



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 06:54 PM UTC

PDB ID : 6QG9 / pdb_00006qg9
Title : Crystal structure of Ideonella sakaiensis MHETase
Authors : Palm, G.J.; Reisky, L.; Boettcher, D.; Mueller, H.; Michels, E.A.P.; Walczak, C.; Berndt, L.; Weiss, M.S.; Bornscheuer, U.T.; Weber, G.
Deposited on : 2019-01-10
Resolution : 2.05 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

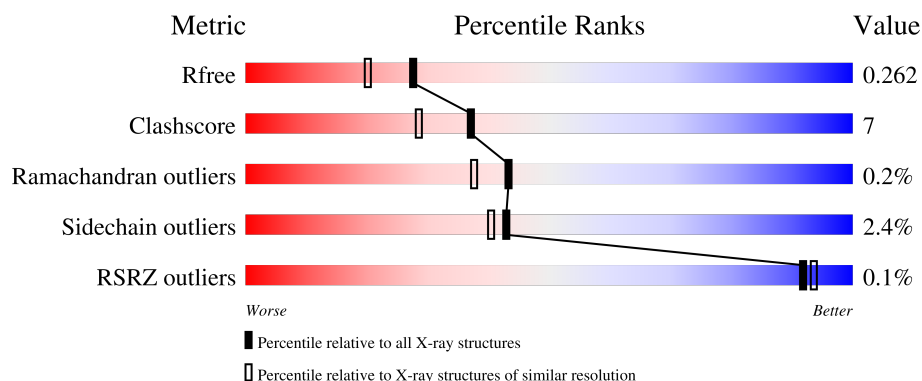
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.05 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}	180053	2260 (2.04-2.04)
Clashscore	190562	2333 (2.04-2.04)
Ramachandran outliers	187476	2318 (2.04-2.04)
Sidechain outliers	187428	2318 (2.04-2.04)
RSRZ outliers	180081	2260 (2.04-2.04)

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 $\leq 5\%$. 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	596	 80% 13% 6%
1	B	596	 78% 15% 6%
1	C	596	 81% 13% 6%
1	D	596	 82% 11% 6%
1	E	596	 81% 13% 6%

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Mol	Chain	Length	Quality of chain
1	F	596	 83% 10% 6%
1	G	596	 79% 15% 6%
1	H	596	 77% 16% 7%
1	I	596	 78% 16% 6%
1	J	596	 74% 17% 7%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	ACT	D	701	-	-	X	-
5	ACT	F	701	-	-	X	-

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 44755 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 Mono(2-hydroxyethyl) terephthalate hydrolase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	559	Total	C	N	O	S	0	0	0
			4129	2586	725	790	28			
1	B	559	Total	C	N	O	S	0	0	0
			4129	2586	725	790	28			
1	C	559	Total	C	N	O	S	0	0	0
			4129	2586	725	790	28			
1	D	559	Total	C	N	O	S	0	0	0
			4129	2586	725	790	28			
1	E	560	Total	C	N	O	S	0	0	0
			4137	2590	727	792	28			
1	F	559	Total	C	N	O	S	0	0	0
			4129	2586	725	790	28			
1	G	562	Total	C	N	O	S	0	0	0
			4149	2602	728	791	28			
1	H	557	Total	C	N	O	S	0	0	0
			4113	2577	723	785	28			
1	I	559	Total	C	N	O	S	0	0	0
			4129	2586	725	790	28			
1	J	555	Total	C	N	O	S	0	0	0
			4104	2570	721	785	28			

There are 120 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	8	MET	-	initiating methionine	UNP A0A0K8P8E7
A	9	ASN	-	expression tag	UNP A0A0K8P8E7
A	10	HIS	-	expression tag	UNP A0A0K8P8E7
A	11	LYS	-	expression tag	UNP A0A0K8P8E7
A	12	VAL	-	expression tag	UNP A0A0K8P8E7
A	13	HIS	-	expression tag	UNP A0A0K8P8E7
A	14	HIS	-	expression tag	UNP A0A0K8P8E7
A	15	HIS	-	expression tag	UNP A0A0K8P8E7
A	16	HIS	-	expression tag	UNP A0A0K8P8E7

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Chain	Residue	Modelled	Actual	Comment	Reference
A	17	HIS	-	expression tag	UNP A0A0K8P8E7
A	18	HIS	-	expression tag	UNP A0A0K8P8E7
A	19	MET	-	expression tag	UNP A0A0K8P8E7
B	8	MET	-	initiating methionine	UNP A0A0K8P8E7
B	9	ASN	-	expression tag	UNP A0A0K8P8E7
B	10	HIS	-	expression tag	UNP A0A0K8P8E7
B	11	LYS	-	expression tag	UNP A0A0K8P8E7
B	12	VAL	-	expression tag	UNP A0A0K8P8E7
B	13	HIS	-	expression tag	UNP A0A0K8P8E7
B	14	HIS	-	expression tag	UNP A0A0K8P8E7
B	15	HIS	-	expression tag	UNP A0A0K8P8E7
B	16	HIS	-	expression tag	UNP A0A0K8P8E7
B	17	HIS	-	expression tag	UNP A0A0K8P8E7
B	18	HIS	-	expression tag	UNP A0A0K8P8E7
B	19	MET	-	expression tag	UNP A0A0K8P8E7
C	8	MET	-	initiating methionine	UNP A0A0K8P8E7
C	9	ASN	-	expression tag	UNP A0A0K8P8E7
C	10	HIS	-	expression tag	UNP A0A0K8P8E7
C	11	LYS	-	expression tag	UNP A0A0K8P8E7
C	12	VAL	-	expression tag	UNP A0A0K8P8E7
C	13	HIS	-	expression tag	UNP A0A0K8P8E7
C	14	HIS	-	expression tag	UNP A0A0K8P8E7
C	15	HIS	-	expression tag	UNP A0A0K8P8E7
C	16	HIS	-	expression tag	UNP A0A0K8P8E7
C	17	HIS	-	expression tag	UNP A0A0K8P8E7
C	18	HIS	-	expression tag	UNP A0A0K8P8E7
C	19	MET	-	expression tag	UNP A0A0K8P8E7
D	8	MET	-	initiating methionine	UNP A0A0K8P8E7
D	9	ASN	-	expression tag	UNP A0A0K8P8E7
D	10	HIS	-	expression tag	UNP A0A0K8P8E7
D	11	LYS	-	expression tag	UNP A0A0K8P8E7
D	12	VAL	-	expression tag	UNP A0A0K8P8E7
D	13	HIS	-	expression tag	UNP A0A0K8P8E7
D	14	HIS	-	expression tag	UNP A0A0K8P8E7
D	15	HIS	-	expression tag	UNP A0A0K8P8E7
D	16	HIS	-	expression tag	UNP A0A0K8P8E7
D	17	HIS	-	expression tag	UNP A0A0K8P8E7
D	18	HIS	-	expression tag	UNP A0A0K8P8E7
D	19	MET	-	expression tag	UNP A0A0K8P8E7
E	8	MET	-	initiating methionine	UNP A0A0K8P8E7
E	9	ASN	-	expression tag	UNP A0A0K8P8E7
E	10	HIS	-	expression tag	UNP A0A0K8P8E7

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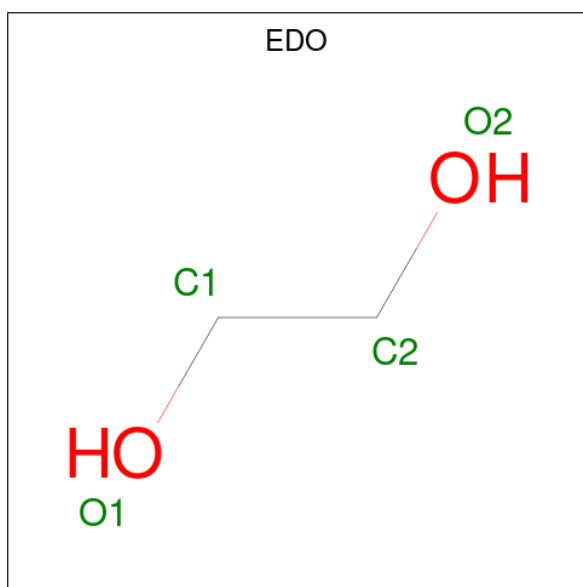
Chain	Residue	Modelled	Actual	Comment	Reference
E	11	LYS	-	expression tag	UNP A0A0K8P8E7
E	12	VAL	-	expression tag	UNP A0A0K8P8E7
E	13	HIS	-	expression tag	UNP A0A0K8P8E7
E	14	HIS	-	expression tag	UNP A0A0K8P8E7
E	15	HIS	-	expression tag	UNP A0A0K8P8E7
E	16	HIS	-	expression tag	UNP A0A0K8P8E7
E	17	HIS	-	expression tag	UNP A0A0K8P8E7
E	18	HIS	-	expression tag	UNP A0A0K8P8E7
E	19	MET	-	expression tag	UNP A0A0K8P8E7
F	8	MET	-	initiating methionine	UNP A0A0K8P8E7
F	9	ASN	-	expression tag	UNP A0A0K8P8E7
F	10	HIS	-	expression tag	UNP A0A0K8P8E7
F	11	LYS	-	expression tag	UNP A0A0K8P8E7
F	12	VAL	-	expression tag	UNP A0A0K8P8E7
F	13	HIS	-	expression tag	UNP A0A0K8P8E7
F	14	HIS	-	expression tag	UNP A0A0K8P8E7
F	15	HIS	-	expression tag	UNP A0A0K8P8E7
F	16	HIS	-	expression tag	UNP A0A0K8P8E7
F	17	HIS	-	expression tag	UNP A0A0K8P8E7
F	18	HIS	-	expression tag	UNP A0A0K8P8E7
F	19	MET	-	expression tag	UNP A0A0K8P8E7
G	8	MET	-	initiating methionine	UNP A0A0K8P8E7
G	9	ASN	-	expression tag	UNP A0A0K8P8E7
G	10	HIS	-	expression tag	UNP A0A0K8P8E7
G	11	LYS	-	expression tag	UNP A0A0K8P8E7
G	12	VAL	-	expression tag	UNP A0A0K8P8E7
G	13	HIS	-	expression tag	UNP A0A0K8P8E7
G	14	HIS	-	expression tag	UNP A0A0K8P8E7
G	15	HIS	-	expression tag	UNP A0A0K8P8E7
G	16	HIS	-	expression tag	UNP A0A0K8P8E7
G	17	HIS	-	expression tag	UNP A0A0K8P8E7
G	18	HIS	-	expression tag	UNP A0A0K8P8E7
G	19	MET	-	expression tag	UNP A0A0K8P8E7
H	8	MET	-	initiating methionine	UNP A0A0K8P8E7
H	9	ASN	-	expression tag	UNP A0A0K8P8E7
H	10	HIS	-	expression tag	UNP A0A0K8P8E7
H	11	LYS	-	expression tag	UNP A0A0K8P8E7
H	12	VAL	-	expression tag	UNP A0A0K8P8E7
H	13	HIS	-	expression tag	UNP A0A0K8P8E7
H	14	HIS	-	expression tag	UNP A0A0K8P8E7
H	15	HIS	-	expression tag	UNP A0A0K8P8E7
H	16	HIS	-	expression tag	UNP A0A0K8P8E7

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Chain	Residue	Modelled	Actual	Comment	Reference
H	17	HIS	-	expression tag	UNP A0A0K8P8E7
H	18	HIS	-	expression tag	UNP A0A0K8P8E7
H	19	MET	-	expression tag	UNP A0A0K8P8E7
I	8	MET	-	initiating methionine	UNP A0A0K8P8E7
I	9	ASN	-	expression tag	UNP A0A0K8P8E7
I	10	HIS	-	expression tag	UNP A0A0K8P8E7
I	11	LYS	-	expression tag	UNP A0A0K8P8E7
I	12	VAL	-	expression tag	UNP A0A0K8P8E7
I	13	HIS	-	expression tag	UNP A0A0K8P8E7
I	14	HIS	-	expression tag	UNP A0A0K8P8E7
I	15	HIS	-	expression tag	UNP A0A0K8P8E7
I	16	HIS	-	expression tag	UNP A0A0K8P8E7
I	17	HIS	-	expression tag	UNP A0A0K8P8E7
I	18	HIS	-	expression tag	UNP A0A0K8P8E7
I	19	MET	-	expression tag	UNP A0A0K8P8E7
J	8	MET	-	initiating methionine	UNP A0A0K8P8E7
J	9	ASN	-	expression tag	UNP A0A0K8P8E7
J	10	HIS	-	expression tag	UNP A0A0K8P8E7
J	11	LYS	-	expression tag	UNP A0A0K8P8E7
J	12	VAL	-	expression tag	UNP A0A0K8P8E7
J	13	HIS	-	expression tag	UNP A0A0K8P8E7
J	14	HIS	-	expression tag	UNP A0A0K8P8E7
J	15	HIS	-	expression tag	UNP A0A0K8P8E7
J	16	HIS	-	expression tag	UNP A0A0K8P8E7
J	17	HIS	-	expression tag	UNP A0A0K8P8E7
J	18	HIS	-	expression tag	UNP A0A0K8P8E7
J	19	MET	-	expression tag	UNP A0A0K8P8E7

- Molecule 2 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			4	2	2		

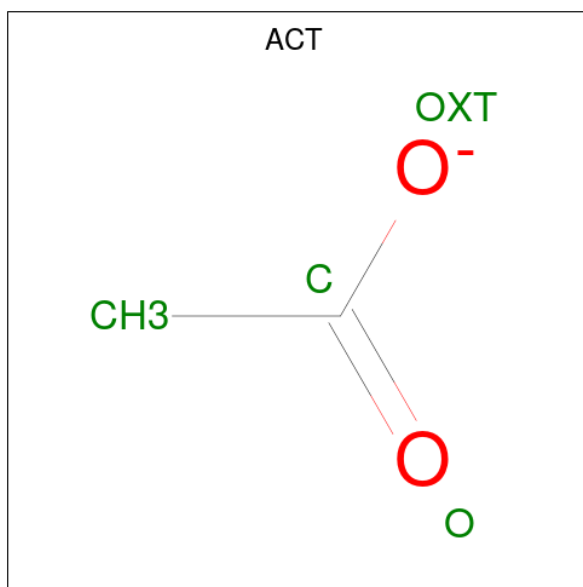
- Molecule 3 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Ca	0	0
			1	1		
3	B	1	Total	Ca	0	0
			1	1		
3	C	1	Total	Ca	0	0
			1	1		
3	D	1	Total	Ca	0	0
			1	1		
3	E	1	Total	Ca	0	0
			1	1		
3	F	1	Total	Ca	0	0
			1	1		
3	G	1	Total	Ca	0	0
			1	1		
3	H	1	Total	Ca	0	0
			1	1		
3	I	1	Total	Ca	0	0
			1	1		
3	J	1	Total	Ca	0	0
			1	1		

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	2	Total Zn 2 2	0	0
4	B	1	Total Zn 1 1	0	0
4	C	1	Total Zn 1 1	0	0
4	D	1	Total Zn 1 1	0	0
4	E	2	Total Zn 2 2	0	0
4	F	1	Total Zn 1 1	0	0
4	G	1	Total Zn 1 1	0	0
4	H	1	Total Zn 1 1	0	0
4	I	1	Total Zn 1 1	0	0

- Molecule 5 is ACETATE ION (CCD ID: ACT) (formula: $C_2H_3O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	D	1	Total C O 4 2 2	0	0
5	F	1	Total C O 4 2 2	0	0

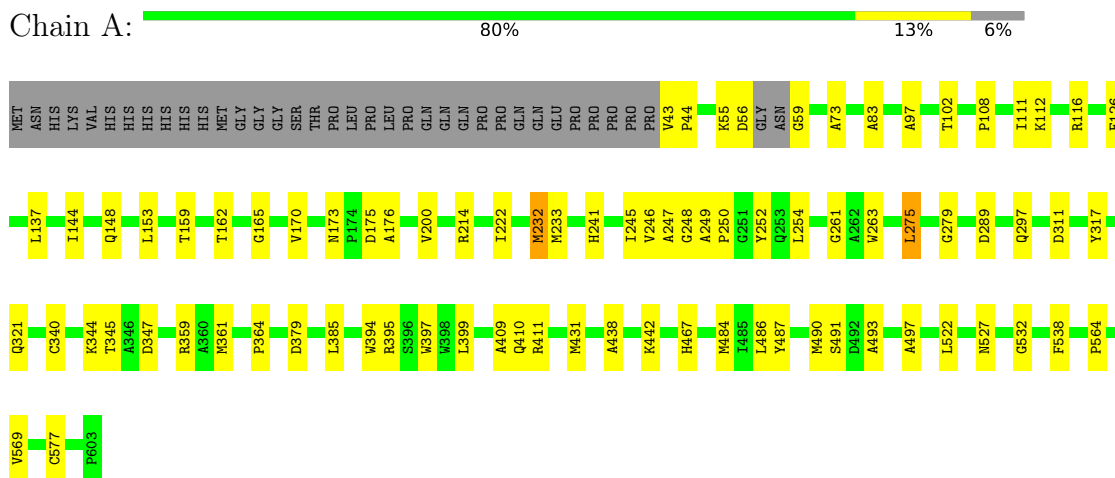
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	430	Total 430	O 430	0	0
6	B	466	Total 466	O 466	0	0
6	C	426	Total 426	O 426	0	0
6	D	419	Total 419	O 419	0	0
6	E	401	Total 401	O 401	0	0
6	F	447	Total 447	O 447	0	0
6	G	265	Total 265	O 265	0	0
6	H	258	Total 258	O 258	0	0
6	I	205	Total 205	O 205	0	0
6	J	128	Total 128	O 128	0	0

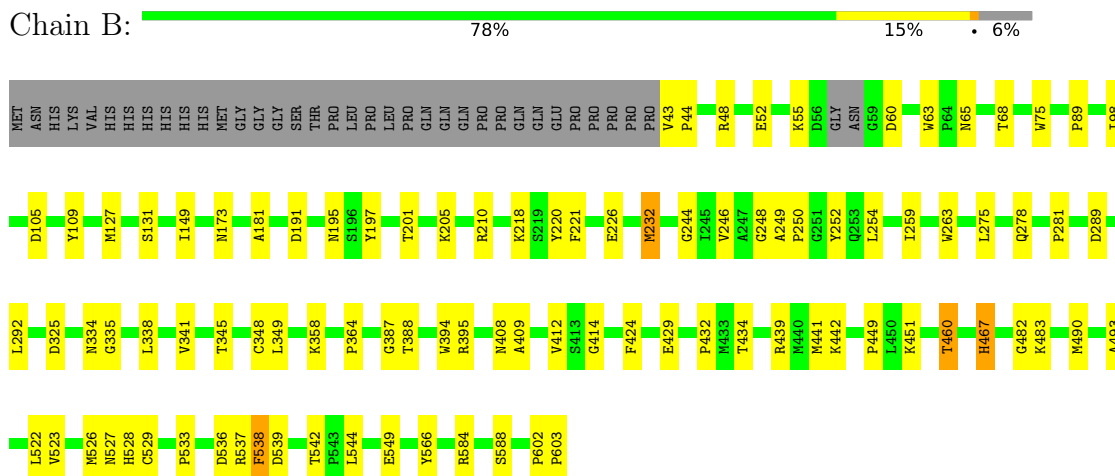
3 Residue-property plots

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 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.

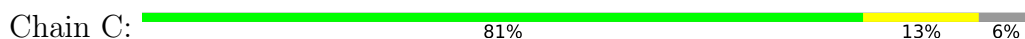
- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase

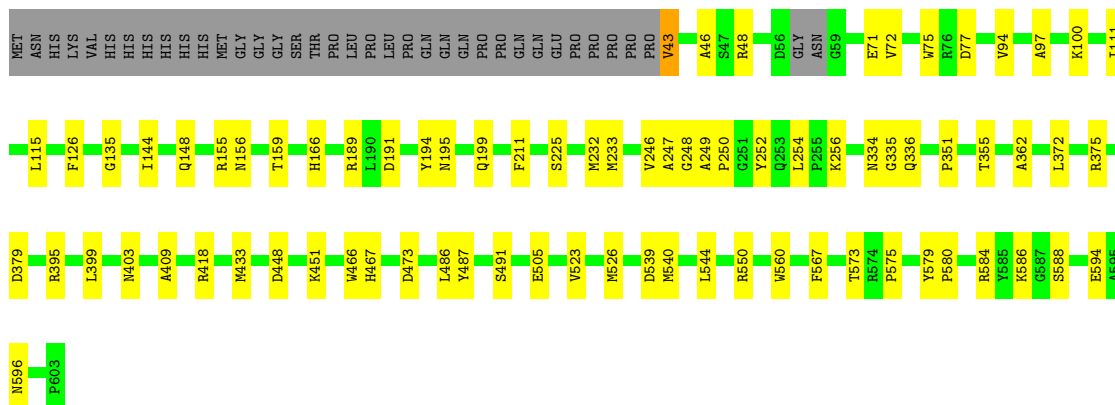


- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase

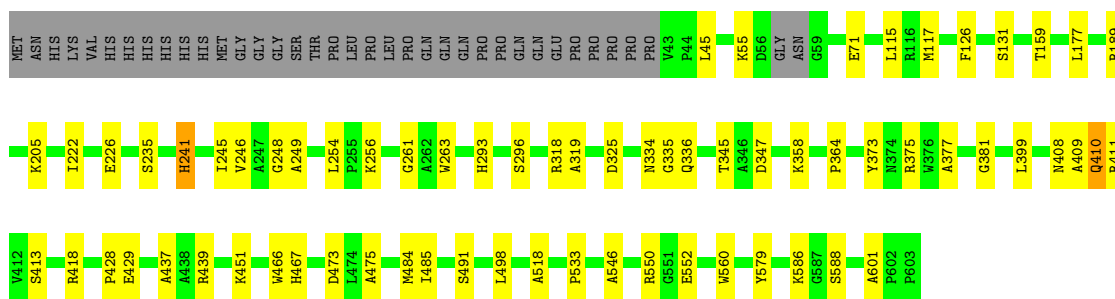
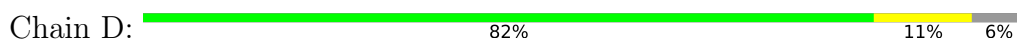


- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase

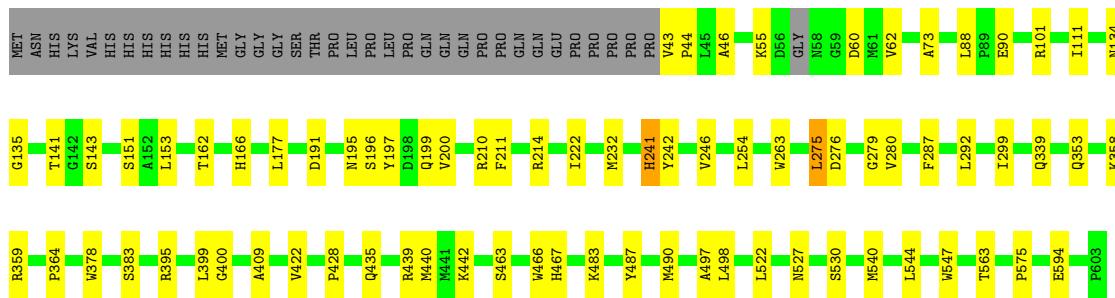
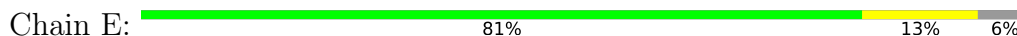




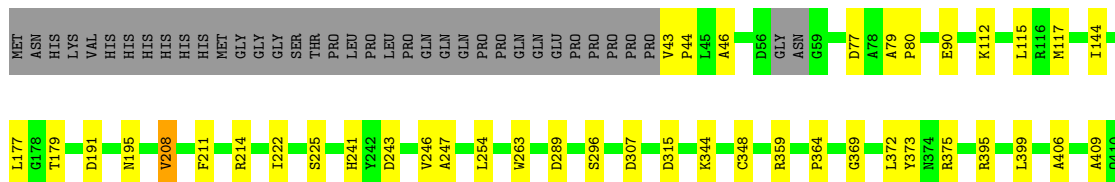
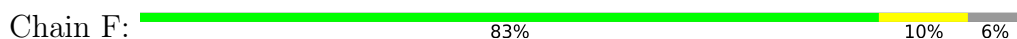
- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase



- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase



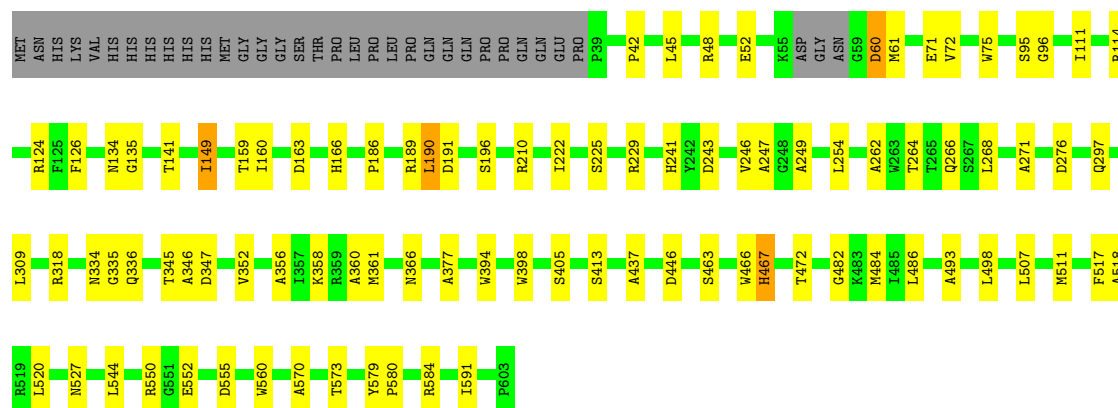
- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase





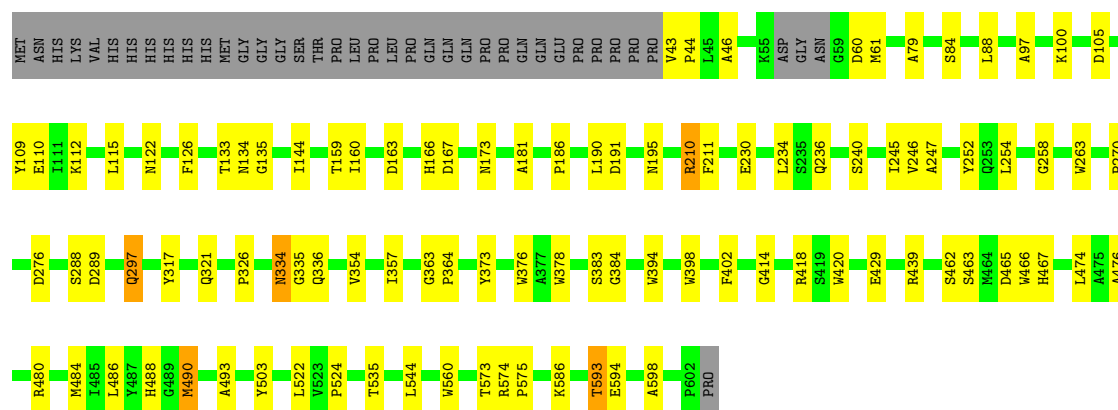
- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase

Chain G: 79% 15% 6%



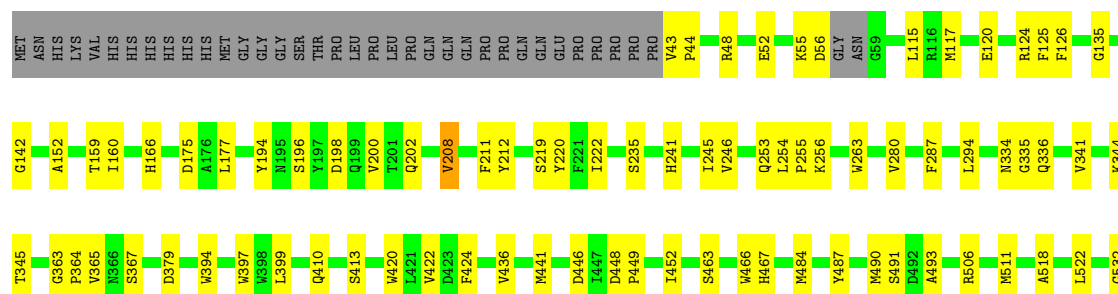
- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase

Chain H: 77% 16% 7%



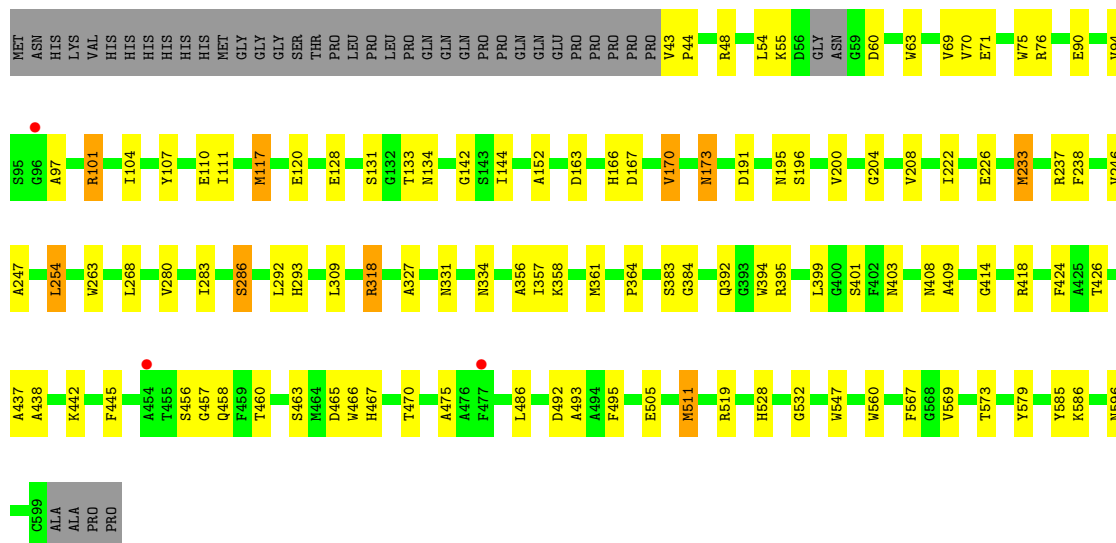
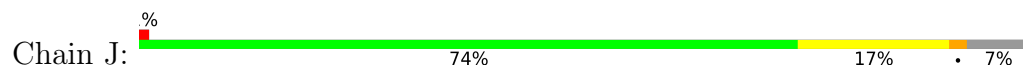
- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase

Chain I: 78% 16% 6%





- Molecule 1: Mono(2-hydroxyethyl) terephthalate hydrolase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	111.29Å 137.95Å 137.05Å 83.01° 66.88° 68.45°	Depositor
Resolution (Å)	40.00 – 2.05 40.00 – 2.05	Depositor EDS
% Data completeness (in resolution range)	93.3 (40.00-2.05) 93.3 (40.00-2.05)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.22	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.21 (at 2.05Å)	Xtriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, R_{free}	0.210 , 0.262 0.210 , 0.262	Depositor DCC
R_{free} test set	20362 reflections (4.66%)	wwPDB-VP
Wilson B-factor (Å ²)	28.8	Xtriage
Anisotropy	0.170	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 29.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	0.010 for h,h-l,k 0.010 for h,l,h-k 0.018 for h,h-k,h-l 0.011 for -h,-k,-h+l 0.011 for -h,-h+k,-l 0.015 for -h,-l,-k 0.076 for -h,-h+l,-h+k	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	44755	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.24% 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.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ACT, CA, EDO, ZN

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	0.62	1/4236 (0.0%)	0.73	1/5766 (0.0%)
1	B	0.61	1/4236 (0.0%)	0.74	2/5766 (0.0%)
1	C	0.56	0/4236	0.71	0/5766
1	D	0.56	0/4236	0.70	0/5766
1	E	0.55	0/4244	0.68	0/5777
1	F	0.60	0/4236	0.70	0/5766
1	G	0.48	0/4260	0.63	0/5802
1	H	0.45	0/4219	0.60	0/5743
1	I	0.43	1/4236 (0.0%)	0.55	0/5766
1	J	0.36	1/4209 (0.0%)	0.53	0/5728
All	All	0.53	4/42348 (0.0%)	0.66	3/57646 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	1
All	All	0	2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	J	532	GLY	C-N	7.91	1.52	1.33
1	A	532	GLY	C-N	-7.71	1.15	1.33
1	I	532	GLY	C-N	6.20	1.48	1.33
1	B	232	MET	SD-CE	-6.07	1.64	1.79

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	334	ASN	CA-C-N	-6.09	104.80	122.46
1	B	334	ASN	C-N-CA	-6.09	104.80	122.46
1	A	232	MET	CG-SD-CE	-5.68	88.41	100.90

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	347	ASP	Peptide
1	B	335	GLY	Peptide

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)	H(added)	Clashes	Symm-Clashes
1	A	4129	0	3919	56	0
1	B	4129	0	3919	73	0
1	C	4129	0	3919	51	0
1	D	4129	0	3919	44	0
1	E	4137	0	3925	49	0
1	F	4129	0	3919	49	0
1	G	4149	0	3944	63	0
1	H	4113	0	3908	66	0
1	I	4129	0	3919	54	0
1	J	4104	0	3895	72	0
2	A	4	0	6	1	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
3	F	1	0	0	0	0
3	G	1	0	0	0	0
3	H	1	0	0	0	0
3	I	1	0	0	0	0
3	J	1	0	0	0	0
4	A	2	0	0	0	0
4	B	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	2	0	0	0	0
4	F	1	0	0	0	0
4	G	1	0	0	0	0
4	H	1	0	0	0	0
4	I	1	0	0	0	0
5	D	4	0	3	2	0
5	F	4	0	3	2	0
6	A	430	0	0	7	1
6	B	466	0	0	11	1
6	C	426	0	0	12	0
6	D	419	0	0	8	0
6	E	401	0	0	11	2
6	F	447	0	0	11	0
6	G	265	0	0	13	2
6	H	258	0	0	11	2
6	I	205	0	0	9	0
6	J	128	0	0	8	0
All	All	44755	0	39198	569	4

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 7.

The worst 5 of 569 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:B:232:MET:HE3	1:B:252:TYR:HB3	1.37	1.05
1:B:490:MET:SD	6:B:1227:HOH:O	2.16	1.02
1:E:287:PHE:O	1:E:395:ARG:NH2	1.93	1.00
1:B:232:MET:HE2	1:B:250:PRO:HB2	1.42	0.99
1:B:526:MET:HE2	1:B:536:ASP:HA	1.45	0.98

All (4) 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)
6:A:1149:HOH:O	6:G:1041:HOH:O[1_655]	2.03	0.17
6:E:1150:HOH:O	6:H:975:HOH:O[1_456]	2.12	0.08
6:B:874:HOH:O	6:G:804:HOH:O[1_655]	2.16	0.04

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:E:819:HOH:O	6:H:1015:HOH:O[1_456]	2.17	0.03

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	Percentiles	
1	A	555/596 (93%)	525 (95%)	29 (5%)	1 (0%)	43	37
1	B	555/596 (93%)	533 (96%)	21 (4%)	1 (0%)	43	37
1	C	555/596 (93%)	528 (95%)	26 (5%)	1 (0%)	43	37
1	D	555/596 (93%)	532 (96%)	21 (4%)	2 (0%)	30	22
1	E	556/596 (93%)	530 (95%)	26 (5%)	0	100	100
1	F	555/596 (93%)	531 (96%)	22 (4%)	2 (0%)	30	22
1	G	558/596 (94%)	534 (96%)	23 (4%)	1 (0%)	43	37
1	H	553/596 (93%)	530 (96%)	21 (4%)	2 (0%)	30	22
1	I	555/596 (93%)	532 (96%)	21 (4%)	2 (0%)	30	22
1	J	551/596 (92%)	512 (93%)	38 (7%)	1 (0%)	43	37
All	All	5548/5960 (93%)	5287 (95%)	248 (4%)	13 (0%)	43	37

5 of 13 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	601	ALA
1	G	335	GLY
1	H	335	GLY
1	F	225	SER
1	H	373	TYR

5.3.2 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	406/439 (92%)	401 (99%)	5 (1%)	63	65
1	B	406/439 (92%)	399 (98%)	7 (2%)	53	53
1	C	406/439 (92%)	399 (98%)	7 (2%)	53	53
1	D	406/439 (92%)	396 (98%)	10 (2%)	42	39
1	E	407/439 (93%)	399 (98%)	8 (2%)	48	48
1	F	406/439 (92%)	397 (98%)	9 (2%)	45	44
1	G	409/439 (93%)	398 (97%)	11 (3%)	39	36
1	H	404/439 (92%)	395 (98%)	9 (2%)	45	44
1	I	406/439 (92%)	396 (98%)	10 (2%)	42	39
1	J	404/439 (92%)	383 (95%)	21 (5%)	21	14
All	All	4060/4390 (92%)	3963 (98%)	97 (2%)	43	40

5 of 97 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	84	SER
1	I	294	LEU
1	H	240	SER
1	H	593	THR
1	I	511	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 22 such sidechains are listed below:

Mol	Chain	Res	Type
1	G	596	ASN
1	H	339	GLN
1	H	297	GLN
1	H	596	ASN
1	C	581	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 24 ligands modelled in this entry, 21 are monoatomic - leaving 3 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	$\# Z > 2$
5	ACT	D	701	-	3,3,3	0.95	0	3,3,3	1.85	1 (33%)
2	EDO	A	701	-	3,3,3	0.89	0	2,2,2	0.31	0
5	ACT	F	701	-	3,3,3	0.98	0	3,3,3	0.74	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	EDO	A	701	-	-	1/1/1/1	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	701	ACT	OXT-C-O	-2.54	112.61	122.03

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	701	EDO	O1-C1-C2-O2

There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	701	ACT	2	0
2	A	701	EDO	1	0
5	F	701	ACT	2	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	532:GLY	C	533:PRO	N	1.15

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

6.1 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(Å²)	Q<0.9	
1	A	559/596 (93%)	-1.54	0	100	100	18, 29, 45, 83	0
1	B	559/596 (93%)	-1.52	0	100	100	20, 29, 44, 97	0
1	C	559/596 (93%)	-1.49	0	100	100	21, 32, 48, 89	0
1	D	559/596 (93%)	-1.53	0	100	100	21, 30, 46, 96	0
1	E	560/596 (93%)	-1.46	0	100	100	17, 33, 54, 101	0
1	F	559/596 (93%)	-1.50	0	100	100	20, 30, 46, 86	0
1	G	562/596 (94%)	-1.33	0	100	100	26, 43, 63, 109	0
1	H	557/596 (93%)	-1.28	0	100	100	26, 46, 65, 89	0
1	I	559/596 (93%)	-1.17	0	100	100	38, 54, 81, 110	0
1	J	555/596 (93%)	-0.76	3 (0%)	87	89	42, 66, 91, 113	0
All	All	5588/5960 (93%)	-1.36	3 (0%)	92	93	17, 37, 74, 113	0

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	J	96	GLY	3.1
1	J	454	ALA	2.3
1	J	477	PHE	2.1

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

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(Å ²)	Q<0.9
5	ACT	D	701	4/4	0.98	0.04	35,38,40,42	0
5	ACT	F	701	4/4	0.98	0.05	31,35,37,39	0
4	ZN	F	703	1/1	0.99	0.02	69,69,69,69	0
2	EDO	A	701	4/4	0.99	0.03	28,29,32,33	0
4	ZN	E	702	1/1	0.99	0.03	62,62,62,62	0
3	CA	E	701	1/1	1.00	0.01	31,31,31,31	0
3	CA	F	702	1/1	1.00	0.01	36,36,36,36	0
3	CA	G	701	1/1	1.00	0.01	50,50,50,50	0
3	CA	H	701	1/1	1.00	0.03	48,48,48,48	0
3	CA	I	701	1/1	1.00	0.01	61,61,61,61	0
3	CA	J	701	1/1	1.00	0.01	61,61,61,61	0
4	ZN	A	703	1/1	1.00	0.01	57,57,57,57	0
4	ZN	A	704	1/1	1.00	0.03	71,71,71,71	0
4	ZN	B	702	1/1	1.00	0.01	63,63,63,63	0
4	ZN	C	702	1/1	1.00	0.02	68,68,68,68	0
4	ZN	D	703	1/1	1.00	0.01	68,68,68,68	0
3	CA	A	702	1/1	1.00	0.01	31,31,31,31	0
4	ZN	E	703	1/1	1.00	0.02	67,67,67,67	0
3	CA	B	701	1/1	1.00	0.04	21,21,21,21	0
4	ZN	G	702	1/1	1.00	0.02	90,90,90,90	0
4	ZN	H	702	1/1	1.00	0.01	75,75,75,75	0
4	ZN	I	702	1/1	1.00	0.01	68,68,68,68	0
3	CA	C	701	1/1	1.00	0.02	32,32,32,32	0
3	CA	D	702	1/1	1.00	0.02	21,21,21,21	0

6.5 Other polymers ⓘ

There are no such residues in this entry.