Full wwPDB X-ray Structure Validation Report (i)

Apr 21, 2026 – 12:29 PM JST

PDB ID	:	9UM3 / pdb_00009um3
Title	:	CaPETaseM9 SEC loop of 6CLb variant
Authors	:	Kim, K.; Ki, D.; Park, J.
Deposited on	:	2025-04-21
Resolution	:	2.01 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 (i) 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 (i)) were used in the production of this report:

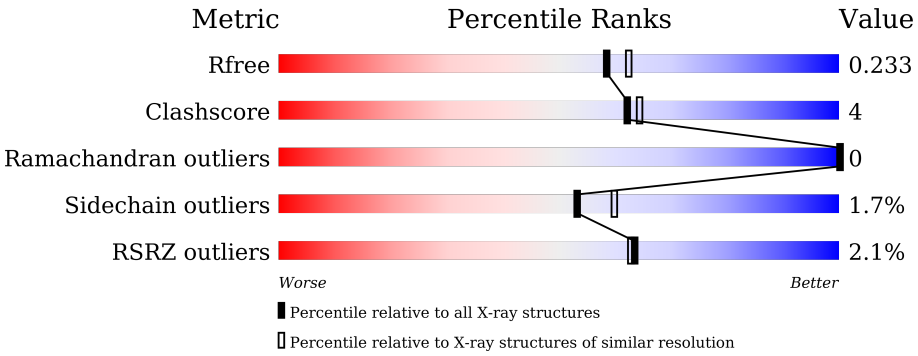
MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.01 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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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 <=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	261	2% 86% 11%
1	B	261	2% 89% 9%
1	C	261	2% 85% 10%
1	D	261	2% 86% 11%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 7967 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 Cutinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	253	Total	C	N	O	S	0	0	0
			1926	1220	334	362	10			
1	B	258	Total	C	N	O	S	0	0	0
			1973	1249	345	369	10			
1	C	253	Total	C	N	O	S	0	0	0
			1926	1220	334	362	10			
1	D	254	Total	C	N	O	S	0	0	0
			1934	1226	335	363	10			

There are 108 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	41	ALA	-	expression tag	UNP A0A1M7II12
A	42	ALA	-	expression tag	UNP A0A1M7II12
A	109	ALA	ASN	engineered mutation	UNP A0A1M7II12
A	129	THR	VAL	engineered mutation	UNP A0A1M7II12
A	155	ARG	ALA	engineered mutation	UNP A0A1M7II12
A	180	CYS	LEU	engineered mutation	UNP A0A1M7II12
A	196	THR	GLY	engineered mutation	UNP A0A1M7II12
A	198	LYS	ARG	engineered mutation	UNP A0A1M7II12
A	202	CYS	ALA	engineered mutation	UNP A0A1M7II12
A	242	CYS	ARG	engineered mutation	UNP A0A1M7II12
A	?	-	PRO	deletion	UNP A0A1M7II12
A	?	-	GLY	deletion	UNP A0A1M7II12
A	?	-	PRO	deletion	UNP A0A1M7II12
A	?	-	SER	deletion	UNP A0A1M7II12
A	?	-	THR	deletion	UNP A0A1M7II12
A	280	ASN	GLY	engineered mutation	UNP A0A1M7II12
A	281	VAL	LEU	engineered mutation	UNP A0A1M7II12
A	282	ASN	PHE	engineered mutation	UNP A0A1M7II12
A	283	ASP	ALA	engineered mutation	UNP A0A1M7II12
A	285	ALA	-	insertion	UNP A0A1M7II12
A	287	CYS	SER	engineered mutation	UNP A0A1M7II12

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	296	LEU	-	expression tag	UNP A0A1M7II12
A	297	GLU	-	expression tag	UNP A0A1M7II12
A	298	HIS	-	expression tag	UNP A0A1M7II12
A	299	HIS	-	expression tag	UNP A0A1M7II12
A	300	HIS	-	expression tag	UNP A0A1M7II12
A	301	HIS	-	expression tag	UNP A0A1M7II12
B	41	ALA	-	expression tag	UNP A0A1M7II12
B	42	ALA	-	expression tag	UNP A0A1M7II12
B	109	ALA	ASN	engineered mutation	UNP A0A1M7II12
B	129	THR	VAL	engineered mutation	UNP A0A1M7II12
B	155	ARG	ALA	engineered mutation	UNP A0A1M7II12
B	180	CYS	LEU	engineered mutation	UNP A0A1M7II12
B	196	THR	GLY	engineered mutation	UNP A0A1M7II12
B	198	LYS	ARG	engineered mutation	UNP A0A1M7II12
B	202	CYS	ALA	engineered mutation	UNP A0A1M7II12
B	242	CYS	ARG	engineered mutation	UNP A0A1M7II12
B	?	-	PRO	deletion	UNP A0A1M7II12
B	?	-	GLY	deletion	UNP A0A1M7II12
B	?	-	PRO	deletion	UNP A0A1M7II12
B	?	-	SER	deletion	UNP A0A1M7II12
B	?	-	THR	deletion	UNP A0A1M7II12
B	280	ASN	GLY	engineered mutation	UNP A0A1M7II12
B	281	VAL	LEU	engineered mutation	UNP A0A1M7II12
B	282	ASN	PHE	engineered mutation	UNP A0A1M7II12
B	283	ASP	ALA	engineered mutation	UNP A0A1M7II12
B	285	ALA	-	insertion	UNP A0A1M7II12
B	287	CYS	SER	engineered mutation	UNP A0A1M7II12
B	296	LEU	-	expression tag	UNP A0A1M7II12
B	297	GLU	-	expression tag	UNP A0A1M7II12
B	298	HIS	-	expression tag	UNP A0A1M7II12
B	299	HIS	-	expression tag	UNP A0A1M7II12
B	300	HIS	-	expression tag	UNP A0A1M7II12
B	301	HIS	-	expression tag	UNP A0A1M7II12
C	41	ALA	-	expression tag	UNP A0A1M7II12
C	42	ALA	-	expression tag	UNP A0A1M7II12
C	109	ALA	ASN	engineered mutation	UNP A0A1M7II12
C	129	THR	VAL	engineered mutation	UNP A0A1M7II12
C	155	ARG	ALA	engineered mutation	UNP A0A1M7II12
C	180	CYS	LEU	engineered mutation	UNP A0A1M7II12
C	196	THR	GLY	engineered mutation	UNP A0A1M7II12
C	198	LYS	ARG	engineered mutation	UNP A0A1M7II12
C	202	CYS	ALA	engineered mutation	UNP A0A1M7II12

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	242	CYS	ARG	engineered mutation	UNP A0A1M7II12
C	?	-	PRO	deletion	UNP A0A1M7II12
C	?	-	GLY	deletion	UNP A0A1M7II12
C	?	-	PRO	deletion	UNP A0A1M7II12
C	?	-	SER	deletion	UNP A0A1M7II12
C	?	-	THR	deletion	UNP A0A1M7II12
C	280	ASN	GLY	engineered mutation	UNP A0A1M7II12
C	281	VAL	LEU	engineered mutation	UNP A0A1M7II12
C	282	ASN	PHE	engineered mutation	UNP A0A1M7II12
C	283	ASP	ALA	engineered mutation	UNP A0A1M7II12
C	285	ALA	-	insertion	UNP A0A1M7II12
C	287	CYS	SER	engineered mutation	UNP A0A1M7II12
C	296	LEU	-	expression tag	UNP A0A1M7II12
C	297	GLU	-	expression tag	UNP A0A1M7II12
C	298	HIS	-	expression tag	UNP A0A1M7II12
C	299	HIS	-	expression tag	UNP A0A1M7II12
C	300	HIS	-	expression tag	UNP A0A1M7II12
C	301	HIS	-	expression tag	UNP A0A1M7II12
D	41	ALA	-	expression tag	UNP A0A1M7II12
D	42	ALA	-	expression tag	UNP A0A1M7II12
D	109	ALA	ASN	engineered mutation	UNP A0A1M7II12
D	129	THR	VAL	engineered mutation	UNP A0A1M7II12
D	155	ARG	ALA	engineered mutation	UNP A0A1M7II12
D	180	CYS	LEU	engineered mutation	UNP A0A1M7II12
D	196	THR	GLY	engineered mutation	UNP A0A1M7II12
D	198	LYS	ARG	engineered mutation	UNP A0A1M7II12
D	202	CYS	ALA	engineered mutation	UNP A0A1M7II12
D	242	CYS	ARG	engineered mutation	UNP A0A1M7II12
D	?	-	PRO	deletion	UNP A0A1M7II12
D	?	-	GLY	deletion	UNP A0A1M7II12
D	?	-	PRO	deletion	UNP A0A1M7II12
D	?	-	SER	deletion	UNP A0A1M7II12
D	?	-	THR	deletion	UNP A0A1M7II12
D	280	ASN	GLY	engineered mutation	UNP A0A1M7II12
D	281	VAL	LEU	engineered mutation	UNP A0A1M7II12
D	282	ASN	PHE	engineered mutation	UNP A0A1M7II12
D	283	ASP	ALA	engineered mutation	UNP A0A1M7II12
D	285	ALA	-	insertion	UNP A0A1M7II12
D	287	CYS	SER	engineered mutation	UNP A0A1M7II12
D	296	LEU	-	expression tag	UNP A0A1M7II12
D	297	GLU	-	expression tag	UNP A0A1M7II12
D	298	HIS	-	expression tag	UNP A0A1M7II12

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
D	299	HIS	-	expression tag	UNP A0A1M7II12
D	300	HIS	-	expression tag	UNP A0A1M7II12
D	301	HIS	-	expression tag	UNP A0A1M7II12

- Molecule 2 is water.

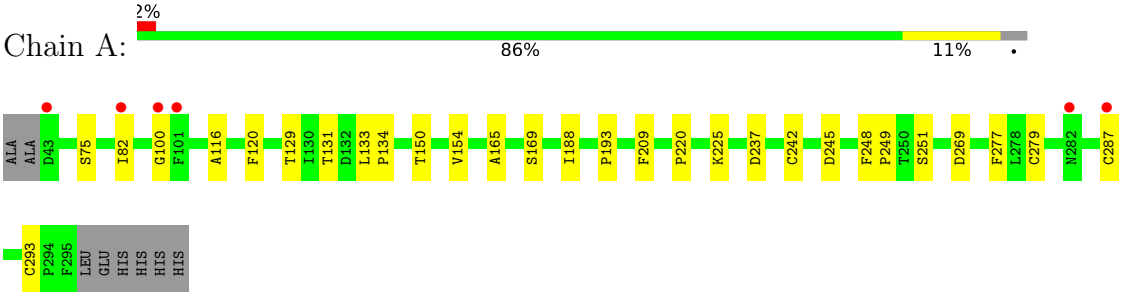
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	72	Total O 72 72	0	0
2	B	63	Total O 63 63	0	0
2	C	35	Total O 35 35	0	0
2	D	38	Total O 38 38	0	0

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.

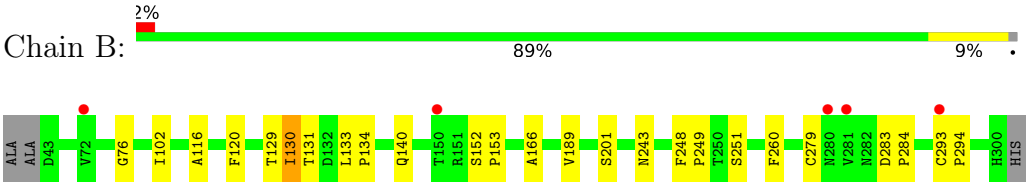
• Molecule 1: Cutinase

Chain A:



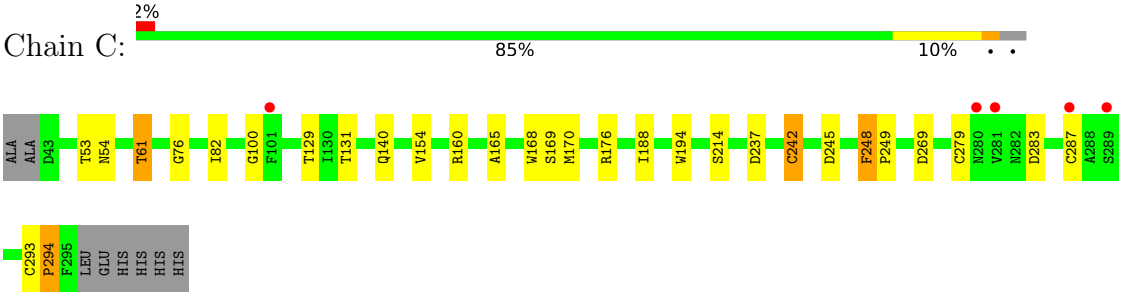
• Molecule 1: Cutinase

Chain B:



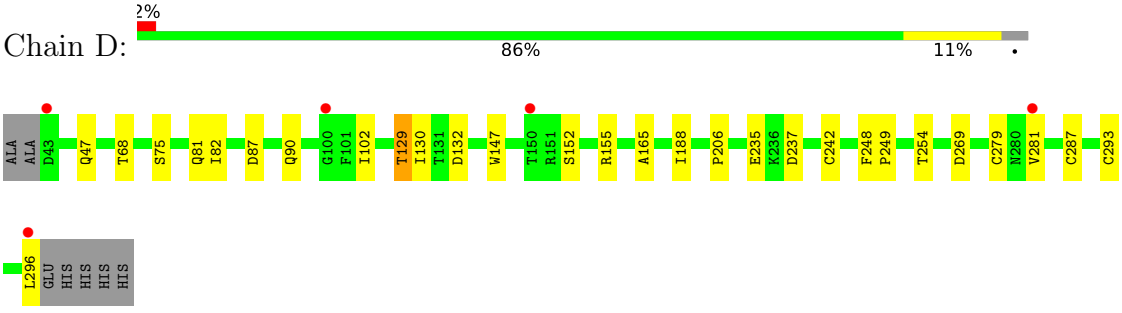
• Molecule 1: Cutinase

Chain C:



• Molecule 1: Cutinase

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	139.04Å 83.69Å 79.02Å 90.00° 90.65° 90.00°	Depositor
Resolution (Å)	28.74 – 2.01 28.74 – 2.01	Depositor EDS
% Data completeness (in resolution range)	98.9 (28.74-2.01) 99.4 (28.74-2.01)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	8.29 (at 2.01Å)	Xtriage
Refinement program	REFMAC 5.8.0425	Depositor
R, R_{free}	0.175 , 0.219 0.189 , 0.233	Depositor DCC
R_{free} test set	3089 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å^2)	27.5	Xtriage
Anisotropy	0.164	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.41 , 42.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.003 for -1/2*h+3/2*k,1/2*h+1/2*k,-l 0.006 for -1/2*h-3/2*k,-1/2*h+1/2*k,-l 0.019 for 1/2*h+3/2*k,1/2*h-1/2*k,-l 0.010 for 1/2*h-3/2*k,-1/2*h-1/2*k,-l 0.022 for -h,-k,l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	7967	wwPDB-VP
Average B, all atoms (Å^2)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.12% 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	0.63	0/1982	1.06	4/2713 (0.1%)
1	B	0.65	0/2032	1.11	1/2781 (0.0%)
1	C	0.62	0/1982	1.09	9/2713 (0.3%)
1	D	0.60	0/1990	1.08	4/2724 (0.1%)
All	All	0.63	0/7986	1.08	18/10931 (0.2%)

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	C	0	2

There are no bond length outliers.

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	61	THR	CA-CB-OG1	-7.16	98.86	109.60
1	D	254	THR	CA-CB-OG1	-6.75	99.47	109.60
1	A	150	THR	CA-CB-OG1	-6.60	99.70	109.60
1	B	260	PHE	CA-CB-CG	6.13	119.93	113.80
1	D	269	ASP	CA-CB-CG	5.91	118.51	112.60
1	A	277	PHE	CA-CB-CG	-5.85	107.95	113.80
1	C	237	ASP	CA-CB-CG	5.73	118.33	112.60
1	C	269	ASP	CA-CB-CG	5.71	118.31	112.60
1	A	269	ASP	CA-CB-CG	5.53	118.13	112.60
1	C	294	PRO	N-CA-CB	-5.52	96.53	102.60
1	C	283	ASP	CA-CB-CG	5.48	118.08	112.60
1	A	237	ASP	CA-CB-CG	5.41	118.01	112.60
1	C	245	ASP	CA-CB-CG	5.40	118.00	112.60
1	C	53	THR	CA-CB-OG1	-5.38	101.53	109.60

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	242	CYS	CB-CA-C	-5.37	100.81	109.72
1	C	248	PHE	CA-CB-CG	5.35	119.15	113.80
1	D	237	ASP	CA-CB-CG	5.21	117.81	112.60
1	D	47	GLN	N-CA-CB	-5.00	102.39	109.85

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	160	ARG	Sidechain
1	C	176	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	1926	0	1849	15	0
1	B	1973	0	1885	14	0
1	C	1926	0	1849	16	0
1	D	1934	0	1860	17	0
2	A	72	0	0	0	0
2	B	63	0	0	1	0
2	C	35	0	0	0	0
2	D	38	0	0	0	0
All	All	7967	0	7443	62	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 4.

All (62) 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:A:242:CYS:SG	1:A:287:CYS:SG	2.45	0.88
1:D:242:CYS:SG	1:D:287:CYS:SG	2.48	0.83
1:D:279:CYS:SG	1:D:293:CYS:SG	2.56	0.80

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:242:CYS:SG	1:C:287:CYS:SG	2.68	0.79
1:C:242:CYS:HG	1:C:287:CYS:HG	0.93	0.78
1:B:129:THR:HG22	1:B:131:THR:H	1.54	0.71
1:B:279:CYS:HG	1:B:293:CYS:HG	0.71	0.70
1:A:279:CYS:SG	1:A:293:CYS:SG	2.60	0.70
1:C:242:CYS:CB	1:C:287:CYS:HG	2.05	0.68
1:C:279:CYS:SG	1:C:293:CYS:SG	2.64	0.66
1:A:100:GLY:HA3	1:A:169:SER:HB3	1.81	0.62
1:A:129:THR:HG22	1:A:131:THR:H	1.68	0.58
1:A:279:CYS:HG	1:A:293:CYS:HG	0.56	0.56
1:C:129:THR:HG22	1:C:131:THR:H	1.70	0.56
1:D:102:ILE:HA	1:D:130:ILE:HG12	1.87	0.56
1:B:279:CYS:SG	1:B:293:CYS:SG	2.74	0.54
1:D:129:THR:HB	1:D:132:ASP:OD1	2.08	0.54
1:C:100:GLY:CA	1:C:168:TRP:O	2.57	0.53
1:D:165:ALA:O	1:D:188:ILE:HA	2.10	0.52
1:B:76:GLY:O	1:B:140:GLN:HG2	2.10	0.52
1:B:201:SER:HB2	2:B:423:HOH:O	2.10	0.52
1:C:248:PHE:CG	1:C:249:PRO:HD3	2.46	0.50
1:D:82:ILE:HD11	1:D:147:TRP:CH2	2.47	0.50
1:B:102:ILE:HA	1:B:130:ILE:HG12	1.94	0.49
1:D:68:THR:HG22	1:D:81:GLN:HE21	1.78	0.48
1:C:279:CYS:HG	1:C:293:CYS:CB	2.25	0.47
1:D:296:LEU:C	1:D:296:LEU:HD12	2.39	0.47
1:D:87:ASP:C	1:D:87:ASP:OD1	2.56	0.47
1:D:82:ILE:HD11	1:D:147:TRP:CZ3	2.50	0.47
1:D:242:CYS:HA	1:D:287:CYS:SG	2.55	0.46
1:C:76:GLY:O	1:C:140:GLN:HG2	2.15	0.46
1:C:170:MET:HE2	1:C:194:TRP:CZ3	2.50	0.46
1:A:82:ILE:HD11	1:A:154:VAL:HG21	1.98	0.45
1:B:133:LEU:HB3	1:B:134:PRO:CD	2.46	0.45
1:C:100:GLY:HA2	1:C:168:TRP:O	2.16	0.45
1:C:100:GLY:HA3	1:C:169:SER:HB3	1.98	0.45
1:A:82:ILE:CD1	1:A:154:VAL:HG21	2.46	0.45
1:C:100:GLY:HA3	1:C:168:TRP:O	2.16	0.44
1:A:220:PRO:O	1:A:225:LYS:HB2	2.18	0.44
1:C:82:ILE:HD13	1:C:154:VAL:HG21	1.99	0.44
1:B:279:CYS:HA	1:B:293:CYS:SG	2.58	0.44
1:B:166:ALA:HA	1:B:189:VAL:O	2.18	0.44
1:D:248:PHE:N	1:D:249:PRO:CD	2.81	0.44
1:D:147:TRP:CZ2	1:D:152:SER:HB2	2.53	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:116:ALA:HA	1:B:120:PHE:O	2.18	0.43
1:C:165:ALA:O	1:C:188:ILE:HA	2.18	0.43
1:D:155:ARG:HG2	1:D:155:ARG:HH11	1.84	0.43
1:D:279:CYS:HG	1:D:293:CYS:CB	2.26	0.43
1:A:193:PRO:HG3	1:A:209:PHE:CD1	2.54	0.43
1:C:242:CYS:HA	1:C:287:CYS:SG	2.59	0.42
1:D:248:PHE:CG	1:D:249:PRO:HD3	2.54	0.42
1:A:133:LEU:HB3	1:A:134:PRO:CD	2.49	0.42
1:A:245:ASP:OD1	1:A:245:ASP:C	2.61	0.42
1:A:116:ALA:HA	1:A:120:PHE:O	2.20	0.41
1:A:165:ALA:O	1:A:188:ILE:HA	2.20	0.41
1:B:283:ASP:HA	1:B:284:PRO:HD2	1.98	0.41
1:B:248:PHE:N	1:B:249:PRO:CD	2.83	0.41
1:A:242:CYS:CB	1:A:287:CYS:SG	3.07	0.41
1:B:248:PHE:N	1:B:249:PRO:HD3	2.35	0.41
1:A:248:PHE:N	1:A:249:PRO:CD	2.84	0.41
1:D:206:PRO:HA	1:D:235:GLU:O	2.20	0.41
1:B:152:SER:HB2	1:B:153:PRO:HD2	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	251/261 (96%)	243 (97%)	8 (3%)	0	100	100
1	B	256/261 (98%)	247 (96%)	9 (4%)	0	100	100
1	C	251/261 (96%)	241 (96%)	10 (4%)	0	100	100
1	D	252/261 (97%)	242 (96%)	10 (4%)	0	100	100
All	All	1010/1044 (97%)	973 (96%)	37 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	202/208 (97%)	200 (99%)	2 (1%)	68 75
1	B	207/208 (100%)	203 (98%)	4 (2%)	50 56
1	C	202/208 (97%)	198 (98%)	4 (2%)	48 54
1	D	203/208 (98%)	199 (98%)	4 (2%)	48 54
All	All	814/832 (98%)	800 (98%)	14 (2%)	53 60

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	75	SER
1	A	251	SER
1	B	130	ILE
1	B	243	ASN
1	B	251	SER
1	B	294	PRO
1	C	54	ASN
1	C	61	THR
1	C	214	SER
1	C	294	PRO
1	D	75	SER
1	D	90	GLN
1	D	129	THR
1	D	281	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	90	GLN
1	A	181	GLN
1	A	221	ASN
1	B	90	GLN
1	B	221	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	243	ASN
1	C	69	GLN
1	C	90	GLN
1	C	221	ASN
1	D	69	GLN
1	D	81	GLN
1	D	90	GLN
1	D	270	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	253/261 (96%)	-0.07	6 (2%)	59	59	19, 28, 41, 58	0
1	B	258/261 (98%)	0.04	5 (1%)	66	66	19, 29, 48, 68	0
1	C	253/261 (96%)	0.16	5 (1%)	65	64	20, 32, 49, 87	0
1	D	254/261 (97%)	0.12	5 (1%)	65	64	22, 32, 50, 68	0
All	All	1018/1044 (97%)	0.06	21 (2%)	63	63	19, 30, 47, 87	0

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	281	VAL	5.0
1	B	150	THR	3.1
1	B	281	VAL	3.0
1	C	287	CYS	3.0
1	A	101	PHE	2.9
1	D	150	THR	2.8
1	A	100	GLY	2.8
1	D	296	LEU	2.8
1	C	280	ASN	2.7
1	C	101	PHE	2.7
1	B	293	CYS	2.6
1	D	100	GLY	2.5
1	D	281	VAL	2.4
1	A	82	ILE	2.3
1	A	282	ASN	2.2
1	A	43	ASP	2.2
1	A	287	CYS	2.2
1	D	43	ASP	2.1
1	C	289	SER	2.1
1	B	72	VAL	2.0
1	B	280	ASN	2.0

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

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

6.3 Carbohydrates (i)

There are no 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.