



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 4, 2026 – 11:48 PM UTC

PDB ID : 9IAJ / pdb_00009iaj
Title : Structure of cyclodi peptide synthase from *Nocardia brasiliensis* (Nbra-CDPS)
in complex with RNA microhelices mimicking tRNA-Ala acceptor arm
Authors : Marouf, F.Z.; Charbonnier, J.B.; Fernandez Varela, P.
Deposited on : 2025-02-11
Resolution : 3.29 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
Mogul	:	2022.3.0, CSD as543be (2022)
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

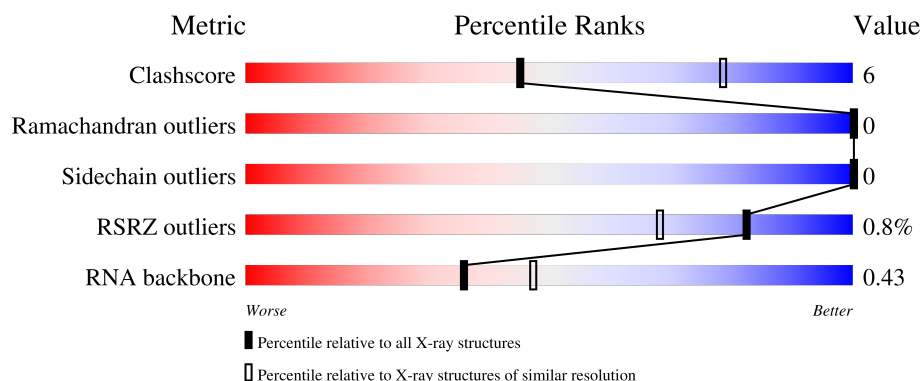
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION






The reported resolution of this entry is 3.29 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	1209 (3.32-3.28)
Ramachandran outliers	187476	1188 (3.32-3.28)
Sidechain outliers	187428	1187 (3.32-3.28)
RSRZ outliers	180081	1169 (3.32-3.28)
RNA backbone	3983	1048 (3.60-3.00)

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	248	
1	B	248	
1	C	248	
1	D	248	
1	E	248	

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Mol	Chain	Length	Quality of chain
1	F	248	
1	G	248	
1	H	248	
1	I	248	
1	J	248	
1	K	248	
1	L	248	
1	M	248	
1	N	248	
2	O	22	
2	P	22	
2	Q	22	
2	R	22	
2	S	22	
2	T	22	
2	U	22	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 28981 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 Cyclodipeptide synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	B	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	C	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	D	226	Total	C	N	O	S	0	0	0
			1821	1140	337	339	5			
1	E	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	F	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	G	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	H	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	I	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	J	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	K	228	Total	C	N	O	S	0	0	0
			1832	1146	339	342	5			
1	L	227	Total	C	N	O	S	0	0	0
			1827	1143	338	341	5			
1	M	227	Total	C	N	O	S	0	0	0
			1827	1143	338	341	5			
1	N	227	Total	C	N	O	S	0	0	0
			1827	1143	338	341	5			

There are 140 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	MET	-	initiating methionine	UNP K0F6G5

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1	ALA	-	expression tag	UNP K0F6G5
A	240	ARG	-	expression tag	UNP K0F6G5
A	241	SER	-	expression tag	UNP K0F6G5
A	242	HIS	-	expression tag	UNP K0F6G5
A	243	HIS	-	expression tag	UNP K0F6G5
A	244	HIS	-	expression tag	UNP K0F6G5
A	245	HIS	-	expression tag	UNP K0F6G5
A	246	HIS	-	expression tag	UNP K0F6G5
A	247	HIS	-	expression tag	UNP K0F6G5
B	0	MET	-	initiating methionine	UNP K0F6G5
B	1	ALA	-	expression tag	UNP K0F6G5
B	240	ARG	-	expression tag	UNP K0F6G5
B	241	SER	-	expression tag	UNP K0F6G5
B	242	HIS	-	expression tag	UNP K0F6G5
B	243	HIS	-	expression tag	UNP K0F6G5
B	244	HIS	-	expression tag	UNP K0F6G5
B	245	HIS	-	expression tag	UNP K0F6G5
B	246	HIS	-	expression tag	UNP K0F6G5
B	247	HIS	-	expression tag	UNP K0F6G5
C	0	MET	-	initiating methionine	UNP K0F6G5
C	1	ALA	-	expression tag	UNP K0F6G5
C	240	ARG	-	expression tag	UNP K0F6G5
C	241	SER	-	expression tag	UNP K0F6G5
C	242	HIS	-	expression tag	UNP K0F6G5
C	243	HIS	-	expression tag	UNP K0F6G5
C	244	HIS	-	expression tag	UNP K0F6G5
C	245	HIS	-	expression tag	UNP K0F6G5
C	246	HIS	-	expression tag	UNP K0F6G5
C	247	HIS	-	expression tag	UNP K0F6G5
D	0	MET	-	initiating methionine	UNP K0F6G5
D	1	ALA	-	expression tag	UNP K0F6G5
D	240	ARG	-	expression tag	UNP K0F6G5
D	241	SER	-	expression tag	UNP K0F6G5
D	242	HIS	-	expression tag	UNP K0F6G5
D	243	HIS	-	expression tag	UNP K0F6G5
D	244	HIS	-	expression tag	UNP K0F6G5
D	245	HIS	-	expression tag	UNP K0F6G5
D	246	HIS	-	expression tag	UNP K0F6G5
D	247	HIS	-	expression tag	UNP K0F6G5
E	0	MET	-	initiating methionine	UNP K0F6G5
E	1	ALA	-	expression tag	UNP K0F6G5
E	240	ARG	-	expression tag	UNP K0F6G5

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Chain	Residue	Modelled	Actual	Comment	Reference
E	241	SER	-	expression tag	UNP K0F6G5
E	242	HIS	-	expression tag	UNP K0F6G5
E	243	HIS	-	expression tag	UNP K0F6G5
E	244	HIS	-	expression tag	UNP K0F6G5
E	245	HIS	-	expression tag	UNP K0F6G5
E	246	HIS	-	expression tag	UNP K0F6G5
E	247	HIS	-	expression tag	UNP K0F6G5
F	0	MET	-	initiating methionine	UNP K0F6G5
F	1	ALA	-	expression tag	UNP K0F6G5
F	240	ARG	-	expression tag	UNP K0F6G5
F	241	SER	-	expression tag	UNP K0F6G5
F	242	HIS	-	expression tag	UNP K0F6G5
F	243	HIS	-	expression tag	UNP K0F6G5
F	244	HIS	-	expression tag	UNP K0F6G5
F	245	HIS	-	expression tag	UNP K0F6G5
F	246	HIS	-	expression tag	UNP K0F6G5
F	247	HIS	-	expression tag	UNP K0F6G5
G	0	MET	-	initiating methionine	UNP K0F6G5
G	1	ALA	-	expression tag	UNP K0F6G5
G	240	ARG	-	expression tag	UNP K0F6G5
G	241	SER	-	expression tag	UNP K0F6G5
G	242	HIS	-	expression tag	UNP K0F6G5
G	243	HIS	-	expression tag	UNP K0F6G5
G	244	HIS	-	expression tag	UNP K0F6G5
G	245	HIS	-	expression tag	UNP K0F6G5
G	246	HIS	-	expression tag	UNP K0F6G5
G	247	HIS	-	expression tag	UNP K0F6G5
H	0	MET	-	initiating methionine	UNP K0F6G5
H	1	ALA	-	expression tag	UNP K0F6G5
H	240	ARG	-	expression tag	UNP K0F6G5
H	241	SER	-	expression tag	UNP K0F6G5
H	242	HIS	-	expression tag	UNP K0F6G5
H	243	HIS	-	expression tag	UNP K0F6G5
H	244	HIS	-	expression tag	UNP K0F6G5
H	245	HIS	-	expression tag	UNP K0F6G5
H	246	HIS	-	expression tag	UNP K0F6G5
H	247	HIS	-	expression tag	UNP K0F6G5
I	0	MET	-	initiating methionine	UNP K0F6G5
I	1	ALA	-	expression tag	UNP K0F6G5
I	240	ARG	-	expression tag	UNP K0F6G5
I	241	SER	-	expression tag	UNP K0F6G5
I	242	HIS	-	expression tag	UNP K0F6G5

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Chain	Residue	Modelled	Actual	Comment	Reference
I	243	HIS	-	expression tag	UNP K0F6G5
I	244	HIS	-	expression tag	UNP K0F6G5
I	245	HIS	-	expression tag	UNP K0F6G5
I	246	HIS	-	expression tag	UNP K0F6G5
I	247	HIS	-	expression tag	UNP K0F6G5
J	0	MET	-	initiating methionine	UNP K0F6G5
J	1	ALA	-	expression tag	UNP K0F6G5
J	240	ARG	-	expression tag	UNP K0F6G5
J	241	SER	-	expression tag	UNP K0F6G5
J	242	HIS	-	expression tag	UNP K0F6G5
J	243	HIS	-	expression tag	UNP K0F6G5
J	244	HIS	-	expression tag	UNP K0F6G5
J	245	HIS	-	expression tag	UNP K0F6G5
J	246	HIS	-	expression tag	UNP K0F6G5
J	247	HIS	-	expression tag	UNP K0F6G5
K	0	MET	-	initiating methionine	UNP K0F6G5
K	1	ALA	-	expression tag	UNP K0F6G5
K	240	ARG	-	expression tag	UNP K0F6G5
K	241	SER	-	expression tag	UNP K0F6G5
K	242	HIS	-	expression tag	UNP K0F6G5
K	243	HIS	-	expression tag	UNP K0F6G5
K	244	HIS	-	expression tag	UNP K0F6G5
K	245	HIS	-	expression tag	UNP K0F6G5
K	246	HIS	-	expression tag	UNP K0F6G5
K	247	HIS	-	expression tag	UNP K0F6G5
L	0	MET	-	initiating methionine	UNP K0F6G5
L	1	ALA	-	expression tag	UNP K0F6G5
L	240	ARG	-	expression tag	UNP K0F6G5
L	241	SER	-	expression tag	UNP K0F6G5
L	242	HIS	-	expression tag	UNP K0F6G5
L	243	HIS	-	expression tag	UNP K0F6G5
L	244	HIS	-	expression tag	UNP K0F6G5
L	245	HIS	-	expression tag	UNP K0F6G5
L	246	HIS	-	expression tag	UNP K0F6G5
L	247	HIS	-	expression tag	UNP K0F6G5
M	0	MET	-	initiating methionine	UNP K0F6G5
M	1	ALA	-	expression tag	UNP K0F6G5
M	240	ARG	-	expression tag	UNP K0F6G5
M	241	SER	-	expression tag	UNP K0F6G5
M	242	HIS	-	expression tag	UNP K0F6G5
M	243	HIS	-	expression tag	UNP K0F6G5
M	244	HIS	-	expression tag	UNP K0F6G5

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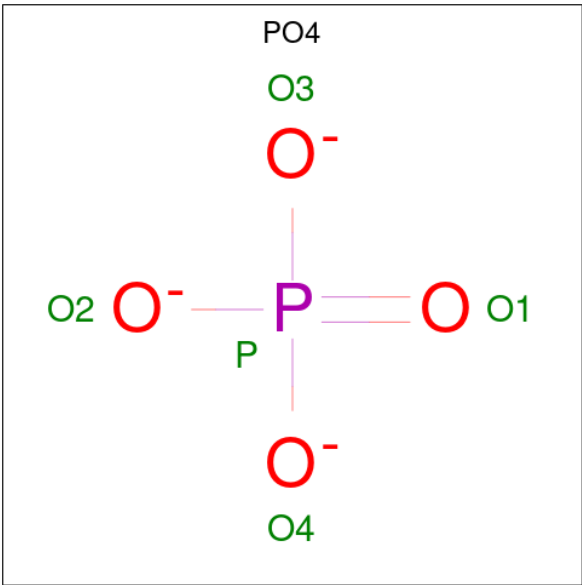
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Chain	Residue	Modelled	Actual	Comment	Reference
M	245	HIS	-	expression tag	UNP K0F6G5
M	246	HIS	-	expression tag	UNP K0F6G5
M	247	HIS	-	expression tag	UNP K0F6G5
N	0	MET	-	initiating methionine	UNP K0F6G5
N	1	ALA	-	expression tag	UNP K0F6G5
N	240	ARG	-	expression tag	UNP K0F6G5
N	241	SER	-	expression tag	UNP K0F6G5
N	242	HIS	-	expression tag	UNP K0F6G5
N	243	HIS	-	expression tag	UNP K0F6G5
N	244	HIS	-	expression tag	UNP K0F6G5
N	245	HIS	-	expression tag	UNP K0F6G5
N	246	HIS	-	expression tag	UNP K0F6G5
N	247	HIS	-	expression tag	UNP K0F6G5

- Molecule 2 is a RNA chain called RNA (5'-R(P*GP*GP*GP*GP*CP*UP*AP*UP*UP*CP*GP*UP*AP*GP*CP*UP*CP*CP*AP*CP*CP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	O	22	Total	C	N	O	P	1	0	0
			467	208	81	156	22			
2	P	22	Total	C	N	O	P	1	0	0
			467	208	81	156	22			
2	Q	22	Total	C	N	O	P	1	0	0
			467	208	81	156	22			
2	R	22	Total	C	N	O	P	1	0	0
			467	208	81	156	22			
2	S	22	Total	C	N	O	P	1	0	0
			467	208	81	156	22			
2	U	22	Total	C	N	O	P	1	0	0
			467	208	81	156	22			
2	T	22	Total	C	N	O	P	1	0	0
			467	208	81	156	22			

- Molecule 3 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	O	P	0	0
			5	4	1		
3	A	1	Total	O	P	0	0
			5	4	1		
3	B	1	Total	O	P	0	0
			5	4	1		
3	C	1	Total	O	P	0	0
			5	4	1		
3	D	1	Total	O	P	0	0
			5	4	1		
3	D	1	Total	O	P	0	0
			5	4	1		
3	E	1	Total	O	P	0	0
			5	4	1		
3	F	1	Total	O	P	0	0
			5	4	1		
3	F	1	Total	O	P	0	0
			5	4	1		
3	G	1	Total	O	P	0	0
			5	4	1		
3	G	1	Total	O	P	0	0
			5	4	1		
3	H	1	Total	O	P	0	0
			5	4	1		
3	I	1	Total	O	P	0	0
			5	4	1		
3	J	1	Total	O	P	0	0
			5	4	1		

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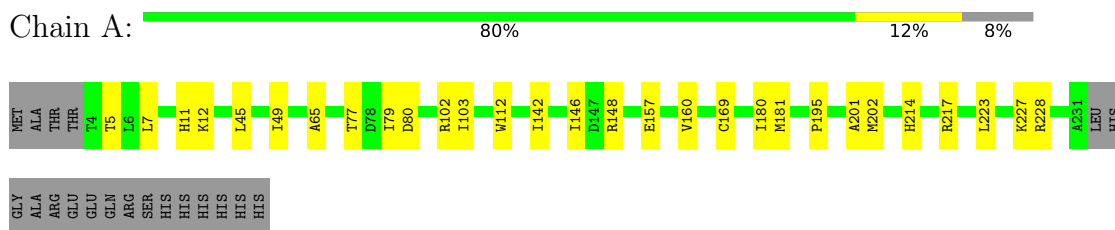
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	K	1	Total	O	P	0	0
			5	4	1		
3	L	1	Total	O	P	0	0
			5	4	1		
3	M	1	Total	O	P	0	0
			5	4	1		
3	N	1	Total	O	P	0	0
			5	4	1		

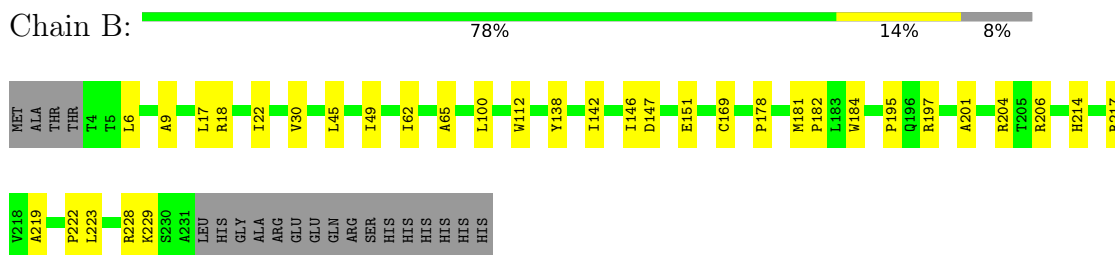
3 Residue-property plots

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.

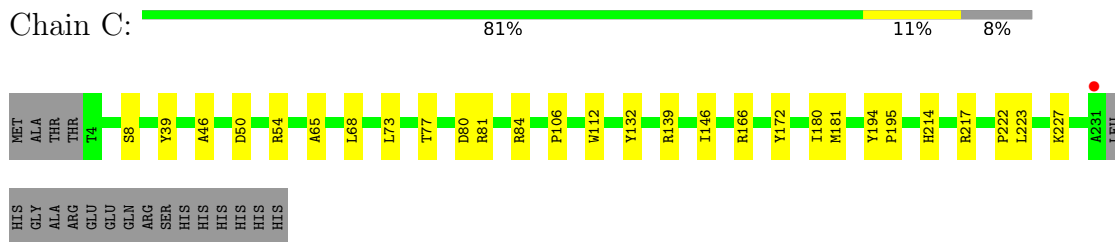
- Molecule 1: Cyclodipeptide synthase



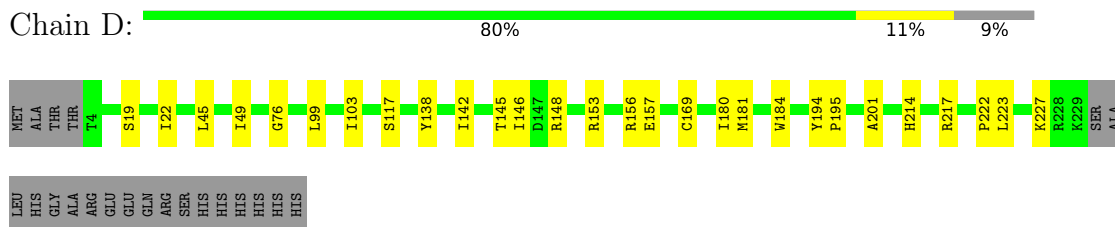
- Molecule 1: Cyclodipeptide synthase



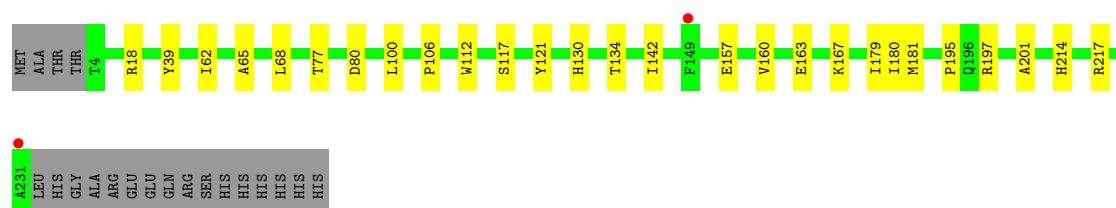
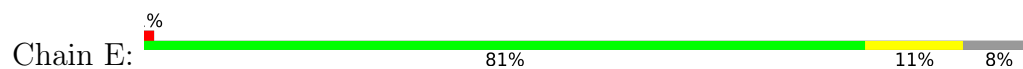
- Molecule 1: Cyclodipeptide synthase



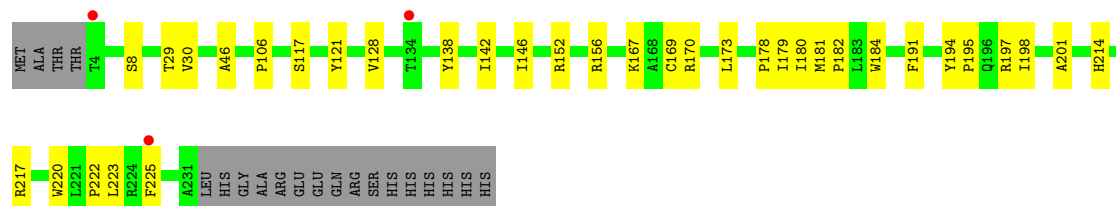
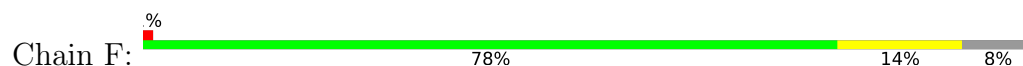
- Molecule 1: Cyclodipeptide synthase



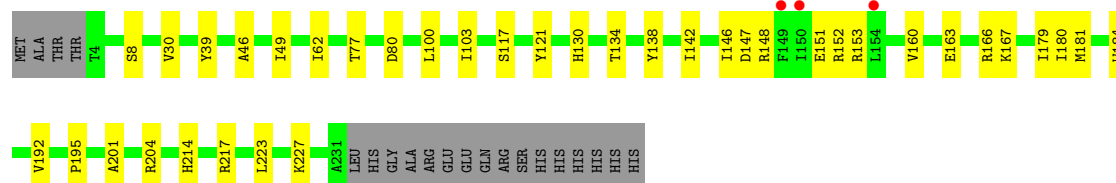
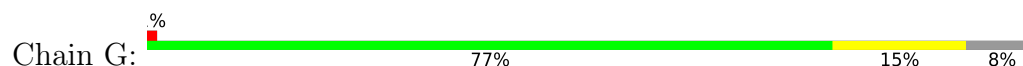
- Molecule 1: Cyclodi peptide synthase



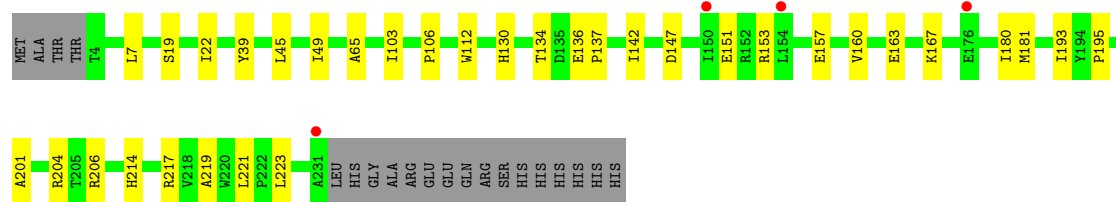
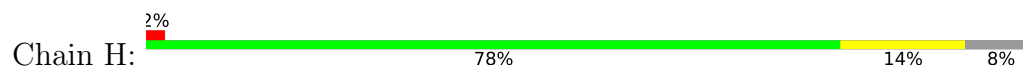
- Molecule 1: Cyclodi peptide synthase



- Molecule 1: Cyclodi peptide synthase

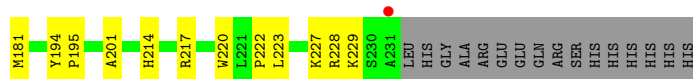


- Molecule 1: Cyclodi peptide synthase

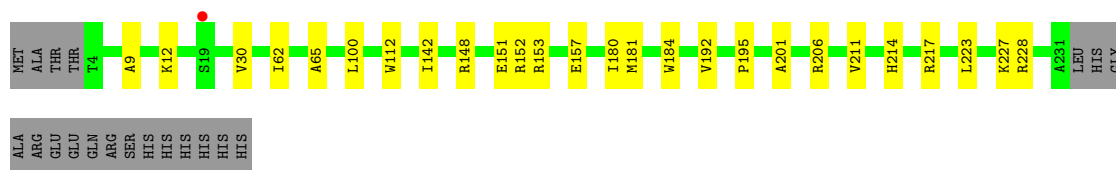
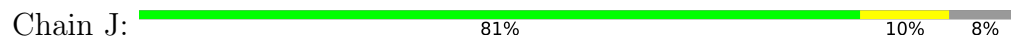


- Molecule 1: Cyclodi peptide synthase

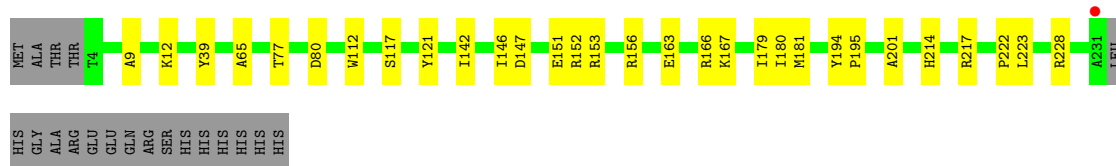
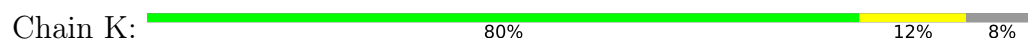




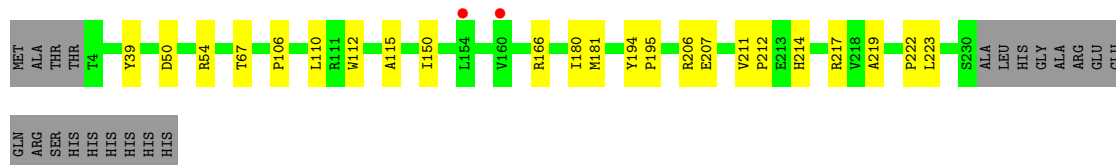
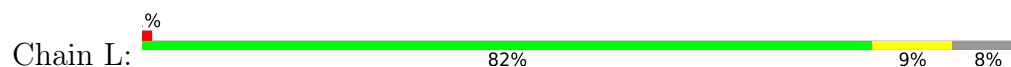
- Molecule 1: Cyclodi peptide synthase



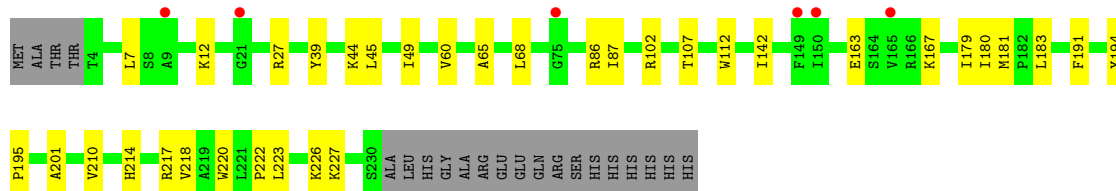
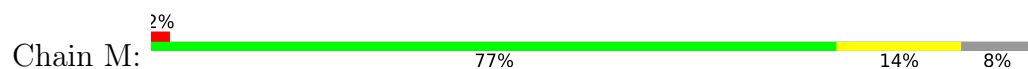
- Molecule 1: Cyclodi peptide synthase



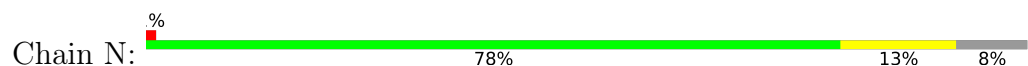
- Molecule 1: Cyclodi peptide synthase

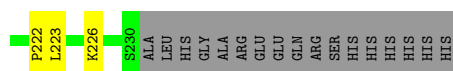


- Molecule 1: Cyclodi peptide synthase

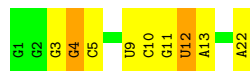


- Molecule 1: Cyclodi peptide synthase





- Molecule 2: RNA (5'-R(P*GP*GP*GP*GP*CP*UP*AP*UP*UP*CP*GP*UP*AP*GP*CP*UP*CP*CP*AP*CP*CP*A)-3')



- Molecule 2: RNA (5'-R(P*GP*GP*GP*GP*CP*UP*AP*UP*UP*CP*GP*UP*AP*GP*CP*UP*CP*CP*AP*CP*CP*A)-3')



- Molecule 2: RNA (5'-R(P*GP*GP*GP*GP*CP*UP*AP*UP*UP*CP*GP*UP*AP*GP*CP*UP*CP*CP*AP*CP*CP*A)-3')



- Molecule 2: RNA (5'-R(P*GP*GP*GP*GP*CP*UP*AP*UP*UP*CP*GP*UP*AP*GP*CP*UP*CP*CP*AP*CP*CP*A)-3')



- Molecule 2: RNA (5'-R(P*GP*GP*GP*GP*CP*UP*AP*UP*UP*CP*GP*UP*AP*GP*CP*UP*CP*CP*AP*CP*CP*A)-3')



- Molecule 2: RNA (5'-R(P*GP*GP*GP*GP*CP*UP*AP*UP*UP*CP*GP*UP*AP*GP*CP*UP*CP*CP*AP*CP*CP*A)-3')





● Molecule 2: RNA (5'-R(P*GP*GP*GP*GP*CP*UP*AP*UP*UP*CP*GP*UP*AP*GP*CP*U
P*CP*CP*AP*CP*CP*A)-3')



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	105.03Å 170.33Å 321.12Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.69 – 3.29 47.69 – 3.29	Depositor EDS
% Data completeness (in resolution range)	74.6 (47.69-3.29) 74.7 (47.69-3.29)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.29 (at 3.25Å)	Xtriage
Refinement program	PHENIX (1.21.2_5419: ???)	Depositor
R, R_{free}	0.208 , 0.236 0.206 , (Not available)	Depositor DCC
R_{free} test set	73 reflections (0.11%)	wwPDB-VP
Wilson B-factor (Å ²)	80.7	Xtriage
Anisotropy	0.064	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 73.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.41$, $\langle L^2 \rangle = 0.24$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	28981	wwPDB-VP
Average B, all atoms (Å ²)	89.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.82% 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: PO4

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	0.16	0/1873	0.39	0/2542
1	B	0.15	0/1873	0.35	0/2542
1	C	0.19	0/1873	0.36	0/2542
1	D	0.13	0/1862	0.36	0/2527
1	E	0.13	0/1873	0.36	0/2542
1	F	0.13	0/1873	0.36	0/2542
1	G	0.14	0/1873	0.35	0/2542
1	H	0.13	0/1873	0.36	0/2542
1	I	0.15	0/1873	0.37	0/2542
1	J	0.15	0/1873	0.35	0/2542
1	K	0.15	0/1873	0.34	0/2542
1	L	0.12	0/1868	0.37	0/2535
1	M	0.15	0/1868	0.35	0/2535
1	N	0.13	0/1868	0.34	0/2535
2	O	0.24	0/520	0.59	0/806
2	P	0.22	0/520	0.63	0/806
2	Q	0.22	0/520	0.61	0/806
2	R	0.22	0/520	0.58	0/806
2	S	0.22	0/520	0.63	0/806
2	T	0.24	0/520	0.64	0/806
2	U	0.25	0/520	0.64	0/806
All	All	0.16	0/29836	0.40	0/41194

There are no bond length outliers.

There are no bond angle outliers.

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	1832	0	1792	19	0
1	B	1832	0	1792	27	0
1	C	1832	0	1792	18	0
1	D	1821	0	1782	20	0
1	E	1832	0	1792	23	0
1	F	1832	0	1792	22	0
1	G	1832	0	1792	23	0
1	H	1832	0	1792	24	0
1	I	1832	0	1792	26	0
1	J	1832	0	1792	18	0
1	K	1832	0	1792	18	0
1	L	1827	0	1787	14	0
1	M	1827	0	1787	23	0
1	N	1827	0	1787	22	0
2	O	467	0	238	6	0
2	P	467	0	238	11	0
2	Q	467	0	238	8	0
2	R	467	0	238	14	0
2	S	467	0	238	11	0
2	T	467	0	238	9	0
2	U	467	0	238	8	0
3	A	10	0	0	0	0
3	B	5	0	0	0	0
3	C	5	0	0	0	0
3	D	10	0	0	0	0
3	E	5	0	0	0	0
3	F	10	0	0	0	0
3	G	10	0	0	0	0
3	H	5	0	0	0	0
3	I	5	0	0	0	0
3	J	5	0	0	0	0
3	K	5	0	0	0	0
3	L	5	0	0	0	0
3	M	5	0	0	0	0
3	N	5	0	0	0	0
All	All	28981	0	26729	330	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 6.

All (330) 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:197:ARG:HH12	1:E:18:ARG:HD3	1.29	0.92
1:B:197:ARG:NH1	1:E:18:ARG:HD3	1.87	0.88
1:H:137:PRO:HB2	1:H:204:ARG:NH1	1.93	0.84
1:M:163:GLU:HG3	1:M:167:LYS:NZ	1.99	0.78
1:N:195:PRO:HA	1:N:223:LEU:HB2	1.65	0.76
1:E:157:GLU:HB2	1:E:160:VAL:HG13	1.67	0.74
1:A:79:ILE:HD11	1:H:7:LEU:HA	1.69	0.74
1:I:163:GLU:HG3	1:I:167:LYS:NZ	2.03	0.73
1:H:137:PRO:HB2	1:H:204:ARG:HH12	1.52	0.73
1:M:163:GLU:HG3	1:M:167:LYS:HZ2	1.52	0.73
1:L:195:PRO:HA	1:L:223:LEU:HB2	1.70	0.72
2:P:3:G:H2'	2:P:4:G:H5''	1.71	0.72
1:C:180:ILE:HG22	1:C:181:MET:HE2	1.74	0.69
1:I:180:ILE:HG22	1:I:181:MET:HE2	1.75	0.69
1:B:169:CYS:HA	2:U:22:A:H61	1.58	0.68
1:D:156:ARG:HH21	2:P:21:C:H5''	1.58	0.68
1:J:152:ARG:NH1	2:S:22:A:OP2	2.27	0.68
1:G:180:ILE:HG22	1:G:181:MET:HE2	1.74	0.67
1:K:180:ILE:HG22	1:K:181:MET:HE2	1.74	0.67
2:R:11:G:H4'	2:R:12:U:OP1	1.94	0.67
1:I:214:HIS:HB3	1:I:217:ARG:HG3	1.77	0.66
2:P:5:C:H2'	2:P:6:U:C6	2.31	0.66
1:E:180:ILE:HG22	1:E:181:MET:HE2	1.77	0.66
1:L:214:HIS:HB3	1:L:217:ARG:HG3	1.78	0.66
1:J:12:LYS:HB2	1:J:228:ARG:NH1	2.12	0.65
1:G:163:GLU:HG3	1:G:167:LYS:NZ	2.11	0.65
1:G:77:THR:HG23	1:G:80:ASP:H	1.61	0.65
1:M:180:ILE:HG22	1:M:181:MET:HE2	1.79	0.64
1:G:214:HIS:HB3	1:G:217:ARG:HG3	1.78	0.64
1:B:17:LEU:HD11	1:B:22:ILE:HD13	1.80	0.64
1:B:195:PRO:HA	1:B:223:LEU:HB2	1.79	0.64
1:D:180:ILE:HG22	1:D:181:MET:HE2	1.79	0.64
1:H:195:PRO:HA	1:H:223:LEU:HB2	1.79	0.64
1:L:206:ARG:NH1	1:L:219:ALA:HA	2.13	0.64
2:T:5:C:H2'	2:T:6:U:C6	2.33	0.64
1:D:153:ARG:HH12	1:D:157:GLU:CD	2.05	0.63
1:N:153:ARG:HH12	1:N:157:GLU:CD	2.08	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:228:ARG:NH1	2:O:13:A:OP1	2.31	0.62
1:F:167:LYS:HD3	1:F:170:ARG:NH1	2.15	0.61
1:M:195:PRO:HA	1:M:223:LEU:HB2	1.81	0.61
1:F:180:ILE:HG22	1:F:181:MET:HE2	1.81	0.61
1:N:180:ILE:HG22	1:N:181:MET:HE2	1.82	0.61
2:R:12:U:H2'	2:R:13:A:C8	2.36	0.61
1:K:214:HIS:HB3	1:K:217:ARG:HG3	1.83	0.61
1:I:195:PRO:HA	1:I:223:LEU:HB2	1.83	0.61
2:O:3:G:C2'	2:O:4:G:H5'	2.31	0.61
1:I:228:ARG:NH1	2:R:13:A:OP1	2.34	0.60
2:P:20:C:H2'	2:P:21:C:H6	1.65	0.60
2:S:3:G:C2'	2:S:4:G:H5'	2.31	0.60
1:K:9:ALA:O	1:K:228:ARG:HD2	2.02	0.60
2:R:12:U:H2'	2:R:13:A:H8	1.67	0.60
1:D:214:HIS:HB3	1:D:217:ARG:HG3	1.84	0.60
1:I:227:LYS:HG3	1:I:229:LYS:H	1.65	0.59
1:B:214:HIS:HB3	1:B:217:ARG:HG3	1.85	0.59
1:C:84:ARG:HG2	1:M:87:ILE:HD11	1.85	0.59
1:J:180:ILE:HG22	1:J:181:MET:HE2	1.84	0.59
1:E:77:THR:HG23	1:E:80:ASP:H	1.68	0.59
1:H:214:HIS:HB3	1:H:217:ARG:HG3	1.85	0.58
1:F:214:HIS:HB3	1:F:217:ARG:HG3	1.86	0.58
1:B:6:LEU:HD13	1:G:80:ASP:HB2	1.86	0.57
1:B:142:ILE:HD13	1:B:201:ALA:HB1	1.86	0.57
2:U:12:U:H2'	2:U:13:A:C8	2.40	0.57
1:K:228:ARG:NH1	2:T:13:A:OP1	2.37	0.57
2:P:5:C:H2'	2:P:6:U:H6	1.69	0.57
1:L:180:ILE:HG22	1:L:181:MET:HE2	1.85	0.57
2:R:9:U:H2'	2:R:11:G:H1	1.70	0.56
2:T:3:G:H2'	2:T:4:G:H5''	1.87	0.56
1:C:214:HIS:HB3	1:C:217:ARG:HG3	1.86	0.56
1:C:195:PRO:HA	1:C:223:LEU:HB2	1.87	0.56
1:J:153:ARG:HH12	1:J:157:GLU:CD	2.14	0.56
1:M:65:ALA:HA	1:M:112:TRP:HB2	1.88	0.56
1:H:206:ARG:NH1	1:H:219:ALA:HA	2.20	0.55
1:D:195:PRO:HA	1:D:223:LEU:HB2	1.89	0.55
1:K:142:ILE:HD13	1:K:201:ALA:HB1	1.89	0.55
1:G:130:HIS:CE1	1:G:134:THR:HG21	2.42	0.55
1:B:17:LEU:HD23	1:B:222:PRO:HD2	1.88	0.55
1:B:18:ARG:HG2	1:E:197:ARG:HH12	1.72	0.55
1:E:130:HIS:CE1	1:E:134:THR:HG21	2.42	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:229:LYS:H	1:B:229:LYS:HD2	1.70	0.55
1:M:220:TRP:HD1	1:M:222:PRO:HD3	1.72	0.55
2:S:11:G:H2'	2:S:12:U:O4'	2.07	0.55
1:C:77:THR:HG23	1:C:80:ASP:H	1.72	0.55
1:K:195:PRO:HA	1:K:223:LEU:HB2	1.88	0.54
1:F:142:ILE:HD13	1:F:201:ALA:HB1	1.88	0.54
1:I:9:ALA:O	1:I:228:ARG:HD2	2.07	0.54
1:I:65:ALA:HA	1:I:112:TRP:HB2	1.90	0.54
2:P:5:C:O2'	2:P:6:U:H5'	2.08	0.54
1:E:214:HIS:HB3	1:E:217:ARG:HG3	1.90	0.54
1:M:39:TYR:CD1	1:M:195:PRO:HG2	2.42	0.54
2:R:3:G:C2'	2:R:4:G:H5'	2.37	0.54
1:N:12:LYS:HD3	1:N:226:LYS:HE2	1.90	0.54
1:E:39:TYR:CD1	1:E:195:PRO:HG2	2.42	0.54
1:F:152:ARG:O	1:F:156:ARG:HG3	2.08	0.53
1:J:142:ILE:HD13	1:J:201:ALA:HB1	1.91	0.53
1:A:157:GLU:HB2	1:A:160:VAL:HG13	1.90	0.53
1:J:62:ILE:HD13	1:J:100:LEU:HD22	1.90	0.53
1:L:39:TYR:CD1	1:L:195:PRO:HG2	2.43	0.53
1:N:7:LEU:HD13	1:N:99:LEU:HD22	1.91	0.53
1:B:18:ARG:NH1	2:U:15:C:H4'	2.23	0.53
1:F:195:PRO:HA	1:F:223:LEU:HB2	1.90	0.53
1:G:195:PRO:HA	1:G:223:LEU:HB2	1.89	0.53
1:J:206:ARG:HG2	1:J:211:VAL:HG23	1.91	0.53
1:I:73:LEU:HB2	1:I:81:ARG:HD2	1.90	0.53
1:A:214:HIS:HB3	1:A:217:ARG:HG3	1.90	0.52
2:Q:8:U:H5'	2:Q:9:U:H5'	1.91	0.52
1:L:67:THR:HG1	1:L:112:TRP:HD1	1.58	0.52
1:D:146:ILE:HG12	1:D:169:CYS:HB3	1.92	0.52
1:J:152:ARG:NH1	2:S:21:C:H3'	2.25	0.52
1:C:65:ALA:HA	1:C:112:TRP:HB2	1.92	0.51
1:D:142:ILE:HD13	1:D:201:ALA:HB1	1.91	0.51
1:N:194:TYR:O	1:N:222:PRO:HA	2.10	0.51
1:D:76:GLY:O	2:O:12:U:OP1	2.29	0.51
1:H:180:ILE:HG22	1:H:181:MET:HE2	1.92	0.51
1:J:214:HIS:HB3	1:J:217:ARG:HG3	1.93	0.51
1:N:148:ARG:NH2	1:N:152:ARG:HH22	2.09	0.51
1:G:39:TYR:CD1	1:G:195:PRO:HG2	2.46	0.51
2:S:3:G:H2'	2:S:4:G:H5'	1.93	0.51
1:A:77:THR:HG23	1:A:80:ASP:H	1.76	0.51
2:T:11:G:H1'	2:T:12:U:O4'	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:206:ARG:NH1	1:B:219:ALA:HA	2.26	0.51
1:J:227:LYS:NZ	2:S:2:G:OP2	2.37	0.51
1:A:180:ILE:HG22	1:A:181:MET:HE2	1.92	0.51
1:H:39:TYR:CD1	1:H:195:PRO:HG2	2.46	0.51
1:H:153:ARG:HH12	1:H:157:GLU:CD	2.19	0.50
1:I:12:LYS:NZ	2:R:13:A:H5''	2.26	0.50
1:K:194:TYR:O	1:K:222:PRO:HA	2.12	0.50
1:N:39:TYR:CD1	1:N:195:PRO:HG2	2.46	0.50
1:I:77:THR:HG23	1:I:80:ASP:H	1.77	0.50
1:M:39:TYR:HA	1:M:44:LYS:HD2	1.94	0.50
1:H:147:ASP:O	1:H:151:GLU:HG2	2.12	0.50
1:B:178:PRO:O	1:B:182:PRO:HD2	2.12	0.50
1:G:146:ILE:HG21	1:G:166:ARG:HG3	1.93	0.50
1:I:8:SER:HB2	1:I:46:ALA:HB3	1.94	0.50
1:K:163:GLU:HG2	1:K:167:LYS:NZ	2.27	0.49
1:N:147:ASP:O	1:N:151:GLU:HG2	2.12	0.49
1:B:65:ALA:HA	1:B:112:TRP:HB2	1.95	0.49
1:E:106:PRO:HG2	1:F:117:SER:OG	2.12	0.49
1:F:146:ILE:HG12	1:F:169:CYS:HB3	1.93	0.49
2:U:21:C:H2'	2:U:22:A:C5'	2.42	0.49
2:R:5:C:O2'	2:R:6:U:OP2	2.30	0.49
2:T:20:C:C2'	2:T:21:C:H5'	2.42	0.49
1:B:146:ILE:HG12	1:B:169:CYS:HB3	1.94	0.49
1:J:30:VAL:HG11	1:J:184:TRP:CZ3	2.48	0.49
1:H:45:LEU:O	1:H:49:ILE:HG12	2.12	0.48
2:U:13:A:H2'	2:U:14:G:C8	2.48	0.48
1:A:142:ILE:HD13	1:A:201:ALA:HB1	1.95	0.48
1:D:145:THR:HA	1:D:148:ARG:HH11	1.78	0.48
1:M:214:HIS:HB3	1:M:217:ARG:HG3	1.96	0.48
1:G:142:ILE:HD13	1:G:201:ALA:HB1	1.95	0.48
1:A:146:ILE:HG12	1:A:169:CYS:HB3	1.94	0.48
1:B:9:ALA:O	1:B:228:ARG:HD2	2.13	0.48
1:C:73:LEU:HB2	1:C:81:ARG:HD2	1.96	0.48
1:L:67:THR:HG1	1:L:112:TRP:CD1	2.31	0.48
1:M:194:TYR:O	1:M:222:PRO:HA	2.14	0.48
2:T:4:G:H2'	2:T:5:C:C6	2.48	0.48
1:C:106:PRO:HG2	1:D:117:SER:OG	2.14	0.48
1:E:62:ILE:HD13	1:E:100:LEU:HD22	1.96	0.48
2:R:9:U:H6	2:R:11:G:H1	1.61	0.48
1:B:197:ARG:CZ	1:E:18:ARG:HH11	2.26	0.48
1:E:163:GLU:HG3	1:E:167:LYS:NZ	2.28	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:197:ARG:HA	1:F:222:PRO:HB3	1.96	0.48
1:N:163:GLU:OE2	1:N:167:LYS:NZ	2.47	0.48
2:Q:12:U:H2'	2:Q:13:A:C8	2.48	0.48
2:P:12:U:H2'	2:P:13:A:C8	2.49	0.47
2:T:20:C:H2'	2:T:21:C:H5'	1.96	0.47
1:C:39:TYR:CD1	1:C:195:PRO:HG2	2.49	0.47
1:D:49:ILE:HG23	1:D:103:ILE:HG12	1.95	0.47
1:E:68:LEU:HB2	1:E:112:TRP:CE2	2.49	0.47
1:E:117:SER:OG	1:F:106:PRO:HG2	2.14	0.47
1:G:227:LYS:HE3	1:G:227:LYS:HB3	1.65	0.47
1:M:45:LEU:O	1:M:49:ILE:HG12	2.14	0.47
1:A:5:THR:HG23	1:A:102:ARG:HH22	1.79	0.47
2:U:4:G:O2'	2:U:5:C:OP1	2.27	0.47
1:C:80:ASP:HB3	1:M:86:ARG:NH2	2.30	0.47
1:D:45:LEU:O	1:D:49:ILE:HG12	2.14	0.47
1:J:152:ARG:NH1	2:S:21:C:H6	2.12	0.47
1:M:12:LYS:HD3	1:M:226:LYS:HE2	1.97	0.47
1:N:49:ILE:HG23	1:N:103:ILE:HG12	1.97	0.47
1:L:150:ILE:HD11	1:L:166:ARG:HB2	1.97	0.47
2:P:7:A:O2'	2:P:8:U:H6	1.98	0.47
1:A:11:HIS:CD2	1:A:227:LYS:HG2	2.50	0.47
1:A:12:LYS:NZ	2:O:13:A:H5''	2.30	0.47
1:B:30:VAL:HG11	1:B:184:TRP:CZ3	2.50	0.47
1:G:163:GLU:HG3	1:G:167:LYS:HZ2	1.80	0.47
2:Q:13:A:H2'	2:Q:14:G:C8	2.50	0.47
1:C:8:SER:HB2	1:C:46:ALA:HB3	1.96	0.47
1:I:12:LYS:HZ2	2:R:13:A:H5''	1.80	0.47
1:K:153:ARG:HD2	1:K:156:ARG:HD3	1.96	0.47
1:G:49:ILE:HG23	1:G:103:ILE:HG12	1.97	0.46
1:F:156:ARG:NH1	2:Q:21:C:OP1	2.48	0.46
1:G:62:ILE:HD13	1:G:100:LEU:HD22	1.97	0.46
1:H:19:SER:HA	1:H:22:ILE:HG12	1.96	0.46
2:P:13:A:H2'	2:P:14:G:C8	2.50	0.46
1:A:195:PRO:HA	1:A:223:LEU:HB2	1.98	0.46
1:M:227:LYS:HB3	1:M:227:LYS:HE3	1.61	0.46
2:Q:20:C:C2'	2:Q:21:C:H5'	2.46	0.46
1:G:117:SER:OG	1:H:106:PRO:HG2	2.15	0.46
1:H:163:GLU:OE2	1:H:167:LYS:NZ	2.49	0.46
1:L:194:TYR:O	1:L:222:PRO:HA	2.16	0.46
1:J:195:PRO:HA	1:J:223:LEU:HB2	1.98	0.46
1:B:147:ASP:O	1:B:151:GLU:HG2	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:18:ARG:HG2	1:E:197:ARG:NH1	2.29	0.46
1:B:18:ARG:CB	1:E:197:ARG:HH12	2.29	0.46
1:N:68:LEU:HB2	1:N:112:TRP:CE2	2.51	0.46
1:B:18:ARG:CG	1:E:197:ARG:HH12	2.28	0.46
1:N:153:ARG:NH1	1:N:157:GLU:OE2	2.49	0.46
1:E:142:ILE:HD13	1:E:201:ALA:HB1	1.98	0.45
1:K:121:TYR:CE1	1:K:179:ILE:HG13	2.51	0.45
2:O:3:G:H2'	2:O:4:G:H5'	1.98	0.45
1:F:146:ILE:HG13	1:F:173:LEU:HD12	1.98	0.45
1:E:157:GLU:HB2	1:E:160:VAL:CG1	2.43	0.45
1:F:29:THR:HG23	1:F:191:PHE:HB2	1.98	0.45
1:N:7:LEU:HD12	1:N:49:ILE:HB	1.98	0.45
1:N:67:THR:HG1	1:N:112:TRP:CD1	2.34	0.45
2:S:5:C:H2'	2:S:6:U:C6	2.52	0.45
1:H:49:ILE:HG23	1:H:103:ILE:HG12	1.99	0.45
1:G:153:ARG:HG3	1:G:160:VAL:HG11	1.98	0.45
1:K:65:ALA:HA	1:K:112:TRP:HB2	1.98	0.45
1:J:12:LYS:HB2	1:J:228:ARG:HH12	1.82	0.45
1:G:8:SER:HB2	1:G:46:ALA:HB3	1.99	0.45
1:J:148:ARG:HA	1:J:151:GLU:HG2	1.98	0.45
2:S:20:C:H2'	2:S:21:C:H5''	1.99	0.45
1:B:45:LEU:O	1:B:49:ILE:HG12	2.16	0.45
1:I:163:GLU:HG3	1:I:167:LYS:HZ1	1.78	0.45
1:M:163:GLU:HG3	1:M:167:LYS:HZ1	1.77	0.45
1:C:50:ASP:O	1:C:54:ARG:HG3	2.17	0.45
1:G:30:VAL:HG11	1:G:184:TRP:CZ3	2.52	0.45
1:G:138:TYR:HA	1:G:204:ARG:HG2	2.00	0.44
1:K:146:ILE:HG21	1:K:166:ARG:HG3	1.99	0.44
2:U:21:C:H2'	2:U:22:A:H5''	2.00	0.44
1:C:146:ILE:HG21	1:C:166:ARG:HG3	1.98	0.44
1:M:142:ILE:HD13	1:M:201:ALA:HB1	1.99	0.44
1:F:8:SER:HB2	1:F:46:ALA:HB3	1.98	0.44
1:H:142:ILE:HD13	1:H:201:ALA:HB1	1.99	0.44
1:N:29:THR:HG23	1:N:191:PHE:HB2	1.99	0.44
1:B:62:ILE:HD13	1:B:100:LEU:HD22	1.99	0.44
1:C:227:LYS:HB3	1:C:227:LYS:HE3	1.74	0.44
1:N:50:ASP:O	1:N:54:ARG:HG3	2.17	0.44
1:I:142:ILE:HD13	1:I:201:ALA:HB1	2.00	0.44
1:I:62:ILE:HD13	1:I:100:LEU:HD22	1.98	0.44
2:T:9:U:H2'	2:T:11:G:H1	1.83	0.44
1:G:148:ARG:O	1:G:152:ARG:HG3	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:220:TRP:HD1	1:I:222:PRO:HD3	1.83	0.43
1:K:77:THR:HG23	1:K:80:ASP:H	1.83	0.43
1:D:194:TYR:O	1:D:222:PRO:HA	2.19	0.43
1:G:30:VAL:HB	1:G:192:VAL:HG22	1.99	0.43
1:H:65:ALA:HA	1:H:112:TRP:HB2	1.99	0.43
1:I:154:LEU:HD11	1:I:162:GLN:NE2	2.34	0.43
1:B:181:MET:HB2	1:B:182:PRO:HD3	2.00	0.43
1:M:60:VAL:HB	1:M:107:THR:HG22	2.00	0.43
1:N:214:HIS:HB3	1:N:217:ARG:HG3	2.00	0.43
2:Q:12:U:H2'	2:Q:13:A:H8	1.83	0.43
1:A:49:ILE:HG23	1:A:103:ILE:HG12	2.01	0.43
1:K:147:ASP:O	1:K:151:GLU:HG2	2.19	0.43
1:D:138:TYR:CZ	1:D:142:ILE:HD11	2.54	0.43
1:H:136:GLU:HB3	1:H:137:PRO:HD3	2.01	0.43
1:N:142:ILE:HD13	1:N:201:ALA:HB1	2.01	0.43
1:A:65:ALA:HA	1:A:112:TRP:HB2	2.00	0.43
1:G:147:ASP:O	1:G:151:GLU:HG2	2.19	0.43
1:A:79:ILE:CD1	1:H:7:LEU:HA	2.46	0.42
1:F:128:VAL:HG13	1:F:138:TYR:OH	2.19	0.42
2:O:4:G:O2'	2:O:5:C:H5'	2.19	0.42
2:R:7:A:H2'	2:R:8:U:O4'	2.19	0.42
1:A:148:ARG:HA	1:A:148:ARG:HD3	1.81	0.42
1:E:77:THR:HG22	1:E:80:ASP:CG	2.44	0.42
1:H:204:ARG:HH11	1:H:204:ARG:HG2	1.84	0.42
1:J:30:VAL:HB	1:J:192:VAL:HG22	2.01	0.42
1:M:68:LEU:HB2	1:M:112:TRP:CE2	2.54	0.42
1:N:148:ARG:HH21	1:N:152:ARG:HH22	1.66	0.42
2:R:3:G:H2'	2:R:4:G:H5'	2.01	0.42
1:F:30:VAL:HG11	1:F:184:TRP:CH2	2.54	0.42
1:F:195:PRO:HB3	1:F:225:PHE:HE2	1.83	0.42
2:U:12:U:H2'	2:U:13:A:H8	1.82	0.42
1:B:138:TYR:HA	1:B:204:ARG:HG2	2.00	0.42
1:G:121:TYR:CE1	1:G:179:ILE:HG13	2.54	0.42
1:I:45:LEU:O	1:I:49:ILE:HG12	2.19	0.42
1:I:121:TYR:CE1	1:I:179:ILE:HG13	2.54	0.42
1:M:210:VAL:HG11	1:M:218:VAL:HG12	2.02	0.42
2:P:21:C:O2	2:P:21:C:H2'	2.20	0.42
1:I:194:TYR:O	1:I:222:PRO:HA	2.20	0.42
1:C:132:TYR:CE1	1:C:139:ARG:HG3	2.55	0.42
1:A:7:LEU:HD21	1:A:102:ARG:CZ	2.50	0.42
1:D:214:HIS:CE1	1:D:217:ARG:NH1	2.88	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:193:ILE:HG12	1:H:221:LEU:HB2	2.01	0.42
1:F:167:LYS:HD3	1:F:170:ARG:HH11	1.84	0.41
1:K:39:TYR:CD1	1:K:195:PRO:HG2	2.55	0.41
1:L:207:GLU:O	1:L:212:PRO:HD3	2.20	0.41
1:D:19:SER:HA	1:D:22:ILE:HG12	2.02	0.41
1:K:117:SER:OG	1:L:106:PRO:HG2	2.20	0.41
2:S:13:A:H2'	2:S:14:G:C8	2.55	0.41
1:D:145:THR:HA	1:D:148:ARG:NH1	2.33	0.41
1:E:65:ALA:HA	1:E:112:TRP:HB2	2.01	0.41
1:F:194:TYR:O	1:F:222:PRO:HA	2.19	0.41
1:L:206:ARG:HG2	1:L:211:VAL:HG23	2.02	0.41
1:F:198:ILE:HB	1:F:220:TRP:CG	2.56	0.41
1:I:68:LEU:HG	1:I:172:TYR:CE2	2.56	0.41
1:J:9:ALA:O	1:J:228:ARG:HG3	2.21	0.41
1:I:24:THR:HB	1:I:55:SER:HB3	2.02	0.41
1:J:65:ALA:HA	1:J:112:TRP:HB2	2.01	0.41
1:F:178:PRO:O	1:F:182:PRO:HG2	2.20	0.41
1:H:153:ARG:NH2	1:H:160:VAL:HG21	2.36	0.41
1:M:7:LEU:HD21	1:M:102:ARG:CZ	2.51	0.41
1:I:144:SER:O	1:I:148:ARG:HG3	2.20	0.41
1:A:181:MET:HG2	1:A:202:MET:SD	2.61	0.41
1:C:194:TYR:O	1:C:222:PRO:HA	2.21	0.41
1:H:204:ARG:HA	1:H:204:ARG:HD2	1.68	0.41
1:N:67:THR:HG1	1:N:112:TRP:HD1	1.67	0.41
1:I:228:ARG:O	1:I:229:LYS:HG2	2.21	0.41
1:N:181:MET:HG2	1:N:202:MET:SD	2.61	0.41
2:Q:21:C:O5'	2:Q:21:C:H6	2.04	0.41
2:R:9:U:H2'	2:R:9:U:H6	1.69	0.41
1:M:179:ILE:O	1:M:183:LEU:HB3	2.20	0.41
2:R:13:A:H2'	2:R:14:G:C8	2.55	0.41
1:H:130:HIS:CE1	1:H:134:THR:HG21	2.56	0.40
1:K:12:LYS:HB2	1:K:228:ARG:CZ	2.51	0.40
1:M:27:ARG:HG3	1:M:191:PHE:HE2	1.86	0.40
1:C:68:LEU:HG	1:C:172:TYR:CE2	2.56	0.40
1:D:180:ILE:HA	1:D:184:TRP:CE3	2.56	0.40
1:D:227:LYS:HE2	2:P:1:G:OP1	2.22	0.40
1:F:121:TYR:CE1	1:F:179:ILE:HG13	2.56	0.40
2:S:4:G:H2'	2:S:5:C:C6	2.56	0.40
1:A:45:LEU:O	1:A:49:ILE:HG12	2.21	0.40
1:I:146:ILE:HG23	1:I:169:CYS:HB2	2.04	0.40
1:L:110:LEU:HD21	1:L:115:ALA:HB2	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:68:LEU:HB2	1:C:112:TRP:CE2	2.56	0.40
1:D:99:LEU:HD23	1:D:99:LEU:HA	1.93	0.40
1:E:121:TYR:CE1	1:E:179:ILE:HG13	2.57	0.40
1:K:152:ARG:NH1	2:T:21:C:H2'	2.36	0.40
1:L:50:ASP:O	1:L:54:ARG:HG3	2.22	0.40
2:Q:13:A:H2'	2:Q:14:G:H8	1.85	0.40

There are no symmetry-related clashes.

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	
1	A	226/248 (91%)	218 (96%)	8 (4%)	0	100	100
1	B	226/248 (91%)	221 (98%)	5 (2%)	0	100	100
1	C	226/248 (91%)	221 (98%)	5 (2%)	0	100	100
1	D	224/248 (90%)	219 (98%)	5 (2%)	0	100	100
1	E	226/248 (91%)	219 (97%)	7 (3%)	0	100	100
1	F	226/248 (91%)	220 (97%)	6 (3%)	0	100	100
1	G	226/248 (91%)	219 (97%)	7 (3%)	0	100	100
1	H	226/248 (91%)	221 (98%)	5 (2%)	0	100	100
1	I	226/248 (91%)	218 (96%)	8 (4%)	0	100	100
1	J	226/248 (91%)	221 (98%)	5 (2%)	0	100	100
1	K	226/248 (91%)	220 (97%)	6 (3%)	0	100	100
1	L	225/248 (91%)	218 (97%)	7 (3%)	0	100	100
1	M	225/248 (91%)	218 (97%)	7 (3%)	0	100	100
1	N	225/248 (91%)	218 (97%)	7 (3%)	0	100	100
All	All	3159/3472 (91%)	3071 (97%)	88 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	194/211 (92%)	194 (100%)	0	100	100
1	B	194/211 (92%)	194 (100%)	0	100	100
1	C	194/211 (92%)	194 (100%)	0	100	100
1	D	193/211 (92%)	193 (100%)	0	100	100
1	E	194/211 (92%)	194 (100%)	0	100	100
1	F	194/211 (92%)	194 (100%)	0	100	100
1	G	194/211 (92%)	194 (100%)	0	100	100
1	H	194/211 (92%)	194 (100%)	0	100	100
1	I	194/211 (92%)	194 (100%)	0	100	100
1	J	194/211 (92%)	194 (100%)	0	100	100
1	K	194/211 (92%)	194 (100%)	0	100	100
1	L	194/211 (92%)	194 (100%)	0	100	100
1	M	194/211 (92%)	194 (100%)	0	100	100
1	N	194/211 (92%)	194 (100%)	0	100	100
All	All	2715/2954 (92%)	2715 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (31) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	69	GLN
1	A	96	ASN
1	A	196	GLN
1	B	69	GLN
1	D	69	GLN
1	D	196	GLN

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Mol	Chain	Res	Type
1	E	69	GLN
1	E	108	ASN
1	E	130	HIS
1	F	96	ASN
1	F	108	ASN
1	F	130	HIS
1	F	214	HIS
1	G	130	HIS
1	H	69	GLN
1	H	130	HIS
1	H	162	GLN
1	H	186	HIS
1	H	196	GLN
1	H	214	HIS
1	I	69	GLN
1	I	162	GLN
1	J	214	HIS
1	K	108	ASN
1	K	196	GLN
1	L	108	ASN
1	L	214	HIS
1	M	71	HIS
1	M	108	ASN
1	N	108	ASN
1	N	214	HIS

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	O	21/22 (95%)	5 (23%)	2 (9%)
2	P	21/22 (95%)	7 (33%)	1 (4%)
2	Q	21/22 (95%)	7 (33%)	1 (4%)
2	R	21/22 (95%)	10 (47%)	1 (4%)
2	S	21/22 (95%)	6 (28%)	1 (4%)
2	T	21/22 (95%)	7 (33%)	1 (4%)
2	U	21/22 (95%)	4 (19%)	2 (9%)
All	All	147/154 (95%)	46 (31%)	9 (6%)

All (46) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	O	4	G
2	O	9	U
2	O	10	C
2	O	12	U
2	O	22	A
2	P	4	G
2	P	6	U
2	P	7	A
2	P	8	U
2	P	9	U
2	P	10	C
2	P	22	A
2	Q	6	U
2	Q	8	U
2	Q	9	U
2	Q	10	C
2	Q	11	G
2	Q	12	U
2	Q	22	A
2	R	4	G
2	R	5	C
2	R	6	U
2	R	9	U
2	R	10	C
2	R	11	G
2	R	12	U
2	R	15	C
2	R	21	C
2	R	22	A
2	S	4	G
2	S	9	U
2	S	10	C
2	S	12	U
2	S	21	C
2	S	22	A
2	U	5	C
2	U	8	U
2	U	12	U
2	U	22	A
2	T	4	G
2	T	8	U
2	T	9	U
2	T	10	C

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Mol	Chain	Res	Type
2	T	11	G
2	T	12	U
2	T	22	A

All (9) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	O	9	U
2	O	11	G
2	P	9	U
2	Q	9	U
2	R	11	G
2	S	9	U
2	U	4	G
2	U	11	G
2	T	11	G

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](#)

18 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
3	PO4	B	301	-	4,4,4	1.62	1 (25%)	6,6,6	0.56	0
3	PO4	M	301	-	4,4,4	1.57	1 (25%)	6,6,6	0.43	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	PO4	N	301	-	4,4,4	1.45	1 (25%)	6,6,6	0.68	0
3	PO4	A	301	-	4,4,4	1.51	1 (25%)	6,6,6	0.59	0
3	PO4	G	301	-	4,4,4	1.58	1 (25%)	6,6,6	0.41	0
3	PO4	F	302	-	4,4,4	1.57	1 (25%)	6,6,6	0.35	0
3	PO4	D	301	-	4,4,4	1.56	1 (25%)	6,6,6	0.62	0
3	PO4	J	301	-	4,4,4	1.50	1 (25%)	6,6,6	0.52	0
3	PO4	F	301	-	4,4,4	1.55	1 (25%)	6,6,6	0.55	0
3	PO4	G	302	-	4,4,4	1.56	1 (25%)	6,6,6	0.47	0
3	PO4	K	301	-	4,4,4	1.63	1 (25%)	6,6,6	0.29	0
3	PO4	D	302	-	4,4,4	1.52	1 (25%)	6,6,6	0.51	0
3	PO4	E	301	-	4,4,4	1.54	1 (25%)	6,6,6	0.57	0
3	PO4	L	301	-	4,4,4	1.50	1 (25%)	6,6,6	0.63	0
3	PO4	H	301	-	4,4,4	1.61	1 (25%)	6,6,6	0.28	0
3	PO4	C	301	-	4,4,4	1.59	1 (25%)	6,6,6	0.40	0
3	PO4	A	302	-	4,4,4	1.53	1 (25%)	6,6,6	0.39	0
3	PO4	I	301	-	4,4,4	1.56	1 (25%)	6,6,6	0.48	0

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	K	301	PO4	P-O1	2.97	1.57	1.50
3	H	301	PO4	P-O1	2.89	1.57	1.50
3	B	301	PO4	P-O1	2.86	1.57	1.50
3	C	301	PO4	P-O1	2.83	1.57	1.50
3	G	301	PO4	P-O1	2.83	1.57	1.50
3	F	302	PO4	P-O1	2.82	1.57	1.50
3	G	302	PO4	P-O1	2.76	1.57	1.50
3	M	301	PO4	P-O1	2.75	1.57	1.50
3	I	301	PO4	P-O1	2.72	1.56	1.50
3	A	302	PO4	P-O1	2.72	1.56	1.50
3	D	301	PO4	P-O1	2.70	1.56	1.50
3	F	301	PO4	P-O1	2.69	1.56	1.50
3	E	301	PO4	P-O1	2.67	1.56	1.50
3	J	301	PO4	P-O1	2.65	1.56	1.50
3	D	302	PO4	P-O1	2.62	1.56	1.50
3	A	301	PO4	P-O1	2.61	1.56	1.50
3	L	301	PO4	P-O1	2.57	1.56	1.50
3	N	301	PO4	P-O1	2.49	1.56	1.50

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	228/248 (91%)	-0.50	0 100 100	30, 56, 89, 123	0
1	B	228/248 (91%)	-0.49	0 100 100	34, 57, 102, 115	0
1	C	228/248 (91%)	-0.39	1 (0%) 88 79	31, 60, 132, 161	0
1	D	226/248 (91%)	-0.26	0 100 100	41, 80, 119, 149	0
1	E	228/248 (91%)	-0.42	2 (0%) 81 65	40, 67, 121, 164	0
1	F	228/248 (91%)	-0.08	3 (1%) 75 56	50, 87, 120, 135	0
1	G	228/248 (91%)	-0.18	3 (1%) 75 56	44, 73, 132, 150	1 (0%)
1	H	228/248 (91%)	-0.25	4 (1%) 67 49	43, 69, 145, 178	0
1	I	228/248 (91%)	-0.17	1 (0%) 88 79	59, 95, 142, 187	0
1	J	228/248 (91%)	-0.21	1 (0%) 88 79	45, 73, 106, 128	0
1	K	228/248 (91%)	-0.20	1 (0%) 88 79	59, 86, 130, 173	0
1	L	227/248 (91%)	-0.17	2 (0%) 81 65	59, 88, 142, 153	0
1	M	227/248 (91%)	0.09	6 (2%) 57 38	54, 95, 145, 163	0
1	N	227/248 (91%)	0.04	3 (1%) 75 56	58, 95, 144, 168	0
2	O	22/22 (100%)	-0.72	0 100 100	67, 82, 96, 99	0
2	P	22/22 (100%)	-0.34	0 100 100	95, 153, 211, 218	0
2	Q	22/22 (100%)	-0.26	0 100 100	99, 155, 211, 225	0
2	R	22/22 (100%)	-0.24	0 100 100	138, 175, 247, 271	0
2	S	22/22 (100%)	-0.84	0 100 100	78, 90, 107, 118	0
2	T	22/22 (100%)	-0.29	0 100 100	123, 184, 284, 356	0
2	U	22/22 (100%)	-0.40	0 100 100	92, 104, 125, 127	0
All	All	3341/3626 (92%)	-0.24	27 (0%) 82 68	30, 79, 141, 356	1 (0%)

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	231	ALA	3.6
1	N	149	PHE	3.2
1	H	154	LEU	3.0
1	L	160	VAL	2.8
1	H	150	ILE	2.7
1	H	231	ALA	2.6
1	F	134	THR	2.6
1	E	231	ALA	2.5
1	N	150	ILE	2.5
1	G	149	PHE	2.5
1	M	165	VAL	2.4
1	I	231	ALA	2.4
1	F	4	THR	2.4
1	E	149	PHE	2.3
1	J	19	SER	2.3
1	F	225	PHE	2.2
1	L	154	LEU	2.2
1	N	105	CYS	2.2
1	G	150	ILE	2.2
1	G	154	LEU	2.2
1	M	21	GLY	2.1
1	M	149	PHE	2.1
1	C	231	ALA	2.1
1	H	176	GLU	2.0
1	M	150	ILE	2.0
1	M	9	ALA	2.0
1	M	75	GLY	2.0

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

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(\AA^2)	Q<0.9
3	PO4	F	301	5/5	0.68	0.19	105,109,142,143	0
3	PO4	K	301	5/5	0.77	0.13	81,116,135,136	0
3	PO4	I	301	5/5	0.78	0.09	106,107,132,145	0
3	PO4	N	301	5/5	0.81	0.10	87,88,121,123	0
3	PO4	H	301	5/5	0.85	0.10	85,92,117,127	0
3	PO4	E	301	5/5	0.85	0.18	91,105,114,123	0
3	PO4	F	302	5/5	0.85	0.20	116,118,132,165	0
3	PO4	M	301	5/5	0.85	0.09	75,100,121,125	0
3	PO4	G	302	5/5	0.85	0.17	84,99,109,129	0
3	PO4	J	301	5/5	0.86	0.12	94,104,115,136	0
3	PO4	A	302	5/5	0.87	0.15	81,87,98,134	0
3	PO4	L	301	5/5	0.88	0.10	95,118,127,140	0
3	PO4	D	301	5/5	0.90	0.10	74,90,106,113	0
3	PO4	C	301	5/5	0.90	0.09	71,88,113,127	0
3	PO4	D	302	5/5	0.91	0.15	94,106,114,143	0
3	PO4	G	301	5/5	0.91	0.09	70,86,95,118	0
3	PO4	B	301	5/5	0.92	0.08	63,80,93,101	0
3	PO4	A	301	5/5	0.92	0.12	78,84,94,114	0

6.5 Other polymers [i](#)

There are no such residues in this entry.