



wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 2, 2023 – 02:32 PM EDT

PDB ID : 6NN5
Title : The structure of human liver pyruvate kinase, hLPYK-W527H
Authors : McFarlane, J.S.; Ronnebaum, T.A.; Meneely, K.M.; Fenton, A.W.; Lamb, A.L.
Deposited on : 2019-01-14
Resolution : 2.26 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 : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : **FAILED**
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) : 2.35.1

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 2.26 Å.

There are no overall percentile quality scores available for this entry.

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

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 26076 atoms, of which 13067 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 Pyruvate kinase PKLR.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	417	6413	1995	3232	579	589	18	0	0	0
1	B	417	6419	1996	3236	581	588	18	0	0	0
1	C	413	6337	1968	3197	574	580	18	0	0	0
1	D	420	6446	2007	3249	581	591	18	0	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	expression tag	UNP P30613
A	2	GLU	-	expression tag	UNP P30613
A	527	HIS	TRP	engineered mutation	UNP P30613
B	1	MET	-	expression tag	UNP P30613
B	2	GLU	-	expression tag	UNP P30613
B	527	HIS	TRP	engineered mutation	UNP P30613
C	1	MET	-	expression tag	UNP P30613
C	2	GLU	-	expression tag	UNP P30613
C	527	HIS	TRP	engineered mutation	UNP P30613
D	1	MET	-	expression tag	UNP P30613
D	2	GLU	-	expression tag	UNP P30613
D	527	HIS	TRP	engineered mutation	UNP P30613

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
2	A	1	14	3	8	3	0	0
2	A	1	14	3	8	3	0	0
2	A	1	13	3	7	3	0	0
2	A	1	14	3	8	3	0	0
2	B	1	13	3	7	3	0	0
2	B	1	14	3	8	3	0	0
2	C	1	14	3	8	3	0	0
2	C	1	13	3	7	3	0	0
2	C	1	14	3	8	3	0	0
2	D	1	14	3	8	3	0	0
2	D	1	14	3	8	3	0	0
2	D	1	14	3	8	3	0	0

- Molecule 3 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	H	O	0	0
			10	2	6	2		
3	A	1	Total	C	H	O	0	0
			10	2	6	2		
3	A	1	Total	C	H	O	0	0
			10	2	6	2		
3	B	1	Total	C	H	O	0	0
			10	2	6	2		
3	B	1	Total	C	H	O	0	0
			10	2	6	2		
3	C	1	Total	C	H	O	0	0
			10	2	6	2		
3	C	1	Total	C	H	O	0	0
			10	2	6	2		
3	C	1	Total	C	H	O	0	0
			10	2	6	2		
3	D	1	Total	C	H	O	0	0
			10	2	6	2		
3	D	1	Total	C	H	O	0	0
			10	2	6	2		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	51	Total	O	0	0
			51	51		
4	B	52	Total	O	0	0
			52	52		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	C	37	Total	O	0	0
			37	37		
4	D	56	Total	O	0	0
			56	56		

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

3 Data and refinement statistics

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	120.01Å 204.62Å 112.38Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	54.18 – 2.26	Depositor
% Data completeness (in resolution range)	64.8 (54.18-2.26)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.06 (at 2.25Å)	Xtrriage
Refinement program	PHENIX (1.13_2998: ???)	Depositor
R, R_{free}	0.225 , 0.264	Depositor
Wilson B-factor (Å ²)	29.9	Xtrriage
Anisotropy	0.122	Xtrriage
L-test for twinning ²	$\langle L \rangle = 0.53$, $\langle L^2 \rangle = 0.36$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	26076	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 44.42 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.5294e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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](#)

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

4.2 Too-close contacts [i](#)

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

4.3 Torsion angles [i](#)

4.3.1 Protein backbone [i](#)

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

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](#)

22 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	GOL	A	601	-	5,5,5	1.21	0	5,5,5	1.09	0
2	GOL	D	601	-	5,5,5	1.52	0	5,5,5	0.75	0
2	GOL	C	603	-	5,5,5	1.15	0	5,5,5	0.60	0
3	EDO	B	603	-	3,3,3	0.53	0	2,2,2	0.45	0
2	GOL	A	603	-	5,5,5	1.17	1 (20%)	5,5,5	0.95	0
3	EDO	A	607	-	3,3,3	0.83	0	2,2,2	0.32	0
2	GOL	D	602	-	5,5,5	0.87	0	5,5,5	1.18	0
3	EDO	D	605	-	3,3,3	0.49	0	2,2,2	0.78	0
3	EDO	C	606	-	3,3,3	0.83	0	2,2,2	1.36	0
3	EDO	A	605	-	3,3,3	0.39	0	2,2,2	0.44	0
3	EDO	C	604	-	3,3,3	0.39	0	2,2,2	0.40	0
2	GOL	D	603	-	5,5,5	0.78	0	5,5,5	0.70	0
3	EDO	A	606	-	3,3,3	0.56	0	2,2,2	0.22	0
2	GOL	B	602	-	5,5,5	1.08	0	5,5,5	1.08	1 (20%)
2	GOL	C	602	-	5,5,5	1.10	1 (20%)	5,5,5	1.10	0
2	GOL	A	604	-	5,5,5	0.99	0	5,5,5	0.53	0
3	EDO	B	604	-	3,3,3	0.43	0	2,2,2	0.55	0
3	EDO	D	604	-	3,3,3	0.70	0	2,2,2	0.25	0
2	GOL	B	601	-	5,5,5	0.71	0	5,5,5	0.85	0
2	GOL	C	601	-	5,5,5	0.80	0	5,5,5	1.45	1 (20%)
3	EDO	C	605	-	3,3,3	0.52	0	2,2,2	0.28	0
2	GOL	A	602	-	5,5,5	0.95	0	5,5,5	0.55	0

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	GOL	A	601	-	-	2/4/4/4	-
2	GOL	D	601	-	-	4/4/4/4	-
2	GOL	C	603	-	-	0/4/4/4	-
3	EDO	B	603	-	-	1/1/1/1	-
2	GOL	A	603	-	-	2/4/4/4	-
3	EDO	A	607	-	-	0/1/1/1	-
2	GOL	D	602	-	-	4/4/4/4	-
3	EDO	D	605	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	C	606	-	-	1/1/1/1	-
3	EDO	A	605	-	-	1/1/1/1	-
3	EDO	C	604	-	-	1/1/1/1	-
2	GOL	D	603	-	-	1/4/4/4	-
3	EDO	A	606	-	-	1/1/1/1	-
2	GOL	B	602	-	-	3/4/4/4	-
2	GOL	C	602	-	-	2/4/4/4	-
2	GOL	A	604	-	-	4/4/4/4	-
3	EDO	B	604	-	-	0/1/1/1	-
3	EDO	D	604	-	-	0/1/1/1	-
2	GOL	B	601	-	-	0/4/4/4	-
2	GOL	C	601	-	-	0/4/4/4	-
3	EDO	C	605	-	-	0/1/1/1	-
2	GOL	A	602	-	-	2/4/4/4	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	602	GOL	O2-C2	-2.08	1.37	1.43
2	A	603	GOL	C1-C2	2.00	1.59	1.51

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	601	GOL	C3-C2-C1	-2.35	102.56	111.70
2	B	602	GOL	C3-C2-C1	-2.05	103.73	111.70

There are no chirality outliers.

5 of 29 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	604	GOL	O1-C1-C2-C3
2	A	604	GOL	C1-C2-C3-O3
2	A	604	GOL	O2-C2-C3-O3
2	B	602	GOL	C1-C2-C3-O3
2	C	602	GOL	O1-C1-C2-C3

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

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

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

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

5.3 Carbohydrates

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

5.4 Ligands

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

5.5 Other polymers

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