



Full wwPDB X-ray Structure Validation Report ⓘ

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PDB ID : 5W83 / pdb_00005w83
Title : Rpn8/Rpn11 dimer complex
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Deposited on : 2017-06-21
Resolution : 1.55 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

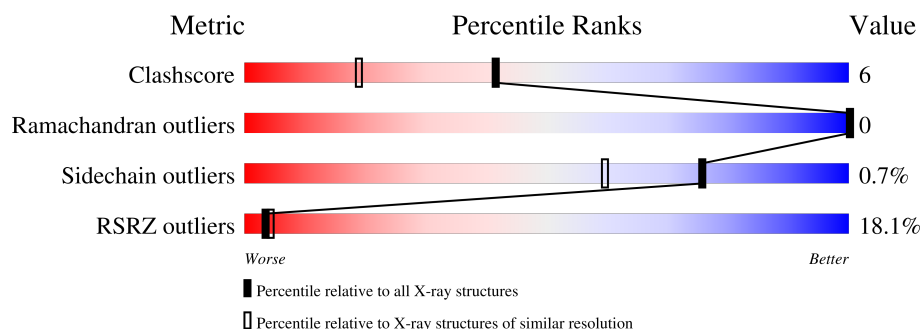
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.55 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))
Clashscore	190562	2189 (1.56-1.56)
Ramachandran outliers	187476	2153 (1.56-1.56)
Sidechain outliers	187428	2150 (1.56-1.56)
RSRZ outliers	180081	2146 (1.56-1.56)

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	338	
2	B	222	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 5506 atoms, of which 2635 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 26S proteasome regulatory subunit RPN8.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	173	Total	C	H	N	O	S	0	8	0
			2763	881	1372	237	268	5			

- Molecule 2 is a protein called Ubiquitin carboxyl-terminal hydrolase RPN11.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	158	Total	C	H	N	O	S	0	6	0
			2535	814	1263	211	234	13			

- Molecule 3 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Zn	1	0
			1	1		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	96	Total	O	0	0
			96	96		
4	B	111	Total	O	0	0
			111	111		

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	58.72Å 74.99Å 82.47Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	55.48 – 1.55 55.48 – 1.55	Depositor EDS
% Data completeness (in resolution range)	99.3 (55.48-1.55) 99.7 (55.48-1.55)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.28 (at 1.55Å)	Xtriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, R_{free}	0.213 , 0.234 0.218 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	26.6	Xtriage
Anisotropy	0.035	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 41.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	5506	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.91% 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

Bond lengths and bond angles in the following residue types are not validated in this section: ZN

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	0/1446	0.69	5/1959 (0.3%)
2	B	0.32	0/1319	0.52	0/1780
All	All	0.35	0/2765	0.62	5/3739 (0.1%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	130	VAL	N-CA-C	12.60	119.70	106.21
1	A	128	GLN	N-CA-C	10.03	124.87	112.23
1	A	126	LYS	CB-CA-C	-7.83	98.06	111.46
1	A	130	VAL	N-CA-CB	-5.50	106.78	112.28
1	A	29	GLU	CB-CA-C	-5.06	110.76	116.63

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	1391	1372	1322	16	0
2	B	1272	1263	1235	22	1
3	B	1	0	0	0	0
4	A	96	0	0	3	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	111	0	0	3	0
All	All	2871	2635	2557	34	1

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 6.

All (34) 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:100:ARG:HD3	2:B:102:GLN:OE1	1.44	1.14
2:B:100:ARG:CD	2:B:102:GLN:OE1	2.20	0.90
1:A:4:GLN:NE2	4:A:402:HOH:O	2.15	0.77
2:B:25:GLU:OE2	2:B:157:ARG:NH2	2.21	0.74
2:B:204:HIS:O	4:B:402:HOH:O	2.13	0.66
2:B:205:LYS:HE2	2:B:210:THR:OG1	1.97	0.64
1:A:108:GLU:OE2	1:A:111:LYS:NZ	2.34	0.59
1:A:130:VAL:HG22	1:A:130:VAL:O	2.03	0.59
1:A:25:THR:O	1:A:26[A]:GLN:HG3	2.03	0.58
2:B:67:ASP:HB2	2:B:100:ARG:NH1	2.20	0.57
2:B:144:ILE:O	2:B:147:VAL:HG22	2.07	0.54
2:B:220:GLN:HG2	2:B:221:TRP:CE2	2.43	0.54
1:A:16:LEU:HD11	2:B:213:LEU:HD21	1.91	0.53
2:B:71:MET:HE2	2:B:83:VAL:HG13	1.91	0.53
1:A:20:ASP:CG	2:B:100:ARG:HH22	2.18	0.51
2:B:222:GLN:O	4:B:403:HOH:O	2.20	0.50
2:B:55:GLY:HA3	2:B:64[B]:ASN:O	2.12	0.49
1:A:81:LYS:NZ	1:A:85:ALA:O	2.46	0.48
1:A:142:GLN:NE2	4:A:403:HOH:O	2.26	0.48
2:B:49:VAL:HG12	2:B:73:GLN:OE1	2.15	0.47
2:B:25:GLU:CD	2:B:157:ARG:HH22	2.20	0.47
1:A:166:ALA:HB3	2:B:42:ARG:HG3	1.98	0.46
2:B:92[B]:MET:HB2	2:B:92[B]:MET:HE2	1.81	0.45
2:B:222:GLN:HB3	4:B:424:HOH:O	2.15	0.45
1:A:124:ASP:OD1	1:A:127:GLN:HA	2.18	0.44
2:B:95:LEU:HB3	2:B:100:ARG:HB3	1.99	0.44
1:A:22:TYR:CG	1:A:125:VAL:HG21	2.53	0.42
1:A:38:LEU:HD12	1:A:50:ASN:HB3	2.02	0.42
2:B:24:LYS:HD2	2:B:24:LYS:HA	1.90	0.42
1:A:81:LYS:HE2	4:A:413:HOH:O	2.19	0.41
1:A:20:ASP:OD1	2:B:100:ARG:NH2	2.51	0.41
1:A:119:LEU:HD11	1:A:136:ALA:HB1	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:88:GLN:O	2:B:92[A]:MET:HG2	2.20	0.41
1:A:31:LYS:HE2	1:A:31:LYS:HA	2.02	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:58:VAL:O	4:A:405:HOH:O[3_545]	2.19	0.01

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	177/338 (52%)	170 (96%)	7 (4%)	0	100	100
2	B	158/222 (71%)	157 (99%)	1 (1%)	0	100	100
All	All	335/560 (60%)	327 (98%)	8 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	153/308 (50%)	151 (99%)	2 (1%)	61	36

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	B	143/193 (74%)	142 (99%)	1 (1%)	76	59
All	All	296/501 (59%)	293 (99%)	3 (1%)	76	47

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	47[A]	ARG
1	A	47[B]	ARG
2	B	195	HIS

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

Mol	Chain	Res	Type
2	B	220	GLN

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](#)

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	173/338 (51%)	1.25	36 (20%) 2 3	23, 41, 73, 81	4 (2%)
2	B	158/222 (71%)	0.99	24 (15%) 5 6	14, 37, 58, 78	3 (1%)
All	All	331/560 (59%)	1.13	60 (18%) 3 4	14, 40, 70, 81	7 (2%)

All (60) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	196	TYR	6.6
1	A	130	VAL	6.5
2	B	83	VAL	6.5
2	B	82	ALA	5.9
1	A	65	VAL	5.7
1	A	177	ASP	5.4
1	A	143	VAL	5.2
1	A	3	LEU	5.2
1	A	147	GLY	4.7
1	A	63	SER	4.7
1	A	62	ASN	4.6
1	A	67	PHE	4.6
2	B	160	ASP	4.4
1	A	30	ASN	4.3
1	A	129	GLY	4.2
2	B	195	HIS	3.9
1	A	60	GLU	3.8
1	A	128	GLN	3.8
2	B	222	GLN	3.8
1	A	146	ASP	3.8
1	A	61	LYS	3.8
1	A	127	GLN	3.7
1	A	70	HIS	3.3
1	A	148	THR	3.3

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Mol	Chain	Res	Type	RSRZ
2	B	74	SER	3.3
1	A	115[A]	GLN	3.2
2	B	204	HIS	3.1
1	A	26[A]	GLN	3.1
1	A	29	GLU	3.0
2	B	214	MET	3.0
2	B	61	TYR	2.9
2	B	100	ARG	2.8
1	A	163	ALA	2.8
1	A	68	LEU	2.8
1	A	81	LYS	2.8
2	B	218	LYS	2.8
2	B	221	TRP	2.8
1	A	47[A]	ARG	2.8
1	A	149	SER	2.7
1	A	132	LEU	2.6
1	A	28	LYS	2.6
2	B	150	LYS	2.6
1	A	64	ASP	2.5
2	B	24	LYS	2.5
2	B	205	LYS	2.5
1	A	59	ASP	2.5
1	A	109	LEU	2.5
1	A	78	GLU	2.4
2	B	217	HIS	2.3
1	A	42	ASN	2.3
2	B	220	GLN	2.3
1	A	150	THR	2.3
1	A	66	TRP	2.2
2	B	101	ASP	2.2
2	B	58	VAL	2.2
2	B	86	VAL	2.2
2	B	157	ARG	2.1
1	A	85	ALA	2.1
2	B	159	ILE	2.1
2	B	216	LEU	2.0

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 [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
3	ZN	B	301	1/1	-	-	30,30,30,30	1

6.5 Other polymers [i](#)

There are no such residues in this entry.