



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2018 – 11:39 am GMT

PDB ID : 5L1L
Title : PostInsertion complex of Human DNA Polymerase Eta bypassing an O6-Methyl-2'-deoxyguanosine : dT site
Authors : Patra, A.; Egli, M.
Deposited on : 2016-07-29
Resolution : 1.62 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.7.3 (157068), CSD as539be (2018)
Xtriage (Phenix) : 1.13
EDS : trunk30967
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)
Refmac : 5.8.0158
CCP4 : 7.0 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk30967

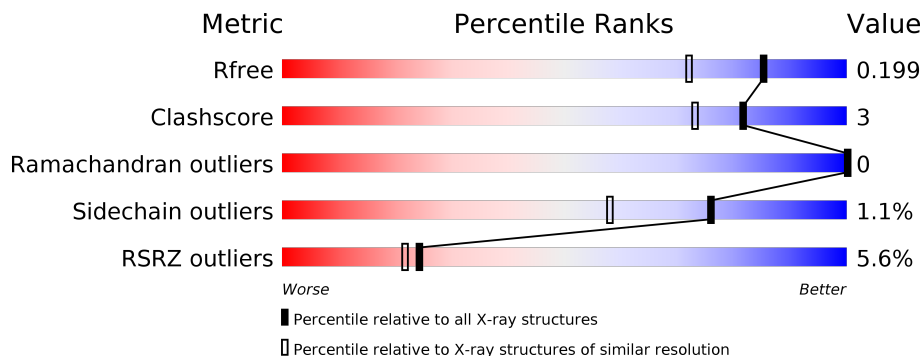
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

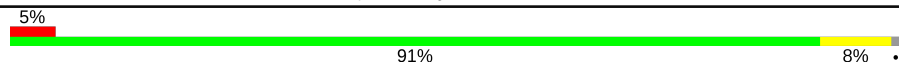
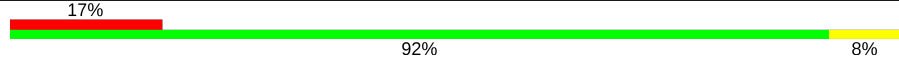

The reported resolution of this entry is 1.62 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	111664	3975 (1.64-1.60)
Clashscore	122126	4258 (1.64-1.60)
Ramachandran outliers	120053	4162 (1.64-1.60)
Sidechain outliers	120020	4161 (1.64-1.60)
RSRZ outliers	108989	3894 (1.64-1.60)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	A	435	 5% 91% 8%
2	T	12	 17% 92% 8%
3	P	8	 75% 25%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 4401 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called DNA polymerase eta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	430	3433	2152	618	634	29	0	15	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP Q9Y253
A	-1	PRO	-	expression tag	UNP Q9Y253
A	0	HIS	-	expression tag	UNP Q9Y253

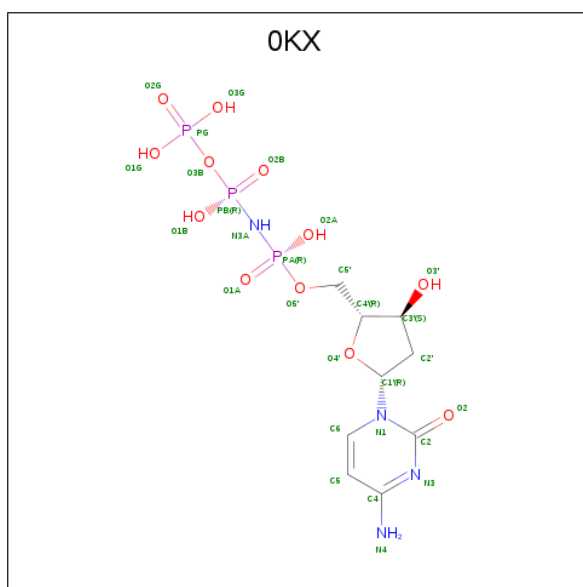
- Molecule 2 is a DNA chain called DNA (5'-D(*CP*AP*TP*GP*(6OG)P*TP*GP*AP*CP*GP*CP*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	T	12	230	109	42	68	11	0	0	1

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
3	P	8	161	78	30	46	7	0	0	0

- Molecule 4 is 2'-deoxy-5'-O-[(R)-hydroxy{[(R)-hydroxy(phosphonooxy)phosphoryl]amino}p hosphoryl]cytidine (three-letter code: 0KX) (formula: C₉H₁₇N₄O₁₂P₃).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
4	A	1	28	9	4	12	3	0	0

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 6 3 3	0	0
6	A	1	Total C O 6 3 3	0	0
6	A	1	Total C O 6 3 3	0	0

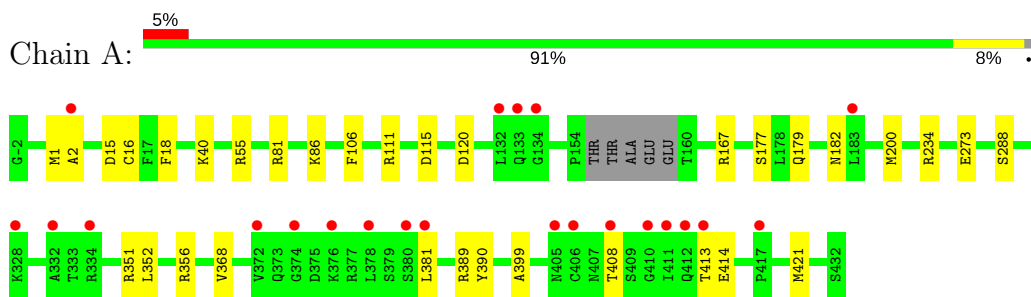
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	464	Total O 467 467	0	3
7	T	38	Total O 38 38	0	0
7	P	24	Total O 24 24	0	0

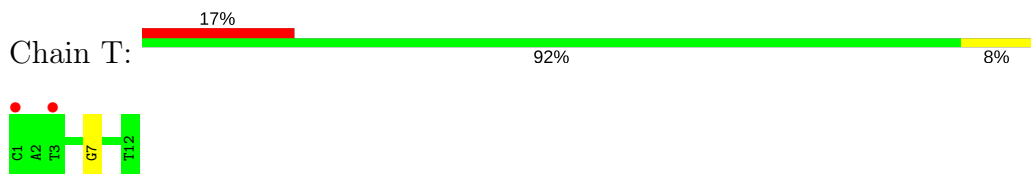
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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.

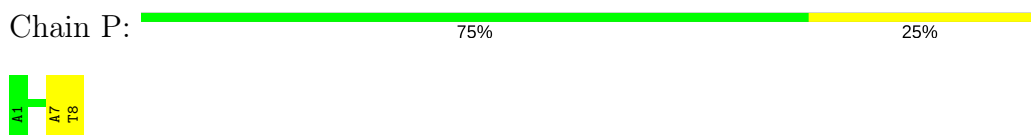
- Molecule 1: DNA polymerase eta



- Molecule 2: DNA (5'-D(*CP*AP*TP*GP*(6OG)P*TP*GP*AP*CP*GP*CP*T)-3')



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



4 Data and refinement statistics i

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α , β , γ	98.36Å 98.36Å 82.03Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	50.00 – 1.62 42.59 – 1.62	Depositor EDS
% Data completeness (in resolution range)	100.0 (50.00-1.62) 100.0 (42.59-1.62)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.24 (at 1.62Å)	Xtrriage
Refinement program	REFMAC 5.8.0151	Depositor
R, R_{free}	0.157 , 0.193 0.167 , 0.199	Depositor DCC
R_{free} test set	2758 reflections (4.82%)	wwPDB-VP
Wilson B-factor (Å ²)	16.7	Xtrriage
Anisotropy	0.019	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 48.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.038 for h,-h-k,-l	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	4401	wwPDB-VP
Average B, all atoms (Å ²)	25.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.81% 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: GOL, 0KX, 6OG, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.91	2/3547 (0.1%)	0.98	11/4783 (0.2%)
2	T	0.78	0/230	1.12	1/352 (0.3%)
3	P	0.79	0/180	1.04	0/276
All	All	0.89	2/3957 (0.1%)	0.99	12/5411 (0.2%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	288[A]	SER	CB-OG	6.21	1.50	1.42
1	A	288[B]	SER	CB-OG	6.21	1.50	1.42

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	120	ASP	CB-CG-OD2	8.31	125.78	118.30
1	A	167	ARG	NE-CZ-NH1	7.95	124.28	120.30
1	A	81	ARG	NE-CZ-NH2	6.62	123.61	120.30
1	A	111	ARG	NE-CZ-NH1	6.55	123.58	120.30
1	A	389	ARG	NE-CZ-NH1	-6.03	117.28	120.30
1	A	234	ARG	NE-CZ-NH1	6.00	123.30	120.30
2	T	7	DG	O5'-P-OP2	-5.71	100.56	105.70
1	A	389	ARG	NE-CZ-NH2	5.51	123.06	120.30
1	A	55	ARG	NE-CZ-NH2	-5.45	117.57	120.30
1	A	111	ARG	NE-CZ-NH2	-5.45	117.58	120.30
1	A	351	ARG	NE-CZ-NH2	-5.33	117.63	120.30
1	A	18	PHE	CB-CG-CD1	5.17	124.42	120.80

There are no chirality outliers.

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	A	3433	0	3493	17	0
2	T	230	0	127	0	0
3	P	161	0	91	2	0
4	A	28	0	14	1	0
5	A	2	0	0	0	0
6	A	18	0	23	1	0
7	A	467	0	0	12	1
7	P	24	0	0	0	0
7	T	38	0	0	0	0
All	All	4401	0	3748	21	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 3.

All (21) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:179:GLN:O	7:A:601:HOH:O	2.01	0.77
6:A:505:GOL:H12	7:A:695:HOH:O	1.93	0.68
1:A:179:GLN:H	1:A:179:GLN:CD	2.04	0.60
1:A:324:ASN:OD1	1:A:421[B]:MET:HG3	2.02	0.59
1:A:2:ALA:HB1	7:A:834:HOH:O	2.04	0.57
7:A:827:HOH:O	3:P:8:DT:H3'	2.05	0.55
1:A:1:MET:HE2	7:A:949:HOH:O	2.06	0.54
1:A:413:THR:HG23	1:A:414:GLU:OE2	2.11	0.51
1:A:273:GLU:OE1	7:A:603:HOH:O	2.19	0.51
1:A:182:ASN:O	7:A:601:HOH:O	2.20	0.50
1:A:106:PHE:CG	1:A:200[B]:MET:HG2	2.50	0.47
3:P:7:DA:H2''	3:P:8:DT:C6	2.51	0.45
1:A:15:ASP:O	1:A:16:CYS:C	2.54	0.45
1:A:177:SER:OG	7:A:602:HOH:O	2.04	0.44
1:A:86:LYS:HE2	7:A:779:HOH:O	2.17	0.44
1:A:356:ARG:NH2	7:A:621:HOH:O	2.52	0.43
4:A:501:OKX:O5'	4:A:501:OKX:H15	2.19	0.42
1:A:352:LEU:HB3	1:A:390:TYR:CE2	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:368:VAL:HG21	1:A:399:ALA:HA	2.01	0.42
1:A:313[A]:ARG:NH1	7:A:606:HOH:O	2.30	0.41
1:A:182:ASN:HB3	7:A:601:HOH:O	2.20	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)
7:A:727:HOH:O	7:A:885:HOH:O[6_665]	2.11	0.09

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	441/435 (101%)	431 (98%)	10 (2%)	0	100 100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	383/372 (103%)	379 (99%)	4 (1%)	78 62

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	40	LYS
1	A	115	ASP
1	A	381	LEU
1	A	408	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	152	GLN
1	A	169	GLN
1	A	179	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

1 non-standard protein/DNA/RNA residue is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	6OG	T	5	3,2	19,25,26	1.11	3 (15%)	21,36,39	2.61	7 (33%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	6OG	T	5	3,2	-	2/5/23/24	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	T	5	6OG	C5-N7	-2.04	1.32	1.39
2	T	5	6OG	O3'-C3'	2.21	1.48	1.43
2	T	5	6OG	C5-C4	2.62	1.46	1.40

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	T	5	6OG	N3-C2-N1	-5.34	119.59	127.41
2	T	5	6OG	C4-C5-N7	-2.30	107.19	109.41
2	T	5	6OG	N2-C2-N3	2.22	121.81	117.75
2	T	5	6OG	O4'-C1'-N9	2.27	111.61	107.78
2	T	5	6OG	O6-C6-C5	4.84	123.02	115.92
2	T	5	6OG	C2-N1-C6	5.40	123.98	116.18
2	T	5	6OG	C2-N3-C4	6.23	122.44	115.16

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	T	5	6OG	C-O6-C6-N1
2	T	5	6OG	C-O6-C6-C5

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	0KX	A	501	5	26,29,29	2.65	9 (34%)	32,45,45	1.76	4 (12%)
6	GOL	A	504	-	5,5,5	1.21	0	5,5,5	0.76	0
6	GOL	A	505	-	5,5,5	0.33	0	5,5,5	0.76	0
6	GOL	A	506	-	5,5,5	0.54	0	5,5,5	0.75	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	0KX	A	501	5	-	0/14/34/34	0/2/2/2
6	GOL	A	504	-	-	0/4/4/4	0/0/0/0
6	GOL	A	505	-	-	0/4/4/4	0/0/0/0
6	GOL	A	506	-	-	0/4/4/4	0/0/0/0

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	501	0KX	C3'-C4'	-3.51	1.43	1.53
4	A	501	0KX	O4'-C1'	-2.86	1.35	1.42
4	A	501	0KX	PA-O2A	-2.00	1.51	1.56
4	A	501	0KX	PB-N3A	2.23	1.69	1.63
4	A	501	0KX	C6-N1	2.69	1.39	1.35
4	A	501	0KX	C6-C5	2.71	1.44	1.38
4	A	501	0KX	PB-O2B	4.26	1.50	1.46
4	A	501	0KX	O4'-C4'	5.07	1.56	1.45
4	A	501	0KX	PA-O1A	8.54	1.55	1.46

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	501	0KX	O1A-PA-N3A	-5.44	103.65	111.79
4	A	501	0KX	O5'-PA-N3A	-2.11	102.82	107.27
4	A	501	0KX	O1B-PB-O2B	2.73	115.53	109.88
4	A	501	0KX	O2A-PA-O1A	4.52	119.22	109.88

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	501	OKX	1	0
6	A	505	GOL	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	A	430/435 (98%)	-0.20	23 (5%) 26 24	10, 18, 51, 80	0
2	T	11/12 (91%)	0.63	2 (18%) 1 1	23, 25, 96, 119	0
3	P	8/8 (100%)	-0.25	0 100 100	20, 27, 31, 43	0
All	All	449/455 (98%)	-0.18	25 (5%) 24 22	10, 19, 53, 119	0

All (25) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	412	GLN	6.9
2	T	1	DC	6.6
1	A	411	ILE	4.3
1	A	378	LEU	4.2
1	A	410	GLY	4.2
1	A	372	VAL	4.1
2	T	3	DT	3.9
1	A	132	LEU	3.6
1	A	376	LYS	3.5
1	A	408	THR	3.4
1	A	332	ALA	3.3
1	A	183	LEU	3.3
1	A	406	CYS	3.3
1	A	380	SER	3.2
1	A	417	PRO	3.1
1	A	133	GLN	3.0
1	A	374	GLY	2.8
1	A	134	GLY	2.8
1	A	413	THR	2.4
1	A	327	GLY	2.4
1	A	328	LYS	2.3
1	A	2	ALA	2.3
1	A	405	ASN	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	334	ARG	2.2
1	A	381	LEU	2.1

6.2 Non-standard residues in protein, DNA, RNA chains [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
2	6OG	T	5	23/24	0.98	0.06	16,20,26,34	0

6.3 Carbohydrates [i](#)

There are no carbohydrates 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
6	GOL	A	505	6/6	0.83	0.20	33,42,45,58	0
6	GOL	A	506	6/6	0.84	0.20	37,40,43,43	0
6	GOL	A	504	6/6	0.97	0.08	14,15,16,16	0
4	OKX	A	501	28/28	0.99	0.06	10,12,16,17	0
5	MG	A	503	1/1	1.00	0.02	13,13,13,13	0
5	MG	A	502	1/1	1.00	0.09	8,8,8,8	0

6.5 Other polymers [i](#)

There are no such residues in this entry.