
1:A:51:TRP:CZ2	1:A:179:LEU:HD11	2.49	0.47
4:D:170:ALA:HA	5:E:191:ARG:HH21	1.79	0.47
4:D:135:ASP:OD1	5:E:193:ARG:NH1	2.37	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:201:LEU:HD11	1:A:254:GLU:HB3	1.97	0.46
4:D:189:ILE:H	4:D:189:ILE:HG13	1.58	0.46
1:A:66:LYS:NZ	3:C:2:LEU:O	2.49	0.46
1:A:133:TRP:HH2	1:A:156:LEU:HD22	1.82	0.45
5:E:128:PRO:HD2	5:E:199:TRP:CZ2	2.51	0.45
2:B:96:ASP:HB3	6:B:203:GOL:H32	1.99	0.45
1:A:65:ARG:NH1	9:A:401:HOH:O	2.29	0.44
4:D:166:LYS:HE3	6:D:303:GOL:H11	1.99	0.44
4:D:48:MET:HE2	4:D:48:MET:HB3	1.62	0.44
4:D:187:ASN:O	4:D:187:ASN:ND2	2.44	0.44
5:E:21:LEU:HD22	5:E:107:THR:HG21	1.98	0.44
1:A:28:VAL:HG11	1:A:179:LEU:HD13	2.00	0.43
6:A:306:GOL:H32	2:B:60:TRP:HD1	1.83	0.43
1:A:197:HIS:HA	1:A:251:SER:HB3	1.99	0.43
1:A:218:GLN:HB2	1:A:223:ASP:HA	2.01	0.43
4:D:36:TYR:HB2	4:D:88:LEU:HB2	2.01	0.43
5:E:121:PRO:HD3	5:E:212:PHE:CD1	2.53	0.43
1:A:14[B]:ARG:NH2	1:A:21:ARG:HD2	2.34	0.43
1:A:121:LYS:HB2	1:A:121:LYS:HE2	1.90	0.43
2:B:70:PHE:CZ	2:B:72:PRO:HG3	2.52	0.43
1:A:218:GLN:NE2	1:A:221:GLY:HA2	2.34	0.43
2:B:99:MET:HE3	6:B:203:GOL:H32	2.01	0.42
2:B:97:ARG:HE	2:B:97:ARG:HB2	1.58	0.42
2:B:27:VAL:HG12	2:B:30:PHE:CE1	2.54	0.42
5:E:169:CYS:SG	5:E:191:ARG:HD3	2.60	0.42
1:A:190:THR:OG1	1:A:202:ARG:HB3	2.20	0.42
5:E:18:ARG:NH2	7:E:401:NAG:O5	2.52	0.42
1:A:49:ALA:O	1:A:52:ILE:HG22	2.20	0.41
2:B:29:GLY:HA2	2:B:61:SER:OG	2.21	0.41
1:A:129:ASP:O	1:A:131:ARG:NH1	2.54	0.41
4:D:195:PHE:CZ	4:D:197:PRO:HB3	2.56	0.41
1:A:220:ASP:OD2	1:A:256:ARG:NH1	2.54	0.40
4:D:151:TYR:CE1	5:E:177:GLU:HA	2.56	0.40
1:A:5:MET:HB2	1:A:168:LEU:HD13	2.02	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	275/279 (99%)	268 (98%)	7 (2%)	0	100	100
2	B	98/100 (98%)	96 (98%)	2 (2%)	0	100	100
3	C	7/9 (78%)	7 (100%)	0	0	100	100
4	D	196/255 (77%)	191 (97%)	5 (3%)	0	100	100
5	E	239/307 (78%)	235 (98%)	4 (2%)	0	100	100
All	All	815/950 (86%)	797 (98%)	18 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 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	233/235 (99%)	228 (98%)	5 (2%)	48	54
2	B	95/95 (100%)	93 (98%)	2 (2%)	48	54
3	C	8/8 (100%)	8 (100%)	0	100	100
4	D	177/223 (79%)	169 (96%)	8 (4%)	23	22
5	E	208/261 (80%)	203 (98%)	5 (2%)	44	48
All	All	721/822 (88%)	701 (97%)	20 (3%)	41	41

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	121	LYS
1	A	197	HIS
1	A	198	GLU
1	A	224	GLN
1	A	254	GLU
2	B	50	GLU
2	B	70	PHE
4	D	48	MET
4	D	77[A]	ARG
4	D	77[B]	ARG
4	D	124	LYS
4	D	148	SER
4	D	177	SER
4	D	189	ILE
4	D	193	ASP
5	E	73	HIS
5	E	88	LEU
5	E	113	GLU
5	E	169	CYS
5	E	242	ASP

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	54	GLN
1	A	191	HIS
1	A	218	GLN
1	A	255	GLN
3	C	8	ASN
4	D	92	ASN
5	E	59	ASN
5	E	182	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

15 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
6	GOL	B	203	-	5,5,5	0.40	0	5,5,5	0.42	0
6	GOL	D	303	-	5,5,5	0.34	0	5,5,5	0.34	0
7	NAG	D	301	4	14,14,15	0.67	0	17,19,21	1.27	2 (11%)
6	GOL	B	201	-	5,5,5	0.34	0	5,5,5	0.35	0
6	GOL	D	304	-	5,5,5	0.32	0	5,5,5	0.36	0
6	GOL	A	305	-	5,5,5	0.34	0	5,5,5	0.38	0
7	NAG	D	302	4	14,14,15	0.71	0	17,19,21	1.08	1 (5%)
8	SO4	D	305	-	4,4,4	0.69	0	6,6,6	0.05	0
7	NAG	E	401	5	14,14,15	0.75	0	17,19,21	0.78	0
6	GOL	A	304	-	5,5,5	0.32	0	5,5,5	0.43	0
6	GOL	A	306	-	5,5,5	0.29	0	5,5,5	0.36	0
6	GOL	B	202	-	5,5,5	0.33	0	5,5,5	0.39	0
6	GOL	A	302	-	5,5,5	0.32	0	5,5,5	0.51	0
6	GOL	A	301	-	5,5,5	0.23	0	5,5,5	0.41	0
6	GOL	A	303	-	5,5,5	0.34	0	5,5,5	0.38	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	GOL	B	203	-	-	2/4/4/4	-
6	GOL	D	303	-	-	4/4/4/4	-
7	NAG	D	301	4	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	GOL	B	201	-	-	4/4/4/4	-
6	GOL	D	304	-	-	2/4/4/4	-
6	GOL	A	305	-	-	2/4/4/4	-
7	NAG	D	302	4	-	1/6/23/26	0/1/1/1
7	NAG	E	401	5	-	2/6/23/26	0/1/1/1
6	GOL	A	304	-	-	4/4/4/4	-
6	GOL	A	306	-	-	4/4/4/4	-
6	GOL	B	202	-	-	0/4/4/4	-
6	GOL	A	302	-	-	4/4/4/4	-
6	GOL	A	301	-	-	2/4/4/4	-
6	GOL	A	303	-	-	2/4/4/4	-

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	D	301	NAG	C2-N2-C7	2.80	126.65	122.90
7	D	302	NAG	C1-O5-C5	2.57	115.64	112.19
7	D	301	NAG	C1-O5-C5	2.12	115.02	112.19

There are no chirality outliers.

All (35) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	301	GOL	C1-C2-C3-O3
6	A	301	GOL	O2-C2-C3-O3
6	A	304	GOL	C1-C2-C3-O3
6	A	304	GOL	O2-C2-C3-O3
6	A	306	GOL	C1-C2-C3-O3
6	B	201	GOL	O2-C2-C3-O3
6	B	203	GOL	C1-C2-C3-O3
6	D	303	GOL	C1-C2-C3-O3
7	E	401	NAG	O5-C5-C6-O6
6	A	302	GOL	O1-C1-C2-C3
6	A	302	GOL	C1-C2-C3-O3
6	A	303	GOL	C1-C2-C3-O3
6	A	304	GOL	O1-C1-C2-C3
6	A	305	GOL	C1-C2-C3-O3
6	A	306	GOL	O1-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
6	B	201	GOL	C1-C2-C3-O3
6	D	303	GOL	O1-C1-C2-C3
6	D	304	GOL	C1-C2-C3-O3
6	A	302	GOL	O2-C2-C3-O3
6	A	303	GOL	O2-C2-C3-O3
6	A	305	GOL	O2-C2-C3-O3
6	A	306	GOL	O2-C2-C3-O3
6	D	303	GOL	O1-C1-C2-O2
6	D	303	GOL	O2-C2-C3-O3
7	E	401	NAG	C4-C5-C6-O6
6	D	304	GOL	O2-C2-C3-O3
6	B	203	GOL	O2-C2-C3-O3
7	D	301	NAG	C1-C2-N2-C7
6	A	302	GOL	O1-C1-C2-O2
6	A	304	GOL	O1-C1-C2-O2
6	A	306	GOL	O1-C1-C2-O2
7	D	301	NAG	C3-C2-N2-C7
6	B	201	GOL	O1-C1-C2-C3
7	D	302	NAG	O5-C5-C6-O6
6	B	201	GOL	O1-C1-C2-O2

There are no ring outliers.

6 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	203	GOL	2	0
6	D	303	GOL	1	0
6	B	201	GOL	1	0
7	E	401	NAG	1	0
6	A	306	GOL	1	0
6	A	301	GOL	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

### 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	276/279 (98%)	0.24	7 (2%) 58 60	30, 59, 129, 152	1 (0%)
2	B	100/100 (100%)	-0.01	0 100 100	40, 55, 87, 94	0
3	C	9/9 (100%)	-0.34	0 100 100	40, 44, 45, 45	0
4	D	197/255 (77%)	0.40	6 (3%) 52 55	32, 64, 126, 153	1 (0%)
5	E	240/307 (78%)	0.28	3 (1%) 74 76	41, 69, 104, 130	1 (0%)
All	All	822/950 (86%)	0.25	16 (1%) 66 68	30, 63, 120, 153	3 (0%)

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1	GLY	2.9
1	A	276	PRO	2.8
4	D	190	ILE	2.8
4	D	189	ILE	2.6
4	D	145	SER	2.5
5	E	10	HIS	2.5
4	D	126	SER	2.5
5	E	181	LEU	2.4
5	E	222	THR	2.3
4	D	125	SER	2.3
1	A	193	ALA	2.3
1	A	91	GLY	2.2
1	A	90	ALA	2.2
4	D	117	VAL	2.2
1	A	274	TRP	2.1
1	A	194	VAL	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 [i](#)

There are no oligosaccharides in this entry.

## 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, 95<sup>th</sup> 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
6	GOL	A	303	6/6	0.67	0.21	74,81,95,98	0
6	GOL	D	303	6/6	0.69	0.17	89,96,97,102	0
7	NAG	D	302	14/15	0.70	0.11	106,114,120,120	0
6	GOL	A	302	6/6	0.71	0.22	67,70,75,87	0
6	GOL	B	203	6/6	0.71	0.17	59,68,71,77	0
6	GOL	A	306	6/6	0.73	0.17	62,74,83,93	0
6	GOL	A	301	6/6	0.76	0.19	65,69,71,75	0
6	GOL	D	304	6/6	0.78	0.15	61,76,82,83	0
6	GOL	B	202	6/6	0.78	0.15	66,83,92,98	0
8	SO4	D	305	5/5	0.81	0.15	85,86,86,103	5
6	GOL	A	304	6/6	0.82	0.17	77,82,92,99	0
6	GOL	A	305	6/6	0.86	0.14	70,78,83,90	0
6	GOL	B	201	6/6	0.86	0.14	58,58,62,69	0
7	NAG	E	401	14/15	0.88	0.11	59,73,85,92	0
7	NAG	D	301	14/15	0.93	0.08	51,62,72,72	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.