



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 09:48 PM UTC

PDB ID : 7NRZ / pdb_00007nrz
Title : Crystal structure of malate dehydrogenase from Trypanosoma cruzi
Authors : Sonani, R.R.; Kurpiewska, K.; Lewinski, K.; Dubin, G.
Deposited on : 2021-03-04
Resolution : 2.60 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

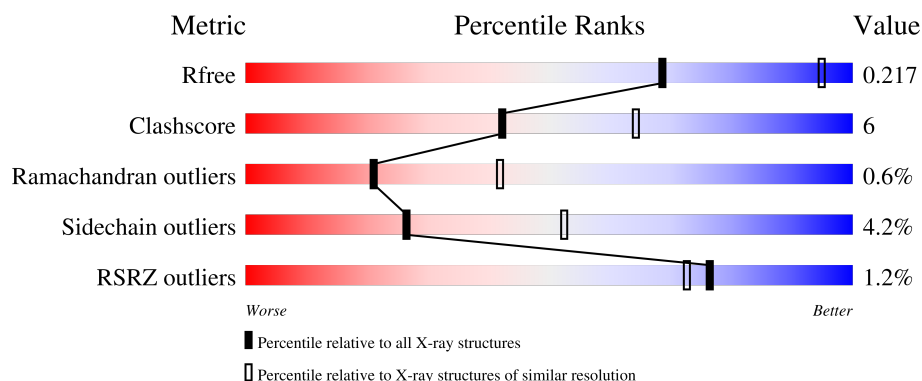
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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	4008 (2.60-2.60)
Clashscore	190562	4347 (2.60-2.60)
Ramachandran outliers	187476	4277 (2.60-2.60)
Sidechain outliers	187428	4277 (2.60-2.60)
RSRZ outliers	180081	4008 (2.60-2.60)

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	323	
1	B	323	
1	C	323	
1	D	323	
1	E	323	

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Mol	Chain	Length	Quality of chain
1	F	323	% 85% 15% .
1	G	323	3% 85% 14% .
1	H	323	% 84% 15% .

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
3	PEG	B	1806	-	-	X	-
6	CL	G	1011	-	-	X	-

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 19867 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 Malate dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	323	Total	C	N	O	S	0	1	0
			2394	1524	418	439	13			
1	B	323	Total	C	N	O	S	0	1	0
			2388	1521	415	439	13			
1	C	323	Total	C	N	O	S	0	0	0
			2384	1519	413	439	13			
1	D	323	Total	C	N	O	S	0	1	0
			2388	1520	416	440	12			
1	E	323	Total	C	N	O	S	0	0	0
			2365	1508	406	439	12			
1	F	323	Total	C	N	O	S	0	0	0
			2384	1519	413	439	13			
1	G	323	Total	C	N	O	S	0	0	0
			2377	1514	412	439	12			
1	H	323	Total	C	N	O	S	0	0	0
			2390	1522	416	439	13			

- 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		
2	A	1	Total	C	O	0	0
			4	2	2		
2	A	1	Total	C	O	0	0
			4	2	2		
2	A	1	Total	C	O	0	0
			4	2	2		
2	A	1	Total	C	O	0	0
			4	2	2		
2	A	1	Total	C	O	0	0
			4	2	2		
2	A	1	Total	C	O	0	0
			4	2	2		
2	A	1	Total	C	O	0	0
			4	2	2		
2	A	1	Total	C	O	0	0
			4	2	2		

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

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

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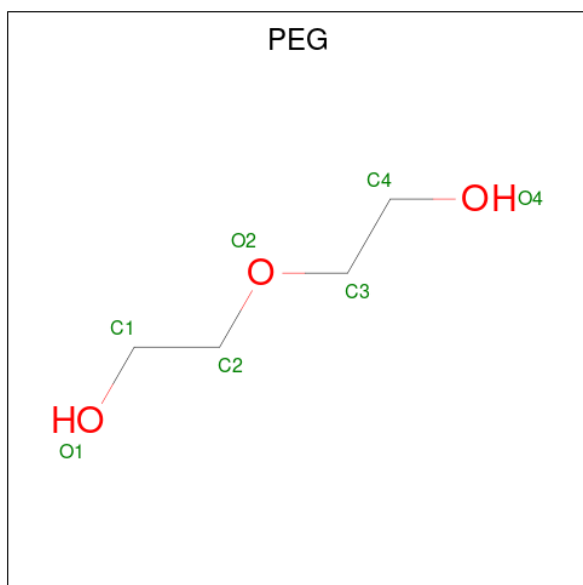
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	F	1	Total	C	O	0	0
			4	2	2		
2	F	1	Total	C	O	0	0
			4	2	2		
2	F	1	Total	C	O	0	0
			4	2	2		
2	F	1	Total	C	O	0	0
			4	2	2		
2	F	1	Total	C	O	0	0
			4	2	2		
2	F	1	Total	C	O	0	0
			4	2	2		
2	F	1	Total	C	O	0	0
			4	2	2		
2	G	1	Total	C	O	0	0
			4	2	2		
2	G	1	Total	C	O	0	0
			4	2	2		
2	G	1	Total	C	O	0	0
			4	2	2		
2	G	1	Total	C	O	0	0
			4	2	2		
2	G	1	Total	C	O	0	0
			4	2	2		
2	G	1	Total	C	O	0	0
			4	2	2		
2	G	1	Total	C	O	0	0
			4	2	2		
2	G	1	Total	C	O	0	0
			4	2	2		
2	H	1	Total	C	O	0	0
			4	2	2		
2	H	1	Total	C	O	0	0
			4	2	2		

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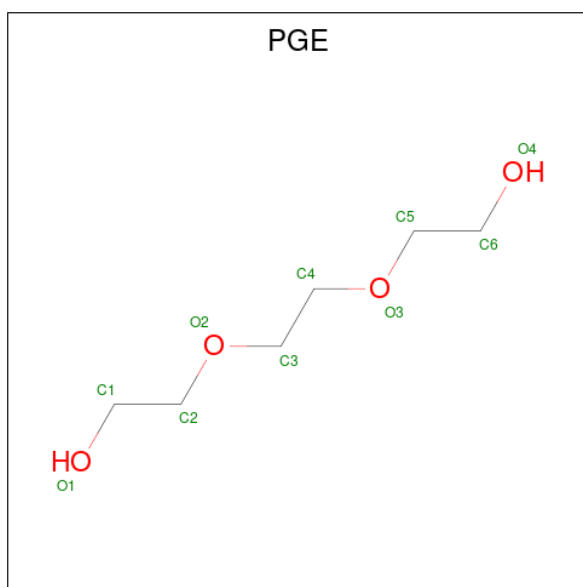
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	H	1	Total	C	O	0	0
			4	2	2		
2	H	1	Total	C	O	0	0
			4	2	2		

- Molecule 3 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: $C_4H_{10}O_3$).



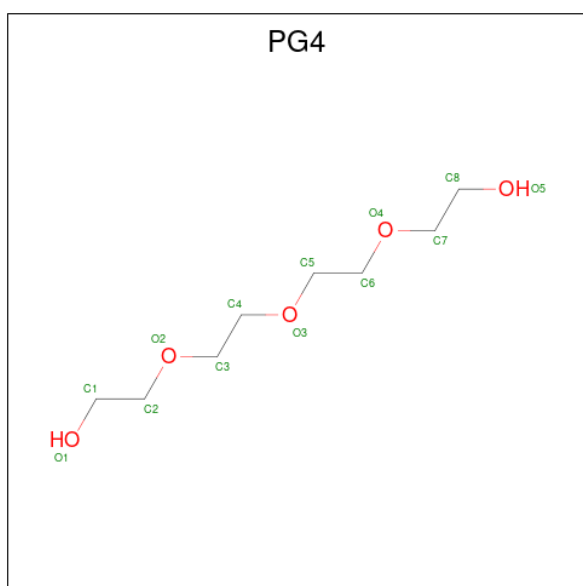
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			7	4	3		
3	A	1	Total	C	O	0	0
			7	4	3		
3	B	1	Total	C	O	0	0
			7	4	3		
3	C	1	Total	C	O	0	0
			7	4	3		
3	F	1	Total	C	O	0	0
			7	4	3		

- Molecule 4 is TRIETHYLENE GLYCOL (CCD ID: PGE) (formula: $C_6H_{14}O_4$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			10	6	4		
4	A	1	Total	C	O	0	0
			10	6	4		

- Molecule 5 is TETRAETHYLENE GLYCOL (CCD ID: PG4) (formula: $C_8H_{18}O_5$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	D	1	Total	C	O	0	0
			13	8	5		
5	E	1	Total	C	O	0	0
			13	8	5		

- Molecule 6 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	G	1	Total Cl 1 1	0	0

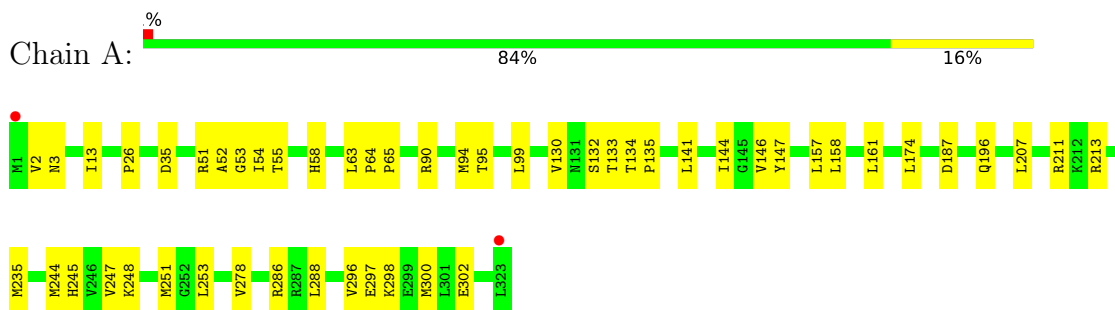
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	62	Total O 62 62	0	0
7	B	56	Total O 56 56	0	0
7	C	59	Total O 59 59	0	0
7	D	57	Total O 57 57	0	0
7	E	44	Total O 44 44	0	0
7	F	45	Total O 45 45	0	0
7	G	42	Total O 42 42	0	0
7	H	34	Total O 34 34	0	0

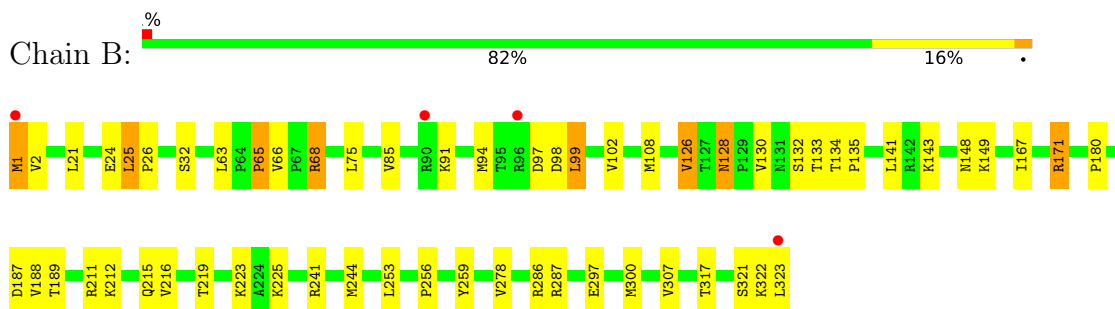
3 Residue-property plots [i](#)

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 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.

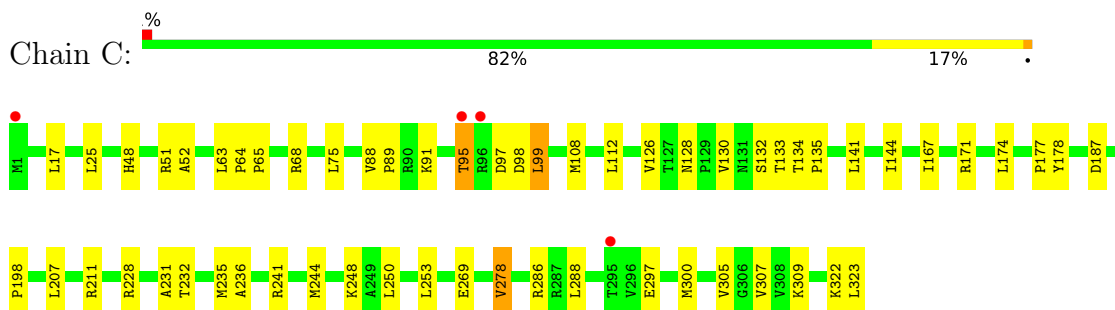
- Molecule 1: Malate dehydrogenase



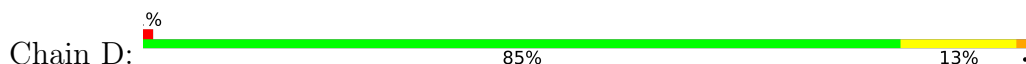
- Molecule 1: Malate dehydrogenase

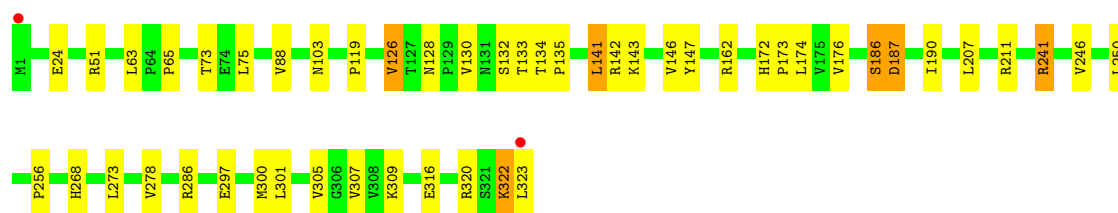


- Molecule 1: Malate dehydrogenase

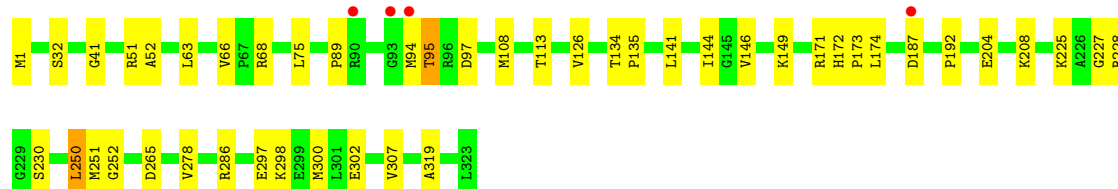
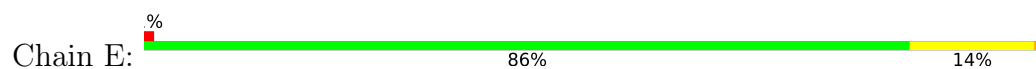


- Molecule 1: Malate dehydrogenase

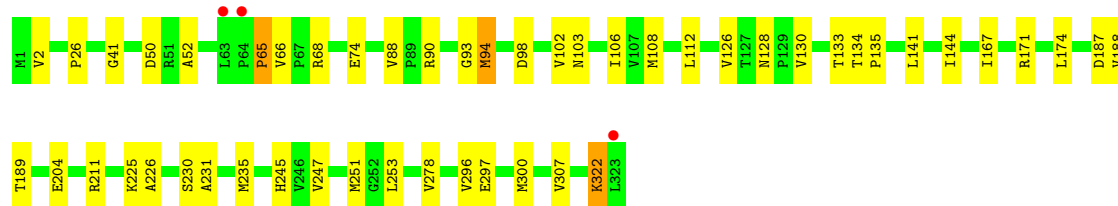
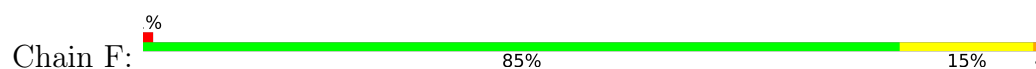




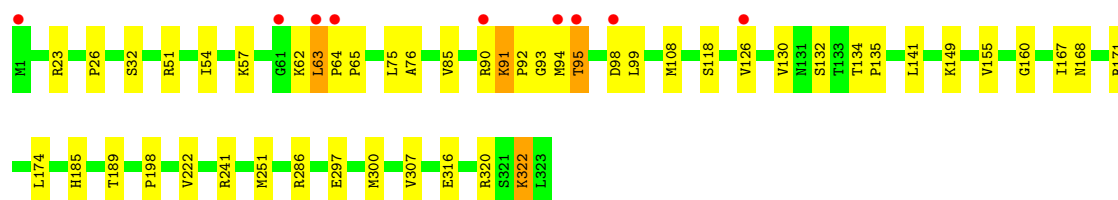
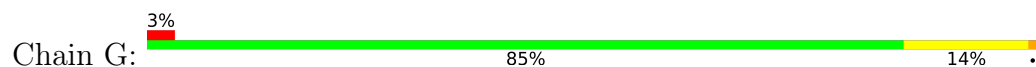
● Molecule 1: Malate dehydrogenase



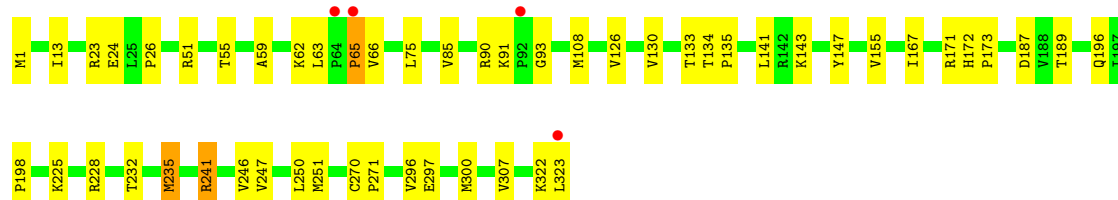
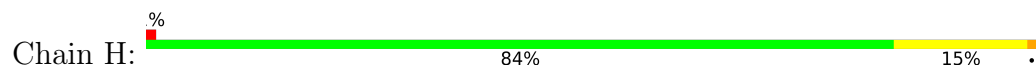
● Molecule 1: Malate dehydrogenase



● Molecule 1: Malate dehydrogenase



● Molecule 1: Malate dehydrogenase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	80.04Å 148.33Å 251.80Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	23.32 – 2.60 23.32 – 2.60	Depositor EDS
% Data completeness (in resolution range)	99.0 (23.32-2.60) 98.9 (23.32-2.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.77 (at 2.61Å)	Xtriage
Refinement program	PHENIX 1.13_2998	Depositor
R, R_{free}	0.203 , 0.216 0.206 , 0.217	Depositor DCC
R_{free} test set	4657 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	51.3	Xtriage
Anisotropy	0.186	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 43.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	19867	wwPDB-VP
Average B, all atoms (Å ²)	57.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.69% 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: PG4, PGE, CL, PEG, EDO

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	0.28	0/2439	0.51	0/3320
1	B	0.41	0/2433	0.64	1/3313 (0.0%)
1	C	0.39	0/2426	0.65	1/3303 (0.0%)
1	D	0.39	0/2430	0.63	2/3310 (0.1%)
1	E	0.44	1/2407 (0.0%)	0.68	3/3282 (0.1%)
1	F	0.38	0/2426	0.60	0/3303
1	G	0.33	0/2419	0.60	2/3296 (0.1%)
1	H	0.27	0/2432	0.50	0/3310
All	All	0.36	1/19412 (0.0%)	0.60	9/26437 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	192	PRO	C-O	-5.01	1.18	1.23

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	99	LEU	N-CA-C	-8.09	102.40	111.14
1	C	99	LEU	N-CA-C	-7.43	103.11	111.07
1	D	128	ASN	CA-C-O	-6.59	113.85	120.64
1	E	94	MET	CB-CA-C	-5.67	110.05	116.63
1	G	98	ASP	CB-CA-C	5.58	119.37	109.65

There are no chirality outliers.

There are no planarity outliers.

5.2 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	2394	0	2506	37	0
1	B	2388	0	2495	37	0
1	C	2384	0	2493	29	0
1	D	2388	0	2487	35	0
1	E	2365	0	2453	22	0
1	F	2384	0	2493	29	0
1	G	2377	0	2475	31	0
1	H	2390	0	2504	35	0
2	A	60	0	90	9	0
2	B	48	0	72	3	0
2	C	36	0	54	3	0
2	D	44	0	66	3	0
2	E	16	0	24	1	0
2	F	56	0	84	2	0
2	G	40	0	60	2	0
2	H	16	0	24	3	0
3	A	14	0	20	0	0
3	B	7	0	10	5	0
3	C	7	0	10	0	0
3	F	7	0	10	1	0
4	A	20	0	28	5	0
5	D	13	0	18	2	0
5	E	13	0	18	2	0
6	G	1	0	0	2	0
7	A	62	0	0	2	0
7	B	56	0	0	0	0
7	C	59	0	0	0	0
7	D	57	0	0	0	0
7	E	44	0	0	0	0
7	F	45	0	0	1	0
7	G	42	0	0	0	0
7	H	34	0	0	0	0
All	All	19867	0	20494	252	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 6.

The worst 5 of 252 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:D:143:LYS:HZ2	1:D:323:LEU:HB3	1.34	0.89
1:H:13:ILE:HD13	1:H:232:THR:HA	1.54	0.88
1:H:143:LYS:HE2	1:H:323:LEU:HD21	1.54	0.87
1:H:13:ILE:CD1	1:H:232:THR:HA	2.07	0.85
1:B:25:LEU:HD13	1:B:244:MET:HE1	1.60	0.82

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	Percentiles	
1	A	322/323 (100%)	314 (98%)	7 (2%)	1 (0%)	36	58
1	B	322/323 (100%)	312 (97%)	9 (3%)	1 (0%)	36	58
1	C	321/323 (99%)	314 (98%)	6 (2%)	1 (0%)	36	58
1	D	322/323 (100%)	312 (97%)	8 (2%)	2 (1%)	21	42
1	E	321/323 (99%)	311 (97%)	9 (3%)	1 (0%)	36	58
1	F	321/323 (99%)	308 (96%)	8 (2%)	5 (2%)	7	16
1	G	321/323 (99%)	309 (96%)	11 (3%)	1 (0%)	36	58
1	H	321/323 (99%)	313 (98%)	5 (2%)	3 (1%)	14	30
All	All	2571/2584 (100%)	2493 (97%)	63 (2%)	15 (1%)	21	42

5 of 15 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	187	ASP
1	B	97	ASP
1	C	187	ASP
1	D	268	HIS

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Mol	Chain	Res	Type
1	F	65	PRO

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	261/261 (100%)	257 (98%)	4 (2%)	57	80
1	B	260/261 (100%)	242 (93%)	18 (7%)	14	32
1	C	260/261 (100%)	243 (94%)	17 (6%)	15	35
1	D	259/261 (99%)	247 (95%)	12 (5%)	24	49
1	E	256/261 (98%)	245 (96%)	11 (4%)	26	51
1	F	260/261 (100%)	250 (96%)	10 (4%)	29	56
1	G	258/261 (99%)	250 (97%)	8 (3%)	35	63
1	H	261/261 (100%)	253 (97%)	8 (3%)	35	63
All	All	2075/2088 (99%)	1987 (96%)	88 (4%)	26	52

5 of 88 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	174	LEU
1	F	322	LYS
1	E	230	SER
1	F	126	VAL
1	G	141	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 11 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	103	ASN
1	D	215	GLN
1	H	215	GLN
1	E	58	HIS

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Mol	Chain	Res	Type
1	B	128	ASN

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 89 ligands modelled in this entry, 1 is monoatomic - leaving 88 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	$\# Z > 2$
2	EDO	D	412	-	3,3,3	0.43	0	2,2,2	0.33	0
2	EDO	B	1801	-	3,3,3	0.45	0	2,2,2	0.36	0
2	EDO	C	410	-	3,3,3	0.44	0	2,2,2	0.31	0
2	EDO	A	403	-	3,3,3	0.43	0	2,2,2	0.39	0
2	EDO	F	810	-	3,3,3	0.39	0	2,2,2	0.55	0
2	EDO	A	412	-	3,3,3	0.45	0	2,2,2	0.33	0
2	EDO	C	408	-	3,3,3	0.43	0	2,2,2	0.41	0
2	EDO	A	417	-	3,3,3	0.40	0	2,2,2	0.42	0
5	PG4	D	404	-	12,12,12	0.54	0	11,11,11	0.25	0
2	EDO	F	804	-	3,3,3	0.45	0	2,2,2	0.35	0
5	PG4	E	403	-	12,12,12	0.53	0	11,11,11	0.22	0
2	EDO	B	1807	-	3,3,3	0.41	0	2,2,2	0.34	0
2	EDO	F	803	-	3,3,3	0.44	0	2,2,2	0.34	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	EDO	D	409	-	3,3,3	0.41	0	2,2,2	0.43	0
2	EDO	B	1812	-	3,3,3	0.44	0	2,2,2	0.35	0
2	EDO	G	1002	-	3,3,3	0.44	0	2,2,2	0.28	0
2	EDO	G	1006	-	3,3,3	0.46	0	2,2,2	0.27	0
2	EDO	C	409	-	3,3,3	0.44	0	2,2,2	0.37	0
2	EDO	D	401	-	3,3,3	0.43	0	2,2,2	0.36	0
2	EDO	D	402	-	3,3,3	0.45	0	2,2,2	0.24	0
2	EDO	D	405	-	3,3,3	0.44	0	2,2,2	0.35	0
2	EDO	C	402	-	3,3,3	0.42	0	2,2,2	0.42	0
2	EDO	A	415	-	3,3,3	0.16	0	2,2,2	0.10	0
2	EDO	C	405	-	3,3,3	0.46	0	2,2,2	0.35	0
2	EDO	F	809	-	3,3,3	0.44	0	2,2,2	0.39	0
4	PGE	A	407	-	9,9,9	0.33	0	8,8,8	0.25	0
2	EDO	B	1804	-	3,3,3	0.47	0	2,2,2	0.23	0
2	EDO	D	406	-	3,3,3	0.42	0	2,2,2	0.36	0
2	EDO	D	408	-	3,3,3	0.44	0	2,2,2	0.32	0
2	EDO	A	404	-	3,3,3	0.45	0	2,2,2	0.36	0
2	EDO	G	1010	-	3,3,3	0.42	0	2,2,2	0.42	0
2	EDO	G	1007	-	3,3,3	0.44	0	2,2,2	0.36	0
2	EDO	F	815	-	3,3,3	0.41	0	2,2,2	0.38	0
2	EDO	D	410	-	3,3,3	0.45	0	2,2,2	0.34	0
2	EDO	D	403	-	3,3,3	0.09	0	2,2,2	0.32	0
2	EDO	B	1803	-	3,3,3	0.46	0	2,2,2	0.29	0
2	EDO	A	408	-	3,3,3	0.42	0	2,2,2	0.36	0
2	EDO	A	416	-	3,3,3	0.06	0	2,2,2	0.30	0
2	EDO	H	1101	-	3,3,3	0.44	0	2,2,2	0.33	0
2	EDO	G	1001	-	3,3,3	0.41	0	2,2,2	0.43	0
2	EDO	E	405	-	3,3,3	0.43	0	2,2,2	0.39	0
2	EDO	B	1802	-	3,3,3	0.45	0	2,2,2	0.29	0
2	EDO	H	1102	-	3,3,3	0.21	0	2,2,2	0.14	0
2	EDO	B	1811	-	3,3,3	0.46	0	2,2,2	0.29	0
2	EDO	G	1004	-	3,3,3	0.43	0	2,2,2	0.40	0
2	EDO	D	407	-	3,3,3	0.15	0	2,2,2	0.07	0
2	EDO	A	401	-	3,3,3	0.46	0	2,2,2	0.20	0
2	EDO	A	402	-	3,3,3	0.45	0	2,2,2	0.22	0
2	EDO	E	402	-	3,3,3	0.48	0	2,2,2	0.14	0
2	EDO	F	806	-	3,3,3	0.42	0	2,2,2	0.42	0
3	PEG	B	1806	-	6,6,6	0.50	0	5,5,5	0.30	0
2	EDO	B	1808	-	3,3,3	0.45	0	2,2,2	0.24	0
2	EDO	H	1104	-	3,3,3	0.43	0	2,2,2	0.30	0
2	EDO	F	802	-	3,3,3	0.46	0	2,2,2	0.29	0
2	EDO	B	1813	-	3,3,3	0.44	0	2,2,2	0.39	0
3	PEG	F	807	-	6,6,6	0.50	0	5,5,5	0.21	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	PEG	A	406	-	6,6,6	0.50	0	5,5,5	0.28	0
2	EDO	D	411	-	3,3,3	0.46	0	2,2,2	0.22	0
2	EDO	F	801	-	3,3,3	0.45	0	2,2,2	0.30	0
2	EDO	G	1005	-	3,3,3	0.10	0	2,2,2	0.20	0
2	EDO	B	1809	-	3,3,3	0.45	0	2,2,2	0.24	0
2	EDO	A	409	-	3,3,3	0.43	0	2,2,2	0.46	0
2	EDO	B	1810	-	3,3,3	0.45	0	2,2,2	0.36	0
2	EDO	A	410	-	3,3,3	0.41	0	2,2,2	0.41	0
2	EDO	F	805	-	3,3,3	0.46	0	2,2,2	0.25	0
2	EDO	G	1008	-	3,3,3	0.42	0	2,2,2	0.45	0
3	PEG	A	419	-	6,6,6	0.50	0	5,5,5	0.27	0
2	EDO	E	401	-	3,3,3	0.42	0	2,2,2	0.44	0
4	PGE	A	418	-	9,9,9	0.33	0	8,8,8	0.24	0
2	EDO	A	414	-	3,3,3	0.45	0	2,2,2	0.36	0
2	EDO	F	814	-	3,3,3	0.46	0	2,2,2	0.30	0
2	EDO	E	404	-	3,3,3	0.46	0	2,2,2	0.28	0
2	EDO	B	1805	-	3,3,3	0.43	0	2,2,2	0.43	0
2	EDO	G	1003	-	3,3,3	0.43	0	2,2,2	0.35	0
2	EDO	C	403	-	3,3,3	0.18	0	2,2,2	0.11	0
2	EDO	A	413	-	3,3,3	0.47	0	2,2,2	0.33	0
2	EDO	F	811	-	3,3,3	0.39	0	2,2,2	0.42	0
3	PEG	C	401	-	6,6,6	0.49	0	5,5,5	0.31	0
2	EDO	A	405	-	3,3,3	0.43	0	2,2,2	0.37	0
2	EDO	H	1103	-	3,3,3	0.43	0	2,2,2	0.40	0
2	EDO	G	1009	-	3,3,3	0.16	0	2,2,2	0.08	0
2	EDO	A	411	-	3,3,3	0.47	0	2,2,2	0.29	0
2	EDO	C	407	-	3,3,3	0.46	0	2,2,2	0.25	0
2	EDO	F	808	-	3,3,3	0.42	0	2,2,2	0.30	0
2	EDO	F	813	-	3,3,3	0.16	0	2,2,2	0.10	0
2	EDO	C	404	-	3,3,3	0.43	0	2,2,2	0.39	0
2	EDO	C	406	-	3,3,3	0.45	0	2,2,2	0.21	0
2	EDO	F	812	-	3,3,3	0.37	0	2,2,2	0.80	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	D	412	-	-	0/1/1/1	-
2	EDO	B	1801	-	-	0/1/1/1	-
2	EDO	C	410	-	-	0/1/1/1	-
2	EDO	A	403	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	EDO	F	810	-	-	0/1/1/1	-
2	EDO	A	412	-	-	1/1/1/1	-
2	EDO	C	408	-	-	1/1/1/1	-
2	EDO	A	417	-	-	1/1/1/1	-
5	PG4	D	404	-	-	8/10/10/10	-
2	EDO	F	804	-	-	1/1/1/1	-
5	PG4	E	403	-	-	4/10/10/10	-
2	EDO	B	1807	-	-	0/1/1/1	-
2	EDO	F	803	-	-	1/1/1/1	-
2	EDO	D	409	-	-	1/1/1/1	-
2	EDO	B	1812	-	-	1/1/1/1	-
2	EDO	G	1002	-	-	1/1/1/1	-
2	EDO	G	1006	-	-	1/1/1/1	-
2	EDO	C	409	-	-	0/1/1/1	-
2	EDO	D	401	-	-	1/1/1/1	-
2	EDO	D	402	-	-	0/1/1/1	-
2	EDO	D	405	-	-	1/1/1/1	-
2	EDO	C	402	-	-	0/1/1/1	-
2	EDO	A	415	-	-	1/1/1/1	-
2	EDO	C	405	-	-	1/1/1/1	-
2	EDO	F	809	-	-	0/1/1/1	-
4	PGE	A	407	-	-	5/7/7/7	-
2	EDO	B	1804	-	-	0/1/1/1	-
2	EDO	D	406	-	-	0/1/1/1	-
2	EDO	D	408	-	-	1/1/1/1	-
2	EDO	A	404	-	-	0/1/1/1	-
2	EDO	G	1010	-	-	0/1/1/1	-
2	EDO	G	1007	-	-	0/1/1/1	-
2	EDO	F	815	-	-	0/1/1/1	-
2	EDO	D	410	-	-	0/1/1/1	-
2	EDO	D	403	-	-	1/1/1/1	-
2	EDO	B	1803	-	-	1/1/1/1	-
2	EDO	A	408	-	-	0/1/1/1	-
2	EDO	A	416	-	-	0/1/1/1	-
2	EDO	H	1101	-	-	0/1/1/1	-
2	EDO	G	1001	-	-	0/1/1/1	-
2	EDO	E	405	-	-	0/1/1/1	-
2	EDO	B	1802	-	-	0/1/1/1	-
2	EDO	H	1102	-	-	1/1/1/1	-
2	EDO	B	1811	-	-	1/1/1/1	-
2	EDO	G	1004	-	-	0/1/1/1	-
2	EDO	D	407	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	EDO	A	401	-	-	0/1/1/1	-
2	EDO	A	402	-	-	0/1/1/1	-
2	EDO	E	402	-	-	0/1/1/1	-
2	EDO	F	806	-	-	0/1/1/1	-
3	PEG	B	1806	-	-	0/4/4/4	-
2	EDO	B	1808	-	-	0/1/1/1	-
2	EDO	H	1104	-	-	1/1/1/1	-
2	EDO	F	802	-	-	0/1/1/1	-
2	EDO	B	1813	-	-	1/1/1/1	-
3	PEG	F	807	-	-	2/4/4/4	-
3	PEG	A	406	-	-	2/4/4/4	-
2	EDO	D	411	-	-	0/1/1/1	-
2	EDO	F	801	-	-	1/1/1/1	-
2	EDO	G	1005	-	-	1/1/1/1	-
2	EDO	B	1809	-	-	1/1/1/1	-
2	EDO	A	409	-	-	0/1/1/1	-
2	EDO	B	1810	-	-	0/1/1/1	-
2	EDO	A	410	-	-	1/1/1/1	-
2	EDO	F	805	-	-	1/1/1/1	-
2	EDO	G	1008	-	-	1/1/1/1	-
3	PEG	A	419	-	-	1/4/4/4	-
2	EDO	E	401	-	-	0/1/1/1	-
4	PGE	A	418	-	-	4/7/7/7	-
2	EDO	A	414	-	-	1/1/1/1	-
2	EDO	F	814	-	-	0/1/1/1	-
2	EDO	E	404	-	-	0/1/1/1	-
2	EDO	B	1805	-	-	1/1/1/1	-
2	EDO	G	1003	-	-	1/1/1/1	-
2	EDO	C	403	-	-	1/1/1/1	-
2	EDO	A	413	-	-	0/1/1/1	-
2	EDO	F	811	-	-	1/1/1/1	-
3	PEG	C	401	-	-	2/4/4/4	-
2	EDO	A	405	-	-	1/1/1/1	-
2	EDO	H	1103	-	-	1/1/1/1	-
2	EDO	G	1009	-	-	0/1/1/1	-
2	EDO	A	411	-	-	1/1/1/1	-
2	EDO	C	407	-	-	0/1/1/1	-
2	EDO	F	808	-	-	1/1/1/1	-
2	EDO	F	813	-	-	0/1/1/1	-
2	EDO	C	404	-	-	1/1/1/1	-
2	EDO	C	406	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	EDO	F	812	-	-	0/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 66 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	D	404	PG4	O3-C5-C6-O4
4	A	418	PGE	C4-C3-O2-C2
5	D	404	PG4	O2-C3-C4-O3
5	E	403	PG4	C6-C5-O3-C4
4	A	407	PGE	O2-C3-C4-O3

There are no ring outliers.

27 monomers are involved in 41 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	412	EDO	3	0
5	D	404	PG4	2	0
5	E	403	PG4	2	0
2	B	1807	EDO	1	0
2	D	409	EDO	1	0
2	G	1002	EDO	1	0
2	C	409	EDO	2	0
2	D	405	EDO	1	0
4	A	407	PGE	2	0
2	A	404	EDO	2	0
2	G	1007	EDO	1	0
2	H	1101	EDO	1	0
3	B	1806	PEG	5	0
3	F	807	PEG	1	0
2	D	411	EDO	1	0
2	B	1809	EDO	1	0
2	A	409	EDO	1	0
2	B	1810	EDO	1	0
2	E	401	EDO	1	0
4	A	418	PGE	3	0
2	F	814	EDO	1	0
2	A	413	EDO	1	0
2	F	811	EDO	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	405	EDO	1	0
2	H	1103	EDO	2	0
2	A	411	EDO	1	0
2	C	406	EDO	1	0

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](#)

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	323/323 (100%)	-0.45	2 (0%) 85 83	25, 48, 74, 99	1 (0%)
1	B	323/323 (100%)	-0.37	4 (1%) 76 73	24, 48, 75, 116	1 (0%)
1	C	323/323 (100%)	-0.35	4 (1%) 76 73	32, 50, 78, 121	0
1	D	323/323 (100%)	-0.30	2 (0%) 85 83	26, 54, 79, 113	1 (0%)
1	E	323/323 (100%)	-0.23	4 (1%) 76 73	40, 54, 85, 130	0
1	F	323/323 (100%)	-0.28	3 (0%) 81 78	36, 54, 83, 125	0
1	G	323/323 (100%)	-0.19	9 (2%) 55 49	37, 57, 90, 145	0
1	H	323/323 (100%)	-0.13	4 (1%) 76 73	42, 62, 93, 141	0
All	All	2584/2584 (100%)	-0.29	32 (1%) 76 73	24, 54, 85, 145	3 (0%)

The worst 5 of 32 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	323	LEU	3.0
1	G	63	LEU	3.0
1	D	1	MET	2.9
1	F	64	PRO	2.7
1	B	90	ARG	2.7

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
2	EDO	C	407	4/4	0.67	0.21	80,81,83,84	0
2	EDO	D	411	4/4	0.70	0.19	73,76,79,79	0
2	EDO	F	804	4/4	0.72	0.20	85,92,93,93	0
2	EDO	D	412	4/4	0.74	0.16	81,85,86,88	0
2	EDO	F	810	4/4	0.74	0.22	64,68,71,76	0
4	PGE	A	418	10/10	0.75	0.17	71,79,86,87	0
2	EDO	D	403	4/4	0.76	0.21	76,80,82,84	0
2	EDO	A	412	4/4	0.76	0.15	78,79,83,83	0
2	EDO	G	1008	4/4	0.77	0.14	61,62,62,66	0
3	PEG	A	419	7/7	0.78	0.17	83,86,89,91	0
2	EDO	B	1813	4/4	0.79	0.24	86,88,89,89	0
2	EDO	B	1812	4/4	0.80	0.21	67,73,74,74	0
5	PG4	E	403	13/13	0.80	0.15	60,80,92,93	0
5	PG4	D	404	13/13	0.81	0.17	72,83,88,89	0
2	EDO	F	803	4/4	0.81	0.17	78,80,83,84	0
2	EDO	C	408	4/4	0.82	0.14	67,68,69,70	0
2	EDO	H	1103	4/4	0.82	0.15	70,70,70,72	0
2	EDO	D	405	4/4	0.84	0.14	68,69,72,72	0
2	EDO	C	405	4/4	0.84	0.13	66,70,72,77	0
2	EDO	A	410	4/4	0.84	0.17	73,76,77,78	0
2	EDO	G	1007	4/4	0.85	0.15	71,72,72,74	0
3	PEG	B	1806	7/7	0.85	0.13	64,71,77,79	0
4	PGE	A	407	10/10	0.85	0.14	66,74,81,81	0
2	EDO	F	801	4/4	0.85	0.17	69,72,73,73	0
2	EDO	F	811	4/4	0.85	0.18	87,88,88,89	0
3	PEG	A	406	7/7	0.85	0.15	58,62,73,74	0
2	EDO	B	1809	4/4	0.86	0.15	67,68,69,69	0
3	PEG	F	807	7/7	0.86	0.13	71,83,88,90	0
2	EDO	F	806	4/4	0.86	0.15	63,67,68,72	0
2	EDO	A	401	4/4	0.86	0.13	51,54,55,57	0
2	EDO	C	410	4/4	0.86	0.15	58,62,64,65	0
2	EDO	F	812	4/4	0.86	0.11	34,34,34,34	0
2	EDO	B	1810	4/4	0.87	0.13	66,68,68,72	0
2	EDO	A	416	4/4	0.87	0.23	20,20,20,20	0
2	EDO	B	1808	4/4	0.87	0.13	41,43,45,47	0
2	EDO	A	414	4/4	0.87	0.13	62,65,65,65	0
3	PEG	C	401	7/7	0.87	0.16	74,83,87,91	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	EDO	C	406	4/4	0.88	0.12	50,51,56,57	0
2	EDO	H	1101	4/4	0.88	0.13	73,73,76,76	0
2	EDO	G	1005	4/4	0.88	0.14	70,70,71,71	0
2	EDO	A	413	4/4	0.88	0.11	62,63,66,66	0
2	EDO	A	405	4/4	0.89	0.14	66,68,70,71	0
2	EDO	F	813	4/4	0.89	0.25	20,20,20,20	0
2	EDO	D	407	4/4	0.89	0.13	53,55,59,59	0
2	EDO	G	1006	4/4	0.89	0.14	62,66,67,68	0
2	EDO	D	409	4/4	0.89	0.12	69,70,70,72	0
2	EDO	D	410	4/4	0.89	0.15	75,76,78,81	0
2	EDO	A	403	4/4	0.89	0.12	56,58,59,61	0
2	EDO	H	1102	4/4	0.89	0.12	45,49,50,52	0
2	EDO	A	411	4/4	0.89	0.12	50,53,53,55	0
2	EDO	C	403	4/4	0.90	0.14	57,58,58,59	0
2	EDO	E	401	4/4	0.90	0.12	60,63,65,65	0
2	EDO	E	404	4/4	0.90	0.09	54,59,59,62	0
2	EDO	G	1004	4/4	0.90	0.12	68,70,73,74	0
2	EDO	A	404	4/4	0.90	0.11	65,72,72,75	0
2	EDO	D	408	4/4	0.91	0.10	51,56,60,64	0
2	EDO	F	805	4/4	0.91	0.10	56,58,59,60	0
2	EDO	A	409	4/4	0.91	0.15	63,64,65,68	0
2	EDO	C	409	4/4	0.91	0.10	60,68,69,70	0
2	EDO	B	1805	4/4	0.92	0.11	47,48,49,49	0
2	EDO	B	1811	4/4	0.92	0.10	67,68,69,70	0
2	EDO	F	808	4/4	0.92	0.09	62,63,66,67	0
2	EDO	G	1010	4/4	0.92	0.10	56,56,57,58	0
6	CL	G	1011	1/1	0.92	0.14	85,85,85,85	0
2	EDO	G	1002	4/4	0.93	0.09	46,47,49,54	0
2	EDO	E	402	4/4	0.93	0.10	49,52,52,54	0
2	EDO	B	1801	4/4	0.93	0.12	60,62,66,71	0
2	EDO	B	1803	4/4	0.93	0.09	49,49,50,51	0
2	EDO	C	404	4/4	0.93	0.10	59,64,65,66	0
2	EDO	F	814	4/4	0.93	0.11	59,63,64,66	0
2	EDO	G	1009	4/4	0.93	0.25	20,20,20,20	0
2	EDO	A	415	4/4	0.94	0.12	20,20,20,20	0
2	EDO	D	401	4/4	0.94	0.11	48,50,53,56	0
2	EDO	F	802	4/4	0.94	0.10	51,53,55,57	0
2	EDO	A	402	4/4	0.94	0.08	42,43,44,45	0
2	EDO	H	1104	4/4	0.94	0.07	54,57,58,59	0
2	EDO	F	809	4/4	0.95	0.07	62,62,63,64	0
2	EDO	C	402	4/4	0.95	0.08	45,46,47,49	0
2	EDO	B	1802	4/4	0.95	0.08	37,41,42,43	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	EDO	B	1807	4/4	0.95	0.11	58,61,61,64	0
2	EDO	A	408	4/4	0.95	0.08	49,49,50,50	0
2	EDO	B	1804	4/4	0.95	0.08	48,50,51,55	0
2	EDO	D	402	4/4	0.95	0.08	51,52,54,58	0
2	EDO	F	815	4/4	0.96	0.08	64,65,66,67	0
2	EDO	D	406	4/4	0.96	0.08	58,60,60,61	0
2	EDO	G	1003	4/4	0.96	0.06	55,57,60,62	0
2	EDO	G	1001	4/4	0.97	0.07	55,58,60,65	0
2	EDO	E	405	4/4	0.97	0.05	46,46,46,48	0
2	EDO	A	417	4/4	0.98	0.04	35,36,38,39	0

6.5 Other polymers [i](#)

There are no such residues in this entry.