



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 25, 2026 – 01:40 PM EDT

PDB ID : 6IZ6 / pdb_00006iz6
Title : Crystal Structure Analysis of TRIC counter-ion channels in calcium release
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Deposited on : 2018-12-18
Resolution : 3.29 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
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

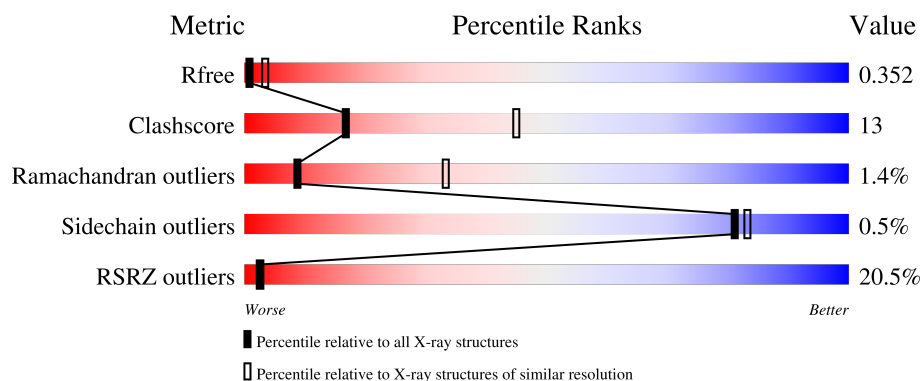
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.29 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	1169 (3.32-3.28)
Clashscore	190562	1209 (3.32-3.28)
Ramachandran outliers	187476	1188 (3.32-3.28)
Sidechain outliers	187428	1187 (3.32-3.28)
RSRZ outliers	180081	1169 (3.32-3.28)

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	314	15% 48% 23% 29%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 1769 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 Trimeric intracellular cation channel type B-B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	224	Total	C	N	O	S	0	0	0
			1766	1166	285	299	16			

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	285	ALA	-	expression tag	UNP Q6GN30
A	286	ALA	-	expression tag	UNP Q6GN30
A	287	ALA	-	expression tag	UNP Q6GN30
A	288	GLU	-	expression tag	UNP Q6GN30
A	289	ASN	-	expression tag	UNP Q6GN30
A	290	LEU	-	expression tag	UNP Q6GN30
A	291	TYR	-	expression tag	UNP Q6GN30
A	292	PHE	-	expression tag	UNP Q6GN30
A	293	GLN	-	expression tag	UNP Q6GN30
A	294	GLY	-	expression tag	UNP Q6GN30
A	295	LEU	-	expression tag	UNP Q6GN30
A	296	GLU	-	expression tag	UNP Q6GN30
A	297	ASP	-	expression tag	UNP Q6GN30
A	298	TYR	-	expression tag	UNP Q6GN30
A	299	LYS	-	expression tag	UNP Q6GN30
A	300	ASP	-	expression tag	UNP Q6GN30
A	301	ASP	-	expression tag	UNP Q6GN30
A	302	ASP	-	expression tag	UNP Q6GN30
A	303	ASP	-	expression tag	UNP Q6GN30
A	304	LYS	-	expression tag	UNP Q6GN30
A	305	HIS	-	expression tag	UNP Q6GN30
A	306	HIS	-	expression tag	UNP Q6GN30
A	307	HIS	-	expression tag	UNP Q6GN30
A	308	HIS	-	expression tag	UNP Q6GN30
A	309	HIS	-	expression tag	UNP Q6GN30
A	310	HIS	-	expression tag	UNP Q6GN30
A	311	HIS	-	expression tag	UNP Q6GN30

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Chain	Residue	Modelled	Actual	Comment	Reference
A	312	HIS	-	expression tag	UNP Q6GN30
A	313	HIS	-	expression tag	UNP Q6GN30
A	314	HIS	-	expression tag	UNP Q6GN30

- Molecule 2 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Ca 1 1	0	0

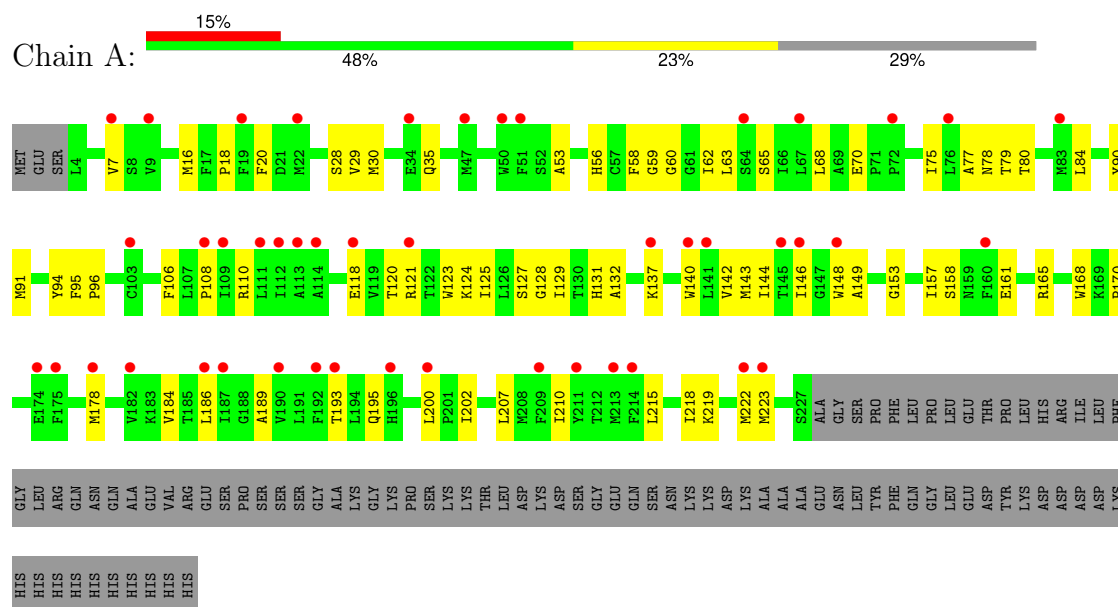
- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	2	Total O 2 2	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: Trimeric intracellular cation channel type B-B



4 Data and refinement statistics

Property	Value	Source
Space group	F 4 3 2	Depositor
Cell constants a, b, c, α , β , γ	250.11Å 250.11Å 250.11Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.13 – 3.29 48.13 – 3.29	Depositor EDS
% Data completeness (in resolution range)	91.8 (48.13-3.29) 91.7 (48.13-3.29)	Depositor EDS
R_{merge}	0.21	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.02 (at 3.33Å)	Xtriage
Refinement program	PHENIX 1.14rc2_3191	Depositor
R, R_{free}	0.326 , 0.354 0.333 , 0.352	Depositor DCC
R_{free} test set	458 reflections (3.29%)	wwPDB-VP
Wilson B-factor (Å ²)	154.7	Xtriage
Anisotropy	0.000	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 146.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.86	EDS
Total number of atoms	1769	wwPDB-VP
Average B, all atoms (Å ²)	149.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.71% 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: CA

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	0.13	0/1820	0.31	0/2470

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	1766	0	1763	45	0
2	A	1	0	0	0	0
3	A	2	0	0	0	0
All	All	1769	0	1763	45	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 13.

All (45) 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:A:184:VAL:HG11	1:A:215:LEU:HD13	1.78	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28:SER:HB3	1:A:56:HIS:HB3	1.82	0.60
1:A:70:GLU:OE2	1:A:131:HIS:NE2	2.36	0.59
1:A:118:GLU:HB3	1:A:215:LEU:HG	1.84	0.59
1:A:16:MET:HA	1:A:20:PHE:HB2	1.85	0.59
1:A:168:TRP:NE1	1:A:170:PRO:HG3	2.19	0.57
1:A:157:ILE:O	1:A:161:GLU:N	2.37	0.56
1:A:207:LEU:HA	1:A:210:ILE:HG22	1.88	0.55
1:A:148:TRP:CZ2	1:A:186:LEU:HB2	2.42	0.55
1:A:35:GLN:OE1	1:A:165:ARG:NH1	2.39	0.55
1:A:129:ILE:HG23	1:A:143:MET:HE3	1.89	0.54
1:A:29:VAL:HG22	1:A:53:ALA:HB1	1.90	0.54
1:A:123:TRP:O	1:A:127:SER:N	2.43	0.51
1:A:106:PHE:CD2	1:A:108:PRO:HD2	2.45	0.51
1:A:30:MET:HE1	1:A:110:ARG:HG3	1.92	0.50
1:A:58:PHE:HB3	1:A:75:ILE:HG21	1.92	0.50
1:A:195:GLN:NE2	1:A:202:ILE:O	2.35	0.48
1:A:120:THR:HG22	1:A:124:LYS:HE3	1.96	0.47
1:A:121:ARG:HD2	1:A:215:LEU:HD21	1.96	0.47
1:A:90:TYR:O	1:A:94:TYR:N	2.47	0.47
1:A:60:GLY:HA2	1:A:153:GLY:HA3	1.97	0.47
1:A:91:MET:O	1:A:95:PHE:HB2	2.15	0.46
1:A:121:ARG:O	1:A:125:ILE:HG13	2.15	0.46
1:A:80:THR:O	1:A:84:LEU:HB2	2.15	0.46
1:A:68:LEU:HD11	1:A:146:ILE:HG21	1.98	0.45
1:A:148:TRP:CZ3	1:A:186:LEU:HD13	2.51	0.45
1:A:178:MET:HE2	1:A:178:MET:HB3	1.87	0.45
1:A:158:SER:HA	1:A:161:GLU:HB3	1.98	0.45
1:A:59:GLY:HA2	1:A:62:ILE:HB	1.99	0.45
1:A:132:ALA:HB1	1:A:142:VAL:HG12	1.98	0.45
1:A:63:LEU:HB2	1:A:157:ILE:HD11	2.00	0.44
1:A:77:ALA:O	1:A:79:THR:N	2.50	0.44
1:A:95:PHE:CG	1:A:96:PRO:HD2	2.53	0.44
1:A:16:MET:HE3	1:A:20:PHE:HB3	2.00	0.44
1:A:189:ALA:O	1:A:193:THR:OG1	2.31	0.44
1:A:140:TRP:O	1:A:144:ILE:HG13	2.19	0.43
1:A:219:LYS:HA	1:A:222:MET:HB2	2.01	0.43
1:A:128:GLY:HA2	1:A:131:HIS:HB3	2.00	0.42
1:A:60:GLY:HA2	1:A:149:ALA:O	2.20	0.42
1:A:30:MET:HE2	1:A:30:MET:HB3	1.89	0.41
1:A:218:ILE:O	1:A:222:MET:N	2.46	0.41
1:A:200:LEU:HD23	1:A:207:LEU:HD22	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:65:SER:OG	1:A:75:ILE:HD11	2.20	0.40
1:A:110:ARG:O	1:A:223:MET:HE1	2.22	0.40
1:A:153:GLY:O	1:A:157:ILE:HG13	2.21	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	222/314 (71%)	209 (94%)	10 (4%)	3 (1%)	9	33

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	18	PRO
1	A	137	LYS
1	A	78	ASN

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	189/268 (70%)	188 (100%)	1 (0%)	81	83

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	159	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 1 ligands modelled in this entry, 1 is 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 ⓘ

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	224/314 (71%)	1.23	46 (20%) 2 2	95, 145, 187, 206	0

All (46) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	47	MET	5.8
1	A	187	ILE	5.7
1	A	211	TYR	5.4
1	A	22	MET	5.1
1	A	213	MET	4.9
1	A	103	CYS	4.7
1	A	186	LEU	4.4
1	A	140	TRP	4.3
1	A	209	PHE	4.2
1	A	160	PHE	4.2
1	A	145	THR	3.9
1	A	51	PHE	3.9
1	A	200	LEU	3.8
1	A	175	PHE	3.7
1	A	148	TRP	3.5
1	A	83	MET	3.4
1	A	67	LEU	3.3
1	A	214	PHE	3.3
1	A	222	MET	3.2
1	A	112	ILE	3.2
1	A	76	LEU	3.2
1	A	108	PRO	3.1
1	A	146	ILE	3.0
1	A	72	PRO	3.0
1	A	111	LEU	2.9
1	A	196	HIS	2.8
1	A	9	VAL	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	178	MET	2.8
1	A	114	ALA	2.8
1	A	121	ARG	2.8
1	A	137	LYS	2.6
1	A	141	LEU	2.5
1	A	113	ALA	2.4
1	A	64	SER	2.4
1	A	109	ILE	2.3
1	A	19	PHE	2.3
1	A	192	PHE	2.3
1	A	118	GLU	2.2
1	A	34	GLU	2.2
1	A	190	VAL	2.2
1	A	223	MET	2.1
1	A	174	GLU	2.1
1	A	182	VAL	2.0
1	A	50	TRP	2.0
1	A	193	THR	2.0
1	A	7	VAL	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](#)

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($\text{\AA}^2$)	Q<0.9
2	CA	A	401	1/1	0.82	0.31	182,182,182,182	1

6.5 Other polymers [i](#)

There are no such residues in this entry.