



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 09:43 AM UTC

PDB ID : 7ICF / pdb_00007icf
Title : DNA POLYMERASE BETA (POL B) (E.C.2.7.7.7) COMPLEXED WITH SIX BASE PAIRS OF DNA; SOAKED IN THE PRESENCE OF CDCL2 (0.1 MILLIMOLAR) (FOUR-DAY SOAK)
Authors : Pelletier, H.; Sawaya, M.R.
Deposited on : 1996-04-19
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

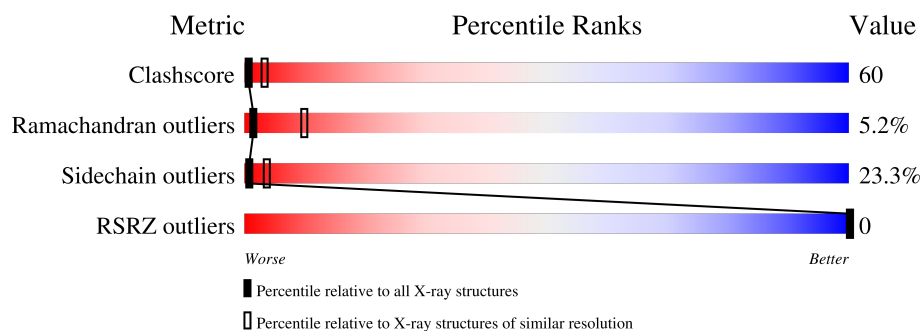
1 Overall quality at a glance

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	7	
2	P	6	
3	A	335	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 3034 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*CP*TP*GP*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	T	7	Total	C	N	O	P	0	0	0
			122	58	20	38	6			

- Molecule 2 is a DNA chain called DNA (5'-D(*CP*AP*GP*AP*TP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	P	6	Total	C	N	O	P	0	0	0
			126	59	25	36	6			

- 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 CADMIUM ION (CCD ID: CD) (formula: Cd).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	Cd	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	11	Total	O	0	0
			11	11		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	P	21	Total 21	O 21	0	0
6	A	127	Total 127	O 127	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.

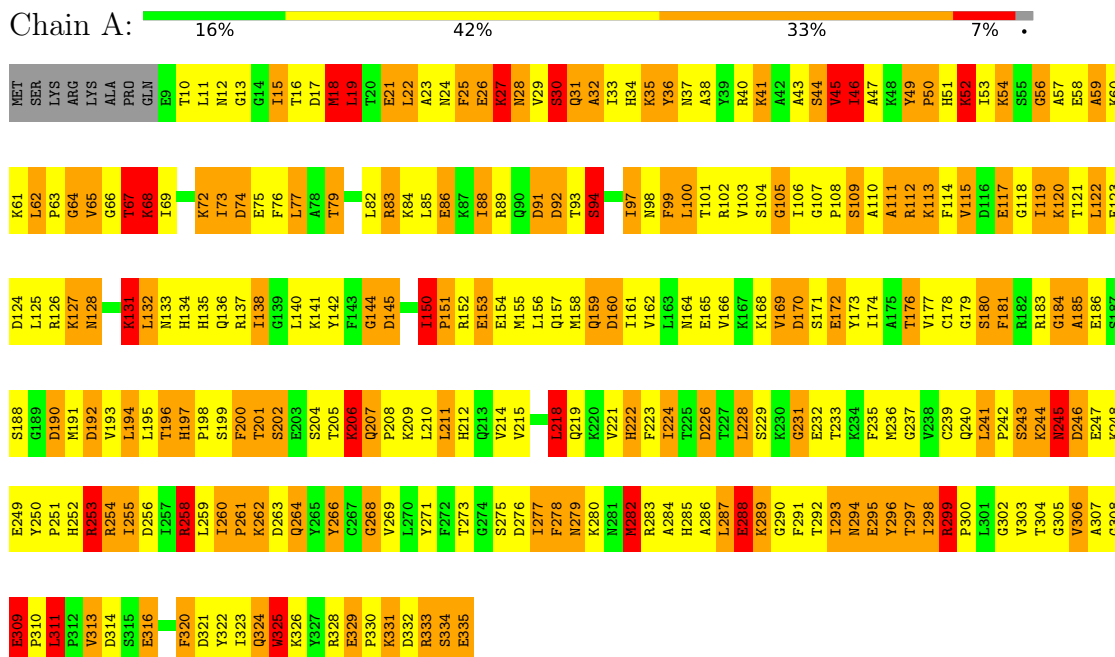
- Molecule 1: DNA (5'-D(*CP*AP*TP*CP*TP*GP*T)-3')



- Molecule 2: DNA (5'-D(*CP*AP*GP*AP*TP*G)-3')



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



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	177.18Å 57.71Å 48.52Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.10 20.00 – 3.10	Depositor EDS
% Data completeness (in resolution range)	93.0 (20.00-3.10) 92.8 (20.00-3.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.06	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.30 (at 2.70Å)	Xtriage
Refinement program	TNT 5-D	Depositor
R, R_{free}	0.158 , (Not available) 0.152 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	32.7	Xtriage
Anisotropy	0.292	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.21 , 238.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.43$, $\langle L^2 \rangle = 0.25$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	3034	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.92% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: CD, 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	1.22	2/135 (1.5%)	2.68	10/207 (4.8%)
2	P	1.35	1/141 (0.7%)	3.32	18/214 (8.4%)
3	A	1.61	33/2672 (1.2%)	2.28	161/3590 (4.5%)
All	All	1.58	36/2948 (1.2%)	2.37	189/4011 (4.7%)

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	2	0

All (36) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	115	VAL	CA-CB	-6.63	1.44	1.54
3	A	138	ILE	N-CA	-6.63	1.39	1.46
3	A	111	ALA	N-CA	-6.20	1.38	1.46
3	A	127	LYS	C-O	-6.06	1.17	1.24
3	A	94	SER	N-CA	-6.06	1.38	1.46
3	A	261	PRO	CA-C	-5.95	1.45	1.52
3	A	15	ILE	CA-C	-5.85	1.46	1.52
2	P	1	DC	OP3-P	5.82	1.60	1.48
3	A	104	SER	CA-C	-5.82	1.45	1.52
3	A	127	LYS	C-N	-5.81	1.25	1.33
3	A	25	PHE	N-CA	-5.80	1.39	1.46
3	A	325	TRP	CA-C	-5.77	1.45	1.52
3	A	215	VAL	CA-C	-5.74	1.45	1.52
3	A	119	ILE	CA-CB	-5.71	1.47	1.53
3	A	245	ASN	CA-CB	5.71	1.60	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	67	THR	N-CA	-5.61	1.39	1.46
3	A	65	VAL	N-CA	-5.56	1.40	1.46
3	A	261	PRO	N-CA	-5.46	1.40	1.47
3	A	19	LEU	CA-C	-5.43	1.45	1.52
3	A	159	GLN	N-CA	-5.43	1.39	1.46
3	A	170	ASP	CA-C	-5.38	1.45	1.52
1	T	7	DG	C1'-N9	-5.35	1.35	1.46
3	A	35	LYS	CA-C	-5.32	1.46	1.52
3	A	52	LYS	CA-C	-5.30	1.46	1.53
3	A	119	ILE	CA-C	-5.30	1.47	1.52
3	A	299	ARG	CA-C	-5.29	1.48	1.52
1	T	6	DT	C1'-N1	-5.26	1.33	1.49
3	A	231	GLY	CA-C	-5.25	1.44	1.51
3	A	111	ALA	CA-C	-5.18	1.45	1.52
3	A	254	ARG	CA-C	-5.11	1.46	1.52
3	A	128	ASN	N-CA	-5.08	1.40	1.46
3	A	215	VAL	N-CA	-5.05	1.40	1.46
3	A	58	GLU	CD-OE1	5.05	1.34	1.25
3	A	144	GLY	C-O	-5.01	1.17	1.23
3	A	242	PRO	N-CA	-5.01	1.41	1.47
3	A	176	THR	N-CA	-5.00	1.40	1.46

All (189) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	P	5	DT	C6-N1-C1'	-20.10	89.21	119.35
2	P	5	DT	C2-N1-C1'	19.93	149.25	119.35
1	T	4	DT	C6-N1-C1'	-16.40	94.76	119.35
1	T	4	DT	C2-N1-C1'	15.98	143.33	119.35
2	P	3	DG	C8-N9-C1'	12.95	146.43	127.00
2	P	3	DG	C4-N9-C1'	-12.21	108.68	127.00
2	P	4	DA	C8-N9-C1'	10.99	143.53	127.05
2	P	4	DA	C4-N9-C1'	-10.96	110.61	127.05
3	A	49	TYR	CA-C-N	10.77	131.68	120.04
3	A	49	TYR	C-N-CA	10.77	131.68	120.04
3	A	329	GLU	N-CA-C	-10.14	96.30	110.29
3	A	45	VAL	N-CA-C	9.78	119.72	110.53
3	A	15	ILE	N-CA-CB	9.11	120.55	110.62
3	A	138	ILE	N-CA-C	-9.06	100.84	110.36
1	T	6	DT	C6-N1-C1'	-9.03	105.81	119.35
3	A	86	GLU	N-CA-CB	9.02	123.51	110.16
2	P	6	DG	C4-N9-C1'	-8.62	114.08	127.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	245	ASN	CA-CB-CG	8.56	121.16	112.60
1	T	3	DA	C4-N9-C1'	-8.30	114.59	127.05
1	T	7	DG	N9-C1'-C2'	-8.30	101.05	113.50
3	A	51	HIS	N-CA-CB	8.04	122.67	110.70
3	A	117	GLU	N-CA-C	-7.97	103.55	113.20
2	P	6	DG	C8-N9-C1'	7.97	138.95	127.00
3	A	222	HIS	CB-CA-C	-7.93	98.01	111.26
1	T	3	DA	C8-N9-C1'	7.89	138.88	127.05
3	A	192	ASP	N-CA-CB	7.85	123.56	110.77
3	A	164	ASN	CA-CB-CG	-7.83	104.77	112.60
3	A	251	PRO	CB-CA-C	-7.81	100.75	110.98
1	T	5	DC	C6-N1-C1'	-7.72	108.11	119.70
3	A	74	ASP	N-CA-CB	7.70	121.42	109.94
3	A	64	GLY	CA-C-N	-7.58	112.87	122.43
3	A	64	GLY	C-N-CA	-7.58	112.87	122.43
3	A	122	LEU	N-CA-C	-7.55	103.05	111.28
1	T	5	DC	C2-N1-C1'	7.54	131.01	119.70
3	A	88	ILE	CB-CA-C	-7.53	102.18	112.04
3	A	296	TYR	N-CA-C	7.45	122.66	113.50
3	A	207	GLN	CA-C-N	7.42	129.12	119.84
3	A	207	GLN	C-N-CA	7.42	129.12	119.84
3	A	104	SER	N-CA-CB	7.37	121.68	109.60
3	A	190	ASP	CA-CB-CG	-7.25	105.35	112.60
3	A	92	ASP	N-CA-CB	7.23	121.57	110.14
2	P	6	DG	P-O5'-C5'	-7.23	109.16	120.00
3	A	204	SER	CA-C-N	-7.23	111.22	121.99
3	A	204	SER	C-N-CA	-7.23	111.22	121.99
3	A	181	PHE	O-C-N	7.12	129.50	122.09
2	P	4	DA	P-O5'-C5'	7.07	130.61	120.00
3	A	77	LEU	N-CA-C	-7.07	103.57	111.28
1	T	6	DT	C2-N1-C1'	7.04	129.91	119.35
3	A	40	ARG	N-CA-C	6.96	119.89	111.40
3	A	191	MET	N-CA-C	6.91	121.10	109.76
3	A	250	TYR	N-CA-C	6.88	120.29	110.24
3	A	26	GLU	CA-C-N	6.87	129.37	120.44
3	A	26	GLU	C-N-CA	6.87	129.37	120.44
3	A	261	PRO	CB-CA-C	-6.80	103.23	111.46
1	T	7	DG	C4-N9-C1'	-6.72	116.91	127.00
2	P	3	DG	C4'-C3'-O3'	-6.71	99.94	110.00
3	A	313	VAL	N-CA-C	6.58	117.32	108.11
3	A	282	MET	N-CA-C	-6.50	104.12	111.14
3	A	181	PHE	CA-C-N	6.48	129.84	120.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	181	PHE	C-N-CA	6.48	129.84	120.38
3	A	215	VAL	O-C-N	6.45	128.23	121.91
3	A	297	THR	N-CA-C	6.44	116.57	108.45
3	A	128	ASN	N-CA-CB	-6.43	101.86	111.25
3	A	321	ASP	CB-CA-C	-6.41	100.56	110.81
3	A	115	VAL	N-CA-CB	-6.36	100.55	110.54
3	A	268	GLY	O-C-N	6.33	128.26	122.18
3	A	69	ILE	CB-CA-C	-6.32	103.77	112.24
3	A	309	GLU	CA-C-N	6.31	127.73	119.84
3	A	309	GLU	C-N-CA	6.31	127.73	119.84
3	A	36	TYR	N-CA-C	-6.30	104.33	111.07
3	A	209	LYS	O-C-N	6.29	128.79	122.12
3	A	266	TYR	N-CA-CB	6.27	119.29	109.94
3	A	25	PHE	CA-CB-CG	-6.25	107.55	113.80
3	A	209	LYS	N-CA-C	-6.25	103.77	111.33
3	A	200	PHE	N-CA-CB	6.23	120.55	110.77
3	A	67	THR	CB-CA-C	6.22	119.83	109.56
3	A	196	THR	N-CA-CB	6.22	121.83	110.76
3	A	65	VAL	N-CA-C	6.20	117.41	107.73
3	A	15	ILE	CA-C-O	-6.19	114.67	121.29
3	A	67	THR	CA-CB-OG1	6.17	118.86	109.60
3	A	180	SER	N-CA-CB	-6.15	100.42	110.14
3	A	51	HIS	CA-C-N	-6.12	114.34	122.85
3	A	51	HIS	C-N-CA	-6.12	114.34	122.85
3	A	241	LEU	N-CA-CB	6.12	117.43	110.03
3	A	211	LEU	N-CA-CB	6.12	119.18	110.13
3	A	258	ARG	N-CA-C	6.12	118.35	108.32
3	A	222	HIS	N-CA-C	6.10	120.67	113.23
3	A	49	TYR	O-C-N	6.07	129.90	121.64
3	A	32	ALA	N-CA-C	6.07	123.72	110.80
3	A	181	PHE	CA-CB-CG	-6.06	107.74	113.80
3	A	232	GLU	N-CA-CB	6.02	119.91	110.46
3	A	50	PRO	CA-C-N	-5.96	112.38	123.05
3	A	50	PRO	C-N-CA	-5.96	112.38	123.05
3	A	253	ARG	N-CA-CB	-5.95	101.20	111.55
3	A	59	ALA	O-C-N	5.92	128.49	122.09
3	A	311	LEU	C-N-CD	-5.92	100.75	125.00
3	A	28	ASN	N-CA-CB	5.88	118.50	109.98
3	A	197	HIS	CA-CB-CG	-5.86	107.94	113.80
3	A	192	ASP	CA-CB-CG	-5.86	106.74	112.60
3	A	30	SER	N-CA-C	-5.83	103.25	110.41
3	A	160	ASP	N-CA-CB	5.82	118.61	109.94

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	46	ILE	N-CA-C	-5.78	103.95	112.04
3	A	49	TYR	CA-CB-CG	5.78	124.30	113.90
3	A	63	PRO	N-CA-C	-5.76	102.10	110.80
3	A	104	SER	O-C-N	5.76	130.55	122.77
3	A	27	LYS	N-CA-CB	-5.75	101.67	110.01
3	A	101	THR	N-CA-CB	-5.75	101.43	110.06
3	A	73	ILE	N-CA-CB	5.74	117.91	110.57
3	A	211	LEU	CA-C-N	5.73	127.96	120.28
3	A	211	LEU	C-N-CA	5.73	127.96	120.28
3	A	31	GLN	CA-C-N	5.72	132.47	121.54
3	A	31	GLN	C-N-CA	5.72	132.47	121.54
3	A	235	PHE	CA-CB-CG	-5.72	108.08	113.80
3	A	131	LYS	N-CA-C	5.71	120.11	113.20
3	A	320	PHE	O-C-N	5.71	128.03	122.09
3	A	28	ASN	CA-CB-CG	5.66	118.26	112.60
3	A	316	GLU	CA-C-N	5.64	128.10	120.65
3	A	316	GLU	C-N-CA	5.64	128.10	120.65
3	A	151	PRO	N-CA-CB	5.64	108.54	103.19
3	A	67	THR	N-CA-CB	-5.63	101.81	110.42
3	A	119	ILE	CA-CB-CG1	-5.63	100.84	110.40
3	A	254	ARG	CB-CA-C	-5.62	100.25	109.53
3	A	232	GLU	N-CA-C	5.62	120.14	113.28
2	P	4	DA	N9-C1'-C2'	5.62	121.93	113.50
3	A	224	ILE	N-CA-CB	-5.59	104.42	111.41
2	P	2	DA	P-O3'-C3'	5.59	128.59	120.20
2	P	4	DA	O3'-P-O5'	-5.59	95.62	104.00
3	A	206	LYS	N-CA-C	5.58	122.68	110.80
3	A	241	LEU	N-CA-C	-5.57	102.60	110.29
3	A	179	GLY	CA-C-N	5.57	128.51	120.38
3	A	179	GLY	C-N-CA	5.57	128.51	120.38
3	A	123	GLU	N-CA-CB	5.57	118.09	110.01
3	A	150	ILE	N-CA-C	5.57	114.62	108.05
2	P	6	DG	C5'-C4'-O4'	5.57	117.75	109.40
3	A	261	PRO	N-CA-C	-5.56	102.40	110.80
3	A	266	TYR	CB-CA-C	5.55	119.70	110.81
3	A	68	LYS	O-C-N	5.53	127.98	122.12
3	A	190	ASP	CB-CA-C	-5.51	101.17	110.43
3	A	246	ASP	N-CA-C	5.51	122.54	110.80
3	A	17	ASP	N-CA-CB	5.48	117.96	110.01
3	A	184	GLY	N-CA-C	-5.45	100.26	113.18
2	P	5	DT	P-O5'-C5'	5.43	128.15	120.00
3	A	54	LYS	N-CA-CB	5.43	118.90	110.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	161	ILE	N-CA-C	5.39	115.59	110.42
3	A	83	ARG	N-CA-CB	5.37	117.86	110.07
3	A	278	PHE	CA-CB-CG	-5.37	108.43	113.80
3	A	24	ASN	N-CA-CB	5.36	117.73	109.91
3	A	34	HIS	CA-CB-CG	-5.36	108.44	113.80
3	A	264	GLN	O-C-N	5.36	128.21	122.05
2	P	5	DT	C5'-C4'-O4'	5.34	117.41	109.40
3	A	104	SER	N-CA-C	5.33	116.83	109.15
3	A	288	GLU	N-CA-C	-5.32	105.12	111.03
3	A	192	ASP	CA-C-O	5.30	126.67	120.20
3	A	288	GLU	N-CA-CB	5.30	117.67	109.98
3	A	98	ASN	CA-CB-CG	-5.30	107.30	112.60
3	A	77	LEU	N-CA-CB	5.29	117.90	110.12
3	A	215	VAL	N-CA-CB	5.29	116.74	110.55
3	A	282	MET	CA-C-N	5.29	127.31	120.44
3	A	282	MET	C-N-CA	5.29	127.31	120.44
3	A	56	GLY	N-CA-C	-5.26	106.40	112.50
3	A	105	GLY	CA-C-N	-5.25	115.82	122.43
3	A	105	GLY	C-N-CA	-5.25	115.82	122.43
3	A	296	TYR	CB-CA-C	-5.24	99.75	109.29
3	A	120	LYS	N-CA-C	5.24	120.68	113.97
3	A	17	ASP	N-CA-C	5.23	116.67	111.07
3	A	293	ILE	CA-C-N	5.22	130.41	122.11
3	A	293	ILE	C-N-CA	5.22	130.41	122.11
3	A	21	GLU	CA-C-N	5.22	127.54	120.44
3	A	21	GLU	C-N-CA	5.22	127.54	120.44
3	A	218	LEU	CB-CA-C	5.21	119.53	110.68
2	P	5	DT	C5'-C4'-C3'	5.20	122.69	114.90
3	A	123	GLU	CB-CA-C	5.18	119.02	110.88
3	A	40	ARG	N-CA-CB	5.17	117.77	110.13
3	A	246	ASP	N-CA-CB	5.16	119.22	110.49
3	A	333	ARG	N-CA-C	-5.15	107.51	112.97
3	A	18	MET	CG-SD-CE	-5.15	89.57	100.90
3	A	115	VAL	CA-C-O	5.15	126.25	120.64
3	A	332	ASP	N-CA-C	5.13	119.11	113.21
3	A	99	PHE	CA-CB-CG	-5.13	108.67	113.80
3	A	240	GLN	N-CA-C	5.12	116.84	108.55
3	A	177	VAL	CB-CA-C	5.11	118.46	111.31
3	A	68	LYS	CB-CA-C	5.07	119.20	110.79
3	A	298	ILE	N-CA-C	-5.06	100.78	108.17
3	A	150	ILE	N-CA-CB	-5.06	104.78	111.21
3	A	299	ARG	O-C-N	5.04	126.21	121.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	192	ASP	N-CA-C	5.01	116.58	108.26
3	A	15	ILE	O-C-N	5.00	127.09	121.94
3	A	278	PHE	CA-C-N	5.00	127.43	120.63
3	A	278	PHE	C-N-CA	5.00	127.43	120.63

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	A	232	GLU	CA
3	A	246	ASP	CA

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	T	122	0	69	12	0
2	P	126	0	68	14	0
3	A	2623	0	2641	320	1
4	A	2	0	0	0	0
5	A	2	0	0	0	0
6	A	127	0	0	11	0
6	P	21	0	0	1	0
6	T	11	0	0	7	0
All	All	3034	0	2778	337	1

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 60.

All (337) 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)
3:A:155:MET:HE3	3:A:188:SER:HB2	1.35	1.07
3:A:277:ILE:HG13	3:A:335:GLU:HB3	1.36	1.07
3:A:18:MET:HE2	3:A:82:LEU:HD22	1.39	1.03

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:152:ARG:HA	3:A:155:MET:HB2	1.42	1.02
3:A:103:VAL:HB	3:A:106:ILE:HD12	1.43	1.01
3:A:201:THR:HA	3:A:261:PRO:HB3	1.47	0.95
3:A:133:ASN:HD22	3:A:135:HIS:H	1.17	0.93
3:A:15:ILE:HD11	3:A:77:LEU:HD11	1.48	0.92
3:A:300:PRO:HD3	3:A:311:LEU:HD13	1.50	0.92
3:A:31:GLN:HE21	3:A:112:ARG:NH1	1.67	0.91
3:A:298:ILE:HG23	3:A:311:LEU:HB2	1.54	0.88
3:A:133:ASN:HD22	3:A:135:HIS:N	1.71	0.87
3:A:19:LEU:HB3	3:A:43:ALA:HB2	1.56	0.87
3:A:11:LEU:HD23	3:A:11:LEU:H	1.40	0.86
3:A:133:ASN:HD21	3:A:135:HIS:HB3	1.43	0.84
3:A:151:PRO:HB2	3:A:153:GLU:HG2	1.60	0.83
3:A:155:MET:HE3	3:A:188:SER:CB	2.08	0.83
3:A:31:GLN:HE21	3:A:112:ARG:HH12	1.23	0.83
3:A:150:ILE:HG21	3:A:158:MET:HE1	1.60	0.83
2:P:1:DC:H2''	2:P:2:DA:H5''	1.61	0.81
3:A:292:THR:CG2	3:A:299:ARG:HH21	1.94	0.81
3:A:302:GLY:H	3:A:307:ALA:HB3	1.46	0.80
3:A:302:GLY:N	3:A:307:ALA:HB3	1.97	0.79
3:A:207:GLN:O	3:A:210:LEU:HB2	1.82	0.79
3:A:292:THR:HG23	3:A:299:ARG:HH21	1.46	0.79
3:A:155:MET:HA	3:A:158:MET:HE3	1.65	0.79
2:P:1:DC:C2'	2:P:2:DA:H5''	2.12	0.79
3:A:178:CYS:SG	3:A:194:LEU:HD22	2.24	0.78
3:A:44:SER:O	3:A:47:ALA:HB3	1.83	0.78
3:A:133:ASN:ND2	3:A:135:HIS:N	2.32	0.77
3:A:68:LYS:HB2	3:A:68:LYS:NZ	1.99	0.77
3:A:292:THR:O	3:A:293:ILE:HD13	1.85	0.77
3:A:108:PRO:O	3:A:112:ARG:HG2	1.85	0.76
3:A:119:ILE:HG23	3:A:124:ASP:HB3	1.68	0.76
1:T:3:DA:H2''	6:T:573:HOH:O	1.85	0.76
3:A:183:ARG:HD3	3:A:273:THR:O	1.86	0.76
3:A:286:ALA:CB	3:A:323:ILE:HG21	2.15	0.75
3:A:31:GLN:NE2	3:A:112:ARG:HH12	1.84	0.75
3:A:277:ILE:HG13	3:A:335:GLU:CB	2.15	0.75
3:A:293:ILE:CD1	3:A:298:ILE:HG13	2.17	0.75
3:A:41:LYS:O	3:A:45:VAL:HG13	1.86	0.75
3:A:244:LYS:HB3	3:A:245:ASN:HD22	1.52	0.74
3:A:155:MET:CE	3:A:188:SER:HB2	2.14	0.74
3:A:218:LEU:CB	3:A:224:ILE:HD12	2.17	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:59:ALA:O	3:A:62:LEU:HB2	1.88	0.73
3:A:289:LYS:HD2	3:A:324:GLN:OE1	1.89	0.72
3:A:19:LEU:CB	3:A:43:ALA:HB2	2.20	0.71
3:A:27:LYS:HG3	3:A:28:ASN:N	2.06	0.71
3:A:122:LEU:O	3:A:126:ARG:HG3	1.91	0.71
3:A:133:ASN:ND2	3:A:135:HIS:H	1.86	0.71
3:A:201:THR:HA	3:A:261:PRO:CB	2.20	0.71
3:A:43:ALA:O	3:A:47:ALA:HB2	1.89	0.70
3:A:294:ASN:N	3:A:294:ASN:HD22	1.87	0.70
3:A:133:ASN:O	3:A:137:ARG:HG3	1.91	0.70
3:A:245:ASN:HD22	3:A:245:ASN:H	1.38	0.70
3:A:277:ILE:CG1	3:A:335:GLU:HB3	2.19	0.70
3:A:18:MET:HE1	3:A:76:PHE:HB2	1.74	0.70
3:A:255:ILE:HG12	3:A:256:ASP:N	2.04	0.70
3:A:128:ASN:HB3	3:A:131:LYS:HD2	1.73	0.70
3:A:286:ALA:HA	3:A:323:ILE:HG21	1.74	0.69
3:A:330:PRO:HA	3:A:333:ARG:HG3	1.73	0.69
3:A:60:LYS:HG3	3:A:66:GLY:O	1.94	0.68
3:A:18:MET:HG2	3:A:19:LEU:N	1.99	0.68
3:A:259:LEU:O	3:A:260:ILE:HD13	1.92	0.68
2:P:5:DT:O5'	3:A:107:GLY:HA3	1.94	0.68
3:A:150:ILE:CG2	3:A:158:MET:HE1	2.24	0.67
3:A:218:LEU:HB2	3:A:224:ILE:HD12	1.75	0.67
3:A:12:ASN:HB3	3:A:46:ILE:HD12	1.75	0.67
3:A:197:HIS:CG	3:A:198:PRO:HD2	2.30	0.67
3:A:300:PRO:HG3	3:A:311:LEU:CD1	2.25	0.67
2:P:5:DT:OP2	3:A:109:SER:HB3	1.95	0.66
3:A:298:ILE:HD13	3:A:322:TYR:HD2	1.61	0.66
3:A:300:PRO:CD	3:A:311:LEU:HD13	2.26	0.66
3:A:286:ALA:HA	3:A:323:ILE:CG2	2.26	0.66
3:A:300:PRO:HG3	3:A:311:LEU:HD11	1.78	0.66
3:A:166:VAL:O	3:A:169:VAL:HG13	1.96	0.66
1:T:7:DG:N3	6:T:634:HOH:O	2.29	0.65
1:T:5:DC:H1'	6:T:670:HOH:O	1.95	0.65
3:A:18:MET:CE	3:A:82:LEU:HD22	2.21	0.65
3:A:120:LYS:N	3:A:124:ASP:OD2	2.28	0.65
3:A:103:VAL:CB	3:A:106:ILE:HD12	2.22	0.65
3:A:18:MET:HE2	3:A:82:LEU:CD2	2.21	0.64
3:A:22:LEU:CD1	3:A:85:LEU:HD13	2.28	0.64
3:A:93:THR:O	3:A:97:ILE:HG13	1.97	0.64
1:T:4:DT:H71	6:T:573:HOH:O	1.96	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:12:ASN:ND2	3:A:53:ILE:HD12	2.13	0.64
3:A:219:GLN:O	3:A:222:HIS:N	2.30	0.64
3:A:254:ARG:NH1	3:A:255:ILE:N	2.46	0.64
3:A:226:ASP:HB3	6:A:544:HOH:O	1.98	0.63
3:A:12:ASN:HB3	3:A:46:ILE:CD1	2.29	0.63
3:A:197:HIS:ND1	3:A:198:PRO:HD2	2.13	0.63
3:A:260:ILE:CG2	3:A:261:PRO:HD2	2.28	0.63
3:A:56:GLY:O	3:A:59:ALA:HB3	1.98	0.62
3:A:218:LEU:HB3	3:A:224:ILE:HD12	1.81	0.62
3:A:253:ARG:HH11	3:A:253:ARG:CG	2.12	0.62
1:T:4:DT:H5"	3:A:231:GLY:HA3	1.81	0.62
3:A:133:ASN:ND2	3:A:135:HIS:HB3	2.13	0.62
3:A:26:GLU:OE1	3:A:26:GLU:HA	2.00	0.62
3:A:11:LEU:HD23	3:A:11:LEU:N	2.13	0.61
3:A:75:GLU:O	3:A:79:THR:HG23	2.00	0.61
3:A:11:LEU:H	3:A:11:LEU:CD2	2.12	0.61
3:A:100:LEU:HD21	3:A:119:ILE:O	2.00	0.61
3:A:211:LEU:HB2	3:A:259:LEU:HD22	1.82	0.61
3:A:243:SER:HB3	3:A:249:GLU:HA	1.83	0.61
3:A:282:MET:HE3	3:A:323:ILE:HD11	1.83	0.61
3:A:303:VAL:C	3:A:305:GLY:H	2.07	0.61
3:A:294:ASN:HD22	3:A:294:ASN:H	1.47	0.61
3:A:12:ASN:HA	6:A:642:HOH:O	2.00	0.60
3:A:16:THR:HG23	3:A:46:ILE:HD11	1.83	0.60
1:T:2:DC:H2"	1:T:3:DA:C8	2.34	0.60
3:A:244:LYS:HB3	3:A:245:ASN:ND2	2.15	0.60
3:A:76:PHE:HD1	3:A:77:LEU:HD12	1.67	0.60
3:A:320:PHE:O	3:A:323:ILE:HG13	2.02	0.60
3:A:244:LYS:CB	3:A:245:ASN:HD22	2.15	0.60
3:A:219:GLN:C	3:A:222:HIS:H	2.11	0.59
3:A:133:ASN:CG	3:A:136:GLN:HG3	2.27	0.59
3:A:52:LYS:HE3	6:A:554:HOH:O	2.01	0.59
3:A:326:LYS:HG3	3:A:326:LYS:O	2.02	0.59
3:A:282:MET:HG2	6:A:555:HOH:O	2.03	0.59
3:A:140:LEU:HD12	3:A:140:LEU:O	2.02	0.59
3:A:286:ALA:CA	3:A:323:ILE:HG21	2.32	0.59
3:A:41:LYS:NZ	3:A:64:GLY:O	2.36	0.59
3:A:254:ARG:NH1	3:A:255:ILE:H	2.00	0.59
3:A:49:TYR:CE2	3:A:53:ILE:HG13	2.37	0.58
3:A:228:LEU:N	3:A:236:MET:O	2.36	0.58
3:A:84:LYS:O	3:A:88:ILE:HG13	2.02	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:294:ASN:ND2	6:A:580:HOH:O	2.36	0.58
3:A:245:ASN:HD22	3:A:245:ASN:N	2.00	0.58
3:A:183:ARG:NH1	6:A:631:HOH:O	2.33	0.58
3:A:278:PHE:HE1	3:A:328:ARG:HD2	1.69	0.58
2:P:2:DA:N7	6:P:598:HOH:O	2.32	0.57
3:A:49:TYR:HE2	3:A:53:ILE:HG13	1.68	0.57
3:A:60:LYS:HA	3:A:65:VAL:HG12	1.86	0.57
1:T:5:DC:C2'	1:T:6:DT:H72	2.35	0.57
3:A:114:PHE:HB3	3:A:119:ILE:HB	1.86	0.57
3:A:152:ARG:O	3:A:156:LEU:HG	2.04	0.57
3:A:99:PHE:O	3:A:102:ARG:HB2	2.04	0.57
3:A:245:ASN:H	3:A:245:ASN:ND2	2.03	0.57
3:A:15:ILE:HD11	3:A:73:ILE:HG23	1.87	0.57
3:A:298:ILE:HD13	3:A:322:TYR:CD2	2.40	0.57
2:P:2:DA:C8	2:P:2:DA:H5'	2.40	0.56
3:A:190:ASP:N	3:A:190:ASP:OD1	2.35	0.56
3:A:27:LYS:HG3	3:A:28:ASN:HD22	1.71	0.56
3:A:288:GLU:C	3:A:290:GLY:H	2.13	0.56
3:A:16:THR:HG23	3:A:46:ILE:CD1	2.36	0.56
3:A:145:ASP:HB3	3:A:252:HIS:O	2.05	0.56
3:A:286:ALA:O	3:A:291:PHE:HB2	2.05	0.56
3:A:138:ILE:N	3:A:138:ILE:HD13	2.20	0.56
3:A:152:ARG:NH2	3:A:181:PHE:O	2.39	0.56
1:T:5:DC:H2''	1:T:6:DT:C7	2.37	0.55
3:A:292:THR:C	3:A:293:ILE:HD13	2.30	0.55
3:A:68:LYS:HB2	3:A:68:LYS:HZ2	1.71	0.55
3:A:165:GLU:O	3:A:169:VAL:HG12	2.05	0.55
3:A:174:ILE:HB	3:A:196:THR:HG22	1.88	0.55
3:A:38:ALA:O	3:A:41:LYS:HD2	2.06	0.55
3:A:212:HIS:H	3:A:212:HIS:CD2	2.23	0.55
3:A:128:ASN:O	3:A:131:LYS:HG2	2.06	0.55
3:A:196:THR:OG1	3:A:197:HIS:N	2.31	0.55
3:A:228:LEU:HB2	3:A:236:MET:O	2.07	0.55
3:A:243:SER:OG	3:A:249:GLU:HG3	2.07	0.55
2:P:5:DT:H2''	2:P:6:DG:C5'	2.37	0.55
1:T:5:DC:H2''	1:T:6:DT:H72	1.89	0.54
3:A:134:HIS:O	3:A:138:ILE:HG12	2.07	0.54
3:A:266:TYR:HB2	3:A:313:VAL:HG11	1.90	0.54
3:A:125:LEU:HB3	3:A:140:LEU:HD22	1.90	0.54
3:A:52:LYS:HD3	3:A:54:LYS:HE3	1.90	0.54
3:A:119:ILE:HG23	3:A:124:ASP:CB	2.35	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:330:PRO:HA	3:A:333:ARG:CG	2.36	0.54
3:A:152:ARG:NH2	3:A:184:GLY:O	2.41	0.54
3:A:295:GLU:CD	3:A:295:GLU:H	2.16	0.54
3:A:56:GLY:H	3:A:74:ASP:CG	2.15	0.54
3:A:197:HIS:ND1	3:A:199:SER:HB3	2.23	0.54
3:A:276:ASP:O	3:A:279:ASN:HB2	2.08	0.54
3:A:278:PHE:CE1	3:A:328:ARG:HD2	2.43	0.54
3:A:292:THR:HG21	3:A:299:ARG:HH21	1.72	0.54
3:A:22:LEU:HD11	3:A:85:LEU:HD13	1.90	0.54
3:A:306:VAL:HG23	3:A:307:ALA:N	2.21	0.54
3:A:311:LEU:HB3	3:A:322:TYR:CE2	2.43	0.53
2:P:5:DT:H2''	2:P:6:DG:H5'	1.91	0.53
1:T:4:DT:H5'	6:T:617:HOH:O	2.08	0.53
3:A:22:LEU:HD13	3:A:85:LEU:HD13	1.89	0.53
3:A:165:GLU:OE1	3:A:168:LYS:HD2	2.09	0.53
1:T:7:DG:H1'	6:T:634:HOH:O	2.09	0.53
3:A:68:LYS:HB2	3:A:68:LYS:HZ3	1.70	0.53
3:A:275:SER:OG	3:A:334:SER:O	2.27	0.53
3:A:60:LYS:HA	3:A:65:VAL:CG1	2.39	0.52
3:A:156:LEU:HD23	3:A:181:PHE:CZ	2.44	0.52
3:A:18:MET:O	3:A:22:LEU:HD22	2.09	0.52
3:A:31:GLN:NE2	3:A:112:ARG:NH1	2.43	0.52
3:A:293:ILE:HD13	3:A:298:ILE:HG13	1.91	0.52
3:A:83:ARG:O	3:A:86:GLU:N	2.43	0.52
3:A:180:SER:O	3:A:185:ALA:HB3	2.10	0.52
3:A:49:TYR:CD1	3:A:50:PRO:HD2	2.45	0.51
3:A:22:LEU:HD13	3:A:85:LEU:CD1	2.39	0.51
3:A:141:LYS:HE2	3:A:142:TYR:OH	2.11	0.51
3:A:25:PHE:CE1	3:A:29:VAL:HG21	2.45	0.51
3:A:200:PHE:C	3:A:201:THR:HG22	2.36	0.51
3:A:76:PHE:O	3:A:79:THR:O	2.29	0.51
3:A:260:ILE:HG22	3:A:261:PRO:HD2	1.92	0.51
3:A:15:ILE:HG22	3:A:46:ILE:CD1	2.41	0.50
3:A:212:HIS:CD2	3:A:212:HIS:N	2.79	0.50
3:A:260:ILE:HG23	3:A:261:PRO:HD2	1.93	0.50
3:A:21:GLU:OE2	3:A:89:ARG:NH2	2.44	0.50
3:A:133:ASN:HD21	3:A:135:HIS:CB	2.20	0.50
3:A:280:LYS:O	3:A:284:ALA:N	2.31	0.50
3:A:27:LYS:HB2	3:A:36:TYR:CG	2.46	0.50
3:A:119:ILE:HG21	3:A:125:LEU:HD23	1.94	0.50
3:A:279:ASN:O	3:A:283:ARG:HG3	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:308:GLY:O	3:A:309:GLU:HB2	2.11	0.50
3:A:159:GLN:HG2	3:A:160:ASP:N	2.21	0.49
3:A:190:ASP:OD1	3:A:190:ASP:O	2.30	0.49
3:A:23:ALA:O	3:A:36:TYR:HD1	1.95	0.49
3:A:253:ARG:HH11	3:A:253:ARG:HG3	1.77	0.49
3:A:26:GLU:O	3:A:30:SER:O	2.30	0.49
3:A:152:ARG:CA	3:A:155:MET:HB2	2.28	0.49
3:A:271:TYR:CD1	3:A:283:ARG:NH2	2.81	0.49
3:A:133:ASN:OD1	3:A:136:GLN:HG3	2.13	0.49
3:A:316:GLU:O	3:A:320:PHE:HD1	1.95	0.49
2:P:4:DA:H5''	3:A:109:SER:OG	2.12	0.49
3:A:158:MET:O	3:A:162:VAL:HG23	2.13	0.49
3:A:156:LEU:HD23	3:A:181:PHE:HZ	1.78	0.49
3:A:255:ILE:HG23	3:A:255:ILE:O	2.12	0.48
3:A:176:THR:O	3:A:193:VAL:HA	2.14	0.48
3:A:158:MET:CG	3:A:241:LEU:HD21	2.43	0.48
3:A:205:THR:O	3:A:206:LYS:O	2.32	0.48
3:A:88:ILE:HD13	3:A:88:ILE:HG21	1.51	0.48
3:A:91:ASP:HB3	3:A:94:SER:HB3	1.96	0.47
3:A:200:PHE:CD2	3:A:259:LEU:HG	2.48	0.47
3:A:200:PHE:O	3:A:262:LYS:N	2.45	0.47
3:A:218:LEU:HB3	3:A:224:ILE:CD1	2.45	0.47
3:A:302:GLY:HA3	3:A:307:ALA:CB	2.44	0.47
3:A:302:GLY:HA3	3:A:307:ALA:HB2	1.97	0.47
3:A:72:LYS:HG2	3:A:82:LEU:HD11	1.96	0.47
3:A:262:LYS:O	3:A:262:LYS:HG3	2.14	0.47
3:A:118:GLY:HA2	3:A:120:LYS:HE2	1.97	0.47
3:A:266:TYR:HB2	3:A:313:VAL:CG1	2.45	0.47
3:A:287:LEU:HD13	3:A:287:LEU:HA	1.63	0.47
3:A:112:ARG:O	3:A:115:VAL:HB	2.15	0.46
3:A:322:TYR:HD1	3:A:322:TYR:HA	1.63	0.46
3:A:35:LYS:O	3:A:38:ALA:HB3	2.14	0.46
3:A:156:LEU:CD2	3:A:181:PHE:CZ	2.98	0.46
3:A:170:ASP:HB3	3:A:173:TYR:CD2	2.49	0.46
3:A:261:PRO:O	3:A:263:ASP:N	2.49	0.46
3:A:60:LYS:HE2	3:A:67:THR:HB	1.97	0.46
3:A:260:ILE:HG22	3:A:261:PRO:CD	2.45	0.46
3:A:157:GLN:HE22	3:A:244:LYS:NZ	2.14	0.46
3:A:218:LEU:N	3:A:218:LEU:CD1	2.78	0.46
2:P:2:DA:H5'	2:P:2:DA:H2'	1.66	0.46
3:A:296:TYR:C	3:A:297:THR:HG23	2.41	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:100:LEU:HD12	3:A:100:LEU:HA	1.62	0.45
3:A:218:LEU:N	3:A:218:LEU:HD13	2.31	0.45
3:A:254:ARG:HH11	3:A:255:ILE:H	1.63	0.45
3:A:125:LEU:HD23	3:A:125:LEU:HA	1.59	0.45
3:A:253:ARG:HH11	3:A:253:ARG:HG2	1.81	0.45
2:P:5:DT:P	3:A:109:SER:HB3	2.55	0.45
3:A:254:ARG:HH11	3:A:255:ILE:N	2.14	0.45
3:A:132:LEU:HB3	3:A:136:GLN:HB2	1.98	0.45
3:A:153:GLU:O	3:A:157:GLN:HG3	2.16	0.45
3:A:131:LYS:HG2	3:A:131:LYS:H	1.46	0.45
3:A:18:MET:HG3	3:A:22:LEU:CD2	2.47	0.45
3:A:183:ARG:O	3:A:331:LYS:HA	2.16	0.45
3:A:261:PRO:C	3:A:263:ASP:N	2.74	0.45
3:A:133:ASN:ND2	6:A:512:HOH:O	2.49	0.45
3:A:156:LEU:CD2	3:A:181:PHE:HZ	2.28	0.45
3:A:268:GLY:O	3:A:271:TYR:HB3	2.17	0.45
3:A:302:GLY:CA	3:A:307:ALA:HB3	2.47	0.45
3:A:85:LEU:HD12	3:A:85:LEU:HA	1.64	0.45
3:A:233:THR:O	3:A:258:ARG:HA	2.17	0.45
3:A:26:GLU:OE1	3:A:30:SER:OG	2.30	0.45
3:A:254:ARG:NH1	3:A:254:ARG:HB3	2.32	0.45
3:A:325:TRP:HD1	6:A:583:HOH:O	1.99	0.44
3:A:27:LYS:CB	3:A:36:TYR:CD1	3.00	0.44
3:A:286:ALA:HB1	3:A:323:ILE:HG21	1.96	0.44
3:A:289:LYS:HG3	3:A:323:ILE:O	2.17	0.44
1:T:4:DT:C5'	3:A:231:GLY:HA3	2.47	0.44
3:A:210:LEU:HD23	3:A:210:LEU:HA	1.75	0.44
3:A:285:HIS:CE1	3:A:289:LYS:HG2	2.52	0.44
3:A:118:GLY:HA2	3:A:120:LYS:CE	2.48	0.43
3:A:112:ARG:HG2	3:A:112:ARG:H	1.61	0.43
3:A:127:LYS:HA	3:A:127:LYS:HD3	1.73	0.43
3:A:73:ILE:HG22	3:A:77:LEU:HD13	2.01	0.43
2:P:5:DT:OP1	3:A:110:ALA:N	2.51	0.43
3:A:15:ILE:CD1	3:A:73:ILE:HG23	2.49	0.43
3:A:298:ILE:HG23	3:A:311:LEU:CB	2.36	0.43
3:A:287:LEU:HD12	3:A:287:LEU:O	2.19	0.43
3:A:303:VAL:O	3:A:305:GLY:N	2.51	0.43
6:T:547:HOH:O	3:A:133:ASN:HB2	2.17	0.43
3:A:261:PRO:C	3:A:263:ASP:H	2.26	0.43
3:A:72:LYS:CG	3:A:82:LEU:HD11	2.49	0.43
3:A:192:ASP:N	3:A:192:ASP:OD1	2.50	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:280:LYS:H	3:A:280:LYS:HG3	1.63	0.43
3:A:60:LYS:C	3:A:62:LEU:H	2.26	0.42
3:A:73:ILE:O	3:A:77:LEU:HD13	2.19	0.42
3:A:288:GLU:O	3:A:290:GLY:N	2.53	0.42
3:A:133:ASN:ND2	3:A:135:HIS:CB	2.81	0.42
3:A:133:ASN:ND2	3:A:136:GLN:H	2.17	0.42
3:A:278:PHE:HZ	3:A:320:PHE:CZ	2.37	0.42
3:A:11:LEU:N	3:A:11:LEU:CD2	2.79	0.42
3:A:57:ALA:O	3:A:61:LYS:HG3	2.19	0.42
3:A:207:GLN:HA	3:A:208:PRO:HD2	1.89	0.42
3:A:219:GLN:O	3:A:222:HIS:HA	2.19	0.42
3:A:237:GLY:O	3:A:254:ARG:NH1	2.52	0.42
2:P:5:DT:H5"	3:A:105:GLY:O	2.20	0.42
3:A:169:VAL:O	3:A:170:ASP:HB2	2.20	0.42
3:A:73:ILE:CG2	3:A:77:LEU:HD13	2.50	0.42
3:A:151:PRO:HD2	3:A:154:GLU:OE1	2.20	0.42
3:A:201:THR:CA	3:A:261:PRO:HB3	2.33	0.42
3:A:228:LEU:O	3:A:229:SER:HB3	2.19	0.42
3:A:27:LYS:HB2	3:A:36:TYR:CD1	2.55	0.41
3:A:259:LEU:HD12	3:A:259:LEU:HA	1.73	0.41
3:A:277:ILE:HG12	3:A:278:PHE:N	2.34	0.41
3:A:223:PHE:O	3:A:239:CYS:HB2	2.20	0.41
2:P:5:DT:P	3:A:107:GLY:HA3	2.60	0.41
3:A:303:VAL:C	3:A:305:GLY:N	2.78	0.41
3:A:158:MET:HG2	3:A:241:LEU:HD21	2.02	0.41
3:A:300:PRO:HG3	3:A:311:LEU:HD13	2.00	0.41
3:A:18:MET:HB3	3:A:18:MET:HE3	1.86	0.41
3:A:150:ILE:HG13	3:A:188:SER:O	2.20	0.41
3:A:309:GLU:HA	3:A:310:PRO:HD2	1.86	0.41
3:A:253:ARG:CG	3:A:253:ARG:NH1	2.79	0.41
3:A:266:TYR:N	6:A:508:HOH:O	2.54	0.41
3:A:282:MET:HB3	6:A:555:HOH:O	2.20	0.41
3:A:27:LYS:HB3	3:A:36:TYR:CD1	2.56	0.41
3:A:111:ALA:O	3:A:115:VAL:HG23	2.21	0.41
3:A:271:TYR:HD1	3:A:283:ARG:HH21	1.69	0.41
3:A:311:LEU:HA	3:A:311:LEU:HD12	1.83	0.41
3:A:172:GLU:HG3	3:A:198:PRO:HG3	2.03	0.41
3:A:299:ARG:HA	3:A:300:PRO:HD3	1.84	0.41
3:A:152:ARG:HG2	3:A:186:GLU:HA	2.03	0.40
3:A:56:GLY:HA3	3:A:74:ASP:OD2	2.21	0.40
3:A:144:GLY:N	6:A:669:HOH:O	2.54	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:298:ILE:HG21	3:A:322:TYR:CD2	2.57	0.40
3:A:15:ILE:HG22	3:A:46:ILE:HD11	2.03	0.40
3:A:31:GLN:CG	3:A:112:ARG:HH12	2.35	0.40
3:A:41:LYS:O	3:A:44:SER:HB3	2.22	0.40
3:A:196:THR:OG1	3:A:260:ILE:O	2.30	0.40
3:A:200:PHE:CD1	3:A:201:THR:N	2.89	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:83:ARG:NH1	3:A:117:GLU:CB[3_558]	2.09	0.11

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
3	A	325/335 (97%)	280 (86%)	28 (9%)	17 (5%)	1 10

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A	32	ALA
3	A	185	ALA
3	A	206	LYS
3	A	244	LYS
3	A	247	GLU
3	A	304	THR
3	A	309	GLU
3	A	145	ASP
3	A	202	SER
3	A	262	LYS

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Mol	Chain	Res	Type
3	A	289	LYS
3	A	10	THR
3	A	13	GLY
3	A	91	ASP
3	A	246	ASP
3	A	324	GLN
3	A	113	LYS

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%)	221 (77%)	67 (23%)	1 4

All (67) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	18	MET
3	A	19	LEU
3	A	22	LEU
3	A	27	LYS
3	A	30	SER
3	A	33	ILE
3	A	37	ASN
3	A	41	LYS
3	A	44	SER
3	A	45	VAL
3	A	46	ILE
3	A	52	LYS
3	A	62	LEU
3	A	67	THR
3	A	68	LYS
3	A	72	LYS
3	A	79	THR
3	A	92	ASP
3	A	94	SER

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Mol	Chain	Res	Type
3	A	97	ILE
3	A	100	LEU
3	A	109	SER
3	A	112	ARG
3	A	113	LYS
3	A	121	THR
3	A	131	LYS
3	A	132	LEU
3	A	150	ILE
3	A	153	GLU
3	A	169	VAL
3	A	171	SER
3	A	172	GLU
3	A	194	LEU
3	A	195	LEU
3	A	201	THR
3	A	202	SER
3	A	214	VAL
3	A	218	LEU
3	A	221	VAL
3	A	226	ASP
3	A	228	LEU
3	A	243	SER
3	A	245	ASN
3	A	248	LYS
3	A	253	ARG
3	A	255	ILE
3	A	258	ARG
3	A	260	ILE
3	A	264	GLN
3	A	269	VAL
3	A	277	ILE
3	A	279	ASN
3	A	282	MET
3	A	287	LEU
3	A	288	GLU
3	A	294	ASN
3	A	295	GLU
3	A	299	ARG
3	A	306	VAL
3	A	309	GLU
3	A	311	LEU

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Mol	Chain	Res	Type
3	A	314	ASP
3	A	325	TRP
3	A	329	GLU
3	A	331	LYS
3	A	334	SER
3	A	335	GLU

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

Mol	Chain	Res	Type
3	A	12	ASN
3	A	28	ASN
3	A	31	GLN
3	A	37	ASN
3	A	90	GLN
3	A	98	ASN
3	A	133	ASN
3	A	136	GLN
3	A	157	GLN
3	A	212	HIS
3	A	213	GLN
3	A	222	HIS
3	A	245	ASN
3	A	264	GLN
3	A	279	ASN
3	A	281	ASN
3	A	294	ASN

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

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

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data [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	7/7 (100%)	-1.01	0 100 100	16, 26, 64, 100	0
2	P	6/6 (100%)	-1.17	0 100 100	13, 22, 28, 35	0
3	A	324/335 (96%)	-0.96	0 100 100	2, 33, 87, 100	0
All	All	337/348 (96%)	-0.97	0 100 100	2, 33, 87, 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	0.97	0.05	22,22,22,22	0
5	NA	A	341	1/1	0.98	0.03	29,29,29,29	0
4	CD	A	340	1/1	0.98	0.12	94,94,94,94	0
4	CD	A	343	1/1	0.99	0.05	48,48,48,48	0

6.5 Other polymers [i](#)

There are no such residues in this entry.