



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 6, 2026 – 03:00 PM UTC

PDB ID : 2QFB / pdb_00002qfb
Title : Crystal structure of the regulatory domain of human RIG-I with bound Zn
Authors : Cui, S.; Lammens, A.; Lammens, K.; Hopfner, K.P.
Deposited on : 2007-06-27
Resolution : 3.00 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

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

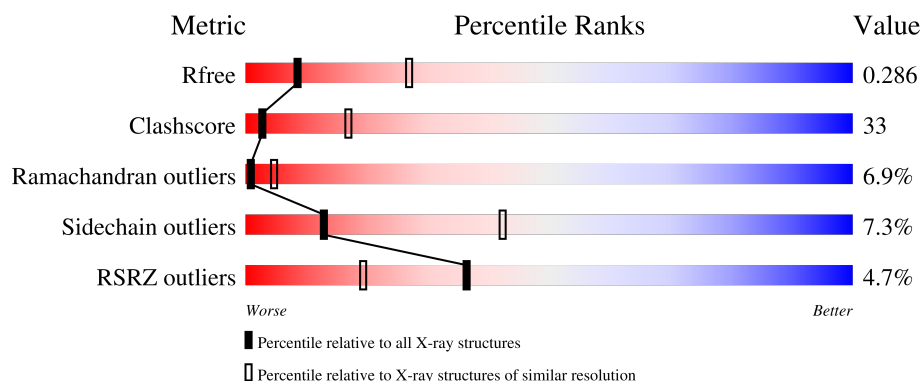
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	2672 (3.00-3.00)
Clashscore	190562	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)
RSRZ outliers	180081	2671 (3.00-3.00)

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	145	50% 30% • 17%
1	B	145	2% 46% 31% 7% 17%
1	C	145	38% 39% 7% 17%
1	D	145	34% 42% 7% • 17%
1	E	145	6% 30% 46% 8% 17%

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Mol	Chain	Length	Quality of chain
1	F	145	
1	G	145	
1	H	145	
1	I	145	
1	J	145	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	ZN	D	1004	-	-	X	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 10039 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 Probable ATP-dependent RNA helicase DDX58.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	121	Total	C	N	O	S	36	0	0
			998	648	169	173	8			
1	B	121	Total	C	N	O	S	73	0	0
			998	648	169	173	8			
1	C	121	Total	C	N	O	S	85	0	0
			998	648	169	173	8			
1	D	121	Total	C	N	O	S	130	0	0
			998	648	169	173	8			
1	E	121	Total	C	N	O	S	110	0	0
			998	648	169	173	8			
1	F	121	Total	C	N	O	S	86	0	0
			998	648	169	173	8			
1	G	121	Total	C	N	O	S	123	0	0
			998	648	169	173	8			
1	H	121	Total	C	N	O	S	102	0	0
			998	648	169	173	8			
1	I	121	Total	C	N	O	S	121	0	0
			998	648	169	173	8			
1	J	121	Total	C	N	O	S	247	0	0
			998	648	169	173	8			

There are 210 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	781	MET	-	expression tag	UNP O95786
A	782	GLY	-	expression tag	UNP O95786
A	783	SER	-	expression tag	UNP O95786
A	784	SER	-	expression tag	UNP O95786
A	785	HIS	-	expression tag	UNP O95786
A	786	HIS	-	expression tag	UNP O95786
A	787	HIS	-	expression tag	UNP O95786
A	788	HIS	-	expression tag	UNP O95786
A	789	HIS	-	expression tag	UNP O95786

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Chain	Residue	Modelled	Actual	Comment	Reference
A	790	HIS	-	expression tag	UNP O95786
A	791	SER	-	expression tag	UNP O95786
A	792	SER	-	expression tag	UNP O95786
A	793	GLY	-	expression tag	UNP O95786
A	794	LEU	-	expression tag	UNP O95786
A	795	VAL	-	expression tag	UNP O95786
A	796	PRO	-	expression tag	UNP O95786
A	797	ARG	-	expression tag	UNP O95786
A	798	GLY	-	expression tag	UNP O95786
A	799	SER	-	expression tag	UNP O95786
A	800	HIS	-	expression tag	UNP O95786
A	801	MET	-	expression tag	UNP O95786
B	781	MET	-	expression tag	UNP O95786
B	782	GLY	-	expression tag	UNP O95786
B	783	SER	-	expression tag	UNP O95786
B	784	SER	-	expression tag	UNP O95786
B	785	HIS	-	expression tag	UNP O95786
B	786	HIS	-	expression tag	UNP O95786
B	787	HIS	-	expression tag	UNP O95786
B	788	HIS	-	expression tag	UNP O95786
B	789	HIS	-	expression tag	UNP O95786
B	790	HIS	-	expression tag	UNP O95786
B	791	SER	-	expression tag	UNP O95786
B	792	SER	-	expression tag	UNP O95786
B	793	GLY	-	expression tag	UNP O95786
B	794	LEU	-	expression tag	UNP O95786
B	795	VAL	-	expression tag	UNP O95786
B	796	PRO	-	expression tag	UNP O95786
B	797	ARG	-	expression tag	UNP O95786
B	798	GLY	-	expression tag	UNP O95786
B	799	SER	-	expression tag	UNP O95786
B	800	HIS	-	expression tag	UNP O95786
B	801	MET	-	expression tag	UNP O95786
C	781	MET	-	expression tag	UNP O95786
C	782	GLY	-	expression tag	UNP O95786
C	783	SER	-	expression tag	UNP O95786
C	784	SER	-	expression tag	UNP O95786
C	785	HIS	-	expression tag	UNP O95786
C	786	HIS	-	expression tag	UNP O95786
C	787	HIS	-	expression tag	UNP O95786
C	788	HIS	-	expression tag	UNP O95786
C	789	HIS	-	expression tag	UNP O95786

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Chain	Residue	Modelled	Actual	Comment	Reference
C	790	HIS	-	expression tag	UNP O95786
C	791	SER	-	expression tag	UNP O95786
C	792	SER	-	expression tag	UNP O95786
C	793	GLY	-	expression tag	UNP O95786
C	794	LEU	-	expression tag	UNP O95786
C	795	VAL	-	expression tag	UNP O95786
C	796	PRO	-	expression tag	UNP O95786
C	797	ARG	-	expression tag	UNP O95786
C	798	GLY	-	expression tag	UNP O95786
C	799	SER	-	expression tag	UNP O95786
C	800	HIS	-	expression tag	UNP O95786
C	801	MET	-	expression tag	UNP O95786
D	781	MET	-	expression tag	UNP O95786
D	782	GLY	-	expression tag	UNP O95786
D	783	SER	-	expression tag	UNP O95786
D	784	SER	-	expression tag	UNP O95786
D	785	HIS	-	expression tag	UNP O95786
D	786	HIS	-	expression tag	UNP O95786
D	787	HIS	-	expression tag	UNP O95786
D	788	HIS	-	expression tag	UNP O95786
D	789	HIS	-	expression tag	UNP O95786
D	790	HIS	-	expression tag	UNP O95786
D	791	SER	-	expression tag	UNP O95786
D	792	SER	-	expression tag	UNP O95786
D	793	GLY	-	expression tag	UNP O95786
D	794	LEU	-	expression tag	UNP O95786
D	795	VAL	-	expression tag	UNP O95786
D	796	PRO	-	expression tag	UNP O95786
D	797	ARG	-	expression tag	UNP O95786
D	798	GLY	-	expression tag	UNP O95786
D	799	SER	-	expression tag	UNP O95786
D	800	HIS	-	expression tag	UNP O95786
D	801	MET	-	expression tag	UNP O95786
E	781	MET	-	expression tag	UNP O95786
E	782	GLY	-	expression tag	UNP O95786
E	783	SER	-	expression tag	UNP O95786
E	784	SER	-	expression tag	UNP O95786
E	785	HIS	-	expression tag	UNP O95786
E	786	HIS	-	expression tag	UNP O95786
E	787	HIS	-	expression tag	UNP O95786
E	788	HIS	-	expression tag	UNP O95786
E	789	HIS	-	expression tag	UNP O95786

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Chain	Residue	Modelled	Actual	Comment	Reference
E	790	HIS	-	expression tag	UNP O95786
E	791	SER	-	expression tag	UNP O95786
E	792	SER	-	expression tag	UNP O95786
E	793	GLY	-	expression tag	UNP O95786
E	794	LEU	-	expression tag	UNP O95786
E	795	VAL	-	expression tag	UNP O95786
E	796	PRO	-	expression tag	UNP O95786
E	797	ARG	-	expression tag	UNP O95786
E	798	GLY	-	expression tag	UNP O95786
E	799	SER	-	expression tag	UNP O95786
E	800	HIS	-	expression tag	UNP O95786
E	801	MET	-	expression tag	UNP O95786
F	781	MET	-	expression tag	UNP O95786
F	782	GLY	-	expression tag	UNP O95786
F	783	SER	-	expression tag	UNP O95786
F	784	SER	-	expression tag	UNP O95786
F	785	HIS	-	expression tag	UNP O95786
F	786	HIS	-	expression tag	UNP O95786
F	787	HIS	-	expression tag	UNP O95786
F	788	HIS	-	expression tag	UNP O95786
F	789	HIS	-	expression tag	UNP O95786
F	790	HIS	-	expression tag	UNP O95786
F	791	SER	-	expression tag	UNP O95786
F	792	SER	-	expression tag	UNP O95786
F	793	GLY	-	expression tag	UNP O95786
F	794	LEU	-	expression tag	UNP O95786
F	795	VAL	-	expression tag	UNP O95786
F	796	PRO	-	expression tag	UNP O95786
F	797	ARG	-	expression tag	UNP O95786
F	798	GLY	-	expression tag	UNP O95786
F	799	SER	-	expression tag	UNP O95786
F	800	HIS	-	expression tag	UNP O95786
F	801	MET	-	expression tag	UNP O95786
G	781	MET	-	expression tag	UNP O95786
G	782	GLY	-	expression tag	UNP O95786
G	783	SER	-	expression tag	UNP O95786
G	784	SER	-	expression tag	UNP O95786
G	785	HIS	-	expression tag	UNP O95786
G	786	HIS	-	expression tag	UNP O95786
G	787	HIS	-	expression tag	UNP O95786
G	788	HIS	-	expression tag	UNP O95786
G	789	HIS	-	expression tag	UNP O95786

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Chain	Residue	Modelled	Actual	Comment	Reference
G	790	HIS	-	expression tag	UNP O95786
G	791	SER	-	expression tag	UNP O95786
G	792	SER	-	expression tag	UNP O95786
G	793	GLY	-	expression tag	UNP O95786
G	794	LEU	-	expression tag	UNP O95786
G	795	VAL	-	expression tag	UNP O95786
G	796	PRO	-	expression tag	UNP O95786
G	797	ARG	-	expression tag	UNP O95786
G	798	GLY	-	expression tag	UNP O95786
G	799	SER	-	expression tag	UNP O95786
G	800	HIS	-	expression tag	UNP O95786
G	801	MET	-	expression tag	UNP O95786
H	781	MET	-	expression tag	UNP O95786
H	782	GLY	-	expression tag	UNP O95786
H	783	SER	-	expression tag	UNP O95786
H	784	SER	-	expression tag	UNP O95786
H	785	HIS	-	expression tag	UNP O95786
H	786	HIS	-	expression tag	UNP O95786
H	787	HIS	-	expression tag	UNP O95786
H	788	HIS	-	expression tag	UNP O95786
H	789	HIS	-	expression tag	UNP O95786
H	790	HIS	-	expression tag	UNP O95786
H	791	SER	-	expression tag	UNP O95786
H	792	SER	-	expression tag	UNP O95786
H	793	GLY	-	expression tag	UNP O95786
H	794	LEU	-	expression tag	UNP O95786
H	795	VAL	-	expression tag	UNP O95786
H	796	PRO	-	expression tag	UNP O95786
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H	798	GLY	-	expression tag	UNP O95786
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H	801	MET	-	expression tag	UNP O95786
I	781	MET	-	expression tag	UNP O95786
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I	794	LEU	-	expression tag	UNP O95786
I	795	VAL	-	expression tag	UNP O95786
I	796	PRO	-	expression tag	UNP O95786
I	797	ARG	-	expression tag	UNP O95786
I	798	GLY	-	expression tag	UNP O95786
I	799	SER	-	expression tag	UNP O95786
I	800	HIS	-	expression tag	UNP O95786
I	801	MET	-	expression tag	UNP O95786
J	781	MET	-	expression tag	UNP O95786
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J	783	SER	-	expression tag	UNP O95786
J	784	SER	-	expression tag	UNP O95786
J	785	HIS	-	expression tag	UNP O95786
J	786	HIS	-	expression tag	UNP O95786
J	787	HIS	-	expression tag	UNP O95786
J	788	HIS	-	expression tag	UNP O95786
J	789	HIS	-	expression tag	UNP O95786
J	790	HIS	-	expression tag	UNP O95786
J	791	SER	-	expression tag	UNP O95786
J	792	SER	-	expression tag	UNP O95786
J	793	GLY	-	expression tag	UNP O95786
J	794	LEU	-	expression tag	UNP O95786
J	795	VAL	-	expression tag	UNP O95786
J	796	PRO	-	expression tag	UNP O95786
J	797	ARG	-	expression tag	UNP O95786
J	798	GLY	-	expression tag	UNP O95786
J	799	SER	-	expression tag	UNP O95786
J	800	HIS	-	expression tag	UNP O95786
J	801	MET	-	expression tag	UNP O95786

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total 1 Zn 1	0	0
2	B	1	Total 1 Zn 1	0	0
2	C	1	Total 1 Zn 1	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	D	1	Total 1	Zn 1	0	0
2	E	1	Total 1	Zn 1	0	0
2	F	1	Total 1	Zn 1	0	0
2	G	1	Total 1	Zn 1	0	0
2	H	1	Total 1	Zn 1	0	0
2	I	1	Total 1	Zn 1	0	0
2	J	1	Total 1	Zn 1	0	0

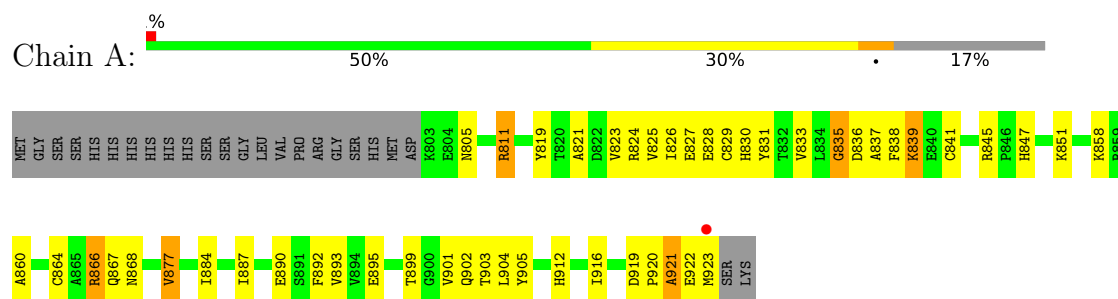
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	11	Total 11	O 11	0	0
3	B	17	Total 17	O 17	0	0
3	C	3	Total 3	O 3	0	0
3	D	8	Total 8	O 8	0	0
3	E	2	Total 2	O 2	0	0
3	F	2	Total 2	O 2	0	0
3	G	2	Total 2	O 2	0	0
3	H	2	Total 2	O 2	0	0
3	I	1	Total 1	O 1	0	0
3	J	1	Total 1	O 1	0	0

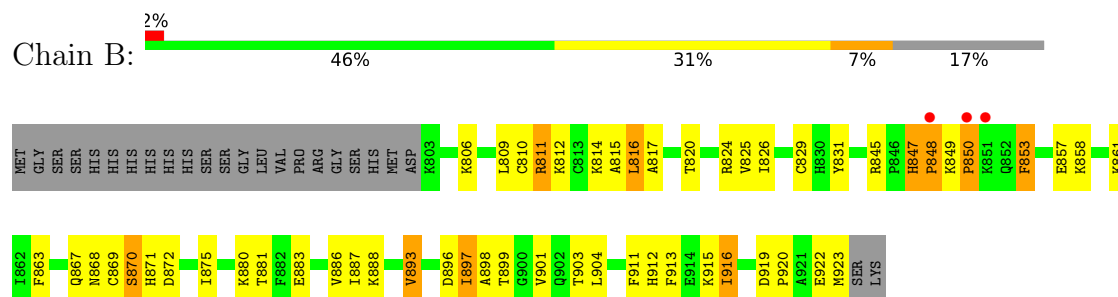
3 Residue-property plots

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.

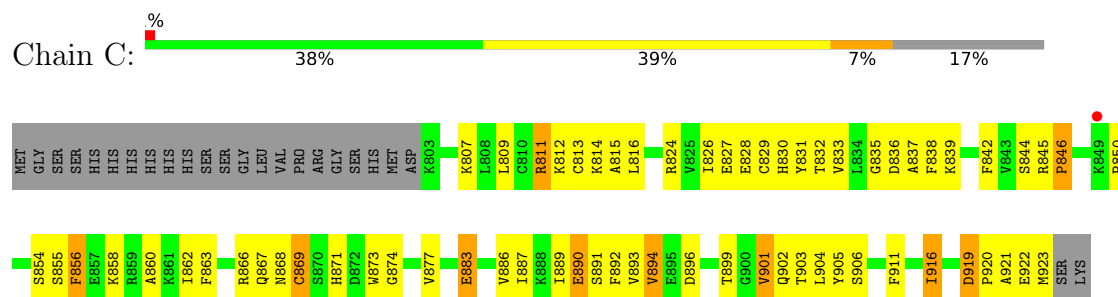
- Molecule 1: Probable ATP-dependent RNA helicase DDX58



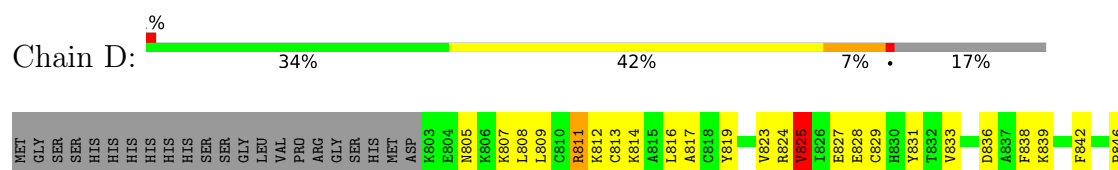
- Molecule 1: Probable ATP-dependent RNA helicase DDX58

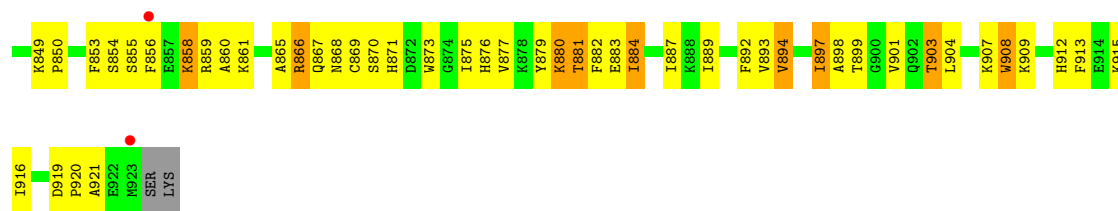


- Molecule 1: Probable ATP-dependent RNA helicase DDX58

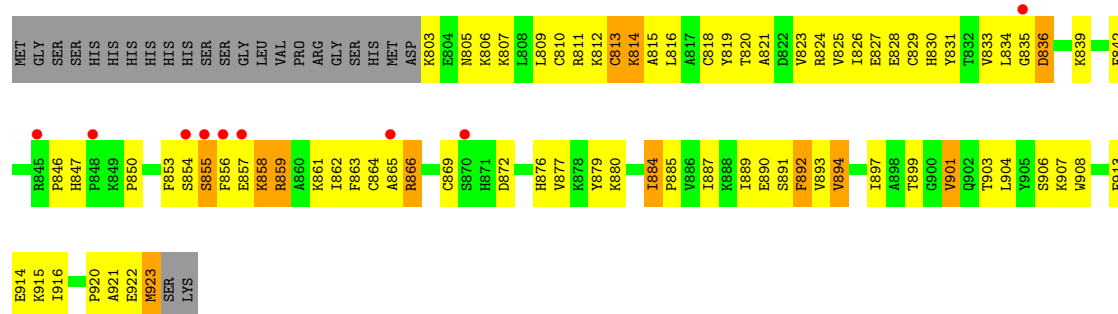


- Molecule 1: Probable ATP-dependent RNA helicase DDX58

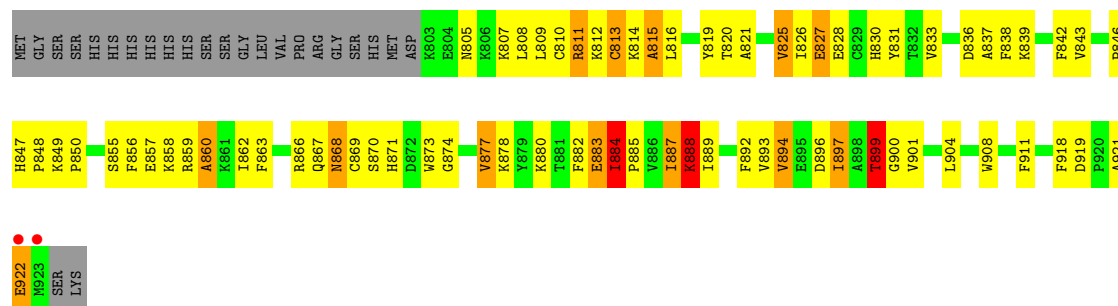




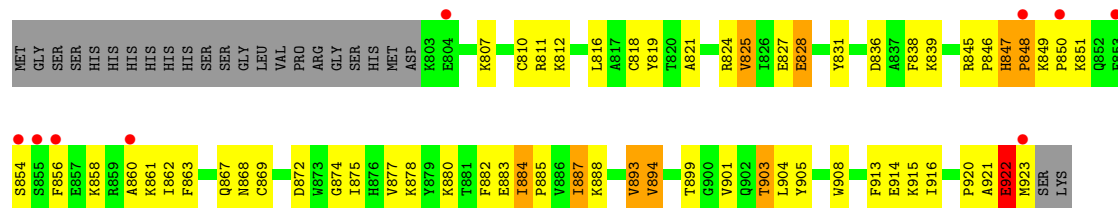
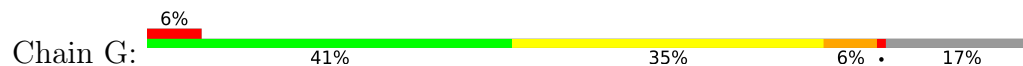
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- Molecule 1: Probable ATP-dependent RNA helicase DDX58

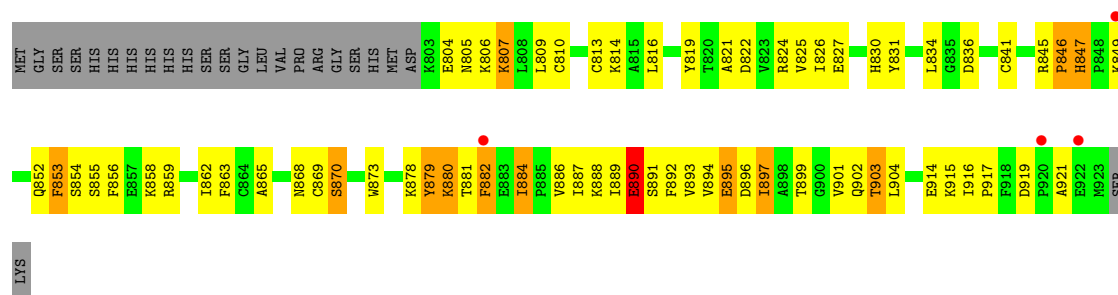


- Molecule 1: Probable ATP-dependent RNA helicase DDX58

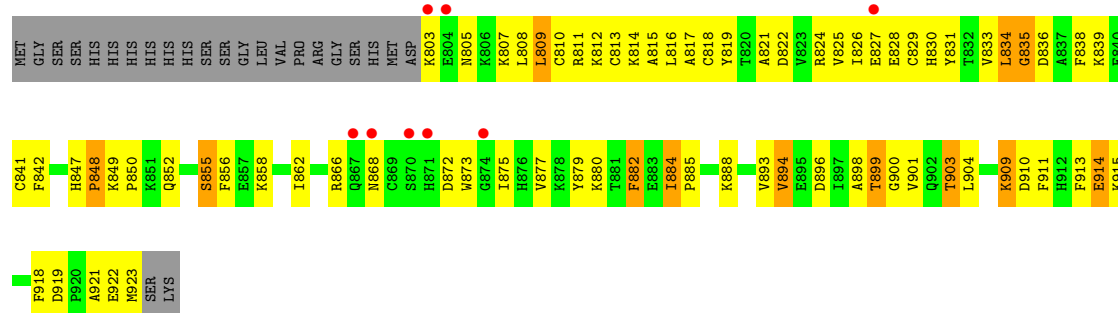


- Molecule 1: Probable ATP-dependent RNA helicase DDX58

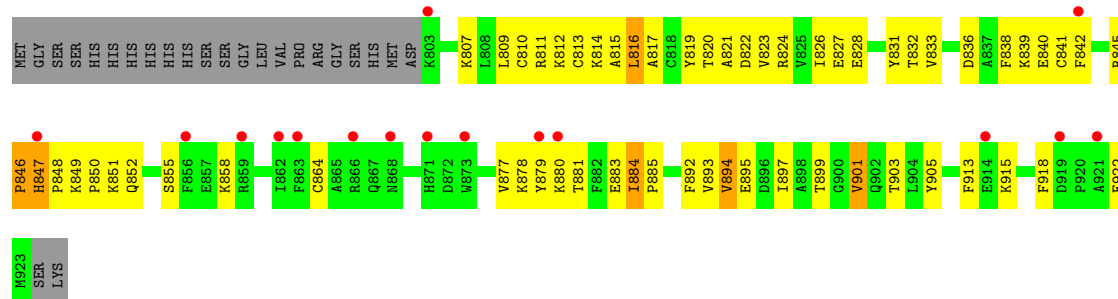
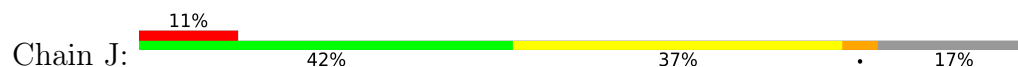




- Molecule 1: Probable ATP-dependent RNA helicase DDX58



- Molecule 1: Probable ATP-dependent RNA helicase DDX58



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	97.90Å 76.60Å 139.40Å 90.00° 93.30° 90.00°	Depositor
Resolution (Å)	50.00 – 3.00 50.00 – 3.00	Depositor EDS
% Data completeness (in resolution range)	98.2 (50.00-3.00) 98.1 (50.00-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.09	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.34 (at 3.01Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.248 , 0.285 0.239 , 0.286	Depositor DCC
R_{free} test set	4111 reflections (10.02%)	wwPDB-VP
Wilson B-factor (Å ²)	57.0	Xtriage
Anisotropy	0.161	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 77.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	10039	wwPDB-VP
Average B, all atoms (Å ²)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.37% 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 [i](#)

5.1 Standard geometry [i](#)

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	0.62	0/1026	1.13	9/1380 (0.7%)
1	B	0.57	0/1026	1.06	5/1380 (0.4%)
1	C	0.47	0/1026	1.00	5/1380 (0.4%)
1	D	0.49	0/1026	0.97	3/1380 (0.2%)
1	E	0.46	0/1026	0.95	3/1380 (0.2%)
1	F	0.49	0/1026	1.09	11/1380 (0.8%)
1	G	0.42	0/1026	1.00	8/1380 (0.6%)
1	H	0.43	0/1026	0.98	4/1380 (0.3%)
1	I	0.40	0/1026	0.84	1/1380 (0.1%)
1	J	0.37	0/1026	0.89	2/1380 (0.1%)
All	All	0.48	0/10260	0.99	51/13800 (0.4%)

There are no bond length outliers.

The worst 5 of 51 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	884	ILE	N-CA-C	8.40	117.16	107.84
1	A	835	GLY	N-CA-C	8.21	123.18	112.18
1	A	877	VAL	N-CA-C	8.01	120.27	108.65
1	C	916	ILE	N-CA-C	7.34	114.94	108.63
1	F	860	ALA	N-CA-C	6.93	117.74	108.38

There are no chirality outliers.

There are no planarity outliers.

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	998	0	993	43	0
1	B	998	0	993	41	0
1	C	998	0	993	63	0
1	D	998	0	994	66	0
1	E	998	0	994	84	0
1	F	998	0	993	73	0
1	G	998	0	993	49	0
1	H	998	0	993	59	0
1	I	998	0	994	59	0
1	J	998	0	995	42	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	2	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
2	G	1	0	0	0	0
2	H	1	0	0	0	0
2	I	1	0	0	0	0
2	J	1	0	0	0	0
3	A	11	0	0	2	0
3	B	17	0	0	0	0
3	C	3	0	0	0	0
3	D	8	0	0	4	0
3	E	2	0	0	0	0
3	F	2	0	0	0	0
3	G	2	0	0	0	0
3	H	2	0	0	0	0
3	I	1	0	0	0	0
3	J	1	0	0	0	0
All	All	10039	0	9935	574	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 33.

The worst 5 of 574 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:H:897:ILE:HD12	1:H:897:ILE:H	1.05	1.20

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:858:LYS:HA	1:G:877:VAL:HG12	1.37	1.04
1:A:866:ARG:HG2	1:A:866:ARG:HH11	1.22	1.00
1:E:858:LYS:HA	1:E:877:VAL:HG12	1.44	0.96
1:H:880:LYS:O	1:H:881:THR:HG22	1.67	0.91

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	119/145 (82%)	105 (88%)	13 (11%)	1 (1%)	16	50
1	B	119/145 (82%)	98 (82%)	13 (11%)	8 (7%)	1	5
1	C	119/145 (82%)	95 (80%)	18 (15%)	6 (5%)	1	10
1	D	119/145 (82%)	88 (74%)	21 (18%)	10 (8%)	0	3
1	E	119/145 (82%)	89 (75%)	17 (14%)	13 (11%)	0	1
1	F	119/145 (82%)	95 (80%)	18 (15%)	6 (5%)	1	10
1	G	119/145 (82%)	94 (79%)	18 (15%)	7 (6%)	1	7
1	H	119/145 (82%)	93 (78%)	18 (15%)	8 (7%)	1	5
1	I	119/145 (82%)	81 (68%)	28 (24%)	10 (8%)	0	3
1	J	119/145 (82%)	85 (71%)	21 (18%)	13 (11%)	0	1
All	All	1190/1450 (82%)	923 (78%)	185 (16%)	82 (7%)	1	5

5 of 82 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	847	HIS
1	B	850	PRO
1	C	867	GLN

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Mol	Chain	Res	Type
1	D	828	GLU
1	D	849	LYS

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	110/131 (84%)	105 (96%)	5 (4%)	24	59
1	B	110/131 (84%)	105 (96%)	5 (4%)	24	59
1	C	110/131 (84%)	104 (94%)	6 (6%)	19	53
1	D	110/131 (84%)	100 (91%)	10 (9%)	9	33
1	E	110/131 (84%)	99 (90%)	11 (10%)	7	29
1	F	110/131 (84%)	102 (93%)	8 (7%)	13	42
1	G	110/131 (84%)	105 (96%)	5 (4%)	24	59
1	H	110/131 (84%)	97 (88%)	13 (12%)	5	22
1	I	110/131 (84%)	100 (91%)	10 (9%)	9	33
1	J	110/131 (84%)	103 (94%)	7 (6%)	16	48
All	All	1100/1310 (84%)	1020 (93%)	80 (7%)	13	42

5 of 80 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	882	PHE
1	I	909	LYS
1	H	890	GLU
1	I	825	VAL
1	J	846	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 23 such sidechains are listed below:

Mol	Chain	Res	Type
1	F	852	GLN

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Mol	Chain	Res	Type
1	G	805	ASN
1	F	876	HIS
1	G	830	HIS
1	C	867	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 10 ligands modelled in this entry, 10 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.

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 ⓘ

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	121/145 (83%)	-0.59	1 (0%) 82 64	3, 21, 48, 62	14 (11%)
1	B	119/145 (82%)	-0.30	3 (2%) 58 35	4, 22, 42, 64	20 (16%)
1	C	119/145 (82%)	-0.04	1 (0%) 82 64	10, 36, 66, 81	24 (20%)
1	D	112/145 (77%)	-0.08	2 (1%) 67 44	8, 35, 65, 90	18 (16%)
1	E	118/145 (81%)	0.37	9 (7%) 20 10	12, 42, 85, 97	25 (21%)
1	F	120/145 (82%)	0.11	2 (1%) 69 45	11, 43, 59, 85	27 (22%)
1	G	118/145 (81%)	0.25	9 (7%) 20 10	14, 45, 68, 96	29 (24%)
1	H	118/145 (81%)	0.31	4 (3%) 48 27	22, 52, 89, 108	26 (22%)
1	I	120/145 (82%)	0.61	8 (6%) 24 12	12, 58, 92, 96	37 (30%)
1	J	109/145 (75%)	0.96	16 (14%) 6 3	9, 62, 91, 105	42 (38%)
All	All	1174/1450 (80%)	0.15	55 (4%) 36 19	3, 42, 80, 108	262 (22%)

The worst 5 of 55 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	851	LYS	15.6
1	F	923	MET	9.3
1	J	868	ASN	8.4
1	G	848	PRO	6.3
1	J	871	HIS	6.1

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
2	ZN	J	1010	1/1	0.95	0.08	86,86,86,86	0
2	ZN	E	1005	1/1	0.99	0.02	50,50,50,50	0
2	ZN	H	1008	1/1	0.99	0.04	57,57,57,57	0
2	ZN	I	1009	1/1	0.99	0.02	88,88,88,88	0
2	ZN	B	1002	1/1	0.99	0.02	30,30,30,30	0
2	ZN	F	1006	1/1	1.00	0.04	44,44,44,44	0
2	ZN	G	1007	1/1	1.00	0.03	52,52,52,52	0
2	ZN	C	1003	1/1	1.00	0.01	47,47,47,47	0
2	ZN	D	1004	1/1	1.00	0.01	47,47,47,47	0
2	ZN	A	1001	1/1	1.00	0.03	28,28,28,28	0

6.5 Other polymers [i](#)

There are no such residues in this entry.