



Full wwPDB X-ray Structure Validation Report ⓘ

Jul 25, 2023 – 02:01 AM EDT

PDB ID : 9ICI
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 : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.34
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.34

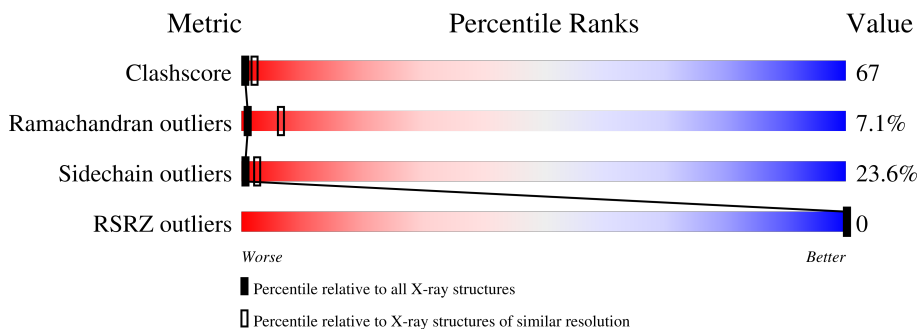
1 Overall quality at a glance

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	141614	1184 (3.10-3.10)
Ramachandran outliers	138981	1141 (3.10-3.10)
Sidechain outliers	138945	1141 (3.10-3.10)
RSRZ outliers	127900	1067 (3.10-3.10)

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	12% 88%
2	P	8	12% 12% 75%
3	A	335	16% 53% 23% 6% •

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
			Total	C	N	O	P			
1	T	8	145	69	27	42	7	0	0	0

- 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
			Total	C	N	O	P			
2	P	8	148	69	24	47	8	0	0	0

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

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

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

- Molecule 5 is SODIUM ION (three-letter code: 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 [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.

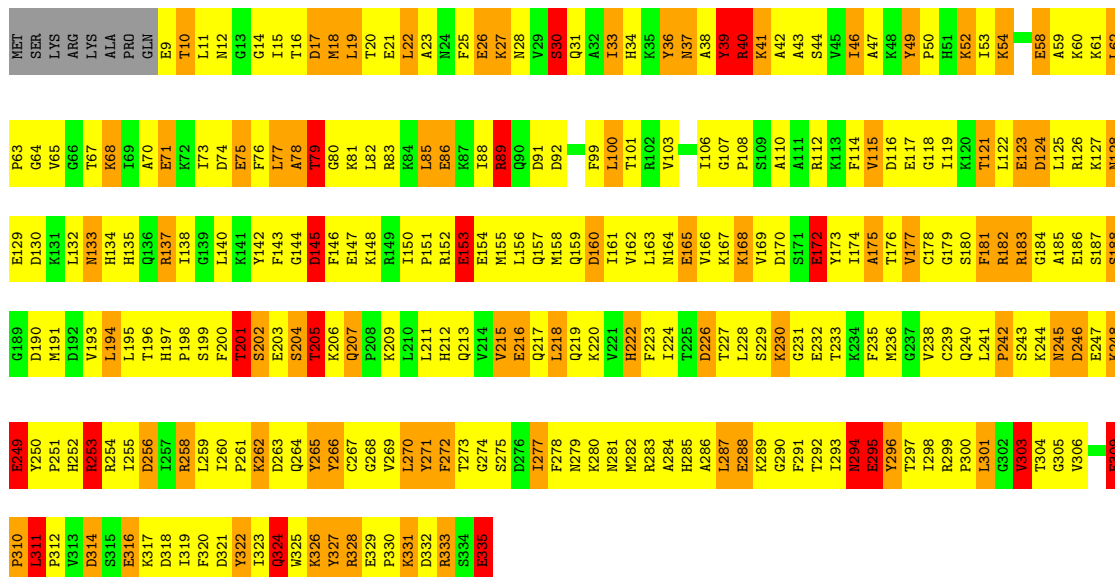
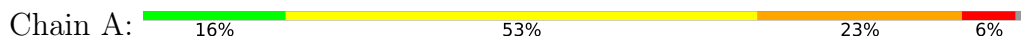
- Molecule 1: DNA (5'-D(*CP*AP*TP*TP*AP*GP*AP*A)-3')



- Molecule 2: DNA (5'-D(*TP*CP*TP*AP*AP*TP*GP*T)-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	180.93Å 57.54Å 48.22Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.10 12.03 – 2.79	Depositor EDS
% Data completeness (in resolution range)	94.0 (20.00-3.10) 86.4 (12.03-2.79)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.30 (at 2.79Å)	Xtrriage
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	Xtrriage
Anisotropy	0.386	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.16 , 147.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.42$, $\langle L^2 \rangle = 0.24$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	3045	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtrriage'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: NA, ZN

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	1.93	2/162 (1.2%)	3.18	27/249 (10.8%)
2	P	2.03	4/164 (2.4%)	4.32	28/250 (11.2%)
3	A	1.25	27/2672 (1.0%)	1.77	58/3590 (1.6%)
All	All	1.35	33/2998 (1.1%)	2.12	113/4089 (2.8%)

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 (33) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	P	3	DT	N1-C2	8.91	1.45	1.38
1	T	5	DA	N3-C4	-7.89	1.30	1.34
3	A	58	GLU	CD-OE1	7.39	1.33	1.25
3	A	329	GLU	CD-OE2	7.28	1.33	1.25
3	A	153	GLU	CD-OE2	7.24	1.33	1.25
3	A	249	GLU	CD-OE2	7.23	1.33	1.25
3	A	71	GLU	CD-OE1	7.13	1.33	1.25
3	A	295	GLU	CD-OE2	7.09	1.33	1.25
3	A	309	GLU	CD-OE2	7.08	1.33	1.25
2	P	3	DT	C1'-N1	6.94	1.58	1.49
3	A	129	GLU	CD-OE1	6.94	1.33	1.25
3	A	147	GLU	CD-OE2	6.80	1.33	1.25
3	A	21	GLU	CD-OE1	6.61	1.32	1.25
3	A	203	GLU	CD-OE1	6.53	1.32	1.25
3	A	86	GLU	CD-OE1	6.46	1.32	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	172	GLU	CD-OE2	6.35	1.32	1.25
3	A	75	GLU	CD-OE1	6.20	1.32	1.25
3	A	186	GLU	CD-OE1	6.17	1.32	1.25
3	A	271	TYR	CB-CG	-6.04	1.42	1.51
3	A	123	GLU	CD-OE1	6.00	1.32	1.25
3	A	117	GLU	CD-OE2	5.99	1.32	1.25
3	A	216	GLU	CD-OE2	5.85	1.32	1.25
3	A	26	GLU	CD-OE1	5.83	1.32	1.25
3	A	335	GLU	CD-OE2	5.80	1.32	1.25
3	A	165	GLU	CD-OE2	5.67	1.31	1.25
3	A	36	TYR	CB-CG	-5.60	1.43	1.51
1	T	5	DA	N1-C2	5.31	1.39	1.34
2	P	1	DT	C5-C7	5.23	1.53	1.50
3	A	9	GLU	CD-OE2	5.18	1.31	1.25
3	A	288	GLU	CD-OE2	5.14	1.31	1.25
3	A	232	GLU	CD-OE2	5.11	1.31	1.25
3	A	316	GLU	CD-OE1	5.08	1.31	1.25
2	P	6	DT	C1'-N1	5.05	1.55	1.49

All (113) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	P	1	DT	C6-N1-C1'	-24.84	83.15	120.40
2	P	6	DT	C6-N1-C1'	-24.21	84.08	120.40
2	P	6	DT	C2-N1-C1'	22.77	154.64	118.20
2	P	1	DT	C2-N1-C1'	21.56	152.70	118.20
2	P	3	DT	C6-N1-C1'	-16.68	95.38	120.40
2	P	3	DT	C2-N1-C1'	15.83	143.53	118.20
1	T	4	DT	C6-N1-C1'	-14.58	98.53	120.40
1	T	4	DT	C2-N1-C1'	13.75	140.20	118.20
1	T	7	DA	C4-N9-C1'	-13.49	102.02	126.30
1	T	7	DA	C8-N9-C1'	12.23	149.71	127.70
2	P	5	DA	C4-N9-C1'	10.96	146.02	126.30
2	P	5	DA	C8-N9-C1'	-10.40	108.98	127.70
1	T	6	DG	O4'-C1'-N9	10.23	115.16	108.00
2	P	2	DC	C2-N1-C1'	10.21	130.03	118.80
2	P	2	DC	C6-N1-C1'	-10.01	108.79	120.80
1	T	5	DA	N1-C6-N6	9.50	124.30	118.60
3	A	333	ARG	NE-CZ-NH1	9.30	124.95	120.30
2	P	7	DG	C4-N9-C1'	-9.28	114.43	126.50
2	P	1	DT	C1'-O4'-C4'	-8.78	101.32	110.10
3	A	226	ASP	CB-CG-OD1	8.77	126.19	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	P	3	DT	O4'-C1'-N1	8.70	114.09	108.00
2	P	7	DG	C8-N9-C1'	8.39	137.91	127.00
1	T	2	DA	C4-N9-C1'	-8.31	111.35	126.30
3	A	190	ASP	CB-CG-OD2	-8.29	110.83	118.30
1	T	3	DT	C6-N1-C1'	8.15	132.62	120.40
3	A	271	TYR	CA-CB-CG	-8.00	98.20	113.40
3	A	263	ASP	CB-CG-OD2	-7.96	111.14	118.30
1	T	1	DC	P-O3'-C3'	7.94	129.23	119.70
1	T	2	DA	C8-N9-C1'	7.83	141.79	127.70
3	A	227	THR	CA-CB-CG2	-7.71	101.60	112.40
3	A	190	ASP	CB-CG-OD1	7.64	125.18	118.30
3	A	79	THR	CA-CB-CG2	-7.56	101.82	112.40
3	A	222	HIS	CA-CB-CG	-7.55	100.77	113.60
3	A	256	ASP	CB-CG-OD1	7.50	125.05	118.30
3	A	314	ASP	CB-CG-OD2	-7.40	111.64	118.30
1	T	6	DG	C4-N9-C1'	-7.31	116.99	126.50
3	A	36	TYR	CB-CG-CD2	-7.17	116.70	121.00
1	T	5	DA	P-O5'-C5'	-7.09	109.55	120.90
3	A	226	ASP	CB-CG-OD2	-7.00	112.00	118.30
3	A	145	ASP	CB-CG-OD2	-6.99	112.01	118.30
3	A	326	LYS	CD-CE-NZ	6.99	127.77	111.70
1	T	3	DT	C2-N1-C1'	-6.86	107.22	118.20
3	A	183	ARG	NE-CZ-NH1	6.84	123.72	120.30
3	A	116	ASP	CB-CG-OD1	-6.84	112.15	118.30
3	A	74	ASP	CB-CG-OD1	6.72	124.34	118.30
1	T	6	DG	C8-N9-C1'	6.62	135.60	127.00
2	P	6	DT	O4'-C1'-N1	6.60	112.62	108.00
3	A	145	ASP	CB-CA-C	-6.59	97.22	110.40
3	A	130	ASP	CB-CG-OD2	-6.57	112.39	118.30
3	A	266	TYR	CA-CB-CG	-6.55	100.95	113.40
3	A	92	ASP	CB-CG-OD2	-6.51	112.44	118.30
3	A	124	ASP	CB-CG-OD2	-6.49	112.46	118.30
3	A	160	ASP	CB-CG-OD1	6.49	124.14	118.30
3	A	89	ARG	NE-CZ-NH1	6.43	123.52	120.30
2	P	1	DT	P-O3'-C3'	6.42	127.41	119.70
3	A	137	ARG	NE-CZ-NH2	-6.40	117.10	120.30
2	P	6	DT	P-O5'-C5'	-6.39	110.67	120.90
3	A	271	TYR	CB-CG-CD1	-6.38	117.17	121.00
3	A	39	TYR	CB-CG-CD1	-6.35	117.19	121.00
1	T	5	DA	C6-C5-N7	-6.33	127.87	132.30
2	P	7	DG	P-O5'-C5'	-6.32	110.78	120.90
3	A	314	ASP	CB-CG-OD1	6.28	123.95	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	294	ASN	N-CA-CB	6.22	121.80	110.60
2	P	5	DA	O4'-C1'-N9	6.21	112.34	108.00
2	P	1	DT	C4-C5-C7	6.19	122.72	119.00
3	A	256	ASP	CB-CG-OD2	-6.19	112.73	118.30
3	A	91	ASP	CB-CG-OD1	-6.16	112.75	118.30
1	T	7	DA	C8-N9-C4	6.13	108.25	105.80
3	A	115	VAL	CA-CB-CG2	-6.10	101.75	110.90
3	A	227	THR	N-CA-CB	6.08	121.85	110.30
1	T	4	DT	O4'-C1'-C2'	-6.03	101.07	105.90
1	T	4	DT	O4'-C1'-N1	6.01	112.21	108.00
2	P	5	DA	O4'-C1'-C2'	-5.97	101.12	105.90
3	A	258	ARG	NE-CZ-NH1	5.86	123.23	120.30
3	A	116	ASP	CB-CA-C	5.83	122.07	110.40
3	A	17	ASP	CB-CG-OD1	-5.83	113.05	118.30
1	T	5	DA	C5-C6-N1	-5.82	114.79	117.70
3	A	130	ASP	CB-CG-OD1	5.82	123.54	118.30
3	A	175	ALA	N-CA-CB	5.80	118.22	110.10
3	A	160	ASP	CB-CG-OD2	-5.80	113.08	118.30
3	A	177	VAL	N-CA-C	-5.78	95.39	111.00
3	A	92	ASP	N-CA-CB	5.75	120.94	110.60
3	A	253	ARG	NE-CZ-NH1	5.73	123.16	120.30
3	A	91	ASP	CB-CG-OD2	5.65	123.39	118.30
2	P	1	DT	C6-N1-C2	5.64	124.12	121.30
3	A	40	ARG	NE-CZ-NH1	5.63	123.11	120.30
3	A	201	THR	CA-CB-CG2	-5.62	104.53	112.40
1	T	4	DT	C1'-O4'-C4'	-5.60	104.50	110.10
2	P	2	DC	P-O5'-C5'	-5.55	112.02	120.90
3	A	263	ASP	CB-CG-OD1	5.52	123.27	118.30
2	P	4	DA	O4'-C1'-N9	-5.49	104.16	108.00
2	P	6	DT	P-O3'-C3'	5.47	126.27	119.70
1	T	5	DA	P-O3'-C3'	-5.47	113.14	119.70
3	A	30	SER	O-C-N	-5.47	113.95	122.70
1	T	4	DT	C4-C5-C7	5.44	122.26	119.00
3	A	40	ARG	CB-CA-C	5.43	121.26	110.40
3	A	311	LEU	C-N-CD	-5.42	108.67	120.60
1	T	5	DA	C4-C5-N7	5.38	113.39	110.70
1	T	5	DA	C5-N7-C8	-5.38	101.21	103.90
3	A	92	ASP	CB-CG-OD1	5.35	123.12	118.30
2	P	5	DA	C1'-O4'-C4'	-5.33	104.77	110.10
1	T	3	DT	C6-C5-C7	-5.33	119.70	122.90
1	T	4	DT	C6-C5-C7	-5.29	119.73	122.90
3	A	36	TYR	N-CA-CB	-5.28	101.10	110.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	215	VAL	CB-CA-C	5.27	121.41	111.40
2	P	3	DT	N3-C2-O2	-5.22	119.17	122.30
3	A	116	ASP	CB-CG-OD2	5.10	122.89	118.30
3	A	17	ASP	CB-CG-OD2	5.10	122.89	118.30
2	P	3	DT	N1-C1'-C2'	5.09	122.27	112.60
3	A	322	TYR	CB-CG-CD1	-5.03	117.98	121.00
3	A	246	ASP	CB-CG-OD1	-5.03	113.78	118.30
1	T	6	DG	O4'-C1'-C2'	-5.03	101.88	105.90
3	A	49	TYR	CB-CA-C	5.02	120.43	110.40

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	A	92	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	145	0	80	8	0
2	P	148	0	80	18	0
3	A	2623	0	2641	352	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	375	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 67.

All (375) 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
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: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
3:A:155:MET:HE2	3:A:188:SER:HB2	1.61	0.82
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: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: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:18:MET:HE1	3:A:76:PHE:HB2	1.65	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:165:GLU:CD	3:A:168:LYS:HD3	2.06	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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
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:155:MET:HE2	3:A:188:SER:CB	2.20	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:245:ASN:N	3:A:245:ASN:ND2	2.37	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: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:270:LEU:HD21	3:A:282:MET:CE	2.22	0.68
3:A:46:ILE:HD12	3:A:46:ILE:O	1.93	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
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:158:MET:HE3	3:A:191:MET:SD	2.34	0.67
3:A:270:LEU:HD21	3:A:282:MET:HE1	1.75	0.67
3:A:245:ASN:H	3:A:245:ASN:ND2	1.90	0.67
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: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: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:323:ILE:C	3:A:324:GLN:HG2	2.19	0.63
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:145:ASP:HA	3:A:148:LYS:HZ2	1.65	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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: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:303:VAL:C	3:A:305:GLY:H	2.06	0.60
3:A:41:LYS:HD3	3:A:42:ALA:N	2.16	0.59
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:18:MET:HE3	3:A:76:PHE:HB2	1.87	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:294:ASN:C	3:A:296:TYR:H	2.09	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:158:MET:HB2	3:A:191:MET:HE1	1.88	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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
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: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: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: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: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:267:CYS:HB2	3:A:296:TYR:C	2.31	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:317:LYS:O	3:A:320:PHE:N	2.43	0.51
3:A:18:MET:HE1	3:A:76:PHE:CB	2.38	0.51
3:A:31:GLN:N	6:A:641:HOH:O	2.43	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: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:HG23	3:A:124:ASP:CG	2.33	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: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:322:TYR:C	3:A:324:GLN:H	2.16	0.48
3:A:165:GLU:OE1	3:A:168:LYS:HD3	2.13	0.48
3:A:118:GLY:C	3:A:119:ILE:HD13	2.33	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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
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: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:145:ASP:HA	3:A:148:LYS:NZ	2.29	0.46
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:270:LEU:HD21	3:A:282:MET:HE3	1.96	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:79:THR:C	3:A:81:LYS:H	2.19	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:106:ILE:O	3:A:106:ILE:HG22	2.15	0.45
3:A:155:MET:HE2	3:A:188:SER:OG	2.16	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:40:ARG:HA	3:A:43:ALA:HB3	1.99	0.45
3:A:49:TYR:CD2	3:A:53:ILE:CG1	3.00	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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: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
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: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: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: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: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: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: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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:259:LEU:HA	3:A:259:LEU:HD12	1.67	0.42
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:288:GLU:C	3:A:290:GLY:H	2.22	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: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:294:ASN:C	3:A:296:TYR:N	2.72	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: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:235:PHE:CD1	3:A:235:PHE:C	2.94	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:321:ASP:C	3:A:324:GLN:H	2.25	0.40
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:177:VAL:HG22	3:A:193:VAL:HG22	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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: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 [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%)	250 (77%)	52 (16%)	23 (7%)	1 6

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
3	A	304	THR
3	A	39	TYR
3	A	78	ALA
3	A	204	SER
3	A	265	TYR

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Mol	Chain	Res	Type
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 [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
3	A	288/295 (98%)	220 (76%)	68 (24%)	1 2

All (68) 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	25	PHE
3	A	27	LYS
3	A	30	SER
3	A	37	ASN
3	A	40	ARG
3	A	41	LYS
3	A	46	ILE
3	A	54	LYS
3	A	62	LEU
3	A	67	THR
3	A	68	LYS
3	A	75	GLU
3	A	77	LEU
3	A	79	THR

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Mol	Chain	Res	Type
3	A	85	LEU
3	A	89	ARG
3	A	100	LEU
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	167	LYS
3	A	168	LYS
3	A	172	GLU
3	A	181	PHE
3	A	182	ARG
3	A	188	SER
3	A	194	LEU
3	A	201	THR
3	A	205	THR
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
3	A	258	ARG
3	A	262	LYS
3	A	270	LEU
3	A	272	PHE
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

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Mol	Chain	Res	Type
3	A	314	ASP
3	A	324	GLN
3	A	325	TRP
3	A	327	TYR
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 (14) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	12	ASN
3	A	28	ASN
3	A	37	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 [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 monosaccharides 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%)	-1.11	0 100 100	22, 42, 72, 99	0
2	P	8/8 (100%)	-1.10	0 100 100	17, 34, 81, 100	0
3	A	324/335 (96%)	-1.08	0 100 100	3, 35, 87, 100	0
All	All	340/351 (96%)	-1.08	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 monosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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	0.61	0.36	57,57,57,57	0
4	ZN	A	340	1/1	0.98	0.04	30,30,30,30	1
5	NA	A	341	1/1	0.99	0.05	3,3,3,3	0
4	ZN	A	343	1/1	0.99	0.04	30,30,30,30	0

6.5 Other polymers [i](#)

There are no such residues in this entry.