



Full wwPDB X-ray Structure Validation Report ⓘ

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PDB ID : 7D2Q
Title : Crystal structure of MazE-MazF (Form-I) from *Deinococcus radiodurans*
Authors : Dhanasingh, I.; Lee, S.H.
Deposited on : 2020-09-17
Resolution : 1.99 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The 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	:	2.16
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

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 3868 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 Endoribonuclease MazF.

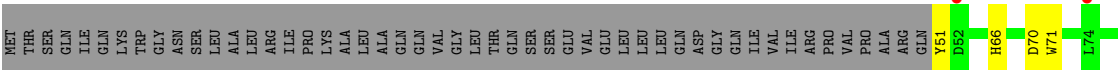
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	100	Total	C	N	O	S	0	0	0
			751	477	135	135	4			
1	C	103	Total	C	N	O	S	0	0	0
			773	489	141	139	4			
1	E	102	Total	C	N	O	S	0	0	0
			767	486	140	137	4			
1	G	110	Total	C	N	O	S	0	0	0
			824	519	152	149	4			

- Molecule 2 is a protein called AbrB/MazE/SpoVT family DNA-binding domain-containing protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	30	Total	C	N	O	S	0	0	0
			240	151	38	50	1			
2	F	30	Total	C	N	O	S	0	0	0
			240	151	38	50	1			

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	66	Total	O	0	0
			66	66		
3	C	65	Total	O	0	0
			65	65		
3	D	27	Total	O	0	0
			27	27		
3	E	44	Total	O	0	0
			44	44		
3	F	28	Total	O	0	0
			28	28		
3	G	43	Total	O	0	0
			43	43		



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	45.49Å 74.08Å 136.85Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	37.30 – 1.99 37.30 – 1.99	Depositor EDS
% Data completeness (in resolution range)	98.7 (37.30-1.99) 98.7 (37.30-1.99)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	6.99 (at 1.98Å)	Xtriage
Refinement program	PHENIX 1.17.1 _3660	Depositor
R, R_{free}	0.178 , 0.223 0.178 , 0.223	Depositor DCC
R_{free} test set	1613 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	23.0	Xtriage
Anisotropy	0.034	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 47.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	3868	wwPDB-VP
Average B, all atoms (Å ²)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.03% 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](#)

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	0.37	0/768	0.62	0/1046
1	C	0.39	0/790	0.56	0/1075
1	E	0.39	0/784	0.60	0/1067
1	G	0.36	0/844	0.57	0/1150
2	D	0.39	0/246	0.51	0/335
2	F	0.36	0/246	0.49	0/335
All	All	0.38	0/3678	0.58	0/5008

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 [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	751	0	751	4	0
1	C	773	0	774	6	0
1	E	767	0	769	12	0
1	G	824	0	817	9	0
2	D	240	0	212	1	0
2	F	240	0	212	5	0
3	A	66	0	0	1	1
3	C	65	0	0	1	1
3	D	27	0	0	0	0
3	E	44	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	F	28	0	0	0	0
3	G	43	0	0	0	0
All	All	3868	0	3535	30	1

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 4.

All (30) 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:C:16:ASN:OD1	3:C:201:HOH:O	2.15	0.64
1:A:104:ARG:HD3	1:E:111:LEU:O	2.06	0.55
1:E:17:PHE:CE2	1:E:28:ARG:HB3	2.43	0.54
1:E:29:ARG:NH2	2:F:70:ASP:O	2.38	0.53
1:E:54:ARG:O	2:F:66:HIS:HE1	1.94	0.49
1:G:27:GLY:O	1:G:29:ARG:HG2	2.12	0.49
1:G:55:ALA:HB2	1:G:73:VAL:HG11	1.92	0.49
1:G:16:ASN:HB3	1:G:20:GLN:HE21	1.78	0.49
1:A:100:LEU:O	1:A:104:ARG:HG3	2.13	0.49
1:G:55:ALA:HB2	1:G:73:VAL:CG1	2.44	0.48
1:A:113:MET:O	3:A:201:HOH:O	2.20	0.47
1:E:80:ARG:HD3	2:F:71:TRP:CD1	2.50	0.46
1:A:88:ARG:HD2	1:A:88:ARG:N	2.31	0.45
1:G:14:TRP:CE2	1:G:92:LEU:HD22	2.52	0.45
1:G:49:CYS:SG	1:G:79:CYS:HB2	2.57	0.44
1:G:61:GLU:O	1:G:106:LYS:NZ	2.49	0.44
1:E:65:PRO:HG2	1:E:68:LEU:HD11	2.00	0.44
1:E:15:LEU:HD11	1:E:46:MET:CE	2.47	0.44
1:E:29:ARG:HD2	2:F:71:TRP:CH2	2.53	0.43
1:C:13:VAL:O	1:C:30:PRO:HA	2.18	0.43
1:E:17:PHE:CD2	1:E:28:ARG:HB3	2.54	0.43
1:C:14:TRP:O	1:C:89:ALA:HA	2.20	0.42
1:C:14:TRP:CE3	1:C:28:ARG:HG3	2.55	0.42
1:E:70:VAL:HB	1:E:92:LEU:HD21	2.01	0.42
1:E:68:LEU:HD23	1:E:68:LEU:HA	1.80	0.41
1:E:102:GLU:HG3	2:F:51:TYR:OH	2.20	0.41
1:C:80:ARG:HD3	2:D:71:TRP:CD1	2.56	0.40
1:G:56:LYS:HD2	1:G:56:LYS:HA	1.74	0.40
1:G:58:TYR:CD1	1:G:58:TYR:N	2.88	0.40
1:C:58:TYR:HB3	1:C:61:GLU:HG3	2.04	0.40

All (1) 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)
3:A:256:HOH:O	3:C:248:HOH:O[2_455]	2.18	0.02

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	96/117 (82%)	95 (99%)	1 (1%)	0	100	100
1	C	99/117 (85%)	99 (100%)	0	0	100	100
1	E	98/117 (84%)	96 (98%)	2 (2%)	0	100	100
1	G	108/117 (92%)	106 (98%)	2 (2%)	0	100	100
2	D	28/80 (35%)	28 (100%)	0	0	100	100
2	F	28/80 (35%)	28 (100%)	0	0	100	100
All	All	457/628 (73%)	452 (99%)	5 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	78/90 (87%)	76 (97%)	2 (3%)	46	48
1	C	80/90 (89%)	79 (99%)	1 (1%)	69	74

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	E	79/90 (88%)	79 (100%)	0	100	100
1	G	84/90 (93%)	82 (98%)	2 (2%)	49	51
2	D	23/66 (35%)	22 (96%)	1 (4%)	29	26
2	F	23/66 (35%)	21 (91%)	2 (9%)	10	6
All	All	367/492 (75%)	359 (98%)	8 (2%)	52	55

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	98	ASP
1	A	109	SER
1	C	3	SER
2	D	80	TRP
2	F	79	GLU
2	F	80	TRP
1	G	80	ARG
1	G	98	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	67	HIS
1	G	20	GLN

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

There are no ligands in this entry.

5.7 Other polymers

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

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, 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	100/117 (85%)	0.17	3 (3%) 50 49	12, 21, 37, 53	0
1	C	103/117 (88%)	0.04	0 100 100	11, 17, 29, 41	0
1	E	102/117 (87%)	0.32	5 (4%) 29 28	14, 23, 40, 45	0
1	G	110/117 (94%)	0.48	12 (10%) 5 5	14, 26, 46, 59	0
2	D	30/80 (37%)	0.14	0 100 100	16, 25, 37, 42	0
2	F	30/80 (37%)	0.47	3 (10%) 7 6	17, 26, 40, 45	0
All	All	475/628 (75%)	0.26	23 (4%) 30 29	11, 22, 41, 59	0

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	18	THR	9.2
1	E	27	GLY	6.8
1	A	17	PHE	5.4
1	G	58	TYR	5.2
2	F	74	LEU	4.3
1	G	20	GLN	3.9
1	E	66	ALA	3.1
1	G	59	PRO	3.1
1	G	19	PRO	3.0
1	G	56	LYS	2.9
1	G	22	GLY	2.7
1	E	28	ARG	2.7
2	F	52	ASP	2.6
1	E	4	ASP	2.5
1	G	57	GLY	2.4
1	E	88	ARG	2.4
1	G	21	ALA	2.4
1	G	23	HIS	2.3
1	G	27	GLY	2.3

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Mol	Chain	Res	Type	RSRZ
2	F	77	ARG	2.3
1	A	3	SER	2.3
1	A	4	ASP	2.1
1	G	55	ALA	2.0

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 monosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.