



# Full wwPDB X-ray Structure Validation Report ⓘ

May 29, 2020 – 08:08 am BST

PDB ID : 5OU5  
Title : Crystal structure of maize chloroplastic photosynthetic NADP(+)-dependent malic enzyme  
Authors : Bovdilova, A.; Hoepfner, A.; Maurino, V.G.  
Deposited on : 2017-08-23  
Resolution : 2.20 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](mailto: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.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Xtriage (Phenix) : 1.13  
EDS : 2.11  
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) : 2.11

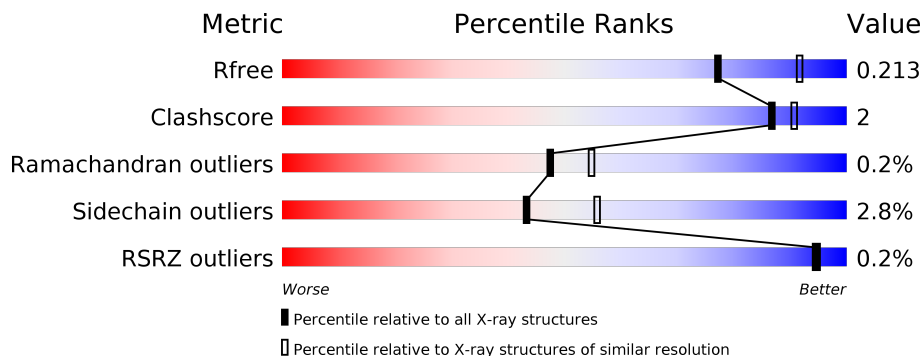
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*





The reported resolution of this entry is 2.20 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	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	576	 90% 5% . .
1	B	576	 91% 6% . .
1	C	576	 90% 6% . .
1	D	576	 88% 8% . .

## 2 Entry composition i

There are 4 unique types of molecules in this entry. The entry contains 18246 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 Malic enzyme.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	553	4348	2795	729	806	18	0	9	0
1	B	566	4424	2839	737	828	20	0	11	0
1	C	557	4346	2791	719	817	19	0	7	0
1	D	554	4382	2813	735	815	19	0	13	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	61	HIS	-	expression tag	UNP B4F8P6
B	61	HIS	-	expression tag	UNP B4F8P6
C	61	HIS	-	expression tag	UNP B4F8P6
D	61	HIS	-	expression tag	UNP B4F8P6

- Molecule 2 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	5	Total	Na	0	0
			5	5		
2	A	3	Total	Na	0	0
			3	3		
2	D	3	Total	Na	0	0
			3	3		
2	C	5	Total	Na	0	0
			5	5		

- Molecule 3 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total K 1 1	0	0


- Molecule 4 is water.

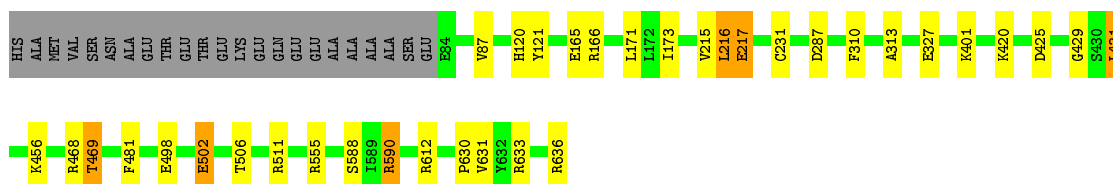
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	204	Total O 204 204	0	0
4	B	144	Total O 144 144	0	0
4	C	164	Total O 164 164	0	0
4	D	217	Total O 217 217	0	0

### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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.

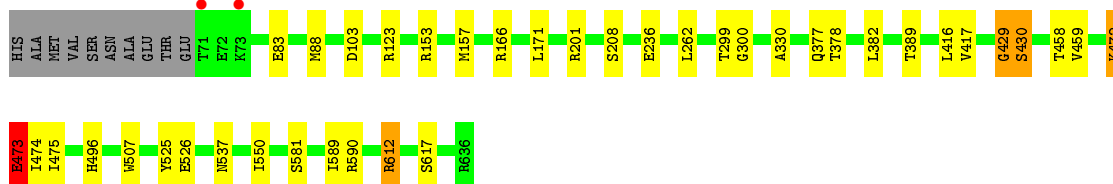
- Molecule 1: Malic enzyme

Chain A: 




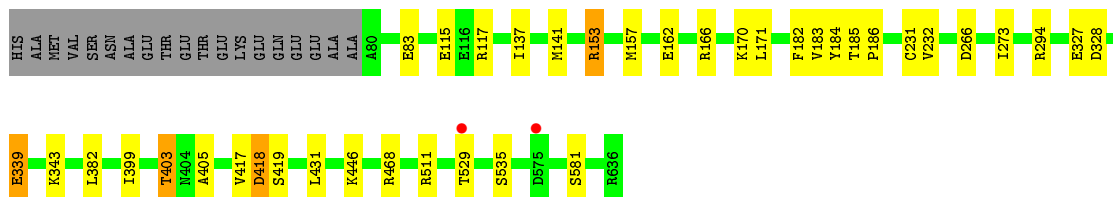
- Molecule 1: Malic enzyme

Chain B: 



- Molecule 1: Malic enzyme

Chain C: 



- Molecule 1: Malic enzyme

Chain D: 





## 4 Data and refinement statistics

Property	Value	Source
Space group	I 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	135.96Å 147.16Å 261.62Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.88 – 2.20 48.88 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.5 (48.88-2.20) 99.5 (48.88-2.20)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.77 (at 2.20Å)	Xtrriage
Refinement program	REFMAC 5.8.0131	Depositor
R, $R_{free}$	0.160 , 0.211 0.168 , 0.213	Depositor DCC
$R_{free}$ test set	6725 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	36.7	Xtrriage
Anisotropy	0.027	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 29.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	18246	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	40.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.51% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: NA, K

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	0.92	3/4472 (0.1%)	0.95	7/6063 (0.1%)
1	B	0.88	0/4554	0.90	8/6183 (0.1%)
1	C	0.90	4/4463 (0.1%)	0.92	12/6060 (0.2%)
1	D	0.91	1/4518 (0.0%)	0.95	13/6125 (0.2%)
All	All	0.90	8/18007 (0.0%)	0.93	40/24431 (0.2%)

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
1	C	0	1
All	All	0	3

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	217[A]	GLU	CA-C	6.28	1.69	1.52
1	A	217[B]	GLU	CA-C	6.28	1.69	1.52
1	C	183[A]	VAL	CA-C	6.07	1.68	1.52
1	C	183[B]	VAL	CA-C	6.07	1.68	1.52
1	D	231	CYS	CB-SG	-5.58	1.72	1.81
1	C	162	GLU	CG-CD	5.51	1.60	1.51
1	C	328	ASP	CB-CG	5.48	1.63	1.51
1	A	166	ARG	CZ-NH1	5.08	1.39	1.33

All (40) bond angle outliers are listed below:



Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	511	ARG	NE-CZ-NH1	-13.81	113.39	120.30
1	D	511	ARG	NE-CZ-NH2	11.46	126.03	120.30
1	B	201	ARG	NE-CZ-NH1	8.86	124.73	120.30
1	B	590	ARG	NE-CZ-NH2	-8.51	116.05	120.30
1	C	184	TYR	C-N-CA	8.47	142.88	121.70
1	A	166	ARG	NE-CZ-NH2	-8.34	116.13	120.30
1	C	166	ARG	NE-CZ-NH2	-8.32	116.14	120.30
1	A	287	ASP	CB-CG-OD1	7.86	125.37	118.30
1	C	166	ARG	NE-CZ-NH1	7.82	124.21	120.30
1	A	511	ARG	NE-CZ-NH2	-7.12	116.74	120.30
1	D	123	ARG	NE-CZ-NH1	7.08	123.84	120.30
1	A	590	ARG	NE-CZ-NH1	6.84	123.72	120.30
1	A	511	ARG	NE-CZ-NH1	6.36	123.48	120.30
1	D	287	ASP	CB-CG-OD1	6.35	124.01	118.30
1	C	117	ARG	NE-CZ-NH2	-6.30	117.15	120.30
1	D	153	ARG	NE-CZ-NH1	6.26	123.43	120.30
1	A	431	LEU	CA-CB-CG	6.26	129.69	115.30
1	D	297	ARG	CG-CD-NE	-6.20	98.77	111.80
1	A	555	ARG	NE-CZ-NH2	-6.20	117.20	120.30
1	C	328	ASP	CB-CG-OD1	6.15	123.84	118.30
1	B	473	GLU	N-CA-C	-6.14	94.43	111.00
1	D	590	ARG	NE-CZ-NH2	-6.05	117.28	120.30
1	D	304	ASP	CB-CG-OD1	5.88	123.59	118.30
1	B	166	ARG	NE-CZ-NH2	-5.87	117.36	120.30
1	C	153	ARG	NE-CZ-NH1	5.78	123.19	120.30
1	B	201	ARG	NE-CZ-NH2	-5.75	117.42	120.30
1	B	590	ARG	NE-CZ-NH1	5.72	123.16	120.30
1	B	166	ARG	NE-CZ-NH1	5.68	123.14	120.30
1	C	511	ARG	NE-CZ-NH1	5.64	123.12	120.30
1	C	153	ARG	NE-CZ-NH2	-5.61	117.50	120.30
1	D	511	ARG	CD-NE-CZ	5.38	131.12	123.60
1	D	85	LEU	CA-CB-CG	5.37	127.66	115.30
1	D	276	ASP	CB-CG-OD1	5.37	123.14	118.30
1	D	153	ARG	NE-CZ-NH2	-5.33	117.64	120.30
1	C	418	ASP	CB-CA-C	-5.30	99.80	110.40
1	C	294	ARG	NE-CZ-NH1	5.24	122.92	120.30
1	B	103	ASP	CB-CG-OD1	5.19	122.97	118.30
1	C	266	ASP	CB-CG-OD1	5.18	122.96	118.30
1	C	468	ARG	NE-CZ-NH1	5.09	122.85	120.30
1	D	555	ARG	NE-CZ-NH1	5.04	122.82	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	217[A]	GLU	Mainchain
1	B	429	GLY	Peptide
1	C	185[B]	THR	Mainchain

## 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	4348	0	4391	19	0
1	B	4424	0	4437	20	0
1	C	4346	0	4363	14	0
1	D	4382	0	4425	23	0
2	A	3	0	0	0	0
2	B	5	0	0	0	0
2	C	5	0	0	0	0
2	D	3	0	0	0	0
3	A	1	0	0	0	0
4	A	204	0	0	2	0
4	B	144	0	0	0	0
4	C	164	0	0	0	0
4	D	217	0	0	2	0
All	All	18246	0	17616	73	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 2.

All (73) 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:287:ASP:O	1:D:294:ARG:NH2	1.67	1.25
1:D:468[A]:ARG:HH11	1:D:468[A]:ARG:HG2	1.05	1.19
1:A:468[B]:ARG:HH11	1:A:468[B]:ARG:HG3	1.19	0.99
1:D:220[A]:ARG:NH1	4:D:801:HOH:O	2.01	0.94
1:D:468[A]:ARG:HH11	1:D:468[A]:ARG:CG	1.82	0.92
1:A:468[B]:ARG:NH1	1:A:468[B]:ARG:HG3	1.80	0.88
1:D:468[A]:ARG:NH1	1:D:468[A]:ARG:HG2	1.88	0.82
1:D:370:VAL:HG11	1:D:513:ILE:HD11	1.63	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:468[B]:ARG:HH11	1:A:468[B]:ARG:CG	1.94	0.80
1:D:159:ASN:O	1:D:163[B]:THR:HG22	1.83	0.78
1:B:472:LYS:CA	1:B:473:GLU:HB2	2.14	0.77
1:A:633[B]:ARG:NE	1:A:633[B]:ARG:HA	2.01	0.76
1:B:458:THR:HG23	1:B:459:VAL:HG23	1.67	0.74
1:B:377:GLN:OE1	1:B:458:THR:HG21	1.91	0.71
1:B:472:LYS:HB3	1:B:473:GLU:HB2	1.74	0.68
1:A:633[B]:ARG:CA	1:A:633[B]:ARG:NE	2.59	0.65
1:B:472:LYS:CB	1:B:473:GLU:HB2	2.27	0.65
1:D:403:THR:O	1:D:404:ASN:HB2	1.97	0.62
1:A:633[B]:ARG:NH1	1:C:83:GLU:O	2.27	0.61
1:C:399:ILE:O	1:C:403:THR:HB	2.01	0.60
1:B:262:LEU:HD22	1:B:589:ILE:HG21	1.84	0.59
1:B:472:LYS:HA	1:B:507:TRP:CE3	2.37	0.59
1:D:468[A]:ARG:NH1	1:D:468[A]:ARG:CG	2.51	0.57
1:C:339:GLU:O	1:C:343:LYS:HE2	2.04	0.57
1:B:472:LYS:N	1:B:473:GLU:HB2	2.19	0.56
1:B:475:ILE:HD13	1:B:507:TRP:HE3	1.71	0.56
1:A:633[B]:ARG:NE	4:A:804:HOH:O	2.41	0.54
1:D:114:GLU:OE1	1:D:123:ARG:NH2	2.44	0.51
1:C:231[A]:CYS:SG	1:C:327:GLU:HG3	2.50	0.51
1:B:153:ARG:O	1:B:157[B]:MET:HG3	2.11	0.51
1:C:403:THR:HG22	1:C:405:ALA:H	1.76	0.51
1:D:216:LEU:HD13	1:D:313:ALA:HB1	1.92	0.51
1:A:216:LEU:HD13	1:A:313:ALA:HB1	1.92	0.51
1:D:331:ASN:HB3	1:D:386:GLU:OE2	2.10	0.50
1:A:469:THR:HG22	1:A:498:GLU:HG3	1.93	0.49
1:A:633[B]:ARG:HA	1:A:633[B]:ARG:CZ	2.41	0.49
1:A:502:GLU:O	1:A:506:THR:HG23	2.12	0.49
1:C:382:LEU:HD12	1:C:417:VAL:HG22	1.95	0.49
1:D:203:GLN:NE2	4:D:808:HOH:O	2.46	0.48
1:B:550:ILE:O	1:B:612[A]:ARG:HG2	2.14	0.47
1:A:456:LYS:HE3	1:A:481:PHE:CD2	2.49	0.47
1:A:633[B]:ARG:CZ	4:A:804:HOH:O	2.63	0.46
1:B:472:LYS:CA	1:B:473:GLU:CB	2.91	0.46
1:D:468[B]:ARG:NH1	1:D:497:SER:O	2.48	0.46
1:B:525:TYR:CE1	1:B:526:GLU:HG3	2.51	0.46
1:C:157[B]:MET:HE1	1:C:182:PHE:CB	2.46	0.45
1:D:370:VAL:CG1	1:D:513:ILE:HD11	2.40	0.45
1:A:231[A]:CYS:SG	1:A:327:GLU:HG3	2.56	0.45
1:B:472:LYS:O	1:B:475:ILE:HB	2.16	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:541:PHE:N	1:D:542:PRO:CD	2.81	0.44
1:B:299[B]:THR:HG22	1:B:300:GLY:H	1.83	0.44
1:C:141:MET:SD	1:C:171:LEU:HD11	2.58	0.43
1:A:469:THR:CG2	1:A:498:GLU:HG3	2.48	0.43
1:C:153:ARG:O	1:C:157[B]:MET:HE2	2.19	0.43
1:D:262:LEU:HD22	1:D:589:ILE:HG21	2.01	0.42
1:C:137:ILE:HD11	1:C:170:LYS:HG2	2.00	0.42
1:A:173:ILE:HD12	1:A:630:PRO:HG3	2.01	0.42
1:C:137:ILE:HG23	1:C:171:LEU:HD12	2.01	0.42
1:D:266:ASP:O	1:D:269:VAL:HG22	2.20	0.42
1:B:382:LEU:HD12	1:B:417:VAL:HG22	2.02	0.42
1:A:120:HIS:NE2	1:A:636:ARG:O	2.53	0.42
1:B:88[A]:MET:SD	1:D:636:ARG:NH1	2.93	0.41
1:B:236:GLU:HG2	1:B:330:ALA:HB2	2.03	0.41
1:C:157[B]:MET:HE1	1:C:182:PHE:HB2	2.03	0.41
1:C:232:VAL:HA	1:C:273:ILE:O	2.20	0.41
1:A:121:TYR:CE2	1:D:94:VAL:HG11	2.56	0.41
1:D:216:LEU:HD13	1:D:313:ALA:CB	2.50	0.41
1:B:429:GLY:O	1:B:430:SER:HB3	2.20	0.40
1:B:475:ILE:CD1	1:B:507:TRP:HE3	2.33	0.40
1:C:339:GLU:O	1:C:343:LYS:CE	2.68	0.40
1:A:215:VAL:HG11	1:A:310:PHE:HA	2.04	0.40
1:D:209:LEU:HD11	1:D:298:ALA:HB2	2.04	0.40

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	560/576 (97%)	550 (98%)	9 (2%)	1 (0%)	47 55
1	B	575/576 (100%)	563 (98%)	9 (2%)	3 (0%)	29 31

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	562/576 (98%)	553 (98%)	8 (1%)	1 (0%)	47	55
1	D	565/576 (98%)	552 (98%)	13 (2%)	0	100	100
All	All	2262/2304 (98%)	2218 (98%)	39 (2%)	5 (0%)	47	55

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	430	SER
1	B	473	GLU
1	B	472	LYS
1	C	186	PRO
1	A	429	GLY

### 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	469/480 (98%)	455 (97%)	14 (3%)	41	53
1	B	474/480 (99%)	460 (97%)	14 (3%)	41	53
1	C	469/480 (98%)	458 (98%)	11 (2%)	50	63
1	D	475/480 (99%)	457 (96%)	18 (4%)	33	42
All	All	1887/1920 (98%)	1830 (97%)	57 (3%)	43	53

All (57) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	87	VAL
1	A	165	GLU
1	A	171	LEU
1	A	216	LEU
1	A	401	LYS
1	A	420	LYS
1	A	425	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	431	LEU
1	A	469	THR
1	A	502	GLU
1	A	588	SER
1	A	590	ARG
1	A	612	ARG
1	A	631	VAL
1	B	83	GLU
1	B	123	ARG
1	B	171	LEU
1	B	208	SER
1	B	378	THR
1	B	389	THR
1	B	416	LEU
1	B	474	ILE
1	B	496	HIS
1	B	537	ASN
1	B	581	SER
1	B	612[A]	ARG
1	B	612[B]	ARG
1	B	617	SER
1	C	115	GLU
1	C	339	GLU
1	C	403	THR
1	C	418	ASP
1	C	419	SER
1	C	431	LEU
1	C	446	LYS
1	C	529[A]	THR
1	C	529[B]	THR
1	C	535	SER
1	C	581	SER
1	D	87	VAL
1	D	92	THR
1	D	148	GLN
1	D	201	ARG
1	D	216	LEU
1	D	237[A]	ARG
1	D	237[B]	ARG
1	D	255	LYS
1	D	294	ARG
1	D	369	MET

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Mol	Chain	Res	Type
1	D	373	THR
1	D	400[A]	SER
1	D	400[B]	SER
1	D	468[A]	ARG
1	D	468[B]	ARG
1	D	575	ASP
1	D	621	LYS
1	D	629	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 17 ligands modelled in this entry, 17 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	553/576 (96%)	-0.60	0 100   100	21, 35, 64, 84	0
1	B	566/576 (98%)	-0.38	2 (0%) 92   91	24, 40, 69, 124	0
1	C	557/576 (96%)	-0.45	2 (0%) 92   91	24, 36, 62, 94	0
1	D	554/576 (96%)	-0.53	0 100   100	23, 35, 58, 90	0
All	All	2230/2304 (96%)	-0.49	4 (0%) 95   94	21, 37, 63, 124	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	71	THR	5.4
1	C	529[A]	THR	2.9
1	B	73	LYS	2.6
1	C	575	ASP	2.4

### 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 carbohydrates in this entry.

### 6.4 Ligands [i](#)

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<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
3	K	A	704	1/1	0.80	0.10	66,66,66,66	0
2	NA	C	702	1/1	0.92	0.11	55,55,55,55	0
2	NA	B	704	1/1	0.95	0.12	45,45,45,45	0
2	NA	A	702	1/1	0.96	0.09	55,55,55,55	0
2	NA	C	704	1/1	0.96	0.12	44,44,44,44	0
2	NA	D	702	1/1	0.97	0.10	43,43,43,43	0
2	NA	C	705	1/1	0.97	0.13	46,46,46,46	0
2	NA	D	703	1/1	0.97	0.11	50,50,50,50	0
2	NA	D	701	1/1	0.97	0.09	36,36,36,36	0
2	NA	A	701	1/1	0.98	0.07	41,41,41,41	0
2	NA	A	703	1/1	0.98	0.07	44,44,44,44	0
2	NA	B	705	1/1	0.98	0.07	46,46,46,46	0
2	NA	B	702	1/1	0.98	0.09	45,45,45,45	0
2	NA	C	703	1/1	0.99	0.11	38,38,38,38	0
2	NA	B	703	1/1	0.99	0.13	45,45,45,45	0
2	NA	C	701	1/1	0.99	0.10	37,37,37,37	0
2	NA	B	701	1/1	0.99	0.07	37,37,37,37	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.