



wwPDB X-ray Structure Validation Summary Report ⓘ

Dec 3, 2023 – 08:10 pm GMT

PDB ID : 2C57
Title : H.pylori type II dehydroquinase in complex with FA1
Authors : Robinson, D.A.; Lapthorn, A.J.
Deposited on : 2005-10-26
Resolution : 3.10 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 : **FAILED**
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
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) : 2.36

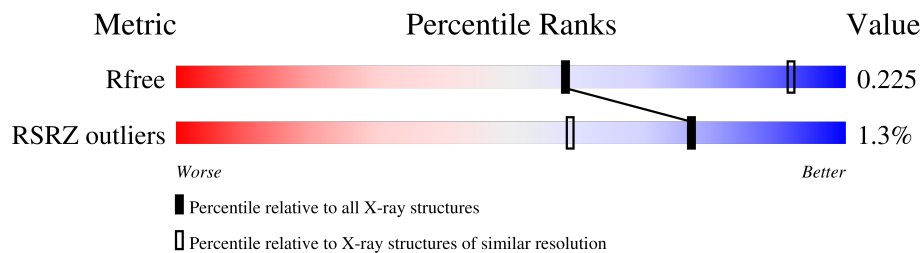
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.10 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	1094 (3.10-3.10)
RSRZ outliers	127900	1067 (3.10-3.10)

MolProbity failed to run properly - the sequence quality summary graphics cannot be shown.

2 Entry composition [i](#)

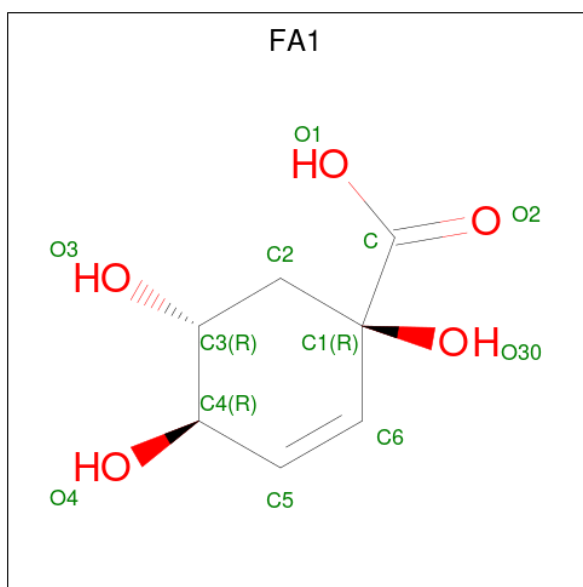
There are 2 unique types of molecules in this entry. The entry contains 14368 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 3-DEHYDROQUINATE DEHYDRATASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	164	1250	787	215	237	11	0	0	0
1	B	153	1153	732	190	221	10	0	0	0
1	C	153	1153	732	190	221	10	0	0	0
1	D	164	1250	787	215	237	11	0	0	0
1	E	153	1153	732	190	221	10	0	0	0
1	F	153	1153	732	190	221	10	0	0	0
1	G	164	1250	787	215	237	11	0	0	0
1	H	153	1153	732	190	221	10	0	0	0
1	I	153	1153	732	190	221	10	0	0	0
1	J	164	1250	787	215	237	11	0	0	0
1	K	153	1153	732	190	221	10	0	0	0
1	L	153	1153	732	190	221	10	0	0	0

- Molecule 2 is 2,3 -ANHYDRO-QUINIC ACID (three-letter code: FA1) (formula: C₇H₁₀O₅).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 12 7 5	0	0
2	B	1	Total C O 12 7 5	0	0
2	C	1	Total C O 12 7 5	0	0
2	D	1	Total C O 12 7 5	0	0
2	E	1	Total C O 12 7 5	0	0
2	F	1	Total C O 12 7 5	0	0
2	G	1	Total C O 12 7 5	0	0
2	H	1	Total C O 12 7 5	0	0
2	I	1	Total C O 12 7 5	0	0
2	J	1	Total C O 12 7 5	0	0
2	K	1	Total C O 12 7 5	0	0
2	L	1	Total C O 12 7 5	0	0

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3 Data and refinement statistics

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, α , β , γ	103.86Å 103.86Å 217.53Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	25.00 – 3.10 24.95 – 3.10	Depositor EDS
% Data completeness (in resolution range)	83.8 (25.00-3.10) 83.8 (24.95-3.10)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.44 (at 3.11Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.207 , 0.237 0.195 , 0.225	Depositor DCC
R_{free} test set	3968 reflections (9.96%)	wwPDB-VP
Wilson B-factor (Å ²)	63.9	Xtriage
Anisotropy	0.020	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.28 , 60.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.459 for -h,-k,l 0.468 for h,-h-k,-l 0.460 for -k,-h,-l	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	14368	wwPDB-VP
Average B, all atoms (Å ²)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.99% 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.

4 Model quality [i](#)

4.1 Standard geometry [i](#)

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4.2 Too-close contacts [i](#)

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4.3 Torsion angles [i](#)

4.3.1 Protein backbone [i](#)

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4.3.2 Protein sidechains [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.3.3 RNA [i](#)

MolProbity failed to run properly - this section is therefore empty.

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

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

4.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

4.6 Ligand geometry [i](#)

12 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	FA1	F	1159	-	9,12,12	1.35	2 (22%)	10,18,18	1.09	1 (10%)
2	FA1	K	1159	-	9,12,12	1.51	3 (33%)	10,18,18	2.56	6 (60%)
2	FA1	I	1159	-	9,12,12	1.29	1 (11%)	10,18,18	1.39	0
2	FA1	L	1159	-	9,12,12	1.06	0	10,18,18	1.15	1 (10%)
2	FA1	D	1159	-	9,12,12	2.08	2 (22%)	10,18,18	2.48	3 (30%)
2	FA1	G	1159	-	9,12,12	1.39	1 (11%)	10,18,18	2.35	2 (20%)
2	FA1	J	1159	-	9,12,12	0.84	0	10,18,18	1.96	2 (20%)
2	FA1	A	1159	-	9,12,12	1.10	1 (11%)	10,18,18	2.28	4 (40%)
2	FA1	B	1159	-	9,12,12	1.90	3 (33%)	10,18,18	2.15	5 (50%)
2	FA1	C	1159	-	9,12,12	1.01	1 (11%)	10,18,18	1.50	1 (10%)
2	FA1	E	1159	-	9,12,12	1.73	4 (44%)	10,18,18	2.56	4 (40%)
2	FA1	H	1159	-	9,12,12	1.49	1 (11%)	10,18,18	2.05	4 (40%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	FA1	F	1159	-	-	4/6/21/21	0/1/1/1
2	FA1	K	1159	-	-	4/6/21/21	0/1/1/1
2	FA1	I	1159	-	-	4/6/21/21	0/1/1/1
2	FA1	L	1159	-	-	4/6/21/21	0/1/1/1
2	FA1	D	1159	-	-	2/6/21/21	0/1/1/1
2	FA1	G	1159	-	-	2/6/21/21	0/1/1/1
2	FA1	J	1159	-	-	2/6/21/21	0/1/1/1
2	FA1	A	1159	-	-	2/6/21/21	0/1/1/1
2	FA1	B	1159	-	-	2/6/21/21	0/1/1/1
2	FA1	C	1159	-	-	4/6/21/21	0/1/1/1
2	FA1	E	1159	-	-	2/6/21/21	0/1/1/1
2	FA1	H	1159	-	-	3/6/21/21	0/1/1/1

The worst 5 of 19 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	1159	FA1	O30-C1	4.35	1.49	1.42
2	D	1159	FA1	C1-C6	3.73	1.54	1.50
2	B	1159	FA1	C1-C6	3.37	1.54	1.50
2	G	1159	FA1	O30-C1	3.12	1.47	1.42
2	E	1159	FA1	C2-C3	2.80	1.57	1.53

The worst 5 of 33 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	1159	FA1	C2-C1-C	-5.55	100.03	110.90
2	G	1159	FA1	O4-C4-C3	-5.23	100.34	109.42
2	E	1159	FA1	C3-C4-C5	5.21	119.35	111.65
2	A	1159	FA1	O4-C4-C3	-4.68	101.31	109.42
2	J	1159	FA1	C2-C1-C	-4.54	102.01	110.90

There are no chirality outliers.

5 of 35 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1159	FA1	O1-C-C1-O30
2	A	1159	FA1	O2-C-C1-C6
2	B	1159	FA1	O1-C-C1-O30
2	C	1159	FA1	O1-C-C1-O30
2	D	1159	FA1	O1-C-C1-O30

There are no ring outliers.

No monomer is involved in short contacts.

4.7 Other polymers [i](#)

There are no such residues in this entry.

4.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	G	1
1	J	1
1	A	1
1	D	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	G	-8:SER	C	-1:SER	N	11.86
1	J	-8:SER	C	-1:SER	N	11.84
1	A	-8:SER	C	-1:SER	N	11.83
1	D	-8:SER	C	-1:SER	N	11.80

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

5.1 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	164/180 (91%)	-0.37	3 (1%) 68 47	60, 61, 62, 63	0
1	B	153/180 (85%)	-0.47	2 (1%) 77 59	60, 61, 62, 62	0
1	C	153/180 (85%)	-0.42	1 (0%) 87 75	60, 61, 62, 62	0
1	D	164/180 (91%)	-0.35	3 (1%) 68 47	60, 61, 62, 63	0
1	E	153/180 (85%)	-0.47	2 (1%) 77 59	60, 61, 62, 62	0
1	F	153/180 (85%)	-0.41	1 (0%) 87 75	60, 61, 62, 62	0
1	G	164/180 (91%)	-0.37	3 (1%) 68 47	60, 61, 62, 63	0
1	H	153/180 (85%)	-0.47	3 (1%) 65 44	60, 61, 62, 62	0
1	I	153/180 (85%)	-0.41	1 (0%) 87 75	60, 61, 62, 62	0
1	J	164/180 (91%)	-0.38	3 (1%) 68 47	59, 61, 62, 63	0
1	K	153/180 (85%)	-0.46	1 (0%) 87 75	60, 61, 62, 62	0
1	L	153/180 (85%)	-0.40	1 (0%) 87 75	60, 61, 62, 62	0
All	All	1880/2160 (87%)	-0.41	24 (1%) 77 59	59, 61, 62, 63	0

The worst 5 of 24 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	158	ASN	5.1
1	D	158	ASN	5.0
1	A	158	ASN	4.6
1	G	155	GLN	4.3
1	K	17	ARG	3.9

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

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

5.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	FA1	B	1159	12/12	0.96	0.22	60,61,62,64	0
2	FA1	E	1159	12/12	0.96	0.24	60,61,62,64	0
2	FA1	L	1159	12/12	0.96	0.19	61,61,62,63	0
2	FA1	C	1159	12/12	0.97	0.20	60,61,62,63	0
2	FA1	F	1159	12/12	0.97	0.17	61,61,62,63	0
2	FA1	H	1159	12/12	0.97	0.22	61,61,62,63	0
2	FA1	I	1159	12/12	0.97	0.17	60,61,62,63	0
2	FA1	J	1159	12/12	0.97	0.18	60,61,62,63	0
2	FA1	K	1159	12/12	0.97	0.23	60,61,62,64	0
2	FA1	D	1159	12/12	0.97	0.17	60,61,62,62	0
2	FA1	G	1159	12/12	0.98	0.20	60,61,62,62	0
2	FA1	A	1159	12/12	0.98	0.20	60,61,62,62	0

5.5 Other polymers [i](#)

There are no such residues in this entry.