



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 03:46 PM UTC

PDB ID : 3RZX / pdb\_00003rzx  
Title : Mouse importin alpha-Ku70 NLS peptide complex  
Authors : Takeda, A.A.S.; Fontes, M.R.M.  
Deposited on : 2011-05-12  
Resolution : 2.61 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](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0  
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

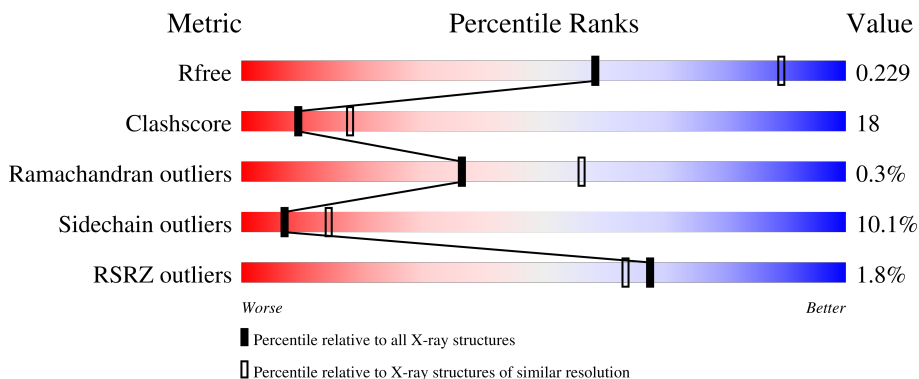
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.61 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	4951 (2.64-2.60)
Clashscore	190562	5303 (2.64-2.60)
Ramachandran outliers	187476	5217 (2.64-2.60)
Sidechain outliers	187428	5217 (2.64-2.60)
RSRZ outliers	180081	4950 (2.64-2.60)

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  $\geq 3$ , 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	510	
2	B	22	

## 2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 3373 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 Importin subunit alpha-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	427	3195	2037	541	607	10	0	0	0

There are 50 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	20	MET	-	expression tag	UNP P52293
A	21	HIS	-	expression tag	UNP P52293
A	22	HIS	-	expression tag	UNP P52293
A	23	HIS	-	expression tag	UNP P52293
A	24	HIS	-	expression tag	UNP P52293
A	25	HIS	-	expression tag	UNP P52293
A	26	HIS	-	expression tag	UNP P52293
A	27	SER	-	expression tag	UNP P52293
A	28	SER	-	expression tag	UNP P52293
A	29	GLY	-	expression tag	UNP P52293
A	30	LEU	-	expression tag	UNP P52293
A	31	VAL	-	expression tag	UNP P52293
A	32	PRO	-	expression tag	UNP P52293
A	33	ARG	-	expression tag	UNP P52293
A	34	GLY	-	expression tag	UNP P52293
A	35	SER	-	expression tag	UNP P52293
A	36	GLY	-	expression tag	UNP P52293
A	37	MET	-	expression tag	UNP P52293
A	38	LYS	-	expression tag	UNP P52293
A	39	GLU	-	expression tag	UNP P52293
A	40	THR	-	expression tag	UNP P52293
A	41	ALA	-	expression tag	UNP P52293
A	42	ALA	-	expression tag	UNP P52293
A	43	ALA	-	expression tag	UNP P52293
A	44	LYS	-	expression tag	UNP P52293
A	45	PHE	-	expression tag	UNP P52293
A	46	GLU	-	expression tag	UNP P52293

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Chain	Residue	Modelled	Actual	Comment	Reference
A	47	ARG	-	expression tag	UNP P52293
A	48	GLN	-	expression tag	UNP P52293
A	49	HIS	-	expression tag	UNP P52293
A	50	MET	-	expression tag	UNP P52293
A	51	ASP	-	expression tag	UNP P52293
A	52	SER	-	expression tag	UNP P52293
A	53	PRO	-	expression tag	UNP P52293
A	54	ASP	-	expression tag	UNP P52293
A	55	LEU	-	expression tag	UNP P52293
A	56	GLY	-	expression tag	UNP P52293
A	57	THR	-	expression tag	UNP P52293
A	58	ASP	-	expression tag	UNP P52293
A	59	ASP	-	expression tag	UNP P52293
A	60	ASP	-	expression tag	UNP P52293
A	61	ASP	-	expression tag	UNP P52293
A	62	LYS	-	expression tag	UNP P52293
A	63	ALA	-	expression tag	UNP P52293
A	64	MET	-	expression tag	UNP P52293
A	65	ALA	-	expression tag	UNP P52293
A	66	ASP	-	expression tag	UNP P52293
A	67	ILE	-	expression tag	UNP P52293
A	68	GLY	-	expression tag	UNP P52293
A	69	SER	-	expression tag	UNP P52293

- Molecule 2 is a protein called Ku70 NLS peptide.

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace	
2	B	12	Total	C	N	O	0	0	0
			82	48	17	17			

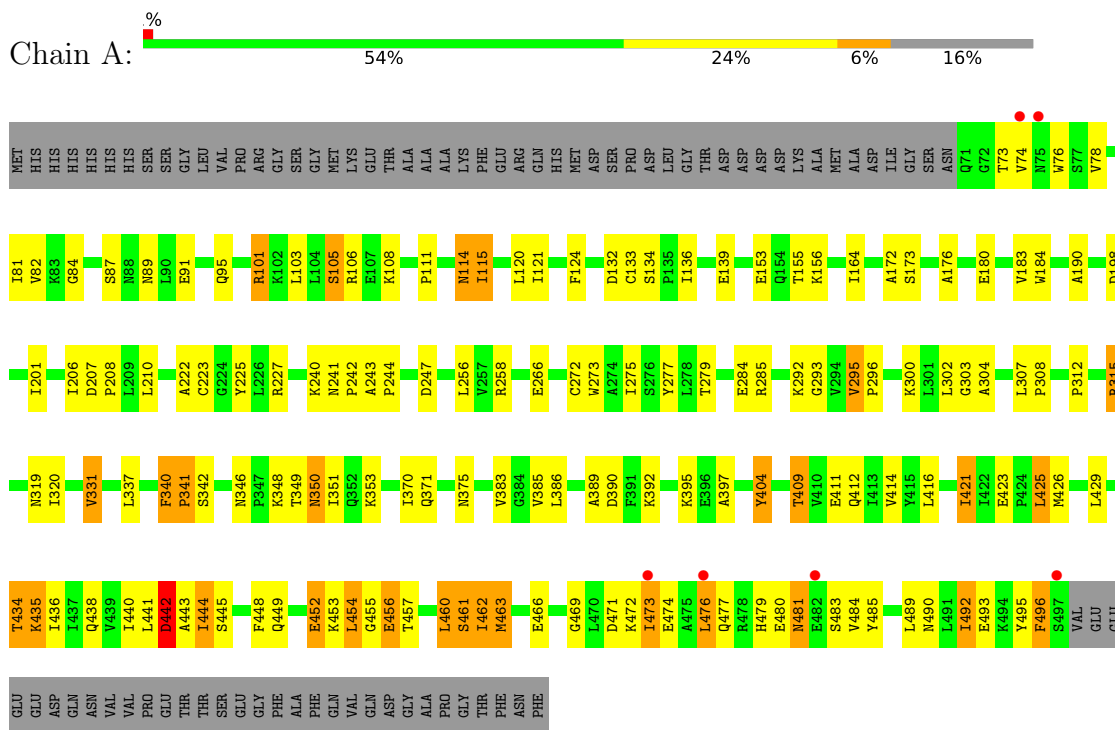
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	89	Total	O	0	0
			89	89		
3	B	7	Total	O	0	0
			7	7		

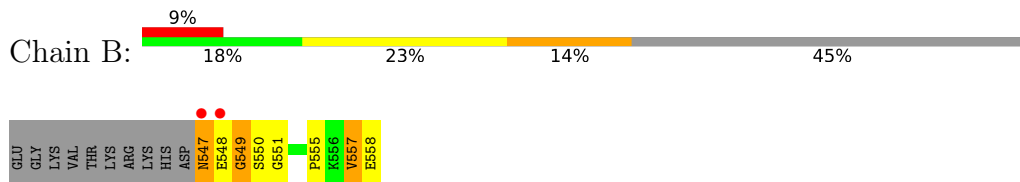
### 3 Residue-property plots [i](#)

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: Importin subunit alpha-2



- Molecule 2: Ku70 NLS peptide



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	78.52Å 90.00Å 100.14Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.07 – 2.61 29.07 – 2.61	Depositor EDS
% Data completeness (in resolution range)	99.2 (29.07-2.61) 99.3 (29.07-2.61)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.58 (at 2.61Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.168 , 0.223 (Not available) , 0.229	Depositor DCC
$R_{free}$ test set	1129 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	53.8	Xtrriage
Anisotropy	0.070	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 43.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	3373	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	53.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.77% 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, 0.333 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	1.41	15/3253 (0.5%)	1.49	44/4445 (1.0%)
2	B	1.83	1/82 (1.2%)	1.91	1/105 (1.0%)
All	All	1.42	16/3335 (0.5%)	1.51	45/4550 (1.0%)

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	3

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	121	ILE	CA-CB	-6.73	1.50	1.54
1	A	223	CYS	N-CA	-6.69	1.37	1.46
1	A	81	ILE	CA-CB	-6.61	1.46	1.54
1	A	370	ILE	CA-CB	-6.49	1.44	1.54
1	A	295	VAL	CA-CB	-6.21	1.50	1.54
1	A	315	ARG	CA-C	5.87	1.60	1.52
1	A	115	ILE	CA-CB	-5.87	1.47	1.54
1	A	124	PHE	CA-C	-5.72	1.45	1.52
1	A	442	ASP	CA-C	-5.67	1.44	1.52
1	A	320	ILE	N-CA	-5.57	1.39	1.46
1	A	89	ASN	N-CA	-5.41	1.40	1.46
2	B	547	ASN	C-N	-5.24	1.26	1.33
1	A	340	PHE	C-O	-5.21	1.19	1.24
1	A	303	GLY	C-O	-5.19	1.17	1.24
1	A	74	VAL	CA-CB	5.19	1.60	1.54
1	A	84	GLY	C-O	5.00	1.29	1.23

All (45) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	456	GLU	N-CA-CB	-11.66	92.65	110.73
1	A	240	LYS	CA-C-N	-9.71	109.33	123.30
1	A	240	LYS	C-N-CA	-9.71	109.33	123.30
1	A	481	ASN	CB-CA-C	8.81	124.18	109.99
1	A	120	LEU	N-CA-C	8.41	121.38	111.71
1	A	304	ALA	N-CA-C	8.28	121.92	110.24
1	A	87	SER	CA-C-N	-8.18	110.29	122.24
1	A	87	SER	C-N-CA	-8.18	110.29	122.24
1	A	156	LYS	N-CA-C	-7.22	103.42	111.28
1	A	389	ALA	N-CA-C	-6.59	99.48	108.38
1	A	423	GLU	CA-C-N	-6.57	112.93	119.56
1	A	423	GLU	C-N-CA	-6.57	112.93	119.56
1	A	198	ASP	N-CA-C	-6.45	104.89	112.89
1	A	409	THR	CB-CA-C	-6.38	97.08	111.30
1	A	443	ALA	N-CA-C	-6.37	104.25	111.07
1	A	277	TYR	N-CA-C	-6.26	104.54	111.36
1	A	341	PRO	N-CA-C	-6.12	104.63	113.75
1	A	222	ALA	CA-C-N	-6.07	110.98	121.66
1	A	222	ALA	C-N-CA	-6.07	110.98	121.66
1	A	134	SER	CA-C-N	-6.00	112.67	119.28
1	A	134	SER	C-N-CA	-6.00	112.67	119.28
1	A	331	VAL	N-CA-C	5.99	116.77	110.72
1	A	74	VAL	N-CA-C	5.95	116.74	108.89
1	A	435	LYS	N-CA-C	5.88	117.77	111.36
1	A	91	GLU	N-CA-C	5.83	117.72	111.36
2	B	551	GLY	N-CA-C	-5.80	104.57	111.36
1	A	87	SER	N-CA-C	-5.78	102.91	110.53
1	A	201	ILE	N-CA-C	5.64	116.28	110.36
1	A	155	THR	CA-C-O	-5.58	114.64	120.55
1	A	190	ALA	N-CA-C	-5.55	105.38	111.82
1	A	351	ILE	CB-CA-C	-5.48	104.75	112.14
1	A	272	CYS	N-CA-C	-5.45	105.50	111.82
1	A	404	TYR	N-CA-C	-5.42	105.37	111.28
1	A	275	ILE	CA-C-N	-5.41	112.49	120.28
1	A	275	ILE	C-N-CA	-5.41	112.49	120.28
1	A	164	ILE	CA-C-N	-5.38	113.36	119.28
1	A	164	ILE	C-N-CA	-5.38	113.36	119.28
1	A	337	LEU	N-CA-C	-5.30	105.68	111.82
1	A	460	LEU	N-CA-C	5.30	116.74	111.07
1	A	340	PHE	N-CA-C	5.27	120.77	113.45
1	A	258	ARG	CG-CD-NE	-5.18	100.59	112.00
1	A	285	ARG	N-CA-C	5.10	116.52	111.07
1	A	444	ILE	CB-CA-C	-5.06	105.49	111.81

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	183	VAL	N-CA-C	-5.05	105.47	110.62
1	A	434	THR	N-CA-C	5.04	117.43	111.33

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	108	LYS	Peptide
1	A	455	GLY	Mainchain
1	A	496	PHE	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	A	3195	0	3219	113	0
2	B	82	0	79	10	0
3	A	89	0	0	11	0
3	B	7	0	0	3	0
All	All	3373	0	3298	118	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 18.

All (118) 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:308:PRO:HA	2:B:547:ASN:CB	1.59	1.29
1:A:308:PRO:CA	2:B:547:ASN:CB	2.11	1.26
2:B:549:GLY:HA3	3:B:71:HOH:O	1.34	1.23
1:A:472:LYS:O	1:A:476:LEU:HD23	1.38	1.17
1:A:308:PRO:N	2:B:547:ASN:CB	2.10	1.14
1:A:307:LEU:C	2:B:547:ASN:CB	2.36	0.99
1:A:349:THR:HG22	3:A:5:HOH:O	1.64	0.98
1:A:461:SER:HB3	1:A:496:PHE:CE1	1.98	0.98

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:481:ASN:HD22	1:A:484:VAL:H	1.11	0.94
2:B:555:PRO:HD2	3:B:31:HOH:O	1.67	0.92
1:A:477:GLN:HE21	1:A:489:LEU:HA	1.36	0.90
1:A:101:ARG:HD3	1:A:139:GLU:OE1	1.72	0.89
1:A:480:GLU:HG2	1:A:480:GLU:O	1.75	0.84
1:A:386:LEU:HD21	1:A:425:LEU:HD13	1.60	0.83
1:A:114:ASN:HD22	1:A:114:ASN:H	1.24	0.83
1:A:114:ASN:H	1:A:114:ASN:ND2	1.75	0.82
1:A:315:ARG:HD2	3:A:12:HOH:O	1.82	0.80
1:A:346:ASN:HD22	1:A:348:LYS:H	1.32	0.78
1:A:426:MET:HE1	1:A:444:ILE:HD12	1.67	0.75
1:A:207:ASP:HB2	1:A:208:PRO:HD3	1.68	0.74
1:A:472:LYS:O	1:A:476:LEU:CD2	2.30	0.74
1:A:473:ILE:O	1:A:476:LEU:HB2	1.88	0.74
1:A:442:ASP:OD2	1:A:442:ASP:N	2.16	0.73
1:A:101:ARG:CD	1:A:139:GLU:OE1	2.37	0.73
1:A:411:GLU:HG3	3:A:531:HOH:O	1.87	0.73
1:A:469:GLY:O	1:A:473:ILE:HG13	1.89	0.72
1:A:477:GLN:HG2	1:A:489:LEU:HB2	1.72	0.72
1:A:346:ASN:ND2	1:A:348:LYS:H	1.87	0.71
1:A:442:ASP:HA	1:A:445:SER:HB3	1.73	0.70
1:A:481:ASN:HB3	1:A:484:VAL:HB	1.74	0.69
1:A:315:ARG:CD	3:A:12:HOH:O	2.40	0.68
1:A:474:GLU:HA	1:A:492:ILE:CD1	2.23	0.68
1:A:480:GLU:O	1:A:480:GLU:CG	2.41	0.68
1:A:307:LEU:O	2:B:547:ASN:CB	2.43	0.67
1:A:456:GLU:HA	1:A:456:GLU:OE2	1.92	0.66
1:A:481:ASN:O	1:A:485:TYR:CD2	2.49	0.65
1:A:346:ASN:HD22	1:A:348:LYS:N	1.95	0.65
1:A:371:GLN:HE21	1:A:375:ASN:HD21	1.44	0.64
1:A:114:ASN:ND2	1:A:114:ASN:N	2.46	0.64
1:A:426:MET:HE1	1:A:444:ILE:CD1	2.28	0.63
1:A:461:SER:CB	1:A:496:PHE:CE1	2.79	0.62
2:B:547:ASN:O	2:B:548:GLU:HG3	2.00	0.62
1:A:474:GLU:CA	1:A:492:ILE:HD11	2.30	0.62
1:A:456:GLU:OE2	1:A:456:GLU:CA	2.48	0.61
1:A:474:GLU:HA	1:A:492:ILE:HD11	1.83	0.61
1:A:207:ASP:HB2	1:A:208:PRO:CD	2.32	0.60
1:A:436:ILE:O	1:A:440:ILE:HG13	2.04	0.57
1:A:315:ARG:HG2	1:A:315:ARG:HH11	1.70	0.57
1:A:481:ASN:ND2	1:A:484:VAL:HG23	2.20	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:349:THR:CG2	1:A:350:ASN:N	2.68	0.56
1:A:409:THR:H	1:A:412:GLN:NE2	2.04	0.56
1:A:315:ARG:HG2	1:A:315:ARG:NH1	2.22	0.55
1:A:349:THR:HG23	1:A:350:ASN:N	2.20	0.55
1:A:474:GLU:HA	1:A:492:ILE:HD12	1.88	0.55
1:A:133:CYS:O	1:A:136:ILE:HG22	2.08	0.54
1:A:180:GLU:HB2	1:A:225:TYR:CD1	2.42	0.54
1:A:480:GLU:O	1:A:481:ASN:HB2	2.08	0.54
1:A:452:GLU:OE1	1:A:495:TYR:HE1	1.91	0.53
1:A:466:GLU:CG	3:A:539:HOH:O	2.56	0.53
1:A:466:GLU:HG2	3:A:539:HOH:O	2.07	0.53
1:A:481:ASN:HD22	1:A:484:VAL:N	1.94	0.53
1:A:457:THR:O	1:A:461:SER:OG	2.26	0.53
1:A:176:ALA:HA	3:A:593:HOH:O	2.10	0.53
1:A:184:TRP:C	1:A:184:TRP:CD1	2.89	0.51
1:A:461:SER:HB3	1:A:496:PHE:HE1	1.67	0.51
2:B:557:VAL:HG13	2:B:558:GLU:N	2.26	0.50
1:A:295:VAL:HB	1:A:296:PRO:HD3	1.92	0.49
1:A:454:LEU:O	1:A:456:GLU:HG2	2.11	0.49
1:A:293:GLY:HA2	3:A:19:HOH:O	2.13	0.49
1:A:440:ILE:O	1:A:444:ILE:HG12	2.12	0.49
1:A:477:GLN:NE2	1:A:489:LEU:HA	2.17	0.49
1:A:180:GLU:HB2	1:A:225:TYR:CE1	2.47	0.49
1:A:243:ALA:HB1	1:A:244:PRO:HD2	1.94	0.48
1:A:461:SER:CB	1:A:496:PHE:HE1	2.23	0.48
1:A:453:LYS:CB	3:A:595:HOH:O	2.62	0.48
1:A:101:ARG:O	1:A:105:SER:OG	2.31	0.47
1:A:460:LEU:HD12	1:A:460:LEU:O	2.14	0.47
1:A:481:ASN:ND2	1:A:484:VAL:H	1.94	0.47
1:A:441:LEU:HA	1:A:441:LEU:HD23	1.33	0.47
1:A:462:ILE:HG22	1:A:463:MET:N	2.28	0.47
1:A:78:VAL:O	1:A:82:VAL:HG23	2.15	0.47
1:A:429:LEU:HA	1:A:429:LEU:HD23	1.49	0.46
1:A:404:TYR:CD1	1:A:416:LEU:HD22	2.51	0.46
1:A:435:LYS:HD3	1:A:438:GLN:HE21	1.81	0.46
2:B:549:GLY:CA	3:B:71:HOH:O	2.16	0.46
1:A:426:MET:CE	1:A:444:ILE:HD12	2.41	0.46
1:A:490:ASN:OD1	1:A:490:ASN:C	2.59	0.45
1:A:273:TRP:CD2	1:A:312:PRO:HB3	2.51	0.45
1:A:307:LEU:N	1:A:308:PRO:CD	2.80	0.45
1:A:476:LEU:O	1:A:479:HIS:HB3	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:73:THR:HA	1:A:76:TRP:NE1	2.31	0.45
1:A:383:VAL:HG22	1:A:421:ILE:HD13	1.99	0.45
1:A:284:GLU:OE2	1:A:284:GLU:N	2.38	0.45
1:A:421:ILE:O	1:A:425:LEU:HB2	2.17	0.45
1:A:340:PHE:O	1:A:341:PRO:C	2.58	0.45
1:A:481:ASN:O	1:A:485:TYR:HD2	1.97	0.45
1:A:448:PHE:O	1:A:449:GLN:C	2.60	0.44
1:A:481:ASN:ND2	1:A:483:SER:H	2.14	0.44
1:A:474:GLU:CA	1:A:492:ILE:CD1	2.91	0.44
1:A:426:MET:O	1:A:429:LEU:HB2	2.17	0.44
1:A:279:THR:O	1:A:319:ASN:HB3	2.18	0.44
1:A:103:LEU:HD23	1:A:103:LEU:HA	1.69	0.43
1:A:227:ARG:HE	1:A:266:GLU:HB2	1.83	0.43
1:A:111:PRO:O	1:A:115:ILE:HG12	2.17	0.43
1:A:409:THR:HG21	3:A:544:HOH:O	2.19	0.43
1:A:172:ALA:O	1:A:173:SER:C	2.59	0.42
1:A:292:LYS:NZ	3:A:559:HOH:O	2.52	0.42
1:A:435:LYS:HA	1:A:438:GLN:HG3	2.01	0.42
1:A:241:ASN:HA	1:A:242:PRO:HA	1.85	0.41
1:A:206:ILE:O	1:A:210:LEU:HG	2.20	0.41
1:A:438:GLN:O	1:A:442:ASP:OD2	2.38	0.41
1:A:489:LEU:O	1:A:490:ASN:C	2.62	0.41
1:A:302:LEU:HD12	1:A:302:LEU:HA	1.93	0.41
1:A:481:ASN:CG	1:A:484:VAL:HG23	2.45	0.41
1:A:349:THR:CG2	1:A:350:ASN:H	2.34	0.41
1:A:385:VAL:HG12	1:A:397:ALA:HB2	2.03	0.40
1:A:295:VAL:O	1:A:296:PRO:C	2.63	0.40
1:A:449:GLN:HE21	1:A:449:GLN:HB3	1.74	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	285/510 (56%)	278 (98%)	7 (2%)	0	100	100
2	B	10/22 (46%)	8 (80%)	1 (10%)	1 (10%)	0	0
All	All	295/532 (56%)	286 (97%)	8 (3%)	1 (0%)	36	56

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	549	GLY

### 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	330/426 (78%)	298 (90%)	32 (10%)	8	16
2	B	8/19 (42%)	6 (75%)	2 (25%)	0	1
All	All	338/445 (76%)	304 (90%)	34 (10%)	7	14

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	95	GLN
1	A	101	ARG
1	A	105	SER
1	A	106	ARG
1	A	114	ASN
1	A	132	ASP
1	A	153	GLU
1	A	247	ASP
1	A	256	LEU
1	A	300	LYS
1	A	331	VAL
1	A	342	SER
1	A	350	ASN
1	A	353	LYS
1	A	390	ASP

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Mol	Chain	Res	Type
1	A	392	LYS
1	A	395	LYS
1	A	414	VAL
1	A	421	ILE
1	A	425	LEU
1	A	434	THR
1	A	442	ASP
1	A	452	GLU
1	A	454	LEU
1	A	461	SER
1	A	462	ILE
1	A	463	MET
1	A	471	ASP
1	A	473	ILE
1	A	476	LEU
1	A	492	ILE
1	A	493	GLU
2	B	550	SER
2	B	557	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	95	GLN
1	A	114	ASN
1	A	262	HIS
1	A	283	ASN
1	A	346	ASN
1	A	375	ASN
1	A	403	ASN
1	A	412	GLN
1	A	438	GLN
1	A	449	GLN
1	A	477	GLN
1	A	481	ASN

### 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 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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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	427/510 (83%)	-0.64	6 (1%) 73 70	33, 48, 91, 100	0
2	B	12/22 (54%)	0.63	2 (16%) 4 3	36, 49, 70, 78	0
All	All	439/532 (82%)	-0.61	8 (1%) 67 63	33, 48, 91, 100	0

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	497	SER	6.0
2	B	547	ASN	4.0
1	A	74	VAL	3.0
2	B	548	GLU	2.6
1	A	482	GLU	2.5
1	A	473	ILE	2.2
1	A	75	ASN	2.2
1	A	476	LEU	2.2

### 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.