



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 6, 2017 – 06:14 AM EST

PDB ID : 4JP8  
Title : Crystal structure of Pro-F17H/S324A  
Authors : Yuzaki, K.; You, D.J.; Uehara, R.; Koga, Y.; Kanaya, S.  
Deposited on : unknown  
Resolution : 2.21 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)

A user guide is available at

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20030345  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20030345

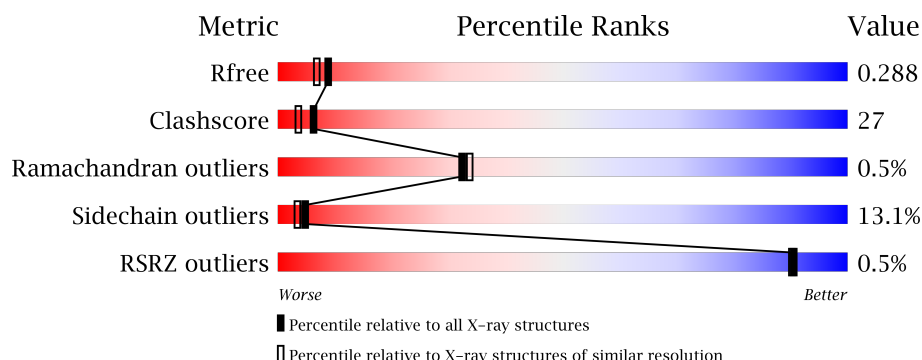
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.21 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))
$R_{free}$	100719	4744 (2.24-2.20)
Clashscore	112137	5509 (2.24-2.20)
Ramachandran outliers	110173	5427 (2.24-2.20)
Sidechain outliers	110143	5428 (2.24-2.20)
RSRZ outliers	101464	4776 (2.24-2.20)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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	398	<div> <div></div> <div>63%</div> <div>29%</div> <div>8%</div> <div>.</div> </div>

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 2978 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 Tk-subtilisin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	395	Total	C	N	O	S	0	0	0
			2893	1828	486	572	7			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	17	HIS	PHE	ENGINEERED MUTATION	UNP P58502
A	324	ALA	SER	ENGINEERED MUTATION	UNP P58502

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	6	Total	Ca	0	0
			6	6		

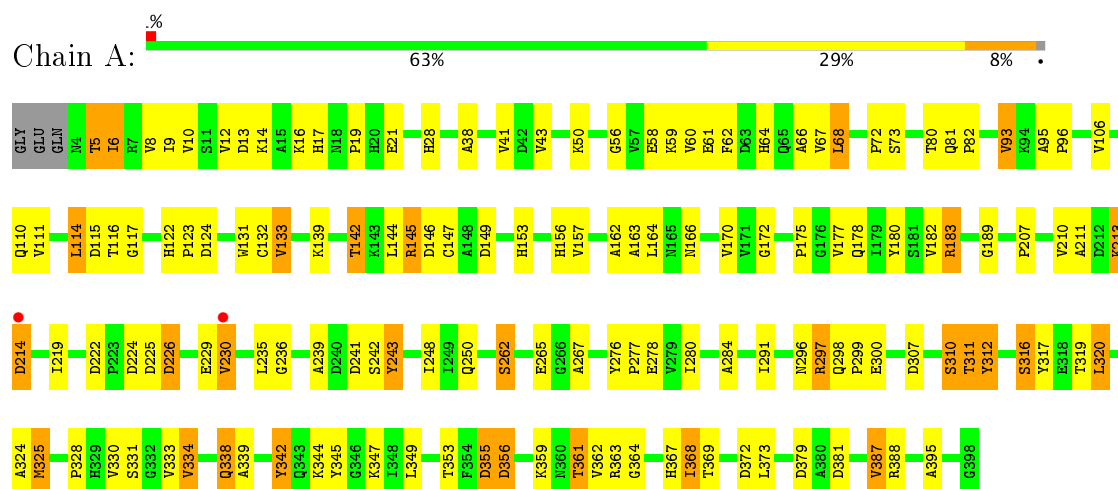
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	79	Total	O	0	0
			79	79		

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

These plots are drawn for all protein, RNA and DNA 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 ( $\text{RSRZ} > 2$ ). 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: Tk-subtilisin



## 4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	77.32Å 92.50Å 122.22Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.21 46.25 – 2.21	Depositor EDS
% Data completeness (in resolution range)	98.9 (50.00-2.21) 98.8 (46.25-2.21)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	0.10	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	9.30 (at 2.20Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, $R_{free}$	0.230 , 0.280 0.239 , 0.288	Depositor DCC
$R_{free}$ test set	1129 reflections (5.38%)	DCC
Wilson B-factor (Å <sup>2</sup> )	35.7	Xtriage
Anisotropy	1.139	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 60.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	2978	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.02% 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: CA

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	1.49	4/2954 (0.1%)	0.87	8/4041 (0.2%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	132	CYS	CB-SG	-5.85	1.72	1.81
1	A	43	VAL	CB-CG2	-5.47	1.41	1.52
1	A	243	TYR	CD2-CE2	-5.46	1.31	1.39
1	A	312	TYR	CD2-CE2	-5.13	1.31	1.39

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	342	TYR	CB-CA-C	-5.75	98.90	110.40
1	A	170	VAL	CB-CA-C	-5.63	100.70	111.40
1	A	320	LEU	CA-CB-CG	5.62	128.23	115.30
1	A	226	ASP	CB-CG-OD2	5.52	123.27	118.30
1	A	225	ASP	CB-CG-OD2	5.16	122.94	118.30
1	A	226	ASP	CB-CG-OD1	-5.14	113.68	118.30
1	A	149	ASP	CB-CG-OD2	5.09	122.88	118.30
1	A	133	VAL	CB-CA-C	-5.08	101.74	111.40

There are no chirality outliers.

There are no planarity outliers.

### 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	2893	0	2850	155	0
2	A	6	0	0	1	0
3	A	79	0	0	4	0
All	All	2978	0	2850	155	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 27.

All (155) 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:80:THR:CG2	1:A:82:PRO:HD3	1.54	1.34
1:A:361:THR:CG2	1:A:364:GLY:H	1.44	1.30
1:A:122:HIS:CE1	1:A:311:THR:HG22	1.79	1.14
1:A:361:THR:HG22	1:A:364:GLY:H	0.96	1.08
1:A:361:THR:HG22	1:A:364:GLY:N	1.70	1.05
1:A:325:MET:HE2	1:A:325:MET:N	1.73	1.04
1:A:80:THR:HG23	1:A:82:PRO:HD3	1.38	1.03
1:A:325:MET:H	1:A:325:MET:CE	1.70	1.03
1:A:8:VAL:HG11	1:A:60:VAL:CG1	1.88	1.02
1:A:8:VAL:HB	3:A:827:HOH:O	1.64	0.96
1:A:80:THR:HG22	1:A:82:PRO:HD3	1.48	0.96
1:A:325:MET:H	1:A:325:MET:HE2	1.29	0.94
1:A:361:THR:CG2	1:A:364:GLY:N	2.29	0.91
1:A:338:GLN:HA	1:A:338:GLN:HE21	1.37	0.90
1:A:80:THR:CG2	1:A:82:PRO:CD	2.49	0.88
1:A:325:MET:CE	1:A:325:MET:N	2.31	0.85
1:A:342:TYR:CD1	1:A:342:TYR:O	2.30	0.85
1:A:122:HIS:NE2	1:A:311:THR:HG22	1.92	0.83
1:A:8:VAL:HG11	1:A:60:VAL:HG13	1.59	0.81
1:A:122:HIS:HD2	1:A:124:ASP:H	1.26	0.81
1:A:8:VAL:HG13	1:A:61:GLU:O	1.82	0.80
1:A:164:LEU:HB3	1:A:166:ASN:ND2	1.97	0.79
1:A:229:GLU:O	1:A:230:VAL:CG2	2.30	0.79
1:A:153:HIS:O	1:A:157:VAL:HG23	1.82	0.79
1:A:164:LEU:CB	1:A:166:ASN:ND2	2.46	0.78
1:A:164:LEU:HB3	1:A:166:ASN:HD22	1.49	0.78
1:A:116:THR:O	1:A:183:ARG:HD3	1.85	0.77
1:A:68:LEU:HD23	1:A:68:LEU:O	1.84	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:325:MET:H	1:A:325:MET:HE3	1.49	0.76
1:A:229:GLU:O	1:A:230:VAL:HG23	1.87	0.74
1:A:210:VAL:HG11	1:A:213:LYS:HB2	1.70	0.72
1:A:359:LYS:HD3	1:A:395:ALA:HB1	1.71	0.72
1:A:324:ALA:HB3	1:A:325:MET:HE2	1.69	0.72
1:A:164:LEU:HB2	1:A:166:ASN:HD21	1.54	0.72
1:A:356:ASP:O	1:A:367:HIS:HD2	1.73	0.72
1:A:122:HIS:CE1	1:A:311:THR:CG2	2.68	0.71
1:A:72:PRO:HA	1:A:320:LEU:HD22	1.71	0.71
1:A:338:GLN:HE22	1:A:349:LEU:H	1.38	0.70
1:A:80:THR:HG21	1:A:82:PRO:HD3	1.71	0.70
1:A:116:THR:O	1:A:183:ARG:CD	2.40	0.69
1:A:344:LYS:NZ	1:A:345:TYR:OH	2.23	0.69
1:A:210:VAL:O	2:A:702:CA:CA	1.68	0.69
1:A:8:VAL:CG1	1:A:60:VAL:CG1	2.70	0.68
1:A:379:ASP:OD2	1:A:381:ASP:N	2.27	0.68
1:A:164:LEU:CB	1:A:166:ASN:HD21	2.07	0.67
1:A:8:VAL:HG11	1:A:60:VAL:HG12	1.75	0.67
1:A:372:ASP:O	1:A:373:LEU:HD23	1.95	0.67
1:A:68:LEU:HD13	1:A:189:GLY:HA3	1.76	0.67
1:A:8:VAL:HG12	1:A:9:ILE:N	2.10	0.67
1:A:5:THR:OG1	1:A:6:ILE:N	2.27	0.66
1:A:344:LYS:HD3	1:A:345:TYR:CE1	2.31	0.66
1:A:333:VAL:HG21	1:A:387:VAL:CG1	2.26	0.65
1:A:229:GLU:C	1:A:230:VAL:HG23	2.18	0.65
1:A:8:VAL:CG1	1:A:60:VAL:HG13	2.27	0.64
1:A:342:TYR:O	1:A:342:TYR:CG	2.50	0.64
1:A:214:ASP:OD2	1:A:214:ASP:N	2.30	0.63
1:A:344:LYS:HD3	1:A:345:TYR:CZ	2.34	0.63
1:A:80:THR:CG2	1:A:81:GLN:N	2.59	0.63
1:A:265:GLU:H	1:A:296:ASN:HD21	1.45	0.62
1:A:122:HIS:NE2	1:A:311:THR:CG2	2.61	0.62
1:A:325:MET:O	1:A:328:PRO:HD2	2.00	0.62
1:A:122:HIS:HE1	1:A:316:SER:O	1.83	0.61
1:A:80:THR:HG22	1:A:82:PRO:CD	2.27	0.60
1:A:114:LEU:HA	1:A:182:VAL:O	2.02	0.60
1:A:59:LYS:HG2	1:A:61:GLU:HG3	1.82	0.60
1:A:265:GLU:H	1:A:296:ASN:ND2	1.99	0.59
1:A:64:HIS:CD2	1:A:241:ASP:OD2	2.56	0.59
1:A:80:THR:HG23	1:A:81:GLN:N	2.18	0.59
1:A:214:ASP:OD1	1:A:222:ASP:OD1	2.21	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:229:GLU:O	1:A:230:VAL:HG22	2.04	0.57
1:A:356:ASP:O	1:A:367:HIS:CD2	2.57	0.57
1:A:122:HIS:CE1	1:A:316:SER:H	2.22	0.56
1:A:210:VAL:CG1	1:A:213:LYS:HB2	2.34	0.56
1:A:131:TRP:HB3	1:A:180:TYR:CD1	2.42	0.55
1:A:8:VAL:HG12	1:A:9:ILE:H	1.70	0.55
1:A:361:THR:HG22	1:A:364:GLY:CA	2.35	0.55
1:A:338:GLN:HA	1:A:338:GLN:NE2	2.15	0.55
1:A:172:GLY:O	1:A:175:PRO:HD3	2.06	0.55
1:A:177:VAL:HG22	1:A:178:GLN:N	2.23	0.54
1:A:157:VAL:HG13	1:A:328:PRO:HG3	1.88	0.54
1:A:207:PRO:HD2	1:A:226:ASP:CG	2.29	0.54
1:A:93:VAL:HG22	1:A:387:VAL:HG12	1.90	0.54
1:A:68:LEU:C	1:A:68:LEU:HD23	2.28	0.53
1:A:115:ASP:O	1:A:183:ARG:HA	2.09	0.52
1:A:267:ALA:H	1:A:296:ASN:ND2	2.08	0.51
1:A:229:GLU:C	1:A:230:VAL:CG2	2.78	0.50
1:A:331:SER:O	1:A:334:VAL:HG13	2.12	0.50
1:A:114:LEU:CD1	1:A:114:LEU:N	2.74	0.50
1:A:355:ASP:OD1	1:A:355:ASP:N	2.44	0.50
1:A:361:THR:HG23	1:A:363:ARG:N	2.27	0.50
1:A:8:VAL:CG1	1:A:60:VAL:HG12	2.40	0.49
1:A:142:THR:O	1:A:142:THR:CG2	2.60	0.49
1:A:207:PRO:HD2	1:A:226:ASP:OD1	2.13	0.49
1:A:372:ASP:C	1:A:373:LEU:HD23	2.32	0.49
1:A:156:HIS:CD2	1:A:310:SER:HB3	2.47	0.49
1:A:344:LYS:CD	1:A:345:TYR:CE1	2.96	0.49
1:A:95:ALA:HB3	1:A:96:PRO:HD3	1.95	0.48
1:A:116:THR:O	1:A:183:ARG:HD2	2.13	0.48
1:A:324:ALA:CB	1:A:325:MET:HE2	2.41	0.48
1:A:12:VAL:HA	1:A:56:GLY:O	2.14	0.48
1:A:369:THR:O	1:A:388:ARG:HD3	2.13	0.48
1:A:59:LYS:HE2	1:A:61:GLU:HG2	1.95	0.48
1:A:300:GLU:OE2	1:A:367:HIS:HE1	1.97	0.48
1:A:325:MET:HB2	1:A:325:MET:HE3	1.66	0.47
1:A:8:VAL:CG1	1:A:61:GLU:O	2.57	0.47
1:A:164:LEU:HB2	1:A:166:ASN:ND2	2.19	0.47
1:A:106:VAL:HG13	1:A:339:ALA:HB1	1.96	0.47
1:A:72:PRO:CA	1:A:320:LEU:HD22	2.42	0.47
1:A:364:GLY:O	1:A:368:ILE:HD12	2.14	0.47
1:A:324:ALA:C	1:A:325:MET:HE2	2.31	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28:HIS:HD2	3:A:859:HOH:O	1.96	0.46
1:A:379:ASP:C	1:A:379:ASP:OD2	2.53	0.46
1:A:222:ASP:OD2	1:A:224:ASP:N	2.44	0.46
1:A:8:VAL:CG1	1:A:9:ILE:N	2.77	0.46
1:A:166:ASN:HB2	3:A:852:HOH:O	2.15	0.46
1:A:110:GLN:HG2	1:A:180:TYR:CZ	2.51	0.46
1:A:333:VAL:HG21	1:A:387:VAL:HG13	1.97	0.46
1:A:262:SER:HB3	1:A:296:ASN:HB2	1.96	0.46
1:A:330:VAL:O	1:A:334:VAL:HG12	2.16	0.46
1:A:13:ASP:OD1	1:A:13:ASP:C	2.53	0.45
1:A:324:ALA:O	1:A:328:PRO:HD3	2.15	0.45
1:A:64:HIS:HD2	1:A:241:ASP:OD2	1.99	0.45
1:A:93:VAL:CG2	1:A:387:VAL:HG12	2.46	0.45
1:A:284:ALA:O	1:A:291:ILE:HD12	2.17	0.45
1:A:62:PHE:HD1	3:A:861:HOH:O	2.00	0.45
1:A:64:HIS:CD2	1:A:239:ALA:HB1	2.52	0.45
1:A:145:ARG:HG3	1:A:146:ASP:N	2.32	0.44
1:A:66:ALA:HA	1:A:236:GLY:O	2.17	0.44
1:A:298:GLN:N	1:A:299:PRO:HD3	2.33	0.44
1:A:307:ASP:C	1:A:319:THR:CG2	2.86	0.44
1:A:115:ASP:O	1:A:117:GLY:N	2.51	0.44
1:A:111:VAL:HG22	1:A:230:VAL:HB	1.99	0.43
1:A:142:THR:O	1:A:142:THR:HG23	2.17	0.43
1:A:59:LYS:HE2	1:A:61:GLU:CG	2.48	0.43
1:A:67:VAL:HG22	1:A:68:LEU:N	2.33	0.43
1:A:114:LEU:HD12	1:A:182:VAL:HB	2.00	0.43
1:A:66:ALA:HB1	1:A:236:GLY:O	2.19	0.42
1:A:210:VAL:HG11	1:A:213:LYS:CB	2.44	0.42
1:A:297:ARG:HD2	1:A:297:ARG:HA	1.69	0.42
1:A:122:HIS:HA	1:A:123:PRO:HD3	1.69	0.42
1:A:317:TYR:N	1:A:317:TYR:CD1	2.87	0.42
1:A:276:TYR:HA	1:A:277:PRO:HD3	1.91	0.42
1:A:353:THR:O	1:A:356:ASP:HB2	2.20	0.42
1:A:144:LEU:O	1:A:147:CYS:N	2.51	0.42
1:A:162:ALA:O	1:A:163:ALA:C	2.58	0.41
1:A:10:VAL:O	1:A:38:ALA:HA	2.19	0.41
1:A:114:LEU:HD12	1:A:114:LEU:N	2.35	0.41
1:A:8:VAL:CG1	1:A:9:ILE:H	2.34	0.41
1:A:9:ILE:HG21	1:A:243:TYR:CD2	2.56	0.41
1:A:115:ASP:C	1:A:117:GLY:H	2.23	0.41
1:A:280:ILE:HA	1:A:300:GLU:OE1	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:280:ILE:HG23	1:A:300:GLU:CD	2.40	0.41
1:A:361:THR:HG23	1:A:362:VAL:N	2.35	0.41
1:A:338:GLN:CA	1:A:338:GLN:HE21	2.16	0.41
1:A:17:HIS:O	1:A:19:PRO:HD3	2.21	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	393/398 (99%)	382 (97%)	9 (2%)	2 (0%)	32 34

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	230	VAL
1	A	211	ALA

### 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	305/307 (99%)	265 (87%)	40 (13%)	5 3

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	THR
1	A	6	ILE
1	A	14	LYS
1	A	16	LYS
1	A	21	GLU
1	A	41	VAL
1	A	50	LYS
1	A	58	GLU
1	A	68	LEU
1	A	73	SER
1	A	93	VAL
1	A	114	LEU
1	A	133	VAL
1	A	139	LYS
1	A	142	THR
1	A	145	ARG
1	A	183	ARG
1	A	213	LYS
1	A	214	ASP
1	A	219	ILE
1	A	235	LEU
1	A	242	SER
1	A	248	ILE
1	A	250	GLN
1	A	262	SER
1	A	278	GLU
1	A	297	ARG
1	A	310	SER
1	A	311	THR
1	A	312	TYR
1	A	316	SER
1	A	325	MET
1	A	334	VAL
1	A	338	GLN
1	A	347	LYS
1	A	355	ASP
1	A	356	ASP
1	A	361	THR
1	A	368	ILE
1	A	387	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	46	ASN
1	A	64	HIS
1	A	122	HIS
1	A	150	GLN
1	A	296	ASN
1	A	338	GLN
1	A	367	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 carbohydrates in this entry.

### 5.6 Ligand geometry ⓘ

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

### 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 [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	395/398 (99%)	-0.16	2 (0%) 90 90	23, 44, 58, 73	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	214	ASP	3.2
1	A	230	VAL	2.4

### 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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
2	CA	A	701	1/1	0.98	0.11	-0.83	40,40,40,40	0
2	CA	A	702	1/1	0.92	0.09	-0.96	55,55,55,55	0
2	CA	A	703	1/1	0.81	0.05	-1.41	44,44,44,44	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	CA	A	706	1/1	0.85	0.05	-1.85	70,70,70,70	0
2	CA	A	705	1/1	0.88	0.07	-2.12	36,36,36,36	0
2	CA	A	704	1/1	0.83	0.05	-	63,63,63,63	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.