



# wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 1, 2016 – 11:38 AM GMT

PDB ID : 3PJS  
Title : Mechanism of Activation Gating in the Full-Length KcsA K<sup>+</sup> Channel  
Authors : Uysal, S.; Cuello, L.G.; Kossiakoff, A.; Perozo, E.  
Deposited on : 2010-11-10  
Resolution : 3.80 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](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/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  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

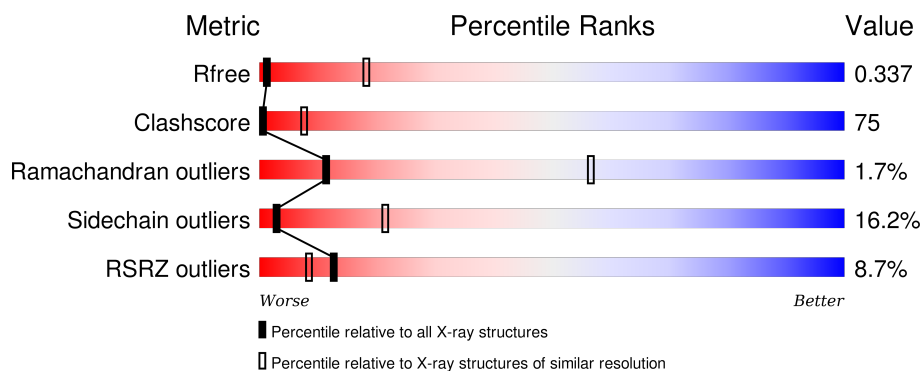
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 3.80 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))
$R_{free}$	91344	1317 (4.10-3.50)
Clashscore	102246	1458 (4.10-3.50)
Ramachandran outliers	100387	1397 (4.10-3.50)
Sidechain outliers	100360	1392 (4.10-3.50)
RSRZ outliers	91569	1325 (4.10-3.50)

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. 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	215	<div> <div>5%</div> <div>27%</div> <div>53%</div> <div>17%</div> <div>.</div> </div>
1	C	215	<div> <div>%</div> <div>28%</div> <div>53%</div> <div>17%</div> <div>.</div> </div>
2	B	224	<div> <div>4%</div> <div>31%</div> <div>51%</div> <div>13%</div> <div>..</div> </div>
2	D	224	<div> <div>30%</div> <div>52%</div> <div>13%</div> <div>..</div> </div>
3	K	166	<div> <div>16%</div> <div>21%</div> <div>54%</div> <div>8%</div> <div>16%</div> </div>

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Mol	Chain	Length	Quality of chain
3	L	166	<p>9% 18% 58% 8% 16%</p>
3	M	166	<p>20% 22% 55% 7% 16%</p>
3	N	166	<p>16% 23% 54% 7% 16%</p>

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 10982 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 FAB light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	215	Total	C	N	O	S	0	0	0
			1658	1038	276	339	5			
1	C	215	Total	C	N	O	S	0	0	0
			1658	1038	276	339	5			

- Molecule 2 is a protein called FAB heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	219	Total	C	N	O	S	0	0	0
			1653	1050	272	325	6			
2	D	219	Total	C	N	O	S	0	0	0
			1653	1050	272	325	6			

- Molecule 3 is a protein called Voltage-gated potassium channel.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	K	139	Total	C	N	O	S	0	0	0
			1090	697	195	196	2			
3	L	139	Total	C	N	O	S	0	0	0
			1090	697	195	196	2			
3	M	139	Total	C	N	O	S	0	0	0
			1090	697	195	196	2			
3	N	139	Total	C	N	O	S	0	0	0
			1090	697	195	196	2			

There are 136 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	-5	MET	-	EXPRESSION TAG	UNP P0A334
K	-4	HIS	-	EXPRESSION TAG	UNP P0A334
K	-3	HIS	-	EXPRESSION TAG	UNP P0A334
K	-2	HIS	-	EXPRESSION TAG	UNP P0A334

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Chain	Residue	Modelled	Actual	Comment	Reference
K	-1	HIS	-	EXPRESSION TAG	UNP P0A334
K	0	HIS	-	EXPRESSION TAG	UNP P0A334
K	1	HIS	-	EXPRESSION TAG	UNP P0A334
K	2	PRO	-	EXPRESSION TAG	UNP P0A334
K	3	PRO	-	EXPRESSION TAG	UNP P0A334
K	4	MET	-	EXPRESSION TAG	UNP P0A334
K	5	LEU	-	EXPRESSION TAG	UNP P0A334
K	6	SER	-	EXPRESSION TAG	UNP P0A334
K	7	GLY	-	EXPRESSION TAG	UNP P0A334
K	8	LEU	-	EXPRESSION TAG	UNP P0A334
K	9	LEU	-	EXPRESSION TAG	UNP P0A334
K	10	ALA	-	EXPRESSION TAG	UNP P0A334
K	11	ARG	-	EXPRESSION TAG	UNP P0A334
K	12	LEU	-	EXPRESSION TAG	UNP P0A334
K	13	VAL	-	EXPRESSION TAG	UNP P0A334
K	14	LYS	-	EXPRESSION TAG	UNP P0A334
K	15	LEU	-	EXPRESSION TAG	UNP P0A334
K	16	LEU	-	EXPRESSION TAG	UNP P0A334
K	17	LEU	-	EXPRESSION TAG	UNP P0A334
K	18	GLY	-	EXPRESSION TAG	UNP P0A334
K	19	ARG	-	EXPRESSION TAG	UNP P0A334
K	20	HIS	-	EXPRESSION TAG	UNP P0A334
K	21	GLY	-	EXPRESSION TAG	UNP P0A334
K	25	GLN	HIS	ENGINEERED MUTATION	UNP P0A334
K	117	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
K	120	GLN	GLU	ENGINEERED MUTATION	UNP P0A334
K	121	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
K	122	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
K	123	GLN	GLY	ENGINEERED MUTATION	UNP P0A334
K	124	GLN	HIS	ENGINEERED MUTATION	UNP P0A334
L	-5	MET	-	EXPRESSION TAG	UNP P0A334
L	-4	HIS	-	EXPRESSION TAG	UNP P0A334
L	-3	HIS	-	EXPRESSION TAG	UNP P0A334
L	-2	HIS	-	EXPRESSION TAG	UNP P0A334
L	-1	HIS	-	EXPRESSION TAG	UNP P0A334
L	0	HIS	-	EXPRESSION TAG	UNP P0A334
L	1	HIS	-	EXPRESSION TAG	UNP P0A334
L	2	PRO	-	EXPRESSION TAG	UNP P0A334
L	3	PRO	-	EXPRESSION TAG	UNP P0A334
L	4	MET	-	EXPRESSION TAG	UNP P0A334
L	5	LEU	-	EXPRESSION TAG	UNP P0A334
L	6	SER	-	EXPRESSION TAG	UNP P0A334

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Chain	Residue	Modelled	Actual	Comment	Reference
L	7	GLY	-	EXPRESSION TAG	UNP P0A334
L	8	LEU	-	EXPRESSION TAG	UNP P0A334
L	9	LEU	-	EXPRESSION TAG	UNP P0A334
L	10	ALA	-	EXPRESSION TAG	UNP P0A334
L	11	ARG	-	EXPRESSION TAG	UNP P0A334
L	12	LEU	-	EXPRESSION TAG	UNP P0A334
L	13	VAL	-	EXPRESSION TAG	UNP P0A334
L	14	LYS	-	EXPRESSION TAG	UNP P0A334
L	15	LEU	-	EXPRESSION TAG	UNP P0A334
L	16	LEU	-	EXPRESSION TAG	UNP P0A334
L	17	LEU	-	EXPRESSION TAG	UNP P0A334
L	18	GLY	-	EXPRESSION TAG	UNP P0A334
L	19	ARG	-	EXPRESSION TAG	UNP P0A334
L	20	HIS	-	EXPRESSION TAG	UNP P0A334
L	21	GLY	-	EXPRESSION TAG	UNP P0A334
L	25	GLN	HIS	ENGINEERED MUTATION	UNP P0A334
L	117	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
L	120	GLN	GLU	ENGINEERED MUTATION	UNP P0A334
L	121	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
L	122	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
L	123	GLN	GLY	ENGINEERED MUTATION	UNP P0A334
L	124	GLN	HIS	ENGINEERED MUTATION	UNP P0A334
M	-5	MET	-	EXPRESSION TAG	UNP P0A334
M	-4	HIS	-	EXPRESSION TAG	UNP P0A334
M	-3	HIS	-	EXPRESSION TAG	UNP P0A334
M	-2	HIS	-	EXPRESSION TAG	UNP P0A334
M	-1	HIS	-	EXPRESSION TAG	UNP P0A334
M	0	HIS	-	EXPRESSION TAG	UNP P0A334
M	1	HIS	-	EXPRESSION TAG	UNP P0A334
M	2	PRO	-	EXPRESSION TAG	UNP P0A334
M	3	PRO	-	EXPRESSION TAG	UNP P0A334
M	4	MET	-	EXPRESSION TAG	UNP P0A334
M	5	LEU	-	EXPRESSION TAG	UNP P0A334
M	6	SER	-	EXPRESSION TAG	UNP P0A334
M	7	GLY	-	EXPRESSION TAG	UNP P0A334
M	8	LEU	-	EXPRESSION TAG	UNP P0A334
M	9	LEU	-	EXPRESSION TAG	UNP P0A334
M	10	ALA	-	EXPRESSION TAG	UNP P0A334
M	11	ARG	-	EXPRESSION TAG	UNP P0A334
M	12	LEU	-	EXPRESSION TAG	UNP P0A334
M	13	VAL	-	EXPRESSION TAG	UNP P0A334
M	14	LYS	-	EXPRESSION TAG	UNP P0A334

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Chain	Residue	Modelled	Actual	Comment	Reference
M	15	LEU	-	EXPRESSION TAG	UNP P0A334
M	16	LEU	-	EXPRESSION TAG	UNP P0A334
M	17	LEU	-	EXPRESSION TAG	UNP P0A334
M	18	GLY	-	EXPRESSION TAG	UNP P0A334
M	19	ARG	-	EXPRESSION TAG	UNP P0A334
M	20	HIS	-	EXPRESSION TAG	UNP P0A334
M	21	GLY	-	EXPRESSION TAG	UNP P0A334
M	25	GLN	HIS	ENGINEERED MUTATION	UNP P0A334
M	117	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
M	120	GLN	GLU	ENGINEERED MUTATION	UNP P0A334
M	121	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
M	122	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
M	123	GLN	GLY	ENGINEERED MUTATION	UNP P0A334
M	124	GLN	HIS	ENGINEERED MUTATION	UNP P0A334
N	-5	MET	-	EXPRESSION TAG	UNP P0A334
N	-4	HIS	-	EXPRESSION TAG	UNP P0A334
N	-3	HIS	-	EXPRESSION TAG	UNP P0A334
N	-2	HIS	-	EXPRESSION TAG	UNP P0A334
N	-1	HIS	-	EXPRESSION TAG	UNP P0A334
N	0	HIS	-	EXPRESSION TAG	UNP P0A334
N	1	HIS	-	EXPRESSION TAG	UNP P0A334
N	2	PRO	-	EXPRESSION TAG	UNP P0A334
N	3	PRO	-	EXPRESSION TAG	UNP P0A334
N	4	MET	-	EXPRESSION TAG	UNP P0A334
N	5	LEU	-	EXPRESSION TAG	UNP P0A334
N	6	SER	-	EXPRESSION TAG	UNP P0A334
N	7	GLY	-	EXPRESSION TAG	UNP P0A334
N	8	LEU	-	EXPRESSION TAG	UNP P0A334
N	9	LEU	-	EXPRESSION TAG	UNP P0A334
N	10	ALA	-	EXPRESSION TAG	UNP P0A334
N	11	ARG	-	EXPRESSION TAG	UNP P0A334
N	12	LEU	-	EXPRESSION TAG	UNP P0A334
N	13	VAL	-	EXPRESSION TAG	UNP P0A334
N	14	LYS	-	EXPRESSION TAG	UNP P0A334
N	15	LEU	-	EXPRESSION TAG	UNP P0A334
N	16	LEU	-	EXPRESSION TAG	UNP P0A334
N	17	LEU	-	EXPRESSION TAG	UNP P0A334
N	18	GLY	-	EXPRESSION TAG	UNP P0A334
N	19	ARG	-	EXPRESSION TAG	UNP P0A334
N	20	HIS	-	EXPRESSION TAG	UNP P0A334
N	21	GLY	-	EXPRESSION TAG	UNP P0A334
N	25	GLN	HIS	ENGINEERED MUTATION	UNP P0A334

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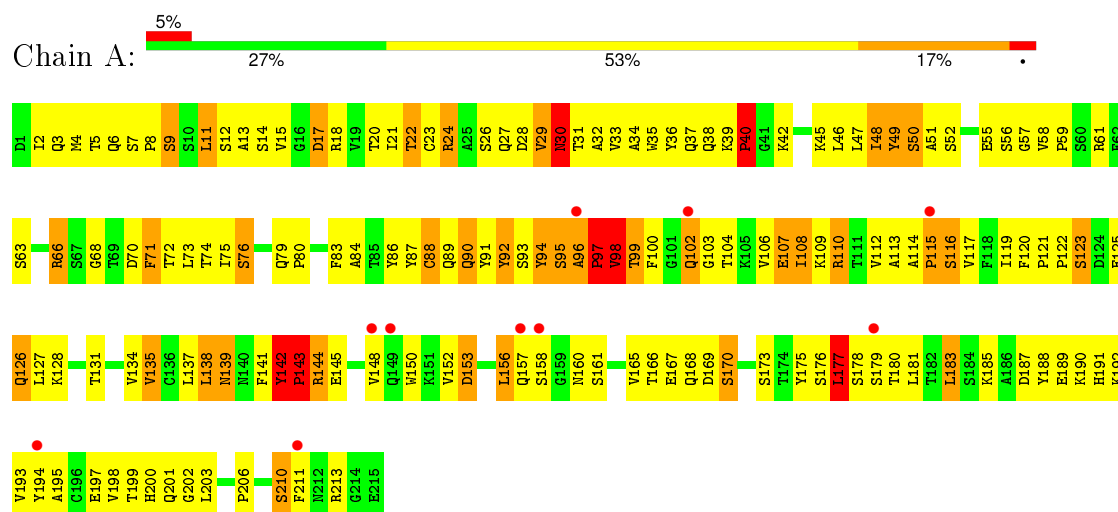
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Chain	Residue	Modelled	Actual	Comment	Reference
N	117	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
N	120	GLN	GLU	ENGINEERED MUTATION	UNP P0A334
N	121	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
N	122	GLN	ARG	ENGINEERED MUTATION	UNP P0A334
N	123	GLN	GLY	ENGINEERED MUTATION	UNP P0A334
N	124	GLN	HIS	ENGINEERED MUTATION	UNP P0A334

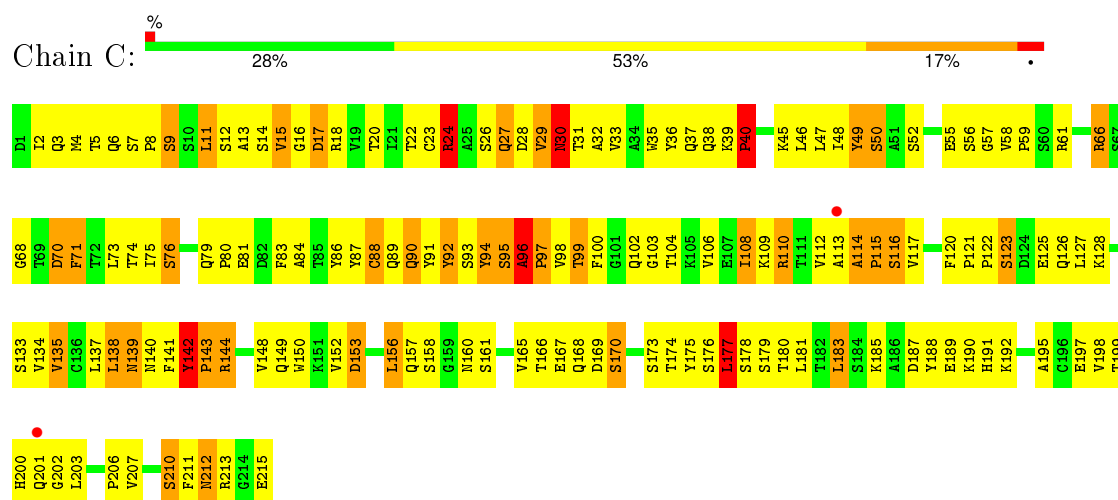
### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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: FAB light chain

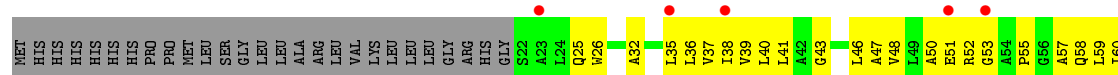


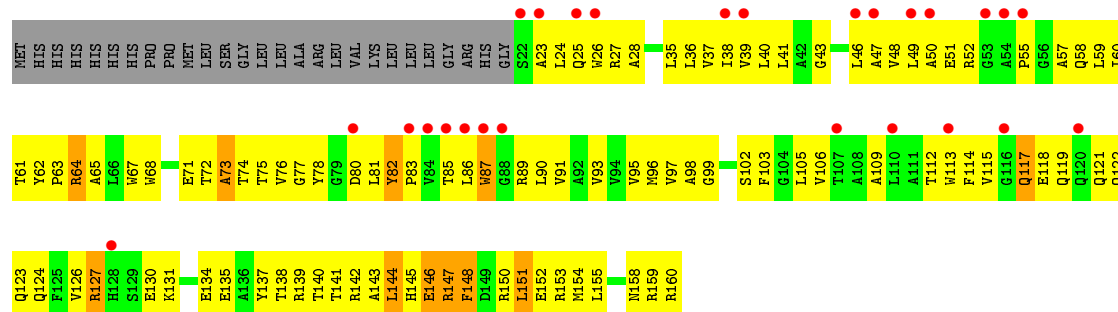
#### • Molecule 1: FAB light chain



#### • Molecule 2: FAB heavy chain







## 4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	118.27Å 176.72Å 340.47Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.00 – 3.80 39.17 – 3.70	Depositor EDS
% Data completeness (in resolution range)	82.4 (40.00-3.80) 80.9 (39.17-3.70)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.73 (at 3.66Å)	Xtriage
Refinement program	CNS	Depositor
R, $R_{free}$	0.281 , 0.332 0.289 , 0.337	Depositor DCC
$R_{free}$ test set	1358 reflections (4.63%)	DCC
Wilson B-factor (Å <sup>2</sup> )	135.7	Xtriage
Anisotropy	0.176	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 163.3	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtriage
Outliers	2 of 35414 reflections (0.006%)	Xtriage
$F_o, F_c$ correlation	0.86	EDS
Total number of atoms	10982	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	177.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.50% 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, 0.375 respectively for untwinned datasets, and 0.333, 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	0.75	6/1694 (0.4%)	1.41	25/2300 (1.1%)
1	C	0.68	0/1694	1.26	24/2300 (1.0%)
2	B	0.78	3/1698 (0.2%)	1.09	16/2319 (0.7%)
2	D	0.74	0/1698	1.17	18/2319 (0.8%)
3	K	0.59	0/1113	0.84	3/1517 (0.2%)
3	L	0.63	0/1113	0.75	0/1517
3	M	0.57	0/1113	0.75	2/1517 (0.1%)
3	N	0.60	0/1113	0.76	0/1517
All	All	0.69	9/11236 (0.1%)	1.08	88/15306 (0.6%)

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	2
1	C	0	1
3	K	0	1
All	All	0	4

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	97	PRO	N-CD	-12.23	1.30	1.47
1	A	115	PRO	CA-C	6.68	1.66	1.52
2	B	166	ASN	C-O	-6.56	1.10	1.23
2	B	154	LYS	C-O	-6.42	1.11	1.23
1	A	116	SER	N-CA	5.69	1.57	1.46

The worst 5 of 88 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	142	TYR	C-N-CD	-26.37	62.58	120.60
1	A	96	ALA	CB-CA-C	-18.99	81.62	110.10
1	A	96	ALA	C-N-CD	-17.89	81.25	120.60
1	A	96	ALA	N-CA-C	16.27	154.93	111.00
1	C	116	SER	N-CA-CB	-16.25	86.13	110.50

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	142	TYR	Mainchain
1	A	92	TYR	Sidechain
1	C	92	TYR	Sidechain
3	K	155	LEU	Peptide

## 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	1658	0	1606	299	0
1	C	1658	0	1606	248	0
2	B	1653	0	1597	285	0
2	D	1653	0	1597	274	0
3	K	1090	0	1093	185	0
3	L	1090	0	1093	193	0
3	M	1090	0	1093	181	0
3	N	1090	0	1093	167	0
All	All	10982	0	10778	1632	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 75.

The worst 5 of 1632 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)
2:B:165:TRP:HE1	2:B:174:VAL:CG2	1.04	1.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:165:TRP:CH2	2:B:193:VAL:HG11	1.39	1.54
2:B:130:PRO:CB	2:B:155:ASP:O	1.64	1.45
1:C:115:PRO:CB	1:C:141:PHE:HB3	1.47	1.45
2:B:165:TRP:CH2	2:B:193:VAL:CG1	1.97	1.43

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	213/215 (99%)	173 (81%)	34 (16%)	6 (3%)	6	47
1	C	213/215 (99%)	177 (83%)	30 (14%)	6 (3%)	6	47
2	B	215/224 (96%)	185 (86%)	28 (13%)	2 (1%)	21	68
2	D	215/224 (96%)	188 (87%)	25 (12%)	2 (1%)	21	68
3	K	137/166 (82%)	116 (85%)	18 (13%)	3 (2%)	8	52
3	L	137/166 (82%)	125 (91%)	10 (7%)	2 (2%)	13	59
3	M	137/166 (82%)	119 (87%)	17 (12%)	1 (1%)	26	72
3	N	137/166 (82%)	116 (85%)	19 (14%)	2 (2%)	13	59
All	All	1404/1542 (91%)	1199 (85%)	181 (13%)	24 (2%)	11	56

5 of 24 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	97	PRO
1	A	143	PRO
1	C	115	PRO
1	A	40	PRO
1	C	96	ALA

### 5.3.2 Protein sidechains ⓘ

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	189/189 (100%)	155 (82%)	34 (18%)	2	16
1	C	189/189 (100%)	155 (82%)	34 (18%)	2	16
2	B	184/188 (98%)	150 (82%)	34 (18%)	2	15
2	D	184/188 (98%)	149 (81%)	35 (19%)	2	13
3	K	108/131 (82%)	94 (87%)	14 (13%)	5	32
3	L	108/131 (82%)	94 (87%)	14 (13%)	5	32
3	M	108/131 (82%)	95 (88%)	13 (12%)	6	34
3	N	108/131 (82%)	95 (88%)	13 (12%)	6	34
All	All	1178/1278 (92%)	987 (84%)	191 (16%)	3	21

5 of 191 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	110	ARG
2	D	58	THR
3	M	153	ARG
1	C	123	SER
1	C	170	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 40 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	168	GLN
2	D	39	GLN
3	N	117	GLN
1	C	212	ASN
2	D	82	GLN

### 5.3.3 RNA ⓘ

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](#)

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, 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	215/215 (100%)	0.30	10 (4%) 35 23	98, 197, 222, 222	0
1	C	215/215 (100%)	-0.01	2 (0%) 85 74	80, 143, 198, 222	0
2	B	219/224 (97%)	0.17	10 (4%) 36 24	78, 153, 222, 222	0
2	D	219/224 (97%)	-0.06	1 (0%) 91 85	73, 134, 211, 222	0
3	K	139/166 (83%)	0.79	26 (18%) 2 1	78, 222, 222, 222	0
3	L	139/166 (83%)	0.63	15 (10%) 8 5	91, 222, 222, 222	0
3	M	139/166 (83%)	1.11	34 (24%) 1 1	90, 222, 222, 222	0
3	N	139/166 (83%)	0.87	26 (18%) 2 1	106, 222, 222, 222	0
All	All	1424/1542 (92%)	0.39	124 (8%) 13 8	73, 190, 222, 222	0

The worst 5 of 124 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	N	54	ALA	5.9
3	N	85	THR	5.8
3	M	73	ALA	5.8
3	L	38	ILE	5.7
3	M	79	GLY	5.2

### 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 carbohydrates 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.