



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 05:18 PM UTC

PDB ID : 4CBL / pdb_00004cbl
Title : Pestivirus NS3 helicase
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Deposited on : 2013-10-14
Resolution : 3.05 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

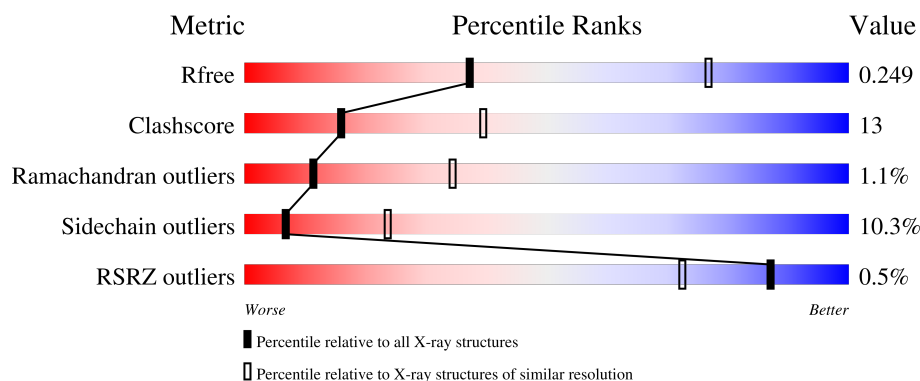
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.05 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	2469 (3.10-3.02)
Clashscore	190562	2569 (3.10-3.02)
Ramachandran outliers	187476	2424 (3.10-3.02)
Sidechain outliers	187428	2423 (3.10-3.02)
RSRZ outliers	180081	2469 (3.10-3.02)

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	509	% 64% 25% 5% 5%
1	B	509	% 65% 24% 5% 6%
1	C	509	62% 25% 6% 8%
1	D	509	60% 27% • 9%

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 14954 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 SERINE PROTEASE NS3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	482	Total	C	N	O	S	0	0	0
			3793	2405	646	720	22			
1	B	479	Total	C	N	O	S	0	0	0
			3778	2391	642	724	21			
1	C	468	Total	C	N	O	S	0	0	0
			3715	2360	630	703	22			
1	D	462	Total	C	N	O	S	0	0	0
			3668	2330	621	696	21			

There are 84 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	183	MET	-	expression tag	UNP P19712
A	184	ALA	-	expression tag	UNP P19712
A	185	SER	-	expression tag	UNP P19712
A	186	HIS	-	expression tag	UNP P19712
A	187	HIS	-	expression tag	UNP P19712
A	188	HIS	-	expression tag	UNP P19712
A	189	HIS	-	expression tag	UNP P19712
A	190	HIS	-	expression tag	UNP P19712
A	191	HIS	-	expression tag	UNP P19712
A	192	HIS	-	expression tag	UNP P19712
A	193	MET	-	expression tag	UNP P19712
A	194	SER	-	expression tag	UNP P19712
A	195	GLY	-	expression tag	UNP P19712
A	196	ILE	-	expression tag	UNP P19712
A	197	GLN	-	expression tag	UNP P19712
A	198	THR	-	expression tag	UNP P19712
A	199	VAL	-	expression tag	UNP P19712
A	200	SER	-	expression tag	UNP P19712
A	201	LYS	-	expression tag	UNP P19712
A	202	SER	-	expression tag	UNP P19712
B	183	MET	-	expression tag	UNP P19712

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Chain	Residue	Modelled	Actual	Comment	Reference
B	184	ALA	-	expression tag	UNP P19712
B	185	SER	-	expression tag	UNP P19712
B	186	HIS	-	expression tag	UNP P19712
B	187	HIS	-	expression tag	UNP P19712
B	188	HIS	-	expression tag	UNP P19712
B	189	HIS	-	expression tag	UNP P19712
B	190	HIS	-	expression tag	UNP P19712
B	191	HIS	-	expression tag	UNP P19712
B	192	HIS	-	expression tag	UNP P19712
B	193	MET	-	expression tag	UNP P19712
B	194	SER	-	expression tag	UNP P19712
B	195	GLY	-	expression tag	UNP P19712
B	196	ILE	-	expression tag	UNP P19712
B	197	GLN	-	expression tag	UNP P19712
B	198	THR	-	expression tag	UNP P19712
B	199	VAL	-	expression tag	UNP P19712
B	200	SER	-	expression tag	UNP P19712
B	201	LYS	-	expression tag	UNP P19712
B	202	SER	-	expression tag	UNP P19712
C	183	MET	-	expression tag	UNP P19712
C	184	ALA	-	expression tag	UNP P19712
C	185	SER	-	expression tag	UNP P19712
C	186	HIS	-	expression tag	UNP P19712
C	187	HIS	-	expression tag	UNP P19712
C	188	HIS	-	expression tag	UNP P19712
C	189	HIS	-	expression tag	UNP P19712
C	190	HIS	-	expression tag	UNP P19712
C	191	HIS	-	expression tag	UNP P19712
C	192	HIS	-	expression tag	UNP P19712
C	193	MET	-	expression tag	UNP P19712
C	194	SER	-	expression tag	UNP P19712
C	195	GLY	-	expression tag	UNP P19712
C	196	ILE	-	expression tag	UNP P19712
C	197	GLN	-	expression tag	UNP P19712
C	198	THR	-	expression tag	UNP P19712
C	199	VAL	-	expression tag	UNP P19712
C	200	SER	-	expression tag	UNP P19712
C	201	LYS	-	expression tag	UNP P19712
C	202	SER	-	expression tag	UNP P19712
D	183	MET	-	expression tag	UNP P19712
D	184	ALA	-	expression tag	UNP P19712
D	185	SER	-	expression tag	UNP P19712

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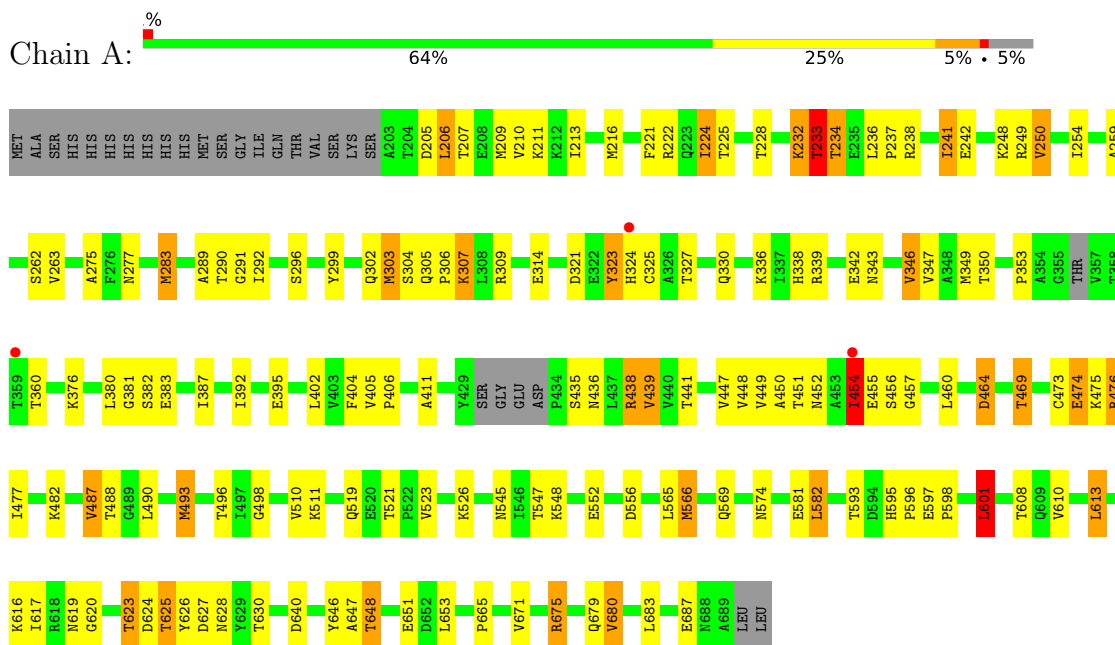
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Chain	Residue	Modelled	Actual	Comment	Reference
D	186	HIS	-	expression tag	UNP P19712
D	187	HIS	-	expression tag	UNP P19712
D	188	HIS	-	expression tag	UNP P19712
D	189	HIS	-	expression tag	UNP P19712
D	190	HIS	-	expression tag	UNP P19712
D	191	HIS	-	expression tag	UNP P19712
D	192	HIS	-	expression tag	UNP P19712
D	193	MET	-	expression tag	UNP P19712
D	194	SER	-	expression tag	UNP P19712
D	195	GLY	-	expression tag	UNP P19712
D	196	ILE	-	expression tag	UNP P19712
D	197	GLN	-	expression tag	UNP P19712
D	198	THR	-	expression tag	UNP P19712
D	199	VAL	-	expression tag	UNP P19712
D	200	SER	-	expression tag	UNP P19712
D	201	LYS	-	expression tag	UNP P19712
D	202	SER	-	expression tag	UNP P19712
A	588	TYR	ASN	engineered mutation	UNP P10725
B	588	TYR	ASN	engineered mutation	UNP P10725
C	588	TYR	ASN	engineered mutation	UNP P10725
D	588	TYR	ASN	engineered mutation	UNP P10725

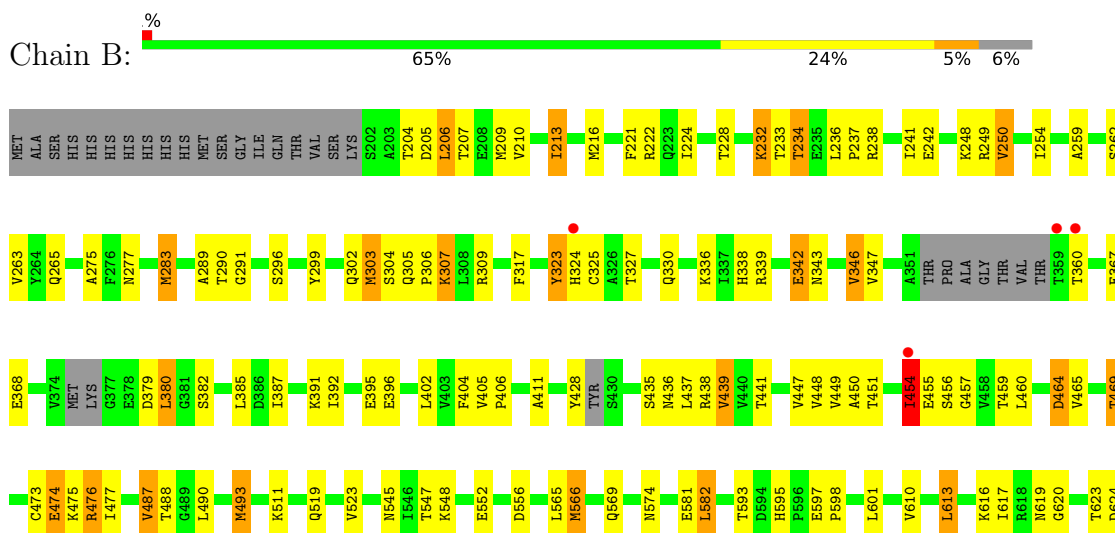
3 Residue-property plots

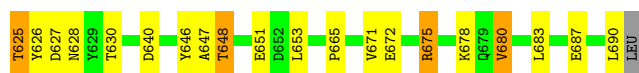
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: SERINE PROTEASE NS3



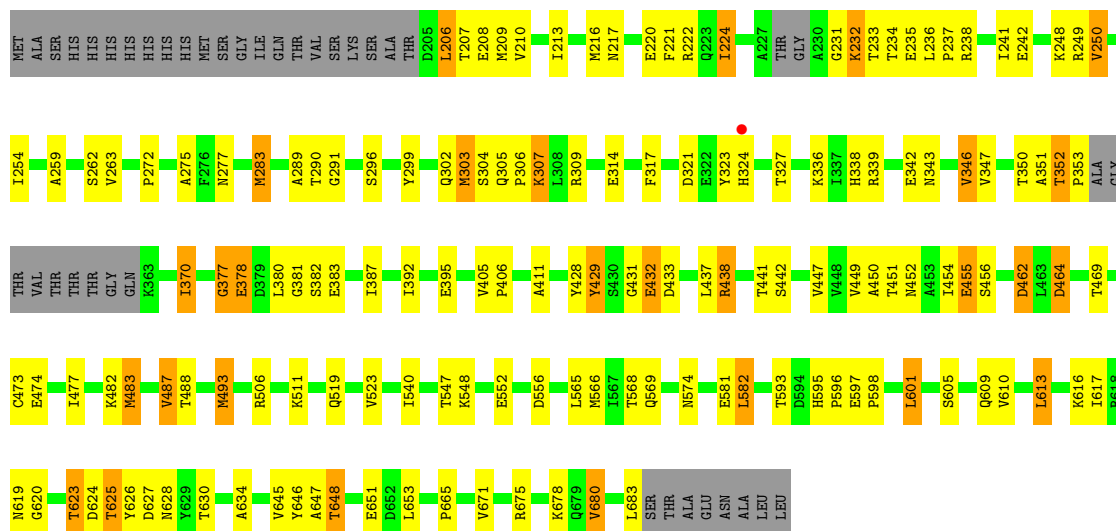
• Molecule 1: SERINE PROTEASE NS3





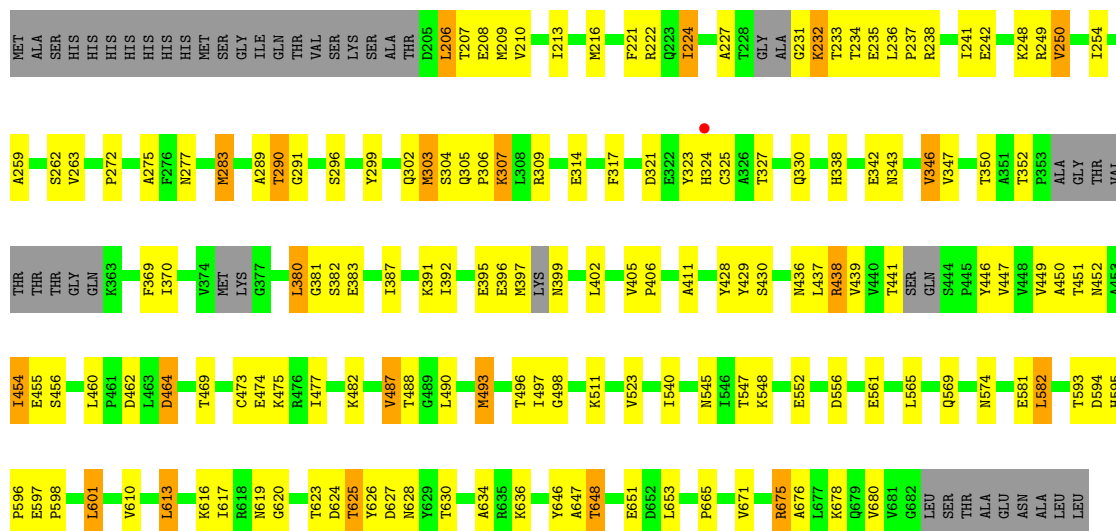
• Molecule 1: SERINE PROTEASE NS3

Chain C: 62% 25% 6% 8%



• Molecule 1: SERINE PROTEASE NS3

Chain D: 60% 27% 9%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	69.91Å 156.84Å 99.40Å 90.00° 97.21° 90.00°	Depositor
Resolution (Å)	20.00 – 3.05 20.00 – 3.05	Depositor EDS
% Data completeness (in resolution range)	94.9 (20.00-3.05) 94.5 (20.00-3.05)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.73 (at 3.04Å)	Xtriage
Refinement program	BUSTER 2.11.4	Depositor
R, R_{free}	0.194 , 0.226 0.218 , 0.249	Depositor DCC
R_{free} test set	1915 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	70.3	Xtriage
Anisotropy	0.539	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 70.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	14954	wwPDB-VP
Average B, all atoms (Å ²)	82.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.31% 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

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	0.85	2/3866 (0.1%)	1.25	18/5233 (0.3%)
1	B	0.80	1/3848 (0.0%)	1.22	20/5208 (0.4%)
1	C	0.86	3/3788 (0.1%)	1.23	19/5126 (0.4%)
1	D	0.77	1/3738 (0.0%)	1.17	15/5057 (0.3%)
All	All	0.82	7/15240 (0.0%)	1.22	72/20624 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1
1	C	0	1
All	All	0	2

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	483	MET	SD-CE	-16.97	1.37	1.79
1	B	234	THR	CA-C	-5.80	1.48	1.52
1	D	234	THR	CA-C	-5.78	1.48	1.52
1	C	351	ALA	CA-C	5.62	1.58	1.53
1	A	360	THR	CA-C	5.46	1.59	1.52
1	A	234	THR	CA-C	-5.37	1.48	1.52
1	C	234	THR	CA-C	-5.37	1.49	1.52

All (72) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	232	LYS	N-CA-C	-13.58	93.01	110.53
1	A	325	CYS	N-CA-C	-10.69	98.54	111.69
1	D	462	ASP	CA-CB-CG	10.53	123.13	112.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	627	ASP	CA-CB-CG	10.13	122.73	112.60
1	C	432	GLU	CA-C-O	-9.70	106.63	120.51
1	C	433	ASP	N-CA-C	9.47	122.41	109.24
1	B	325	CYS	N-CA-C	-9.46	100.31	112.23
1	B	640	ASP	CA-CB-CG	8.12	120.72	112.60
1	A	640	ASP	CA-CB-CG	7.86	120.46	112.60
1	B	360	THR	N-CA-C	-7.73	103.30	112.89
1	C	378	GLU	N-CA-C	7.34	126.43	110.80
1	D	325	CYS	N-CA-C	-6.54	104.23	111.36
1	A	323	TYR	N-CA-C	6.38	120.17	112.38
1	C	675	ARG	CA-CB-CG	6.36	126.83	114.10
1	B	205	ASP	CA-CB-CG	6.33	118.93	112.60
1	C	378	GLU	CA-C-O	-6.32	111.47	120.51
1	D	429	TYR	N-CA-C	6.30	124.22	110.80
1	C	462	ASP	CA-CB-CG	6.29	118.89	112.60
1	A	205	ASP	CA-CB-CG	6.27	118.87	112.60
1	A	454	ILE	CB-CA-C	-6.15	103.83	112.14
1	B	454	ILE	CB-CA-C	-6.13	103.86	112.14
1	C	429	TYR	N-CA-C	5.92	123.40	110.80
1	D	352	THR	CB-CA-C	5.87	116.91	110.15
1	A	360	THR	N-CA-C	5.83	117.08	108.86
1	D	464	ASP	CA-CB-CG	5.79	118.39	112.60
1	B	627	ASP	CA-C-N	-5.72	115.11	123.00
1	B	627	ASP	C-N-CA	-5.72	115.11	123.00
1	B	581	GLU	CB-CG-CD	5.70	122.29	112.60
1	D	497	ILE	N-CA-C	-5.70	104.81	110.62
1	C	464	ASP	CA-CB-CG	5.64	118.24	112.60
1	C	352	THR	CA-C-O	-5.57	112.52	120.16
1	A	581	GLU	CB-CG-CD	5.54	122.02	112.60
1	C	624	ASP	N-CA-C	-5.53	106.32	112.57
1	A	627	ASP	CA-C-N	-5.52	115.38	123.00
1	A	627	ASP	C-N-CA	-5.52	115.38	123.00
1	C	377	GLY	CA-C-N	5.52	132.09	121.54
1	C	377	GLY	C-N-CA	5.52	132.09	121.54
1	C	627	ASP	CA-C-N	-5.49	115.42	123.00
1	C	627	ASP	C-N-CA	-5.49	115.42	123.00
1	B	464	ASP	CA-CB-CG	5.48	118.08	112.60
1	A	464	ASP	CA-CB-CG	5.47	118.07	112.60
1	B	519	GLN	CA-C-N	5.46	129.10	121.02
1	B	519	GLN	C-N-CA	5.46	129.10	121.02
1	C	601	LEU	CD1-CG-CD2	-5.45	98.81	110.80
1	B	624	ASP	N-CA-C	-5.45	106.41	112.57

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	457	GLY	CA-C-N	5.45	130.65	122.75
1	A	457	GLY	C-N-CA	5.45	130.65	122.75
1	C	395	GLU	CB-CG-CD	5.44	121.85	112.60
1	D	627	ASP	CA-C-N	-5.42	115.52	123.00
1	D	627	ASP	C-N-CA	-5.42	115.52	123.00
1	B	323	TYR	N-CA-C	5.37	118.93	112.38
1	C	234	THR	N-CA-C	5.35	119.16	111.02
1	B	457	GLY	CA-C-N	5.34	130.50	122.75
1	B	457	GLY	C-N-CA	5.34	130.50	122.75
1	D	624	ASP	N-CA-C	-5.32	106.56	112.57
1	D	581	GLU	CB-CG-CD	5.31	121.62	112.60
1	C	272	PRO	N-CA-C	5.30	120.82	113.98
1	D	272	PRO	N-CA-C	5.28	120.79	113.98
1	B	204	THR	N-CA-C	-5.27	105.61	111.36
1	A	624	ASP	N-CA-C	-5.25	106.64	112.57
1	B	234	THR	N-CA-C	5.20	118.92	111.02
1	C	581	GLU	CB-CG-CD	5.18	121.41	112.60
1	A	601	LEU	CD1-CG-CD2	-5.18	99.41	110.80
1	B	213	ILE	CB-CG1-CD1	5.14	124.59	113.80
1	D	594	ASP	N-CA-C	-5.11	106.64	112.92
1	B	232	LYS	CA-C-N	5.09	128.82	120.63
1	B	232	LYS	C-N-CA	5.09	128.82	120.63
1	D	234	THR	N-CA-C	5.07	118.72	111.02
1	D	290	THR	N-CA-C	5.07	119.17	112.89
1	A	519	GLN	CA-C-N	5.03	128.47	121.02
1	A	519	GLN	C-N-CA	5.03	128.47	121.02
1	D	454	ILE	N-CA-CB	5.01	116.42	110.55

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	342	GLU	Sidechain
1	C	378	GLU	Mainchain

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	3793	0	3787	115	1
1	B	3778	0	3777	108	1
1	C	3715	0	3721	97	0
1	D	3668	0	3661	95	0
All	All	14954	0	14946	394	1

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 13.

All (394) 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:B:323:TYR:CE1	1:B:324:HIS:CE1	2.04	1.43
1:C:324:HIS:HD2	1:C:350:THR:OG1	1.12	1.31
1:A:323:TYR:HE1	1:A:324:HIS:CE1	1.51	1.26
1:A:451:THR:O	1:A:454:ILE:HG13	1.36	1.26
1:B:451:THR:O	1:B:454:ILE:HG13	1.35	1.22
1:C:324:HIS:CD2	1:C:350:THR:OG1	1.91	1.22
1:A:323:TYR:CE1	1:A:324:HIS:CE1	2.25	1.22
1:A:450:ALA:CB	1:A:454:ILE:HG12	1.69	1.21
1:B:450:ALA:CB	1:B:454:ILE:HG12	1.69	1.20
1:B:323:TYR:CZ	1:B:324:HIS:CE1	2.33	1.17
1:B:368:GLU:OE1	1:D:370:ILE:HD11	1.51	1.11
1:A:436:ASN:O	1:A:439:VAL:HG13	1.53	1.06
1:A:233:THR:HG23	1:A:321:ASP:OD2	1.53	1.06
1:B:436:ASN:O	1:B:439:VAL:HG13	1.55	1.05
1:B:450:ALA:HB1	1:B:454:ILE:HG12	1.09	1.05
1:D:323:TYR:CE1	1:D:324:HIS:CE1	2.43	1.05
1:A:450:ALA:HB1	1:A:454:ILE:HG12	1.09	1.04
1:B:323:TYR:CZ	1:B:324:HIS:HE1	1.75	1.01
1:D:233:THR:HG22	1:D:321:ASP:OD2	1.59	1.01
1:C:233:THR:HG22	1:C:321:ASP:OD2	1.59	1.01
1:A:323:TYR:CE1	1:A:324:HIS:NE2	2.30	1.00
1:D:324:HIS:HD2	1:D:350:THR:OG1	1.44	0.97
1:B:436:ASN:O	1:B:439:VAL:CG1	2.13	0.96
1:A:436:ASN:O	1:A:439:VAL:CG1	2.15	0.94
1:B:323:TYR:HE1	1:B:324:HIS:CE1	1.84	0.91
1:D:323:TYR:HE1	1:D:324:HIS:CE1	1.88	0.91
1:C:323:TYR:CE1	1:C:324:HIS:CE1	2.60	0.90
1:B:367:GLU:HG2	1:D:369:PHE:CE2	2.09	0.87
1:D:397:MET:HG2	1:D:399:ASN:N	1.90	0.86
1:D:324:HIS:CD2	1:D:350:THR:OG1	2.29	0.85

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:613:LEU:HD12	1:D:626:TYR:HB3	1.59	0.84
1:B:428:TYR:HB2	1:B:437:LEU:HD11	1.60	0.84
1:C:593:THR:HG22	1:C:595:HIS:H	1.43	0.83
1:D:593:THR:HG22	1:D:595:HIS:H	1.43	0.83
1:B:323:TYR:OH	1:B:324:HIS:HE1	1.62	0.82
1:C:613:LEU:HD12	1:C:626:TYR:HB3	1.61	0.82
1:B:593:THR:HG22	1:B:595:HIS:H	1.43	0.82
1:A:593:THR:HG22	1:A:595:HIS:H	1.43	0.82
1:A:451:THR:O	1:A:454:ILE:CG1	2.26	0.81
1:D:428:TYR:HB2	1:D:437:LEU:HD11	1.62	0.81
1:B:450:ALA:CB	1:B:454:ILE:CG1	2.58	0.80
1:A:450:ALA:CB	1:A:454:ILE:CG1	2.57	0.79
1:D:283:MET:HE1	1:D:307:LYS:HD2	1.65	0.79
1:B:451:THR:O	1:B:454:ILE:CG1	2.25	0.78
1:B:367:GLU:CG	1:D:369:PHE:CE2	2.67	0.78
1:B:613:LEU:HD12	1:B:626:TYR:HB3	1.65	0.78
1:A:595:HIS:CD2	1:A:597:GLU:H	2.02	0.77
1:A:613:LEU:HD12	1:A:626:TYR:HB3	1.65	0.77
1:C:283:MET:HE1	1:C:307:LYS:HD2	1.67	0.77
1:A:402:LEU:HD21	1:A:454:ILE:HD13	1.66	0.77
1:A:545:ASN:HB2	1:D:342:GLU:HG2	1.67	0.76
1:A:593:THR:HG23	1:A:630:THR:O	1.86	0.76
1:A:259:ALA:O	1:A:263:VAL:HG23	1.85	0.76
1:A:595:HIS:HD2	1:A:597:GLU:H	1.33	0.76
1:A:675:ARG:HD2	1:A:679:GLN:HE21	1.48	0.76
1:C:429:TYR:C	1:C:431:GLY:H	1.93	0.76
1:B:595:HIS:CD2	1:B:597:GLU:H	2.04	0.75
1:C:259:ALA:O	1:C:263:VAL:HG23	1.86	0.75
1:D:593:THR:HG23	1:D:630:THR:O	1.86	0.75
1:B:259:ALA:O	1:B:263:VAL:HG23	1.86	0.75
1:B:404:PHE:CE1	1:B:454:ILE:HD12	2.21	0.75
1:C:593:THR:HG23	1:C:630:THR:O	1.87	0.75
1:A:323:TYR:CZ	1:A:324:HIS:NE2	2.54	0.75
1:B:283:MET:HE1	1:B:307:LYS:HD2	1.67	0.75
1:C:324:HIS:HD2	1:C:350:THR:HG1	1.32	0.75
1:B:476:ARG:NH2	1:B:566:MET:HE1	2.02	0.75
1:A:404:PHE:CE1	1:A:454:ILE:HD12	2.22	0.74
1:A:283:MET:HE1	1:A:307:LYS:HD2	1.69	0.74
1:B:323:TYR:CE1	1:B:324:HIS:ND1	2.55	0.74
1:B:402:LEU:HD21	1:B:454:ILE:HD13	1.68	0.74
1:B:545:ASN:HB2	1:C:342:GLU:HG2	1.68	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:236:LEU:HB3	1:B:237:PRO:HD3	1.70	0.74
1:B:595:HIS:HD2	1:B:597:GLU:H	1.36	0.74
1:B:593:THR:HG23	1:B:630:THR:O	1.87	0.74
1:C:616:LYS:HE3	1:C:625:THR:CG2	2.17	0.74
1:A:616:LYS:HE3	1:A:625:THR:CG2	2.18	0.73
1:D:595:HIS:CD2	1:D:597:GLU:H	2.05	0.73
1:C:595:HIS:CD2	1:C:597:GLU:H	2.05	0.73
1:D:259:ALA:O	1:D:263:VAL:HG23	1.88	0.73
1:C:595:HIS:HD2	1:C:597:GLU:H	1.38	0.72
1:A:342:GLU:HG2	1:D:545:ASN:HB2	1.71	0.72
1:B:616:LYS:HE3	1:B:625:THR:CG2	2.20	0.72
1:D:616:LYS:HE3	1:D:625:THR:CG2	2.20	0.72
1:D:595:HIS:HD2	1:D:597:GLU:H	1.38	0.71
1:B:476:ARG:HH22	1:B:566:MET:HE1	1.56	0.71
1:C:236:LEU:HB3	1:C:237:PRO:HD3	1.73	0.71
1:A:406:PRO:HD3	1:A:469:THR:HG21	1.72	0.70
1:A:236:LEU:HB3	1:A:237:PRO:HD3	1.73	0.70
1:B:250:VAL:HG22	1:B:317:PHE:HB2	1.72	0.70
1:A:450:ALA:HB3	1:A:454:ILE:HG12	1.69	0.70
1:D:250:VAL:HG22	1:D:317:PHE:HB2	1.74	0.70
1:B:309:ARG:HH21	1:B:343:ASN:HD21	1.39	0.70
1:B:545:ASN:CB	1:C:342:GLU:HG2	2.21	0.70
1:A:435:SER:O	1:A:438:ARG:HG2	1.91	0.69
1:B:450:ALA:HB3	1:B:454:ILE:HG12	1.70	0.68
1:C:324:HIS:NE2	1:C:350:THR:HG21	2.08	0.68
1:B:406:PRO:HD3	1:B:469:THR:HG21	1.76	0.68
1:A:250:VAL:HG22	1:A:292:ILE:HG12	1.75	0.68
1:A:545:ASN:CB	1:D:342:GLU:HG2	2.23	0.68
1:D:309:ARG:HH21	1:D:343:ASN:HD21	1.40	0.68
1:D:236:LEU:HB3	1:D:237:PRO:HD3	1.74	0.68
1:A:476:ARG:NH2	1:A:566:MET:HE1	2.07	0.68
1:B:323:TYR:CE1	1:B:324:HIS:NE2	2.61	0.68
1:C:250:VAL:HG22	1:C:317:PHE:HB2	1.76	0.68
1:C:324:HIS:CD2	1:C:350:THR:CB	2.77	0.67
1:B:323:TYR:HE1	1:B:324:HIS:NE2	1.91	0.65
1:C:450:ALA:HB1	1:C:454:ILE:HB	1.78	0.65
1:A:342:GLU:HG2	1:D:545:ASN:CB	2.27	0.65
1:D:450:ALA:HB1	1:D:454:ILE:HB	1.78	0.65
1:C:428:TYR:HB2	1:C:437:LEU:HD21	1.79	0.64
1:A:476:ARG:HH22	1:A:566:MET:HE1	1.62	0.63
1:D:299:TYR:O	1:D:302:GLN:HG3	1.98	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:406:PRO:HD3	1:C:469:THR:HG21	1.80	0.63
1:A:241:ILE:HD12	1:A:250:VAL:HG13	1.79	0.63
1:C:299:TYR:O	1:C:302:GLN:HG3	1.99	0.63
1:B:299:TYR:O	1:B:302:GLN:HG3	1.97	0.63
1:D:323:TYR:CE1	1:D:324:HIS:NE2	2.66	0.62
1:C:309:ARG:HH21	1:C:343:ASN:HD21	1.45	0.62
1:D:406:PRO:HD3	1:D:469:THR:HG21	1.82	0.62
1:A:299:TYR:O	1:A:302:GLN:HG3	2.00	0.61
1:C:370:ILE:HD11	1:C:519:GLN:HA	1.83	0.61
1:C:429:TYR:C	1:C:431:GLY:N	2.56	0.61
1:D:436:ASN:O	1:D:439:VAL:HG22	2.01	0.61
1:A:451:THR:HG22	1:A:452:ASN:N	2.16	0.60
1:A:474:GLU:HB2	1:A:493:MET:SD	2.41	0.60
1:D:487:VAL:HA	1:D:647:ALA:O	2.01	0.60
1:A:487:VAL:HA	1:A:647:ALA:O	2.02	0.59
1:A:683:LEU:CD1	1:B:687:GLU:HG3	2.32	0.59
1:A:213:ILE:HD11	1:A:224:ILE:HD11	1.84	0.59
1:A:450:ALA:HB3	1:A:454:ILE:CD1	2.33	0.59
1:C:593:THR:HG22	1:C:595:HIS:N	2.17	0.59
1:B:464:ASP:OD1	1:B:511:LYS:HE2	2.03	0.59
1:A:283:MET:CE	1:A:307:LYS:HD2	2.33	0.59
1:A:623:THR:OG1	1:A:625:THR:HB	2.03	0.59
1:C:487:VAL:HA	1:C:647:ALA:O	2.02	0.59
1:C:623:THR:OG1	1:C:625:THR:HB	2.03	0.59
1:A:309:ARG:HH21	1:A:343:ASN:HD21	1.50	0.58
1:D:323:TYR:CZ	1:D:324:HIS:NE2	2.70	0.58
1:B:450:ALA:HB3	1:B:454:ILE:CD1	2.33	0.58
1:A:521:THR:HG21	1:C:353:PRO:HB3	1.86	0.58
1:B:233:THR:HG23	1:B:234:THR:HG23	1.85	0.58
1:A:496:THR:HG22	1:A:498:GLY:H	1.68	0.58
1:B:476:ARG:HH22	1:B:566:MET:CE	2.15	0.58
1:B:487:VAL:HA	1:B:647:ALA:O	2.04	0.58
1:A:324:HIS:HD2	1:A:350:THR:OG1	1.86	0.58
1:D:464:ASP:OD1	1:D:511:LYS:HE2	2.03	0.58
1:C:428:TYR:HD2	1:C:437:LEU:HD13	1.69	0.58
1:C:605:SER:HB2	1:C:609:GLN:NE2	2.19	0.58
1:B:474:GLU:HB2	1:B:493:MET:SD	2.44	0.57
1:D:451:THR:HG22	1:D:452:ASN:N	2.19	0.57
1:B:221:PHE:HD1	1:B:346:VAL:HG22	1.70	0.57
1:C:483:MET:HE2	1:C:645:VAL:HG22	1.86	0.57
1:C:213:ILE:HD11	1:C:224:ILE:HD11	1.85	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:623:THR:OG1	1:B:625:THR:HB	2.04	0.57
1:A:476:ARG:HH22	1:A:566:MET:CE	2.18	0.57
1:C:221:PHE:HD1	1:C:346:VAL:HG22	1.69	0.57
1:C:451:THR:HG22	1:C:452:ASN:N	2.19	0.56
1:D:221:PHE:HD1	1:D:346:VAL:HG22	1.69	0.56
1:D:623:THR:OG1	1:D:625:THR:HB	2.04	0.56
1:A:593:THR:HG22	1:A:595:HIS:N	2.18	0.56
1:B:450:ALA:HB3	1:B:454:ILE:CG1	2.30	0.56
1:A:221:PHE:HD1	1:A:346:VAL:HG22	1.69	0.56
1:B:283:MET:CE	1:B:307:LYS:HD2	2.35	0.56
1:C:605:SER:HB2	1:C:609:GLN:HE22	1.71	0.56
1:D:283:MET:CE	1:D:307:LYS:HD2	2.34	0.55
1:A:232:LYS:C	1:A:234:THR:H	2.14	0.55
1:A:464:ASP:OD1	1:A:511:LYS:HE2	2.07	0.55
1:D:593:THR:HG22	1:D:595:HIS:N	2.17	0.55
1:B:436:ASN:O	1:B:439:VAL:HG12	2.02	0.55
1:B:593:THR:HG22	1:B:595:HIS:N	2.18	0.55
1:A:438:ARG:HG3	1:A:439:VAL:N	2.21	0.55
1:D:213:ILE:HD11	1:D:224:ILE:HD11	1.89	0.55
1:C:464:ASP:OD1	1:C:511:LYS:HE2	2.07	0.55
1:C:323:TYR:HE1	1:C:324:HIS:CE1	2.20	0.55
1:A:450:ALA:HB3	1:A:454:ILE:CG1	2.29	0.54
1:B:283:MET:HE1	1:B:307:LYS:CD	2.37	0.54
1:B:648:THR:HG22	1:B:651:GLU:H	1.72	0.54
1:B:275:ALA:O	1:B:291:GLY:HA3	2.08	0.54
1:C:275:ALA:O	1:C:291:GLY:HA3	2.08	0.54
1:A:323:TYR:CE1	1:A:324:HIS:CD2	2.95	0.54
1:B:617:ILE:HD13	1:B:653:LEU:HD23	1.91	0.53
1:C:277:ASN:CG	1:C:289:ALA:HB1	2.33	0.53
1:B:380:LEU:HG	1:B:391:LYS:HE2	1.91	0.53
1:C:593:THR:HG21	1:C:595:HIS:HB2	1.90	0.53
1:B:277:ASN:CG	1:B:289:ALA:HB1	2.33	0.53
1:A:275:ALA:O	1:A:291:GLY:HA3	2.09	0.53
1:A:648:THR:HG22	1:A:651:GLU:H	1.73	0.53
1:B:206:LEU:O	1:B:210:VAL:HG23	2.07	0.53
1:D:275:ALA:O	1:D:291:GLY:HA3	2.09	0.53
1:A:206:LEU:O	1:A:210:VAL:HG23	2.08	0.53
1:D:593:THR:HG21	1:D:595:HIS:HB2	1.91	0.53
1:D:617:ILE:HD13	1:D:653:LEU:HD23	1.91	0.53
1:B:448:VAL:HG11	1:B:460:LEU:HD11	1.89	0.53
1:C:477:ILE:HG22	1:C:488:THR:HG22	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:283:MET:HE1	1:C:307:LYS:CD	2.38	0.53
1:C:283:MET:CE	1:C:307:LYS:HD2	2.35	0.53
1:D:283:MET:HE1	1:D:307:LYS:CD	2.37	0.52
1:B:613:LEU:CD1	1:B:626:TYR:HB3	2.37	0.52
1:A:617:ILE:HD13	1:A:653:LEU:HD23	1.91	0.52
1:B:593:THR:HG21	1:B:595:HIS:HB2	1.90	0.52
1:C:648:THR:HG22	1:C:651:GLU:H	1.74	0.52
1:D:648:THR:HG22	1:D:651:GLU:H	1.72	0.52
1:A:593:THR:HG21	1:A:595:HIS:HB2	1.91	0.52
1:D:277:ASN:CG	1:D:289:ALA:HB1	2.35	0.52
1:D:397:MET:CG	1:D:399:ASN:N	2.67	0.51
1:A:277:ASN:CG	1:A:289:ALA:HB1	2.35	0.51
1:A:613:LEU:CD1	1:A:626:TYR:HB3	2.39	0.51
1:C:323:TYR:CZ	1:C:324:HIS:CE1	2.98	0.51
1:D:475:LYS:HG2	1:D:490:LEU:HD13	1.93	0.51
1:D:477:ILE:HG22	1:D:488:THR:HG22	1.93	0.51
1:D:446:TYR:HE2	1:D:460:LEU:HD12	1.77	0.51
1:A:675:ARG:HD2	1:A:679:GLN:NE2	2.22	0.50
1:B:213:ILE:HD13	1:B:347:VAL:HG21	1.94	0.50
1:A:283:MET:HE1	1:A:307:LYS:CD	2.37	0.50
1:B:323:TYR:OH	1:B:324:HIS:CE1	2.47	0.50
1:D:231:GLY:HA3	1:D:235:GLU:HB2	1.94	0.50
1:A:213:ILE:O	1:A:216:MET:HB2	2.12	0.50
1:B:404:PHE:CE1	1:B:454:ILE:CD1	2.94	0.50
1:D:248:LYS:O	1:D:290:THR:O	2.30	0.50
1:A:451:THR:CG2	1:A:452:ASN:N	2.75	0.49
1:D:206:LEU:O	1:D:210:VAL:HG23	2.12	0.49
1:C:438:ARG:HA	1:C:441:THR:OG1	2.12	0.49
1:A:436:ASN:O	1:A:439:VAL:HG12	2.08	0.49
1:C:617:ILE:HD13	1:C:653:LEU:HD23	1.92	0.49
1:A:404:PHE:CE1	1:A:454:ILE:CD1	2.95	0.49
1:C:616:LYS:HE3	1:C:625:THR:HG22	1.95	0.49
1:B:545:ASN:HB3	1:C:342:GLU:HG2	1.95	0.49
1:B:248:LYS:O	1:B:290:THR:O	2.30	0.49
1:A:448:VAL:HG11	1:A:460:LEU:HD11	1.95	0.49
1:D:213:ILE:O	1:D:216:MET:HB2	2.13	0.48
1:D:304:SER:H	1:D:307:LYS:HZ1	1.61	0.48
1:A:687:GLU:HG3	1:B:683:LEU:HD11	1.94	0.48
1:C:304:SER:H	1:C:307:LYS:HZ1	1.62	0.48
1:A:248:LYS:O	1:A:290:THR:O	2.30	0.48
1:A:687:GLU:HG3	1:B:683:LEU:CD1	2.43	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:598:PRO:O	1:D:601:LEU:HB2	2.14	0.48
1:B:309:ARG:HH21	1:B:343:ASN:ND2	2.09	0.48
1:C:248:LYS:O	1:C:290:THR:O	2.31	0.48
1:C:451:THR:CG2	1:C:452:ASN:N	2.77	0.48
1:D:613:LEU:CD1	1:D:626:TYR:HB3	2.38	0.48
1:C:206:LEU:O	1:C:210:VAL:HG23	2.13	0.47
1:C:231:GLY:HA3	1:C:235:GLU:HB2	1.96	0.47
1:C:213:ILE:O	1:C:216:MET:HB2	2.13	0.47
1:C:222:ARG:O	1:C:347:VAL:HA	2.14	0.47
1:A:304:SER:H	1:A:307:LYS:HZ1	1.63	0.47
1:A:548:LYS:O	1:A:552:GLU:HG3	2.14	0.47
1:D:451:THR:CG2	1:D:452:ASN:N	2.77	0.47
1:B:213:ILE:O	1:B:216:MET:HB2	2.14	0.47
1:B:367:GLU:HG3	1:D:369:PHE:CE2	2.48	0.47
1:A:598:PRO:O	1:A:601:LEU:HB2	2.15	0.47
1:A:679:GLN:HB3	1:B:690:LEU:HD23	1.95	0.47
1:C:303:MET:HB3	1:C:307:LYS:HB3	1.97	0.47
1:D:309:ARG:HH21	1:D:343:ASN:ND2	2.09	0.47
1:D:548:LYS:O	1:D:552:GLU:HG3	2.15	0.47
1:A:521:THR:CG2	1:C:353:PRO:HB3	2.44	0.47
1:B:304:SER:H	1:B:307:LYS:HZ1	1.62	0.46
1:D:222:ARG:O	1:D:347:VAL:HA	2.15	0.46
1:B:665:PRO:HB2	1:B:671:VAL:HG22	1.97	0.46
1:A:616:LYS:HE3	1:A:625:THR:HG22	1.96	0.46
1:C:277:ASN:OD1	1:C:289:ALA:HB1	2.16	0.46
1:A:338:HIS:HE1	1:A:556:ASP:OD2	1.99	0.46
1:A:477:ILE:HG22	1:A:488:THR:HG22	1.98	0.46
1:D:323:TYR:CZ	1:D:324:HIS:CE1	2.99	0.46
1:D:303:MET:HB3	1:D:307:LYS:HB3	1.97	0.46
1:A:277:ASN:OD1	1:A:289:ALA:HB1	2.16	0.46
1:C:613:LEU:CD1	1:C:626:TYR:HB3	2.39	0.46
1:A:222:ARG:O	1:A:347:VAL:HA	2.16	0.45
1:B:548:LYS:O	1:B:552:GLU:HG3	2.16	0.45
1:B:477:ILE:HG22	1:B:488:THR:HG22	1.98	0.45
1:D:411:ALA:HA	1:D:449:VAL:CG1	2.46	0.45
1:C:338:HIS:HE1	1:C:556:ASP:OD2	2.00	0.45
1:A:411:ALA:HA	1:A:449:VAL:CG1	2.46	0.45
1:C:309:ARG:HH21	1:C:343:ASN:ND2	2.12	0.45
1:C:548:LYS:O	1:C:552:GLU:HG3	2.15	0.45
1:C:619:ASN:HB3	1:C:620:GLY:H	1.52	0.45
1:D:238:ARG:NH1	1:D:242:GLU:OE1	2.49	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:540:ILE:HG21	1:D:582:LEU:HD22	1.98	0.45
1:D:438:ARG:HA	1:D:441:THR:OG1	2.16	0.45
1:C:428:TYR:HD2	1:C:437:LEU:CD1	2.30	0.45
1:D:619:ASN:HB3	1:D:620:GLY:H	1.51	0.45
1:C:411:ALA:HA	1:C:449:VAL:CG1	2.47	0.45
1:C:540:ILE:HG21	1:C:582:LEU:HD22	1.98	0.45
1:B:338:HIS:HE1	1:B:556:ASP:OD2	2.00	0.44
1:B:616:LYS:HE3	1:B:625:THR:HG22	1.96	0.44
1:D:616:LYS:HE3	1:D:625:THR:HG22	1.96	0.44
1:A:545:ASN:HB3	1:D:342:GLU:HG2	1.99	0.44
1:B:616:LYS:HG3	1:B:625:THR:HG22	1.99	0.44
1:C:598:PRO:O	1:C:601:LEU:HB2	2.16	0.44
1:A:593:THR:CG2	1:A:595:HIS:H	2.24	0.44
1:B:277:ASN:OD1	1:B:289:ALA:HB1	2.17	0.44
1:D:277:ASN:OD1	1:D:289:ALA:HB1	2.17	0.44
1:A:233:THR:CG2	1:A:321:ASP:OD2	2.45	0.44
1:A:303:MET:HB3	1:A:307:LYS:HB3	2.00	0.44
1:A:438:ARG:HA	1:A:441:THR:OG1	2.18	0.44
1:B:411:ALA:HA	1:B:449:VAL:CG1	2.47	0.44
1:C:323:TYR:CZ	1:C:324:HIS:NE2	2.85	0.44
1:B:435:SER:O	1:B:438:ARG:HB2	2.18	0.44
1:D:380:LEU:HB3	1:D:391:LYS:NZ	2.33	0.44
1:C:238:ARG:NH1	1:C:242:GLU:OE1	2.50	0.44
1:D:613:LEU:HD23	1:D:634:ALA:CB	2.48	0.44
1:C:324:HIS:NE2	1:C:350:THR:CB	2.81	0.44
1:C:474:GLU:HB3	1:C:493:MET:SD	2.58	0.44
1:C:547:THR:H	1:C:574:ASN:ND2	2.16	0.44
1:A:435:SER:O	1:A:438:ARG:CG	2.63	0.43
1:B:222:ARG:O	1:B:347:VAL:HA	2.18	0.43
1:C:411:ALA:HA	1:C:449:VAL:HG12	2.00	0.43
1:D:338:HIS:HE1	1:D:556:ASP:OD2	2.01	0.43
1:D:411:ALA:HA	1:D:449:VAL:HG12	2.00	0.43
1:D:675:ARG:HG3	1:D:676:ALA:N	2.32	0.43
1:B:305:GLN:N	1:B:306:PRO:HD2	2.33	0.43
1:C:405:VAL:HG21	1:C:449:VAL:HG12	2.00	0.43
1:A:249:ARG:HD2	1:A:289:ALA:O	2.18	0.43
1:C:451:THR:O	1:C:454:ILE:HG22	2.18	0.43
1:D:232:LYS:HE3	1:D:233:THR:HG23	2.01	0.43
1:C:565:LEU:O	1:C:569:GLN:HG3	2.18	0.43
1:A:305:GLN:N	1:A:306:PRO:HD2	2.33	0.43
1:B:238:ARG:NH1	1:B:242:GLU:OE1	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:232:LYS:HE3	1:C:233:THR:HG23	2.00	0.43
1:D:405:VAL:HG21	1:D:449:VAL:HG12	2.01	0.43
1:D:496:THR:HG22	1:D:498:GLY:H	1.83	0.43
1:C:254:ILE:O	1:C:296:SER:HA	2.19	0.43
1:D:547:THR:H	1:D:574:ASN:ND2	2.16	0.43
1:B:619:ASN:HB3	1:B:620:GLY:H	1.53	0.43
1:D:595:HIS:CD2	1:D:596:PRO:HD2	2.53	0.43
1:B:547:THR:H	1:B:574:ASN:ND2	2.17	0.43
1:C:324:HIS:NE2	1:C:350:THR:CG2	2.80	0.43
1:D:451:THR:O	1:D:454:ILE:HG22	2.18	0.43
1:D:565:LEU:O	1:D:569:GLN:HG3	2.18	0.43
1:A:309:ARG:HH21	1:A:343:ASN:ND2	2.14	0.43
1:A:336:LYS:O	1:A:339:ARG:HB2	2.18	0.43
1:A:547:THR:H	1:A:574:ASN:ND2	2.17	0.43
1:A:565:LEU:O	1:A:569:GLN:HG3	2.19	0.42
1:C:582:LEU:HD12	1:C:582:LEU:HA	1.90	0.42
1:C:593:THR:CG2	1:C:595:HIS:H	2.24	0.42
1:A:209:MET:O	1:A:213:ILE:HG12	2.19	0.42
1:A:683:LEU:HD11	1:B:687:GLU:HG3	2.00	0.42
1:A:323:TYR:HA	1:A:330:GLN:NE2	2.35	0.42
1:A:665:PRO:HB2	1:A:671:VAL:HG22	2.01	0.42
1:A:225:THR:HG21	1:A:353:PRO:HG3	2.00	0.42
1:D:254:ILE:O	1:D:296:SER:HA	2.20	0.42
1:D:305:GLN:N	1:D:306:PRO:HD2	2.34	0.42
1:A:565:LEU:HD12	1:A:680:VAL:HG13	2.00	0.42
1:B:303:MET:HB3	1:B:307:LYS:HB3	2.01	0.42
1:B:475:LYS:HG2	1:B:490:LEU:HD23	2.02	0.42
1:D:249:ARG:HH21	1:D:314:GLU:CB	2.33	0.42
1:A:616:LYS:HG3	1:A:625:THR:HG22	2.01	0.42
1:B:209:MET:O	1:B:213:ILE:HG13	2.18	0.42
1:B:598:PRO:O	1:B:601:LEU:HB2	2.19	0.42
1:A:349:MET:HE3	1:A:349:MET:HB2	1.89	0.42
1:D:323:TYR:HA	1:D:330:GLN:NE2	2.35	0.42
1:A:475:LYS:HG2	1:A:490:LEU:HD23	2.01	0.42
1:A:582:LEU:HD22	1:A:582:LEU:HA	1.91	0.42
1:B:593:THR:CG2	1:B:595:HIS:H	2.24	0.42
1:B:672:GLU:OE1	1:B:675:ARG:HG2	2.20	0.42
1:C:595:HIS:CD2	1:C:596:PRO:HD2	2.55	0.42
1:C:305:GLN:N	1:C:306:PRO:HD2	2.35	0.41
1:A:411:ALA:HA	1:A:449:VAL:HG12	2.01	0.41
1:C:616:LYS:HG3	1:C:625:THR:HG22	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:665:PRO:HB2	1:D:671:VAL:HG22	2.02	0.41
1:A:304:SER:OG	1:A:307:LYS:HE3	2.21	0.41
1:C:336:LYS:O	1:C:339:ARG:HB2	2.20	0.41
1:C:568:THR:HG22	1:C:680:VAL:HG21	2.02	0.41
1:D:396:GLU:O	1:D:397:MET:HB2	2.21	0.41
1:B:411:ALA:HA	1:B:449:VAL:HG12	2.01	0.41
1:A:225:THR:CG2	1:A:353:PRO:HG3	2.51	0.41
1:A:595:HIS:CD2	1:A:596:PRO:HD2	2.55	0.41
1:B:438:ARG:HA	1:B:441:THR:OG1	2.20	0.41
1:C:613:LEU:HD23	1:C:634:ALA:CB	2.49	0.41
1:B:249:ARG:HD2	1:B:289:ALA:O	2.20	0.41
1:C:209:MET:O	1:C:213:ILE:HG12	2.21	0.41
1:B:336:LYS:O	1:B:339:ARG:HB2	2.19	0.41
1:C:249:ARG:HD2	1:C:289:ALA:O	2.21	0.41
1:A:249:ARG:HH21	1:A:314:GLU:CB	2.34	0.41
1:B:367:GLU:HG2	1:D:369:PHE:CZ	2.54	0.41
1:B:379:ASP:O	1:B:380:LEU:HD22	2.21	0.41
1:C:217:ASN:HB2	1:C:220:GLU:OE2	2.21	0.41
1:C:249:ARG:HH21	1:C:314:GLU:CB	2.33	0.41
1:C:665:PRO:HB2	1:C:671:VAL:HG22	2.02	0.41
1:D:474:GLU:HB3	1:D:493:MET:SD	2.60	0.41
1:D:582:LEU:HD12	1:D:582:LEU:HA	1.89	0.41
1:D:616:LYS:HG3	1:D:625:THR:HG22	2.03	0.41
1:A:254:ILE:O	1:A:296:SER:HA	2.21	0.41
1:A:619:ASN:HB3	1:A:620:GLY:H	1.53	0.41
1:A:238:ARG:NH1	1:A:242:GLU:OE1	2.53	0.40
1:B:323:TYR:HA	1:B:330:GLN:NE2	2.35	0.40
1:C:455:GLU:HG3	1:C:506:ARG:HE	1.86	0.40
1:A:342:GLU:HG2	1:D:545:ASN:HB3	2.01	0.40
1:B:254:ILE:O	1:B:296:SER:HA	2.21	0.40
1:B:396:GLU:HG3	1:B:465:VAL:HG11	2.03	0.40
1:B:565:LEU:O	1:B:569:GLN:HG3	2.21	0.40
1:B:593:THR:CG2	1:B:595:HIS:HB2	2.51	0.40
1:D:209:MET:O	1:D:213:ILE:HG12	2.21	0.40
1:B:582:LEU:HD22	1:B:582:LEU:HA	1.92	0.40
1:B:565:LEU:HD12	1:B:680:VAL:HG13	2.03	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:510:VAL:CG2	1:B:265:GLN:NE2[1_554]	2.10	0.10

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	476/509 (94%)	459 (96%)	12 (2%)	5 (1%)	11	34
1	B	471/509 (92%)	454 (96%)	14 (3%)	3 (1%)	21	48
1	C	462/509 (91%)	438 (95%)	17 (4%)	7 (2%)	8	28
1	D	450/509 (88%)	430 (96%)	14 (3%)	6 (1%)	9	31
All	All	1859/2036 (91%)	1781 (96%)	57 (3%)	21 (1%)	11	34

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	456	SER
1	B	456	SER
1	C	352	THR
1	C	432	GLU
1	C	456	SER
1	D	456	SER
1	A	376	LYS
1	A	382	SER
1	B	232	LYS
1	B	382	SER
1	C	377	GLY
1	C	381	GLY
1	D	381	GLY
1	D	430	SER
1	A	233	THR
1	C	232	LYS
1	D	227	ALA

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Mol	Chain	Res	Type
1	D	232	LYS
1	C	382	SER
1	D	382	SER
1	A	381	GLY

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	407/436 (93%)	360 (88%)	47 (12%)	5	19
1	B	410/436 (94%)	368 (90%)	42 (10%)	7	24
1	C	403/436 (92%)	364 (90%)	39 (10%)	8	26
1	D	398/436 (91%)	359 (90%)	39 (10%)	7	26
All	All	1618/1744 (93%)	1451 (90%)	167 (10%)	7	24

All (167) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	206	LEU
1	A	207	THR
1	A	211	LYS
1	A	224	ILE
1	A	228	THR
1	A	233	THR
1	A	241	ILE
1	A	250	VAL
1	A	262	SER
1	A	283	MET
1	A	303	MET
1	A	307	LYS
1	A	327	THR
1	A	346	VAL
1	A	380	LEU
1	A	383	GLU
1	A	387	ILE

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Mol	Chain	Res	Type
1	A	392	ILE
1	A	395	GLU
1	A	405	VAL
1	A	438	ARG
1	A	439	VAL
1	A	447	VAL
1	A	454	ILE
1	A	455	GLU
1	A	469	THR
1	A	473	CYS
1	A	474	GLU
1	A	476	ARG
1	A	482	LYS
1	A	487	VAL
1	A	493	MET
1	A	523	VAL
1	A	526	LYS
1	A	566	MET
1	A	582	LEU
1	A	601	LEU
1	A	608	THR
1	A	610	VAL
1	A	613	LEU
1	A	623	THR
1	A	625	THR
1	A	628	ASN
1	A	646	TYR
1	A	648	THR
1	A	675	ARG
1	A	680	VAL
1	B	206	LEU
1	B	207	THR
1	B	224	ILE
1	B	228	THR
1	B	241	ILE
1	B	250	VAL
1	B	262	SER
1	B	283	MET
1	B	303	MET
1	B	307	LYS
1	B	327	THR
1	B	342	GLU

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Mol	Chain	Res	Type
1	B	346	VAL
1	B	380	LEU
1	B	385	LEU
1	B	387	ILE
1	B	392	ILE
1	B	395	GLU
1	B	405	VAL
1	B	439	VAL
1	B	447	VAL
1	B	454	ILE
1	B	455	GLU
1	B	459	THR
1	B	469	THR
1	B	473	CYS
1	B	474	GLU
1	B	476	ARG
1	B	487	VAL
1	B	493	MET
1	B	523	VAL
1	B	566	MET
1	B	582	LEU
1	B	610	VAL
1	B	613	LEU
1	B	625	THR
1	B	628	ASN
1	B	646	TYR
1	B	648	THR
1	B	675	ARG
1	B	678	LYS
1	B	680	VAL
1	C	206	LEU
1	C	207	THR
1	C	208	GLU
1	C	224	ILE
1	C	241	ILE
1	C	250	VAL
1	C	262	SER
1	C	283	MET
1	C	303	MET
1	C	307	LYS
1	C	327	THR
1	C	346	VAL

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Mol	Chain	Res	Type
1	C	370	ILE
1	C	380	LEU
1	C	383	GLU
1	C	387	ILE
1	C	392	ILE
1	C	438	ARG
1	C	442	SER
1	C	447	VAL
1	C	455	GLU
1	C	462	ASP
1	C	473	CYS
1	C	482	LYS
1	C	487	VAL
1	C	493	MET
1	C	523	VAL
1	C	566	MET
1	C	582	LEU
1	C	610	VAL
1	C	613	LEU
1	C	623	THR
1	C	625	THR
1	C	628	ASN
1	C	646	TYR
1	C	648	THR
1	C	678	LYS
1	C	680	VAL
1	C	683	LEU
1	D	206	LEU
1	D	207	THR
1	D	208	GLU
1	D	224	ILE
1	D	241	ILE
1	D	250	VAL
1	D	262	SER
1	D	283	MET
1	D	303	MET
1	D	307	LYS
1	D	327	THR
1	D	346	VAL
1	D	380	LEU
1	D	383	GLU
1	D	387	ILE

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Mol	Chain	Res	Type
1	D	392	ILE
1	D	395	GLU
1	D	402	LEU
1	D	438	ARG
1	D	447	VAL
1	D	455	GLU
1	D	473	CYS
1	D	482	LYS
1	D	487	VAL
1	D	493	MET
1	D	523	VAL
1	D	561	GLU
1	D	582	LEU
1	D	601	LEU
1	D	610	VAL
1	D	613	LEU
1	D	625	THR
1	D	628	ASN
1	D	636	LYS
1	D	646	TYR
1	D	648	THR
1	D	675	ARG
1	D	678	LYS
1	D	680	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (48) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	223	GLN
1	A	302	GLN
1	A	305	GLN
1	A	338	HIS
1	A	343	ASN
1	A	424	ASN
1	A	436	ASN
1	A	536	GLN
1	A	574	ASN
1	A	595	HIS
1	A	628	ASN
1	A	679	GLN
1	B	223	GLN
1	B	302	GLN

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Mol	Chain	Res	Type
1	B	305	GLN
1	B	324	HIS
1	B	338	HIS
1	B	343	ASN
1	B	424	ASN
1	B	436	ASN
1	B	500	GLN
1	B	536	GLN
1	B	574	ASN
1	B	595	HIS
1	B	628	ASN
1	B	679	GLN
1	C	223	GLN
1	C	302	GLN
1	C	305	GLN
1	C	324	HIS
1	C	338	HIS
1	C	343	ASN
1	C	424	ASN
1	C	536	GLN
1	C	574	ASN
1	C	595	HIS
1	C	609	GLN
1	C	628	ASN
1	D	223	GLN
1	D	302	GLN
1	D	305	GLN
1	D	324	HIS
1	D	338	HIS
1	D	343	ASN
1	D	536	GLN
1	D	574	ASN
1	D	595	HIS
1	D	628	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 [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	482/509 (94%)	-0.39	3 (0%) 85 69	39, 71, 111, 147	0
1	B	479/509 (94%)	-0.33	4 (0%) 82 63	41, 79, 123, 142	0
1	C	468/509 (91%)	-0.33	1 (0%) 91 83	41, 78, 117, 134	0
1	D	462/509 (90%)	-0.23	1 (0%) 91 83	43, 89, 128, 151	0
All	All	1891/2036 (92%)	-0.32	9 (0%) 87 72	39, 79, 121, 151	0

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	359	THR	3.6
1	C	324	HIS	3.2
1	D	324	HIS	3.2
1	A	324	HIS	3.0
1	A	454	ILE	2.8
1	B	454	ILE	2.4
1	B	324	HIS	2.4
1	A	359	THR	2.3
1	B	360	THR	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](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.