

# Integrative Structure Validation Report

June 25, 2026 - 11:04 AM PDT

The following software was used in the production of this report:

*IHMValidation Version 3.2*


*Python-IHM Version 2.9*

*MolProbity Version 4.5.2*

PDB ID	9AA8   pdb_00009aa8
Structure Title	MLLT3_YEATS domain with SL4 of 7SK nc-RNA
Structure Authors	Kabra, A.; Bushweller, J.H.
Deposited on	2025-09-30

*This is a PDB-IHM Structure Validation Report.*

*We welcome your comments at [helpdesk@pdb-ihm.org](mailto:helpdesk@pdb-ihm.org)*

*A user guide is available at [https://pdb-ihm.org/validation\\_help.html](https://pdb-ihm.org/validation_help.html) with specific help available everywhere you see the  symbol.*

*List of references used to build this report is available [here](#).*

## 1. Overview

### 1.1. Summary

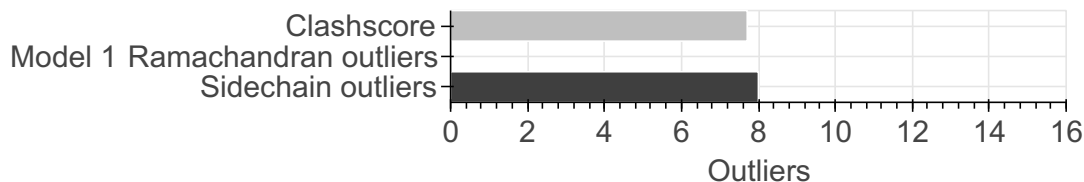
*This entry consists of 1 model(s). A total of 5 dataset(s) were used to build this entry.*

Name	Type	Count
NMR data	Experimental data	2
Other	Experimental data	1
Experimental model	Starting model	2

## 1.2. Overall quality ?

This validation report contains model quality assessments for all structures, data quality and fit to model assessments for SAS and crosslinking-MS datasets. Data quality and fit to model assessments for other datasets and model uncertainty are under development. Number of plots is limited to 256.

### Model Quality: MolProbity Analysis ?



## 2. Model Details ?

### 2.1. Ensemble information ?

This entry consists of 0 distinct ensemble(s).

### 2.2. Representation ?

This entry has 1 representation(s).

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
1	1	1	Protein AF-9	A	140	-	1-140	100.00 / 100.00	Atomic
		2	RNA (37-MER)	B	37	-	1-37	100.00 / 100.00	Atomic

### 2.3. Datasets used for modeling ?

There are 5 unique datasets used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	Experimental model	PDB	<a href="#">pdb_00005hjb</a>
2	Experimental model	PDB	<a href="#">pdb_00007slp</a>
3	NMR data	Not available	Not available
4	NMR data	BMRB	<a href="#">53503</a>
5	Other	Not available	Not available

### 2.4. Methodology and software ?

This entry is a result of 1 distinct protocol(s).

Step number	Protocol ID	Method name	Method type	Method description	Number of computed models	Multi state modeling	Multi scale modeling
1	1	Not available	Not available	Initial PDBs (5HJB for MLLT3 with H3K9Cr and 7SLP for 7SK_SL4) were removed. Both PDBs were processed in such way that non-essential components (H3K9Cr peptide from 5HJB and 7sk core RNP from 7SLP) were submitted to HADDOCK webservice for docking using default parameters. Active residues were defined for both components. For MLLT3 : Residues H56, R61, K63, C66, K67 were defined as active residues from our NMR chemical shift perturbation (CSP) data. For 7SK_SL4: C324 was defined as active base for the interaction based on our Photoactivatable-Ribonucleoside-Enhanced Cross linking and Immunoprecipitation (PAR-CLIP) data. No other restraints used except the active residues.	Not available	False	False

There is 1 software package reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	<a href="https://wenmr.science.uu.nl/haddock2.4/">HADDOCK</a>	Not available	docking	<a href="https://wenmr.science.uu.nl/haddock2.4/">https://wenmr.science.uu.nl/haddock2.4/</a>

### 3. Data quality

#### 3.4. NMR

Validation for this section is under development.

### 4. Model quality

For models with atomic structures, MolProbity analysis is performed. For models with coarse-grained or multi-scale structures, excluded volume analysis is performed.

#### 4.1b. MolProbity Analysis

Excluded volume satisfaction for the models in the entry are listed below. The Analysed column shows the number of particle-particle or particle-atom pairs for which excluded volume was analysed.

##### Standard geometry: bond outliers

There are no bond length outliers.

##### Standard geometry: angle outliers

There are 1 bond angle outliers in this entry (0.03% of 2976 assessed bonds). A summary is provided below.

Chain	Res	Type	Atoms	Z	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
B	6	A	O4'-C4'-C3'	4.01	102.09	106.10	1	1

Too-close contacts ?

The following all-atom clashscore is based on a MolProbity analysis. All-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The table below contains clashscores for all atomic models in this entry.

Model ID	Clash score	Number of clashes
1	7.71	27

There are 27 clashes. The table below contains the detailed list of all clashes based on a MolProbity analysis. Bad clashes are  $\geq 0.4$  Angstrom.

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
B:32:U:H4'	B:33:C:H5'	0.95	1	1
B:32:U:C4'	B:33:C:H5'	0.74	1	1
A:135:ARG:O	A:139:LYS:HG3	0.61	1	1
B:4:U:H2'	B:5:G:C8	0.59	1	1
B:25:C:OP1	B:27:G:H4'	0.58	1	1
A:133:PHE:HA	A:136:LYS:HD2	0.55	1	1
A:65:LYS:HE2	B:30:U:H5''	0.54	1	1
A:52:LYS:HE2	B:29:C:H5'	0.51	1	1
B:13:G:H8	B:13:G:OP2	0.51	1	1
B:12:U:H4'	B:12:U:OP1	0.51	1	1
A:52:LYS:HB3	A:69:LYS:HG2	0.50	1	1
A:48:HIS:HB3	A:139:LYS:HD2	0.50	1	1
A:14:GLU:OE1	A:39:ARG:HD2	0.49	1	1
A:90:TYR:CZ	A:99:LYS:HD3	0.48	1	1
A:55:PHE:HB2	A:66:ARG:HB2	0.48	1	1
A:57:LEU:HB2	A:64:PRO:HA	0.46	1	1
A:11:VAL:HG23	A:124:LEU:HB2	0.45	1	1
A:100:VAL:HG11	A:124:LEU:HD11	0.44	1	1
A:76:GLU:O	A:77:GLU:HG2	0.44	1	1
A:52:LYS:HG3	A:90:TYR:HB2	0.43	1	1
B:34:U:H6	B:34:U:OP2	0.42	1	1
A:65:LYS:HE2	B:30:U:C5'	0.42	1	1
B:13:G:O2'	B:14:C:H5''	0.41	1	1
A:94:LYS:HG2	B:25:C:O2	0.41	1	1
A:17:HIS:CD2	A:106:LEU:HG	0.41	1	1
A:14:GLU:HB2	A:39:ARG:HG3	0.41	1	1
A:114:PRO:HA	A:115:PRO:HD3	0.40	1	1

Torsion angles: Protein backbone ?

In the following table, Ramachandran outliers are listed. The Analysed column shows the number of residues for which the backbone conformation was analysed.

Model ID	Analysed	Favored	Allowed	Outliers
1	138	131	7	0

### Torsion angles : Protein sidechains ?

In the following table, sidechain rotameric outliers are listed. The Analysed column shows the number of residues for which the sidechain conformation was analysed.

Model ID	Analysed	Favored	Allowed	Outliers
1	129	112	9	8

There are 8 unique sidechain outliers. Detailed list of outliers are tabulated below.

Chain	Res	Type	Models (Total)
A	1	SER	1
A	2	HIS	1
A	5	SER	1
A	15	LEU	1
A	39	ARG	1
A	106	LEU	1
A	128	ASN	1
A	132	ASP	1

## 5. Fit to Data Used for Modeling Assessment ?

### 5.4. NMR ?

Validation for this section is under development.

## 6. Fit to Data Used for Validation Assessment ?

Validation for this section is under development.

### *Acknowledgments*

The development of integrative model validation metrics, implementation of a model validation pipeline, and creation of a validation report for integrative structures are funded by NSF awards to the [PDB-IHM team](#) (DBI-1756248, DBI-2112966, DBI-2112967, DBI-2112968, and DBI-1756250) and awards from NSF, NIH, and DOE to the [RCSB PDB](#) (DBI-2321666, R01GM157729, and DE-SC0019749). The PDB-IHM team and members of the [Sali lab](#) contributed model validation metrics

*and software packages.*

*Dr. Jill Trewhella, Dr. Dina Schneidman, and members of the [SASBDB](#) repository are acknowledged for their advice and support in implementing SAS validation methods. Team members from the labs of Dr. Juri Rappsilber, Dr. Alexander Leitner, Dr. Andrea Graziadei, and members of [PRIDE](#) database are acknowledged for their advice and support in implementing crosslinking-MS validation methods. We are grateful to Dr. Shruthi Viswanath for discussions about uncertainty assessment of integrative structural models.*

*Members of the [wwPDB Integrative/Hybrid Methods Task Force](#) provided recommendations and community support for the project.*