



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 12:17 PM UTC

PDB ID : 3TBE / pdb\_00003tbe  
Title : The crystal structure of the complex of Streptococcus agalactiae sortase C1 and MTSET  
Authors : Khare, B.  
Deposited on : 2011-08-05  
Resolution : 2.85 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](mailto:validation@mail.wwpdb.org)

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<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>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
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

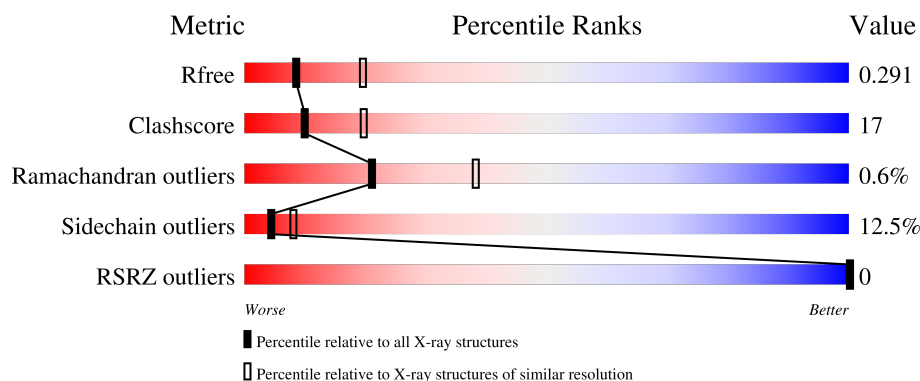
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.85 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	1407 (2.88-2.84)
Clashscore	190562	1446 (2.88-2.84)
Ramachandran outliers	187476	1406 (2.88-2.84)
Sidechain outliers	187428	1407 (2.88-2.84)
RSRZ outliers	180081	1408 (2.88-2.84)

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  $\geq 3$ , 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	230	
1	B	230	
1	C	230	
1	D	230	
1	E	230	

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Mol	Chain	Length	Quality of chain
1	F	230	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	SO4	B	220	-	-	X	-
3	SO4	D	220	-	-	X	-
4	CL	C	220	-	-	X	-

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 9008 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 Sortase family protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	194	Total	C	N	O	S	0	0	0
			1509	959	266	281	3			
1	B	193	Total	C	N	O	S	0	0	0
			1478	940	261	274	3			
1	C	189	Total	C	N	O	S	0	0	0
			1455	924	255	273	3			
1	D	193	Total	C	N	O	S	0	0	0
			1473	936	262	272	3			
1	E	193	Total	C	N	O	S	0	0	0
			1483	944	261	275	3			
1	F	188	Total	C	N	O	S	0	0	0
			1434	914	253	264	3			

There are 72 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-10	MET	-	expression tag	UNP Q8E0S7
A	-9	ARG	-	expression tag	UNP Q8E0S7
A	-8	GLY	-	expression tag	UNP Q8E0S7
A	-7	SER	-	expression tag	UNP Q8E0S7
A	-6	HIS	-	expression tag	UNP Q8E0S7
A	-5	HIS	-	expression tag	UNP Q8E0S7
A	-4	HIS	-	expression tag	UNP Q8E0S7
A	-3	HIS	-	expression tag	UNP Q8E0S7
A	-2	HIS	-	expression tag	UNP Q8E0S7
A	-1	HIS	-	expression tag	UNP Q8E0S7
A	0	GLY	-	expression tag	UNP Q8E0S7
A	1	SER	-	expression tag	UNP Q8E0S7
B	-10	MET	-	expression tag	UNP Q8E0S7
B	-9	ARG	-	expression tag	UNP Q8E0S7
B	-8	GLY	-	expression tag	UNP Q8E0S7
B	-7	SER	-	expression tag	UNP Q8E0S7
B	-6	HIS	-	expression tag	UNP Q8E0S7

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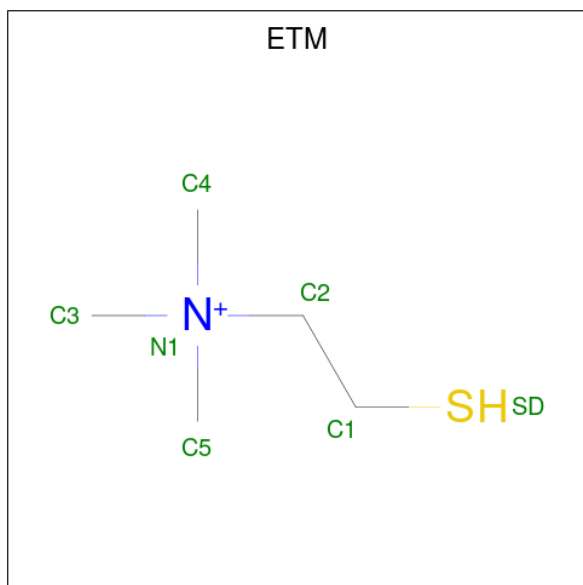
Chain	Residue	Modelled	Actual	Comment	Reference
B	-5	HIS	-	expression tag	UNP Q8E0S7
B	-4	HIS	-	expression tag	UNP Q8E0S7
B	-3	HIS	-	expression tag	UNP Q8E0S7
B	-2	HIS	-	expression tag	UNP Q8E0S7
B	-1	HIS	-	expression tag	UNP Q8E0S7
B	0	GLY	-	expression tag	UNP Q8E0S7
B	1	SER	-	expression tag	UNP Q8E0S7
C	-10	MET	-	expression tag	UNP Q8E0S7
C	-9	ARG	-	expression tag	UNP Q8E0S7
C	-8	GLY	-	expression tag	UNP Q8E0S7
C	-7	SER	-	expression tag	UNP Q8E0S7
C	-6	HIS	-	expression tag	UNP Q8E0S7
C	-5	HIS	-	expression tag	UNP Q8E0S7
C	-4	HIS	-	expression tag	UNP Q8E0S7
C	-3	HIS	-	expression tag	UNP Q8E0S7
C	-2	HIS	-	expression tag	UNP Q8E0S7
C	-1	HIS	-	expression tag	UNP Q8E0S7
C	0	GLY	-	expression tag	UNP Q8E0S7
C	1	SER	-	expression tag	UNP Q8E0S7
D	-10	MET	-	expression tag	UNP Q8E0S7
D	-9	ARG	-	expression tag	UNP Q8E0S7
D	-8	GLY	-	expression tag	UNP Q8E0S7
D	-7	SER	-	expression tag	UNP Q8E0S7
D	-6	HIS	-	expression tag	UNP Q8E0S7
D	-5	HIS	-	expression tag	UNP Q8E0S7
D	-4	HIS	-	expression tag	UNP Q8E0S7
D	-3	HIS	-	expression tag	UNP Q8E0S7
D	-2	HIS	-	expression tag	UNP Q8E0S7
D	-1	HIS	-	expression tag	UNP Q8E0S7
D	0	GLY	-	expression tag	UNP Q8E0S7
D	1	SER	-	expression tag	UNP Q8E0S7
E	-10	MET	-	expression tag	UNP Q8E0S7
E	-9	ARG	-	expression tag	UNP Q8E0S7
E	-8	GLY	-	expression tag	UNP Q8E0S7
E	-7	SER	-	expression tag	UNP Q8E0S7
E	-6	HIS	-	expression tag	UNP Q8E0S7
E	-5	HIS	-	expression tag	UNP Q8E0S7
E	-4	HIS	-	expression tag	UNP Q8E0S7
E	-3	HIS	-	expression tag	UNP Q8E0S7
E	-2	HIS	-	expression tag	UNP Q8E0S7
E	-1	HIS	-	expression tag	UNP Q8E0S7
E	0	GLY	-	expression tag	UNP Q8E0S7

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Chain	Residue	Modelled	Actual	Comment	Reference
E	1	SER	-	expression tag	UNP Q8E0S7
F	-10	MET	-	expression tag	UNP Q8E0S7
F	-9	ARG	-	expression tag	UNP Q8E0S7
F	-8	GLY	-	expression tag	UNP Q8E0S7
F	-7	SER	-	expression tag	UNP Q8E0S7
F	-6	HIS	-	expression tag	UNP Q8E0S7
F	-5	HIS	-	expression tag	UNP Q8E0S7
F	-4	HIS	-	expression tag	UNP Q8E0S7
F	-3	HIS	-	expression tag	UNP Q8E0S7
F	-2	HIS	-	expression tag	UNP Q8E0S7
F	-1	HIS	-	expression tag	UNP Q8E0S7
F	0	GLY	-	expression tag	UNP Q8E0S7
F	1	SER	-	expression tag	UNP Q8E0S7

- Molecule 2 is 2-(TRIMETHYLAMMONIUM)ETHYL THIOL (CCD ID: ETM) (formula:  $C_5H_{14}NS$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	S	0	0
			7	5	1	1		
2	B	1	Total	C	N	S	0	0
			7	5	1	1		
2	C	1	Total	C	N	S	0	0
			7	5	1	1		
2	D	1	Total	C	N	S	0	0
			7	5	1	1		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	E	1	Total	C	N	S	0	0
			7	5	1	1		
2	F	1	Total	C	N	S	0	0
			7	5	1	1		

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	D	1	Total	O	S	0	0
			5	4	1		
3	F	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	C	1	Total	Cl	0	0
			1	1		

- Molecule 5 is water.

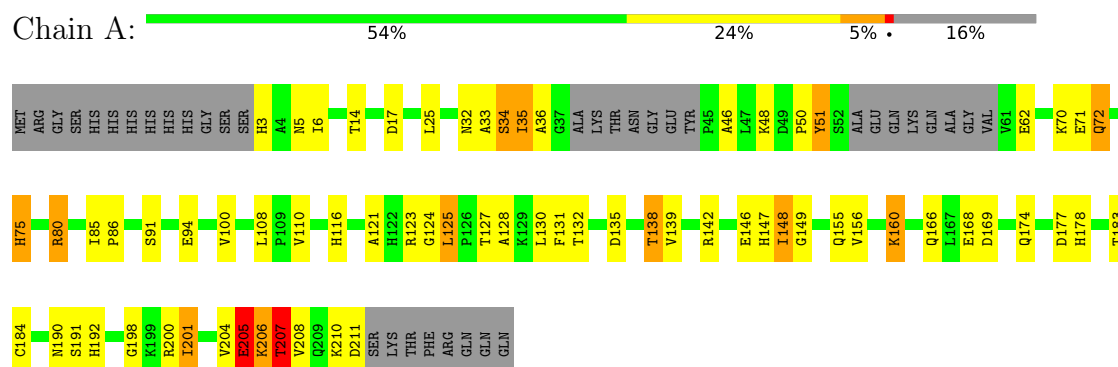
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	10	Total 10	O 10	0	0
5	B	17	Total 17	O 17	0	0
5	C	11	Total 11	O 11	0	0
5	D	36	Total 36	O 36	0	0
5	E	19	Total 19	O 19	0	0
5	F	15	Total 15	O 15	0	0



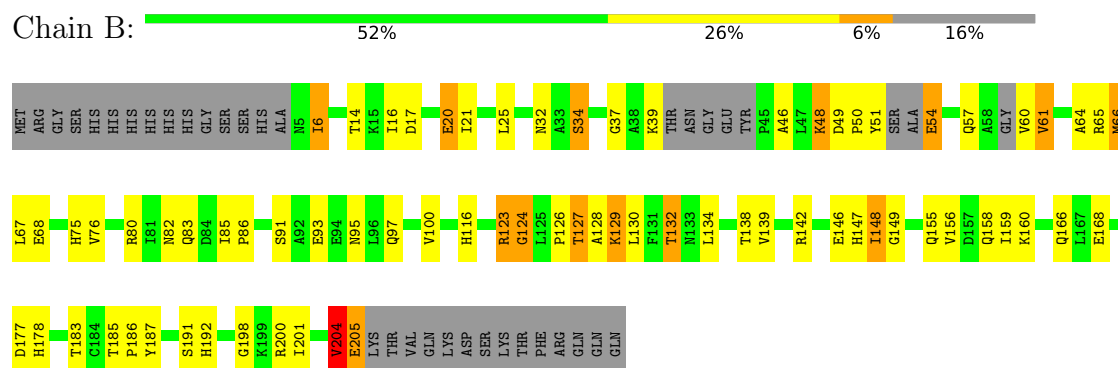
### 3 Residue-property plots [i](#)

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.

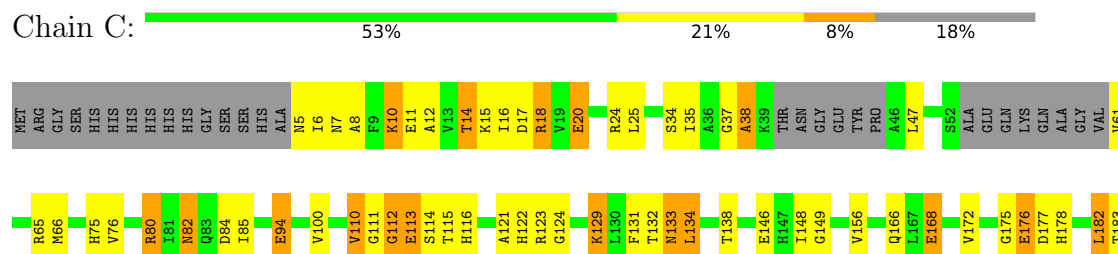
#### • Molecule 1: Sortase family protein

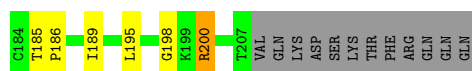


#### • Molecule 1: Sortase family protein



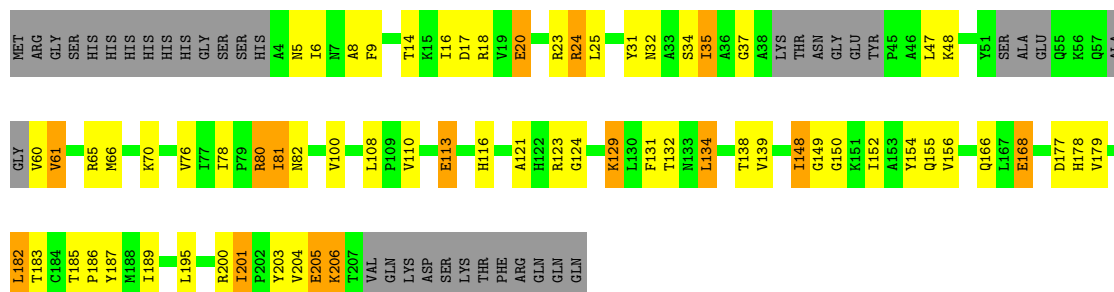
#### • Molecule 1: Sortase family protein





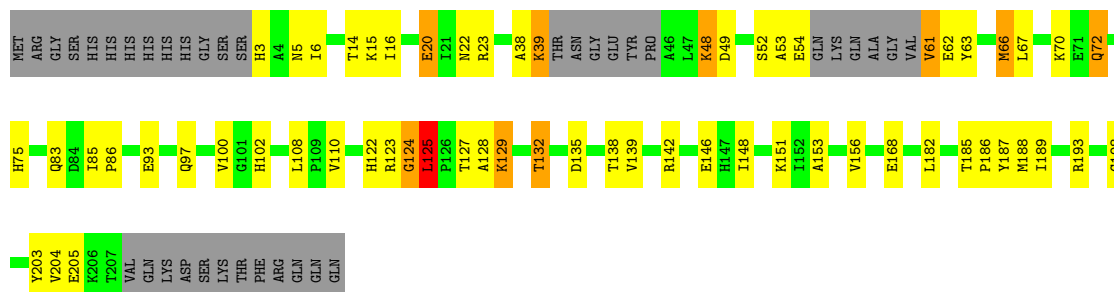
- Molecule 1: Sortase family protein

Chain D: 54% 23% 7% 16%



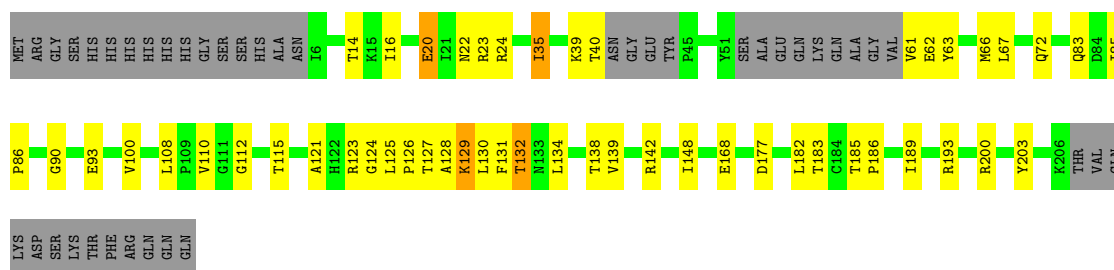
- Molecule 1: Sortase family protein

Chain E: 57% 23% 16%



- Molecule 1: Sortase family protein

Chain F: 60% 20% 18%



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	122.41Å 70.65Å 194.44Å 90.00° 90.43° 90.00°	Depositor
Resolution (Å)	27.71 – 2.85 27.71 – 2.85	Depositor EDS
% Data completeness (in resolution range)	99.3 (27.71-2.85) 97.9 (27.71-2.85)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.16 (at 2.85Å)	Xtriage
Refinement program	REFMAC 5.5.0102, CNS	Depositor
R, $R_{free}$	0.250 , 0.296 0.245 , 0.291	Depositor DCC
$R_{free}$ test set	1956 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	68.8	Xtriage
Anisotropy	0.338	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.26 , 33.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.52$ , $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	0.004 for -1/2*h-3/2*k,-1/2*h+1/2*k,-l 0.008 for -1/2*h+3/2*k,1/2*h+1/2*k,-l 0.448 for 1/2*h-3/2*k,-1/2*h-1/2*k,-l 0.438 for 1/2*h+3/2*k,1/2*h-1/2*k,-l 0.002 for -h,-k,l	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	9008	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.31% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, CL, ETM

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	0.95	1/1536 (0.1%)	1.11	5/2084 (0.2%)
1	B	1.05	4/1503 (0.3%)	1.04	5/2041 (0.2%)
1	C	1.15	2/1480 (0.1%)	1.19	10/2010 (0.5%)
1	D	1.19	6/1497 (0.4%)	1.13	9/2032 (0.4%)
1	E	0.99	0/1509	1.14	8/2048 (0.4%)
1	F	1.01	3/1460 (0.2%)	1.05	4/1987 (0.2%)
All	All	1.06	16/8985 (0.2%)	1.11	41/12202 (0.3%)

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	B	0	1

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	78	ILE	CA-C	-7.26	1.45	1.52
1	D	76	VAL	C-O	-6.20	1.17	1.24
1	D	201	ILE	C-O	-6.08	1.19	1.24
1	B	130	LEU	C-O	-5.86	1.18	1.24
1	F	130	LEU	C-O	-5.66	1.18	1.24
1	A	130	LEU	C-O	-5.63	1.19	1.24
1	C	110	VAL	CA-CB	-5.61	1.46	1.54
1	B	61	VAL	CA-CB	-5.49	1.47	1.54
1	C	76	VAL	C-O	-5.38	1.18	1.24
1	B	82	ASN	CA-C	-5.32	1.47	1.53
1	D	6	ILE	CA-CB	-5.18	1.48	1.54
1	B	204	VAL	CA-CB	5.18	1.59	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	78	ILE	C-O	-5.16	1.18	1.24
1	F	128	ALA	CA-CB	-5.14	1.44	1.53
1	D	81	ILE	CA-CB	-5.14	1.47	1.54
1	F	35	ILE	CA-CB	-5.01	1.48	1.54

All (41) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	124	GLY	N-CA-C	-14.12	94.89	112.68
1	C	111	GLY	N-CA-C	13.41	127.05	111.36
1	A	205	GLU	N-CA-C	-13.05	93.33	110.43
1	C	82	ASN	N-CA-C	10.03	125.18	111.54
1	E	205	GLU	N-CA-C	9.24	121.35	111.28
1	D	8	ALA	N-CA-C	-8.85	102.03	112.92
1	F	124	GLY	N-CA-C	8.74	127.38	115.32
1	B	124	GLY	N-CA-C	7.57	125.83	115.30
1	A	34	SER	N-CA-C	-7.37	103.60	112.59
1	E	193	ARG	NE-CZ-NH1	-6.91	114.59	121.50
1	B	34	SER	N-CA-C	-6.87	104.47	112.92
1	C	176	GLU	N-CA-C	6.75	120.16	109.50
1	A	207	THR	CB-CA-C	-6.71	99.43	109.90
1	D	113	GLU	N-CA-C	-6.27	101.01	110.28
1	E	193	ARG	NE-CZ-NH2	6.24	124.81	119.20
1	E	125	LEU	N-CA-CB	6.23	121.46	110.37
1	C	112	GLY	N-CA-C	-6.06	101.85	111.18
1	F	203	TYR	N-CA-C	5.95	118.22	108.52
1	D	65	ARG	NE-CZ-NH2	5.79	124.41	119.20
1	E	62	GLU	N-CA-C	-5.77	104.95	113.72
1	B	127	THR	CB-CA-C	-5.65	101.97	110.90
1	D	150	GLY	N-CA-C	5.57	117.51	110.38
1	C	110	VAL	CA-C-N	5.53	125.23	119.92
1	C	110	VAL	C-N-CA	5.53	125.23	119.92
1	B	160	LYS	N-CA-C	5.42	117.03	108.96
1	D	148	ILE	CB-CA-C	-5.36	104.22	112.05
1	E	125	LEU	N-CA-C	-5.36	97.96	109.81
1	E	204	VAL	N-CA-C	-5.36	100.67	108.17
1	D	6	ILE	N-CA-C	-5.34	106.30	112.98
1	D	24	ARG	NE-CZ-NH2	5.33	124.00	119.20
1	C	111	GLY	CA-C-N	5.30	126.14	121.58
1	C	111	GLY	C-N-CA	5.30	126.14	121.58
1	D	65	ARG	NE-CZ-NH1	-5.29	116.21	121.50
1	C	84	ASP	N-CA-C	-5.17	99.86	108.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	148	ILE	CB-CA-C	-5.17	104.51	112.05
1	F	142	ARG	NE-CZ-NH1	-5.15	116.35	121.50
1	B	148	ILE	CB-CA-C	-5.12	104.58	112.05
1	C	133	ASN	N-CA-C	5.11	118.55	112.72
1	F	142	ARG	NE-CZ-NH2	5.10	123.79	119.20
1	A	208	VAL	N-CA-C	5.09	115.24	108.11
1	D	205	GLU	N-CA-C	-5.08	99.97	110.80

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	123	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	1509	0	1509	64	0
1	B	1478	0	1459	61	0
1	C	1455	0	1437	59	0
1	D	1473	0	1461	55	0
1	E	1483	0	1468	47	0
1	F	1434	0	1413	28	0
2	A	7	0	13	3	0
2	B	7	0	13	0	0
2	C	7	0	14	1	0
2	D	7	0	13	0	0
2	E	7	0	13	2	0
2	F	7	0	13	0	0
3	B	10	0	0	2	0
3	C	5	0	0	0	0
3	D	5	0	0	2	0
3	F	5	0	0	0	0
4	C	1	0	0	2	0
5	A	10	0	0	0	0
5	B	17	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	C	11	0	0	0	0
5	D	36	0	0	10	0
5	E	19	0	0	0	0
5	F	15	0	0	0	0
All	All	9008	0	8826	308	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 17.

All (308) 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:E:129:LYS:O	1:E:132:THR:HG22	1.42	1.18
1:B:129:LYS:O	1:B:132:THR:HG22	1.46	1.15
1:A:204:VAL:HG12	1:A:205:GLU:O	1.48	1.11
1:E:123:ARG:HG3	1:E:132:THR:HA	1.36	1.06
1:D:32:ASN:OD1	5:D:241:HOH:O	1.71	1.05
1:B:60:VAL:HG22	1:B:60:VAL:O	1.55	1.03
1:F:61:VAL:HG13	1:F:61:VAL:O	1.55	1.03
1:A:207:THR:O	1:A:207:THR:HG22	1.57	1.02
1:C:110:VAL:HG23	1:C:110:VAL:O	1.57	1.01
1:E:123:ARG:CG	1:E:132:THR:HA	1.95	0.96
1:C:132:THR:HG23	1:C:133:ASN:HD22	1.31	0.95
1:C:7:ASN:HA	1:C:10:LYS:HG3	1.52	0.91
1:E:124:GLY:N	1:E:132:THR:HB	1.84	0.91
1:B:123:ARG:NH2	3:B:220:SO4:O3	2.05	0.89
1:C:123:ARG:HG2	1:C:132:THR:HA	1.55	0.88
1:A:124:GLY:H	1:A:132:THR:HB	1.42	0.84
1:E:16:ILE:CG2	1:E:20:GLU:HG2	2.08	0.84
1:A:75:HIS:CD2	1:A:146:GLU:HB3	2.14	0.82
1:A:204:VAL:CG1	1:A:205:GLU:O	2.27	0.82
1:E:122:HIS:CE1	2:E:422:ETM:H52	2.16	0.81
1:A:177:ASP:OD2	1:A:200:ARG:HB2	1.79	0.81
1:B:54:GLU:O	1:B:54:GLU:HG2	1.79	0.81
1:C:6:ILE:O	1:C:10:LYS:HG2	1.79	0.81
1:C:113:GLU:O	1:C:114:SER:HB2	1.80	0.81
1:B:75:HIS:CD2	1:B:146:GLU:HB3	2.15	0.81
1:E:61:VAL:O	1:E:61:VAL:CG1	2.30	0.80
1:D:113:GLU:OE1	5:D:244:HOH:O	1.99	0.79
1:E:124:GLY:CA	1:E:132:THR:HB	2.12	0.79
1:C:6:ILE:O	1:C:10:LYS:CG	2.30	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:123:ARG:HG2	1:B:132:THR:HA	1.65	0.78
1:B:60:VAL:O	1:B:60:VAL:CG2	2.30	0.78
1:A:166:GLN:HE21	1:A:168:GLU:H	1.29	0.78
1:C:132:THR:HG23	1:C:133:ASN:ND2	1.97	0.78
1:E:122:HIS:HE1	2:E:422:ETM:H52	1.48	0.78
1:F:39:LYS:O	1:F:40:THR:CB	2.30	0.77
1:C:35:ILE:O	1:C:38:ALA:HB2	1.83	0.77
1:F:61:VAL:O	1:F:62:GLU:CB	2.32	0.77
1:B:129:LYS:O	1:B:132:THR:CG2	2.30	0.76
1:A:210:LYS:O	1:A:211:ASP:C	2.27	0.76
1:A:205:GLU:O	1:A:206:LYS:CB	2.34	0.76
1:A:124:GLY:N	1:A:132:THR:HB	1.99	0.75
1:E:129:LYS:O	1:E:132:THR:CG2	2.30	0.75
1:C:7:ASN:CA	1:C:10:LYS:HG3	2.16	0.75
1:B:166:GLN:HE21	1:B:168:GLU:H	1.32	0.74
1:F:16:ILE:CG2	1:F:20:GLU:HG2	2.16	0.74
1:E:61:VAL:O	1:E:61:VAL:HG13	1.86	0.73
1:D:9:PHE:CB	5:D:224:HOH:O	2.36	0.72
1:C:112:GLY:O	1:C:115:THR:HG23	1.89	0.72
1:E:61:VAL:HG12	1:E:63:TYR:HB3	1.70	0.72
1:A:205:GLU:O	1:A:206:LYS:HB2	1.89	0.71
1:B:147:HIS:HD2	1:B:149:GLY:H	1.38	0.71
1:F:72:GLN:OE1	1:F:86:PRO:HB3	1.91	0.70
1:E:123:ARG:NH2	1:E:135:ASP:HB3	2.06	0.69
1:E:16:ILE:HG23	1:E:20:GLU:HG2	1.73	0.69
1:C:7:ASN:HA	1:C:10:LYS:CG	2.20	0.69
1:E:66:MET:HG2	1:E:67:LEU:N	2.06	0.69
1:A:147:HIS:HD2	1:A:149:GLY:H	1.41	0.69
1:B:129:LYS:HG2	5:B:232:HOH:O	1.93	0.68
1:B:124:GLY:H	1:B:132:THR:HB	1.58	0.68
1:F:61:VAL:O	1:F:61:VAL:CG1	2.29	0.68
1:C:114:SER:O	1:C:172:VAL:CG1	2.41	0.68
1:A:51:TYR:HD2	2:A:422:ETM:SD	2.16	0.67
1:A:123:ARG:NH2	1:A:135:ASP:OD2	2.28	0.67
1:C:7:ASN:HA	1:C:10:LYS:HD3	1.77	0.67
1:A:190:ASN:HD22	2:A:422:ETM:H33	1.60	0.66
1:C:129:LYS:HG2	4:C:220:CL:CL	2.33	0.65
1:D:70:LYS:O	5:D:254:HOH:O	2.14	0.65
1:F:16:ILE:HG23	1:F:20:GLU:HG2	1.79	0.65
1:A:205:GLU:O	1:A:206:LYS:HG3	1.98	0.64
1:D:204:VAL:O	1:D:205:GLU:HB3	1.98	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:35:ILE:HG13	1:A:36:ALA:N	2.13	0.63
1:B:57:GLN:CB	1:B:93:GLU:HB2	2.28	0.63
1:D:123:ARG:HG2	1:D:132:THR:HA	1.80	0.63
1:A:6:ILE:HG23	1:A:86:PRO:HG3	1.82	0.62
1:A:123:ARG:HH22	1:A:135:ASP:HB3	1.65	0.62
1:B:61:VAL:HG23	1:B:61:VAL:O	1.98	0.62
1:C:114:SER:O	1:C:172:VAL:HG13	1.98	0.62
1:B:127:THR:HG23	1:D:34:SER:HB2	1.81	0.62
1:C:12:ALA:HA	1:C:15:LYS:HE3	1.80	0.62
1:A:51:TYR:CD2	2:A:422:ETM:SD	2.93	0.61
1:A:50:PRO:C	1:A:51:TYR:HD1	2.09	0.61
1:A:205:GLU:C	1:A:206:LYS:HG3	2.25	0.61
1:C:124:GLY:H	1:C:132:THR:HB	1.65	0.61
1:E:187:TYR:CE1	1:E:188:MET:HE3	2.36	0.61
1:A:166:GLN:NE2	1:A:168:GLU:H	1.96	0.60
1:B:185:THR:OG1	1:B:186:PRO:HA	2.01	0.60
1:D:123:ARG:NH2	3:D:220:SO4:O1	2.34	0.60
1:D:129:LYS:HD2	5:D:234:HOH:O	2.02	0.60
1:B:129:LYS:C	1:B:132:THR:HG22	2.25	0.60
1:F:185:THR:OG1	1:F:186:PRO:HA	2.02	0.59
1:F:61:VAL:O	1:F:62:GLU:HB2	2.02	0.59
1:A:205:GLU:O	1:A:206:LYS:CG	2.51	0.59
1:C:6:ILE:O	1:C:10:LYS:HG3	2.03	0.59
1:B:139:VAL:HA	1:B:156:VAL:HG12	1.85	0.59
1:B:54:GLU:O	1:B:54:GLU:CG	2.51	0.59
1:C:75:HIS:CE1	1:C:146:GLU:HB3	2.37	0.58
1:B:126:PRO:HG2	1:D:35:ILE:CD1	2.34	0.58
1:C:7:ASN:HA	1:C:10:LYS:CD	2.33	0.58
1:F:83:GLN:HG3	1:F:85:ILE:HD11	1.84	0.57
1:D:124:GLY:H	1:D:132:THR:HB	1.69	0.57
1:D:185:THR:OG1	1:D:186:PRO:HA	2.04	0.57
1:E:123:ARG:HG2	1:E:132:THR:HA	1.80	0.57
1:D:129:LYS:HG2	5:D:256:HOH:O	2.04	0.57
1:A:205:GLU:OE1	1:A:205:GLU:HA	2.03	0.57
1:D:166:GLN:HE21	1:D:168:GLU:CG	2.18	0.57
1:B:85:ILE:HG21	1:B:100:VAL:HG23	1.87	0.56
1:B:177:ASP:OD2	1:B:200:ARG:HB2	2.04	0.56
1:F:134:LEU:HD23	1:F:183:THR:HG22	1.86	0.56
1:A:124:GLY:CA	1:A:132:THR:HB	2.36	0.56
1:B:65:ARG:O	1:B:66:MET:C	2.48	0.56
1:A:177:ASP:OD2	1:A:200:ARG:CB	2.53	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:187:TYR:HB2	3:B:220:SO4:O3	2.06	0.56
1:D:203:TYR:HA	5:D:253:HOH:O	2.05	0.56
1:D:80:ARG:HG3	1:D:81:ILE:N	2.16	0.56
1:B:50:PRO:C	1:B:51:TYR:HD1	2.14	0.55
1:A:156:VAL:HA	1:A:198:GLY:HA2	1.88	0.55
1:D:31:TYR:HD2	5:D:241:HOH:O	1.88	0.55
1:D:152:ILE:HD12	1:D:154:TYR:HE2	1.71	0.55
1:C:129:LYS:HE3	4:C:220:CL:CL	2.43	0.55
1:C:114:SER:O	1:C:172:VAL:HG11	2.05	0.55
1:C:166:GLN:HE21	1:C:168:GLU:CG	2.19	0.55
1:A:5:ASN:HB3	1:A:72:GLN:HE22	1.71	0.54
1:B:65:ARG:O	1:B:67:LEU:N	2.41	0.54
1:B:57:GLN:CB	1:B:93:GLU:CB	2.84	0.54
1:A:155:GLN:HB2	1:A:201:ILE:HD13	1.90	0.54
1:D:166:GLN:HE21	1:D:168:GLU:HG3	1.73	0.54
1:E:185:THR:OG1	1:E:186:PRO:HA	2.08	0.54
1:F:61:VAL:O	1:F:62:GLU:HB3	2.08	0.54
1:A:123:ARG:HD2	1:A:184:CYS:O	2.08	0.54
1:F:129:LYS:O	1:F:132:THR:HB	2.08	0.54
1:C:121:ALA:HB3	1:C:131:PHE:CD2	2.44	0.53
1:D:110:VAL:HG23	1:D:110:VAL:O	2.08	0.53
1:B:166:GLN:NE2	1:B:168:GLU:H	2.03	0.53
1:D:116:HIS:HA	1:D:178:HIS:O	2.09	0.53
1:D:187:TYR:HB2	3:D:220:SO4:O1	2.09	0.53
1:C:16:ILE:HG23	1:C:20:GLU:HG2	1.91	0.53
1:A:204:VAL:C	1:A:205:GLU:O	2.40	0.52
1:E:38:ALA:C	1:E:39:LYS:HG3	2.34	0.52
1:F:85:ILE:HG21	1:F:100:VAL:HG23	1.91	0.52
1:A:75:HIS:NE2	1:A:146:GLU:HB3	2.25	0.52
1:C:110:VAL:O	1:C:110:VAL:CG2	2.30	0.52
1:C:7:ASN:C	1:C:10:LYS:HG3	2.35	0.52
1:A:25:LEU:HD11	1:A:149:GLY:HA3	1.92	0.51
1:C:25:LEU:HD11	1:C:149:GLY:HA3	1.92	0.51
1:B:127:THR:OG1	1:B:128:ALA:N	2.44	0.51
1:B:204:VAL:O	1:B:205:GLU:HG3	2.11	0.51
1:E:72:GLN:OE1	1:E:86:PRO:HB3	2.10	0.51
1:E:108:LEU:O	1:E:110:VAL:N	2.43	0.51
1:C:16:ILE:CG2	1:C:20:GLU:HG2	2.40	0.51
1:A:70:LYS:O	1:A:71:GLU:HB2	2.09	0.50
1:F:123:ARG:HG3	1:F:183:THR:OG1	2.11	0.50
1:D:134:LEU:HD22	1:D:183:THR:HG22	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:83:GLN:HG3	1:E:85:ILE:HD11	1.92	0.50
1:D:5:ASN:OD1	1:D:5:ASN:O	2.30	0.50
1:E:16:ILE:HG22	1:E:20:GLU:HG2	1.91	0.49
1:E:127:THR:OG1	1:E:128:ALA:N	2.44	0.49
1:C:85:ILE:HG21	1:C:100:VAL:HG23	1.94	0.49
1:C:94:GLU:CD	1:C:94:GLU:H	2.20	0.49
1:A:123:ARG:HG3	1:A:183:THR:OG1	2.11	0.49
1:C:11:GLU:O	1:C:14:THR:OG1	2.29	0.49
1:F:186:PRO:HG2	1:F:189:ILE:HB	1.95	0.49
1:D:82:ASN:OD1	1:D:82:ASN:O	2.31	0.49
1:E:182:LEU:C	1:E:182:LEU:HD23	2.38	0.49
1:D:182:LEU:HD22	1:D:195:LEU:CD2	2.42	0.49
1:B:6:ILE:HG23	1:B:86:PRO:HG3	1.94	0.49
1:C:37:GLY:O	1:C:38:ALA:O	2.30	0.49
1:D:110:VAL:HG23	5:D:225:HOH:O	2.11	0.49
1:D:60:VAL:HG22	1:D:61:VAL:H	1.78	0.49
1:A:191:SER:OG	1:A:192:HIS:HD2	1.96	0.48
1:C:185:THR:OG1	1:C:186:PRO:HA	2.13	0.48
1:C:18:ARG:NH1	1:C:18:ARG:HG3	2.28	0.48
1:B:116:HIS:HA	1:B:178:HIS:O	2.13	0.48
1:B:83:GLN:HE22	1:B:129:LYS:CD	2.27	0.48
1:E:53:ALA:O	1:E:54:GLU:C	2.56	0.48
1:F:112:GLY:O	1:F:115:THR:HG23	2.14	0.48
1:C:124:GLY:N	1:C:132:THR:HB	2.28	0.48
1:F:108:LEU:O	1:F:110:VAL:N	2.45	0.48
1:A:100:VAL:HG22	1:A:121:ALA:HB2	1.96	0.47
1:A:205:GLU:OE1	1:A:205:GLU:CA	2.59	0.47
1:D:121:ALA:HB3	1:D:131:PHE:CD2	2.49	0.47
1:D:182:LEU:C	1:D:182:LEU:HD12	2.39	0.47
1:E:125:LEU:HD23	1:E:125:LEU:HA	1.56	0.47
1:B:155:GLN:HB2	1:B:201:ILE:HD13	1.95	0.47
1:C:200:ARG:HH11	1:C:200:ARG:CG	2.27	0.47
1:C:134:LEU:HD22	1:C:183:THR:HG22	1.95	0.47
1:C:122:HIS:HE1	2:C:422:ETM:H42	1.78	0.47
1:C:182:LEU:HD12	1:C:182:LEU:C	2.39	0.47
1:F:63:TYR:HE1	1:F:90:GLY:N	2.12	0.47
1:B:126:PRO:HD2	1:D:34:SER:OG	2.14	0.47
1:B:25:LEU:HD11	1:B:149:GLY:HA3	1.97	0.47
1:C:166:GLN:HE21	1:C:168:GLU:HG3	1.78	0.47
1:E:70:LYS:O	1:E:72:GLN:HG2	2.14	0.47
1:A:108:LEU:O	1:A:110:VAL:N	2.46	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:16:ILE:CG2	1:B:20:GLU:HG2	2.45	0.46
1:E:85:ILE:HG21	1:E:100:VAL:HG23	1.97	0.46
1:B:64:ALA:O	1:B:65:ARG:C	2.56	0.46
1:D:5:ASN:OD1	1:D:5:ASN:C	2.56	0.46
1:B:156:VAL:HA	1:B:198:GLY:HA2	1.98	0.46
1:D:60:VAL:HG22	1:D:61:VAL:N	2.31	0.46
1:E:151:LYS:HD3	1:E:203:TYR:OH	2.16	0.46
1:A:32:ASN:C	1:A:34:SER:H	2.24	0.46
1:A:35:ILE:HD13	1:A:174:GLN:OE1	2.15	0.46
1:E:186:PRO:HG2	1:E:189:ILE:HB	1.97	0.46
1:E:63:TYR:OH	1:E:102:HIS:ND1	2.40	0.46
1:D:139:VAL:HA	1:D:156:VAL:HG12	1.99	0.45
1:A:204:VAL:HG12	1:A:206:LYS:HB2	1.98	0.45
1:B:75:HIS:NE2	1:B:146:GLU:HB3	2.32	0.45
1:E:61:VAL:O	1:E:61:VAL:HG12	2.14	0.45
1:F:134:LEU:HD12	1:F:134:LEU:HA	1.81	0.45
1:A:51:TYR:N	1:A:51:TYR:CD1	2.85	0.45
1:D:152:ILE:HG22	1:D:200:ARG:NH2	2.32	0.45
1:B:37:GLY:C	1:B:39:LYS:H	2.23	0.45
1:C:182:LEU:HD22	1:C:195:LEU:CD2	2.47	0.45
1:B:126:PRO:HG3	1:D:31:TYR:CE1	2.51	0.45
1:C:113:GLU:HG3	1:C:175:GLY:C	2.42	0.45
1:C:156:VAL:HA	1:C:198:GLY:HA2	1.99	0.45
1:D:206:LYS:HD3	1:D:206:LYS:HA	1.65	0.45
1:A:33:ALA:HA	1:A:35:ILE:HG23	1.98	0.45
1:A:139:VAL:HA	1:A:156:VAL:HG12	1.99	0.45
1:E:156:VAL:HA	1:E:198:GLY:HA2	1.99	0.45
1:B:204:VAL:C	1:B:205:GLU:HG3	2.41	0.45
1:A:85:ILE:HG21	1:A:100:VAL:HG23	1.98	0.44
1:E:49:ASP:O	1:E:52:SER:CB	2.65	0.44
1:E:123:ARG:HG3	1:E:132:THR:CA	2.26	0.44
1:B:129:LYS:HB3	5:B:232:HOH:O	2.17	0.44
1:A:204:VAL:O	1:A:205:GLU:C	2.60	0.44
1:B:48:LYS:O	1:B:49:ASP:C	2.60	0.44
1:D:80:ARG:HE	1:D:80:ARG:HB2	1.56	0.44
1:D:35:ILE:CD1	1:D:35:ILE:N	2.80	0.44
1:D:152:ILE:HD12	1:D:154:TYR:CE2	2.50	0.44
1:E:48:LYS:HB3	1:E:48:LYS:HE3	1.30	0.44
1:E:123:ARG:HH22	1:E:135:ASP:HB3	1.79	0.44
1:B:32:ASN:C	1:B:34:SER:H	2.26	0.43
1:C:114:SER:H	1:C:176:GLU:C	2.26	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:182:LEU:HD12	1:D:183:THR:N	2.33	0.43
1:E:61:VAL:C	1:E:63:TYR:N	2.75	0.43
1:D:31:TYR:O	1:D:35:ILE:HD13	2.18	0.43
1:D:177:ASP:OD2	1:D:200:ARG:HD3	2.17	0.43
1:F:121:ALA:HB3	1:F:131:PHE:CD1	2.54	0.43
1:F:182:LEU:HD23	1:F:182:LEU:C	2.43	0.43
1:C:177:ASP:CG	1:C:200:ARG:HB2	2.43	0.43
1:A:138:THR:O	1:A:139:VAL:C	2.60	0.43
1:C:5:ASN:O	1:C:8:ALA:HB3	2.19	0.43
1:C:80:ARG:HE	1:C:80:ARG:HB2	1.11	0.43
1:A:124:GLY:HA2	1:A:132:THR:HB	1.99	0.43
1:C:116:HIS:HA	1:C:178:HIS:O	2.18	0.43
1:B:177:ASP:OD2	1:B:200:ARG:CB	2.66	0.43
1:D:16:ILE:HG23	1:D:20:GLU:HG2	2.00	0.43
1:F:139:VAL:O	1:F:139:VAL:HG23	2.18	0.43
1:A:32:ASN:O	1:A:35:ILE:HG23	2.19	0.43
1:A:139:VAL:HG11	1:B:159:ILE:HG22	2.01	0.43
1:C:113:GLU:HG3	1:C:175:GLY:HA2	2.00	0.43
1:A:123:ARG:HH22	1:A:135:ASP:CB	2.32	0.43
1:D:168:GLU:HG3	1:D:168:GLU:H	1.53	0.43
1:E:129:LYS:C	1:E:132:THR:HG22	2.30	0.43
1:B:95:ASN:C	1:B:97:GLN:H	2.25	0.42
1:D:155:GLN:HB2	1:D:201:ILE:HD13	2.01	0.42
1:A:124:GLY:N	1:A:132:THR:CB	2.78	0.42
1:C:35:ILE:O	1:C:38:ALA:CB	2.61	0.42
1:E:139:VAL:O	1:E:139:VAL:HG23	2.19	0.42
1:F:177:ASP:CG	1:F:200:ARG:HB2	2.45	0.42
1:A:3:HIS:CD2	1:A:5:ASN:H	2.37	0.42
1:B:61:VAL:O	1:B:61:VAL:CG2	2.67	0.42
1:B:20:GLU:O	1:B:21:ILE:C	2.63	0.42
1:E:61:VAL:C	1:E:63:TYR:H	2.26	0.42
1:F:24:ARG:NE	1:F:66:MET:O	2.42	0.42
1:B:95:ASN:C	1:B:97:GLN:N	2.78	0.42
1:C:100:VAL:HG22	1:C:121:ALA:HB2	2.00	0.42
1:D:108:LEU:N	5:D:241:HOH:O	2.50	0.42
1:B:75:HIS:HD2	1:B:146:GLU:HB3	1.74	0.42
1:C:114:SER:OG	1:C:175:GLY:N	2.37	0.42
1:E:3:HIS:O	1:E:6:ILE:CD1	2.68	0.42
1:F:66:MET:HG2	1:F:67:LEU:N	2.34	0.42
1:B:6:ILE:HG21	1:B:75:HIS:HB3	2.02	0.42
1:E:75:HIS:CE1	1:E:146:GLU:HB3	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:131:PHE:O	1:A:132:THR:C	2.63	0.41
1:C:18:ARG:NH1	1:C:18:ARG:CG	2.81	0.41
1:C:182:LEU:HD12	1:C:183:THR:N	2.35	0.41
1:D:25:LEU:HD11	1:D:149:GLY:HA3	2.03	0.41
1:C:168:GLU:HG3	1:C:168:GLU:H	1.49	0.41
1:A:116:HIS:HA	1:A:178:HIS:O	2.20	0.41
1:A:121:ALA:HB3	1:A:131:PHE:CD2	2.55	0.41
1:B:83:GLN:HE22	1:B:129:LYS:HD2	1.84	0.41
1:B:134:LEU:HD12	1:B:134:LEU:HA	1.89	0.41
1:C:18:ARG:CG	1:C:18:ARG:HH11	2.32	0.41
1:B:134:LEU:HD23	1:B:183:THR:HG22	2.03	0.41
1:D:121:ALA:HB3	1:D:131:PHE:CG	2.55	0.41
1:A:6:ILE:CG2	1:A:86:PRO:HG3	2.49	0.41
1:A:160:LYS:HE2	1:B:158:GLN:OE1	2.20	0.41
1:B:85:ILE:CG2	1:B:100:VAL:HG23	2.50	0.41
1:B:191:SER:OG	1:B:192:HIS:HD2	2.04	0.41
1:D:70:LYS:HA	1:D:70:LYS:HD3	1.88	0.41
1:D:100:VAL:HG22	1:D:121:ALA:HB2	2.03	0.41
1:A:75:HIS:HD2	1:A:146:GLU:HB3	1.80	0.41
1:A:80:ARG:O	1:A:80:ARG:HG3	2.17	0.41
1:B:147:HIS:HD2	1:B:149:GLY:N	2.12	0.41
1:C:123:ARG:HG2	1:C:132:THR:CA	2.38	0.41
1:A:205:GLU:C	1:A:206:LYS:CG	2.88	0.41
1:D:204:VAL:O	1:D:205:GLU:CB	2.64	0.41
1:D:110:VAL:O	1:D:110:VAL:CG2	2.68	0.40
1:F:125:LEU:HA	1:F:126:PRO:HD3	1.94	0.40
1:A:125:LEU:O	1:A:128:ALA:O	2.39	0.40
1:E:61:VAL:CG1	1:E:63:TYR:HB3	2.47	0.40
1:E:16:ILE:CG2	1:E:20:GLU:CG	2.89	0.40
1:E:153:ALA:HB2	1:E:203:TYR:HD2	1.87	0.40
1:F:20:GLU:O	1:F:24:ARG:HG2	2.21	0.40
1:D:154:TYR:CZ	1:D:179:VAL:HG23	2.56	0.40
1:D:204:VAL:C	1:D:205:GLU:O	2.63	0.40

There are no symmetry-related clashes.

## 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	188/230 (82%)	173 (92%)	13 (7%)	2 (1%)	11	24
1	B	185/230 (80%)	171 (92%)	12 (6%)	2 (1%)	11	24
1	C	183/230 (80%)	172 (94%)	10 (6%)	1 (0%)	24	42
1	D	185/230 (80%)	178 (96%)	6 (3%)	1 (0%)	24	42
1	E	187/230 (81%)	178 (95%)	8 (4%)	1 (0%)	24	42
1	F	182/230 (79%)	170 (93%)	12 (7%)	0	100	100
All	All	1110/1380 (80%)	1042 (94%)	61 (6%)	7 (1%)	21	38

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	38	ALA
1	E	5	ASN
1	A	46	ALA
1	B	46	ALA
1	A	206	LYS
1	B	66	MET
1	D	37	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	159/193 (82%)	138 (87%)	21 (13%)	4	7

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	151/193 (78%)	134 (89%)	17 (11%)	5	11
1	C	150/193 (78%)	127 (85%)	23 (15%)	3	5
1	D	150/193 (78%)	130 (87%)	20 (13%)	4	7
1	E	151/193 (78%)	132 (87%)	19 (13%)	4	8
1	F	146/193 (76%)	133 (91%)	13 (9%)	9	20
All	All	907/1158 (78%)	794 (88%)	113 (12%)	4	8

All (113) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	THR
1	A	17	ASP
1	A	35	ILE
1	A	48	LYS
1	A	51	TYR
1	A	62	GLU
1	A	72	GLN
1	A	75	HIS
1	A	80	ARG
1	A	91	SER
1	A	94	GLU
1	A	125	LEU
1	A	127	THR
1	A	138	THR
1	A	142	ARG
1	A	148	ILE
1	A	160	LYS
1	A	169	ASP
1	A	201	ILE
1	A	205	GLU
1	A	207	THR
1	B	6	ILE
1	B	14	THR
1	B	17	ASP
1	B	20	GLU
1	B	48	LYS
1	B	54	GLU
1	B	68	GLU
1	B	76	VAL
1	B	80	ARG

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Mol	Chain	Res	Type
1	B	91	SER
1	B	129	LYS
1	B	132	THR
1	B	138	THR
1	B	142	ARG
1	B	148	ILE
1	B	204	VAL
1	B	205	GLU
1	C	10	LYS
1	C	14	THR
1	C	17	ASP
1	C	18	ARG
1	C	20	GLU
1	C	24	ARG
1	C	34	SER
1	C	47	LEU
1	C	61	VAL
1	C	65	ARG
1	C	66	MET
1	C	80	ARG
1	C	82	ASN
1	C	94	GLU
1	C	113	GLU
1	C	129	LYS
1	C	134	LEU
1	C	138	THR
1	C	148	ILE
1	C	168	GLU
1	C	182	LEU
1	C	189	ILE
1	C	200	ARG
1	D	14	THR
1	D	17	ASP
1	D	18	ARG
1	D	20	GLU
1	D	23	ARG
1	D	24	ARG
1	D	35	ILE
1	D	47	LEU
1	D	48	LYS
1	D	61	VAL
1	D	66	MET

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Mol	Chain	Res	Type
1	D	80	ARG
1	D	129	LYS
1	D	134	LEU
1	D	138	THR
1	D	148	ILE
1	D	168	GLU
1	D	182	LEU
1	D	189	ILE
1	D	206	LYS
1	E	14	THR
1	E	15	LYS
1	E	20	GLU
1	E	22	ASN
1	E	23	ARG
1	E	39	LYS
1	E	48	LYS
1	E	61	VAL
1	E	66	MET
1	E	72	GLN
1	E	93	GLU
1	E	97	GLN
1	E	125	LEU
1	E	129	LYS
1	E	132	THR
1	E	138	THR
1	E	142	ARG
1	E	148	ILE
1	E	168	GLU
1	F	14	THR
1	F	20	GLU
1	F	22	ASN
1	F	23	ARG
1	F	35	ILE
1	F	93	GLU
1	F	127	THR
1	F	129	LYS
1	F	132	THR
1	F	138	THR
1	F	148	ILE
1	F	168	GLU
1	F	193	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33)

such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3	HIS
1	A	72	GLN
1	A	147	HIS
1	A	166	GLN
1	A	190	ASN
1	A	192	HIS
1	B	72	GLN
1	B	83	GLN
1	B	147	HIS
1	B	166	GLN
1	B	192	HIS
1	C	122	HIS
1	C	133	ASN
1	C	166	GLN
1	C	174	GLN
1	C	192	HIS
1	D	82	ASN
1	D	166	GLN
1	D	190	ASN
1	D	192	HIS
1	E	3	HIS
1	E	7	ASN
1	E	75	HIS
1	E	83	GLN
1	E	97	GLN
1	E	122	HIS
1	E	174	GLN
1	E	192	HIS
1	F	7	ASN
1	F	75	HIS
1	F	122	HIS
1	F	174	GLN
1	F	192	HIS

### 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 oligosaccharides in this entry.

## 5.6 Ligand geometry

Of 12 ligands modelled in this entry, 1 is monoatomic - leaving 11 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
2	ETM	E	422	1	6,6,6	0.62	0	8,8,8	0.41	0
3	SO4	F	220	-	4,4,4	0.23	0	6,6,6	0.35	0
2	ETM	D	422	1	6,6,6	0.77	0	8,8,8	0.53	0
2	ETM	A	422	1	6,6,6	0.60	0	8,8,8	0.49	0
2	ETM	F	422	1	6,6,6	0.50	0	8,8,8	0.48	0
3	SO4	B	221	-	4,4,4	0.26	0	6,6,6	0.50	0
2	ETM	B	422	1	6,6,6	0.74	0	8,8,8	0.53	0
3	SO4	C	221	-	4,4,4	0.21	0	6,6,6	0.25	0
3	SO4	D	220	-	4,4,4	0.23	0	6,6,6	0.25	0
2	ETM	C	422	1	6,6,6	0.64	0	8,8,8	0.44	0
3	SO4	B	220	-	4,4,4	0.32	0	6,6,6	0.35	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	ETM	E	422	1	-	0/4/4/4	-
2	ETM	D	422	1	-	0/4/4/4	-
2	ETM	A	422	1	-	0/4/4/4	-
2	ETM	F	422	1	-	1/4/4/4	-
2	ETM	B	422	1	-	2/4/4/4	-
2	ETM	C	422	1	-	0/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	F	422	ETM	SD-C1-C2-N1
2	B	422	ETM	C1-C2-N1-C3
2	B	422	ETM	C1-C2-N1-C4

There are no ring outliers.

5 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	422	ETM	2	0
2	A	422	ETM	3	0
3	D	220	SO4	2	0
2	C	422	ETM	1	0
3	B	220	SO4	2	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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	194/230 (84%)	-1.15	0 100 100	24, 43, 89, 96	0
1	B	193/230 (83%)	-1.22	0 100 100	25, 43, 85, 122	0
1	C	189/230 (82%)	-1.15	0 100 100	26, 45, 89, 93	0
1	D	193/230 (83%)	-1.20	0 100 100	26, 44, 88, 115	0
1	E	193/230 (83%)	-1.09	0 100 100	28, 48, 95, 106	0
1	F	188/230 (81%)	-1.13	0 100 100	29, 49, 93, 109	0
All	All	1150/1380 (83%)	-1.16	0 100 100	24, 46, 90, 122	0

There are no RSRZ outliers to report.

### 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](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	ETM	E	422	7/7	0.91	0.15	121,123,124,124	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	ETM	F	422	7/7	0.96	0.16	182,184,185,185	0
2	ETM	A	422	7/7	0.97	0.12	111,115,116,116	0
2	ETM	C	422	7/7	0.97	0.12	144,146,146,146	0
2	ETM	D	422	7/7	0.98	0.09	85,85,86,88	0
3	SO4	C	221	5/5	0.98	0.04	93,94,94,95	0
4	CL	C	220	1/1	0.98	0.04	71,71,71,71	0
3	SO4	B	221	5/5	0.99	0.03	89,89,90,90	0
2	ETM	B	422	7/7	0.99	0.07	99,99,100,101	0
3	SO4	D	220	5/5	0.99	0.05	50,51,51,51	0
3	SO4	F	220	5/5	0.99	0.04	55,56,57,57	0
3	SO4	B	220	5/5	0.99	0.03	48,48,49,49	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.