



# wwPDB X-ray Structure Validation Summary Report ⓘ

Dec 3, 2023 – 07:35 pm GMT

PDB ID : 2BR2  
Title : RNase PH core of the archaeal exosome  
Authors : lorentzen, E.; Fribourg, S.; Conti, E.  
Deposited on : 2005-04-30  
Resolution : 2.80 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

<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 : **FAILED**  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

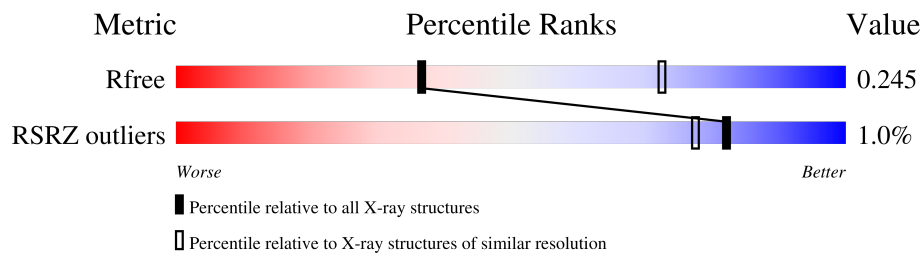
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 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))
$R_{free}$	130704	3140 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

MolProbity failed to run properly - the sequence quality summary graphics cannot be shown.

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 46287 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 EXOSOME COMPLEX EXONUCLEASE 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	260	Total 1960	C 1248	N 323	O 384	S 5	0	0	0
1	C	260	Total 1972	C 1255	N 325	O 387	S 5	0	0	0
1	E	260	Total 1968	C 1253	N 324	O 386	S 5	0	0	0
1	G	260	Total 1964	C 1251	N 324	O 384	S 5	0	0	0
1	I	260	Total 1961	C 1250	N 323	O 383	S 5	0	0	0
1	K	260	Total 1964	C 1251	N 324	O 384	S 5	0	0	0
1	M	260	Total 1972	C 1255	N 325	O 387	S 5	0	0	0
1	O	260	Total 1968	C 1253	N 325	O 385	S 5	0	0	0
1	Q	260	Total 1968	C 1253	N 325	O 385	S 5	0	0	0
1	S	260	Total 1967	C 1253	N 324	O 385	S 5	0	0	0
1	U	260	Total 1968	C 1253	N 325	O 385	S 5	0	0	0
1	W	260	Total 1968	C 1253	N 324	O 386	S 5	0	0	0

- Molecule 2 is a protein called EXOSOME COMPLEX EXONUCLEASE 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	241	Total 1863	C 1175	N 322	O 356	S 10	0	0	0
2	D	247	Total 1905	C 1202	N 329	O 363	S 11	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	F	241	Total	C	N	O	S	0	0	0
			1863	1175	322	356	10			
2	H	241	Total	C	N	O	S	0	0	0
			1863	1175	322	356	10			
2	J	241	Total	C	N	O	S	0	0	0
			1863	1175	322	356	10			
2	L	247	Total	C	N	O	S	0	0	0
			1909	1204	329	365	11			
2	N	241	Total	C	N	O	S	0	0	0
			1863	1175	322	356	10			
2	P	248	Total	C	N	O	S	0	0	0
			1907	1204	327	364	12			
2	R	245	Total	C	N	O	S	0	0	0
			1889	1192	327	359	11			
2	T	247	Total	C	N	O	S	0	0	0
			1905	1202	329	363	11			
2	V	244	Total	C	N	O	S	0	0	0
			1883	1189	325	359	10			
2	X	241	Total	C	N	O	S	0	0	0
			1863	1175	322	356	10			

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Cl	0	0
			1	1		
3	D	1	Total	Cl	0	0
			1	1		
3	F	1	Total	Cl	0	0
			1	1		
3	H	1	Total	Cl	0	0
			1	1		
3	J	1	Total	Cl	0	0
			1	1		
3	L	1	Total	Cl	0	0
			1	1		
3	M	1	Total	Cl	0	0
			1	1		
3	N	1	Total	Cl	0	0
			1	1		
3	P	1	Total	Cl	0	0
			1	1		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	R	1	Total Cl 1 1	0	0
3	T	1	Total Cl 1 1	0	0
3	V	1	Total Cl 1 1	0	0
3	X	1	Total Cl 1 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	6	Total O 6 6	0	0
4	B	5	Total O 5 5	0	0
4	C	4	Total O 4 4	0	0
4	D	1	Total O 1 1	0	0
4	E	6	Total O 6 6	0	0
4	F	4	Total O 4 4	0	0
4	G	2	Total O 2 2	0	0
4	H	3	Total O 3 3	0	0
4	I	1	Total O 1 1	0	0
4	J	5	Total O 5 5	0	0
4	K	3	Total O 3 3	0	0
4	L	3	Total O 3 3	0	0
4	M	8	Total O 8 8	0	0
4	N	4	Total O 4 4	0	0
4	O	9	Total O 9 9	0	0

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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>	<b>ZeroOcc</b>	<b>AltConf</b>
4	P	6	Total O 6 6	0	0
4	Q	4	Total O 4 4	0	0
4	R	5	Total O 5 5	0	0
4	S	6	Total O 6 6	0	0
4	T	4	Total O 4 4	0	0
4	U	3	Total O 3 3	0	0
4	V	3	Total O 3 3	0	0
4	W	2	Total O 2 2	0	0
4	X	1	Total O 1 1	0	0

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### 3 Data and refinement statistics i

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	206.88Å 212.72Å 434.05Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	218.22 – 2.80 217.03 – 2.80	Depositor EDS
% Data completeness (in resolution range)	99.7 (218.22-2.80) 99.7 (217.03-2.80)	Depositor EDS
$R_{merge}$	0.16	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.81 (at 2.82Å)	Xtrriage
Refinement program	REFMAC 5.2.0005	Depositor
R, $R_{free}$	0.215 , 0.237 0.227 , 0.245	Depositor DCC
$R_{free}$ test set	7031 reflections (3.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	38.3	Xtrriage
Anisotropy	0.066	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 33.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	0.033 for -k,-h,-l	Xtrriage
$F_o, F_c$ correlation	0.90	EDS
Total number of atoms	46287	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	33.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 18.64% 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.

## 4 Model quality [i](#)

### 4.1 Standard geometry [i](#)

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### 4.2 Too-close contacts [i](#)

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### 4.3 Torsion angles [i](#)

#### 4.3.1 Protein backbone [i](#)

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#### 4.3.2 Protein sidechains [i](#)

MolProbity failed to run properly - this section is therefore empty.

#### 4.3.3 RNA [i](#)

MolProbity failed to run properly - this section is therefore empty.

### 4.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

### 4.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 4.6 Ligand geometry [i](#)

Of 13 ligands modelled in this entry, 13 are 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.

#### 4.7 Other polymers [i](#)

There are no such residues in this entry.

#### 4.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 5 Fit of model and data [i](#)

### 5.1 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	260/275 (94%)	0.20	6 (2%) 60 51	23, 32, 46, 60	0
1	C	260/275 (94%)	0.19	1 (0%) 92 91	24, 32, 46, 58	0
1	E	260/275 (94%)	0.15	2 (0%) 86 81	24, 32, 46, 57	0
1	G	260/275 (94%)	0.23	8 (3%) 49 39	24, 32, 46, 58	0
1	I	260/275 (94%)	0.12	1 (0%) 92 91	24, 32, 46, 57	0
1	K	260/275 (94%)	0.21	1 (0%) 92 91	24, 32, 46, 58	0
1	M	260/275 (94%)	0.16	1 (0%) 92 91	24, 32, 46, 58	0
1	O	260/275 (94%)	0.27	5 (1%) 66 59	24, 32, 46, 59	0
1	Q	260/275 (94%)	0.19	2 (0%) 86 81	24, 32, 46, 59	0
1	S	260/275 (94%)	0.15	3 (1%) 79 73	24, 32, 46, 57	0
1	U	260/275 (94%)	0.15	3 (1%) 79 73	24, 32, 46, 58	0
1	W	260/275 (94%)	0.15	3 (1%) 79 73	24, 32, 46, 57	0
2	B	241/248 (97%)	0.17	0 100 100	25, 31, 46, 59	0
2	D	247/248 (99%)	0.20	3 (1%) 79 73	22, 30, 46, 59	0
2	F	241/248 (97%)	0.17	4 (1%) 70 63	25, 31, 47, 59	0
2	H	241/248 (97%)	0.17	3 (1%) 79 73	25, 31, 46, 59	0
2	J	241/248 (97%)	0.16	0 100 100	25, 31, 46, 59	0
2	L	247/248 (99%)	0.21	7 (2%) 53 43	22, 31, 46, 59	0
2	N	241/248 (97%)	0.15	1 (0%) 92 91	25, 31, 46, 59	0
2	P	248/248 (100%)	0.19	2 (0%) 86 81	23, 30, 46, 59	0
2	R	245/248 (98%)	0.28	3 (1%) 79 73	23, 31, 46, 59	0
2	T	247/248 (99%)	0.20	2 (0%) 86 81	22, 31, 46, 59	0
2	V	244/248 (98%)	0.17	1 (0%) 92 91	25, 31, 46, 59	0
2	X	241/248 (97%)	0.16	1 (0%) 92 91	25, 31, 46, 59	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
All	All	6044/6276 (96%)	0.18	63 (1%) 82 77	22, 31, 47, 60	0

The worst 5 of 63 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	248	VAL	4.6
2	F	247	GLY	3.9
1	G	181	SER	3.6
1	E	175	GLN	3.4
1	U	275	ILE	3.4

## 5.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.4 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, 95<sup>th</sup> 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(Å <sup>2</sup> )	Q<0.9
3	CL	D	1249	1/1	0.76	0.15	49,49,49,49	0
3	CL	L	1249	1/1	0.84	0.20	45,45,45,45	0
3	CL	N	1249	1/1	0.85	0.19	56,56,56,56	0
3	CL	B	1249	1/1	0.86	0.20	67,67,67,67	0
3	CL	F	1249	1/1	0.90	0.17	48,48,48,48	0
3	CL	X	1249	1/1	0.90	0.16	43,43,43,43	0
3	CL	P	1249	1/1	0.93	0.09	59,59,59,59	0
3	CL	T	1249	1/1	0.94	0.14	50,50,50,50	0
3	CL	V	1249	1/1	0.94	0.17	52,52,52,52	0
3	CL	M	1276	1/1	0.94	0.12	45,45,45,45	0
3	CL	R	1249	1/1	0.95	0.15	46,46,46,46	0
3	CL	J	1249	1/1	0.95	0.17	47,47,47,47	0
3	CL	H	1249	1/1	0.96	0.17	52,52,52,52	0

## 5.5 Other polymers [i](#)

There are no such residues in this entry.