



wwPDB X-ray Structure Validation Summary Report ⓘ

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PDB ID : 4CLC / pdb_00004clc
Title : Crystal structure of Ybr137w protein
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Deposited on : 2014-01-14
Resolution : 2.80 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

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>.

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

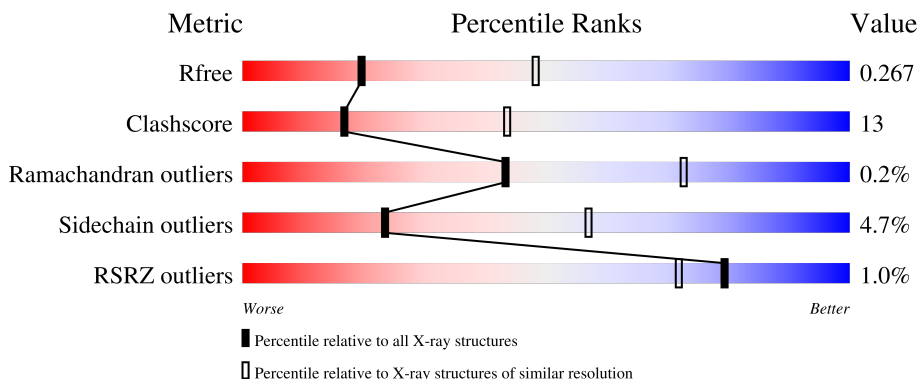
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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	3866 (2.80-2.80)
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (2.80-2.80)
RSRZ outliers	180081	3869 (2.80-2.80)

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 $\leq 5\%$. 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	179	 64% 28% • 6%
2	B	179	 65% 27% • 5%
3	C	179	 62% 32% • •
4	D	179	 73% 22% • •
5	E	179	 78% 17% • •

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 6657 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 UPF0303 PROTEIN YBR137W.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	169	1305	837	211	250	7	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	161	LEU	VAL	conflict	UNP P38276

- Molecule 2 is a protein called UPF0303 PROTEIN YBR137W.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	170	1293	830	211	244	8	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	28	LYS	ARG	conflict	UNP P38276
B	47	LYS	ARG	conflict	UNP P38276
B	56	ASP	GLU	conflict	UNP P38276
B	140	THR	ASP	conflict	UNP P38276

- Molecule 3 is a protein called UPF0303 PROTEIN YBR137W.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	174	1352	860	221	263	8	0	0	1

- Molecule 4 is a protein called UPF0303 PROTEIN YBR137W.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	D	173	1322	846	218	250	8	0	0	1

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	21	GLN	GLU	conflict	UNP P38276

- Molecule 5 is a protein called UPF0303 PROTEIN YBR137W.

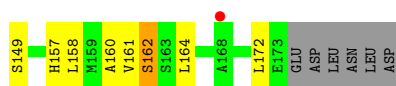
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	E	173	1321	845	218	251	7	0	0	1

There is a discrepancy between the modelled and reference sequences:

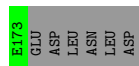
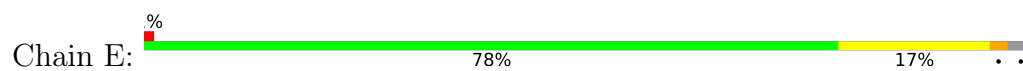
Chain	Residue	Modelled	Actual	Comment	Reference
E	17	THR	VAL	conflict	UNP P38276

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
6	A	7	7	7	0	0
6	B	11	11	11	0	0
6	C	14	14	14	0	0
6	D	16	16	16	0	0
6	E	16	16	16	0	0



• Molecule 5: UPF0303 PROTEIN YBR137W



4 Data and refinement statistics i

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α , β , γ	135.25Å 135.25Å 121.50Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	26.96 – 2.80 26.96 – 2.80	Depositor EDS
% Data completeness (in resolution range)	95.7 (26.96-2.80) 93.4 (26.96-2.80)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	6.01 (at 2.80Å)	Xtrriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.207 , 0.268 0.211 , 0.267	Depositor DCC
R_{free} test set	1992 reflections (6.51%)	wwPDB-VP
Wilson B-factor (Å ²)	59.6	Xtrriage
Anisotropy	0.157	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 29.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.019 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	6657	wwPDB-VP
Average B, all atoms (Å ²)	55.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.52% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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	0.50	0/1335	0.93	2/1809 (0.1%)
2	B	0.61	0/1323	1.02	6/1791 (0.3%)
3	C	0.65	1/1382 (0.1%)	1.05	9/1870 (0.5%)
4	D	0.63	1/1352 (0.1%)	1.00	6/1829 (0.3%)
5	E	0.64	1/1351 (0.1%)	1.02	7/1831 (0.4%)
All	All	0.61	3/6743 (0.0%)	1.01	30/9130 (0.3%)

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
3	C	0	1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	172	LEU	C-N	-6.62	1.24	1.33
3	C	173	GLU	C-N	-6.27	1.24	1.33
5	E	172	LEU	C-N	-6.19	1.24	1.33

The worst 5 of 30 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	104	TYR	N-CA-C	-8.04	102.60	111.36
5	E	57	LYS	CA-C-N	7.61	129.35	119.84
5	E	57	LYS	C-N-CA	7.61	129.35	119.84
5	E	139	SER	N-CA-C	7.20	123.08	113.72
2	B	15	ARG	CA-C-N	-6.79	112.73	122.77

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	C	78	GLY	Peptide

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	1305	0	1230	41	0
2	B	1293	0	1222	34	0
3	C	1352	0	1275	46	0
4	D	1322	0	1249	31	0
5	E	1321	0	1245	23	0
6	A	7	0	0	0	0
6	B	11	0	0	2	0
6	C	14	0	0	1	0
6	D	16	0	0	1	0
6	E	16	0	0	0	0
All	All	6657	0	6221	164	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 13.

The worst 5 of 164 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:97:ARG:HE	4:D:83:ASP:HB2	1.36	0.91
3:C:58:PRO:HB3	3:C:79:GLY:H	1.37	0.89
1:A:102:SER:HB2	1:A:129:GLY:H	1.42	0.82
3:C:10:GLU:HA	3:C:13:THR:HB	1.64	0.78
2:B:90:ARG:NH1	2:B:122:SER:O	2.16	0.77

There are no symmetry-related clashes.

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	167/179 (93%)	160 (96%)	7 (4%)	0	100	100
2	B	168/179 (94%)	154 (92%)	13 (8%)	1 (1%)	21	51
3	C	172/179 (96%)	158 (92%)	13 (8%)	1 (1%)	21	51
4	D	171/179 (96%)	162 (95%)	9 (5%)	0	100	100
5	E	171/179 (96%)	164 (96%)	7 (4%)	0	100	100
All	All	849/895 (95%)	798 (94%)	49 (6%)	2 (0%)	43	72

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	115	GLU
3	C	16	LYS

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	136/158 (86%)	126 (93%)	10 (7%)	13	37
2	B	133/158 (84%)	127 (96%)	6 (4%)	24	58
3	C	143/158 (90%)	137 (96%)	6 (4%)	26	61
4	D	136/158 (86%)	129 (95%)	7 (5%)	21	54
5	E	136/158 (86%)	133 (98%)	3 (2%)	45	78
All	All	684/790 (87%)	652 (95%)	32 (5%)	23	57

5 of 32 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	D	162	SER
5	E	2	VAL
2	B	56	ASP
2	B	44	THR
5	E	32	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 6 such sidechains are listed below:

Mol	Chain	Res	Type
2	B	153	GLN
3	C	53	ASN
4	D	53	ASN
1	A	157	HIS
1	A	37	GLN

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, 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	169/179 (94%)	-0.02	2 (1%) 76 68	44, 63, 79, 90	0
2	B	170/179 (94%)	0.04	3 (1%) 67 58	41, 62, 80, 95	0
3	C	174/179 (97%)	-0.24	1 (0%) 85 80	39, 48, 67, 89	0
4	D	173/179 (96%)	-0.27	2 (1%) 76 68	39, 48, 66, 90	0
5	E	173/179 (96%)	-0.30	1 (0%) 85 80	39, 52, 74, 93	0
All	All	859/895 (95%)	-0.16	9 (1%) 79 72	39, 54, 76, 95	0

The worst 5 of 9 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	115	GLU	3.5
2	B	114	PRO	2.8
2	B	18	PRO	2.4
1	A	152	LYS	2.4
3	C	112	LYS	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 [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.