



wwPDB X-ray Structure Validation Summary Report ⓘ

Nov 23, 2023 – 12:52 AM JST

PDB ID : 7Y17
Title : Crystal structure of ribosomal ITS2 pre-rRNA processing complex from *Cyberlindnera jadinii*
Authors : Chen, J.; Liu, L.
Deposited on : 2022-06-07
Resolution : 3.39 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 : 4.02b-467
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

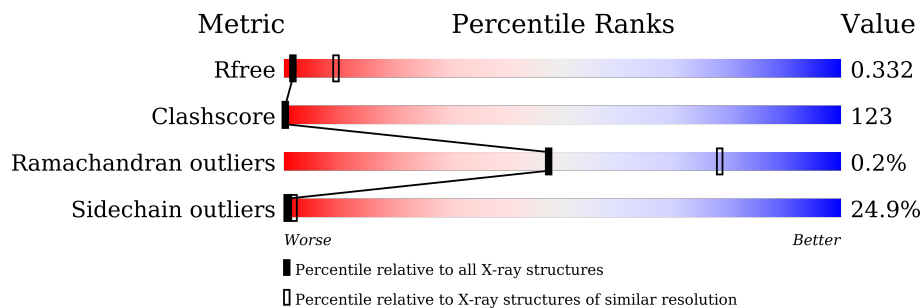
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.39 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	1026 (3.48-3.32)
Clashscore	141614	1055 (3.48-3.32)
Ramachandran outliers	138981	1038 (3.48-3.32)
Sidechain outliers	138945	1038 (3.48-3.32)

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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	610	23% (green), 43% (yellow), 19% (orange), 15% (grey)
1	B	610	20% (green), 45% (yellow), 17% (orange), 17% (grey), 1% (red)
1	E	610	23% (green), 45% (yellow), 16% (orange), 15% (grey), 1% (red)
2	C	421	27% (green), 42% (yellow), 12% (orange), 19% (grey)
2	D	421	24% (green), 42% (yellow), 10% (orange), 23% (grey)
2	F	421	29% (green), 38% (yellow), 13% (orange), 20% (grey)

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 19118 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 Polynucleotide 5'-hydroxyl-kinase GRC3.

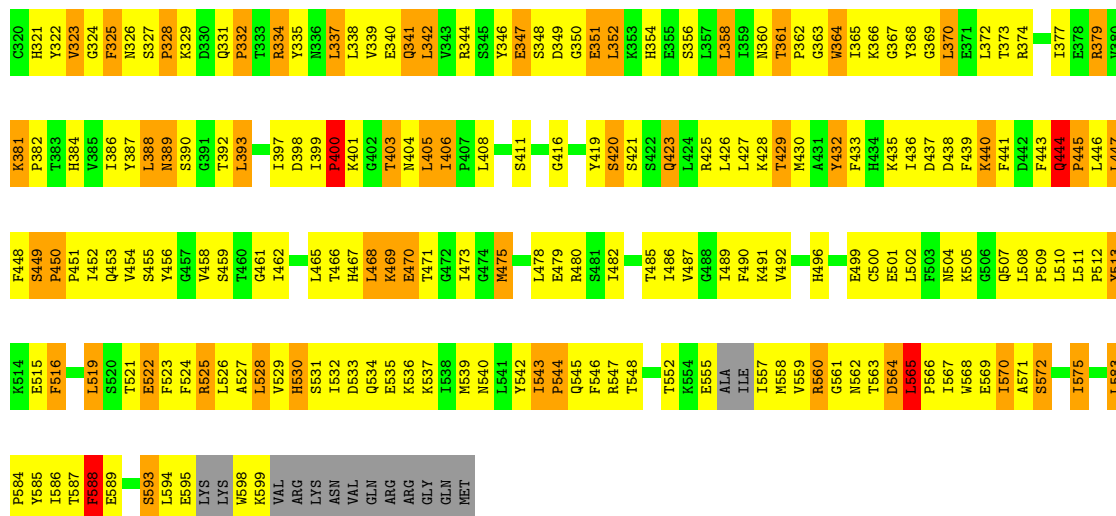
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	B	506	Total 3713	C 2387	N 619	O 695	S 12	0	0	0
1	A	519	Total 3817	C 2451	N 636	O 718	S 12	0	0	0
1	E	519	Total 3794	C 2429	N 633	O 720	S 12	0	0	0

- Molecule 2 is a protein called LAS1 protein.

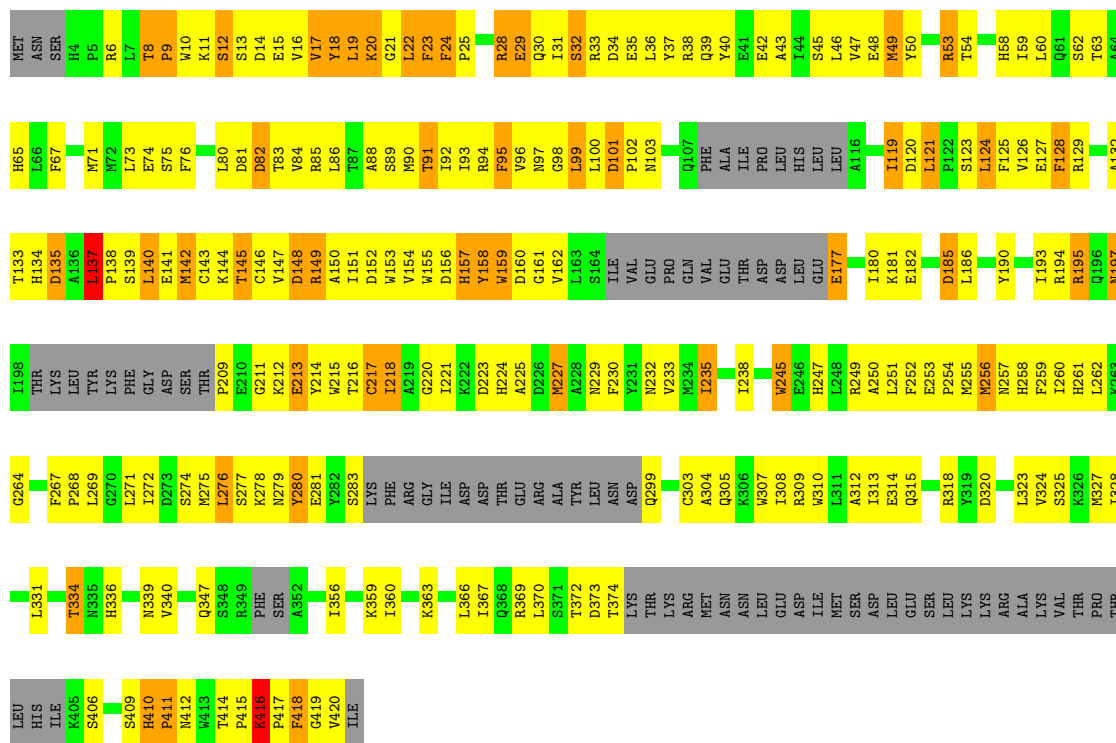
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	340	Total 2551	C 1622	N 426	O 489	S 14	0	0	0
2	D	325	Total 2323	C 1478	N 397	O 436	S 12	0	0	0
2	F	338	Total 2534	C 1623	N 422	O 477	S 12	0	0	0

- Molecule 3 is water.

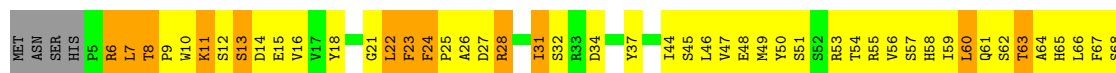
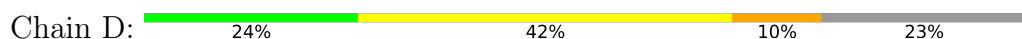
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	61	Total 61	O 61	0	0
3	C	46	Total 46	O 46	0	0
3	D	60	Total 60	O 60	0	0
3	A	94	Total 94	O 94	0	0
3	E	79	Total 79	O 79	0	0
3	F	46	Total 46	O 46	0	0



• Molecule 2: LAS1 protein



• Molecule 2: LAS1 protein



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	152.62Å 240.02Å 237.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	21.41 – 3.39 46.80 – 3.39	Depositor EDS
% Data completeness (in resolution range)	68.3 (21.41-3.39) 68.5 (46.80-3.39)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.26 (at 3.40Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.309 , 0.332 0.309 , 0.332	Depositor DCC
R_{free} test set	2105 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å ²)	71.4	Xtrriage
Anisotropy	0.383	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.15 , 67.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.34$, $\langle L^2 \rangle = 0.17$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.68	EDS
Total number of atoms	19118	wwPDB-VP
Average B, all atoms (Å ²)	124.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.21% 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](#)

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	0.61	8/3894 (0.2%)	0.81	17/5301 (0.3%)
1	B	0.61	13/3787 (0.3%)	0.81	20/5155 (0.4%)
1	E	0.64	10/3872 (0.3%)	0.86	28/5281 (0.5%)
2	C	0.51	2/2601 (0.1%)	0.72	9/3540 (0.3%)
2	D	0.56	2/2365 (0.1%)	0.75	12/3228 (0.4%)
2	F	0.57	8/2577 (0.3%)	0.77	18/3501 (0.5%)
All	All	0.59	43/19096 (0.2%)	0.79	104/26006 (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	B	0	3
1	E	0	2
All	All	0	5

The worst 5 of 43 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	588	PHE	C-N	5.75	1.47	1.34
1	E	212	PRO	N-CD	5.60	1.55	1.47
1	A	512	PRO	N-CD	5.37	1.55	1.47
2	F	5	PRO	N-CD	5.36	1.55	1.47
1	B	288	PRO	N-CD	5.35	1.55	1.47

The worst 5 of 104 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	588	PHE	O-C-N	-11.22	104.75	122.70
2	F	354	PRO	CA-N-CD	-8.96	98.96	111.50
1	A	465	LEU	CB-CG-CD2	-7.66	97.97	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	588	PHE	CA-C-N	7.25	133.16	117.20
1	E	588	PHE	C-N-CA	6.56	138.10	121.70

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	292	GLY	Peptide
1	B	297	SER	Peptide
1	B	371	GLU	Sidechain
1	E	138	SER	Peptide
1	E	588	PHE	Mainchain

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	3817	0	3551	1084	0
1	B	3713	0	3465	944	1
1	E	3794	0	3501	967	3
2	C	2551	0	2321	572	1
2	D	2323	0	2023	514	0
2	F	2534	0	2341	577	3
3	A	94	0	0	14	0
3	B	61	0	0	26	0
3	C	46	0	0	6	0
3	D	60	0	0	9	0
3	E	79	0	0	24	0
3	F	46	0	0	9	0
All	All	19118	0	17202	4426	4

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 123.

The worst 5 of 4426 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:B:454:VAL:HG11	2:D:407:PHE:CE1	1.23	1.73
1:A:63:PHE:CE2	1:A:214:THR:HA	1.26	1.69
2:F:252:PHE:HD1	2:F:307:TRP:CZ2	1.09	1.66
2:F:252:PHE:CD1	2:F:307:TRP:CH2	1.75	1.66
2:F:24:PHE:HD1	2:F:155:TRP:CE3	1.14	1.64

All (4) 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:C:195:ARG:NH2	1:E:207:ASP:OD2[1_655]	1.73	0.47
1:B:503:PHE:O	2:F:371:SER:O[5_545]	1.97	0.23
1:E:366:LYS:NZ	2:F:123:SER:CB[3_554]	2.02	0.18
1:E:366:LYS:CE	2:F:123:SER:CB[3_554]	2.17	0.03

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	505/610 (83%)	481 (95%)	23 (5%)	1 (0%)	47 78
1	B	488/610 (80%)	462 (95%)	26 (5%)	0	100 100
1	E	509/610 (83%)	483 (95%)	24 (5%)	2 (0%)	34 67
2	C	326/421 (77%)	315 (97%)	11 (3%)	0	100 100
2	D	309/421 (73%)	296 (96%)	11 (4%)	2 (1%)	25 57
2	F	314/421 (75%)	301 (96%)	12 (4%)	1 (0%)	41 72
All	All	2451/3093 (79%)	2338 (95%)	107 (4%)	6 (0%)	47 78

5 of 6 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	D	101	ASP

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Mol	Chain	Res	Type
1	E	154	PRO
1	A	121	PRO
2	F	244	LYS
1	E	400	PRO

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	386/561 (69%)	267 (69%)	119 (31%)	0	1
1	B	377/561 (67%)	273 (72%)	104 (28%)	0	1
1	E	383/561 (68%)	292 (76%)	91 (24%)	0	2
2	C	254/388 (66%)	199 (78%)	55 (22%)	1	3
2	D	211/388 (54%)	165 (78%)	46 (22%)	1	3
2	F	254/388 (66%)	205 (81%)	49 (19%)	1	4
All	All	1865/2847 (66%)	1401 (75%)	464 (25%)	0	2

5 of 464 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	209	THR
2	F	248	LEU
1	A	429	THR
2	F	214	TYR
1	E	491	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 56 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	267	HIS
2	F	339	ASN
1	A	582	GLN
2	F	315	GLN

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Mol	Chain	Res	Type
2	F	134	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates

Unable to reproduce the depositors R factor - this section is therefore empty.

6.4 Ligands

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers

Unable to reproduce the depositors R factor - this section is therefore empty.