



Full wwPDB X-ray Structure Validation Report ⓘ

May 15, 2020 – 08:01 pm BST

PDB ID : 3D39
Title : The complex between TCR A6 and human Class I MHC HLA-A2 with the modified HTLV-1 TAX (Y5(4-fluoroPhenylalanine)) peptide
Authors : Borbulevych, O.Y.; Clemens, J.R.; Baker, B.M.
Deposited on : 2008-05-09
Resolution : 2.81 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 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 : 2.11
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) : 2.11

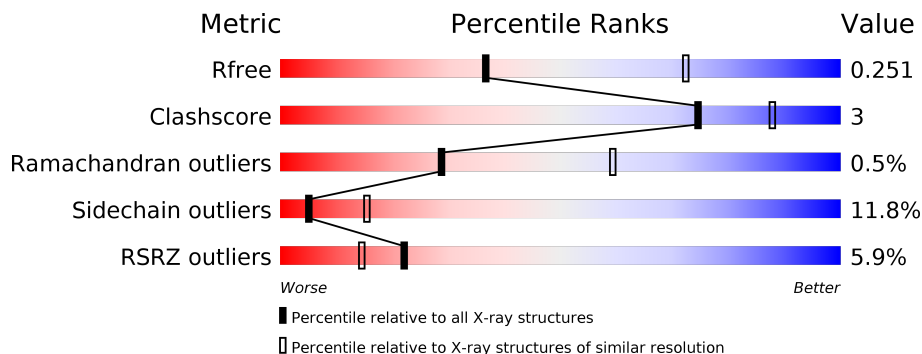
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.81 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	3617 (2.84-2.80)
Clashscore	141614	4060 (2.84-2.80)
Ramachandran outliers	138981	3978 (2.84-2.80)
Sidechain outliers	138945	3980 (2.84-2.80)
RSRZ outliers	127900	3552 (2.84-2.80)

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 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	<div style="display: flex; align-items: center;"> <div style="width: 8%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 87%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 12%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: red;"></div> </div> <p style="text-align: center;">8% 87% 12% •</p>
2	B	100	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 88%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 11%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: red;"></div> </div> <p style="text-align: center;">% 88% 11% •</p>
3	C	9	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 89%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 11%; height: 10px; background-color: yellow; margin-right: 5px;"></div> </div> <p style="text-align: center;">89% 11%</p>
4	D	200	<div style="display: flex; align-items: center;"> <div style="width: 9%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 78%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 21%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: red;"></div> </div> <p style="text-align: center;">9% 78% 21% ••</p>
5	E	245	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 79%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 18%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: red;"></div> </div> <p style="text-align: center;">4% 79% 18% •</p>

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 6718 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	-	EXPRESSION TAG	UNP P61769

- Molecule 3 is a protein called Modified HTLV-1 TAX (Y5(4fluoro)F) peptide.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	F	N	O			
3	C	9	77	56	1	9	11	0	0	0

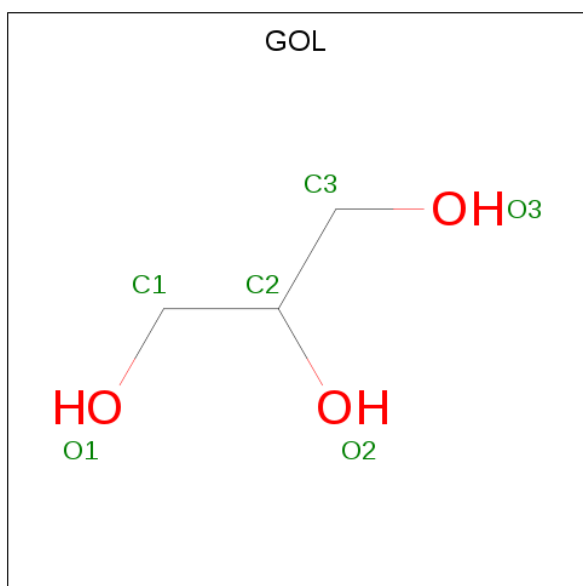
- Molecule 4 is a protein called A6 TCR alpha chain.

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 A6 TCR beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	E	245	1928	1209	339	372	8	0	0	0

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



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

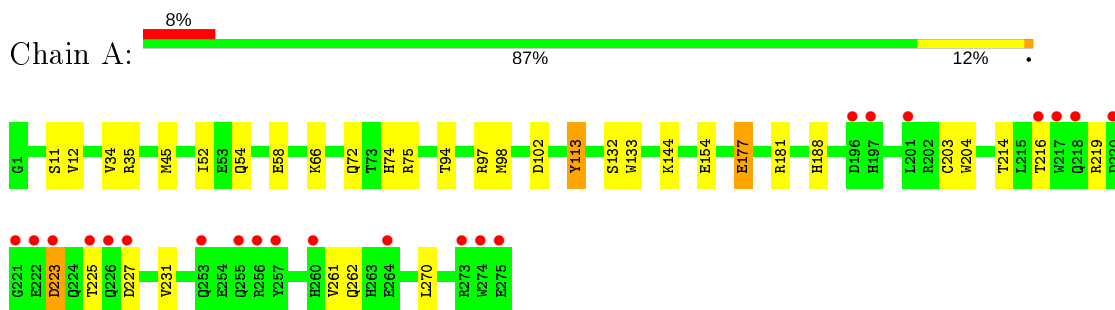
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	18	Total O 18 18	0	0
7	B	13	Total O 13 13	0	0
7	D	8	Total O 8 8	0	0
7	E	14	Total O 14 14	0	0

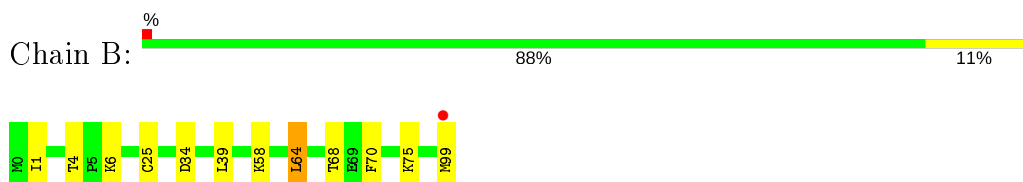
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of 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.

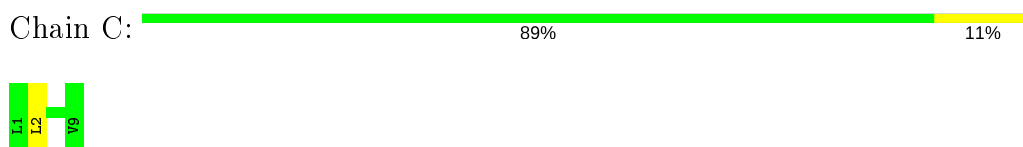
- Molecule 1: HLA class I histocompatibility antigen, A-2 alpha chain



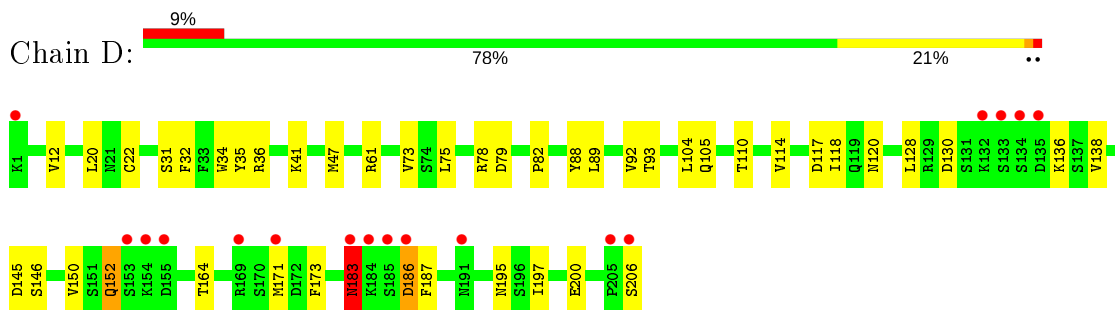
- Molecule 2: Beta-2-microglobulin




- Molecule 3: Modified HTLV-1 TAX (Y5(4fluoro)F) peptide

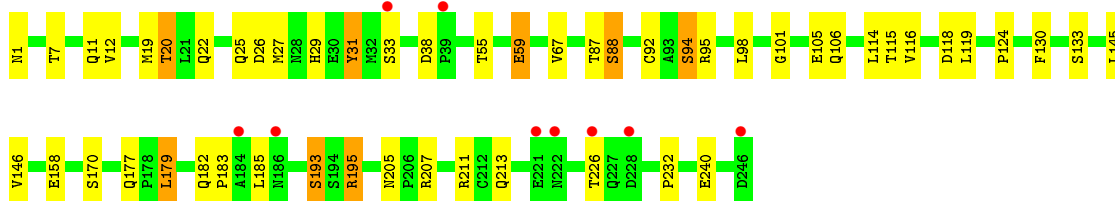


- Molecule 4: A6 TCR alpha chain



- Molecule 5: A6 TCR beta chain

Chain E:  4% 79% 18%



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	224.25Å 48.32Å 93.22Å 90.00° 90.51° 90.00°	Depositor
Resolution (Å)	20.00 – 2.81 19.94 – 2.81	Depositor EDS
% Data completeness (in resolution range)	91.0 (20.00-2.81) 90.7 (19.94-2.81)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.61 (at 2.79Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.201 , 0.269 0.195 , 0.251	Depositor DCC
R_{free} test set	1166 reflections (5.16%)	wwPDB-VP
Wilson B-factor (Å ²)	65.5	Xtrriage
Anisotropy	0.233	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 60.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.024 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	6718	wwPDB-VP
Average B, all atoms (Å ²)	66.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.25% of the height of the origin peak. No significant pseudotranslation is detected.*

¹ Intensities estimated from amplitudes.

² 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, PFF

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	0.59	0/2312	0.74	0/3137
2	B	0.60	0/860	0.75	0/1162
3	C	0.73	0/66	0.90	0/86
4	D	0.57	1/1585 (0.1%)	0.75	1/2150 (0.0%)
5	E	0.59	0/1981	0.80	1/2699 (0.0%)
All	All	0.59	1/6804 (0.0%)	0.76	2/9234 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	22	CYS	CB-SG	-5.92	1.72	1.81

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	179	LEU	CA-CB-CG	6.62	130.53	115.30
4	D	128	LEU	CA-CB-CG	5.02	126.84	115.30

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	2247	0	2096	9	0
2	B	837	0	803	2	0
3	C	77	0	77	1	0
4	D	1552	0	1461	16	0
5	E	1928	0	1832	17	0
6	D	6	0	8	2	0
6	E	18	0	24	2	0
7	A	18	0	0	0	0
7	B	13	0	0	0	0
7	D	8	0	0	0	0
7	E	14	0	0	1	0
All	All	6718	0	6301	42	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 3.

All (42) 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)
5:E:1:ASN:N	7:E:254:HOH:O	2.25	0.69
4:D:93:THR:HB	4:D:104:LEU:HD12	1.84	0.59
5:E:29:HIS:ND1	5:E:94:SER:OG	2.31	0.59
4:D:171:MET:HB3	4:D:173:PHE:HB2	1.86	0.58
5:E:193:SER:OG	5:E:195:ARG:NH1	2.40	0.55
2:B:25:CYS:HB2	2:B:39:LEU:HD21	1.90	0.52
1:A:223:ASP:OD1	1:A:223:ASP:N	2.34	0.51
4:D:183:ASN:N	4:D:183:ASN:OD1	2.42	0.51
5:E:11:GLN:HB3	5:E:114:LEU:HD13	1.92	0.51
4:D:104:LEU:O	6:D:207:GOL:O3	2.24	0.51
4:D:130:ASP:HA	5:E:130:PHE:HA	1.94	0.49
1:A:188:HIS:HB3	1:A:204:TRP:HB2	1.95	0.49
4:D:138:VAL:HG11	5:E:146:VAL:HG21	1.95	0.48
4:D:118:ILE:HD11	4:D:145:ASP:HA	1.97	0.47
4:D:35:TYR:HB2	4:D:89:LEU:HB2	1.97	0.46
5:E:124:PRO:HD3	5:E:232:PRO:HB3	1.96	0.46
5:E:87:THR:HG23	5:E:115:THR:HA	1.98	0.46
5:E:240:GLU:HG2	6:E:248:GOL:H31	1.98	0.46
1:A:66:LYS:NZ	3:C:2:LEU:O	2.48	0.45
1:A:177:GLU:HG2	1:A:177:GLU:H	1.46	0.45
4:D:82:PRO:HA	4:D:114:VAL:HB	1.98	0.44
4:D:61:ARG:NH1	4:D:79:ASP:O	2.51	0.44
1:A:102:ASP:OD1	1:A:113:TYR:OH	2.28	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:31:TYR:HB3	5:E:95:ARG:HB3	2.00	0.44
4:D:34:TRP:HB2	4:D:47:MET:HB2	2.00	0.42
5:E:205:ASN:HD21	5:E:207:ARG:HH11	1.67	0.42
4:D:20:LEU:HB2	4:D:75:LEU:HB3	2.00	0.42
4:D:32:PHE:HD1	4:D:92:VAL:HG22	1.83	0.42
5:E:211:ARG:NH2	5:E:213:GLN:OE1	2.52	0.42
6:D:207:GOL:O2	5:E:59:GLU:OE1	2.37	0.42
2:B:64:LEU:HA	2:B:64:LEU:HD12	1.81	0.42
1:A:214:THR:HB	1:A:262:GLN:HB2	2.02	0.41
4:D:152:GLN:HB3	4:D:152:GLN:HE21	1.66	0.41
5:E:95:ARG:HG3	5:E:106:GLN:HB2	2.02	0.41
4:D:36:ARG:HG3	4:D:88:TYR:CE2	2.55	0.41
1:A:133:TRP:HB2	1:A:144:LYS:HG3	2.03	0.40
1:A:261:VAL:HB	1:A:270:LEU:HB2	2.04	0.40
4:D:20:LEU:HD12	4:D:75:LEU:HD23	2.04	0.40
5:E:20:THR:OG1	5:E:22:GLN:NE2	2.55	0.40
5:E:158:GLU:HA	6:E:250:GOL:H11	2.02	0.40
5:E:38:ASP:OD2	5:E:88:SER:OG	2.29	0.40
1:A:74:HIS:CE1	1:A:97:ARG:HE	2.40	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	273/275 (99%)	265 (97%)	8 (3%)	0	100	100
2	B	98/100 (98%)	96 (98%)	2 (2%)	0	100	100
3	C	6/9 (67%)	5 (83%)	1 (17%)	0	100	100
4	D	198/200 (99%)	175 (88%)	21 (11%)	2 (1%)	15	42
5	E	243/245 (99%)	233 (96%)	8 (3%)	2 (1%)	19	47

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	818/829 (99%)	774 (95%)	40 (5%)	4 (0%)	29 59

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	E	101	GLY
4	D	183	ASN
4	D	186	ASP
5	E	183	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%)	207 (90%)	24 (10%)	7 20
2	B	95/95 (100%)	85 (90%)	10 (10%)	7 20
3	C	7/7 (100%)	7 (100%)	0	100 100
4	D	178/178 (100%)	157 (88%)	21 (12%)	5 15
5	E	209/209 (100%)	179 (86%)	30 (14%)	3 9
All	All	720/720 (100%)	635 (88%)	85 (12%)	5 15

All (85) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	11	SER
1	A	12	VAL
1	A	34	VAL
1	A	35	ARG
1	A	45	MET
1	A	52	ILE
1	A	54	GLN
1	A	58	GLU
1	A	72	GLN
1	A	75	ARG

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Mol	Chain	Res	Type
1	A	94	THR
1	A	98	MET
1	A	113	TYR
1	A	132	SER
1	A	154	GLU
1	A	177	GLU
1	A	181	ARG
1	A	203	CYS
1	A	216	THR
1	A	219	ARG
1	A	223	ASP
1	A	225	THR
1	A	227	ASP
1	A	231	VAL
2	B	1	ILE
2	B	4	THR
2	B	6	LYS
2	B	34	ASP
2	B	58	LYS
2	B	64	LEU
2	B	68	THR
2	B	70	PHE
2	B	75	LYS
2	B	99	MET
4	D	12	VAL
4	D	31	SER
4	D	41	LYS
4	D	73	VAL
4	D	78	ARG
4	D	105	GLN
4	D	110	THR
4	D	117	ASP
4	D	120	ASN
4	D	136	LYS
4	D	146	SER
4	D	150	VAL
4	D	152	GLN
4	D	164	THR
4	D	183	ASN
4	D	186	ASP
4	D	187	PHE
4	D	195	ASN

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Mol	Chain	Res	Type
4	D	197	ILE
4	D	200	GLU
4	D	206	SER
5	E	7	THR
5	E	12	VAL
5	E	19	MET
5	E	20	THR
5	E	25	GLN
5	E	26	ASP
5	E	27	MET
5	E	31	TYR
5	E	33	SER
5	E	55	THR
5	E	59	GLU
5	E	67	VAL
5	E	88	SER
5	E	92	CYS
5	E	94	SER
5	E	98	LEU
5	E	105	GLU
5	E	116	VAL
5	E	118	ASP
5	E	119	LEU
5	E	133	SER
5	E	145	LEU
5	E	170	SER
5	E	177	GLN
5	E	179	LEU
5	E	182	GLN
5	E	185	LEU
5	E	193	SER
5	E	195	ARG
5	E	226	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	115	GLN
1	A	224	GLN
2	B	2	GLN
4	D	37	GLN
4	D	105	GLN

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Mol	Chain	Res	Type
4	D	111	GLN
4	D	152	GLN
5	E	1	ASN
5	E	22	GLN
5	E	37	GLN
5	E	57	GLN
5	E	227	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](#)

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
3	PFF	C	5	3	11,12,13	0.84	0	12,15,17	2.24	3 (25%)

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	PFF	C	5	3	-	0/5/6/8	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	5	PFF	CG-CB-CA	-6.21	101.52	114.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	5	PFF	CB-CA-C	-2.44	106.89	111.47
3	C	5	PFF	CD2-CG-CD1	2.30	121.78	118.17

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

4 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	E	250	-	5,5,5	0.29	0	5,5,5	0.31	0
6	GOL	E	249	-	5,5,5	0.39	0	5,5,5	0.33	0
6	GOL	E	248	-	5,5,5	0.46	0	5,5,5	0.63	0
6	GOL	D	207	-	5,5,5	0.38	0	5,5,5	0.35	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	E	250	-	-	2/4/4/4	-
6	GOL	E	249	-	-	4/4/4/4	-
6	GOL	E	248	-	-	0/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	GOL	D	207	-	-	0/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	E	249	GOL	O1-C1-C2-C3
6	E	249	GOL	C1-C2-C3-O3
6	E	250	GOL	C1-C2-C3-O3
6	E	250	GOL	O2-C2-C3-O3
6	E	249	GOL	O1-C1-C2-O2
6	E	249	GOL	O2-C2-C3-O3

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	E	250	GOL	1	0
6	E	248	GOL	1	0
6	D	207	GOL	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

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	275/275 (100%)	0.27	22 (8%) 12 7	53, 66, 80, 85	0
2	B	100/100 (100%)	-0.13	1 (1%) 82 77	47, 64, 75, 87	0
3	C	8/9 (88%)	-0.47	0 100 100	58, 64, 65, 67	0
4	D	200/200 (100%)	0.37	17 (8%) 10 5	57, 67, 78, 83	0
5	E	245/245 (100%)	0.05	9 (3%) 41 31	54, 65, 78, 83	0
All	All	828/829 (99%)	0.18	49 (5%) 22 14	47, 66, 78, 87	0

All (49) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	273	ARG	5.5
1	A	223	ASP	5.5
1	A	220	ASP	5.4
4	D	171	MET	5.1
1	A	253	GLN	5.0
4	D	184	LYS	4.8
4	D	133	SER	4.6
4	D	183	ASN	4.6
4	D	134	SER	4.5
4	D	206	SER	4.4
1	A	257	TYR	4.3
1	A	222	GLU	4.0
4	D	155	ASP	3.8
1	A	221	GLY	3.8
4	D	185	SER	3.7
1	A	197	HIS	3.6
5	E	246	ASP	3.6
1	A	260	HIS	3.5
4	D	205	PRO	3.5
2	B	99	MET	3.4

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Mol	Chain	Res	Type	RSRZ
4	D	135	ASP	3.3
4	D	154	LYS	3.3
4	D	169	ARG	3.2
5	E	221	GLU	3.2
5	E	184	ALA	3.2
4	D	186	ASP	3.1
4	D	132	LYS	3.1
1	A	227	ASP	3.0
1	A	218	GLN	2.8
5	E	39	PRO	2.8
5	E	33	SER	2.8
1	A	256	ARG	2.7
4	D	1	LYS	2.7
1	A	226	GLN	2.6
4	D	153	SER	2.6
5	E	228	ASP	2.5
1	A	225	THR	2.3
1	A	201	LEU	2.3
1	A	196	ASP	2.3
1	A	216	THR	2.2
1	A	274	TRP	2.2
5	E	226	THR	2.2
1	A	217	TRP	2.1
4	D	191	ASN	2.1
1	A	275	GLU	2.1
5	E	222	ASN	2.0
1	A	255	GLN	2.0
5	E	186	ASN	2.0
1	A	264	GLU	2.0

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

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	PFF	C	5	12/13	0.97	0.12	59,60,63,64	0

6.3 Carbohydrates [i](#)

There are no carbohydrates 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, 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
6	GOL	E	250	6/6	0.83	0.42	59,61,62,62	0
6	GOL	D	207	6/6	0.83	0.26	69,71,71,71	0
6	GOL	E	248	6/6	0.87	0.44	50,52,52,52	6
6	GOL	E	249	6/6	0.88	0.44	72,73,73,73	0

6.5 Other polymers [i](#)

There are no such residues in this entry.