



wwPDB X-ray Structure Validation Summary Report ⓘ

May 16, 2020 – 07:23 am BST

PDB ID : 1M3J
Title : CRYSTAL form II of perfringolysin O
Authors : Rossjohn, J.; Parker, M.; Polekhina, G.; Feil, S.; Tweten, R.
Deposited on : 2002-06-28
Resolution : 3.00 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
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

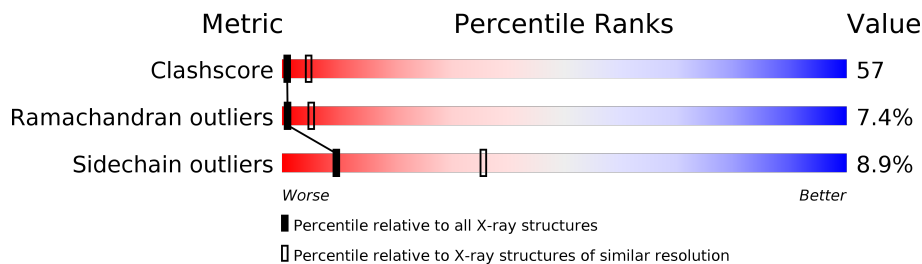
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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))
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)

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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	471	
1	B	471	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 7467 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 perfringolysin o.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	471	3705	2332	622	746	5	0	0	0
1	B	471	3705	2332	622	746	5	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	114	LEU	PHE	see remark 999	UNP P19995
B	114	LEU	PHE	see remark 999	UNP P19995

- Molecule 2 is water.

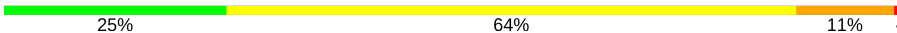
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	26	Total	O	0	0
			26	26		
2	B	31	Total	O	0	0
			31	31		

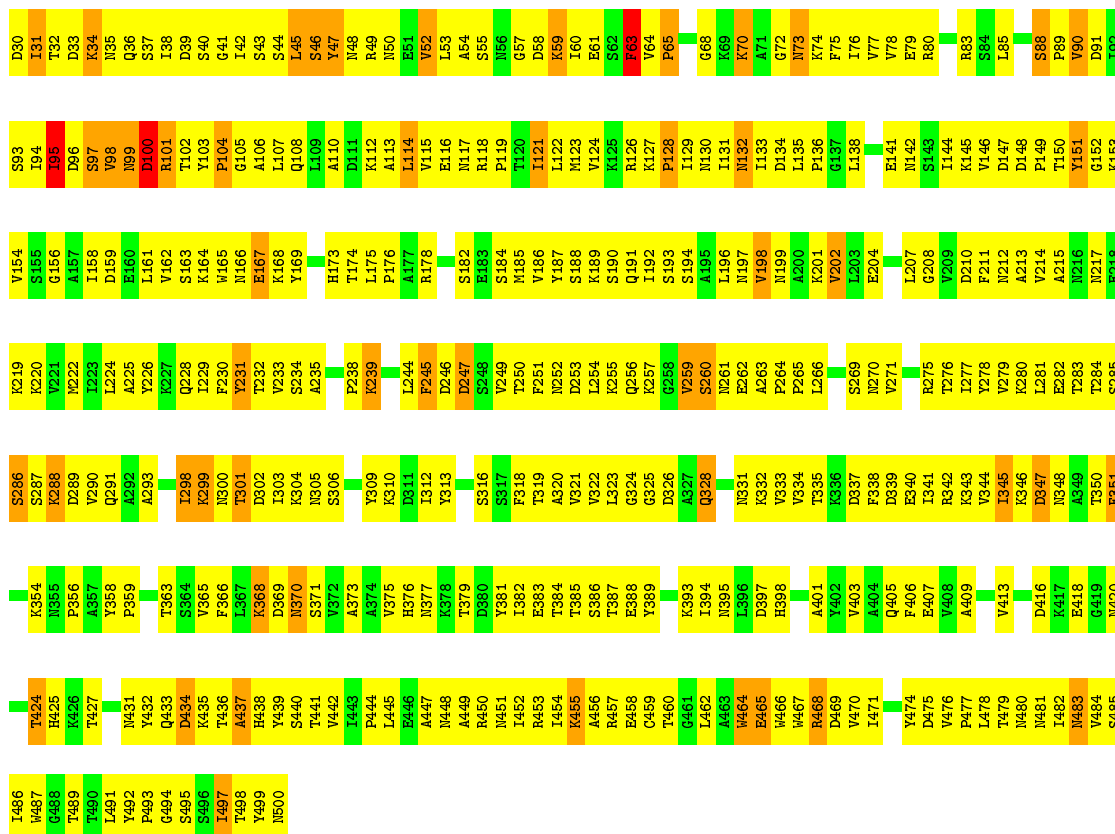
3 Residue-property plots

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. 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. 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.

Note EDS was not executed.

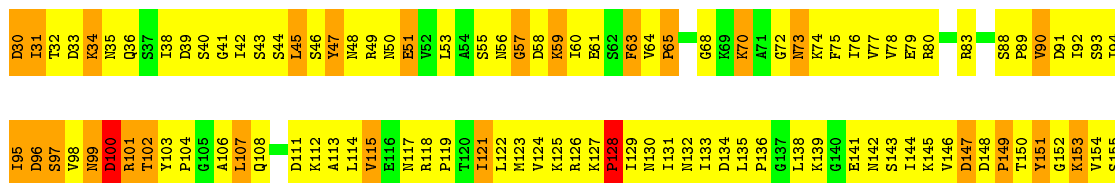
- Molecule 1: perfringolysin o

Chain A: 



- Molecule 1: perfringolysin o

Chain B: 



T490	G156	Y226	A293	K855	H425	G156	Y226	A293	K855	H425
L491	A187	K227	F294	P386	K426	A187	K227	F294	P386	K426
Y492	I158	Q228	K295	A357	T427	I158	Q228	K295	A357	T427
P493	D159	I229	A296	Y358	Y432	D159	I229	A296	Y358	Y432
G494	V162	F230	L297	P359	Q433	V162	F230	L297	P359	Q433
I497	K163	Y231	I298	I360	D434	K163	Y231	I298	I360	D434
T498	S163	T232	K299	S361	K435	S163	T232	K299	S361	K435
Y499	K164	V233	N300	Y362	T436	K164	V233	N300	Y362	T436
N500	M165	S234	T301	T363	T436	M165	S234	T301	T363	T436
	N166	D236	D302	S364	V365	N166	D236	D302	S364	V365
	E167	D236	I303	V365	T436	E167	D236	I303	V365	T436
	K168	D236	K304	F366	A437	K168	D236	K304	F366	A437
	Y169	D236	N305	L367	H438	Y169	D236	N305	L367	H438
		D236	S306	K868	Y439		D236	S306	K868	Y439
		D236	Q307	D369	S440		D236	Q307	D369	S440
		D236	Q308	N370	T441		D236	Q308	N370	T441
		D236	Y309	S371	V442		D236	Y309	S371	V442
		D236	K310	V372	E446		D236	K310	V372	E446
		D236	D311	A373	A447		D236	D311	A373	A447
		D236	E312	A374	M448		D236	E312	A374	M448
		D236	Y313	V375	A449		D236	Y313	V375	A449
		D236	E314	T379	R450		D236	E314	T379	R450
		D236	N315	D360	M451		D236	N315	D360	M451
		D236	S316	Y361	I452		D236	S316	Y361	I452
		D236	S317	L362	R453		D236	S317	L362	R453
		D236	F318	E388	I454		D236	F318	E388	I454
		D236	T319	Y389	K455		D236	T319	Y389	K455
		D236	A320	S390	R456		D236	A320	S390	R456
		D236	Q258	K391	A457		D236	Q258	K391	A457
		D236	V259	S392	R457		D236	V259	S392	R457
		D236	S260	T387	E458		D236	S260	T387	E458
		D236	A263	E388	G459		D236	A263	E388	G459
		D236	P264	Y389	T460		D236	P264	Y389	T460
		D236	P265	S390	G461		D236	P265	S390	G461
		D236	L266	K391	L462		D236	L266	K391	L462
		D236	S269	A327	A463		D236	S269	A327	A463
		D236	I270	Q329	W464		D236	I270	Q329	W464
		D236	V271	H330	E465		D236	V271	H330	E465
		D236	A272	N331	W466		D236	A272	N331	W466
		D236	Y273	K332	W467		D236	Y273	K332	W467
		D236	G274	V333	R468		D236	G274	V333	R468
		D236	R275	V334	D469		D236	R275	V334	D469
		D236	T276	T335	V470		D236	T276	T335	V470
		D236	L277	K336	I471		D236	L277	K336	I471
		D236	D210	D337	G475		D236	D210	D337	G475
		D236	F211	F338	V476		D236	F211	F338	V476
		D236	N212	D339	P477		D236	N212	D339	P477
		D236	A213	E340	L478		D236	A213	E340	L478
		D236	V214	I341	T479		D236	V214	I341	T479
		D236	A215	R342	M480		D236	A215	R342	M480
		D236	R216	K343	N481		D236	R216	K343	N481
		D236	N217	V344	I482		D236	N217	V344	I482
		D236	E218	I345	M483		D236	E218	I345	M483
		D236	K219	K346	L483		D236	K219	K346	L483
		D236	K220	D347	V484		D236	K220	D347	V484
		D236	V221	N348	S485		D236	V221	N348	S485
		D236	M222	K417	I486		D236	M222	K417	I486
		D236	L223	E418	W487		D236	L223	E418	W487
		D236	L224	G419	T489		D236	L224	G419	T489
		D236	A225	N420			D236	A225	N420	

4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	167.00Å 214.11Å 47.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.00	Depositor
% Data completeness (in resolution range)	(Not available) (20.00-3.00)	Depositor
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.247 , 0.337	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	7467	wwPDB-VP
Average B, all atoms (Å ²)	52.0	wwPDB-VP

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	0.46	0/3776	0.70	0/5127
1	B	0.48	0/3776	0.70	0/5127
All	All	0.47	0/7552	0.70	0/10254

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	3705	0	3656	427	0
1	B	3705	0	3656	418	0
2	A	26	0	0	3	0
2	B	31	0	0	0	0
All	All	7467	0	7312	845	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 57.

The worst 5 of 845 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:96:ASP:HB2	1:B:100:ASP:HB2	1.22	1.17

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:96:ASP:HB2	1:A:100:ASP:HB2	1.23	1.16
1:A:481:ASN:HB2	1:A:500:ASN:ND2	1.62	1.12
1:B:70:LYS:H	1:B:70:LYS:HD3	1.08	1.10
1:A:70:LYS:HD3	1:A:70:LYS:H	1.15	1.09

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 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	469/471 (100%)	358 (76%)	77 (16%)	34 (7%)	1	5
1	B	469/471 (100%)	358 (76%)	76 (16%)	35 (8%)	1	5
All	All	938/942 (100%)	716 (76%)	153 (16%)	69 (7%)	1	5

5 of 69 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	298	ILE
1	B	288	LYS
1	B	438	HIS
1	A	151	TYR
1	A	259	VAL

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	418/418 (100%)	379 (91%)	39 (9%)	9	33
1	B	418/418 (100%)	383 (92%)	35 (8%)	11	38
All	All	836/836 (100%)	762 (91%)	74 (9%)	9	35

5 of 74 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	424	THR
1	B	34	LYS
1	B	395	ASN
1	A	434	ASP
1	A	475	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 32 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	451	ASN
1	B	50	ASN
1	B	433	GLN
1	B	48	ASN
1	B	56	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

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.