



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 5, 2023 – 08:59 AM EDT

PDB ID : 6VK5
Title : Crystal Structure of Methylosinus trichosporium OB3b Soluble Methane Monooxygenase Hydroxylase and Regulatory Component Complex
Authors : Jones, J.C.; Banerjee, R.; Shi, K.; Aihara, H.; Lipscomb, J.D.
Deposited on : 2020-01-18
Resolution : 1.86 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

<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)
Xtriage (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 1.86 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

There are 9 unique types of molecules in this entry. The entry contains 40070 atoms, of which 19003 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 Methane monooxygenase component A alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	515	Total 8145	C 2676	H 3970	N 723	O 764	S 12	0	0	0
1	E	515	Total 8164	C 2682	H 3981	N 724	O 765	S 12	0	2	0

- Molecule 2 is a protein called Methane monooxygenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
2	B	392	Total 6196	C 2033	H 3010	N 556	O 592	S 5	0	0	0
2	F	392	Total 6224	C 2040	H 3024	N 559	O 596	S 5	0	3	0

- Molecule 3 is a protein called Methane monooxygenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
3	C	168	Total 2762	C 874	H 1400	N 234	O 253	S 1	0	0	0
3	G	168	Total 2762	C 874	H 1400	N 234	O 253	S 1	0	0	0

- Molecule 4 is a protein called Methane monooxygenase regulatory protein B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
4	D	132	Total 1997	C 639	H 995	N 162	O 198	S 3	0	0	0
4	H	137	Total 2071	C 662	H 1033	N 167	O 206	S 3	0	0	0

- Molecule 5 is FE (III) ION (three-letter code: FE) (formula: Fe) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	2	Total	Fe	0	0
			2	2		
5	E	2	Total	Fe	0	0
			2	2		

- Molecule 6 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



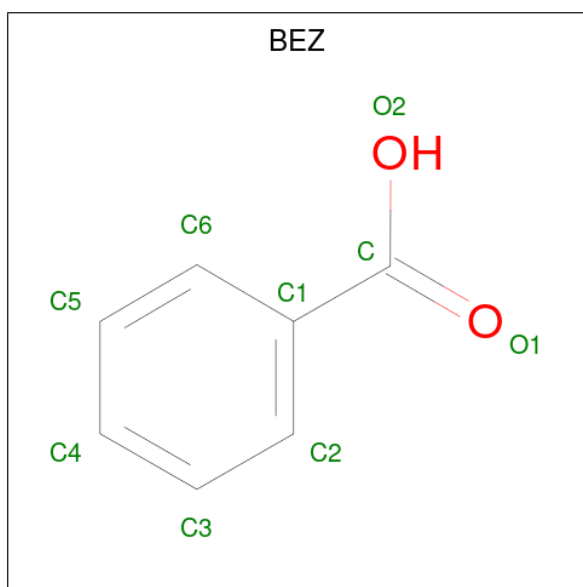
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1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

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	B	1	Total	C	H	O	0	0
			10	2	6	2		
6	B	1	Total	C	H	O	0	0
			10	2	6	2		
6	B	1	Total	C	H	O	0	0
			10	2	6	2		
6	C	1	Total	C	H	O	0	0
			10	2	6	2		
6	D	1	Total	C	H	O	0	0
			10	2	6	2		
6	D	1	Total	C	H	O	0	0
			10	2	6	2		
6	E	1	Total	C	H	O	0	0
			10	2	6	2		
6	E	1	Total	C	H	O	0	0
			10	2	6	2		
6	E	1	Total	C	H	O	0	0
			10	2	6	2		
6	E	1	Total	C	H	O	0	0
			10	2	6	2		
6	E	1	Total	C	H	O	0	0
			10	2	6	2		
6	E	1	Total	C	H	O	0	0
			10	2	6	2		
6	E	1	Total	C	H	O	0	0
			10	2	6	2		
6	F	1	Total	C	H	O	0	0
			10	2	6	2		
6	F	1	Total	C	H	O	0	0
			10	2	6	2		
6	F	1	Total	C	H	O	0	0
			10	2	6	2		
6	F	1	Total	C	H	O	0	0
			10	2	6	2		
6	G	1	Total	C	H	O	0	0
			10	2	6	2		
6	G	1	Total	C	H	O	0	0
			10	2	6	2		
6	H	1	Total	C	H	O	0	0
			10	2	6	2		

- Molecule 7 is BENZOIC ACID (three-letter code: BEZ) (formula: C₇H₆O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	A	1	Total	C	H	O	0	0
			14	7	5	2		
7	E	1	Total	C	H	O	0	0
			14	7	5	2		

- Molecule 8 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	E	1	Total	Cl	0	0
			1	1		

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	293	Total	O	0	0
			293	293		
9	B	257	Total	O	0	1
			258	258		
9	C	105	Total	O	0	0
			105	105		
9	D	40	Total	O	0	0
			40	40		
9	E	296	Total	O	0	0
			296	296		
9	F	257	Total	O	0	1
			258	258		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	G	111	Total 111	O 111	0	0
9	H	55	Total 55	O 55	0	0

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 21	Depositor
Cell constants a, b, c, α , β , γ	102.61Å 105.46Å 299.42Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	73.54 – 1.86	Depositor
% Data completeness (in resolution range)	99.7 (73.54-1.86)	Depositor
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.54 (at 1.86Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.170 , 0.193	Depositor
Wilson B-factor (Å ²)	28.8	Xtrriage
Anisotropy	0.229	Xtrriage
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.030 for k,h,-l	Xtrriage
Total number of atoms	40070	wwPDB-VP
Average B, all atoms (Å ²)	31.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.10% 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](#)

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](#)

Of 37 ligands modelled in this entry, 5 are monoatomic - leaving 32 for Mogul analysis.

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
6	EDO	F	402	-	3,3,3	0.49	0	2,2,2	0.32	0
6	EDO	A	811	-	3,3,3	0.51	0	2,2,2	0.41	0
6	EDO	E	809	-	3,3,3	0.68	0	2,2,2	0.16	0
7	BEZ	E	810	5	9,9,9	1.59	1 (11%)	11,11,11	0.83	0
6	EDO	E	803	-	3,3,3	0.56	0	2,2,2	0.44	0
6	EDO	A	810	-	3,3,3	0.51	0	2,2,2	0.18	0
6	EDO	E	807	-	3,3,3	0.48	0	2,2,2	0.61	0
6	EDO	G	202	-	3,3,3	0.39	0	2,2,2	0.49	0
6	EDO	E	808	-	3,3,3	0.55	0	2,2,2	0.31	0
6	EDO	A	805	-	3,3,3	0.47	0	2,2,2	0.39	0
6	EDO	A	808	-	3,3,3	0.38	0	2,2,2	0.50	0
6	EDO	F	404	-	3,3,3	0.40	0	2,2,2	0.53	0
6	EDO	A	804	-	3,3,3	0.54	0	2,2,2	0.39	0
6	EDO	A	812	-	3,3,3	0.52	0	2,2,2	0.37	0
6	EDO	F	403	-	3,3,3	0.48	0	2,2,2	0.21	0
6	EDO	C	201	-	3,3,3	0.37	0	2,2,2	0.47	0
6	EDO	D	202	-	3,3,3	0.51	0	2,2,2	0.10	0
6	EDO	F	401	-	3,3,3	0.55	0	2,2,2	0.24	0
7	BEZ	A	813	5	9,9,9	1.62	1 (11%)	11,11,11	0.90	0
6	EDO	B	401	-	3,3,3	0.57	0	2,2,2	0.31	0
6	EDO	E	805	-	3,3,3	0.51	0	2,2,2	0.24	0
6	EDO	A	806	-	3,3,3	0.65	0	2,2,2	0.15	0
6	EDO	E	804	-	3,3,3	0.51	0	2,2,2	0.30	0
6	EDO	A	803	-	3,3,3	0.39	0	2,2,2	0.37	0
6	EDO	B	403	-	3,3,3	0.67	0	2,2,2	0.35	0
6	EDO	G	201	-	3,3,3	0.55	0	2,2,2	0.25	0
6	EDO	A	807	-	3,3,3	0.41	0	2,2,2	0.40	0
6	EDO	D	201	-	3,3,3	0.61	0	2,2,2	0.33	0
6	EDO	H	201	-	3,3,3	0.55	0	2,2,2	0.11	0
6	EDO	B	402	-	3,3,3	0.41	0	2,2,2	0.38	0
6	EDO	E	806	-	3,3,3	0.46	0	2,2,2	0.42	0
6	EDO	A	809	-	3,3,3	0.47	0	2,2,2	0.24	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
6	EDO	F	402	-	-	0/1/1/1	-
6	EDO	A	811	-	-	1/1/1/1	-
6	EDO	E	809	-	-	1/1/1/1	-
7	BEZ	E	810	5	-	0/4/4/4	0/1/1/1
6	EDO	E	803	-	-	1/1/1/1	-
6	EDO	A	810	-	-	0/1/1/1	-
6	EDO	E	807	-	-	0/1/1/1	-
6	EDO	G	202	-	-	0/1/1/1	-
6	EDO	E	808	-	-	0/1/1/1	-
6	EDO	A	805	-	-	0/1/1/1	-
6	EDO	A	808	-	-	1/1/1/1	-
6	EDO	F	404	-	-	1/1/1/1	-
6	EDO	A	804	-	-	0/1/1/1	-
6	EDO	A	812	-	-	0/1/1/1	-
6	EDO	F	403	-	-	1/1/1/1	-
6	EDO	C	201	-	-	0/1/1/1	-
6	EDO	D	202	-	-	0/1/1/1	-
6	EDO	F	401	-	-	1/1/1/1	-
7	BEZ	A	813	5	-	0/4/4/4	0/1/1/1
6	EDO	B	401	-	-	0/1/1/1	-
6	EDO	E	805	-	-	1/1/1/1	-
6	EDO	A	806	-	-	0/1/1/1	-
6	EDO	E	804	-	-	1/1/1/1	-
6	EDO	A	803	-	-	0/1/1/1	-
6	EDO	B	403	-	-	0/1/1/1	-
6	EDO	G	201	-	-	0/1/1/1	-
6	EDO	A	807	-	-	0/1/1/1	-
6	EDO	D	201	-	-	1/1/1/1	-
6	EDO	H	201	-	-	1/1/1/1	-
6	EDO	B	402	-	-	1/1/1/1	-
6	EDO	E	806	-	-	0/1/1/1	-
6	EDO	A	809	-	-	1/1/1/1	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	A	813	BEZ	C1-C	-4.39	1.40	1.49
7	E	810	BEZ	C1-C	-4.22	1.40	1.49

There are no bond angle outliers.

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	F	403	EDO	O1-C1-C2-O2
6	D	201	EDO	O1-C1-C2-O2
6	E	805	EDO	O1-C1-C2-O2
6	F	401	EDO	O1-C1-C2-O2
6	A	809	EDO	O1-C1-C2-O2
6	E	803	EDO	O1-C1-C2-O2
6	E	809	EDO	O1-C1-C2-O2
6	F	404	EDO	O1-C1-C2-O2
6	A	808	EDO	O1-C1-C2-O2
6	A	811	EDO	O1-C1-C2-O2
6	B	402	EDO	O1-C1-C2-O2
6	E	804	EDO	O1-C1-C2-O2
6	H	201	EDO	O1-C1-C2-O2

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.