

Full wwPDB/EMDatabank EM Map/Model Validation Report ⓘ

Mar 23, 2019 – 10:20 AM EDT

PDB ID : 6NT9
EMDB ID: : EMD-0506
Title : Cryo-EM structure of the complex between human TBK1 and chicken STING
Authors : Shang, G.; Zhang, C.; Chen, Z.J.; Bai, X.; Zhang, X.
Deposited on : 2019-01-28
Resolution : 3.30 Å(reported)
Based on PDB ID : 4IM0

This is a Full wwPDB/EMDatabank EM Map/Model Validation Report
for a publicly released PDB/EMDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

MolProbity : 4.02b-467
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20031633

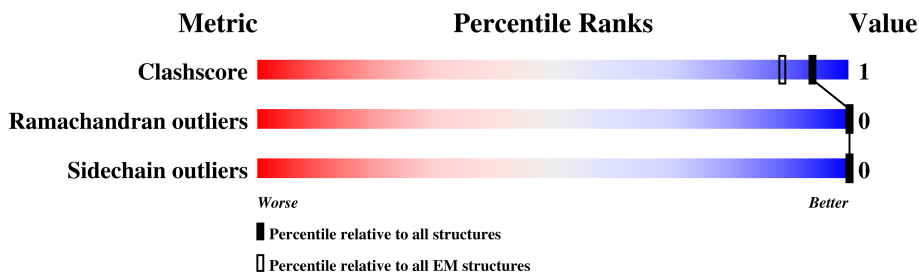
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.30 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)	EM structures (#Entries)
Clashscore	136327	1886
Ramachandran outliers	132723	1663
Sidechain outliers	132532	1531

The table below summarises the geometric issues observed across the polymeric chains. The red, orange, yellow and green segments on the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	742	 79% • 18%
1	B	742	 78% • 18%
2	C	392	 • 98%
2	D	392	 • 98%

2 Entry composition i

There are 2 unique types of molecules in this entry. The entry contains 9906 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Serine/threonine-protein kinase TBK1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	605	4881	3113	833	911	24	0	0
1	B	605	4881	3113	833	911	24	0	0

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	135	ASN	ASP	engineered mutation	UNP Q9UHD2
A	730	GLY	-	expression tag	UNP Q9UHD2
A	731	ILE	-	expression tag	UNP Q9UHD2
A	732	HIS	-	expression tag	UNP Q9UHD2
A	733	ARG	-	expression tag	UNP Q9UHD2
A	734	PRO	-	expression tag	UNP Q9UHD2
A	735	ASP	-	expression tag	UNP Q9UHD2
A	736	TYR	-	expression tag	UNP Q9UHD2
A	737	LYS	-	expression tag	UNP Q9UHD2
A	738	ASP	-	expression tag	UNP Q9UHD2
A	739	ASP	-	expression tag	UNP Q9UHD2
A	740	ASP	-	expression tag	UNP Q9UHD2
A	741	ASP	-	expression tag	UNP Q9UHD2
A	742	LYS	-	expression tag	UNP Q9UHD2
B	135	ASN	ASP	engineered mutation	UNP Q9UHD2
B	730	GLY	-	expression tag	UNP Q9UHD2
B	731	ILE	-	expression tag	UNP Q9UHD2
B	732	HIS	-	expression tag	UNP Q9UHD2
B	733	ARG	-	expression tag	UNP Q9UHD2
B	734	PRO	-	expression tag	UNP Q9UHD2
B	735	ASP	-	expression tag	UNP Q9UHD2
B	736	TYR	-	expression tag	UNP Q9UHD2
B	737	LYS	-	expression tag	UNP Q9UHD2
B	738	ASP	-	expression tag	UNP Q9UHD2
B	739	ASP	-	expression tag	UNP Q9UHD2
B	740	ASP	-	expression tag	UNP Q9UHD2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	741	ASP	-	expression tag	UNP Q9UHD2
B	742	LYS	-	expression tag	UNP Q9UHD2

- Molecule 2 is a protein called Stimulator of interferon genes protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
2	C	9	Total	C	N	O	0	0
			72	44	13	15		
2	D	9	Total	C	N	O	0	0
			72	44	13	15		

There are 26 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	380	GLY	-	expression tag	UNP A0A1D5P7Q9
C	381	ILE	-	expression tag	UNP A0A1D5P7Q9
C	382	HIS	-	expression tag	UNP A0A1D5P7Q9
C	383	ARG	-	expression tag	UNP A0A1D5P7Q9
C	384	PRO	-	expression tag	UNP A0A1D5P7Q9
C	385	ASP	-	expression tag	UNP A0A1D5P7Q9
C	386	TYR	-	expression tag	UNP A0A1D5P7Q9
C	387	LYS	-	expression tag	UNP A0A1D5P7Q9
C	388	ASP	-	expression tag	UNP A0A1D5P7Q9
C	389	ASP	-	expression tag	UNP A0A1D5P7Q9
C	390	ASP	-	expression tag	UNP A0A1D5P7Q9
C	391	ASP	-	expression tag	UNP A0A1D5P7Q9
C	392	LYS	-	expression tag	UNP A0A1D5P7Q9
D	380	GLY	-	expression tag	UNP A0A1D5P7Q9
D	381	ILE	-	expression tag	UNP A0A1D5P7Q9
D	382	HIS	-	expression tag	UNP A0A1D5P7Q9
D	383	ARG	-	expression tag	UNP A0A1D5P7Q9
D	384	PRO	-	expression tag	UNP A0A1D5P7Q9
D	385	ASP	-	expression tag	UNP A0A1D5P7Q9
D	386	TYR	-	expression tag	UNP A0A1D5P7Q9
D	387	LYS	-	expression tag	UNP A0A1D5P7Q9
D	388	ASP	-	expression tag	UNP A0A1D5P7Q9
D	389	ASP	-	expression tag	UNP A0A1D5P7Q9
D	390	ASP	-	expression tag	UNP A0A1D5P7Q9
D	391	ASP	-	expression tag	UNP A0A1D5P7Q9
D	392	LYS	-	expression tag	UNP A0A1D5P7Q9

4 Experimental information

Property	Value	Source
Reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	86276	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	48	Depositor
Minimum defocus (nm)	Not provided	Depositor
Maximum defocus (nm)	Not provided	Depositor
Magnification	Not provided	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

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	$\# Z > 2$	RMSZ	$\# Z > 2$
1	A	0.49	0/4979	0.55	0/6722
1	B	0.49	0/4979	0.55	0/6722
2	C	0.39	0/73	0.70	0/99
2	D	0.39	0/73	0.70	0/99
All	All	0.49	0/10104	0.55	0/13642

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	4881	0	4876	13	0
1	B	4881	0	4876	15	0
2	C	72	0	69	0	0
2	D	72	0	69	2	0
All	All	9906	0	9890	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 1.

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:357:ARG:NH2	1:B:452:ASP:OD2	2.27	0.64
1:B:475:ILE:HD11	1:B:654:LEU:HD23	1.84	0.58
1:A:475:ILE:HD11	1:A:654:LEU:HD23	1.85	0.57
1:B:351:GLU:OE1	1:B:627:ARG:NH2	2.36	0.56
1:A:351:GLU:OE1	1:A:627:ARG:NH2	2.36	0.56
1:A:1:MET:HB3	1:A:10:LEU:HD13	1.88	0.56
1:B:1:MET:HB3	1:B:10:LEU:HD13	1.88	0.56
1:A:133:HIS:HB2	1:A:158:PHE:HB2	1.90	0.54
1:B:133:HIS:HB2	1:B:158:PHE:HB2	1.90	0.53
1:B:657:THR:HG23	1:B:658:LEU:HG	1.91	0.52
1:A:657:THR:HG23	1:A:658:LEU:HG	1.91	0.52
1:B:532:LEU:HD22	1:B:626:LEU:HD13	1.95	0.49
1:A:532:LEU:HD22	1:A:626:LEU:HD13	1.95	0.48
1:B:581:GLN:NE2	2:D:372:GLN:H	2.11	0.48
1:B:475:ILE:HD13	1:B:651:THR:HG23	1.96	0.47
1:A:475:ILE:HD13	1:A:651:THR:HG23	1.96	0.46
1:B:581:GLN:HE22	2:D:372:GLN:H	1.64	0.44
1:B:383:SER:OG	1:B:384:ARG:N	2.53	0.42
1:A:383:SER:OG	1:A:384:ARG:N	2.53	0.42
1:A:39:VAL:HG22	1:A:83:VAL:HG12	2.02	0.42
1:A:357:ARG:HH12	1:B:357:ARG:HG3	1.83	0.41
1:B:39:VAL:HG22	1:B:83:VAL:HG12	2.03	0.41
1:A:134:ARG:NE	1:A:159:GLY:O	2.54	0.41
1:B:134:ARG:NE	1:B:159:GLY:O	2.54	0.40
1:B:511:SER:O	1:B:515:ILE:HG12	2.22	0.40
1:A:475:ILE:HA	1:A:475:ILE:HD12	1.99	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 PDB entries followed by that with respect to all EM entries.

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	593/742 (80%)	572 (96%)	21 (4%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	593/742 (80%)	572 (96%)	21 (4%)	0	100	100
2	C	7/392 (2%)	7 (100%)	0	0	100	100
2	D	7/392 (2%)	7 (100%)	0	0	100	100
All	All	1200/2268 (53%)	1158 (96%)	42 (4%)	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 PDB entries followed by that with respect to all EM entries.

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	540/663 (81%)	540 (100%)	0	100	100
1	B	540/663 (81%)	540 (100%)	0	100	100
2	C	9/345 (3%)	9 (100%)	0	100	100
2	D	9/345 (3%)	9 (100%)	0	100	100
All	All	1098/2016 (54%)	1098 (100%)	0	100	100

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

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	312	HIS
1	B	312	HIS
1	B	369	HIS
1	B	581	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 carbohydrates 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.