Full wwPDB X-ray Structure Validation Report ⓘ

Jan 9, 2024 – 03:36 pm GMT

PDB ID	:	8ACX
Title	:	Pathogen effector of Zymoseptoria tritici: Zt-KP4
Authors	:	Hoh, F.; Padilla, A.; De Guillen, K.
Deposited on	:	2022-07-07
Resolution	:	1.90 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 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:

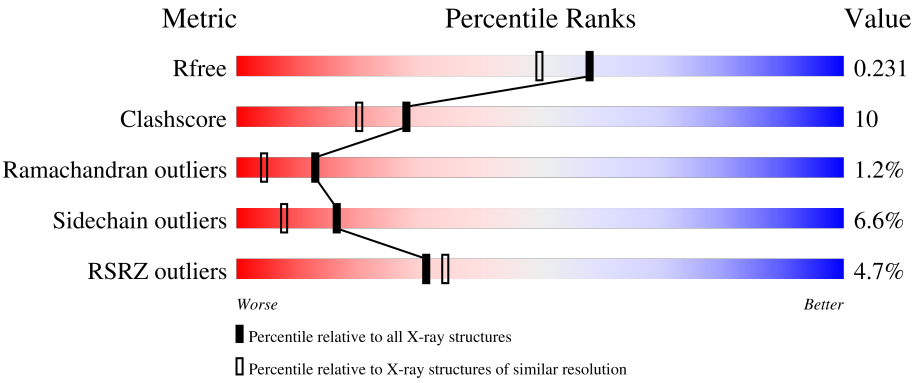
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 1.90 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	6207 (1.90-1.90)
Clashscore	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of 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 <=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	144	4% 58% 18% • 22%
1	B	144	3% 66% 11% • 22%
1	C	144	4% 65% 11% • 22%
1	D	144	4% 58% 13% • 26%
1	E	144	2% 61% 15% • 23%

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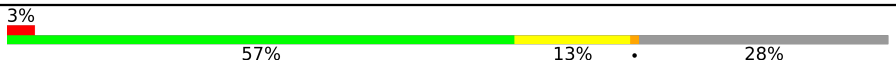
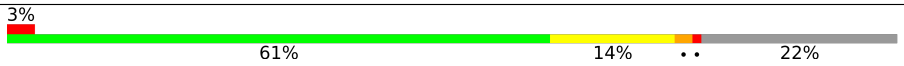
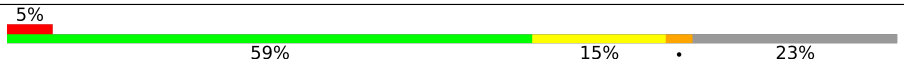
Mol	Chain	Length	Quality of chain
1	F	144	
1	G	144	
1	H	144	

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 6773 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 Hce2 domain-containing protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	112	Total	C	N	O	S	0	0	0
			837	519	150	161	7			
1	B	113	Total	C	N	O	S	0	0	0
			852	529	154	162	7			
1	C	112	Total	C	N	O	S	0	0	0
			843	524	152	160	7			
1	D	107	Total	C	N	O	S	0	0	0
			803	500	142	154	7			
1	E	111	Total	C	N	O	S	0	0	0
			839	522	151	159	7			
1	F	103	Total	C	N	O	S	0	0	0
			775	486	137	146	6			
1	G	112	Total	C	N	O	S	0	0	0
			840	521	152	160	7			
1	H	111	Total	C	N	O	S	0	0	0
			827	514	148	158	7			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	4	MET	-	initiating methionine	UNP A0A2H1H404
B	4	MET	-	initiating methionine	UNP A0A2H1H404
C	4	MET	-	initiating methionine	UNP A0A2H1H404
D	4	MET	-	initiating methionine	UNP A0A2H1H404
E	4	MET	-	initiating methionine	UNP A0A2H1H404
F	4	MET	-	initiating methionine	UNP A0A2H1H404
G	4	MET	-	initiating methionine	UNP A0A2H1H404
H	4	MET	-	initiating methionine	UNP A0A2H1H404

- Molecule 2 is water.

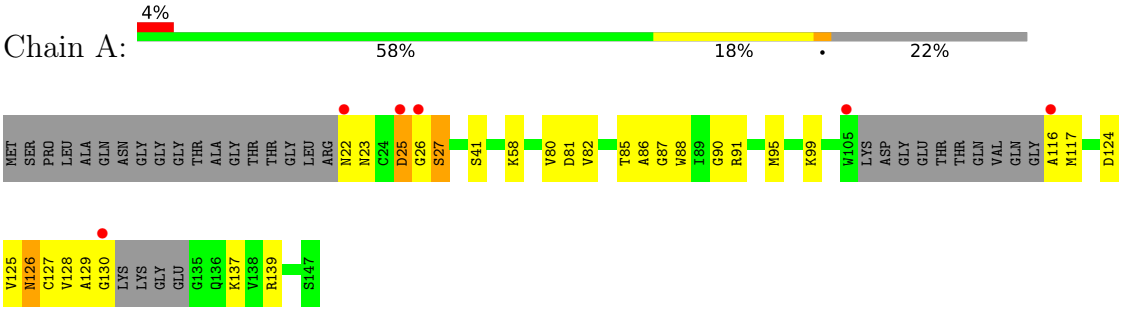
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	20	Total O 20 20	0	0
2	B	24	Total O 24 24	0	0
2	C	23	Total O 23 23	0	0
2	D	11	Total O 11 11	0	0
2	E	17	Total O 17 17	0	0
2	F	17	Total O 17 17	0	0
2	G	23	Total O 23 23	0	0
2	H	22	Total O 22 22	0	0

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.

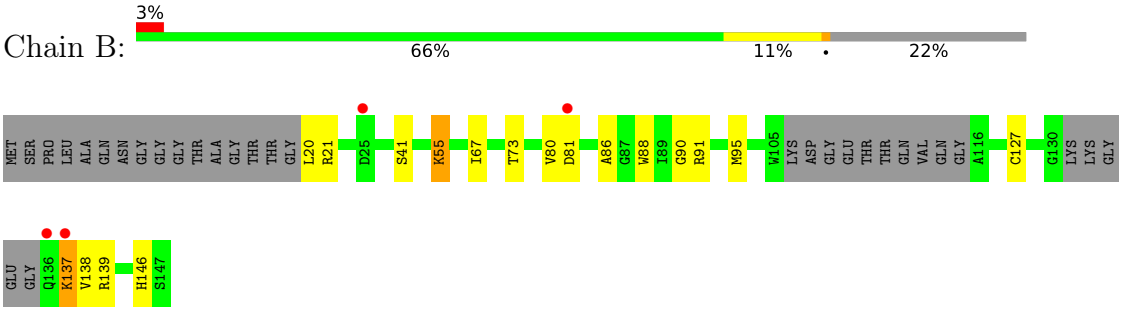
• Molecule 1: Hce2 domain-containing protein

Chain A:



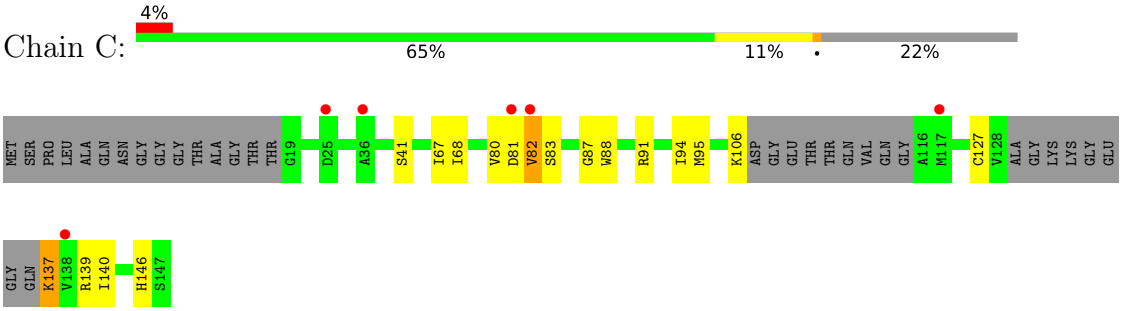
• Molecule 1: Hce2 domain-containing protein

Chain B:



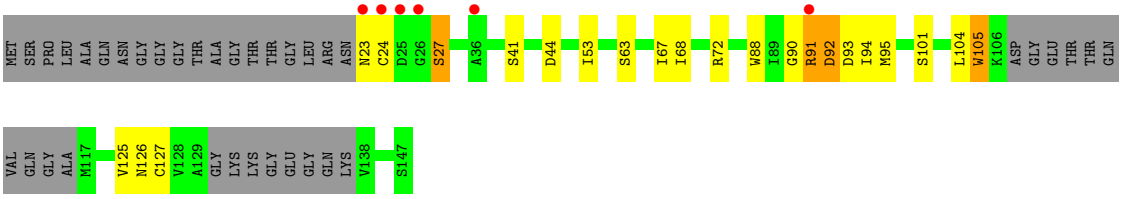
• Molecule 1: Hce2 domain-containing protein

Chain C:



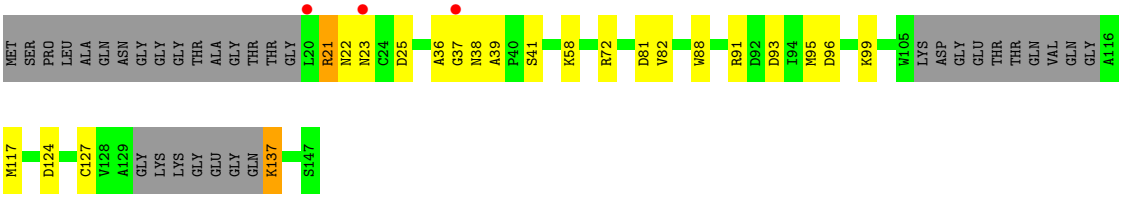
• Molecule 1: Hce2 domain-containing protein

Chain D:



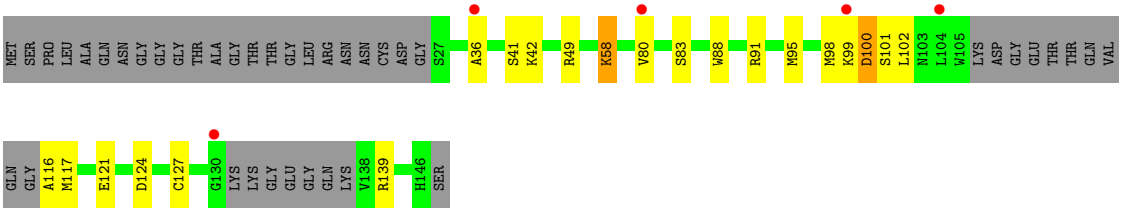
• Molecule 1: Hce2 domain-containing protein

Chain E:



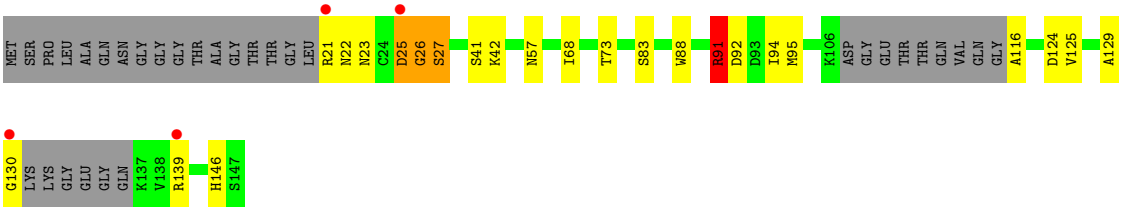
• Molecule 1: Hce2 domain-containing protein

Chain F:



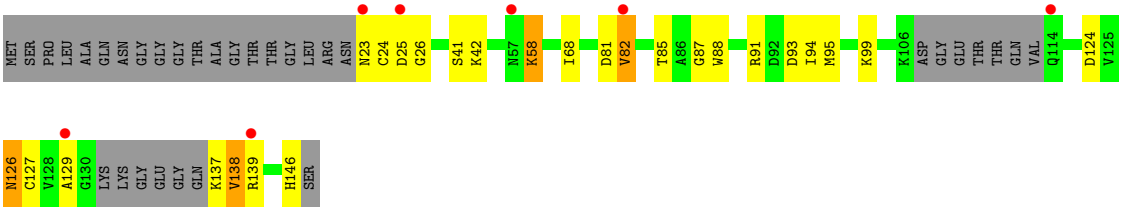
• Molecule 1: Hce2 domain-containing protein

Chain G:



• Molecule 1: Hce2 domain-containing protein

Chain H:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α, β, γ	109.11Å 109.11Å 252.75Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	46.44 – 1.90 46.44 – 1.90	Depositor EDS
% Data completeness (in resolution range)	93.9 (46.44-1.90) 93.9 (46.44-1.90)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.64 (at 1.91Å)	Xtriage
Refinement program	REFMAC 5.8.0267	Depositor
R, R_{free}	0.171 , 0.220 0.193 , 0.231	Depositor DCC
R_{free} test set	1006 reflections (1.22%)	wwPDB-VP
Wilson B-factor (Å^2)	56.3	Xtriage
Anisotropy	0.059	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 33.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.41$, $< L^2 > = 0.24$	Xtriage
Estimated twinning fraction	0.266 for h,-h-k,-l	Xtriage
Reported twinning fraction	0.710 for H, K, L 0.290 for K, H, -L	Depositor
Outliers	0 of 82549 reflections	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	6773	wwPDB-VP
Average B, all atoms (Å^2)	60.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.04% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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

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	0.84	0/851	0.99	0/1151
1	B	0.81	0/866	0.93	0/1171
1	C	0.78	0/857	0.95	0/1159
1	D	0.79	0/817	0.96	0/1107
1	E	0.81	0/853	0.97	1/1154 (0.1%)
1	F	0.73	0/789	0.93	0/1069
1	G	0.75	0/854	0.94	0/1155
1	H	0.85	0/839	0.95	0/1133
All	All	0.80	0/6726	0.95	1/9099 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	E	0	1
1	G	0	2
1	H	0	1
All	All	0	4

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	25	ASP	CB-CA-C	5.24	120.88	110.40

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	E	21	ARG	Sidechain

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Mol	Chain	Res	Type	Group
1	G	139	ARG	Sidechain
1	G	91	ARG	Sidechain
1	H	139	ARG	Sidechain

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	837	0	809	27	0
1	B	852	0	830	9	0
1	C	843	0	819	14	0
1	D	803	0	773	13	0
1	E	839	0	819	17	0
1	F	775	0	758	11	0
1	G	840	0	813	17	0
1	H	827	0	795	24	0
2	A	20	0	0	0	0
2	B	24	0	0	0	0
2	C	23	0	0	4	0
2	D	11	0	0	0	0
2	E	17	0	0	1	0
2	F	17	0	0	1	0
2	G	23	0	0	2	0
2	H	22	0	0	1	0
All	All	6773	0	6416	129	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 10.

All (129) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:106:LYS:HA	2:C:204:HOH:O	1.49	1.11
1:H:81:ASP:O	1:H:82:VAL:HG22	1.55	1.03
1:H:129:ALA:N	1:H:129:ALA:CB	2.40	0.84
1:A:22:ASN:HD21	1:A:90:GLY:HA3	1.43	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:37:GLY:H	1:E:117:MET:CE	1.93	0.82
1:H:129:ALA:CB	1:H:129:ALA:C	2.48	0.82
1:A:22:ASN:HD21	1:A:90:GLY:CA	1.93	0.81
1:A:88:TRP:CD1	1:A:130:GLY:HA3	2.16	0.80
1:A:126:ASN:HD22	1:A:137:LYS:HB3	1.47	0.78
1:H:146:HIS:C	2:H:205:HOH:O	2.22	0.78
1:G:57:ASN:HA	1:G:91:ARG:HH11	1.49	0.77
1:A:22:ASN:ND2	1:A:90:GLY:HA3	2.03	0.74
1:G:21:ARG:NE	1:G:57:ASN:OD1	2.20	0.74
1:E:37:GLY:H	1:E:117:MET:HE1	1.52	0.74
1:C:82:VAL:HG12	1:C:83:SER:H	1.59	0.68
1:A:80:VAL:HG21	1:A:85:THR:OG1	1.95	0.67
1:F:101:SER:HB2	1:F:121:GLU:HG2	1.77	0.66
1:G:91:ARG:HG3	1:G:92:ASP:N	2.11	0.66
1:F:42:LYS:NZ	2:F:201:HOH:O	2.28	0.65
1:H:82:VAL:HG23	1:H:85:THR:CG2	2.27	0.65
1:G:129:ALA:O	1:G:130:GLY:C	2.33	0.65
1:D:104:LEU:O	1:D:105:TRP:HB2	1.98	0.64
1:E:37:GLY:N	1:E:117:MET:CE	2.61	0.64
1:C:137:LYS:N	2:C:201:HOH:O	2.31	0.64
1:E:37:GLY:N	1:E:117:MET:HE2	2.13	0.63
1:D:27:SER:HB2	1:D:125:VAL:HB	1.81	0.63
1:E:36:ALA:HA	1:E:117:MET:HE2	1.82	0.60
1:H:82:VAL:HG23	1:H:82:VAL:O	2.02	0.59
1:D:53:ILE:HG22	1:D:91:ARG:HG3	1.84	0.59
1:G:57:ASN:HA	1:G:91:ARG:NH1	2.16	0.58
1:A:22:ASN:HD21	1:A:90:GLY:C	2.06	0.58
1:A:126:ASN:ND2	1:A:137:LYS:HB3	2.14	0.58
1:A:80:VAL:CG2	1:A:85:THR:OG1	2.51	0.58
1:A:27:SER:HB2	1:A:125:VAL:CG2	2.34	0.57
1:H:129:ALA:N	1:H:129:ALA:C	2.58	0.57
1:D:24:CYS:HA	1:D:126:ASN:O	2.05	0.56
1:H:82:VAL:HG21	1:H:85:THR:HG21	1.88	0.56
1:E:37:GLY:H	1:E:117:MET:HE2	1.68	0.56
1:B:21:ARG:O	1:B:90:GLY:HA3	2.06	0.55
1:G:88:TRP:CD1	1:G:130:GLY:HA3	2.43	0.54
1:H:82:VAL:HG23	1:H:85:THR:OG1	2.07	0.54
1:H:82:VAL:CG2	1:H:85:THR:HG21	2.37	0.54
1:H:81:ASP:O	1:H:82:VAL:CG2	2.43	0.54
1:A:91:ARG:O	1:A:95:MET:HG2	2.08	0.53
1:H:82:VAL:CG2	1:H:85:THR:CG2	2.86	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:91:ARG:O	1:E:95:MET:HG2	2.07	0.53
1:B:91:ARG:O	1:B:95:MET:HG2	2.08	0.53
1:C:91:ARG:O	1:C:95:MET:HG2	2.08	0.53
1:G:21:ARG:N	2:G:202:HOH:O	2.43	0.52
1:H:91:ARG:O	1:H:95:MET:HG2	2.09	0.52
1:D:23:ASN:O	1:D:127:CYS:HA	2.11	0.51
1:F:91:ARG:O	1:F:95:MET:HG2	2.11	0.51
1:A:124:ASP:OD2	1:A:139:ARG:NH2	2.43	0.51
1:E:36:ALA:CA	1:E:117:MET:HE2	2.41	0.51
1:B:55:LYS:N	1:B:55:LYS:HD2	2.26	0.50
1:C:146:HIS:CE1	2:C:208:HOH:O	2.64	0.50
1:G:26:GLY:O	1:G:27:SER:HB3	2.12	0.50
1:H:82:VAL:HG23	1:H:85:THR:HG23	1.95	0.49
1:H:87:GLY:HA3	1:H:138:VAL:HG11	1.94	0.49
1:C:82:VAL:HG12	1:C:83:SER:N	2.26	0.49
1:C:67:ILE:HG13	1:F:116:ALA:HB2	1.95	0.49
1:F:124:ASP:OD2	1:F:139:ARG:NH1	2.47	0.48
1:E:72:ARG:NH2	2:E:204:HOH:O	2.44	0.48
1:G:91:ARG:O	1:G:95:MET:HG2	2.13	0.48
1:B:67:ILE:HG13	1:G:116:ALA:HB2	1.96	0.48
1:D:101:SER:O	1:D:104:LEU:O	2.31	0.48
1:A:88:TRP:HD1	1:A:130:GLY:HA3	1.71	0.47
1:A:22:ASN:OD1	1:A:90:GLY:HA3	2.14	0.47
1:D:23:ASN:HD21	1:D:90:GLY:H	1.63	0.47
1:G:27:SER:HB2	1:G:125:VAL:CG2	2.45	0.47
1:G:88:TRP:HD1	1:G:130:GLY:HA3	1.79	0.47
1:A:22:ASN:CG	1:A:90:GLY:HA3	2.35	0.47
1:G:25:ASP:O	1:G:125:VAL:CG2	2.63	0.47
1:A:116:ALA:HB2	1:D:67:ILE:HG13	1.96	0.47
1:H:82:VAL:O	1:H:82:VAL:CG2	2.62	0.47
1:B:81:ASP:HB2	1:B:139:ARG:HB2	1.97	0.46
1:E:137:LYS:HD2	1:E:137:LYS:HA	1.44	0.46
1:B:88:TRP:O	1:B:127:CYS:HB3	2.16	0.46
1:G:25:ASP:O	1:G:125:VAL:HG23	2.16	0.46
1:E:39:ALA:H	1:E:117:MET:HE3	1.81	0.46
1:F:101:SER:HB2	1:F:121:GLU:CG	2.44	0.45
1:A:23:ASN:HB2	1:A:128:VAL:HG22	1.97	0.45
1:G:42:LYS:NZ	2:G:203:HOH:O	2.49	0.45
1:H:23:ASN:HD21	1:H:88:TRP:HB3	1.81	0.45
1:C:127:CYS:HB2	1:C:140:ILE:HD12	1.98	0.45
1:C:88:TRP:O	1:C:127:CYS:HB3	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:24:CYS:SG	1:H:126:ASN:O	2.75	0.45
1:C:127:CYS:HB2	1:C:140:ILE:CD1	2.47	0.44
1:D:91:ARG:O	1:D:95:MET:HG2	2.18	0.44
1:F:36:ALA:HA	1:F:117:MET:SD	2.58	0.44
1:E:38:ASN:H	1:E:117:MET:CE	2.31	0.43
1:A:25:ASP:O	1:A:125:VAL:HG23	2.18	0.43
1:C:81:ASP:HB2	1:C:139:ARG:HB2	2.00	0.43
1:E:88:TRP:O	1:E:127:CYS:HB3	2.19	0.43
1:H:23:ASN:HB3	1:H:93:ASP:OD2	2.19	0.42
1:H:82:VAL:CG2	1:H:85:THR:OG1	2.67	0.42
1:A:88:TRP:O	1:A:127:CYS:HB3	2.19	0.42
1:B:86:ALA:O	1:B:138:VAL:HG21	2.19	0.42
1:D:88:TRP:O	1:D:127:CYS:HB3	2.20	0.42
1:A:27:SER:HB2	1:A:125:VAL:HG23	2.00	0.42
1:A:88:TRP:HB2	1:A:128:VAL:HG23	2.01	0.42
1:H:58:LYS:HB3	1:H:58:LYS:HE3	1.84	0.42
1:A:58:LYS:HB3	1:A:58:LYS:HE2	1.87	0.41
1:D:44:ASP:OD1	1:D:72:ARG:HD2	2.20	0.41
1:F:88:TRP:O	1:F:127:CYS:HB3	2.20	0.41
1:A:25:ASP:O	1:A:125:VAL:CG2	2.69	0.41
1:E:39:ALA:N	1:E:117:MET:HE3	2.36	0.41
1:C:146:HIS:HE1	2:C:208:HOH:O	2.03	0.41
1:F:49:ARG:HB2	1:F:98:MET:HE2	2.03	0.41
1:H:88:TRP:O	1:H:127:CYS:HB3	2.21	0.41
1:A:117:MET:HE2	1:A:117:MET:HB2	1.90	0.41
1:A:81:ASP:OD2	1:A:124:ASP:OD1	2.37	0.41
1:F:100:ASP:O	1:F:102:LEU:N	2.50	0.41
1:E:21:ARG:CZ	1:E:58:LYS:HA	2.50	0.41
1:G:73:THR:O	1:G:146:HIS:HA	2.21	0.41
1:D:92:ASP:O	1:D:95:MET:HB2	2.20	0.41
1:B:73:THR:O	1:B:146:HIS:HA	2.21	0.41
1:E:22:ASN:HA	1:E:93:ASP:OD1	2.21	0.41
1:E:37:GLY:N	1:E:117:MET:HE1	2.26	0.41
1:B:137:LYS:HE3	1:B:137:LYS:HB2	1.56	0.40
1:C:68:ILE:HG21	1:C:94:ILE:HD13	2.02	0.40
1:F:58:LYS:HE3	1:F:58:LYS:HB3	1.80	0.40
1:A:87:GLY:HA2	1:A:129:ALA:O	2.21	0.40
1:H:126:ASN:HA	1:H:138:VAL:O	2.21	0.40
1:C:87:GLY:HA3	1:C:140:ILE:HD11	2.04	0.40
1:A:86:ALA:O	1:A:129:ALA:O	2.38	0.40
1:D:68:ILE:HG21	1:D:94:ILE:HD13	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:68:ILE:HG21	1:G:94:ILE:HD13	2.03	0.40
1:H:68:ILE:HG21	1:H:94:ILE: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	106/144 (74%)	101 (95%)	2 (2%)	3 (3%)	5 1
1	B	107/144 (74%)	104 (97%)	3 (3%)	0	100 100
1	C	106/144 (74%)	101 (95%)	4 (4%)	1 (1%)	17 7
1	D	101/144 (70%)	98 (97%)	2 (2%)	1 (1%)	15 6
1	E	105/144 (73%)	100 (95%)	4 (4%)	1 (1%)	15 6
1	F	97/144 (67%)	92 (95%)	5 (5%)	0	100 100
1	G	106/144 (74%)	102 (96%)	2 (2%)	2 (2%)	8 1
1	H	104/144 (72%)	99 (95%)	3 (3%)	2 (2%)	8 1
All	All	832/1152 (72%)	797 (96%)	25 (3%)	10 (1%)	13 4

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	26	GLY
1	C	82	VAL
1	D	105	TRP
1	G	26	GLY
1	H	26	GLY
1	A	27	SER
1	G	27	SER
1	A	82	VAL

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Mol	Chain	Res	Type
1	E	82	VAL
1	H	82	VAL

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	90/112 (80%)	86 (96%)	4 (4%)	28 19
1	B	92/112 (82%)	87 (95%)	5 (5%)	22 13
1	C	91/112 (81%)	88 (97%)	3 (3%)	38 29
1	D	87/112 (78%)	81 (93%)	6 (7%)	15 7
1	E	91/112 (81%)	84 (92%)	7 (8%)	13 5
1	F	83/112 (74%)	77 (93%)	6 (7%)	14 6
1	G	90/112 (80%)	83 (92%)	7 (8%)	12 5
1	H	88/112 (79%)	79 (90%)	9 (10%)	7 2
All	All	712/896 (80%)	665 (93%)	47 (7%)	16 8

All (47) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	25	ASP
1	A	41	SER
1	A	99	LYS
1	A	126	ASN
1	B	20	LEU
1	B	41	SER
1	B	55	LYS
1	B	80	VAL
1	B	137	LYS
1	C	41	SER
1	C	80	VAL
1	C	137	LYS
1	D	27	SER

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Mol	Chain	Res	Type
1	D	41	SER
1	D	63	SER
1	D	91	ARG
1	D	92	ASP
1	D	93	ASP
1	E	23	ASN
1	E	41	SER
1	E	81	ASP
1	E	96	ASP
1	E	99	LYS
1	E	124	ASP
1	E	137	LYS
1	F	41	SER
1	F	58	LYS
1	F	80	VAL
1	F	83	SER
1	F	99	LYS
1	F	100	ASP
1	G	22	ASN
1	G	23	ASN
1	G	25	ASP
1	G	41	SER
1	G	83	SER
1	G	91	ARG
1	G	124	ASP
1	H	25	ASP
1	H	41	SER
1	H	42	LYS
1	H	58	LYS
1	H	99	LYS
1	H	124	ASP
1	H	126	ASN
1	H	137	LYS
1	H	138	VAL

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	22	ASN
1	A	126	ASN
1	D	23	ASN
1	D	103	ASN

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Mol	Chain	Res	Type
1	G	22	ASN
1	G	103	ASN
1	H	23	ASN

5.3.3 RNA

There are no RNA molecules 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 monosaccharides 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^{th} 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	112/144 (77%)	0.51	6 (5%)	25	29	54, 60, 67, 75	0
1	B	113/144 (78%)	0.42	4 (3%)	44	47	52, 57, 62, 64	0
1	C	112/144 (77%)	0.43	6 (5%)	25	29	54, 59, 68, 72	0
1	D	107/144 (74%)	0.46	6 (5%)	24	27	56, 62, 69, 71	0
1	E	111/144 (77%)	0.32	3 (2%)	54	57	54, 59, 67, 69	0
1	F	103/144 (71%)	0.42	5 (4%)	29	33	56, 63, 72, 74	0
1	G	112/144 (77%)	0.39	4 (3%)	42	45	53, 57, 63, 67	0
1	H	111/144 (77%)	0.41	7 (6%)	20	22	56, 61, 71, 74	0
All	All	881/1152 (76%)	0.42	41 (4%)	31	34	52, 60, 69, 75	0

All (41) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	82	VAL	6.6
1	D	26	GLY	6.0
1	E	20	LEU	4.8
1	A	25	ASP	4.4
1	D	23	ASN	3.9
1	H	25	ASP	3.8
1	A	22	ASN	3.7
1	A	116	ALA	3.7
1	G	139	ARG	3.6
1	D	25	ASP	3.6
1	B	136	GLN	3.5
1	A	26	GLY	3.5
1	H	57	ASN	3.4
1	D	91	ARG	3.2
1	C	81	ASP	3.2
1	C	117	MET	3.2

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Mol	Chain	Res	Type	RSRZ
1	C	25	ASP	3.0
1	H	129	ALA	3.0
1	G	25	ASP	3.0
1	D	36	ALA	2.9
1	D	24	CYS	2.8
1	H	139	ARG	2.7
1	F	130	GLY	2.7
1	E	37	GLY	2.6
1	B	25	ASP	2.5
1	H	23	ASN	2.5
1	F	36	ALA	2.5
1	H	82	VAL	2.4
1	C	138	VAL	2.4
1	A	105	TRP	2.4
1	A	130	GLY	2.3
1	F	80	VAL	2.3
1	B	137	LYS	2.3
1	B	81	ASP	2.3
1	C	36	ALA	2.3
1	G	21	ARG	2.2
1	G	130	GLY	2.2
1	H	114	GLN	2.1
1	E	23	ASN	2.1
1	F	104	LEU	2.1
1	F	99	LYS	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)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.