



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 05:46 PM UTC

PDB ID : 2BZR / pdb_00002bzs
Title : Crystal structure of accD5 (Rv3280), an acyl-CoA carboxylase beta- subunit from Mycobacterium tuberculosis
Authors : Holton, S.J.
Deposited on : 2005-08-22
Resolution : 2.20 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

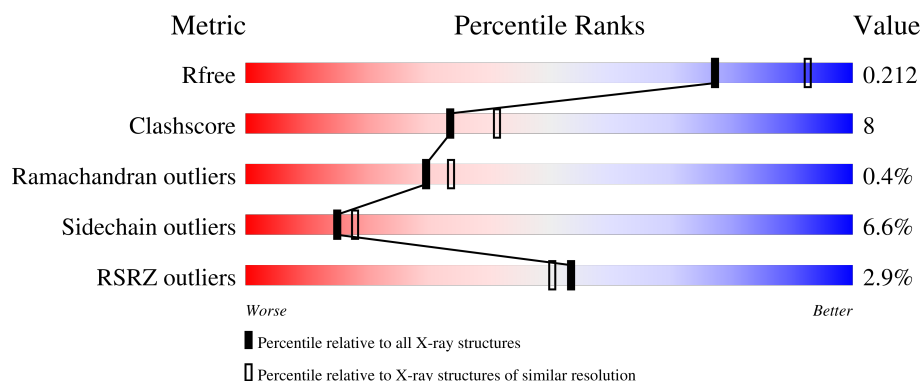
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (2.20-2.20)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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	548	3% 76% 15% • 7%
1	B	548	2% 76% 14% • 8%
1	C	548	4% 74% 15% • • 8%
1	D	548	3% 77% 13% • • 7%
1	E	548	0% 74% 17% • 8%

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Mol	Chain	Length	Quality of chain
1	F	548	3% 76% 14% 8%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 24961 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 PROPIONYL-COA CARBOXYLASE BETA CHAIN 5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	512	Total	C	N	O	S	0	6	0
			3948	2488	684	760	16			
1	B	504	Total	C	N	O	S	0	7	0
			3883	2449	669	749	16			
1	C	506	Total	C	N	O	S	0	1	0
			3862	2434	670	742	16			
1	D	508	Total	C	N	O	S	0	0	0
			3875	2441	674	744	16			
1	E	506	Total	C	N	O	S	0	0	0
			3857	2431	670	740	16			
1	F	505	Total	C	N	O	S	0	0	0
			3846	2425	666	739	16			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	512	GLY	ASP	conflict	UNP P96885
B	512	GLY	ASP	conflict	UNP P96885
C	512	GLY	ASP	conflict	UNP P96885
D	512	GLY	ASP	conflict	UNP P96885
E	512	GLY	ASP	conflict	UNP P96885
F	512	GLY	ASP	conflict	UNP P96885

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	280	Total	O	0	0
			280	280		
2	B	273	Total	O	0	0
			273	273		
2	C	285	Total	O	0	0
			285	285		

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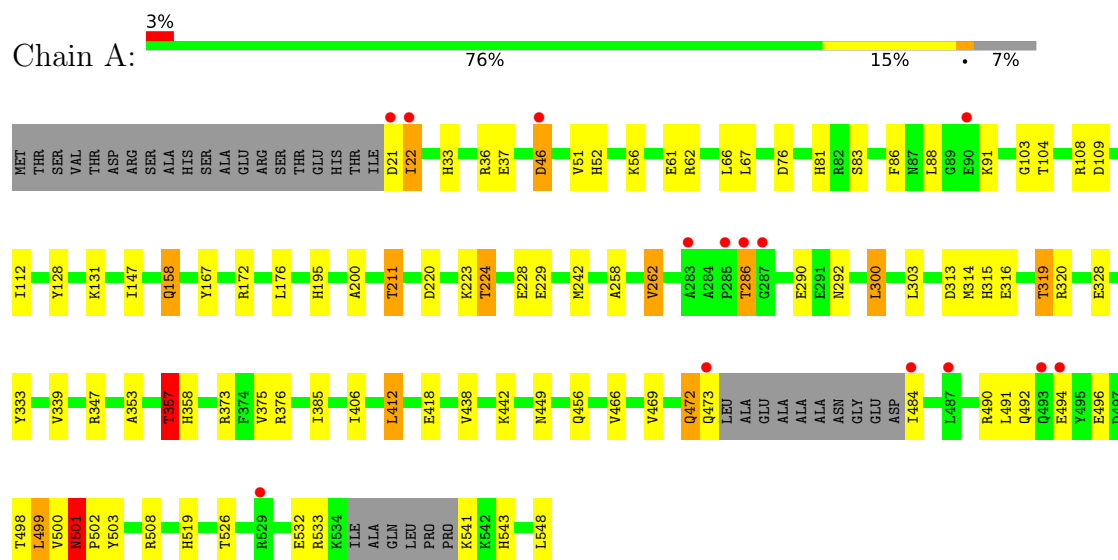
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	D	271	Total 271	O 271	0	0
2	E	307	Total 307	O 307	0	0
2	F	274	Total 274	O 274	0	0

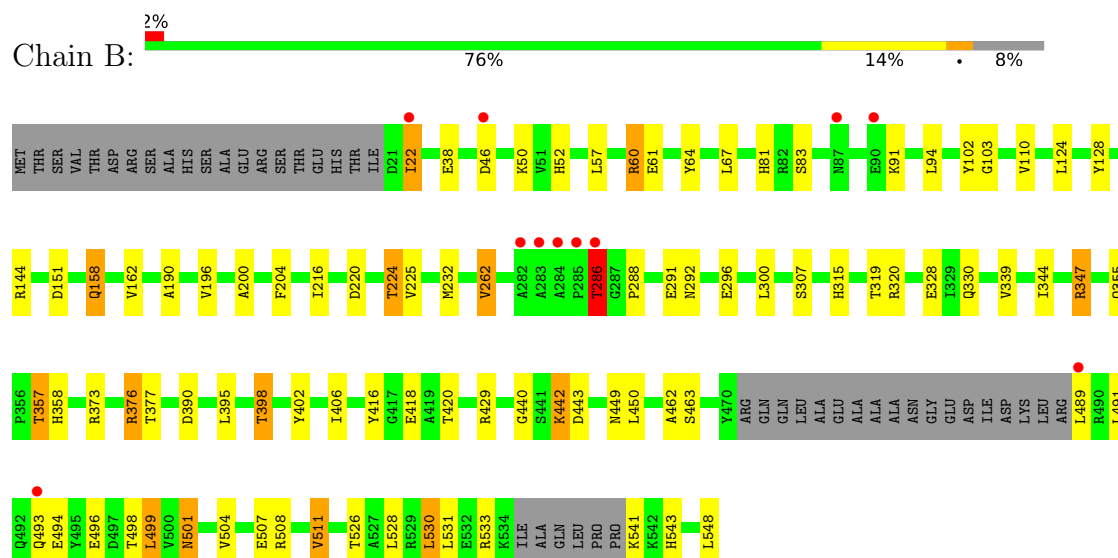
3 Residue-property plots

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: PROPIONYL-COA CARBOXYLASE BETA CHAIN 5

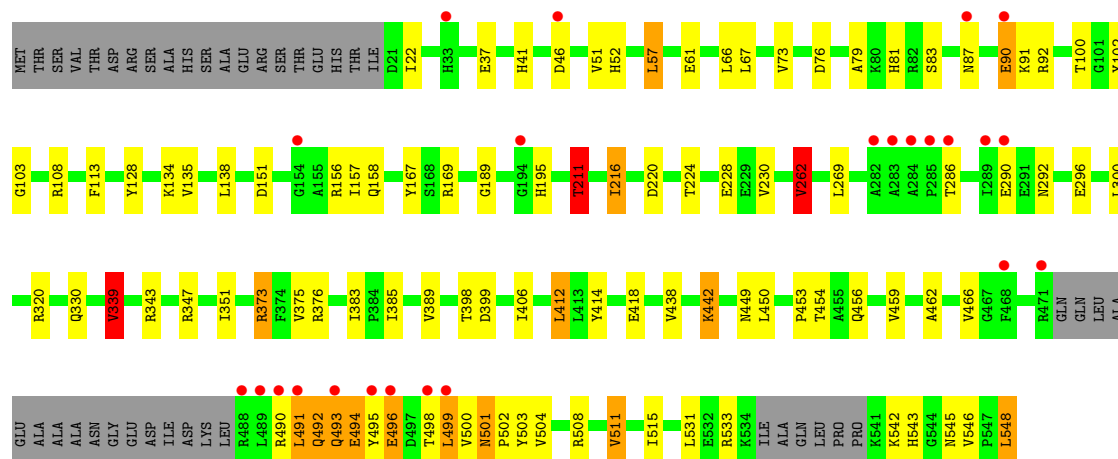


• Molecule 1: PROPIONYL-COA CARBOXYLASE BETA CHAIN 5

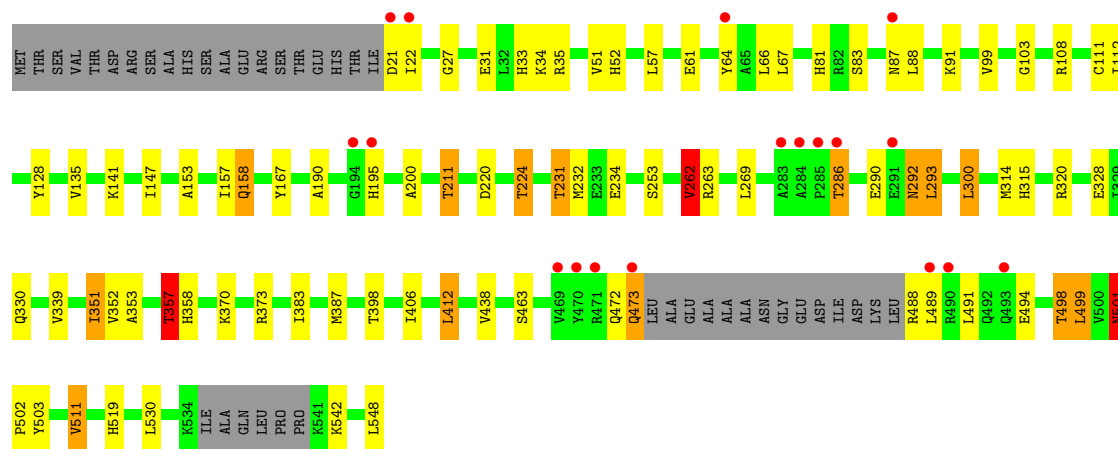
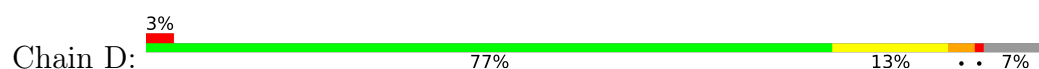


• Molecule 1: PROPIONYL-COA CARBOXYLASE BETA CHAIN 5

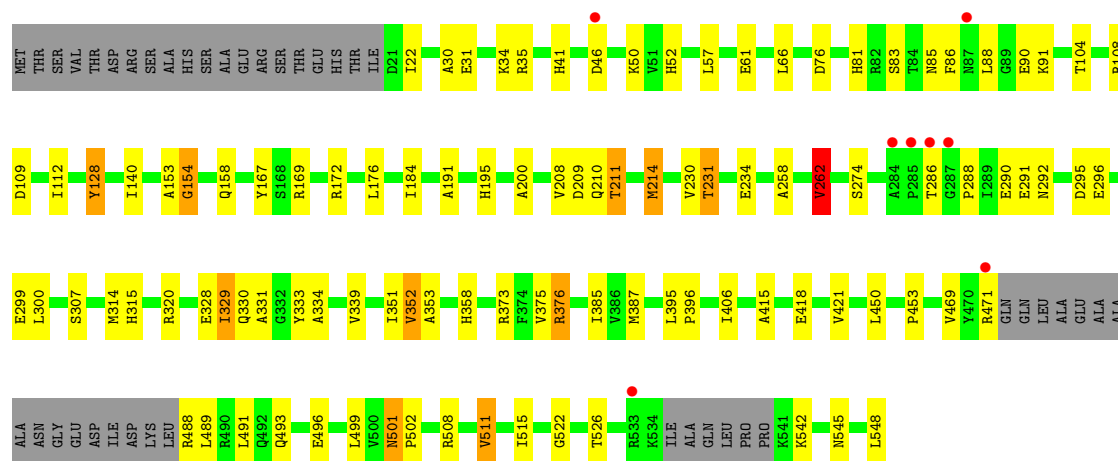




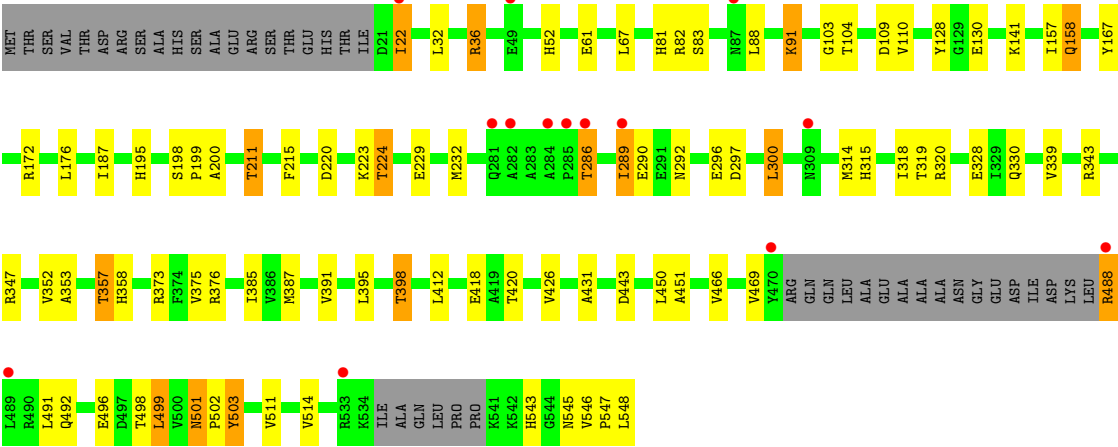
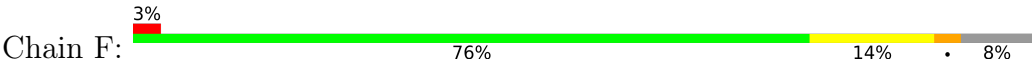
• Molecule 1: PROPIONYL-COA CARBOXYLASE BETA CHAIN 5



• Molecule 1: PROPIONYL-COA CARBOXYLASE BETA CHAIN 5



• Molecule 1: PROPIONYL-COA CARBOXYLASE BETA CHAIN 5



4 Data and refinement statistics

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants a, b, c, α , β , γ	173.56Å 173.56Å 339.82Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	32.09 – 2.20 32.09 – 2.20	Depositor EDS
% Data completeness (in resolution range)	100.0 (32.09-2.20) 96.4 (32.09-2.20)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.89 (at 2.20Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.176 , 0.211 0.179 , 0.212	Depositor DCC
R_{free} test set	13260 reflections (5.27%)	wwPDB-VP
Wilson B-factor (Å ²)	22.8	Xtriage
Anisotropy	0.026	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 45.2	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	0.94	EDS
Total number of atoms	24961	wwPDB-VP
Average B, all atoms (Å ²)	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.00% 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	1.06	1/4030 (0.0%)	1.09	5/5464 (0.1%)
1	B	1.02	2/3966 (0.1%)	1.08	9/5381 (0.2%)
1	C	1.07	4/3938 (0.1%)	1.06	9/5341 (0.2%)
1	D	1.09	6/3948 (0.2%)	1.10	8/5354 (0.1%)
1	E	1.10	8/3930 (0.2%)	1.10	10/5330 (0.2%)
1	F	1.04	6/3919 (0.2%)	1.05	3/5316 (0.1%)
All	All	1.06	27/23731 (0.1%)	1.08	44/32186 (0.1%)

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	D	0	2
1	E	0	1
All	All	0	3

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	431	ALA	CA-CB	7.04	1.61	1.52
1	E	511	VAL	CA-CB	6.64	1.62	1.54
1	C	511	VAL	CA-CB	6.60	1.62	1.54
1	E	230	VAL	CA-CB	6.49	1.63	1.54
1	D	511	VAL	CA-CB	6.30	1.62	1.54
1	E	415	ALA	CA-CB	6.17	1.62	1.53
1	D	286	THR	CA-CB	6.12	1.62	1.52
1	A	51	VAL	CA-CB	6.03	1.61	1.54
1	E	112	ILE	CA-CB	5.95	1.63	1.54
1	B	162	VAL	CA-CB	5.89	1.61	1.54
1	D	262	VAL	CA-CB	5.71	1.61	1.54
1	F	391	VAL	CA-CB	5.66	1.61	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	459	VAL	CA-CB	5.52	1.61	1.54
1	F	426	VAL	CA-CB	5.51	1.61	1.53
1	D	351	ILE	CA-CB	5.50	1.61	1.54
1	F	286	THR	CA-CB	5.40	1.60	1.53
1	E	30	ALA	CA-CB	5.40	1.61	1.53
1	E	421	VAL	CA-CB	5.37	1.61	1.54
1	C	230	VAL	CA-CB	5.32	1.61	1.55
1	D	51	VAL	CA-CB	5.27	1.60	1.54
1	F	187	ILE	CA-CB	5.25	1.60	1.54
1	B	511	VAL	CA-CB	5.24	1.60	1.54
1	C	51	VAL	CA-CB	5.24	1.60	1.54
1	E	352	VAL	CA-CB	5.21	1.61	1.54
1	F	157	ILE	CA-CB	5.21	1.60	1.54
1	E	329	ILE	CA-CB	5.11	1.60	1.54
1	D	99	VAL	CA-CB	5.04	1.60	1.54

All (44) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	293	LEU	N-CA-C	8.57	129.06	110.80
1	D	501	ASN	CA-C-N	-7.01	112.97	120.47
1	D	501	ASN	C-N-CA	-7.01	112.97	120.47
1	B	286	THR	N-CA-C	-6.87	103.72	111.14
1	C	262	VAL	N-CA-C	6.57	117.33	110.62
1	B	307	SER	CA-C-N	6.56	126.49	119.28
1	B	307	SER	C-N-CA	6.56	126.49	119.28
1	B	355	GLN	CA-C-N	6.19	125.87	119.56
1	B	355	GLN	C-N-CA	6.19	125.87	119.56
1	E	262	VAL	N-CA-C	6.07	116.81	110.62
1	A	86	PHE	CB-CA-C	-6.03	103.32	111.89
1	B	262	VAL	N-CA-C	5.99	116.77	110.72
1	B	376	ARG	NE-CZ-NH2	-5.92	113.87	119.20
1	F	503	TYR	N-CA-C	5.84	119.58	112.23
1	E	376	ARG	NE-CZ-NH2	-5.80	113.98	119.20
1	B	347	ARG	CB-CA-C	5.76	116.27	109.47
1	C	389	VAL	N-CA-C	5.68	116.06	108.11
1	C	216	ILE	CB-CA-C	-5.65	104.75	111.81
1	E	307	SER	CA-C-N	5.59	125.96	119.47
1	E	307	SER	C-N-CA	5.59	125.96	119.47
1	B	60	ARG	N-CA-CB	-5.52	102.01	110.12
1	D	157	ILE	CB-CA-C	-5.45	104.90	112.04
1	D	153	ALA	CA-C-N	-5.40	112.82	122.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	153	ALA	C-N-CA	-5.40	112.82	122.00
1	D	262	VAL	N-CA-CB	5.40	117.88	110.54
1	C	262	VAL	N-CA-CB	5.39	117.88	110.54
1	E	274	SER	CB-CA-C	-5.28	101.28	110.09
1	A	357	THR	N-CA-CB	-5.25	101.58	110.41
1	E	128	TYR	CA-CB-CG	5.25	123.35	113.90
1	D	357	THR	N-CA-CB	-5.23	102.43	110.44
1	E	86	PHE	CB-CA-C	-5.19	104.53	111.89
1	E	153	ALA	CA-C-N	-5.17	111.27	121.41
1	E	153	ALA	C-N-CA	-5.17	111.27	121.41
1	F	318	ILE	CA-C-N	5.17	127.20	120.28
1	F	318	ILE	C-N-CA	5.17	127.20	120.28
1	C	339	VAL	N-CA-CB	-5.13	103.02	111.44
1	C	211	THR	N-CA-CB	-5.11	102.90	110.61
1	C	211	THR	CB-CA-C	5.11	118.80	110.17
1	A	501	ASN	CA-C-N	5.10	124.79	119.64
1	A	501	ASN	C-N-CA	5.10	124.79	119.64
1	A	86	PHE	N-CA-C	5.10	118.43	111.39
1	E	86	PHE	N-CA-C	5.05	118.36	111.39
1	C	494	GLU	CA-C-N	5.02	127.32	120.54
1	C	494	GLU	C-N-CA	5.02	127.32	120.54

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	292	ASN	Peptide
1	D	498	THR	Peptide
1	E	154	GLY	Peptide

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	3948	0	3917	66	0
1	B	3883	0	3841	56	0
1	C	3862	0	3827	71	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	3875	0	3839	65	0
1	E	3857	0	3823	61	0
1	F	3846	0	3810	55	0
2	A	280	0	0	12	0
2	B	273	0	0	8	0
2	C	285	0	0	14	0
2	D	271	0	0	15	0
2	E	307	0	0	13	0
2	F	274	0	0	17	0
All	All	24961	0	23057	355	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 8.

All (355) 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:399[B]:ASP:OD1	2:C:2222:HOH:O	1.62	1.15
1:E:154:GLY:HA2	2:E:2095:HOH:O	1.47	1.12
1:C:286:THR:HB	1:C:292:ASN:HD21	1.19	1.04
1:E:286:THR:HB	1:E:292:ASN:HD21	1.23	1.03
1:A:158:GLN:H	1:A:158:GLN:HE21	1.09	0.96
1:D:231:THR:HG22	1:D:234:GLU:H	1.33	0.90
1:A:52:HIS:HE1	1:A:61:GLU:OE1	1.58	0.87
1:C:286:THR:HB	1:C:292:ASN:ND2	1.90	0.87
1:D:167:TYR:CE1	1:D:195:HIS:HB3	2.10	0.86
1:C:81:HIS:HD2	1:C:83:SER:H	1.22	0.85
1:D:472:GLN:HB2	1:D:473:GLN:HE21	1.42	0.84
1:F:357:THR:HG21	2:F:2185:HOH:O	1.78	0.84
1:C:501:ASN:HD22	1:C:501:ASN:C	1.86	0.83
1:B:81:HIS:HD2	1:B:83:SER:H	1.26	0.83
1:C:37:GLU:OE2	1:C:41:HIS:HE1	1.61	0.82
1:E:231:THR:HG22	1:E:234:GLU:H	1.44	0.82
1:A:81:HIS:HD2	1:A:83:SER:H	1.29	0.81
1:D:81:HIS:HD2	1:D:83:SER:H	1.27	0.81
1:E:286:THR:HB	1:E:292:ASN:ND2	1.96	0.81
1:C:211:THR:CG2	2:C:2140:HOH:O	2.28	0.80
1:E:286:THR:CB	1:E:292:ASN:HD21	1.93	0.80
1:D:108:ARG:HD2	2:D:2055:HOH:O	1.80	0.79
1:D:358:HIS:HE1	2:D:2197:HOH:O	1.64	0.79
1:A:357:THR:HG21	2:A:2194:HOH:O	1.80	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:211:THR:CG2	2:F:2097:HOH:O	2.32	0.78
1:F:286:THR:HB	1:F:292:ASN:HD21	1.50	0.77
1:B:442:LYS:HE2	1:B:449:ASN:OD1	1.86	0.76
1:A:526:THR:HB	2:B:2055:HOH:O	1.85	0.76
1:A:158:GLN:H	1:A:158:GLN:NE2	1.83	0.75
1:A:228:GLU:OE1	1:D:398:THR:HG23	1.86	0.75
1:E:376:ARG:HD2	1:E:418:GLU:OE2	1.86	0.75
1:F:81:HIS:HD2	1:F:83:SER:H	1.35	0.75
1:D:231:THR:HG21	2:D:2051:HOH:O	1.85	0.74
1:E:211:THR:HG23	2:E:2102:HOH:O	1.86	0.74
1:D:33:HIS:HB3	2:D:2005:HOH:O	1.87	0.74
1:D:519:HIS:HD2	2:F:2007:HOH:O	1.69	0.74
1:C:286:THR:CB	1:C:292:ASN:HD21	1.99	0.73
1:F:488:ARG:N	2:F:2243:HOH:O	2.22	0.73
1:B:501:ASN:C	1:B:501:ASN:HD22	1.97	0.73
1:E:231:THR:HG21	2:E:2126:HOH:O	1.89	0.72
1:A:376:ARG:HD2	1:A:418:GLU:OE2	1.90	0.72
1:C:376:ARG:HD2	1:C:418:GLU:OE2	1.89	0.71
1:C:211:THR:HG23	2:C:2140:HOH:O	1.88	0.71
1:D:211:THR:HG23	2:D:2127:HOH:O	1.88	0.71
1:D:111:CYS:HB3	1:D:135:VAL:CG2	2.21	0.70
1:A:498:THR:HG22	1:A:499:LEU:HD13	1.73	0.70
1:B:357:THR:HG21	2:B:2192:HOH:O	1.91	0.70
1:B:315:HIS:HE1	1:B:328:GLU:OE2	1.75	0.70
1:E:52:HIS:HD2	2:E:2017:HOH:O	1.73	0.70
1:F:224:THR:HG21	2:F:2113:HOH:O	1.92	0.68
1:C:495:TYR:HA	2:C:2257:HOH:O	1.92	0.68
1:C:498:THR:HB	2:C:2257:HOH:O	1.93	0.68
1:D:211:THR:CG2	2:D:2127:HOH:O	2.42	0.68
1:C:498:THR:HG22	1:C:499:LEU:HD13	1.74	0.68
1:F:358:HIS:HE1	2:F:2187:HOH:O	1.75	0.68
1:D:501:ASN:C	1:D:501:ASN:HD22	2.01	0.68
1:C:442:LYS:HE2	1:C:449:ASN:OD1	1.94	0.67
1:B:489:LEU:O	1:B:493[A]:GLN:HG2	1.94	0.67
1:C:52:HIS:HE1	1:C:61:GLU:OE1	1.76	0.67
1:D:253:SER:HB3	2:D:2046:HOH:O	1.93	0.67
1:E:81:HIS:HD2	1:E:83:SER:H	1.42	0.67
1:C:542:LYS:HD2	2:F:2200:HOH:O	1.95	0.67
1:D:286:THR:O	1:D:286:THR:HG22	1.95	0.67
1:C:167:TYR:CE1	1:C:195:HIS:HB3	2.29	0.67
1:B:52:HIS:HE1	1:B:61:GLU:OE1	1.77	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:315:HIS:HE1	1:E:328:GLU:OE2	1.78	0.66
1:B:376:ARG:HD2	1:B:418:GLU:OE2	1.96	0.65
1:C:108:ARG:HD2	2:C:2062:HOH:O	1.96	0.65
1:B:344:ILE:O	1:B:347:ARG:HG2	1.96	0.65
1:D:286:THR:HB	1:D:292:ASN:HD21	1.61	0.65
1:B:158:GLN:H	1:B:158:GLN:NE2	1.94	0.65
1:B:420:THR:OG1	1:E:542:LYS:HE2	1.96	0.65
1:B:494:GLU:O	1:B:498:THR:HG23	1.97	0.65
1:E:81:HIS:HE1	1:E:91:LYS:O	1.80	0.64
1:D:64:TYR:HD1	2:D:2023:HOH:O	1.80	0.64
1:D:263:ARG:HD2	2:D:2133:HOH:O	1.98	0.63
1:F:158:GLN:H	1:F:158:GLN:HE21	1.44	0.63
1:A:211:THR:CG2	2:A:2088:HOH:O	2.46	0.63
1:D:473:GLN:HE21	1:D:473:GLN:H	1.46	0.63
1:D:472:GLN:HB2	1:D:473:GLN:NE2	2.12	0.63
1:D:412:LEU:HD13	1:D:438:VAL:CG1	2.29	0.63
1:E:358:HIS:HE1	2:E:2219:HOH:O	1.81	0.62
1:A:490:ARG:O	1:A:494:GLU:HG3	2.00	0.61
1:E:501:ASN:HB2	1:E:502:PRO:CD	2.30	0.61
1:D:66:LEU:HD11	1:D:262:VAL:HG22	1.82	0.61
1:F:67:LEU:HD13	1:F:103:GLY:HA3	1.83	0.61
1:A:358:HIS:HE1	2:A:2196:HOH:O	1.84	0.61
1:B:358:HIS:HE1	2:B:2193:HOH:O	1.84	0.60
1:D:111:CYS:HB3	1:D:135:VAL:HG23	1.82	0.60
1:E:66:LEU:HD11	1:E:262:VAL:HG22	1.83	0.60
1:A:158:GLN:HE21	1:A:158:GLN:N	1.90	0.60
1:B:541:LYS:N	2:B:2268:HOH:O	2.34	0.59
1:C:542:LYS:HE2	1:F:420:THR:OG1	2.02	0.59
1:A:519:HIS:HD2	2:B:2005:HOH:O	1.84	0.59
1:C:412:LEU:HD13	1:C:438:VAL:CG1	2.32	0.59
1:E:88:LEU:HD11	1:E:158:GLN:HB2	1.84	0.59
1:E:296:GLU:HG2	1:E:320:ARG:HG2	1.85	0.59
1:C:453:PRO:HD3	1:C:515:ILE:O	2.02	0.58
1:F:376:ARG:HD2	1:F:418:GLU:OE2	2.03	0.58
1:D:357:THR:CG2	2:D:2196:HOH:O	2.51	0.58
1:C:87:ASN:HB3	1:C:90:GLU:OE1	2.04	0.58
1:E:288:PRO:HD2	1:E:291:GLU:OE2	2.03	0.58
1:F:220:ASP:O	1:F:224:THR:HG23	2.04	0.58
1:D:108:ARG:CD	2:D:2055:HOH:O	2.46	0.57
1:A:286:THR:HB	1:A:292:ASN:HD21	1.68	0.57
1:B:442:LYS:CE	1:B:449:ASN:OD1	2.53	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:466:VAL:HG11	1:F:492:GLN:HA	1.86	0.57
1:D:412:LEU:HD13	1:D:438:VAL:HG12	1.87	0.57
1:A:347:ARG:NH2	1:A:532:GLU:OE1	2.27	0.56
1:D:52:HIS:HD2	2:D:2012:HOH:O	1.88	0.56
1:C:37:GLU:OE2	1:C:41:HIS:CE1	2.51	0.56
1:C:508:ARG:HD3	2:C:2264:HOH:O	2.06	0.56
1:F:167:TYR:CE1	1:F:195:HIS:HB3	2.41	0.56
1:F:498:THR:HG22	1:F:499:LEU:HD13	1.88	0.56
1:A:501:ASN:HB2	1:A:502:PRO:CD	2.36	0.56
1:B:499:LEU:HD12	1:B:504:VAL:HG21	1.87	0.56
1:A:81:HIS:HD2	1:A:83:SER:N	2.02	0.55
1:F:315:HIS:HE1	1:F:328:GLU:OE2	1.90	0.55
1:D:220:ASP:O	1:D:224:THR:HG23	2.06	0.55
1:A:300:LEU:HD13	1:A:320:ARG:HD2	1.88	0.55
1:B:67:LEU:HD13	1:B:103:GLY:HA3	1.89	0.55
1:A:81:HIS:HE1	1:A:91:LYS:O	1.90	0.55
1:C:442:LYS:CE	1:C:449:ASN:OD1	2.54	0.55
1:A:88:LEU:HD11	1:A:158:GLN:HB2	1.89	0.55
1:C:466:VAL:HG11	1:C:492:GLN:HA	1.89	0.55
1:C:286:THR:HG22	1:C:286:THR:O	2.07	0.54
1:C:399[B]:ASP:OD1	2:C:2221:HOH:O	2.18	0.54
1:F:52:HIS:HE1	1:F:61:GLU:OE1	1.90	0.54
1:D:231:THR:CG2	1:D:234:GLU:H	2.13	0.54
1:C:296:GLU:CG	1:C:320:ARG:HG2	2.37	0.54
1:A:21:ASP:N	2:A:2001:HOH:O	2.41	0.54
1:A:33:HIS:NE2	1:A:37[A]:GLU:OE2	2.40	0.54
1:F:501:ASN:HD22	1:F:503:TYR:H	1.56	0.54
1:A:541:LYS:N	2:A:2277:HOH:O	2.40	0.54
1:A:442:LYS:HE2	1:A:449:ASN:OD1	2.07	0.54
1:F:88:LEU:HD11	1:F:158:GLN:HB2	1.89	0.54
1:A:67:LEU:HD13	1:A:103:GLY:HA3	1.90	0.54
1:E:501:ASN:HB2	1:E:502:PRO:HD2	1.90	0.54
1:A:315:HIS:HE1	1:A:328:GLU:OE2	1.91	0.53
1:C:412:LEU:HD13	1:C:438:VAL:HG12	1.89	0.53
1:E:211:THR:CG2	2:E:2102:HOH:O	2.50	0.53
1:E:375:VAL:HG13	1:E:385:ILE:HD13	1.90	0.53
1:C:462:ALA:HB2	1:C:496:GLU:HB3	1.90	0.53
1:F:375:VAL:HG13	1:F:385:ILE:HD13	1.90	0.53
1:C:456:GLN:HB3	1:C:500:VAL:HG12	1.91	0.53
1:C:546:VAL:HG13	1:C:548:LEU:HD13	1.89	0.53
1:F:104:THR:HG22	1:F:109:ASP:OD1	2.07	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:501:ASN:HD22	1:F:501:ASN:C	2.16	0.53
1:A:315:HIS:O	1:A:319:THR:HB	2.09	0.53
1:D:269:LEU:HD23	1:D:383:ILE:HD11	1.90	0.53
1:A:526:THR:HG22	1:B:102:TYR:HE1	1.72	0.53
1:F:198:SER:HB3	1:F:199:PRO:CD	2.39	0.53
1:E:46:ASP:OD2	1:E:50:LYS:HE3	2.09	0.52
1:C:462:ALA:CB	1:C:496:GLU:HB3	2.38	0.52
1:E:295:ASP:O	1:E:299:GLU:HG3	2.09	0.52
1:B:220[B]:ASP:O	1:B:224:THR:HG23	2.09	0.52
1:C:501:ASN:C	1:C:501:ASN:ND2	2.60	0.52
1:D:300:LEU:HD13	1:D:320:ARG:HD2	1.92	0.52
1:D:167:TYR:CZ	1:D:195:HIS:HB3	2.45	0.52
1:D:473:GLN:H	1:D:473:GLN:NE2	2.08	0.52
1:A:303:LEU:HD11	1:A:316:GLU:HB3	1.91	0.51
1:A:81:HIS:CD2	1:A:83:SER:H	2.19	0.51
1:D:315:HIS:HE1	1:D:328:GLU:OE2	1.93	0.51
1:B:190:ALA:HB2	1:B:232:MET:HE1	1.90	0.51
1:D:21:ASP:O	1:D:27:GLY:HA3	2.10	0.51
1:A:167:TYR:CE1	1:A:195:HIS:HB3	2.46	0.51
1:B:220[A]:ASP:O	1:B:224:THR:HG23	2.10	0.51
1:F:289:ILE:HD12	1:F:290:GLU:OE1	2.10	0.51
1:A:501:ASN:C	1:A:501:ASN:HD22	2.19	0.51
1:C:169:ARG:HG3	1:F:443:ASP:HB3	1.93	0.51
1:A:108:ARG:HD3	2:A:2048:HOH:O	2.11	0.51
1:A:286:THR:CB	1:A:292:ASN:HD21	2.24	0.51
1:B:398:THR:HG23	1:B:402:TYR:CE1	2.46	0.51
1:E:52:HIS:HE1	1:E:61:GLU:OE1	1.93	0.51
1:F:224:THR:CG2	2:F:2113:HOH:O	2.55	0.51
1:B:190:ALA:CB	1:B:232:MET:HE1	2.41	0.50
1:F:501:ASN:ND2	1:F:503:TYR:H	2.09	0.50
1:A:501:ASN:HD22	1:A:503:TYR:H	1.59	0.50
1:B:462:ALA:HB2	1:B:496:GLU:HB3	1.92	0.50
1:B:526:THR:HG21	1:C:73:VAL:HG21	1.93	0.50
1:D:31:GLU:O	1:D:35:ARG:HG3	2.11	0.50
1:A:46:ASP:HA	2:A:2014:HOH:O	2.11	0.50
1:E:76:ASP:HA	2:F:2256:HOH:O	2.12	0.50
1:B:60:ARG:HG2	1:B:64:TYR:CE1	2.47	0.49
1:D:314:MET:HG2	1:D:353:ALA:HB1	1.92	0.49
1:F:223:LYS:HD3	1:F:229:GLU:HG2	1.92	0.49
1:F:158:GLN:H	1:F:158:GLN:NE2	2.11	0.49
1:C:57:LEU:HG	1:C:61:GLU:HB3	1.93	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:314:MET:HG2	1:A:353:ALA:HB1	1.94	0.49
1:B:225:VAL:HG11	1:E:396:PRO:HG2	1.93	0.49
1:C:296:GLU:HG2	1:C:320:ARG:HG2	1.94	0.49
1:E:81:HIS:CE1	1:E:91:LYS:O	2.64	0.49
1:F:358:HIS:HD2	2:F:2184:HOH:O	1.96	0.49
1:A:108:ARG:CD	2:A:2048:HOH:O	2.61	0.48
1:D:52:HIS:HE1	1:D:61:GLU:OE1	1.95	0.48
1:A:46:ASP:HB2	2:A:2011:HOH:O	2.13	0.48
1:B:530:LEU:HD11	1:C:138:LEU:HD21	1.95	0.48
1:E:496:GLU:HG2	2:E:2282:HOH:O	2.13	0.48
1:B:330:GLN:NE2	2:B:2177:HOH:O	2.45	0.48
1:B:158:GLN:H	1:B:158:GLN:HE21	1.61	0.47
1:B:526:THR:HG22	1:C:102:TYR:HE1	1.78	0.47
1:E:41:HIS:O	1:E:41:HIS:CD2	2.68	0.47
1:F:488:ARG:CA	2:F:2243:HOH:O	2.60	0.47
1:A:313:ASP:OD1	1:A:315:HIS:HD2	1.96	0.47
1:D:190:ALA:HB2	1:D:232:MET:HE1	1.97	0.47
1:C:501:ASN:HD21	1:C:504:VAL:H	1.62	0.47
1:F:297:ASP:O	1:F:300:LEU:HB2	2.14	0.47
1:F:215:PHE:HZ	1:F:232:MET:HE3	1.79	0.47
1:C:195:HIS:CD2	1:C:195:HIS:H	2.33	0.47
1:D:339:VAL:HA	1:D:351:ILE:O	2.14	0.47
1:F:198:SER:HB3	1:F:199:PRO:HD3	1.94	0.47
1:C:339:VAL:HA	1:C:351:ILE:O	2.15	0.47
1:B:406:ILE:HG22	1:E:200:ALA:HB2	1.97	0.47
1:D:501:ASN:C	1:D:501:ASN:ND2	2.72	0.47
1:E:508:ARG:CD	2:E:2288:HOH:O	2.63	0.47
1:F:358:HIS:HB2	2:F:2186:HOH:O	2.14	0.47
1:A:533:ARG:HD2	1:B:144:ARG:HH22	1.80	0.47
1:E:288:PRO:CD	1:E:291:GLU:OE2	2.63	0.47
1:D:81:HIS:HE1	1:D:91:LYS:O	1.97	0.46
1:B:390:ASP:CG	1:B:429:ARG:HB3	2.41	0.46
1:F:82:ARG:HD3	2:F:2037:HOH:O	2.15	0.46
1:F:215:PHE:CZ	1:F:232:MET:HE3	2.51	0.46
1:F:296:GLU:HG2	1:F:320:ARG:HG2	1.96	0.46
1:A:66:LEU:HD11	1:A:262:VAL:HG22	1.97	0.46
1:C:100:THR:HG22	1:C:113:PHE:HB3	1.98	0.46
1:A:412:LEU:HD13	1:A:438:VAL:HG12	1.96	0.46
1:E:31:GLU:O	1:E:35:ARG:HG3	2.16	0.46
1:F:546:VAL:CG2	1:F:547:PRO:HD2	2.46	0.46
1:F:81:HIS:HE1	1:F:91:LYS:O	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:67:LEU:HD13	1:D:103:GLY:HA3	1.96	0.46
1:D:81:HIS:HD2	1:D:83:SER:N	2.03	0.46
1:D:357:THR:HG23	2:D:2196:HOH:O	2.13	0.46
1:E:501:ASN:C	1:E:501:ASN:HD22	2.24	0.46
1:F:501:ASN:HB2	1:F:502:PRO:CD	2.46	0.46
1:C:67:LEU:HD13	1:C:103:GLY:HA3	1.99	0.45
1:C:158:GLN:H	1:C:158:GLN:NE2	2.15	0.45
1:E:108:ARG:HD2	2:E:2062:HOH:O	2.16	0.45
1:A:52:HIS:CE1	1:A:61:GLU:OE1	2.50	0.45
1:C:76:ASP:OD1	1:C:134:LYS:NZ	2.48	0.45
1:C:108:ARG:CD	2:C:2062:HOH:O	2.62	0.45
1:C:466:VAL:HG11	1:C:492:GLN:CA	2.47	0.45
1:A:508:ARG:HD3	2:A:2258:HOH:O	2.16	0.44
1:E:140:ILE:HD13	1:E:176:LEU:HD23	1.99	0.44
1:B:81:HIS:HD2	1:B:83:SER:N	2.04	0.44
1:A:76:ASP:HA	2:C:2261:HOH:O	2.16	0.44
1:B:507:GLU:HA	1:C:79:ALA:HA	1.99	0.44
1:C:52:HIS:HD2	2:C:2023:HOH:O	1.99	0.44
1:D:330:GLN:NE2	2:D:2183:HOH:O	2.50	0.44
1:E:314:MET:HG2	1:E:353:ALA:HB1	1.98	0.44
1:F:343:ARG:HA	1:F:347:ARG:O	2.17	0.44
1:D:501:ASN:HB2	1:D:502:PRO:CD	2.47	0.44
1:E:195:HIS:CD2	1:E:195:HIS:H	2.36	0.44
1:F:488:ARG:N	2:F:2244:HOH:O	2.51	0.44
1:A:466:VAL:HG11	1:A:492:GLN:HA	1.99	0.44
1:E:209:ASP:O	1:E:210:GLN:HB2	2.18	0.44
1:C:66:LEU:HD11	1:C:262:VAL:HG22	2.00	0.44
1:A:375:VAL:HG13	1:A:385:ILE:HD13	1.99	0.44
1:A:406:ILE:HG22	1:D:200:ALA:HB2	2.00	0.44
1:D:81:HIS:CD2	1:D:83:SER:H	2.19	0.44
1:A:104:THR:HG22	1:A:109:ASP:OD1	2.17	0.44
1:F:330:GLN:NE2	2:F:2169:HOH:O	2.51	0.44
1:A:223:LYS:HD3	1:A:229:GLU:HG2	1.98	0.43
1:C:220:ASP:O	1:C:224:THR:HG23	2.17	0.43
1:E:339:VAL:HA	1:E:351:ILE:O	2.18	0.43
1:B:200:ALA:HB2	1:E:406:ILE:HG22	1.98	0.43
1:B:204:PHE:CZ	1:B:377:THR:HG21	2.54	0.43
1:B:541:LYS:CA	2:B:2268:HOH:O	2.64	0.43
1:C:456:GLN:HB3	1:C:500:VAL:CG1	2.48	0.43
1:C:92:ARG:HD3	2:C:2052:HOH:O	2.18	0.43
1:C:414:TYR:C	1:C:414:TYR:CD2	2.96	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:352:VAL:O	1:F:387:MET:HA	2.18	0.43
1:A:501:ASN:ND2	1:A:503:TYR:H	2.15	0.43
1:E:167:TYR:CE1	1:E:195:HIS:HB3	2.53	0.43
1:A:456:GLN:HB3	1:A:500:VAL:HG12	2.01	0.43
1:B:288:PRO:HG2	1:B:291:GLU:HG3	1.99	0.43
1:C:343:ARG:HA	1:C:347:ARG:O	2.19	0.43
1:A:220:ASP:O	1:A:224:THR:HG23	2.19	0.43
1:A:412:LEU:HD13	1:A:438:VAL:CG1	2.49	0.43
1:C:501:ASN:HB2	1:C:502:PRO:CD	2.49	0.43
1:E:85:ASN:O	1:E:88:LEU:HB2	2.18	0.43
1:E:333:TYR:O	1:E:334:ALA:C	2.61	0.43
1:F:32:LEU:O	1:F:36:ARG:HG2	2.18	0.43
1:F:82:ARG:HH22	1:F:130:GLU:CD	2.26	0.43
1:A:300:LEU:HD13	1:A:320:ARG:CD	2.49	0.43
1:C:330:GLN:NE2	2:C:2185:HOH:O	2.51	0.43
1:C:373:ARG:HD3	1:F:545:ASN:HD21	1.84	0.43
1:C:269:LEU:HD23	1:C:383:ILE:HD11	2.01	0.43
1:D:352:VAL:O	1:D:387:MET:HA	2.19	0.43
1:D:112:ILE:HA	1:D:147:ILE:O	2.19	0.42
1:E:104:THR:HG22	1:E:109:ASP:OD1	2.18	0.42
1:E:453:PRO:HD3	1:E:515:ILE:O	2.19	0.42
1:C:151:ASP:OD1	1:C:189:GLY:HA3	2.19	0.42
1:A:519:HIS:HE1	2:A:2264:HOH:O	2.02	0.42
1:B:196:VAL:CG2	1:B:216:ILE:HD13	2.49	0.42
1:B:416:TYR:CE2	1:B:440:GLY:HA2	2.54	0.42
1:F:22:ILE:H	1:F:22:ILE:HG13	1.65	0.42
1:B:81:HIS:HE1	1:B:91:LYS:O	2.02	0.42
1:A:172:ARG:O	1:A:176[A]:LEU:HG	2.20	0.42
1:A:200:ALA:HB2	1:D:406:ILE:HG22	2.02	0.42
1:B:319[A]:THR:HG23	1:B:320:ARG:N	2.35	0.42
1:B:501:ASN:HD21	1:B:504:VAL:HG23	1.85	0.42
1:E:352:VAL:O	1:E:387:MET:HA	2.20	0.42
1:A:258:ALA:O	1:A:262:VAL:HG13	2.20	0.42
1:B:296:GLU:HG2	1:B:320:ARG:HG2	2.02	0.42
1:C:491:LEU:O	1:C:494:GLU:HB2	2.19	0.42
1:B:443:ASP:HB3	1:E:169:ARG:HG2	2.01	0.42
1:B:489:LEU:N	2:B:2245:HOH:O	2.53	0.42
1:C:490:ARG:O	1:C:494:GLU:HG3	2.20	0.42
1:E:158:GLN:H	1:E:158:GLN:HG2	1.59	0.42
1:E:330:GLN:NE2	2:E:2205:HOH:O	2.53	0.42
1:D:286:THR:O	1:D:286:THR:CG2	2.62	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:330:GLN:HB2	1:D:370:LYS:HE3	2.01	0.42
1:D:494:GLU:O	1:D:498:THR:OG1	2.35	0.42
1:E:258:ALA:O	1:E:262:VAL:HG13	2.20	0.42
1:B:124:LEU:C	1:B:124:LEU:HD23	2.45	0.41
1:B:347:ARG:HG3	1:B:528:LEU:HD13	2.02	0.41
1:C:343:ARG:NE	2:C:2190:HOH:O	2.29	0.41
1:D:499:LEU:HD12	1:D:499:LEU:HA	1.90	0.41
1:E:328:GLU:HG2	1:E:331:ALA:HB2	2.01	0.41
1:A:112:ILE:HA	1:A:147:ILE:O	2.20	0.41
1:D:519:HIS:CD2	2:F:2007:HOH:O	2.56	0.41
1:E:191:ALA:O	1:E:214:MET:HA	2.20	0.41
1:B:81:HIS:CD2	1:B:83:SER:H	2.18	0.41
1:B:315:HIS:CE1	1:B:328:GLU:OE2	2.64	0.41
1:F:314:MET:HG2	1:F:353:ALA:HB1	2.03	0.41
1:A:56:LYS:NZ	1:A:62:ARG:HH22	2.18	0.41
1:B:501:ASN:C	1:B:501:ASN:ND2	2.68	0.41
1:A:76:ASP:HB2	1:A:131:LYS:HE3	2.02	0.41
1:E:508:ARG:HD2	2:E:2288:HOH:O	2.20	0.41
1:A:242:MET:O	1:A:333:TYR:HB2	2.20	0.41
1:B:286:THR:HB	1:B:292:ASN:HD21	1.85	0.41
1:D:286:THR:HB	1:D:292:ASN:ND2	2.33	0.41
1:D:501:ASN:ND2	1:D:503:TYR:H	2.19	0.41
1:E:329:ILE:HB	1:E:339:VAL:HG23	2.02	0.41
1:F:451:ALA:O	1:F:514:VAL:HA	2.21	0.41
1:B:38:GLU:HG2	1:B:94:LEU:HD12	2.03	0.41
1:C:375:VAL:HG13	1:C:385:ILE:HD13	2.01	0.41
1:C:414:TYR:CG	1:C:546:VAL:HG23	2.55	0.41
1:E:208:VAL:CG1	1:E:211:THR:HG22	2.50	0.41
1:A:472:GLN:HB3	1:A:473:GLN:HE21	1.86	0.41
2:A:2209:HOH:O	1:D:542:LYS:HD2	2.20	0.41
1:C:228:GLU:OE1	1:F:398:THR:HB	2.20	0.41
1:D:87:ASN:HA	2:D:2044:HOH:O	2.20	0.41
1:E:352:VAL:HB	1:E:387:MET:HG2	2.02	0.41
1:E:522:GLY:O	1:E:526:THR:HG23	2.21	0.41
1:B:286:THR:HB	1:B:292:ASN:OD1	2.22	0.40
1:E:46:ASP:HB3	2:E:2014:HOH:O	2.21	0.40
1:F:286:THR:O	1:F:286:THR:HG22	2.21	0.40
1:D:158:GLN:H	1:D:158:GLN:NE2	2.19	0.40
1:D:167:TYR:HE1	1:D:195:HIS:HB3	1.76	0.40
1:F:496:GLU:HG3	2:F:2249:HOH:O	2.21	0.40
1:C:406:ILE:HG22	1:F:200:ALA:HB2	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:548:LEU:HD23	1:D:548:LEU:HA	1.91	0.40
1:C:501:ASN:ND2	1:C:503:TYR:H	2.20	0.40
1:E:508:ARG:HD3	2:E:2288:HOH:O	2.20	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	512/548 (93%)	494 (96%)	16 (3%)	2 (0%)	30	34
1	B	505/548 (92%)	487 (96%)	15 (3%)	3 (1%)	21	23
1	C	501/548 (91%)	482 (96%)	14 (3%)	5 (1%)	12	11
1	D	502/548 (92%)	479 (95%)	22 (4%)	1 (0%)	43	51
1	E	500/548 (91%)	483 (97%)	17 (3%)	0	100	100
1	F	499/548 (91%)	485 (97%)	13 (3%)	1 (0%)	43	51
All	All	3019/3288 (92%)	2910 (96%)	97 (3%)	12 (0%)	30	34

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	22	ILE
1	B	22	ILE
1	D	293	LEU
1	C	156	ARG
1	C	492	GLN
1	F	543	HIS
1	A	543	HIS
1	C	290	GLU
1	C	543	HIS

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Mol	Chain	Res	Type
1	B	151	ASP
1	B	543	HIS
1	C	493	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	417/439 (95%)	393 (94%)	24 (6%)	18	22
1	B	410/439 (93%)	382 (93%)	28 (7%)	14	17
1	C	406/439 (92%)	377 (93%)	29 (7%)	13	16
1	D	407/439 (93%)	382 (94%)	25 (6%)	17	20
1	E	405/439 (92%)	378 (93%)	27 (7%)	15	17
1	F	404/439 (92%)	376 (93%)	28 (7%)	14	16
All	All	2449/2634 (93%)	2288 (93%)	161 (7%)	15	18

All (161) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	22	ILE
1	A	36	ARG
1	A	46	ASP
1	A	128	TYR
1	A	158	GLN
1	A	211	THR
1	A	224	THR
1	A	262	VAL
1	A	286	THR
1	A	290	GLU
1	A	300	LEU
1	A	319	THR
1	A	339	VAL
1	A	357	THR
1	A	373	ARG

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Mol	Chain	Res	Type
1	A	412	LEU
1	A	469	VAL
1	A	472	GLN
1	A	484	ILE
1	A	491	LEU
1	A	496	GLU
1	A	499	LEU
1	A	501	ASN
1	A	548	LEU
1	B	22	ILE
1	B	46	ASP
1	B	50	LYS
1	B	57	LEU
1	B	110	VAL
1	B	128	TYR
1	B	158	GLN
1	B	224	THR
1	B	262	VAL
1	B	286	THR
1	B	300	LEU
1	B	339	VAL
1	B	357	THR
1	B	373	ARG
1	B	395	LEU
1	B	398	THR
1	B	442	LYS
1	B	450	LEU
1	B	463	SER
1	B	491	LEU
1	B	499	LEU
1	B	501	ASN
1	B	508	ARG
1	B	511	VAL
1	B	530	LEU
1	B	531	LEU
1	B	533	ARG
1	B	548	LEU
1	C	22	ILE
1	C	46	ASP
1	C	57	LEU
1	C	90	GLU
1	C	91	LYS

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Mol	Chain	Res	Type
1	C	128	TYR
1	C	135	VAL
1	C	157	ILE
1	C	211	THR
1	C	216	ILE
1	C	262	VAL
1	C	300	LEU
1	C	339	VAL
1	C	373	ARG
1	C	398	THR
1	C	412	LEU
1	C	442	LYS
1	C	450	LEU
1	C	454	THR
1	C	491	LEU
1	C	493	GLN
1	C	496	GLU
1	C	499	LEU
1	C	501	ASN
1	C	511	VAL
1	C	531	LEU
1	C	533	ARG
1	C	545	ASN
1	C	548	LEU
1	D	22	ILE
1	D	34	LYS
1	D	57	LEU
1	D	88	LEU
1	D	128	TYR
1	D	141	LYS
1	D	158	GLN
1	D	211	THR
1	D	224	THR
1	D	231	THR
1	D	262	VAL
1	D	290	GLU
1	D	300	LEU
1	D	357	THR
1	D	373	ARG
1	D	412	LEU
1	D	463	SER
1	D	473	GLN

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Mol	Chain	Res	Type
1	D	488	ARG
1	D	489	LEU
1	D	491	LEU
1	D	499	LEU
1	D	501	ASN
1	D	511	VAL
1	D	530	LEU
1	E	22	ILE
1	E	34	LYS
1	E	57	LEU
1	E	90	GLU
1	E	128	TYR
1	E	172	ARG
1	E	184	ILE
1	E	211	THR
1	E	214	MET
1	E	231	THR
1	E	262	VAL
1	E	290	GLU
1	E	300	LEU
1	E	373	ARG
1	E	395	LEU
1	E	450	LEU
1	E	469	VAL
1	E	471	ARG
1	E	488	ARG
1	E	489	LEU
1	E	491	LEU
1	E	493	GLN
1	E	499	LEU
1	E	501	ASN
1	E	511	VAL
1	E	545	ASN
1	E	548	LEU
1	F	22	ILE
1	F	36	ARG
1	F	91	LYS
1	F	110	VAL
1	F	128	TYR
1	F	141	LYS
1	F	158	GLN
1	F	172	ARG

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Mol	Chain	Res	Type
1	F	176	LEU
1	F	211	THR
1	F	224	THR
1	F	289	ILE
1	F	300	LEU
1	F	319	THR
1	F	339	VAL
1	F	357	THR
1	F	373	ARG
1	F	395	LEU
1	F	398	THR
1	F	412	LEU
1	F	450	LEU
1	F	469	VAL
1	F	488	ARG
1	F	491	LEU
1	F	499	LEU
1	F	501	ASN
1	F	511	VAL
1	F	548	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (80) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	23	HIS
1	A	41	HIS
1	A	52	HIS
1	A	81	HIS
1	A	85	ASN
1	A	158	GLN
1	A	174	ASN
1	A	292	ASN
1	A	315	HIS
1	A	358	HIS
1	A	473	GLN
1	A	501	ASN
1	A	519	HIS
1	A	545	ASN
1	B	52	HIS
1	B	81	HIS
1	B	150	ASN
1	B	158	GLN

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Mol	Chain	Res	Type
1	B	315	HIS
1	B	330	GLN
1	B	358	HIS
1	B	501	ASN
1	B	545	ASN
1	C	41	HIS
1	C	52	HIS
1	C	81	HIS
1	C	85	ASN
1	C	150	ASN
1	C	158	GLN
1	C	174	ASN
1	C	210	GLN
1	C	292	ASN
1	C	330	GLN
1	C	456	GLN
1	C	501	ASN
1	C	545	ASN
1	D	41	HIS
1	D	52	HIS
1	D	81	HIS
1	D	85	ASN
1	D	150	ASN
1	D	158	GLN
1	D	174	ASN
1	D	292	ASN
1	D	315	HIS
1	D	330	GLN
1	D	358	HIS
1	D	473	GLN
1	D	493	GLN
1	D	501	ASN
1	D	519	HIS
1	D	545	ASN
1	E	41	HIS
1	E	52	HIS
1	E	81	HIS
1	E	85	ASN
1	E	150	ASN
1	E	174	ASN
1	E	210	GLN
1	E	273	ASN

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Mol	Chain	Res	Type
1	E	292	ASN
1	E	315	HIS
1	E	330	GLN
1	E	358	HIS
1	E	501	ASN
1	E	545	ASN
1	F	33	HIS
1	F	41	HIS
1	F	52	HIS
1	F	81	HIS
1	F	85	ASN
1	F	158	GLN
1	F	174	ASN
1	F	292	ASN
1	F	315	HIS
1	F	330	GLN
1	F	358	HIS
1	F	501	ASN
1	F	519	HIS
1	F	545	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	512/548 (93%)	-0.35	14 (2%)	56 53	9, 20, 45, 73	6 (1%)
1	B	504/548 (91%)	-0.38	11 (2%)	62 59	7, 21, 42, 64	7 (1%)
1	C	506/548 (92%)	-0.32	24 (4%)	36 33	12, 20, 46, 66	1 (0%)
1	D	508/548 (92%)	-0.35	18 (3%)	47 44	11, 19, 47, 71	0
1	E	506/548 (92%)	-0.48	8 (1%)	70 67	12, 19, 41, 62	0
1	F	505/548 (92%)	-0.37	14 (2%)	55 52	14, 21, 43, 64	0
All	All	3041/3288 (92%)	-0.37	89 (2%)	53 50	7, 20, 44, 73	14 (0%)

All (89) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	484	ILE	9.6
1	F	286	THR	6.8
1	A	286	THR	6.0
1	D	286	THR	5.9
1	E	286	THR	5.8
1	D	285	PRO	5.5
1	C	286	THR	5.4
1	F	289	ILE	5.0
1	E	285	PRO	4.8
1	F	285	PRO	4.7
1	C	285	PRO	4.7
1	E	284	ALA	4.7
1	B	285	PRO	4.3
1	B	286	THR	4.3
1	C	489	LEU	4.2
1	A	285	PRO	4.2
1	D	194	GLY	4.0
1	B	489	LEU	3.9
1	C	493	GLN	3.8

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Mol	Chain	Res	Type	RSRZ
1	D	493	GLN	3.5
1	C	499	LEU	3.5
1	C	87	ASN	3.5
1	F	22	ILE	3.5
1	C	488	ARG	3.4
1	C	491	LEU	3.4
1	B	284	ALA	3.2
1	E	87	ASN	3.2
1	B	493[A]	GLN	3.2
1	A	487	LEU	3.1
1	E	471	ARG	3.1
1	D	87	ASN	3.1
1	A	473	GLN	3.1
1	F	470	TYR	3.0
1	A	493[A]	GLN	3.0
1	C	284	ALA	2.9
1	C	490	ARG	2.9
1	C	290	GLU	2.9
1	A	22	ILE	2.9
1	C	194	GLY	2.8
1	D	489	LEU	2.7
1	F	488	ARG	2.7
1	D	22	ILE	2.7
1	D	283	ALA	2.6
1	A	494	GLU	2.6
1	C	46	ASP	2.6
1	B	22	ILE	2.6
1	C	471	ARG	2.6
1	B	283	ALA	2.6
1	C	282	ALA	2.6
1	D	473	GLN	2.6
1	D	490	ARG	2.5
1	D	470	TYR	2.5
1	D	21	ASP	2.4
1	D	471	ARG	2.4
1	B	87	ASN	2.4
1	F	309	ASN	2.4
1	C	154	GLY	2.4
1	D	195	HIS	2.4
1	F	533	ARG	2.4
1	F	281	GLN	2.3
1	A	21	ASP	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	287	GLY	2.3
1	A	46	ASP	2.3
1	E	46	ASP	2.3
1	A	529	ARG	2.3
1	C	33	HIS	2.3
1	C	496	GLU	2.3
1	D	291	GLU	2.3
1	F	489	LEU	2.2
1	C	498	THR	2.2
1	D	64	TYR	2.2
1	C	289	ILE	2.2
1	B	282	ALA	2.2
1	C	283	ALA	2.2
1	D	469	VAL	2.2
1	F	284	ALA	2.2
1	D	284	ALA	2.1
1	B	90	GLU	2.1
1	E	533	ARG	2.1
1	A	283	ALA	2.1
1	A	90	GLU	2.1
1	E	287	GLY	2.1
1	F	282	ALA	2.1
1	F	49	GLU	2.1
1	C	495	TYR	2.1
1	C	468	PHE	2.1
1	C	90	GLU	2.0
1	F	87	ASN	2.0
1	B	46	ASP	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.