



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 9, 2026 – 10:37 AM UTC

PDB ID : 3QD8 / pdb_00003qd8
Title : Crystal structure of Mycobacterium tuberculosis BfrB
Authors : Khare, G.; Gupta, V.; Nangpal, P.; Gupta, R.K.; Sauter, N.K.; Tyagi, A.K.
Deposited on : 2011-01-18
Resolution : 3.00 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
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)	:	2.49

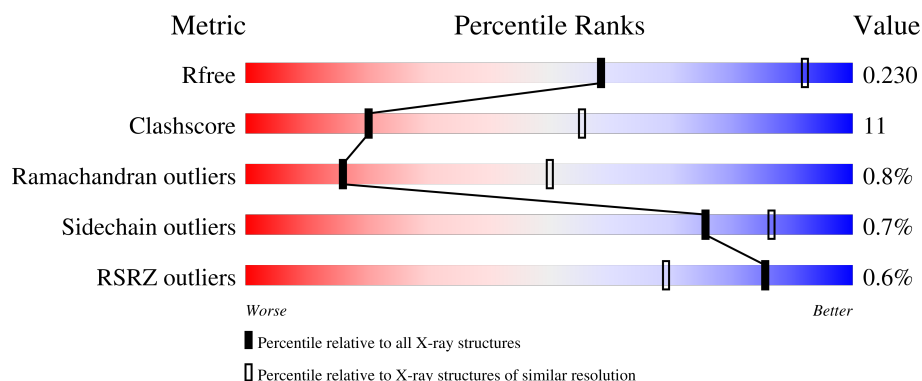
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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}	180053	2672 (3.00-3.00)
Clashscore	190562	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)
RSRZ outliers	180081	2671 (3.00-3.00)

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 $\leq 5\%$. 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	181	 4% 70% 20% 5% 5%
1	B	181	 2% 71% 17% • 10%
1	C	181	 % 72% 16% • 10%
1	D	181	 71% 17% • 10%
1	E	181	 69% 20% • 10%

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Mol	Chain	Length	Quality of chain
1	F	181	
1	G	181	
1	H	181	
1	I	181	
1	J	181	
1	K	181	
1	L	181	
1	M	181	
1	N	181	
1	O	181	
1	P	181	
1	Q	181	
1	R	181	
1	S	181	
1	T	181	
1	U	181	
1	V	181	
1	W	181	
1	X	181	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 31864 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 Probable bacterioferritin BfrB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	172	Total	C	N	O	S	0	0	0
			1357	852	244	256	5			
1	B	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	C	162	Total	C	N	O	S	0	0	0
			1298	816	231	246	5			
1	D	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	E	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	F	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	G	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	H	162	Total	C	N	O	S	0	0	0
			1298	816	231	246	5			
1	I	162	Total	C	N	O	S	0	1	0
			1314	827	236	246	5			
1	J	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	K	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	L	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	M	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	N	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	O	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	P	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	Q	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	R	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	S	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	T	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	U	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	V	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	W	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			
1	X	162	Total	C	N	O	S	0	0	0
			1304	819	234	246	5			

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	21	Total	O	0	0
			21	21		
2	B	27	Total	O	0	0
			27	27		
2	C	23	Total	O	0	0
			23	23		
2	D	20	Total	O	0	0
			20	20		
2	E	31	Total	O	0	0
			31	31		
2	F	24	Total	O	0	0
			24	24		
2	G	19	Total	O	0	0
			19	19		
2	H	22	Total	O	0	0
			22	22		
2	I	19	Total	O	0	0
			19	19		
2	J	32	Total	O	0	0
			32	32		
2	K	21	Total	O	0	0
			21	21		

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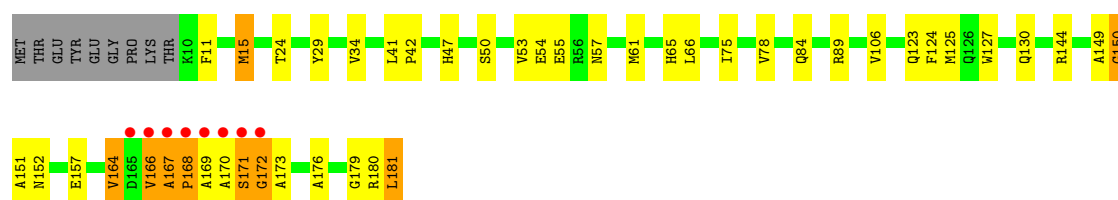
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	L	19	Total 19	O 19	0	0
2	M	22	Total 22	O 22	0	0
2	N	21	Total 21	O 21	0	0
2	O	18	Total 18	O 18	0	0
2	P	15	Total 15	O 15	0	0
2	Q	20	Total 20	O 20	0	0
2	R	23	Total 23	O 23	0	0
2	S	16	Total 16	O 16	0	0
2	T	19	Total 19	O 19	0	0
2	U	24	Total 24	O 24	0	0
2	V	16	Total 16	O 16	0	0
2	W	26	Total 26	O 26	0	0
2	X	19	Total 19	O 19	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.

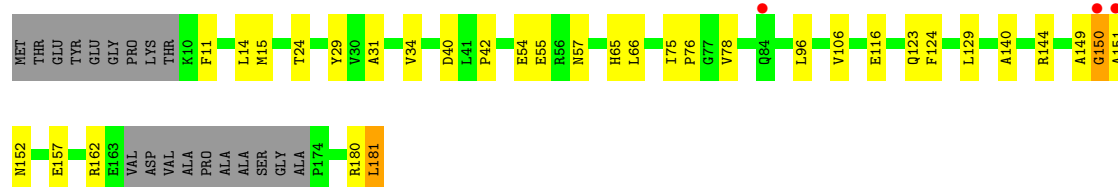
• Molecule 1: Probable bacterioferritin BfrB

Chain A: 



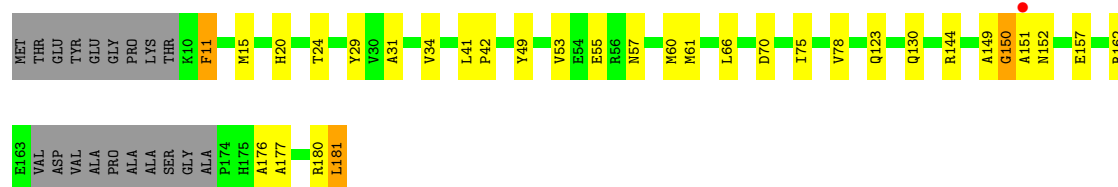
• Molecule 1: Probable bacterioferritin BfrB

Chain B: 



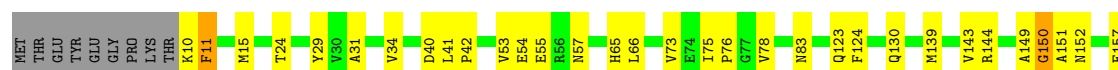
• Molecule 1: Probable bacterioferritin BfrB

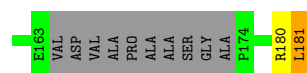
Chain C: 



• Molecule 1: Probable bacterioferritin BfrB

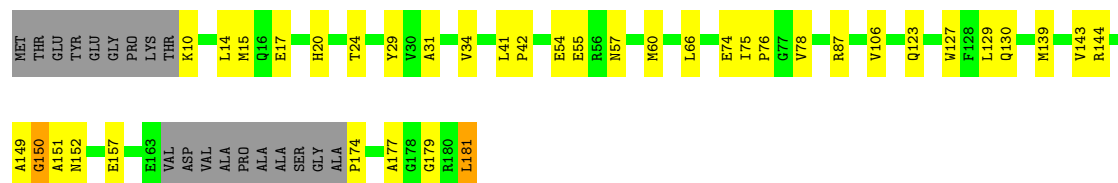
Chain D: 





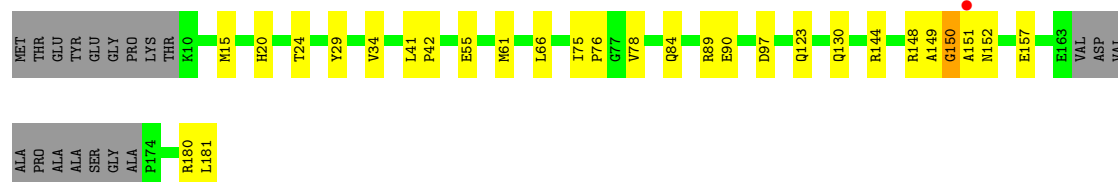
- Molecule 1: Probable bacterioferritin BfrB

Chain E: 69% 20% 10%



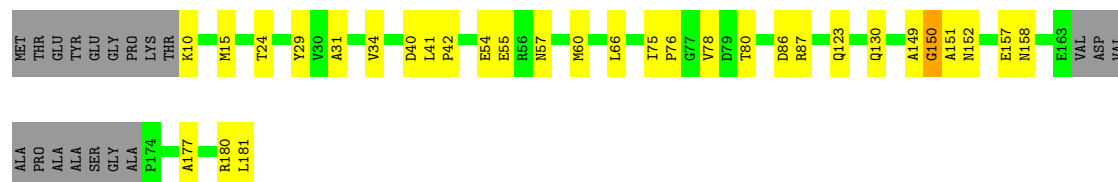
- Molecule 1: Probable bacterioferritin BfrB

Chain F: 74% 15% 10%



- Molecule 1: Probable bacterioferritin BfrB

Chain G: 72% 17% 10%



- Molecule 1: Probable bacterioferritin BfrB

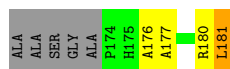
Chain H: 73% 16% 10%



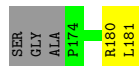
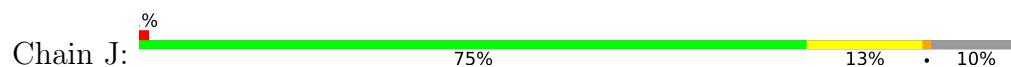
- Molecule 1: Probable bacterioferritin BfrB

Chain I: 73% 14% 10%

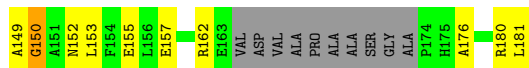




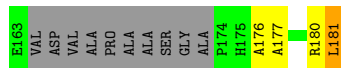
- Molecule 1: Probable bacterioferritin BfrB



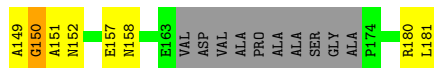
- Molecule 1: Probable bacterioferritin BfrB



- Molecule 1: Probable bacterioferritin BfrB

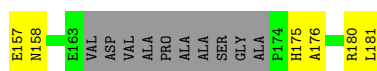


- Molecule 1: Probable bacterioferritin BfrB

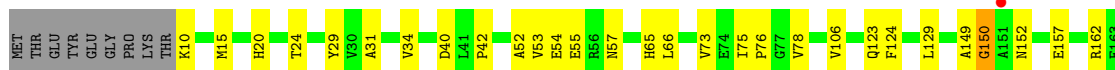
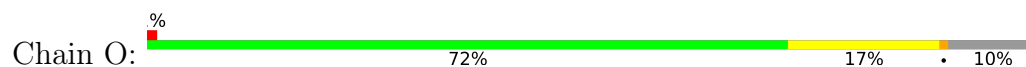


- Molecule 1: Probable bacterioferritin BfrB

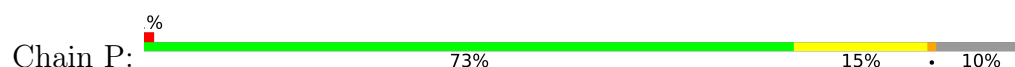




- Molecule 1: Probable bacterioferritin BfrB



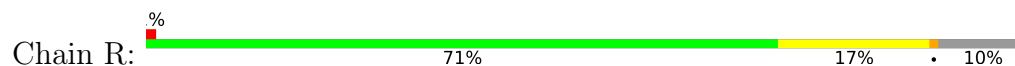
- Molecule 1: Probable bacterioferritin BfrB



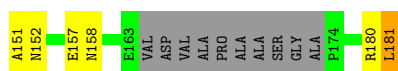
- Molecule 1: Probable bacterioferritin BfrB



- Molecule 1: Probable bacterioferritin BfrB

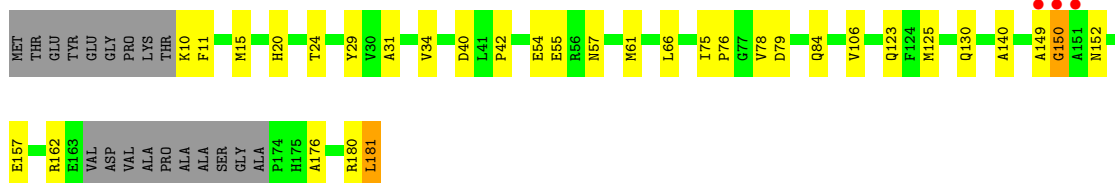


- Molecule 1: Probable bacterioferritin BfrB

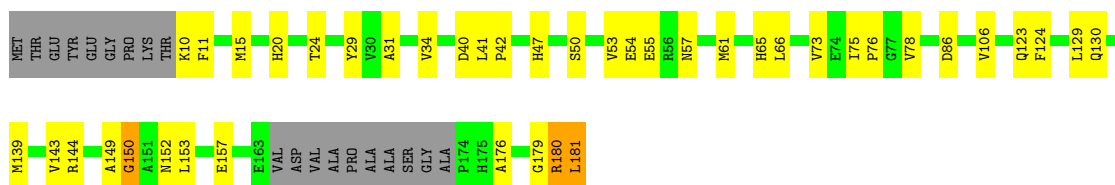




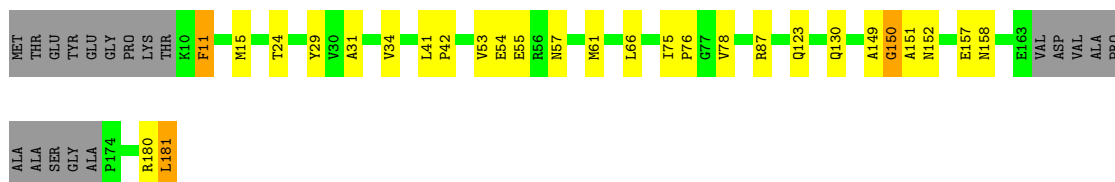
• Molecule 1: Probable bacterioferritin BfrB



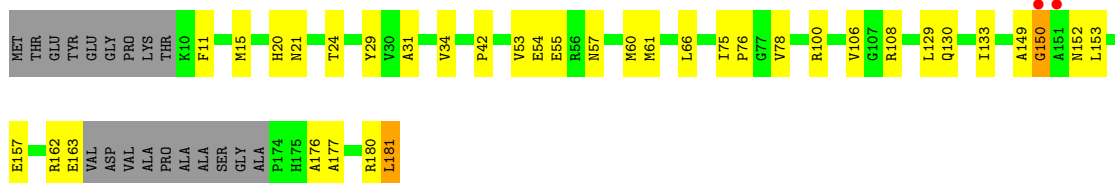
• Molecule 1: Probable bacterioferritin BfrB



• Molecule 1: Probable bacterioferritin BfrB

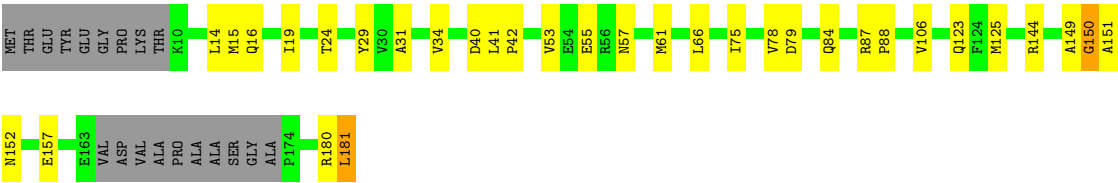


• Molecule 1: Probable bacterioferritin BfrB



• Molecule 1: Probable bacterioferritin BfrB





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	226.07Å 226.18Å 113.69Å 90.00° 94.44° 90.00°	Depositor
Resolution (Å)	31.98 – 3.00 31.98 – 3.00	Depositor EDS
% Data completeness (in resolution range)	81.2 (31.98-3.00) 81.1 (31.98-3.00)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.85 (at 3.00Å)	Xtrriage
Refinement program	PHENIX 1.5_2	Depositor
R, R_{free}	0.210 , 0.236 0.210 , 0.230	Depositor DCC
R_{free} test set	2009 reflections (2.18%)	wwPDB-VP
Wilson B-factor (Å ²)	22.0	Xtrriage
Anisotropy	0.061	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 45.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	31864	wwPDB-VP
Average B, all atoms (Å ²)	16.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 34.98 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 6.2673e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical 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

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	0.58	0/1382	0.88	4/1874 (0.2%)
1	B	0.55	0/1327	0.81	2/1794 (0.1%)
1	C	0.60	0/1321	0.82	5/1787 (0.3%)
1	D	0.58	0/1327	0.84	3/1794 (0.2%)
1	E	0.58	0/1327	0.81	4/1794 (0.2%)
1	F	0.58	0/1327	0.81	3/1794 (0.2%)
1	G	0.56	0/1327	0.81	3/1794 (0.2%)
1	H	0.55	0/1321	0.79	1/1787 (0.1%)
1	I	0.60	0/1340	0.87	5/1809 (0.3%)
1	J	0.58	0/1327	0.81	2/1794 (0.1%)
1	K	0.55	0/1327	0.80	2/1794 (0.1%)
1	L	0.58	0/1327	0.80	4/1794 (0.2%)
1	M	0.58	0/1327	0.80	1/1794 (0.1%)
1	N	0.55	0/1327	0.82	3/1794 (0.2%)
1	O	0.53	0/1327	0.81	0/1794
1	P	0.55	0/1327	0.79	3/1794 (0.2%)
1	Q	0.55	0/1327	0.81	1/1794 (0.1%)
1	R	0.58	0/1327	0.80	3/1794 (0.2%)
1	S	0.56	0/1327	0.82	2/1794 (0.1%)
1	T	0.57	0/1327	0.81	0/1794
1	U	0.58	0/1327	0.80	3/1794 (0.2%)
1	V	0.57	0/1327	0.80	4/1794 (0.2%)
1	W	0.55	0/1327	0.78	0/1794
1	X	0.55	0/1327	0.80	3/1794 (0.2%)
All	All	0.57	0/31904	0.81	61/43137 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2

There are no bond length outliers.

The worst 5 of 61 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	164	VAL	O-C-N	-12.34	107.15	122.57
1	I	11	PHE	N-CA-C	-8.18	102.56	112.54
1	E	151	ALA	N-CA-C	-7.00	104.83	113.15
1	N	151	ALA	N-CA-C	-6.52	105.40	113.15
1	J	151	ALA	N-CA-C	-6.14	105.84	113.15

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	164	VAL	Peptide,Mainchain

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	1357	0	1298	50	0
1	B	1304	0	1253	30	0
1	C	1298	0	1242	27	0
1	D	1304	0	1253	32	0
1	E	1304	0	1253	33	0
1	F	1304	0	1253	30	0
1	G	1304	0	1253	26	3
1	H	1298	0	1242	27	0
1	I	1314	0	1276	45	0
1	J	1304	0	1253	28	0
1	K	1304	0	1253	41	0
1	L	1304	0	1253	27	5
1	M	1304	0	1253	33	5
1	N	1304	0	1253	32	5
1	O	1304	0	1253	32	0
1	P	1304	0	1253	26	0
1	Q	1304	0	1253	30	0
1	R	1304	0	1253	36	3
1	S	1304	0	1253	31	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	T	1304	0	1253	33	0
1	U	1304	0	1253	39	0
1	V	1304	0	1253	24	5
1	W	1304	0	1253	43	0
1	X	1304	0	1253	35	0
2	A	21	0	0	4	0
2	B	27	0	0	2	0
2	C	23	0	0	4	0
2	D	20	0	0	2	0
2	E	31	0	0	9	0
2	F	24	0	0	5	0
2	G	19	0	0	5	0
2	H	22	0	0	3	0
2	I	19	0	0	4	0
2	J	32	0	0	6	0
2	K	21	0	0	9	0
2	L	19	0	0	3	0
2	M	22	0	0	2	0
2	N	21	0	0	3	0
2	O	18	0	0	1	0
2	P	15	0	0	2	0
2	Q	20	0	0	2	0
2	R	23	0	0	10	0
2	S	16	0	0	5	0
2	T	19	0	0	4	0
2	U	24	0	0	4	0
2	V	16	0	0	0	0
2	W	26	0	0	17	0
2	X	19	0	0	3	0
All	All	31864	0	30118	696	16

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 11.

The worst 5 of 696 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:N:55:GLU:HG2	2:N:453:HOH:O	1.31	1.25
1:U:55:GLU:HG2	2:U:436:HOH:O	1.38	1.23
1:G:80:THR:HG23	2:G:501:HOH:O	1.47	1.15
1:X:144:ARG:HG3	2:X:493:HOH:O	1.52	1.09

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:55:GLU:HG2	2:E:431:HOH:O	1.53	1.08

The worst 5 of 16 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:L:87:ARG:CZ	1:V:87:ARG:NH2[4_555]	1.84	0.36
1:R:87:ARG:CZ	1:R:87:ARG:NH2[2_555]	1.84	0.36
1:L:87:ARG:NH2	1:V:87:ARG:CZ[4_555]	1.85	0.35
1:G:87:ARG:CZ	1:G:87:ARG:NH2[2_655]	1.86	0.34
1:G:87:ARG:NE	1:G:87:ARG:NH2[2_655]	2.00	0.20

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	170/181 (94%)	159 (94%)	4 (2%)	7 (4%)	2	13
1	B	158/181 (87%)	153 (97%)	4 (2%)	1 (1%)	21	56
1	C	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	D	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	E	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	F	158/181 (87%)	157 (99%)	0	1 (1%)	21	56
1	G	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	H	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	I	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	J	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	K	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	L	158/181 (87%)	155 (98%)	2 (1%)	1 (1%)	21	56

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	M	158/181 (87%)	155 (98%)	2 (1%)	1 (1%)	21	56
1	N	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	O	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	P	158/181 (87%)	155 (98%)	2 (1%)	1 (1%)	21	56
1	Q	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	R	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	S	158/181 (87%)	157 (99%)	0	1 (1%)	21	56
1	T	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	U	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	V	158/181 (87%)	156 (99%)	1 (1%)	1 (1%)	21	56
1	W	158/181 (87%)	155 (98%)	2 (1%)	1 (1%)	21	56
1	X	158/181 (87%)	157 (99%)	0	1 (1%)	21	56
All	All	3804/4344 (88%)	3743 (98%)	31 (1%)	30 (1%)	16	50

5 of 30 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	166	VAL
1	A	167	ALA
1	A	171	SER
1	A	150	GLY
1	A	172	GLY

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	135/147 (92%)	133 (98%)	2 (2%)	57	80
1	B	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	C	132/147 (90%)	130 (98%)	2 (2%)	57	80
1	D	133/147 (90%)	131 (98%)	2 (2%)	57	80

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	E	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	F	133/147 (90%)	133 (100%)	0	100	100
1	G	133/147 (90%)	133 (100%)	0	100	100
1	H	132/147 (90%)	132 (100%)	0	100	100
1	I	135/147 (92%)	131 (97%)	4 (3%)	36	69
1	J	133/147 (90%)	133 (100%)	0	100	100
1	K	133/147 (90%)	133 (100%)	0	100	100
1	L	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	M	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	N	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	O	133/147 (90%)	133 (100%)	0	100	100
1	P	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	Q	133/147 (90%)	133 (100%)	0	100	100
1	R	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	S	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	T	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	U	133/147 (90%)	131 (98%)	2 (2%)	57	80
1	V	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	W	133/147 (90%)	132 (99%)	1 (1%)	73	86
1	X	133/147 (90%)	132 (99%)	1 (1%)	73	86
All	All	3194/3528 (90%)	3170 (99%)	24 (1%)	76	86

5 of 24 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	N	15	MET
1	S	181	LEU
1	R	181	LEU
1	T	181	LEU
1	D	181	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 53 such sidechains are listed below:

Mol	Chain	Res	Type
1	N	57	ASN
1	Q	51	GLN
1	W	175	HIS
1	N	132	GLN
1	O	132	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no 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, 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	172/181 (95%)	-0.27	8 (4%) 36 19	3, 13, 46, 89	0
1	B	162/181 (89%)	-0.35	3 (1%) 66 43	4, 13, 34, 53	0
1	C	162/181 (89%)	-0.35	1 (0%) 85 69	4, 12, 30, 46	0
1	D	162/181 (89%)	-0.36	0 100 100	4, 12, 32, 47	0
1	E	162/181 (89%)	-0.39	0 100 100	4, 13, 31, 46	0
1	F	162/181 (89%)	-0.41	1 (0%) 85 69	4, 12, 31, 47	0
1	G	162/181 (89%)	-0.48	0 100 100	3, 12, 32, 41	0
1	H	162/181 (89%)	-0.36	0 100 100	4, 13, 33, 47	0
1	I	162/181 (89%)	-0.29	3 (1%) 66 43	4, 13, 33, 52	1 (0%)
1	J	162/181 (89%)	-0.43	1 (0%) 85 69	4, 12, 31, 47	0
1	K	162/181 (89%)	-0.36	0 100 100	4, 13, 33, 50	0
1	L	162/181 (89%)	-0.39	0 100 100	4, 12, 32, 44	0
1	M	162/181 (89%)	-0.43	0 100 100	5, 12, 32, 47	0
1	N	162/181 (89%)	-0.45	0 100 100	4, 13, 31, 44	0
1	O	162/181 (89%)	-0.34	1 (0%) 85 69	4, 14, 35, 50	0
1	P	162/181 (89%)	-0.34	1 (0%) 85 69	5, 13, 33, 51	0
1	Q	162/181 (89%)	-0.45	0 100 100	4, 12, 32, 47	0
1	R	162/181 (89%)	-0.37	1 (0%) 85 69	4, 12, 32, 43	0
1	S	162/181 (89%)	-0.33	0 100 100	4, 13, 34, 49	0
1	T	162/181 (89%)	-0.30	3 (1%) 66 43	5, 14, 31, 50	0
1	U	162/181 (89%)	-0.37	0 100 100	4, 13, 32, 49	0
1	V	162/181 (89%)	-0.45	0 100 100	4, 13, 33, 49	0
1	W	162/181 (89%)	-0.31	2 (1%) 76 55	4, 13, 32, 53	0
1	X	162/181 (89%)	-0.36	0 100 100	4, 13, 33, 49	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2		OWAB(Å ²)	Q<0.9
All	All	3898/4344 (89%)	-0.37	25 (0%)	85 69	3, 13, 34, 89	1 (0%)

The worst 5 of 25 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	151	ALA	10.1
1	T	151	ALA	5.8
1	P	151	ALA	5.2
1	B	151	ALA	5.0
1	W	151	ALA	4.8

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 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.