



# Full wwPDB X-ray Structure Validation Report

Feb 26, 2014 – 10:00 PM GMT

PDB ID : 3A3I  
Title : Crystal structure of penicillin binding protein 4 (dacB) from Haemophilus influenzae, complexed with ampicillin (AIX)  
Authors : Kawai, F.; Roper, D.I.; Park, S.-Y.; Tame, J.R.H.  
Deposited on : 2009-06-12  
Resolution : 2.00 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.  
We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)  
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

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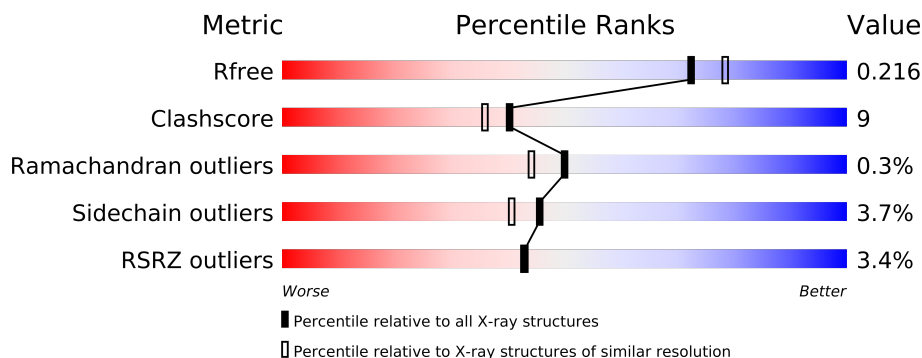
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.15 2013  
Xtriage (Phenix) : dev-1323  
EDS : stable22639  
Percentile statistics : 21963  
Refmac : 5.8.0049  
CCP4 : 6.3.0 (Settle)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)  
Validation Pipeline (wwPDB-VP) : stable22683

# 1 Overall quality at a glance



The reported resolution of this entry is 2.00 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))
$R_{free}$	66092	4888 (2.00-2.00)
Clashscore	79885	6188 (2.00-2.00)
Ramachandran outliers	78287	6102 (2.00-2.00)
Sidechain outliers	78261	6100 (2.00-2.00)
RSRZ outliers	66119	4890 (2.00-2.00)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	453	
1	B	453	

## 2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 7436 atoms, of which 0 are hydrogen and 0 are deuterium.

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.

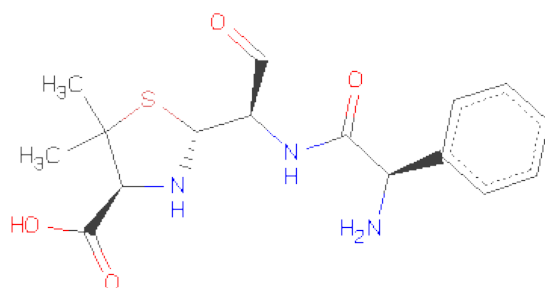
- Molecule 1 is a protein called Penicillin-binding protein 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	453	Total	C	N	O	S	0	0	0
			3506	2237	605	652	12			
1	B	453	Total	C	N	O	S	0	0	0
			3502	2235	605	650	12			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	27	MET	-	EXPRESSION TAG	UNP A8E0K8
B	27	MET	-	EXPRESSION TAG	UNP A8E0K8

- Molecule 2 is (2R,4S)-2-[(1R)-1-[(2R)-2-AMINO-2-PHENYLACETYL]AMINO]-2-OXOETHYL]-5,5-DIMETHYL-1,3-THIAZOLIDINE-4-CARBOXYLICACID (three-letter code: AIX) (formula: C<sub>16</sub>H<sub>21</sub>N<sub>3</sub>O<sub>4</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 24	C 16	N 3	O 4	S 1	0	0
2	B	1	Total 24	C 16	N 3	O 4	S 1	0	0

- Molecule 3 is water.

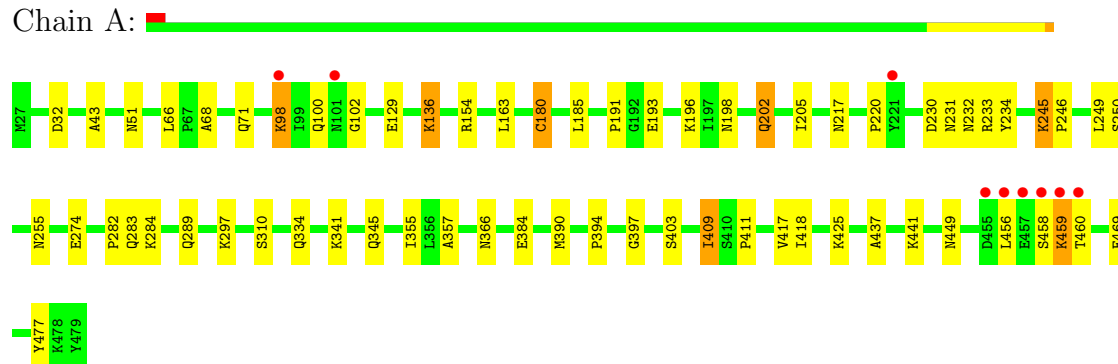
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	233	Total 233	O 233	0	0
3	B	147	Total 147	O 147	0	0

### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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: Penicillin-binding protein 4

Chain A:



- Molecule 1: Penicillin-binding protein 4

Chain B:



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	64.45Å 92.34Å 104.41Å 90.00° 107.66° 90.00°	Depositor
Resolution (Å)	31.72 – 2.00 31.72 – 2.00	Depositor EDS
% Data completeness (in resolution range)	100.0 (31.72-2.00) 94.4 (31.72-2.00)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.94 (at 2.00Å)	Xtriage
Refinement program	REFMAC 5.5.0066	Depositor
R, $R_{free}$	0.176 , 0.225 0.172 , 0.216	Depositor DCC
$R_{free}$ test set	3766 reflections (5.31%)	DCC
Wilson B-factor (Å <sup>2</sup> )	22.9	Xtriage
Anisotropy	0.338	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 37.6	EDS
Estimated twinning fraction	0.022 for h,-k,-h-l	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 74722 reflections	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	7436	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.36% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

## 5 Model quality ⓘ

### 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: AIX

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	1.21	8/3572 (0.2%)	1.00	3/4830 (0.1%)
1	B	1.09	5/3568 (0.1%)	0.96	3/4825 (0.1%)
All	All	1.15	13/7140 (0.2%)	0.98	6/9655 (0.1%)

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	180	CYS	CB-SG	-14.13	1.58	1.82
1	A	477	TYR	CD1-CE1	7.19	1.50	1.39
1	A	68	ALA	CA-CB	6.54	1.66	1.52
1	B	393	PHE	CE2-CZ	5.93	1.48	1.37
1	B	208	PHE	CE2-CZ	5.76	1.48	1.37
1	B	473	TYR	CE1-CZ	5.57	1.45	1.38
1	A	43	ALA	CA-CB	5.53	1.64	1.52
1	A	417	VAL	CB-CG2	5.31	1.64	1.52
1	B	78	ALA	CA-CB	5.28	1.63	1.52
1	A	469	GLU	CB-CG	5.25	1.62	1.52
1	A	129	GLU	CB-CG	-5.15	1.42	1.52
1	B	251	PHE	CB-CG	-5.15	1.42	1.51
1	A	437	ALA	CA-CB	5.04	1.63	1.52

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
1	B	266	ARG	NE-CZ-NH1	-7.00	116.80	120.30
1	B	456	LEU	CA-CB-CG	5.93	128.94	115.30
1	A	32	ASP	CB-CG-OD1	5.39	123.15	118.30
1	A	297	LYS	CD-CE-NZ	-5.38	99.34	111.70
1	B	242	ARG	NE-CZ-NH1	-5.28	117.66	120.30
1	A	180	CYS	N-CA-CB	-5.05	101.50	110.60

There are no chirality outliers.

There are no planarity outliers.

## 5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3506	0	3553	52	0
1	B	3502	0	3549	84	0
2	A	24	0	19	0	0
2	B	24	0	19	1	0
3	A	233	0	0	6	0
3	B	147	0	0	3	0
All	All	7436	0	7140	134	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 9.

All (134) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:386:LYS:HE3	1:B:386:LYS:N	1.52	1.21
1:B:188:ASN:OD1	1:B:242:ARG:NH2	1.89	1.04
1:B:98:LYS:HD2	1:B:99:ILE:N	1.80	0.95
1:A:202:GLN:NE2	1:A:202:GLN:H	1.64	0.95
1:B:386:LYS:H	1:B:386:LYS:HE3	1.14	0.93
1:A:202:GLN:HE21	1:A:202:GLN:N	1.65	0.93
1:B:66:LEU:H	1:B:449:ASN:HD21	1.18	0.91
1:B:217:ASN:O	1:B:220:PRO:HD2	1.70	0.90
1:A:425:LYS:HZ1	1:A:456:LEU:CG	1.85	0.88
1:B:287:GLN:OE1	1:B:287:GLN:HA	1.75	0.85
1:A:425:LYS:HZ1	1:A:456:LEU:HG	1.41	0.84
1:B:33:LEU:O	1:B:36:LYS:HD2	1.77	0.84
1:A:202:GLN:HE21	1:A:202:GLN:H	0.86	0.83
1:B:386:LYS:CE	1:B:386:LYS:N	2.42	0.81
1:A:66:LEU:H	1:A:449:ASN:HD21	1.27	0.81
1:B:28:ILE:CD1	1:B:476:LEU:HD23	2.08	0.81
1:A:425:LYS:NZ	1:A:456:LEU:CB	2.46	0.79

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:425:LYS:HZ1	1:A:456:LEU:CB	1.94	0.79
1:A:232:ASN:HD21	1:A:255:ASN:H	1.28	0.78
1:B:51:ASN:ND2	1:B:441:LYS:H	1.82	0.78
1:A:425:LYS:HZ2	1:A:456:LEU:HB3	1.54	0.72
1:B:98:LYS:HD2	1:B:99:ILE:H	1.55	0.72
1:B:461:LYS:HD2	1:B:463:ALA:HB3	1.73	0.70
1:A:425:LYS:NZ	1:A:456:LEU:CG	2.54	0.70
1:A:357:ALA:H	1:A:366:ASN:ND2	1.90	0.70
1:A:233:ARG:HD3	3:A:576:HOH:O	1.91	0.70
1:B:36:LYS:HB3	1:B:36:LYS:NZ	2.07	0.69
1:B:51:ASN:HD21	1:B:441:LYS:H	1.39	0.69
1:A:232:ASN:ND2	1:A:255:ASN:H	1.89	0.69
1:B:90:GLU:HG2	1:B:295:LEU:CD2	2.22	0.69
1:A:274:GLU:OE1	3:A:673:HOH:O	2.11	0.68
1:A:425:LYS:NZ	1:A:456:LEU:HB3	2.08	0.68
1:B:287:GLN:OE1	1:B:287:GLN:CA	2.41	0.68
1:B:385:ASP:HB3	1:B:386:LYS:CE	2.24	0.68
1:B:232:ASN:HD21	1:B:255:ASN:H	1.41	0.67
1:A:357:ALA:H	1:A:366:ASN:HD21	1.42	0.67
1:A:51:ASN:ND2	1:A:441:LYS:H	1.94	0.66
1:B:385:ASP:HB3	1:B:386:LYS:NZ	2.12	0.64
1:B:98:LYS:CD	1:B:99:ILE:H	2.12	0.63
1:B:98:LYS:CD	1:B:99:ILE:N	2.57	0.63
1:B:131:LYS:O	1:B:134:GLY:N	2.31	0.62
1:B:461:LYS:HD2	1:B:463:ALA:CB	2.29	0.62
1:B:137:LYS:NZ	1:B:139:ASN:ND2	2.48	0.61
1:B:100:GLN:O	1:B:101:ASN:HB2	2.01	0.60
1:B:36:LYS:NZ	1:B:36:LYS:CB	2.64	0.60
1:A:459:LYS:O	1:A:459:LYS:HD3	2.02	0.60
1:B:385:ASP:HB3	1:B:386:LYS:HE2	1.85	0.58
1:B:90:GLU:HG2	1:B:295:LEU:HD23	1.84	0.58
1:B:137:LYS:HZ2	1:B:139:ASN:ND2	2.01	0.58
1:B:154:ARG:NH1	1:B:163:LEU:HD13	2.18	0.58
1:B:188:ASN:O	1:B:189:LYS:HG2	2.02	0.57
1:A:51:ASN:HD21	1:A:441:LYS:H	1.49	0.57
1:A:245:LYS:HB2	1:A:246:PRO:CD	2.35	0.57
1:B:474:ASN:O	1:B:478:LYS:HG3	2.05	0.56
1:B:137:LYS:HB2	1:B:274:GLU:HB3	1.88	0.56
1:B:446:GLN:HE22	1:B:469:GLU:HG2	1.70	0.55
1:B:66:LEU:H	1:B:449:ASN:ND2	1.98	0.55
1:B:221:TYR:N	1:B:221:TYR:CD2	2.75	0.55
1:A:154:ARG:HD3	3:A:560:HOH:O	2.08	0.54

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:425:LYS:NZ	1:A:456:LEU:HG	2.19	0.54
1:B:28:ILE:HD13	1:B:476:LEU:HD23	1.90	0.53
1:B:99:ILE:C	1:B:100:GLN:HG2	2.29	0.53
1:B:461:LYS:HD3	1:B:463:ALA:H	1.73	0.53
1:B:461:LYS:HD3	1:B:462:ARG:N	2.24	0.52
1:B:451:TYR:HE2	1:B:460:THR:CG2	2.22	0.52
1:B:283:GLN:O	1:B:283:GLN:HG2	2.10	0.52
1:B:119:THR:OG1	1:B:122:GLN:HG3	2.09	0.52
1:B:36:LYS:HZ2	1:B:36:LYS:CB	2.23	0.51
1:A:193:GLU:HG3	3:A:634:HOH:O	2.10	0.51
1:B:461:LYS:CD	1:B:463:ALA:H	2.24	0.50
1:B:232:ASN:ND2	1:B:255:ASN:H	2.09	0.50
1:B:216:SER:O	1:B:220:PRO:HD3	2.11	0.50
1:B:188:ASN:OD1	1:B:242:ARG:CZ	2.57	0.50
1:A:232:ASN:HD21	1:A:255:ASN:N	2.04	0.49
1:B:245:LYS:C	1:B:246:PRO:O	2.50	0.49
1:B:99:ILE:HA	1:B:103:ASN:O	2.13	0.49
1:A:334:GLN:HG2	1:B:223:GLN:OE1	2.12	0.49
1:B:384:GLU:OE1	1:B:390:MET:HG2	2.13	0.48
1:B:435:THR:CG2	1:B:439:GLY:HA2	2.44	0.48
1:A:282:PRO:O	1:A:283:GLN:HB2	2.14	0.48
1:A:196:LYS:HE3	1:A:198:ASN:HD21	1.79	0.48
1:B:28:ILE:HD12	1:B:476:LEU:HD23	1.93	0.48
1:B:411:PRO:HA	3:B:608:HOH:O	2.14	0.48
1:A:193:GLU:OE2	3:A:658:HOH:O	2.20	0.48
1:B:451:TYR:CE2	1:B:460:THR:CG2	2.97	0.47
1:B:221:TYR:N	1:B:221:TYR:HD2	2.13	0.47
1:A:289:GLN:O	1:A:289:GLN:HG3	2.14	0.47
1:B:95:SER:O	1:B:289:GLN:HB3	2.15	0.47
1:B:154:ARG:HH11	1:B:163:LEU:HD13	1.79	0.47
1:A:384:GLU:OE1	1:A:390:MET:HG2	2.14	0.47
1:A:245:LYS:HB2	1:A:246:PRO:HD2	1.96	0.47
1:B:36:LYS:HZ3	1:B:36:LYS:HB3	1.80	0.46
1:A:98:LYS:HZ3	1:A:98:LYS:HB3	1.80	0.46
1:B:245:LYS:O	1:B:246:PRO:O	2.33	0.46
1:B:102:GLY:HA2	1:B:134:GLY:O	2.15	0.46
1:B:245:LYS:O	1:B:246:PRO:C	2.54	0.46
1:A:425:LYS:NZ	1:A:456:LEU:HD23	2.31	0.46
1:B:129:GLU:O	1:B:133:GLN:HG3	2.16	0.46
1:B:221:TYR:HD2	1:B:221:TYR:H	1.64	0.45
1:B:345:GLN:NE2	3:B:551:HOH:O	2.31	0.45
1:B:52:GLN:NE2	1:B:440:GLU:OE2	2.42	0.45

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:217:ASN:O	1:A:220:PRO:HD2	2.17	0.45
1:A:355:ILE:CD1	1:B:455:ASP:HA	2.47	0.44
1:A:409:ILE:CD1	1:A:409:ILE:C	2.86	0.44
1:A:154:ARG:HD2	1:A:163:LEU:HD22	1.99	0.44
1:B:323:ALA:HB1	1:B:335:LEU:HD23	1.99	0.44
1:B:394:PRO:HB2	1:B:402:ILE:HG12	1.99	0.44
1:A:459:LYS:HE2	1:A:459:LYS:HB2	1.83	0.44
1:A:205:ILE:C	1:A:205:ILE:HD12	2.39	0.44
1:A:397:GLY:HA2	1:A:403:SER:O	2.18	0.43
1:B:185:LEU:HG	1:B:197:ILE:HG12	2.01	0.43
1:B:188:ASN:C	1:B:189:LYS:CG	2.86	0.43
1:B:154:ARG:HD3	3:B:517:HOH:O	2.17	0.43
1:B:312:ASN:HD21	2:B:501:AIX:H14	1.82	0.43
1:A:334:GLN:N	1:A:334:GLN:CD	2.72	0.43
1:A:341:LYS:O	1:A:345:GLN:HB2	2.18	0.43
1:A:185:LEU:HG	1:A:249:LEU:HD11	2.00	0.42
1:A:154:ARG:CZ	1:A:163:LEU:HD13	2.49	0.42
1:A:411:PRO:HA	3:A:557:HOH:O	2.19	0.42
1:A:234:TYR:N	1:A:234:TYR:CD2	2.86	0.42
1:A:102:GLY:O	1:A:136:LYS:HD2	2.20	0.42
1:B:80:LYS:HE2	1:B:303:LEU:HD12	2.02	0.42
1:B:232:ASN:ND2	1:B:254:GLN:H	2.18	0.42
1:A:409:ILE:H	1:A:409:ILE:HD12	1.85	0.41
1:B:90:GLU:HG2	1:B:295:LEU:HD21	2.01	0.41
1:B:218:GLU:O	1:B:221:TYR:HB2	2.21	0.41
1:B:461:LYS:C	1:B:461:LYS:HD3	2.40	0.41
1:B:32:ASP:O	1:B:35:GLN:HG2	2.20	0.41
1:A:394:PRO:O	1:A:418:ILE:HA	2.21	0.41
1:A:230:ASP:O	1:A:231:ASN:HB2	2.20	0.41
1:B:318:LEU:O	1:B:322:VAL:HG23	2.21	0.41
1:B:461:LYS:HG3	1:B:464:PRO:HD3	2.03	0.40
1:A:282:PRO:O	1:A:283:GLN:CB	2.68	0.40
1:B:217:ASN:O	1:B:220:PRO:CD	2.55	0.40

There are no symmetry-related clashes.

## 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	451/453 (100%)	443 (98%)	8 (2%)	0	100	100
1	B	451/453 (100%)	435 (96%)	13 (3%)	3 (1%)	30	20
All	All	902/906 (100%)	878 (97%)	21 (2%)	3 (0%)	50	44

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	217	ASN
1	B	246	PRO
1	B	100	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	378/378 (100%)	363 (96%)	15 (4%)	42	36
1	B	377/378 (100%)	364 (97%)	13 (3%)	49	45
All	All	755/756 (100%)	727 (96%)	28 (4%)	45	40

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	71	GLN
1	A	98	LYS
1	A	100	GLN
1	A	136	LYS
1	A	180	CYS
1	A	191	PRO
1	A	202	GLN
1	A	245	LYS
1	A	250	SER
1	A	284	LYS
1	A	310	SER
1	A	409	ILE

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Mol	Chain	Res	Type
1	A	458	SER
1	A	459	LYS
1	A	460	THR
1	B	36	LYS
1	B	96	ASN
1	B	98	LYS
1	B	100	GLN
1	B	105	ASP
1	B	131	LYS
1	B	191	PRO
1	B	284	LYS
1	B	287	GLN
1	B	338	LEU
1	B	386	LYS
1	B	409	ILE
1	B	461	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	42	ASN
1	A	51	ASN
1	A	198	ASN
1	A	202	GLN
1	A	232	ASN
1	A	366	ASN
1	A	388	HIS
1	A	449	ASN
1	B	51	ASN
1	B	54	GLN
1	B	100	GLN
1	B	103	ASN
1	B	139	ASN
1	B	179	ASN
1	B	232	ASN
1	B	286	GLN
1	B	312	ASN
1	B	325	ASN
1	B	353	ASN
1	B	446	GLN
1	B	449	ASN
1	B	474	ASN

### 5.3.3 RNA ⓘ

There are no RNA chains 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 carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

2 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. 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  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
2	AIX	A	501	1	25,25,25	1.37	2 (8%)	36,36,36	1.83	10 (27%)
2	AIX	B	501	1	25,25,25	1.78	4 (16%)	36,36,36	1.91	11 (30%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	AIX	A	501	1	-	0/17/37/37	0/2/2/2
2	AIX	B	501	1	-	0/17/37/37	0/2/2/2

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	501	AIX	C14-C15	5.83	1.56	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	AIX	C6-S1	-3.13	1.79	1.85
2	B	501	AIX	C6-S1	-3.01	1.79	1.85
2	B	501	AIX	C13-S1	-2.44	1.78	1.85
2	B	501	AIX	C5-C4	-2.33	1.48	1.52
2	A	501	AIX	C7-C5	2.11	1.42	1.39

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	AIX	S1-C13-N3	-5.29	99.54	106.66
2	B	501	AIX	S1-C13-N3	-5.00	99.93	106.66
2	B	501	AIX	C14-C13-S1	3.98	121.47	110.25
2	B	501	AIX	C6-S1-C13	3.65	101.88	94.01
2	A	501	AIX	C14-C13-S1	3.47	120.02	110.25
2	A	501	AIX	C13-C14-C15	-3.28	106.94	112.03
2	A	501	AIX	C6-S1-C13	3.26	101.03	94.01
2	A	501	AIX	C13-N3-C12	3.13	117.07	109.62
2	B	501	AIX	C13-C14-C15	-3.04	107.31	112.03
2	B	501	AIX	C14-C13-N3	-2.99	106.16	112.69
2	B	501	AIX	C11-C5-C7	2.95	122.25	118.33
2	B	501	AIX	C13-N3-C12	2.89	116.51	109.62
2	A	501	AIX	C6-C12-C2	2.74	116.39	112.55
2	A	501	AIX	C14-C13-N3	-2.53	107.14	112.69
2	A	501	AIX	C1-C6-S1	2.49	113.38	109.15
2	A	501	AIX	C13-C14-N1	2.49	113.96	109.11
2	B	501	AIX	C6-C12-C2	2.47	116.01	112.55
2	B	501	AIX	C16-C6-C1	-2.41	106.83	110.90
2	B	501	AIX	C12-C6-S1	-2.35	99.83	104.00
2	B	501	AIX	C16-C6-S1	2.14	112.79	109.15
2	A	501	AIX	C16-C6-C1	-2.02	107.50	110.90

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	453/453 (100%)	-0.44	9 (1%) 62 62	12, 20, 40, 67	1 (0%)
1	B	453/453 (100%)	-0.12	22 (4%) 28 28	14, 27, 55, 76	1 (0%)
All	All	906/906 (100%)	-0.28	31 (3%) 43 43	12, 24, 51, 76	2 (0%)

All (31) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	456	LEU	7.3
1	B	457	GLU	7.0
1	B	458	SER	6.0
1	B	459	LYS	5.4
1	B	455	ASP	5.2
1	B	460	THR	4.8
1	A	457	GLU	4.4
1	B	454	GLY	4.3
1	B	216	SER	4.3
1	B	220	PRO	4.0
1	B	221	TYR	3.8
1	A	458	SER	3.6
1	B	101	ASN	3.4
1	B	217	ASN	3.4
1	B	219	ALA	3.4
1	B	283	GLN	3.0
1	B	287	GLN	2.9
1	A	459	LYS	2.7
1	A	460	THR	2.5
1	A	455	ASP	2.4
1	B	99	ILE	2.4
1	B	134	GLY	2.4
1	A	221	TYR	2.3
1	A	456	LEU	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	98	LYS	2.3
1	B	100	GLN	2.2
1	A	98	LYS	2.2
1	B	462	ARG	2.2
1	B	222	CYS	2.2
1	B	105	ASP	2.2
1	A	101	ASN	2.1

## 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 carbohydrates in this entry.

## 6.4 Ligands ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
2	AIX	B	501	24/24	0.06	-1.42	16,22,27,33	0
2	AIX	A	501	24/24	0.06	-1.67	12,19,22,23	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.