



Full wwPDB X-ray Structure Validation Report ⓘ

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PDB ID : 6V97 / pdb_00006v97
Title : Kindlin-3 double deletion mutant short form
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Deposited on : 2019-12-13
Resolution : 2.38 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

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
Xtriage (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

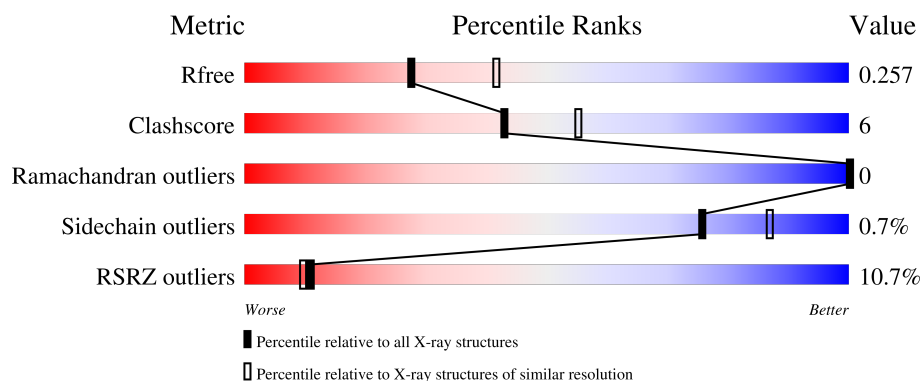
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.38 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	7164 (2.40-2.36)
Clashscore	190562	7722 (2.40-2.36)
Ramachandran outliers	187476	7626 (2.40-2.36)
Sidechain outliers	187428	7627 (2.40-2.36)
RSRZ outliers	180081	7170 (2.40-2.36)

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	462	6% 78% 11% 11%
1	B	462	13% 76% 14% 10%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 7014 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 Fermitin family homolog 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	412	Total	C	N	O	S	0	3	0
			3410	2186	611	602	11			
1	B	416	Total	C	N	O	S	0	1	0
			3425	2193	614	607	11			

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	664	LEU	-	expression tag	UNP Q86UX7
A	665	GLU	-	expression tag	UNP Q86UX7
A	666	HIS	-	expression tag	UNP Q86UX7
A	667	HIS	-	expression tag	UNP Q86UX7
A	668	HIS	-	expression tag	UNP Q86UX7
A	669	HIS	-	expression tag	UNP Q86UX7
A	670	HIS	-	expression tag	UNP Q86UX7
A	671	HIS	-	expression tag	UNP Q86UX7
B	664	LEU	-	expression tag	UNP Q86UX7
B	665	GLU	-	expression tag	UNP Q86UX7
B	666	HIS	-	expression tag	UNP Q86UX7
B	667	HIS	-	expression tag	UNP Q86UX7
B	668	HIS	-	expression tag	UNP Q86UX7
B	669	HIS	-	expression tag	UNP Q86UX7
B	670	HIS	-	expression tag	UNP Q86UX7
B	671	HIS	-	expression tag	UNP Q86UX7

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	104	Total	O	0	0
			104	104		
2	B	75	Total	O	0	0
			75	75		

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	67.50Å 131.49Å 134.15Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.95 – 2.38 46.95 – 2.38	Depositor EDS
% Data completeness (in resolution range)	98.3 (46.95-2.38) 94.2 (46.95-2.38)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.78 (at 2.39Å)	Xtriage
Refinement program	PHENIX 1.12 _2829	Depositor
R, R_{free}	0.203 , 0.257 0.205 , 0.257	Depositor DCC
R_{free} test set	2001 reflections (4.19%)	wwPDB-VP
Wilson B-factor (Å ²)	46.3	Xtriage
Anisotropy	0.096	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 42.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.016 for -h,l,k	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	7014	wwPDB-VP
Average B, all atoms (Å ²)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.71% 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

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	0.20	0/3503	0.41	0/4744
1	B	0.19	0/3513	0.42	0/4759
All	All	0.20	0/7016	0.41	0/9503

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	3410	0	3395	33	0
1	B	3425	0	3402	52	0
2	A	104	0	0	0	0
2	B	75	0	0	0	0
All	All	7014	0	6797	84	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 6.

All (84) 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:B:499:PRO:HG3	1:B:517:THR:HG22	1.62	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:16:TRP:CZ3	1:B:18:LEU:HG	2.18	0.78
1:A:264:ASP:HB3	1:A:267:ARG:HB3	1.68	0.74
1:B:68:GLN:HE22	1:B:89:ALA:HA	1.53	0.73
1:A:120:LEU:HB3	1:A:232:SER:HA	1.72	0.71
1:B:66:TRP:CZ3	1:B:69:LYS:HE2	2.27	0.68
1:B:68:GLN:NE2	1:B:89:ALA:HA	2.09	0.67
1:A:200:ARG:NH2	1:A:305:SER:O	2.28	0.67
1:A:555:MET:HE1	1:A:579:LEU:HD11	1.79	0.65
1:A:103[B]:ARG:HD2	1:A:109:ALA:HB2	1.78	0.64
1:B:555:MET:HE2	1:B:564:ASP:HB3	1.80	0.62
1:B:499:PRO:HB2	1:B:516:LEU:HD23	1.83	0.61
1:A:103[B]:ARG:HH21	1:A:109:ALA:HB2	1.66	0.59
1:B:66:TRP:HE1	1:B:68:GLN:NE2	2.01	0.57
1:A:647:GLU:OE2	1:A:648:LEU:N	2.38	0.57
1:B:292:MET:HE1	1:B:516:LEU:HD12	1.86	0.56
1:B:16:TRP:CZ3	1:B:18:LEU:CG	2.88	0.56
1:B:120:LEU:HD23	1:B:232:SER:HA	1.86	0.56
1:B:555:MET:HE1	1:B:579:LEU:HD13	1.88	0.56
1:A:234:ARG:HH11	1:A:234:ARG:HG3	1.72	0.55
1:B:142:LEU:HD11	1:B:250:ARG:HD2	1.89	0.55
1:B:89:ALA:HB1	1:B:91:LEU:HD21	1.89	0.54
1:B:579:LEU:O	1:B:579:LEU:HG	2.07	0.54
1:A:555:MET:HE2	1:A:564:ASP:HB3	1.90	0.53
1:A:221:ASP:OD1	1:B:589:ARG:NH1	2.32	0.53
1:B:220:SER:HB2	1:B:579:LEU:HD11	1.90	0.53
1:A:647:GLU:OE2	1:A:648:LEU:HB2	2.09	0.52
1:B:260:ASP:OD1	1:B:260:ASP:C	2.53	0.51
1:B:288:GLU:HA	1:B:507:PHE:CE2	2.46	0.51
1:B:521:LEU:O	1:B:525:GLN:HG2	2.11	0.51
1:B:514:LYS:HA	1:B:517:THR:HG23	1.93	0.51
1:B:232:SER:HB2	1:B:629:GLU:OE2	2.10	0.51
1:B:66:TRP:HE1	1:B:68:GLN:HE21	1.60	0.50
1:B:110:LEU:HD22	1:B:197:MET:HE1	1.93	0.50
1:A:108:ARG:HD2	1:A:202:GLN:CD	2.36	0.50
1:A:108:ARG:HD2	1:A:202:GLN:OE1	2.13	0.48
1:A:32:VAL:HG21	1:A:52:GLN:HB2	1.95	0.48
1:B:296:ALA:HB1	1:B:524:HIS:HA	1.96	0.48
1:B:511:PHE:HB3	1:B:515:GLN:HB3	1.94	0.48
1:A:28:GLU:CD	1:A:90:ARG:HH22	2.22	0.47
1:A:261:PRO:HA	1:A:268:LEU:HD22	1.97	0.47
1:B:499:PRO:HB2	1:B:516:LEU:CD2	2.45	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:260:ASP:OD1	1:A:263:THR:HB	2.15	0.47
1:B:292:MET:HE2	1:B:519:ARG:HG3	1.97	0.47
1:B:21:PHE:HD2	1:B:28:GLU:HA	1.79	0.47
1:B:641:GLU:OE1	1:B:644:ARG:NH2	2.44	0.47
1:B:34:LEU:HD11	1:B:49:ILE:HG13	1.98	0.46
1:B:16:TRP:HZ3	1:B:18:LEU:CG	2.29	0.45
1:B:24:GLU:OE2	1:B:55:ARG:NH1	2.49	0.45
1:B:16:TRP:HZ3	1:B:18:LEU:HD21	1.82	0.45
1:B:499:PRO:HG3	1:B:517:THR:CG2	2.39	0.45
1:B:525:GLN:HG2	1:B:525:GLN:H	1.62	0.45
1:B:161:LEU:HD13	1:B:162:TYR:O	2.17	0.45
1:A:636:PHE:O	1:A:639:THR:HB	2.17	0.44
1:A:254:TYR:CG	1:A:550:GLY:HA2	2.52	0.44
1:B:299:TYR:HB2	1:B:502:LEU:HD21	1.99	0.44
1:B:196:HIS:CG	1:B:197:MET:N	2.85	0.44
1:B:209:LEU:O	1:B:213:LEU:HG	2.18	0.44
1:B:254:TYR:CG	1:B:550:GLY:HA2	2.52	0.44
1:B:66:TRP:CH2	1:B:69:LYS:HE2	2.53	0.44
1:B:208:LEU:O	1:B:212:ARG:HG2	2.17	0.43
1:A:67:GLU:OE2	1:A:90:ARG:HD3	2.19	0.43
1:A:254:TYR:CD2	1:A:550:GLY:HA2	2.53	0.43
1:B:18:LEU:O	1:B:33:THR:HA	2.18	0.43
1:B:648:LEU:HD23	1:B:648:LEU:HA	1.85	0.43
1:B:68:GLN:OE1	1:B:90:ARG:HB2	2.17	0.43
1:A:28:GLU:OE2	1:A:90:ARG:NH2	2.52	0.43
1:A:544:GLN:HG2	1:A:549:PHE:CZ	2.54	0.42
1:A:578:ASP:HB3	1:A:581:VAL:HB	2.01	0.42
1:B:18:LEU:HA	1:B:18:LEU:HD23	1.37	0.42
1:B:571:ASN:HA	1:B:634:TYR:CD1	2.55	0.42
1:A:66:TRP:CH2	1:A:69:LYS:HG3	2.54	0.42
1:B:211:GLN:OE1	1:B:215:ARG:NH2	2.52	0.42
1:A:234:ARG:HH11	1:A:234:ARG:CG	2.33	0.42
1:A:145:PRO:HG3	1:A:228:ARG:CZ	2.49	0.42
1:B:16:TRP:HZ3	1:B:18:LEU:CD2	2.33	0.42
1:B:544:GLN:HG2	1:B:549:PHE:CZ	2.55	0.42
1:A:500:TYR:OH	1:A:512:LYS:HA	2.20	0.41
1:A:144:ALA:HA	1:A:248:TRP:CZ3	2.55	0.41
1:A:253:TYR:HB3	1:A:634:TYR:CE1	2.55	0.41
1:A:198:LEU:HB3	1:A:266:VAL:HG13	2.03	0.41
1:A:555:MET:HE3	1:A:565:GLU:C	2.45	0.41
1:A:103[B]:ARG:NH1	1:A:107:ARG:O	2.53	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:512:LYS:HG2	1:B:513:ALA:H	1.86	0.40

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	407/462 (88%)	394 (97%)	13 (3%)	0	100	100
1	B	411/462 (89%)	401 (98%)	10 (2%)	0	100	100
All	All	818/924 (88%)	795 (97%)	23 (3%)	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	367/407 (90%)	364 (99%)	3 (1%)	73	85
1	B	367/407 (90%)	365 (100%)	2 (0%)	81	90
All	All	734/814 (90%)	729 (99%)	5 (1%)	76	87

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	40	SER
1	A	293	VAL
1	A	639	THR
1	B	198	LEU
1	B	293	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	196	HIS
1	A	597	ASN
1	A	599	ASN
1	A	604	GLN
1	B	52	GLN
1	B	306	GLN
1	B	498	ASN
1	B	524	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

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	412/462 (89%)	0.33	29 (7%) 22 21	27, 48, 103, 136	3 (0%)
1	B	416/462 (90%)	0.70	60 (14%) 6 5	35, 59, 113, 138	1 (0%)
All	All	828/924 (89%)	0.52	89 (10%) 11 10	27, 54, 107, 138	4 (0%)

All (89) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	263	THR	5.9
1	B	579	LEU	5.4
1	A	37	THR	5.3
1	B	513	ALA	5.1
1	A	88	ASP	5.0
1	A	659	GLY	4.6
1	B	83	TYR	4.3
1	B	85	ILE	4.2
1	B	86	LEU	4.2
1	A	41[A]	HIS	4.1
1	B	659	GLY	4.1
1	A	600	TRP	4.1
1	B	208	LEU	3.9
1	B	511	PHE	3.8
1	B	77	HIS	3.6
1	B	308	GLY	3.6
1	A	602	ILE	3.6
1	B	81	ASP	3.5
1	B	88	ASP	3.5
1	B	516	LEU	3.4
1	B	79	THR	3.4
1	A	27	PRO	3.3
1	A	496	GLY	3.3
1	A	648	LEU	3.2

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Mol	Chain	Res	Type	RSRZ
1	A	196	HIS	3.1
1	B	68	GLN	3.1
1	A	29	ALA	3.1
1	B	500	TYR	3.0
1	B	41[A]	HIS	3.0
1	B	496	GLY	3.0
1	A	86	LEU	3.0
1	B	563	LYS	3.0
1	B	21	PHE	2.9
1	A	497	LEU	2.9
1	B	34	LEU	2.9
1	B	33	THR	2.9
1	B	80	LEU	2.9
1	A	40	SER	2.8
1	A	308	GLY	2.8
1	B	90	ARG	2.8
1	B	27	PRO	2.8
1	B	242	LYS	2.8
1	B	16	TRP	2.8
1	A	307	SER	2.8
1	B	510	LYS	2.8
1	B	89	ALA	2.7
1	B	113	ARG	2.7
1	B	19	ARG	2.7
1	B	209	LEU	2.7
1	B	601	ASP	2.7
1	A	263	THR	2.6
1	A	642	ARG	2.6
1	B	161	LEU	2.6
1	A	87	ALA	2.6
1	A	259	LEU	2.6
1	B	84	GLY	2.6
1	A	89	ALA	2.5
1	B	600	TRP	2.5
1	B	529	GLN	2.5
1	B	512	LYS	2.5
1	B	211	GLN	2.5
1	B	261	PRO	2.5
1	B	66	TRP	2.4
1	B	38	GLY	2.4
1	B	196	HIS	2.4
1	B	525	GLN	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	145	PRO	2.3
1	B	87	ALA	2.3
1	B	18	LEU	2.2
1	B	497	LEU	2.2
1	A	144	ALA	2.2
1	B	250	ARG	2.2
1	A	38	GLY	2.2
1	B	56	LYS	2.2
1	B	29	ALA	2.2
1	B	146	GLU	2.1
1	A	612	HIS	2.1
1	B	498	ASN	2.1
1	A	262	LYS	2.1
1	B	82	LYS	2.1
1	B	581	VAL	2.1
1	B	71	GLN	2.1
1	B	210	LEU	2.0
1	A	162	TYR	2.0
1	A	15	SER	2.0
1	B	289	GLU	2.0
1	B	307	SER	2.0
1	A	53	ILE	2.0
1	B	70	ARG	2.0

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.