



Full wwPDB X-ray Structure Validation Report ⓘ

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PDB ID : 6V9G / pdb_00006v9g
Title : Kindlin-3 double deletion mutant long form
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Deposited on : 2019-12-13
Resolution : 2.35 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
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

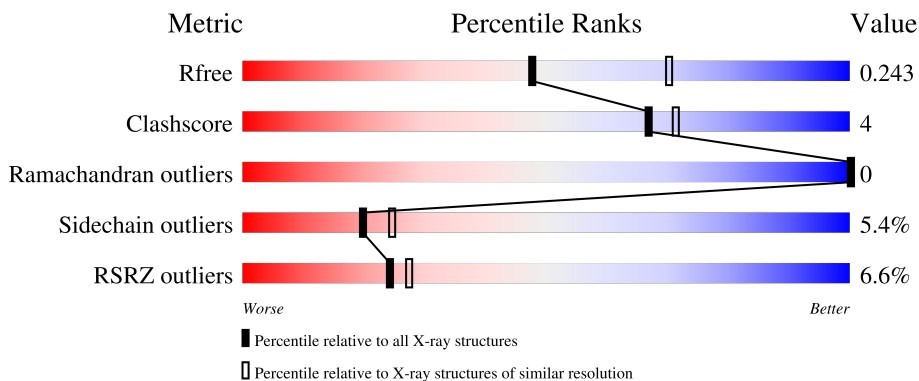
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.35 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	1596 (2.36-2.36)
Clashscore	190562	1663 (2.36-2.36)
Ramachandran outliers	187476	1646 (2.36-2.36)
Sidechain outliers	187428	1646 (2.36-2.36)
RSRZ outliers	180081	1598 (2.36-2.36)

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	492	 4% 73% 11% 16%
1	B	492	 7% 72% 10% 16%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 6998 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
			Total	C	N	O	S			
1	A	412	Total 3402	C 2181	N 608	O 602	S 11	0	2	0
1	B	411	Total 3375	C 2162	N 606	O 596	S 11	0	1	0

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	122	Total 122	O 122	0	0
2	B	99	Total 99	O 99	0	0

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	67.73Å 129.17Å 134.55Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.73 – 2.35 47.73 – 2.35	Depositor EDS
% Data completeness (in resolution range)	99.7 (47.73-2.35) 99.6 (47.73-2.35)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.79 (at 2.34Å)	Xtrriage
Refinement program	REFMAC 5.8.0135	Depositor
R, R_{free}	0.214 , 0.245 0.214 , 0.243	Depositor DCC
R_{free} test set	2101 reflections (4.22%)	wwPDB-VP
Wilson B-factor (Å ²)	48.8	Xtrriage
Anisotropy	0.342	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 36.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.015 for -h,l,k	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	6998	wwPDB-VP
Average B, all atoms (Å ²)	56.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.21% 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	0.60	2/3492 (0.1%)	0.88	1/4730 (0.0%)
1	B	0.56	0/3460	0.87	1/4688 (0.0%)
All	All	0.58	2/6952 (0.0%)	0.88	2/9418 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	96	GLN	C-O	-6.75	1.16	1.24
1	A	111	ARG	C-O	-6.37	1.16	1.24

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	640	ARG	N-CA-C	8.25	122.31	111.75
1	B	640	ARG	N-CA-C	6.96	118.86	111.28

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	3402	0	3382	24	0
1	B	3375	0	3351	27	0
2	A	122	0	0	1	0
2	B	99	0	0	0	0
All	All	6998	0	6733	50	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 4.

All (50) 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:120:LEU:HB3	1:A:232:SER:HA	1.71	0.71
1:A:555:MET:HE2	1:A:564:ASP:HB3	1.75	0.69
1:A:641:GLU:O	1:A:642:ARG:HB2	1.93	0.67
1:A:110:LEU:HD13	1:A:197:MET:CE	2.24	0.67
1:A:264:ASP:HB3	1:A:267:ARG:HB3	1.79	0.64
1:B:508:GLN:HA	1:B:512:LYS:HG3	1.82	0.61
1:B:206:ASP:HB3	1:B:209:LEU:HB2	1.82	0.61
1:B:291:MET:HE3	1:B:504:ALA:H	1.66	0.61
1:B:264:ASP:HB3	1:B:267:ARG:HB3	1.86	0.58
1:A:121:PHE:HB3	1:A:232:SER:HB2	1.87	0.57
1:A:555:MET:HE3	1:A:565:GLU:O	2.07	0.54
1:A:555:MET:HE1	1:A:579:LEU:HD11	1.91	0.53
1:A:221:ASP:OD1	1:B:589:ARG:NH2	2.36	0.53
1:A:509:ARG:NH2	2:A:701:HOH:O	2.42	0.53
1:A:142:LEU:HD11	1:A:250:ARG:HD3	1.90	0.52
1:A:145:PRO:HA	1:A:228:ARG:HD3	1.91	0.52
1:B:16:TRP:CE3	1:B:36:VAL:HG23	2.44	0.51
1:B:58:ASP:OD1	1:B:60:SER:HB2	2.10	0.51
1:A:110:LEU:HD13	1:A:197:MET:HE1	1.92	0.51
1:B:291:MET:CE	1:B:504:ALA:H	2.24	0.51
1:A:241:ILE:HG12	1:A:247:LEU:HD21	1.93	0.50
1:B:72:TRP:HZ2	1:B:237:MET:HE3	1.77	0.49
1:A:37:THR:C	1:A:39:GLU:H	2.21	0.49
1:A:110:LEU:HD13	1:A:197:MET:HE2	1.95	0.48
1:A:34:LEU:HD11	1:A:49:ILE:HG13	1.95	0.48
1:B:79:THR:HG23	1:B:82:LYS:H	1.78	0.47
1:B:609:PHE:HE2	1:B:615:VAL:CG1	2.26	0.47
1:B:208:LEU:HD12	1:B:212:ARG:HH11	1.81	0.45
1:B:120:LEU:HB3	1:B:232:SER:HA	1.98	0.45
1:A:261:PRO:HA	1:A:268:LEU:HD22	1.98	0.45
1:A:99:PRO:HD3	1:A:113:ARG:HH21	1.82	0.44
1:B:609:PHE:HE2	1:B:615:VAL:HG11	1.82	0.44
1:A:108:ARG:HE	1:A:202:GLN:HG2	1.82	0.43
1:B:68:GLN:NE2	1:B:90:ARG:HG3	2.34	0.43
1:B:72:TRP:CZ2	1:B:237:MET:HE3	2.54	0.43
1:B:24:GLU:HG3	1:B:25:GLU:H	1.82	0.43
1:B:86:LEU:HB2	1:B:88:ASP:OD1	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:512:LYS:HB3	1:B:516:LEU:HD23	2.00	0.43
1:B:34:LEU:HD22	1:B:48:LYS:HB3	2.02	0.42
1:B:134:ARG:HD3	1:B:264:ASP:OD1	2.20	0.42
1:A:110:LEU:HD23	1:A:112:LEU:HD21	2.01	0.41
1:B:571:ASN:HA	1:B:634:TYR:CD1	2.55	0.41
1:B:607:ILE:HB	1:B:615:VAL:HG13	2.01	0.41
1:B:107:ARG:HD2	1:B:277:TRP:CD2	2.56	0.41
1:A:566:ILE:HB	1:A:577:ILE:HB	2.03	0.41
1:B:558:PHE:CE2	1:B:576:ARG:HG3	2.56	0.40
1:A:141:LEU:HD13	1:A:247:LEU:HD13	2.03	0.40
1:B:142:LEU:HB2	1:B:248:TRP:HB2	2.03	0.40
1:A:254:TYR:CD2	1:A:550:GLY:HA2	2.57	0.40
1:B:254:TYR:CG	1:B:550:GLY:HA2	2.57	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	406/492 (82%)	398 (98%)	8 (2%)	0	100	100
1	B	404/492 (82%)	391 (97%)	13 (3%)	0	100	100
All	All	810/984 (82%)	789 (97%)	21 (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	366/431 (85%)	349 (95%)	17 (5%)	24	31
1	B	360/431 (84%)	338 (94%)	22 (6%)	17	20
All	All	726/862 (84%)	687 (95%)	39 (5%)	20	24

All (39) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	22	VAL
1	A	45	VAL
1	A	54	ASN
1	A	107	ARG
1	A	110	LEU
1	A	131	LEU
1	A	160	GLU
1	A	198	LEU
1	A	258	ASP
1	A	293	VAL
1	A	516	LEU
1	A	529	GLN
1	A	594	ARG
1	A	630	TYR
1	A	639	THR
1	A	640	ARG
1	A	648	LEU
1	B	16	TRP
1	B	22	VAL
1	B	34	LEU
1	B	41	HIS
1	B	45	VAL
1	B	60	SER
1	B	79	THR
1	B	100	VAL
1	B	146	GLU
1	B	198	LEU
1	B	208	LEU
1	B	209	LEU
1	B	297	LEU
1	B	304	LEU
1	B	306	GLN
1	B	516	LEU

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Mol	Chain	Res	Type
1	B	557	ARG
1	B	562	ARG
1	B	589	ARG
1	B	630	TYR
1	B	639	THR
1	B	647	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	57	GLN
1	A	122	GLN
1	A	211	GLN
1	B	75	GLN
1	B	211	GLN
1	B	498	ASN
1	B	515	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

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	412/492 (83%)	0.23	19 (4%) 37 43	29, 47, 87, 105	2 (0%)
1	B	411/492 (83%)	0.57	35 (8%) 16 18	27, 55, 104, 128	1 (0%)
All	All	823/984 (83%)	0.40	54 (6%) 24 27	27, 51, 98, 128	3 (0%)

All (54) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	513	ALA	5.2
1	B	27	PRO	5.2
1	B	308	GLY	4.7
1	B	516	LEU	4.6
1	B	508	GLN	4.6
1	B	26	ASP	4.2
1	B	500	TYR	4.0
1	A	580	ALA	3.9
1	B	37	THR	3.7
1	A	581	VAL	3.6
1	B	209	LEU	3.4
1	B	196	HIS	3.4
1	A	15	SER	3.4
1	B	512	LYS	3.3
1	B	16	TRP	3.2
1	B	208	LEU	3.2
1	A	110	LEU	3.2
1	A	308	GLY	3.2
1	B	213	LEU	3.2
1	A	162	TYR	3.1
1	A	38	GLY	2.8
1	A	146	GLU	2.8
1	B	260	ASP	2.8
1	A	659	GLY	2.8

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Mol	Chain	Res	Type	RSRZ
1	B	147	LYS	2.7
1	B	38	GLY	2.7
1	A	19	ARG	2.7
1	B	521	LEU	2.7
1	B	41	HIS	2.6
1	B	507	PHE	2.6
1	B	210	LEU	2.6
1	B	29	ALA	2.6
1	B	25	GLU	2.6
1	B	514	LYS	2.6
1	B	54	ASN	2.5
1	B	161	LEU	2.5
1	A	260	ASP	2.4
1	B	211	GLN	2.4
1	B	515	GLN	2.4
1	A	641	GLU	2.4
1	A	639	THR	2.4
1	B	212	ARG	2.3
1	A	648	LEU	2.3
1	B	520	ILE	2.3
1	A	612	HIS	2.2
1	B	499	PRO	2.2
1	A	615	VAL	2.1
1	B	36	VAL	2.1
1	B	109	ALA	2.1
1	B	207	PRO	2.1
1	A	18	LEU	2.1
1	B	519	ARG	2.1
1	A	196	HIS	2.0
1	A	642	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.