



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 08:03 PM UTC

PDB ID : 5VHA / pdb_00005vha
Title : DHX36 with an N-terminal truncation
Authors : Chen, M.; Ferre-D'Amare, A.
Deposited on : 2017-04-12
Resolution : 2.23 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

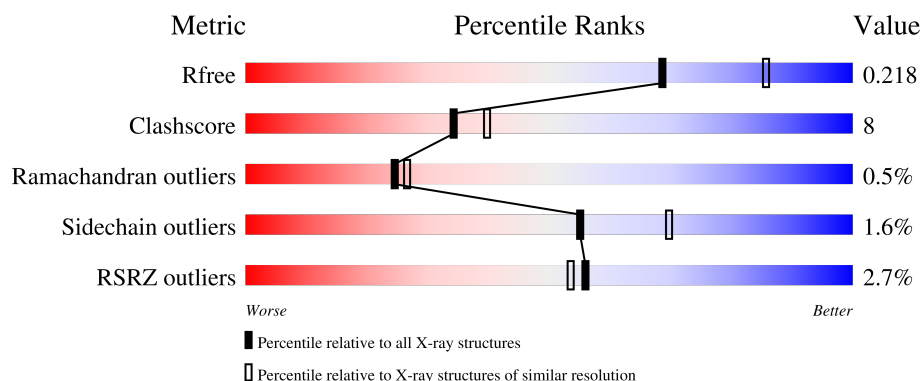
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

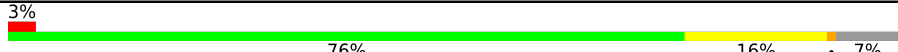
The reported resolution of this entry is 2.23 Å.

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	7682 (2.24-2.20)
Clashscore	190562	8402 (2.24-2.20)
Ramachandran outliers	187476	8303 (2.24-2.20)
Sidechain outliers	187428	8304 (2.24-2.20)
RSRZ outliers	180081	7683 (2.24-2.20)

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	870	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 6477 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 DEAH (Asp-Glu-Ala-His) box polypeptide 36.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	810	Total	C	N	O	S	0	0	0
			6286	4025	1051	1177	33			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	435	TYR	GLU	conflict	UNP Q05B79
A	436	TYR	GLU	conflict	UNP Q05B79
A	437	TYR	LYS	conflict	UNP Q05B79
A	1011	PRO	-	expression tag	UNP Q05B79
A	1012	HIS	-	expression tag	UNP Q05B79
A	1013	HIS	-	expression tag	UNP Q05B79
A	1014	HIS	-	expression tag	UNP Q05B79
A	1015	HIS	-	expression tag	UNP Q05B79
A	1016	HIS	-	expression tag	UNP Q05B79
A	1017	HIS	-	expression tag	UNP Q05B79
A	1018	HIS	-	expression tag	UNP Q05B79
A	1019	HIS	-	expression tag	UNP Q05B79

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	191	Total	O	0	0
			191	191		

- Molecule 1: DEAH (Asp-Glu-Ala-His) box polypeptide 36



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	61.32Å 109.19Å 62.41Å 90.00° 112.71° 90.00°	Depositor
Resolution (Å)	39.61 – 2.23 39.61 – 2.23	Depositor EDS
% Data completeness (in resolution range)	99.8 (39.61-2.23) 99.7 (39.61-2.23)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.89 (at 2.22Å)	Xtriage
Refinement program	PHENIX (1.10.1_2155)	Depositor
R, R_{free}	0.177 , 0.217 0.178 , 0.218	Depositor DCC
R_{free} test set	1996 reflections (5.33%)	wwPDB-VP
Wilson B-factor (Å ²)	40.3	Xtriage
Anisotropy	0.030	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 40.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.024 for l,-k,h	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	6477	wwPDB-VP
Average B, all atoms (Å ²)	53.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.19% 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	0.19	0/6413	0.45	3/8720 (0.0%)

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
1	A	0	1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	924	ASP	N-CA-C	5.22	117.05	111.36
1	A	561	THR	CA-C-N	5.09	130.85	121.70
1	A	561	THR	C-N-CA	5.09	130.85	121.70

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	367	MET	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	6286	0	6153	94	0
2	A	191	0	0	16	0
All	All	6477	0	6153	94	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 8.

All (94) 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:845:VAL:O	2:A:1101:HOH:O	1.88	0.91
1:A:297:ARG:NH2	2:A:1104:HOH:O	2.06	0.89
1:A:858:MET:O	2:A:1102:HOH:O	1.92	0.87
1:A:443:GLU:O	2:A:1103:HOH:O	1.96	0.83
1:A:562:ILE:HB	1:A:563:ASP:HA	1.61	0.81
1:A:873:PRO:HA	1:A:875:SER:H	1.47	0.79
1:A:898:SER:O	2:A:1105:HOH:O	2.06	0.72
1:A:221:MET:HE2	1:A:228:THR:HG23	1.71	0.72
1:A:207:GLU:OE2	2:A:1106:HOH:O	2.09	0.71
1:A:835:ALA:HB2	1:A:989:ILE:HG21	1.74	0.69
1:A:562:ILE:CB	1:A:563:ASP:HA	2.22	0.68
1:A:630:LEU:O	1:A:635:ARG:NH2	2.28	0.67
1:A:354:ASP:OD1	1:A:659:ARG:NH1	2.31	0.63
1:A:236:CYS:SG	1:A:238:LYS:HG3	2.39	0.63
1:A:204:ARG:NE	2:A:1107:HOH:O	2.31	0.63
1:A:728:SER:O	1:A:799:MET:HE1	1.99	0.63
1:A:655:HIS:CE1	1:A:659:ARG:HE	2.18	0.62
1:A:593:VAL:HG22	1:A:597:ASN:HB2	1.80	0.62
1:A:444:ARG:HA	2:A:1103:HOH:O	1.98	0.61
1:A:690:PRO:HG3	1:A:960:GLN:HG2	1.82	0.61
1:A:537:GLN:NE2	2:A:1117:HOH:O	2.33	0.60
1:A:562:ILE:HG22	1:A:564:ASP:H	1.66	0.60
1:A:715:CYS:HG	1:A:971:TRP:CD1	2.20	0.59
1:A:201:GLU:OE1	2:A:1107:HOH:O	2.17	0.59
1:A:924:ASP:N	1:A:925:ASN:HA	2.18	0.59
1:A:378:GLU:OE1	1:A:382:ASN:ND2	2.34	0.57
1:A:873:PRO:HA	1:A:875:SER:N	2.19	0.57
1:A:744:ASP:O	1:A:748:LYS:HG3	2.04	0.57
1:A:962:LYS:HE3	1:A:967:HIS:O	2.06	0.56
1:A:538:VAL:HG13	1:A:550:VAL:HG21	1.86	0.55
1:A:736:PRO:HB2	1:A:739:LYS:HD3	1.87	0.55
1:A:973:ASP:O	1:A:975:LYS:N	2.40	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:866:ASP:H	1:A:867:GLY:HA2	1.72	0.54
1:A:909:PRO:HB3	1:A:938:PHE:CE1	2.42	0.54
1:A:405:GLU:HA	1:A:460:THR:HG21	1.89	0.53
1:A:560:ILE:O	1:A:562:ILE:HG13	2.10	0.52
1:A:868:VAL:HG11	1:A:901:LEU:HG	1.92	0.52
1:A:401:GLU:HG2	1:A:452:LEU:HD21	1.92	0.51
1:A:453:ARG:NE	2:A:1114:HOH:O	2.31	0.51
1:A:207:GLU:HG2	1:A:212:TYR:CZ	2.45	0.51
1:A:338:ILE:HG12	1:A:367:MET:O	2.10	0.51
1:A:846:ALA:HB1	1:A:861:VAL:CG1	2.41	0.51
1:A:900:TYR:N	2:A:1105:HOH:O	2.32	0.50
1:A:721:LEU:HD12	1:A:818:PRO:HB3	1.93	0.50
1:A:321:LEU:HD13	1:A:351:VAL:HG11	1.93	0.50
1:A:218:LEU:HD23	1:A:386:ILE:HD13	1.93	0.49
1:A:894:MET:HE3	1:A:902:TYR:HD2	1.77	0.49
1:A:950:GLU:OE1	2:A:1108:HOH:O	2.20	0.49
1:A:273:SER:HB2	1:A:561:THR:O	2.11	0.49
1:A:267:ARG:HD2	1:A:555:ILE:HG13	1.96	0.48
1:A:257:SER:O	1:A:306:GLN:HB3	2.14	0.47
1:A:606:GLY:HA2	1:A:609:GLN:O	2.14	0.47
1:A:646:LYS:HD3	1:A:653:ILE:HD11	1.97	0.46
1:A:338:ILE:HD11	1:A:368:SER:HB2	1.96	0.46
1:A:735:ILE:HD12	1:A:743:ALA:HB1	1.96	0.46
1:A:877:ASN:HB3	1:A:883:PHE:HZ	1.80	0.46
1:A:859:VAL:HA	2:A:1102:HOH:O	2.15	0.45
1:A:768:TRP:CG	1:A:793:LEU:HD13	2.51	0.45
1:A:847:LYS:HD2	1:A:862:TYR:CE1	2.51	0.45
1:A:872:HIS:HB2	1:A:900:TYR:CG	2.52	0.45
1:A:841:LEU:HD13	1:A:890:TYR:O	2.16	0.45
1:A:841:LEU:HD13	1:A:890:TYR:C	2.42	0.44
1:A:864:LYS:HD3	1:A:935:TRP:HB2	2.00	0.44
1:A:592:TRP:CZ2	1:A:621:ARG:HD3	2.53	0.44
1:A:861:VAL:O	1:A:869:VAL:HA	2.17	0.44
1:A:863:THR:C	1:A:865:THR:H	2.25	0.44
1:A:527:HIS:HB3	1:A:530:MET:HG3	1.98	0.44
1:A:193:LYS:HE3	1:A:282:ARG:O	2.18	0.43
1:A:229:VAL:HG23	1:A:383:CYS:SG	2.58	0.43
1:A:262:VAL:HG11	1:A:317:ILE:HD11	1.99	0.43
1:A:866:ASP:OD2	1:A:893:LYS:HD3	2.18	0.43
1:A:666:ASN:OD1	2:A:1109:HOH:O	2.21	0.43
1:A:366:LEU:HD21	1:A:380:PHE:CE2	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:892:LEU:HD23	1:A:902:TYR:CG	2.54	0.42
1:A:892:LEU:HB3	1:A:902:TYR:HB3	2.01	0.42
1:A:253:ARG:HD2	1:A:255:LYS:HE2	2.01	0.42
1:A:376:PHE:CD1	1:A:661:MET:HE1	2.55	0.42
1:A:537:GLN:O	1:A:538:VAL:HB	2.20	0.42
1:A:558:THR:O	1:A:560:ILE:N	2.52	0.42
1:A:717:LEU:HD22	1:A:721:LEU:HG	2.01	0.42
1:A:872:HIS:HB2	1:A:900:TYR:CD1	2.56	0.41
1:A:503:ILE:HG12	1:A:551:ILE:HG22	2.01	0.41
1:A:846:ALA:HB1	1:A:861:VAL:HG11	2.03	0.41
1:A:799:MET:HE2	1:A:799:MET:HB3	1.81	0.41
1:A:168:ASP:N	2:A:1126:HOH:O	2.48	0.41
1:A:482:ARG:NH1	1:A:515:MET:HE2	2.35	0.41
1:A:888:LEU:HD23	1:A:906:GLU:HA	2.02	0.41
1:A:326:HIS:HA	1:A:355:LEU:HD11	2.02	0.41
1:A:267:ARG:HH21	1:A:558:THR:HG23	1.86	0.41
1:A:562:ILE:HB	1:A:563:ASP:CA	2.42	0.41
1:A:920:SER:OG	1:A:931:ALA:HB3	2.21	0.41
1:A:559:SER:HA	1:A:604:ARG:NH1	2.36	0.40
1:A:582:GLN:C	1:A:584:ASN:H	2.30	0.40
1:A:989:ILE:C	1:A:991:THR:H	2.29	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	806/870 (93%)	776 (96%)	26 (3%)	4 (0%)	24	26

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	538	VAL
1	A	411	PRO
1	A	559	SER
1	A	562	ILE

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	667/784 (85%)	656 (98%)	11 (2%)	55	70

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	197	LEU
1	A	399	LEU
1	A	526	LEU
1	A	562	ILE
1	A	593	VAL
1	A	715	CYS
1	A	717	LEU
1	A	868	VAL
1	A	899	ILE
1	A	905	THR
1	A	913	LEU

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	225	HIS
1	A	295	GLN
1	A	537	GLN
1	A	583	ASN
1	A	644	GLN
1	A	872	HIS
1	A	922	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 [i](#)

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	810/870 (93%)	-0.05	22 (2%) 56 53	25, 47, 101, 201	0

All (22) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	560	ILE	5.0
1	A	729	PHE	5.0
1	A	899	ILE	3.6
1	A	728	SER	3.4
1	A	538	VAL	3.4
1	A	562	ILE	3.0
1	A	898	SER	3.0
1	A	897	SER	2.9
1	A	563	ASP	2.8
1	A	539	PHE	2.8
1	A	894	MET	2.8
1	A	902	TYR	2.6
1	A	869	VAL	2.6
1	A	561	THR	2.5
1	A	650	LEU	2.4
1	A	585	ILE	2.2
1	A	865	THR	2.2
1	A	867	GLY	2.2
1	A	925	ASN	2.1
1	A	873	PRO	2.1
1	A	994	LYS	2.0
1	A	896	THR	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.