



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 06:53 PM UTC

PDB ID : 2WV7 / pdb_00002wv7
Title : Intracellular subtilisin precursor from *B. clausii*
Authors : Vevodova, J.; Gamble, M.; Ariza, A.; Dodson, E.; Jones, D.D.; Wilson, K.S.
Deposited on : 2009-10-15
Resolution : 2.45 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

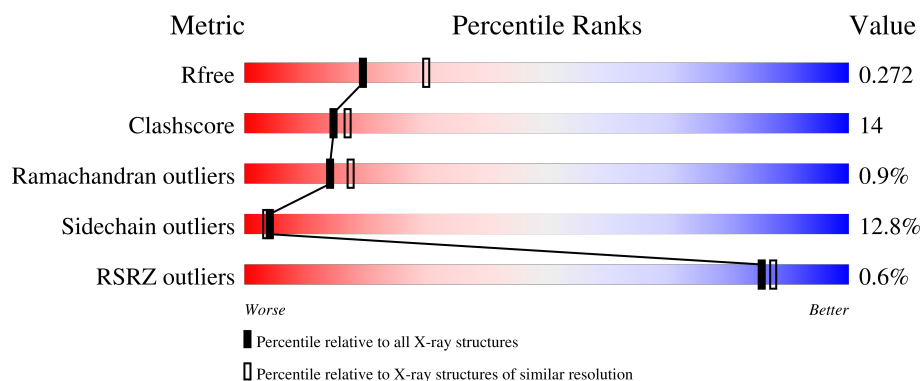
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.45 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	1190 (2.46-2.46)
Clashscore	190562	1229 (2.46-2.46)
Ramachandran outliers	187476	1218 (2.46-2.46)
Sidechain outliers	187428	1218 (2.46-2.46)
RSRZ outliers	180081	1190 (2.46-2.46)

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	329	
1	B	329	
1	C	329	
1	D	329	
1	E	329	

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Mol	Chain	Length	Quality of chain
1	F	329	% 61% 25% • 10%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 13494 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 INTRACELLULAR SUBTILISIN PROTEASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	298	Total	C	N	O	S	0	0	0
			2197	1385	373	432	7			
1	B	298	Total	C	N	O	S	0	0	0
			2197	1385	373	432	7			
1	C	298	Total	C	N	O	S	0	0	0
			2197	1385	373	432	7			
1	D	298	Total	C	N	O	S	0	0	0
			2197	1385	373	432	7			
1	E	298	Total	C	N	O	S	0	0	0
			2197	1385	373	432	7			
1	F	295	Total	C	N	O	S	0	0	0
			2183	1376	372	427	8			

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	322	LEU	-	expression tag	UNP D0AB41
A	323	GLU	-	expression tag	UNP D0AB41
A	324	HIS	-	expression tag	UNP D0AB41
A	325	HIS	-	expression tag	UNP D0AB41
A	326	HIS	-	expression tag	UNP D0AB41
A	327	HIS	-	expression tag	UNP D0AB41
A	328	HIS	-	expression tag	UNP D0AB41
A	329	HIS	-	expression tag	UNP D0AB41
B	322	LEU	-	expression tag	UNP D0AB41
B	323	GLU	-	expression tag	UNP D0AB41
B	324	HIS	-	expression tag	UNP D0AB41
B	325	HIS	-	expression tag	UNP D0AB41
B	326	HIS	-	expression tag	UNP D0AB41
B	327	HIS	-	expression tag	UNP D0AB41
B	328	HIS	-	expression tag	UNP D0AB41
B	329	HIS	-	expression tag	UNP D0AB41
C	322	LEU	-	expression tag	UNP D0AB41

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Chain	Residue	Modelled	Actual	Comment	Reference
C	323	GLU	-	expression tag	UNP D0AB41
C	324	HIS	-	expression tag	UNP D0AB41
C	325	HIS	-	expression tag	UNP D0AB41
C	326	HIS	-	expression tag	UNP D0AB41
C	327	HIS	-	expression tag	UNP D0AB41
C	328	HIS	-	expression tag	UNP D0AB41
C	329	HIS	-	expression tag	UNP D0AB41
D	322	LEU	-	expression tag	UNP D0AB41
D	323	GLU	-	expression tag	UNP D0AB41
D	324	HIS	-	expression tag	UNP D0AB41
D	325	HIS	-	expression tag	UNP D0AB41
D	326	HIS	-	expression tag	UNP D0AB41
D	327	HIS	-	expression tag	UNP D0AB41
D	328	HIS	-	expression tag	UNP D0AB41
D	329	HIS	-	expression tag	UNP D0AB41
E	322	LEU	-	expression tag	UNP D0AB41
E	323	GLU	-	expression tag	UNP D0AB41
E	324	HIS	-	expression tag	UNP D0AB41
E	325	HIS	-	expression tag	UNP D0AB41
E	326	HIS	-	expression tag	UNP D0AB41
E	327	HIS	-	expression tag	UNP D0AB41
E	328	HIS	-	expression tag	UNP D0AB41
E	329	HIS	-	expression tag	UNP D0AB41
F	322	LEU	-	expression tag	UNP D0AB41
F	323	GLU	-	expression tag	UNP D0AB41
F	324	HIS	-	expression tag	UNP D0AB41
F	325	HIS	-	expression tag	UNP D0AB41
F	326	HIS	-	expression tag	UNP D0AB41
F	327	HIS	-	expression tag	UNP D0AB41
F	328	HIS	-	expression tag	UNP D0AB41
F	329	HIS	-	expression tag	UNP D0AB41

- Molecule 2 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total Na 1 1	0	0
2	C	1	Total Na 1 1	0	0
2	D	1	Total Na 1 1	0	0
2	E	1	Total Na 1 1	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	F	1	Total 1	Na 1	0	0

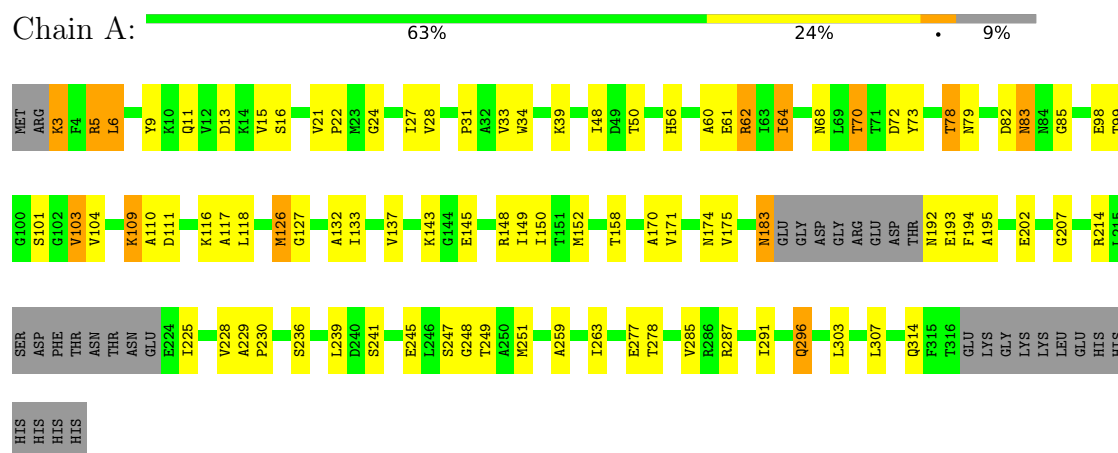
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	64	Total 64	O 64	0	0
3	B	42	Total 42	O 42	0	0
3	C	74	Total 74	O 74	0	0
3	D	40	Total 40	O 40	0	0
3	E	55	Total 55	O 55	0	0
3	F	46	Total 46	O 46	0	0

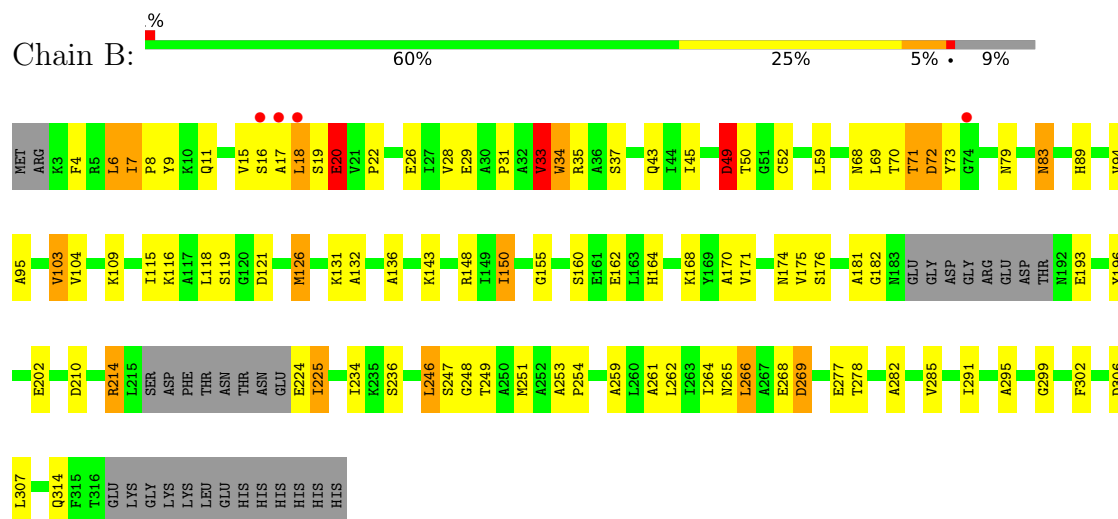
3 Residue-property plots

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.

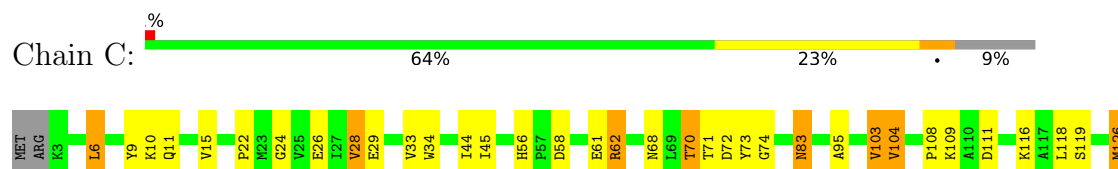
• Molecule 1: INTRACELLULAR SUBTILISIN PROTEASE

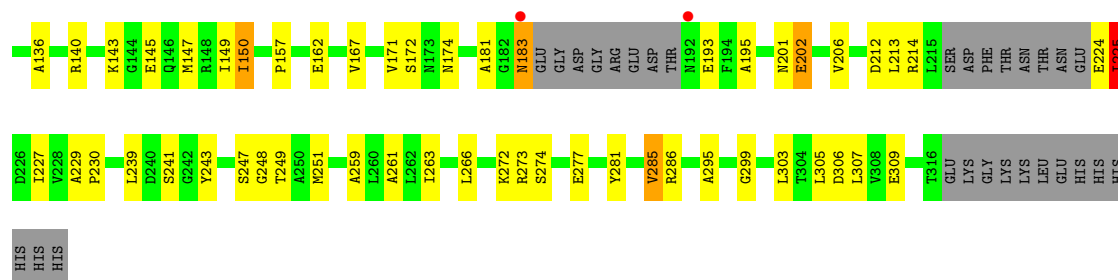


• Molecule 1: INTRACELLULAR SUBTILISIN PROTEASE



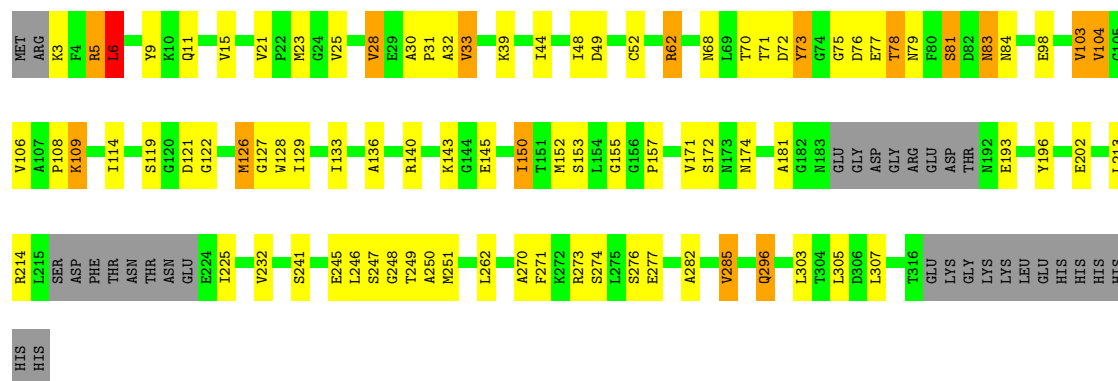
• Molecule 1: INTRACELLULAR SUBTILISIN PROTEASE





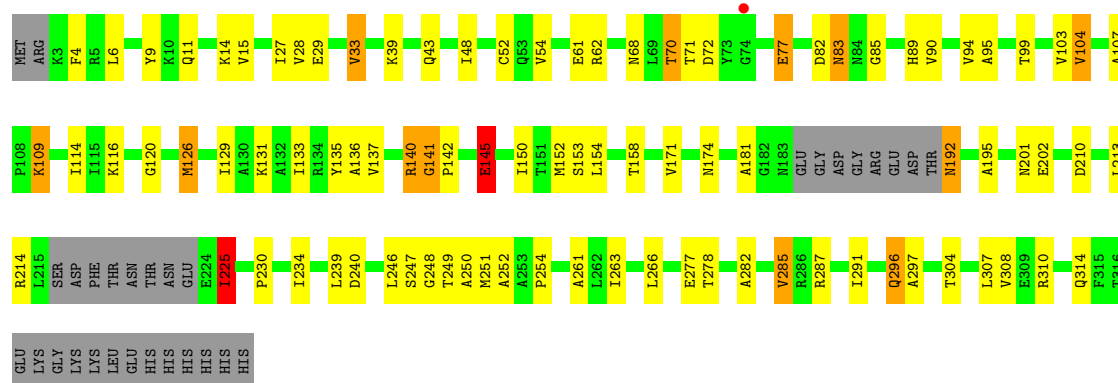
• Molecule 1: INTRACELLULAR SUBTILISIN PROTEASE

Chain D: 64% 22% 5% 9%



• Molecule 1: INTRACELLULAR SUBTILISIN PROTEASE

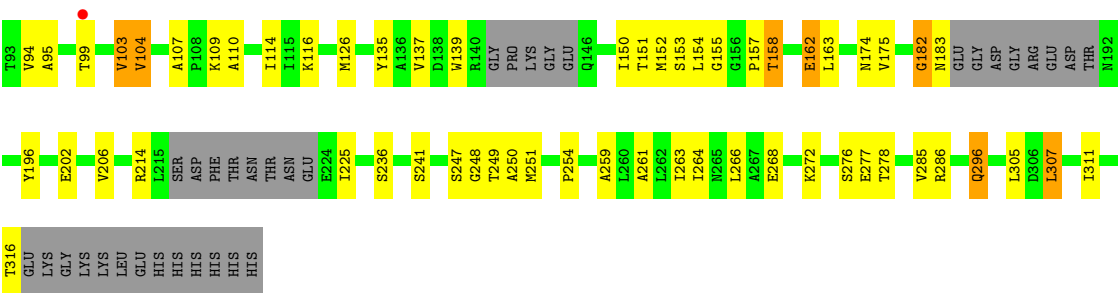
Chain E: 63% 24% 9%



• Molecule 1: INTRACELLULAR SUBTILISIN PROTEASE

Chain F: 61% 25% 10%





4 Data and refinement statistics

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, α , β , γ	119.83Å 119.83Å 106.20Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	46.62 – 2.45 46.62 – 2.45	Depositor EDS
% Data completeness (in resolution range)	100.0 (46.62-2.45) 99.7 (46.62-2.45)	Depositor EDS
R_{merge}	0.18	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.04 (at 2.45Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.197 , 0.274 0.196 , 0.272	Depositor DCC
R_{free} test set	3902 reflections (6.23%)	wwPDB-VP
Wilson B-factor (Å ²)	23.0	Xtriage
Anisotropy	0.002	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 45.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	0.030 for -h,-k,l 0.048 for h,-h-k,-l 0.034 for -k,-h,-l	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	13494	wwPDB-VP
Average B, all atoms (Å ²)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.85% 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: NA

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	0.94	0/2234	1.12	2/3035 (0.1%)
1	B	0.89	0/2234	1.08	9/3035 (0.3%)
1	C	0.97	0/2234	1.14	4/3035 (0.1%)
1	D	0.85	1/2234 (0.0%)	1.08	2/3035 (0.1%)
1	E	0.91	1/2234 (0.0%)	1.13	4/3035 (0.1%)
1	F	0.92	1/2218 (0.0%)	1.13	7/3011 (0.2%)
All	All	0.91	3/13388 (0.0%)	1.11	28/18186 (0.2%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	104	VAL	CA-CB	5.79	1.61	1.54
1	E	104	VAL	CA-CB	5.09	1.61	1.54
1	D	285	VAL	CA-CB	5.04	1.60	1.54

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	141	GLY	CA-C-N	7.49	127.86	119.32
1	E	141	GLY	C-N-CA	7.49	127.86	119.32
1	C	225	ILE	N-CA-C	6.58	119.26	108.99
1	B	225	ILE	N-CA-C	6.45	118.36	109.46
1	B	18	LEU	N-CA-C	5.81	117.43	109.18
1	B	34	TRP	N-CA-C	5.80	117.28	111.07
1	B	33	VAL	N-CA-C	-5.62	107.64	113.10
1	C	195	ALA	N-CA-C	5.61	117.39	111.28
1	E	225	ILE	N-CA-C	5.59	117.78	109.17
1	C	34	TRP	N-CA-C	5.57	117.35	111.28
1	B	94	VAL	N-CA-C	-5.56	105.09	110.42
1	F	163	LEU	N-CA-C	5.49	116.94	111.07

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	107	ALA	CA-C-N	5.48	126.20	120.12
1	F	107	ALA	C-N-CA	5.48	126.20	120.12
1	E	33	VAL	N-CA-C	-5.47	107.95	113.47
1	F	151	THR	N-CA-C	5.46	117.33	108.26
1	A	60	ALA	N-CA-C	5.44	117.91	111.33
1	F	95	ALA	N-CA-C	5.44	120.75	112.54
1	F	206	VAL	N-CA-C	5.43	115.67	107.80
1	C	74	GLY	N-CA-C	5.25	125.63	113.18
1	D	232	VAL	N-CA-C	5.24	115.13	107.37
1	B	7	ILE	CA-C-N	5.14	125.06	119.76
1	B	7	ILE	C-N-CA	5.14	125.06	119.76
1	B	314	GLN	N-CA-C	5.10	117.71	107.41
1	A	117	ALA	N-CA-C	-5.07	106.00	113.61
1	B	95	ALA	N-CA-C	5.07	121.59	110.80
1	D	44	ILE	N-CA-C	5.04	115.17	108.11
1	F	162	GLU	N-CA-C	-5.03	105.69	111.07

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	2197	0	2165	71	0
1	B	2197	0	2164	73	0
1	C	2197	0	2164	57	0
1	D	2197	0	2164	62	0
1	E	2197	0	2164	71	0
1	F	2183	0	2156	54	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
3	A	64	0	0	4	0
3	B	42	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	74	0	0	1	0
3	D	40	0	0	2	0
3	E	55	0	0	1	0
3	F	46	0	0	1	0
All	All	13494	0	12977	364	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 14.

All (364) 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:D:9:TYR:HB2	1:D:251:MET:HE1	1.30	1.12
1:A:70:THR:CG2	1:A:72:ASP:H	1.82	0.93
1:A:28:VAL:HG11	1:A:303:LEU:HD23	1.52	0.91
1:C:70:THR:HG22	1:C:72:ASP:H	1.33	0.90
1:F:1:MET:SD	1:F:158:THR:HG21	2.13	0.89
1:E:70:THR:HG23	1:E:72:ASP:H	1.35	0.88
1:F:247:SER:C	1:F:251:MET:HE3	1.98	0.88
1:B:70:THR:HG22	1:B:72:ASP:H	1.38	0.88
1:F:70:THR:HG22	1:F:72:ASP:H	1.41	0.84
1:A:70:THR:HG22	1:A:72:ASP:H	1.42	0.83
1:D:9:TYR:CB	1:D:251:MET:HE1	2.08	0.82
1:D:153:SER:HB3	1:D:250:ALA:HB1	1.63	0.81
1:A:263:ILE:CD1	1:A:287:ARG:HD2	2.11	0.79
1:A:296:GLN:H	1:A:296:GLN:HE21	1.29	0.79
1:A:9:TYR:HB2	1:A:251:MET:HE1	1.67	0.76
1:F:70:THR:CG2	1:F:72:ASP:H	1.98	0.76
1:C:201:ASN:HD21	1:D:276:SER:HB3	1.52	0.74
1:B:174:ASN:HA	1:B:277:GLU:HB2	1.70	0.74
1:B:17:ALA:HB3	1:E:142:PRO:N	2.04	0.72
1:B:181:ALA:O	1:B:249:THR:HG21	1.88	0.72
1:E:263:ILE:CD1	1:E:287:ARG:HD2	2.21	0.71
1:A:21:VAL:HG22	1:A:104:VAL:HG11	1.72	0.71
1:E:136:ALA:HB1	1:E:150:ILE:HD11	1.72	0.70
1:B:247:SER:C	1:B:251:MET:HE1	2.16	0.70
1:D:133:ILE:HD11	1:D:152:MET:HE1	1.74	0.69
1:B:247:SER:C	1:B:251:MET:CE	2.66	0.69
1:C:44:ILE:HG22	1:C:147:MET:HG2	1.73	0.69
1:B:210:ASP:OD2	1:B:214:ARG:HD2	1.93	0.69
1:D:152:MET:HA	3:D:2021:HOH:O	1.93	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:83:ASN:H	1:A:83:ASN:HD22	1.40	0.69
1:D:21:VAL:HG22	1:D:104:VAL:HG11	1.73	0.68
1:C:251:MET:HE2	1:C:251:MET:H	1.58	0.68
1:C:6:LEU:HD13	1:C:118:LEU:CD1	2.23	0.68
1:D:181:ALA:O	1:D:249:THR:HG21	1.94	0.67
1:E:70:THR:CG2	1:E:72:ASP:H	2.07	0.67
1:E:210:ASP:OD1	1:E:214:ARG:HB3	1.95	0.67
1:A:70:THR:HG22	1:A:72:ASP:N	2.10	0.67
1:B:22:PRO:HG3	1:B:103:VAL:HG22	1.77	0.67
1:D:70:THR:HG22	1:D:71:THR:N	2.10	0.67
1:D:70:THR:HG22	1:D:72:ASP:H	1.60	0.66
1:F:83:ASN:H	1:F:83:ASN:HD22	1.44	0.66
1:B:37:SER:HB3	1:B:266:LEU:HD23	1.76	0.66
1:D:143:LYS:HB2	1:D:145:GLU:OE1	1.95	0.66
1:B:126:MET:HE1	1:B:162:GLU:HB3	1.78	0.66
1:F:174:ASN:HA	1:F:277:GLU:HB2	1.77	0.66
1:D:157:PRO:HB3	1:D:193:GLU:HA	1.78	0.66
1:B:155:GLY:HA2	1:B:196:TYR:O	1.96	0.65
1:E:247:SER:C	1:E:251:MET:CE	2.68	0.65
1:C:136:ALA:HB1	1:C:150:ILE:HD11	1.78	0.65
1:E:263:ILE:HD12	1:E:287:ARG:HD2	1.79	0.65
1:A:24:GLY:HA2	1:A:27:ILE:HG22	1.80	0.64
1:A:277:GLU:OE1	3:A:2052:HOH:O	2.15	0.64
1:B:52:CYS:SG	1:B:59:LEU:HD13	2.38	0.64
1:E:89:HIS:CE1	1:E:246:LEU:HG	2.32	0.64
1:B:248:GLY:N	1:B:251:MET:CE	2.60	0.64
1:A:28:VAL:HG11	1:A:303:LEU:CD2	2.26	0.63
1:A:296:GLN:H	1:A:296:GLN:NE2	1.97	0.63
1:D:68:ASN:HB2	1:D:79:ASN:O	1.97	0.63
1:F:7:ILE:HG12	1:F:182:GLY:HA2	1.81	0.63
1:C:266:LEU:HD12	1:C:266:LEU:C	2.24	0.63
1:E:90:VAL:HG13	1:E:254:PRO:HG3	1.80	0.63
1:C:22:PRO:HG3	1:C:103:VAL:HG22	1.81	0.62
1:D:21:VAL:HG22	1:D:104:VAL:CG1	2.29	0.62
1:E:248:GLY:N	1:E:251:MET:HE2	2.13	0.62
1:F:22:PRO:CG	1:F:103:VAL:HG22	2.30	0.62
1:F:2:ARG:HD3	1:F:157:PRO:HG3	1.82	0.62
1:F:247:SER:C	1:F:251:MET:CE	2.71	0.62
1:C:83:ASN:H	1:C:83:ASN:ND2	1.96	0.61
1:A:296:GLN:HE21	1:A:296:GLN:N	1.96	0.61
1:E:29:GLU:CD	1:E:310:ARG:HH22	2.08	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28:VAL:CG1	1:A:303:LEU:HD23	2.28	0.61
1:B:17:ALA:HB2	1:E:140:ARG:O	2.01	0.61
1:A:62:ARG:HA	1:A:62:ARG:NH1	2.16	0.61
1:D:126:MET:HE3	1:D:127:GLY:HA2	1.84	0.60
1:D:174:ASN:HA	1:D:277:GLU:HB2	1.84	0.60
1:C:83:ASN:H	1:C:83:ASN:HD22	1.48	0.59
1:A:70:THR:HG23	1:A:72:ASP:H	1.63	0.59
1:C:181:ALA:O	1:C:249:THR:HG21	2.03	0.59
1:E:201:ASN:HD21	1:F:276:SER:HB3	1.68	0.59
1:B:17:ALA:H	1:E:142:PRO:HA	1.69	0.58
1:A:9:TYR:CB	1:A:251:MET:HE1	2.32	0.58
1:F:49:ASP:OD1	1:F:50:THR:HG23	2.03	0.58
1:F:33:VAL:HG13	1:F:266:LEU:HD22	1.85	0.58
1:C:29:GLU:OE1	1:C:306:ASP:HB3	2.02	0.58
1:C:171:VAL:HG21	1:C:202:GLU:HB2	1.86	0.57
1:A:99:THR:OG1	1:A:101:SER:O	2.23	0.57
1:D:246:LEU:HB3	1:D:251:MET:HE3	1.85	0.57
1:D:83:ASN:H	1:D:83:ASN:HD22	1.51	0.57
1:A:83:ASN:HD21	1:A:116:LYS:NZ	2.03	0.57
1:C:9:TYR:HB3	1:C:251:MET:HE1	1.86	0.57
1:C:140:ARG:HA	1:C:145:GLU:O	2.04	0.57
1:E:248:GLY:N	1:E:251:MET:CE	2.68	0.57
1:B:18:LEU:HD22	1:B:20:GLU:HG2	1.86	0.57
1:E:181:ALA:O	1:E:249:THR:HG21	2.05	0.57
1:B:17:ALA:CB	1:E:141:GLY:C	2.78	0.57
1:C:70:THR:CG2	1:C:72:ASP:H	2.13	0.56
1:E:133:ILE:O	1:E:137:VAL:HG23	2.05	0.56
1:A:133:ILE:HD11	1:A:152:MET:HE1	1.87	0.56
1:A:83:ASN:HD21	1:A:116:LYS:HZ1	1.52	0.56
1:C:248:GLY:N	1:C:251:MET:HE3	2.20	0.56
1:E:136:ALA:CB	1:E:150:ILE:HD11	2.36	0.56
1:E:213:LEU:HB3	1:E:291:ILE:HD13	1.88	0.56
1:F:259:ALA:O	1:F:263:ILE:HG13	2.06	0.56
1:B:17:ALA:CB	1:E:141:GLY:HA2	2.36	0.56
1:B:89:HIS:ND1	1:B:236:SER:HB3	2.21	0.56
1:A:78:THR:CG2	1:A:78:THR:O	2.54	0.55
1:A:68:ASN:HB2	1:A:79:ASN:O	2.06	0.55
1:A:150:ILE:HG12	1:A:175:VAL:HG11	1.88	0.55
1:B:265:ASN:O	1:B:269:ASP:HB2	2.07	0.55
1:C:272:LYS:HD2	1:D:296:GLN:HE22	1.71	0.55
1:C:259:ALA:O	1:C:263:ILE:HG12	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:73:TYR:CE2	1:B:116:LYS:HE2	2.42	0.55
1:C:68:ASN:OD1	1:C:70:THR:HB	2.07	0.55
1:E:263:ILE:HD11	1:E:287:ARG:HD2	1.87	0.55
1:B:83:ASN:H	1:B:83:ASN:HD22	1.55	0.54
1:A:83:ASN:HD22	1:A:83:ASN:N	2.03	0.54
1:D:133:ILE:CD1	1:D:152:MET:HE1	2.36	0.54
1:F:70:THR:HG22	1:F:72:ASP:N	2.16	0.54
1:B:69:LEU:HD22	1:B:131:LYS:HD3	1.90	0.54
1:F:45:ILE:HD11	1:F:261:ALA:HB2	1.90	0.54
1:B:171:VAL:HG21	1:B:202:GLU:HB2	1.88	0.54
1:D:11:GLN:HA	1:D:246:LEU:CD2	2.38	0.54
1:E:62:ARG:HG3	1:E:95:ALA:O	2.07	0.54
1:B:43:GLN:HE22	1:B:148:ARG:HG3	1.72	0.54
1:C:44:ILE:CG2	1:C:147:MET:HG2	2.38	0.54
1:E:11:GLN:OE1	1:E:14:LYS:HD2	2.08	0.54
1:B:17:ALA:HB3	1:E:141:GLY:C	2.32	0.53
1:B:253:ALA:HB3	1:B:254:PRO:HD3	1.90	0.53
1:F:183:ASN:OD1	1:F:183:ASN:C	2.52	0.53
1:A:22:PRO:HD3	1:A:103:VAL:HG22	1.91	0.53
1:D:31:PRO:C	1:D:33:VAL:H	2.16	0.53
1:E:68:ASN:HB3	1:E:77:GLU:HA	1.90	0.53
1:A:285:VAL:HG21	1:B:282:ALA:HB1	1.91	0.53
1:C:83:ASN:HD22	1:C:83:ASN:N	2.02	0.53
1:A:174:ASN:HA	1:A:277:GLU:HB2	1.90	0.53
1:D:153:SER:HB3	1:D:250:ALA:CB	2.35	0.53
1:B:17:ALA:HB2	1:E:141:GLY:CA	2.38	0.53
1:C:45:ILE:HD11	1:C:261:ALA:HB2	1.91	0.53
1:C:201:ASN:ND2	1:D:276:SER:HB3	2.22	0.53
1:E:225:ILE:HD11	1:E:297:ALA:O	2.09	0.53
1:A:28:VAL:HG12	1:A:28:VAL:O	2.09	0.52
1:B:6:LEU:HD13	1:B:118:LEU:HD13	1.90	0.52
1:D:62:ARG:HD2	1:D:108:PRO:O	2.10	0.52
1:D:136:ALA:CB	1:D:150:ILE:HD11	2.39	0.52
1:F:248:GLY:N	1:F:251:MET:CE	2.72	0.52
1:E:131:LYS:O	1:E:135:TYR:HB2	2.09	0.52
1:A:83:ASN:H	1:A:83:ASN:ND2	2.06	0.52
1:A:64:ILE:HG23	3:A:2015:HOH:O	2.09	0.52
1:C:6:LEU:HD13	1:C:118:LEU:HD13	1.92	0.52
1:F:94:VAL:HG23	1:F:254:PRO:HB3	1.90	0.52
1:A:28:VAL:HG13	1:A:303:LEU:O	2.10	0.51
1:C:143:LYS:N	1:C:145:GLU:OE1	2.29	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:22:PRO:HG3	1:B:103:VAL:CG2	2.40	0.51
1:F:153:SER:HB3	1:F:250:ALA:HB1	1.92	0.51
1:B:83:ASN:H	1:B:83:ASN:ND2	2.07	0.51
1:C:174:ASN:HA	1:C:277:GLU:HB2	1.93	0.51
1:D:39:LYS:HB2	1:D:109:LYS:HB2	1.92	0.51
1:F:70:THR:CG2	1:F:71:THR:N	2.74	0.51
1:B:136:ALA:CB	1:B:150:ILE:HD11	2.41	0.50
1:A:259:ALA:O	1:A:263:ILE:HG12	2.12	0.50
1:A:263:ILE:HD13	1:A:287:ARG:HD2	1.92	0.50
1:A:68:ASN:OD1	1:A:70:THR:HB	2.11	0.50
1:A:83:ASN:ND2	1:A:116:LYS:NZ	2.59	0.50
1:D:81:SER:HB3	3:D:2009:HOH:O	2.11	0.50
1:E:142:PRO:HD2	1:E:145:GLU:OE2	2.11	0.50
1:D:76:ASP:OD1	1:D:78:THR:HB	2.12	0.50
1:D:70:THR:HG22	1:D:71:THR:H	1.76	0.49
1:E:133:ILE:HD11	1:E:152:MET:HE1	1.92	0.49
1:D:6:LEU:HD23	1:D:122:GLY:HA2	1.94	0.49
1:A:21:VAL:HA	1:A:104:VAL:HG12	1.93	0.49
1:A:62:ARG:NH1	1:A:111:ASP:OD1	2.44	0.49
1:B:19:SER:O	1:B:20:GLU:HB3	2.13	0.49
1:E:43:GLN:HG3	1:E:261:ALA:HA	1.95	0.49
1:A:247:SER:C	1:A:251:MET:CE	2.86	0.49
1:A:3:LYS:N	3:A:2001:HOH:O	2.45	0.49
1:A:248:GLY:N	1:A:251:MET:HE2	2.27	0.49
1:E:230:PRO:O	1:E:252:ALA:HA	2.13	0.49
1:E:263:ILE:HD11	1:E:287:ARG:CD	2.42	0.49
1:F:56:HIS:CD2	1:F:241:SER:HA	2.48	0.49
1:E:296:GLN:HG2	1:F:272:LYS:HB2	1.93	0.49
1:F:62:ARG:HD3	1:F:110:ALA:O	2.10	0.49
1:E:153:SER:HB3	1:E:250:ALA:HB1	1.94	0.49
1:E:90:VAL:HG13	1:E:254:PRO:CG	2.42	0.49
1:A:6:LEU:HD13	1:A:118:LEU:HD13	1.94	0.48
1:B:83:ASN:HD21	1:B:116:LYS:HZ1	1.61	0.48
1:E:70:THR:HG23	1:E:71:THR:N	2.28	0.48
1:F:89:HIS:HD2	3:F:2017:HOH:O	1.95	0.48
1:A:150:ILE:HG12	1:A:175:VAL:CG1	2.43	0.48
1:C:295:ALA:HB3	1:D:270:ALA:C	2.38	0.48
1:D:247:SER:C	1:D:251:MET:HE2	2.38	0.48
1:F:5:ARG:O	1:F:154:LEU:HA	2.13	0.48
1:C:24:GLY:O	1:C:28:VAL:HB	2.13	0.48
1:E:278:THR:HG23	1:F:278:THR:HG23	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:248:GLY:N	1:D:251:MET:HE2	2.29	0.48
1:F:92:GLY:HA3	1:F:236:SER:OG	2.13	0.48
1:A:5:ARG:HD2	1:A:194:PHE:CE1	2.48	0.48
1:B:259:ALA:O	1:B:262:LEU:HB2	2.14	0.48
1:B:45:ILE:HD11	1:B:261:ALA:HB2	1.96	0.48
1:C:28:VAL:HG13	1:C:305:LEU:HD12	1.96	0.47
1:C:201:ASN:HD21	1:D:276:SER:CB	2.24	0.47
1:E:83:ASN:H	1:E:83:ASN:ND2	2.12	0.47
1:F:126:MET:HE1	1:F:162:GLU:HB3	1.95	0.47
1:F:259:ALA:HB1	1:F:305:LEU:HD21	1.96	0.47
1:B:4:PHE:CE1	1:B:126:MET:HB2	2.49	0.47
1:B:248:GLY:N	1:B:251:MET:HE1	2.27	0.47
1:D:52:CYS:O	1:D:81:SER:HA	2.14	0.47
1:E:136:ALA:HB1	1:E:150:ILE:CD1	2.41	0.47
1:D:150:ILE:HD13	1:D:150:ILE:HA	1.79	0.47
1:B:83:ASN:HD22	1:B:83:ASN:N	2.11	0.47
1:D:70:THR:HG23	1:D:128:TRP:CZ3	2.49	0.47
1:E:83:ASN:ND2	1:E:120:GLY:HA2	2.30	0.47
1:F:68:ASN:OD1	1:F:70:THR:HB	2.15	0.47
1:D:262:LEU:HD12	1:D:305:LEU:HD13	1.97	0.47
1:E:9:TYR:HB2	1:E:251:MET:HE1	1.96	0.47
1:A:229:ALA:HB1	1:A:230:PRO:CD	2.45	0.47
1:A:137:VAL:HG21	1:A:170:ALA:HA	1.97	0.47
1:C:70:THR:CG2	1:C:71:THR:N	2.77	0.47
1:E:225:ILE:HD11	1:E:297:ALA:C	2.40	0.47
1:B:248:GLY:N	1:B:251:MET:HE2	2.31	0.46
1:C:183:ASN:OD1	1:C:183:ASN:C	2.57	0.46
1:B:295:ALA:O	1:B:299:GLY:N	2.42	0.46
1:E:129:ILE:HD13	1:E:154:LEU:HD13	1.96	0.46
1:E:90:VAL:O	1:E:94:VAL:HG23	2.15	0.46
1:B:17:ALA:CB	1:E:141:GLY:CA	2.93	0.46
1:B:33:VAL:HG12	1:B:262:LEU:HD13	1.96	0.46
1:E:282:ALA:HB1	1:F:285:VAL:CG2	2.45	0.46
1:A:28:VAL:CG1	1:A:303:LEU:CD2	2.92	0.46
1:A:83:ASN:ND2	1:A:116:LYS:HZ3	2.13	0.46
1:C:149:ILE:O	1:C:150:ILE:HD13	2.16	0.46
1:B:119:SER:HB2	1:B:121:ASP:OD2	2.16	0.46
1:C:157:PRO:HB3	1:C:193:GLU:HA	1.98	0.46
1:C:248:GLY:CA	1:C:251:MET:HE3	2.46	0.46
1:E:314:GLN:NE2	3:E:2054:HOH:O	2.45	0.46
1:B:9:TYR:CD1	1:B:246:LEU:HD13	2.51	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:17:ALA:N	1:E:142:PRO:HA	2.31	0.45
1:C:61:GLU:HB3	3:C:2021:HOH:O	2.16	0.45
1:F:137:VAL:HG22	1:F:175:VAL:HG21	1.97	0.45
1:D:25:VAL:HG22	1:D:106:VAL:HG22	1.98	0.45
1:D:171:VAL:HG13	1:D:277:GLU:OE1	2.17	0.45
1:F:248:GLY:N	1:F:251:MET:HE3	2.28	0.45
1:B:264:ILE:O	1:B:268:GLU:HG3	2.16	0.45
1:C:58:ASP:OD2	1:C:243:TYR:OH	2.27	0.45
1:E:234:ILE:HG13	1:E:251:MET:HB3	1.99	0.45
1:C:206:VAL:HA	1:C:227:ILE:O	2.17	0.45
1:D:68:ASN:HB3	1:D:77:GLU:HA	1.98	0.45
1:F:264:ILE:O	1:F:268:GLU:HG3	2.16	0.45
1:B:70:THR:HG22	1:B:71:THR:N	2.30	0.45
1:B:115:ILE:HG21	1:B:132:ALA:HB1	1.99	0.45
1:E:48:ILE:HD12	1:E:150:ILE:CG2	2.47	0.45
1:A:183:ASN:OD1	1:A:183:ASN:C	2.59	0.45
1:B:70:THR:CG2	1:B:71:THR:N	2.79	0.45
1:D:245:GLU:O	1:D:246:LEU:HD23	2.17	0.45
1:E:263:ILE:CD1	1:E:287:ARG:CD	2.91	0.45
1:B:17:ALA:HB2	1:E:141:GLY:C	2.42	0.45
1:F:59:LEU:O	1:F:62:ARG:N	2.45	0.45
1:F:83:ASN:HD21	1:F:116:LYS:HZ1	1.64	0.45
1:A:48:ILE:HD13	1:A:132:ALA:HB1	1.99	0.45
1:E:174:ASN:HA	1:E:277:GLU:HB2	1.98	0.45
1:D:136:ALA:HB1	1:D:150:ILE:HD11	2.00	0.44
1:B:29:GLU:OE1	1:B:306:ASP:HB3	2.16	0.44
1:B:68:ASN:OD1	1:B:70:THR:HB	2.16	0.44
1:A:192:ASN:HB3	1:A:195:ALA:HB2	1.98	0.44
1:B:7:ILE:HA	1:B:8:PRO:HD3	1.79	0.44
1:D:48:ILE:HD11	1:D:150:ILE:HD12	2.00	0.44
1:C:62:ARG:NH1	1:C:111:ASP:OD1	2.50	0.44
1:C:285:VAL:HG21	1:D:282:ALA:HB1	1.98	0.44
1:E:83:ASN:H	1:E:83:ASN:HD22	1.65	0.44
1:C:251:MET:HE2	1:C:251:MET:N	2.29	0.44
1:D:70:THR:CG2	1:D:71:THR:N	2.79	0.44
1:A:148:ARG:C	1:A:149:ILE:HG13	2.42	0.44
1:C:247:SER:C	1:C:251:MET:HE3	2.43	0.44
1:C:56:HIS:CD2	1:C:241:SER:HA	2.53	0.44
1:D:28:VAL:HG21	1:D:303:LEU:HD23	2.00	0.44
1:A:291:ILE:HG22	1:A:291:ILE:O	2.17	0.43
1:E:136:ALA:CB	1:E:150:ILE:CD1	2.96	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:210:ASP:CG	1:E:214:ARG:HB3	2.41	0.43
1:F:68:ASN:O	1:F:77:GLU:HG2	2.17	0.43
1:A:31:PRO:HA	1:A:34:TRP:CD2	2.53	0.43
1:B:22:PRO:CG	1:B:103:VAL:HG22	2.45	0.43
1:B:68:ASN:HB2	1:B:79:ASN:O	2.18	0.43
1:D:84:ASN:OD1	1:D:84:ASN:C	2.62	0.43
1:B:83:ASN:ND2	1:B:83:ASN:N	2.67	0.43
1:A:6:LEU:HD12	1:A:6:LEU:HA	1.83	0.43
1:B:17:ALA:HB2	1:E:141:GLY:HA2	1.98	0.43
1:B:89:HIS:CE1	1:B:236:SER:HB3	2.54	0.43
1:C:212:ASP:O	1:C:213:LEU:HB2	2.18	0.43
1:D:52:CYS:HB2	1:D:114:ILE:HG21	2.00	0.43
1:C:104:VAL:HG23	1:C:108:PRO:HB3	1.99	0.43
1:C:126:MET:HE1	1:C:162:GLU:HB3	2.01	0.43
1:C:136:ALA:CB	1:C:150:ILE:HD11	2.46	0.43
1:E:140:ARG:HA	1:E:145:GLU:O	2.18	0.43
1:F:155:GLY:HA2	1:F:196:TYR:O	2.18	0.43
1:A:15:VAL:HG12	1:A:16:SER:N	2.34	0.43
1:D:31:PRO:C	1:D:33:VAL:N	2.76	0.43
1:C:259:ALA:HB2	1:C:303:LEU:HD21	2.01	0.42
1:E:266:LEU:HD12	1:E:266:LEU:C	2.44	0.42
1:F:9:TYR:HB2	1:F:251:MET:HE1	2.01	0.42
1:F:52:CYS:HB2	1:F:114:ILE:HG21	2.01	0.42
1:F:83:ASN:HD21	1:F:116:LYS:NZ	2.17	0.42
1:A:56:HIS:CD2	1:A:241:SER:HA	2.55	0.42
1:A:62:ARG:HD3	1:A:110:ALA:O	2.19	0.42
1:A:278:THR:HG23	1:B:278:THR:HG23	2.01	0.42
1:C:70:THR:HG22	1:C:72:ASP:N	2.16	0.42
1:D:103:VAL:HG13	1:D:104:VAL:N	2.34	0.42
1:F:64:ILE:HD13	1:F:139:TRP:HH2	1.84	0.42
1:B:234:ILE:N	1:B:234:ILE:HD13	2.34	0.42
1:D:73:TYR:O	1:D:75:GLY:HA2	2.19	0.42
1:D:121:ASP:OD2	1:D:121:ASP:C	2.61	0.42
1:E:39:LYS:HB2	1:E:109:LYS:HB2	2.02	0.42
1:E:248:GLY:CA	1:E:251:MET:HE2	2.49	0.42
1:F:59:LEU:O	1:F:60:ALA:C	2.62	0.42
1:A:39:LYS:HB2	1:A:109:LYS:HB2	2.01	0.42
1:B:251:MET:HE2	1:B:251:MET:HB2	1.83	0.42
1:C:62:ARG:HG3	1:C:95:ALA:O	2.19	0.42
1:C:229:ALA:HB1	1:C:230:PRO:CD	2.49	0.42
1:F:1:MET:CE	1:F:126:MET:HG2	2.49	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:136:ALA:HB1	1:B:150:ILE:HD11	2.01	0.42
1:C:83:ASN:HD21	1:C:116:LYS:HZ1	1.68	0.42
1:E:70:THR:HG21	1:E:116:LYS:HE3	2.01	0.42
1:A:192:ASN:O	1:A:194:PHE:N	2.44	0.42
1:B:31:PRO:HA	1:B:34:TRP:CD2	2.55	0.42
1:D:30:ALA:HB2	1:D:106:VAL:HG13	2.02	0.42
1:B:170:ALA:HB1	1:B:175:VAL:HB	2.02	0.42
1:D:271:PHE:HD2	1:D:273:ARG:NH2	2.18	0.42
1:A:13:ASP:HB2	1:A:245:GLU:HB3	2.02	0.42
1:F:22:PRO:HG3	1:F:103:VAL:HG22	2.00	0.42
1:F:296:GLN:HE21	1:F:296:GLN:H	1.68	0.42
1:F:307:LEU:O	1:F:311:ILE:HG12	2.19	0.42
1:B:70:THR:HG22	1:B:72:ASP:N	2.20	0.42
1:E:52:CYS:CB	1:E:114:ILE:HD12	2.50	0.41
1:F:82:ASP:CG	1:F:85:GLY:H	2.28	0.41
1:F:83:ASN:HD22	1:F:83:ASN:N	2.09	0.41
1:A:22:PRO:CD	1:A:103:VAL:HG22	2.50	0.41
1:A:207:GLY:C	1:A:228:VAL:HG12	2.44	0.41
1:E:192:ASN:HB3	1:E:195:ALA:HB2	2.02	0.41
1:F:150:ILE:HG12	1:F:175:VAL:HG11	2.02	0.41
1:C:83:ASN:HD21	1:C:116:LYS:NZ	2.18	0.41
1:D:155:GLY:HA2	1:D:196:TYR:O	2.20	0.41
1:E:82:ASP:CG	1:E:85:GLY:H	2.28	0.41
1:B:73:TYR:HE2	1:B:116:LYS:HE2	1.84	0.41
1:C:45:ILE:HD12	1:C:45:ILE:N	2.36	0.41
1:D:73:TYR:C	1:D:75:GLY:HA2	2.46	0.41
1:E:285:VAL:HG23	1:F:286:ARG:HD3	2.03	0.41
1:F:9:TYR:CB	1:F:251:MET:HE1	2.51	0.41
1:A:126:MET:HG3	1:A:127:GLY:N	2.35	0.41
1:B:9:TYR:CE1	1:B:246:LEU:HD13	2.56	0.41
1:B:291:ILE:HD11	1:B:302:PHE:HB2	2.03	0.41
1:D:83:ASN:H	1:D:83:ASN:ND2	2.15	0.41
1:E:4:PHE:CE1	1:E:126:MET:HB3	2.56	0.41
1:A:3:LYS:HD2	3:A:2029:HOH:O	2.20	0.40
1:B:7:ILE:HG21	1:B:182:GLY:HA2	2.04	0.40
1:D:28:VAL:CG2	1:D:303:LEU:HD23	2.50	0.40
1:A:82:ASP:CG	1:A:85:GLY:H	2.26	0.40
1:B:164:HIS:O	1:B:168:LYS:HG3	2.21	0.40
1:D:83:ASN:HD22	1:D:83:ASN:N	2.13	0.40
1:A:21:VAL:HG22	1:A:104:VAL:CG1	2.46	0.40
1:C:225:ILE:HD11	1:C:299:GLY:N	2.36	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:281:TYR:O	1:C:285:VAL:HG13	2.21	0.40
1:F:135:TYR:CD2	1:F:135:TYR:C	2.99	0.40
1:B:49:ASP:HB3	1:B:50:THR:H	1.54	0.40
1:D:5:ARG:O	1:D:6:LEU:C	2.64	0.40
1:A:50:THR:C	1:A:116:LYS:HG3	2.46	0.40
1:A:70:THR:HG21	1:A:72:ASP:HB2	2.03	0.40
1:E:107:ALA:C	1:E:109:LYS:H	2.29	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	292/329 (89%)	276 (94%)	14 (5%)	2 (1%)	18	24
1	B	292/329 (89%)	273 (94%)	17 (6%)	2 (1%)	18	24
1	C	292/329 (89%)	274 (94%)	16 (6%)	2 (1%)	18	24
1	D	292/329 (89%)	269 (92%)	20 (7%)	3 (1%)	12	14
1	E	292/329 (89%)	271 (93%)	18 (6%)	3 (1%)	12	14
1	F	287/329 (87%)	267 (93%)	16 (6%)	4 (1%)	9	8
All	All	1747/1974 (88%)	1630 (93%)	101 (6%)	16 (1%)	14	17

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	20	GLU
1	E	239	LEU
1	F	19	SER
1	F	67	VAL
1	F	182	GLY

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Mol	Chain	Res	Type
1	A	98	GLU
1	B	49	ASP
1	C	239	LEU
1	C	273	ARG
1	E	308	VAL
1	F	60	ALA
1	A	239	LEU
1	D	32	ALA
1	E	145	GLU
1	D	6	LEU
1	D	98	GLU

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	224/252 (89%)	195 (87%)	29 (13%)	4	3
1	B	224/252 (89%)	194 (87%)	30 (13%)	4	3
1	C	224/252 (89%)	195 (87%)	29 (13%)	4	3
1	D	224/252 (89%)	193 (86%)	31 (14%)	3	3
1	E	224/252 (89%)	197 (88%)	27 (12%)	5	4
1	F	223/252 (88%)	197 (88%)	26 (12%)	5	4
All	All	1343/1512 (89%)	1171 (87%)	172 (13%)	4	3

All (172) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	LYS
1	A	5	ARG
1	A	6	LEU
1	A	11	GLN
1	A	33	VAL
1	A	61	GLU
1	A	62	ARG

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Mol	Chain	Res	Type
1	A	64	ILE
1	A	70	THR
1	A	73	TYR
1	A	78	THR
1	A	83	ASN
1	A	103	VAL
1	A	109	LYS
1	A	126	MET
1	A	143	LYS
1	A	145	GLU
1	A	158	THR
1	A	171	VAL
1	A	183	ASN
1	A	193	GLU
1	A	202	GLU
1	A	214	ARG
1	A	225	ILE
1	A	236	SER
1	A	249	THR
1	A	296	GLN
1	A	307	LEU
1	A	314	GLN
1	B	6	LEU
1	B	11	GLN
1	B	15	VAL
1	B	16	SER
1	B	20	GLU
1	B	26	GLU
1	B	28	VAL
1	B	33	VAL
1	B	35	ARG
1	B	49	ASP
1	B	71	THR
1	B	72	ASP
1	B	83	ASN
1	B	103	VAL
1	B	104	VAL
1	B	109	LYS
1	B	126	MET
1	B	143	LYS
1	B	150	ILE
1	B	160	SER

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Mol	Chain	Res	Type
1	B	176	SER
1	B	193	GLU
1	B	214	ARG
1	B	224	GLU
1	B	225	ILE
1	B	246	LEU
1	B	266	LEU
1	B	269	ASP
1	B	285	VAL
1	B	307	LEU
1	C	6	LEU
1	C	10	LYS
1	C	11	GLN
1	C	15	VAL
1	C	26	GLU
1	C	28	VAL
1	C	33	VAL
1	C	62	ARG
1	C	70	THR
1	C	73	TYR
1	C	83	ASN
1	C	103	VAL
1	C	104	VAL
1	C	109	LYS
1	C	119	SER
1	C	126	MET
1	C	150	ILE
1	C	167	VAL
1	C	172	SER
1	C	183	ASN
1	C	202	GLU
1	C	214	ARG
1	C	224	GLU
1	C	225	ILE
1	C	274	SER
1	C	285	VAL
1	C	286	ARG
1	C	307	LEU
1	C	309	GLU
1	D	3	LYS
1	D	5	ARG
1	D	6	LEU

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Mol	Chain	Res	Type
1	D	15	VAL
1	D	23	MET
1	D	28	VAL
1	D	33	VAL
1	D	49	ASP
1	D	62	ARG
1	D	73	TYR
1	D	78	THR
1	D	81	SER
1	D	83	ASN
1	D	103	VAL
1	D	104	VAL
1	D	109	LYS
1	D	119	SER
1	D	126	MET
1	D	129	ILE
1	D	140	ARG
1	D	150	ILE
1	D	172	SER
1	D	202	GLU
1	D	213	LEU
1	D	214	ARG
1	D	225	ILE
1	D	241	SER
1	D	274	SER
1	D	285	VAL
1	D	296	GLN
1	D	307	LEU
1	E	6	LEU
1	E	15	VAL
1	E	27	ILE
1	E	28	VAL
1	E	33	VAL
1	E	54	VAL
1	E	61	GLU
1	E	70	THR
1	E	77	GLU
1	E	83	ASN
1	E	99	THR
1	E	103	VAL
1	E	104	VAL
1	E	109	LYS

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Mol	Chain	Res	Type
1	E	126	MET
1	E	140	ARG
1	E	145	GLU
1	E	158	THR
1	E	171	VAL
1	E	192	ASN
1	E	202	GLU
1	E	225	ILE
1	E	240	ASP
1	E	285	VAL
1	E	296	GLN
1	E	304	THR
1	E	307	LEU
1	F	3	LYS
1	F	5	ARG
1	F	6	LEU
1	F	10	LYS
1	F	11	GLN
1	F	12	VAL
1	F	16	SER
1	F	19	SER
1	F	28	VAL
1	F	54	VAL
1	F	62	ARG
1	F	70	THR
1	F	83	ASN
1	F	99	THR
1	F	103	VAL
1	F	104	VAL
1	F	109	LYS
1	F	152	MET
1	F	158	THR
1	F	202	GLU
1	F	214	ARG
1	F	225	ILE
1	F	249	THR
1	F	296	GLN
1	F	307	LEU
1	F	316	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	43	GLN
1	A	83	ASN
1	A	86	HIS
1	A	89	HIS
1	A	296	GLN
1	A	314	GLN
1	B	43	GLN
1	B	83	ASN
1	B	89	HIS
1	B	183	ASN
1	B	296	GLN
1	C	43	GLN
1	C	83	ASN
1	C	201	ASN
1	C	265	ASN
1	C	296	GLN
1	C	314	GLN
1	D	43	GLN
1	D	83	ASN
1	D	296	GLN
1	E	43	GLN
1	E	83	ASN
1	E	89	HIS
1	E	201	ASN
1	E	314	GLN
1	F	43	GLN
1	F	83	ASN
1	F	89	HIS
1	F	296	GLN

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 5 ligands modelled in this entry, 5 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	298/329 (90%)	-0.45	0 100 100	14, 24, 37, 46	0
1	B	298/329 (90%)	-0.19	4 (1%) 75 77	17, 30, 51, 68	0
1	C	298/329 (90%)	-0.47	2 (0%) 84 86	16, 24, 34, 47	0
1	D	298/329 (90%)	-0.23	0 100 100	19, 32, 48, 62	0
1	E	298/329 (90%)	-0.30	1 (0%) 90 91	20, 30, 43, 50	0
1	F	295/329 (89%)	-0.11	3 (1%) 79 80	17, 33, 51, 68	0
All	All	1785/1974 (90%)	-0.29	10 (0%) 85 87	14, 29, 47, 68	0

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	74	GLY	3.4
1	F	1	MET	3.3
1	B	17	ALA	2.6
1	B	16	SER	2.5
1	F	74	GLY	2.3
1	B	74	GLY	2.2
1	C	183	ASN	2.2
1	F	99	THR	2.1
1	B	18	LEU	2.0
1	C	192	ASN	2.0

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

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	NA	E	401	1/1	0.55	0.39	32,32,32,32	0
2	NA	F	401	1/1	0.68	0.23	36,36,36,36	0
2	NA	B	401	1/1	0.78	0.17	34,34,34,34	0
2	NA	D	401	1/1	0.85	0.19	40,40,40,40	0
2	NA	C	401	1/1	0.91	0.24	26,26,26,26	0

6.5 Other polymers [i](#)

There are no such residues in this entry.