



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 26, 2026 – 02:16 PM EDT

PDB ID : 8H0N / pdb_00008h0n
Title : Crystal structure of the human METTL1-WDR4 complex
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Deposited on : 2022-09-30
Resolution : 1.80 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

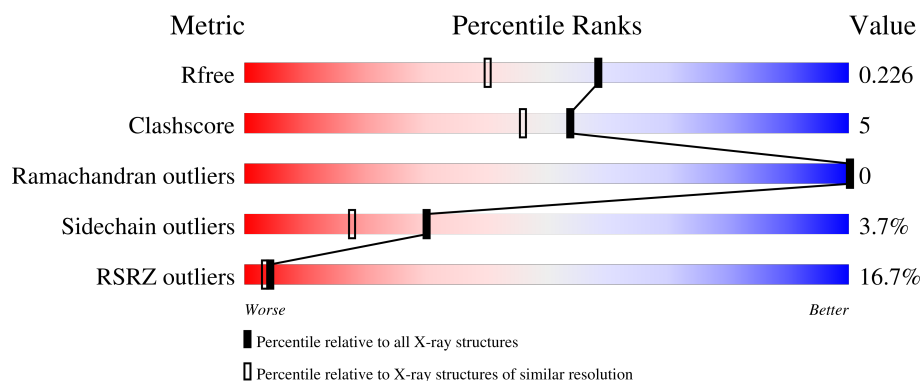
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 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	7662 (1.80-1.80)
Clashscore	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)
RSRZ outliers	180081	7663 (1.80-1.80)

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	367	17% 75% 13% 12%
2	B	244	11% 80% 8% 11%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4751 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 tRNA (guanine-N(7)-)-methyltransferase non-catalytic subunit WDR4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	323	Total	C	N	O	S	0	0	0
			2500	1583	436	467	14			

- Molecule 2 is a protein called tRNA (guanine-N(7)-)-methyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	217	Total	C	N	O	S	0	0	0
			1751	1141	300	305	5			

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	107	SER	CYS	conflict	UNP Q9UBP6
B	179	SER	CYS	conflict	UNP Q9UBP6
B	237	LEU	-	expression tag	UNP Q9UBP6
B	238	GLU	-	expression tag	UNP Q9UBP6
B	239	HIS	-	expression tag	UNP Q9UBP6
B	240	HIS	-	expression tag	UNP Q9UBP6
B	241	HIS	-	expression tag	UNP Q9UBP6
B	242	HIS	-	expression tag	UNP Q9UBP6
B	243	HIS	-	expression tag	UNP Q9UBP6
B	244	HIS	-	expression tag	UNP Q9UBP6

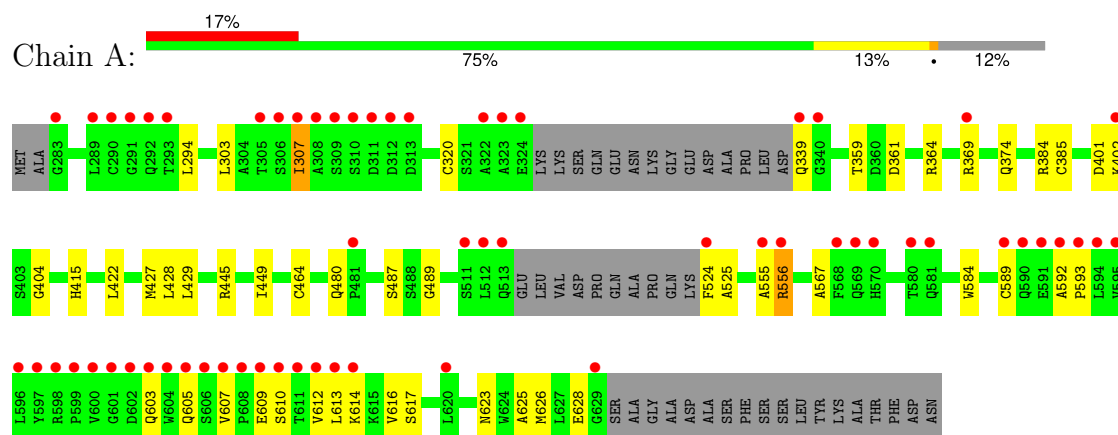
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	218	Total	O	0	0
			218	218		
3	B	282	Total	O	0	0
			282	282		

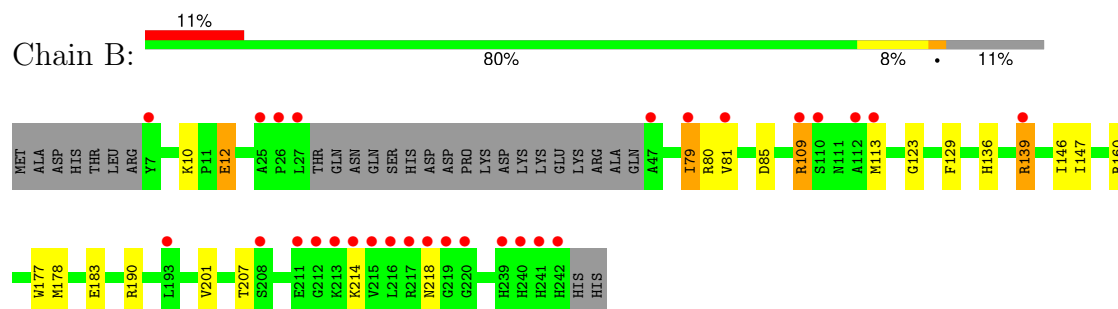
3 Residue-property plots [i](#)

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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). 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: tRNA (guanine-N(7)-)-methyltransferase non-catalytic subunit WDR4



- Molecule 2: tRNA (guanine-N(7)-)-methyltransferase



4 Data and refinement statistics

Property	Value	Source
Space group	P 2 ₁ 2 ₁ 2 ₁	Depositor
Cell constants a, b, c, α , β , γ	84.47Å 87.03Å 95.92Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.68 – 1.80 38.68 – 1.80	Depositor EDS
% Data completeness (in resolution range)	99.9 (38.68-1.80) 99.9 (38.68-1.80)	Depositor EDS
R_{merge}	0.03	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.73 (at 1.79Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.193 , 0.227 0.193 , 0.226	Depositor DCC
R_{free} test set	3206 reflections (4.84%)	wwPDB-VP
Wilson B-factor (Å ²)	22.7	Xtriage
Anisotropy	0.719	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 44.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.014 for k,h,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	4751	wwPDB-VP
Average B, all atoms (Å ²)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.61% 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	0.28	0/2552	0.55	0/3462
2	B	0.29	0/1804	0.49	0/2447
All	All	0.28	0/4356	0.52	0/5909

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 [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	2500	0	2458	27	0
2	B	1751	0	1724	14	0
3	A	218	0	0	7	2
3	B	282	0	0	4	3
All	All	4751	0	4182	41	3

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 5.

All (41) 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:214:LYS:NZ	3:B:301:HOH:O	2.02	0.85

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:567:ALA:O	3:A:701:HOH:O	1.99	0.80
1:A:427:MET:HE3	1:A:429:LEU:HD21	1.68	0.74
1:A:427:MET:HE2	1:A:445:ARG:HD2	1.76	0.67
2:B:80:ARG:NH2	3:B:303:HOH:O	2.27	0.67
1:A:339:GLN:NE2	3:A:706:HOH:O	2.25	0.66
2:B:207:THR:OG1	3:B:302:HOH:O	2.12	0.66
1:A:592:ALA:O	3:A:703:HOH:O	2.15	0.64
1:A:369:ARG:HG2	1:A:374:GLN:HB3	1.80	0.63
1:A:609:GLU:HG3	1:A:610:SER:H	1.64	0.63
1:A:307:ILE:HG22	1:A:616:VAL:HG21	1.80	0.62
1:A:589:CYS:HB3	3:A:703:HOH:O	2.00	0.62
2:B:79:ILE:HD12	2:B:146:ILE:HD12	1.85	0.59
1:A:361:ASP:OD1	3:A:704:HOH:O	2.17	0.58
1:A:320:CYS:HB3	1:A:364:ARG:HH21	1.69	0.55
1:A:384:ARG:H	1:A:402:LYS:HE2	1.71	0.55
1:A:556:ARG:HD3	1:A:556:ARG:H	1.72	0.55
1:A:449:ILE:HB	1:A:464:CYS:HB2	1.89	0.54
2:B:129:PHE:HE1	2:B:201:VAL:HG11	1.75	0.51
1:A:385:CYS:HA	1:A:401:ASP:HA	1.95	0.49
1:A:489:GLY:HA2	1:A:525:ALA:HB2	1.96	0.48
2:B:80:ARG:HD3	3:B:307:HOH:O	2.12	0.48
2:B:183:GLU:HG2	2:B:190:ARG:HB2	1.95	0.47
1:A:487:SER:OG	3:A:702:HOH:O	2.02	0.47
1:A:584:TRP:HZ3	1:A:613:LEU:HD13	1.80	0.47
1:A:480:GLN:NE2	1:A:555:ALA:HB1	2.30	0.46
2:B:136:HIS:HB2	2:B:139:ARG:HH21	1.81	0.45
2:B:79:ILE:HD12	2:B:146:ILE:CD1	2.46	0.45
2:B:79:ILE:HG12	2:B:113:MET:HE3	1.99	0.45
1:A:359:THR:HG21	1:A:385:CYS:HB2	1.99	0.44
1:A:609:GLU:OE2	1:A:614:LYS:HD2	2.18	0.44
2:B:85:ASP:OD1	2:B:109:ARG:NE	2.51	0.44
1:A:625:ALA:HA	1:A:628:GLU:HG2	2.01	0.43
1:A:404:GLY:HA2	1:A:428:LEU:HG	1.99	0.43
2:B:123:GLY:O	2:B:160:ARG:HB3	2.18	0.42
1:A:623:ASN:O	1:A:626:MET:HG2	2.19	0.42
1:A:593:PRO:HD2	1:A:617:SER:HB3	2.02	0.41
1:A:415:HIS:HD2	3:A:867:HOH:O	2.03	0.41
2:B:147:ILE:HB	2:B:177:TRP:CH2	2.56	0.41
1:A:584:TRP:CZ3	1:A:613:LEU:HD13	2.56	0.40
2:B:10:LYS:HG3	2:B:12:GLU:HG2	2.03	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the sym-

metry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:463:HOH:O	3:B:526:HOH:O[2_555]	1.93	0.27
3:A:763:HOH:O	3:B:516:HOH:O[3_445]	1.96	0.24
3:A:855:HOH:O	3:B:507:HOH:O[3_445]	2.04	0.16

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	317/367 (86%)	307 (97%)	10 (3%)	0	100	100
2	B	213/244 (87%)	208 (98%)	5 (2%)	0	100	100
All	All	530/611 (87%)	515 (97%)	15 (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	271/308 (88%)	261 (96%)	10 (4%)	30	18
2	B	186/215 (86%)	179 (96%)	7 (4%)	29	17
All	All	457/523 (87%)	440 (96%)	17 (4%)	30	18

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	294	LEU
1	A	303	LEU
1	A	307	ILE
1	A	422	LEU
1	A	524	PHE
1	A	556	ARG
1	A	603	GLN
1	A	605	GLN
1	A	607	VAL
1	A	612	VAL
2	B	12	GLU
2	B	79	ILE
2	B	81	VAL
2	B	109	ARG
2	B	139	ARG
2	B	178	MET
2	B	218	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	508	HIS
1	A	513	GLN
1	A	558	GLN
1	A	570	HIS
2	B	142	HIS
2	B	242	HIS

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 oligosaccharides 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 ⓘ

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	323/367 (88%)	0.83	62 (19%)	3 2	16, 28, 81, 128	0
2	B	217/244 (88%)	0.35	28 (12%)	7 6	16, 24, 62, 120	0
All	All	540/611 (88%)	0.64	90 (16%)	4 3	16, 27, 76, 128	0

All (90) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	27	LEU	7.2
1	A	589	CYS	6.8
1	A	607	VAL	6.5
1	A	601	GLY	6.3
1	A	602	ASP	6.2
2	B	79	ILE	5.9
1	A	308	ALA	5.8
1	A	600	VAL	5.5
1	A	323	ALA	5.4
1	A	595	VAL	5.2
1	A	310	SER	5.1
1	A	592	ALA	5.0
2	B	239	HIS	4.9
1	A	309	SER	4.7
2	B	214	LYS	4.6
1	A	606	SER	4.5
2	B	216	LEU	4.4
2	B	218	ASN	4.4
1	A	599	PRO	4.3
2	B	110	SER	4.3
2	B	242	HIS	4.3
2	B	219	GLY	4.3
1	A	513	GLN	4.2
1	A	306	SER	4.1

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Mol	Chain	Res	Type	RSRZ
1	A	608	PRO	4.1
1	A	524	PHE	4.0
1	A	594	LEU	4.0
1	A	629	GLY	3.9
1	A	307	ILE	3.9
1	A	609	GLU	3.8
1	A	597	TYR	3.8
1	A	481	PRO	3.8
1	A	322	ALA	3.7
1	A	604	TRP	3.7
2	B	139	ARG	3.6
1	A	605	GLN	3.6
1	A	596	LEU	3.5
1	A	598	ARG	3.4
2	B	81	VAL	3.4
1	A	611	THR	3.4
1	A	292	GLN	3.3
1	A	512	LEU	3.3
1	A	591	GLU	3.3
1	A	593	PRO	3.3
1	A	313	ASP	3.2
1	A	612	VAL	3.2
1	A	311	ASP	3.1
2	B	7	TYR	3.0
2	B	113	MET	3.0
1	A	603	GLN	3.0
2	B	26	PRO	3.0
1	A	369	ARG	3.0
1	A	610	SER	2.9
2	B	211	GLU	2.9
1	A	293	THR	2.9
1	A	556	ARG	2.9
2	B	220	GLY	2.9
1	A	580	THR	2.8
2	B	217	ARG	2.8
2	B	212	GLY	2.8
1	A	324	GLU	2.8
2	B	109	ARG	2.7
2	B	208	SER	2.7
2	B	215	VAL	2.7
1	A	340	GLY	2.7
1	A	339	GLN	2.7

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Mol	Chain	Res	Type	RSRZ
2	B	241	HIS	2.7
1	A	291	GLY	2.6
2	B	112	ALA	2.6
2	B	25	ALA	2.6
1	A	590	GLN	2.6
1	A	555	ALA	2.5
1	A	290	CYS	2.5
1	A	402	LYS	2.5
1	A	312	ASP	2.4
2	B	240	HIS	2.4
1	A	613	LEU	2.4
1	A	568	PHE	2.4
1	A	569	GLN	2.4
1	A	614	LYS	2.3
1	A	289	LEU	2.3
1	A	511	SER	2.3
2	B	213	LYS	2.3
1	A	570	HIS	2.3
2	B	193	LEU	2.2
2	B	47	ALA	2.2
1	A	283	GLY	2.2
1	A	620	LEU	2.1
1	A	305	THR	2.1
1	A	581	GLN	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.