W O R L D W I D E

wwPDB

PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

Oct 5, 2023 – 06:29 PM EDT

PDB ID	:	6UOK
Title	:	Y271G DNA polymerase beta substrate complex with templating cytosine and incoming r8-oxo-GTP
Authors	:	Smith, M.R.; Freudenthal, B.D.
Deposited on	:	2019-10-15
Resolution	:	2.55 Å(reported)

The following versions of software and data (see references (i)) were used in the production of this report:

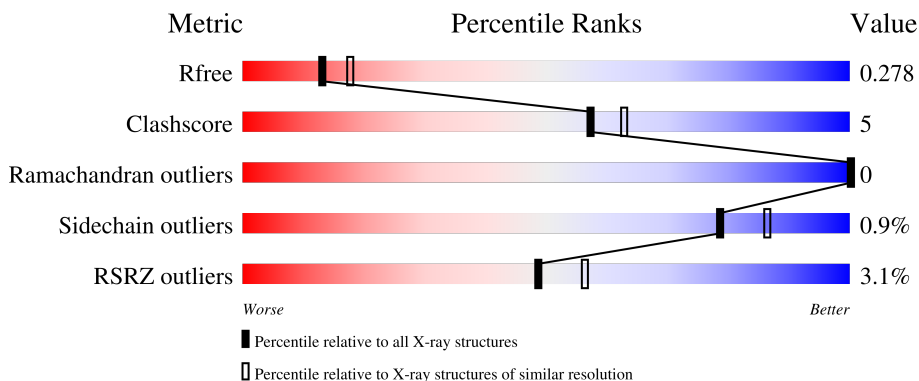|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

1   Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.55 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.
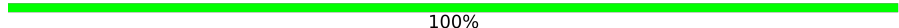
Metric	Percentile Ranks	Value
Rfree		0.278
Clashscore		5
Ramachandran outliers		0
Sidechain outliers		0.9%
RSRZ outliers		3.1%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1284 (2.56-2.52)
Clashscore	141614	1332 (2.56-2.52)
Ramachandran outliers	138981	1315 (2.56-2.52)
Sidechain outliers	138945	1315 (2.56-2.52)
RSRZ outliers	127900	1272 (2.56-2.52)

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 <=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	B	16	81% 19%
1	T	16	62% 38%
2	C	10	80% 10% 10%
2	P	10	90% 10%
3	D	5	60% 40%

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Mol	Chain	Length	Quality of chain
3	E	5	100%
4	A	335	3% 86% 10%
4	F	335	4% 84% 14%

2 Entry composition ⓘ

There are 11 unique types of molecules in this entry. The entry contains 6475 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*CP*GP*AP*CP*CP*GP*CP*GP*CP* AP*TP*CP*AP*GP*C)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	16	Total 319	C 151	N 61	O 92	P 15	0	0	0
1	T	16	Total 342	C 162	N 66	O 98	P 16	0	1	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	10	Total 202	C 97	N 38	O 58	P 9	0	0	0
2	P	10	Total 202	C 97	N 38	O 58	P 9	0	0	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	5	Total 106	C 49	N 20	O 32	P 5	0	0	0
3	D	5	Total 106	C 49	N 20	O 32	P 5	0	0	0

- Molecule 4 is a protein called DNA polymerase beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	F	326	Total 2554	C 1614	N 448	O 483	S 9	0	0	0
4	A	322	Total 2513	C 1591	N 440	O 473	S 9	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	271	GLY	TYR	engineered mutation	UNP P06746
A	271	GLY	TYR	engineered mutation	UNP P06746

- Molecule 5 is CHLORIDE ION (three-letter code: CL) (formula: Cl).
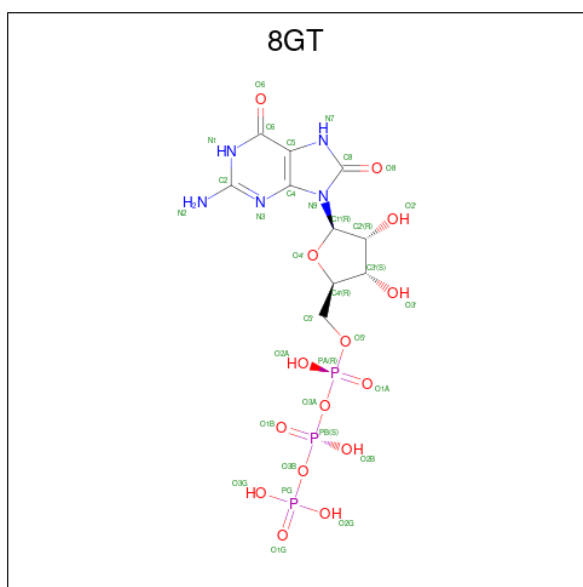
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total Cl 1 1	0	0

- Molecule 6 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	E	1	Total Na 1 1	0	0
6	F	2	Total Na 2 2	0	0
6	A	3	Total Na 3 3	0	0

- Molecule 7 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	F	5	Total Mn 5 5	0	0
7	A	1	Total Mn 1 1	0	0

- Molecule 8 is 8-OXO-GUANOSINE-5'-TRIPHOSPHATE (three-letter code: 8GT) (formula: $C_{10}H_{16}N_5O_{15}P_3$) (labeled as "Ligand of Interest" by depositor).

8GT

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
8	F	1	Total	C	N	O	P	0	0
			33	10	5	15	3		
8	A	1	Total	C	N	O	P	0	0
			33	10	5	15	3		

- Molecule 9 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).

EDO

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	A	1	Total	C	O	0	0
			4	2	2		

- Molecule 10 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	D	1	Total 1	Mg 1	0	0

- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	B	2	Total 2	O 2	0	0
11	C	2	Total 2	O 2	0	0
11	F	15	Total 15	O 15	0	0
11	A	21	Total 21	O 21	0	0
11	T	5	Total 5	O 5	0	0
11	P	1	Total 1	O 1	0	0
11	D	1	Total 1	O 1	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.
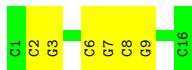
• Molecule 1: DNA (5'-D(*CP*CP*GP*AP*CP*CP*GP*CP*GP*CP*AP*TP*CP*AP*GP*C)-3')

Chain B:

81%   19%

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

Chain T:

62%   38%

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

Chain C:

80%   10%   10%

• Molecule 2: DNA (5'-D(*GP*CP*TP*GP*AP*TP*GP*CP*GP*(DOC))-3')
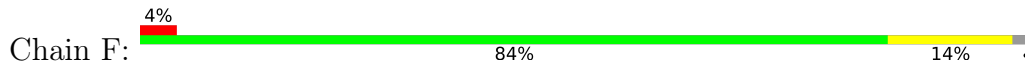
Chain P:

90%   10%

• Molecule 3: DNA (5'-D(P*GP*TP*CP*GP*G)-3')

Chain E:

100%

There are no outlier residues recorded for this chain.

• Molecule 3: DNA (5'-D(P*GP*TP*CP*GP*G)-3')

Chain D:

60%   40%

G1 T2 C3 G4 G5

• Molecule 4: DNA polymerase beta

4%

Chain F:

84%   14%

MET SER LYS ARG LYS ALA PRO GLN GLU T10 L11 N12 I53 K54 S55 E58 T67 E71 F76 L77 A78 T79 G80 L85 I88 R89 Q90 D91 S94 F99 R102 I119 K120 E123 D124 K127 Y142 E153 E154 M155 L156 D160 C178

G179 S180 F181 R182 S188 L195 V214 D226 T233 D246 R258 G274 S275 D276 A284 T292 I293 N294 E295 I298 R299 P300 L301 G302 V303 T304 G305 V306 A307 I319 W325 R328 S334 E335

• Molecule 4: DNA polymerase beta

3%

Chain A:

86%   10%

MET SER LYS ARG LYS ALA PRO GLN GLU T10 V29 T79 G80 K81 L82 E86 Q90 R112 E123 K127 R137 R152 L156 Q157 M158 V162 L163 V166 K167 D170 S171 I174 V177 F181 S187 V193 T196 S204 THR LYS

GLN PRO K209 Q217 L218 Q219 K220 K244 N245 D246 E247 K248 F272 S275 D276 I277 F278 L287 L301 G302 V303 D318 W325 E335

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	54.69Å 79.96Å 100.83Å 90.00° 97.64° 90.00°	Depositor
Resolution (Å)	24.14 – 2.55 24.14 – 2.54	Depositor EDS
% Data completeness (in resolution range)	76.2 (24.14-2.55) 77.3 (24.14-2.54)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.07 (at 2.53Å)	Xtriage
Refinement program	PHENIX 1.16_3549	Depositor
R, R_{free}	0.224 , 0.279 0.224 , 0.278	Depositor DCC
R_{free} test set	1999 reflections (7.80%)	wwPDB-VP
Wilson B-factor (Å^2)	35.8	Xtriage
Anisotropy	0.067	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 34.1	EDS
L-test for twinning[2]	$< |L| > = 0.46, < L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	6475	wwPDB-VP
Average B, all atoms (Å^2)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 26.42 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 2.6429e-03.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: DOC, NA, 8GT, EDO, CL, MG, MN

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	B	0.56	0/356	0.82	0/544
1	T	0.68	0/383	0.83	0/588
2	C	0.75	0/206	1.03	0/317
2	P	0.62	0/206	0.99	0/317
3	D	0.46	0/118	0.80	0/179
3	E	0.44	0/118	0.80	0/179
4	A	0.24	0/2559	0.40	0/3447
4	F	0.24	0/2602	0.40	0/3504
All	All	0.36	0/6548	0.55	0/9075

There are no bond length outliers.

There are no bond angle outliers.

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	B	319	0	175	2	0
1	T	342	0	190	4	0
2	C	202	0	114	4	0
2	P	202	0	114	0	0
3	D	106	0	57	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	E	106	0	57	0	0
4	A	2513	0	2477	21	0
4	F	2554	0	2529	24	0
5	B	1	0	0	0	0
6	A	3	0	0	0	0
6	E	1	0	0	0	0
6	F	2	0	0	0	0
7	A	1	0	0	0	0
7	F	5	0	0	0	0
8	A	33	0	12	3	0
8	F	33	0	12	3	0
9	A	4	0	6	0	0
10	D	1	0	0	0	0
11	A	21	0	0	1	0
11	B	2	0	0	0	0
11	C	2	0	0	0	0
11	D	1	0	0	0	0
11	F	15	0	0	0	0
11	P	1	0	0	0	0
11	T	5	0	0	0	0
All	All	6475	0	5743	57	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 5.

The worst 5 of 57 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)
4:F:91:ASP:HB3	4:F:94:SER:HB2	1.75	0.69
4:A:29:VAL:O	4:A:112:ARG:NH2	2.29	0.65
8:A:405:8GT:O8	8:A:405:8GT:H1	1.99	0.61
4:F:55:SER:HB2	4:F:58:GLU:HB2	1.82	0.61
1:T:6:DC:H2"	1:T:7[B]:DG:O5'	2.02	0.60

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	A	318/335 (95%)	303 (95%)	15 (5%)	0	100	100
4	F	324/335 (97%)	311 (96%)	13 (4%)	0	100	100
All	All	642/670 (96%)	614 (96%)	28 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	A	265/294 (90%)	263 (99%)	2 (1%)	81	88
4	F	272/294 (92%)	269 (99%)	3 (1%)	73	83
All	All	537/588 (91%)	532 (99%)	5 (1%)	78	86

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

Mol	Chain	Res	Type
4	F	160	ASP
4	F	292	THR
4	F	325	TRP
4	A	318	ASP
4	A	325	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

2 non-standard protein/DNA/RNA residues are 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	DOC	C	10	1,2	16,19,20	1.09	1 (6%)	20,26,29	0.97	0
2	DOC	P	10	1,2	16,19,20	1.09	1 (6%)	20,26,29	0.98	1 (5%)

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	DOC	C	10	1,2	-	2/7/18/19	0/2/2/2
2	DOC	P	10	1,2	-	1/7/18/19	0/2/2/2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	10	DOC	C2-N1	-3.09	1.33	1.40
2	P	10	DOC	C2-N1	-2.85	1.33	1.40

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	P	10	DOC	O2-C2-N3	-2.30	118.59	122.33

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	10	DOC	C3'-C4'-C5'-O5'
2	C	10	DOC	O4'-C4'-C5'-O5'
2	P	10	DOC	O4'-C4'-C5'-O5'

There are no ring outliers.

1 monomer is involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	10	DOC	4	0

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 17 ligands modelled in this entry, 14 are monoatomic - leaving 3 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	#$|Z| > 2$
8	8GT	F	406	6,7	31,35,35	2.09	5 (16%)	45,56,56	1.94	8 (17%)
9	EDO	A	401	-	3,3,3	0.46	0	2,2,2	0.38	0
8	8GT	A	405	6,7	31,35,35	2.12	6 (19%)	45,56,56	1.91	9 (20%)

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
8	8GT	F	406	6,7	-	6/22/38/38	0/3/3/3
9	EDO	A	401	-	-	0/1/1/1	-
8	8GT	A	405	6,7	-	7/22/38/38	0/3/3/3

The worst 5 of 11 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	F	406	8GT	C2'-C1'	-6.93	1.31	1.53
8	A	405	8GT	C8-N9	6.76	1.52	1.40
8	A	405	8GT	C2'-C1'	-6.54	1.32	1.53
8	F	406	8GT	C8-N9	6.17	1.51	1.40
8	A	405	8GT	C5-N7	4.56	1.44	1.37

The worst 5 of 17 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	A	405	8GT	C5-C4-N3	-7.09	120.48	127.80
8	F	406	8GT	C5-C4-N3	-6.85	120.73	127.80
8	F	406	8GT	C2-N1-C6	-5.04	115.91	125.10
8	A	405	8GT	C2-N1-C6	-4.98	116.01	125.10
8	A	405	8GT	N9-C4-N3	4.29	130.72	125.81

There are no chirality outliers.

5 of 13 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	A	405	8GT	PB-O3B-PG-O2G
8	A	405	8GT	C2'-C1'-N9-C8
8	A	405	8GT	C2'-C1'-N9-C4
8	F	406	8GT	O4'-C4'-C5'-O5'
8	F	406	8GT	C3'-C4'-C5'-O5'

There are no ring outliers.

2 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	F	406	8GT	3	0
8	A	405	8GT	3	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and

any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand 8GT F 406	
Bond lengths	Bond angles
Torsions	Rings

Ligand 8GT A 405	
Bond lengths	Bond angles
Torsions	Rings
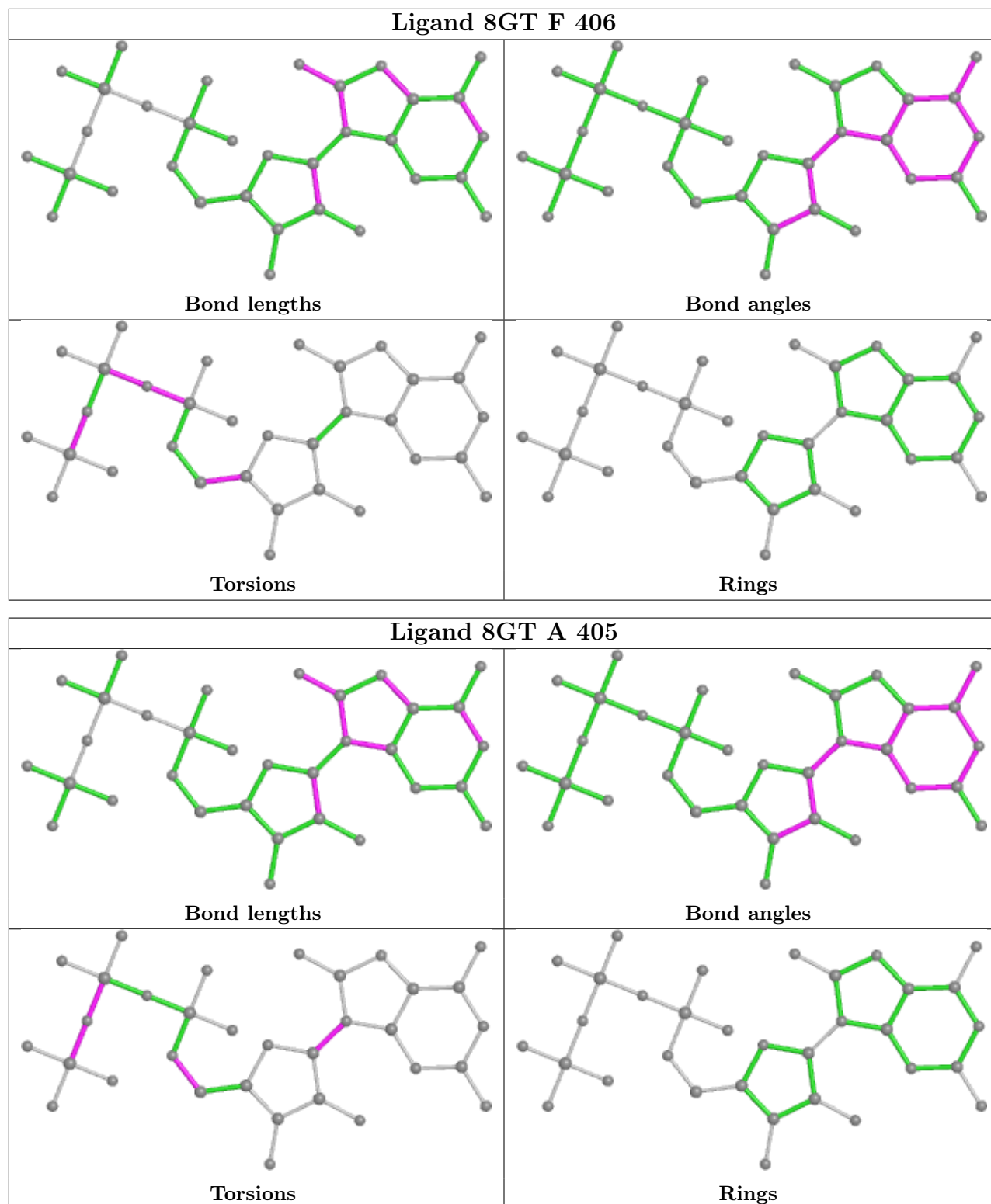
5.7 Other polymers ⓘ

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 ⓘ

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(Å²)	Q<0.9
1	B	16/16 (100%)	0.17	0	100	100	29, 44, 66, 69	2 (12%)
1	T	16/16 (100%)	-0.31	0	100	100	26, 40, 45, 45	0
2	C	9/10 (90%)	-0.48	0	100	100	24, 41, 45, 45	0
2	P	9/10 (90%)	-0.33	0	100	100	23, 32, 43, 43	0
3	D	5/5 (100%)	-0.50	0	100	100	26, 28, 35, 40	0
3	E	5/5 (100%)	-0.05	0	100	100	35, 36, 51, 52	0
4	A	322/335 (96%)	0.27	9 (2%)	53	60	16, 42, 63, 92	0
4	F	326/335 (97%)	0.33	13 (3%)	38	45	24, 43, 67, 106	0
All	All	708/732 (96%)	0.25	22 (3%)	49	56	16, 42, 67, 106	2 (0%)

The worst 5 of 22 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	F	305	GLY	4.7
4	A	244	LYS	4.7
4	A	277	ILE	4.4
4	F	78	ALA	4.3
4	F	306	VAL	3.7

## 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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(Å²)	Q<0.9
2	DOC	P	10	18/19	0.95	0.14	24,34,52,58	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	DOC	C	10	18/19	0.96	0.13	26,35,38,43	0

6.3   Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4   Ligands ⓘ

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.

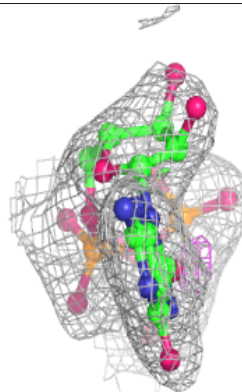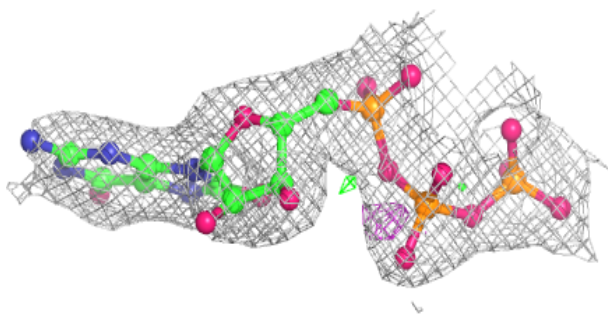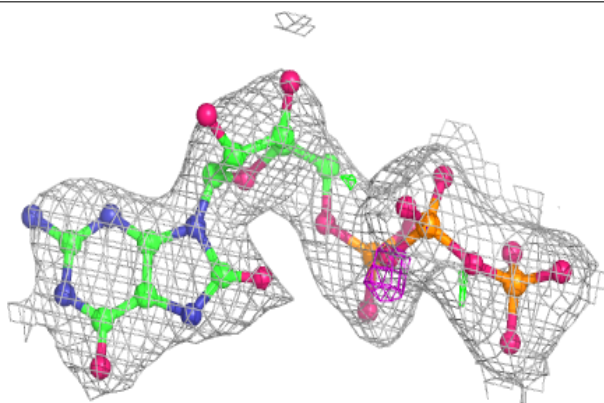| Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	NA	E	101	1/1	0.44	0.35	55,55,55,55	0
7	MN	F	408	1/1	0.68	0.20	94,94,94,94	0
6	NA	F	401	1/1	0.69	0.19	32,32,32,32	0
6	NA	A	406	1/1	0.73	0.32	54,54,54,54	0
9	EDO	A	401	4/4	0.79	0.29	48,51,54,58	0
7	MN	F	404	1/1	0.80	0.10	75,75,75,75	0
8	8GT	A	405	33/33	0.84	0.26	48,62,68,72	33
6	NA	A	403	1/1	0.85	0.18	27,27,27,27	0
6	NA	A	402	1/1	0.90	0.08	37,37,37,37	0
7	MN	F	407	1/1	0.92	0.06	76,76,76,76	0
6	NA	F	405	1/1	0.92	0.14	28,28,28,28	0
7	MN	F	402	1/1	0.94	0.11	41,41,41,41	0
7	MN	A	404	1/1	0.94	0.13	52,52,52,52	1
5	CL	B	101	1/1	0.95	0.10	57,57,57,57	0
10	MG	D	101	1/1	0.95	0.09	31,31,31,31	0
7	MN	F	403	1/1	0.96	0.06	68,68,68,68	0
8	8GT	F	406	33/33	0.97	0.12	28,39,50,51	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around 8GT A 405:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
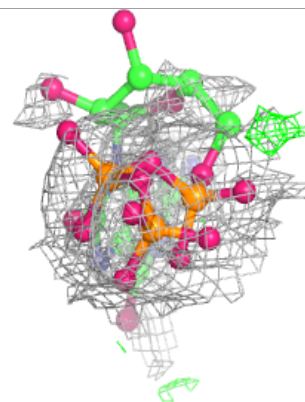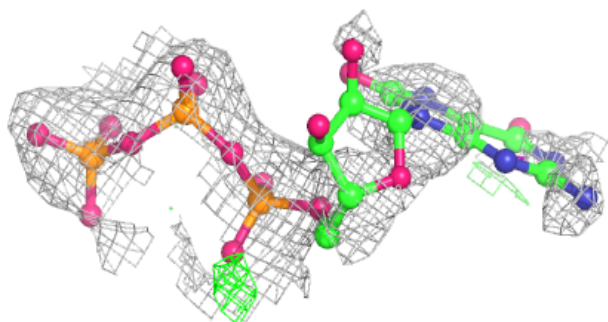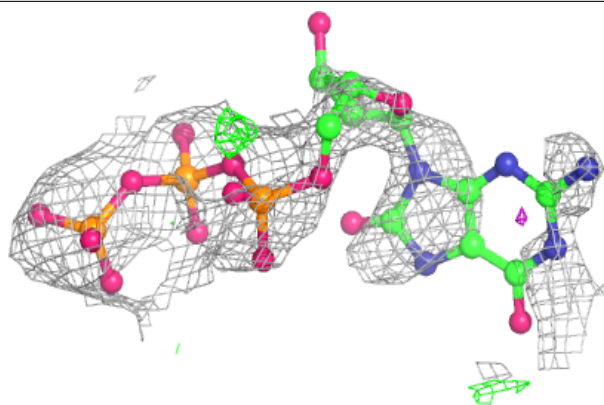
Electron density around 8GT F 406:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

6.5 Other polymers ⓘ

There are no such residues in this entry.