



Full wwPDB X-ray Structure Validation Report ⓘ

May 28, 2020 – 08:53 pm BST

PDB ID : 6VG3
Title : Structure of unliganded, inactive PTK7 kinase domain
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Deposited on : 2020-01-07
Resolution : 1.95 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.11
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

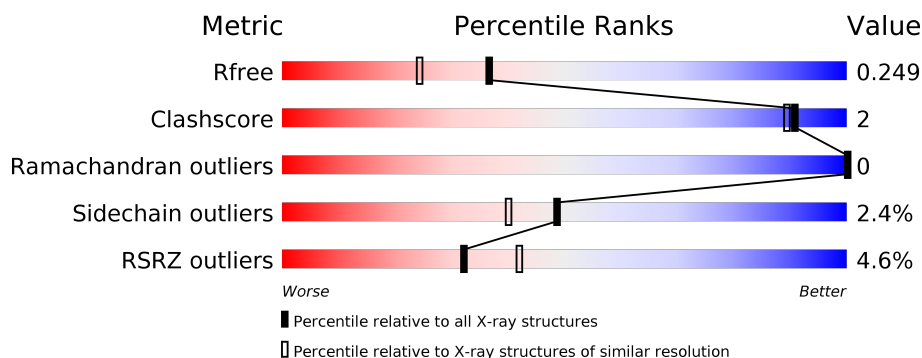
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.95 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))
R_{free}	130704	2580 (1.96-1.96)
Clashscore	141614	2705 (1.96-1.96)
Ramachandran outliers	138981	2678 (1.96-1.96)
Sidechain outliers	138945	2678 (1.96-1.96)
RSRZ outliers	127900	2539 (1.96-1.96)

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 ≥ 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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	296	<div> <div>2%</div> <div> <div></div> <div>89%</div> <div>5%</div> <div>6%</div> </div> </div>
1	B	296	<div> <div>4%</div> <div> <div></div> <div>88%</div> <div>7%</div> <div>6%</div> </div> </div>
1	C	296	<div> <div>7%</div> <div> <div></div> <div>82%</div> <div>7%</div> <div>10%</div> </div> </div>

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 7161 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 Inactive tyrosine-protein kinase 7.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	277	Total	C	N	O	S	0	0	0
			2199	1394	386	406	13			
1	B	279	Total	C	N	O	S	0	0	0
			2213	1403	388	409	13			
1	C	265	Total	C	N	O	S	0	0	0
			2104	1336	369	386	13			

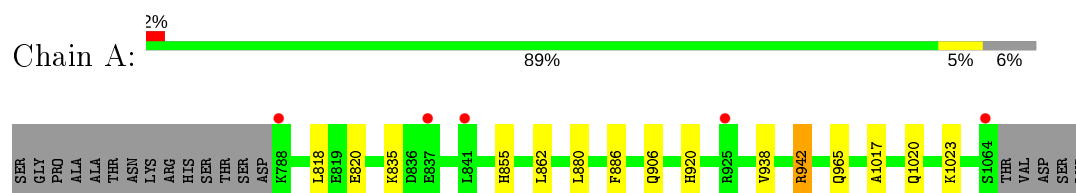
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	250	Total	O	0	0
			250	250		
2	B	215	Total	O	0	0
			215	215		
2	C	180	Total	O	0	0
			180	180		

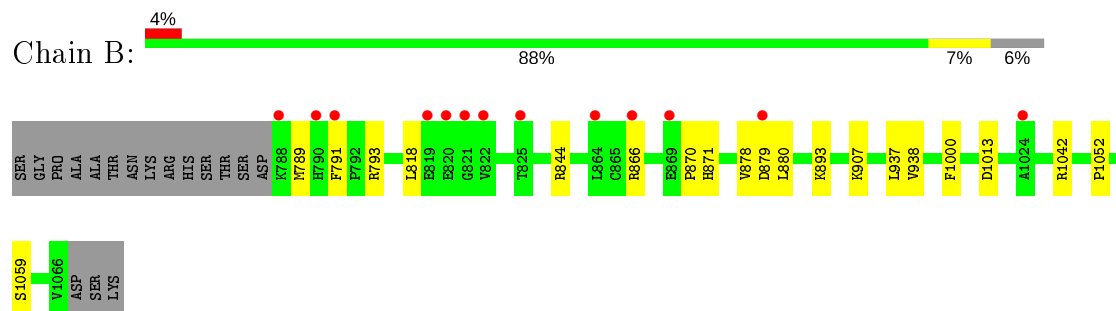
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). 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.

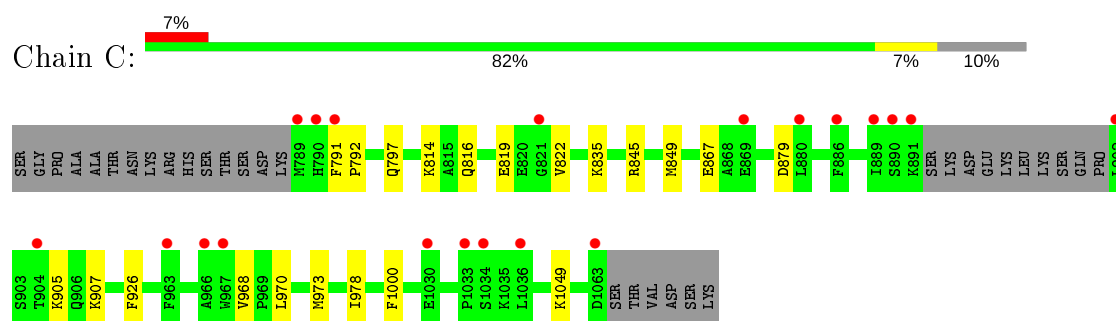
• Molecule 1: Inactive tyrosine-protein kinase 7



• Molecule 1: Inactive tyrosine-protein kinase 7



• Molecule 1: Inactive tyrosine-protein kinase 7



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	95.63Å 119.92Å 166.52Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.66 – 1.95 48.66 – 1.95	Depositor EDS
% Data completeness (in resolution range)	98.5 (48.66-1.95) 98.5 (48.66-1.95)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	0.17	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.51 (at 1.95Å)	Xtriage
Refinement program	BUSTER 2.10.3	Depositor
R, R_{free}	0.189 , 0.244 0.194 , 0.249	Depositor DCC
R_{free} test set	3335 reflections (4.84%)	wwPDB-VP
Wilson B-factor (Å ²)	34.2	Xtriage
Anisotropy	0.595	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 51.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	7161	wwPDB-VP
Average B, all atoms (Å ²)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.60% of the height of the origin peak. No significant pseudotranslation is detected.*

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

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	0.50	0/2246	0.62	0/3028
1	B	0.50	0/2260	0.63	0/3048
1	C	0.49	0/2149	0.65	0/2899
All	All	0.50	0/6655	0.63	0/8975

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	2199	0	2197	6	0
1	B	2213	0	2213	9	0
1	C	2104	0	2093	7	0
2	A	250	0	0	0	0
2	B	215	0	0	0	0
2	C	180	0	0	0	0
All	All	7161	0	6503	22	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 2.

All (22) 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:B:878:VAL:HG22	1:B:937:LEU:HB3	1.66	0.78
1:B:791:PHE:HE2	1:B:818:LEU:HD13	1.66	0.60
1:A:906:GLN:HG2	1:A:942:ARG:HH21	1.67	0.59
1:B:878:VAL:CG2	1:B:937:LEU:HB3	2.33	0.58
1:A:1017:ALA:HA	1:A:1020:GLN:HE21	1.73	0.54
1:C:819:GLU:HB2	1:C:822:VAL:HG12	1.90	0.54
1:C:797:GLN:HB2	1:C:814:LYS:HG3	1.91	0.51
1:B:907:LYS:HD3	1:B:1000:PHE:HA	1.96	0.47
1:A:818:LEU:HD21	1:A:862:LEU:HD13	1.95	0.47
1:A:880:LEU:HB3	1:A:938:VAL:O	2.15	0.47
1:B:880:LEU:HB3	1:B:938:VAL:O	2.14	0.47
1:B:793:ARG:NH1	1:B:870:PRO:HD2	2.31	0.45
1:B:844:ARG:HH21	1:B:866:ARG:HH21	1.65	0.45
1:A:855:HIS:HB2	1:A:920:HIS:CD2	2.52	0.44
1:C:907:LYS:HE2	1:C:1000:PHE:HA	1.99	0.44
1:C:970:LEU:HD12	1:C:978:ILE:HD13	2.00	0.44
1:C:791:PHE:CD1	1:C:792:PRO:HD2	2.53	0.44
1:B:1042:ARG:HB3	1:B:1052:PRO:HD3	2.01	0.43
1:C:849:MET:HG3	1:C:926:PHE:CG	2.55	0.41
1:C:968:VAL:HB	1:C:973:MET:SD	2.60	0.41
1:B:866:ARG:HG3	1:B:871:HIS:NE2	2.36	0.41
1:A:886:PHE:HZ	1:A:942:ARG:HD2	1.86	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	275/296 (93%)	265 (96%)	10 (4%)	0	100	100
1	B	277/296 (94%)	267 (96%)	10 (4%)	0	100	100
1	C	261/296 (88%)	250 (96%)	11 (4%)	0	100	100
All	All	813/888 (92%)	782 (96%)	31 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	239/255 (94%)	234 (98%)	5 (2%)	53	46
1	B	241/255 (94%)	236 (98%)	5 (2%)	53	46
1	C	227/255 (89%)	220 (97%)	7 (3%)	40	28
All	All	707/765 (92%)	690 (98%)	17 (2%)	49	40

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	820	GLU
1	A	835	LYS
1	A	942	ARG
1	A	965	GLN
1	A	1023	LYS
1	B	789	MET
1	B	879	ASP
1	B	893	LYS
1	B	1013	ASP
1	B	1059	SER
1	C	816	GLN
1	C	835	LYS
1	C	845	ARG
1	C	867	GLU
1	C	879	ASP
1	C	905	LYS
1	C	1049	LYS

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	900	GLN

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Mol	Chain	Res	Type
1	A	1020	GLN
1	B	900	GLN
1	B	924	ASN

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.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	277/296 (93%)	0.23	5 (1%) 68 76	25, 37, 62, 105	0
1	B	279/296 (94%)	0.27	13 (4%) 31 41	24, 40, 67, 91	0
1	C	265/296 (89%)	0.38	20 (7%) 14 22	27, 41, 73, 118	0
All	All	821/888 (92%)	0.29	38 (4%) 32 42	24, 40, 67, 118	0

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	869	GLU	9.0
1	A	1064	SER	6.2
1	C	891	LYS	6.1
1	C	869	GLU	5.7
1	A	788	LYS	5.5
1	B	791	PHE	5.4
1	B	820	GLU	5.3
1	B	788	LYS	4.6
1	B	1024	ALA	4.4
1	B	821	GLY	4.2
1	B	822	VAL	3.9
1	C	967	TRP	3.6
1	B	819	GLU	3.5
1	C	902	LEU	3.4
1	B	864	LEU	3.3
1	A	841	LEU	3.2
1	B	790	HIS	3.2
1	C	904	THR	3.2
1	C	1063	ASP	3.2
1	C	1036	LEU	2.8
1	C	963	PHE	2.8
1	C	789	MET	2.7
1	C	791	PHE	2.5

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Mol	Chain	Res	Type	RSRZ
1	C	1030	GLU	2.5
1	C	889	ILE	2.4
1	C	890	SER	2.4
1	C	790	HIS	2.4
1	C	1034	SER	2.3
1	C	821	GLY	2.3
1	C	880	LEU	2.3
1	B	879	ASP	2.2
1	C	1033	PRO	2.2
1	A	925	ARG	2.1
1	C	886	PHE	2.1
1	B	825	THR	2.1
1	C	966	ALA	2.1
1	A	837	GLU	2.1
1	B	866	ARG	2.0

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

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

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.