



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 15, 2017 – 11:19 AM EDT

PDB ID : 5G48
Title : H.pylori Beta clamp in complex with Diflunisal
Authors : Pandey, P.; Gourinath, S.
Deposited on : unknown
Resolution : 2.28 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

<http://wwpdb.org/validation/2016/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
Mogul : 1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20029824
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20029824

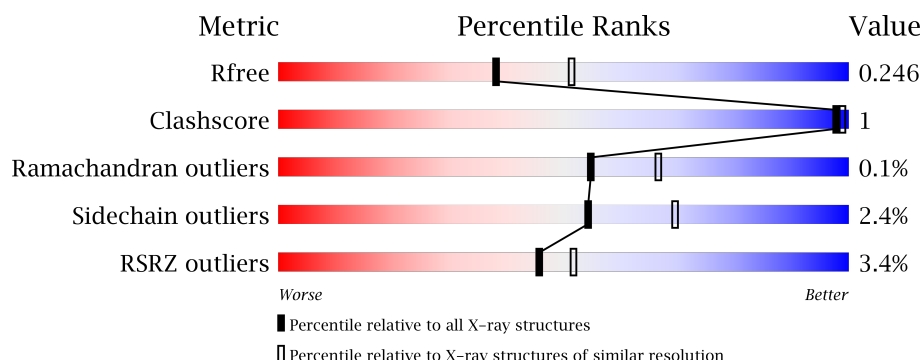
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.28 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}	100719	5609 (2.30-2.26)
Clashscore	112137	6364 (2.30-2.26)
Ramachandran outliers	110173	6281 (2.30-2.26)
Sidechain outliers	110143	6281 (2.30-2.26)
RSRZ outliers	101464	5639 (2.30-2.26)

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. 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	374	<div> <div>3%</div> <div>95%</div> <div>6%</div> </div>
1	B	374	<div> <div>3%</div> <div>94%</div> <div>6%</div> </div>

2 Entry composition [i](#)

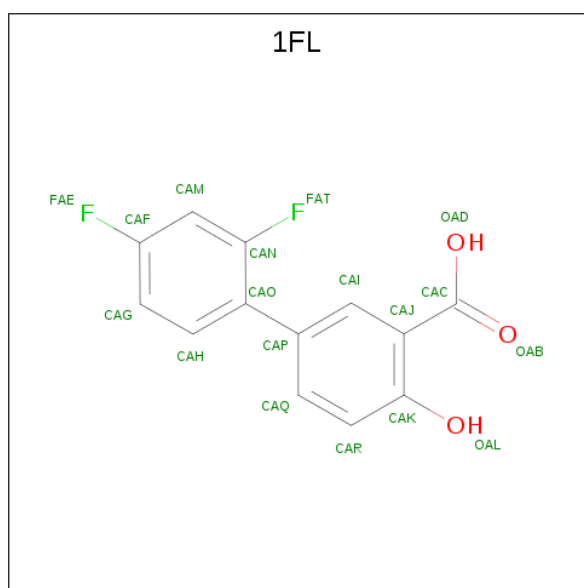
There are 3 unique types of molecules in this entry. The entry contains 6057 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 DNA POLYMERASE III SUBUNIT BETA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	370	Total	C	N	O	S	0	0	0
			2934	1885	468	570	11			
1	B	374	Total	C	N	O	S	0	0	0
			2963	1901	473	578	11			

- Molecule 2 is 5-(2,4-DIFLUOROPHENYL)-2-HYDROXY-BENZOIC ACID (three-letter code: 1FL) (formula: C₁₃H₈F₂O₃).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	F	O	0	0
			18	13	2	3		
2	B	1	Total	C	F	O	0	0
			18	13	2	3		

- Molecule 3 is water.

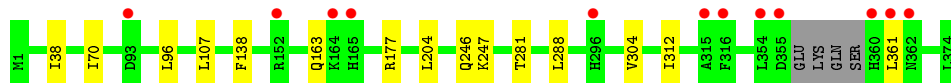
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	67	Total 67	O 67	0	0
3	B	57	Total 57	O 57	0	0

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.

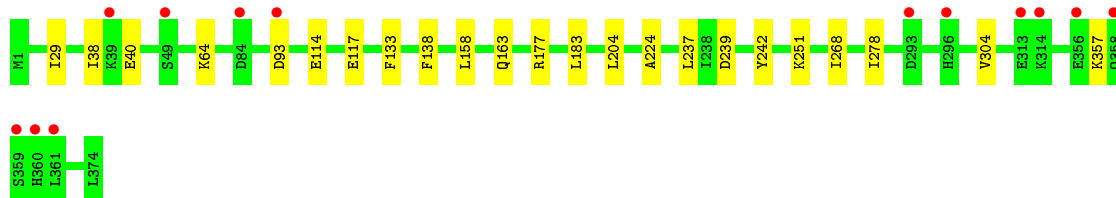
• Molecule 1: DNA POLYMERASE III SUBUNIT BETA

Chain A:



• Molecule 1: DNA POLYMERASE III SUBUNIT BETA

Chain B:



GLOBAL-STATISTICS INFOmissingINFO

4 Model quality

4.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 1FL

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	0.36	0/2984	0.58	0/4016
1	B	0.36	0/3014	0.59	0/4058
All	All	0.36	0/5998	0.58	0/8074

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

4.2 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	2934	0	2993	4	1
1	B	2963	0	3015	7	1
2	A	18	0	6	0	0
2	B	18	0	6	0	0
3	A	67	0	0	0	0
3	B	57	0	0	0	0
All	All	6057	0	6020	11	1

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 1.

All (11) 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:70:ILE:HD11	1:A:107:LEU:HD12	1.90	0.54
1:A:138:PHE:HB3	1:A:204:LEU:HD11	1.94	0.48
1:B:158:LEU:HD22	1:B:242:TYR:CD1	2.48	0.47
1:B:268:ILE:HG23	1:B:278:ILE:HD12	1.98	0.46
1:B:138:PHE:HB3	1:B:204:LEU:HD11	1.99	0.44
1:B:29:ILE:HD13	1:B:114:GLU:HB3	2.00	0.43
1:B:133:PHE:HD1	1:B:183:LEU:HD13	1.84	0.43
1:A:281:THR:HB	1:A:288:LEU:HB2	2.02	0.41
1:B:133:PHE:CD1	1:B:183:LEU:HD13	2.56	0.41
1:A:70:ILE:HD12	1:A:96:LEU:HD23	2.03	0.40
1:B:224:ALA:HB2	1:B:237:LEU:HD21	2.03	0.40

All (1) 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:A:246:GLN:O	1:B:251:LYS:NZ[1_554]	2.13	0.07

4.3 Torsion angles ⓘ

4.3.1 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	366/374 (98%)	353 (96%)	13 (4%)	0	100	100
1	B	372/374 (100%)	356 (96%)	15 (4%)	1 (0%)	44	54
All	All	738/748 (99%)	709 (96%)	28 (4%)	1 (0%)	55	66

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	93	ASP

4.3.2 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	338/342 (99%)	331 (98%)	7 (2%)	59	73
1	B	341/342 (100%)	332 (97%)	9 (3%)	51	66
All	All	679/684 (99%)	663 (98%)	16 (2%)	54	69

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	38	ILE
1	A	163	GLN
1	A	177	ARG
1	A	247	LYS
1	A	304	VAL
1	A	312	ILE
1	A	361	LEU
1	B	38	ILE
1	B	40	GLU
1	B	64	LYS
1	B	117	GLU
1	B	163	GLN
1	B	177	ARG
1	B	239	ASP
1	B	304	VAL
1	B	357	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	86	ASN
1	A	286	ASN
1	B	86	ASN

4.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

4.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

4.6 Ligand geometry ⓘ

2 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	1FL	A	1375	-	16,19,19	2.37	2 (12%)	22,27,27	1.66	6 (27%)
2	1FL	B	1375	-	16,19,19	2.43	2 (12%)	22,27,27	1.60	5 (22%)

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	1FL	A	1375	-	-	0/4/8/8	0/2/2/2
2	1FL	B	1375	-	-	0/4/8/8	0/2/2/2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1375	1FL	CAJ-CAK	3.06	1.49	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1375	1FL	CAJ-CAK	3.08	1.49	1.40
2	A	1375	1FL	CAO-CAN	8.48	1.49	1.39
2	B	1375	1FL	CAO-CAN	8.77	1.49	1.39

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1375	1FL	CAM-CAN-CAO	-3.92	119.11	124.07
2	B	1375	1FL	CAM-CAN-CAO	-3.85	119.20	124.07
2	A	1375	1FL	CAP-CAO-CAN	-2.28	120.06	123.02
2	B	1375	1FL	CAQ-CAP-CAI	2.05	120.81	118.16
2	A	1375	1FL	CAQ-CAP-CAI	2.08	120.85	118.16
2	A	1375	1FL	CAH-CAG-CAF	2.34	120.81	118.35
2	B	1375	1FL	CAH-CAO-CAN	2.44	118.47	115.87
2	B	1375	1FL	CAH-CAG-CAF	2.62	121.10	118.35
2	A	1375	1FL	CAH-CAO-CAN	2.85	118.90	115.87
2	A	1375	1FL	CAN-CAM-CAF	3.07	120.01	116.65
2	B	1375	1FL	CAN-CAM-CAF	3.21	120.15	116.65

There are no chirality outliers.

There are no torsion outliers.

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](#)

There are no chain breaks in this entry.

5 Fit of model and data ⓘ

5.1 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	370/374 (98%)	0.04	12 (3%)	48	54	30, 40, 61, 82	0
1	B	374/374 (100%)	0.07	13 (3%)	44	50	27, 41, 58, 86	0
All	All	744/748 (99%)	0.05	25 (3%)	46	52	27, 40, 60, 86	0

All (25) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	361	LEU	5.0
1	B	361	LEU	4.4
1	A	152	ARG	3.5
1	A	296	HIS	3.5
1	B	358	GLN	3.3
1	B	356	GLU	3.2
1	B	93	ASP	3.2
1	B	293	ASP	3.2
1	A	360	HIS	3.2
1	A	164	LYS	3.1
1	B	360	HIS	3.0
1	A	93	ASP	2.9
1	A	355	ASP	2.7
1	A	165	HIS	2.7
1	B	313	GLU	2.6
1	B	314	LYS	2.6
1	A	362	ASN	2.5
1	B	296	HIS	2.5
1	A	354	LEU	2.4
1	B	359	SER	2.3
1	B	49	SER	2.3
1	A	316	PHE	2.3
1	A	315	ALA	2.2
1	B	84	ASP	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	39	LYS	2.1

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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
2	1FL	B	1375	18/18	0.92	0.15	0.75	36,37,39,40	0
2	1FL	A	1375	18/18	0.89	0.15	0.17	42,46,49,49	0

5.5 Other polymers [i](#)

There are no such residues in this entry.