



# wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 07:02 PM UTC

PDB ID : 5DCM / pdb\_00005dcm  
Title : Structure of a lantibiotic response regulator: C-terminal domain of the nisin resistance regulator NsrR  
Authors : Khosa, S.; Kleinschrodt, D.; Hoepfner, A.; Smits, S.H.J.  
Deposited on : 2015-08-24  
Resolution : 1.60 Å (reported)

This is a wwPDB X-ray Structure Validation Summary 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

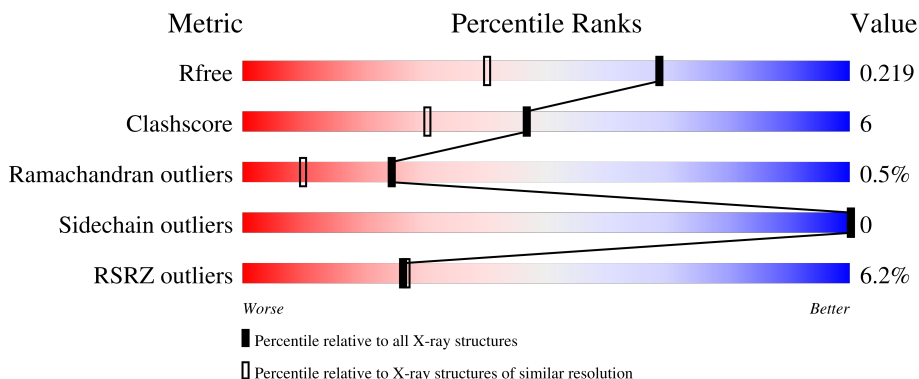
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.60 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	4673 (1.60-1.60)
Clashscore	190562	4931 (1.60-1.60)
Ramachandran outliers	187476	4831 (1.60-1.60)
Sidechain outliers	187428	4830 (1.60-1.60)
RSRZ outliers	180081	4672 (1.60-1.60)

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	243	 4% 35% 5% 60%
2	B	243	 4% 35% 5% 60%

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 1877 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 PhoB family transcriptional regulator.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	97	773	497	131	143	2	0	0	0

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	222	ASP	-	expression tag	UNP X5JZS1
A	223	PRO	-	expression tag	UNP X5JZS1
A	224	ASN	-	expression tag	UNP X5JZS1
A	225	SER	-	expression tag	UNP X5JZS1
A	226	SER	-	expression tag	UNP X5JZS1
A	227	SER	-	expression tag	UNP X5JZS1
A	228	VAL	-	expression tag	UNP X5JZS1
A	229	ASP	-	expression tag	UNP X5JZS1
A	230	LYS	-	expression tag	UNP X5JZS1
A	231	LEU	-	expression tag	UNP X5JZS1
A	232	ALA	-	expression tag	UNP X5JZS1
A	233	ALA	-	expression tag	UNP X5JZS1
A	234	ALA	-	expression tag	UNP X5JZS1
A	235	LEU	-	expression tag	UNP X5JZS1
A	236	GLU	-	expression tag	UNP X5JZS1
A	237	HIS	-	expression tag	UNP X5JZS1
A	238	HIS	-	expression tag	UNP X5JZS1
A	239	HIS	-	expression tag	UNP X5JZS1
A	240	HIS	-	expression tag	UNP X5JZS1
A	241	HIS	-	expression tag	UNP X5JZS1
A	242	HIS	-	expression tag	UNP X5JZS1

- Molecule 2 is a protein called PhoB family transcriptional regulator.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	98	779	500	130	147	2	0	0	0

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	222	ASN	-	expression tag	UNP X5JZS1
B	223	ASP	-	expression tag	UNP X5JZS1
B	224	PRO	-	expression tag	UNP X5JZS1
B	225	SER	-	expression tag	UNP X5JZS1
B	226	SER	-	expression tag	UNP X5JZS1
B	227	SER	-	expression tag	UNP X5JZS1
B	228	VAL	-	expression tag	UNP X5JZS1
B	229	ASP	-	expression tag	UNP X5JZS1
B	230	LYS	-	expression tag	UNP X5JZS1
B	231	LEU	-	expression tag	UNP X5JZS1
B	232	ALA	-	expression tag	UNP X5JZS1
B	233	ALA	-	expression tag	UNP X5JZS1
B	234	ALA	-	expression tag	UNP X5JZS1
B	235	LEU	-	expression tag	UNP X5JZS1
B	236	GLU	-	expression tag	UNP X5JZS1
B	237	HIS	-	expression tag	UNP X5JZS1
B	238	HIS	-	expression tag	UNP X5JZS1
B	239	HIS	-	expression tag	UNP X5JZS1
B	240	HIS	-	expression tag	UNP X5JZS1
B	241	HIS	-	expression tag	UNP X5JZS1
B	242	HIS	-	expression tag	UNP X5JZS1

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
3	A	164	164	164	0	0
3	B	161	161	161	0	0



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	56.38Å 60.46Å 56.85Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	56.85 – 1.60 56.85 – 1.60	Depositor EDS
% Data completeness (in resolution range)	99.0 (56.85-1.60) 95.8 (56.85-1.60)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.89 (at 1.60Å)	Xtrriage
Refinement program	PHENIX 1.9_1692	Depositor
R, $R_{free}$	0.187 , 0.219 0.188 , 0.219	Depositor DCC
$R_{free}$ test set	2006 reflections (7.63%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	17.1	Xtrriage
Anisotropy	0.051	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 35.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.024 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	1877	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	21.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.68% 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	0.45	0/786	0.71	0/1063
2	B	0.46	0/790	0.74	0/1066
All	All	0.45	0/1576	0.72	0/2129

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	773	0	797	8	0
2	B	779	0	794	10	0
3	A	164	0	0	4	3
3	B	161	0	0	6	3
All	All	1877	0	1591	18	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 6.

The worst 5 of 18 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)
2:B:223:ASP:N	3:B:302:HOH:O	2.14	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:188:GLN:OE1	3:B:301:HOH:O	2.11	0.67
1:A:128:GLU:OE2	3:A:301:HOH:O	2.14	0.64
1:A:199:ARG:NH2	1:A:212:THR:OG1	2.25	0.63
2:B:127:GLN:N	3:B:306:HOH:O	2.33	0.61

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)
3:A:403:HOH:O	3:B:341:HOH:O[3_656]	2.00	0.20
3:A:424:HOH:O	3:B:451:HOH:O[4_456]	2.02	0.18
3:A:403:HOH:O	3:B:457:HOH:O[3_656]	2.18	0.02

## 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	95/243 (39%)	89 (94%)	6 (6%)	0	100	100
2	B	93/243 (38%)	89 (96%)	3 (3%)	1 (1%)	11	2
All	All	188/486 (39%)	178 (95%)	9 (5%)	1 (0%)	24	10

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	128	GLU

### 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	89/223 (40%)	89 (100%)	0	100	100
2	B	90/223 (40%)	90 (100%)	0	100	100
All	All	179/446 (40%)	179 (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 (1) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	194	ASN

### 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 [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	B	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B	222:ASN	C	223:ASP	N	7.20
1	B	221:GLN	C	222:ASN	N	6.75

## 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	97/243 (39%)	0.08	3 (3%) 51 54	10, 18, 29, 50	0
2	B	98/243 (40%)	0.31	9 (9%) 14 14	11, 20, 33, 50	0
All	All	195/486 (40%)	0.19	12 (6%) 26 27	10, 19, 32, 50	0

The worst 5 of 12 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	222	ASN	3.8
2	B	127	GLN	3.7
1	A	224	ASN	3.4
2	B	224	PRO	3.4
2	B	216	VAL	2.9

### 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.