wwPDB X-ray Structure Validation Summary Report (i)

Jan 24, 2021 – 01:05 PM EST

PDB ID	:	2PGW
Title	:	Crystal structure of a putative muconate cycloisomerase from Sinorhizobium meliloti 1021
Authors	:	Kumaran, D.; Burley, S.K.; Swaminathan, S.; New York SGX Research Center for Structural Genomics (NYSGXRC)
Deposited on	:	2007-04-10
Resolution	:	1.95 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 following versions of software and data (see references (i)) were used in the production of this report:

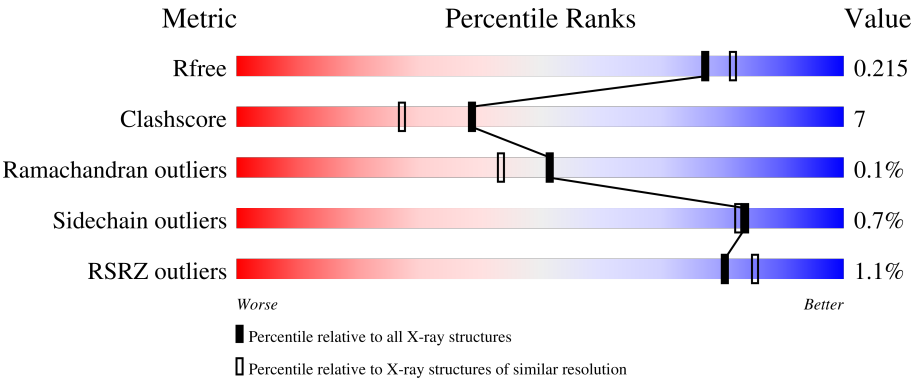
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.16
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.16

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 1.95 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}	130704	2580 (1.96-1.96)
Clashscore	141614	2705 (1.96-1.96)
Ramachandran outliers	138981	2678 (1.96-1.96)
Sidechain outliers	138945	2678 (1.96-1.96)
RSRZ outliers	127900	2539 (1.96-1.96)

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% 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	384	83% 14%
1	B	384	79% 17%
1	C	384	80% 17%
1	D	384	76% 21%
1	E	384	79% 17%

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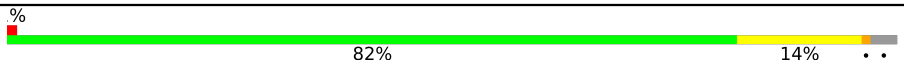
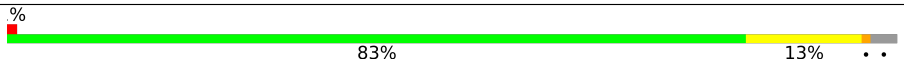
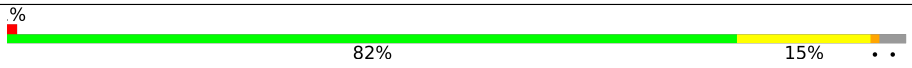
Mol	Chain	Length	Quality of chain
1	F	384	
1	G	384	
1	H	384	

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
2	GOL	A	2100	-	X	-	-
2	GOL	B	2200	-	X	-	-
2	GOL	C	2300	-	X	-	-
2	GOL	D	2400	-	X	-	-
2	GOL	E	2500	-	X	-	-
2	GOL	F	2600	-	X	-	-

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 24653 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 Muconate cycloisomerase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	371	Total	C	N	O	S	Se	0	0	0
			2859	1816	504	524	6	9			
1	B	372	Total	C	N	O	S	Se	0	0	0
			2865	1819	505	526	6	9			
1	C	375	Total	C	N	O	S	Se	0	0	0
			2889	1832	511	531	6	9			
1	D	372	Total	C	N	O	S	Se	0	0	0
			2865	1819	505	526	6	9			
1	E	372	Total	C	N	O	S	Se	0	0	0
			2865	1819	505	526	6	9			
1	F	372	Total	C	N	O	S	Se	0	0	0
			2865	1819	505	526	6	9			
1	G	372	Total	C	N	O	S	Se	0	0	0
			2865	1819	505	526	6	9			
1	H	372	Total	C	N	O	S	Se	0	0	0
			2865	1819	505	526	6	9			

There are 160 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	-	cloning artifact	UNP Q92YR6
A	2	SER	-	cloning artifact	UNP Q92YR6
A	3	LEU	-	cloning artifact	UNP Q92YR6
A	99	MSE	MET	modified residue	UNP Q92YR6
A	111	MSE	MET	modified residue	UNP Q92YR6
A	113	MSE	MET	modified residue	UNP Q92YR6
A	209	MSE	MET	modified residue	UNP Q92YR6
A	233	MSE	MET	modified residue	UNP Q92YR6
A	267	MSE	MET	modified residue	UNP Q92YR6
A	281	MSE	MET	modified residue	UNP Q92YR6
A	282	MSE	MET	modified residue	UNP Q92YR6
A	327	MSE	MET	modified residue	UNP Q92YR6
A	377	GLU	-	cloning artifact	UNP Q92YR6

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Chain	Residue	Modelled	Actual	Comment	Reference
A	378	GLY	-	cloning artifact	UNP Q92YR6
A	379	HIS	-	cloning artifact	UNP Q92YR6
A	380	HIS	-	cloning artifact	UNP Q92YR6
A	381	HIS	-	cloning artifact	UNP Q92YR6
A	382	HIS	-	cloning artifact	UNP Q92YR6
A	383	HIS	-	cloning artifact	UNP Q92YR6
A	384	HIS	-	cloning artifact	UNP Q92YR6
B	1	MSE	-	cloning artifact	UNP Q92YR6
B	2	SER	-	cloning artifact	UNP Q92YR6
B	3	LEU	-	cloning artifact	UNP Q92YR6
B	99	MSE	MET	modified residue	UNP Q92YR6
B	111	MSE	MET	modified residue	UNP Q92YR6
B	113	MSE	MET	modified residue	UNP Q92YR6
B	209	MSE	MET	modified residue	UNP Q92YR6
B	233	MSE	MET	modified residue	UNP Q92YR6
B	267	MSE	MET	modified residue	UNP Q92YR6
B	281	MSE	MET	modified residue	UNP Q92YR6
B	282	MSE	MET	modified residue	UNP Q92YR6
B	327	MSE	MET	modified residue	UNP Q92YR6
B	377	GLU	-	cloning artifact	UNP Q92YR6
B	378	GLY	-	cloning artifact	UNP Q92YR6
B	379	HIS	-	cloning artifact	UNP Q92YR6
B	380	HIS	-	cloning artifact	UNP Q92YR6
B	381	HIS	-	cloning artifact	UNP Q92YR6
B	382	HIS	-	cloning artifact	UNP Q92YR6
B	383	HIS	-	cloning artifact	UNP Q92YR6
B	384	HIS	-	cloning artifact	UNP Q92YR6
C	1	MSE	-	cloning artifact	UNP Q92YR6
C	2	SER	-	cloning artifact	UNP Q92YR6
C	3	LEU	-	cloning artifact	UNP Q92YR6
C	99	MSE	MET	modified residue	UNP Q92YR6
C	111	MSE	MET	modified residue	UNP Q92YR6
C	113	MSE	MET	modified residue	UNP Q92YR6
C	209	MSE	MET	modified residue	UNP Q92YR6
C	233	MSE	MET	modified residue	UNP Q92YR6
C	267	MSE	MET	modified residue	UNP Q92YR6
C	281	MSE	MET	modified residue	UNP Q92YR6
C	282	MSE	MET	modified residue	UNP Q92YR6
C	327	MSE	MET	modified residue	UNP Q92YR6
C	377	GLU	-	cloning artifact	UNP Q92YR6
C	378	GLY	-	cloning artifact	UNP Q92YR6
C	379	HIS	-	cloning artifact	UNP Q92YR6

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Chain	Residue	Modelled	Actual	Comment	Reference
C	380	HIS	-	cloning artifact	UNP Q92YR6
C	381	HIS	-	cloning artifact	UNP Q92YR6
C	382	HIS	-	cloning artifact	UNP Q92YR6
C	383	HIS	-	cloning artifact	UNP Q92YR6
C	384	HIS	-	cloning artifact	UNP Q92YR6
D	1	MSE	-	cloning artifact	UNP Q92YR6
D	2	SER	-	cloning artifact	UNP Q92YR6
D	3	LEU	-	cloning artifact	UNP Q92YR6
D	99	MSE	MET	modified residue	UNP Q92YR6
D	111	MSE	MET	modified residue	UNP Q92YR6
D	113	MSE	MET	modified residue	UNP Q92YR6
D	209	MSE	MET	modified residue	UNP Q92YR6
D	233	MSE	MET	modified residue	UNP Q92YR6
D	267	MSE	MET	modified residue	UNP Q92YR6
D	281	MSE	MET	modified residue	UNP Q92YR6
D	282	MSE	MET	modified residue	UNP Q92YR6
D	327	MSE	MET	modified residue	UNP Q92YR6
D	377	GLU	-	cloning artifact	UNP Q92YR6
D	378	GLY	-	cloning artifact	UNP Q92YR6
D	379	HIS	-	cloning artifact	UNP Q92YR6
D	380	HIS	-	cloning artifact	UNP Q92YR6
D	381	HIS	-	cloning artifact	UNP Q92YR6
D	382	HIS	-	cloning artifact	UNP Q92YR6
D	383	HIS	-	cloning artifact	UNP Q92YR6
D	384	HIS	-	cloning artifact	UNP Q92YR6
E	1	MSE	-	cloning artifact	UNP Q92YR6
E	2	SER	-	cloning artifact	UNP Q92YR6
E	3	LEU	-	cloning artifact	UNP Q92YR6
E	99	MSE	MET	modified residue	UNP Q92YR6
E	111	MSE	MET	modified residue	UNP Q92YR6
E	113	MSE	MET	modified residue	UNP Q92YR6
E	209	MSE	MET	modified residue	UNP Q92YR6
E	233	MSE	MET	modified residue	UNP Q92YR6
E	267	MSE	MET	modified residue	UNP Q92YR6
E	281	MSE	MET	modified residue	UNP Q92YR6
E	282	MSE	MET	modified residue	UNP Q92YR6
E	327	MSE	MET	modified residue	UNP Q92YR6
E	377	GLU	-	cloning artifact	UNP Q92YR6
E	378	GLY	-	cloning artifact	UNP Q92YR6
E	379	HIS	-	cloning artifact	UNP Q92YR6
E	380	HIS	-	cloning artifact	UNP Q92YR6
E	381	HIS	-	cloning artifact	UNP Q92YR6

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Chain	Residue	Modelled	Actual	Comment	Reference
E	382	HIS	-	cloning artifact	UNP Q92YR6
E	383	HIS	-	cloning artifact	UNP Q92YR6
E	384	HIS	-	cloning artifact	UNP Q92YR6
F	1	MSE	-	cloning artifact	UNP Q92YR6
F	2	SER	-	cloning artifact	UNP Q92YR6
F	3	LEU	-	cloning artifact	UNP Q92YR6
F	99	MSE	MET	modified residue	UNP Q92YR6
F	111	MSE	MET	modified residue	UNP Q92YR6
F	113	MSE	MET	modified residue	UNP Q92YR6
F	209	MSE	MET	modified residue	UNP Q92YR6
F	233	MSE	MET	modified residue	UNP Q92YR6
F	267	MSE	MET	modified residue	UNP Q92YR6
F	281	MSE	MET	modified residue	UNP Q92YR6
F	282	MSE	MET	modified residue	UNP Q92YR6
F	327	MSE	MET	modified residue	UNP Q92YR6
F	377	GLU	-	cloning artifact	UNP Q92YR6
F	378	GLY	-	cloning artifact	UNP Q92YR6
F	379	HIS	-	cloning artifact	UNP Q92YR6
F	380	HIS	-	cloning artifact	UNP Q92YR6
F	381	HIS	-	cloning artifact	UNP Q92YR6
F	382	HIS	-	cloning artifact	UNP Q92YR6
F	383	HIS	-	cloning artifact	UNP Q92YR6
F	384	HIS	-	cloning artifact	UNP Q92YR6
G	1	MSE	-	cloning artifact	UNP Q92YR6
G	2	SER	-	cloning artifact	UNP Q92YR6
G	3	LEU	-	cloning artifact	UNP Q92YR6
G	99	MSE	MET	modified residue	UNP Q92YR6
G	111	MSE	MET	modified residue	UNP Q92YR6
G	113	MSE	MET	modified residue	UNP Q92YR6
G	209	MSE	MET	modified residue	UNP Q92YR6
G	233	MSE	MET	modified residue	UNP Q92YR6
G	267	MSE	MET	modified residue	UNP Q92YR6
G	281	MSE	MET	modified residue	UNP Q92YR6
G	282	MSE	MET	modified residue	UNP Q92YR6
G	327	MSE	MET	modified residue	UNP Q92YR6
G	377	GLU	-	cloning artifact	UNP Q92YR6
G	378	GLY	-	cloning artifact	UNP Q92YR6
G	379	HIS	-	cloning artifact	UNP Q92YR6
G	380	HIS	-	cloning artifact	UNP Q92YR6
G	381	HIS	-	cloning artifact	UNP Q92YR6
G	382	HIS	-	cloning artifact	UNP Q92YR6
G	383	HIS	-	cloning artifact	UNP Q92YR6

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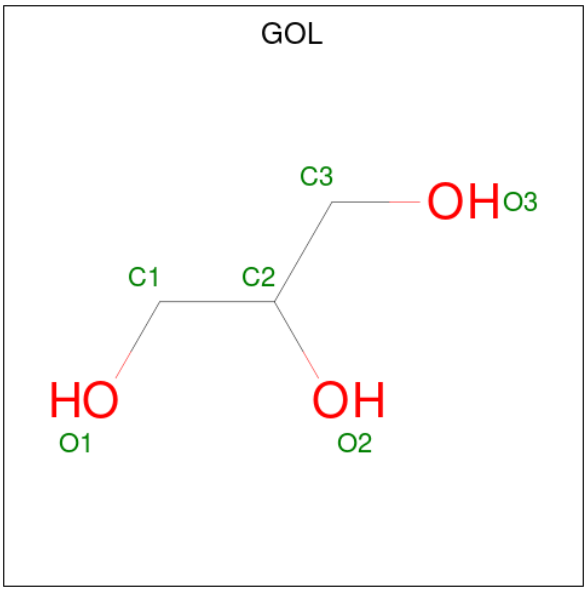
Chain	Residue	Modelled	Actual	Comment	Reference
G	384	HIS	-	cloning artifact	UNP Q92YR6
H	1	MSE	-	cloning artifact	UNP Q92YR6
H	2	SER	-	cloning artifact	UNP Q92YR6
H	3	LEU	-	cloning artifact	UNP Q92YR6
H	99	MSE	MET	modified residue	UNP Q92YR6
H	111	MSE	MET	modified residue	UNP Q92YR6
H	113	MSE	MET	modified residue	UNP Q92YR6
H	209	MSE	MET	modified residue	UNP Q92YR6
H	233	MSE	MET	modified residue	UNP Q92YR6
H	267	MSE	MET	modified residue	UNP Q92YR6
H	281	MSE	MET	modified residue	UNP Q92YR6
H	282	MSE	MET	modified residue	UNP Q92YR6
H	327	MSE	MET	modified residue	UNP Q92YR6
H	377	GLU	-	cloning artifact	UNP Q92YR6
H	378	GLY	-	cloning artifact	UNP Q92YR6
H	379	HIS	-	cloning artifact	UNP Q92YR6
H	380	HIS	-	cloning artifact	UNP Q92YR6
H	381	HIS	-	cloning artifact	UNP Q92YR6
H	382	HIS	-	cloning artifact	UNP Q92YR6
H	383	HIS	-	cloning artifact	UNP Q92YR6
H	384	HIS	-	cloning artifact	UNP Q92YR6

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	A	1	6	3	3	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total C O 6 3 3	0	0
2	C	1	Total C O 6 3 3	0	0
2	D	1	Total C O 6 3 3	0	0
2	E	1	Total C O 6 3 3	0	0
2	F	1	Total C O 6 3 3	0	0

- Molecule 3 is water.

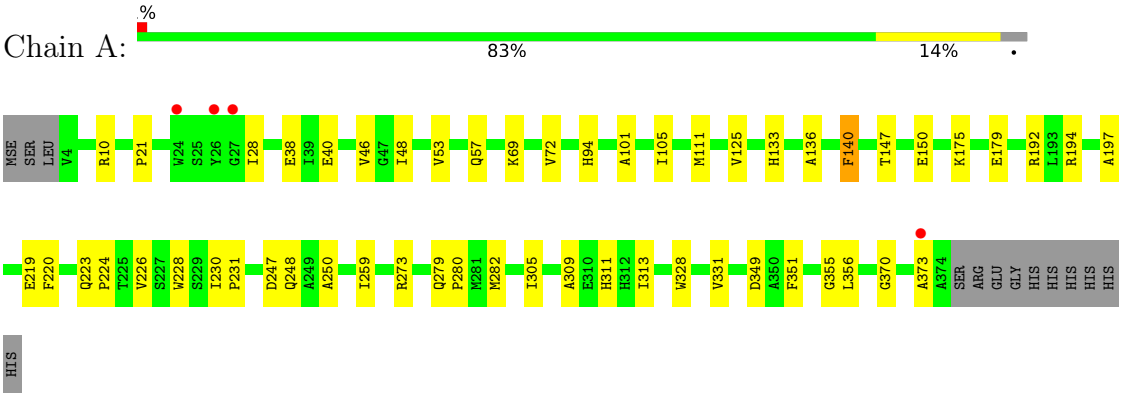
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	191	Total O 191 191	0	0
3	B	211	Total O 211 211	0	0
3	C	226	Total O 226 226	0	0
3	D	219	Total O 219 219	0	0
3	E	185	Total O 185 185	0	0
3	F	210	Total O 210 210	0	0
3	G	212	Total O 212 212	0	0
3	H	225	Total O 225 225	0	0

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.

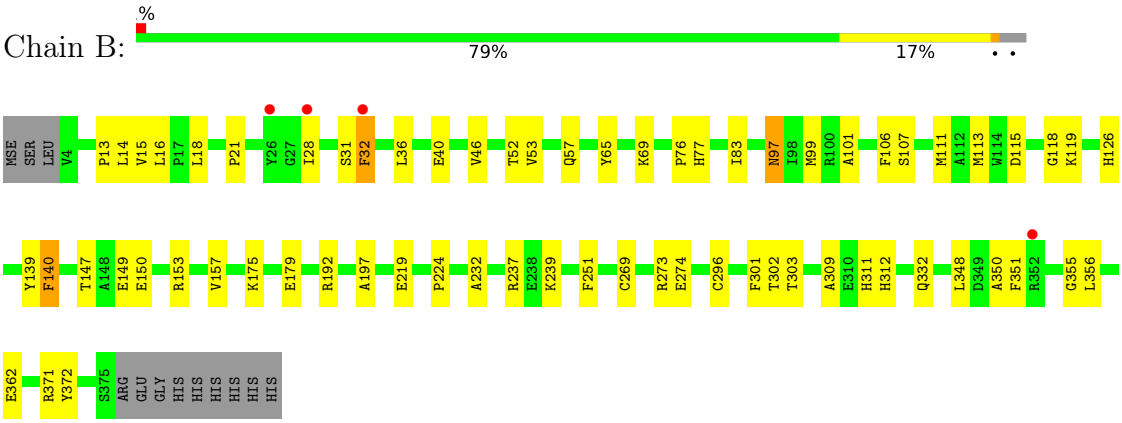
• Molecule 1: Muconate cycloisomerase

Chain A:



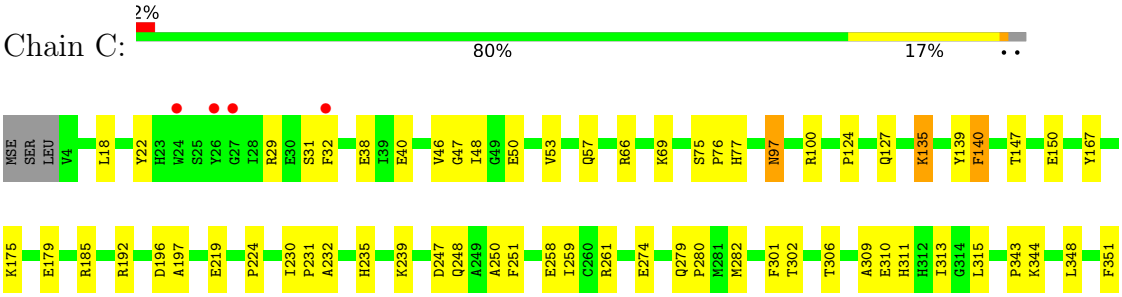
• Molecule 1: Muconate cycloisomerase

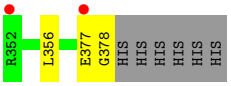
Chain B:



• Molecule 1: Muconate cycloisomerase

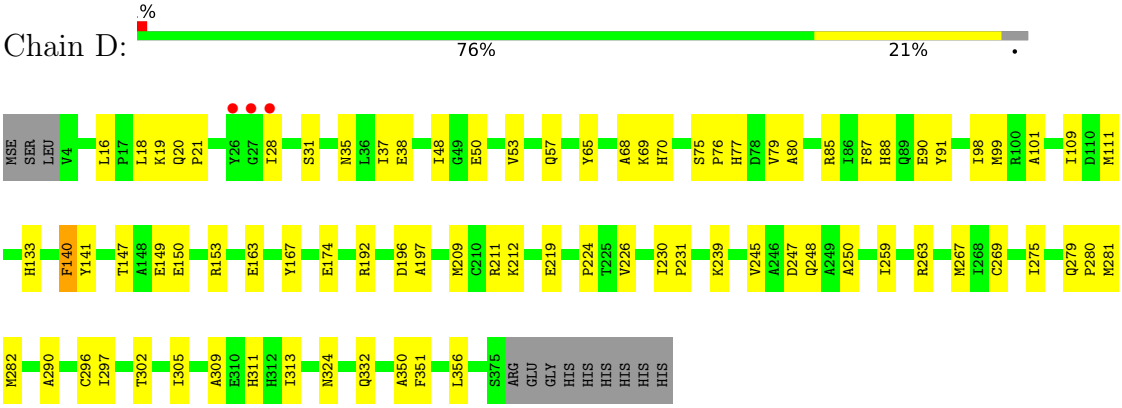
Chain C:





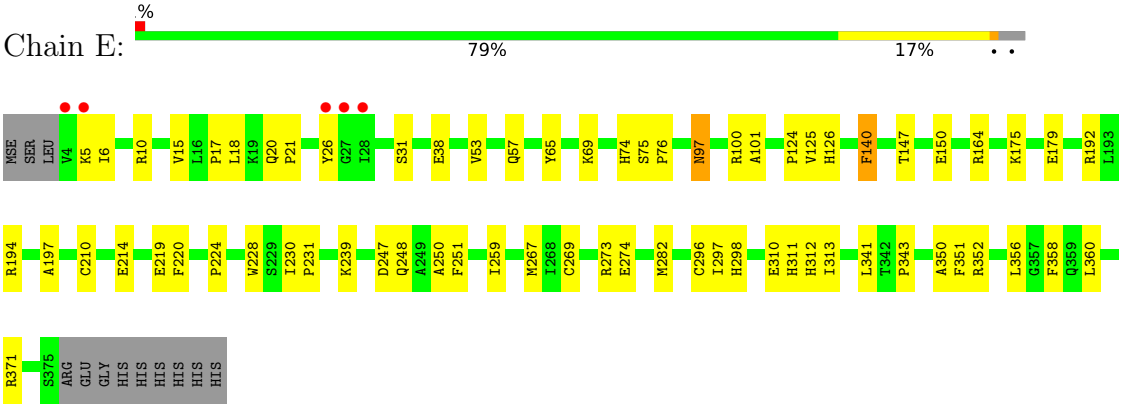
• Molecule 1: Muconate cycloisomerase

Chain D:



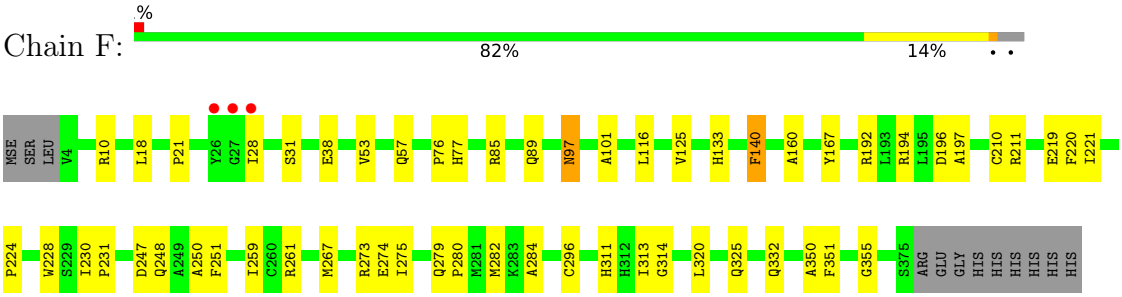
• Molecule 1: Muconate cycloisomerase

Chain E:



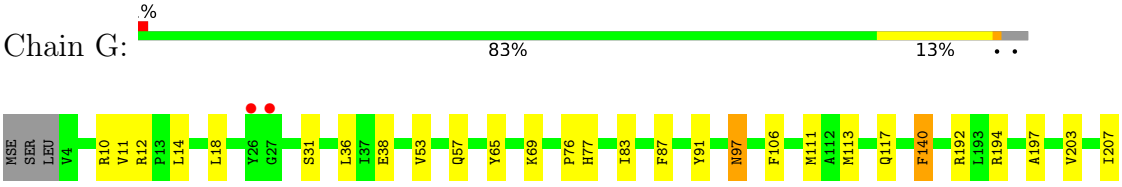
• Molecule 1: Muconate cycloisomerase

Chain F:



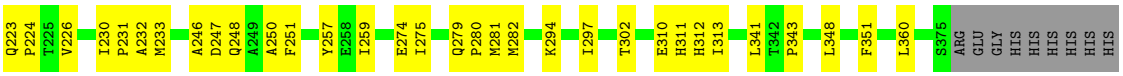
• Molecule 1: Muconate cycloisomerase

Chain G:



- Molecule 1: Muconate cycloisomerase

Chain H:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	85.31Å 178.14Å 115.18Å 90.00° 106.20° 90.00°	Depositor
Resolution (Å)	48.89 – 1.95 48.89 – 1.87	Depositor EDS
% Data completeness (in resolution range)	95.5 (48.89-1.95) 90.3 (48.89-1.87)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.11	Depositor
$< I/\sigma(I) >$ [1]	1.77 (at 1.87Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.196 , 0.215 0.196 , 0.215	Depositor DCC
R_{free} test set	11367 reflections (4.48%)	wwPDB-VP
Wilson B-factor (Å^2)	13.8	Xtriage
Anisotropy	0.196	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 40.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	24653	wwPDB-VP
Average B, all atoms (Å^2)	17.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.37% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GOL

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	0.35	0/2913	0.59	0/3937
1	B	0.36	0/2919	0.59	0/3945
1	C	0.36	0/2943	0.60	0/3976
1	D	0.36	0/2919	0.60	0/3945
1	E	0.34	0/2919	0.60	0/3945
1	F	0.36	0/2919	0.59	0/3945
1	G	0.35	0/2919	0.60	0/3945
1	H	0.36	0/2919	0.60	0/3945
All	All	0.36	0/23370	0.60	0/31583

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

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	2859	0	2835	37	0
1	B	2865	0	2840	49	0
1	C	2889	0	2862	46	0
1	D	2865	0	2840	61	0
1	E	2865	0	2840	45	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	F	2865	0	2840	40	0
1	G	2865	0	2840	37	0
1	H	2865	0	2840	38	0
2	A	6	0	4	0	0
2	B	6	0	4	1	0
2	C	6	0	4	0	0
2	D	6	0	4	0	0
2	E	6	0	4	0	0
2	F	6	0	4	0	0
3	A	191	0	0	4	0
3	B	211	0	0	7	0
3	C	226	0	0	6	0
3	D	219	0	0	6	0
3	E	185	0	0	6	0
3	F	210	0	0	8	0
3	G	212	0	0	3	0
3	H	225	0	0	3	0
All	All	24653	0	22761	342	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 7.

The worst 5 of 342 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:111:MSE:HE1	1:D:305:ILE:HG22	1.37	1.03
1:G:111:MSE:HE1	1:G:305:ILE:HG22	1.40	1.01
1:A:111:MSE:HE1	1:A:305:ILE:HG22	1.40	1.01
1:G:111:MSE:HE3	1:G:309:ALA:HB2	1.45	0.97
1:D:297:ILE:H	1:D:324:ASN:HD22	1.10	0.95

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	369/384 (96%)	356 (96%)	13 (4%)	0	100 100
1	B	370/384 (96%)	355 (96%)	15 (4%)	0	100 100
1	C	373/384 (97%)	362 (97%)	11 (3%)	0	100 100
1	D	370/384 (96%)	355 (96%)	15 (4%)	0	100 100
1	E	370/384 (96%)	354 (96%)	14 (4%)	2 (0%)	29 17
1	F	370/384 (96%)	360 (97%)	10 (3%)	0	100 100
1	G	370/384 (96%)	357 (96%)	13 (4%)	0	100 100
1	H	370/384 (96%)	358 (97%)	12 (3%)	0	100 100
All	All	2962/3072 (96%)	2857 (96%)	103 (4%)	2 (0%)	51 43

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	6	ILE
1	E	5	LYS

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	Percentiles
1	A	291/293 (99%)	290 (100%)	1 (0%)	92 92
1	B	292/293 (100%)	289 (99%)	3 (1%)	76 74
1	C	294/293 (100%)	290 (99%)	4 (1%)	67 62
1	D	292/293 (100%)	291 (100%)	1 (0%)	92 92
1	E	292/293 (100%)	290 (99%)	2 (1%)	84 82
1	F	292/293 (100%)	290 (99%)	2 (1%)	84 82
1	G	292/293 (100%)	290 (99%)	2 (1%)	84 82
1	H	292/293 (100%)	290 (99%)	2 (1%)	84 82

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	2337/2344 (100%)	2320 (99%)	17 (1%)	84 82

5 of 17 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	239	LYS
1	D	140	PHE
1	G	97	ASN
1	C	140	PHE
1	G	140	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 59 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	77	HIS
1	D	324	ASN
1	H	94	HIS
1	D	94	HIS
1	D	133	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

6 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	E	2500	-	5,5,5	4.48	5 (100%)	5,5,5	5.68	3 (60%)
2	GOL	A	2100	-	5,5,5	4.33	5 (100%)	5,5,5	5.74	3 (60%)
2	GOL	F	2600	-	5,5,5	4.37	5 (100%)	5,5,5	5.72	3 (60%)
2	GOL	B	2200	-	5,5,5	4.41	5 (100%)	5,5,5	5.73	3 (60%)
2	GOL	D	2400	-	5,5,5	4.37	5 (100%)	5,5,5	5.76	3 (60%)
2	GOL	C	2300	-	5,5,5	4.37	5 (100%)	5,5,5	5.70	3 (60%)

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	E	2500	-	-	3/4/4/4	-
2	GOL	A	2100	-	-	3/4/4/4	-
2	GOL	F	2600	-	-	3/4/4/4	-
2	GOL	B	2200	-	-	3/4/4/4	-
2	GOL	D	2400	-	-	3/4/4/4	-
2	GOL	C	2300	-	-	3/4/4/4	-

The worst 5 of 30 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2200	GOL	C3-C2	-8.00	1.18	1.51
2	E	2500	GOL	C3-C2	-7.97	1.18	1.51
2	F	2600	GOL	C3-C2	-7.77	1.19	1.51
2	D	2400	GOL	C3-C2	-7.71	1.20	1.51
2	C	2300	GOL	C3-C2	-7.70	1.20	1.51

The worst 5 of 18 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	2400	GOL	O3-C3-C2	10.27	159.46	110.20
2	B	2200	GOL	O3-C3-C2	10.20	159.13	110.20
2	A	2100	GOL	O3-C3-C2	10.19	159.07	110.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	2300	GOL	O3-C3-C2	10.18	159.00	110.20
2	F	2600	GOL	O3-C3-C2	10.17	158.97	110.20

There are no chirality outliers.

5 of 18 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	2200	GOL	C1-C2-C3-O3
2	E	2500	GOL	C1-C2-C3-O3
2	D	2400	GOL	C1-C2-C3-O3
2	A	2100	GOL	C1-C2-C3-O3
2	F	2600	GOL	C1-C2-C3-O3

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	2200	GOL	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

6.1 Protein, DNA and RNA chains

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, 95^{th} 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	362/384 (94%)	-0.13	4 (1%)	80	85	6, 18, 30, 42	0
1	B	363/384 (94%)	-0.15	4 (1%)	80	85	7, 16, 30, 41	0
1	C	366/384 (95%)	-0.38	6 (1%)	72	79	6, 14, 31, 47	0
1	D	363/384 (94%)	-0.20	3 (0%)	86	90	6, 17, 29, 40	0
1	E	363/384 (94%)	-0.07	5 (1%)	75	82	7, 18, 34, 43	0
1	F	363/384 (94%)	-0.21	3 (0%)	86	90	5, 15, 29, 42	0
1	G	363/384 (94%)	-0.25	2 (0%)	89	93	7, 18, 30, 43	0
1	H	363/384 (94%)	-0.34	4 (1%)	80	85	6, 14, 28, 40	0
All	All	2906/3072 (94%)	-0.22	31 (1%)	80	85	5, 16, 30, 47	0

The worst 5 of 31 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	28	ILE	4.6
1	E	5	LYS	4.5
1	B	26	TYR	4.4
1	A	26	TYR	4.2
1	A	27	GLY	4.2

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

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

6.3 Carbohydrates

There are no monosaccharides 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, 95^{th} 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	GOL	F	2600	6/6	0.83	0.13	19,22,23,23	0
2	GOL	E	2500	6/6	0.84	0.15	19,21,22,23	0
2	GOL	C	2300	6/6	0.87	0.15	21,21,22,23	0
2	GOL	D	2400	6/6	0.90	0.14	19,22,22,22	0
2	GOL	A	2100	6/6	0.90	0.13	20,21,22,22	0
2	GOL	B	2200	6/6	0.91	0.10	19,21,23,24	0

6.5 Other polymers

There are no such residues in this entry.