



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 05:04 PM UTC

PDB ID : 3EQS / pdb_00003eqs
Title : Crystal structure of human MDM2 in complex with a 12-mer peptide inhibitor
Authors : Pazgier, M.; Lu, W.
Deposited on : 2008-10-01
Resolution : 1.65 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
Mogul	:	NOT EXECUTED
Xtriage (Phenix)	:	2.0
EDS	:	NOT EXECUTED
Buster-report	:	NOT EXECUTED
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

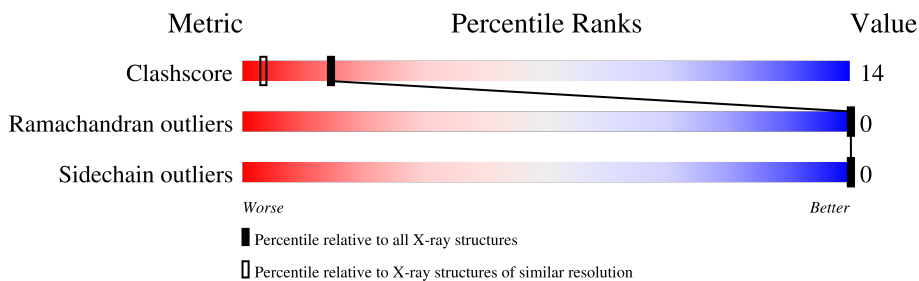
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.65 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))
Clashscore	190562	2662 (1.66-1.66)
Ramachandran outliers	187476	2621 (1.66-1.66)
Sidechain outliers	187428	2621 (1.66-1.66)

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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	85	 82% 16% .
2	B	12	 92% 8%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 1001 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.

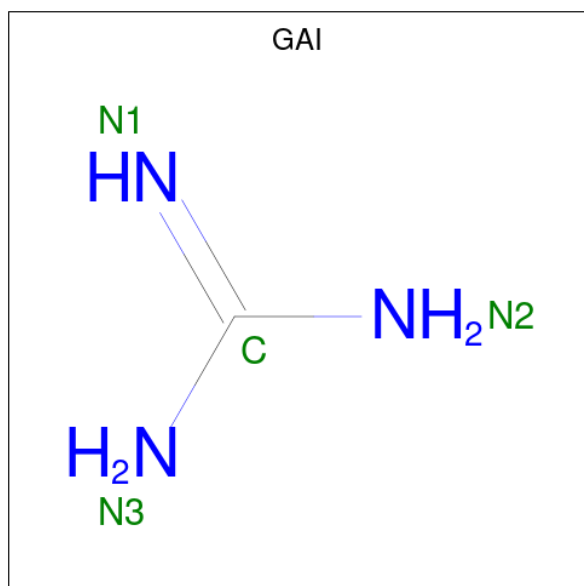
- Molecule 1 is a protein called E3 ubiquitin-protein ligase Mdm2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	84	Total	C	N	O	S	0	15	0
			786	529	122	128	7			

- Molecule 2 is a protein called 12-mer peptide inhibitor.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	11	Total	C	N	O	0	0	0
			94	63	13	18			

- Molecule 3 is GUANIDINE (CCD ID: GAI) (formula: CH_5N_3).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	N	0	0
			4	1	3		

- Molecule 4 is water.


Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	99	Total 99	O 99	0	0
4	B	18	Total 18	O 18	0	0

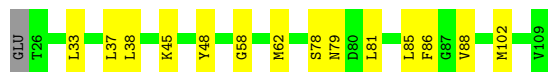
3 Residue-property plots [i](#)

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. 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.

Note EDS was not executed.

- Molecule 1: E3 ubiquitin-protein ligase Mdm2

Chain A:  82% 16%



- Molecule 2: 12-mer peptide inhibitor

Chain B:  92% 8%



4 Data and refinement statistics

EDS was not executed - this section is therefore incomplete.

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	71.52Å 43.27Å 35.04Å 90.00° 116.51° 90.00°	Depositor
Resolution (Å)	15.00 – 1.65	Depositor
% Data completeness (in resolution range)	99.6 (15.00-1.65)	Depositor
R_{merge}	0.06	Depositor
R_{sym}	0.06	Depositor
$\langle I/\sigma(I) \rangle$ ¹	9.61 (at 1.63Å)	Xtriage
Refinement program	REFMAC 5.4.0077	Depositor
R, R_{free}	0.154 , 0.193	Depositor
Wilson B-factor (Å ²)	19.6	Xtriage
Anisotropy	0.096	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.022 for -h-2*k,l	Xtriage
Total number of atoms	1001	wwPDB-VP
Average B, all atoms (Å ²)	17.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 20.54 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 8.4975e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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

Bond lengths and bond angles in the following residue types are not validated in this section: GAI

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	0.77	0/843	0.80	0/1130
2	B	0.75	0/97	0.68	0/132
All	All	0.77	0/940	0.78	0/1262

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	786	0	881	26	0
2	B	94	0	86	0	0
3	A	4	0	4	0	0
4	A	99	0	0	0	0
4	B	18	0	0	0	0
All	All	1001	0	971	26	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 14.

All (26) 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:86:PHE:CD2	1:A:102[B]:MET:SD	2.41	1.13
1:A:86:PHE:HB3	1:A:88:VAL:HG22	1.62	0.81
1:A:33[A]:LEU:HD11	1:A:81[A]:LEU:CD1	2.13	0.79
1:A:86:PHE:CE2	1:A:102[B]:MET:SD	2.77	0.77
1:A:86:PHE:CG	1:A:102[B]:MET:SD	2.86	0.68
1:A:58:GLY:O	1:A:62[B]:MET:HG3	1.93	0.68
1:A:45:LYS:HE3	1:A:48[A]:TYR:CE1	2.28	0.67
1:A:38[B]:LEU:HD23	1:A:48[B]:TYR:CZ	2.31	0.66
1:A:86:PHE:HA	1:A:102[B]:MET:HG3	1.80	0.64
1:A:33[A]:LEU:CD1	1:A:81[A]:LEU:HD11	2.30	0.61
1:A:33[A]:LEU:CD1	1:A:81[A]:LEU:CD1	2.80	0.58
1:A:45:LYS:CE	1:A:48[A]:TYR:CE1	2.86	0.58
1:A:86:PHE:CE2	1:A:102[A]:MET:HE2	2.42	0.55
1:A:33[A]:LEU:HG	1:A:81[A]:LEU:HD11	1.93	0.51
1:A:33[B]:LEU:HB3	1:A:85[B]:LEU:HD11	1.91	0.50
1:A:81[B]:LEU:HD23	1:A:85[B]:LEU:HD22	1.94	0.49
1:A:37:LEU:C	1:A:37:LEU:HD23	2.42	0.45
1:A:45:LYS:HE3	1:A:48[A]:TYR:CD1	2.52	0.44
1:A:33[A]:LEU:HD11	1:A:81[A]:LEU:HD13	1.97	0.43
1:A:33[A]:LEU:CG	1:A:81[A]:LEU:HD11	2.49	0.43
1:A:78:SER:O	1:A:79[B]:ASN:HB2	2.19	0.42
1:A:38[B]:LEU:HD23	1:A:48[B]:TYR:CE2	2.56	0.41
1:A:86:PHE:CE2	1:A:102[B]:MET:CE	3.03	0.41

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	97/85 (114%)	97 (100%)	0	0	100	100
2	B	9/12 (75%)	9 (100%)	0	0	100	100
All	All	106/97 (109%)	106 (100%)	0	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	94/80 (118%)	94 (100%)	0	100	100
2	B	10/11 (91%)	10 (100%)	0	100	100
All	All	104/91 (114%)	104 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

Mogul was not executed - this section is therefore empty.

5.5 Carbohydrates [i](#)

Mogul was not executed - this section is therefore empty.

5.6 Ligand geometry [i](#)

Mogul was not executed - this section is therefore empty.

5.7 Other polymers [i](#)

Mogul was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.