



# Full wwPDB X-ray Structure Validation Report ⓘ

Sep 14, 2020 – 09:43 AM BST

PDB ID : 6TTX  
Title : Crystal structure of the human METTL3-METTL14 complex bound to Compound 5 (ASI\_M3M\_051)  
Authors : Bedi, R.K.; Huang, D.; Sledz, P.; Caffisch, A.  
Deposited on : 2019-12-30  
Resolution : 2.00 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](mailto: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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : **FAILED**  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.14.4.dev1

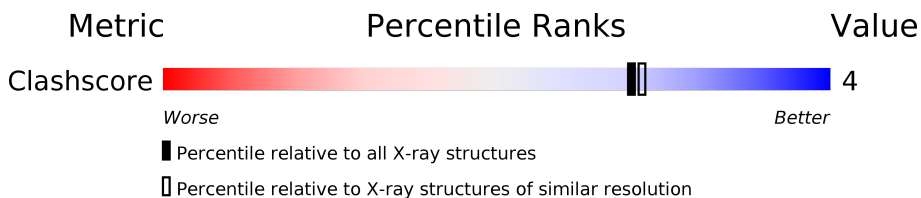
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.00 Å.


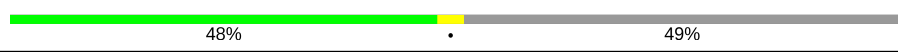
Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	9178 (2.00-2.00)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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 failed to run properly.

Mol	Chain	Length	Quality of chain
1	A	580	
2	B	456	

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 3768 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.

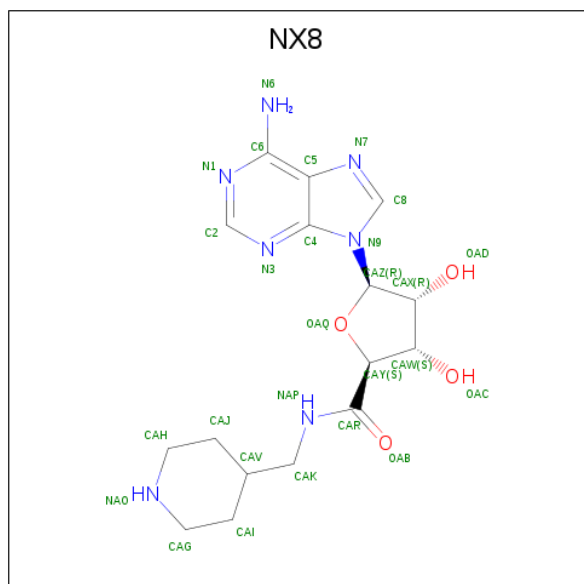
- Molecule 1 is a protein called N6-adenosine-methyltransferase catalytic subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	197	1568	1010	270	278	10	0	3	0

- Molecule 2 is a protein called N6-adenosine-methyltransferase non-catalytic subunit.

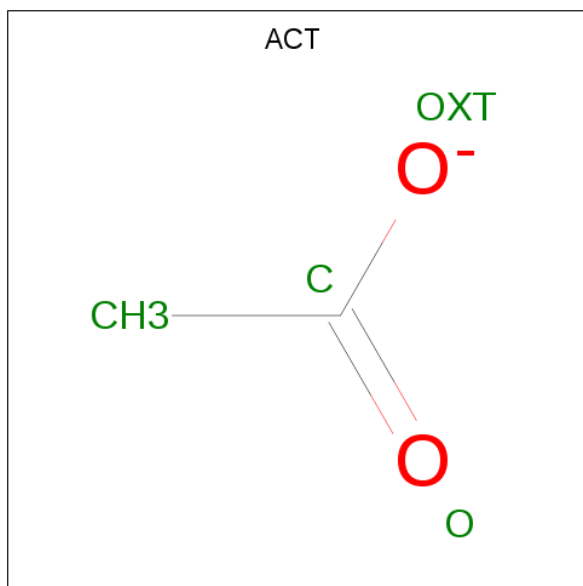
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	233	1849	1193	309	334	13	0	1	0

- Molecule 3 is (2 {S},3 {S},4 {R},5 {R})-5-(6-aminopurin-9-yl)-3,4-bis(oxidanyl)- {N}-(piperidin-4-ylmethyl)oxolane-2-carboxamide (three-letter code: NX8) (formula: C<sub>16</sub>H<sub>23</sub>N<sub>7</sub>O<sub>4</sub>) (labeled as "Ligand of Interest" by author).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	A	1	27	16	7	4	0	0

- Molecule 4 is ACETATE ION (three-letter code: ACT) (formula:  $C_2H_3O_2$ ).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	1	Total	C O	0	0
			4	2 2		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	133	Total	O	0	0
			133	133		
5	B	187	Total	O	0	0
			187	187		



ILE  
HIS  
ALA  
ASN  
V309  
L313  
I321  
I339  
Y374  
E391  
ILE  
GLU  
ARG  
LEU  
ARG  
PRO  
LYS  
SER  
PRO  
PRO  
LYS  
SER  
LYS  
SER  
ASP  
ARG  
GLY  
GLY  
ALA  
PRO  
ARG  
GLY  
GLY  
GLY  
ARG  
GLY  
GLY  
THR  
SER  
ALA  
GLY  
ARG  
GLY  
ARG  
GLU  
ARG  
ASN  
ARG  
SER  
ASN  
PHE  
ARG  
GLY

GLU  
ARG  
GLY  
PHE  
ARG  
GLY  
ARG  
GLY  
GLY  
ALA  
HIS  
ARG  
GLY  
GLY  
PHE  
PRO  
PRO  
ARG

## 4 Data and refinement statistics i

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	64.21Å 64.21Å 226.38Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	44.77 – 2.00	Depositor
% Data completeness (in resolution range)	99.6 (44.77-2.00)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.40 (at 2.00Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, $R_{free}$	0.191 , 0.217	Depositor
Wilson B-factor (Å <sup>2</sup> )	32.3	Xtrriage
Anisotropy	0.136	Xtrriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.033 for -h,-k,l	Xtrriage
Total number of atoms	3768	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	36.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.99% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup> Intensities estimated from amplitudes.

<sup>2</sup> Theoretical 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](#)

Bond lengths and bond angles in the following residue types are not validated in this section: NX8, ACT

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	0.43	0/1616	0.59	0/2199
2	B	0.46	0/1896	0.59	0/2574
All	All	0.45	0/3512	0.59	0/4773

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	1568	0	1520	13	0
2	B	1849	0	1756	13	0
3	A	27	0	0	0	0
4	B	4	0	3	0	0
5	A	133	0	0	1	1
5	B	187	0	0	1	1
All	All	3768	0	3279	24	1

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 (24) 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:321:ILE:O	2:B:321:ILE:HD12	1.74	0.87
2:B:168:MET:HE1	2:B:374:TYR:HB2	1.67	0.76
1:A:456[A]:ILE:HG12	2:B:285:LYS:HE2	1.79	0.64
1:A:457:TRP:CE2	1:A:514:PRO:HG3	2.42	0.55
2:B:230:PHE:CE1	2:B:339:LEU:HD22	2.44	0.53
2:B:321:ILE:C	2:B:321:ILE:HD12	2.28	0.53
1:A:373:TRP:HB2	1:A:551:LEU:HD13	1.93	0.50
1:A:456[A]:ILE:HG12	2:B:285:LYS:CE	2.40	0.50
1:A:398:TRP:HB2	1:A:400:ILE:HD11	1.94	0.48
2:B:275:LEU:N	5:B:608:HOH:O	2.47	0.46
1:A:369:PHE:HD1	1:A:369:PHE:H	1.63	0.46
1:A:539:ASN:O	1:A:541:GLN:HG2	2.17	0.45
2:B:168:MET:HE2	2:B:374:TYR:CD1	2.52	0.45
1:A:397:PRO:HB2	1:A:408:THR:HA	1.98	0.45
1:A:533:LEU:HD22	1:A:547:LEU:HD12	1.98	0.44
1:A:490:ASN:HB2	5:A:739:HOH:O	2.17	0.44
2:B:321:ILE:C	2:B:321:ILE:CD1	2.86	0.43
1:A:494:PHE:CD2	1:A:525:SER:HB2	2.53	0.42
2:B:168:MET:CE	2:B:374:TYR:HB2	2.43	0.42
2:B:262:ILE:HD12	2:B:313:LEU:HD22	2.02	0.41
2:B:293:LYS:HE2	2:B:293:LYS:HB2	1.87	0.41
2:B:260[B]:CYS:SG	2:B:287:HIS:CE1	3.14	0.41
1:A:456[A]:ILE:HG23	1:A:480:LYS:HB2	2.03	0.40
1:A:542:PRO:O	1:A:543:ASN:HB2	2.21	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:813:HOH:O	5:B:700:HOH:O[6_664]	2.14	0.06

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

There are no protein backbone outliers to report in this entry.

### 5.3.2 Protein sidechains [i](#)

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

### 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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

2 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	ACT	B	501	-	1,3,3	9.85	1 (100%)	0,3,3	0.00	-
3	NX8	A	601	-	27,30,30	5.85	10 (37%)	30,43,43	2.20	7 (23%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NX8	A	601	-	-	4/9/37/37	1/4/4/4

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	601	NX8	CAX-CAZ	-17.53	1.27	1.53
3	A	601	NX8	OAQ-CAZ	15.79	1.63	1.41
3	A	601	NX8	CAW-CAY	-15.18	1.34	1.53
4	B	501	ACT	CH3-C	9.85	1.61	1.48
3	A	601	NX8	OAQ-CAY	5.59	1.51	1.43
3	A	601	NX8	CAX-CAW	5.02	1.67	1.53
3	A	601	NX8	CAR-NAP	4.49	1.43	1.33
3	A	601	NX8	CAK-CAV	4.11	1.59	1.51
3	A	601	NX8	OAB-CAR	-4.03	1.15	1.23
3	A	601	NX8	CAK-NAP	2.94	1.54	1.46
3	A	601	NX8	C6-N6	2.88	1.44	1.34

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	601	NX8	OAQ-CAY-CAR	-5.82	101.39	111.11
3	A	601	NX8	CAK-NAP-CAR	-4.51	114.06	122.67
3	A	601	NX8	N3-C2-N1	-4.28	121.99	128.68
3	A	601	NX8	CAY-CAR-NAP	3.77	120.14	115.47
3	A	601	NX8	CAX-CAW-CAY	3.60	105.83	101.64
3	A	601	NX8	CAZ-OAQ-CAY	-2.81	104.23	109.11
3	A	601	NX8	C4-C5-N7	-2.30	107.00	109.40

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	601	NX8	NAP-CAK-CAV-CAJ
3	A	601	NX8	NAP-CAK-CAV-CAI
3	A	601	NX8	OAB-CAR-CAY-OAQ
3	A	601	NX8	NAP-CAR-CAY-OAQ

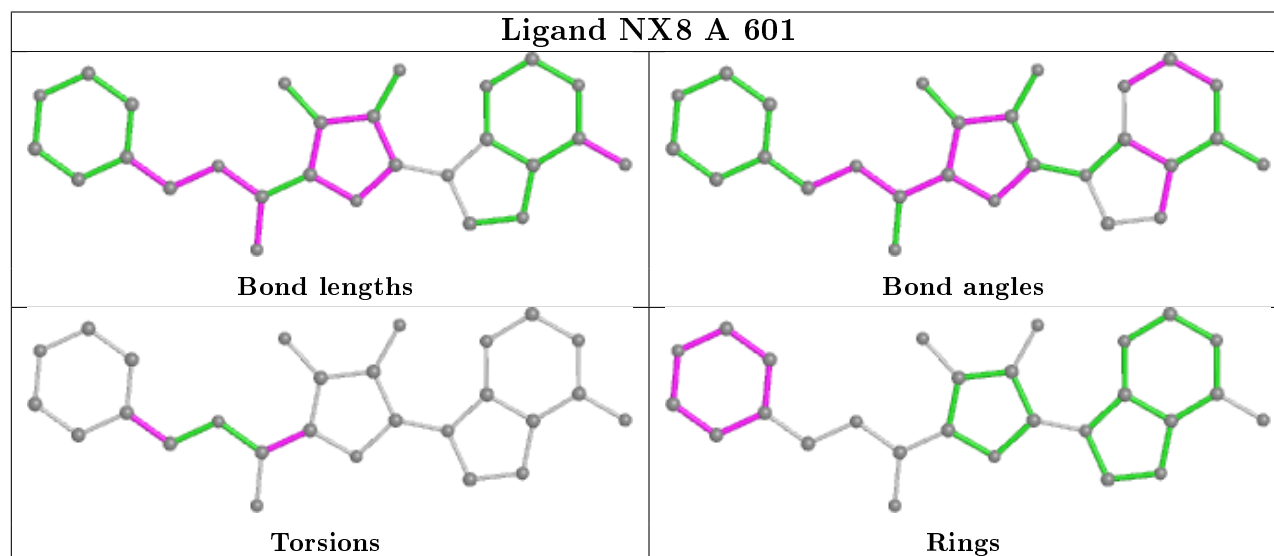
All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	601	NX8	CAG-CAH-CAI-CAJ-CAV-NAO

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is

within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 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

### 6.1 Protein, DNA and RNA chains

EDS failed to run properly - this section is therefore empty.

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

EDS failed to run properly - this section is therefore empty.

### 6.3 Carbohydrates

EDS failed to run properly - this section is therefore empty.

### 6.4 Ligands

EDS failed to run properly - this section is therefore empty.

### 6.5 Other polymers

EDS failed to run properly - this section is therefore empty.