

wwPDB X-ray Structure Validation Summary Report (i)

Jun 12, 2024 – 04:10 AM EDT

PDB ID : 1B9L

Title: 7,8-DIHYDRONEOPTERIN TRIPHOSPHATE EPIMERASE

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J.; Huber, R.

Deposited on : 1999-02-11

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 (i) 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 (1)) were used in the production of this report:

MolProbity: 4.02b-467

Xtriage (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)

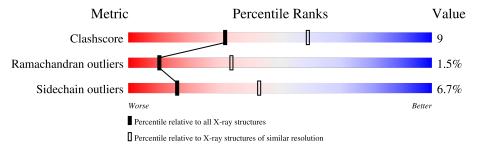
Validation Pipeline (wwPDB-VP) : 2.36.2

1 Overall quality at a glance (i)

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	Similar resolution
Metric	$(\# \mathrm{Entries})$	$(\# ext{Entries}, ext{ resolution range}(ext{Å}))$
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (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 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 <=5%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain		
1	A	120	68%	28%	
1	В	120	76%	20%	
1	С	120	82%	16%	
1	D	120	66%	30%	-
1	E	120	73%	25%	
1	F	120	69%	28%	
1	G	120	76%	18%	5% •
1	Н	120	72%	24%	•••



2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 7872 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 PROTEIN (EPIMERASE).

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace	
1	Λ	119	Total C N O S		S	S	0	0			
1	A	119	984	618	181	184	1	24	U	0	
1	В	119	Total	С	N	О	S	24	0	0	
1	Б	119	984	618	181	184	1	24	U		
1	С	119	Total	С	N	О	S	24	0	0	
1		119	984	618	181	184	1	24	U		
1	D	119	Total	С	N	О	S	24	0	0	
1	D	119	984	618	181	184	1	24	U		
1	E	119	Total	С	N	O	S	24	0	0	
1	ш	119	984	618	181	184	1	24	0		
1	F	119	Total	С	N	О	S	24	0	0	
1	I.	119	984	618	181	184	1	24	U		
1	G	119	Total	С	N	О	S	24	0	0	
1	G	119	984	618	181	184	1	24			
1	Н	119	Total	С	N	O	S	24	0	0	
1	11	119	984	618	181	184	1	24	0	U	



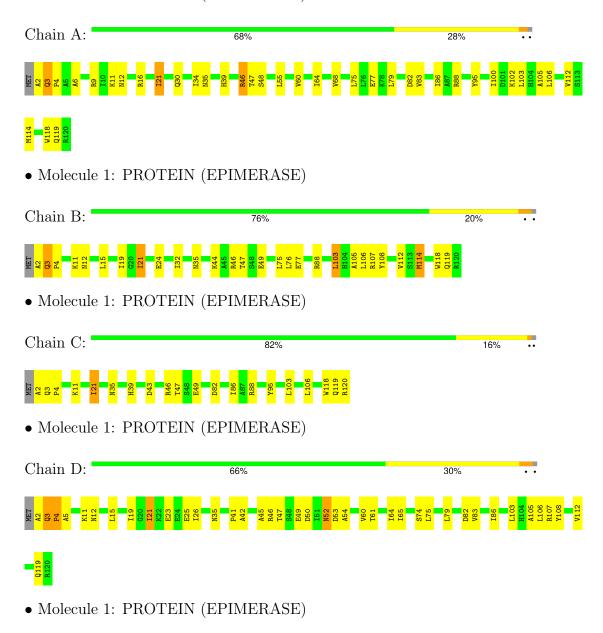
Chain E:

3 Residue-property plots (i)

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. 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.

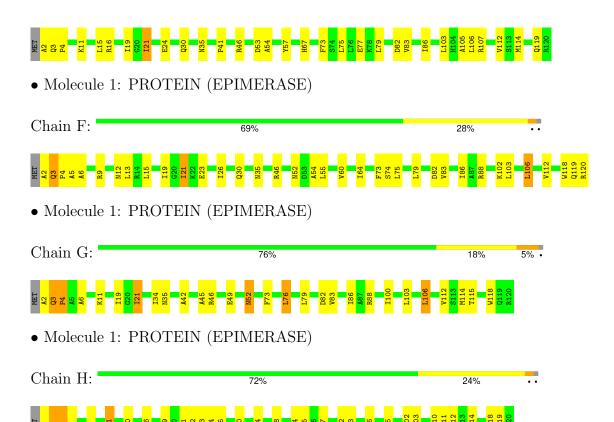
• Molecule 1: PROTEIN (EPIMERASE)





25%

73%





4 Data and refinement statistics (i)

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

Property	Value	Source	
Space group	P 41	Depositor	
Cell constants	69.68Å 69.68Å 239.72Å	Depositor	
a, b, c, α , β , γ	90.00° 90.00° 90.00°	Depositor	
Resolution (Å)	20.00 - 2.90	Depositor	
% Data completeness	94.6 (20.00-2.90)	Depositor	
(in resolution range)	34.0 (20.00 2.30)	Depositor	
R_{merge}	0.12	Depositor	
R_{sym}	11.90	Depositor	
Refinement program	X-PLOR 3.8	Depositor	
R, R_{free}	0.188 , 0.259	Depositor	
Estimated twinning fraction	No twinning to report.	Xtriage	
Total number of atoms	7872	wwPDB-VP	
Average B, all atoms (Å ²)	42.0	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	Mol Chain		lengths	Bond	angles
IVIOI	Chain	RMSZ	# Z > 5	RMSZ	# Z > 5
1	A	0.51	0/1000	0.77	0/1356
1	В	0.52	0/1000	0.76	0/1356
1	С	0.51	0/1000	0.77	0/1356
1	D	0.52	0/1000	0.80	0/1356
1	Ε	0.50	0/1000	0.80	0/1356
1	F	0.55	0/1000	0.78	0/1356
1	G	0.52	0/1000	0.74	0/1356
1	Н	0.49	0/1000	0.75	0/1356
All	All	0.52	0/8000	0.77	0/10848

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)	$\mathbf{H}(\mathbf{added})$	Clashes	Symm-Clashes
1	A	984	0	989	25	0
1	В	984	0	989	22	0
1	С	984	0	989	11	0
1	D	984	0	989	23	0
1	Е	984	0	989	16	0
1	F	984	0	989	23	0
1	G	984	0	989	19	0
1	Н	984	0	989	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	7872	0	7912	137	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 9.

The worst 5 of 137 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	$\begin{array}{c} {\rm Interatomic} \\ {\rm distance} \ ({\rm \AA}) \end{array}$	Clash overlap (Å)
1:D:2:ALA:O	1:D:4:PRO:HD3	1.80	0.80
1:B:21:ILE:HD12	1:B:21:ILE:H	1.47	0.79
1:A:79:LEU:O	1:A:83:VAL:HG23	1.90	0.71
1:G:82:ASP:O	1:G:86:ILE:HG13	1.92	0.70
1:A:118:TRP:HA	1:C:2:ALA:HA	1.74	0.69

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	P	erce	entiles
1	A	117/120 (98%)	111 (95%)	5 (4%)	1 (1%)		17	48
1	В	117/120 (98%)	110 (94%)	6 (5%)	1 (1%)		17	48
1	C	117/120 (98%)	110 (94%)	6 (5%)	1 (1%)		17	48
1	D	117/120 (98%)	108 (92%)	6 (5%)	3 (3%)		5	20
1	E	117/120 (98%)	111 (95%)	4 (3%)	2 (2%)		9	31
1	F	117/120 (98%)	112 (96%)	4 (3%)	1 (1%)		17	48
1	G	117/120 (98%)	111 (95%)	5 (4%)	1 (1%)		17	48
1	Н	117/120 (98%)	108 (92%)	5 (4%)	4 (3%)		3	15
All	All	936/960 (98%)	881 (94%)	41 (4%)	14 (2%)		10	34



5 of 14 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	4	PRO
1	С	4	PRO
1	D	52	ASN
1	D	53	ASP
1	Е	54	ALA

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	F	erce	entiles
1	A	108/109 (99%)	102 (94%)	6 (6%)		21	52
1	В	108/109 (99%)	100 (93%)	8 (7%)		13	38
1	C	108/109 (99%)	101 (94%)	7 (6%)		17	45
1	D	108/109 (99%)	100 (93%)	8 (7%)		13	38
1	E	108/109 (99%)	100 (93%)	8 (7%)		13	38
1	F	108/109 (99%)	102 (94%)	6 (6%)		21	52
1	G	108/109 (99%)	100 (93%)	8 (7%)		13	38
1	Н	108/109 (99%)	101 (94%)	7 (6%)		17	45
All	All	864/872 (99%)	806 (93%)	58 (7%)		16	43

5 of 58 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	106	LEU
1	Н	52	ASN
1	Е	103	LEU
1	Н	49	GLU
1	G	103	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 40 such sidechains are listed below:



Mol	Chain	Res	Type
1	F	70	ASN
1	Н	12	ASN
1	F	91	HIS
1	G	52	ASN
1	Н	39	HIS

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 monosaccharides 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)

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains (i)

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates (i)

EDS was not executed - this section is therefore empty.

6.4 Ligands (i)

EDS was not executed - this section is therefore empty.

6.5 Other polymers (i)

EDS was not executed - this section is therefore empty.

