



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 10:47 PM UTC

PDB ID : 3C5F / pdb_00003c5f
Title : Structure of a binary complex of the R517A Pol lambda mutant
Authors : Garcia-Diaz, M.; Bebenek, K.; Foley, M.C.; Pedersen, L.C.; Schlick, T.; Kunkel, T.A.
Deposited on : 2008-01-31
Resolution : 2.25 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
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

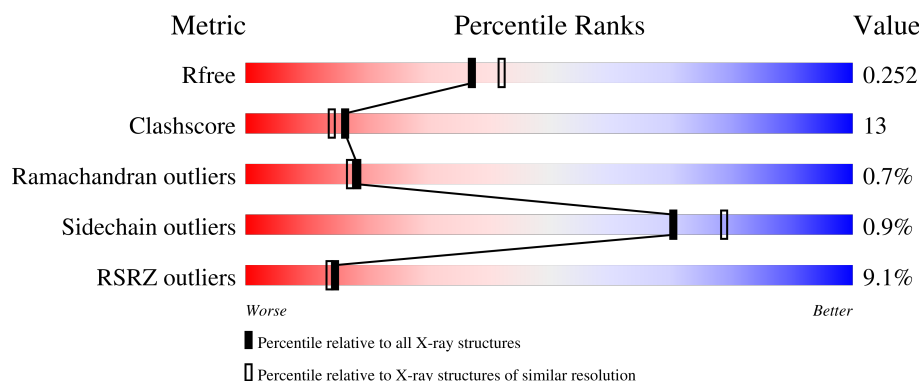
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.25 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



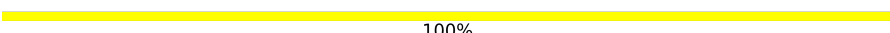
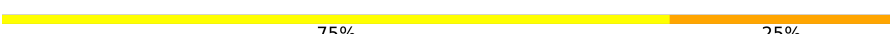
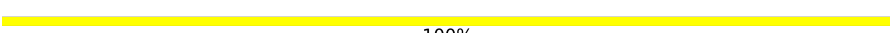
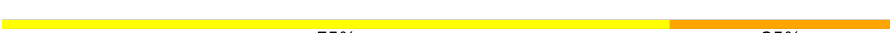
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1898 (2.26-2.26)
Clashscore	190562	2005 (2.26-2.26)
Ramachandran outliers	187476	1965 (2.26-2.26)
Sidechain outliers	187428	1966 (2.26-2.26)
RSRZ outliers	180081	1898 (2.26-2.26)

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	1-T	11	64% 55% 45%
1	1-U	11	91% 27% 73%
1	2-T	11	18% 73% 9%
1	2-U	11	9% 91%
2	1-P	6	17% 100%

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Mol	Chain	Length	Quality of chain
2	1-Q	6	 33% 67%
2	2-P	6	 67% 33%
2	2-Q	6	 17% 83%
3	1-D	4	 100%
3	1-E	4	 75% 25%
3	2-D	4	 100%
3	2-E	4	 75% 25%
4	1-A	335	 7% 81% 14% ..
4	1-B	335	 6% 73% 23% ..
4	2-A	335	 82% 15% .
4	2-B	335	 74% 22% ..

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 13157 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 DNA chain called DNA (5'-D(*DCP*DGP*DGP*DCP*DCP*DGP*DTP*DAP*DCP*DTP*DG)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	1-T	11	Total	C	N	O	P	0	11	0
			222	106	41	65	10			
1	2-T	11	Total	C	N	O	P	0	11	0
			222	106	41	65	10			
1	1-U	11	Total	C	N	O	P	0	11	0
			222	106	41	65	10			
1	2-U	11	Total	C	N	O	P	0	11	0
			222	106	41	65	10			

- Molecule 2 is a DNA chain called DNA (5'-D(*DCP*DAP*DGP*DTP*DAP*DC)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	1-P	6	Total	C	N	O	P	0	6	0
			119	58	23	33	5			
2	2-P	6	Total	C	N	O	P	0	6	0
			119	58	23	33	5			
2	1-Q	6	Total	C	N	O	P	0	6	0
			119	58	23	33	5			
2	2-Q	6	Total	C	N	O	P	0	6	0
			119	58	23	33	5			

- Molecule 3 is a DNA chain called DNA (5'-D(P*DGP*DCP*DCP*DG)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	1-D	4	Total	C	N	O	P	0	4	0
			83	38	16	25	4			
3	2-D	4	Total	C	N	O	P	0	4	0
			83	38	16	25	4			
3	1-E	4	Total	C	N	O	P	0	4	0
			83	38	16	25	4			
3	2-E	4	Total	C	N	O	P	0	4	0
			83	38	16	25	4			

- Molecule 4 is a protein called DNA polymerase lambda.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	1-A	326	Total	C	N	O	S	0	326	0
			2541	1598	462	469	12			
4	2-A	326	Total	C	N	O	S	0	326	0
			2541	1598	462	469	12			
4	1-B	326	Total	C	N	O	S	0	326	0
			2551	1604	467	468	12			
4	2-B	325	Total	C	N	O	S	0	325	0
			2538	1597	465	464	12			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	241	MET	-	expression tag	UNP Q9UGP5
A	517	ALA	ARG	engineered mutation	UNP Q9UGP5
B	241	MET	-	expression tag	UNP Q9UGP5
B	517	ALA	ARG	engineered mutation	UNP Q9UGP5

- Molecule 5 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	1-A	3	Total	Na	0	3
			3	3		
5	2-A	3	Total	Na	0	3
			3	3		
5	1-B	3	Total	Na	0	3
			3	3		
5	2-B	3	Total	Na	0	3
			3	3		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	1-T	16	Total	O	0	16
			16	16		
6	2-T	11	Total	O	0	11
			11	11		
6	1-P	18	Total	O	0	18
			18	18		
6	2-P	18	Total	O	0	18
			18	18		
6	1-D	3	Total	O	0	3
			3	3		

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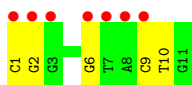
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	2-D	3	Total 3	O 3	0	3
6	1-U	8	Total 8	O 8	0	8
6	2-U	13	Total 13	O 13	0	13
6	1-Q	11	Total 11	O 11	0	11
6	2-Q	11	Total 11	O 11	0	11
6	1-E	3	Total 3	O 3	0	3
6	2-E	2	Total 2	O 2	0	2
6	1-A	321	Total 321	O 321	0	321
6	2-A	324	Total 324	O 324	0	324
6	1-B	259	Total 259	O 259	0	259
6	2-B	257	Total 257	O 257	0	257

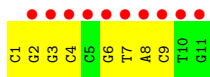
3 Residue-property plots [i](#)

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.

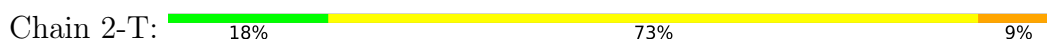
- Molecule 1: DNA (5'-D(*DCP*DGP*DGP*DCP*DCP*DGP*DTP*DAP*DCP*DTP*DG)-3')



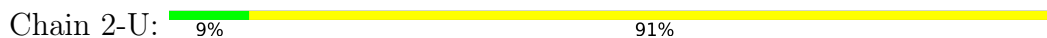
- Molecule 1: DNA (5'-D(*DCP*DGP*DGP*DCP*DCP*DGP*DTP*DAP*DCP*DTP*DG)-3')



- Molecule 1: DNA (5'-D(*DCP*DGP*DGP*DCP*DCP*DGP*DTP*DAP*DCP*DTP*DG)-3')



- Molecule 1: DNA (5'-D(*DCP*DGP*DGP*DCP*DCP*DGP*DTP*DAP*DCP*DTP*DG)-3')



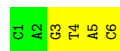
- Molecule 2: DNA (5'-D(*DCP*DAP*DGP*DTP*DAP*DC)-3')





- Molecule 2: DNA (5'-D(*DCP*DAP*DGP*DTP*DAP*DC)-3')

Chain 1-Q: 33% 67%



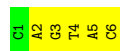
- Molecule 2: DNA (5'-D(*DCP*DAP*DGP*DTP*DAP*DC)-3')

Chain 2-P: 67% 33%



- Molecule 2: DNA (5'-D(*DCP*DAP*DGP*DTP*DAP*DC)-3')

Chain 2-Q: 17% 83%



- Molecule 3: DNA (5'-D(P*DGP*DCP*DCP*DG)-3')

Chain 1-D: 100%



- Molecule 3: DNA (5'-D(P*DGP*DCP*DCP*DG)-3')

Chain 1-E: 75% 25%



- Molecule 3: DNA (5'-D(P*DGP*DCP*DCP*DG)-3')

Chain 2-D: 100%

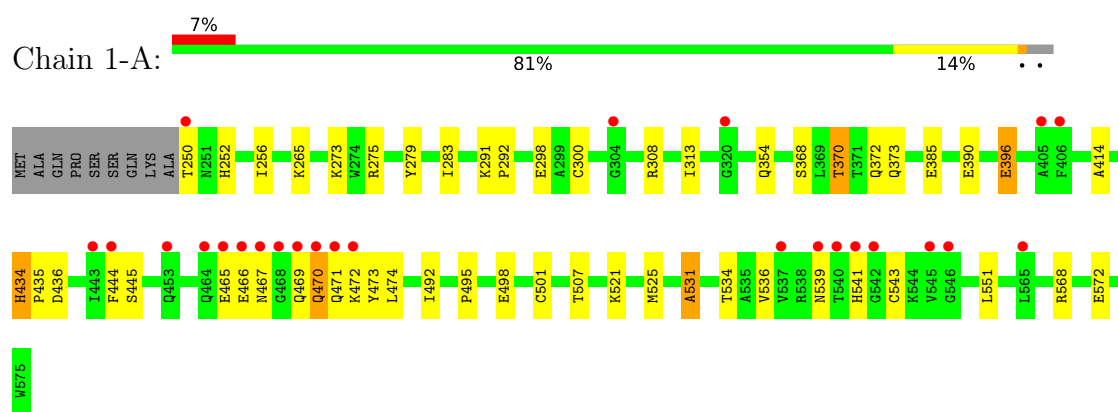


- Molecule 3: DNA (5'-D(P*DGP*DCP*DCP*DG)-3')

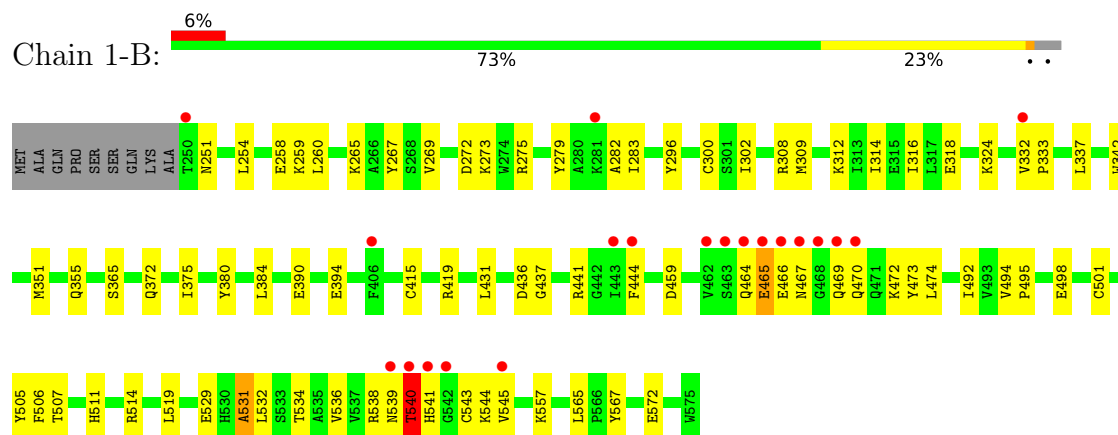
Chain 2-E: 75% 25%



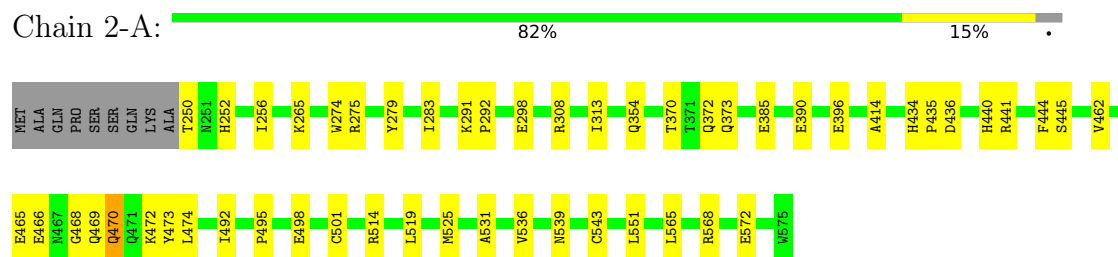
- Molecule 4: DNA polymerase lambda



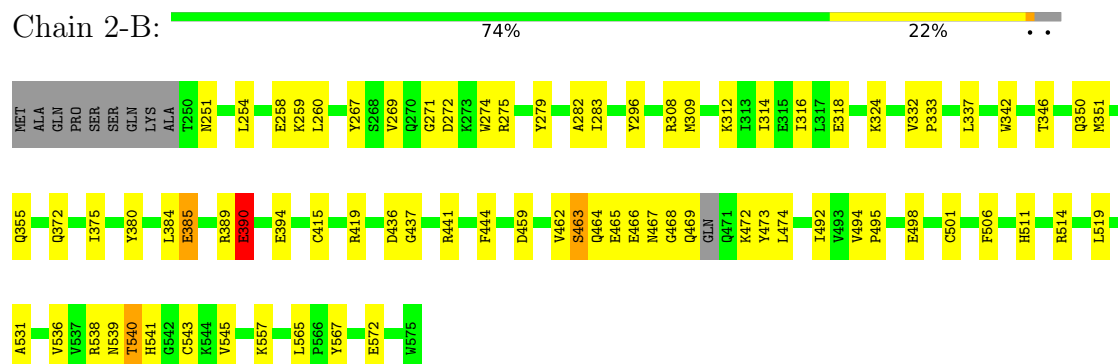
- Molecule 4: DNA polymerase lambda



- Molecule 4: DNA polymerase lambda



- Molecule 4: DNA polymerase lambda



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	94.24Å 151.88Å 85.64Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.25 50.00 – 2.25	Depositor EDS
% Data completeness (in resolution range)	85.2 (50.00-2.25) 85.5 (50.00-2.25)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.76 (at 2.24Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.224 , 0.263 0.213 , 0.252	Depositor DCC
R_{free} test set	2877 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	27.5	Xtriage
Anisotropy	0.223	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.17 , 47.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	13157	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 39.39 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.1954e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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:
NA

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	1-T	0.25	0/248	0.48	0/381
1	1-U	0.19	0/248	0.42	0/381
2	1-P	0.31	0/133	0.69	0/203
2	1-Q	0.34	0/133	0.70	0/203
3	1-D	0.53	0/92	0.70	0/138
3	1-E	0.54	0/92	0.62	0/138
4	1-A	0.45	0/2594	0.92	10/3502 (0.3%)
4	1-B	0.45	0/2604	0.90	10/3515 (0.3%)
All	All	0.43	0/6144	0.86	20/8461 (0.2%)

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	2-T	0	1
2	1-Q	0	1
2	2-Q	0	1
3	1-E	0	1
3	2-E	0	1
4	2-B	0	3
All	All	0	8

There are no bond length outliers.

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	1-A	471[A]	GLN	N-CA-C	12.36	126.47	110.53
4	1-B	302[A]	ILE	N-CA-C	7.14	114.77	108.63

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	1-A	368[A]	SER	CB-CA-C	6.95	121.16	109.84
4	1-A	434[A]	HIS	CA-C-N	6.48	126.70	119.32
4	1-A	434[A]	HIS	C-N-CA	6.48	126.70	119.32
4	1-A	534[A]	THR	N-CA-C	-6.36	101.96	110.55
4	1-B	544[A]	LYS	CA-C-N	-6.15	110.91	121.97
4	1-B	544[A]	LYS	C-N-CA	-6.15	110.91	121.97
4	1-A	273[A]	LYS	N-CA-C	6.07	117.89	111.28
4	1-A	541[A]	HIS	N-CA-C	5.99	119.32	112.97
4	1-B	273[A]	LYS	N-CA-C	5.86	117.66	111.28
4	1-A	507[A]	THR	N-CA-C	-5.75	104.99	112.23
4	1-B	540[A]	THR	N-CA-C	5.55	119.55	112.34
4	1-B	534[A]	THR	N-CA-C	-5.46	103.18	110.55
4	1-A	370[A]	THR	N-CA-C	-5.36	103.31	110.55
4	1-A	531[A]	ALA	N-CA-C	5.32	115.39	107.88
4	1-B	532[A]	LEU	N-CA-C	-5.26	100.60	109.07
4	1-B	531[A]	ALA	N-CA-C	5.25	115.28	107.88
4	1-B	507[A]	THR	N-CA-C	-5.22	105.27	111.69
4	1-B	365[A]	SER	N-CA-C	5.17	118.75	112.23

There are no chirality outliers.

All (8) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	1-E	1[A]	DG	Sidechain
2	1-Q	6[A]	DC	Sidechain
4	2-B	385[B]	GLU	Mainchain
4	2-B	389[B]	ARG	Mainchain
4	2-B	390[B]	GLU	Mainchain
3	2-E	1[B]	DG	Sidechain
2	2-Q	6[B]	DC	Sidechain
1	2-T	4[B]	DC	Sidechain

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	1-T	222	0	125	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	1-U	222	0	125	22	0
1	2-T	222	0	126	43	0
1	2-U	222	0	125	26	0
2	1-P	119	0	69	0	0
2	1-Q	119	0	69	2	0
2	2-P	119	0	69	6	0
2	2-Q	119	0	69	8	0
3	1-D	83	0	45	3	0
3	1-E	83	0	45	3	0
3	2-D	83	0	45	3	0
3	2-E	83	0	45	3	0
4	1-A	2541	0	2520	34	0
4	1-B	2551	0	2539	79	0
4	2-A	2541	0	2518	50	0
4	2-B	2538	0	2528	71	0
5	1-A	3	0	0	0	0
5	1-B	3	0	0	0	0
5	2-A	3	0	0	0	0
5	2-B	3	0	0	0	0
6	1-A	321	0	0	7	0
6	1-B	259	0	0	6	0
6	1-D	3	0	0	0	0
6	1-E	3	0	0	0	0
6	1-P	18	0	0	0	0
6	1-Q	11	0	0	0	0
6	1-T	16	0	0	1	0
6	1-U	8	0	0	0	0
6	2-A	324	0	0	7	0
6	2-B	257	0	0	8	0
6	2-D	3	0	0	0	0
6	2-E	2	0	0	0	0
6	2-P	18	0	0	0	0
6	2-Q	11	0	0	0	0
6	2-T	11	0	0	1	0
6	2-U	13	0	0	0	0
All	All	13157	0	11062	298	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 13.

All (298) 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:T:10[B]:DT:H3'	1:T:11[B]:DG:P	1.66	1.36
1:T:10[B]:DT:C3'	1:T:11[B]:DG:P	2.19	1.28
1:T:10[B]:DT:O3'	1:T:11[B]:DG:H5'	1.08	1.24
1:U:9[B]:DC:OP2	4:B:464[B]:GLN:OE1	1.56	1.23
1:T:10[B]:DT:O3'	1:T:11[B]:DG:C5'	1.86	1.22
1:T:3[B]:DG:O3'	1:T:4[B]:DC:P	1.99	1.20
1:U:9[A]:DC:C4'	4:B:465[A]:GLU:HG2	1.78	1.09
1:T:10[B]:DT:O3'	1:T:11[B]:DG:P	2.11	1.08
4:A:469[B]:GLN:N	4:B:469[B]:GLN:HA	1.67	1.01
1:T:3[B]:DG:C3'	1:T:4[B]:DC:OP2	2.08	1.01
4:A:469[B]:GLN:NE2	4:B:468[B]:GLY:O	1.93	1.00
1:T:4[B]:DC:H3'	1:T:5[B]:DC:H5''	1.43	0.99
4:B:519[A]:LEU:HD23	4:B:565[A]:LEU:HD11	1.44	0.99
4:B:519[B]:LEU:HD23	4:B:565[B]:LEU:HD11	1.44	0.99
4:B:260[A]:LEU:HD13	4:B:309[A]:MET:HE1	1.49	0.92
4:B:260[B]:LEU:HD13	4:B:309[B]:MET:HE1	1.49	0.92
1:U:8[B]:DA:H2''	1:U:9[B]:DC:OP1	1.70	0.91
1:T:5[B]:DC:OP2	4:A:514[B]:ARG:NH2	2.07	0.87
4:A:354[A]:GLN:HG2	6:A:1114[A]:HOH:O	1.75	0.85
4:B:472[A]:LYS:HD3	4:B:474[A]:LEU:HD21	1.56	0.85
4:A:354[B]:GLN:HG2	6:A:1114[B]:HOH:O	1.75	0.85
4:B:472[B]:LYS:HD3	4:B:474[B]:LEU:HD21	1.56	0.85
1:U:9[A]:DC:OP2	4:B:466[A]:GLU:C	2.16	0.85
1:U:9[A]:DC:H4'	4:B:465[A]:GLU:HG2	1.58	0.82
4:A:469[B]:GLN:HA	4:B:469[B]:GLN:N	1.93	0.82
4:B:470[A]:GLN:HG2	4:B:494[A]:VAL:HG12	1.63	0.81
1:T:3[B]:DG:O3'	1:T:4[B]:DC:OP1	1.96	0.81
1:T:4[B]:DC:C3'	1:T:5[B]:DC:H5''	2.09	0.81
1:T:3[B]:DG:H3'	1:T:4[B]:DC:OP2	1.79	0.81
1:T:10[B]:DT:HO3'	1:T:11[B]:DG:H5'	1.01	0.80
1:T:9[B]:DC:N4	2:P:2[B]:DA:H61	1.79	0.80
4:B:572[A]:GLU:HG3	6:B:864[A]:HOH:O	1.82	0.79
4:B:572[B]:GLU:HG3	6:B:864[B]:HOH:O	1.82	0.79
1:T:3[B]:DG:O3'	1:T:4[B]:DC:OP2	1.94	0.79
1:U:9[A]:DC:O4'	4:B:465[A]:GLU:HG2	1.81	0.79
1:U:8[A]:DA:H1'	4:B:465[A]:GLU:CD	2.08	0.79
1:U:8[A]:DA:H3'	4:B:467[A]:ASN:CA	1.82	0.78
1:U:9[A]:DC:OP2	4:B:467[A]:ASN:N	2.18	0.76
1:U:4[B]:DC:H2'	4:B:274[B]:TRP:CZ3	2.21	0.76
1:T:10[B]:DT:C4	1:T:11[B]:DG:C6	2.75	0.74
4:A:468[B]:GLY:C	4:B:469[B]:GLN:HA	2.12	0.74
1:U:9[B]:DC:N4	2:Q:2[B]:DA:H61	1.86	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:465[A]:GLU:HA	6:A:1090[A]:HOH:O	1.89	0.72
4:A:465[B]:GLU:HA	6:A:1090[B]:HOH:O	1.89	0.72
1:U:9[B]:DC:H5''	1:U:9[B]:DC:H6	1.54	0.71
4:B:539[A]:ASN:ND2	4:B:543[A]:CYS:HB2	2.06	0.71
4:B:539[B]:ASN:ND2	4:B:543[B]:CYS:HB2	2.06	0.71
1:U:8[B]:DA:N6	2:Q:3[B]:DG:O6	2.23	0.71
4:B:540[A]:THR:OG1	4:B:541[A]:HIS:CD2	2.44	0.71
4:B:540[B]:THR:OG1	4:B:541[B]:HIS:CD2	2.44	0.71
4:B:538[A]:ARG:HA	4:B:543[A]:CYS:O	1.91	0.70
4:B:538[B]:ARG:HA	4:B:543[B]:CYS:O	1.91	0.70
4:B:540[A]:THR:OG1	4:B:541[A]:HIS:HD2	1.74	0.70
4:B:540[B]:THR:OG1	4:B:541[B]:HIS:HD2	1.74	0.70
1:U:5[B]:DC:C2'	1:U:6[B]:DG:H5'	2.21	0.69
1:T:6[A]:DG:OP1	4:A:521[A]:LYS:HD2	1.92	0.69
1:T:10[B]:DT:N3	1:T:11[B]:DG:C6	2.62	0.68
1:T:9[B]:DC:H42	2:P:2[B]:DA:N6	1.92	0.68
1:U:10[B]:DT:H2''	1:U:11[B]:DG:H5'	1.76	0.68
4:B:279[A]:TYR:OH	4:B:312[A]:LYS:HE2	1.93	0.67
4:A:469[B]:GLN:HA	4:B:469[B]:GLN:H	1.59	0.67
4:B:279[B]:TYR:OH	4:B:312[B]:LYS:HE2	1.93	0.67
1:T:9[B]:DC:N4	2:P:2[B]:DA:N6	2.42	0.67
1:U:9[B]:DC:N3	2:Q:3[B]:DG:N1	2.41	0.66
4:B:467[B]:ASN:ND2	4:B:469[B]:GLN:H	1.94	0.66
1:U:1[B]:DC:H2''	1:U:2[B]:DG:H5'	1.77	0.65
4:A:372[A]:GLN:HG3	6:A:982[A]:HOH:O	1.94	0.65
4:A:372[B]:GLN:HG3	6:A:982[B]:HOH:O	1.94	0.65
1:U:1[A]:DC:H2''	1:U:2[A]:DG:O5'	1.96	0.65
1:T:4[B]:DC:H2''	4:A:274[B]:TRP:CZ3	2.32	0.64
4:B:351[A]:MET:HG2	4:B:355[A]:GLN:HE21	1.61	0.64
4:B:351[B]:MET:HG2	4:B:355[B]:GLN:HE21	1.61	0.64
4:B:519[A]:LEU:HD21	4:B:565[A]:LEU:HD21	1.81	0.63
4:B:519[B]:LEU:HD21	4:B:565[B]:LEU:HD21	1.81	0.63
4:A:444[A]:PHE:CZ	4:A:473[A]:TYR:HB2	2.34	0.62
4:A:444[B]:PHE:CZ	4:A:473[B]:TYR:HB2	2.34	0.62
1:T:10[B]:DT:H3'	1:T:11[B]:DG:OP2	2.00	0.61
4:A:308[A]:ARG:HH11	4:A:308[A]:ARG:HG3	1.66	0.60
4:A:308[B]:ARG:HH11	4:A:308[B]:ARG:HG3	1.66	0.60
4:A:536[A]:VAL:HG22	6:A:950[A]:HOH:O	2.00	0.60
4:A:536[B]:VAL:HG22	6:A:950[B]:HOH:O	2.00	0.60
4:A:396[A]:GLU:HG3	4:A:414[A]:ALA:HB2	1.83	0.60
4:A:525[A]:MET:HE3	4:A:551[A]:LEU:CD1	2.32	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:B:254[A]:LEU:O	4:B:258[A]:GLU:HG2	2.01	0.60
4:A:396[B]:GLU:HG3	4:A:414[B]:ALA:HB2	1.83	0.60
4:A:525[B]:MET:HE3	4:A:551[B]:LEU:CD1	2.32	0.60
4:B:254[B]:LEU:O	4:B:258[B]:GLU:HG2	2.01	0.60
1:T:10[B]:DT:O4	1:T:11[B]:DG:O6	2.20	0.60
4:B:470[A]:GLN:HG2	4:B:494[A]:VAL:CG1	2.31	0.60
4:B:539[A]:ASN:C	4:B:539[A]:ASN:OD1	2.45	0.60
4:B:539[B]:ASN:OD1	4:B:539[B]:ASN:C	2.45	0.60
1:U:9[B]:DC:N4	2:Q:2[B]:DA:N6	2.49	0.59
4:B:260[A]:LEU:CD1	4:B:309[A]:MET:HE1	2.28	0.59
4:B:260[B]:LEU:CD1	4:B:309[B]:MET:HE1	2.28	0.59
1:U:9[A]:DC:H4'	4:B:465[A]:GLU:CG	2.32	0.58
4:A:519[B]:LEU:HD21	4:A:565[B]:LEU:HD21	1.84	0.58
1:U:8[A]:DA:H3'	4:B:467[A]:ASN:N	2.18	0.58
1:T:4[B]:DC:C3'	1:T:5[B]:DC:C5'	2.81	0.57
1:U:5[B]:DC:H2'	1:U:6[B]:DG:H5'	1.84	0.57
1:T:10[B]:DT:C4	1:T:11[B]:DG:O6	2.58	0.57
4:B:385[B]:GLU:HG2	6:B:979[B]:HOH:O	2.04	0.57
4:A:252[A]:HIS:HB3	4:A:292[A]:PRO:HG3	1.86	0.57
4:A:252[B]:HIS:HB3	4:A:292[B]:PRO:HG3	1.86	0.57
4:B:279[A]:TYR:O	4:B:283[A]:ILE:HG13	2.06	0.56
1:T:8[B]:DA:C6	2:P:3[B]:DG:O6	2.58	0.56
1:T:8[B]:DA:N1	2:P:3[B]:DG:O6	2.39	0.56
4:B:279[B]:TYR:O	4:B:283[B]:ILE:HG13	2.06	0.56
1:U:9[A]:DC:C4'	4:B:465[A]:GLU:CG	2.67	0.56
4:A:525[A]:MET:HE3	4:A:551[A]:LEU:HD12	1.86	0.56
4:A:441[B]:ARG:CZ	4:B:465[B]:GLU:O	2.54	0.56
4:A:525[B]:MET:HE3	4:A:551[B]:LEU:HD12	1.86	0.56
4:B:260[A]:LEU:HD13	4:B:309[A]:MET:CE	2.27	0.56
4:B:260[B]:LEU:HD13	4:B:309[B]:MET:CE	2.27	0.56
4:B:346[B]:THR:O	4:B:350[B]:GLN:HG3	2.06	0.56
4:B:372[A]:GLN:HG3	6:B:903[A]:HOH:O	2.06	0.55
4:B:372[B]:GLN:HG3	6:B:903[B]:HOH:O	2.06	0.55
4:A:492[A]:ILE:HD12	4:A:492[A]:ILE:N	2.21	0.55
4:A:492[B]:ILE:HD12	4:A:492[B]:ILE:N	2.21	0.55
4:B:465[A]:GLU:O	4:B:466[A]:GLU:C	2.38	0.55
1:T:10[B]:DT:C3'	1:T:11[B]:DG:OP2	2.54	0.55
4:A:466[A]:GLU:HG2	4:B:437[A]:GLY:O	2.06	0.55
4:A:466[B]:GLU:HG2	4:B:437[B]:GLY:O	2.06	0.55
1:U:8[B]:DA:H2'	1:U:9[B]:DC:C6	2.42	0.55
1:U:8[B]:DA:H2'	1:U:9[B]:DC:H5''	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:B:296[A]:TYR:N	4:B:314[A]:ILE:HD11	2.22	0.54
4:B:464[A]:GLN:O	4:B:465[A]:GLU:HB2	2.06	0.54
4:B:296[B]:TYR:N	4:B:314[B]:ILE:HD11	2.22	0.54
1:T:5[B]:DC:P	4:A:514[B]:ARG:HH21	2.29	0.54
4:A:501[A]:CYS:SG	4:A:531[A]:ALA:HA	2.48	0.54
4:A:501[B]:CYS:SG	4:A:531[B]:ALA:HA	2.48	0.54
4:B:519[A]:LEU:CD2	4:B:565[A]:LEU:HD11	2.29	0.53
1:T:10[B]:DT:C4	1:T:11[B]:DG:C5	2.96	0.53
4:B:519[B]:LEU:CD2	4:B:565[B]:LEU:HD11	2.29	0.53
4:B:390[B]:GLU:O	4:B:394[B]:GLU:HG3	2.08	0.53
1:T:1[A]:DC:H2'	1:T:2[A]:DG:C8	2.44	0.53
3:D:3[A]:DC:H2''	3:D:4[A]:DG:C8	2.44	0.53
1:T:1[B]:DC:H2'	1:T:2[B]:DG:C8	2.44	0.53
3:D:3[B]:DC:H2''	3:D:4[B]:DG:C8	2.44	0.53
1:T:5[B]:DC:H2'	6:T:591[B]:HOH:O	2.08	0.52
1:T:4[B]:DC:H3'	1:T:5[B]:DC:C5'	2.28	0.52
1:T:10[B]:DT:O3'	1:T:11[B]:DG:O5'	2.23	0.52
4:B:464[A]:GLN:O	4:B:465[A]:GLU:CB	2.58	0.52
4:B:511[A]:HIS:O	4:B:514[A]:ARG:HG3	2.09	0.52
4:B:511[B]:HIS:O	4:B:514[B]:ARG:HG3	2.09	0.52
1:T:10[B]:DT:C5	1:T:11[B]:DG:N7	2.78	0.52
4:B:501[A]:CYS:SG	4:B:531[A]:ALA:HA	2.50	0.52
4:B:501[B]:CYS:SG	4:B:531[B]:ALA:HA	2.50	0.52
1:T:6[A]:DG:H1'	6:T:229[A]:HOH:O	2.10	0.51
1:T:10[B]:DT:N3	1:T:11[B]:DG:C5	2.79	0.51
4:A:519[B]:LEU:HD22	4:A:565[B]:LEU:HD11	1.91	0.51
4:B:390[A]:GLU:O	4:B:394[A]:GLU:HG3	2.11	0.51
4:A:539[A]:ASN:N	4:A:543[A]:CYS:O	2.41	0.51
4:A:539[B]:ASN:N	4:A:543[B]:CYS:O	2.41	0.51
1:U:1[A]:DC:H2'	1:U:2[A]:DG:C8	2.46	0.51
1:T:9[B]:DC:H4'	4:A:462[B]:VAL:HG13	1.93	0.50
4:B:351[A]:MET:HE3	4:B:355[A]:GLN:HE22	1.76	0.50
4:B:351[B]:MET:HE3	4:B:355[B]:GLN:HE22	1.76	0.50
1:U:7[A]:DT:H2''	4:B:467[A]:ASN:ND2	2.27	0.50
1:T:3[B]:DG:C2'	1:T:4[B]:DC:OP2	2.60	0.50
1:U:7[A]:DT:H4'	4:B:529[A]:GLU:OE1	2.13	0.49
3:E:1[A]:DG:H2'	3:E:2[A]:DC:C6	2.48	0.49
4:B:314[A]:ILE:O	4:B:318[A]:GLU:HG3	2.11	0.49
4:B:384[A]:LEU:HD23	6:B:946[A]:HOH:O	2.11	0.49
3:E:1[B]:DG:H2'	3:E:2[B]:DC:C6	2.48	0.49
4:B:314[B]:ILE:O	4:B:318[B]:GLU:HG3	2.11	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:B:384[B]:LEU:HD23	6:B:946[B]:HOH:O	2.11	0.49
4:B:269[A]:VAL:HG21	4:B:332[A]:VAL:HG13	1.94	0.49
4:B:337[A]:LEU:HD12	4:B:380[A]:TYR:OH	2.12	0.49
4:B:269[B]:VAL:HG21	4:B:332[B]:VAL:HG13	1.94	0.49
4:B:337[B]:LEU:HD12	4:B:380[B]:TYR:OH	2.12	0.49
4:B:282[A]:ALA:HB1	4:B:309[A]:MET:HE2	1.95	0.49
4:B:282[B]:ALA:HB1	4:B:309[B]:MET:HE2	1.95	0.49
4:B:259[A]:LYS:HD2	4:B:316[A]:ILE:HD13	1.94	0.49
4:B:259[B]:LYS:HD2	4:B:316[B]:ILE:HD13	1.94	0.49
4:B:519[A]:LEU:CD2	4:B:565[A]:LEU:HD21	2.42	0.49
4:B:519[B]:LEU:CD2	4:B:565[B]:LEU:HD21	2.42	0.49
4:A:568[A]:ARG:HG3	4:A:572[A]:GLU:HB2	1.95	0.49
4:A:568[B]:ARG:HG3	4:A:572[B]:GLU:HB2	1.95	0.49
1:T:10[B]:DT:C6	1:T:11[B]:DG:N7	2.81	0.48
4:B:467[B]:ASN:HD22	4:B:468[B]:GLY:N	2.11	0.48
1:U:1[B]:DC:H2'	1:U:2[B]:DG:C8	2.49	0.48
4:A:441[B]:ARG:NH1	4:B:465[B]:GLU:HB3	2.28	0.48
1:T:10[B]:DT:C2	1:T:11[B]:DG:C5	3.01	0.48
1:U:8[B]:DA:C6	2:Q:3[B]:DG:O6	2.67	0.48
1:U:8[B]:DA:C2'	1:U:9[B]:DC:H5''	2.44	0.48
1:U:8[A]:DA:H1'	4:B:465[A]:GLU:OE2	2.13	0.48
4:A:469[A]:GLN:O	4:A:470[A]:GLN:C	2.57	0.48
4:A:469[B]:GLN:O	4:A:470[B]:GLN:C	2.57	0.48
4:B:492[A]:ILE:HD13	4:B:506[A]:PHE:CZ	2.48	0.48
4:B:539[A]:ASN:CG	4:B:543[A]:CYS:HB2	2.39	0.48
4:B:462[B]:VAL:O	4:B:463[B]:SER:HB2	2.12	0.48
4:B:492[B]:ILE:HD13	4:B:506[B]:PHE:CZ	2.48	0.48
4:B:539[B]:ASN:CG	4:B:543[B]:CYS:HB2	2.39	0.48
3:E:3[A]:DC:H2''	3:E:4[A]:DG:C8	2.48	0.47
3:E:3[B]:DC:H2''	3:E:4[B]:DG:C8	2.48	0.47
1:U:9[B]:DC:H42	2:Q:2[B]:DA:N6	2.13	0.47
4:A:291[A]:LYS:HE3	4:A:298[A]:GLU:OE2	2.14	0.47
4:A:291[B]:LYS:HE3	4:A:298[B]:GLU:OE2	2.14	0.47
1:U:8[A]:DA:H1'	4:B:465[A]:GLU:OE1	2.13	0.47
1:U:5[B]:DC:N4	1:U:6[B]:DG:C6	2.82	0.47
1:U:8[A]:DA:OP1	4:B:467[A]:ASN:C	2.58	0.47
1:T:9[B]:DC:O2	2:P:3[B]:DG:N2	2.41	0.47
4:A:440[B]:HIS:CE1	4:B:466[B]:GLU:O	2.68	0.46
4:A:468[B]:GLY:O	4:B:468[B]:GLY:C	2.57	0.46
4:B:271[B]:GLY:HA2	4:B:346[B]:THR:HG21	1.96	0.46
1:U:9[A]:DC:P	4:B:467[A]:ASN:N	2.88	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:467[A]:ASN:OD1	4:B:469[A]:GLN:HA	2.15	0.46
4:B:351[A]:MET:HG2	4:B:355[A]:GLN:NE2	2.29	0.46
4:B:470[A]:GLN:CG	4:B:494[A]:VAL:HG12	2.40	0.46
1:U:9[B]:DC:OP1	1:U:9[B]:DC:H4'	2.15	0.46
4:B:351[B]:MET:HG2	4:B:355[B]:GLN:NE2	2.29	0.46
4:B:495[A]:PRO:HG2	4:B:498[A]:GLU:HG3	1.98	0.46
4:B:536[A]:VAL:HG22	6:B:958[A]:HOH:O	2.15	0.46
4:B:495[B]:PRO:HG2	4:B:498[B]:GLU:HG3	1.98	0.46
4:B:536[B]:VAL:HG22	6:B:958[B]:HOH:O	2.15	0.46
4:A:308[A]:ARG:HG3	4:A:308[A]:ARG:NH1	2.26	0.46
4:A:308[B]:ARG:HG3	4:A:308[B]:ARG:NH1	2.26	0.46
4:B:390[B]:GLU:HG2	6:B:947[B]:HOH:O	2.16	0.46
4:A:256[A]:ILE:HD13	4:A:313[A]:ILE:HG23	1.98	0.46
4:A:256[B]:ILE:HD13	4:A:313[B]:ILE:HG23	1.98	0.46
4:A:385[A]:GLU:HB3	6:A:842[A]:HOH:O	2.14	0.46
1:U:9[B]:DC:OP1	1:U:9[B]:DC:C4'	2.64	0.46
4:A:385[B]:GLU:HB3	6:A:842[B]:HOH:O	2.14	0.46
4:B:436[A]:ASP:OD1	4:B:436[A]:ASP:C	2.58	0.45
1:U:5[B]:DC:C3'	1:U:6[B]:DG:H5'	2.46	0.45
4:B:436[B]:ASP:C	4:B:436[B]:ASP:OD1	2.58	0.45
1:U:9[A]:DC:H4'	4:B:464[A]:GLN:C	2.40	0.45
4:A:441[B]:ARG:HH12	4:B:465[B]:GLU:HB3	1.81	0.45
1:U:6[A]:DG:C2	4:B:505[A]:TYR:OH	2.61	0.45
4:A:390[A]:GLU:H	4:A:390[A]:GLU:CD	2.25	0.45
4:B:415[A]:CYS:HA	4:B:419[A]:ARG:HB2	1.97	0.45
4:A:390[B]:GLU:H	4:A:390[B]:GLU:CD	2.25	0.45
4:B:415[B]:CYS:HA	4:B:419[B]:ARG:HB2	1.97	0.45
2:Q:3[A]:DG:H2''	2:Q:4[A]:DT:O5'	2.16	0.45
2:Q:3[B]:DG:H2''	2:Q:4[B]:DT:O5'	2.16	0.45
3:D:1[A]:DG:H2''	3:D:2[A]:DC:H5'	1.98	0.45
3:D:1[B]:DG:H2''	3:D:2[B]:DC:H5'	1.98	0.45
4:A:279[A]:TYR:O	4:A:283[A]:ILE:HG13	2.17	0.44
4:A:495[A]:PRO:HG2	4:A:498[A]:GLU:HG3	1.99	0.44
4:A:279[B]:TYR:O	4:A:283[B]:ILE:HG13	2.17	0.44
4:A:495[B]:PRO:HG2	4:A:498[B]:GLU:HG3	1.99	0.44
3:E:2[A]:DC:P	4:B:308[A]:ARG:HB2	2.57	0.44
4:B:545[A]:VAL:HG22	4:B:545[A]:VAL:O	2.17	0.44
3:E:2[B]:DC:P	4:B:308[B]:ARG:HB2	2.57	0.44
4:B:545[B]:VAL:O	4:B:545[B]:VAL:HG22	2.17	0.44
1:U:3[A]:DG:H2''	1:U:4[A]:DC:O5'	2.18	0.44
4:B:464[A]:GLN:O	4:B:472[A]:LYS:O	2.35	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:U:9[B]:DC:H5''	1:U:9[B]:DC:C6	2.43	0.44
1:U:1[B]:DC:C2'	1:U:2[B]:DG:H5'	2.47	0.43
4:B:375[A]:ILE:HD13	4:B:459[A]:ASP:HB3	2.01	0.43
4:B:375[B]:ILE:HD13	4:B:459[B]:ASP:HB3	2.01	0.43
4:A:472[A]:LYS:HE2	4:A:474[A]:LEU:HD21	2.00	0.43
4:A:472[B]:LYS:HE2	4:A:474[B]:LEU:HD21	2.00	0.43
1:U:8[A]:DA:H3'	4:B:467[A]:ASN:HA	1.86	0.43
2:Q:5[A]:DA:H4'	4:B:342[A]:TRP:CZ2	2.54	0.43
2:Q:5[B]:DA:H4'	4:B:342[B]:TRP:CZ2	2.54	0.43
4:A:370[A]:THR:HG23	4:A:373[A]:GLN:OE1	2.18	0.43
4:A:436[A]:ASP:OD1	4:A:436[A]:ASP:C	2.62	0.43
4:B:272[A]:ASP:OD1	4:B:275[A]:ARG:HB2	2.19	0.43
4:A:370[B]:THR:HG23	4:A:373[B]:GLN:OE1	2.18	0.43
4:A:436[B]:ASP:OD1	4:A:436[B]:ASP:C	2.62	0.43
4:B:272[B]:ASP:OD1	4:B:275[B]:ARG:HB2	2.19	0.43
1:T:9[A]:DC:H2''	1:T:10[A]:DT:H6	1.85	0.42
3:D:1[A]:DG:OP2	4:A:275[A]:ARG:NH1	2.52	0.42
4:A:434[A]:HIS:HA	4:A:435[A]:PRO:HD3	1.85	0.42
3:D:1[B]:DG:OP2	4:A:275[B]:ARG:NH1	2.52	0.42
1:U:3[B]:DG:H2''	1:U:4[B]:DC:C6	2.55	0.42
4:A:434[B]:HIS:HA	4:A:435[B]:PRO:HD3	1.85	0.42
4:A:445[A]:SER:HB3	4:B:441[A]:ARG:NH1	2.34	0.42
4:A:445[B]:SER:HB3	4:B:441[B]:ARG:NH1	2.34	0.42
4:A:250[A]:THR:HG22	6:A:1118[A]:HOH:O	2.19	0.42
4:A:250[B]:THR:HG22	6:A:1118[B]:HOH:O	2.19	0.42
4:B:332[A]:VAL:HB	4:B:333[A]:PRO:HD3	2.02	0.42
4:B:572[A]:GLU:CG	6:B:864[A]:HOH:O	2.55	0.42
4:B:332[B]:VAL:HB	4:B:333[B]:PRO:HD3	2.02	0.42
4:B:572[B]:GLU:CG	6:B:864[B]:HOH:O	2.55	0.42
4:B:541[A]:HIS:CD2	4:B:541[A]:HIS:N	2.87	0.41
4:B:541[B]:HIS:CD2	4:B:541[B]:HIS:N	2.87	0.41
1:T:1[A]:DC:H2''	1:T:2[A]:DG:H5'	2.01	0.41
4:B:267[A]:TYR:CE1	4:B:275[A]:ARG:HD2	2.55	0.41
1:T:1[B]:DC:H2''	1:T:2[B]:DG:H5'	2.01	0.41
4:A:519[B]:LEU:CD2	4:A:565[B]:LEU:HD21	2.50	0.41
4:B:267[B]:TYR:CE1	4:B:275[B]:ARG:HD2	2.55	0.41
1:T:5[B]:DC:OP2	4:A:514[B]:ARG:CZ	2.66	0.41
4:A:265[A]:LYS:NZ	6:A:837[A]:HOH:O	2.53	0.41
4:A:265[B]:LYS:NZ	6:A:837[B]:HOH:O	2.53	0.41
4:A:250[A]:THR:HG22	4:A:250[A]:THR:O	2.20	0.41
4:A:250[B]:THR:HG22	4:A:250[B]:THR:O	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:B:494[A]:VAL:HB	4:B:495[A]:PRO:HD2	2.03	0.41
4:B:494[B]:VAL:HB	4:B:495[B]:PRO:HD2	2.03	0.41
4:B:324[A]:LYS:HD2	6:B:1025[A]:HOH:O	2.22	0.40
4:B:444[A]:PHE:CZ	4:B:473[A]:TYR:HB2	2.56	0.40
4:B:324[B]:LYS:HD2	6:B:1025[B]:HOH:O	2.22	0.40
4:B:444[B]:PHE:CZ	4:B:473[B]:TYR:HB2	2.56	0.40
1:T:3[B]:DG:O3'	1:T:4[B]:DC:O5'	2.39	0.40
4:B:557[A]:LYS:HE3	4:B:567[A]:TYR:CZ	2.56	0.40
1:U:4[B]:DC:H5'	1:U:5[B]:DC:H5'	2.04	0.40
4:B:557[B]:LYS:HE3	4:B:567[B]:TYR:CZ	2.56	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	
4	1-A	324/335 (97%)	315 (97%)	8 (2%)	1 (0%)	36	40
4	1-B	324/335 (97%)	311 (96%)	10 (3%)	3 (1%)	14	12
4	2-A	324/335 (97%)	315 (97%)	8 (2%)	1 (0%)	36	40
4	2-B	321/335 (96%)	309 (96%)	8 (2%)	4 (1%)	10	7
All	All	1293/1340 (96%)	1250 (97%)	34 (3%)	9 (1%)	18	17

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	2-B	463[B]	SER
4	1-A	470[A]	GLN
4	1-B	465[A]	GLU
4	2-A	470[B]	GLN
4	1-B	251[A]	ASN

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Mol	Chain	Res	Type
4	2-B	251[B]	ASN
4	2-B	390[B]	GLU
4	1-B	540[A]	THR
4	2-B	540[B]	THR

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	
4	1-A	267/280 (95%)	265 (99%)	2 (1%)	76	82
4	1-B	269/280 (96%)	266 (99%)	3 (1%)	65	75
All	All	536/560 (96%)	531 (99%)	5 (1%)	70	79

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	1-A	300[A]	CYS
4	1-A	396[A]	GLU
4	1-B	265[A]	LYS
4	1-B	300[A]	CYS
4	1-B	431[A]	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
4	1-A	327[A]	HIS
4	1-A	379[A]	HIS
4	1-A	400[A]	GLN
4	1-A	486[A]	HIS
4	1-B	355[A]	GLN
4	1-B	379[A]	HIS
4	1-B	471[A]	GLN
4	1-B	486[A]	HIS
4	1-B	541[A]	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 12 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](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	2-T	3

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
2	T	10[B]:DT	O3'	11[B]:DG	P	2.11
2	T	3[B]:DG	O3'	4[B]:DC	P	1.99

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
2	T	4[B]:DC	O3'	5[B]:DC	P	1.77

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	1-T	11/11 (100%)	2.93	7 (63%) 0 0	24, 29, 40, 51	11 (100%)
1	1-U	11/11 (100%)	2.96	10 (90%) 0 0	11, 15, 23, 23	11 (100%)
1	2-T	0/11	-	-	-	-
1	2-U	0/11	-	-	-	-
2	1-P	6/6 (100%)	0.69	1 (16%) 4 3	16, 16, 29, 31	6 (100%)
2	1-Q	6/6 (100%)	0.74	0 100 100	17, 18, 30, 33	6 (100%)
2	2-P	0/6	-	-	-	-
2	2-Q	0/6	-	-	-	-
3	1-D	4/4 (100%)	0.46	0 100 100	15, 20, 24, 27	4 (100%)
3	1-E	4/4 (100%)	0.53	0 100 100	17, 19, 25, 28	4 (100%)
3	2-D	0/4	-	-	-	-
3	2-E	0/4	-	-	-	-
4	1-A	326/335 (97%)	0.64	25 (7%) 19 17	9, 15, 26, 37	326 (100%)
4	1-B	326/335 (97%)	0.55	20 (6%) 27 25	5, 14, 24, 35	326 (100%)
4	2-A	0/335	-	-	-	-
4	2-B	0/335	-	-	-	-
All	All	694/1424 (48%)	0.67	63 (9%) 15 14	5, 15, 27, 51	694 (100%)

All (63) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	1-A	470[A]	GLN	11.8
4	1-A	468[A]	GLY	8.2
4	1-B	465[A]	GLU	8.1
4	1-B	467[A]	ASN	7.3
4	1-A	469[A]	GLN	6.9
4	1-B	469[A]	GLN	6.3
4	1-A	471[A]	GLN	6.0
1	1-T	1[A]	DC	5.9

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Mol	Chain	Res	Type	RSRZ
4	1-B	470[A]	GLN	5.5
1	1-T	3[A]	DG	5.2
4	1-A	540[A]	THR	5.1
1	1-T	2[A]	DG	5.0
4	1-B	466[A]	GLU	4.8
4	1-B	464[A]	GLN	4.6
4	1-A	539[A]	ASN	4.4
4	1-B	468[A]	GLY	4.3
1	1-U	3[A]	DG	4.1
4	1-A	466[A]	GLU	4.1
4	1-A	541[A]	HIS	4.1
4	1-A	545[A]	VAL	4.0
4	1-B	250[A]	THR	3.9
1	1-U	4[A]	DC	3.9
1	1-U	9[A]	DC	3.8
4	1-B	463[A]	SER	3.8
4	1-A	467[A]	ASN	3.8
4	1-B	444[A]	PHE	3.8
1	1-U	11[A]	DG	3.7
4	1-A	546[A]	GLY	3.6
4	1-A	464[A]	GLN	3.5
4	1-A	444[A]	PHE	3.4
4	1-B	443[A]	ILE	3.3
4	1-A	565[A]	LEU	3.1
1	1-T	6[A]	DG	3.0
1	1-U	8[A]	DA	2.9
4	1-A	320[A]	GLY	2.9
4	1-A	406[A]	PHE	2.8
4	1-A	465[A]	GLU	2.8
1	1-U	5[A]	DC	2.8
4	1-B	462[A]	VAL	2.8
1	1-T	7[A]	DT	2.8
4	1-B	406[A]	PHE	2.8
4	1-A	472[A]	LYS	2.7
2	1-P	1[A]	DC	2.7
1	1-U	10[A]	DT	2.7
4	1-B	540[A]	THR	2.6
4	1-B	541[A]	HIS	2.6
4	1-A	405[A]	ALA	2.6
1	1-U	2[A]	DG	2.4
4	1-B	539[A]	ASN	2.4
4	1-A	250[A]	THR	2.4

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Mol	Chain	Res	Type	RSRZ
1	1-U	6[A]	DG	2.4
1	1-T	9[A]	DC	2.4
4	1-A	542[A]	GLY	2.3
4	1-B	281[A]	LYS	2.3
4	1-A	537[A]	VAL	2.3
4	1-B	545[A]	VAL	2.3
4	1-B	332[A]	VAL	2.2
4	1-A	453[A]	GLN	2.2
4	1-A	443[A]	ILE	2.1
4	1-A	304[A]	GLY	2.1
1	1-U	7[A]	DT	2.1
4	1-B	542[A]	GLY	2.1
1	1-T	8[A]	DA	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($\text{\AA}^2$)	Q<0.9
5	NA	1-A	800[A]	1/1	0.94	0.11	39,39,39,39	1
5	NA	2-A	800[B]	1/1	-	-	39,39,39,39	1
5	NA	1-B	805[A]	1/1	0.94	0.11	50,50,50,50	1
5	NA	2-A	801[B]	1/1	-	-	32,32,32,32	1
5	NA	1-B	802[A]	1/1	0.95	0.04	26,26,26,26	1
5	NA	2-A	804[B]	1/1	-	-	32,32,32,32	1
5	NA	1-B	803[A]	1/1	0.96	0.06	30,30,30,30	1
5	NA	2-B	802[B]	1/1	-	-	26,26,26,26	1
5	NA	1-A	801[A]	1/1	0.96	0.04	32,32,32,32	1
5	NA	2-B	803[B]	1/1	-	-	30,30,30,30	1

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	NA	1-A	804[A]	1/1	0.99	0.03	32,32,32,32	1
5	NA	2-B	805[B]	1/1	-	-	50,50,50,50	1

6.5 Other polymers [i](#)

There are no such residues in this entry.