



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 06:50 PM UTC

PDB ID : 5F72 / pdb_00005f72
Title : De novo design and crystallographic validation of antibodies targeting a pre-selected epitope
Authors : Liu, X.; Taylor, R.D.; Griffin, L.; Coker, S.; Adams, R.; Ceska, T.; Shi, J.; Lawson, A.D.G.; Baker, T.
Deposited on : 2015-12-07
Resolution : 1.85 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

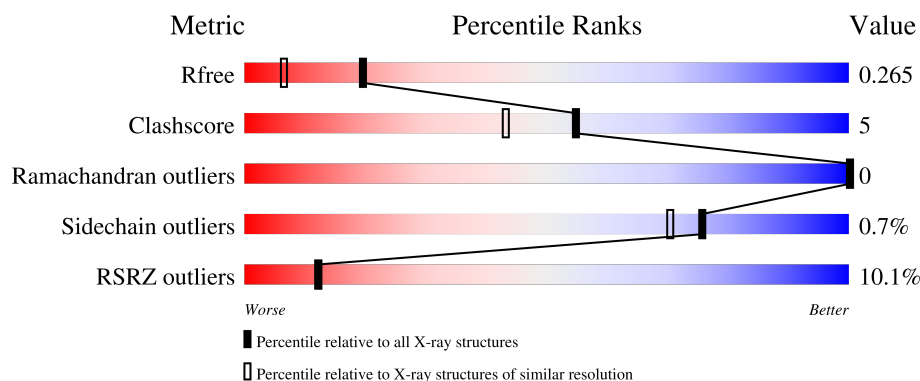
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.85 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	3428 (1.86-1.86)
Clashscore	190562	3579 (1.86-1.86)
Ramachandran outliers	187476	3553 (1.86-1.86)
Sidechain outliers	187428	3553 (1.86-1.86)
RSRZ outliers	180081	3429 (1.86-1.86)

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	C	296	<div> <div>18%</div> <div> <div></div> <div>80%</div> <div>15%</div> <div>• •</div> </div> </div>
1	K	296	<div> <div>9%</div> <div> <div></div> <div>81%</div> <div>13%</div> <div>• •</div> </div> </div>
2	S	257	<div> <div>6%</div> <div> <div></div> <div>76%</div> <div>11%</div> <div>• 12%</div> </div> </div>
2	T	257	<div> <div>4%</div> <div> <div></div> <div>83%</div> <div>5%</div> <div>11%</div> </div> </div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 8333 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 Kelch-like ECH-associated protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	K	285	Total	C	N	O	S	0	0	0
			2190	1361	394	420	15			
1	C	285	Total	C	N	O	S	0	0	0
			2190	1361	394	420	15			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	316	GLY	-	expression tag	UNP Q14145
K	317	SER	-	expression tag	UNP Q14145
K	318	MET	-	expression tag	UNP Q14145
K	319	GLY	-	expression tag	UNP Q14145
K	320	HIS	-	expression tag	UNP Q14145
K	354	ASP	ARG	conflict	UNP Q14145
C	316	GLY	-	expression tag	UNP Q14145
C	317	SER	-	expression tag	UNP Q14145
C	318	MET	-	expression tag	UNP Q14145
C	319	GLY	-	expression tag	UNP Q14145
C	320	HIS	-	expression tag	UNP Q14145
C	354	ASP	ARG	conflict	UNP Q14145

- Molecule 2 is a protein called Single chain Fv from a Fab.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	T	229	Total	C	N	O	S	0	0	0
			1707	1069	288	342	8			
2	S	226	Total	C	N	O	S	0	0	0
			1682	1054	281	339	8			

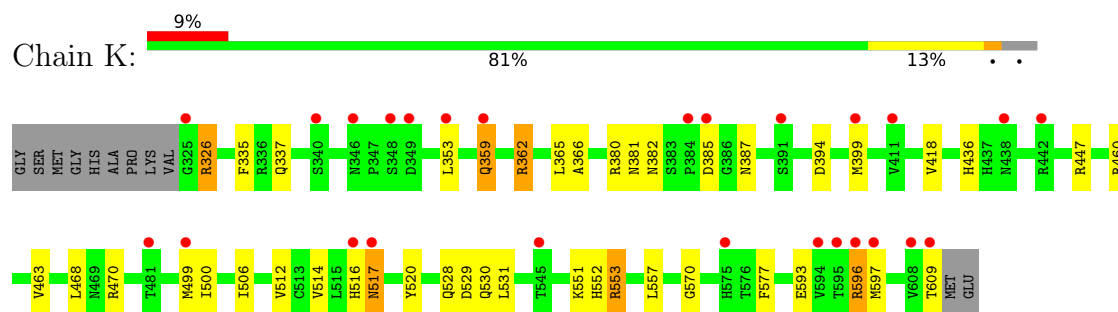
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	K	181	Total 181	O 181	0	0
3	C	155	Total 155	O 155	0	0
3	T	136	Total 136	O 136	0	0
3	S	92	Total 92	O 92	0	0

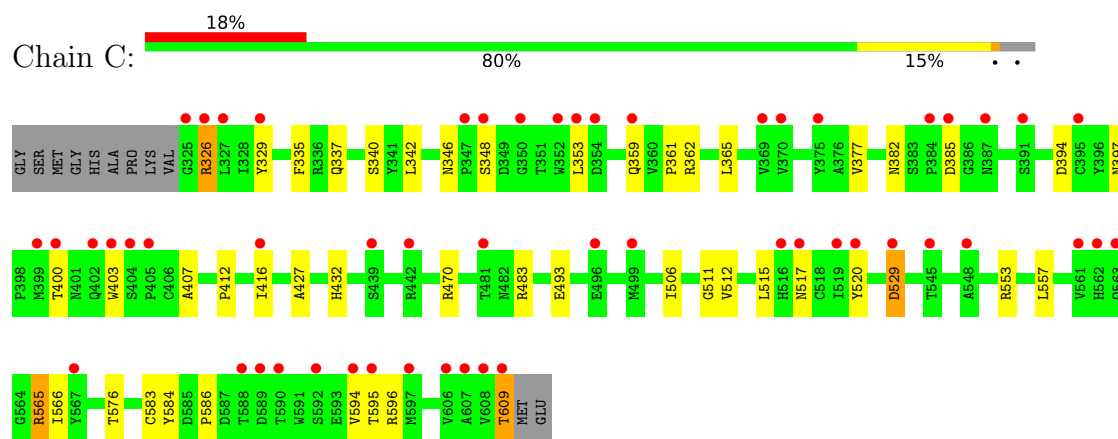
3 Residue-property plots

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.

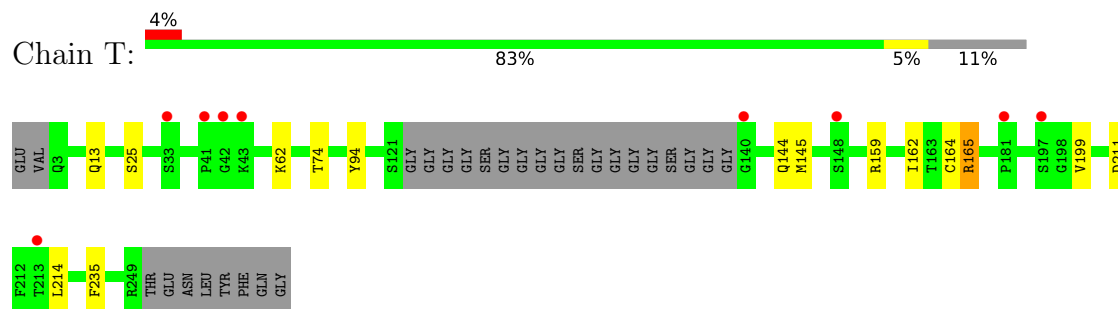
- Molecule 1: Kelch-like ECH-associated protein 1



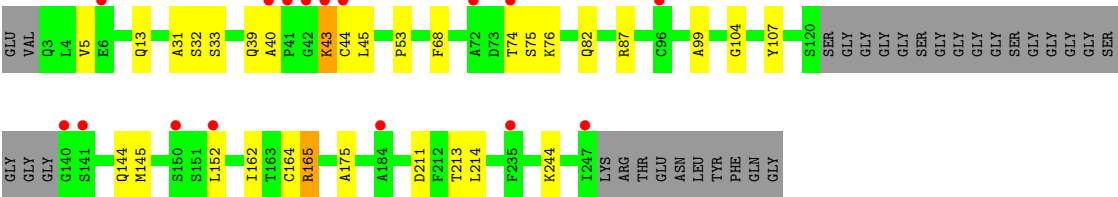
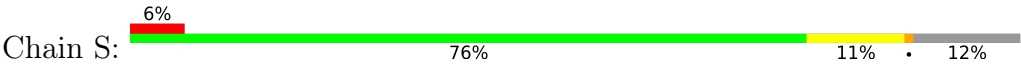
- Molecule 1: Kelch-like ECH-associated protein 1



- Molecule 2: Single chain Fv from a Fab



- Molecule 2: Single chain Fv from a Fab



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	70.50Å 69.81Å 99.56Å 90.00° 92.23° 90.00°	Depositor
Resolution (Å)	29.69 – 1.85 29.69 – 1.85	Depositor EDS
% Data completeness (in resolution range)	99.2 (29.69-1.85) 99.2 (29.69-1.85)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.05 (at 1.85Å)	Xtriage
Refinement program	REFMAC 5.8.0103	Depositor
R, R_{free}	0.223 , 0.265 0.223 , 0.265	Depositor DCC
R_{free} test set	4108 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å ²)	21.8	Xtriage
Anisotropy	0.037	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 38.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.011 for k,h,-l 0.013 for -k,-h,-l 0.025 for h,-k,-l	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	8333	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 7.72% 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

5.1 Standard geometry

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	C	1.52	10/2243 (0.4%)	1.30	16/3055 (0.5%)
1	K	1.49	13/2243 (0.6%)	1.25	14/3055 (0.5%)
2	S	1.26	6/1718 (0.3%)	1.17	5/2335 (0.2%)
2	T	1.34	4/1743 (0.2%)	1.11	4/2366 (0.2%)
All	All	1.42	33/7947 (0.4%)	1.22	39/10811 (0.4%)

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	K	0	1

All (33) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	326	ARG	NE-CZ	23.75	1.59	1.33
1	K	326	ARG	CZ-NH2	16.18	1.54	1.33
1	C	326	ARG	CD-NE	15.86	1.68	1.46
1	C	517	ASN	CG-OD1	14.37	1.50	1.23
1	K	326	ARG	CD-NE	14.19	1.66	1.46
1	K	528	GLN	CD-OE1	13.06	1.48	1.23
1	K	326	ARG	CZ-NH1	-12.69	1.15	1.32
1	K	326	ARG	NE-CZ	11.33	1.45	1.33
1	C	359	GLN	CD-OE1	-9.00	1.06	1.23
2	T	165	ARG	CZ-NH1	8.91	1.45	1.32
1	C	565	ARG	CZ-NH1	8.68	1.44	1.32
1	C	609	THR	CB-OG1	-8.44	1.30	1.43
2	S	43	LYS	CD-CE	7.92	1.76	1.52
1	C	553	ARG	NE-CZ	7.56	1.41	1.33
2	S	165	ARG	CD-NE	-7.51	1.35	1.46
2	S	75	SER	CB-OG	7.47	1.57	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	K	399	MET	SD-CE	-7.36	1.61	1.79
1	K	385	ASP	CB-CG	7.06	1.69	1.52
1	K	577	PHE	CA-C	-6.64	1.44	1.52
1	C	517	ASN	CG-ND2	-6.63	1.19	1.33
2	T	165	ARG	CD-NE	6.53	1.55	1.46
2	T	144	GLN	CD-NE2	6.52	1.47	1.33
1	C	609	THR	CA-C	6.28	1.66	1.52
2	S	76	LYS	CE-NZ	5.84	1.66	1.49
1	C	359	GLN	CD-NE2	-5.83	1.21	1.33
2	S	13	GLN	CD-OE1	5.83	1.34	1.23
2	T	94	TYR	N-CA	5.55	1.52	1.46
1	K	359	GLN	CD-OE1	-5.41	1.13	1.23
2	S	152	LEU	CG-CD1	5.35	1.70	1.52
1	K	528	GLN	CG-CD	5.34	1.65	1.52
1	K	531	LEU	CA-C	-5.21	1.46	1.52
1	K	399	MET	CB-CG	5.14	1.67	1.52
1	K	553	ARG	CD-NE	5.08	1.53	1.46

All (39) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	S	13	GLN	CG-CD-NE2	12.77	135.55	116.40
1	C	359	GLN	OE1-CD-NE2	-12.48	110.12	122.60
2	S	13	GLN	OE1-CD-NE2	-11.66	110.94	122.60
1	K	359	GLN	OE1-CD-NE2	-10.88	111.72	122.60
1	K	517	ASN	OD1-CG-ND2	-8.74	113.86	122.60
2	T	13	GLN	OE1-CD-NE2	-7.74	114.86	122.60
1	K	596	ARG	CB-CG-CD	7.70	129.00	111.30
2	S	144	GLN	OE1-CD-NE2	-7.53	115.07	122.60
1	C	609	THR	CA-CB-CG2	7.47	123.20	110.50
1	K	385	ASP	CA-CB-CG	-7.40	105.20	112.60
1	C	517	ASN	N-CA-C	7.11	121.69	113.38
1	K	528	GLN	CG-CD-NE2	-7.05	105.82	116.40
1	C	609	THR	CB-CA-C	-6.92	93.87	109.10
1	C	553	ARG	NE-CZ-NH2	6.64	125.17	119.20
1	C	326	ARG	CD-NE-CZ	6.44	133.42	124.40
1	K	326	ARG	CD-NE-CZ	6.25	133.15	124.40
1	K	528	GLN	CB-CG-CD	-6.06	102.29	112.60
1	C	517	ASN	CB-CA-C	-5.97	101.50	111.23
1	C	407	ALA	CA-C-N	-5.84	114.54	120.85
1	C	407	ALA	C-N-CA	-5.84	114.54	120.85
2	T	13	GLN	CG-CD-OE1	5.82	132.44	120.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	359	GLN	CA-CB-CG	-5.82	102.47	114.10
1	K	362	ARG	NE-CZ-NH1	-5.68	115.82	121.50
1	C	511	GLY	N-CA-C	-5.55	101.31	111.25
2	S	43	LYS	CB-CA-C	-5.54	100.32	113.02
1	C	353	LEU	CD1-CG-CD2	-5.48	98.75	110.80
1	K	353	LEU	CD1-CG-CD2	-5.38	98.95	110.80
2	S	43	LYS	CB-CG-CD	5.33	123.55	111.30
1	C	553	ARG	CG-CD-NE	-5.28	100.39	112.00
1	K	359	GLN	CG-CD-OE1	5.26	131.32	120.80
2	T	199	VAL	CA-C-N	-5.24	114.56	119.85
2	T	199	VAL	C-N-CA	-5.24	114.56	119.85
1	K	506	ILE	N-CA-C	-5.23	102.77	109.30
1	C	382	ASN	CA-C-N	-5.19	116.49	123.96
1	C	382	ASN	C-N-CA	-5.19	116.49	123.96
1	K	551	LYS	CG-CD-CE	-5.06	99.67	111.30
1	K	362	ARG	NE-CZ-NH2	5.06	123.75	119.20
1	C	385	ASP	N-CA-CB	-5.05	102.53	110.30
1	K	326	ARG	NH1-CZ-NH2	5.00	125.81	119.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	K	529	ASP	Peptide

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	C	2190	0	2075	26	0
1	K	2190	0	2075	23	0
2	S	1682	0	1617	18	0
2	T	1707	0	1648	8	0
3	C	155	0	0	3	0
3	K	181	0	0	2	0
3	S	92	0	0	2	0
3	T	136	0	0	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	8333	0	7415	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 5.

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)
2:S:43:LYS:CD	2:S:43:LYS:CE	1.76	1.55
1:C:326:ARG:NE	1:C:326:ARG:CD	1.68	1.51
1:K:359:GLN:HG3	3:K:863:HOH:O	1.62	0.99
1:C:326:ARG:HD3	1:C:609:THR:C	2.11	0.75
1:K:326:ARG:HD2	1:K:609:THR:C	2.14	0.73
2:S:165:ARG:HG2	2:S:211:ASP:OD1	1.89	0.70
2:S:43:LYS:CE	2:S:43:LYS:CG	2.71	0.69
1:C:329:TYR:HE1	1:C:609:THR:HG22	1.57	0.68
1:K:530:GLN:NE2	2:S:53:PRO:O	2.28	0.66
1:C:329:TYR:CE1	1:C:609:THR:HG22	2.31	0.66
1:K:499:MET:HE2	1:K:500:ILE:O	1.97	0.64
2:S:40:ALA:HB3	2:S:43:LYS:HG3	1.82	0.61
3:C:748:HOH:O	2:T:74:THR:HG21	2.01	0.60
1:K:380:ARG:HD2	1:K:387:ASN:HD22	1.67	0.60
2:S:145:MET:HE3	2:S:164:CYS:SG	2.42	0.59
2:T:62:LYS:HD3	3:T:421:HOH:O	2.02	0.59
2:T:62:LYS:HD2	3:T:399:HOH:O	2.03	0.58
1:C:365:LEU:H	1:C:365:LEU:HD23	1.68	0.57
1:C:397:ASN:CG	1:C:400:THR:HG22	2.30	0.57
1:K:596:ARG:HG3	1:K:596:ARG:HH21	1.70	0.56
1:C:529:ASP:HB3	3:C:716:HOH:O	2.04	0.56
1:C:566:ILE:HB	1:C:584:TYR:HB3	1.87	0.55
2:S:5:VAL:HG23	2:S:5:VAL:O	2.08	0.53
1:C:576:THR:HB	3:C:812:HOH:O	2.08	0.53
1:C:470:ARG:NH2	1:C:493:GLU:OE1	2.41	0.52
2:T:162:ILE:HD11	2:T:214:LEU:HD23	1.91	0.52
2:T:145:MET:HE3	2:T:164:CYS:SG	2.50	0.52
2:T:165:ARG:HG3	2:T:211:ASP:OD1	2.10	0.51
2:S:244:LYS:HE3	3:S:380:HOH:O	2.10	0.51
1:K:365:LEU:H	1:K:365:LEU:HD23	1.76	0.50
1:K:570:GLY:HA3	1:K:597:MET:HE1	1.94	0.50
2:S:107:TYR:CD1	2:S:175:ALA:HB2	2.45	0.50
1:K:470:ARG:HD3	3:K:817:HOH:O	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:382:ASN:HA	1:K:387:ASN:HB3	1.93	0.49
1:C:515:LEU:HD21	1:C:586:PRO:HG3	1.94	0.49
1:K:436:HIS:CE1	2:S:104:GLY:HA2	2.48	0.49
1:K:552:HIS:NE2	1:K:593:GLU:OE2	2.46	0.47
1:K:362:ARG:NH1	1:K:394:ASP:OD2	2.47	0.47
1:K:447:ARG:HE	1:K:447:ARG:HB3	1.33	0.47
1:C:335:PHE:C	1:C:337:GLN:H	2.24	0.46
1:C:565:ARG:HD3	1:C:583:CYS:SG	2.55	0.46
2:T:159:ARG:HG2	3:T:415:HOH:O	2.15	0.46
1:K:596:ARG:HG3	1:K:596:ARG:NH2	2.30	0.45
1:K:381:ASN:O	1:K:387:ASN:HA	2.17	0.45
2:S:43:LYS:HB3	2:S:44:CYS:H	1.55	0.45
2:S:33:SER:HB2	2:S:99:ALA:HB3	1.98	0.45
1:C:416:ILE:HD11	1:C:427:ALA:HB1	1.98	0.45
2:S:213:THR:HG23	3:S:378:HOH:O	2.16	0.44
1:K:366:ALA:HB3	1:K:418:VAL:HG13	1.99	0.44
2:S:39:GLN:HB2	2:S:45:LEU:HD23	1.99	0.44
1:K:516:HIS:O	1:K:517:ASN:CB	2.66	0.43
1:C:329:TYR:HE1	1:C:609:THR:CG2	2.26	0.43
1:C:346:ASN:OD1	1:C:348:SER:HB3	2.18	0.43
2:S:162:ILE:HG21	2:S:162:ILE:HD13	1.69	0.43
1:C:397:ASN:HB3	1:C:400:THR:CG2	2.49	0.43
1:C:512:VAL:HA	1:C:520:TYR:O	2.18	0.43
1:K:512:VAL:HA	1:K:520:TYR:O	2.19	0.43
2:S:162:ILE:HD12	2:S:214:LEU:HD23	2.01	0.43
1:C:483:ARG:HB3	1:C:506:ILE:CG2	2.48	0.43
1:C:594:VAL:O	1:C:595:THR:C	2.61	0.42
2:S:31:ALA:O	2:S:32:SER:HB3	2.20	0.42
2:T:235:PHE:CD1	2:T:235:PHE:C	2.99	0.41
1:C:342:LEU:HD22	1:C:403:TRP:CZ2	2.56	0.41
1:K:468:LEU:HD13	1:K:514:VAL:HG21	2.01	0.41
1:K:557:LEU:H	1:K:557:LEU:HD23	1.86	0.41
1:K:335:PHE:C	1:K:337:GLN:H	2.29	0.41
1:C:596:ARG:NH2	1:C:596:ARG:HG2	2.36	0.41
1:K:460:ARG:HB3	1:K:463:VAL:HB	2.02	0.41
1:C:362:ARG:NH1	1:C:394:ASP:OD2	2.54	0.41
1:C:340:SER:OG	1:C:361:PRO:HG3	2.21	0.40
1:C:412:PRO:HG2	1:C:432:HIS:CD2	2.56	0.40
1:C:557:LEU:H	1:C:557:LEU:HD23	1.86	0.40
2:S:68:PHE:HA	2:S:82:GLN:O	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	C	283/296 (96%)	273 (96%)	10 (4%)	0	100	100
1	K	283/296 (96%)	276 (98%)	7 (2%)	0	100	100
2	S	222/257 (86%)	214 (96%)	8 (4%)	0	100	100
2	T	225/257 (88%)	220 (98%)	5 (2%)	0	100	100
All	All	1013/1106 (92%)	983 (97%)	30 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	C	231/239 (97%)	229 (99%)	2 (1%)	70	64
1	K	231/239 (97%)	230 (100%)	1 (0%)	84	82
2	S	182/197 (92%)	180 (99%)	2 (1%)	65	57
2	T	185/197 (94%)	184 (100%)	1 (0%)	81	77
All	All	829/872 (95%)	823 (99%)	6 (1%)	76	70

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	K	553	ARG
1	C	377	VAL

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Mol	Chain	Res	Type
1	C	529	ASP
2	T	25	SER
2	S	74	THR
2	S	87	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	K	337	GLN
1	K	387	ASN
1	K	414	ASN
1	K	575	HIS
1	C	414	ASN
2	T	82	GLN
2	T	84	ASN
2	S	35	HIS

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 ⓘ

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	C	285/296 (96%)	1.03	53 (18%) 3 3	4, 25, 47, 67	23 (8%)
1	K	285/296 (96%)	0.49	26 (9%) 15 15	3, 20, 39, 67	19 (6%)
2	S	226/257 (87%)	0.55	16 (7%) 22 24	7, 26, 43, 64	2 (0%)
2	T	229/257 (89%)	0.11	9 (3%) 43 47	5, 19, 36, 61	3 (1%)
All	All	1025/1106 (92%)	0.57	104 (10%) 12 12	3, 23, 43, 67	47 (4%)

All (104) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	481	THR	8.3
1	C	517	ASN	7.3
1	K	517	ASN	7.2
1	C	609	THR	7.0
1	C	416	ILE	6.9
1	C	608	VAL	6.4
2	S	96	CYS	6.4
1	C	404	SER	6.3
1	C	395	CYS	5.8
2	S	41	PRO	5.7
1	K	481	THR	5.7
1	K	411	VAL	5.6
1	K	391	SER	5.5
1	K	353	LEU	5.2
1	K	340	SER	5.0
1	C	545	THR	5.0
2	T	213	THR	5.0
1	K	545	THR	4.9
1	C	391	SER	4.9
1	K	325	GLY	4.8
1	C	597	MET	4.7

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Mol	Chain	Res	Type	RSRZ
1	C	439	SER	4.7
2	T	197	SER	4.6
2	T	33	SER	4.5
1	K	499	MET	4.5
1	K	608	VAL	4.4
2	S	247	ILE	4.2
1	C	399	MET	4.1
1	K	399	MET	4.0
1	C	595	THR	3.8
2	S	140	GLY	3.8
1	C	326	ARG	3.7
2	S	6	GLU	3.6
2	S	43	LYS	3.6
1	C	353	LEU	3.5
1	C	325	GLY	3.5
1	C	442	ARG	3.4
2	T	140	GLY	3.4
1	K	385	ASP	3.3
1	C	385	ASP	3.3
2	T	43	LYS	3.3
1	C	329	TYR	3.2
2	T	42	GLY	3.2
1	K	596	ARG	3.2
1	K	442	ARG	3.2
1	C	354	ASP	3.2
2	S	72	ALA	3.1
1	C	375	TYR	3.1
1	C	369	VAL	3.1
1	K	348	SER	3.1
1	C	519	ILE	3.0
1	K	594	VAL	3.0
1	C	567	TYR	3.0
1	C	387	ASN	2.8
2	S	141	SER	2.8
1	C	592	SER	2.8
2	S	150	SER	2.7
1	C	499	MET	2.7
1	C	594	VAL	2.7
2	S	42	GLY	2.7
1	C	589	ASP	2.7
1	C	588	THR	2.7
1	K	438	ASN	2.6

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Mol	Chain	Res	Type	RSRZ
1	K	516	HIS	2.6
1	C	561	VAL	2.6
2	S	40	ALA	2.6
1	C	607	ALA	2.6
1	C	348	SER	2.6
1	C	384	PRO	2.6
2	S	152	LEU	2.6
1	C	562	HIS	2.5
1	K	349	ASP	2.5
1	C	496	GLU	2.5
1	C	352	TRP	2.5
2	S	184	ALA	2.5
1	K	595	THR	2.5
1	C	590	THR	2.5
2	T	41	PRO	2.5
1	C	402	GLN	2.4
2	T	148	SER	2.4
1	C	347	PRO	2.4
1	C	516	HIS	2.4
2	S	44	CYS	2.4
1	K	384	PRO	2.4
1	C	359	GLN	2.4
1	C	350	GLY	2.4
1	C	400	THR	2.3
2	S	235	PHE	2.3
2	S	74	THR	2.3
1	K	575	HIS	2.2
1	K	597	MET	2.2
1	K	609	THR	2.2
2	T	181	PRO	2.2
1	C	606	VAL	2.2
1	C	529	ASP	2.1
1	K	346	ASN	2.1
1	C	327	LEU	2.1
1	C	405	PRO	2.1
1	C	563	GLN	2.1
1	C	520	TYR	2.1
1	K	359	GLN	2.1
1	C	403	TRP	2.0
1	C	548	ALA	2.0
1	C	370	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](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.