Full wwPDB X-ray Structure Validation Report ⓘ

Apr 6, 2026 – 12:09 PM JST

PDB ID	:	9JVB / pdb_00009jvb
Title	:	Trypanosoma brucei strain TREU927 TFIIS2-1 LW domain
Authors	:	Wang, Y.Z.; Wang, C.C.
Deposited on	:	2024-10-08
Resolution	:	3.50 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:

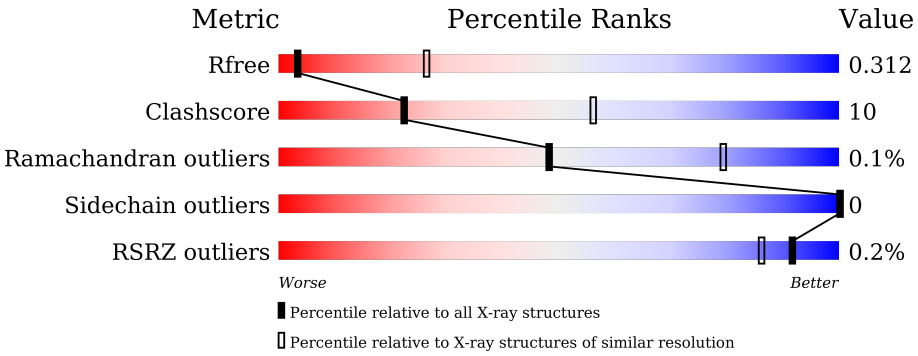
MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.48.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.50 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1094 (3.56-3.44)
Clashscore	180529	1045 (3.54-3.46)
Ramachandran outliers	177936	1032 (3.54-3.46)
Sidechain outliers	177891	1033 (3.54-3.46)
RSRZ outliers	164620	1093 (3.56-3.44)

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	117	77% 14% • 9%
1	B	117	65% 26% 9%
1	C	117	% 75% 15% 9%
1	D	117	72% 19% • 9%
1	E	117	74% 18% 9%
1	F	117	67% 18% 15%

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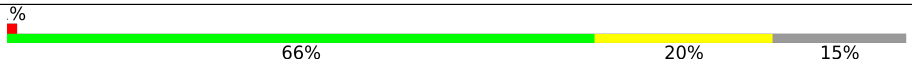
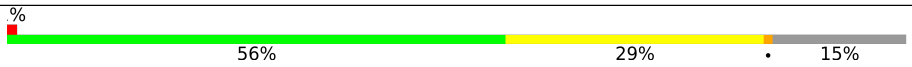
Mol	Chain	Length	Quality of chain
1	G	117	
1	H	117	
1	I	117	
1	J	117	
1	K	117	
1	L	117	

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 9462 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 Transcription elongation factor S-II, putative.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	107	Total	C	N	O	S	0	0	0
			830	515	150	162	3			
1	B	106	Total	C	N	O	S	0	0	0
			820	509	147	161	3			
1	C	106	Total	C	N	O	S	0	0	0
			820	509	147	161	3			
1	D	107	Total	C	N	O	S	0	0	0
			831	515	151	162	3			
1	E	107	Total	C	N	O	S	0	0	0
			830	515	150	162	3			
1	F	99	Total	C	N	O	S	0	0	0
			758	470	137	148	3			
1	G	98	Total	C	N	O	S	0	0	0
			748	464	134	147	3			
1	I	92	Total	C	N	O	S	0	0	0
			705	441	126	136	2			
1	K	100	Total	C	N	O	S	0	0	0
			770	479	138	150	3			
1	L	100	Total	C	N	O	S	0	0	0
			769	478	136	152	3			
1	J	105	Total	C	N	O	S	0	0	0
			812	503	146	160	3			
1	H	100	Total	C	N	O	S	0	0	0
			769	478	136	152	3			

There are 108 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-8	MET	-	initiating methionine	UNP Q586X9
A	-7	GLY	-	expression tag	UNP Q586X9
A	-6	HIS	-	expression tag	UNP Q586X9
A	-5	HIS	-	expression tag	UNP Q586X9
A	-4	HIS	-	expression tag	UNP Q586X9

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	HIS	-	expression tag	UNP Q586X9
A	-2	HIS	-	expression tag	UNP Q586X9
A	-1	HIS	-	expression tag	UNP Q586X9
A	0	MET	-	expression tag	UNP Q586X9
B	-8	MET	-	initiating methionine	UNP Q586X9
B	-7	GLY	-	expression tag	UNP Q586X9
B	-6	HIS	-	expression tag	UNP Q586X9
B	-5	HIS	-	expression tag	UNP Q586X9
B	-4	HIS	-	expression tag	UNP Q586X9
B	-3	HIS	-	expression tag	UNP Q586X9
B	-2	HIS	-	expression tag	UNP Q586X9
B	-1	HIS	-	expression tag	UNP Q586X9
B	0	MET	-	expression tag	UNP Q586X9
C	-8	MET	-	initiating methionine	UNP Q586X9
C	-7	GLY	-	expression tag	UNP Q586X9
C	-6	HIS	-	expression tag	UNP Q586X9
C	-5	HIS	-	expression tag	UNP Q586X9
C	-4	HIS	-	expression tag	UNP Q586X9
C	-3	HIS	-	expression tag	UNP Q586X9
C	-2	HIS	-	expression tag	UNP Q586X9
C	-1	HIS	-	expression tag	UNP Q586X9
C	0	MET	-	expression tag	UNP Q586X9
D	-8	MET	-	initiating methionine	UNP Q586X9
D	-7	GLY	-	expression tag	UNP Q586X9
D	-6	HIS	-	expression tag	UNP Q586X9
D	-5	HIS	-	expression tag	UNP Q586X9
D	-4	HIS	-	expression tag	UNP Q586X9
D	-3	HIS	-	expression tag	UNP Q586X9
D	-2	HIS	-	expression tag	UNP Q586X9
D	-1	HIS	-	expression tag	UNP Q586X9
D	0	MET	-	expression tag	UNP Q586X9
E	-8	MET	-	initiating methionine	UNP Q586X9
E	-7	GLY	-	expression tag	UNP Q586X9
E	-6	HIS	-	expression tag	UNP Q586X9
E	-5	HIS	-	expression tag	UNP Q586X9
E	-4	HIS	-	expression tag	UNP Q586X9
E	-3	HIS	-	expression tag	UNP Q586X9
E	-2	HIS	-	expression tag	UNP Q586X9
E	-1	HIS	-	expression tag	UNP Q586X9
E	0	MET	-	expression tag	UNP Q586X9
F	-8	MET	-	initiating methionine	UNP Q586X9
F	-7	GLY	-	expression tag	UNP Q586X9

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Chain	Residue	Modelled	Actual	Comment	Reference
F	-6	HIS	-	expression tag	UNP Q586X9
F	-5	HIS	-	expression tag	UNP Q586X9
F	-4	HIS	-	expression tag	UNP Q586X9
F	-3	HIS	-	expression tag	UNP Q586X9
F	-2	HIS	-	expression tag	UNP Q586X9
F	-1	HIS	-	expression tag	UNP Q586X9
F	0	MET	-	expression tag	UNP Q586X9
G	-8	MET	-	initiating methionine	UNP Q586X9
G	-7	GLY	-	expression tag	UNP Q586X9
G	-6	HIS	-	expression tag	UNP Q586X9
G	-5	HIS	-	expression tag	UNP Q586X9
G	-4	HIS	-	expression tag	UNP Q586X9
G	-3	HIS	-	expression tag	UNP Q586X9
G	-2	HIS	-	expression tag	UNP Q586X9
G	-1	HIS	-	expression tag	UNP Q586X9
G	0	MET	-	expression tag	UNP Q586X9
I	-8	MET	-	initiating methionine	UNP Q586X9
I	-7	GLY	-	expression tag	UNP Q586X9
I	-6	HIS	-	expression tag	UNP Q586X9
I	-5	HIS	-	expression tag	UNP Q586X9
I	-4	HIS	-	expression tag	UNP Q586X9
I	-3	HIS	-	expression tag	UNP Q586X9
I	-2	HIS	-	expression tag	UNP Q586X9
I	-1	HIS	-	expression tag	UNP Q586X9
I	0	MET	-	expression tag	UNP Q586X9
K	-8	MET	-	initiating methionine	UNP Q586X9
K	-7	GLY	-	expression tag	UNP Q586X9
K	-6	HIS	-	expression tag	UNP Q586X9
K	-5	HIS	-	expression tag	UNP Q586X9
K	-4	HIS	-	expression tag	UNP Q586X9
K	-3	HIS	-	expression tag	UNP Q586X9
K	-2	HIS	-	expression tag	UNP Q586X9
K	-1	HIS	-	expression tag	UNP Q586X9
K	0	MET	-	expression tag	UNP Q586X9
L	-8	MET	-	initiating methionine	UNP Q586X9
L	-7	GLY	-	expression tag	UNP Q586X9
L	-6	HIS	-	expression tag	UNP Q586X9
L	-5	HIS	-	expression tag	UNP Q586X9
L	-4	HIS	-	expression tag	UNP Q586X9
L	-3	HIS	-	expression tag	UNP Q586X9
L	-2	HIS	-	expression tag	UNP Q586X9
L	-1	HIS	-	expression tag	UNP Q586X9

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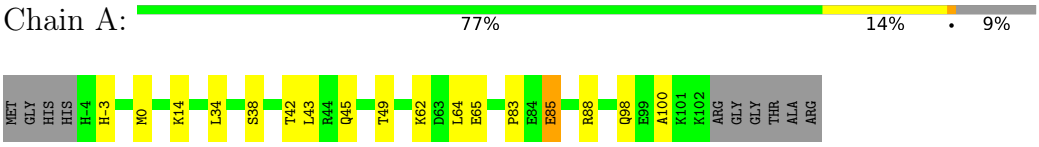
Chain	Residue	Modelled	Actual	Comment	Reference
L	0	MET	-	expression tag	UNP Q586X9
J	-8	MET	-	initiating methionine	UNP Q586X9
J	-7	GLY	-	expression tag	UNP Q586X9
J	-6	HIS	-	expression tag	UNP Q586X9
J	-5	HIS	-	expression tag	UNP Q586X9
J	-4	HIS	-	expression tag	UNP Q586X9
J	-3	HIS	-	expression tag	UNP Q586X9
J	-2	HIS	-	expression tag	UNP Q586X9
J	-1	HIS	-	expression tag	UNP Q586X9
J	0	MET	-	expression tag	UNP Q586X9
H	-8	MET	-	initiating methionine	UNP Q586X9
H	-7	GLY	-	expression tag	UNP Q586X9
H	-6	HIS	-	expression tag	UNP Q586X9
H	-5	HIS	-	expression tag	UNP Q586X9
H	-4	HIS	-	expression tag	UNP Q586X9
H	-3	HIS	-	expression tag	UNP Q586X9
H	-2	HIS	-	expression tag	UNP Q586X9
H	-1	HIS	-	expression tag	UNP Q586X9
H	0	MET	-	expression tag	UNP Q586X9

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.

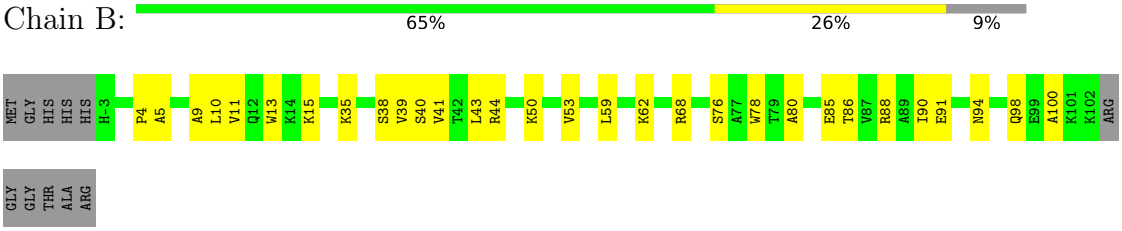
• Molecule 1: Transcription elongation factor S-II, putative

Chain A:



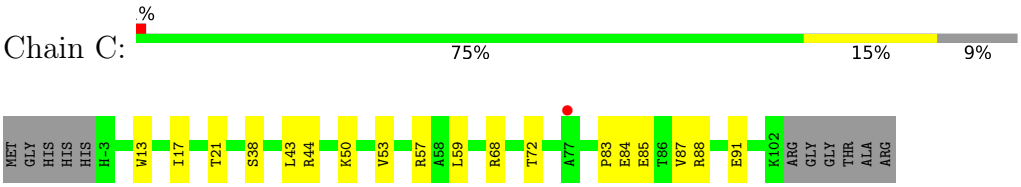
• Molecule 1: Transcription elongation factor S-II, putative

Chain B:



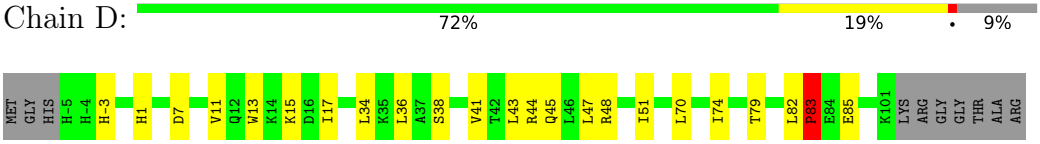
• Molecule 1: Transcription elongation factor S-II, putative

Chain C:



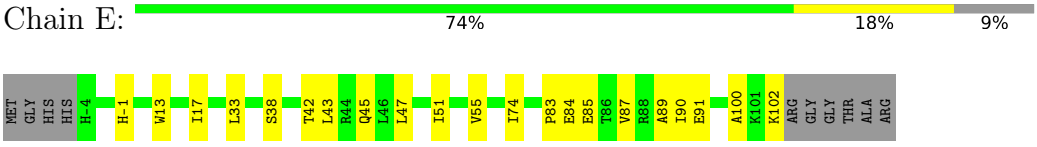
• Molecule 1: Transcription elongation factor S-II, putative

Chain D:



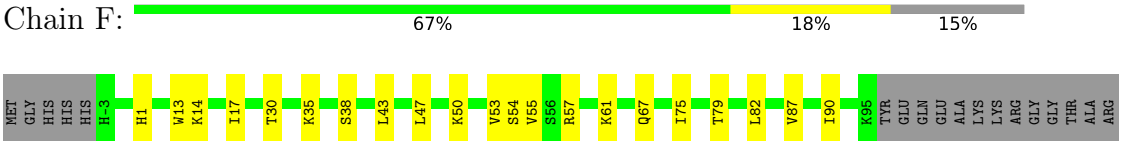
• Molecule 1: Transcription elongation factor S-II, putative

Chain E:



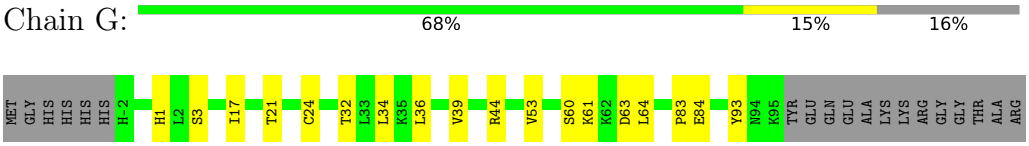
• Molecule 1: Transcription elongation factor S-II, putative

Chain F:



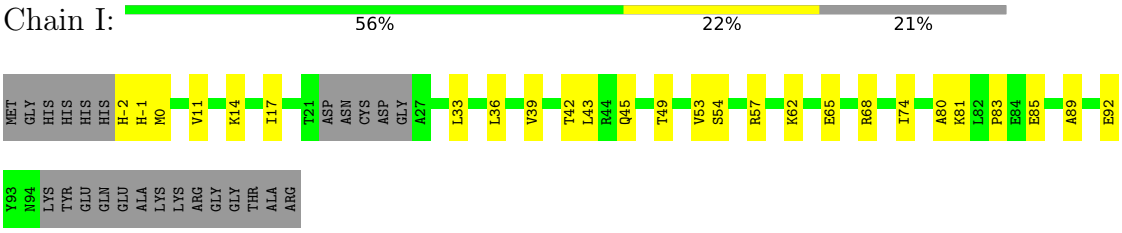
• Molecule 1: Transcription elongation factor S-II, putative

Chain G:



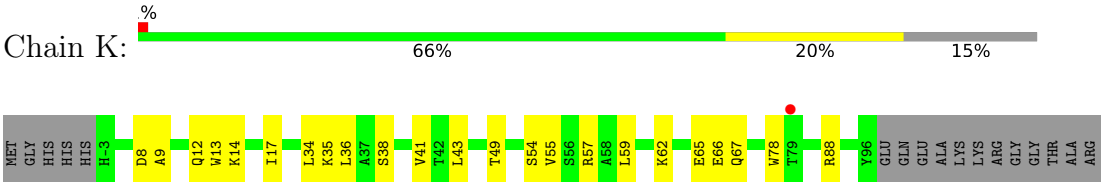
• Molecule 1: Transcription elongation factor S-II, putative

Chain I:



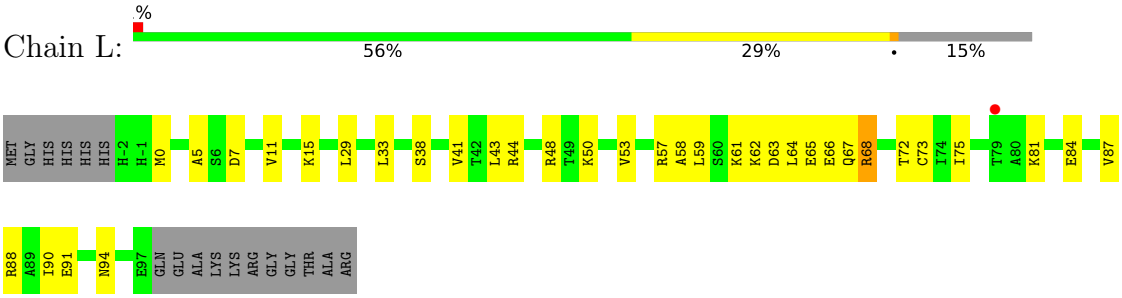
• Molecule 1: Transcription elongation factor S-II, putative

Chain K:



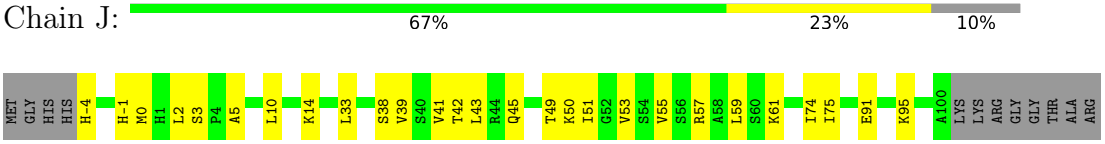
• Molecule 1: Transcription elongation factor S-II, putative

Chain L:



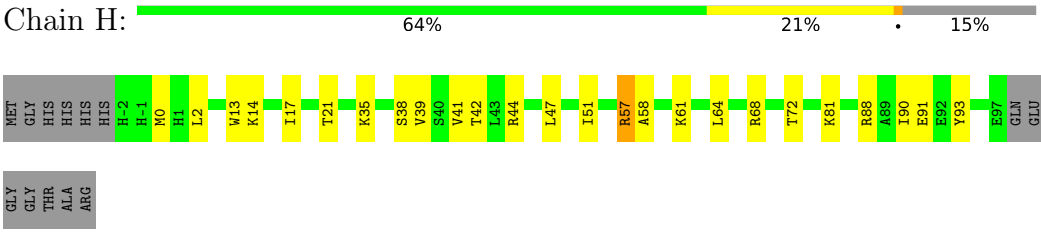
• Molecule 1: Transcription elongation factor S-II, putative

Chain J:



• Molecule 1: Transcription elongation factor S-II, putative

Chain H:


64%
21%
15%
MET GLY HIS HIS HIS H-2 H-1 MO H1 L2 W13 K14 I17 T21 K35 S38 V39 S40 V41 T42 L43 R44 L47 I51 R57 A58 K61 L64 R68 T72 K81 R88 A89 I90 E91 E92 Y93 E97 GLN GLU ALA LYS LYS ARG
GLY GLY THR ALA ARG

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	60.51Å 80.94Å 86.79Å 116.78° 96.47° 105.93°	Depositor
Resolution (Å)	32.82 – 3.50 32.82 – 3.50	Depositor EDS
% Data completeness (in resolution range)	97.7 (32.82-3.50) 97.5 (32.82-3.50)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.43 (at 3.47Å)	Xtriage
Refinement program	PHENIX dev_5463	Depositor
R, R_{free}	0.276 , 0.312 0.276 , 0.312	Depositor DCC
R_{free} test set	828 reflections (4.83%)	wwPDB-VP
Wilson B-factor (Å^2)	124.6	Xtriage
Anisotropy	0.298	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 75.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	9462	wwPDB-VP
Average B, all atoms (Å^2)	127.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.75% 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	0.39	0/842	0.70	1/1138 (0.1%)
1	B	0.20	0/831	0.46	1/1123 (0.1%)
1	C	0.17	0/831	0.44	0/1123
1	D	0.17	0/844	0.49	2/1142 (0.2%)
1	E	0.24	0/842	0.43	0/1138
1	F	0.26	0/768	0.43	0/1040
1	G	0.34	0/757	0.60	0/1025
1	H	0.18	0/779	0.45	0/1055
1	I	0.24	0/713	0.48	0/965
1	J	0.25	0/824	0.49	0/1116
1	K	0.29	0/781	0.51	0/1058
1	L	0.44	0/779	0.71	0/1055
All	All	0.28	0/9591	0.52	4/12978 (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	A	0	1
1	H	0	1
1	L	0	1
All	All	0	3

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	85	GLU	N-CA-C	-6.30	105.53	113.72
1	D	83	PRO	N-CA-C	5.87	124.55	112.47
1	B	85	GLU	N-CA-C	-5.50	106.57	113.28
1	D	83	PRO	CB-CA-C	-5.29	102.83	111.56

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	88	ARG	Sidechain
1	H	57	ARG	Sidechain
1	L	68	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	830	0	827	14	0
1	B	820	0	820	26	0
1	C	820	0	820	11	0
1	D	831	0	821	21	0
1	E	830	0	827	16	0
1	F	758	0	760	16	0
1	G	748	0	753	16	0
1	H	769	0	768	21	0
1	I	705	0	717	15	1
1	J	812	0	801	28	0
1	K	770	0	769	21	0
1	L	769	0	768	35	1
All	All	9462	0	9451	196	1

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 (196) 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:L:61:LYS:HG2	1:L:68:ARG:NH1	1.66	1.11
1:L:62:LYS:O	1:L:64:LEU:HD22	1.60	1.01
1:L:61:LYS:HG2	1:L:68:ARG:HH12	0.84	0.99
1:G:39:VAL:HG12	1:H:44:ARG:HH21	1.31	0.93
1:L:61:LYS:CG	1:L:68:ARG:HH12	1.79	0.92
1:B:43:LEU:HB3	1:J:38:SER:HB3	1.61	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:63:ASP:O	1:L:64:LEU:HD13	1.79	0.83
1:G:53:VAL:HG13	1:G:93:TYR:CD2	2.19	0.77
1:B:78:TRP:HB3	1:J:0:MET:HE3	1.63	0.77
1:B:38:SER:HB3	1:C:43:LEU:HB3	1.69	0.74
1:K:62:LYS:O	1:K:65:GLU:HG3	1.90	0.72
1:L:62:LYS:O	1:L:64:LEU:CD2	2.37	0.69
1:C:21:THR:HG21	1:C:57:ARG:HG2	1.74	0.68
1:J:14:LYS:HZ3	1:J:51:ILE:HA	1.59	0.68
1:F:14:LYS:HE3	1:F:54:SER:HB3	1.77	0.67
1:L:29:LEU:O	1:L:33:LEU:HD12	1.97	0.65
1:J:14:LYS:NZ	1:J:51:ILE:HA	2.14	0.63
1:L:81:LYS:O	1:L:81:LYS:HD2	1.98	0.63
1:A:-3:HIS:NE2	1:D:-3:HIS:NE2	2.47	0.62
1:I:36:LEU:HD22	1:I:74:ILE:HD13	1.81	0.61
1:K:55:VAL:O	1:K:59:LEU:HD12	2.01	0.60
1:A:38:SER:HB3	1:D:43:LEU:HB3	1.84	0.59
1:A:43:LEU:HB3	1:C:38:SER:HB3	1.85	0.59
1:G:3:SER:HB3	1:H:44:ARG:HH22	1.67	0.59
1:F:47:LEU:HD11	1:K:34:LEU:HD23	1.84	0.58
1:D:34:LEU:HD11	1:E:89:ALA:HA	1.86	0.58
1:D:38:SER:HB3	1:E:43:LEU:HB3	1.86	0.58
1:B:62:LYS:HA	1:B:68:ARG:HH22	1.68	0.58
1:B:91:GLU:HA	1:B:94:ASN:ND2	2.20	0.57
1:C:83:PRO:HG2	1:C:85:GLU:OE1	2.04	0.57
1:E:38:SER:HB3	1:J:43:LEU:HB3	1.86	0.56
1:I:45:GLN:O	1:I:49:THR:HG22	2.06	0.55
1:I:83:PRO:HG2	1:I:85:GLU:OE1	2.05	0.55
1:I:33:LEU:HD22	1:I:74:ILE:HD12	1.88	0.55
1:C:88:ARG:HH12	1:C:91:GLU:HG2	1.72	0.55
1:A:38:SER:OG	1:D:44:ARG:HG3	2.06	0.55
1:G:1:HIS:O	1:H:42:THR:HG22	2.07	0.54
1:E:83:PRO:HG2	1:E:85:GLU:HG3	1.89	0.54
1:L:59:LEU:HA	1:L:68:ARG:NH2	2.22	0.54
1:F:79:THR:HA	1:F:82:LEU:HD13	1.90	0.54
1:L:65:GLU:O	1:L:66:GLU:C	2.50	0.54
1:L:59:LEU:HD11	1:L:75:ILE:HG13	1.89	0.53
1:L:62:LYS:C	1:L:64:LEU:HD22	2.30	0.53
1:H:61:LYS:NZ	1:H:64:LEU:HB2	2.24	0.53
1:L:50:LYS:O	1:L:53:VAL:HG12	2.09	0.53
1:L:65:GLU:OE1	1:L:65:GLU:N	2.43	0.52
1:B:38:SER:OG	1:C:44:ARG:HG3	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:88:ARG:NE	1:L:67:GLN:HG2	2.24	0.52
1:J:33:LEU:HD22	1:J:74:ILE:HD12	1.91	0.52
1:F:87:VAL:O	1:F:90:ILE:HG22	2.10	0.52
1:K:13:TRP:CE3	1:K:36:LEU:HD23	2.45	0.52
1:B:44:ARG:NH1	1:J:39:VAL:HG23	2.25	0.52
1:K:66:GLU:HB3	1:K:67:GLN:OE1	2.09	0.51
1:I:11:VAL:HA	1:I:14:LYS:HG2	1.92	0.51
1:A:83:PRO:HD2	1:A:85:GLU:CD	2.36	0.51
1:B:62:LYS:HA	1:B:68:ARG:NH2	2.26	0.51
1:J:50:LYS:O	1:J:53:VAL:HG22	2.11	0.51
1:K:17:ILE:HG21	1:K:54:SER:HB3	1.93	0.51
1:L:59:LEU:HA	1:L:68:ARG:HH21	1.75	0.51
1:B:44:ARG:HH12	1:J:39:VAL:HG23	1.76	0.50
1:E:13:TRP:O	1:E:17:ILE:HG13	2.11	0.50
1:F:43:LEU:HD21	1:K:34:LEU:HG	1.94	0.50
1:K:41:VAL:O	1:L:0:MET:HG2	2.11	0.50
1:A:64:LEU:HD12	1:A:64:LEU:O	2.12	0.50
1:D:82:LEU:HB2	1:D:85:GLU:OE2	2.11	0.50
1:F:38:SER:HB2	1:I:43:LEU:HB3	1.94	0.50
1:L:7:ASP:O	1:L:11:VAL:HG23	2.11	0.50
1:K:78:TRP:HB3	1:L:0:MET:HE3	1.94	0.49
1:H:14:LYS:HB2	1:H:51:ILE:HG22	1.94	0.49
1:L:11:VAL:O	1:L:15:LYS:HG3	2.12	0.49
1:F:13:TRP:O	1:F:17:ILE:HG12	2.11	0.49
1:A:0:MET:HA	1:D:41:VAL:O	2.12	0.49
1:C:50:LYS:O	1:C:53:VAL:HG22	2.12	0.49
1:F:50:LYS:O	1:F:53:VAL:HG22	2.13	0.49
1:H:13:TRP:NE1	1:H:35:LYS:HD2	2.27	0.49
1:H:90:ILE:HA	1:H:93:TYR:CD2	2.48	0.49
1:H:58:ALA:O	1:H:61:LYS:HG2	2.12	0.49
1:H:68:ARG:O	1:H:72:THR:HG23	2.12	0.49
1:L:84:GLU:O	1:L:87:VAL:HG12	2.12	0.49
1:I:80:ALA:HB3	1:I:81:LYS:NZ	2.27	0.48
1:J:5:ALA:HB2	1:J:41:VAL:HG22	1.95	0.48
1:L:5:ALA:HB2	1:L:41:VAL:HG22	1.93	0.48
1:J:57:ARG:O	1:J:61:LYS:HG2	2.13	0.48
1:D:11:VAL:O	1:D:15:LYS:HG3	2.14	0.48
1:G:61:LYS:HZ3	1:G:63:ASP:HB2	1.77	0.48
1:E:42:THR:OG1	1:E:45:GLN:HG3	2.13	0.48
1:L:91:GLU:HA	1:L:94:ASN:ND2	2.28	0.48
1:B:5:ALA:HB1	1:B:10:LEU:HD11	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:10:LEU:HB3	1:J:49:THR:HG21	1.96	0.47
1:H:88:ARG:O	1:H:91:GLU:HG3	2.15	0.47
1:E:33:LEU:HD22	1:E:74:ILE:HD12	1.96	0.47
1:A:62:LYS:O	1:A:65:GLU:HG3	2.15	0.47
1:C:84:GLU:O	1:C:87:VAL:HG12	2.15	0.46
1:B:41:VAL:O	1:J:0:MET:HA	2.15	0.46
1:B:39:VAL:O	1:J:-1:HIS:HD2	1.98	0.46
1:F:57:ARG:O	1:F:61:LYS:HG2	2.15	0.46
1:H:14:LYS:O	1:H:17:ILE:HG22	2.16	0.46
1:C:59:LEU:HD12	1:C:68:ARG:HG3	1.96	0.46
1:E:51:ILE:O	1:E:55:VAL:HG23	2.15	0.46
1:G:36:LEU:O	1:G:39:VAL:HG22	2.16	0.46
1:G:83:PRO:HB2	1:G:84:GLU:CD	2.40	0.46
1:C:68:ARG:O	1:C:72:THR:HG23	2.16	0.46
1:L:72:THR:O	1:L:73:CYS:C	2.58	0.46
1:L:88:ARG:O	1:L:91:GLU:HG3	2.15	0.46
1:D:45:GLN:HG2	1:D:48:ARG:HH22	1.81	0.46
1:G:60:SER:O	1:G:61:LYS:C	2.59	0.46
1:L:87:VAL:HA	1:L:90:ILE:HD12	1.98	0.46
1:G:3:SER:HB3	1:H:44:ARG:NH2	2.29	0.45
1:L:44:ARG:O	1:L:48:ARG:HG3	2.16	0.45
1:L:53:VAL:HG22	1:L:57:ARG:HE	1.81	0.45
1:F:30:THR:HG22	1:F:67:GLN:HG2	1.97	0.45
1:G:44:ARG:HH22	1:I:39:VAL:HG12	1.80	0.45
1:J:42:THR:HG22	1:J:45:GLN:HG3	1.98	0.45
1:A:98:GLN:C	1:A:100:ALA:H	2.24	0.45
1:K:14:LYS:HD3	1:K:49:THR:O	2.17	0.45
1:H:17:ILE:O	1:H:21:THR:HG23	2.16	0.45
1:B:40:SER:HA	1:J:-1:HIS:HA	1.99	0.45
1:K:57:ARG:HA	1:K:57:ARG:HD2	1.80	0.45
1:E:84:GLU:O	1:E:87:VAL:HG22	2.17	0.45
1:G:21:THR:HA	1:G:64:LEU:HD11	1.98	0.45
1:B:59:LEU:HA	1:B:68:ARG:HH11	1.82	0.45
1:K:13:TRP:HE1	1:K:35:LYS:NZ	2.15	0.44
1:L:61:LYS:CG	1:L:68:ARG:NH1	2.58	0.44
1:J:42:THR:CG2	1:J:45:GLN:HG3	2.48	0.44
1:A:14:LYS:HD2	1:A:49:THR:O	2.18	0.44
1:G:53:VAL:CG1	1:G:93:TYR:CD2	2.98	0.44
1:D:1:HIS:O	1:E:42:THR:HG22	2.18	0.44
1:J:55:VAL:HG11	1:J:75:ILE:HD11	2.00	0.44
1:E:38:SER:HB2	1:J:42:THR:OG1	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:87:VAL:O	1:E:90:ILE:HG22	2.18	0.44
1:I:89:ALA:O	1:I:92:GLU:HB2	2.18	0.43
1:K:8:ASP:O	1:K:12:GLN:HG2	2.18	0.43
1:A:42:THR:OG1	1:A:45:GLN:HG3	2.17	0.43
1:J:41:VAL:HG13	1:J:45:GLN:HB2	2.00	0.43
1:A:34:LEU:HB3	1:D:47:LEU:HD11	1.99	0.43
1:D:82:LEU:HD12	1:D:85:GLU:HG2	1.99	0.43
1:B:44:ARG:HH22	1:J:3:SER:HB3	1.82	0.43
1:I:17:ILE:HG21	1:I:54:SER:OG	2.18	0.43
1:A:83:PRO:O	1:A:85:GLU:N	2.51	0.43
1:B:43:LEU:HB3	1:J:38:SER:CB	2.42	0.43
1:B:76:SER:O	1:B:80:ALA:HB2	2.19	0.43
1:H:0:MET:HE3	1:H:0:MET:HB3	1.91	0.43
1:H:81:LYS:O	1:H:81:LYS:HG2	2.18	0.43
1:B:11:VAL:O	1:B:15:LYS:HG3	2.18	0.43
1:E:100:ALA:HA	1:E:102:LYS:NZ	2.34	0.42
1:F:43:LEU:HB3	1:K:38:SER:HB2	2.01	0.42
1:I:0:MET:HE2	1:I:0:MET:HB3	1.92	0.42
1:H:61:LYS:HZ1	1:H:64:LEU:HB2	1.84	0.42
1:D:34:LEU:HD23	1:D:34:LEU:HA	1.86	0.42
1:B:88:ARG:CZ	1:B:91:GLU:HG2	2.49	0.42
1:D:13:TRP:O	1:D:17:ILE:HG12	2.19	0.42
1:D:45:GLN:HG2	1:D:48:ARG:NH2	2.34	0.42
1:F:1:HIS:O	1:I:42:THR:HG22	2.20	0.42
1:G:34:LEU:HB3	1:H:47:LEU:HD11	2.01	0.42
1:J:14:LYS:HE3	1:J:49:THR:O	2.19	0.42
1:D:36:LEU:HD11	1:D:51:ILE:HD11	2.01	0.42
1:K:88:ARG:HG3	1:L:67:GLN:HE21	1.85	0.42
1:E:87:VAL:O	1:E:91:GLU:HG2	2.19	0.42
1:B:13:TRP:HE1	1:B:35:LYS:HE3	1.85	0.42
1:D:70:LEU:O	1:D:74:ILE:HG12	2.20	0.42
1:E:43:LEU:O	1:E:47:LEU:HG	2.20	0.42
1:F:55:VAL:HG22	1:F:75:ILE:HD11	2.01	0.42
1:A:83:PRO:C	1:A:85:GLU:N	2.77	0.42
1:B:4:PRO:HG3	1:J:-4:HIS:CD2	2.55	0.42
1:G:17:ILE:HG13	1:G:32:THR:HG21	2.02	0.42
1:H:2:LEU:HD23	1:H:39:VAL:N	2.34	0.42
1:B:86:THR:O	1:B:90:ILE:HG13	2.20	0.41
1:K:9:ALA:HB1	1:K:13:TRP:CZ2	2.55	0.41
1:E:-1:HIS:CE1	1:J:2:LEU:HD21	2.56	0.41
1:I:-2:HIS:CG	1:I:-1:HIS:H	2.38	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:9:ALA:HB1	1:B:13:TRP:CH2	2.56	0.41
1:B:50:LYS:O	1:B:53:VAL:HG22	2.21	0.41
1:B:98:GLN:C	1:B:100:ALA:H	2.29	0.41
1:D:7:ASP:O	1:D:11:VAL:HG22	2.21	0.41
1:D:79:THR:HA	1:D:82:LEU:HD23	2.01	0.41
1:G:24:CYS:SG	1:G:61:LYS:NZ	2.92	0.41
1:L:58:ALA:O	1:L:68:ARG:CZ	2.69	0.41
1:J:91:GLU:O	1:J:95:LYS:HG3	2.21	0.41
1:C:13:TRP:O	1:C:17:ILE:HG13	2.21	0.41
1:D:36:LEU:HD23	1:D:36:LEU:HA	1.89	0.41
1:F:13:TRP:NE1	1:F:35:LYS:HD2	2.36	0.41
1:F:43:LEU:HD23	1:K:38:SER:HB2	2.02	0.41
1:I:65:GLU:O	1:I:68:ARG:HG3	2.21	0.41
1:K:43:LEU:HB3	1:L:38:SER:HB3	2.02	0.41
1:L:58:ALA:O	1:L:68:ARG:NE	2.54	0.41
1:D:82:LEU:HA	1:D:83:PRO:HD3	1.98	0.41
1:G:24:CYS:HA	1:G:64:LEU:HD21	2.03	0.41
1:K:13:TRP:CD1	1:K:35:LYS:HZ2	2.39	0.41
1:L:43:LEU:HB3	1:H:38:SER:HB2	2.03	0.40
1:H:41:VAL:HG12	1:H:42:THR:O	2.21	0.40
1:L:62:LYS:HD2	1:L:62:LYS:HA	1.87	0.40
1:B:78:TRP:CB	1:J:0:MET:HE3	2.43	0.40
1:F:43:LEU:HB3	1:K:38:SER:CB	2.51	0.40
1:J:55:VAL:O	1:J:59:LEU:HG	2.20	0.40
1:H:57:ARG:HA	1:H:57:ARG:HD2	1.91	0.40
1:I:53:VAL:O	1:I:57:ARG:HG2	2.22	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	Interatomic distance (Å)	Clash overlap (Å)
1:I:62:LYS:NZ	1:L:61:LYS:NZ[1_445]	2.10	0.10

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	105/117 (90%)	100 (95%)	5 (5%)	0	100	100
1	B	104/117 (89%)	99 (95%)	5 (5%)	0	100	100
1	C	104/117 (89%)	100 (96%)	4 (4%)	0	100	100
1	D	105/117 (90%)	101 (96%)	3 (3%)	1 (1%)	13	46
1	E	105/117 (90%)	101 (96%)	4 (4%)	0	100	100
1	F	97/117 (83%)	94 (97%)	3 (3%)	0	100	100
1	G	96/117 (82%)	92 (96%)	4 (4%)	0	100	100
1	H	98/117 (84%)	96 (98%)	2 (2%)	0	100	100
1	I	88/117 (75%)	88 (100%)	0	0	100	100
1	J	103/117 (88%)	98 (95%)	5 (5%)	0	100	100
1	K	98/117 (84%)	95 (97%)	3 (3%)	0	100	100
1	L	98/117 (84%)	92 (94%)	6 (6%)	0	100	100
All	All	1201/1404 (86%)	1156 (96%)	44 (4%)	1 (0%)	48	79

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	83	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	89/100 (89%)	89 (100%)	0	100	100
1	B	88/100 (88%)	88 (100%)	0	100	100
1	C	88/100 (88%)	88 (100%)	0	100	100
1	D	89/100 (89%)	89 (100%)	0	100	100
1	E	89/100 (89%)	89 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	F	82/100 (82%)	82 (100%)	0	100	100
1	G	81/100 (81%)	81 (100%)	0	100	100
1	H	83/100 (83%)	83 (100%)	0	100	100
1	I	76/100 (76%)	76 (100%)	0	100	100
1	J	87/100 (87%)	87 (100%)	0	100	100
1	K	83/100 (83%)	83 (100%)	0	100	100
1	L	83/100 (83%)	83 (100%)	0	100	100
All	All	1018/1200 (85%)	1018 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	-3	HIS
1	C	-1	HIS
1	E	-3	HIS
1	K	-1	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

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^{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	107/117 (91%)	-0.49	0	100	100	77, 103, 129, 153	0
1	B	106/117 (90%)	-0.40	0	100	100	82, 109, 150, 161	0
1	C	106/117 (90%)	-0.43	1 (0%)	81	64	79, 100, 140, 158	0
1	D	107/117 (91%)	-0.45	0	100	100	80, 109, 148, 163	0
1	E	107/117 (91%)	-0.34	0	100	100	88, 110, 142, 180	0
1	F	99/117 (84%)	-0.39	0	100	100	111, 133, 168, 185	0
1	G	98/117 (83%)	-0.18	0	100	100	115, 143, 174, 186	0
1	H	100/117 (85%)	-0.31	0	100	100	116, 147, 185, 200	0
1	I	92/117 (78%)	-0.06	0	100	100	109, 142, 179, 192	0
1	J	105/117 (89%)	-0.26	0	100	100	94, 117, 145, 161	0
1	K	100/117 (85%)	-0.31	1 (1%)	79	61	108, 135, 176, 185	0
1	L	100/117 (85%)	-0.31	1 (1%)	79	61	109, 142, 175, 179	0
All	All	1227/1404 (87%)	-0.33	3 (0%)	92	86	77, 125, 172, 200	0

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	L	79	THR	2.7
1	K	79	THR	2.6
1	C	77	ALA	2.5

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 (i)

There are no oligosaccharides 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.