



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 07:00 AM GMT

PDB ID : 2Z5O
Title : Complex of Transportin 1 with JKTBP NLS
Authors : Imasaki, T.; Shimizu, T.; Hashimoto, H.; Hidaka, Y.; Kose, S.; Imamoto, N.; Yamada, M.; Sato, M.
Deposited on : 2007-07-14
Resolution : 3.20 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

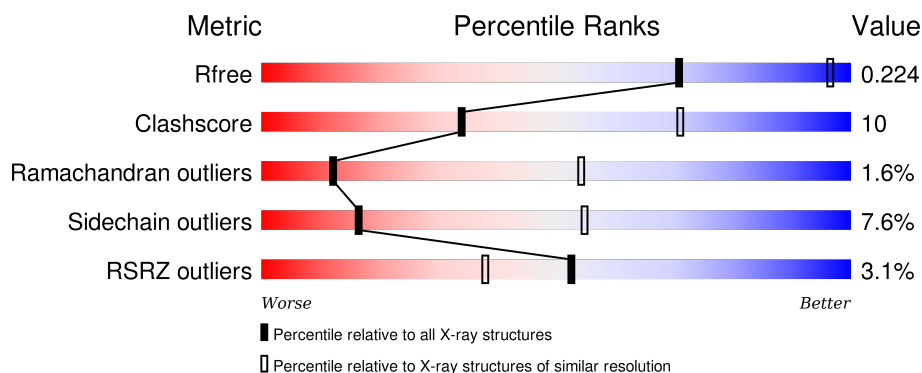
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.20 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	1124 (3.24-3.16)
Clashscore	102246	1024 (3.22-3.18)
Ramachandran outliers	100387	1004 (3.22-3.18)
Sidechain outliers	100360	1003 (3.22-3.18)
RSRZ outliers	91569	1129 (3.24-3.16)

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 ≥ 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	890	<div> <div>3%</div> <div>71%</div> <div>19%</div> <div>6%</div> </div>
2	B	10	<div> <div>80%</div> <div>20%</div> </div>

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 6689 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 Transportin-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	834	Total	C	N	O	S	0	0	0
			6638	4257	1107	1223	51			

- Molecule 2 is a protein called Heterogeneous nuclear ribonucleoprotein D-like.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	10	Total	C	N	O	0	0	0
			51	30	10	11			

4 Data and refinement statistics

Property	Value	Source
Space group	P 2 ₁ 2 ₁ 2	Depositor
Cell constants a, b, c, α , β , γ	132.31Å 169.81Å 68.46Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.57 – 3.20 47.57 – 3.18	Depositor EDS
% Data completeness (in resolution range)	95.0 (47.57-3.20) 94.3 (47.57-3.18)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.26 (at 3.19Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.236 , 0.279 0.229 , 0.224	Depositor DCC
R_{free} test set	1238 reflections (5.23%)	DCC
Wilson B-factor (Å ²)	95.2	Xtriage
Anisotropy	0.897	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 112.7	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 25190 reflections	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	6689	wwPDB-VP
Average B, all atoms (Å ²)	129.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.73% 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, 0.375 respectively for untwinned datasets, and 0.333, 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	A	0.37	0/6779	0.54	0/9205

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

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	6638	0	6710	131	0
2	B	51	0	14	5	0
All	All	6689	0	6724	136	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 10.

All (136) 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:10:UNK:C	2:B:10:UNK:CA	1.74	1.59
1:A:584:PHE:HD2	1:A:584:PHE:H	1.14	0.89
1:A:47:ASN:HD21	1:A:75:ASN:HD22	1.24	0.85
1:A:821:ILE:HG12	1:A:828:VAL:HG21	1.57	0.85

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:6:LYS:N	1:A:7:PRO:HD3	1.92	0.85
2:B:8:UNK:O	2:B:10:UNK:N	2.09	0.85
1:A:879:PRO:O	1:A:883:ARG:HB2	1.82	0.80
1:A:584:PHE:HB2	1:A:585:PRO:HD3	1.63	0.80
1:A:672:MET:O	1:A:676:MET:HG3	1.80	0.80
1:A:736:SER:HA	1:A:743:MET:HG3	1.65	0.79
1:A:877:PRO:HD2	1:A:880:LEU:HD23	1.66	0.78
1:A:70:LEU:HD13	1:A:109:THR:HG23	1.64	0.77
1:A:700:GLN:HE21	1:A:700:GLN:H	1.34	0.75
1:A:38:GLU:HA	1:A:41:ASN:HB2	1.67	0.75
1:A:791:GLN:HG3	1:A:827:GLY:HA2	1.73	0.70
1:A:584:PHE:N	1:A:584:PHE:HD2	1.88	0.69
1:A:504:PHE:HZ	1:A:522:ILE:HD12	1.57	0.68
1:A:815:ARG:HH11	1:A:815:ARG:HG2	1.58	0.68
2:B:8:UNK:C	2:B:10:UNK:N	2.58	0.66
1:A:790:LEU:HD23	1:A:828:VAL:HG23	1.78	0.65
1:A:185:HIS:CD2	1:A:187:SER:H	2.15	0.65
1:A:629:GLN:OE1	1:A:633:TYR:HB2	1.98	0.64
1:A:8:ASP:HB2	1:A:9:GLU:HB3	1.79	0.64
1:A:122:GLU:HA	1:A:123:LEU:HB2	1.79	0.64
1:A:185:HIS:HD2	1:A:187:SER:H	1.45	0.63
1:A:824:ASN:C	1:A:824:ASN:HD22	2.00	0.63
1:A:240:VAL:O	1:A:243:LEU:HB2	1.98	0.63
1:A:130:LEU:HB2	1:A:131:PRO:HD3	1.80	0.63
1:A:790:LEU:HD11	1:A:820:MET:HB3	1.80	0.62
1:A:581:LYS:HA	1:A:584:PHE:CE2	2.35	0.61
1:A:582:ASP:O	1:A:585:PRO:HD2	1.99	0.61
1:A:629:GLN:N	1:A:630:PRO:HD3	2.14	0.61
1:A:504:PHE:CZ	1:A:522:ILE:HD12	2.36	0.61
1:A:815:ARG:HH11	1:A:815:ARG:CG	2.14	0.60
1:A:422:GLY:HA3	1:A:460:TRP:CZ3	2.37	0.60
1:A:6:LYS:N	1:A:7:PRO:CD	2.66	0.58
1:A:173:ASN:HD22	1:A:208:ALA:HB2	1.69	0.58
1:A:883:ARG:HH11	1:A:883:ARG:HG3	1.69	0.57
1:A:700:GLN:NE2	1:A:700:GLN:H	2.00	0.56
1:A:692:GLY:HA3	1:A:730:TRP:CZ3	2.41	0.55
1:A:258:VAL:O	1:A:262:LEU:HB2	2.06	0.55
1:A:251:LEU:HB3	1:A:252:PRO:HD3	1.89	0.55
1:A:584:PHE:HB2	1:A:585:PRO:CD	2.34	0.54
1:A:191:ARG:O	1:A:195:VAL:HG12	2.08	0.54
1:A:47:ASN:ND2	1:A:75:ASN:HD22	1.99	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:629:GLN:HB3	1:A:633:TYR:H	1.73	0.54
1:A:254:MET:O	1:A:258:VAL:HG13	2.08	0.54
1:A:824:ASN:HD22	1:A:826:SER:H	1.56	0.53
1:A:695:THR:HG21	1:A:735:ILE:HA	1.91	0.53
1:A:422:GLY:HA3	1:A:460:TRP:HZ3	1.73	0.53
2:B:10:UNK:CB	2:B:10:UNK:C	2.81	0.52
1:A:591:SER:HA	1:A:647:LEU:HD13	1.92	0.52
1:A:313:ILE:HD13	1:A:313:ILE:N	2.25	0.52
2:B:10:UNK:C	2:B:10:UNK:N	2.64	0.52
1:A:604:TYR:O	1:A:607:PRO:HD2	2.10	0.52
1:A:847:ASP:O	1:A:850:ARG:HB2	2.10	0.51
1:A:572:LYS:O	1:A:576:LEU:HG	2.09	0.51
1:A:174:ILE:O	1:A:178:LYS:HB2	2.10	0.51
1:A:57:LEU:HD23	1:A:60:GLU:HB2	1.93	0.51
1:A:885:ALA:HA	1:A:890:VAL:H	1.76	0.50
1:A:151:ALA:O	1:A:155:ILE:HG12	2.12	0.50
1:A:573:TRP:CZ2	1:A:608:VAL:HA	2.47	0.50
1:A:80:PHE:O	1:A:83:PHE:HB2	2.12	0.50
1:A:584:PHE:N	1:A:584:PHE:CD2	2.60	0.50
1:A:629:GLN:C	1:A:631:ASP:H	2.15	0.49
1:A:795:ARG:HB2	1:A:796:PRO:HD3	1.94	0.49
1:A:883:ARG:NH1	1:A:883:ARG:HG3	2.28	0.49
1:A:869:TRP:HE1	1:A:890:VAL:HG12	1.78	0.49
1:A:712:ILE:O	1:A:716:ASN:HB2	2.12	0.48
1:A:300:LEU:HD22	1:A:304:LEU:HD22	1.94	0.48
1:A:479:LYS:HB3	1:A:480:PRO:HD3	1.94	0.48
1:A:77:LYS:O	1:A:78:ALA:HB2	2.12	0.48
1:A:169:ASP:CG	1:A:170:ARG:H	2.16	0.48
1:A:559:PRO:O	1:A:563:GLN:HG2	2.13	0.48
1:A:710:MET:HB2	1:A:711:PRO:HD3	1.95	0.48
1:A:676:MET:HE1	1:A:709:PHE:HD1	1.79	0.48
1:A:651:LEU:O	1:A:655:LEU:HB2	2.14	0.47
1:A:415:GLU:HG2	1:A:457:ILE:HD11	1.96	0.47
1:A:815:ARG:CG	1:A:815:ARG:NH1	2.77	0.47
1:A:395:LEU:HA	1:A:398:ILE:HG22	1.95	0.47
1:A:843:ILE:HA	1:A:883:ARG:HH21	1.79	0.47
1:A:381:ALA:O	1:A:385:VAL:HG23	2.15	0.47
1:A:276:ALA:O	1:A:279:PHE:HB3	2.15	0.46
1:A:46:PHE:CZ	1:A:50:LEU:HD11	2.50	0.46
1:A:444:ILE:HA	1:A:447:LEU:HD12	1.97	0.46
1:A:518:TYR:CD1	1:A:518:TYR:N	2.84	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:173:ASN:ND2	1:A:208:ALA:HB2	2.30	0.46
1:A:513:THR:HA	1:A:516:VAL:HG23	1.98	0.45
1:A:319:LYS:HD2	1:A:493:ASN:HD21	1.81	0.45
1:A:7:PRO:HB2	1:A:49:TYR:CZ	2.52	0.45
1:A:170:ARG:NH1	1:A:170:ARG:HB2	2.32	0.45
1:A:8:ASP:CB	1:A:9:GLU:HB3	2.46	0.45
1:A:168:LEU:O	1:A:169:ASP:HB3	2.16	0.45
1:A:512:CYS:HA	1:A:551:SER:HB3	1.99	0.45
1:A:293:LEU:O	1:A:295:ARG:N	2.50	0.45
1:A:99:ILE:HG21	1:A:136:LEU:HD23	1.98	0.45
1:A:99:ILE:O	1:A:107:ARG:HG3	2.17	0.45
1:A:504:PHE:HZ	1:A:522:ILE:CD1	2.29	0.45
1:A:80:PHE:HA	1:A:83:PHE:CD2	2.53	0.44
1:A:739:MET:CB	1:A:743:MET:HG2	2.48	0.44
1:A:739:MET:HB2	1:A:743:MET:HG2	1.99	0.44
1:A:629:GLN:N	1:A:630:PRO:CD	2.79	0.44
1:A:877:PRO:CD	1:A:880:LEU:HD23	2.43	0.44
1:A:488:ARG:HB3	1:A:500:ALA:HB2	1.99	0.44
1:A:268:GLN:HB3	1:A:268:GLN:HE21	1.63	0.43
1:A:418:ILE:HB	1:A:457:ILE:HD13	1.99	0.43
1:A:699:PHE:CD2	1:A:738:GLN:HB3	2.52	0.43
1:A:670:THR:HG22	1:A:674:GLN:HE21	1.83	0.43
1:A:518:TYR:O	1:A:522:ILE:HG12	2.18	0.43
1:A:242:LEU:HB3	1:A:250:LEU:HD22	2.00	0.43
1:A:433:ILE:HA	1:A:436:LEU:HD12	1.99	0.43
1:A:278:GLU:OE2	1:A:373:TRP:NE1	2.50	0.43
1:A:876:PHE:CB	1:A:881:LYS:HB2	2.49	0.43
1:A:275:GLU:O	1:A:278:GLU:HB2	2.18	0.43
1:A:685:GLN:HB2	1:A:724:VAL:HG22	2.01	0.43
1:A:67:LEU:O	1:A:71:ILE:HG12	2.20	0.42
1:A:817:ILE:O	1:A:821:ILE:HG13	2.19	0.42
1:A:821:ILE:HG12	1:A:828:VAL:CG2	2.39	0.42
1:A:387:ALA:O	1:A:427:GLY:HA3	2.19	0.42
1:A:843:ILE:HA	1:A:883:ARG:NH2	2.35	0.42
1:A:824:ASN:C	1:A:824:ASN:ND2	2.71	0.42
1:A:656:GLY:O	1:A:697:ALA:HB1	2.20	0.41
1:A:814:PHE:O	1:A:817:ILE:HG22	2.20	0.41
1:A:677:GLN:HE21	1:A:712:ILE:HG13	1.85	0.41
1:A:860:PHE:N	1:A:860:PHE:CD1	2.88	0.41
1:A:479:LYS:HG3	1:A:518:TYR:HE2	1.86	0.41
1:A:664:ALA:HB2	1:A:701:HIS:CE1	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:850:ARG:NH1	1:A:887:PHE:O	2.54	0.41
1:A:297:LEU:N	1:A:298:PRO:CD	2.83	0.41
1:A:285:GLU:HG2	1:A:285:GLU:H	1.69	0.41
1:A:629:GLN:O	1:A:631:ASP:N	2.52	0.41
1:A:876:PHE:HB3	1:A:881:LYS:HB2	2.03	0.41
1:A:43:TYR:HA	1:A:44:PRO:HD3	1.96	0.41
1:A:497:GLN:HB2	1:A:537:ASN:ND2	2.36	0.41
1:A:824:ASN:ND2	1:A:826:SER:H	2.19	0.40
1:A:573:TRP:HE1	1:A:607:PRO:HB2	1.86	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	830/890 (93%)	758 (91%)	59 (7%)	13 (2%)	12 54

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	78	ALA
1	A	294	VAL
1	A	512	CYS
1	A	534	GLN
1	A	123	LEU
1	A	169	ASP
1	A	77	LYS
1	A	790	LEU
1	A	532	LYS
1	A	25	PRO
1	A	104	PRO
1	A	722	ILE

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Mol	Chain	Res	Type
1	A	704	PRO

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	749/802 (93%)	692 (92%)	57 (8%)	16 55

All (57) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	ASP
1	A	9	GLU
1	A	14	GLN
1	A	27	THR
1	A	41	ASN
1	A	57	LEU
1	A	70	LEU
1	A	123	LEU
1	A	128	ASP
1	A	140	GLU
1	A	149	PHE
1	A	242	LEU
1	A	247	MET
1	A	262	LEU
1	A	264	ARG
1	A	268	GLN
1	A	281	LEU
1	A	283	LEU
1	A	285	GLU
1	A	294	VAL
1	A	300	LEU
1	A	313	ILE
1	A	319	LYS
1	A	403	LYS
1	A	421	LEU

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Mol	Chain	Res	Type
1	A	451	LYS
1	A	457	ILE
1	A	488	ARG
1	A	512	CYS
1	A	518	TYR
1	A	548	LEU
1	A	569	LEU
1	A	584	PHE
1	A	605	CYS
1	A	613	VAL
1	A	618	LYS
1	A	627	ASN
1	A	633	TYR
1	A	648	LEU
1	A	669	LEU
1	A	679	LYS
1	A	700	GLN
1	A	716	ASN
1	A	743	MET
1	A	766	THR
1	A	799	THR
1	A	824	ASN
1	A	833	ILE
1	A	844	ASN
1	A	855	LYS
1	A	858	HIS
1	A	860	PHE
1	A	867	GLU
1	A	878	LEU
1	A	883	ARG
1	A	887	PHE
1	A	890	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	34	GLN
1	A	47	ASN
1	A	48	ASN
1	A	82	ASN
1	A	97	ASN
1	A	125	ASN

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Mol	Chain	Res	Type
1	A	173	ASN
1	A	185	HIS
1	A	193	HIS
1	A	268	GLN
1	A	296	HIS
1	A	534	GLN
1	A	574	ASN
1	A	674	GLN
1	A	677	GLN
1	A	700	GLN
1	A	716	ASN
1	A	726	ASN
1	A	753	GLN
1	A	770	ASN
1	A	791	GLN
1	A	824	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 carbohydrates in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

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	834/890 (93%)	0.15	26 (3%) 52 38	112, 129, 141, 152	0
2	B	0/10	-	-	-	-
All	All	834/900 (92%)	0.15	26 (3%) 52 38	112, 129, 141, 152	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	794	ILE	3.9
1	A	167	VAL	3.7
1	A	633	TYR	3.5
1	A	751	LEU	3.2
1	A	758	ILE	3.1
1	A	31	ARG	3.0
1	A	793	PHE	3.0
1	A	561	TYR	2.9
1	A	755	VAL	2.9
1	A	754	LEU	2.8
1	A	565	LEU	2.5
1	A	717	LEU	2.5
1	A	583	LEU	2.5
1	A	835	PHE	2.4
1	A	27	THR	2.4
1	A	582	ASP	2.4
1	A	752	HIS	2.4
1	A	556	LEU	2.3
1	A	619	THR	2.2
1	A	777	ARG	2.2
1	A	681	PRO	2.1
1	A	530	PHE	2.1
1	A	576	LEU	2.1
1	A	95	CYS	2.1
1	A	778	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	52	PHE	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 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.