



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 08:19 PM UTC

PDB ID : 3ETI / pdb_00003eti
Title : Structure of a cubic crystal form of X (ADRP) domain from FCoV
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Deposited on : 2008-10-08
Resolution : 2.20 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 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:

MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

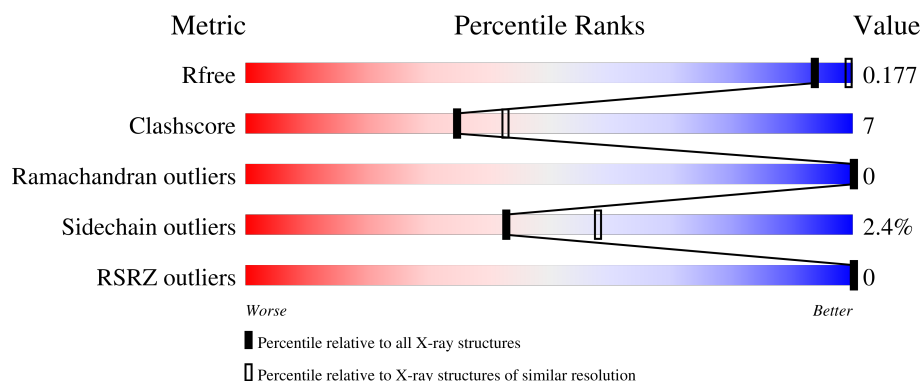
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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}	180053	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (2.20-2.20)

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 of 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	168	
1	B	168	
1	C	168	
1	D	168	
1	E	168	

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Mol	Chain	Length	Quality of chain
1	F	168	 86% 12% •
1	G	168	 80% 20% •
1	H	168	 87% 13%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 13011 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 macro domain of Non-structural protein 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	168	Total	C	N	O	S	0	8	0
			1348	866	231	247	4			
1	B	168	Total	C	N	O	S	0	5	0
			1326	852	224	246	4			
1	C	168	Total	C	N	O	S	0	5	0
			1329	852	229	244	4			
1	D	168	Total	C	N	O	S	0	5	0
			1331	854	228	245	4			
1	E	168	Total	C	N	O	S	0	4	0
			1322	848	225	245	4			
1	F	168	Total	C	N	O	S	0	6	0
			1338	859	229	246	4			
1	G	168	Total	C	N	O	S	0	6	0
			1334	857	228	245	4			
1	H	168	Total	C	N	O	S	0	7	0
			1340	860	227	249	4			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	122	MET	LEU	engineered mutation	UNP Q98VG9
B	122	MET	LEU	engineered mutation	UNP Q98VG9
C	122	MET	LEU	engineered mutation	UNP Q98VG9
D	122	MET	LEU	engineered mutation	UNP Q98VG9
E	122	MET	LEU	engineered mutation	UNP Q98VG9
F	122	MET	LEU	engineered mutation	UNP Q98VG9
G	122	MET	LEU	engineered mutation	UNP Q98VG9
H	122	MET	LEU	engineered mutation	UNP Q98VG9

- Molecule 2 is water.

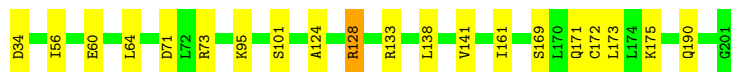
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	331	Total 331	O 331	0	0
2	B	305	Total 305	O 305	0	0
2	C	293	Total 293	O 293	0	0
2	D	296	Total 296	O 296	0	0
2	E	312	Total 312	O 312	0	0
2	F	231	Total 231	O 231	0	0
2	G	260	Total 260	O 260	0	0
2	H	315	Total 315	O 315	0	0

3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide 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.

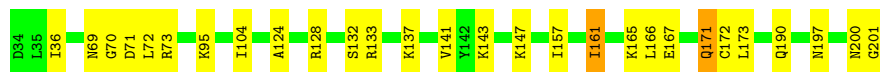
- Molecule 1: macro domain of Non-structural protein 3

Chain A: 



- Molecule 1: macro domain of Non-structural protein 3

Chain B: 



- Molecule 1: macro domain of Non-structural protein 3

Chain C: 



- Molecule 1: macro domain of Non-structural protein 3

Chain D: 



- Molecule 1: macro domain of Non-structural protein 3

Chain E: 

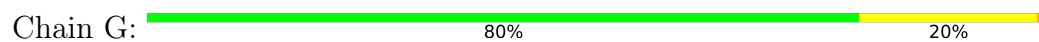


- Molecule 1: macro domain of Non-structural protein 3

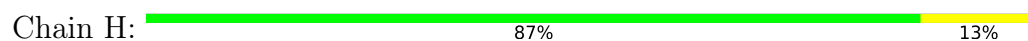
Chain F: 



- Molecule 1: macro domain of Non-structural protein 3



- Molecule 1: macro domain of Non-structural protein 3



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 3	Depositor
Cell constants a, b, c, α , β , γ	218.99Å 218.99Å 218.99Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	24.80 – 2.20 24.80 – 2.20	Depositor EDS
% Data completeness (in resolution range)	100.0 (24.80-2.20) 100.0 (24.80-2.20)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.16 (at 2.19Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.147 , 0.181 (Not available) , 0.177	Depositor DCC
R_{free} test set	8795 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	25.1	Xtriage
Anisotropy	0.000	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 67.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.43$, $\langle L^2 \rangle = 0.25$	Xtriage
Estimated twinning fraction	0.095 for l,-k,h	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	13011	wwPDB-VP
Average B, all atoms (Å ²)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.64% 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 [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	1.02	0/1392	0.98	1/1878 (0.1%)
1	B	1.05	0/1361	0.97	1/1838 (0.1%)
1	C	1.08	1/1364 (0.1%)	0.99	3/1842 (0.2%)
1	D	1.02	0/1363	1.04	1/1840 (0.1%)
1	E	1.05	0/1354	1.00	2/1829 (0.1%)
1	F	0.95	0/1373	1.01	2/1853 (0.1%)
1	G	0.99	0/1372	0.99	0/1852
1	H	1.08	0/1378	0.97	0/1861
All	All	1.03	1/10957 (0.0%)	0.99	10/14793 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	161	ILE	CA-CB	5.30	1.60	1.54

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	71	ASP	N-CA-C	5.93	120.14	113.02
1	C	60	GLU	CA-C-N	-5.79	114.00	119.85
1	C	60	GLU	C-N-CA	-5.79	114.00	119.85
1	C	192	ARG	NE-CZ-NH2	-5.69	114.08	119.20
1	F	70	GLY	CA-C-N	-5.41	114.02	122.73

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	1348	0	1407	17	1
1	B	1326	0	1373	20	0
1	C	1329	0	1378	22	0
1	D	1331	0	1379	20	0
1	E	1322	0	1365	23	0
1	F	1338	0	1389	19	0
1	G	1334	0	1388	26	0
1	H	1340	0	1386	25	3
2	A	331	0	0	8	4
2	B	305	0	0	7	0
2	C	293	0	0	5	2
2	D	296	0	0	9	1
2	E	312	0	0	10	2
2	F	231	0	0	9	0
2	G	260	0	0	7	1
2	H	315	0	0	8	3
All	All	13011	0	11065	162	9

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 7.

The worst 5 of 162 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:71[A]:ASP:OD1	1:A:73:ARG:NH1	2.03	0.90
1:A:71[A]:ASP:OD1	1:A:73:ARG:CZ	2.23	0.85
1:F:70:GLY:O	2:F:359:HOH:O	1.95	0.84
1:H:71[A]:ASP:OD1	1:H:73:ARG:CZ	2.28	0.82
1:F:95[B]:LYS:NZ	2:F:360:HOH:O	2.11	0.82

The worst 5 of 9 symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:80:ARG:NH1	2:H:489:HOH:O[7_555]	1.58	0.62
2:E:473:HOH:O	2:G:385:HOH:O[7_555]	1.62	0.58
1:H:201:GLY:C	2:A:437:HOH:O[11_456]	1.85	0.35
2:D:427:HOH:O	2:D:495:HOH:O[9_555]	1.94	0.26

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:448:HOH:O	2:C:432:HOH:O[5_555]	1.99	0.21

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 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	174/168 (104%)	172 (99%)	2 (1%)	0	100	100
1	B	171/168 (102%)	166 (97%)	5 (3%)	0	100	100
1	C	171/168 (102%)	167 (98%)	4 (2%)	0	100	100
1	D	171/168 (102%)	168 (98%)	3 (2%)	0	100	100
1	E	170/168 (101%)	166 (98%)	4 (2%)	0	100	100
1	F	172/168 (102%)	169 (98%)	3 (2%)	0	100	100
1	G	172/168 (102%)	168 (98%)	4 (2%)	0	100	100
1	H	173/168 (103%)	169 (98%)	4 (2%)	0	100	100
All	All	1374/1344 (102%)	1345 (98%)	29 (2%)	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 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	151/143 (106%)	147 (97%)	4 (3%)	40	55

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	148/143 (104%)	142 (96%)	6 (4%)	27	37
1	C	148/143 (104%)	145 (98%)	3 (2%)	48	64
1	D	148/143 (104%)	144 (97%)	4 (3%)	39	53
1	E	147/143 (103%)	144 (98%)	3 (2%)	48	64
1	F	149/143 (104%)	146 (98%)	3 (2%)	48	64
1	G	149/143 (104%)	147 (99%)	2 (1%)	61	76
1	H	150/143 (105%)	147 (98%)	3 (2%)	48	64
All	All	1190/1144 (104%)	1162 (98%)	28 (2%)	43	58

5 of 28 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	102	LYS
1	H	175	LYS
1	E	102	LYS
1	G	172	CYS
1	D	172	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	183	ASN
1	C	190	GLN
1	D	190	GLN
1	G	183	ASN
1	H	57	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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 [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	168/168 (100%)	-1.73	0 100 100	14, 33, 49, 54	8 (4%)
1	B	168/168 (100%)	-1.71	0 100 100	18, 35, 52, 67	5 (2%)
1	C	168/168 (100%)	-1.73	0 100 100	14, 34, 50, 57	5 (2%)
1	D	168/168 (100%)	-1.72	0 100 100	15, 34, 52, 61	5 (2%)
1	E	168/168 (100%)	-1.73	0 100 100	16, 34, 49, 58	4 (2%)
1	F	168/168 (100%)	-1.67	0 100 100	16, 38, 55, 77	6 (3%)
1	G	168/168 (100%)	-1.68	0 100 100	16, 36, 54, 76	6 (3%)
1	H	168/168 (100%)	-1.74	0 100 100	18, 33, 49, 56	7 (4%)
All	All	1344/1344 (100%)	-1.71	0 100 100	14, 34, 52, 77	46 (3%)

There are no RSRZ outliers to report.

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 oligosaccharides 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.