



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 27, 2023 – 08:56 PM EDT

PDB ID : 3H9S  
Title : The complex between TCR A6 and human Class I MHC HLA-A2 with the bound Tellp peptide  
Authors : Borbulevych, O.Y.; Baker, B.M.  
Deposited on : 2009-04-30  
Resolution : 2.70 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>.

---

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.35  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35

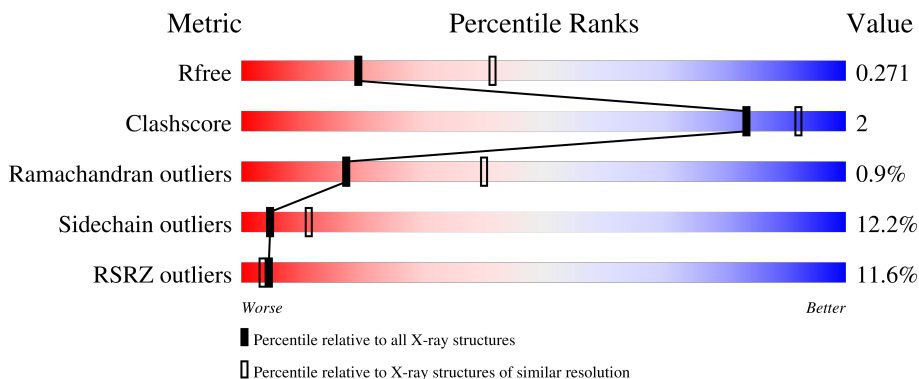
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.70 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))
$R_{free}$	130704	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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	275	13% (Poor fit) 86% (0-1 outliers) 13% (2-3 outliers)
2	B	100	4% (Poor fit) 85% (0-1 outliers) 13% (2-3 outliers)
3	C	9	44% (0-1 outliers) 44% (2 outliers) 11% (3 outliers)
4	D	200	20% (Poor fit) 80% (0-1 outliers) 17% (2-3 outliers)
5	E	245	7% (Poor fit) 83% (0-1 outliers) 15% (2-3 outliers)

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
6	GOL	A	277	-	-	-	X
6	GOL	D	207	-	X	-	-

## 2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 6723 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-2 alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	275	2247	1403	409	426	9	0	0	0

- 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	-	insertion	UNP P61769

- Molecule 3 is a protein called Tel1p peptide.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	9	83	58	11	13	1	0	0	0

- Molecule 4 is a protein called A6 TCR alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	D	200	1552	965	255	325	7	0	0	0

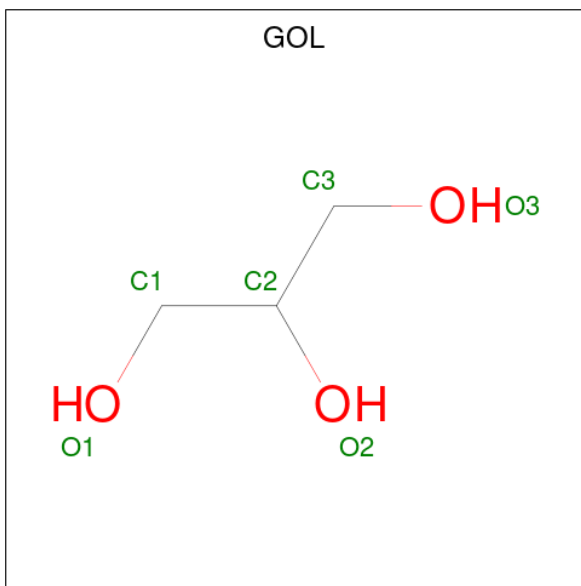
- Molecule 5 is a protein called TRBV6-5 protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	E	245	1928	1209	338	373	8	0	0	0

There are 11 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	?	-	SER	deletion	UNP Q2YDB4
E	98	LEU	-	insertion	UNP Q2YDB4
E	99	ALA	-	insertion	UNP Q2YDB4
E	100	GLY	GLN	conflict	UNP Q2YDB4
E	102	ARG	THR	conflict	UNP Q2YDB4
E	103	PRO	GLU	conflict	UNP Q2YDB4
E	105	GLU	THR	conflict	UNP Q2YDB4
E	115	THR	LEU	conflict	UNP Q2YDB4
E	116A	THR	LEU	conflict	UNP Q2YDB4
E	191	ALA	CYS	conflict	UNP Q2YDB4
E	205	ASP	ASN	conflict	UNP Q2YDB4

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula:  $C_3H_8O_3$ ).



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

*Continued on next page...*

*Continued from previous page...*

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

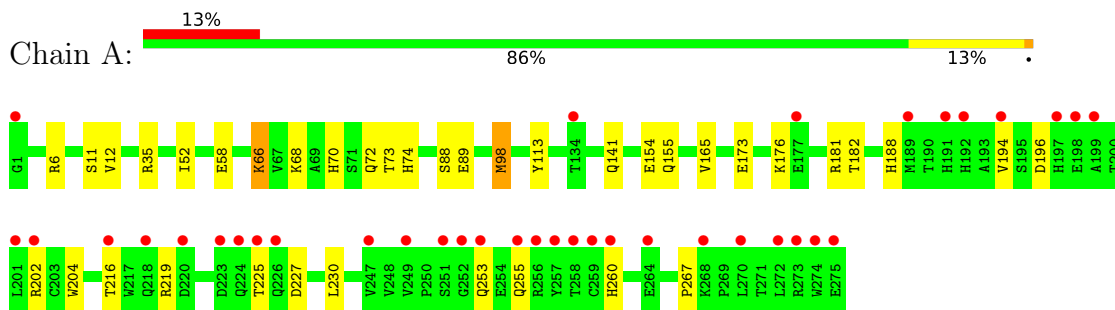
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	14	Total	O	0	0
			14	14		
7	B	8	Total	O	0	0
			8	8		
7	C	1	Total	O	0	0
			1	1		
7	D	5	Total	O	0	0
			5	5		
7	E	12	Total	O	0	0
			12	12		

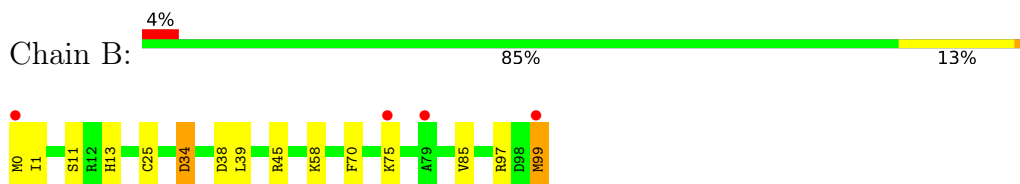
### 3 Residue-property plots [i](#)

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.

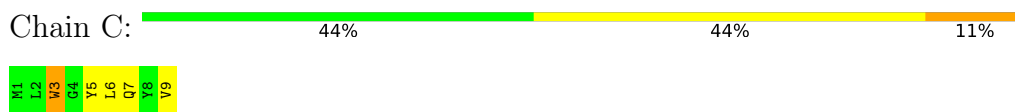
- Molecule 1: HLA class I histocompatibility antigen, A-2 alpha chain



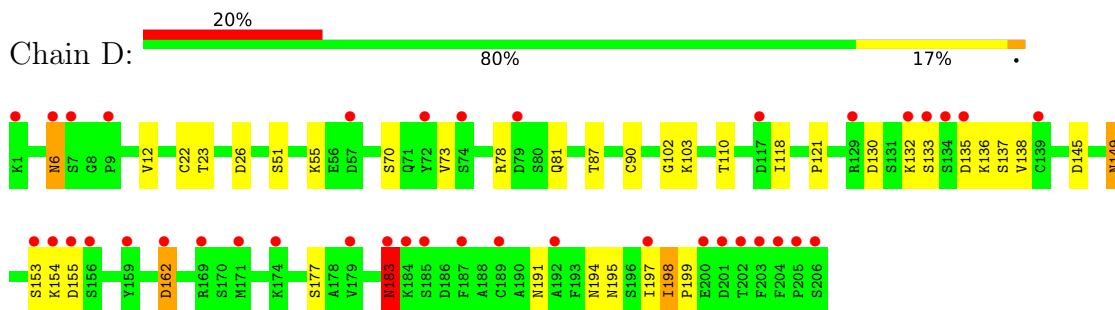
- Molecule 2: Beta-2-microglobulin



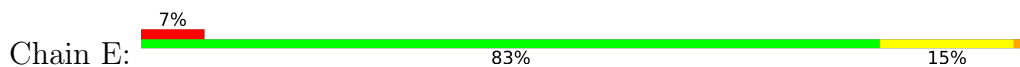
- Molecule 3: Tel1p peptide

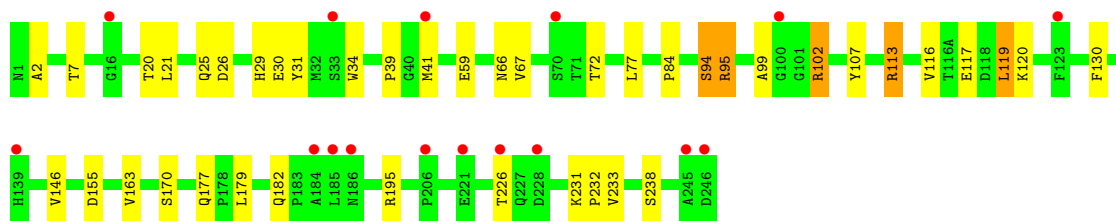


- Molecule 4: A6 TCR alpha chain



- Molecule 5: TRBV6-5 protein







## 4 Data and refinement statistics i

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	223.11Å 48.31Å 92.48Å 90.00° 90.97° 90.00°	Depositor
Resolution (Å)	20.00 – 2.70 19.96 – 2.70	Depositor EDS
% Data completeness (in resolution range)	99.4 (20.00-2.70) 99.4 (19.96-2.70)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.96 (at 2.71Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.217 , 0.289 0.210 , 0.271	Depositor DCC
$R_{free}$ test set	1387 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	57.4	Xtrriage
Anisotropy	0.161	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , 61.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.024 for -h,-k,l	Xtrriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	6723	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	62.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.11% 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: GOL

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	0.65	0/2312	0.77	0/3137
2	B	0.73	0/860	0.83	0/1162
3	C	0.93	0/86	1.41	2/115 (1.7%)
4	D	0.62	2/1585 (0.1%)	0.75	1/2150 (0.0%)
5	E	0.65	0/1981	0.87	4/2699 (0.1%)
All	All	0.66	2/6824 (0.0%)	0.81	7/9263 (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
4	D	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	90	CYS	CB-SG	-6.51	1.71	1.82
4	D	22	CYS	CB-SG	-6.29	1.71	1.82

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	113	ARG	NE-CZ-NH1	7.15	123.88	120.30
5	E	113	ARG	NE-CZ-NH2	-7.01	116.79	120.30
5	E	119	LEU	CA-CB-CG	6.56	130.39	115.30
5	E	113	ARG	CG-CD-NE	5.86	124.11	111.80
3	C	6	LEU	CA-CB-CG	5.82	128.69	115.30
3	C	3	TRP	CA-CB-CG	5.80	124.71	113.70

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	26	ASP	CB-CG-OD1	5.02	122.82	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	D	121	PRO	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	2247	0	2096	7	0
2	B	837	0	803	5	0
3	C	83	0	81	2	0
4	D	1552	0	1461	11	0
5	E	1928	0	1830	12	0
6	A	18	0	24	0	0
6	B	6	0	8	0	0
6	D	6	0	8	0	0
6	E	6	0	8	0	0
7	A	14	0	0	0	0
7	B	8	0	0	0	0
7	C	1	0	0	0	0
7	D	5	0	0	0	0
7	E	12	0	0	0	0
All	All	6723	0	6319	31	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 2.

All (31) 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:102:GLY:O	5:E:95:ARG:NH2	2.24	0.64

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:153:SER:OG	4:D:154:LYS:N	2.30	0.64
4:D:162:ASP:OD1	4:D:162:ASP:N	2.32	0.60
2:B:38:ASP:OD2	2:B:45:ARG:NE	2.35	0.59
5:E:155:ASP:N	5:E:155:ASP:OD1	2.41	0.54
2:B:25:CYS:HB2	2:B:39:LEU:HD21	1.91	0.51
1:A:70:HIS:O	1:A:74:HIS:HD2	1.95	0.50
4:D:118:ILE:HD11	4:D:145:ASP:HA	1.95	0.49
5:E:102:ARG:NH2	5:E:107:TYR:OH	2.46	0.48
3:C:3:TRP:CH2	3:C:5:TYR:HB3	2.49	0.47
5:E:29:HIS:ND1	5:E:94:SER:OG	2.38	0.47
4:D:138:VAL:HG11	5:E:146:VAL:HG21	1.95	0.47
5:E:231:LYS:HA	5:E:232:PRO:HD3	1.75	0.47
2:B:11:SER:OG	2:B:13:HIS:O	2.32	0.46
1:A:202:ARG:NH1	2:B:99:MET:SD	2.90	0.45
4:D:149:ASN:N	4:D:149:ASN:OD1	2.49	0.45
1:A:6:ARG:HD3	1:A:98:MET:HE1	1.98	0.44
5:E:84:PRO:HA	5:E:116:VAL:HB	2.00	0.44
1:A:155:GLN:HB3	3:C:3:TRP:HH2	1.83	0.44
5:E:102:ARG:HH21	5:E:102:ARG:HB2	1.82	0.44
4:D:132:LYS:HB3	4:D:133:SER:H	1.48	0.43
1:A:154:GLU:OE2	4:D:55:LYS:NZ	2.48	0.43
4:D:130:ASP:HA	5:E:130:PHE:HA	2.01	0.43
4:D:198:ILE:HA	4:D:199:PRO:HD2	1.73	0.43
4:D:183:ASN:OD1	4:D:183:ASN:N	2.35	0.43
1:A:188:HIS:HB3	1:A:204:TRP:HB2	2.01	0.42
5:E:34:TRP:CE2	5:E:77:LEU:HB2	2.54	0.42
5:E:30:GLU:HG3	5:E:99:ALA:HB2	2.00	0.42
5:E:231:LYS:HG2	5:E:233:VAL:HG13	2.02	0.41
2:B:34:ASP:OD1	2:B:34:ASP:N	2.51	0.41
1:A:66:LYS:HB2	1:A:66:LYS:HE3	1.77	0.41

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	273/275 (99%)	257 (94%)	15 (6%)	1 (0%)	34	60
2	B	98/100 (98%)	95 (97%)	3 (3%)	0	100	100
3	C	7/9 (78%)	7 (100%)	0	0	100	100
4	D	198/200 (99%)	179 (90%)	15 (8%)	4 (2%)	7	19
5	E	243/245 (99%)	230 (95%)	11 (4%)	2 (1%)	19	43
All	All	819/829 (99%)	768 (94%)	44 (5%)	7 (1%)	17	40

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	E	2	ALA
4	D	135	ASP
4	D	183	ASN
1	A	267	PRO
4	D	6	ASN
4	D	191	ASN
5	E	39	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	231/231 (100%)	202 (87%)	29 (13%)	4	10
2	B	95/95 (100%)	86 (90%)	9 (10%)	8	20
3	C	8/8 (100%)	6 (75%)	2 (25%)	0	1
4	D	178/178 (100%)	156 (88%)	22 (12%)	4	11
5	E	209/209 (100%)	183 (88%)	26 (12%)	4	11
All	All	721/721 (100%)	633 (88%)	88 (12%)	5	11

All (88) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	11	SER
1	A	12	VAL
1	A	35	ARG
1	A	52	ILE
1	A	58	GLU
1	A	66	LYS
1	A	68	LYS
1	A	72	GLN
1	A	73	THR
1	A	88	SER
1	A	89	GLU
1	A	98	MET
1	A	113	TYR
1	A	141	GLN
1	A	165	VAL
1	A	173	GLU
1	A	176	LYS
1	A	181	ARG
1	A	182	THR
1	A	194	VAL
1	A	196	ASP
1	A	216	THR
1	A	219	ARG
1	A	225	THR
1	A	227	ASP
1	A	230	LEU
1	A	253	GLN
1	A	255	GLN
1	A	260	HIS
2	B	0	MET
2	B	1	ILE
2	B	34	ASP
2	B	58	LYS
2	B	70	PHE
2	B	75	LYS
2	B	85	VAL
2	B	97	ARG
2	B	99	MET
3	C	7	GLN
3	C	9	VAL
4	D	6	ASN
4	D	12	VAL
4	D	23	THR

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
4	D	51	SER
4	D	70	SER
4	D	73	VAL
4	D	78	ARG
4	D	81	GLN
4	D	87	THR
4	D	103	LYS
4	D	110	THR
4	D	136	LYS
4	D	137	SER
4	D	149	ASN
4	D	155	ASP
4	D	162	ASP
4	D	177	SER
4	D	183	ASN
4	D	194	ASN
4	D	195	ASN
4	D	197	ILE
4	D	198	ILE
5	E	7	THR
5	E	20	THR
5	E	21	LEU
5	E	25	GLN
5	E	26	ASP
5	E	31	TYR
5	E	41	MET
5	E	59	GLU
5	E	66	ASN
5	E	67	VAL
5	E	72	THR
5	E	94	SER
5	E	95	ARG
5	E	102	ARG
5	E	113	ARG
5	E	117	GLU
5	E	119	LEU
5	E	120	LYS
5	E	163	VAL
5	E	170	SER
5	E	177	GLN
5	E	179	LEU
5	E	182	GLN

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
5	E	195	ARG
5	E	226	THR
5	E	238	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	253	GLN
2	B	2	GLN
4	D	37	GLN
4	D	111	GLN
4	D	119	GLN
4	D	152	GLN
5	E	37	GLN

### 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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

6 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	A	278	-	5,5,5	0.31	0	5,5,5	0.66	0
6	GOL	D	207	-	5,5,5	2.68	3 (60%)	5,5,5	2.38	2 (40%)
6	GOL	E	247	-	5,5,5	0.25	0	5,5,5	0.87	0
6	GOL	A	277	-	5,5,5	0.50	0	5,5,5	0.51	0
6	GOL	A	276	-	5,5,5	0.36	0	5,5,5	0.42	0
6	GOL	B	100	-	5,5,5	0.33	0	5,5,5	0.34	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	A	278	-	-	4/4/4/4	-
6	GOL	D	207	-	-	2/4/4/4	-
6	GOL	E	247	-	-	4/4/4/4	-
6	GOL	A	277	-	-	4/4/4/4	-
6	GOL	A	276	-	-	2/4/4/4	-
6	GOL	B	100	-	-	2/4/4/4	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	D	207	GOL	O2-C2	4.02	1.55	1.43
6	D	207	GOL	C1-C2	3.51	1.66	1.51
6	D	207	GOL	C3-C2	2.71	1.62	1.51

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	D	207	GOL	O2-C2-C1	-4.27	90.30	109.12
6	D	207	GOL	O3-C3-C2	-2.78	96.89	110.20

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	277	GOL	O1-C1-C2-C3
6	A	277	GOL	C1-C2-C3-O3
6	A	278	GOL	C1-C2-C3-O3

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms
6	D	207	GOL	O1-C1-C2-C3
6	E	247	GOL	C1-C2-C3-O3
6	A	276	GOL	O1-C1-C2-C3
6	A	276	GOL	O1-C1-C2-O2
6	A	277	GOL	O1-C1-C2-O2
6	A	277	GOL	O2-C2-C3-O3
6	A	278	GOL	O2-C2-C3-O3
6	D	207	GOL	O1-C1-C2-O2
6	A	278	GOL	O1-C1-C2-O2
6	B	100	GOL	O2-C2-C3-O3
6	E	247	GOL	O1-C1-C2-O2
6	E	247	GOL	O2-C2-C3-O3
6	E	247	GOL	O1-C1-C2-C3
6	B	100	GOL	C1-C2-C3-O3
6	A	278	GOL	O1-C1-C2-C3

There are no ring outliers.

No monomer is involved in short contacts.

## 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	275/275 (100%)	0.70	37 (13%) <b>3</b> <b>2</b>	50, 61, 71, 77	0
2	B	100/100 (100%)	0.38	4 (4%) 38 37	49, 62, 71, 86	0
3	C	9/9 (100%)	0.88	0 <b>100</b> <b>100</b>	61, 66, 73, 73	0
4	D	200/200 (100%)	0.98	39 (19%) <b>1</b> <b>0</b>	54, 64, 75, 82	0
5	E	245/245 (100%)	0.42	16 (6%) 18 17	54, 62, 73, 82	0
All	All	829/829 (100%)	0.65	96 (11%) <b>4</b> <b>3</b>	49, 62, 73, 86	0

All (96) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	D	200	GLU	8.3
4	D	205	PRO	7.9
4	D	133	SER	7.0
5	E	245	ALA	6.8
4	D	171	MET	6.5
1	A	273	ARG	6.4
4	D	183	ASN	6.3
4	D	203	PHE	5.4
5	E	246	ASP	5.3
1	A	220	ASP	5.1
4	D	206	SER	5.0
4	D	184	LYS	5.0
2	B	99	MET	4.9
1	A	252	GLY	4.7
5	E	228	ASP	4.5
5	E	123	PHE	4.4
1	A	251	SER	4.4
4	D	154	LYS	4.4
1	A	218	GLN	4.3
1	A	260	HIS	4.2

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
4	D	202	THR	4.2
1	A	256	ARG	4.1
1	A	257	TYR	4.1
4	D	1	LYS	4.0
1	A	258	THR	4.0
1	A	198	GLU	4.0
5	E	226	THR	3.7
4	D	139	CYS	3.7
4	D	134	SER	3.6
1	A	223	ASP	3.6
1	A	255	GLN	3.6
1	A	199	ALA	3.6
1	A	275	GLU	3.5
1	A	253	GLN	3.5
4	D	153	SER	3.5
4	D	156	SER	3.4
4	D	135	ASP	3.4
4	D	79	ASP	3.4
4	D	57	ASP	3.3
5	E	186	ASN	3.3
4	D	169	ARG	3.2
1	A	272	LEU	3.1
2	B	0	MET	3.1
5	E	16	GLY	3.1
1	A	247	VAL	3.1
5	E	185	LEU	3.0
1	A	189	MET	3.0
5	E	221	GLU	3.0
4	D	129	ARG	3.0
1	A	177	GLU	3.0
1	A	270	LEU	3.0
4	D	132	LYS	2.9
5	E	206	PRO	2.9
1	A	134	THR	2.8
1	A	191	HIS	2.8
4	D	7	SER	2.7
2	B	75	LYS	2.7
4	D	162	ASP	2.7
1	A	274	TRP	2.7
4	D	189	CYS	2.7
1	A	264	GLU	2.6
4	D	185	SER	2.6

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
4	D	9	PRO	2.6
1	A	1	GLY	2.6
1	A	226	GLN	2.5
1	A	192	HIS	2.5
4	D	201	ASP	2.5
1	A	225	THR	2.4
4	D	74	SER	2.4
1	A	249	VAL	2.4
4	D	204	PHE	2.4
4	D	155	ASP	2.4
5	E	41	MET	2.3
1	A	224	GLN	2.3
4	D	192	ALA	2.3
1	A	201	LEU	2.3
5	E	33	SER	2.3
1	A	216	THR	2.3
4	D	6	ASN	2.3
4	D	179	VAL	2.3
4	D	174	LYS	2.2
1	A	194	VAL	2.2
1	A	268	LYS	2.2
5	E	70	SER	2.2
2	B	79	ALA	2.2
1	A	202	ARG	2.2
4	D	197	ILE	2.1
5	E	100	GLY	2.1
4	D	187	PHE	2.1
4	D	72	TYR	2.1
4	D	159	TYR	2.1
5	E	139	HIS	2.1
1	A	259	CYS	2.1
4	D	117	ASP	2.0
5	E	184	ALA	2.0
1	A	197	HIS	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 monosaccharides 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(Å <sup>2</sup> )	Q<0.9
6	GOL	A	277	6/6	0.45	0.47	78,78,79,79	0
6	GOL	E	247	6/6	0.81	0.53	50,51,52,55	0
6	GOL	B	100	6/6	0.83	0.32	76,76,76,77	0
6	GOL	D	207	6/6	0.88	0.33	49,49,49,49	6
6	GOL	A	276	6/6	0.89	0.36	61,62,62,63	0
6	GOL	A	278	6/6	0.94	0.36	70,71,71,72	0

### 6.5 Other polymers [i](#)

There are no such residues in this entry.