



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 09:44 AM UTC

PDB ID : 3WIU / pdb_00003wiu
Title : Crystal structure of Pro-S324A/L349A
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Deposited on : 2013-09-25
Resolution : 1.80 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	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

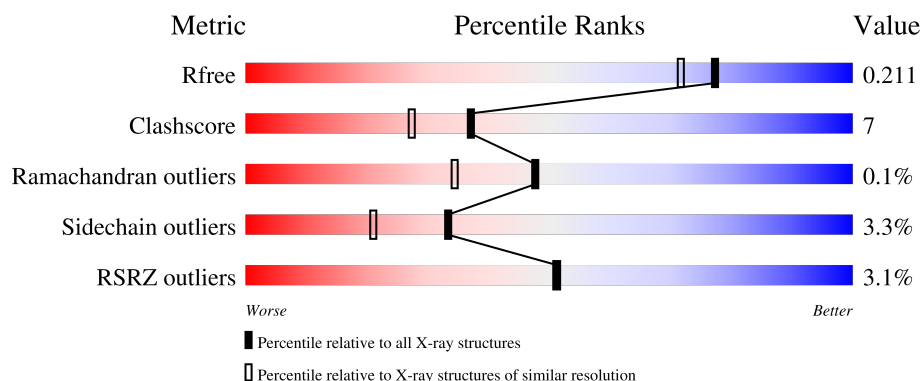
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 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	7662 (1.80-1.80)
Clashscore	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)
RSRZ outliers	180081	7663 (1.80-1.80)

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	398	3% 79% 18% ..
1	B	398	3% 81% 14% ..
1	C	398	4% 82% 16% ..

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 9421 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
			2891	1828	484	572	7			
1	B	387	Total	C	N	O	S	0	0	0
			2835	1793	474	561	7			
1	C	394	Total	C	N	O	S	0	0	0
			2887	1826	483	571	7			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	324	ALA	SER	engineered mutation	UNP P58502
A	349	ALA	LEU	engineered mutation	UNP P58502
B	324	ALA	SER	engineered mutation	UNP P58502
B	349	ALA	LEU	engineered mutation	UNP P58502
C	324	ALA	SER	engineered mutation	UNP P58502
C	349	ALA	LEU	engineered mutation	UNP P58502

- Molecule 2 is CALCIUM ION (CCD ID: CA) (formula: Ca).

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

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	262	Total	O	0	0
			262	262		

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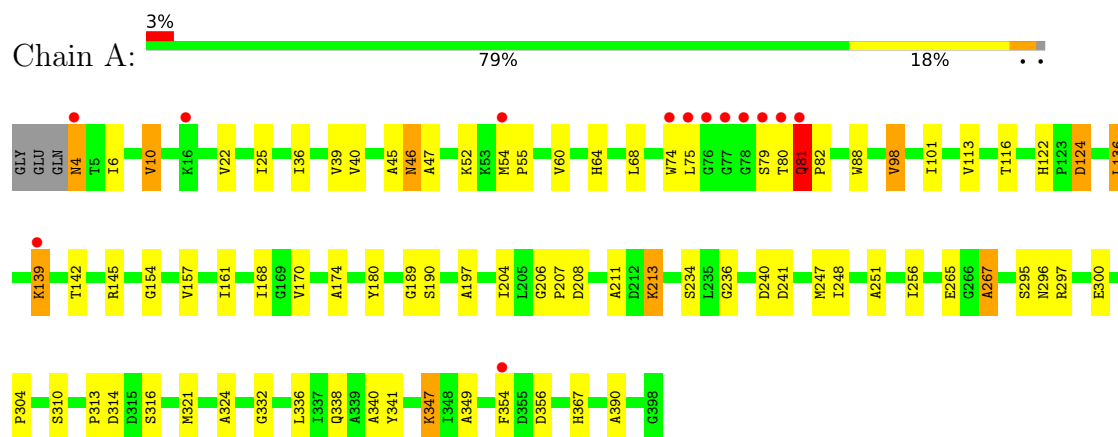
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	275	Total	O	0	0
			275	275		
3	C	253	Total	O	0	0
			253	253		

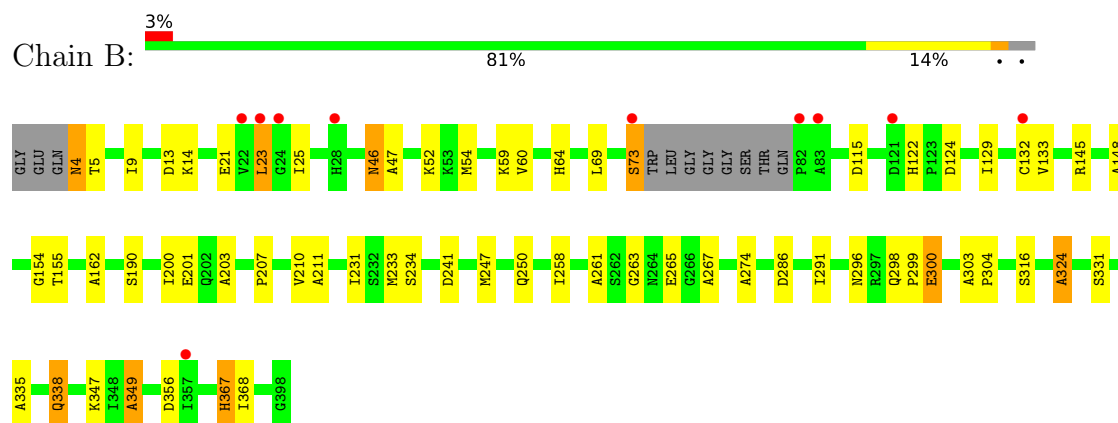
3 Residue-property plots

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.

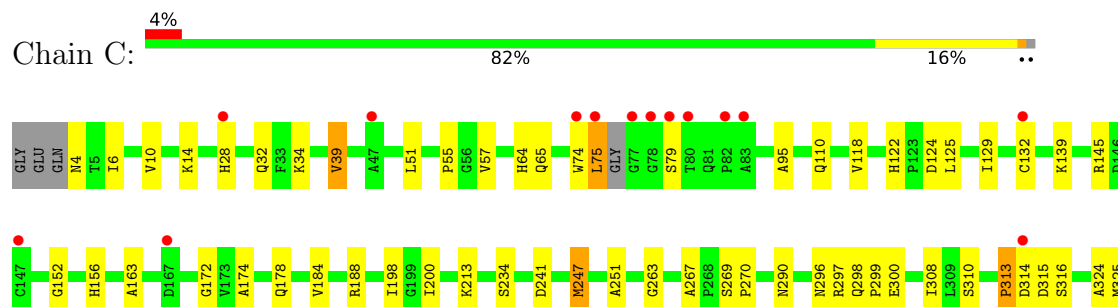
• Molecule 1: Tk-subtilisin



• Molecule 1: Tk-subtilisin



• Molecule 1: Tk-subtilisin



A326	
Q338	
A349	
P350	
V351	
D356	
H367	
D381	
A390	
G398	

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	93.78Å 118.37Å 120.02Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.98 – 1.80 40.98 – 1.80	Depositor EDS
% Data completeness (in resolution range)	99.8 (40.98-1.80) 99.8 (40.98-1.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.95 (at 1.81Å)	Xtriage
Refinement program	REFMAC 5.5.0110	Depositor
R, R_{free}	0.179 , 0.220 (Not available) , 0.211	Depositor DCC
R_{free} test set	6201 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	22.9	Xtriage
Anisotropy	0.213	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 31.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.012 for -h,l,k	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	9421	wwPDB-VP
Average B, all atoms (Å ²)	26.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.74% of the height of the origin peak. No significant pseudotranslation is detected.*

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

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	1.72	34/2952 (1.2%)	1.38	12/4038 (0.3%)
1	B	1.69	26/2893 (0.9%)	1.35	8/3955 (0.2%)
1	C	1.57	11/2947 (0.4%)	1.33	13/4030 (0.3%)
All	All	1.66	71/8792 (0.8%)	1.36	33/12023 (0.3%)

All (71) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	248	ILE	CA-CB	-8.37	1.44	1.54
1	B	331	SER	N-CA	8.32	1.56	1.46
1	C	247	MET	SD-CE	-8.04	1.59	1.79
1	B	231	ILE	C-O	-7.98	1.15	1.24
1	A	204	ILE	N-CA	7.80	1.55	1.46
1	B	247	MET	SD-CE	-7.68	1.60	1.79
1	B	200	ILE	CA-CB	-7.47	1.45	1.54
1	B	115	ASP	N-CA	7.32	1.53	1.46
1	B	335	ALA	CA-CB	7.25	1.64	1.53
1	B	367	HIS	C-O	7.24	1.32	1.24
1	A	170	VAL	C-O	-6.98	1.15	1.24
1	A	45	ALA	N-CA	6.93	1.55	1.46
1	A	310	SER	C-O	6.90	1.30	1.24
1	B	133	VAL	C-O	6.87	1.31	1.23
1	A	340	ALA	CA-CB	-6.85	1.42	1.53
1	A	101	ILE	N-CA	6.70	1.54	1.46
1	A	154	GLY	N-CA	6.58	1.53	1.45
1	B	211	ALA	C-O	-6.51	1.16	1.24
1	A	256	ILE	N-CA	6.50	1.54	1.46
1	C	184	VAL	CA-CB	6.46	1.62	1.54
1	A	336	LEU	CA-C	6.44	1.61	1.52
1	A	197	ALA	N-CA	6.39	1.54	1.46
1	C	390	ALA	CA-CB	6.37	1.63	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	163	ALA	N-CA	6.15	1.53	1.46
1	B	324	ALA	N-CA	6.13	1.53	1.46
1	A	113	VAL	CA-CB	6.12	1.61	1.53
1	B	261	ALA	N-CA	6.12	1.53	1.45
1	A	247	MET	SD-CE	-6.10	1.64	1.79
1	B	148	ALA	CA-CB	6.07	1.63	1.53
1	B	300	GLU	CA-CB	6.05	1.63	1.53
1	B	263	GLY	N-CA	6.05	1.50	1.45
1	A	174	ALA	CA-CB	5.98	1.60	1.53
1	C	118	VAL	CA-CB	5.95	1.64	1.55
1	C	184	VAL	N-CA	5.77	1.51	1.46
1	A	236	GLY	N-CA	5.76	1.50	1.45
1	B	201	GLU	N-CA	5.74	1.53	1.46
1	B	203	ALA	CA-CB	5.71	1.62	1.53
1	A	10	VAL	CA-CB	5.70	1.61	1.54
1	C	125	LEU	N-CA	5.63	1.53	1.46
1	A	161	ILE	N-CA	5.63	1.53	1.46
1	B	274	ALA	CA-CB	5.63	1.62	1.53
1	C	172	GLY	N-CA	5.58	1.51	1.45
1	C	174	ALA	CA-CB	5.57	1.59	1.53
1	A	39	VAL	C-O	-5.56	1.18	1.24
1	C	39	VAL	C-O	5.54	1.29	1.24
1	B	155	THR	CA-CB	5.46	1.61	1.53
1	A	6	ILE	N-CA	-5.46	1.40	1.46
1	B	258	ILE	CA-CB	-5.43	1.48	1.54
1	A	240	ASP	C-O	5.42	1.30	1.24
1	A	36	ILE	CA-CB	5.41	1.61	1.55
1	A	314	ASP	CA-C	-5.39	1.46	1.53
1	A	40	VAL	CA-CB	-5.38	1.47	1.54
1	B	250	GLN	N-CA	5.37	1.52	1.46
1	B	59	LYS	N-CA	5.36	1.52	1.46
1	A	98	VAL	CA-CB	5.27	1.61	1.54
1	A	304	PRO	N-CA	5.25	1.53	1.47
1	A	116	THR	CA-CB	5.23	1.61	1.53
1	A	157	VAL	N-CA	5.21	1.52	1.46
1	B	207	PRO	C-O	-5.17	1.17	1.24
1	B	233	MET	SD-CE	-5.17	1.66	1.79
1	B	211	ALA	CA-CB	-5.16	1.45	1.53
1	A	332	GLY	CA-C	5.15	1.57	1.52
1	A	267	ALA	CA-CB	5.15	1.60	1.53
1	A	251	ALA	CA-CB	5.12	1.61	1.53
1	A	142	THR	CA-CB	5.12	1.60	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	210	VAL	C-O	-5.12	1.18	1.24
1	C	270	PRO	N-CA	5.06	1.53	1.47
1	A	22	VAL	N-CA	5.06	1.52	1.46
1	A	124	ASP	C-O	5.05	1.30	1.24
1	A	168	ILE	C-O	5.03	1.29	1.23
1	B	4	ASN	N-CA	5.01	1.55	1.46

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	313	PRO	CA-C-N	7.71	133.73	122.63
1	C	313	PRO	C-N-CA	7.71	133.73	122.63
1	C	314	ASP	N-CA-C	-7.09	101.71	111.28
1	A	354	PHE	CA-C-N	6.80	132.08	120.72
1	A	354	PHE	C-N-CA	6.80	132.08	120.72
1	A	313	PRO	O-C-N	6.56	130.85	122.91
1	C	198	ILE	N-CA-C	-6.44	104.22	110.72
1	C	314	ASP	CB-CA-C	6.26	121.25	112.11
1	A	206	GLY	CA-C-N	6.21	126.40	119.32
1	A	206	GLY	C-N-CA	6.21	126.40	119.32
1	C	313	PRO	N-CA-C	6.09	120.90	111.21
1	B	263	GLY	N-CA-C	-6.06	105.96	112.08
1	C	351	VAL	N-CA-C	-5.72	105.27	110.82
1	B	162	ALA	CA-C-N	-5.69	112.63	120.71
1	B	162	ALA	C-N-CA	-5.69	112.63	120.71
1	C	95	ALA	CA-C-N	-5.67	113.04	119.28
1	C	95	ALA	C-N-CA	-5.67	113.04	119.28
1	A	98	VAL	CB-CA-C	-5.61	103.17	112.26
1	A	145	ARG	CG-CD-NE	-5.38	100.16	112.00
1	C	263	GLY	N-CA-C	-5.33	106.70	112.08
1	C	326	ALA	N-CA-C	-5.28	105.19	111.69
1	A	136	LEU	N-CA-C	5.23	117.93	110.24
1	B	154	GLY	N-CA-C	-5.19	106.50	112.73
1	C	251	ALA	N-CA-C	-5.18	105.71	111.36
1	B	60	VAL	N-CA-C	-5.17	100.20	107.75
1	B	349	ALA	CA-C-N	5.10	125.03	119.78
1	B	349	ALA	C-N-CA	5.10	125.03	119.78
1	A	211	ALA	N-CA-C	5.06	116.48	111.07
1	C	152	GLY	N-CA-C	-5.04	108.19	113.58
1	A	180	TYR	CA-C-N	-5.03	115.50	122.30
1	A	180	TYR	C-N-CA	-5.03	115.50	122.30
1	A	336	LEU	N-CA-C	-5.03	105.88	111.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	73	SER	CA-C-O	-5.02	112.26	120.80

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	2891	0	2846	48	0
1	B	2835	0	2796	33	0
1	C	2887	0	2842	47	0
2	A	6	0	0	0	0
2	B	6	0	0	0	0
2	C	6	0	0	0	0
3	A	262	0	0	4	0
3	B	275	0	0	4	0
3	C	253	0	0	5	0
All	All	9421	0	8484	121	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 7.

All (121) 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:C:74:TRP:O	1:C:75:LEU:HB2	1.57	0.98
1:C:122:HIS:HD2	1:C:124:ASP:H	1.13	0.95
1:A:25:ILE:HD12	1:A:47:ALA:HB1	1.52	0.91
1:A:122:HIS:HD2	1:A:124:ASP:H	1.14	0.91
1:A:81:GLN:HG3	1:C:6:ILE:CD1	2.02	0.89
1:B:23:LEU:HD12	1:B:23:LEU:H	1.40	0.86
1:C:338:GLN:HE21	1:C:338:GLN:HA	1.41	0.85
1:A:64:HIS:HD2	1:A:241:ASP:OD2	1.58	0.84
1:C:338:GLN:HE22	1:C:349:ALA:H	1.26	0.83
1:A:338:GLN:HE22	1:A:349:ALA:H	1.25	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:338:GLN:HE22	1:B:349:ALA:H	1.30	0.80
1:C:300:GLU:OE2	1:C:367:HIS:HE1	1.66	0.79
1:A:265:GLU:H	1:A:296:ASN:HD21	1.31	0.78
1:B:122:HIS:HD2	1:B:124:ASP:H	1.29	0.78
1:A:25:ILE:HD13	1:A:54:MET:CE	2.17	0.74
1:A:356:ASP:O	1:A:367:HIS:HD2	1.73	0.72
1:B:338:GLN:HE21	1:B:338:GLN:HA	1.55	0.71
1:B:300:GLU:OE2	1:B:367:HIS:HE1	1.74	0.71
1:A:265:GLU:H	1:A:296:ASN:ND2	1.90	0.70
1:C:267:ALA:H	1:C:296:ASN:ND2	1.91	0.68
1:A:122:HIS:CD2	1:A:124:ASP:H	2.05	0.68
1:C:356:ASP:O	1:C:367:HIS:HD2	1.76	0.68
1:A:81:GLN:HG3	1:C:6:ILE:HD13	1.75	0.67
1:B:64:HIS:HD2	1:B:241:ASP:OD2	1.77	0.67
1:C:64:HIS:HD2	1:C:241:ASP:OD2	1.78	0.67
1:B:356:ASP:O	1:B:367:HIS:HD2	1.78	0.65
1:B:23:LEU:H	1:B:23:LEU:CD1	2.09	0.64
1:C:28:HIS:HE1	3:C:1268:HOH:O	1.80	0.64
1:A:81:GLN:HG3	1:C:6:ILE:HD11	1.79	0.63
1:A:25:ILE:HD13	1:A:54:MET:HE1	1.80	0.63
1:C:122:HIS:CD2	1:C:124:ASP:H	2.04	0.63
1:C:300:GLU:OE2	1:C:367:HIS:CE1	2.52	0.62
1:B:25:ILE:HD12	1:B:47:ALA:HB1	1.83	0.61
1:A:300:GLU:OE2	1:A:367:HIS:HE1	1.84	0.61
1:A:338:GLN:HA	1:A:338:GLN:HE21	1.69	0.58
1:B:23:LEU:HD12	1:B:23:LEU:N	2.17	0.57
1:A:208:ASP:OD2	1:A:213:LYS:NZ	2.37	0.57
1:B:122:HIS:CD2	1:B:124:ASP:H	2.17	0.57
1:A:267:ALA:H	1:A:296:ASN:ND2	2.02	0.57
1:B:21:GLU:HG2	1:B:54:MET:HE2	1.87	0.57
1:A:88:TRP:H	1:C:4:ASN:HD22	1.53	0.56
1:A:55:PRO:HA	3:A:1336:HOH:O	2.04	0.56
1:A:74:TRP:HZ2	3:B:1321:HOH:O	1.88	0.56
1:B:265:GLU:H	1:B:296:ASN:HD21	1.53	0.56
1:A:122:HIS:HE1	1:A:316:SER:O	1.89	0.55
1:A:25:ILE:HD13	1:A:54:MET:HE3	1.89	0.55
1:B:267:ALA:H	1:B:296:ASN:ND2	2.05	0.55
1:C:74:TRP:O	1:C:75:LEU:CB	2.39	0.54
1:C:290:ASN:ND2	3:C:1120:HOH:O	2.40	0.54
1:B:122:HIS:HE1	1:B:316:SER:O	1.90	0.54
1:A:4:ASN:N	3:A:1299:HOH:O	2.41	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:65:GLN:NE2	3:C:1314:HOH:O	2.38	0.53
1:B:69:LEU:C	1:B:324:ALA:HB2	2.34	0.53
1:B:265:GLU:H	1:B:296:ASN:ND2	2.07	0.52
1:A:338:GLN:NE2	1:A:349:ALA:H	2.01	0.52
1:C:10:VAL:HG13	1:C:57:VAL:HG13	1.92	0.52
1:A:338:GLN:HE22	1:A:349:ALA:N	2.02	0.51
1:C:338:GLN:HA	1:C:338:GLN:NE2	2.19	0.51
1:A:88:TRP:H	1:C:4:ASN:ND2	2.08	0.51
1:C:200:ILE:CG2	1:C:247:MET:HG3	2.41	0.51
1:C:297:ARG:HD2	1:C:381:ASP:OD1	2.11	0.51
1:C:200:ILE:HG21	1:C:247:MET:HG3	1.92	0.50
1:B:5:THR:O	3:B:1317:HOH:O	2.20	0.50
1:C:234:SER:HB3	1:C:324:ALA:HB1	1.93	0.50
1:C:338:GLN:HE21	1:C:338:GLN:CA	2.18	0.50
1:A:341:TYR:HE2	1:A:347:LYS:HE3	1.77	0.50
1:A:136:LEU:O	1:A:139:LYS:HG3	2.11	0.50
1:B:338:GLN:NE2	1:B:349:ALA:H	2.05	0.49
1:A:79:SER:O	1:A:79:SER:OG	2.30	0.49
3:A:1266:HOH:O	1:C:188:ARG:HD3	2.12	0.49
1:A:81:GLN:NE2	1:A:81:GLN:HA	2.27	0.49
1:B:145:ARG:NE	3:B:1273:HOH:O	2.45	0.49
1:C:298:GLN:N	1:C:299:PRO:CD	2.76	0.49
1:A:265:GLU:N	1:A:296:ASN:HD21	2.06	0.49
1:B:234:SER:HB3	1:B:324:ALA:HB1	1.94	0.48
1:C:269:SER:HA	1:C:297:ARG:O	2.13	0.48
1:A:46:ASN:OD1	1:A:46:ASN:N	2.47	0.47
1:C:267:ALA:H	1:C:296:ASN:HD22	1.60	0.47
1:A:68:LEU:HD13	1:A:189:GLY:HA3	1.97	0.47
1:A:64:HIS:CD2	1:A:241:ASP:OD2	2.50	0.47
3:A:1266:HOH:O	1:C:188:ARG:CD	2.63	0.47
1:B:129:ILE:CG2	1:B:132:CYS:SG	3.03	0.47
1:C:356:ASP:O	1:C:367:HIS:CD2	2.64	0.47
1:A:10:VAL:HG12	1:A:60:VAL:HG22	1.97	0.47
1:C:129:ILE:CG2	1:C:132:CYS:SG	3.04	0.46
1:B:300:GLU:OE2	1:B:367:HIS:CE1	2.62	0.46
1:A:300:GLU:OE2	1:A:367:HIS:CE1	2.66	0.46
1:C:338:GLN:NE2	1:C:349:ALA:H	2.04	0.46
1:A:213:LYS:HB2	1:A:213:LYS:HZ3	1.81	0.46
1:A:234:SER:HB3	1:A:324:ALA:HB1	1.98	0.46
1:C:156:HIS:CD2	1:C:310:SER:HB3	2.51	0.46
1:A:122:HIS:HD2	1:A:124:ASP:N	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4:ASN:N	1:A:4:ASN:HD22	2.15	0.45
1:C:122:HIS:HE1	1:C:316:SER:O	2.00	0.45
1:A:81:GLN:CG	1:C:6:ILE:HD11	2.43	0.45
1:A:295:SER:O	1:A:297:ARG:HD3	2.16	0.45
1:C:75:LEU:N	1:C:75:LEU:HD23	2.31	0.45
1:B:9:ILE:HD12	1:B:9:ILE:N	2.32	0.44
1:C:110:GLN:HE21	1:C:178:GLN:NE2	2.16	0.44
1:A:74:TRP:CD2	1:A:321:MET:HE1	2.53	0.44
1:C:14:LYS:HE2	3:C:1254:HOH:O	2.17	0.44
1:C:32:GLN:HG2	1:C:39:VAL:HG13	2.00	0.43
1:C:28:HIS:CE1	3:C:1268:HOH:O	2.63	0.43
1:C:129:ILE:HG21	1:C:132:CYS:SG	2.59	0.43
1:B:338:GLN:HA	1:B:338:GLN:NE2	2.30	0.43
1:A:356:ASP:O	1:A:367:HIS:CD2	2.62	0.42
1:C:75:LEU:HD22	1:C:75:LEU:HA	1.57	0.42
1:A:81:GLN:HA	1:A:82:PRO:HD3	1.91	0.42
1:B:298:GLN:N	1:B:299:PRO:CD	2.83	0.41
1:A:80:THR:O	1:A:80:THR:OG1	2.31	0.41
1:B:13:ASP:OD1	1:B:13:ASP:C	2.63	0.41
1:A:98:VAL:HG22	1:A:390:ALA:HA	2.02	0.41
1:B:4:ASN:N	3:B:1191:HOH:O	2.52	0.41
1:B:286:ASP:OD2	1:B:286:ASP:C	2.64	0.41
1:B:291:ILE:HD12	1:B:291:ILE:HA	2.00	0.41
1:B:46:ASN:C	1:B:46:ASN:HD22	2.29	0.41
1:B:303:ALA:HB1	1:B:304:PRO:HD2	2.03	0.41
1:C:308:ILE:HG13	1:C:325:MET:HB3	2.02	0.40
1:A:88:TRP:N	1:C:4:ASN:HD22	2.16	0.40
1:C:247:MET:HE2	1:C:247:MET:HB2	1.79	0.40
1:B:356:ASP:O	1:B:367:HIS:CD2	2.67	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	393/398 (99%)	375 (95%)	17 (4%)	1 (0%)	36	25
1	B	383/398 (96%)	369 (96%)	14 (4%)	0	100	100
1	C	390/398 (98%)	374 (96%)	16 (4%)	0	100	100
All	All	1166/1194 (98%)	1118 (96%)	47 (4%)	1 (0%)	48	34

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	81	GLN

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	304/306 (99%)	294 (97%)	10 (3%)	33	21
1	B	299/306 (98%)	290 (97%)	9 (3%)	36	24
1	C	304/306 (99%)	293 (96%)	11 (4%)	31	18
All	All	907/918 (99%)	877 (97%)	30 (3%)	33	21

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	ASN
1	A	46	ASN
1	A	52	LYS
1	A	75	LEU
1	A	81	GLN
1	A	139	LYS
1	A	190	SER
1	A	207	PRO
1	A	213	LYS
1	A	347	LYS
1	B	14	LYS
1	B	23	LEU

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Mol	Chain	Res	Type
1	B	46	ASN
1	B	52	LYS
1	B	73	SER
1	B	190	SER
1	B	338	GLN
1	B	347	LYS
1	B	368	ILE
1	C	34	LYS
1	C	51	LEU
1	C	55	PRO
1	C	75	LEU
1	C	79	SER
1	C	139	LYS
1	C	145	ARG
1	C	213	LYS
1	C	313	PRO
1	C	315	ASP
1	C	338	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	4	ASN
1	A	64	HIS
1	A	81	GLN
1	A	122	HIS
1	A	290	ASN
1	A	296	ASN
1	A	338	GLN
1	A	367	HIS
1	B	46	ASN
1	B	64	HIS
1	B	122	HIS
1	B	290	ASN
1	B	296	ASN
1	B	338	GLN
1	B	367	HIS
1	C	4	ASN
1	C	20	HIS
1	C	64	HIS
1	C	122	HIS
1	C	150	GLN

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Mol	Chain	Res	Type
1	C	178	GLN
1	C	250	GLN
1	C	290	ASN
1	C	296	ASN
1	C	338	GLN
1	C	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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 18 ligands modelled in this entry, 18 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 ⓘ

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	395/398 (99%)	-0.09	13 (3%)	49 49	15, 23, 43, 60	0
1	B	387/398 (97%)	-0.14	10 (2%)	57 57	15, 23, 38, 62	0
1	C	394/398 (98%)	-0.08	14 (3%)	46 46	16, 24, 40, 74	0
All	All	1176/1194 (98%)	-0.10	37 (3%)	51 51	15, 23, 40, 74	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	82	PRO	6.8
1	A	80	THR	5.6
1	C	75	LEU	5.6
1	A	4	ASN	5.5
1	C	79	SER	4.3
1	B	132	CYS	4.3
1	A	79	SER	4.0
1	C	74	TRP	3.9
1	C	77	GLY	3.6
1	C	82	PRO	3.6
1	A	78	GLY	3.4
1	B	23	LEU	3.2
1	B	24	GLY	3.2
1	A	76	GLY	3.2
1	A	354	PHE	3.2
1	A	75	LEU	3.2
1	C	132	CYS	3.1
1	C	83	ALA	3.1
1	A	74	TRP	3.0
1	C	80	THR	2.8
1	C	78	GLY	2.6
1	A	81	GLN	2.5
1	B	121	ASP	2.5

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Mol	Chain	Res	Type	RSRZ
1	C	147	CYS	2.4
1	A	77	GLY	2.4
1	C	28	HIS	2.4
1	B	83	ALA	2.4
1	B	22	VAL	2.4
1	C	314	ASP	2.4
1	B	73	SER	2.3
1	B	357	ILE	2.2
1	C	167	ASP	2.2
1	A	54	MET	2.2
1	A	139	LYS	2.2
1	C	47	ALA	2.1
1	A	16	LYS	2.1
1	B	28	HIS	2.1

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, 95th 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($\text{\AA}^2$)	Q<0.9
2	CA	A	1004	1/1	0.91	0.14	43,43,43,43	0
2	CA	B	1004	1/1	0.96	0.23	37,37,37,37	0
2	CA	C	1006	1/1	0.96	0.11	34,34,34,34	0
2	CA	A	1003	1/1	0.97	0.05	29,29,29,29	0
2	CA	C	1001	1/1	0.97	0.04	28,28,28,28	0
2	CA	A	1006	1/1	0.97	0.12	36,36,36,36	0
2	CA	B	1002	1/1	0.98	0.10	32,32,32,32	0
2	CA	A	1005	1/1	0.98	0.03	23,23,23,23	0
2	CA	B	1003	1/1	0.99	0.06	22,22,22,22	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	CA	A	1002	1/1	0.99	0.06	26,26,26,26	0
2	CA	B	1005	1/1	0.99	0.02	20,20,20,20	0
2	CA	B	1006	1/1	0.99	0.03	23,23,23,23	0
2	CA	B	1001	1/1	0.99	0.02	25,25,25,25	0
2	CA	C	1005	1/1	0.99	0.02	20,20,20,20	0
2	CA	A	1001	1/1	0.99	0.02	17,17,17,17	0
2	CA	C	1004	1/1	1.00	0.01	19,19,19,19	0
2	CA	C	1002	1/1	1.00	0.04	23,23,23,23	0
2	CA	C	1003	1/1	1.00	0.02	19,19,19,19	0

6.5 Other polymers [i](#)

There are no such residues in this entry.