



wwPDB X-ray Structure Validation Summary Report i

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PDB ID : 1XQB
Title : X-Ray Structure Of YaeB from Haemophilus influenzae. Northeast Structural Genomics Research Consortium (NESGC)target IR47.
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Deposited on : 2004-10-11
Resolution : 2.85 Å(reported)

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

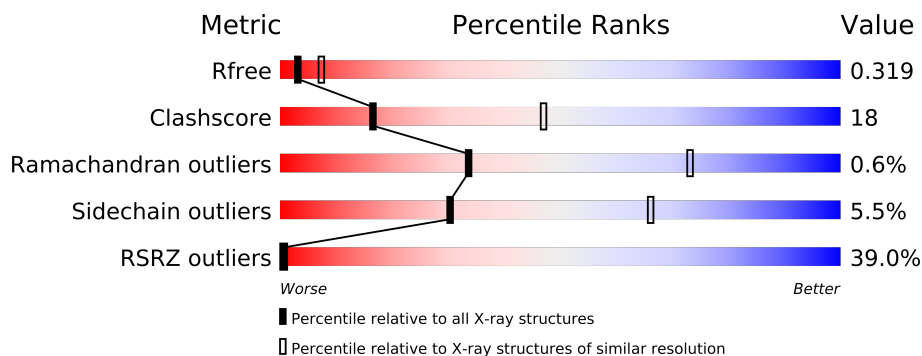
The following versions of software and data (see [references](#)) were used in the production of this report:

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 2.85 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	1524 (2.90-2.82)
Clashscore	79885	1879 (2.90-2.82)
Ramachandran outliers	78287	1824 (2.90-2.82)
Sidechain outliers	78261	1827 (2.90-2.82)
RSRZ outliers	66119	1526 (2.90-2.82)

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 ≥ 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	247	
1	B	247	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 3036 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 Hypothetical UPF0066 protein HI0510.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	186	Total	C	N	O	S	Se	0	0	0
			1484	952	254	271	4	3			
1	B	186	Total	C	N	O	S	Se	0	0	0
			1484	952	254	271	4	3			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	MET	MODIFIED RESIDUE	UNP P44740
A	63	MSE	PHE	ENGINEERED	UNP P44740
A	102	MSE	LEU	ENGINEERED	UNP P44740
A	161	MET	LEU	ENGINEERED	UNP P44740
A	240	LEU	-	CLONING ARTIFACT	UNP P44740
A	241	GLU	-	CLONING ARTIFACT	UNP P44740
A	242	HIS	-	EXPRESSION TAG	UNP P44740
A	243	HIS	-	EXPRESSION TAG	UNP P44740
A	244	HIS	-	EXPRESSION TAG	UNP P44740
A	245	HIS	-	EXPRESSION TAG	UNP P44740
A	246	HIS	-	EXPRESSION TAG	UNP P44740
A	247	HIS	-	EXPRESSION TAG	UNP P44740
B	1	MSE	MET	MODIFIED RESIDUE	UNP P44740
B	63	MSE	PHE	ENGINEERED	UNP P44740
B	102	MSE	LEU	ENGINEERED	UNP P44740
B	161	MET	LEU	ENGINEERED	UNP P44740
B	240	LEU	-	CLONING ARTIFACT	UNP P44740
B	241	GLU	-	CLONING ARTIFACT	UNP P44740
B	242	HIS	-	EXPRESSION TAG	UNP P44740
B	243	HIS	-	EXPRESSION TAG	UNP P44740
B	244	HIS	-	EXPRESSION TAG	UNP P44740
B	245	HIS	-	EXPRESSION TAG	UNP P44740
B	246	HIS	-	EXPRESSION TAG	UNP P44740
B	247	HIS	-	EXPRESSION TAG	UNP P44740

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	33	Total 33	O 33	0	0
2	B	35	Total 35	O 35	0	0

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	69.65Å 69.91Å 119.83Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.74 – 2.85 27.70 – 2.81	Depositor EDS
% Data completeness (in resolution range)	93.2 (19.74-2.85) 92.4 (27.70-2.81)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	40.10 (at 2.80Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.279 , 0.324 0.280 , 0.319	Depositor DCC
R_{free} test set	1334 reflections (10.08%)	DCC
Wilson B-factor (Å ²)	56.9	Xtriage
Anisotropy	0.580	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 24.5	EDS
Estimated twinning fraction	0.458 for k,h,-l	Xtriage
L-test for twinning	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtriage
Outliers	0 of 13694 reflections	Xtriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	3036	wwPDB-VP
Average B, all atoms (Å ²)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.08% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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	0.43	0/1514	0.68	0/2045
1	B	0.44	0/1514	0.67	0/2045
All	All	0.43	0/3028	0.67	0/4090

There are no bond length outliers.

There are no bond angle outliers.

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	1484	0	1486	61	0
1	B	1484	0	1486	57	0
2	A	33	0	0	1	0
2	B	35	0	0	2	0
All	All	3036	0	2972	107	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 18.

The worst 5 of 107 close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:102:MSE:HE2	1:B:136:LYS:HD2	1.52	0.89

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:11:ILE:HG13	1:B:39:LEU:HD21	1.55	0.88
1:A:11:ILE:HG13	1:A:39:LEU:HD21	1.56	0.88
1:A:63:MSE:HE1	1:A:96:ARG:HD2	1.59	0.84
1:A:136:LYS:HD2	1:B:102:MSE:HE2	1.58	0.82

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	176/247 (71%)	153 (87%)	22 (12%)	1 (1%)	33	73
1	B	176/247 (71%)	154 (88%)	21 (12%)	1 (1%)	33	73
All	All	352/494 (71%)	307 (87%)	43 (12%)	2 (1%)	33	73

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	3	ASP
1	A	3	ASP

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	165/217 (76%)	157 (95%)	8 (5%)	35	73
1	B	165/217 (76%)	155 (94%)	10 (6%)	26	59
All	All	330/434 (76%)	312 (94%)	18 (6%)	30	66

5 of 18 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	38	LEU
1	B	51	LEU
1	B	180	ARG
1	A	189	GLN
1	A	231	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 7 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	27	ASN
1	B	168	GLN
1	B	56	HIS
1	A	56	HIS
1	B	109	GLN

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 ⓘ

There are no ligands in this entry.

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, 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	186/247 (75%)	2.11	76 (40%) 1 0	25, 50, 74, 132	0
1	B	186/247 (75%)	2.00	69 (37%) 1 1	25, 50, 75, 132	0
All	All	372/494 (75%)	2.05	145 (38%) 1 0	25, 50, 75, 132	0

The worst 5 of 145 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	207	ARG	9.8
1	B	88	VAL	9.5
1	B	27	ASN	9.3
1	B	163	VAL	8.7
1	A	206	ASP	8.2

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 ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.