



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 01:24 PM UTC

PDB ID : 7DC3 / pdb_00007dc3
Title : Crystal structure of the MyRF ICA domain
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Deposited on : 2020-10-23
Resolution : 2.40 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 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)
Xtrriage (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

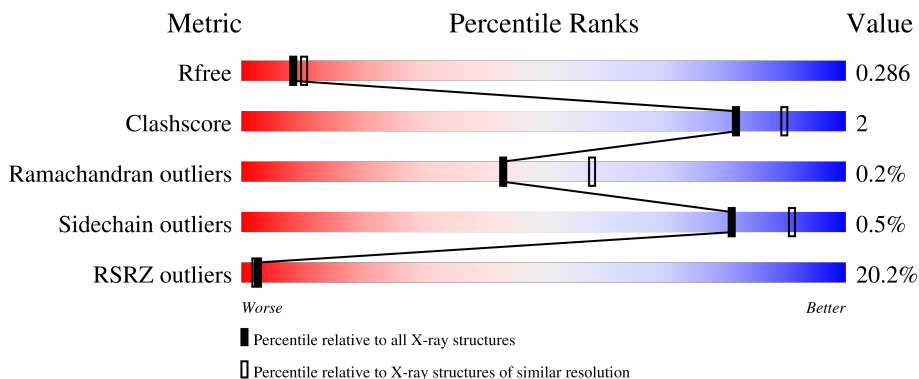
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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	4912 (2.40-2.40)
Clashscore	190562	5391 (2.40-2.40)
Ramachandran outliers	187476	5320 (2.40-2.40)
Sidechain outliers	187428	5321 (2.40-2.40)
RSRZ outliers	180081	4916 (2.40-2.40)

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	179	9% (Poor fit) 78% (0-1 outliers) 18% (2-3+ outliers)
1	B	179	4% (Poor fit) 73% (0-1 outliers) 23% (2-3+ outliers)
1	C	179	33% (Poor fit) 72% (0-1 outliers) 7% (2-3+ outliers)

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 3468 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 Isoform 2 of Myelin regulatory factor.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	147	1164	728	209	222	1	4	0	0	0
1	B	138	1093	686	193	209	1	4	0	0	0
1	C	142	1126	705	200	216	1	4	0	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	587	ALA	SER	engineered mutation	UNP Q3UR85
B	587	ALA	SER	engineered mutation	UNP Q3UR85
C	587	ALA	SER	engineered mutation	UNP Q3UR85

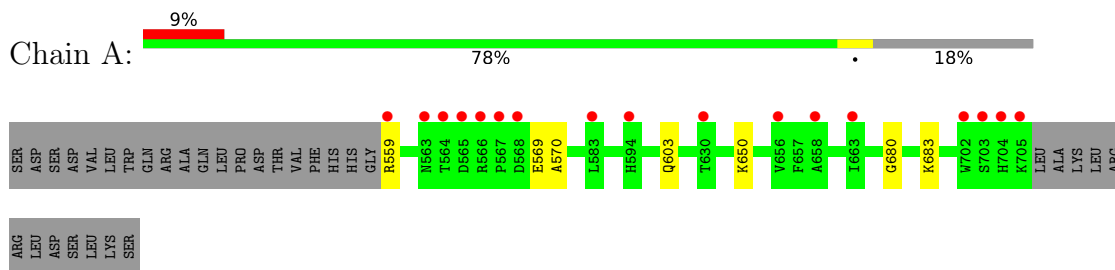
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	24	Total	O	0	0
			24	24		
2	B	54	Total	O	0	0
			54	54		
2	C	7	Total	O	0	0
			7	7		

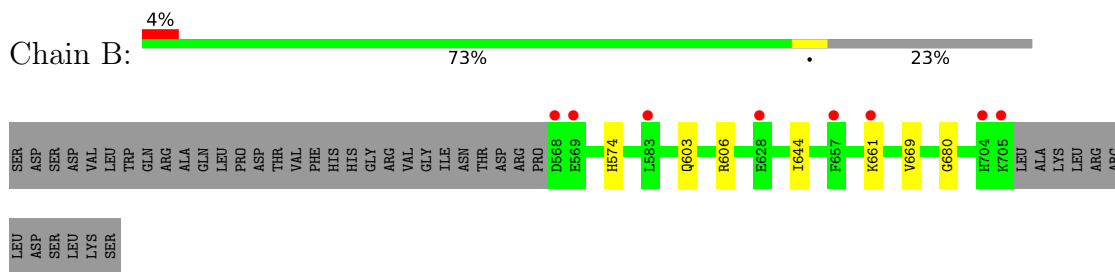
3 Residue-property plots [i](#)

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.

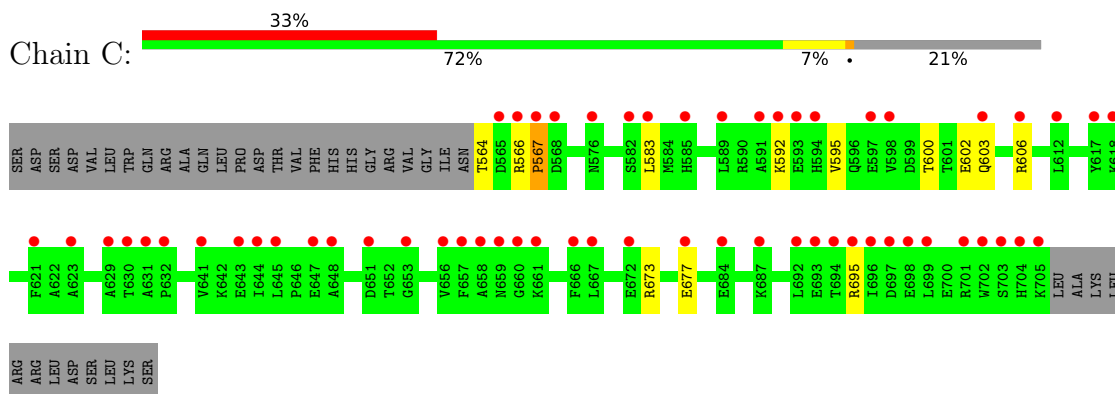
- Molecule 1: Isoform 2 of Myelin regulatory factor



- Molecule 1: Isoform 2 of Myelin regulatory factor



- Molecule 1: Isoform 2 of Myelin regulatory factor



4 Data and refinement statistics i

Property	Value	Source
Space group	P 3 2 1	Depositor
Cell constants a, b, c, α , β , γ	78.71Å 78.71Å 138.46Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	38.22 – 2.40 38.22 – 2.40	Depositor EDS
% Data completeness (in resolution range)	94.0 (38.22-2.40) 87.1 (38.22-2.40)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.31 (at 2.31Å)	Xtrriage
Refinement program	PHENIX 1.19rc3_4028, PHENIX 1.19rc3_4028	Depositor
R, R_{free}	0.217 , 0.268 (Not available) , 0.286	Depositor DCC
R_{free} test set	1709 reflections (4.37%)	wwPDB-VP
Wilson B-factor (Å ²)	14.3	Xtrriage
Anisotropy	1.137	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 51.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.088 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.89	EDS
Total number of atoms	3468	wwPDB-VP
Average B, all atoms (Å ²)	59.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.18% 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	0.09	0/1177	0.25	0/1582
1	B	0.09	0/1105	0.24	0/1484
1	C	0.11	0/1139	0.32	0/1531
All	All	0.10	0/3421	0.27	0/4597

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	1164	0	1176	5	0
1	B	1093	0	1103	4	0
1	C	1126	0	1134	9	0
2	A	24	0	0	1	0
2	B	54	0	0	1	0
2	C	7	0	0	1	0
All	All	3468	0	3413	17	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 (17) 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:592:LYS:HD2	1:C:595:VAL:HG21	1.78	0.66
1:C:566:ARG:HB3	1:C:567:PRO:HD2	1.80	0.62
1:B:606:ARG:NH1	1:B:644:ILE:O	2.34	0.60
1:C:564:THR:N	2:C:802:HOH:O	2.35	0.60
1:C:600:THR:HA	1:C:603:GLN:HG3	1.84	0.58
1:A:683:LYS:NZ	2:A:803:HOH:O	2.40	0.54
1:B:661:LYS:NZ	2:B:804:HOH:O	2.41	0.53
1:A:603:GLN:OE1	1:A:680:GLY:HA3	2.12	0.49
1:C:606:ARG:HH21	1:C:677:GLU:CD	2.21	0.48
1:C:602:GLU:HB3	1:C:606:ARG:NH1	2.28	0.47
1:B:603:GLN:OE1	1:B:680:GLY:HA3	2.17	0.44
1:C:583:LEU:HD23	1:C:583:LEU:HA	1.85	0.44
1:C:673:ARG:HH12	1:C:677:GLU:HG2	1.83	0.43
1:A:559:ARG:HD2	1:A:570:ALA:HA	2.01	0.43
1:A:559:ARG:HA	1:B:574:HIS:HB2	2.01	0.42
1:C:673:ARG:NH1	1:C:677:GLU:HG2	2.36	0.41
1:A:569:GLU:OE2	1:A:650:LYS:NZ	2.38	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	145/179 (81%)	143 (99%)	2 (1%)	0	100	100
1	B	136/179 (76%)	135 (99%)	1 (1%)	0	100	100
1	C	140/179 (78%)	136 (97%)	3 (2%)	1 (1%)	18	28
All	All	421/537 (78%)	414 (98%)	6 (1%)	1 (0%)	43	58

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	567	PRO

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	127/152 (84%)	127 (100%)	0	100	100
1	B	119/152 (78%)	118 (99%)	1 (1%)	73	86
1	C	123/152 (81%)	122 (99%)	1 (1%)	73	86
All	All	369/456 (81%)	367 (100%)	2 (0%)	81	91

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	669	VAL
1	C	695	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	585	HIS
1	B	596	GLN
1	C	594	HIS
1	C	670	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](#)

There are no ligands in this entry.

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, 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	143/179 (79%)	1.00	17 (11%) 9 6	16, 51, 85, 123	0
1	B	134/179 (74%)	0.46	8 (5%) 27 24	13, 30, 62, 100	0
1	C	138/179 (77%)	1.94	59 (42%) 0 0	42, 86, 119, 169	0
All	All	415/537 (77%)	1.14	84 (20%) 3 2	13, 54, 108, 169	0

All (84) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	567	PRO	5.5
1	C	705	LYS	4.2
1	C	583	LEU	4.2
1	A	566	ARG	4.1
1	C	592	LYS	4.1
1	C	667	LEU	3.8
1	B	568	ASP	3.6
1	C	704	HIS	3.6
1	C	591	ALA	3.6
1	A	568	ASP	3.4
1	C	651	ASP	3.4
1	C	566	ARG	3.4
1	C	631	ALA	3.3
1	A	583	LEU	3.2
1	B	628	GLU	3.2
1	C	648	ALA	3.1
1	B	705	LYS	3.1
1	C	698	GLU	3.1
1	A	559	ARG	3.1
1	A	564	THR	3.0
1	A	705	LYS	3.0
1	C	621	PHE	3.0
1	C	702	TRP	3.0

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Mol	Chain	Res	Type	RSRZ
1	C	617	TYR	3.0
1	C	623	ALA	2.9
1	C	666	PHE	2.9
1	C	594	HIS	2.8
1	C	645	LEU	2.8
1	C	657	PHE	2.8
1	C	692	LEU	2.8
1	A	704	HIS	2.7
1	C	632	PRO	2.7
1	C	672	GLU	2.7
1	C	630	THR	2.7
1	C	660	GLY	2.6
1	A	594	HIS	2.6
1	C	585	HIS	2.6
1	A	703	SER	2.6
1	C	659	ASN	2.5
1	A	565	ASP	2.5
1	A	702	TRP	2.5
1	C	612	LEU	2.5
1	C	641	VAL	2.5
1	A	658	ALA	2.5
1	C	644	ILE	2.4
1	C	603	GLN	2.4
1	A	563	ASN	2.4
1	C	647	GLU	2.4
1	C	677	GLU	2.4
1	C	653	GLY	2.4
1	C	697	ASP	2.4
1	B	583	LEU	2.4
1	C	618	LYS	2.4
1	C	684	GLU	2.4
1	B	704	HIS	2.4
1	C	656	VAL	2.3
1	C	606	ARG	2.3
1	B	569	GLU	2.3
1	C	643	GLU	2.3
1	C	701	ARG	2.3
1	A	663	ILE	2.2
1	C	699	LEU	2.2
1	C	597	GLU	2.2
1	A	567	PRO	2.2
1	A	656	VAL	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	658	ALA	2.2
1	C	568	ASP	2.2
1	C	593	GLU	2.2
1	C	629	ALA	2.2
1	C	598	VAL	2.1
1	C	589	LEU	2.1
1	C	694	THR	2.1
1	C	696	ILE	2.1
1	A	630	THR	2.1
1	C	576	ASN	2.1
1	C	661	LYS	2.1
1	C	582	SER	2.1
1	C	703	SER	2.1
1	B	661	LYS	2.1
1	B	657	PHE	2.0
1	C	695	ARG	2.0
1	C	565	ASP	2.0
1	C	687	LYS	2.0
1	C	693	GLU	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 oligosaccharides 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.