



# Full wwPDB X-ray Structure Validation Report

Feb 28, 2014 – 12:18 PM GMT

PDB ID : 1T5W  
Title : HLA-DR1 in complex with a synthetic peptide (AAYSDQATPLLLSPR)  
Authors : Zavala-Ruiz, Z.; Strug, I.; Anderson, M.W.; Gorski, J.; Stern, L.J.  
Deposited on : 2004-05-05  
Resolution : 2.40 Å(reported)

This is a full wwPDB 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 <http://wwpdb.org/ValidationPDFNotes.html>

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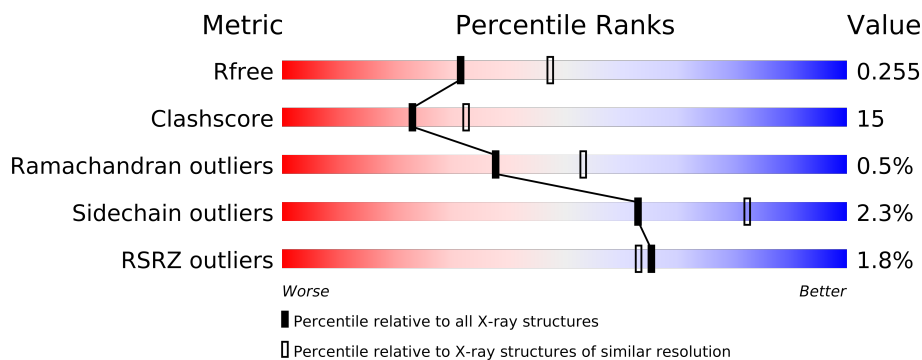
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.15 2013  
Xtriage (Phenix) : dev-1323  
EDS : stable22639  
Percentile statistics : 21963  
Refmac : 5.8.0049  
CCP4 : 6.3.0 (Settle)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)  
Validation Pipeline (wwPDB-VP) : stable22683

# 1 Overall quality at a glance






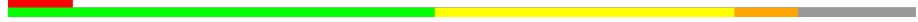
The reported resolution of this entry is 2.40 Å.

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))
$R_{free}$	66092	2207 (2.40-2.40)
Clashscore	79885	2789 (2.40-2.40)
Ramachandran outliers	78287	2736 (2.40-2.40)
Sidechain outliers	78261	2737 (2.40-2.40)
RSRZ outliers	66119	2210 (2.40-2.40)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	180	
1	D	180	
2	B	190	
2	E	190	
3	C	15	
3	F	15	

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 6407 atoms, of which 0 are hydrogen and 0 are deuterium.

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 II histocompatibility antigen, DR alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	180	Total	C	N	O	S	9	0	0
			1483	960	241	277	5			
1	D	179	Total	C	N	O	S	0	0	0
			1474	954	239	276	5			

- Molecule 2 is a protein called HLA class II histocompatibility antigen, DRB1-1 beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	190	Total	C	N	O	S	22	0	0
			1557	979	279	293	6			
2	E	190	Total	C	N	O	S	0	0	0
			1557	979	279	293	6			

- Molecule 3 is a protein called 15-mer peptide fragment of Regulatory protein MIG1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	C	13	Total	C	N	O	0	0	0
			94	60	14	20			
3	F	13	Total	C	N	O	0	0	0
			94	60	14	20			

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	0	ALA	-	INSERTION	UNP P27705
C	1	ALA	-	INSERTION	UNP P27705
C	2	TYR	-	INSERTION	UNP P27705
C	3	SER	-	INSERTION	UNP P27705
C	4	ASP	-	INSERTION	UNP P27705
C	5	GLN	-	INSERTION	UNP P27705
C	6	ALA	-	INSERTION	UNP P27705
F	0	ALA	-	INSERTION	UNP P27705

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Chain	Residue	Modelled	Actual	Comment	Reference
F	1	ALA	-	INSERTION	UNP P27705
F	2	TYR	-	INSERTION	UNP P27705
F	3	SER	-	INSERTION	UNP P27705
F	4	ASP	-	INSERTION	UNP P27705
F	5	GLN	-	INSERTION	UNP P27705
F	6	ALA	-	INSERTION	UNP P27705

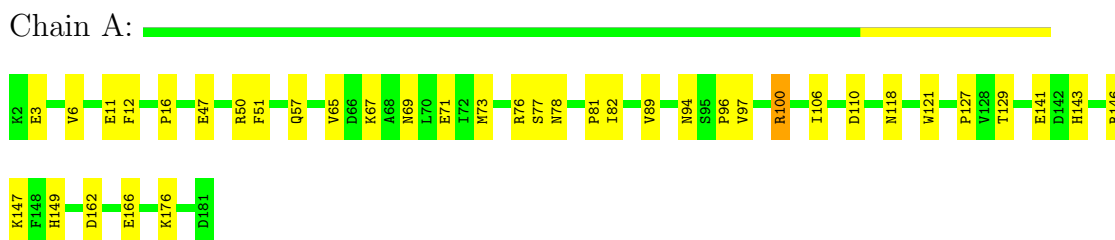
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	64	Total O 64 64	0	0
4	B	42	Total O 42 42	0	0
4	C	4	Total O 4 4	0	0
4	D	12	Total O 12 12	0	0
4	E	26	Total O 26 26	0	0

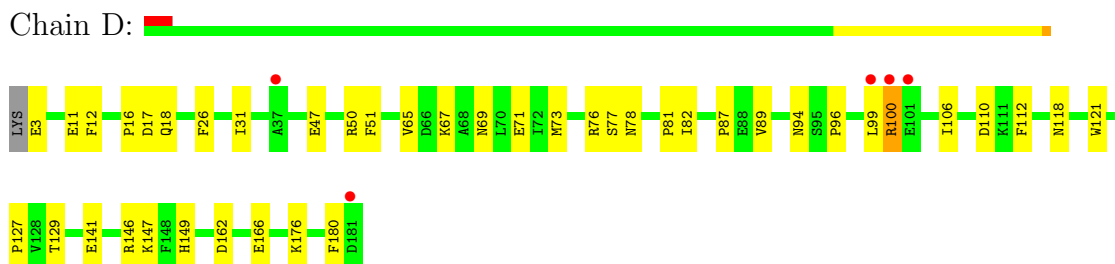
### 3 Residue-property plots

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 ( $RSRZ > 2$ ). 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 II histocompatibility antigen, DR alpha chain



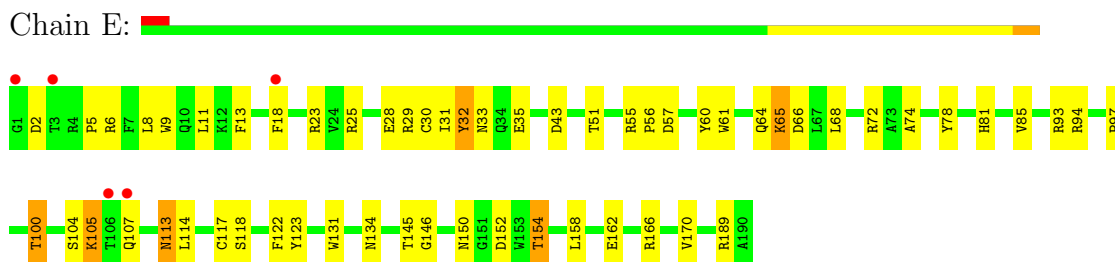
- Molecule 1: HLA class II histocompatibility antigen, DR alpha chain



- Molecule 2: HLA class II histocompatibility antigen, DRB1-1 beta chain

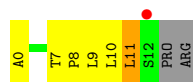


- Molecule 2: HLA class II histocompatibility antigen, DRB1-1 beta chain



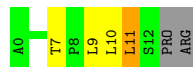
- Molecule 3: 15-mer peptide fragment of Regulatory protein MIG1

Chain C: 



- Molecule 3: 15-mer peptide fragment of Regulatory protein MIG1

Chain F: 



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	96.55Å 112.65Å 206.98Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	23.90 – 2.40 24.79 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.8 (23.90-2.40) 99.4 (24.79-2.30)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	0.07	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.07 (at 2.28Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, $R_{free}$	0.231 , 0.255 0.231 , 0.255	Depositor DCC
$R_{free}$ test set	3142 reflections (7.09%)	DCC
Wilson B-factor (Å <sup>2</sup> )	36.0	Xtriage
Anisotropy	0.689	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 29.1	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.34$	Xtriage
Outliers	0 of 50347 reflections	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	6407	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.56% of the height of the origin peak. No significant pseudotranslation is detected.*

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

## 5 Model quality

### 5.1 Standard geometry

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	0.43	0/1528	0.65	0/2081
1	D	0.36	0/1519	0.62	0/2070
2	B	0.40	0/1597	0.66	2/2168 (0.1%)
2	E	0.35	0/1597	0.63	2/2168 (0.1%)
3	C	0.39	0/95	0.70	0/130
3	F	0.37	0/95	0.71	0/130
All	All	0.38	0/6431	0.64	4/8747 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	166	ARG	NE-CZ-NH2	-7.34	116.63	120.30
2	B	166	ARG	NE-CZ-NH1	-6.97	116.81	120.30
2	E	166	ARG	NE-CZ-NH1	6.58	123.59	120.30
2	B	166	ARG	NE-CZ-NH2	6.32	123.46	120.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1483	0	1420	34	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1474	0	1407	35	0
2	B	1557	0	1488	61	0
2	E	1557	0	1488	65	0
3	C	94	0	95	14	0
3	F	94	0	95	10	0
4	A	64	0	0	2	0
4	B	42	0	0	2	0
4	C	4	0	0	0	0
4	D	12	0	0	0	0
4	E	26	0	0	1	0
All	All	6407	0	5993	178	1

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 15.

All (178) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
2:E:150:ASN:HD22	2:E:154:THR:HG22	1.08	1.13
2:B:150:ASN:HD22	2:B:154:THR:HG22	1.09	1.08
1:D:96:PRO:HG3	2:E:100:THR:HG21	1.37	1.01
2:E:65:LYS:H	2:E:65:LYS:HE3	1.35	0.91
2:B:65:LYS:HE3	2:B:65:LYS:H	1.32	0.91
1:D:147:LYS:HE3	1:D:149:HIS:HE1	1.38	0.86
2:B:100:THR:HG23	2:B:118:SER:HB3	1.58	0.84
2:E:150:ASN:ND2	2:E:154:THR:HG22	1.91	0.84
2:E:56:PRO:HB3	3:F:11:LEU:HD12	1.59	0.83
2:B:150:ASN:HD22	2:B:154:THR:CG2	1.90	0.82
1:A:147:LYS:HE3	1:A:149:HIS:HE1	1.45	0.81
2:B:150:ASN:ND2	2:B:154:THR:HG22	1.93	0.80
2:E:100:THR:HG23	2:E:118:SER:HB3	1.62	0.79
2:B:56:PRO:HB3	3:C:11:LEU:HD12	1.64	0.77
1:A:16:PRO:HD2	2:B:6:ARG:HD3	1.68	0.76
2:E:150:ASN:HD22	2:E:154:THR:CG2	1.96	0.75
1:D:16:PRO:HD2	2:E:6:ARG:HD3	1.70	0.73
1:A:96:PRO:HG3	2:B:100:THR:HG21	1.69	0.73
1:D:67:LYS:O	1:D:71:GLU:HG2	1.89	0.72
2:B:105:LYS:HZ3	2:B:107:GLN:HE21	1.36	0.71
2:E:94:ARG:HG3	2:E:94:ARG:HH11	1.56	0.71
2:B:8:LEU:O	2:B:32:TYR:O	2.08	0.70
2:E:93:ARG:HG2	2:E:123:TYR:CD1	2.26	0.70
2:E:97:PRO:HB3	2:E:122:PHE:HB3	1.74	0.70
2:B:93:ARG:HG2	2:B:123:TYR:CD1	2.27	0.69

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
2:E:105:LYS:HZ3	2:E:107:GLN:HE21	1.39	0.69
2:E:56:PRO:CB	3:F:11:LEU:HD12	2.23	0.69
2:B:97:PRO:HB3	2:B:122:PHE:HB3	1.76	0.68
2:E:8:LEU:O	2:E:32:TYR:O	2.11	0.68
2:B:94:ARG:HH11	2:B:94:ARG:HG3	1.57	0.68
1:D:81:PRO:HB3	2:E:5:PRO:HB2	1.76	0.67
1:A:67:LYS:O	1:A:71:GLU:HG2	1.95	0.66
2:B:65:LYS:CE	2:B:65:LYS:H	2.07	0.65
2:B:56:PRO:CB	3:C:11:LEU:HD12	2.26	0.64
2:E:152:ASP:OD1	2:E:154:THR:HB	1.99	0.63
2:B:2:ASP:OD1	2:B:4:ARG:HD3	1.98	0.63
2:E:170:VAL:HG22	2:E:189:ARG:HG2	1.81	0.62
2:E:113:ASN:HD22	2:E:114:LEU:H	1.47	0.62
1:D:147:LYS:HE3	1:D:149:HIS:CE1	2.27	0.62
1:D:100:ARG:HH11	1:D:100:ARG:CG	2.13	0.62
2:B:105:LYS:NZ	2:B:107:GLN:HE21	1.99	0.60
2:E:94:ARG:HG3	2:E:94:ARG:NH1	2.17	0.60
1:A:100:ARG:HH11	1:A:100:ARG:CG	2.15	0.60
2:E:105:LYS:NZ	2:E:107:GLN:HE21	1.99	0.59
1:D:99:LEU:HD21	1:D:180:PHE:CE2	2.37	0.58
2:B:94:ARG:HG3	2:B:94:ARG:NH1	2.18	0.58
2:B:55:ARG:HB2	2:B:56:PRO:HD3	1.86	0.58
1:A:147:LYS:HE3	1:A:149:HIS:CE1	2.34	0.57
2:B:113:ASN:HD22	2:B:114:LEU:H	1.50	0.57
2:E:55:ARG:HB2	2:E:56:PRO:HD3	1.86	0.57
2:E:145:THR:CG2	2:E:158:LEU:H	2.17	0.57
2:E:105:LYS:NZ	2:E:105:LYS:HB2	2.20	0.56
1:D:118:ASN:HB2	1:D:166:GLU:HB2	1.87	0.56
1:A:77:SER:O	1:A:78:ASN:HB3	2.05	0.56
2:E:25:ARG:HD2	2:E:43:ASP:OD2	2.05	0.56
2:B:145:THR:CG2	2:B:158:LEU:H	2.18	0.56
2:B:61:TRP:CZ2	3:C:10:LEU:HD12	2.41	0.56
2:B:105:LYS:NZ	2:B:105:LYS:HB2	2.22	0.55
2:E:65:LYS:H	2:E:65:LYS:CE	2.12	0.55
2:B:25:ARG:HD2	2:B:43:ASP:OD2	2.07	0.55
1:A:110:ASP:OD1	1:A:146:ARG:HG2	2.06	0.55
2:B:152:ASP:OD1	2:B:154:THR:HB	2.06	0.55
1:A:89:VAL:HG12	1:A:176:LYS:HG3	1.89	0.54
2:B:61:TRP:HZ2	3:C:10:LEU:HD12	1.73	0.54
1:D:110:ASP:OD1	1:D:146:ARG:HG2	2.07	0.54
2:E:2:ASP:OD1	2:E:6:ARG:NH2	2.41	0.54
2:E:60:TYR:CD2	3:F:11:LEU:HD23	2.43	0.54

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
2:E:23:ARG:HG2	2:E:23:ARG:HH11	1.72	0.54
1:D:77:SER:O	1:D:78:ASN:HB3	2.08	0.53
2:E:35:GLU:CG	2:E:51:THR:HG21	2.38	0.53
2:E:100:THR:HG22	4:E:193:HOH:O	2.09	0.52
1:A:97:VAL:HG12	4:A:218:HOH:O	2.09	0.52
2:B:35:GLU:CG	2:B:51:THR:HG21	2.40	0.52
1:A:100:ARG:HH11	1:A:100:ARG:HG3	1.75	0.52
2:E:61:TRP:CZ2	3:F:10:LEU:HD12	2.45	0.52
2:B:23:ARG:HH11	2:B:23:ARG:HG2	1.75	0.52
1:A:69:ASN:HB3	3:C:10:LEU:HD22	1.93	0.51
2:E:81:HIS:O	2:E:85:VAL:HG23	2.10	0.51
1:A:76:ARG:NH2	2:B:57:ASP:OD2	2.39	0.51
1:D:99:LEU:HD21	1:D:180:PHE:CD2	2.46	0.51
2:B:35:GLU:CD	2:B:51:THR:HG21	2.31	0.51
1:D:76:ARG:NH2	2:E:57:ASP:OD2	2.38	0.50
1:A:65:VAL:HG11	3:C:7:THR:OG1	2.12	0.50
1:A:100:ARG:NH1	1:A:100:ARG:HG3	2.26	0.50
2:B:51:THR:HA	2:E:51:THR:HA	1.92	0.50
1:D:100:ARG:NH1	1:D:100:ARG:CG	2.74	0.50
2:E:9:TRP:CH2	2:E:30:CYS:HB3	2.47	0.50
2:E:105:LYS:NZ	2:E:107:GLN:NE2	2.60	0.50
2:E:35:GLU:CD	2:E:51:THR:HG21	2.31	0.49
2:E:134:ASN:ND2	2:E:170:VAL:H	2.11	0.49
2:B:85:VAL:HG22	3:C:0:ALA:HB1	1.93	0.49
2:B:105:LYS:NZ	2:B:107:GLN:NE2	2.59	0.49
1:D:89:VAL:HG12	1:D:176:LYS:HG3	1.94	0.48
2:E:60:TYR:CE1	2:E:64:GLN:NE2	2.81	0.48
2:E:55:ARG:CB	2:E:56:PRO:HD3	2.43	0.48
1:D:12:PHE:C	1:D:12:PHE:CD1	2.87	0.48
2:E:113:ASN:ND2	2:E:114:LEU:H	2.10	0.47
2:E:145:THR:HG22	2:E:158:LEU:H	1.78	0.47
1:D:100:ARG:HG3	1:D:100:ARG:NH1	2.29	0.47
2:B:104:SER:O	2:B:105:LYS:HB2	2.15	0.47
4:A:187:HOH:O	2:B:120:SER:HB2	2.15	0.47
2:E:31:ILE:HD12	2:E:31:ILE:N	2.28	0.47
2:B:162:GLU:OE2	1:D:162:ASP:OD2	2.33	0.47
2:B:31:ILE:N	2:B:31:ILE:HD12	2.30	0.47
2:B:55:ARG:CB	2:B:56:PRO:HD3	2.45	0.46
2:B:113:ASN:ND2	2:B:114:LEU:H	2.14	0.46
2:B:145:THR:HG21	2:B:158:LEU:H	1.81	0.46
1:D:3:GLU:HB2	2:E:18:PHE:CE2	2.50	0.46
1:A:118:ASN:HB2	1:A:166:GLU:HB2	1.96	0.46

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
2:E:145:THR:HG23	2:E:146:GLY:O	2.16	0.46
2:B:134:ASN:ND2	2:B:170:VAL:H	2.14	0.46
2:B:2:ASP:OD1	2:B:6:ARG:NH2	2.49	0.46
2:B:100:THR:HG22	4:B:192:HOH:O	2.16	0.45
2:E:61:TRP:HZ2	3:F:10:LEU:HD12	1.81	0.45
1:D:69:ASN:HB3	3:F:10:LEU:HD22	1.98	0.45
1:D:96:PRO:HG3	2:E:100:THR:CG2	2.27	0.45
2:E:65:LYS:HG2	2:E:66:ASP:N	2.32	0.45
2:E:60:TYR:HB2	3:F:11:LEU:HD21	1.99	0.45
1:A:73:MET:HE2	3:C:10:LEU:HD21	1.99	0.45
2:B:117:CYS:HB2	2:B:131:TRP:CZ2	2.52	0.45
2:B:60:TYR:CD2	3:C:11:LEU:HD23	2.53	0.44
1:A:82:ILE:HG13	2:B:33:ASN:HB3	2.00	0.44
1:D:121:TRP:O	1:D:127:PRO:HA	2.17	0.44
1:D:141:GLU:HA	1:D:141:GLU:OE1	2.17	0.44
1:A:3:GLU:OE2	1:A:6:VAL:CG2	2.65	0.44
2:B:145:THR:HG23	2:B:146:GLY:O	2.17	0.44
2:E:18:PHE:HB2	2:E:23:ARG:HB3	2.00	0.44
1:A:65:VAL:CG1	3:C:7:THR:OG1	2.67	0.43
2:B:11:LEU:CD2	3:C:7:THR:HG22	2.48	0.43
2:B:65:LYS:HG2	2:B:66:ASP:N	2.34	0.43
3:C:11:LEU:HA	3:C:11:LEU:HD23	1.62	0.43
1:D:73:MET:HE2	3:F:10:LEU:HD21	2.01	0.43
1:D:94:ASN:HB3	1:D:106:ILE:HD11	2.01	0.43
2:B:9:TRP:CH2	2:B:30:CYS:HB3	2.54	0.43
4:B:228:HOH:O	3:C:8:PRO:HD2	2.18	0.43
1:D:82:ILE:HG13	2:E:33:ASN:HB3	2.00	0.43
1:D:50:ARG:HB2	1:D:50:ARG:NH2	2.34	0.43
1:A:50:ARG:CB	1:A:50:ARG:HH21	2.31	0.43
3:F:11:LEU:HD23	3:F:11:LEU:HA	1.51	0.43
1:A:50:ARG:NH2	1:A:50:ARG:HB2	2.34	0.43
1:A:94:ASN:HB3	1:A:106:ILE:HD11	2.00	0.43
2:B:90:THR:OG1	2:B:91:VAL:N	2.51	0.43
2:E:30:CYS:C	2:E:31:ILE:HD12	2.39	0.42
1:D:26:PHE:HB2	1:D:31:ILE:HD11	2.01	0.42
1:D:11:GLU:HG3	2:E:11:LEU:HB3	2.00	0.42
1:D:129:THR:O	1:D:129:THR:HG22	2.19	0.42
2:E:104:SER:O	2:E:105:LYS:HB2	2.19	0.42
1:D:50:ARG:HH21	1:D:50:ARG:CB	2.31	0.42
2:E:13:PHE:CE2	2:E:28:GLU:HG3	2.54	0.42
1:A:12:PHE:C	1:A:12:PHE:CD1	2.92	0.42
1:D:65:VAL:HG11	3:F:7:THR:OG1	2.19	0.42

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:121:TRP:O	1:A:127:PRO:HA	2.19	0.42
2:B:55:ARG:NE	2:E:55:ARG:HH21	2.17	0.42
2:B:2:ASP:CG	2:B:6:ARG:HH22	2.22	0.42
2:B:97:PRO:CB	2:B:122:PHE:HB3	2.48	0.42
1:A:69:ASN:CB	3:C:10:LEU:HD22	2.50	0.42
1:A:129:THR:O	1:A:129:THR:HG22	2.20	0.42
2:E:117:CYS:HB2	2:E:131:TRP:CZ2	2.54	0.42
2:E:113:ASN:HD22	2:E:114:LEU:N	2.16	0.41
1:D:87:PRO:HB3	1:D:112:PHE:HB3	2.02	0.41
2:B:18:PHE:HB2	2:B:23:ARG:HB3	2.02	0.41
2:E:68:LEU:O	2:E:72:ARG:HG3	2.19	0.41
1:A:11:GLU:HG3	2:B:11:LEU:HB3	2.03	0.41
1:A:76:ARG:HH22	2:B:57:ASP:CG	2.23	0.41
1:A:47:GLU:O	1:A:51:PHE:HD1	2.04	0.41
1:A:81:PRO:HB3	2:B:5:PRO:HB2	2.03	0.41
2:E:9:TRP:CZ2	2:E:30:CYS:HB3	2.56	0.41
2:B:145:THR:HG22	2:B:158:LEU:H	1.83	0.41
2:E:74:ALA:O	2:E:78:TYR:HB3	2.21	0.41
1:A:141:GLU:OE1	1:A:141:GLU:HA	2.21	0.41
1:A:162:ASP:OD2	2:E:162:GLU:OE2	2.39	0.41
1:A:143:HIS:HD2	2:B:12:LYS:NZ	2.19	0.40
1:D:17:ASP:O	1:D:18:GLN:HB2	2.21	0.40
2:E:2:ASP:CG	2:E:6:ARG:HH22	2.24	0.40
2:E:105:LYS:HZ3	2:E:105:LYS:HB2	1.87	0.40
2:B:113:ASN:HD22	2:B:114:LEU:N	2.18	0.40
2:E:145:THR:HG21	2:E:158:LEU:H	1.84	0.40
1:D:47:GLU:O	1:D:51:PHE:HD1	2.05	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:57:GLN:NE2	1:A:57:GLN:NE2[4_555]	1.83	0.37

## 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	178/180 (99%)	173 (97%)	5 (3%)	0	100	100
1	D	177/180 (98%)	172 (97%)	5 (3%)	0	100	100
2	B	188/190 (99%)	182 (97%)	4 (2%)	2 (1%)	21	29
2	E	188/190 (99%)	180 (96%)	6 (3%)	2 (1%)	21	29
3	C	11/15 (73%)	10 (91%)	1 (9%)	0	100	100
3	F	11/15 (73%)	9 (82%)	2 (18%)	0	100	100
All	All	753/770 (98%)	726 (96%)	23 (3%)	4 (0%)	38	53

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	32	TYR
2	E	32	TYR
2	B	105	LYS
2	E	105	LYS

### 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	165/165 (100%)	164 (99%)	1 (1%)	92	98
1	D	164/165 (99%)	163 (99%)	1 (1%)	92	98
2	B	171/171 (100%)	166 (97%)	5 (3%)	55	76
2	E	171/171 (100%)	166 (97%)	5 (3%)	55	76
3	C	10/12 (83%)	8 (80%)	2 (20%)	2	2
3	F	10/12 (83%)	8 (80%)	2 (20%)	2	2
All	All	691/696 (99%)	675 (98%)	16 (2%)	63	82

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	100	ARG
2	B	29	ARG
2	B	65	LYS

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Mol	Chain	Res	Type
2	B	100	THR
2	B	113	ASN
2	B	154	THR
3	C	9	LEU
3	C	11	LEU
1	D	100	ARG
2	E	29	ARG
2	E	65	LYS
2	E	100	THR
2	E	113	ASN
2	E	154	THR
3	F	9	LEU
3	F	11	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	GLN
1	A	143	HIS
1	A	149	HIS
2	B	64	GLN
2	B	107	GLN
2	B	113	ASN
2	B	134	ASN
2	B	150	ASN
2	B	156	GLN
3	C	5	GLN
1	D	18	GLN
1	D	143	HIS
1	D	149	HIS
2	E	64	GLN
2	E	107	GLN
2	E	113	ASN
2	E	134	ASN
2	E	150	ASN
2	E	156	GLN
3	F	5	GLN

### 5.3.3 RNA ⓘ

There are no RNA chains in this entry.

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

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

There are no ligands in this entry.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues

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	179/180 (99%)	-0.45	0	100	100	18, 30, 69, 93	0
1	D	179/180 (99%)	0.01	5 (2%)	50	48	27, 46, 96, 138	0
2	B	190/190 (100%)	-0.18	3 (1%)	68	67	17, 34, 75, 169	5 (2%)
2	E	190/190 (100%)	0.16	5 (2%)	53	51	24, 47, 96, 149	0
3	C	13/15 (86%)	0.37	1 (7%)	13	12	26, 42, 67, 104	0
3	F	13/15 (86%)	0.51	0	100	100	47, 61, 70, 71	0
All	All	764/770 (99%)	-0.09	14 (1%)	65	63	17, 41, 87, 169	5 (0%)

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	1	GLY	15.7
2	E	1	GLY	7.6
1	D	100	ARG	4.7
1	D	99	LEU	3.8
2	E	107	GLN	3.2
1	D	37	ALA	3.1
2	E	106	THR	2.7
2	E	18	PHE	2.6
3	C	12	SER	2.3
1	D	181	ASP	2.3
2	B	181	THR	2.3
2	E	3	THR	2.3
1	D	101	GLU	2.2
2	B	136	GLN	2.2

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

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

### 6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

### 6.4 Ligands ⓘ

There are no ligands in this entry.

### 6.5 Other polymers ⓘ

There are no such residues in this entry.