



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 11:53 AM UTC

PDB ID : 8G83 / pdb\_00008g83  
Title : Structure of NAD<sup>+</sup> consuming protein *Acinetobacter baumannii* TIR domain  
Authors : Klontz, E.H.; Wang, Y.; Glendening, G.; Carr, J.; Tsibouris, T.; Buddula, S.;  
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Deposited on : 2023-02-17  
Resolution : 3.03 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](mailto: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>.

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

MolProbity : 4-5-2 with Phenix2.0  
Xtrriage (Phenix) : 2.0  
EDS : 3.0  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

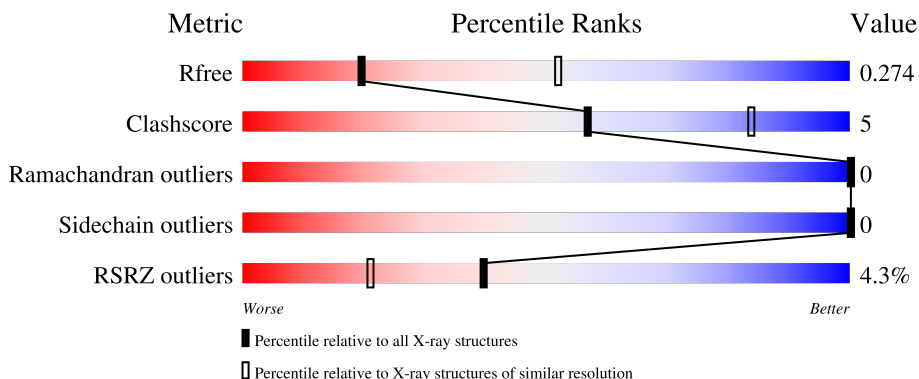
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.03 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	3685 (3.08-3.00)
Clashscore	190562	4007 (3.08-3.00)
Ramachandran outliers	187476	3834 (3.08-3.00)
Sidechain outliers	187428	3836 (3.08-3.00)
RSRZ outliers	180081	3684 (3.08-3.00)

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 of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	184	 2% 67% 8% 25%
1	B	184	 5% 70% 6% 24%

## 2 Entry composition i

There are 2 unique types of molecules in this entry. The entry contains 4154 atoms, of which 2025 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 NAD(+) hydrolase AbTIR.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	138	2055	669	1006	174	204	2	0	0	0
1	B	139	2092	684	1019	182	205	2	0	0	0

There are 96 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	92	HIS	-	expression tag	UNP A0A009IHW8
A	93	MET	-	expression tag	UNP A0A009IHW8
A	94	SER	-	expression tag	UNP A0A009IHW8
A	95	ALA	-	expression tag	UNP A0A009IHW8
A	96	TRP	-	expression tag	UNP A0A009IHW8
A	97	SER	-	expression tag	UNP A0A009IHW8
A	98	HIS	-	expression tag	UNP A0A009IHW8
A	99	PRO	-	expression tag	UNP A0A009IHW8
A	100	GLN	-	expression tag	UNP A0A009IHW8
A	101	PHE	-	expression tag	UNP A0A009IHW8
A	102	GLU	-	expression tag	UNP A0A009IHW8
A	103	LYS	-	expression tag	UNP A0A009IHW8
A	104	GLY	-	expression tag	UNP A0A009IHW8
A	105	GLY	-	expression tag	UNP A0A009IHW8
A	106	GLY	-	expression tag	UNP A0A009IHW8
A	107	SER	-	expression tag	UNP A0A009IHW8
A	108	GLY	-	expression tag	UNP A0A009IHW8
A	109	GLY	-	expression tag	UNP A0A009IHW8
A	110	GLY	-	expression tag	UNP A0A009IHW8
A	111	SER	-	expression tag	UNP A0A009IHW8
A	112	GLY	-	expression tag	UNP A0A009IHW8
A	113	GLY	-	expression tag	UNP A0A009IHW8
A	114	SER	-	expression tag	UNP A0A009IHW8
A	115	ALA	-	expression tag	UNP A0A009IHW8
A	116	TRP	-	expression tag	UNP A0A009IHW8

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Chain	Residue	Modelled	Actual	Comment	Reference
A	117	SER	-	expression tag	UNP A0A009IHW8
A	118	HIS	-	expression tag	UNP A0A009IHW8
A	119	PRO	-	expression tag	UNP A0A009IHW8
A	120	GLN	-	expression tag	UNP A0A009IHW8
A	121	PHE	-	expression tag	UNP A0A009IHW8
A	122	GLU	-	expression tag	UNP A0A009IHW8
A	123	LYS	-	expression tag	UNP A0A009IHW8
A	124	GLY	-	expression tag	UNP A0A009IHW8
A	125	GLY	-	expression tag	UNP A0A009IHW8
A	126	GLY	-	expression tag	UNP A0A009IHW8
A	127	SER	-	expression tag	UNP A0A009IHW8
A	128	SER	-	expression tag	UNP A0A009IHW8
A	129	GLY	-	expression tag	UNP A0A009IHW8
A	130	GLY	-	expression tag	UNP A0A009IHW8
A	131	GLY	-	expression tag	UNP A0A009IHW8
A	132	ALA	-	expression tag	UNP A0A009IHW8
A	133	SER	-	expression tag	UNP A0A009IHW8
A	270	HIS	-	expression tag	UNP A0A009IHW8
A	271	HIS	-	expression tag	UNP A0A009IHW8
A	272	HIS	-	expression tag	UNP A0A009IHW8
A	273	HIS	-	expression tag	UNP A0A009IHW8
A	274	HIS	-	expression tag	UNP A0A009IHW8
A	275	HIS	-	expression tag	UNP A0A009IHW8
B	92	HIS	-	expression tag	UNP A0A009IHW8
B	93	MET	-	expression tag	UNP A0A009IHW8
B	94	SER	-	expression tag	UNP A0A009IHW8
B	95	ALA	-	expression tag	UNP A0A009IHW8
B	96	TRP	-	expression tag	UNP A0A009IHW8
B	97	SER	-	expression tag	UNP A0A009IHW8
B	98	HIS	-	expression tag	UNP A0A009IHW8
B	99	PRO	-	expression tag	UNP A0A009IHW8
B	100	GLN	-	expression tag	UNP A0A009IHW8
B	101	PHE	-	expression tag	UNP A0A009IHW8
B	102	GLU	-	expression tag	UNP A0A009IHW8
B	103	LYS	-	expression tag	UNP A0A009IHW8
B	104	GLY	-	expression tag	UNP A0A009IHW8
B	105	GLY	-	expression tag	UNP A0A009IHW8
B	106	GLY	-	expression tag	UNP A0A009IHW8
B	107	SER	-	expression tag	UNP A0A009IHW8
B	108	GLY	-	expression tag	UNP A0A009IHW8
B	109	GLY	-	expression tag	UNP A0A009IHW8
B	110	GLY	-	expression tag	UNP A0A009IHW8

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Chain	Residue	Modelled	Actual	Comment	Reference
B	111	SER	-	expression tag	UNP A0A009IHW8
B	112	GLY	-	expression tag	UNP A0A009IHW8
B	113	GLY	-	expression tag	UNP A0A009IHW8
B	114	SER	-	expression tag	UNP A0A009IHW8
B	115	ALA	-	expression tag	UNP A0A009IHW8
B	116	TRP	-	expression tag	UNP A0A009IHW8
B	117	SER	-	expression tag	UNP A0A009IHW8
B	118	HIS	-	expression tag	UNP A0A009IHW8
B	119	PRO	-	expression tag	UNP A0A009IHW8
B	120	GLN	-	expression tag	UNP A0A009IHW8
B	121	PHE	-	expression tag	UNP A0A009IHW8
B	122	GLU	-	expression tag	UNP A0A009IHW8
B	123	LYS	-	expression tag	UNP A0A009IHW8
B	124	GLY	-	expression tag	UNP A0A009IHW8
B	125	GLY	-	expression tag	UNP A0A009IHW8
B	126	GLY	-	expression tag	UNP A0A009IHW8
B	127	SER	-	expression tag	UNP A0A009IHW8
B	128	SER	-	expression tag	UNP A0A009IHW8
B	129	GLY	-	expression tag	UNP A0A009IHW8
B	130	GLY	-	expression tag	UNP A0A009IHW8
B	131	GLY	-	expression tag	UNP A0A009IHW8
B	132	ALA	-	expression tag	UNP A0A009IHW8
B	133	SER	-	expression tag	UNP A0A009IHW8
B	270	HIS	-	expression tag	UNP A0A009IHW8
B	271	HIS	-	expression tag	UNP A0A009IHW8
B	272	HIS	-	expression tag	UNP A0A009IHW8
B	273	HIS	-	expression tag	UNP A0A009IHW8
B	274	HIS	-	expression tag	UNP A0A009IHW8
B	275	HIS	-	expression tag	UNP A0A009IHW8

- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	2	Total O 2 2	0	0
2	B	5	Total O 5 5	0	0



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	44.20Å 76.19Å 97.33Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	28.86 – 3.03 28.86 – 3.03	Depositor EDS
% Data completeness (in resolution range)	98.2 (28.86-3.03) 98.0 (28.86-3.03)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.31 (at 3.05Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487, PHENIX 1.20.1_4487	Depositor
R, $R_{free}$	0.228 , 0.274 0.228 , 0.274	Depositor DCC
$R_{free}$ test set	344 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	63.3	Xtrriage
Anisotropy	0.532	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 34.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	4154	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	54.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.79% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical 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 [i](#)

### 5.1 Standard geometry [i](#)

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	0.29	0/1067	0.48	0/1452
1	B	0.29	0/1095	0.47	0/1493
All	All	0.29	0/2162	0.47	0/2945

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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	1049	1006	1006	12	0
1	B	1073	1019	1019	7	0
2	A	2	0	0	0	0
2	B	5	0	0	0	0
All	All	2129	2025	2025	19	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 5.

All (19) 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:209:LEU:HD23	1:A:209:LEU:O	1.94	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:239:SER:HB2	1:B:242:LEU:HD12	1.84	0.59
1:B:209:LEU:O	1:B:209:LEU:HD12	2.02	0.58
1:A:193:VAL:HG23	1:A:195:LEU:CD1	2.34	0.57
1:A:145:ASP:O	1:A:150:VAL:HG23	2.08	0.53
1:A:144:GLU:OE1	1:A:144:GLU:N	2.39	0.52
1:B:270:HIS:ND1	1:B:270:HIS:O	2.42	0.51
1:B:224:LEU:HD12	1:B:262:LEU:HD23	1.93	0.50
1:A:141:HIS:CG	1:A:150:VAL:HG21	2.49	0.48
1:B:140:SER:HB3	1:B:193:VAL:HG12	1.98	0.46
1:B:206:ASN:OD1	1:B:206:ASN:O	2.33	0.45
1:A:198:ASP:O	1:A:202:LYS:HG2	2.16	0.45
1:B:200:ILE:HD13	1:B:230:ILE:HD11	1.98	0.44
1:A:193:VAL:HG23	1:A:195:LEU:HD13	1.98	0.43
1:A:137:LEU:HD13	1:A:266:ILE:HD11	2.01	0.42
1:A:230:ILE:CD1	1:A:235:VAL:HG23	2.50	0.42
1:A:160:LEU:HD21	1:A:260:HIS:CE1	2.56	0.41
1:A:230:ILE:HD13	1:A:235:VAL:HG23	2.04	0.41
1:A:193:VAL:CG2	1:A:195:LEU:CD1	2.99	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	136/184 (74%)	129 (95%)	7 (5%)	0	100	100
1	B	137/184 (74%)	128 (93%)	9 (7%)	0	100	100
All	All	273/368 (74%)	257 (94%)	16 (6%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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	110/154 (71%)	110 (100%)	0	100	100
1	B	113/154 (73%)	113 (100%)	0	100	100
All	All	223/308 (72%)	223 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	206	ASN
1	A	260	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

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

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

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	138/184 (75%)	0.29	3 (2%) 62 38	33, 52, 77, 95	0
1	B	139/184 (75%)	0.55	9 (6%) 25 12	30, 53, 94, 105	0
All	All	277/368 (75%)	0.43	12 (4%) 40 21	30, 52, 87, 105	0

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	175	ASP	5.4
1	A	133	SER	3.7
1	A	132	ALA	3.3
1	B	208	GLU	3.3
1	B	181	ILE	2.8
1	B	133	SER	2.8
1	B	198	ASP	2.7
1	B	173	VAL	2.5
1	B	203	ASP	2.5
1	A	205	THR	2.4
1	B	172	LYS	2.4
1	B	267	LEU	2.2

### 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

There are no ligands in this entry.

## 6.5 Other polymers

There are no such residues in this entry.