wwPDB X-ray Structure Validation Summary Report (i)

Jun 15, 2024 – 01:41 PM EDT

PDB ID	:	2ELB
Title	:	Crystal Structure of the BAR-PH domain of human APPL1
Authors	:	Li, J.; Mao, X.; Dong, L.Q.; Liu, F.; Tong, L.
Deposited on	:	2007-03-27
Resolution	:	2.60 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*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
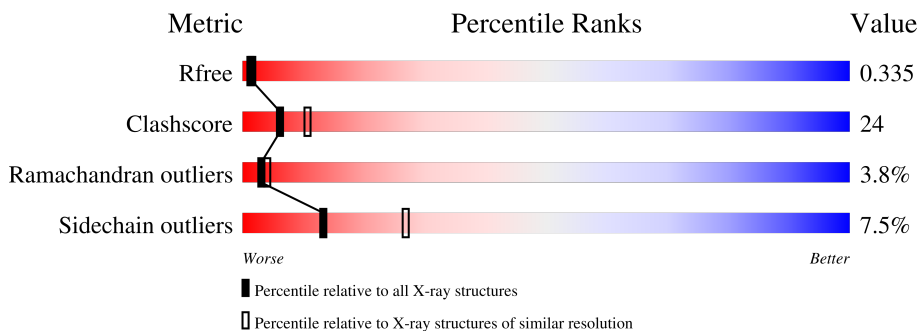http://www.wwpdb.org/validation/2017/FAQs#types.

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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 2.60 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	Percentile Ranks	Value
Rfree		0.335
Clashscore		24
Ramachandran outliers		3.8%
Sidechain outliers		7.5%

Worse ————————— *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)

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 >=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 <=5%

Mol	Chain	Length	Quality of chain
1	A	396	49% 33% 6% · 11%

2　Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 2834 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 Adapter protein containing PH domain, PTB domain and leucine zipper motif 1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	351	2834	1773	480	561	6	14	0	0	0

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MSE	-	CLONING ARTIFACT	UNP Q9UKG1
A	-18	GLY	-	CLONING ARTIFACT	UNP Q9UKG1
A	-17	SER	-	CLONING ARTIFACT	UNP Q9UKG1
A	-16	SER	-	CLONING ARTIFACT	UNP Q9UKG1
A	-15	HIS	-	CLONING ARTIFACT	UNP Q9UKG1
A	-14	HIS	-	CLONING ARTIFACT	UNP Q9UKG1
A	-13	HIS	-	CLONING ARTIFACT	UNP Q9UKG1
A	-12	HIS	-	CLONING ARTIFACT	UNP Q9UKG1
A	-11	HIS	-	CLONING ARTIFACT	UNP Q9UKG1
A	-10	HIS	-	CLONING ARTIFACT	UNP Q9UKG1
A	-9	SER	-	CLONING ARTIFACT	UNP Q9UKG1
A	-8	SER	-	CLONING ARTIFACT	UNP Q9UKG1
A	-7	GLY	-	CLONING ARTIFACT	UNP Q9UKG1
A	-6	LEU	-	CLONING ARTIFACT	UNP Q9UKG1
A	-5	VAL	-	CLONING ARTIFACT	UNP Q9UKG1
A	-4	PRO	-	CLONING ARTIFACT	UNP Q9UKG1
A	-3	ARG	-	CLONING ARTIFACT	UNP Q9UKG1
A	-2	GLY	-	CLONING ARTIFACT	UNP Q9UKG1
A	-1	SER	-	CLONING ARTIFACT	UNP Q9UKG1
A	0	HIS	-	CLONING ARTIFACT	UNP Q9UKG1
A	1	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	37	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	44	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	82	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	111	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	112	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1

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Chain	Residue	Modelled	Actual	Comment	Reference
A	178	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	179	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	204	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	213	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	240	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	247	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	270	ASP	LYS	CONFLICT	UNP Q9UKG1
A	310	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	323	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1
A	331	MSE	MET	MODIFIED RESIDUE	UNP Q9UKG1

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. 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. 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: Adapter protein containing PH domain, PTB domain and leucine zipper motif 1
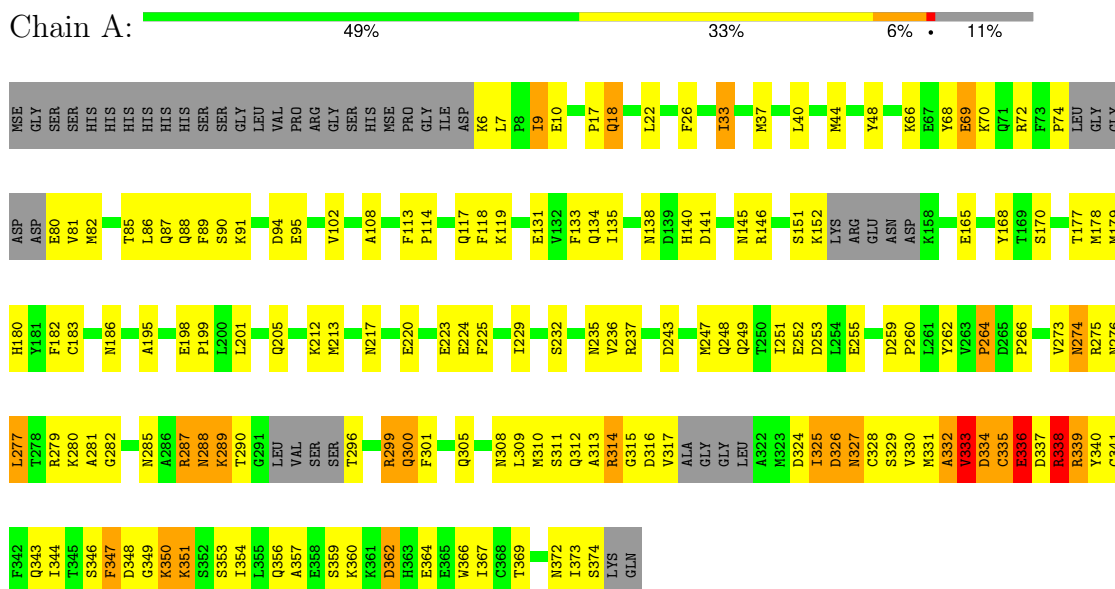
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	100.57Å 104.13Å 37.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.84 – 2.60 29.84 – 2.40	Depositor EDS
% Data completeness (in resolution range)	83.6 (29.84-2.60) 93.1 (29.84-2.40)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.16 (at 2.39Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.236 , 0.327 0.247 , 0.335	Depositor DCC
R_{free} test set	2110 reflections (7.29%)	wwPDB-VP
Wilson B-factor (Å²)	38.6	Xtriage
Anisotropy	0.615	Xtriage
Bulk solvent k_{sol}(e/Å³), B_{sol}(Å²)	0.33 , 44.5	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.009 for k,h,-l	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	2834	wwPDB-VP
Average B, all atoms (Å²)	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.41% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

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	0.45	0/2865	0.62	0/3835

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 ⓘ

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	2834	0	2768	137	0
All	All	2834	0	2768	137	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 24.

The worst 5 of 137 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:330:VAL:HB	1:A:348:ASP:HB2	1.24	1.15
1:A:347:PHE:HA	1:A:351:LYS:HA	1.62	0.81
1:A:18:GLN:HE21	1:A:18:GLN:HA	1.45	0.81
1:A:336:GLU:CD	1:A:337:ASP:H	1.84	0.79
1:A:290:THR:HA	1:A:296:THR:N	1.96	0.79

WORLDWIDE
wwPDB
PROTEIN DATA BANK

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	341/396 (86%)	291 (85%)	37 (11%)	13 (4%)	3	4

5 of 13 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	287	ARG
1	A	332	ALA
1	A	351	LYS
1	A	333	VAL
1	A	334	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	318/338 (94%)	294 (92%)	24 (8%)	13	27

5 of 24 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	325	ILE
1	A	333	VAL
1	A	327	ASN
1	A	336	GLU

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Mol	Chain	Res	Type
1	A	274	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 19 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	312	GLN
1	A	356	GLN
1	A	372	ASN
1	A	343	GLN
1	A	221	GLN

5.3.3 RNA ⓘ

There are no RNA molecules 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 monosaccharides 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 ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

6.4 Ligands ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.