wwPDB X-ray Structure Validation Summary Report ⓘ

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PDB ID : 1B7F
Title : SXL-LETHAL PROTEIN/RNA COMPLEX
Authors : Handa, N.; Nureki, O.; Kurimoto, K.; Kim, I.; Sakamoto, H.; Shimura, Y.;
Muto, Y.; Yokoyama, S.; RIKEN Structural Genomics/Proteomics Initiative
(RSGI)
Deposited on : 1999-01-23
Resolution : 2.60 Å(reported)

1 Overall quality at a glance ⓘ

The reported resolution of this entry is 2.60 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	Percentile Ranks	Value
Clashscore		28
Ramachandran outliers		1.2%
Sidechain outliers		28.3%
RNA backbone		0.21

Worse   *Better*

▌ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
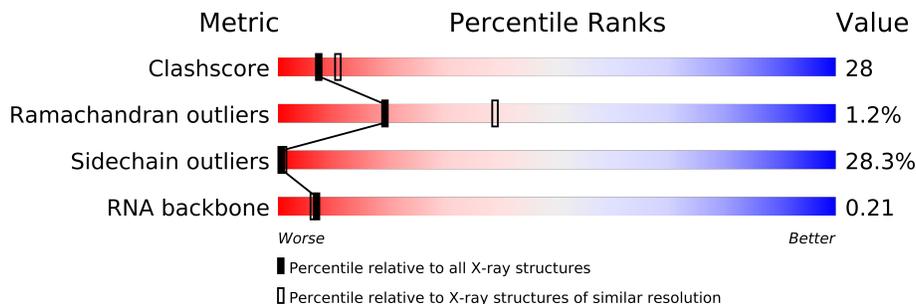
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	79885	2154 (2.60-2.60)
Ramachandran outliers	78287	2113 (2.60-2.60)
Sidechain outliers	78261	2113 (2.60-2.60)
RNA backbone	1838	1002 (3.12-2.08)

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. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	P	12	
1	Q	12	
2	A	168	
2	B	168	

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 3236 atoms, of which 0 are hydrogen and 0 are deuterium.

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 RNA chain called RNA (5'-R(P*GP*UP*UP*GP*UP*UP*UP*UP*UP*UP *UP*U)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	P	12	Total 247	C 110	N 30	O 95	P 12	0	0	0
1	Q	12	Total 247	C 110	N 30	O 95	P 12	0	0	0

- Molecule 2 is a protein called PROTEIN (SXL-LETHAL PROTEIN).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	167	Total 1329	C 834	N 239	O 252	S 4	0	0	0
2	B	167	Total 1329	C 834	N 239	O 252	S 4	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	166	TYR	PHE	ENGINEERED	UNP P19339
B	166	TYR	PHE	ENGINEERED	UNP P19339

- Molecule 3 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	36	Total 36	O 36	0	0
3	B	33	Total 33	O 33	0	0
3	P	7	Total 7	O 7	0	0
3	Q	8	Total 8	O 8	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

Note EDS was not executed.

• Molecule 1: RNA (5'-R(P*GP*UP*UP*GP*UP*UP*UP*UP*UP*UP*UP*U)-3')

Chain P:

• Molecule 1: RNA (5'-R(P*GP*UP*UP*GP*UP*UP*UP*UP*UP*UP*UP*U)-3')

Chain Q:
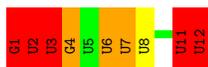
• Molecule 2: PROTEIN (SXL-LETHAL PROTEIN)

Chain A:
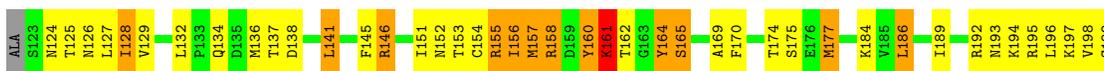
• Molecule 2: PROTEIN (SXL-LETHAL PROTEIN)

Chain B:
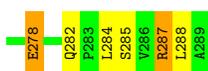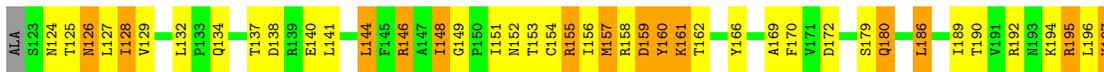
4 Data and refinement statistics (i)

Xtriage (Phenix) and EDS were not executed - this section will therefore be incomplete.

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α, β, γ	77.90Å 86.80Å 160.40Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	15.00 – 2.60	Depositor
% Data completeness (in resolution range)	98.5 (15.00-2.60)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.09	Depositor
Refinement program	X-PLOR 3.851	Depositor
R, R_{free}	0.201 , 0.294	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	3236	wwPDB-VP
Average B, all atoms (Å^2)	39.0	wwPDB-VP

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	P	1.52	0/272	1.81	9/418 (2.2%)
1	Q	1.66	0/272	1.84	9/418 (2.2%)
2	A	0.43	0/1350	0.68	0/1823
2	B	0.48	0/1350	0.68	0/1823
All	All	0.78	0/3244	1.00	18/4482 (0.4%)

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	Q	1	0

There are no bond length outliers.

The worst 5 of 18 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	P	3	U	O4'-C1'-N1	9.04	115.44	108.20
1	P	1	G	O4'-C1'-N9	7.60	114.28	108.20
1	Q	6	U	O4'-C1'-N1	6.75	113.60	108.20
1	P	2	U	O4'-C1'-N1	6.34	113.28	108.20
1	P	10	U	O4'-C1'-N1	6.19	113.16	108.20

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	Q	2	U	C1'

There are no planarity outliers.

5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	P	247	0	123	16	3
1	Q	247	0	123	20	3
2	A	1329	0	1345	73	1
2	B	1329	0	1345	76	1
3	A	36	0	0	9	0
3	B	33	0	0	8	0
3	P	7	0	0	10	1
3	Q	8	0	0	7	1
All	All	3236	0	2936	171	5

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 28.

The worst 5 of 171 close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:Q:1:G:H4'	3:Q:143:HOH:O	1.30	1.22
1:Q:2:U:C6	3:Q:145:HOH:O	2.09	1.03
1:P:1:G:H4'	3:P:59:HOH:O	1.61	0.99
2:B:154:CYS:HB3	3:B:319:HOH:O	1.63	0.97
2:A:160:TYR:O	2:A:161:LYS:HB2	1.65	0.94

All (5) 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	Distance(Å)	Clash(Å)
1:P:4:G:N7	1:Q:2:U:O4[2_665]	1.88	0.32
1:P:3:U:OP2	1:Q:2:U:O4[2_665]	1.97	0.23
1:P:2:U:O2	1:Q:4:G:O6[2_665]	2.11	0.09
2:A:206:GLU:OE2	2:B:154:CYS:SG[1_565]	2.13	0.07
3:P:42:HOH:O	3:Q:20:HOH:O[2_665]	2.19	0.01

5.3 Torsion angles

5.3.1 Protein backbone ⓘ

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	
2	A	165/168 (98%)	155 (94%)	8 (5%)	2 (1%)	19	39
2	B	165/168 (98%)	154 (93%)	9 (6%)	2 (1%)	19	39
All	All	330/336 (98%)	309 (94%)	17 (5%)	4 (1%)	19	39

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	161	LYS
2	A	157	MET
2	B	161	LYS
2	B	157	MET

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	
2	A	145/145 (100%)	100 (69%)	45 (31%)	0	1
2	B	145/145 (100%)	108 (74%)	37 (26%)	1	1
All	All	290/290 (100%)	208 (72%)	82 (28%)	0	1

5 of 82 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	A	254	VAL
2	B	126	ASN
2	B	263	GLU
2	A	261	LYS
2	A	276	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 6 such sidechains are listed below:

Mol	Chain	Res	Type
2	A	241	ASN
2	B	134	GLN
2	B	124	ASN
2	A	134	GLN
2	B	126	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	P	12/12 (100%)	6 (50%)	4 (33%)
1	Q	12/12 (100%)	7 (58%)	5 (41%)
All	All	24/24 (100%)	13 (54%)	9 (37%)

5 of 13 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	P	2	U
1	P	3	U
1	P	6	U
1	P	7	U
1	P	11	U

5 of 9 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	Q	1	G
1	Q	11	U
1	Q	3	U
1	P	6	U
1	Q	2	U

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 ⓘ

EDS was not executed - this section will therefore be empty.

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

EDS was not executed - this section will therefore be empty.

6.3 Carbohydrates ⓘ

EDS was not executed - this section will therefore be empty.

6.4 Ligands ⓘ

EDS was not executed - this section will therefore be empty.

6.5 Other polymers ⓘ

EDS was not executed - this section will therefore be empty.