Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2024 – 11:43 AM EST

PDB ID	:	2ZNI
Title	:	Crystal structure of Pyrrolysyl-tRNA synthetase-tRNA(Pyl) complex from Desulfitobacterium hafniense
Authors	:	Nozawa, K.; Araiso, Y.; Soll, D.; Ishitani, R.; Nureki, O.
Deposited on	:	2008-04-25
Resolution	:	3.10 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:

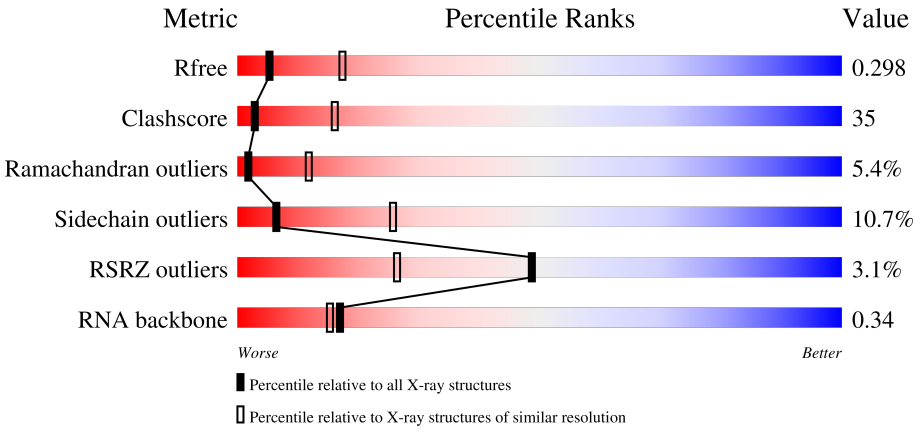
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.10 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	1094 (3.10-3.10)
Clashscore	141614	1184 (3.10-3.10)
Ramachandran outliers	138981	1141 (3.10-3.10)
Sidechain outliers	138945	1141 (3.10-3.10)
RSRZ outliers	127900	1067 (3.10-3.10)
RNA backbone	3102	1116 (3.40-2.80)

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 <=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	308	3% 38% 47% 6% 9%
1	B	308	3% 32% 48% 10% 9%
2	C	72	4% 22% 33% 40% .
2	D	72	4% . 54% 32% 10%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 7621 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 Pyrrolysyl-tRNA synthetase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	279	Total	C	N	O	S	0	0	0
			2263	1440	397	414	12			
1	B	279	Total	C	N	O	S	0	0	0
			2263	1440	397	414	12			

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	expression tag	UNP B0S4P3
A	-18	GLY	-	expression tag	UNP B0S4P3
A	-17	SER	-	expression tag	UNP B0S4P3
A	-16	SER	-	expression tag	UNP B0S4P3
A	-15	HIS	-	expression tag	UNP B0S4P3
A	-14	HIS	-	expression tag	UNP B0S4P3
A	-13	HIS	-	expression tag	UNP B0S4P3
A	-12	HIS	-	expression tag	UNP B0S4P3
A	-11	HIS	-	expression tag	UNP B0S4P3
A	-10	HIS	-	expression tag	UNP B0S4P3
A	-9	SER	-	expression tag	UNP B0S4P3
A	-8	SER	-	expression tag	UNP B0S4P3
A	-7	GLY	-	expression tag	UNP B0S4P3
A	-6	LEU	-	expression tag	UNP B0S4P3
A	-5	VAL	-	expression tag	UNP B0S4P3
A	-4	PRO	-	expression tag	UNP B0S4P3
A	-3	ARG	-	expression tag	UNP B0S4P3
A	-2	GLY	-	expression tag	UNP B0S4P3
A	-1	SER	-	expression tag	UNP B0S4P3
A	0	HIS	-	expression tag	UNP B0S4P3
B	-19	MET	-	expression tag	UNP B0S4P3
B	-18	GLY	-	expression tag	UNP B0S4P3
B	-17	SER	-	expression tag	UNP B0S4P3
B	-16	SER	-	expression tag	UNP B0S4P3
B	-15	HIS	-	expression tag	UNP B0S4P3

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-14	HIS	-	expression tag	UNP B0S4P3
B	-13	HIS	-	expression tag	UNP B0S4P3
B	-12	HIS	-	expression tag	UNP B0S4P3
B	-11	HIS	-	expression tag	UNP B0S4P3
B	-10	HIS	-	expression tag	UNP B0S4P3
B	-9	SER	-	expression tag	UNP B0S4P3
B	-8	SER	-	expression tag	UNP B0S4P3
B	-7	GLY	-	expression tag	UNP B0S4P3
B	-6	LEU	-	expression tag	UNP B0S4P3
B	-5	VAL	-	expression tag	UNP B0S4P3
B	-4	PRO	-	expression tag	UNP B0S4P3
B	-3	ARG	-	expression tag	UNP B0S4P3
B	-2	GLY	-	expression tag	UNP B0S4P3
B	-1	SER	-	expression tag	UNP B0S4P3
B	0	HIS	-	expression tag	UNP B0S4P3

- Molecule 2 is a RNA chain called bacterial tRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	72	Total	C	N	O	P	0	0	0
			1541	687	281	501	72			
2	D	72	Total	C	N	O	P	0	0	0
			1541	687	281	501	72			

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca).

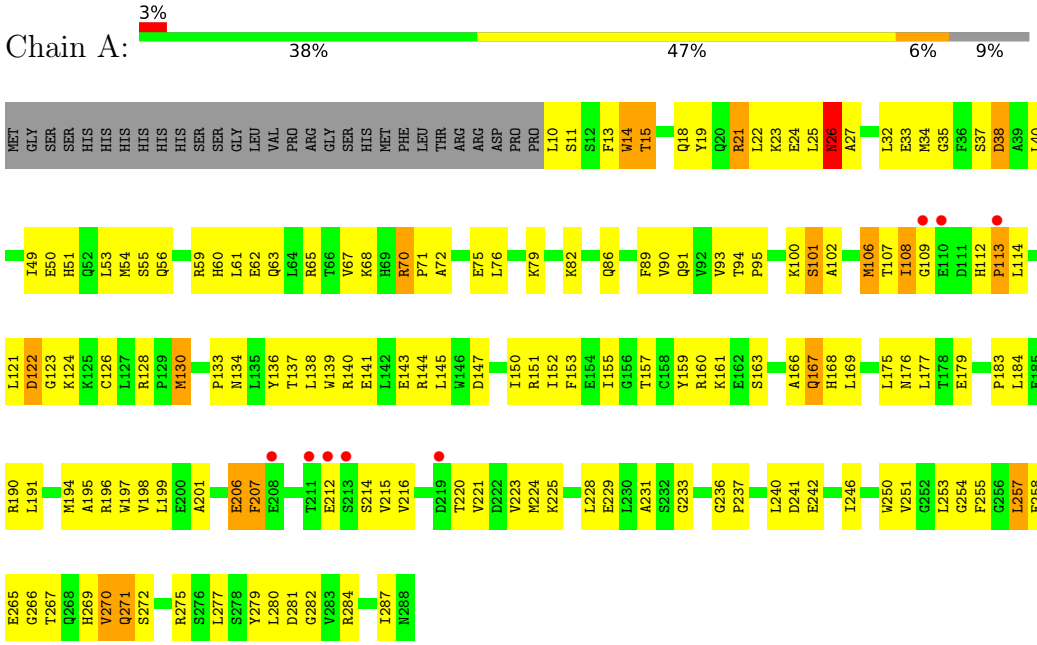
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	6	Total	Ca	0	0
			6	6		
3	D	7	Total	Ca	0	0
			7	7		

3 Residue-property plots (i)

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.

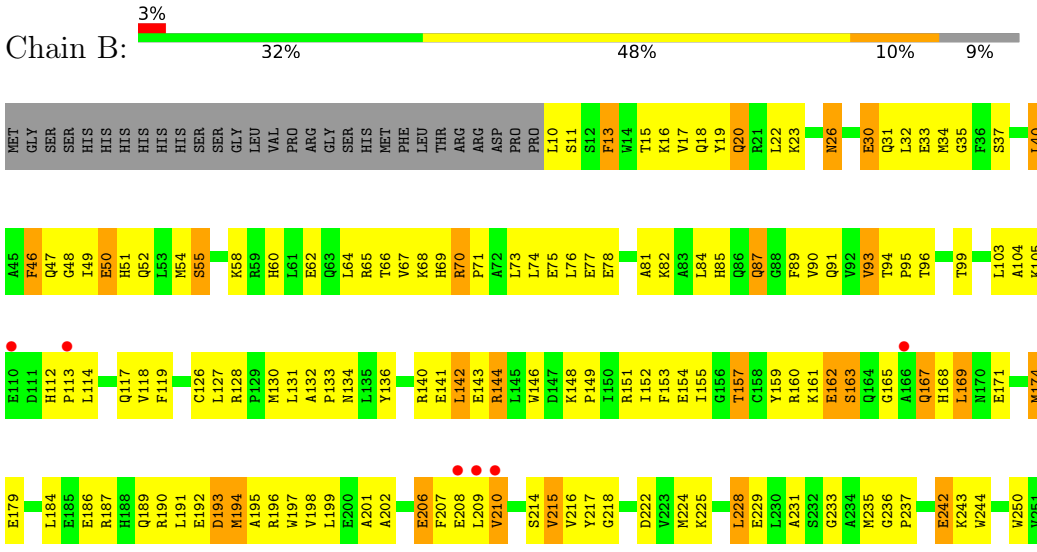
• Molecule 1: Pyrrolysyl-tRNA synthetase

Chain A:

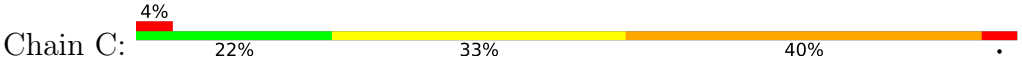


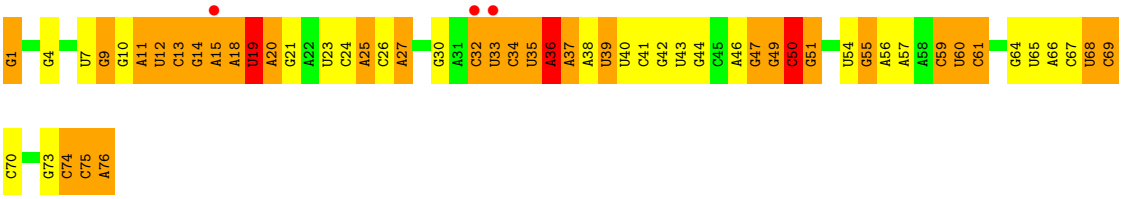
• Molecule 1: Pyrrolysyl-tRNA synthetase

Chain B:

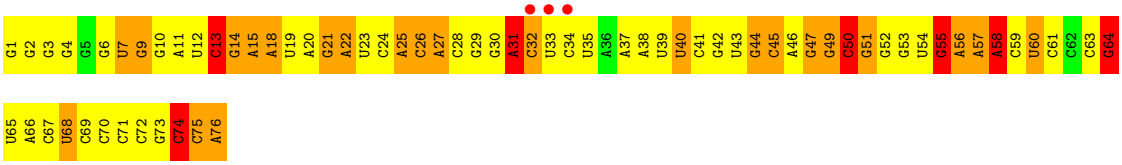


• Molecule 2: bacterial tRNA





• Molecule 2: bacterial tRNA



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	103.63Å 103.63Å 214.04Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.64 – 3.10 46.64 – 3.10	Depositor EDS
% Data completeness (in resolution range)	98.4 (46.64-3.10) 98.4 (46.64-3.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.07	Depositor
$< I/\sigma(I) >$ [1]	2.14 (at 3.12Å)	Xtriage
Refinement program	PHENIX (phenix.refine)	Depositor
R, R_{free}	0.224 , 0.296 0.221 , 0.298	Depositor DCC
R_{free} test set	1053 reflections (4.88%)	wwPDB-VP
Wilson B-factor (Å^2)	79.4	Xtriage
Anisotropy	0.528	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 65.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.42$, $< L^2 > = 0.25$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	7621	wwPDB-VP
Average B, all atoms (Å^2)	121.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.45% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: CA

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	0.37	0/2311	0.56	0/3116
1	B	0.37	0/2311	0.54	0/3116
2	C	0.67	1/1723 (0.1%)	1.33	12/2683 (0.4%)
2	D	0.67	1/1723 (0.1%)	1.39	20/2683 (0.7%)
All	All	0.52	2/8068 (0.0%)	1.01	32/11598 (0.3%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	1	G	OP3-P	-10.96	1.48	1.61
2	D	1	G	OP3-P	-10.34	1.48	1.61

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	55	G	O4'-C1'-N9	9.28	115.62	108.20
2	D	22	A	O4'-C1'-N9	7.97	114.58	108.20
2	C	55	G	C1'-O4'-C4'	-7.95	103.54	109.90
2	D	55	G	C1'-O4'-C4'	-7.69	103.75	109.90
2	D	55	G	C4'-C3'-C2'	-7.50	95.09	102.60
2	D	52	G	P-O3'-C3'	-7.14	111.13	119.70
2	D	12	U	C4'-C3'-C2'	-6.98	95.62	102.60
2	D	44	G	C4'-C3'-C2'	-6.79	95.81	102.60
2	C	36	A	P-O3'-C3'	6.32	127.28	119.70
2	D	47	G	C3'-C2'-C1'	6.13	106.41	101.50
2	D	64	G	C4'-C3'-C2'	-6.11	96.49	102.60
2	D	50	C	C3'-C2'-C1'	-5.97	96.73	101.50
2	D	58	A	O4'-C1'-N9	-5.70	103.64	108.20
2	C	19	U	O4'-C1'-N1	5.69	112.75	108.20
2	C	23	U	C4'-C3'-C2'	-5.66	96.94	102.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	50	C	C4'-C3'-C2'	-5.63	96.97	102.60
2	D	47	G	P-O3'-C3'	5.55	126.36	119.70
2	C	61	C	P-O3'-C3'	-5.54	113.05	119.70
2	C	64	G	N9-C1'-C2'	-5.46	106.00	112.00
2	C	56	A	O4'-C4'-C3'	-5.42	98.58	104.00
2	C	50	C	C3'-C2'-C1'	-5.37	97.20	101.50
2	C	19	U	P-O3'-C3'	5.37	126.14	119.70
2	D	24	C	C4'-C3'-C2'	-5.36	97.24	102.60
2	D	31	A	P-O3'-C3'	5.30	126.06	119.70
2	D	57	A	O4'-C1'-N9	-5.29	103.97	108.20
2	D	55	G	C8-N9-C4	-5.22	104.31	106.40
2	D	45	C	N1-C2-O2	5.21	122.03	118.90
2	C	12	U	C4'-C3'-C2'	-5.16	97.44	102.60
2	D	50	C	C4'-C3'-C2'	-5.07	97.53	102.60
2	D	74	C	C3'-C2'-C1'	5.06	105.55	101.50
2	D	13	C	C5'-C4'-C3'	-5.06	107.90	116.00
2	C	68	U	P-O3'-C3'	-5.02	113.67	119.70

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	2263	0	2260	178	0
1	B	2263	0	2260	188	0
2	C	1541	0	780	78	0
2	D	1541	0	780	84	0
3	C	6	0	0	0	0
3	D	7	0	0	0	0
All	All	7621	0	6080	482	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 35.

All (482) 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:A:140:ARG:HH21	2:C:9:G:H2'	1.25	1.01
1:B:54:MET:HG3	1:B:287:ILE:HB	1.43	1.00
1:A:51:HIS:HD2	2:D:25:A:H4'	1.27	0.98
1:A:51:HIS:CD2	2:D:25:A:H4'	1.98	0.97
1:A:108:ILE:HG23	1:A:109:GLY:H	1.29	0.97
2:D:14:G:C8	2:D:14:G:H5"	2.02	0.93
2:C:36:A:H2'	2:C:37:A:C8	2.04	0.92
2:D:14:G:H5"	2:D:14:G:H8	1.36	0.89
1:A:65:ARG:HD3	1:B:146:TRP:CD2	2.10	0.87
1:A:196:ARG:HE	1:A:207:PHE:HZ	1.23	0.87
1:B:144:ARG:HH11	1:B:144:ARG:CG	1.88	0.87
1:B:108:ILE:HG13	1:B:112:HIS:HB3	1.56	0.87
1:B:286:ASN:O	2:C:10:G:H4'	1.74	0.86
1:A:93:VAL:HG21	1:B:74:LEU:HD21	1.56	0.86
2:C:41:C:H2'	2:C:42:G:H8	1.41	0.86
1:B:15:THR:HG21	2:C:13:C:OP1	1.77	0.85
2:C:67:C:H2'	2:C:68:U:H6	1.41	0.85
1:A:91:GLN:O	1:B:71:PRO:HD3	1.77	0.84
1:A:168:HIS:CE1	2:D:74:C:H2'	2.14	0.82
2:D:7:U:H4'	2:D:9:G:OP1	1.78	0.81
2:D:31:A:H2'	2:D:32:C:H6	1.46	0.81
1:B:144:ARG:HH11	1:B:144:ARG:HG3	1.46	0.80
1:A:114:LEU:HA	1:A:117:GLN:HG3	1.62	0.80
1:A:191:LEU:HD13	1:A:221:VAL:HG21	1.65	0.78
1:A:108:ILE:HG23	1:A:109:GLY:N	1.99	0.77
1:B:144:ARG:HH11	1:B:144:ARG:CB	1.98	0.76
2:C:14:G:H8	2:C:14:G:H5"	1.51	0.76
1:B:87:GLN:HE21	1:B:87:GLN:HA	1.51	0.76
1:A:54:MET:HG3	1:A:287:ILE:HB	1.68	0.75
1:A:155:ILE:HG13	1:A:175:LEU:HD13	1.69	0.75
2:C:14:G:H5"	2:C:14:G:C8	2.23	0.74
1:B:90:VAL:HB	1:B:152:ILE:HG22	1.69	0.74
2:C:14:G:H5'	2:C:15:A:OP1	1.87	0.74
1:A:228:LEU:HD22	1:A:263:ILE:HD11	1.69	0.73
2:D:31:A:H2'	2:D:32:C:C6	2.22	0.73
1:B:168:HIS:CE1	2:C:74:C:H2'	2.24	0.73
1:B:269:HIS:CD2	1:B:271:GLN:HG2	2.24	0.72
2:C:55:G:H2'	2:C:57:A:OP2	1.89	0.72
2:C:41:C:H2'	2:C:42:G:C8	2.24	0.72
1:B:165:GLY:HA3	2:C:74:C:H42	1.55	0.71
1:A:65:ARG:HD3	1:B:146:TRP:CE3	2.26	0.71
2:C:67:C:H2'	2:C:68:U:C6	2.26	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:119:PHE:CZ	1:A:161:LYS:HA	2.26	0.70
1:A:214:SER:OG	1:A:216:VAL:HG12	1.91	0.70
1:A:258:GLU:HB3	1:A:270:VAL:HG23	1.73	0.69
1:A:141:GLU:O	1:A:144:ARG:HB2	1.93	0.69
2:D:41:C:H2'	2:D:42:G:H8	1.56	0.69
1:A:258:GLU:HB3	1:A:270:VAL:CG2	2.22	0.69
1:B:269:HIS:HD2	1:B:271:GLN:HG2	1.57	0.69
1:A:272:SER:O	1:A:282:GLY:HA2	1.92	0.69
2:C:69:C:C2	2:C:70:C:C5	2.81	0.69
1:B:13:PHE:O	1:B:42:ARG:HD2	1.93	0.68
2:D:57:A:H2'	2:D:58:A:H5'	1.75	0.68
1:B:144:ARG:HG3	1:B:144:ARG:NH1	2.07	0.67
2:D:66:A:H2'	2:D:67:C:C6	2.30	0.67
1:A:108:ILE:CG2	1:A:109:GLY:H	2.04	0.67
2:D:73:G:N7	2:D:74:C:C2	2.63	0.66
1:A:70:ARG:NH1	1:A:75:GLU:HG3	2.11	0.66
1:B:89:PHE:HB3	1:B:153:PHE:HD1	1.61	0.66
2:C:19:U:H5"	2:C:20:A:OP2	1.96	0.66
2:D:30:G:H1	2:D:40:U:H3	1.42	0.66
2:D:31:A:C4	2:D:32:C:C5	2.83	0.66
1:B:51:HIS:CD2	2:C:25:A:H4'	2.32	0.64
1:B:87:GLN:HA	1:B:87:GLN:NE2	2.11	0.64
1:A:70:ARG:HH11	1:A:75:GLU:HG3	1.63	0.63
1:B:15:THR:HG23	1:B:18:GLN:H	1.63	0.63
1:A:275:ARG:HG2	1:B:94:THR:O	1.99	0.63
1:A:51:HIS:CD2	2:D:25:A:H5'	2.34	0.62
1:B:177:LEU:HD21	1:B:253:LEU:HB3	1.80	0.62
2:C:69:C:H2'	2:C:70:C:H6	1.64	0.62
1:A:108:ILE:HG13	1:A:112:HIS:HD2	1.65	0.62
1:B:16:LYS:HE2	2:C:4:G:O2'	1.99	0.62
2:C:32:C:O2	2:C:38:A:N1	2.33	0.62
1:A:56:GLN:HA	1:A:59:ARG:HD2	1.82	0.62
1:B:163:SER:HB3	1:B:169:LEU:O	2.00	0.61
1:A:144:ARG:NH2	1:B:287:ILE:O	2.32	0.61
1:A:241:ASP:HB3	1:A:246:ILE:O	2.00	0.61
1:B:18:GLN:O	1:B:22:LEU:HG	2.00	0.61
1:A:196:ARG:NE	1:A:207:PHE:HZ	1.93	0.61
1:B:231:ALA:HA	1:B:254:GLY:O	2.01	0.61
1:A:265:GLU:O	1:A:267:THR:N	2.33	0.61
1:B:163:SER:HA	2:C:74:C:O2	2.00	0.61
1:B:242:GLU:OE1	1:B:243:LYS:HG2	2.00	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:15:THR:HG22	1:B:18:GLN:HB2	1.83	0.61
2:D:57:A:C2'	2:D:58:A:H5'	2.31	0.61
1:B:157:THR:HG22	1:B:157:THR:O	2.00	0.60
2:C:37:A:H2'	2:C:38:A:C8	2.36	0.60
1:B:108:ILE:HG13	1:B:112:HIS:CB	2.28	0.60
1:A:121:LEU:O	1:A:122:ASP:HB3	2.01	0.60
1:B:167:GLN:O	1:B:259:ARG:NH1	2.35	0.60
1:B:94:THR:HB	1:B:95:PRO:HD2	1.82	0.60
2:C:68:U:O2	2:C:69:C:C6	2.54	0.60
1:A:262:MET:HA	1:A:267:THR:HG22	1.83	0.59
2:D:25:A:C2'	2:D:26:C:H5'	2.32	0.59
1:A:21:ARG:O	1:A:21:ARG:CD	2.50	0.59
1:A:51:HIS:CD2	2:D:25:A:C4'	2.81	0.59
1:A:119:PHE:CE1	1:A:161:LYS:HG3	2.38	0.59
1:A:139:TRP:HE3	1:A:246:ILE:HD13	1.68	0.59
1:B:114:LEU:O	1:B:118:VAL:HG23	2.02	0.59
1:A:94:THR:CB	1:A:134:ASN:HD22	2.16	0.58
1:A:183:PRO:HG2	1:A:186:GLU:HB2	1.84	0.58
2:D:7:U:O2'	2:D:49:G:H5'	2.02	0.58
2:D:31:A:O5'	2:D:31:A:H8	1.87	0.58
1:B:236:GLY:HA3	1:B:250:TRP:NE1	2.17	0.58
1:B:112:HIS:CG	1:B:113:PRO:HD2	2.39	0.58
1:B:280:LEU:O	1:B:281:ASP:HB3	2.04	0.58
1:B:208:GLU:O	1:B:209:LEU:HD23	2.04	0.58
2:C:68:U:N3	2:C:69:C:C5	2.72	0.58
1:A:155:ILE:CG1	1:A:175:LEU:HD13	2.33	0.57
2:C:36:A:H2'	2:C:37:A:H8	1.67	0.57
2:C:69:C:H2'	2:C:70:C:C6	2.39	0.57
1:A:184:LEU:HA	1:A:187:ARG:HG3	1.87	0.57
1:B:42:ARG:HG2	1:B:43:ASP:N	2.20	0.57
2:D:22:A:H2'	2:D:23:U:H6	1.69	0.57
1:A:50:GLU:HG3	1:A:54:MET:HE3	1.87	0.57
2:D:38:A:H2'	2:D:39:U:H5'	1.86	0.57
1:B:177:LEU:HD23	1:B:177:LEU:H	1.70	0.57
1:A:155:ILE:HG12	1:A:175:LEU:HB2	1.87	0.57
1:B:148:LYS:HB3	1:B:149:PRO:HA	1.86	0.56
1:A:90:VAL:HB	1:A:152:ILE:HG22	1.87	0.56
1:A:24:GLU:HB3	1:A:284:ARG:HG2	1.86	0.56
1:B:70:ARG:NH1	1:B:75:GLU:HA	2.20	0.56
1:B:236:GLY:HA2	1:B:237:PRO:C	2.25	0.56
1:B:263:ILE:N	1:B:263:ILE:HD12	2.20	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:67:C:C2	2:C:68:U:C6	2.93	0.56
1:A:93:VAL:HG12	1:B:275:ARG:HG2	1.87	0.56
1:A:140:ARG:NH2	2:C:9:G:H2'	2.07	0.56
1:A:70:ARG:HE	1:B:85:HIS:HE1	1.54	0.56
1:B:144:ARG:HH11	1:B:144:ARG:HB2	1.70	0.56
2:D:75:C:H5'	2:D:76:A:OP1	2.05	0.56
1:B:178:THR:HG22	1:B:252:GLY:CA	2.36	0.56
2:D:66:A:H2'	2:D:67:C:H6	1.69	0.56
1:B:114:LEU:HA	1:B:117:GLN:HG3	1.88	0.56
1:B:258:GLU:HB3	1:B:270:VAL:HG22	1.88	0.56
2:C:49:G:H2'	2:C:50:C:C6	2.41	0.56
1:A:108:ILE:HG13	1:A:112:HIS:CD2	2.40	0.55
2:D:63:C:H2'	2:D:64:G:O4'	2.06	0.55
1:A:168:HIS:ND1	2:D:74:C:H2'	2.21	0.55
1:B:19:TYR:CE1	1:B:32:LEU:HD22	2.41	0.55
1:B:20:GLN:HE21	1:B:20:GLN:C	2.10	0.55
2:D:41:C:H2'	2:D:42:G:C8	2.39	0.55
1:B:91:GLN:HB2	1:B:153:PHE:CZ	2.41	0.55
1:A:112:HIS:CE1	1:A:114:LEU:HD13	2.41	0.55
2:D:64:G:C6	2:D:65:U:C4	2.95	0.55
1:A:106:MET:CE	1:A:240:LEU:HD13	2.37	0.55
1:A:94:THR:HB	1:A:134:ASN:ND2	2.22	0.55
1:A:95:PRO:HA	1:B:275:ARG:HB3	1.88	0.55
1:A:15:THR:HG21	2:D:13:C:OP1	2.08	0.54
1:A:22:LEU:HB3	1:A:27:ALA:HB2	1.88	0.54
1:B:206:GLU:O	1:B:225:LYS:HG2	2.07	0.54
1:B:256:GLY:HA3	2:C:76:A:H1'	1.88	0.54
1:A:95:PRO:HA	1:B:275:ARG:HD3	1.90	0.54
2:C:68:U:C2	2:C:69:C:C5	2.96	0.54
1:B:15:THR:HG22	1:B:18:GLN:NE2	2.22	0.54
2:D:44:G:C5	2:D:45:C:C5	2.96	0.54
2:C:30:G:H1	2:C:40:U:H3	1.55	0.54
1:A:113:PRO:O	1:A:117:GLN:HG3	2.08	0.54
1:B:94:THR:HG21	1:B:134:ASN:HB3	1.90	0.54
1:B:67:VAL:HG23	1:B:68:LYS:N	2.24	0.53
1:B:119:PHE:CB	1:B:127:LEU:HD12	2.37	0.53
1:B:202:ALA:O	1:B:264:ARG:HD3	2.09	0.53
2:C:39:U:H4'	2:C:39:U:OP1	2.09	0.53
2:D:44:G:H2'	2:D:45:C:H5'	1.90	0.53
1:B:162:GLU:N	1:B:162:GLU:CD	2.62	0.53
2:D:18:A:H61	2:D:55:G:H1'	1.73	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:33:U:H3'	2:D:33:U:C6	2.44	0.53
1:A:21:ARG:O	1:A:21:ARG:HD2	2.09	0.53
1:A:82:LYS:HE3	1:B:78:GLU:OE2	2.08	0.53
2:C:67:C:H2'	2:C:68:U:O4'	2.08	0.53
2:D:26:C:H2'	2:D:27:A:C8	2.44	0.53
1:A:139:TRP:CE3	1:A:246:ILE:HD13	2.44	0.53
1:A:223:VAL:HB	1:A:231:ALA:HB3	1.90	0.53
1:A:130:MET:HE3	1:A:133:PRO:HD3	1.92	0.52
2:D:56:A:H2'	2:D:57:A:C8	2.44	0.52
1:B:106:MET:O	1:B:107:THR:C	2.48	0.52
2:D:33:U:O5'	2:D:33:U:H6	1.93	0.52
2:C:43:U:H2'	2:C:44:G:H8	1.75	0.52
1:A:112:HIS:ND1	1:A:113:PRO:HD2	2.25	0.52
1:B:68:LYS:O	1:B:70:ARG:HD2	2.09	0.52
1:A:194:MET:HA	1:A:197:TRP:HE3	1.75	0.52
1:B:49:ILE:O	1:B:50:GLU:C	2.48	0.52
1:B:186:GLU:OE1	1:B:190:ARG:NH2	2.42	0.52
1:B:262:MET:HA	1:B:267:THR:HG22	1.92	0.52
1:A:143:GLU:HA	1:A:150:ILE:HD11	1.92	0.52
2:C:49:G:H2'	2:C:50:C:H6	1.74	0.52
1:B:105:LYS:HB2	1:B:244:TRP:CZ2	2.45	0.51
1:B:194:MET:O	1:B:198:VAL:HG23	2.10	0.51
2:D:14:G:H5'	2:D:15:A:OP1	2.11	0.51
1:A:63:GLN:O	1:A:67:VAL:HG22	2.11	0.51
1:A:163:SER:OG	1:A:168:HIS:HB3	2.11	0.51
1:B:15:THR:HG22	1:B:18:GLN:CG	2.39	0.51
1:B:155:ILE:CG1	1:B:175:LEU:HD13	2.41	0.51
2:C:13:C:C6	2:C:13:C:H5"	2.45	0.51
1:A:94:THR:HB	1:A:134:ASN:HD22	1.75	0.51
1:B:87:GLN:HE21	1:B:87:GLN:CA	2.20	0.51
2:C:67:C:C2'	2:C:68:U:H6	2.18	0.51
1:A:21:ARG:O	1:A:21:ARG:HD3	2.11	0.51
1:A:37:SER:O	1:A:38:ASP:HB3	2.10	0.51
1:A:13:PHE:O	1:A:14:TRP:C	2.48	0.51
1:A:206:GLU:HB2	1:A:225:LYS:HE3	1.93	0.51
1:B:96:THR:O	1:B:128:ARG:HG2	2.11	0.51
1:B:257:LEU:HD23	1:B:257:LEU:H	1.76	0.51
1:A:75:GLU:HG2	1:A:79:LYS:HE3	1.93	0.50
1:B:283:VAL:O	1:B:284:ARG:C	2.48	0.50
1:A:194:MET:HA	1:A:197:TRP:CE3	2.46	0.50
1:B:51:HIS:O	1:B:55:SER:HB2	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:193:ASP:O	1:B:194:MET:C	2.49	0.50
2:D:14:G:C8	2:D:14:G:C5'	2.88	0.50
2:D:18:A:HO2'	2:D:57:A:H2	1.56	0.50
1:B:131:LEU:CD1	1:B:154:GLU:HG2	2.42	0.50
1:B:280:LEU:O	1:B:281:ASP:CB	2.59	0.50
1:A:60:HIS:CE1	1:A:281:ASP:OD2	2.65	0.50
1:B:73:LEU:HA	1:B:261:LEU:HD11	1.94	0.50
2:D:28:C:H3'	2:D:28:C:C6	2.47	0.50
1:A:128:ARG:O	1:A:128:ARG:HG3	2.11	0.50
2:C:50:C:C2	2:C:51:G:C8	3.00	0.50
1:B:155:ILE:HA	1:B:174:MET:O	2.12	0.50
1:B:161:LYS:O	1:B:161:LYS:HG3	2.12	0.50
1:B:233:GLY:HA3	1:B:253:LEU:HD13	1.94	0.50
1:B:271:GLN:CD	1:B:271:GLN:H	2.13	0.50
2:C:39:U:H2'	2:C:40:U:O4'	2.11	0.50
2:D:58:A:O2'	2:D:60:U:OP2	2.19	0.50
1:A:120:TRP:CE3	1:A:126:CYS:HB3	2.47	0.50
2:C:66:A:H2'	2:C:67:C:C6	2.46	0.50
2:D:74:C:H5'	2:D:75:C:OP2	2.12	0.50
1:A:91:GLN:HB2	1:A:153:PHE:CE1	2.47	0.50
2:C:7:U:H4'	2:C:9:G:OP1	2.12	0.50
1:B:68:LYS:HE3	1:B:70:ARG:O	2.11	0.50
1:B:233:GLY:CA	1:B:253:LEU:HD13	2.41	0.50
2:C:43:U:H2'	2:C:44:G:C8	2.46	0.50
1:A:112:HIS:C	1:A:114:LEU:H	2.16	0.49
2:D:22:A:C5	2:D:23:U:C5	3.00	0.49
1:A:91:GLN:HB2	1:A:153:PHE:CZ	2.47	0.49
2:C:34:C:H2'	2:C:34:C:O2	2.11	0.49
2:D:64:G:C5	2:D:65:U:C4	2.99	0.49
2:D:75:C:H5"	2:D:75:C:H6	1.77	0.49
1:A:10:LEU:HD21	1:A:35:GLY:HA3	1.93	0.49
1:A:186:GLU:OE1	1:A:190:ARG:NH2	2.44	0.49
1:B:272:SER:O	1:B:282:GLY:HA2	2.13	0.49
1:A:117:GLN:HE21	1:A:160:ARG:HG2	1.76	0.49
1:A:60:HIS:HE1	1:A:281:ASP:OD2	1.95	0.49
2:C:18:A:OP1	2:C:18:A:H8	1.94	0.49
1:A:40:LEU:HD11	1:A:44:ARG:CZ	2.42	0.49
1:A:100:LYS:N	1:A:124:LYS:O	2.40	0.49
1:A:19:TYR:HE1	1:A:32:LEU:O	1.95	0.49
1:B:64:LEU:HD13	1:B:281:ASP:HB2	1.95	0.49
1:B:178:THR:HG22	1:B:252:GLY:HA2	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:37:A:H2'	2:C:38:A:H8	1.76	0.49
2:D:29:G:N2	2:D:42:G:C4	2.81	0.49
1:A:71:PRO:HD3	1:B:91:GLN:O	2.13	0.49
2:D:22:A:H2'	2:D:23:U:C6	2.48	0.49
2:D:53:G:H2'	2:D:54:U:O4'	2.13	0.49
2:D:67:C:H2'	2:D:68:U:H6	1.77	0.48
1:B:90:VAL:H	1:B:152:ILE:HA	1.77	0.48
1:B:184:LEU:HA	1:B:187:ARG:HG3	1.95	0.48
1:B:103:LEU:HD11	1:B:126:CYS:SG	2.53	0.48
1:B:67:VAL:CG2	1:B:68:LYS:N	2.77	0.48
2:D:30:G:C5	2:D:31:A:C5	3.00	0.48
1:B:15:THR:HG22	1:B:18:GLN:CB	2.43	0.48
1:B:262:MET:HG2	1:B:267:THR:HG23	1.94	0.48
2:C:59:C:C4	2:C:60:U:C4	3.01	0.48
2:D:7:U:O2	2:D:49:G:C8	2.67	0.48
2:D:41:C:O2'	2:D:42:G:H5'	2.13	0.48
1:A:179:GLU:OE2	1:A:190:ARG:NH1	2.45	0.48
1:B:10:LEU:HB3	1:B:37:SER:HA	1.95	0.48
2:C:26:C:H2'	2:C:27:A:C8	2.49	0.48
1:A:231:ALA:HB2	1:A:255:PHE:CD2	2.49	0.47
1:B:89:PHE:CE1	1:B:197:TRP:HZ3	2.32	0.47
1:B:178:THR:HG22	1:B:252:GLY:HA3	1.96	0.47
2:C:69:C:O2	2:C:70:C:C6	2.67	0.47
1:A:224:MET:HG2	1:A:229:GLU:HA	1.96	0.47
2:D:31:A:O5'	2:D:31:A:C8	2.67	0.47
2:D:50:C:HO2'	2:D:51:G:P	2.37	0.47
1:A:108:ILE:O	1:A:112:HIS:HB2	2.14	0.47
1:A:236:GLY:HA3	1:A:250:TRP:NE1	2.29	0.47
1:B:157:THR:HG22	1:B:159:TYR:CZ	2.48	0.47
1:B:93:VAL:HG22	1:B:93:VAL:O	2.14	0.47
1:B:94:THR:HB	1:B:134:ASN:ND2	2.30	0.47
2:C:75:C:HO2'	2:C:76:A:H8	1.61	0.47
1:B:65:ARG:HG2	1:B:66:THR:HG22	1.97	0.47
1:A:119:PHE:CE1	1:A:161:LYS:HA	2.50	0.47
1:A:198:VAL:O	1:A:201:ALA:HB3	2.14	0.47
1:A:258:GLU:HB3	1:A:270:VAL:HG21	1.96	0.47
1:B:13:PHE:CD1	1:B:35:GLY:HA3	2.50	0.47
1:B:108:ILE:HG23	1:B:108:ILE:O	2.15	0.47
2:C:13:C:C6	2:C:13:C:C5'	2.97	0.47
1:A:25:LEU:O	1:A:26:ASN:CB	2.63	0.47
1:B:32:LEU:C	1:B:34:MET:H	2.19	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:65:ARG:HG2	1:B:66:THR:CG2	2.45	0.47
2:D:25:A:O2'	2:D:26:C:H5'	2.15	0.47
1:A:53:LEU:C	1:A:55:SER:H	2.17	0.47
1:B:195:ALA:O	1:B:199:LEU:HD12	2.15	0.47
1:A:70:ARG:O	1:A:70:ARG:HG2	2.13	0.46
1:B:260:LEU:HD12	1:B:260:LEU:N	2.30	0.46
1:A:70:ARG:HH11	1:A:75:GLU:CG	2.27	0.46
2:D:30:G:C6	2:D:31:A:C6	3.04	0.46
1:A:59:ARG:O	1:A:62:GLU:HB2	2.15	0.46
2:C:7:U:C4'	2:C:9:G:OP1	2.63	0.46
2:C:67:C:C2	2:C:68:U:C5	3.04	0.46
1:B:130:MET:HG3	1:B:133:PRO:HD2	1.98	0.46
1:A:112:HIS:HE2	1:A:114:LEU:HD22	1.81	0.46
1:A:177:LEU:HD21	1:A:253:LEU:HB3	1.97	0.46
1:B:51:HIS:CD2	2:C:25:A:H5'	2.51	0.46
1:A:71:PRO:HA	1:A:281:ASP:OD1	2.15	0.46
1:A:72:ALA:N	1:A:281:ASP:OD1	2.49	0.46
1:A:159:TYR:O	1:A:160:ARG:HG3	2.15	0.46
2:D:37:A:H2'	2:D:38:A:O4'	2.16	0.46
2:D:31:A:C6	2:D:32:C:N4	2.84	0.46
2:D:3:G:O2'	2:D:4:G:H5'	2.16	0.46
2:D:21:G:H2'	2:D:22:A:C8	2.51	0.46
1:B:187:ARG:NH1	1:B:236:GLY:O	2.49	0.45
1:B:257:LEU:O	1:B:258:GLU:C	2.55	0.45
1:A:157:THR:HG22	1:A:159:TYR:CZ	2.51	0.45
1:A:75:GLU:HG2	1:A:79:LYS:CE	2.46	0.45
1:B:15:THR:CG2	1:B:18:GLN:H	2.29	0.45
1:B:142:LEU:HD13	1:B:146:TRP:CZ3	2.51	0.45
1:B:210:VAL:CG2	1:B:224:MET:HG3	2.46	0.45
1:B:23:LYS:O	1:B:26:ASN:N	2.47	0.45
1:B:89:PHE:HE1	1:B:197:TRP:CZ3	2.35	0.45
1:B:159:TYR:CD1	1:B:159:TYR:N	2.84	0.45
1:B:162:GLU:CD	1:B:162:GLU:H	2.20	0.45
1:A:65:ARG:O	1:A:65:ARG:HG2	2.16	0.45
2:C:7:U:O2'	2:C:49:G:H5'	2.16	0.45
1:A:91:GLN:O	1:B:71:PRO:CD	2.58	0.45
1:A:194:MET:O	1:A:195:ALA:C	2.53	0.45
1:A:95:PRO:CA	1:B:275:ARG:HB3	2.47	0.45
1:B:262:MET:C	1:B:263:ILE:HD12	2.38	0.45
2:D:34:C:C4	2:D:35:U:C4	3.05	0.45
1:A:51:HIS:CD2	2:D:25:A:C5'	2.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:177:LEU:CD2	1:B:253:LEU:HB3	2.45	0.45
2:C:41:C:O2'	2:C:42:G:H5'	2.16	0.45
1:A:106:MET:HE2	1:A:240:LEU:HD13	1.98	0.45
1:A:121:LEU:O	1:A:122:ASP:CB	2.65	0.45
1:A:233:GLY:HA3	1:A:253:LEU:CD1	2.46	0.45
1:B:89:PHE:HB3	1:B:153:PHE:CD1	2.45	0.45
1:B:119:PHE:HB3	1:B:127:LEU:HD12	1.98	0.45
1:B:258:GLU:HB3	1:B:270:VAL:CG2	2.47	0.45
1:A:90:VAL:HG11	1:B:64:LEU:HD21	1.99	0.44
2:C:24:C:H2'	2:C:25:A:O5'	2.17	0.44
2:D:28:C:C6	2:D:28:C:C3'	3.00	0.44
1:A:71:PRO:CD	1:B:91:GLN:O	2.64	0.44
1:A:191:LEU:CD1	1:A:221:VAL:HG21	2.42	0.44
1:B:199:LEU:C	1:B:201:ALA:N	2.70	0.44
2:D:10:G:H2'	2:D:11:A:O4'	2.17	0.44
2:D:28:C:H3'	2:D:28:C:H6	1.82	0.44
1:A:13:PHE:CE1	1:A:35:GLY:HA3	2.51	0.44
1:A:24:GLU:O	1:A:284:ARG:HB2	2.18	0.44
1:A:231:ALA:HA	1:A:254:GLY:O	2.17	0.44
2:C:15:A:OP2	2:C:18:A:OP2	2.35	0.44
2:C:34:C:O2	2:C:35:U:O4'	2.35	0.44
1:A:76:LEU:HD23	1:A:257:LEU:HD13	1.99	0.44
1:A:177:LEU:CD2	1:A:253:LEU:HB3	2.47	0.44
1:A:187:ARG:O	1:A:251:VAL:HG11	2.18	0.44
1:A:229:GLU:OE2	2:D:75:C:H2'	2.17	0.44
2:C:32:C:C5	2:C:33:U:C4	3.05	0.44
2:C:46:A:H2'	2:C:47:G:N9	2.31	0.44
1:A:236:GLY:HA2	1:A:237:PRO:C	2.37	0.44
1:B:190:ARG:HD3	1:B:190:ARG:HA	1.84	0.44
2:D:42:G:H2'	2:D:43:U:O4'	2.18	0.44
1:A:68:LYS:HB3	1:A:68:LYS:HE2	1.73	0.44
2:C:34:C:C6	2:C:34:C:O5'	2.71	0.44
2:C:76:A:H5'	2:C:76:A:C8	2.53	0.44
2:D:69:C:C2	2:D:70:C:C5	3.05	0.44
1:A:65:ARG:HB2	1:B:146:TRP:CZ2	2.53	0.44
1:A:119:PHE:HE1	1:A:161:LYS:HG3	1.81	0.44
1:A:121:LEU:HG	1:A:126:CYS:HA	2.00	0.44
1:A:137:THR:HG22	1:A:138:LEU:N	2.31	0.44
1:A:157:THR:HG22	1:A:159:TYR:CE1	2.53	0.44
2:D:13:C:H3'	2:D:14:G:H8	1.82	0.44
1:A:106:MET:O	1:A:107:THR:C	2.55	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:122:ASP:O	1:A:123:GLY:C	2.57	0.44
1:A:257:LEU:H	1:A:257:LEU:HD23	1.82	0.44
1:B:15:THR:HG22	1:B:18:GLN:CD	2.37	0.44
1:A:117:GLN:NE2	1:A:160:ARG:HG2	2.32	0.44
1:B:62:GLU:O	1:B:66:THR:HG23	2.18	0.44
1:A:253:LEU:HD12	1:A:253:LEU:HA	1.85	0.43
2:D:6:G:C5	2:D:7:U:C5	3.06	0.43
2:D:69:C:H2'	2:D:70:C:H6	1.83	0.43
1:A:199:LEU:C	1:A:201:ALA:H	2.20	0.43
1:A:275:ARG:HB3	1:B:95:PRO:HA	1.99	0.43
1:A:95:PRO:HD2	1:B:277:LEU:HG	1.99	0.43
1:B:46:PHE:O	1:B:49:ILE:N	2.50	0.43
1:B:68:LYS:O	1:B:70:ARG:N	2.51	0.43
1:B:273:MET:HE3	1:B:273:MET:HB2	1.96	0.43
2:D:33:U:C6	2:D:33:U:C3'	3.01	0.43
1:B:18:GLN:HG2	1:B:46:PHE:CE1	2.53	0.43
1:B:119:PHE:CE2	1:B:161:LYS:HB3	2.53	0.43
2:C:54:U:H2'	2:C:55:G:O4'	2.18	0.43
1:A:130:MET:HE3	1:A:130:MET:HB2	1.83	0.43
1:B:103:LEU:O	1:B:104:ALA:C	2.55	0.43
1:A:271:GLN:H	1:A:271:GLN:HG2	1.50	0.43
1:B:40:LEU:O	1:B:44:ARG:HG3	2.18	0.43
1:B:60:HIS:CE1	1:B:281:ASP:OD2	2.72	0.43
1:B:132:ALA:O	1:B:136:TYR:HD2	2.01	0.43
2:D:2:G:N2	2:D:72:C:C2	2.86	0.43
2:D:22:A:C4	2:D:23:U:C5	3.07	0.43
1:A:166:ALA:HB2	2:D:71:C:H5"	2.00	0.43
1:B:187:ARG:NH1	1:B:235:MET:HG3	2.34	0.43
2:C:11:A:H2'	2:C:12:U:C6	2.54	0.43
2:C:34:C:OP1	2:C:34:C:C5	2.71	0.43
1:B:54:MET:O	1:B:58:LYS:HD3	2.19	0.43
1:B:76:LEU:O	1:B:77:GLU:C	2.56	0.43
1:B:131:LEU:HD11	1:B:154:GLU:HG2	2.00	0.43
1:A:53:LEU:C	1:A:55:SER:N	2.73	0.43
1:A:67:VAL:HG23	1:A:68:LYS:N	2.33	0.43
1:B:151:ARG:HG2	1:B:179:GLU:HG3	2.00	0.42
1:B:168:HIS:ND1	2:C:74:C:H2'	2.34	0.42
1:B:189:GLN:O	1:B:189:GLN:HG3	2.19	0.42
1:B:214:SER:OG	1:B:215:VAL:N	2.52	0.42
1:B:222:ASP:OD2	1:B:229:GLU:OE1	2.37	0.42
1:B:159:TYR:O	1:B:160:ARG:HG3	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:258:GLU:O	1:B:259:ARG:C	2.58	0.42
2:D:38:A:H2'	2:D:39:U:C5'	2.48	0.42
1:A:70:ARG:NH1	1:A:75:GLU:HA	2.34	0.42
2:C:13:C:H3'	2:C:14:G:C8	2.53	0.42
2:C:75:C:H3'	2:C:75:C:O2	2.20	0.42
1:A:167:GLN:NE2	1:A:228:LEU:HD12	2.34	0.42
2:C:49:G:C5	2:C:66:A:C2	3.07	0.42
1:A:112:HIS:CD2	1:A:114:LEU:HB2	2.55	0.42
1:A:138:LEU:HD21	1:B:277:LEU:HA	2.01	0.42
1:B:52:GLN:HE21	1:B:52:GLN:HB2	1.68	0.42
1:B:199:LEU:C	1:B:201:ALA:H	2.22	0.42
2:D:2:G:N2	2:D:72:C:N3	2.68	0.42
1:A:65:ARG:HD3	1:B:146:TRP:CE2	2.55	0.42
1:A:141:GLU:O	1:A:144:ARG:N	2.52	0.42
1:A:54:MET:CG	1:A:287:ILE:HB	2.46	0.42
1:B:47:GLN:HA	1:B:50:GLU:HB2	2.01	0.42
1:B:163:SER:OG	2:C:76:A:N6	2.53	0.42
1:A:101:SER:OG	1:A:102:ALA:N	2.52	0.42
1:A:188:HIS:O	1:A:189:GLN:C	2.57	0.42
1:B:51:HIS:HD2	2:C:25:A:H4'	1.82	0.42
1:B:143:GLU:OE1	1:B:148:LYS:HE2	2.21	0.41
2:C:32:C:H3'	2:C:33:U:H5"	2.02	0.41
2:D:30:G:H2'	2:D:31:A:C8	2.55	0.41
1:B:94:THR:CB	1:B:134:ASN:HD22	2.33	0.41
2:D:2:G:C2	2:D:72:C:N3	2.89	0.41
1:B:13:PHE:HA	1:B:35:GLY:HA2	2.01	0.41
1:A:46:PHE:O	1:A:49:ILE:N	2.52	0.41
1:A:55:SER:O	1:A:59:ARG:HG3	2.20	0.41
2:C:50:C:H4'	2:C:51:G:OP1	2.21	0.41
1:A:106:MET:SD	1:A:133:PRO:HG3	2.61	0.41
1:A:151:ARG:HG2	1:A:179:GLU:HG3	2.02	0.41
1:A:22:LEU:HB3	1:A:27:ALA:CB	2.51	0.41
1:A:23:LYS:O	1:A:24:GLU:C	2.59	0.41
1:A:89:PHE:HB3	1:A:153:PHE:HD1	1.85	0.41
1:A:257:LEU:HD23	1:A:257:LEU:N	2.35	0.41
2:C:1:G:C6	2:C:73:G:N1	2.88	0.41
2:D:49:G:H2'	2:D:50:C:C6	2.55	0.41
1:A:136:TYR:CD1	1:A:246:ILE:CD1	3.04	0.41
1:B:130:MET:HG3	1:B:133:PRO:CD	2.51	0.41
1:B:208:GLU:C	1:B:209:LEU:HD23	2.40	0.41
1:A:272:SER:HA	1:A:279:TYR:CD2	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:31:GLN:HA	1:B:34:MET:HG3	2.02	0.41
2:C:65:U:O2'	2:C:66:A:H5'	2.21	0.41
1:A:18:GLN:O	1:A:22:LEU:HD22	2.21	0.41
1:A:167:GLN:NE2	1:A:228:LEU:CD1	2.84	0.41
1:A:254:GLY:O	2:D:76:A:H4'	2.21	0.41
1:B:191:LEU:O	1:B:192:GLU:C	2.58	0.41
2:C:49:G:C6	2:C:66:A:C6	3.09	0.41
2:D:32:C:H3'	2:D:33:U:C5	2.55	0.41
1:B:91:GLN:HA	1:B:153:PHE:O	2.21	0.41
1:B:151:ARG:NH2	1:B:190:ARG:NH1	2.69	0.41
1:B:196:ARG:O	1:B:197:TRP:C	2.59	0.41
1:B:222:ASP:HA	1:B:231:ALA:O	2.20	0.41
1:B:46:PHE:O	1:B:48:GLY:N	2.55	0.40
1:B:132:ALA:N	1:B:133:PRO:HD2	2.36	0.40
1:B:262:MET:HA	1:B:267:THR:CG2	2.51	0.40
1:A:49:ILE:O	1:A:50:GLU:C	2.60	0.40
1:A:112:HIS:O	1:A:114:LEU:N	2.54	0.40
1:A:144:ARG:HH21	1:A:145:LEU:HD21	1.86	0.40
1:A:212:GLU:HB2	1:A:220:THR:O	2.21	0.40
1:B:228:LEU:HD23	1:B:228:LEU:HA	1.84	0.40
2:D:6:G:C4	2:D:7:U:C5	3.10	0.40
1:A:169:LEU:HD11	1:A:270:VAL:HG21	2.03	0.40
1:B:81:ALA:O	1:B:85:HIS:CD2	2.75	0.40
1:A:53:LEU:O	1:A:55:SER:N	2.54	0.40
1:B:84:LEU:HD23	1:B:84:LEU:HA	1.80	0.40
1:B:199:LEU:O	1:B:201:ALA:N	2.55	0.40
2:D:13:C:H3'	2:D:14:G:C8	2.56	0.40
1:A:86:GLN:OE1	1:A:86:GLN:HA	2.22	0.40
1:B:112:HIS:ND1	1:B:113:PRO:HD2	2.37	0.40
2:C:13:C:C5'	2:C:13:C:H6	2.33	0.40

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	277/308 (90%)	216 (78%)	47 (17%)	14 (5%)	2	13
1	B	277/308 (90%)	216 (78%)	45 (16%)	16 (6%)	1	10
All	All	554/616 (90%)	432 (78%)	92 (17%)	30 (5%)	2	12

All (30) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	11	SER
1	A	266	GLY
1	B	257	LEU
1	A	34	MET
1	A	38	ASP
1	A	122	ASP
1	B	46	PHE
1	B	69	HIS
1	B	107	THR
1	B	193	ASP
1	B	210	VAL
1	B	218	GLY
1	B	281	ASP
1	A	14	TRP
1	A	33	GLU
1	B	13	PHE
1	A	46	PHE
1	A	280	LEU
1	B	26	ASN
1	B	33	GLU
1	B	50	GLU
1	B	194	MET
1	A	26	ASN
1	A	113	PRO
1	B	30	GLU
1	A	206	GLU
1	B	17	VAL
1	B	93	VAL
1	A	215	VAL
1	A	108	ILE

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	243/269 (90%)	224 (92%)	19 (8%)	12 40
1	B	243/269 (90%)	210 (86%)	33 (14%)	3 16
All	All	486/538 (90%)	434 (89%)	52 (11%)	6 26

All (52) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	15	THR
1	A	21	ARG
1	A	26	ASN
1	A	61	LEU
1	A	70	ARG
1	A	101	SER
1	A	106	MET
1	A	118	VAL
1	A	130	MET
1	A	147	ASP
1	A	167	GLN
1	A	176	ASN
1	A	207	PHE
1	A	242	GLU
1	A	257	LEU
1	A	269	HIS
1	A	270	VAL
1	A	271	GLN
1	A	277	LEU
1	B	11	SER
1	B	20	GLN
1	B	30	GLU
1	B	40	LEU
1	B	42	ARG
1	B	55	SER
1	B	70	ARG
1	B	82	LYS

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Mol	Chain	Res	Type
1	B	87	GLN
1	B	99	THR
1	B	140	ARG
1	B	141	GLU
1	B	142	LEU
1	B	144	ARG
1	B	157	THR
1	B	162	GLU
1	B	163	SER
1	B	167	GLN
1	B	169	LEU
1	B	171	GLU
1	B	174	MET
1	B	176	ASN
1	B	206	GLU
1	B	207	PHE
1	B	215	VAL
1	B	216	VAL
1	B	217	TYR
1	B	228	LEU
1	B	242	GLU
1	B	257	LEU
1	B	271	GLN
1	B	276	SER
1	B	277	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	26	ASN
1	A	51	HIS
1	A	56	GLN
1	A	60	HIS
1	A	85	HIS
1	A	117	GLN
1	A	167	GLN
1	A	168	HIS
1	A	176	ASN
1	A	189	GLN
1	A	271	GLN
1	B	18	GLN
1	B	20	GLN

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Mol	Chain	Res	Type
1	B	52	GLN
1	B	63	GLN
1	B	87	GLN
1	B	167	GLN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	C	71/72 (98%)	27 (38%)	11 (15%)
2	D	71/72 (98%)	27 (38%)	13 (18%)
All	All	142/144 (98%)	54 (38%)	24 (16%)

All (54) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	C	9	G
2	C	11	A
2	C	14	G
2	C	15	A
2	C	18	A
2	C	19	U
2	C	20	A
2	C	21	G
2	C	25	A
2	C	27	A
2	C	32	C
2	C	33	U
2	C	34	C
2	C	35	U
2	C	36	A
2	C	37	A
2	C	39	U
2	C	47	G
2	C	49	G
2	C	50	C
2	C	51	G
2	C	59	C
2	C	60	U
2	C	61	C
2	C	69	C
2	C	75	C

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Mol	Chain	Res	Type
2	C	76	A
2	D	9	G
2	D	13	C
2	D	14	G
2	D	15	A
2	D	18	A
2	D	19	U
2	D	20	A
2	D	21	G
2	D	25	A
2	D	26	C
2	D	27	A
2	D	32	C
2	D	40	U
2	D	46	A
2	D	49	G
2	D	50	C
2	D	51	G
2	D	56	A
2	D	58	A
2	D	59	C
2	D	60	U
2	D	61	C
2	D	64	G
2	D	68	U
2	D	74	C
2	D	75	C
2	D	76	A

All (24) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	C	13	C
2	C	18	A
2	C	19	U
2	C	20	A
2	C	33	U
2	C	34	C
2	C	36	A
2	C	49	G
2	C	50	C
2	C	60	U

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Mol	Chain	Res	Type
2	C	74	C
2	D	7	U
2	D	9	G
2	D	14	G
2	D	15	A
2	D	18	A
2	D	20	A
2	D	31	A
2	D	47	G
2	D	49	G
2	D	50	C
2	D	55	G
2	D	60	U
2	D	74	C

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)

Of 13 ligands modelled in this entry, 13 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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, 95^{th} 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	279/308 (90%)	0.14	8 (2%)	51	28	57, 96, 166, 200	0
1	B	279/308 (90%)	-0.03	8 (2%)	51	28	58, 94, 155, 194	0
2	C	72/72 (100%)	0.12	3 (4%)	36	18	106, 135, 250, 288	0
2	D	72/72 (100%)	0.03	3 (4%)	36	18	95, 131, 263, 300	0
All	All	702/760 (92%)	0.06	22 (3%)	49	26	57, 103, 187, 300	0

All (22) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	219	ASP	7.4
1	B	110	GLU	4.7
1	A	213	SER	3.9
1	B	109	GLY	3.9
1	A	208	GLU	3.6
1	B	113	PRO	3.2
1	B	108	ILE	3.2
2	C	15	A	3.2
2	C	32	C	2.9
1	A	113	PRO	2.9
2	D	32	C	2.8
1	A	110	GLU	2.8
1	A	109	GLY	2.8
1	A	212	GLU	2.6
1	B	208	GLU	2.6
2	D	33	U	2.4
1	B	166	ALA	2.4
2	C	33	U	2.3
2	D	34	C	2.3
1	B	210	VAL	2.1
1	A	211	THR	2.1
1	B	209	LEU	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 monosaccharides 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, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	CA	D	83	1/1	0.79	0.14	105,105,105,105	0
3	CA	C	80	1/1	0.86	0.31	102,102,102,102	0
3	CA	C	82	1/1	0.88	0.22	114,114,114,114	0
3	CA	D	78	1/1	0.89	0.36	97,97,97,97	0
3	CA	D	82	1/1	0.89	0.12	106,106,106,106	0
3	CA	C	78	1/1	0.89	0.17	111,111,111,111	0
3	CA	D	79	1/1	0.91	0.21	90,90,90,90	0
3	CA	D	80	1/1	0.92	0.37	108,108,108,108	0
3	CA	C	79	1/1	0.94	0.26	93,93,93,93	0
3	CA	C	77	1/1	0.94	0.43	111,111,111,111	0
3	CA	C	81	1/1	0.95	0.20	84,84,84,84	0
3	CA	D	81	1/1	0.96	0.34	90,90,90,90	0
3	CA	D	77	1/1	0.98	0.42	83,83,83,83	0

6.5 Other polymers (i)

There are no such residues in this entry.