Full wwPDB X-ray Structure Validation Report (i)

Nov 1, 2021 – 01:31 PM EDT

PDB ID	:	1Z52
Title	:	Proaerolysin Mutant W373L
Authors	:	Parker, M.W.; Feil, S.C.; Tang, J.W.
Deposited on	:	2005-03-16
Resolution	:	2.38 Å(reported)

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

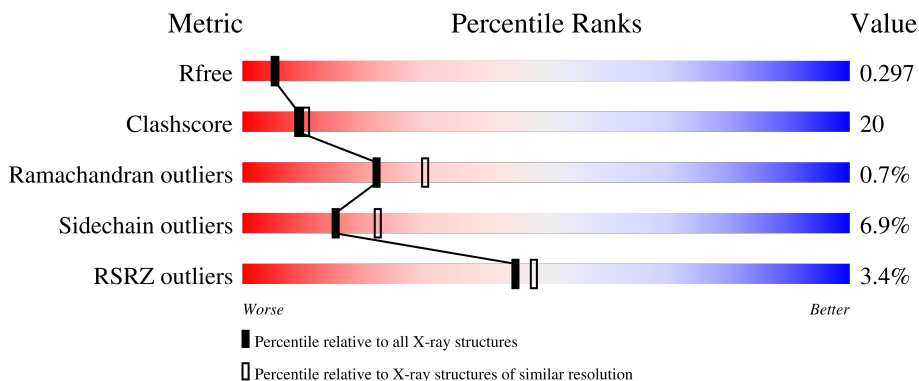|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

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 2.38 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	Percentile Ranks	Value
Rfree		0.297
Clashscore		20
Ramachandran outliers		0.7%
Sidechain outliers		6.9%
RSRZ outliers		3.4%

Worse *Better*

▌ Percentile relative to all X-ray structures
▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5509 (2.40-2.36)
Clashscore	141614	6082 (2.40-2.36)
Ramachandran outliers	138981	5973 (2.40-2.36)
Sidechain outliers	138945	5975 (2.40-2.36)
RSRZ outliers	127900	5397 (2.40-2.36)

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 <=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	470	4% / 65% / 27% / · / ·
1	B	470	3% / 61% / 29% / 6% / ·

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 7179 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 Aerolysin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	451	Total	C	N	O	S	0	0	0
			3525	2227	607	682	9			
1	B	450	Total	C	N	O	S	0	0	0
			3522	2226	605	682	9			

There are 2 discrepancies between the modelled and reference sequences:

| Chain	Residue	Modelled	Actual	Comment	Reference
A	373	LEU	TRP	engineered mutation	UNP P09167
B	373	LEU	TRP	engineered mutation	UNP P09167

- Molecule 2 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	50	Total	O	0	0
			50	50		
2	B	82	Total	O	0	0
			82	82		

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: Aerolysin
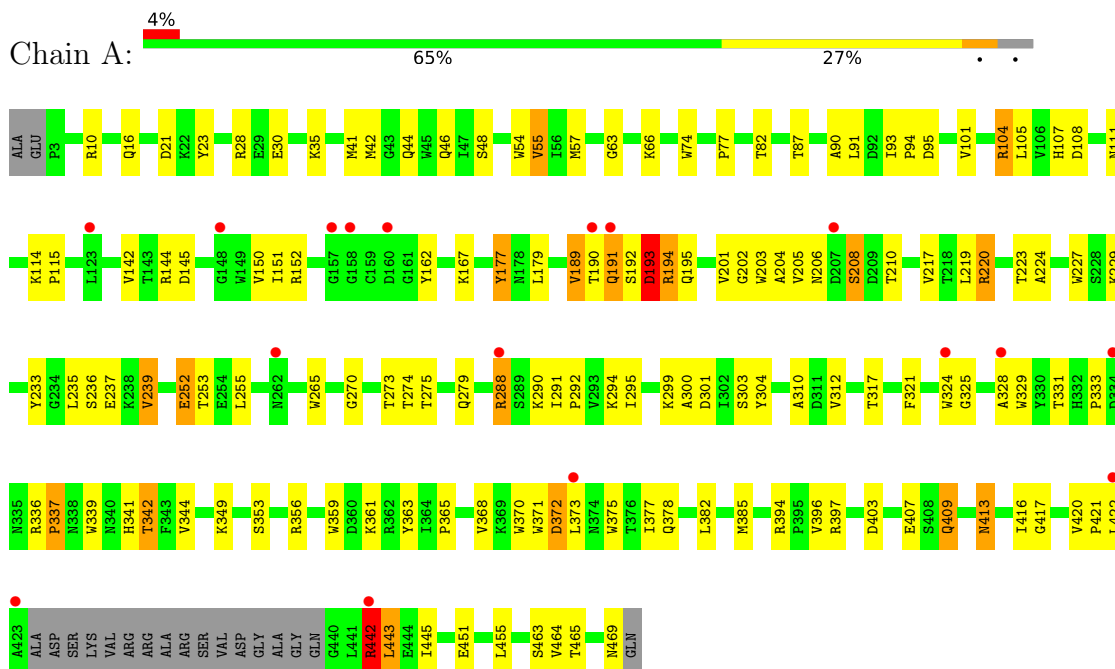
• Molecule 1: Aerolysin
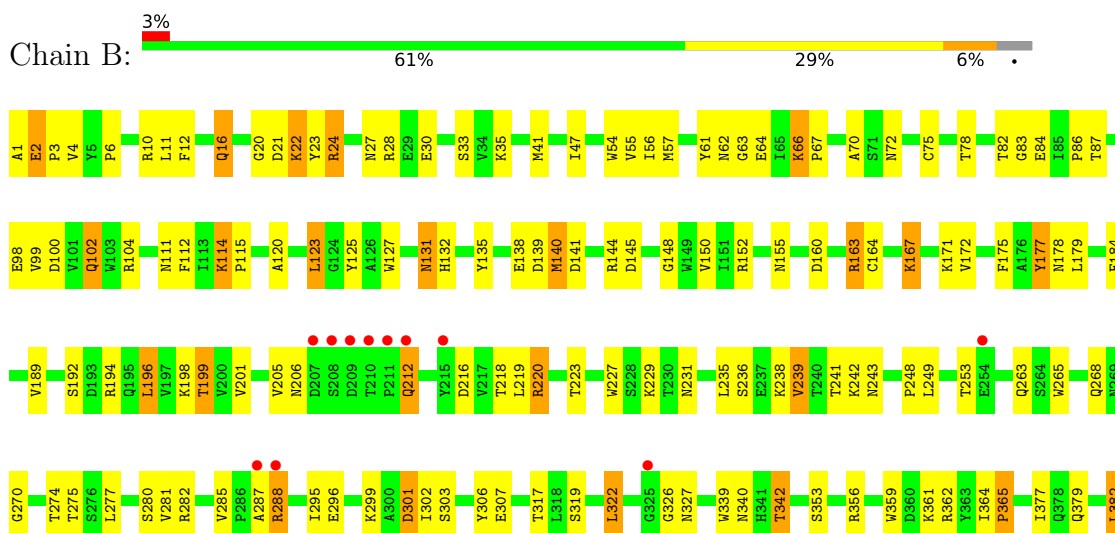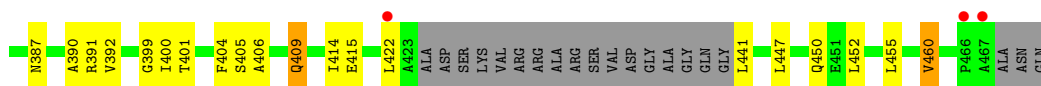
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	70.71Å 91.14Å 168.22Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	25.00 – 2.38 25.00 – 2.39	Depositor EDS
% Data completeness (in resolution range)	(Not available) (25.00-2.38) 86.7 (25.00-2.39)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.79 (at 2.39Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.250 , 0.301 0.246 , 0.297	Depositor DCC
R_{free} test set	1908 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	33.2	Xtriage
Anisotropy	0.127	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 32.8	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	7179	wwPDB-VP
Average B, all atoms (Å^2)	26.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.29% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ 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	0.69	5/3621 (0.1%)	0.87	7/4941 (0.1%)
1	B	0.58	1/3618 (0.0%)	0.79	6/4938 (0.1%)
All	All	0.64	6/7239 (0.1%)	0.83	13/9879 (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	A	0	1
1	B	0	2
All	All	0	3

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	193	ASP	C-N	22.70	1.86	1.34
1	A	370	TRP	C-N	-9.24	1.12	1.34
1	A	189	VAL	C-N	9.00	1.54	1.34
1	B	102	GLN	C-N	8.59	1.53	1.34
1	A	203	TRP	C-N	-6.58	1.19	1.34
1	A	413	ASN	C-N	-5.14	1.22	1.34

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	193	ASP	CA-C-N	-22.34	68.05	117.20
1	A	193	ASP	O-C-N	16.85	149.66	122.70
1	A	104	ARG	NE-CZ-NH2	7.74	124.17	120.30
1	A	442	ARG	NE-CZ-NH2	7.55	124.07	120.30
1	A	220	ARG	NE-CZ-NH2	7.51	124.05	120.30
1	B	163	ARG	NE-CZ-NH2	7.49	124.05	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	144	ARG	NE-CZ-NH2	7.45	124.03	120.30
1	B	152	ARG	NE-CZ-NH2	7.38	123.99	120.30
1	B	104	ARG	NE-CZ-NH2	7.27	123.94	120.30
1	A	194	ARG	NE-CZ-NH2	7.13	123.86	120.30
1	B	288	ARG	NE-CZ-NH2	6.58	123.59	120.30
1	A	385	MET	CG-SD-CE	5.83	109.53	100.20
1	B	140	MET	CG-SD-CE	5.83	109.53	100.20

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	443	LEU	Mainchain
1	B	172	VAL	Mainchain
1	B	196	LEU	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	3525	0	3362	134	1
1	B	3522	0	3365	145	1
2	A	50	0	0	15	2
2	B	82	0	0	27	2
All	All	7179	0	6727	275	3

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 20.

All (275) 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:A:193:ASP:CA	1:A:194:ARG:N	1.92	1.33
1:A:193:ASP:C	1:A:194:ARG:N	1.86	1.29
1:A:193:ASP:HA	1:A:194:ARG:N	1.50	1.26

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:442:ARG:HH11	1:A:442:ARG:CG	1.53	1.21
1:B:353:SER:HB3	2:B:535:HOH:O	1.41	1.18
1:B:131:ASN:HD21	1:B:167:LYS:NZ	1.43	1.16
1:A:442:ARG:HH11	1:A:442:ARG:HG3	1.20	1.05
1:B:155:ASN:OD1	1:B:167:LYS:HE3	1.55	1.04
1:B:249:LEU:HD13	2:B:530:HOH:O	1.58	1.00
1:A:324:TRP:HE3	1:A:336:ARG:HE	1.03	0.97
1:B:131:ASN:ND2	1:B:167:LYS:NZ	2.12	0.96
1:B:249:LEU:HB2	2:B:530:HOH:O	1.67	0.94
1:A:442:ARG:HG3	1:A:442:ARG:NH1	1.76	0.94
1:B:155:ASN:OD1	1:B:167:LYS:CE	2.17	0.93
1:B:361:LYS:HD3	2:B:544:HOH:O	1.69	0.92
1:A:442:ARG:CG	1:A:442:ARG:NH1	2.24	0.92
1:A:442:ARG:HH11	1:A:442:ARG:HG2	1.33	0.91
1:B:22:LYS:HE2	1:B:22:LYS:HA	1.53	0.89
1:A:144:ARG:CD	2:A:485:HOH:O	2.20	0.89
1:B:131:ASN:HD21	1:B:167:LYS:HZ1	1.10	0.87
1:A:190:THR:HG22	1:A:190:THR:O	1.73	0.86
1:B:148:GLY:HA3	2:B:526:HOH:O	1.76	0.84
1:A:152:ARG:HE	1:A:167:LYS:HB2	1.44	0.82
1:B:189:VAL:HG11	1:B:192:SER:HB2	1.63	0.80
1:A:41:MET:HE3	1:A:74:TRP:CH2	2.17	0.79
1:A:368:VAL:HG21	1:A:372:ASP:HB2	1.65	0.79
1:B:178:ASN:HD21	1:B:242:LYS:H	1.29	0.77
1:A:144:ARG:HD3	2:A:485:HOH:O	1.80	0.76
1:B:452:LEU:HD13	1:B:460:VAL:HG11	1.68	0.76
1:A:142:VAL:HG12	1:A:151:ILE:HG12	1.67	0.76
1:A:292:PRO:HG2	1:A:417:GLY:HA3	1.68	0.76
1:A:144:ARG:HD2	2:A:485:HOH:O	1.85	0.75
1:A:236:SER:HA	1:A:239:VAL:HG12	1.67	0.75
1:A:192:SER:O	1:A:193:ASP:HB2	1.87	0.74
1:B:206:ASN:OD1	1:B:212:GLN:HB2	1.87	0.74
1:B:317:THR:OG1	1:B:342:THR:HB	1.87	0.74
1:B:220:ARG:HG2	2:B:484:HOH:O	1.87	0.74
2:A:473:HOH:O	1:B:356:ARG:HD3	1.88	0.73
1:B:322:LEU:HB3	1:B:327:ASN:ND2	2.03	0.73
1:A:341:HIS:CD2	1:A:371:TRP:HE1	2.06	0.72
1:A:465:THR:HG23	1:A:469:ASN:ND2	2.04	0.71
1:B:447:LEU:HA	2:B:518:HOH:O	1.91	0.71
1:B:132:HIS:HB2	1:B:139:ASP:CG	2.12	0.71
2:A:473:HOH:O	1:B:356:ARG:CG	2.40	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:202:GLY:HA3	1:A:445:ILE:HG12	1.74	0.69
1:B:231:ASN:HA	2:B:549:HOH:O	1.93	0.69
1:A:344:VAL:HG23	1:A:353:SER:HB2	1.75	0.69
1:B:155:ASN:CG	1:B:167:LYS:HE3	2.13	0.68
1:B:249:LEU:CD1	2:B:530:HOH:O	2.28	0.68
1:B:212:GLN:HG2	1:B:441:LEU:HB2	1.75	0.68
1:A:107:HIS:NE2	1:A:142:VAL:HG21	2.09	0.68
1:A:279:GLN:NE2	1:A:413:ASN:HA	2.09	0.67
1:A:465:THR:HG23	1:A:469:ASN:HD22	1.60	0.67
1:B:28:ARG:HD2	1:B:54:TRP:CE2	2.29	0.67
1:A:87:THR:O	1:A:87:THR:HG23	1.95	0.66
1:A:361:LYS:C	2:A:498:HOH:O	2.34	0.66
1:B:194:ARG:O	1:B:194:ARG:HG3	1.96	0.66
1:A:57:MET:O	1:A:63:GLY:HA2	1.95	0.65
1:B:220:ARG:CG	2:B:484:HOH:O	2.43	0.65
1:B:229:LYS:NZ	1:B:231:ASN:HD21	1.94	0.65
1:A:324:TRP:HE3	1:A:336:ARG:NE	1.86	0.65
1:A:219:LEU:HD22	1:A:295:ILE:HG21	1.79	0.64
1:B:189:VAL:CG1	1:B:192:SER:HB2	2.27	0.64
1:A:324:TRP:HD1	1:A:325:GLY:H	1.45	0.64
1:A:372:ASP:HA	2:A:494:HOH:O	1.97	0.64
1:A:229:LYS:HA	1:A:403:ASP:O	1.98	0.63
1:A:142:VAL:HA	1:A:150:VAL:O	1.97	0.63
2:A:473:HOH:O	1:B:356:ARG:HG2	1.97	0.63
1:B:223:THR:HB	1:B:409:GLN:HB2	1.80	0.63
1:B:131:ASN:HD21	1:B:167:LYS:HZ3	1.43	0.62
1:A:190:THR:O	1:A:191:GLN:HB2	2.00	0.62
1:A:177:TYR:HD2	1:A:312:VAL:HG22	1.65	0.62
1:A:41:MET:CE	1:A:74:TRP:CH2	2.82	0.61
1:B:131:ASN:ND2	1:B:167:LYS:HZ3	1.97	0.61
1:A:28:ARG:HD3	1:A:54:TRP:CE3	2.37	0.60
1:B:319:SER:HA	1:B:339:TRP:O	2.02	0.60
1:A:48:SER:O	1:A:55:VAL:HG22	2.02	0.60
1:B:327:ASN:HB3	2:B:499:HOH:O	2.01	0.59
1:A:190:THR:O	1:A:190:THR:CG2	2.45	0.59
1:B:164:CYS:HB2	2:B:519:HOH:O	2.02	0.59
1:A:205:VAL:HG13	1:A:422:LEU:HD21	1.85	0.58
1:A:236:SER:HA	1:A:239:VAL:CG1	2.31	0.58
1:A:377:ILE:HD13	1:A:382:LEU:CD1	2.34	0.58
1:B:216:ASP:OD1	1:B:282:ARG:HD3	2.04	0.58
1:B:280:SER:HA	1:B:414:ILE:HD12	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:359:TRP:HA	1:A:373:LEU:HD12	1.85	0.58
1:B:66:LYS:HD2	1:B:67:PRO:O	2.04	0.58
1:A:253:THR:HG23	1:A:300:ALA:HB3	1.85	0.58
1:A:356:ARG:HG2	1:A:356:ARG:HH11	1.68	0.58
1:A:44:GLN:NE2	1:B:356:ARG:HD3	2.19	0.57
1:A:451:GLU:O	1:A:455:LEU:HD12	2.03	0.57
1:B:1:ALA:H1	1:B:83:GLY:H	1.53	0.57
1:A:107:HIS:CD2	1:A:142:VAL:HG21	2.39	0.57
1:A:101:VAL:HG11	1:A:235:LEU:HD22	1.87	0.57
1:A:324:TRP:HB3	1:A:336:ARG:NH2	2.20	0.56
1:A:359:TRP:CA	1:A:373:LEU:HD12	2.35	0.56
1:A:193:ASP:CB	1:A:194:ARG:N	2.66	0.56
1:B:184:PHE:CG	1:B:248:PRO:HG3	2.40	0.56
1:B:84:GLU:HA	2:B:476:HOH:O	2.06	0.56
1:B:115:PRO:HB2	1:B:392:VAL:HG12	1.88	0.56
1:A:229:LYS:HE2	1:A:265:TRP:CZ2	2.40	0.56
1:A:368:VAL:O	1:A:368:VAL:HG13	2.04	0.56
1:B:319:SER:HB3	1:B:340:ASN:ND2	2.20	0.56
1:B:132:HIS:HB2	1:B:139:ASP:OD2	2.04	0.56
1:B:24:ARG:HG2	1:B:24:ARG:HH11	1.71	0.56
1:A:253:THR:O	1:A:255:LEU:HD13	2.07	0.55
1:B:98:GLU:OE1	1:B:238:LYS:HD2	2.06	0.54
1:B:229:LYS:HZ3	1:B:231:ASN:HD21	1.54	0.54
1:A:114:LYS:HB2	1:A:115:PRO:HD3	1.89	0.54
1:A:331:THR:OG1	1:A:333:PRO:HD3	2.08	0.54
1:A:189:VAL:HA	1:A:304:TYR:HB3	1.89	0.54
1:A:208:SER:O	1:A:288:ARG:HD2	2.08	0.54
1:B:57:MET:O	1:B:63:GLY:HA2	2.08	0.54
1:A:253:THR:HG23	1:A:300:ALA:CB	2.38	0.54
1:B:179:LEU:O	1:B:241:THR:HG22	2.07	0.54
1:A:291:ILE:HD12	1:A:416:ILE:HG23	1.91	0.53
1:B:452:LEU:CD1	1:B:460:VAL:HG11	2.37	0.53
1:A:229:LYS:HE2	1:A:265:TRP:CE2	2.43	0.53
1:A:317:THR:OG1	1:A:342:THR:HB	2.09	0.53
1:B:171:LYS:HE3	2:B:510:HOH:O	2.08	0.53
1:B:218:THR:HG22	1:B:220:ARG:HD2	1.91	0.53
1:A:361:LYS:HA	2:A:498:HOH:O	2.09	0.53
1:B:227:TRP:CE2	1:B:270:GLY:HA2	2.43	0.53
1:A:194:ARG:HG2	1:A:195:GLN:N	2.23	0.52
1:A:294:LYS:HE3	1:B:135:TYR:CE2	2.44	0.52
1:A:324:TRP:HB3	1:A:336:ARG:HH21	1.73	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:450:GLN:NE2	2:B:550:HOH:O	2.41	0.52
1:B:127:TRP:CE2	1:B:164:CYS:HA	2.45	0.52
1:B:179:LEU:HB3	1:B:241:THR:CG2	2.40	0.52
1:B:86:PRO:HD2	1:B:390:ALA:HB2	1.92	0.52
1:B:178:ASN:ND2	1:B:242:LYS:H	2.05	0.51
1:B:206:ASN:HB2	1:B:285:VAL:CG1	2.40	0.51
1:A:10:ARG:HD3	2:A:520:HOH:O	2.09	0.51
1:B:10:ARG:NH2	2:B:491:HOH:O	2.26	0.51
1:B:377:ILE:HD13	1:B:382:LEU:CD1	2.41	0.51
1:A:30:GLU:HG2	2:A:504:HOH:O	2.10	0.51
1:B:47:ILE:HG23	1:B:55:VAL:HG11	1.92	0.50
1:B:47:ILE:HG23	1:B:55:VAL:CG1	2.42	0.50
1:B:35:LYS:HE3	1:B:63:GLY:O	2.12	0.50
1:B:1:ALA:C	1:B:3:PRO:HD2	2.32	0.50
1:A:224:ALA:HA	1:A:273:THR:O	2.11	0.50
1:A:190:THR:O	1:A:191:GLN:CB	2.59	0.49
1:A:420:VAL:HG23	1:A:420:VAL:O	2.11	0.49
1:B:229:LYS:HE3	1:B:268:GLN:O	2.12	0.49
1:B:127:TRP:NE1	1:B:164:CYS:HA	2.28	0.49
1:A:142:VAL:HG23	1:A:142:VAL:O	2.13	0.49
1:B:198:LYS:HG3	1:B:199:THR:N	2.27	0.49
1:B:415:GLU:HG3	2:B:531:HOH:O	2.13	0.49
1:B:16:GLN:HG2	1:B:70:ALA:O	2.13	0.49
1:B:23:TYR:HB3	1:B:75:CYS:HB3	1.95	0.49
1:B:102:GLN:NE2	1:B:175:PHE:CD2	2.81	0.48
1:B:219:LEU:HD22	1:B:295:ILE:HD13	1.94	0.48
1:B:120:ALA:O	1:B:125:TYR:HB2	2.14	0.48
1:A:57:MET:SD	1:A:66:LYS:HE2	2.52	0.48
1:B:30:GLU:O	1:B:33:SER:HB3	2.13	0.48
1:A:328:ALA:HB3	1:A:371:TRP:CE3	2.49	0.48
1:B:22:LYS:HG3	1:B:78:THR:OG1	2.14	0.48
1:B:145:ASP:HB2	1:B:150:VAL:HG23	1.94	0.48
1:A:227:TRP:CE2	1:A:270:GLY:HA2	2.48	0.48
1:A:443:LEU:HD13	1:A:464:VAL:HG22	1.95	0.47
1:A:377:ILE:HG23	1:A:382:LEU:HA	1.96	0.47
1:A:299:LYS:HE3	1:A:407:GLU:OE2	2.14	0.47
1:A:394:ARG:HD2	2:A:478:HOH:O	2.14	0.47
1:B:301:ASP:HA	1:B:406:ALA:O	2.14	0.47
1:A:223:THR:O	1:A:274:THR:HA	2.15	0.47
1:A:359:TRP:CH2	1:A:377:ILE:HD11	2.50	0.47
1:B:359:TRP:NE1	1:B:362:ARG:NH2	2.62	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:375:TRP:O	1:A:378:GLN:HG2	2.14	0.47
1:B:387:ASN:O	1:B:391:ARG:HG3	2.15	0.47
1:B:206:ASN:O	1:B:288:ARG:HA	2.15	0.47
1:A:375:TRP:HA	1:A:378:GLN:CD	2.35	0.46
1:A:162:TYR:HE2	1:A:336:ARG:CD	2.28	0.46
1:A:223:THR:HG21	1:A:409:GLN:O	2.15	0.46
1:A:219:LEU:HD22	1:A:295:ILE:HD13	1.98	0.46
1:B:11:LEU:HD11	1:B:72:ASN:HD22	1.80	0.46
1:B:206:ASN:HB2	1:B:285:VAL:HG13	1.97	0.46
1:B:306:TYR:CD1	1:B:306:TYR:C	2.89	0.46
1:A:82:THR:HG23	1:A:382:LEU:HD21	1.96	0.46
1:A:377:ILE:HD13	1:A:382:LEU:HD13	1.97	0.46
1:B:1:ALA:N	1:B:83:GLY:H	2.14	0.46
1:A:292:PRO:CG	1:A:417:GLY:HA3	2.44	0.46
1:A:361:LYS:CA	2:A:498:HOH:O	2.64	0.46
1:B:12:PHE:CE1	1:B:20:GLY:HA3	2.51	0.46
1:B:299:LYS:HB2	1:B:409:GLN:HE22	1.80	0.46
1:B:239:VAL:HG22	1:B:265:TRP:CB	2.45	0.45
1:B:275:THR:O	1:B:277:LEU:HG	2.16	0.45
1:B:281:VAL:HG22	1:B:282:ARG:N	2.31	0.45
1:A:291:ILE:HD12	1:A:416:ILE:CG2	2.46	0.45
1:B:16:GLN:HE21	1:B:16:GLN:C	2.20	0.45
1:A:191:GLN:HA	1:A:191:GLN:NE2	2.32	0.45
1:A:356:ARG:HG2	1:A:356:ARG:NH1	2.32	0.45
1:B:123:LEU:HD12	1:B:123:LEU:HA	1.78	0.45
1:A:394:ARG:HG2	1:A:394:ARG:HH11	1.81	0.45
1:B:322:LEU:HB3	1:B:327:ASN:HD22	1.82	0.45
1:A:204:ALA:HB3	1:A:291:ILE:HG13	1.98	0.45
1:B:220:ARG:CD	2:B:484:HOH:O	2.64	0.45
1:B:231:ASN:CB	2:B:549:HOH:O	2.65	0.45
1:A:217:VAL:HA	1:A:463:SER:O	2.17	0.44
1:A:442:ARG:NH1	1:A:442:ARG:HG2	2.12	0.44
1:B:155:ASN:OD1	1:B:167:LYS:NZ	2.49	0.44
1:B:231:ASN:HB3	2:B:549:HOH:O	2.17	0.44
1:A:217:VAL:HG13	1:A:443:LEU:HD21	1.99	0.44
1:B:263:GLN:NE2	1:B:268:GLN:HG2	2.32	0.44
1:B:307:GLU:HB2	1:B:401:THR:HG22	2.00	0.44
1:B:194:ARG:O	1:B:194:ARG:CG	2.65	0.44
1:A:87:THR:O	1:A:87:THR:CG2	2.66	0.44
1:A:363:TYR:N	2:A:498:HOH:O	2.51	0.44
1:B:167:LYS:H	1:B:167:LYS:HG2	1.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:152:ARG:NE	1:A:167:LYS:HB2	2.24	0.43
1:B:223:THR:CB	1:B:409:GLN:HB2	2.48	0.43
1:B:206:ASN:ND2	1:B:287:ALA:HA	2.33	0.43
1:B:236:SER:N	2:B:496:HOH:O	2.43	0.43
1:A:90:ALA:C	1:A:394:ARG:HH12	2.22	0.43
1:A:107:HIS:NE2	1:A:142:VAL:CG2	2.79	0.43
1:B:205:VAL:O	1:B:441:LEU:HD12	2.19	0.43
1:B:220:ARG:HD3	2:B:484:HOH:O	2.18	0.43
1:A:95:ASP:OD2	1:A:233:TYR:HB2	2.19	0.43
1:A:44:GLN:HE21	1:B:356:ARG:HD3	1.83	0.42
1:B:4:VAL:O	1:B:6:PRO:HD3	2.20	0.42
1:B:84:GLU:OE2	2:B:492:HOH:O	2.22	0.42
1:A:42:MET:HG2	1:A:46:GLN:NE2	2.34	0.42
1:A:162:TYR:HE2	1:A:336:ARG:HD2	1.84	0.42
1:B:177:TYR:CD1	1:B:177:TYR:N	2.87	0.42
1:B:235:LEU:N	2:B:496:HOH:O	2.52	0.42
1:B:27:ASN:OD1	1:B:30:GLU:HG3	2.19	0.42
1:A:204:ALA:O	1:A:290:LYS:HA	2.20	0.42
1:A:253:THR:O	1:A:255:LEU:CD1	2.67	0.42
1:B:61:TYR:O	1:B:62:ASN:HB2	2.19	0.42
1:B:177:TYR:CE2	1:B:235:LEU:HD11	2.54	0.42
1:B:239:VAL:HG22	1:B:265:TRP:HB2	2.01	0.42
1:B:141:ASP:HA	2:B:502:HOH:O	2.19	0.42
1:B:223:THR:O	1:B:274:THR:HA	2.19	0.42
1:A:179:LEU:HA	1:A:310:ALA:HA	2.01	0.42
1:B:364:ILE:HA	1:B:365:PRO:HD2	1.77	0.42
1:A:220:ARG:NH1	1:A:463:SER:OG	2.53	0.42
1:A:252:GLU:CD	1:B:111:ASN:HD21	2.23	0.42
1:A:93:ILE:HA	1:A:94:PRO:HD3	1.90	0.42
1:A:108:ASP:CG	1:A:111:ASN:HB2	2.40	0.42
1:A:292:PRO:HG2	1:A:417:GLY:CA	2.44	0.42
1:B:99:VAL:HG13	1:B:100:ASP:N	2.34	0.42
1:B:303:SER:HA	1:B:404:PHE:O	2.20	0.42
1:B:399:GLY:O	1:B:400:ILE:HD13	2.20	0.42
1:A:206:ASN:OD1	1:A:208:SER:HB3	2.20	0.41
1:A:205:VAL:HG22	1:A:290:LYS:CB	2.51	0.41
1:A:329:TRP:CE2	1:A:339:TRP:CZ2	3.08	0.41
2:A:473:HOH:O	1:B:356:ARG:CD	2.50	0.41
1:B:11:LEU:HD21	1:B:72:ASN:HD22	1.85	0.41
1:A:23:TYR:CE1	1:A:77:PRO:HG3	2.54	0.41
1:A:205:VAL:HG22	1:A:290:LYS:HB3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:132:HIS:ND1	1:B:139:ASP:OD2	2.53	0.41
1:A:365:PRO:O	1:A:368:VAL:HG12	2.20	0.41
1:B:379:GLN:NE2	2:B:528:HOH:O	2.53	0.41
1:A:253:THR:HG22	1:A:255:LEU:CD1	2.51	0.41
1:A:303:SER:O	1:A:304:TYR:HB3	2.20	0.41
1:A:329:TRP:CE2	1:A:339:TRP:HZ2	2.37	0.41
1:A:105:LEU:HD13	1:A:396:VAL:HG11	2.02	0.41
1:B:179:LEU:HB3	1:B:241:THR:HG22	2.03	0.41
1:A:321:PHE:HA	1:A:337:PRO:O	2.21	0.41
1:B:1:ALA:HA	1:B:82:THR:HB	2.03	0.41
1:B:55:VAL:CG1	1:B:56:ILE:N	2.84	0.41
1:A:41:MET:HE1	1:A:74:TRP:CZ3	2.55	0.41
1:B:302:ILE:O	1:B:405:SER:HA	2.21	0.41
1:A:301:ASP:OD2	1:A:407:GLU:OE1	2.39	0.40
1:B:177:TYR:CD2	1:B:235:LEU:HD11	2.57	0.40
1:B:62:ASN:O	1:B:63:GLY:C	2.59	0.40
1:B:64:GLU:OE2	1:B:66:LYS:HB3	2.21	0.40
1:B:114:LYS:HE3	1:B:138:GLU:HG3	2.03	0.40
1:B:179:LEU:HD13	1:B:265:TRP:CE3	2.56	0.40
1:B:361:LYS:CD	2:B:544:HOH:O	2.48	0.40
1:A:91:LEU:HB2	1:A:394:ARG:NH1	2.36	0.40
1:B:229:LYS:HZ2	1:B:231:ASN:HD21	1.69	0.40
1:A:344:VAL:HG11	1:A:349:LYS:HG3	2.03	0.40
1:B:112:PHE:C	1:B:115:PRO:HD2	2.42	0.40
1:B:196:LEU:CD1	1:B:296:GLU:HB3	2.51	0.40
1:B:198:LYS:CG	1:B:199:THR:N	2.83	0.40

All (3) 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)
2:A:517:HOH:O	2:B:534:HOH:O[4_456]	1.94	0.26
1:A:210:THR:OG1	2:B:548:HOH:O[4_556]	2.14	0.06
1:B:1:ALA:CB	2:A:518:HOH:O[4_556]	2.16	0.04

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	447/470 (95%)	414 (93%)	30 (7%)	3 (1%)	22	30
1	B	446/470 (95%)	414 (93%)	29 (6%)	3 (1%)	22	30
All	All	893/940 (95%)	828 (93%)	59 (7%)	6 (1%)	22	30

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	191	GLN
1	A	145	ASP
1	A	193	ASP
1	B	365	PRO
1	B	2	GLU
1	B	326	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	379/392 (97%)	358 (94%)	21 (6%)	21	32
1	B	379/392 (97%)	348 (92%)	31 (8%)	11	15
All	All	758/784 (97%)	706 (93%)	52 (7%)	15	22

All (52) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	16	GLN
1	A	21	ASP
1	A	35	LYS
1	A	55	VAL
1	A	104	ARG
1	A	177	TYR
1	A	193	ASP
1	A	201	VAL
1	A	208	SER
1	A	237	GLU
1	A	239	VAL
1	A	252	GLU
1	A	275	THR
1	A	288	ARG
1	A	337	PRO
1	A	342	THR
1	A	372	ASP
1	A	397	ARG
1	A	409	GLN
1	A	421	PRO
1	A	442	ARG
1	B	2	GLU
1	B	16	GLN
1	B	21	ASP
1	B	22	LYS
1	B	24	ARG
1	B	41	MET
1	B	66	LYS
1	B	87	THR
1	B	114	LYS
1	B	123	LEU
1	B	131	ASN
1	B	140	MET
1	B	160	ASP
1	B	163	ARG
1	B	167	LYS
1	B	177	TYR
1	B	199	THR
1	B	201	VAL
1	B	212	GLN
1	B	220	ARG
1	B	239	VAL
1	B	243	ASN

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Mol	Chain	Res	Type
1	B	253	THR
1	B	301	ASP
1	B	322	LEU
1	B	342	THR
1	B	382	LEU
1	B	409	GLN
1	B	422	LEU
1	B	455	LEU
1	B	460	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	52	ASN
1	A	62	ASN
1	A	174	ASN
1	A	226	ASN
1	A	231	ASN
1	A	279	GLN
1	A	341	HIS
1	A	386	GLN
1	A	450	GLN
1	A	469	ASN
1	B	16	GLN
1	B	32	GLN
1	B	72	ASN
1	B	79	ASN
1	B	131	ASN
1	B	178	ASN
1	B	212	GLN
1	B	231	ASN
1	B	263	GLN
1	B	279	GLN
1	B	378	GLN
1	B	379	GLN
1	B	387	ASN
1	B	409	GLN
1	B	413	ASN
1	B	450	GLN
1	B	459	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 monosaccharides 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 ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	3

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	193:ASP	C	194:ARG	N	1.86
1	A	203:TRP	C	204:ALA	N	1.18
1	A	370:TRP	C	371:TRP	N	1.12

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	451/470 (95%)	0.19	17 (3%)	40	43	10, 26, 47, 66	0
1	B	450/470 (95%)	0.14	14 (3%)	49	51	9, 23, 49, 72	0
All	All	901/940 (95%)	0.17	31 (3%)	45	48	9, 25, 49, 72	0

All (31) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	190	THR	6.3
1	A	423	ALA	6.2
1	A	324	TRP	4.4
1	B	210	THR	4.2
1	B	211	PRO	4.1
1	A	157	GLY	3.8
1	A	422	LEU	3.7
1	B	466	PRO	3.5
1	A	262	ASN	3.4
1	B	422	LEU	3.2
1	A	207	ASP	3.1
1	B	209	ASP	3.1
1	B	212	GLN	3.0
1	A	158	GLY	3.0
1	B	467	ALA	2.9
1	B	287	ALA	2.7
1	B	215	TYR	2.6
1	A	288	ARG	2.6
1	A	334	ASP	2.6
1	B	208	SER	2.6
1	B	254	GLU	2.5
1	B	207	ASP	2.4
1	A	123	LEU	2.3
1	A	191	GLN	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	160	ASP	2.2
1	A	148	GLY	2.2
1	B	325	GLY	2.1
1	A	373	LEU	2.1
1	A	328	ALA	2.1
1	A	442	ARG	2.0
1	B	288	ARG	2.0

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

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.