



wwPDB X-ray Structure Validation Summary Report ⓘ

May 21, 2020 – 01:35 pm BST

PDB ID : 2OZK
Title : Structure of an N-Terminal Truncated Form of Nendou (NSP15) From SARS-CORONAVIRUS
Authors : Saikatendu, K.; Joseph, J.; Subramanian, V.; Neuman, B.; Buchmeier, M.; Stevens, R.C.; Kuhn, P.
Deposited on : 2007-02-26
Resolution : 2.90 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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

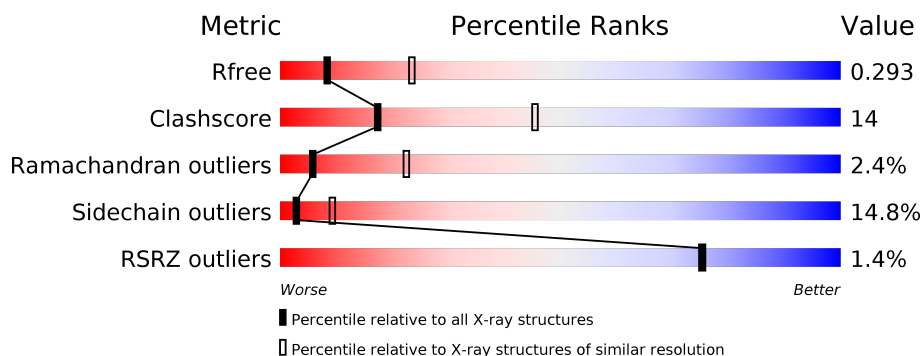
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.90 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	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

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	346	<div> <div>%</div> <div> <div></div> <div>61%</div> <div>23%</div> <div>•</div> <div>12%</div> </div> </div>
1	B	346	<div> <div>%</div> <div> <div></div> <div>61%</div> <div>23%</div> <div>• •</div> <div>12%</div> </div> </div>
1	C	346	<div> <div>2%</div> <div> <div></div> <div>54%</div> <div>24%</div> <div>• •</div> <div>16%</div> </div> </div>
1	D	346	<div> <div>%</div> <div> <div></div> <div>51%</div> <div>30%</div> <div>5%</div> <div>14%</div> </div> </div>

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 9402 atoms, of which 0 are hydrogens and 0 are deuteriums.

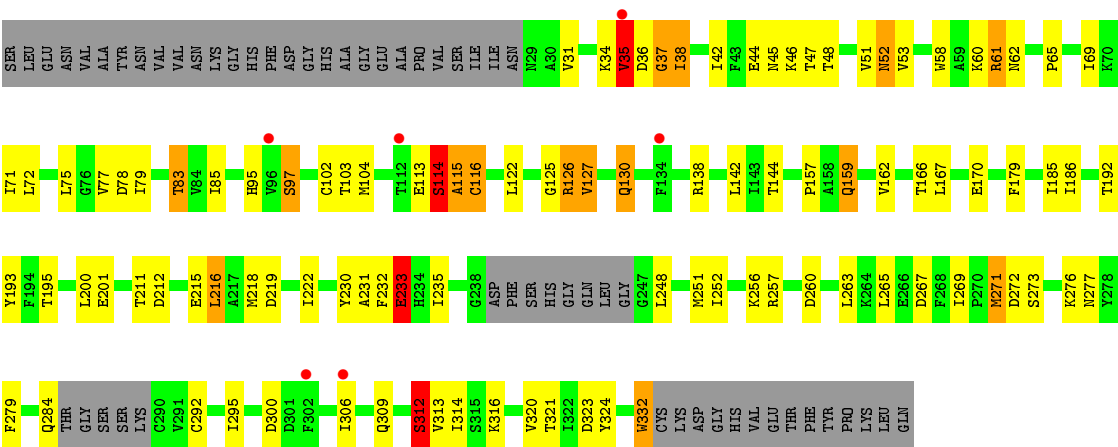
In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Uridylate-specific endoribonuclease.

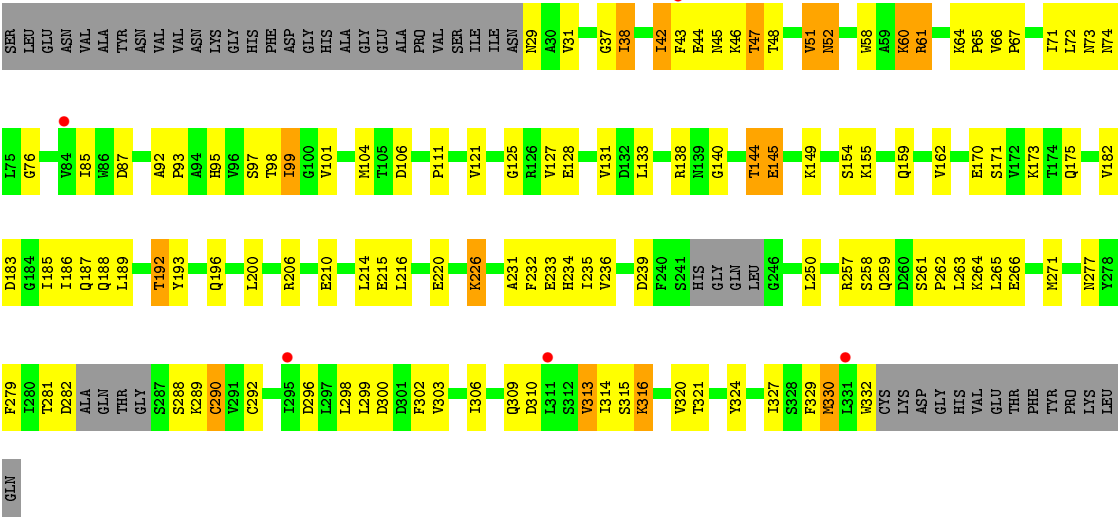
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	306	Total	C	N	O	S	0	0	0
			2402	1538	391	463	10			
1	B	305	Total	C	N	O	S	0	0	0
			2394	1532	390	462	10			
1	C	291	Total	C	N	O	S	0	0	0
			2294	1473	371	440	10			
1	D	296	Total	C	N	O	S	0	0	0
			2312	1485	374	443	10			

- Molecule 1: Uridylate-specific endoribonuclease





● Molecule 1: Uridylate-specific endoribonuclease



4 Data and refinement statistics

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, α , β , γ	98.97Å 98.97Å 214.93Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	85.75 – 2.90 48.23 – 2.90	Depositor EDS
% Data completeness (in resolution range)	97.8 (85.75-2.90) 97.8 (48.23-2.90)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	0.09	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.98 (at 2.91Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.243 , 0.301 0.237 , 0.293	Depositor DCC
R_{free} test set	2601 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å ²)	73.6	Xtriage
Anisotropy	0.061	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 20.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	0.014 for -h,-k,l 0.448 for h,-h-k,-l 0.018 for -k,-h,-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	9402	wwPDB-VP
Average B, all atoms (Å ²)	70.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.79% 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	0.55	0/2447	0.71	1/3316 (0.0%)
1	B	0.57	0/2439	0.75	2/3305 (0.1%)
1	C	0.56	0/2335	0.68	0/3163
1	D	0.56	0/2354	0.71	0/3190
All	All	0.56	0/9575	0.71	3/12974 (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	C	0	1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	167	LEU	CA-CB-CG	6.84	131.04	115.30
1	A	245	LEU	CA-CB-CG	6.80	130.95	115.30
1	B	245	LEU	CA-CB-CG	6.26	129.71	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	35	VAL	Peptide

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	2402	0	2410	57	0
1	B	2394	0	2401	53	0
1	C	2294	0	2308	64	0
1	D	2312	0	2311	92	0
All	All	9402	0	9430	260	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 14.

The worst 5 of 260 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:D:281:THR:HA	1:D:282:ASP:CB	1.80	1.10
1:D:281:THR:HA	1:D:282:ASP:HB2	1.12	1.05
1:D:281:THR:CA	1:D:282:ASP:HB2	1.94	0.96
1:D:192:THR:HG21	1:D:324:TYR:H	1.31	0.96
1:B:192:THR:HG21	1:B:324:TYR:H	1.31	0.92

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	304/346 (88%)	267 (88%)	34 (11%)	3 (1%)	15 45
1	B	303/346 (88%)	271 (89%)	27 (9%)	5 (2%)	9 31

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	285/346 (82%)	240 (84%)	32 (11%)	13 (5%)	2	9
1	D	290/346 (84%)	247 (85%)	36 (12%)	7 (2%)	6	22
All	All	1182/1384 (85%)	1025 (87%)	129 (11%)	28 (2%)	6	22

5 of 28 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	46	LYS
1	C	115	ALA
1	C	232	PHE
1	D	52	ASN
1	D	232	PHE

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	270/303 (89%)	230 (85%)	40 (15%)	3	9
1	B	269/303 (89%)	229 (85%)	40 (15%)	3	9
1	C	258/303 (85%)	212 (82%)	46 (18%)	2	5
1	D	258/303 (85%)	228 (88%)	30 (12%)	5	16
All	All	1055/1212 (87%)	899 (85%)	156 (15%)	3	9

5 of 156 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	261	SER
1	C	97	SER
1	D	215	GLU
1	B	265	LEU
1	B	326	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 28 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	73	ASN
1	C	159	GLN
1	D	234	HIS
1	C	95	HIS
1	C	130	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.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	306/346 (88%)	0.28	4 (1%) 77 77	48, 63, 79, 86	0
1	B	305/346 (88%)	0.29	2 (0%) 87 87	47, 63, 79, 82	0
1	C	291/346 (84%)	0.39	6 (2%) 63 61	50, 78, 95, 103	0
1	D	296/346 (85%)	0.36	5 (1%) 70 69	55, 77, 95, 104	0
All	All	1198/1384 (86%)	0.33	17 (1%) 75 75	47, 70, 92, 104	0

The worst 5 of 17 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	112	THR	3.4
1	D	311	LEU	2.9
1	C	134	PHE	2.9
1	D	331	LEU	2.3
1	C	96	VAL	2.3

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.