



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 25, 2026 – 10:20 AM EDT

PDB ID : 3VSK / pdb_00003vsk
Title : Crystal structure of penicillin-binding protein 3 (PBP3) from methicillin-resistant *Staphylococcus aureus* in the apo form.
Authors : Yoshida, H.; Tame, J.R.; Park, S.Y.
Deposited on : 2012-04-25
Resolution : 2.30 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

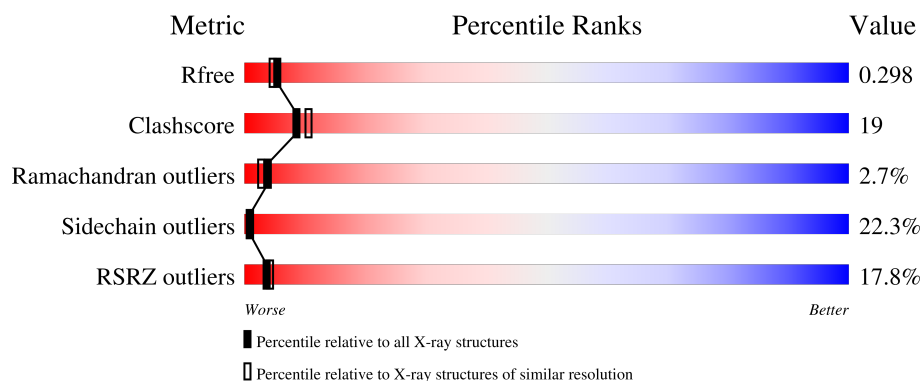
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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	646	
1	B	646	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 10150 atoms, of which 0 are hydrogens and 0 are deuteriums.

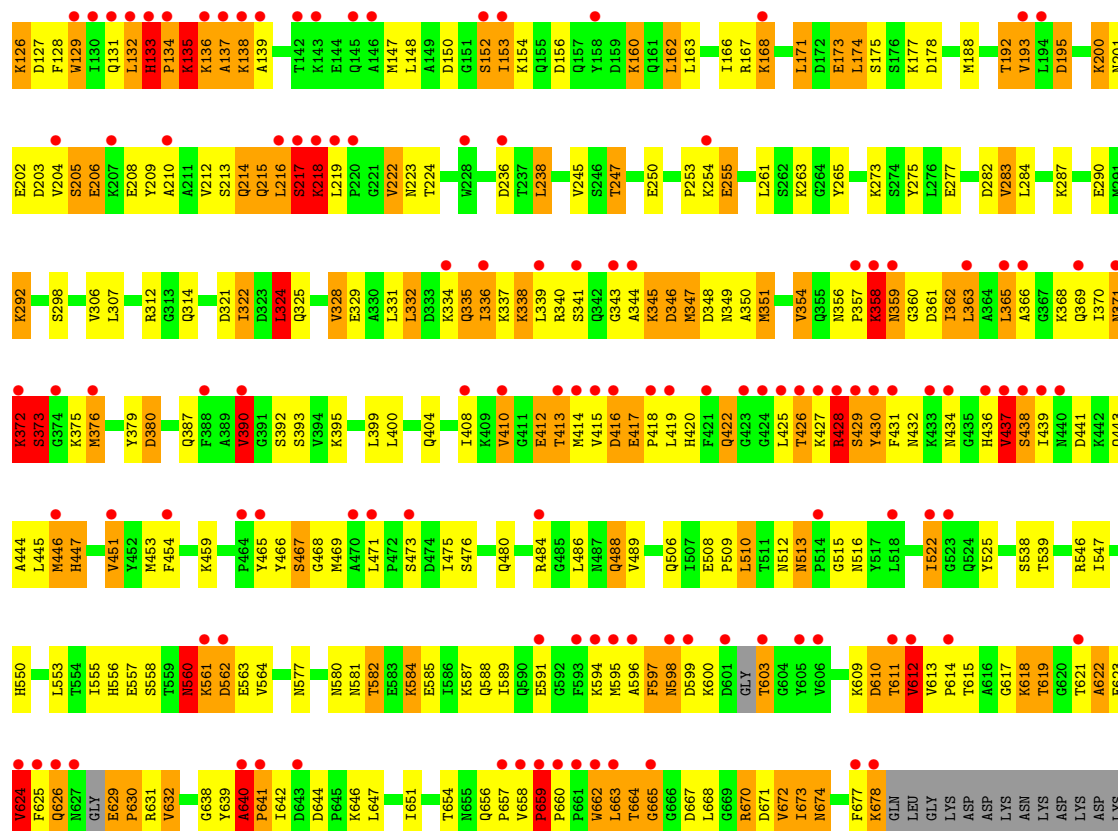
In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Penicillin-binding protein 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	631	Total	C	N	O	S	0	0	0
			4943	3105	852	967	19			
1	B	631	Total	C	N	O	S	0	0	0
			4947	3107	853	968	19			

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	141	Total	O	0	0
			141	141		
2	B	119	Total	O	0	0
			119	119		



4 Data and refinement statistics

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α , β , γ	143.42Å 143.42Å 189.36Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.90 – 2.30 40.90 – 2.30	Depositor EDS
% Data completeness (in resolution range)	96.8 (40.90-2.30) 96.8 (40.90-2.30)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.47 (at 2.29Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.7.2_869)	Depositor
R, R_{free}	0.261 , 0.300 0.257 , 0.298	Depositor DCC
R_{free} test set	4274 reflections (4.86%)	wwPDB-VP
Wilson B-factor (Å ²)	36.7	Xtriage
Anisotropy	0.178	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 62.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	10150	wwPDB-VP
Average B, all atoms (Å ²)	76.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.92% 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	0.64	0/5025	1.04	16/6769 (0.2%)
1	B	0.60	1/5028 (0.0%)	1.05	22/6772 (0.3%)
All	All	0.62	1/10053 (0.0%)	1.05	38/13541 (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	A	0	8
1	B	0	19
All	All	0	27

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	622	ALA	CA-CB	-5.20	1.44	1.53

All (38) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	622	ALA	N-CA-C	11.30	125.81	110.55
1	A	658	VAL	N-CA-C	10.34	117.52	108.63
1	B	373	SER	N-CA-C	-9.66	100.75	112.54
1	B	217	SER	N-CA-C	-9.50	99.20	110.41
1	B	193	VAL	N-CA-C	8.06	118.62	110.23
1	A	513	ASN	CA-C-N	7.62	127.51	119.05
1	A	513	ASN	C-N-CA	7.62	127.51	119.05
1	A	366	ALA	N-CA-C	7.58	120.09	108.42
1	B	629	GLU	CA-C-N	7.34	127.76	119.83
1	B	629	GLU	C-N-CA	7.34	127.76	119.83
1	A	237	THR	N-CA-C	7.26	119.82	111.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	663	LEU	N-CA-C	7.02	120.14	110.24
1	B	515	GLY	N-CA-C	-6.97	106.19	115.32
1	A	660	PRO	N-CA-C	6.62	118.77	110.70
1	B	324	LEU	N-CA-C	-6.29	105.26	113.12
1	B	612	VAL	N-CA-C	-6.18	103.95	113.16
1	B	644	ASP	CA-C-N	6.17	126.11	119.76
1	B	644	ASP	C-N-CA	6.17	126.11	119.76
1	B	415	VAL	N-CA-C	6.07	117.84	109.46
1	A	372	LYS	CA-C-N	5.96	132.93	121.54
1	A	372	LYS	C-N-CA	5.96	132.93	121.54
1	B	659	PRO	N-CA-C	5.95	117.96	110.70
1	B	173	GLU	N-CA-C	-5.86	106.08	113.18
1	B	206	GLU	N-CA-C	-5.79	105.05	111.71
1	A	338	LYS	N-CA-C	-5.78	104.97	111.28
1	A	642	ILE	N-CA-C	5.67	116.45	110.72
1	B	135	LYS	N-CA-C	-5.42	99.25	110.80
1	B	97	THR	N-CA-C	5.37	117.71	109.07
1	A	644	ASP	CA-C-N	5.28	125.21	119.78
1	A	644	ASP	C-N-CA	5.28	125.21	119.78
1	A	365	LEU	N-CA-C	5.26	118.39	108.65
1	A	362	ILE	N-CA-C	5.24	116.51	108.71
1	A	414	MET	N-CA-C	5.20	117.40	110.53
1	B	131	GLN	N-CA-C	-5.09	107.24	113.50
1	B	630	PRO	N-CA-C	5.08	118.86	111.03
1	B	610	ASP	N-CA-C	5.08	117.67	110.10
1	B	577	ASN	N-CA-C	5.02	116.06	108.07
1	B	560	ASN	N-CA-C	5.02	118.48	111.56

There are no chirality outliers.

All (27) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	251	GLY	Peptide
1	A	371	ASN	Peptide
1	A	430	TYR	Peptide
1	A	434	ASN	Peptide
1	A	563	GLU	Peptide
1	A	657	PRO	Peptide
1	A	658	VAL	Peptide
1	A	660	PRO	Peptide
1	B	132	LEU	Peptide
1	B	133	HIS	Peptide

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Mol	Chain	Res	Type	Group
1	B	218	LYS	Peptide
1	B	219	LEU	Peptide
1	B	345	LYS	Peptide
1	B	346	ASP	Peptide
1	B	371	ASN	Peptide
1	B	372	LYS	Peptide
1	B	412	GLU	Peptide
1	B	425	LEU	Peptide
1	B	428	ARG	Peptide
1	B	560	ASN	Peptide
1	B	561	LYS	Peptide
1	B	562	ASP	Peptide
1	B	612	VAL	Peptide
1	B	621	THR	Peptide
1	B	624	VAL	Peptide
1	B	640	ALA	Peptide
1	B	96	LYS	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	4943	0	4992	161	0
1	B	4947	0	4994	230	0
2	A	141	0	0	3	0
2	B	119	0	0	10	0
All	All	10150	0	9986	376	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 19.

All (376) 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:339:LEU:CD2	1:B:663:LEU:HD22	1.65	1.25
1:B:339:LEU:HD22	1:B:663:LEU:CD2	1.68	1.21

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:339:LEU:HD22	1:B:663:LEU:HD22	1.00	0.99
1:B:441:ASP:HA	2:B:819:HOH:O	1.64	0.95
1:B:324:LEU:HD23	1:B:363:LEU:HD12	1.51	0.92
1:A:408:ILE:HG21	1:A:456:THR:HG22	1.52	0.90
1:B:339:LEU:CD2	1:B:663:LEU:CD2	2.39	0.90
1:A:529:THR:HG22	1:A:532:GLN:H	1.37	0.87
1:B:658:VAL:HG21	1:B:663:LEU:HD12	1.67	0.76
1:A:354:VAL:H	1:A:364:ALA:HB2	1.52	0.75
1:A:273:LYS:HZ2	1:B:484:ARG:HH12	1.36	0.74
1:A:428:ARG:HE	1:A:451:VAL:HB	1.52	0.73
1:B:443:GLN:HA	1:B:446:MET:HE2	1.72	0.72
1:B:339:LEU:HD21	1:B:663:LEU:HD22	1.69	0.72
1:B:129:TRP:HB3	1:B:136:LYS:HE3	1.71	0.71
1:A:428:ARG:NH2	1:A:449:SER:OG	2.23	0.71
1:A:320:ILE:HG12	1:A:363:LEU:HA	1.73	0.70
1:B:52:LYS:HD2	1:B:66:SER:HB3	1.73	0.69
1:B:200:LYS:HD2	1:B:202:GLU:HG2	1.74	0.69
1:A:353:VAL:HA	1:A:364:ALA:HB1	1.74	0.69
1:B:238:LEU:HD22	1:B:325:GLN:HG2	1.75	0.69
1:B:336:ILE:HD13	1:B:369:GLN:HE21	1.57	0.68
1:B:594:LYS:HE3	1:B:642:ILE:HG23	1.74	0.68
1:B:657:PRO:HG2	1:B:658:VAL:HG13	1.75	0.68
1:B:247:THR:HG22	1:B:250:GLU:H	1.58	0.68
1:B:444:ALA:CB	2:B:819:HOH:O	2.41	0.68
1:A:91:TYR:HB2	1:A:199:ILE:HD11	1.76	0.67
1:B:598:ASN:ND2	1:B:610:ASP:OD2	2.24	0.67
1:A:71:ARG:HH22	1:A:563:GLU:HA	1.58	0.67
1:A:289:LYS:HE2	1:A:291:MET:HE2	1.76	0.67
1:A:344:ALA:HA	2:A:830:HOH:O	1.93	0.67
1:A:246:SER:HB2	1:A:250:GLU:HG3	1.77	0.67
1:B:47:GLN:NE2	1:B:560:ASN:O	2.27	0.67
1:A:390:VAL:HG21	1:A:533:LEU:HD21	1.75	0.66
1:B:390:VAL:O	1:B:622:ALA:HB3	1.96	0.66
1:A:427:LYS:HD3	1:A:432:ASN:HB3	1.78	0.65
1:B:444:ALA:HB3	2:B:819:HOH:O	1.95	0.65
1:A:49:SER:HB2	1:A:65:GLU:HB3	1.80	0.64
1:B:108:LYS:O	1:B:111:LYS:HG2	1.98	0.64
1:A:345:LYS:O	1:A:371:ASN:HB3	1.97	0.64
1:B:392:SER:OG	1:B:618:LYS:NZ	2.31	0.64
1:A:375:LYS:HG3	1:B:512:ASN:HD22	1.63	0.64
1:B:331:LEU:HD13	1:B:671:ASP:HB3	1.78	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:370:ILE:HD13	1:B:513:ASN:HB2	1.80	0.63
1:A:47:GLN:N	2:A:733:HOH:O	2.31	0.63
1:A:241:ILE:HD13	1:A:381:ILE:HG22	1.80	0.62
1:A:347:MET:HE2	1:A:656:GLN:HE21	1.63	0.62
1:B:612:VAL:O	1:B:614:PRO:HD3	1.98	0.62
1:A:250:GLU:OE2	1:B:484:ARG:NH1	2.33	0.62
1:A:395:LYS:HA	1:A:398:THR:HG23	1.82	0.62
1:B:215:GLN:HA	1:B:218:LYS:HG3	1.82	0.62
1:B:329:GLU:HG2	1:B:365:LEU:HD22	1.81	0.62
1:B:662:TRP:CD1	1:B:663:LEU:H	2.17	0.62
1:B:395:LYS:HE2	1:B:522:ILE:HG22	1.82	0.61
1:A:630:PRO:O	1:A:631:ARG:NH1	2.33	0.61
1:A:660:PRO:O	1:A:662:TRP:N	2.33	0.61
1:B:447:HIS:HA	1:B:600:LYS:HE3	1.82	0.61
1:A:327:GLU:HG3	1:A:675:TYR:CZ	2.34	0.61
1:A:349:ASN:HB2	1:A:654:THR:HG23	1.83	0.61
1:B:354:VAL:HG13	1:B:363:LEU:HB3	1.82	0.61
1:B:641:PRO:HD2	1:B:646:LYS:H	1.66	0.61
1:A:52:LYS:HD3	1:A:66:SER:HB3	1.83	0.61
1:B:370:ILE:HD11	1:B:375:LYS:HG3	1.83	0.61
1:A:535:GLN:O	1:A:539:THR:HG22	2.01	0.60
1:B:321:ASP:HB3	1:B:324:LEU:HB2	1.84	0.60
1:B:594:LYS:NZ	1:B:639:TYR:OH	2.34	0.60
1:B:611:THR:H	1:B:613:VAL:HG22	1.67	0.60
1:A:537:VAL:HG21	1:A:637:ILE:HB	1.84	0.60
1:A:365:LEU:HD11	1:A:380:ASP:HB3	1.82	0.60
1:A:276:LEU:HD13	1:A:499:LEU:HD21	1.84	0.60
1:B:674:ASN:OD1	1:B:674:ASN:N	2.35	0.59
1:A:141:MET:HE3	1:A:144:GLU:HG3	1.83	0.59
1:B:205:SER:HB2	1:B:208:GLU:HB2	1.84	0.59
1:A:428:ARG:NE	1:A:451:VAL:HB	2.18	0.59
1:B:339:LEU:HD22	1:B:663:LEU:HD21	1.75	0.59
1:B:340:ARG:HA	1:B:372:LYS:NZ	2.18	0.59
1:A:344:ALA:HB1	1:A:347:MET:HB2	1.84	0.58
1:B:324:LEU:O	1:B:363:LEU:HD11	2.03	0.58
1:B:347:MET:HE2	1:B:656:GLN:HE21	1.68	0.58
1:A:273:LYS:HZ2	1:B:484:ARG:NH1	2.02	0.58
1:A:455:LYS:O	1:A:459:LYS:HG3	2.03	0.58
1:A:632:VAL:N	1:A:656:GLN:O	2.36	0.58
1:B:658:VAL:HB	1:B:662:TRP:HE1	1.68	0.58
1:B:123:ARG:HD2	1:B:127:ASP:OD2	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:641:PRO:HD3	1:B:677:PHE:CZ	2.38	0.58
1:A:662:TRP:CD1	1:A:663:LEU:H	2.21	0.58
1:A:369:GLN:HB3	1:A:376:MET:HG2	1.85	0.58
1:A:102:MET:HG2	1:A:188:MET:HE2	1.85	0.57
1:B:345:LYS:O	1:B:371:ASN:HA	2.04	0.57
1:A:656:GLN:HB3	1:A:658:VAL:HG13	1.86	0.57
1:B:215:GLN:H	1:B:215:GLN:NE2	2.03	0.57
1:B:134:PRO:HB3	1:B:138:LYS:HB2	1.87	0.57
1:A:349:ASN:HB3	1:A:351:MET:HE3	1.87	0.57
1:B:72:ILE:HD11	1:B:284:LEU:HD11	1.86	0.57
1:B:283:VAL:HG11	1:B:555:ILE:HD13	1.87	0.57
1:A:175:SER:O	1:A:175:SER:OG	2.21	0.57
1:A:600:LYS:HE3	1:A:600:LYS:H	1.69	0.57
1:B:94:GLY:HA3	1:B:193:VAL:HG13	1.87	0.56
1:B:214:GLN:CA	2:B:789:HOH:O	2.52	0.56
1:B:380:ASP:OD1	1:B:380:ASP:N	2.36	0.56
1:B:336:ILE:HD13	1:B:369:GLN:NE2	2.19	0.56
1:B:340:ARG:HG3	1:B:372:LYS:HG2	1.87	0.56
1:A:414:MET:HG2	1:A:415:VAL:H	1.69	0.56
1:B:150:ASP:OD1	1:B:152:SER:HB3	2.06	0.56
1:B:395:LYS:HD3	1:B:453:MET:HE3	1.88	0.56
1:B:629:GLU:HG3	1:B:631:ARG:HH12	1.69	0.56
1:B:419:LEU:HB3	1:B:465:TYR:CZ	2.41	0.56
1:B:215:GLN:H	1:B:215:GLN:HE21	1.52	0.56
1:B:417:GLU:HB3	1:B:419:LEU:HG	1.87	0.56
1:A:477:SER:HB3	1:A:478:PRO:HD3	1.87	0.56
1:B:358:LYS:HG3	1:B:359:ASN:N	2.20	0.56
1:B:422:GLN:NE2	1:B:468:GLY:O	2.34	0.55
1:B:640:ALA:HB3	1:B:647:LEU:HB3	1.87	0.55
1:B:126:LYS:O	1:B:129:TRP:HB2	2.06	0.55
1:A:509:PRO:HB2	1:B:368:LYS:HE2	1.88	0.55
1:B:624:VAL:HG23	1:B:632:VAL:HA	1.89	0.55
1:B:205:SER:CB	1:B:208:GLU:HB2	2.37	0.54
1:A:341:SER:C	1:A:343:GLY:H	2.15	0.54
1:A:428:ARG:HH11	1:A:430:TYR:HE1	1.56	0.54
1:B:74:ASP:OD1	1:B:78:LYS:N	2.36	0.54
1:B:416:ASP:HB3	1:B:451:VAL:HG11	1.89	0.54
1:A:461:ALA:HA	1:A:478:PRO:HG3	1.89	0.54
1:B:641:PRO:HD3	1:B:677:PHE:CE1	2.42	0.54
1:B:662:TRP:HD1	1:B:663:LEU:H	1.55	0.54
1:B:214:GLN:OE1	1:B:215:GLN:NE2	2.40	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:617:GLY:HA2	1:B:638:GLY:HA2	1.90	0.54
1:A:618:LYS:HD2	1:A:619:THR:H	1.73	0.54
1:A:171:LEU:HA	1:A:174:LEU:HD13	1.90	0.53
1:B:215:GLN:HE21	1:B:215:GLN:N	2.07	0.53
1:B:416:ASP:OD1	1:B:416:ASP:N	2.41	0.53
1:B:148:LEU:HD23	1:B:153:ILE:O	2.08	0.53
1:A:273:LYS:NZ	1:B:484:ARG:HH22	2.07	0.53
1:B:325:GLN:HA	1:B:363:LEU:HD21	1.90	0.53
1:B:417:GLU:O	1:B:419:LEU:N	2.39	0.53
1:A:659:PRO:HD2	1:A:662:TRP:HZ2	1.74	0.53
1:A:325:GLN:OE1	1:A:365:LEU:HB2	2.08	0.53
1:A:368:LYS:HD3	1:B:509:PRO:HD2	1.89	0.53
1:A:393:SER:OG	1:A:635:THR:HG22	2.08	0.53
1:A:387:GLN:HG2	1:A:527:THR:CB	2.39	0.53
1:A:387:GLN:HG2	1:A:527:THR:OG1	2.09	0.53
1:A:512:ASN:HD22	1:B:375:LYS:HE3	1.74	0.53
1:A:339:LEU:HG	1:A:342:GLN:H	1.73	0.52
1:A:335:GLN:HG2	1:A:668:LEU:HB2	1.92	0.52
1:B:600:LYS:HG2	1:B:603:THR:N	2.24	0.52
1:B:358:LYS:HG3	1:B:359:ASN:H	1.75	0.52
1:B:359:ASN:HA	1:B:550:HIS:NE2	2.24	0.52
1:A:578:LYS:H	1:B:254:LYS:HZ2	1.57	0.52
1:B:156:ASP:OD2	1:B:160:LYS:NZ	2.37	0.51
1:B:404:GLN:NE2	1:B:580:ASN:OD1	2.43	0.51
1:A:512:ASN:O	1:A:514:PRO:HD3	2.09	0.51
1:A:174:LEU:O	1:A:176:SER:N	2.43	0.51
1:B:351:MET:HE1	1:B:379:TYR:CD2	2.45	0.51
1:B:663:LEU:C	1:B:665:GLY:H	2.18	0.51
1:A:351:MET:HA	1:A:366:ALA:CB	2.41	0.51
1:A:557:GLU:OE1	1:A:558:SER:N	2.28	0.51
1:B:597:PHE:CE2	1:B:617:GLY:HA3	2.46	0.51
1:A:108:LYS:HD2	1:A:111:LYS:HD2	1.93	0.51
1:A:327:GLU:HG3	1:A:675:TYR:CE1	2.46	0.51
1:A:375:LYS:HG3	1:B:512:ASN:ND2	2.26	0.51
1:B:314:GLN:HB3	1:B:556:HIS:O	2.11	0.51
1:B:343:GLY:O	1:B:657:PRO:HG3	2.10	0.51
1:A:653:TYR:CE2	1:A:665:GLY:HA3	2.46	0.50
1:A:371:ASN:O	1:A:372:LYS:HB2	2.12	0.50
1:A:415:VAL:HG12	1:A:438:SER:OG	2.12	0.50
1:B:329:GLU:CD	1:B:365:LEU:HD13	2.36	0.50
1:A:65:GLU:O	1:A:288:LYS:HB2	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:62:THR:HG1	1:B:292:LYS:HZ2	1.56	0.50
1:B:127:ASP:C	1:B:129:TRP:H	2.20	0.50
1:B:657:PRO:O	1:B:659:PRO:HD3	2.11	0.50
1:B:247:THR:HG22	1:B:250:GLU:HG3	1.94	0.50
1:B:410:VAL:HG13	1:B:585:GLU:HG3	1.93	0.50
1:B:312:ARG:NH1	1:B:562:ASP:OD1	2.41	0.50
1:A:390:VAL:HG11	1:A:528:TYR:HD2	1.76	0.50
1:B:290:GLU:HG2	1:B:307:LEU:HD12	1.93	0.50
1:A:351:MET:HA	1:A:366:ALA:HB1	1.93	0.50
1:A:365:LEU:HD13	1:A:366:ALA:H	1.76	0.50
1:A:428:ARG:HH12	1:A:449:SER:HB2	1.77	0.50
1:B:349:ASN:HB2	1:B:654:THR:OG1	2.12	0.50
1:B:434:ASN:HB3	1:B:436:HIS:NE2	2.27	0.50
1:A:614:PRO:HB2	1:A:642:ILE:HD13	1.93	0.49
1:B:212:VAL:O	1:B:214:GLN:HG3	2.12	0.49
1:A:661:PRO:HG2	1:A:662:TRP:CZ3	2.47	0.49
1:B:400:LEU:HD22	1:B:581:ASN:CG	2.37	0.49
1:B:489:VAL:HG12	1:B:539:THR:HG21	1.94	0.49
1:A:537:VAL:CG2	1:A:637:ILE:HB	2.41	0.49
1:A:584:LYS:HE3	1:A:584:LYS:H	1.77	0.49
1:B:247:THR:CG2	1:B:250:GLU:H	2.24	0.49
1:B:359:ASN:O	1:B:359:ASN:CG	2.55	0.49
1:A:492:GLY:H	1:A:532:GLN:NE2	2.10	0.49
1:A:512:ASN:ND2	1:B:375:LYS:HE3	2.28	0.49
1:A:668:LEU:O	1:A:672:VAL:HG13	2.13	0.49
1:B:366:ALA:HB3	1:B:379:TYR:O	2.12	0.49
1:A:578:LYS:H	1:B:254:LYS:NZ	2.11	0.49
1:B:340:ARG:HA	1:B:372:LYS:HE2	1.95	0.49
1:A:150:ASP:HB3	1:A:152:SER:H	1.78	0.48
1:A:91:TYR:CE1	1:A:188:MET:HE3	2.47	0.48
1:B:214:GLN:N	2:B:789:HOH:O	2.45	0.48
1:B:263:LYS:HB2	1:B:265:TYR:HD1	1.77	0.48
1:A:308:ASN:OD1	1:A:309:PRO:HD2	2.13	0.48
1:B:162:LEU:HD22	1:B:166:ILE:HD11	1.95	0.48
1:A:141:MET:CE	1:A:144:GLU:HG3	2.44	0.48
1:A:624:VAL:HG22	1:A:625:PHE:H	1.78	0.48
1:B:412:GLU:HG3	1:B:413:THR:H	1.78	0.48
1:B:623:GLU:HA	1:B:632:VAL:HG23	1.96	0.48
1:A:251:GLY:HA3	1:A:267:ARG:O	2.14	0.48
1:A:347:MET:CE	1:A:656:GLN:HE21	2.27	0.48
1:B:419:LEU:HD13	1:B:465:TYR:CE2	2.49	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:106:ALA:HB2	1:B:188:MET:SD	2.54	0.48
1:B:335:GLN:O	1:B:335:GLN:NE2	2.46	0.47
1:A:631:ARG:NH2	1:A:657:PRO:HB3	2.29	0.47
1:B:337:LYS:HA	1:B:340:ARG:HB2	1.96	0.47
1:B:488:GLN:O	1:B:546:ARG:HD3	2.13	0.47
1:B:612:VAL:HG21	1:B:674:ASN:HB3	1.95	0.47
1:A:670:ARG:O	1:A:673:ILE:HG22	2.14	0.47
1:B:91:TYR:CE1	1:B:188:MET:HE3	2.49	0.47
1:A:578:LYS:O	1:B:254:LYS:HE3	2.15	0.47
1:A:170:GLN:O	1:A:173:GLU:HG2	2.15	0.47
1:A:387:GLN:HG2	1:A:527:THR:HB	1.96	0.47
1:B:98:THR:OG1	1:B:99:GLN:N	2.47	0.47
1:B:445:LEU:O	1:B:618:LYS:HE2	2.15	0.47
1:B:454:PHE:HE1	1:B:522:ILE:HG12	1.79	0.47
1:A:73:LEU:HD22	1:A:79:VAL:HA	1.96	0.47
1:A:171:LEU:HD12	1:A:174:LEU:HD22	1.97	0.47
1:B:253:PRO:HG2	1:B:273:LYS:HG2	1.97	0.47
1:B:340:ARG:HA	1:B:372:LYS:CE	2.44	0.47
1:A:414:MET:HE3	1:A:415:VAL:HG22	1.96	0.47
1:A:623:GLU:HA	1:A:632:VAL:HG22	1.97	0.47
1:B:282:ASP:HB2	2:B:723:HOH:O	2.14	0.47
1:A:173:GLU:C	1:A:175:SER:N	2.72	0.47
1:A:372:LYS:HA	1:A:372:LYS:HD3	1.47	0.46
1:B:441:ASP:OD1	1:B:441:ASP:N	2.48	0.46
1:A:148:LEU:HD11	1:A:155:GLN:NE2	2.30	0.46
1:A:370:ILE:H	1:A:370:ILE:HG13	1.30	0.46
1:B:629:GLU:HG3	1:B:631:ARG:NH1	2.30	0.46
1:A:408:ILE:CG2	1:A:456:THR:HG22	2.33	0.46
1:A:661:PRO:HG2	1:A:662:TRP:CE3	2.50	0.46
1:B:192:THR:HG23	1:B:195:ASP:HB3	1.97	0.46
1:B:668:LEU:O	1:B:672:VAL:HG13	2.16	0.46
1:A:464:PRO:O	1:B:123:ARG:NH2	2.47	0.46
1:B:69:ARG:NH2	1:B:277:GLU:OE1	2.39	0.46
1:B:215:GLN:HA	1:B:218:LYS:CG	2.46	0.46
1:B:53:GLN:HB3	1:B:64:ASN:HB2	1.97	0.45
1:B:86:LYS:HD2	1:B:201:ASN:HB3	1.97	0.45
1:B:171:LEU:O	1:B:174:LEU:HB2	2.17	0.45
1:B:344:ALA:HB1	1:B:347:MET:HB2	1.98	0.45
1:B:585:GLU:O	1:B:589:ILE:HD13	2.16	0.45
1:B:625:PHE:HA	1:B:630:PRO:HA	1.99	0.45
1:B:98:THR:HG23	1:B:101:GLU:HG2	1.97	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:437:VAL:HB	1:B:438:SER:H	1.56	0.45
1:B:444:ALA:HB2	2:B:819:HOH:O	2.08	0.45
1:A:331:LEU:HD22	1:A:671:ASP:HB3	1.98	0.45
1:B:215:GLN:HB2	1:B:222:VAL:CG2	2.46	0.45
1:B:597:PHE:CZ	1:B:617:GLY:HA3	2.51	0.45
1:A:67:VAL:HG23	1:A:286:GLY:HA3	1.99	0.45
1:B:362:ILE:H	1:B:362:ILE:HG12	1.62	0.45
1:B:446:MET:HB3	1:B:596:ALA:HA	1.98	0.45
1:A:348:ASP:OD1	1:A:654:THR:OG1	2.33	0.45
1:B:204:VAL:HG22	1:B:208:GLU:HB3	1.99	0.45
1:B:348:ASP:OD1	1:B:348:ASP:N	2.45	0.45
1:B:129:TRP:HE3	1:B:136:LYS:HG3	1.79	0.45
1:B:137:ALA:O	1:B:139:ALA:N	2.50	0.45
1:A:529:THR:HG21	2:A:730:HOH:O	2.17	0.44
1:B:133:HIS:CE1	1:B:135:LYS:HB2	2.52	0.44
1:B:376:MET:HB3	1:B:376:MET:HE3	1.67	0.44
1:A:339:LEU:HD12	1:A:342:GLN:HB2	1.98	0.44
1:B:86:LYS:HD2	1:B:201:ASN:CG	2.42	0.44
1:A:430:TYR:CZ	1:A:431:PHE:CE2	3.05	0.44
1:B:664:THR:O	1:B:667:ASP:N	2.49	0.44
1:A:317:LYS:HD3	1:A:556:HIS:NE2	2.32	0.44
1:B:132:LEU:O	1:B:135:LYS:HB3	2.17	0.44
1:B:359:ASN:O	1:B:360:GLY:C	2.60	0.44
1:B:582:THR:HG23	1:B:584:LYS:H	1.82	0.44
1:A:349:ASN:HB2	1:A:654:THR:CG2	2.47	0.44
1:B:664:THR:O	1:B:667:ASP:HB2	2.18	0.44
1:A:439:ILE:HG21	1:A:452:TYR:HD2	1.83	0.44
1:B:147:MET:HB3	1:B:153:ILE:HB	2.00	0.44
1:B:428:ARG:HB3	1:B:429:SER:H	1.50	0.44
1:B:466:TYR:O	1:B:469:MET:HB3	2.18	0.44
1:B:263:LYS:HB2	1:B:265:TYR:CD1	2.53	0.44
1:B:331:LEU:HD23	1:B:331:LEU:HA	1.80	0.44
1:B:334:LYS:O	1:B:338:LYS:N	2.47	0.44
1:B:369:GLN:OE1	1:B:369:GLN:N	2.51	0.43
1:A:144:GLU:HA	1:A:147:MET:HB2	1.99	0.43
1:A:418:PRO:HG2	1:A:433:LYS:O	2.18	0.43
1:A:511:THR:OG1	1:A:512:ASN:N	2.51	0.43
1:A:533:LEU:HB3	1:A:637:ILE:HG21	2.00	0.43
1:B:90:THR:HG22	1:B:223:ASN:HB2	2.00	0.43
1:B:345:LYS:C	2:B:792:HOH:O	2.61	0.43
1:B:370:ILE:O	1:B:373:SER:N	2.45	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:439:ILE:HD12	1:B:439:ILE:O	2.18	0.43
1:A:141:MET:HE2	1:A:162:LEU:HB2	1.99	0.43
1:A:175:SER:O	1:A:178:ASP:N	2.50	0.43
1:A:371:ASN:HA	1:A:374:GLY:N	2.33	0.43
1:A:529:THR:HG22	1:A:532:GLN:N	2.19	0.43
1:A:442:LYS:HB3	1:A:595:MET:SD	2.59	0.43
1:A:512:ASN:C	1:A:514:PRO:HD3	2.44	0.43
1:B:392:SER:HB3	1:B:619:THR:O	2.18	0.43
1:A:425:LEU:HD22	1:A:427:LYS:HE2	2.01	0.43
1:A:636:TYR:OH	1:A:665:GLY:N	2.44	0.43
1:B:167:ARG:HD2	1:B:167:ARG:HA	1.87	0.43
1:B:351:MET:O	1:B:651:ILE:HA	2.18	0.43
1:B:678:LYS:H	1:B:678:LYS:HD2	1.83	0.43
1:B:216:LEU:HD12	1:B:217:SER:H	1.84	0.43
1:B:663:LEU:HA	1:B:663:LEU:HD23	1.76	0.43
1:B:121:THR:O	1:B:124:ASP:HB2	2.19	0.43
1:B:420:HIS:HA	1:B:426:THR:O	2.19	0.43
1:B:167:ARG:NH1	1:B:168:LYS:HE2	2.34	0.43
1:B:336:ILE:HD11	1:B:376:MET:SD	2.58	0.43
1:B:350:ALA:C	1:B:351:MET:HG2	2.44	0.43
1:B:209:TYR:OH	1:B:224:THR:HG23	2.19	0.42
1:B:348:ASP:O	1:B:368:LYS:HA	2.19	0.42
1:B:214:GLN:HG3	1:B:214:GLN:H	1.44	0.42
1:B:465:TYR:CZ	1:B:467:SER:HA	2.54	0.42
1:B:673:ILE:O	1:B:677:PHE:HD2	2.01	0.42
1:A:284:LEU:O	1:A:313:GLY:HA3	2.18	0.42
1:A:631:ARG:HG3	1:A:657:PRO:HA	2.00	0.42
1:B:247:THR:O	1:B:250:GLU:HB2	2.19	0.42
1:B:404:GLN:HG3	1:B:581:ASN:ND2	2.35	0.42
1:A:119:LYS:HB3	1:A:186:ARG:NH1	2.35	0.42
1:B:175:SER:O	1:B:178:ASP:HB2	2.20	0.42
1:B:214:GLN:HA	2:B:789:HOH:O	2.19	0.42
1:A:365:LEU:HD21	1:A:380:ASP:HB3	2.02	0.42
1:A:381:ILE:HD13	1:A:381:ILE:H	1.85	0.42
1:B:80:LEU:HD21	1:B:322:ILE:HG12	2.02	0.42
1:B:370:ILE:O	1:B:373:SER:OG	2.29	0.42
1:A:440:ASN:OD1	1:A:443:GLN:HG3	2.20	0.42
1:B:441:ASP:CA	2:B:819:HOH:O	2.42	0.42
1:A:465:TYR:HA	1:A:469:MET:SD	2.60	0.42
1:A:533:LEU:HB3	1:A:637:ILE:CG2	2.50	0.42
1:A:584:LYS:HE3	1:A:584:LYS:N	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:611:THR:OG1	1:B:670:ARG:HD2	2.20	0.42
1:B:660:PRO:HD2	1:B:662:TRP:CZ2	2.54	0.42
1:B:325:GLN:HA	1:B:363:LEU:CD2	2.49	0.42
1:A:321:ASP:H	1:A:363:LEU:HD23	1.84	0.41
1:A:390:VAL:HG23	1:A:635:THR:HG21	2.02	0.41
1:B:510:LEU:HD21	1:B:516:ASN:HB2	2.02	0.41
1:B:622:ALA:O	1:B:632:VAL:HG22	2.20	0.41
1:A:392:SER:HB3	1:A:395:LYS:HD2	2.02	0.41
1:A:434:ASN:HB2	1:A:435:GLY:H	1.67	0.41
1:A:567:LEU:HD12	1:A:568:LYS:N	2.35	0.41
1:A:234:TYR:CG	1:A:322:ILE:HD12	2.55	0.41
1:A:498:ASP:OD1	1:A:498:ASP:N	2.52	0.41
1:B:129:TRP:CE3	1:B:136:LYS:HG3	2.55	0.41
1:A:75:ARG:HD2	1:A:319:THR:O	2.20	0.41
1:A:433:LYS:HA	1:A:433:LYS:HD3	1.88	0.41
1:B:129:TRP:HZ2	1:B:173:GLU:OE2	2.04	0.41
1:B:174:LEU:HA	1:B:174:LEU:HD12	1.82	0.41
1:B:365:LEU:HG	1:B:380:ASP:OD1	2.19	0.41
1:B:400:LEU:HD23	1:B:400:LEU:HA	1.89	0.41
1:B:625:PHE:CD1	1:B:626:GLN:N	2.88	0.41
1:B:328:VAL:HG21	1:B:363:LEU:HD13	2.01	0.41
1:B:408:ILE:CG2	1:B:412:GLU:HB3	2.51	0.41
1:B:446:MET:H	1:B:446:MET:HG2	1.47	0.41
1:A:600:LYS:H	1:A:600:LYS:CE	2.31	0.41
1:B:255:GLU:H	1:B:255:GLU:HG3	1.54	0.41
1:B:516:ASN:HB3	1:B:525:TYR:CD1	2.55	0.41
1:A:128:PHE:CG	1:A:182:LEU:HD13	2.56	0.41
1:A:168:LYS:H	1:A:168:LYS:HG2	1.42	0.41
1:A:334:LYS:O	1:A:338:LYS:N	2.53	0.41
1:A:539:THR:HB	1:A:546:ARG:HA	2.02	0.41
1:A:548:GLN:HB2	1:A:576:LEU:HD11	2.03	0.41
1:B:328:VAL:O	1:B:332:LEU:N	2.51	0.41
1:B:416:ASP:HA	1:B:451:VAL:HG21	2.02	0.41
1:B:417:GLU:HA	1:B:418:PRO:HD3	1.90	0.41
1:B:431:PHE:CE1	1:B:436:HIS:CD2	3.08	0.41
1:B:615:THR:HG21	1:B:673:ILE:HG21	2.02	0.40
1:B:646:LYS:HA	1:B:646:LYS:HD3	1.95	0.40
1:A:200:LYS:HE2	1:A:202:GLU:HB2	2.02	0.40
1:A:600:LYS:H	1:A:600:LYS:CD	2.32	0.40
1:B:357:PRO:HG3	1:B:538:SER:OG	2.22	0.40
1:A:91:TYR:O	1:A:197:GLN:N	2.51	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:105:THR:O	1:A:109:LEU:HB2	2.22	0.40
1:B:510:LEU:HD23	1:B:510:LEU:HA	1.75	0.40
1:A:355:GLN:HB2	1:A:361:ASP:O	2.22	0.40
1:B:97:THR:HA	1:B:101:GLU:OE2	2.21	0.40
1:B:126:LYS:HG3	1:B:166:ILE:HG21	2.04	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	627/646 (97%)	551 (88%)	66 (10%)	10 (2%)	7	7
1	B	625/646 (97%)	539 (86%)	62 (10%)	24 (4%)	2	1
All	All	1252/1292 (97%)	1090 (87%)	128 (10%)	34 (3%)	4	3

All (34) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	152	SER
1	A	175	SER
1	A	609	LYS
1	B	133	HIS
1	B	134	PRO
1	B	210	ALA
1	B	430	TYR
1	B	640	ALA
1	A	373	SER
1	A	439	ILE
1	B	98	THR
1	B	99	GLN
1	B	390	VAL

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Mol	Chain	Res	Type
1	B	437	VAL
1	B	558	SER
1	B	663	LEU
1	B	664	THR
1	B	665	GLY
1	B	128	PHE
1	B	213	SER
1	B	358	LYS
1	A	371	ASN
1	B	135	LYS
1	B	137	ALA
1	B	275	TYR
1	B	429	SER
1	A	282	ASP
1	B	136	LYS
1	B	641	PRO
1	A	606	VAL
1	B	624	VAL
1	B	659	PRO
1	A	564	VAL
1	A	661	PRO

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	546/559 (98%)	438 (80%)	108 (20%)	1	1
1	B	547/559 (98%)	411 (75%)	136 (25%)	0	0
All	All	1093/1118 (98%)	849 (78%)	244 (22%)	1	1

All (244) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	73	LEU
1	A	74	ASP

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Mol	Chain	Res	Type
1	A	85	SER
1	A	95	ARG
1	A	97	THR
1	A	103	LEU
1	A	109	LEU
1	A	112	LEU
1	A	113	ILE
1	A	122	GLU
1	A	123	ARG
1	A	138	LYS
1	A	142	THR
1	A	144	GLU
1	A	145	GLN
1	A	156	ASP
1	A	161	GLN
1	A	163	LEU
1	A	166	ILE
1	A	167	ARG
1	A	168	LYS
1	A	171	LEU
1	A	175	SER
1	A	177	LYS
1	A	179	LEU
1	A	192	THR
1	A	193	VAL
1	A	202	GLU
1	A	206	GLU
1	A	207	LYS
1	A	216	LEU
1	A	237	THR
1	A	245	VAL
1	A	256	LEU
1	A	266	SER
1	A	267	ARG
1	A	276	LEU
1	A	282	ASP
1	A	283	VAL
1	A	297	LYS
1	A	298	SER
1	A	317	LYS
1	A	322	ILE
1	A	324	LEU

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Mol	Chain	Res	Type
1	A	327	GLU
1	A	329	GLU
1	A	334	LYS
1	A	339	LEU
1	A	341	SER
1	A	346	ASP
1	A	347	MET
1	A	351	MET
1	A	354	VAL
1	A	358	LYS
1	A	363	LEU
1	A	365	LEU
1	A	369	GLN
1	A	370	ILE
1	A	372	LYS
1	A	376	MET
1	A	377	THR
1	A	380	ASP
1	A	381	ILE
1	A	387	GLN
1	A	398	THR
1	A	400	LEU
1	A	406	LYS
1	A	410	VAL
1	A	414	MET
1	A	417	GLU
1	A	422	GLN
1	A	427	LYS
1	A	428	ARG
1	A	429	SER
1	A	434	ASN
1	A	437	VAL
1	A	441	ASP
1	A	446	MET
1	A	449	SER
1	A	471	LEU
1	A	480	GLN
1	A	493	VAL
1	A	510	LEU
1	A	511	THR
1	A	529	THR
1	A	537	VAL

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Mol	Chain	Res	Type
1	A	539	THR
1	A	553	LEU
1	A	562	ASP
1	A	564	VAL
1	A	568	LYS
1	A	576	LEU
1	A	584	LYS
1	A	600	LYS
1	A	609	LYS
1	A	611	THR
1	A	612	VAL
1	A	613	VAL
1	A	621	THR
1	A	623	GLU
1	A	629	GLU
1	A	631	ARG
1	A	632	VAL
1	A	635	THR
1	A	654	THR
1	A	664	THR
1	A	672	VAL
1	A	673	ILE
1	B	47	GLN
1	B	85	SER
1	B	90	THR
1	B	97	THR
1	B	98	THR
1	B	102	MET
1	B	107	GLU
1	B	109	LEU
1	B	111	LYS
1	B	115	MET
1	B	118	LYS
1	B	126	LYS
1	B	129	TRP
1	B	133	HIS
1	B	135	LYS
1	B	138	LYS
1	B	152	SER
1	B	153	ILE
1	B	154	LYS
1	B	160	LYS

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Mol	Chain	Res	Type
1	B	162	LEU
1	B	163	LEU
1	B	168	LYS
1	B	171	LEU
1	B	174	LEU
1	B	177	LYS
1	B	192	THR
1	B	195	ASP
1	B	200	LYS
1	B	203	ASP
1	B	205	SER
1	B	206	GLU
1	B	214	GLN
1	B	215	GLN
1	B	216	LEU
1	B	217	SER
1	B	218	LYS
1	B	222	VAL
1	B	236	ASP
1	B	238	LEU
1	B	245	VAL
1	B	247	THR
1	B	255	GLU
1	B	261	LEU
1	B	283	VAL
1	B	287	LYS
1	B	292	LYS
1	B	298	SER
1	B	306	VAL
1	B	322	ILE
1	B	324	LEU
1	B	328	VAL
1	B	332	LEU
1	B	335	GLN
1	B	336	ILE
1	B	338	LYS
1	B	341	SER
1	B	346	ASP
1	B	347	MET
1	B	351	MET
1	B	354	VAL
1	B	356	ASN

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Mol	Chain	Res	Type
1	B	358	LYS
1	B	359	ASN
1	B	361	ASP
1	B	362	ILE
1	B	363	LEU
1	B	365	LEU
1	B	372	LYS
1	B	373	SER
1	B	376	MET
1	B	380	ASP
1	B	387	GLN
1	B	390	VAL
1	B	393	SER
1	B	399	LEU
1	B	410	VAL
1	B	413	THR
1	B	414	MET
1	B	416	ASP
1	B	417	GLU
1	B	422	GLN
1	B	426	THR
1	B	427	LYS
1	B	428	ARG
1	B	430	TYR
1	B	432	ASN
1	B	437	VAL
1	B	438	SER
1	B	446	MET
1	B	447	HIS
1	B	451	VAL
1	B	459	LYS
1	B	467	SER
1	B	471	LEU
1	B	473	SER
1	B	475	ILE
1	B	476	SER
1	B	480	GLN
1	B	486	LEU
1	B	488	GLN
1	B	506	GLN
1	B	508	GLU
1	B	510	LEU

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Mol	Chain	Res	Type
1	B	513	ASN
1	B	522	ILE
1	B	547	ILE
1	B	553	LEU
1	B	557	GLU
1	B	561	LYS
1	B	563	GLU
1	B	564	VAL
1	B	582	THR
1	B	584	LYS
1	B	587	LYS
1	B	588	GLN
1	B	591	GLU
1	B	595	MET
1	B	597	PHE
1	B	598	ASN
1	B	599	ASP
1	B	603	THR
1	B	609	LYS
1	B	611	THR
1	B	612	VAL
1	B	618	LYS
1	B	619	THR
1	B	624	VAL
1	B	626	GLN
1	B	632	VAL
1	B	662	TRP
1	B	670	ARG
1	B	672	VAL
1	B	673	ILE
1	B	674	ASN
1	B	678	LYS

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	155	GLN
1	A	161	GLN
1	A	189	ASN
1	A	215	GLN
1	A	314	GLN
1	A	335	GLN

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Mol	Chain	Res	Type
1	A	349	ASN
1	A	355	GLN
1	A	369	GLN
1	A	420	HIS
1	A	436	HIS
1	A	548	GLN
1	A	656	GLN
1	B	50	HIS
1	B	155	GLN
1	B	161	GLN
1	B	201	ASN
1	B	215	GLN
1	B	314	GLN
1	B	404	GLN
1	B	432	ASN
1	B	480	GLN
1	B	488	GLN
1	B	501	ASN
1	B	513	ASN
1	B	548	GLN
1	B	627	ASN
1	B	633	ASN
1	B	656	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 ⓘ

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

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	631/646 (97%)	0.79	95 (15%) 5 6	30, 67, 127, 171	0
1	B	631/646 (97%)	1.13	130 (20%) 2 3	36, 77, 129, 165	0
All	All	1262/1292 (97%)	0.96	225 (17%) 4 4	30, 72, 128, 171	0

All (225) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	168	LYS	8.2
1	B	625	PHE	6.6
1	B	661	PRO	6.4
1	A	174	LEU	6.2
1	B	437	VAL	5.8
1	B	601	ASP	5.7
1	A	660	PRO	5.7
1	A	370	ILE	5.7
1	B	344	ALA	5.6
1	B	339	LEU	5.5
1	B	662	TRP	5.4
1	B	138	LYS	5.3
1	B	660	PRO	5.3
1	B	363	LEU	5.1
1	B	425	LEU	5.0
1	A	139	ALA	4.9
1	A	341	SER	4.9
1	B	658	VAL	4.8
1	A	425	LEU	4.8
1	A	432	ASN	4.7
1	A	662	TRP	4.7
1	B	603	THR	4.7
1	B	436	HIS	4.7
1	B	596	ALA	4.7

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Mol	Chain	Res	Type	RSRZ
1	B	424	GLY	4.6
1	B	612	VAL	4.5
1	A	606	VAL	4.5
1	B	657	PRO	4.4
1	B	194	LEU	4.4
1	B	216	LEU	4.4
1	B	438	SER	4.3
1	A	564	VAL	4.3
1	A	658	VAL	4.3
1	B	217	SER	4.3
1	A	625	PHE	4.2
1	A	372	LYS	4.2
1	A	165	LYS	4.1
1	A	621	THR	4.1
1	A	343	GLY	4.1
1	B	371	ASN	4.1
1	B	415	VAL	4.1
1	B	134	PRO	4.0
1	B	139	ALA	4.0
1	A	142	THR	4.0
1	B	218	LYS	3.9
1	B	430	TYR	3.9
1	B	663	LEU	3.9
1	A	413	THR	3.9
1	B	142	THR	3.9
1	B	621	THR	3.9
1	A	170	GLN	3.7
1	A	363	LEU	3.7
1	B	336	ILE	3.6
1	A	167	ARG	3.6
1	A	160	LYS	3.6
1	B	357	PRO	3.6
1	A	611	THR	3.6
1	A	149	ALA	3.5
1	B	343	GLY	3.4
1	A	426	THR	3.4
1	B	678	LYS	3.4
1	B	594	LYS	3.3
1	A	414	MET	3.3
1	A	428	ARG	3.3
1	B	413	THR	3.3
1	B	611	THR	3.3

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Mol	Chain	Res	Type	RSRZ
1	B	143	LYS	3.3
1	A	613	VAL	3.3
1	A	171	LEU	3.3
1	B	429	SER	3.3
1	A	148	LEU	3.2
1	A	173	GLU	3.2
1	B	136	LYS	3.2
1	A	140	MET	3.2
1	B	374	GLY	3.2
1	B	627	ASN	3.2
1	B	643	ASP	3.2
1	A	194	LEU	3.2
1	A	365	LEU	3.2
1	B	365	LEU	3.2
1	B	659	PRO	3.2
1	A	369	GLN	3.1
1	A	619	THR	3.1
1	B	358	LYS	3.1
1	B	359	ASN	3.1
1	A	143	LYS	3.1
1	B	414	MET	3.1
1	B	677	PHE	3.1
1	A	513	ASN	3.1
1	A	631	ARG	3.1
1	A	522	ILE	3.0
1	A	562	ASP	3.0
1	B	454	PHE	3.0
1	B	372	LYS	3.0
1	A	663	LEU	3.0
1	A	172	ASP	3.0
1	B	593	PHE	3.0
1	A	146	ALA	3.0
1	A	659	PRO	3.0
1	A	166	ILE	3.0
1	A	431	PHE	3.0
1	B	421	PHE	3.0
1	B	137	ALA	2.9
1	B	451	VAL	2.9
1	B	153	ILE	2.9
1	B	426	THR	2.9
1	A	657	PRO	2.9
1	B	390	VAL	2.9

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Mol	Chain	Res	Type	RSRZ
1	A	158	TYR	2.9
1	A	598	ASN	2.9
1	B	665	GLY	2.9
1	A	340	ARG	2.9
1	B	431	PHE	2.9
1	B	129	TRP	2.9
1	B	428	ARG	2.8
1	A	46	ALA	2.8
1	B	595	MET	2.8
1	B	146	ALA	2.8
1	B	210	ALA	2.8
1	A	416	ASP	2.7
1	B	440	ASN	2.7
1	B	626	GLN	2.7
1	A	429	SER	2.7
1	B	614	PRO	2.7
1	B	132	LEU	2.7
1	A	337	LYS	2.7
1	A	673	ILE	2.7
1	B	471	LEU	2.7
1	A	424	GLY	2.7
1	B	133	HIS	2.6
1	A	153	ILE	2.6
1	B	46	ALA	2.5
1	A	141	MET	2.5
1	B	236	ASP	2.5
1	A	129	TRP	2.5
1	A	151	GLY	2.5
1	A	661	PRO	2.5
1	A	675	TYR	2.5
1	B	219	LEU	2.5
1	B	419	LEU	2.5
1	B	598	ASN	2.5
1	B	418	PRO	2.5
1	B	130	ILE	2.5
1	B	641	PRO	2.5
1	A	137	ALA	2.5
1	B	640	ALA	2.5
1	B	434	ASN	2.4
1	A	342	GLN	2.4
1	B	366	ALA	2.4
1	A	390	VAL	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	410	VAL	2.4
1	A	138	LYS	2.4
1	B	376	MET	2.4
1	B	408	ILE	2.4
1	B	433	LYS	2.4
1	B	561	LYS	2.4
1	B	446	MET	2.4
1	A	616	ALA	2.4
1	A	437	VAL	2.4
1	B	522	ILE	2.4
1	B	131	GLN	2.4
1	A	169	SER	2.3
1	B	439	ILE	2.3
1	B	562	ASP	2.3
1	A	338	LYS	2.3
1	A	614	PRO	2.3
1	B	207	LYS	2.3
1	A	642	ILE	2.3
1	B	624	VAL	2.3
1	A	162	LEU	2.3
1	B	112	LEU	2.3
1	A	333	ASP	2.3
1	B	60	ASN	2.3
1	B	599	ASP	2.3
1	B	228	TRP	2.3
1	B	470	ALA	2.3
1	B	47	GLN	2.3
1	A	612	VAL	2.3
1	A	434	ASN	2.3
1	B	523	GLY	2.3
1	A	559	THR	2.3
1	A	152	SER	2.3
1	B	152	SER	2.3
1	B	341	SER	2.3
1	A	433	LYS	2.3
1	B	93	ARG	2.2
1	B	254	LYS	2.2
1	B	606	VAL	2.2
1	A	448	SER	2.2
1	B	465	TYR	2.2
1	A	439	ILE	2.2
1	A	163	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	371	ASN	2.2
1	A	147	MET	2.2
1	A	48	GLY	2.2
1	A	156	ASP	2.2
1	A	632	VAL	2.2
1	B	423	GLY	2.2
1	A	603	THR	2.2
1	B	484	ARG	2.1
1	B	113	ILE	2.1
1	A	136	LYS	2.1
1	A	427	LYS	2.1
1	B	427	LYS	2.1
1	B	605	TYR	2.1
1	A	57	ASN	2.1
1	B	416	ASP	2.1
1	B	591	GLU	2.1
1	B	193	VAL	2.1
1	B	334	LYS	2.1
1	A	417	GLU	2.1
1	B	59	GLU	2.1
1	B	518	LEU	2.1
1	B	158	TYR	2.1
1	B	369	GLN	2.1
1	B	204	VAL	2.1
1	B	464	PRO	2.1
1	B	98	THR	2.1
1	B	168	LYS	2.1
1	B	145	GLN	2.1
1	B	220	PRO	2.1
1	A	377	THR	2.0
1	B	514	PRO	2.0
1	B	388	PHE	2.0
1	B	473	SER	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.