



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 09:23 PM UTC

PDB ID : 9ICI / pdb_00009ici
Title : DNA POLYMERASE BETA (POL B) (E.C.2.7.7.7) COMPLEXED WITH SEVEN BASE PAIRS OF DNA; SOAKED IN THE PRESENCE OF DTTP (1 MILLIMOLAR) AND ZNCL2 (1 MILLIMOLAR)
Authors : Pelletier, H.; Sawaya, M.R.
Deposited on : 1995-12-15
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	:	4-5-2 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

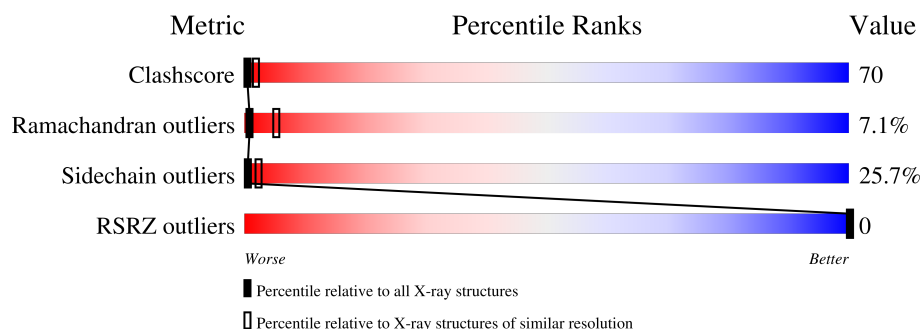
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 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))
Clashscore	190562	1539 (3.10-3.10)
Ramachandran outliers	187476	1467 (3.10-3.10)
Sidechain outliers	187428	1467 (3.10-3.10)
RSRZ outliers	180081	1456 (3.10-3.10)

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	T	8	
2	P	8	
3	A	335	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 3045 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(*CP*AP*TP*TP*AP*GP*AP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	T	8	Total	C	N	O	P	0	0	0
			145	69	27	42	7			

- Molecule 2 is a DNA chain called DNA (5'-D(*TP*CP*TP*AP*AP*TP*GP*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	P	8	Total	C	N	O	P	0	0	0
			148	69	24	47	8			

- Molecule 3 is a protein called PROTEIN (DNA POLYMERASE BETA (E.C.2.7.7.7)).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	A	327	Total	C	N	O	S	26	0	0
			2623	1657	458	499	9			

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	Zn	0	0
			2	2		

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	2	Total	Na	0	0
			2	2		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	T	13	Total	O	0	0
			13	13		

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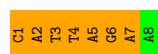
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	P	24	Total 24	O 24	0	0
6	A	88	Total 88	O 88	0	0

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: DNA (5'-D(*CP*AP*TP*TP*AP*GP*AP*A)-3')

Chain T: 



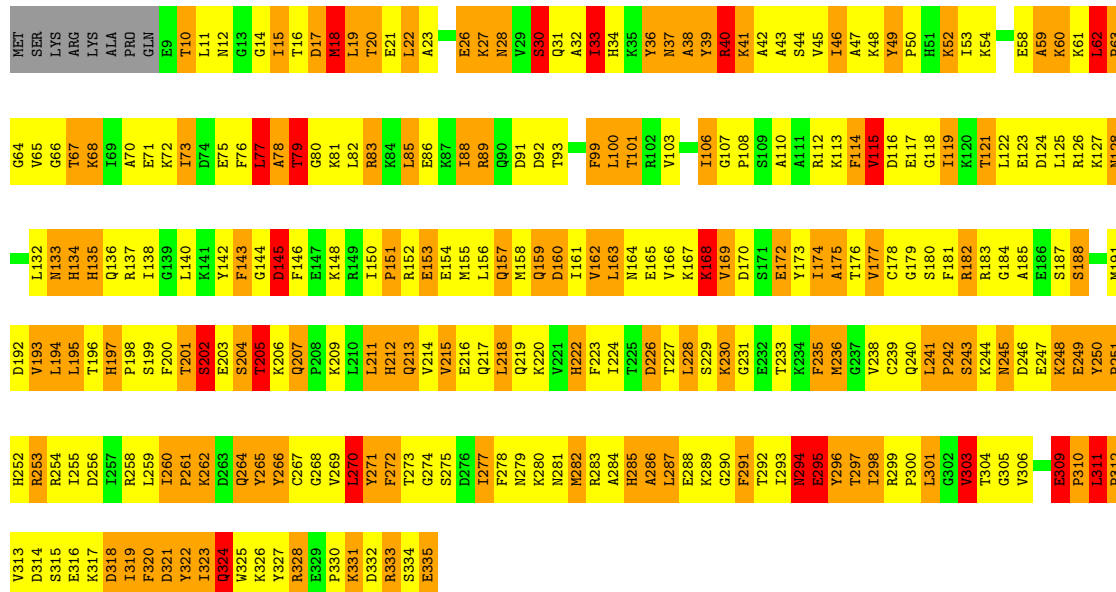
- Molecule 2: DNA (5'-D(*TP*CP*TP*AP*AP*TP*GP*T)-3')

Chain P: 



- Molecule 3: PROTEIN (DNA POLYMERASE BETA (E.C.2.7.7.7))

Chain A: 



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	180.93Å 57.54Å 48.22Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.10 20.00 – 3.10	Depositor EDS
% Data completeness (in resolution range)	94.0 (20.00-3.10) 89.9 (20.00-3.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.30 (at 2.79Å)	Xtriage
Refinement program	TNT 5-D	Depositor
R, R_{free}	0.169 , (Not available) 0.161 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	33.8	Xtriage
Anisotropy	0.386	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.16 , 169.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.42$, $\langle L^2 \rangle = 0.24$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	3045	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.97% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, 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	T	0.93	0/162	2.77	13/249 (5.2%)
2	P	1.11	1/164 (0.6%)	4.01	19/250 (7.6%)
3	A	1.54	9/2672 (0.3%)	2.24	133/3590 (3.7%)
All	All	1.49	10/2998 (0.3%)	2.42	165/4089 (4.0%)

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
3	A	1	0

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	P	1	DT	OP3-P	6.33	1.61	1.48
3	A	115	VAL	CA-CB	-6.05	1.46	1.54
3	A	114	PHE	C-N	-5.89	1.26	1.33
3	A	160	ASP	CA-C	-5.63	1.45	1.52
3	A	193	VAL	CA-CB	-5.35	1.47	1.53
3	A	15	ILE	CA-C	-5.21	1.46	1.52
3	A	235	PHE	C-O	-5.20	1.18	1.24
3	A	251	PRO	N-CA	-5.13	1.41	1.46
3	A	62	LEU	C-N	-5.11	1.28	1.33
3	A	67	THR	CA-CB	5.05	1.61	1.53

All (165) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	P	1	DT	C6-N1-C1'	-24.14	83.15	119.35
2	P	6	DT	C2-N1-C1'	23.52	154.64	119.35
2	P	6	DT	C6-N1-C1'	-23.51	84.08	119.35
2	P	1	DT	C2-N1-C1'	22.23	152.70	119.35
1	T	7	DA	C4-N9-C1'	-16.69	102.02	127.05
2	P	3	DT	C2-N1-C1'	16.12	143.53	119.35
2	P	3	DT	C6-N1-C1'	-15.98	95.38	119.35
1	T	7	DA	C8-N9-C1'	15.10	149.71	127.05
1	T	4	DT	C2-N1-C1'	13.90	140.20	119.35
1	T	4	DT	C6-N1-C1'	-13.88	98.53	119.35
3	A	222	HIS	CA-CB-CG	-13.03	100.77	113.80
2	P	5	DA	C4-N9-C1'	12.65	146.02	127.05
2	P	5	DA	C8-N9-C1'	-12.05	108.98	127.05
1	T	2	DA	C4-N9-C1'	-10.47	111.35	127.05
3	A	49	TYR	CA-C-N	10.42	132.87	119.84
3	A	49	TYR	C-N-CA	10.42	132.87	119.84
1	T	2	DA	C8-N9-C1'	9.83	141.79	127.05
3	A	334	SER	N-CA-C	9.10	122.34	111.33
3	A	260	ILE	N-CA-C	8.85	116.45	109.19
1	T	3	DT	C6-N1-C1'	8.85	132.62	119.35
3	A	271	TYR	CA-CB-CG	-8.72	98.20	113.90
3	A	99	PHE	CA-CB-CG	-8.64	105.16	113.80
3	A	313	VAL	N-CA-C	8.45	118.85	106.85
3	A	272	PHE	CA-CB-CG	-8.39	105.41	113.80
2	P	7	DG	C4-N9-C1'	-8.38	114.43	127.00
3	A	297	THR	N-CA-C	8.30	120.20	108.74
1	T	3	DT	C2-N1-C1'	-8.09	107.22	119.35
3	A	143	PHE	CA-CB-CG	-8.05	105.75	113.80
3	A	286	ALA	CA-C-N	7.98	130.97	120.28
3	A	286	ALA	C-N-CA	7.98	130.97	120.28
3	A	30	SER	O-C-N	-7.96	113.95	123.10
3	A	134	HIS	N-CA-C	7.93	120.63	111.11
3	A	177	VAL	N-CA-C	-7.91	95.39	107.73
3	A	45	VAL	N-CA-CB	7.75	119.07	110.62
3	A	15	ILE	N-CA-CB	7.71	119.07	110.51
3	A	285	HIS	N-CA-C	7.71	120.36	111.11
3	A	291	PHE	N-CA-C	7.57	119.53	108.86
3	A	193	VAL	N-CA-C	7.52	118.30	106.88
3	A	32	ALA	N-CA-C	7.48	120.08	110.65
3	A	195	LEU	N-CA-C	7.45	121.68	109.24
3	A	92	ASP	N-CA-C	7.42	120.07	111.02
3	A	134	HIS	CA-CB-CG	7.34	121.14	113.80
3	A	92	ASP	N-CA-CB	7.32	120.94	109.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	P	2	DC	C6-N1-C1'	-7.27	108.79	119.70
2	P	7	DG	C8-N9-C1'	7.27	137.91	127.00
3	A	30	SER	CA-C-N	-7.25	111.21	122.08
3	A	30	SER	C-N-CA	-7.25	111.21	122.08
3	A	91	ASP	N-CA-C	7.22	121.32	110.64
3	A	266	TYR	CA-CB-CG	-7.20	100.95	113.90
3	A	160	ASP	O-C-N	7.10	129.68	122.08
3	A	135	HIS	O-C-N	7.09	129.40	122.03
3	A	228	LEU	N-CA-C	-7.02	103.71	112.90
3	A	26	GLU	CA-C-N	7.00	130.61	120.38
3	A	26	GLU	C-N-CA	7.00	130.61	120.38
1	T	5	DA	P-O5'-C5'	-6.97	109.55	120.00
3	A	227	THR	N-CA-CB	6.96	121.85	110.37
2	P	2	DC	C2-N1-C1'	6.88	130.03	119.70
3	A	62	LEU	N-CA-C	6.82	120.03	110.20
3	A	49	TYR	O-C-N	6.75	129.08	121.32
3	A	212	HIS	CA-CB-CG	-6.73	107.07	113.80
3	A	169	VAL	N-CA-C	6.70	116.83	110.53
3	A	241	LEU	O-C-N	6.70	127.98	121.28
1	T	6	DG	C4-N9-C1'	-6.67	116.99	127.00
3	A	215	VAL	CB-CA-C	6.66	121.41	112.22
3	A	145	ASP	CB-CA-C	-6.63	97.22	110.42
3	A	320	PHE	CA-C-N	6.47	129.27	120.54
3	A	320	PHE	C-N-CA	6.47	129.27	120.54
3	A	203	GLU	N-CA-C	6.39	120.94	111.04
3	A	264	GLN	CB-CG-CD	-6.36	101.79	112.60
3	A	320	PHE	O-C-N	6.33	128.59	122.07
3	A	202	SER	CA-C-N	6.26	130.28	120.89
3	A	202	SER	C-N-CA	6.26	130.28	120.89
3	A	312	PRO	O-C-N	6.24	127.16	122.73
3	A	294	ASN	N-CA-C	6.23	118.65	109.24
3	A	163	LEU	N-CA-C	6.22	118.87	111.71
2	P	6	DT	P-O5'-C5'	-6.22	110.67	120.00
3	A	116	ASP	CA-CB-CG	-6.21	106.39	112.60
3	A	333	ARG	N-CA-C	-6.17	105.68	112.72
2	P	7	DG	P-O5'-C5'	-6.14	110.78	120.00
3	A	36	TYR	N-CA-CB	-6.12	101.10	110.16
2	P	3	DT	O5'-C5'-C4'	-6.09	101.67	110.80
3	A	21	GLU	N-CA-C	-6.08	103.61	111.02
3	A	226	ASP	CA-CB-CG	6.05	118.65	112.60
3	A	261	PRO	N-CA-C	-6.02	101.71	110.80
1	T	1	DC	P-O3'-C3'	6.02	129.23	120.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	250	TYR	N-CA-C	6.01	118.20	109.84
3	A	40	ARG	N-CA-C	6.00	120.68	112.04
3	A	261	PRO	N-CA-CB	5.99	108.63	103.36
3	A	264	GLN	N-CA-C	5.98	117.47	110.41
3	A	168	LYS	N-CA-CB	5.98	119.59	110.14
3	A	151	PRO	N-CA-CB	5.96	108.60	103.36
3	A	175	ALA	N-CA-C	5.96	119.19	109.06
3	A	21	GLU	CB-CA-C	-5.94	101.47	110.92
3	A	116	ASP	CB-CA-C	5.94	122.07	110.67
3	A	270	LEU	CA-C-O	5.93	127.05	120.82
3	A	226	ASP	N-CA-C	5.93	118.08	109.07
3	A	192	ASP	CA-CB-CG	5.92	118.52	112.60
3	A	309	GLU	N-CA-C	5.90	122.85	109.81
2	P	3	DT	N1-C1'-C2'	5.85	122.27	113.50
3	A	40	ARG	CB-CA-C	5.85	121.26	110.56
3	A	48	LYS	O-C-N	5.85	128.41	122.09
3	A	282	MET	N-CA-C	-5.84	105.05	111.82
3	A	60	LYS	CA-CB-CG	-5.83	102.43	114.10
3	A	115	VAL	O-C-N	5.82	128.38	121.80
3	A	243	SER	CA-C-N	5.82	132.65	121.54
3	A	243	SER	C-N-CA	5.82	132.65	121.54
3	A	294	ASN	N-CA-CB	5.81	121.80	111.69
3	A	197	HIS	CA-CB-CG	5.78	119.58	113.80
3	A	67	THR	CA-CB-OG1	5.75	118.22	109.60
1	T	6	DG	C8-N9-C1'	5.74	135.60	127.00
3	A	197	HIS	CB-CA-C	5.74	118.86	109.97
3	A	83	ARG	N-CA-CB	5.73	118.32	110.01
3	A	311	LEU	N-CA-C	5.73	117.81	109.84
3	A	28	ASN	CA-CB-CG	-5.72	106.88	112.60
3	A	294	ASN	CA-CB-CG	5.71	118.31	112.60
3	A	17	ASP	N-CA-C	5.67	117.14	111.07
3	A	264	GLN	CG-CD-NE2	-5.67	107.89	116.40
3	A	309	GLU	CA-C-N	5.64	126.89	119.84
3	A	309	GLU	C-N-CA	5.64	126.89	119.84
3	A	106	ILE	N-CA-C	5.63	115.90	107.51
2	P	1	DT	C1'-O4'-C4'	-5.59	101.32	109.70
2	P	3	DT	P-O5'-C5'	5.59	128.38	120.00
3	A	282	MET	N-CA-CB	5.57	118.92	110.28
3	A	157	GLN	N-CA-CB	5.56	118.39	110.16
3	A	62	LEU	CA-C-O	5.49	126.91	120.87
3	A	88	ILE	CB-CA-C	-5.49	104.67	111.70
3	A	236	MET	CA-C-O	-5.41	114.52	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	212	HIS	N-CA-C	5.38	117.14	111.28
3	A	45	VAL	O-C-N	5.36	127.46	121.94
3	A	162	VAL	N-CA-CB	5.33	117.13	110.47
2	P	2	DC	P-O5'-C5'	-5.32	112.02	120.00
3	A	322	TYR	CA-CB-CG	-5.29	104.38	113.90
3	A	26	GLU	O-C-N	5.28	127.52	122.03
3	A	59	ALA	O-C-N	5.26	127.48	122.07
3	A	318	ASP	CA-CB-CG	-5.25	107.35	112.60
3	A	211	LEU	CA-C-N	5.25	127.31	120.28
3	A	211	LEU	C-N-CA	5.25	127.31	120.28
3	A	227	THR	CA-CB-CG2	-5.24	101.60	110.50
3	A	195	LEU	N-CA-CB	-5.23	101.53	111.00
3	A	20	THR	N-CA-CB	5.23	117.87	110.13
3	A	213	GLN	CA-C-N	5.23	128.74	120.47
3	A	213	GLN	C-N-CA	5.23	128.74	120.47
3	A	117	GLU	N-CA-C	-5.22	106.76	113.23
3	A	321	ASP	O-C-N	5.22	127.52	122.09
3	A	49	TYR	CB-CA-C	5.21	120.43	110.17
3	A	77	LEU	CB-CA-C	5.21	118.98	110.96
3	A	298	ILE	CA-C-O	5.16	124.81	120.22
3	A	241	LEU	CA-C-N	5.16	126.29	119.84
3	A	241	LEU	C-N-CA	5.16	126.29	119.84
3	A	66	GLY	O-C-N	5.15	127.77	122.88
3	A	116	ASP	N-CA-CB	5.13	118.23	110.28
3	A	143	PHE	O-C-N	5.12	128.00	122.11
3	A	319	ILE	CB-CA-C	-5.12	105.42	111.97
3	A	79	THR	CA-CB-CG2	-5.11	101.82	110.50
3	A	60	LYS	CB-CG-CD	5.10	123.03	111.30
3	A	115	VAL	CA-CB-CG2	-5.09	101.75	110.40
3	A	91	ASP	N-CA-CB	5.06	116.98	109.19
3	A	295	GLU	CB-CG-CD	5.06	121.20	112.60
3	A	63	PRO	N-CA-C	-5.05	102.31	110.55
3	A	18	MET	CA-C-N	5.05	127.55	120.28
3	A	18	MET	C-N-CA	5.05	127.55	120.28
3	A	38	ALA	CA-C-O	5.03	126.08	120.90
1	T	5	DA	O5'-C5'-C4'	5.03	118.34	110.80
3	A	79	THR	N-CA-CB	-5.00	101.90	110.16
3	A	258	ARG	N-CA-C	5.00	116.55	108.34

All (1) chirality outliers are listed below:

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Mol	Chain	Res	Type	Atom
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Mol	Chain	Res	Type	Atom
3	A	92	ASP	CA

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	T	145	0	80	8	0
2	P	148	0	80	18	0
3	A	2623	0	2641	366	0
4	A	2	0	0	0	0
5	A	2	0	0	0	0
6	A	88	0	0	17	0
6	P	24	0	0	3	0
6	T	13	0	0	3	0
All	All	3045	0	2801	389	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 70.

All (389) 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)
2:P:5:DA:H2''	2:P:6:DT:H5''	1.40	1.03
2:P:1:DT:H2''	2:P:2:DC:H5'	1.39	1.01
3:A:31:GLN:HB2	3:A:112:ARG:HH12	1.25	1.01
3:A:19:LEU:HD23	3:A:43:ALA:HA	1.40	1.00
3:A:23:ALA:HB2	3:A:39:TYR:HB3	1.46	0.98
3:A:172:GLU:HB3	3:A:197:HIS:CD2	2.00	0.95
3:A:245:ASN:N	3:A:245:ASN:HD22	1.65	0.93
3:A:293:ILE:HD13	3:A:298:ILE:HG13	1.51	0.93
3:A:165:GLU:HA	3:A:168:LYS:HG2	1.51	0.92
3:A:286:ALA:HA	3:A:323:ILE:HG21	1.50	0.92

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:270:LEU:HD21	3:A:282:MET:HE1	1.51	0.92
3:A:218:LEU:HB2	3:A:224:ILE:HD12	1.52	0.91
3:A:125:LEU:HD22	3:A:132:LEU:HD21	1.53	0.90
3:A:11:LEU:HD23	3:A:12:ASN:H	1.39	0.87
3:A:172:GLU:HG3	3:A:198:PRO:HG2	1.56	0.86
3:A:155:MET:HE2	3:A:188:SER:HB2	1.58	0.84
3:A:19:LEU:HB3	3:A:43:ALA:HB2	1.60	0.84
2:P:6:DT:H2''	2:P:7:DG:H5''	1.60	0.83
3:A:119:ILE:HG23	3:A:124:ASP:HB3	1.58	0.83
2:P:5:DA:H2''	2:P:6:DT:C5'	2.09	0.82
3:A:133:ASN:HD22	3:A:134:HIS:N	1.77	0.81
3:A:175:ALA:HB2	3:A:195:LEU:HD13	1.60	0.81
3:A:194:LEU:HD21	3:A:272:PHE:HB2	1.62	0.81
3:A:182:ARG:HG2	3:A:182:ARG:HH11	1.43	0.81
3:A:18:MET:CE	3:A:76:PHE:HB2	2.11	0.80
3:A:165:GLU:CD	3:A:168:LYS:HD3	2.06	0.80
3:A:31:GLN:HB2	3:A:112:ARG:NH1	1.96	0.79
3:A:277:ILE:HG12	3:A:335:GLU:HA	1.65	0.79
3:A:154:GLU:O	3:A:158:MET:HG3	1.83	0.79
3:A:209:LYS:O	3:A:213:GLN:HG3	1.83	0.78
3:A:41:LYS:HE2	3:A:64:GLY:CA	2.14	0.77
3:A:18:MET:HE3	3:A:76:PHE:HB2	1.64	0.77
3:A:49:TYR:CE2	3:A:53:ILE:HG12	2.20	0.77
3:A:291:PHE:HD2	3:A:323:ILE:HG22	1.50	0.77
3:A:108:PRO:O	3:A:112:ARG:HG3	1.85	0.77
2:P:6:DT:C2'	2:P:7:DG:H5''	2.15	0.76
2:P:1:DT:H2''	2:P:2:DC:C5'	2.14	0.76
3:A:52:LYS:HD3	3:A:54:LYS:HE3	1.66	0.76
3:A:172:GLU:HB3	3:A:197:HIS:HD2	1.49	0.76
3:A:323:ILE:O	3:A:324:GLN:HG2	1.85	0.76
3:A:197:HIS:CD2	3:A:198:PRO:HD2	2.21	0.75
3:A:15:ILE:O	3:A:19:LEU:HD22	1.86	0.75
3:A:299:ARG:HD2	3:A:310:PRO:HD3	1.67	0.75
3:A:243:SER:HB3	3:A:249:GLU:HA	1.69	0.74
3:A:191:MET:HA	6:A:502:HOH:O	1.87	0.74
3:A:319:ILE:O	3:A:322:TYR:HB2	1.86	0.74
3:A:330:PRO:HA	3:A:333:ARG:CG	2.17	0.74
3:A:180:SER:HB2	3:A:185:ALA:HB2	1.70	0.74
3:A:267:CYS:SG	3:A:297:THR:HA	2.28	0.73
3:A:245:ASN:HD22	3:A:245:ASN:H	1.34	0.73
3:A:119:ILE:CG2	3:A:124:ASP:HB3	2.19	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:285:HIS:NE2	3:A:289:LYS:HG2	2.04	0.72
3:A:287:LEU:HD13	3:A:291:PHE:O	1.89	0.72
3:A:165:GLU:HA	3:A:168:LYS:CG	2.18	0.72
3:A:41:LYS:HD3	3:A:42:ALA:H	1.54	0.72
6:P:568:HOH:O	3:A:110:ALA:HB2	1.88	0.72
3:A:41:LYS:HE2	3:A:64:GLY:HA3	1.70	0.72
3:A:172:GLU:HG3	3:A:198:PRO:CG	2.18	0.72
3:A:42:ALA:O	3:A:46:ILE:HG23	1.89	0.72
3:A:271:TYR:HB2	6:A:592:HOH:O	1.88	0.71
3:A:180:SER:HB2	3:A:185:ALA:CB	2.20	0.71
3:A:209:LYS:HA	3:A:212:HIS:HB2	1.71	0.71
1:T:6:DG:N7	6:T:652:HOH:O	2.23	0.71
3:A:172:GLU:CG	3:A:198:PRO:HG2	2.20	0.70
3:A:278:PHE:HE1	3:A:328:ARG:HD3	1.55	0.70
2:P:5:DA:H1'	6:P:565:HOH:O	1.92	0.70
3:A:157:GLN:O	3:A:160:ASP:HB3	1.91	0.70
3:A:11:LEU:HD23	3:A:12:ASN:N	2.05	0.70
3:A:286:ALA:HA	3:A:323:ILE:CG2	2.19	0.69
3:A:330:PRO:HA	3:A:333:ARG:HG3	1.74	0.69
3:A:158:MET:HE3	3:A:191:MET:SD	2.32	0.69
2:P:5:DA:C2'	2:P:6:DT:H5''	2.20	0.69
3:A:23:ALA:HB2	3:A:39:TYR:CB	2.22	0.69
2:P:6:DT:C3'	2:P:7:DG:H5''	2.23	0.68
3:A:119:ILE:N	3:A:119:ILE:HD13	2.08	0.68
3:A:159:GLN:HG2	3:A:160:ASP:N	2.08	0.68
3:A:270:LEU:HD13	3:A:316:GLU:OE1	1.92	0.68
3:A:323:ILE:C	3:A:324:GLN:HG2	2.19	0.68
3:A:114:PHE:HB3	3:A:119:ILE:HB	1.74	0.68
3:A:16:THR:HG23	3:A:46:ILE:HD11	1.74	0.68
3:A:100:LEU:HD21	3:A:119:ILE:O	1.94	0.68
3:A:151:PRO:HG2	3:A:154:GLU:HG3	1.76	0.68
3:A:46:ILE:HD12	3:A:46:ILE:O	1.93	0.68
3:A:166:VAL:CG1	3:A:173:TYR:HB3	2.24	0.68
3:A:277:ILE:HD13	3:A:277:ILE:H	1.59	0.68
3:A:162:VAL:O	3:A:166:VAL:HG23	1.94	0.67
3:A:253:ARG:HG3	3:A:253:ARG:HH11	1.58	0.67
3:A:270:LEU:HD21	3:A:282:MET:CE	2.22	0.67
1:T:5:DA:N3	6:T:564:HOH:O	2.26	0.67
3:A:293:ILE:HD13	3:A:298:ILE:CG1	2.25	0.67
2:P:6:DT:H2''	2:P:7:DG:C5'	2.25	0.67
3:A:245:ASN:H	3:A:245:ASN:ND2	1.90	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:T:6:DG:O6	2:P:2:DC:N3	2.28	0.66
3:A:278:PHE:CE2	3:A:333:ARG:HD2	2.31	0.66
3:A:215:VAL:O	3:A:219:GLN:HB2	1.95	0.66
3:A:59:ALA:O	3:A:65:VAL:HG21	1.95	0.66
3:A:240:GLN:NE2	3:A:250:TYR:O	2.28	0.66
3:A:178:CYS:SG	3:A:194:LEU:HD22	2.35	0.66
3:A:294:ASN:O	3:A:296:TYR:N	2.29	0.66
3:A:204:SER:O	3:A:206:LYS:N	2.29	0.65
3:A:182:ARG:HG2	3:A:182:ARG:NH1	2.06	0.65
3:A:299:ARG:HG2	3:A:310:PRO:HD3	1.77	0.65
3:A:211:LEU:HD12	3:A:211:LEU:O	1.96	0.65
3:A:286:ALA:CA	3:A:323:ILE:HG21	2.25	0.65
3:A:197:HIS:CE1	3:A:199:SER:HB3	2.32	0.64
3:A:303:VAL:C	3:A:305:GLY:H	2.06	0.64
3:A:15:ILE:HD11	3:A:77:LEU:HD11	1.80	0.64
3:A:103:VAL:HG22	3:A:143:PHE:CE1	2.33	0.64
3:A:175:ALA:HB2	3:A:195:LEU:CD1	2.28	0.64
3:A:264:GLN:HA	6:A:536:HOH:O	1.97	0.64
3:A:155:MET:HE2	3:A:188:SER:CB	2.27	0.64
3:A:299:ARG:HG2	3:A:310:PRO:CD	2.27	0.64
3:A:218:LEU:CB	3:A:224:ILE:HD12	2.28	0.64
3:A:62:LEU:HD12	3:A:63:PRO:HD2	1.80	0.63
3:A:253:ARG:HD3	6:A:521:HOH:O	1.97	0.63
3:A:299:ARG:CD	3:A:310:PRO:HD3	2.28	0.63
3:A:253:ARG:NH1	6:A:503:HOH:O	2.32	0.63
3:A:299:ARG:CG	3:A:310:PRO:HD3	2.29	0.63
3:A:285:HIS:CE1	3:A:289:LYS:HG2	2.34	0.62
3:A:83:ARG:HA	3:A:86:GLU:HG2	1.81	0.62
3:A:73:ILE:HG22	3:A:77:LEU:HD22	1.80	0.62
3:A:73:ILE:HG22	3:A:77:LEU:CD2	2.29	0.61
3:A:125:LEU:CD2	3:A:132:LEU:HD21	2.28	0.61
3:A:33:ILE:O	3:A:36:TYR:HB3	2.01	0.61
3:A:27:LYS:HB3	3:A:36:TYR:CD1	2.35	0.61
3:A:243:SER:CB	3:A:249:GLU:HA	2.30	0.61
3:A:306:VAL:HG22	6:A:650:HOH:O	2.01	0.61
3:A:294:ASN:C	3:A:296:TYR:H	2.09	0.60
3:A:260:ILE:HG23	3:A:261:PRO:HD2	1.82	0.60
3:A:278:PHE:HB2	3:A:333:ARG:O	2.02	0.60
3:A:128:ASN:N	3:A:128:ASN:HD22	1.99	0.60
3:A:151:PRO:HB2	3:A:153:GLU:HG2	1.82	0.60
3:A:41:LYS:HD3	3:A:42:ALA:N	2.16	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:165:GLU:HA	3:A:168:LYS:CD	2.32	0.59
3:A:286:ALA:O	3:A:291:PHE:HB2	2.01	0.59
3:A:70:ALA:HA	3:A:73:ILE:HG13	1.84	0.59
3:A:278:PHE:CZ	3:A:333:ARG:HD2	2.38	0.59
3:A:282:MET:HG2	6:A:555:HOH:O	2.02	0.59
3:A:260:ILE:CG2	3:A:261:PRO:HD2	2.33	0.58
3:A:279:ASN:O	3:A:283:ARG:N	2.33	0.58
3:A:330:PRO:HA	3:A:333:ARG:HG2	1.85	0.58
3:A:213:GLN:O	3:A:216:GLU:HB2	2.03	0.58
3:A:250:TYR:HB3	6:A:577:HOH:O	2.04	0.57
3:A:15:ILE:HD13	3:A:73:ILE:CG2	2.34	0.57
3:A:41:LYS:NZ	3:A:64:GLY:O	2.35	0.57
3:A:133:ASN:O	3:A:137:ARG:HG3	2.04	0.57
3:A:165:GLU:O	3:A:169:VAL:HG12	2.05	0.57
3:A:166:VAL:HG13	3:A:173:TYR:HB3	1.85	0.57
3:A:11:LEU:H	3:A:11:LEU:CD2	2.17	0.57
3:A:291:PHE:HD1	3:A:300:PRO:HA	1.69	0.57
3:A:58:GLU:HA	3:A:61:LYS:HE2	1.87	0.57
3:A:328:ARG:HB2	3:A:333:ARG:HD3	1.87	0.56
3:A:144:GLY:O	3:A:146:PHE:N	2.38	0.56
3:A:99:PHE:HD2	3:A:100:LEU:CD1	2.18	0.56
3:A:331:LYS:HG2	3:A:332:ASP:N	2.04	0.56
3:A:195:LEU:O	3:A:260:ILE:N	2.39	0.56
3:A:18:MET:HE1	3:A:76:PHE:HB2	1.88	0.56
3:A:267:CYS:HB2	3:A:296:TYR:C	2.31	0.56
3:A:40:ARG:O	3:A:44:SER:N	2.38	0.56
3:A:328:ARG:O	3:A:333:ARG:NE	2.28	0.56
3:A:11:LEU:HD23	3:A:11:LEU:H	1.72	0.55
3:A:196:THR:OG1	3:A:197:HIS:N	2.37	0.55
1:T:3:DT:H1'	6:T:617:HOH:O	2.07	0.55
3:A:165:GLU:HA	3:A:168:LYS:HD3	1.88	0.55
3:A:16:THR:HG23	3:A:46:ILE:CD1	2.37	0.55
3:A:30:SER:HB3	6:A:561:HOH:O	2.07	0.55
3:A:164:ASN:O	3:A:168:LYS:N	2.31	0.55
3:A:206:LYS:O	3:A:207:GLN:HB2	2.07	0.55
3:A:218:LEU:HB2	3:A:224:ILE:CD1	2.32	0.55
3:A:59:ALA:O	3:A:62:LEU:HD22	2.07	0.55
3:A:103:VAL:HG22	3:A:143:PHE:CD1	2.41	0.55
3:A:291:PHE:CD1	3:A:300:PRO:HA	2.41	0.54
3:A:320:PHE:O	3:A:324:GLN:N	2.41	0.54
3:A:158:MET:HG2	3:A:241:LEU:HD21	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:85:LEU:O	3:A:89:ARG:HB2	2.07	0.54
3:A:173:TYR:OH	3:A:213:GLN:NE2	2.40	0.54
3:A:88:ILE:HG22	3:A:89:ARG:N	2.23	0.53
1:T:4:DT:O5'	3:A:231:GLY:HA3	2.08	0.53
3:A:26:GLU:O	3:A:30:SER:O	2.26	0.53
3:A:248:LYS:O	3:A:248:LYS:HG2	2.08	0.53
3:A:41:LYS:O	3:A:44:SER:HB3	2.09	0.53
3:A:121:THR:OG1	3:A:122:LEU:N	2.39	0.53
3:A:260:ILE:HG22	3:A:261:PRO:N	2.23	0.53
3:A:133:ASN:ND2	6:A:596:HOH:O	2.36	0.53
3:A:11:LEU:HD23	3:A:11:LEU:N	2.24	0.53
3:A:121:THR:HG23	3:A:124:ASP:CG	2.33	0.53
3:A:174:ILE:O	3:A:195:LEU:HD12	2.09	0.53
3:A:151:PRO:HG2	3:A:154:GLU:CG	2.38	0.53
2:P:5:DA:H2'	2:P:6:DT:H71	1.90	0.53
3:A:118:GLY:C	3:A:119:ILE:HD13	2.33	0.53
3:A:12:ASN:ND2	6:A:642:HOH:O	2.41	0.52
3:A:299:ARG:CD	3:A:310:PRO:HG3	2.40	0.52
3:A:322:TYR:C	3:A:324:GLN:H	2.16	0.52
3:A:79:THR:O	3:A:81:LYS:N	2.37	0.52
3:A:99:PHE:HD2	3:A:100:LEU:HD13	1.74	0.52
3:A:145:ASP:N	3:A:148:LYS:NZ	2.57	0.52
3:A:128:ASN:N	3:A:128:ASN:ND2	2.57	0.52
1:T:1:DC:H2''	1:T:2:DA:OP2	2.09	0.52
3:A:145:ASP:HA	3:A:148:LYS:HZ2	1.74	0.52
3:A:294:ASN:ND2	6:A:593:HOH:O	2.43	0.52
3:A:59:ALA:O	3:A:62:LEU:HB2	2.10	0.52
3:A:60:LYS:HA	3:A:65:VAL:HG23	1.91	0.52
3:A:254:ARG:NH2	3:A:256:ASP:OD1	2.37	0.52
3:A:278:PHE:HZ	3:A:320:PHE:CZ	2.28	0.52
3:A:152:ARG:NH2	3:A:181:PHE:O	2.43	0.51
3:A:36:TYR:O	3:A:40:ARG:HG2	2.10	0.51
3:A:255:ILE:HG12	3:A:256:ASP:N	2.25	0.51
3:A:317:LYS:O	3:A:320:PHE:N	2.43	0.51
3:A:31:GLN:N	6:A:641:HOH:O	2.43	0.51
3:A:79:THR:C	3:A:81:LYS:H	2.19	0.51
3:A:31:GLN:O	3:A:31:GLN:HG2	2.11	0.50
3:A:157:GLN:O	3:A:161:ILE:HG13	2.12	0.50
1:T:5:DA:H2''	1:T:6:DG:O5'	2.11	0.50
3:A:241:LEU:HB2	3:A:250:TYR:CD2	2.47	0.50
3:A:270:LEU:CD2	3:A:282:MET:HE1	2.35	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:49:TYR:HE2	3:A:53:ILE:HG12	1.70	0.50
3:A:223:PHE:O	3:A:239:CYS:HA	2.12	0.50
3:A:332:ASP:OD1	3:A:332:ASP:O	2.29	0.50
3:A:326:LYS:O	3:A:328:ARG:HG2	2.11	0.49
3:A:121:THR:O	3:A:124:ASP:HB2	2.13	0.49
3:A:239:CYS:O	3:A:240:GLN:HB2	2.11	0.49
3:A:280:LYS:O	3:A:284:ALA:N	2.45	0.49
3:A:145:ASP:OD2	3:A:252:HIS:HB2	2.12	0.49
3:A:298:ILE:HG23	3:A:298:ILE:O	2.12	0.49
3:A:16:THR:HG22	3:A:43:ALA:O	2.12	0.49
3:A:289:LYS:HD3	3:A:289:LYS:HA	1.42	0.49
3:A:159:GLN:N	3:A:191:MET:HE1	2.27	0.49
3:A:265:TYR:O	3:A:268:GLY:N	2.46	0.49
3:A:62:LEU:HB2	3:A:65:VAL:CG2	2.42	0.49
3:A:182:ARG:NH2	3:A:316:GLU:OE2	2.30	0.49
3:A:152:ARG:NH2	3:A:184:GLY:HA2	2.28	0.48
3:A:254:ARG:HH11	3:A:255:ILE:H	1.61	0.48
3:A:291:PHE:O	3:A:301:LEU:HD22	2.13	0.48
3:A:299:ARG:HD2	3:A:310:PRO:CD	2.42	0.48
3:A:163:LEU:HD23	3:A:163:LEU:HA	1.53	0.48
3:A:275:SER:OG	3:A:277:ILE:HD13	2.14	0.48
3:A:165:GLU:OE1	3:A:168:LYS:HD3	2.13	0.48
3:A:194:LEU:O	3:A:265:TYR:OH	2.29	0.48
3:A:194:LEU:CD2	3:A:272:PHE:HB2	2.40	0.48
1:T:6:DG:H2''	1:T:7:DA:C8	2.49	0.48
3:A:62:LEU:HD12	3:A:63:PRO:CD	2.42	0.48
3:A:78:ALA:HB3	3:A:79:THR:HG23	1.95	0.48
3:A:182:ARG:NH1	3:A:273:THR:OG1	2.47	0.48
3:A:220:LYS:O	3:A:220:LYS:HG2	2.12	0.48
3:A:39:TYR:O	3:A:43:ALA:HB2	2.13	0.47
3:A:49:TYR:HA	3:A:50:PRO:HD2	1.55	0.47
3:A:152:ARG:O	3:A:155:MET:HB2	2.15	0.47
3:A:289:LYS:HD3	3:A:289:LYS:N	2.23	0.47
3:A:23:ALA:O	3:A:36:TYR:HD1	1.97	0.47
3:A:62:LEU:HD12	3:A:62:LEU:HA	1.71	0.47
3:A:194:LEU:HD23	3:A:269:VAL:HA	1.97	0.47
3:A:295:GLU:HA	6:A:592:HOH:O	2.13	0.47
3:A:142:TYR:CE2	3:A:238:VAL:HG11	2.49	0.47
3:A:179:GLY:O	3:A:182:ARG:HB3	2.14	0.47
3:A:294:ASN:HB2	3:A:295:GLU:OE1	2.14	0.47
3:A:68:LYS:O	3:A:71:GLU:HB3	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:145:ASP:HA	3:A:148:LYS:NZ	2.29	0.47
3:A:197:HIS:CG	3:A:198:PRO:HD2	2.50	0.47
3:A:217:GLN:NE2	3:A:217:GLN:HA	2.30	0.47
3:A:125:LEU:HD23	3:A:125:LEU:HA	1.50	0.47
3:A:288:GLU:C	3:A:290:GLY:H	2.22	0.47
3:A:292:THR:O	3:A:298:ILE:HA	2.14	0.47
3:A:212:HIS:N	3:A:212:HIS:CD2	2.79	0.47
3:A:100:LEU:HD12	3:A:100:LEU:HA	1.65	0.47
3:A:49:TYR:CD2	3:A:53:ILE:HG12	2.51	0.46
3:A:62:LEU:HD13	3:A:62:LEU:N	2.28	0.46
3:A:194:LEU:HD21	3:A:272:PHE:CB	2.38	0.46
3:A:291:PHE:HD2	3:A:323:ILE:CG2	2.24	0.46
3:A:12:ASN:HD21	3:A:53:ILE:H	1.63	0.46
3:A:40:ARG:HE	3:A:40:ARG:HB2	1.37	0.46
3:A:299:ARG:HD3	3:A:310:PRO:HG3	1.97	0.46
3:A:201:THR:OG1	3:A:202:SER:N	2.47	0.46
3:A:309:GLU:N	3:A:310:PRO:CD	2.78	0.46
3:A:52:LYS:CD	3:A:54:LYS:HE3	2.41	0.46
3:A:254:ARG:NH1	3:A:255:ILE:H	2.13	0.46
3:A:293:ILE:CD1	3:A:298:ILE:HD12	2.46	0.46
2:P:1:DT:H72	6:P:571:HOH:O	2.15	0.45
3:A:15:ILE:HD13	3:A:73:ILE:HG23	1.98	0.45
3:A:235:PHE:CD1	3:A:235:PHE:C	2.94	0.45
3:A:282:MET:SD	3:A:320:PHE:CE1	3.09	0.45
3:A:277:ILE:O	3:A:281:ASN:HB2	2.17	0.45
3:A:278:PHE:HZ	3:A:320:PHE:HZ	1.64	0.45
3:A:38:ALA:O	3:A:41:LYS:HD3	2.17	0.45
3:A:301:LEU:HD12	3:A:301:LEU:HA	1.52	0.45
3:A:255:ILE:CG1	3:A:256:ASP:N	2.79	0.45
3:A:321:ASP:C	3:A:324:GLN:H	2.25	0.45
3:A:40:ARG:HA	3:A:43:ALA:HB3	1.99	0.45
3:A:245:ASN:N	3:A:245:ASN:ND2	2.37	0.45
3:A:49:TYR:CD2	3:A:53:ILE:CG1	3.00	0.45
3:A:49:TYR:CE2	3:A:53:ILE:CG1	2.98	0.45
3:A:278:PHE:O	3:A:282:MET:N	2.44	0.45
3:A:46:ILE:HD12	3:A:46:ILE:C	2.42	0.44
3:A:170:ASP:HB3	3:A:173:TYR:CD2	2.51	0.44
3:A:291:PHE:CD2	3:A:323:ILE:HG22	2.39	0.44
3:A:317:LYS:HG3	3:A:318:ASP:N	2.33	0.44
3:A:150:ILE:O	3:A:187:SER:HA	2.17	0.44
3:A:241:LEU:HA	3:A:242:PRO:HD2	1.69	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:33:ILE:O	3:A:36:TYR:HD2	1.98	0.44
3:A:201:THR:HA	3:A:261:PRO:HB3	1.99	0.44
3:A:99:PHE:CD2	3:A:99:PHE:C	2.94	0.44
3:A:194:LEU:HD12	3:A:194:LEU:HA	1.81	0.44
3:A:200:PHE:O	3:A:261:PRO:HA	2.18	0.44
3:A:230:LYS:HB2	3:A:230:LYS:HE2	1.57	0.44
3:A:242:PRO:HG2	6:A:589:HOH:O	2.17	0.44
3:A:267:CYS:O	3:A:271:TYR:HB2	2.18	0.44
3:A:285:HIS:NE2	3:A:289:LYS:CG	2.79	0.44
2:P:4:DA:H2''	2:P:5:DA:O5'	2.17	0.44
3:A:14:GLY:O	3:A:17:ASP:N	2.51	0.44
3:A:18:MET:HG2	3:A:22:LEU:HD23	2.00	0.44
2:P:6:DT:H6	2:P:6:DT:H2'	1.30	0.43
3:A:27:LYS:CB	3:A:36:TYR:CD1	2.99	0.43
3:A:309:GLU:N	3:A:309:GLU:OE1	2.51	0.43
3:A:315:SER:C	3:A:317:LYS:N	2.76	0.43
3:A:11:LEU:CD2	3:A:11:LEU:N	2.80	0.43
3:A:166:VAL:HG12	3:A:173:TYR:HB3	1.99	0.43
3:A:11:LEU:CD2	3:A:12:ASN:N	2.79	0.43
3:A:217:GLN:O	3:A:220:LYS:N	2.52	0.43
3:A:133:ASN:HD22	3:A:133:ASN:C	2.26	0.43
3:A:250:TYR:HD1	3:A:251:PRO:HD2	1.84	0.43
3:A:79:THR:HG23	3:A:79:THR:H	1.10	0.43
3:A:133:ASN:CG	3:A:136:GLN:HG3	2.43	0.43
3:A:22:LEU:HD13	3:A:22:LEU:HA	1.45	0.43
3:A:82:LEU:HB3	3:A:85:LEU:HB2	2.01	0.43
3:A:180:SER:HB3	3:A:183:ARG:NH2	2.33	0.43
3:A:135:HIS:HB2	6:A:596:HOH:O	2.19	0.43
3:A:205:THR:HG23	3:A:205:THR:O	2.19	0.43
3:A:274:GLY:HA3	3:A:275:SER:HA	1.82	0.42
3:A:23:ALA:CB	3:A:39:TYR:HB3	2.34	0.42
3:A:200:PHE:O	3:A:262:LYS:N	2.44	0.42
3:A:59:ALA:C	3:A:65:VAL:HG21	2.44	0.42
3:A:165:GLU:HB3	3:A:217:GLN:HG3	2.01	0.42
3:A:303:VAL:O	3:A:305:GLY:N	2.48	0.42
3:A:44:SER:O	3:A:47:ALA:HB3	2.19	0.42
3:A:140:LEU:HD12	3:A:140:LEU:O	2.18	0.42
3:A:151:PRO:HG2	3:A:154:GLU:CD	2.45	0.42
3:A:181:PHE:HB2	6:A:530:HOH:O	2.19	0.42
3:A:265:TYR:HB3	3:A:266:TYR:H	1.59	0.42
3:A:259:LEU:HA	3:A:259:LEU:HD12	1.67	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:62:LEU:HB2	3:A:65:VAL:HG21	2.01	0.42
2:P:4:DA:N6	2:P:5:DA:N6	2.68	0.42
3:A:33:ILE:HG23	3:A:34:HIS:H	1.85	0.42
3:A:176:THR:O	3:A:194:LEU:N	2.51	0.42
3:A:123:GLU:O	3:A:126:ARG:N	2.52	0.42
3:A:291:PHE:CD2	3:A:323:ILE:CG2	3.03	0.42
3:A:22:LEU:HD22	3:A:85:LEU:HD11	2.01	0.42
3:A:28:ASN:N	3:A:28:ASN:HD22	2.17	0.42
3:A:238:VAL:CG1	3:A:252:HIS:HB3	2.50	0.41
3:A:285:HIS:CD2	3:A:323:ILE:HB	2.55	0.41
3:A:18:MET:O	3:A:22:LEU:HB2	2.19	0.41
3:A:34:HIS:O	3:A:38:ALA:N	2.53	0.41
3:A:38:ALA:C	3:A:40:ARG:N	2.77	0.41
3:A:58:GLU:O	3:A:61:LYS:HG3	2.20	0.41
3:A:73:ILE:HG22	3:A:77:LEU:HD21	2.02	0.41
3:A:156:LEU:HD23	3:A:156:LEU:HA	1.83	0.41
3:A:121:THR:HG23	3:A:124:ASP:OD1	2.21	0.41
3:A:243:SER:CB	3:A:249:GLU:HB2	2.50	0.41
3:A:330:PRO:CA	3:A:333:ARG:HG2	2.50	0.41
3:A:101:THR:HA	3:A:106:ILE:HG22	2.02	0.41
3:A:119:ILE:HG21	3:A:125:LEU:HD23	2.03	0.41
3:A:322:TYR:C	3:A:324:GLN:N	2.78	0.41
3:A:152:ARG:HA	3:A:155:MET:HB2	2.02	0.41
3:A:165:GLU:HB3	3:A:217:GLN:CG	2.51	0.41
3:A:279:ASN:HD22	3:A:279:ASN:HA	1.57	0.41
3:A:293:ILE:CD1	3:A:298:ILE:CD1	2.99	0.41
3:A:33:ILE:O	3:A:37:ASN:N	2.52	0.41
3:A:122:LEU:O	3:A:126:ARG:HG3	2.20	0.41
3:A:133:ASN:ND2	3:A:133:ASN:C	2.79	0.41
3:A:143:PHE:CD2	3:A:143:PHE:C	2.97	0.41
3:A:144:GLY:C	3:A:146:PHE:N	2.79	0.41
3:A:285:HIS:CD2	3:A:285:HIS:C	2.98	0.41
3:A:286:ALA:CB	3:A:293:ILE:CG1	2.99	0.41
3:A:311:LEU:HD12	3:A:312:PRO:HD2	2.02	0.41
3:A:112:ARG:O	3:A:115:VAL:HB	2.21	0.40
3:A:138:ILE:O	3:A:138:ILE:HG22	2.20	0.40
3:A:286:ALA:CB	3:A:293:ILE:HG12	2.51	0.40
3:A:38:ALA:O	3:A:40:ARG:N	2.54	0.40
3:A:293:ILE:CD1	3:A:298:ILE:CG1	2.99	0.40
3:A:327:TYR:C	3:A:327:TYR:CD1	2.99	0.40
3:A:327:TYR:C	3:A:327:TYR:HD1	2.29	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:327:TYR:HD1	3:A:328:ARG:N	2.19	0.40
2:P:5:DA:P	3:A:107:GLY:HA3	2.62	0.40
3:A:42:ALA:C	3:A:44:SER:N	2.77	0.40
3:A:177:VAL:HG22	3:A:193:VAL:HG22	2.04	0.40
2:P:4:DA:C6	2:P:5:DA:C6	3.09	0.40
3:A:28:ASN:N	3:A:28:ASN:ND2	2.70	0.40
3:A:78:ALA:HB3	3:A:79:THR:CG2	2.51	0.40
3:A:106:ILE:HG22	3:A:106:ILE:O	2.15	0.40
3:A:133:ASN:ND2	3:A:135:HIS:H	2.19	0.40
3:A:260:ILE:CG2	3:A:261:PRO:CD	3.00	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
3	A	325/335 (97%)	250 (77%)	52 (16%)	23 (7%)	1 5

All (23) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A	205	THR
3	A	244	LYS
3	A	246	ASP
3	A	247	GLU
3	A	295	GLU
3	A	309	GLU
3	A	145	ASP
3	A	202	SER
3	A	207	GLN
3	A	222	HIS
3	A	303	VAL

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Mol	Chain	Res	Type
3	A	304	THR
3	A	39	TYR
3	A	78	ALA
3	A	204	SER
3	A	265	TYR
3	A	310	PRO
3	A	33	ILE
3	A	324	GLN
3	A	10	THR
3	A	52	LYS
3	A	80	GLY
3	A	242	PRO

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
3	A	288/295 (98%)	214 (74%)	74 (26%)	0 2

All (74) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	10	THR
3	A	18	MET
3	A	19	LEU
3	A	20	THR
3	A	22	LEU
3	A	27	LYS
3	A	30	SER
3	A	33	ILE
3	A	37	ASN
3	A	40	ARG
3	A	41	LYS
3	A	46	ILE
3	A	62	LEU
3	A	67	THR

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Mol	Chain	Res	Type
3	A	68	LYS
3	A	72	LYS
3	A	73	ILE
3	A	75	GLU
3	A	77	LEU
3	A	79	THR
3	A	85	LEU
3	A	89	ARG
3	A	93	THR
3	A	100	LEU
3	A	101	THR
3	A	113	LYS
3	A	115	VAL
3	A	119	ILE
3	A	121	THR
3	A	127	LYS
3	A	128	ASN
3	A	133	ASN
3	A	145	ASP
3	A	153	GLU
3	A	159	GLN
3	A	167	LYS
3	A	168	LYS
3	A	172	GLU
3	A	174	ILE
3	A	182	ARG
3	A	188	SER
3	A	194	LEU
3	A	201	THR
3	A	205	THR
3	A	214	VAL
3	A	218	LEU
3	A	226	ASP
3	A	228	LEU
3	A	229	SER
3	A	230	LYS
3	A	233	THR
3	A	236	MET
3	A	245	ASN
3	A	248	LYS
3	A	249	GLU
3	A	253	ARG

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Mol	Chain	Res	Type
3	A	262	LYS
3	A	270	LEU
3	A	277	ILE
3	A	287	LEU
3	A	294	ASN
3	A	295	GLU
3	A	296	TYR
3	A	301	LEU
3	A	303	VAL
3	A	309	GLU
3	A	311	LEU
3	A	314	ASP
3	A	323	ILE
3	A	324	GLN
3	A	325	TRP
3	A	328	ARG
3	A	331	LYS
3	A	335	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	12	ASN
3	A	28	ASN
3	A	90	GLN
3	A	128	ASN
3	A	133	ASN
3	A	136	GLN
3	A	212	HIS
3	A	213	GLN
3	A	217	GLN
3	A	245	ASN
3	A	264	GLN
3	A	279	ASN
3	A	294	ASN

5.3.3 RNA ⓘ

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 4 ligands modelled in this entry, 4 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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	T	8/8 (100%)	-0.57	0 100 100	22, 42, 72, 99	0
2	P	8/8 (100%)	-0.72	0 100 100	17, 34, 81, 100	0
3	A	324/335 (96%)	-0.80	0 100 100	3, 35, 87, 100	0
All	All	340/351 (96%)	-0.80	0 100 100	3, 35, 88, 100	0

There are no RSRZ outliers to report.

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(Å ²)	Q<0.9
5	NA	A	342	1/1	0.80	0.11	57,57,57,57	0
4	ZN	A	343	1/1	0.98	0.04	30,30,30,30	0
5	NA	A	341	1/1	1.00	0.01	3,3,3,3	0
4	ZN	A	340	1/1	1.00	0.01	30,30,30,30	1

6.5 Other polymers [i](#)

There are no such residues in this entry.