



Full wwPDB EM Validation Report ⓘ

Oct 9, 2025 – 12:18 PM JST

PDB ID : 9IZ7 / pdb_00009iz7
EMDB ID : EMD-61024
Title : ATM/Tel1 in Basal state
Authors : Wang, P.
Deposited on : 2024-07-31
Resolution : 4.32 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp>

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:

EMDB validation analysis : **FAILED**
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : **NOT EXECUTED**
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.46

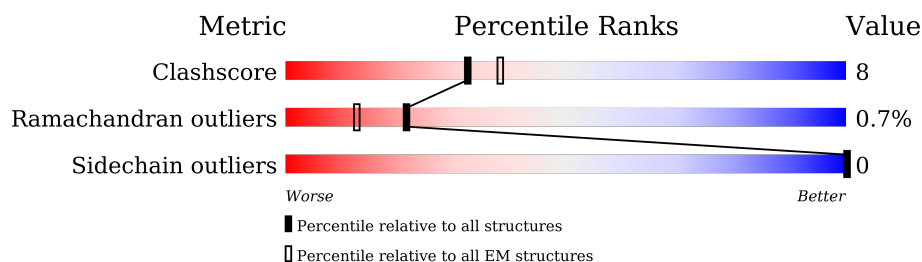
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.32 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	2812	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 12996 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 tell1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	A	2611	12996	7773	2611	2612	0	0

G2744	N2745	I2746	T2747	T2748	D2749	A2750	S2751	R2752	D2753	P2754	K2755	I2756	Q2757	G2763	E2764	S2765	E2766	A2770	V2774	R2775	L2778	S2779	SER	T2781	A2786	S2787	V2788	G2789	E2790	L2791	I2792	R2793	Q2812
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-----	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	17894	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k 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	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.29	3/12978 (0.0%)	0.55	7/18098 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	4

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	2744	GLY	C-O	7.52	1.33	1.23
1	A	2748	THR	CA-CB	6.64	1.63	1.53
1	A	2747	THR	C-O	6.00	1.31	1.23

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	2744	GLY	N-CA-C	8.48	124.24	112.37
1	A	2730	LYS	N-CA-C	8.09	128.04	110.80
1	A	2745	ASN	N-CA-C	-7.73	100.27	111.17
1	A	2752	ARG	N-CA-C	7.09	120.13	108.99
1	A	2653	ALA	N-CA-C	6.20	116.42	108.24
1	A	2734	GLN	CB-CA-C	-5.45	110.27	116.54
1	A	1262	GLY	N-CA-C	-5.36	106.45	115.62

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	138	HIS	Peptide
1	A	2000	SER	Peptide
1	A	2003	LEU	Peptide
1	A	2730	LYS	Mainchain

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	12996	0	5550	154	0
All	All	12996	0	5550	154	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 8.

All (154) 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:2623:GLY:O	1:A:2627:GLY:N	2.10	0.84
1:A:208:TYR:HA	1:A:245:ALA:HB2	1.60	0.82
1:A:2524:LEU:H	1:A:2529:GLY:HA2	1.45	0.82
1:A:1706:LEU:O	1:A:1710:ASP:N	2.15	0.78
1:A:430:ASN:O	1:A:434:SER:N	2.18	0.76
1:A:2000:SER:HA	1:A:2007:PHE:H	1.51	0.75
1:A:2013:ILE:O	1:A:2017:LEU:N	2.20	0.75
1:A:2715:ASP:O	1:A:2718:PHE:N	2.19	0.75
1:A:986:LYS:O	1:A:990:GLU:N	2.17	0.75
1:A:2749:ASP:O	1:A:2750:ALA:C	2.29	0.75
1:A:1123:GLN:O	1:A:1127:ILE:N	2.20	0.75
1:A:503:LEU:O	1:A:507:SER:N	2.17	0.74
1:A:2685:GLY:O	1:A:2689:ARG:N	2.20	0.73
1:A:392:LYS:O	1:A:396:LEU:N	2.20	0.73
1:A:2000:SER:N	1:A:2002:GLN:O	2.16	0.72
1:A:2178:SER:O	1:A:2182:THR:N	2.16	0.72
1:A:1112:ILE:O	1:A:1116:LEU:N	2.20	0.72
1:A:714:GLU:O	1:A:718:PHE:N	2.21	0.71
1:A:2789:GLY:O	1:A:2793:ARG:N	2.22	0.71

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:163:LYS:O	1:A:200:LYS:N	2.24	0.70
1:A:2277:SER:O	1:A:2281:LEU:N	2.22	0.69
1:A:1794:HIS:O	1:A:1798:THR:N	2.18	0.68
1:A:2130:LEU:O	1:A:2134:LYS:N	2.28	0.67
1:A:2069:ALA:O	1:A:2073:LYS:N	2.27	0.67
1:A:1253:GLU:O	1:A:1258:VAL:N	2.26	0.67
1:A:2741:PRO:O	1:A:2742:GLU:C	2.36	0.67
1:A:2747:THR:O	1:A:2748:THR:C	2.38	0.67
1:A:2003:LEU:O	1:A:2005:GLU:N	2.25	0.66
1:A:1052:ASP:O	1:A:1056:ILE:N	2.25	0.66
1:A:1099:GLN:O	1:A:1103:LEU:CB	2.44	0.66
1:A:2334:PRO:O	1:A:2338:LEU:N	2.28	0.66
1:A:891:HIS:O	1:A:895:ILE:N	2.29	0.65
1:A:644:LEU:O	1:A:648:LYS:N	2.29	0.65
1:A:2548:HIS:O	1:A:2552:HIS:N	2.29	0.65
1:A:1686:LEU:O	1:A:1690:MET:N	2.30	0.64
1:A:2373:ASN:O	1:A:2377:SER:N	2.28	0.64
1:A:1544:GLY:O	1:A:1547:PHE:N	2.31	0.64
1:A:1033:ASP:O	1:A:1037:ILE:N	2.31	0.64
1:A:2051:PHE:O	1:A:2056:ASN:N	2.32	0.63
1:A:2744:GLY:O	1:A:2745:ASN:C	2.41	0.63
1:A:1330:LEU:O	1:A:1334:LEU:N	2.29	0.63
1:A:2730:LYS:O	1:A:2732:LYS:N	2.28	0.62
1:A:2590:VAL:N	1:A:2812:GLN:O	2.32	0.62
1:A:2745:ASN:O	1:A:2746:ILE:C	2.43	0.62
1:A:2456:ALA:N	1:A:2462:PRO:O	2.33	0.62
1:A:788:ASP:O	1:A:792:HIS:N	2.33	0.61
1:A:2547:ALA:O	1:A:2551:TYR:N	2.26	0.61
1:A:353:HIS:HA	1:A:366:ASP:H	1.65	0.61
1:A:2750:ALA:O	1:A:2751:SER:C	2.41	0.61
1:A:500:LYS:O	1:A:504:ALA:N	2.34	0.60
1:A:2731:GLN:C	1:A:2733:MET:H	2.09	0.60
1:A:1070:LYS:O	1:A:1075:GLY:N	2.35	0.60
1:A:2749:ASP:C	1:A:2751:SER:N	2.56	0.60
1:A:504:ALA:O	1:A:508:ARG:N	2.31	0.59
1:A:988:PHE:O	1:A:993:PHE:N	2.24	0.59
1:A:2000:SER:CB	1:A:2006:CYS:H	2.15	0.58
1:A:216:TRP:H	1:A:219:ALA:HB2	1.67	0.58
1:A:2486:LEU:O	1:A:2490:ALA:N	2.33	0.57
1:A:389:PHE:O	1:A:393:LEU:N	2.30	0.57
1:A:2763:GLY:O	1:A:2765:SER:N	2.38	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1498:LEU:HA	1:A:1502:GLN:CB	2.35	0.56
1:A:2000:SER:N	1:A:2002:GLN:H	2.03	0.56
1:A:2731:GLN:O	1:A:2733:MET:N	2.37	0.56
1:A:1605:ASP:O	1:A:1609:MET:N	2.33	0.55
1:A:140:PRO:O	1:A:144:HIS:CB	2.55	0.55
1:A:2623:GLY:O	1:A:2626:LEU:N	2.40	0.55
1:A:1606:CYS:O	1:A:1610:PHE:N	2.32	0.54
1:A:1183:LEU:O	1:A:1185:LYS:N	2.36	0.54
1:A:2464:VAL:HA	1:A:2478:LEU:HA	1.89	0.53
1:A:2100:ILE:O	1:A:2104:GLY:N	2.37	0.53
1:A:2745:ASN:O	1:A:2746:ILE:O	2.26	0.53
1:A:388:PHE:O	1:A:392:LYS:N	2.24	0.53
1:A:1496:LEU:O	1:A:1499:TYR:N	2.41	0.52
1:A:2038:LYS:O	1:A:2040:TYR:N	2.41	0.52
1:A:1308:ARG:O	1:A:1312:GLU:N	2.41	0.52
1:A:419:ILE:O	1:A:423:LEU:N	2.33	0.52
1:A:2507:ARG:C	1:A:2509:THR:H	2.17	0.52
1:A:337:ASN:HA	1:A:384:TYR:HA	1.91	0.52
1:A:2741:PRO:O	1:A:2743:SER:N	2.43	0.52
1:A:2731:GLN:C	1:A:2733:MET:N	2.68	0.51
1:A:1454:GLY:C	1:A:1456:LEU:H	2.16	0.51
1:A:2766:GLU:O	1:A:2770:ALA:N	2.42	0.51
1:A:353:HIS:HA	1:A:366:ASP:N	2.25	0.50
1:A:71:SER:O	1:A:75:GLN:N	2.44	0.50
1:A:2733:MET:O	1:A:2734:GLN:C	2.55	0.50
1:A:2405:THR:N	1:A:2453:ILE:O	2.45	0.49
1:A:651:TRP:O	1:A:655:THR:N	2.46	0.49
1:A:1237:LEU:O	1:A:1241:LEU:CB	2.60	0.49
1:A:2051:PHE:HB3	1:A:2056:ASN:HA	1.95	0.49
1:A:345:LEU:HA	1:A:370:HIS:HA	1.94	0.49
1:A:2774:VAL:O	1:A:2778:LEU:N	2.46	0.48
1:A:1131:PHE:O	1:A:1135:ARG:N	2.25	0.48
1:A:787:SER:O	1:A:791:LYS:N	2.36	0.48
1:A:2732:LYS:O	1:A:2733:MET:C	2.55	0.48
1:A:1965:LEU:O	1:A:1968:TYR:N	2.37	0.48
1:A:2403:ASP:O	1:A:2455:PHE:N	2.47	0.48
1:A:2788:VAL:O	1:A:2792:ILE:N	2.38	0.48
1:A:525:TYR:O	1:A:528:MET:N	2.46	0.48
1:A:2732:LYS:CB	1:A:2737:ASN:HA	2.44	0.48
1:A:2000:SER:H	1:A:2002:GLN:H	1.62	0.48
1:A:2469:GLY:C	1:A:2472:GLY:H	2.23	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:160:ALA:O	1:A:164:LEU:N	2.33	0.47
1:A:1442:VAL:O	1:A:1446:LEU:N	2.48	0.47
1:A:1902:SER:O	1:A:1905:ARG:N	2.44	0.47
1:A:2445:THR:H	1:A:2470:SER:CB	2.27	0.47
1:A:2749:ASP:O	1:A:2751:SER:N	2.45	0.47
1:A:501:GLU:O	1:A:504:ALA:HB3	2.14	0.47
1:A:542:LYS:O	1:A:546:ILE:N	2.47	0.47
1:A:1795:ASN:HA	1:A:1799:ASP:H	1.79	0.47
1:A:499:LYS:O	1:A:503:LEU:N	2.33	0.46
1:A:301:SER:O	1:A:305:TRP:N	2.46	0.46
1:A:2750:ALA:O	1:A:2752:ARG:N	2.49	0.46
1:A:381:PHE:O	1:A:385:PHE:N	2.34	0.46
1:A:2775:ARG:O	1:A:2779:SER:N	2.48	0.46
1:A:1965:LEU:HA	1:A:1968:TYR:CB	2.46	0.46
1:A:224:VAL:O	1:A:228:LEU:N	2.41	0.46
1:A:2673:ASP:HA	1:A:2812:GLN:HA	1.97	0.45
1:A:1070:LYS:C	1:A:1076:PHE:H	2.25	0.45
1:A:983:PHE:O	1:A:986:LYS:HA	2.17	0.45
1:A:2479:VAL:HA	1:A:2531:ILE:H	1.82	0.45
1:A:1233:ILE:O	1:A:1235:GLU:N	2.47	0.44
1:A:1795:ASN:HA	1:A:1799:ASP:HA	1.99	0.44
1:A:372:PHE:HA	1:A:379:SER:HA	2.00	0.44
1:A:1181:LEU:O	1:A:1190:ALA:N	2.50	0.44
1:A:2754:PRO:O	1:A:2755:LYS:CB	2.65	0.44
1:A:382:GLU:O	1:A:386:ILE:N	2.49	0.44
1:A:2628:LEU:O	1:A:2653:ALA:HA	2.18	0.44
1:A:2313:ASN:CB	1:A:2359:ARG:HA	2.47	0.44
1:A:1770:ASN:O	1:A:1774:ALA:N	2.39	0.44
1:A:1440:GLY:O	1:A:1444:ALA:N	2.51	0.43
1:A:2685:GLY:N	1:A:2688:ARG:H	2.16	0.43
1:A:164:LEU:HA	1:A:200:LYS:O	2.18	0.43
1:A:701:ILE:O	1:A:704:ALA:HB3	2.18	0.43
1:A:1444:ALA:O	1:A:1447:ASN:N	2.33	0.43
1:A:517:PRO:HA	1:A:555:LEU:HA	2.00	0.43
1:A:1441:TYR:HA	1:A:1444:ALA:HB3	2.01	0.43
1:A:2020:LEU:O	1:A:2023:SER:N	2.52	0.42
1:A:518:VAL:O	1:A:522:ILE:N	2.40	0.42
1:A:574:LEU:O	1:A:576:VAL:N	2.51	0.42
1:A:645:PHE:C	1:A:647:LEU:H	2.26	0.42
1:A:2506:TYR:O	1:A:2510:SER:N	2.53	0.42
1:A:2620:SER:C	1:A:2623:GLY:H	2.27	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1760:PRO:O	1:A:1763:ALA:HB3	2.19	0.42
1:A:354:THR:N	1:A:366:ASP:H	2.18	0.41
1:A:2343:SER:O	1:A:2347:ASN:N	2.38	0.41
1:A:1508:PRO:O	1:A:1512:LEU:N	2.43	0.41
1:A:2591:PHE:N	1:A:2812:GLN:O	2.54	0.41
1:A:2786:ALA:O	1:A:2790:GLU:N	2.38	0.41
1:A:981:THR:HA	1:A:984:ILE:CB	2.50	0.41
1:A:516:SER:O	1:A:517:PRO:C	2.64	0.41
1:A:537:ILE:O	1:A:541:ILE:N	2.43	0.41
1:A:1965:LEU:C	1:A:1968:TYR:H	2.24	0.40
1:A:2630:ASP:O	1:A:2632:HIS:N	2.50	0.40
1:A:1005:PHE:O	1:A:1009:LEU:N	2.42	0.40

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 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	2573/2812 (92%)	2331 (91%)	225 (9%)	17 (1%)	19	55

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1115	PRO
1	A	2731	GLN
1	A	2740	GLN
1	A	2742	GLU
1	A	2746	ILE
1	A	2751	SER
1	A	2754	PRO
1	A	2755	LYS
1	A	2730	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	345	LEU
1	A	2743	SER
1	A	2750	ALA
1	A	1261	LEU
1	A	1815	CYS
1	A	2753	ASP
1	A	2756	ILE
1	A	2757	GLN

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	2/2621 (0%)	2 (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](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

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.