wwPDB X-ray Structure Validation Summary Report ⓘ

Jan 6, 2026 – 01:46 PM EST

PDB ID	:	9N2Q / pdb_00009n2q
Title	:	Structure of GDP-bound GM4951
Authors	:	Raj, R.; Beutler, B.
Deposited on	:	2025-01-29
Resolution	:	2.51 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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:

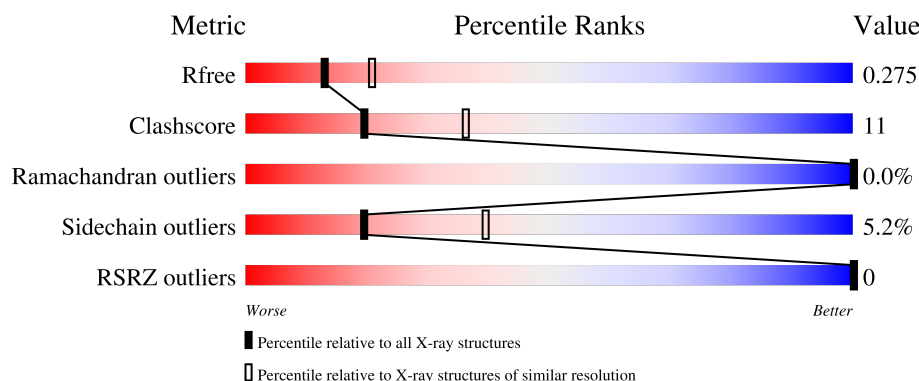|		
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.47

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 2.51 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		0.275
Clashscore		11
Ramachandran outliers		0.0%
Sidechain outliers		5.2%
RSRZ outliers		0

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}	164625	5504 (2.50-2.50)
Clashscore	180529	6282 (2.50-2.50)
Ramachandran outliers	177936	6191 (2.50-2.50)
Sidechain outliers	177891	6193 (2.50-2.50)
RSRZ outliers	164620	5504 (2.50-2.50)

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	A	416	66% 26% • 6%
1	B	416	69% 24% • 5%
1	C	416	70% 23% • 6%
1	D	416	72% 21% • 5%
1	E	416	71% 22% • 5%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	416	72% 20% • 6%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	GOL	B	504	-	-	X	-

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 19314 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 Interferon inducible GTPase 1C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	393	Total	C	N	O	S	0	0	0
			3162	2022	527	597	16			
1	B	397	Total	C	N	O	S	0	0	0
			3180	2032	529	603	16			
1	C	393	Total	C	N	O	S	0	0	0
			3173	2031	526	600	16			
1	D	397	Total	C	N	O	S	0	0	0
			3187	2039	527	605	16			
1	E	397	Total	C	N	O	S	0	0	0
			3201	2047	531	607	16			
1	F	393	Total	C	N	O	S	0	0	0
			3171	2033	529	593	16			

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-9	HIS	-	expression tag	UNP Q3UED7
A	-8	HIS	-	expression tag	UNP Q3UED7
A	-7	HIS	-	expression tag	UNP Q3UED7
A	-6	HIS	-	expression tag	UNP Q3UED7
A	-5	HIS	-	expression tag	UNP Q3UED7
A	-4	HIS	-	expression tag	UNP Q3UED7
A	-3	SER	-	expression tag	UNP Q3UED7
A	-2	GLN	-	expression tag	UNP Q3UED7
A	-1	ASP	-	expression tag	UNP Q3UED7
A	0	PRO	-	expression tag	UNP Q3UED7
B	-9	HIS	-	expression tag	UNP Q3UED7
B	-8	HIS	-	expression tag	UNP Q3UED7
B	-7	HIS	-	expression tag	UNP Q3UED7
B	-6	HIS	-	expression tag	UNP Q3UED7
B	-5	HIS	-	expression tag	UNP Q3UED7
B	-4	HIS	-	expression tag	UNP Q3UED7
B	-3	SER	-	expression tag	UNP Q3UED7

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	-2	GLN	-	expression tag	UNP Q3UED7
B	-1	ASP	-	expression tag	UNP Q3UED7
B	0	PRO	-	expression tag	UNP Q3UED7
C	-9	HIS	-	expression tag	UNP Q3UED7
C	-8	HIS	-	expression tag	UNP Q3UED7
C	-7	HIS	-	expression tag	UNP Q3UED7
C	-6	HIS	-	expression tag	UNP Q3UED7
C	-5	HIS	-	expression tag	UNP Q3UED7
C	-4	HIS	-	expression tag	UNP Q3UED7
C	-3	SER	-	expression tag	UNP Q3UED7
C	-2	GLN	-	expression tag	UNP Q3UED7
C	-1	ASP	-	expression tag	UNP Q3UED7
C	0	PRO	-	expression tag	UNP Q3UED7
D	-9	HIS	-	expression tag	UNP Q3UED7
D	-8	HIS	-	expression tag	UNP Q3UED7
D	-7	HIS	-	expression tag	UNP Q3UED7
D	-6	HIS	-	expression tag	UNP Q3UED7
D	-5	HIS	-	expression tag	UNP Q3UED7
D	-4	HIS	-	expression tag	UNP Q3UED7
D	-3	SER	-	expression tag	UNP Q3UED7
D	-2	GLN	-	expression tag	UNP Q3UED7
D	-1	ASP	-	expression tag	UNP Q3UED7
D	0	PRO	-	expression tag	UNP Q3UED7
E	-9	HIS	-	expression tag	UNP Q3UED7
E	-8	HIS	-	expression tag	UNP Q3UED7
E	-7	HIS	-	expression tag	UNP Q3UED7
E	-6	HIS	-	expression tag	UNP Q3UED7
E	-5	HIS	-	expression tag	UNP Q3UED7
E	-4	HIS	-	expression tag	UNP Q3UED7
E	-3	SER	-	expression tag	UNP Q3UED7
E	-2	GLN	-	expression tag	UNP Q3UED7
E	-1	ASP	-	expression tag	UNP Q3UED7
E	0	PRO	-	expression tag	UNP Q3UED7
F	-9	HIS	-	expression tag	UNP Q3UED7
F	-8	HIS	-	expression tag	UNP Q3UED7
F	-7	HIS	-	expression tag	UNP Q3UED7
F	-6	HIS	-	expression tag	UNP Q3UED7
F	-5	HIS	-	expression tag	UNP Q3UED7
F	-4	HIS	-	expression tag	UNP Q3UED7
F	-3	SER	-	expression tag	UNP Q3UED7
F	-2	GLN	-	expression tag	UNP Q3UED7
F	-1	ASP	-	expression tag	UNP Q3UED7

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
F	0	PRO	-	expression tag	UNP Q3UED7

- Molecule 2 is GUANOSINE-5'-DIPHOSPHATE (CCD ID: GDP) (formula: $C_{10}H_{15}N_5O_{11}P_2$) (labeled as "Ligand of Interest" by depositor).
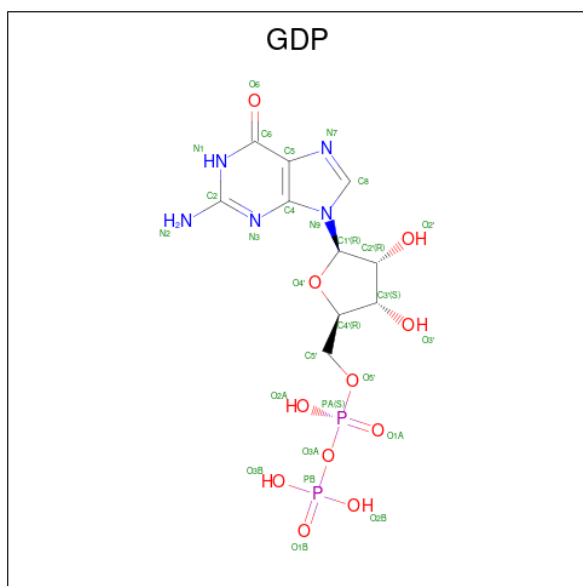
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
2	B	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
2	C	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
2	D	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
2	E	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
2	F	1	Total	C	N	O	P	0	0
			28	10	5	11	2		

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).

GOL

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

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	3	Total 3	O 3	0	0
4	B	4	Total 4	O 4	0	0
4	C	7	Total 7	O 7	0	0
4	D	7	Total 7	O 7	0	0
4	E	5	Total 5	O 5	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	F	4	Total 4	O 4	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: Interferon inducible GTPase 1C
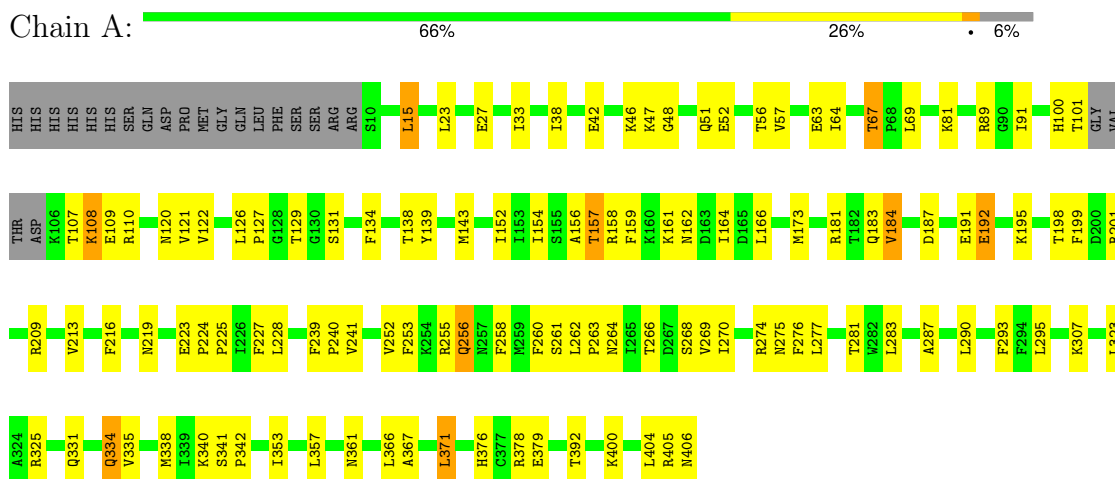
Chain A:

- Molecule 1: Interferon inducible GTPase 1C
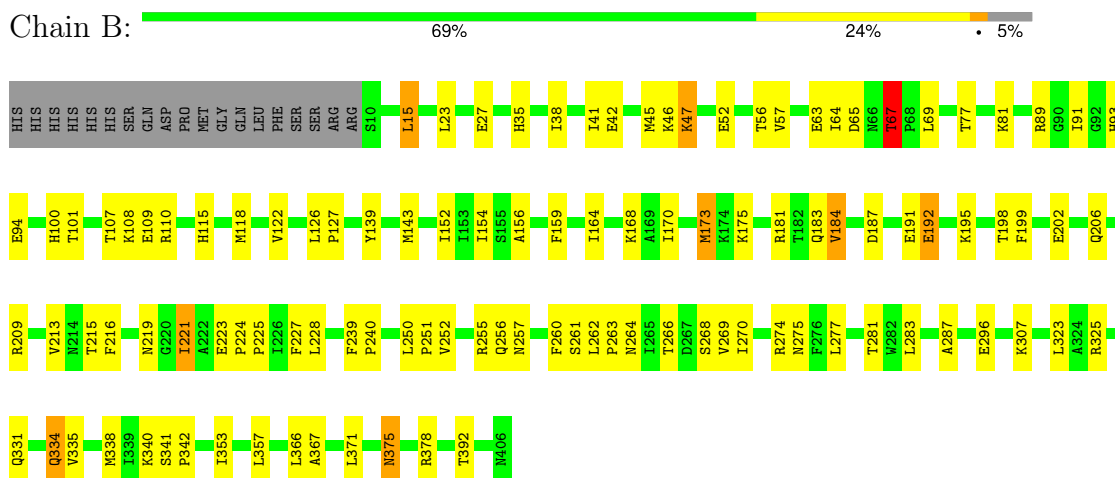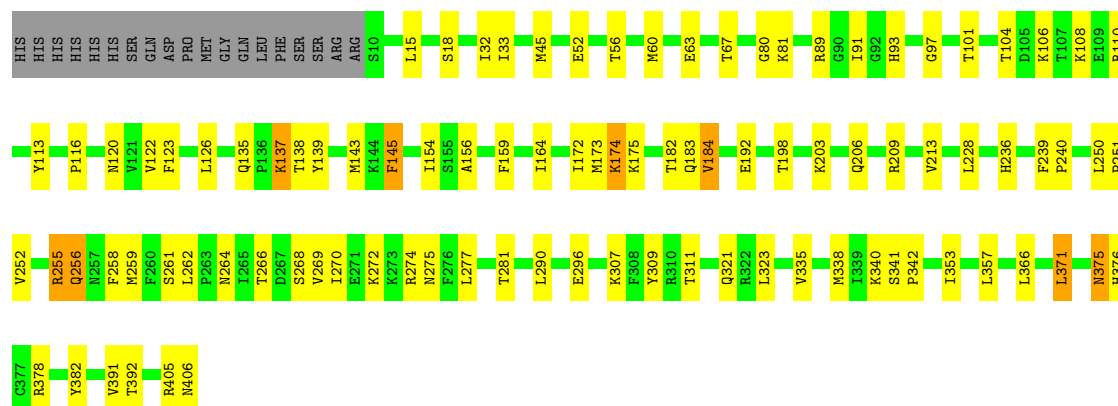
Chain B:

- Molecule 1: Interferon inducible GTPase 1C
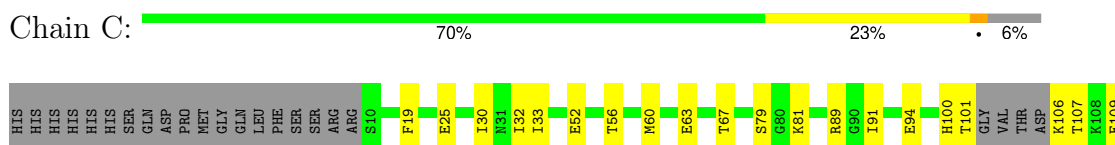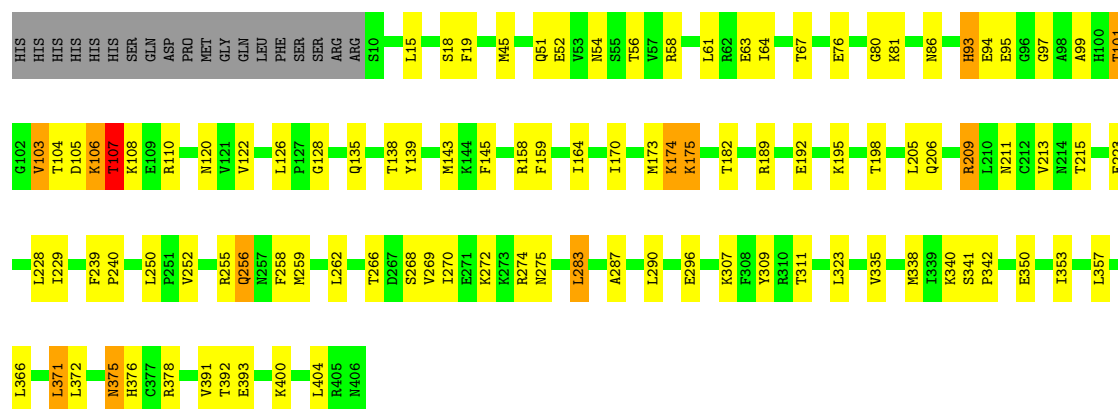
Chain C:

• Molecule 1: Interferon inducible GTPase 1C

Chain D:

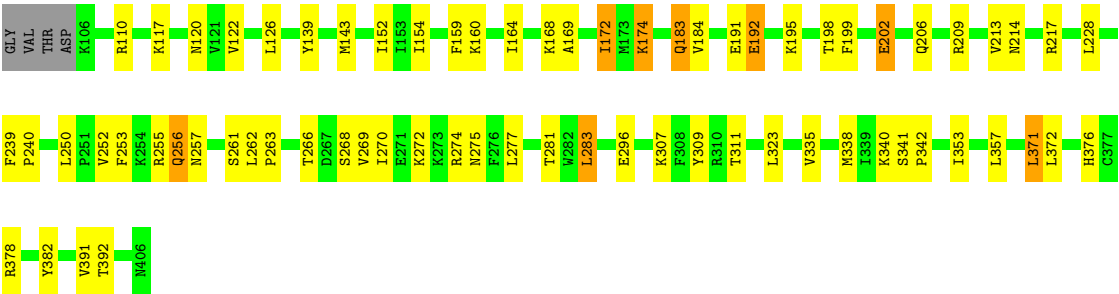72%   21%   • 5%

• Molecule 1: Interferon inducible GTPase 1C

Chain E:

71%   22%   • 5%

• Molecule 1: Interferon inducible GTPase 1C

Chain F:

72%   20%   • 6%

GLY VAL THR ASP K106 R110 K117 N120 V121 V122 L126 Y139 M143 I152 I153 I154 F159 K160 I164 K168 A169 I172 M173 K174 Q183 V184 E191 E192 K195 T198 F199 E202 Q206 R209 V213 N214 R217 L228

F239 P240 L250 P251 V252 F253 K254 R255 Q256 N257 S261 L262 P263 T266 D267 S268 V269 I270 E271 K272 K273 R274 N275 F276 L277 T281 W282 L283 E296 K307 F308 Y309 R310 T311 L323 V335 M338 I339 K340 S341 P342 I353 L357 L371 L372 H376 C377

R378 Y382 V391 T392 M406

4   Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	60.32Å 100.64Å 152.35Å 87.49° 78.52° 89.91°	Depositor
Resolution (Å)	49.72 – 2.51 49.72 – 2.51	Depositor EDS
% Data completeness (in resolution range)	90.6 (49.72-2.51) 90.7 (49.72-2.51)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.61 (at 2.51Å)	Xtriage
Refinement program	REFMAC 5.8.0349	Depositor
R, R_{free}	0.230 , 0.274 0.237 , 0.275	Depositor DCC
R_{free} test set	5324 reflections (4.43%)	wwPDB-VP
Wilson B-factor (Å^2)	56.7	Xtriage
Anisotropy	0.062	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 56.2	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.450 for h,-k,h-l 0.005 for -h,k,-l 0.004 for -h,-k,-h+l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	19314	wwPDB-VP
Average B, all atoms (Å^2)	79.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.30% of the height of the origin peak. No significant pseudotranslation is detected.*

---

[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: GOL, GDP

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	0.61	1/3230 (0.0%)	1.07	4/4367 (0.1%)
1	B	0.62	3/3248 (0.1%)	1.07	3/4395 (0.1%)
1	C	0.62	1/3241 (0.0%)	1.05	5/4381 (0.1%)
1	D	0.62	2/3255 (0.1%)	1.05	3/4401 (0.1%)
1	E	0.62	1/3269 (0.0%)	1.05	5/4419 (0.1%)
1	F	0.60	2/3239 (0.1%)	1.04	2/4375 (0.0%)
All	All	0.62	10/19482 (0.1%)	1.05	22/26338 (0.1%)

The worst 5 of 10 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	376	HIS	CE1-NE2	7.68	1.40	1.32
1	C	376	HIS	CE1-NE2	7.57	1.40	1.32
1	E	376	HIS	CE1-NE2	6.29	1.38	1.32
1	A	376	HIS	CE1-NE2	5.38	1.38	1.32
1	B	35	HIS	CE1-NE2	5.35	1.37	1.32

The worst 5 of 22 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	128	GLY	N-CA-C	-7.37	101.24	112.89
1	E	103	VAL	N-CA-C	-6.64	106.66	113.10
1	C	202	GLU	CB-CG-CD	6.01	122.82	112.60
1	B	173	MET	N-CA-C	-5.79	102.47	110.35
1	F	159	PHE	CB-CA-C	5.72	119.24	109.80

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	3162	0	3066	89	0
1	B	3180	0	3081	85	0
1	C	3173	0	3088	81	0
1	D	3187	0	3105	69	0
1	E	3201	0	3127	82	0
1	F	3171	0	3104	62	0
2	A	28	0	12	1	0
2	B	28	0	12	2	0
2	C	28	0	12	0	0
2	D	28	0	12	1	0
2	E	28	0	12	2	0
2	F	28	0	12	3	0
3	A	6	0	8	2	0
3	B	18	0	24	11	0
3	D	6	0	8	0	0
3	E	12	0	16	0	0
4	A	3	0	0	0	0
4	B	4	0	0	0	0
4	C	7	0	0	0	0
4	D	7	0	0	0	0
4	E	5	0	0	0	0
4	F	4	0	0	2	0
All	All	19314	0	18699	431	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 11.

The worst 5 of 431 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:C:81:LYS:HB2	1:C:154:ILE:HD11	1.28	1.11
1:C:202:GLU:HG3	1:E:366:LEU:HD13	1.41	1.02
1:D:91:ILE:HD11	1:D:116:PRO:HG3	1.42	1.00
1:D:206:GLN:HE21	1:F:371:LEU:HD12	1.32	0.92
1:C:81:LYS:HB2	1:C:154:ILE:CD1	2.00	0.91

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	
1	A	389/416 (94%)	376 (97%)	13 (3%)	0	100	100
1	B	395/416 (95%)	378 (96%)	16 (4%)	1 (0%)	37	56
1	C	389/416 (94%)	378 (97%)	11 (3%)	0	100	100
1	D	395/416 (95%)	379 (96%)	16 (4%)	0	100	100
1	E	395/416 (95%)	382 (97%)	13 (3%)	0	100	100
1	F	389/416 (94%)	378 (97%)	11 (3%)	0	100	100
All	All	2352/2496 (94%)	2271 (97%)	80 (3%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	108	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	
1	A	345/382 (90%)	328 (95%)	17 (5%)	21	42
1	B	346/382 (91%)	328 (95%)	18 (5%)	19	39
1	C	348/382 (91%)	334 (96%)	14 (4%)	27	51

Continued on next page...

WORLDWIDE
wwPDB
PROTEIN DATA BANK

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	349/382 (91%)	330 (95%)	19 (5%)	18	37
1	E	352/382 (92%)	330 (94%)	22 (6%)	15	30
1	F	347/382 (91%)	329 (95%)	18 (5%)	19	39
All	All	2087/2292 (91%)	1979 (95%)	108 (5%)	19	39

5 of 108 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	192	GLU
1	E	106	LYS
1	F	202	GLU
1	D	203	LYS
1	D	307	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 56 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	162	ASN
1	F	275	ASN
1	E	44	ASN
1	F	256	GLN
1	F	51	GLN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5   Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

13 ligands 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	#$|Z| > 2$
3	GOL	B	502	-	5,5,5	0.08	0	5,5,5	0.34	0
3	GOL	D	502	-	5,5,5	0.18	0	5,5,5	0.56	0
2	GDP	A	501	-	25,30,30	1.03	2 (8%)	30,47,47	1.10	3 (10%)
3	GOL	A	502	-	5,5,5	0.16	0	5,5,5	0.42	0
3	GOL	E	503	-	5,5,5	0.20	0	5,5,5	0.38	0
2	GDP	D	501	-	25,30,30	1.03	2 (8%)	30,47,47	0.80	0
3	GOL	E	502	-	5,5,5	0.19	0	5,5,5	0.59	0
2	GDP	C	501	-	25,30,30	1.08	2 (8%)	30,47,47	1.00	1 (3%)
2	GDP	E	501	-	25,30,30	1.05	3 (12%)	30,47,47	0.97	2 (6%)
2	GDP	B	501	-	25,30,30	1.03	2 (8%)	30,47,47	1.30	4 (13%)
3	GOL	B	504	-	5,5,5	0.05	0	5,5,5	0.47	0
3	GOL	B	503	-	5,5,5	0.22	0	5,5,5	0.51	0
2	GDP	F	501	-	25,30,30	1.08	2 (8%)	30,47,47	1.06	1 (3%)

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
3	GOL	B	502	-	-	2/4/4/4	-
3	GOL	D	502	-	-	4/4/4/4	-
2	GDP	A	501	-	-	1/12/32/32	0/3/3/3
3	GOL	A	502	-	-	4/4/4/4	-
3	GOL	E	503	-	-	4/4/4/4	-
2	GDP	D	501	-	-	1/12/32/32	0/3/3/3
3	GOL	E	502	-	-	3/4/4/4	-
2	GDP	C	501	-	-	2/12/32/32	0/3/3/3
2	GDP	E	501	-	-	3/12/32/32	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GDP	B	501	-	-	1/12/32/32	0/3/3/3
3	GOL	B	504	-	-	0/4/4/4	-
3	GOL	B	503	-	-	2/4/4/4	-
2	GDP	F	501	-	-	1/12/32/32	0/3/3/3

The worst 5 of 13 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	GDP	C5-C6	-3.00	1.41	1.47
2	B	501	GDP	C5-C6	-2.97	1.41	1.47
2	C	501	GDP	C5-C6	-2.64	1.42	1.47
2	F	501	GDP	C5-C6	-2.61	1.42	1.47
2	D	501	GDP	C5-C6	-2.46	1.42	1.47

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

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	501	GDP	O3'-C3'-C2'	-3.38	100.98	111.82
2	C	501	GDP	O3'-C3'-C2'	-3.29	101.27	111.82
2	A	501	GDP	O4'-C1'-N9	-3.03	104.72	108.75
2	F	501	GDP	O3'-C3'-C2'	-2.82	102.78	111.82
2	B	501	GDP	O4'-C1'-N9	-2.76	105.09	108.75

There are no chirality outliers.

5 of 28 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	502	GOL	C1-C2-C3-O3
3	B	502	GOL	O1-C1-C2-C3
3	B	503	GOL	O1-C1-C2-C3
3	D	502	GOL	O1-C1-C2-C3
3	D	502	GOL	C1-C2-C3-O3

There are no ring outliers.

8 monomers are involved in 22 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	501	GDP	1	0
3	A	502	GOL	2	0
2	D	501	GDP	1	0
2	E	501	GDP	2	0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	501	GDP	2	0
3	B	504	GOL	8	0
3	B	503	GOL	3	0
2	F	501	GDP	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 GDP A 501

Bond lengths

Bond angles

Torsions

Rings

Ligand GDP D 501

Bond lengths

Bond angles

Torsions

Rings

Ligand GDP C 501

Bond lengths

Bond angles

Torsions

Rings

Ligand GDP E 501

Bond lengths

Bond angles

Torsions

Rings

Ligand GDP B 501

Bond lengths

Bond angles

Torsions

Rings

Ligand GDP F 501

Bond lengths

Bond angles

Torsions

Rings
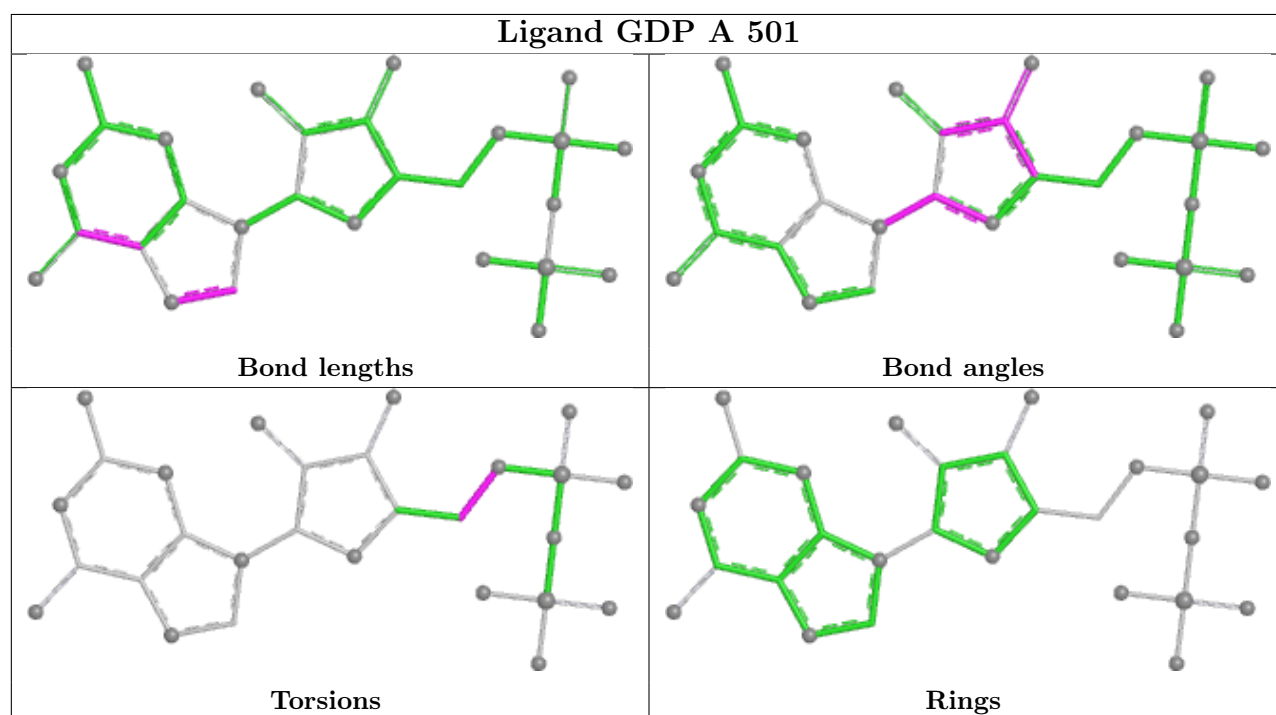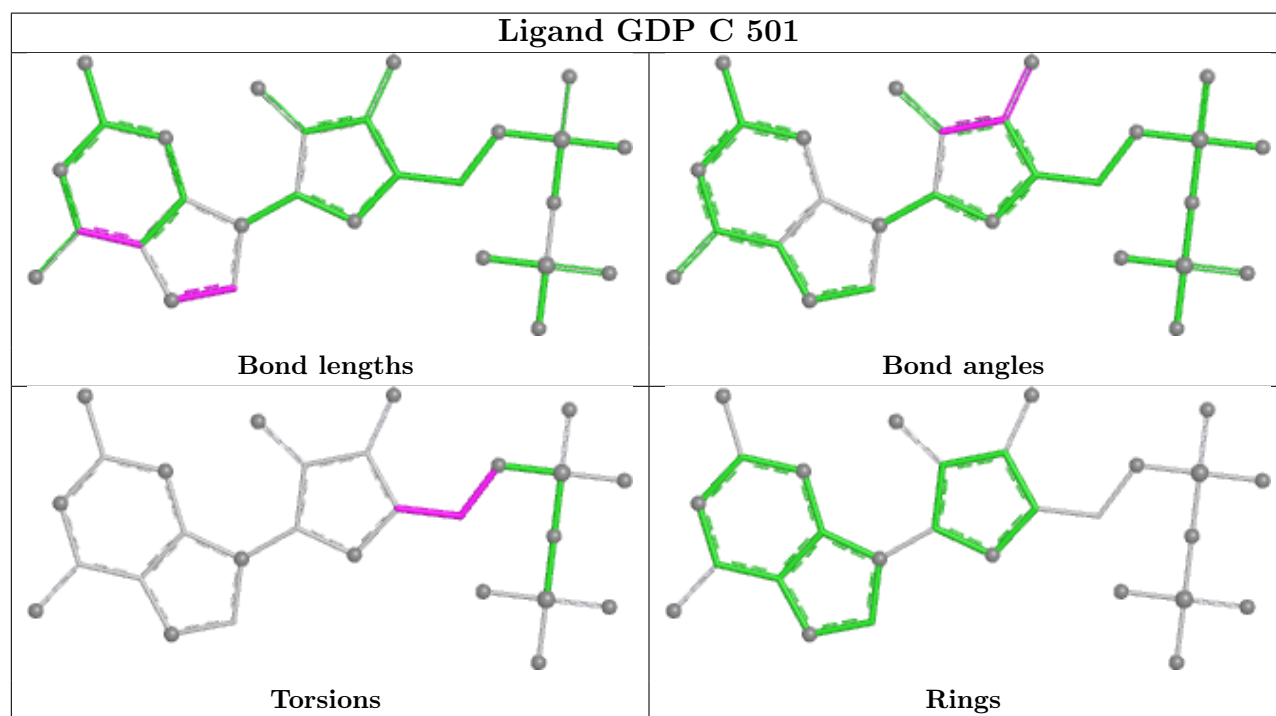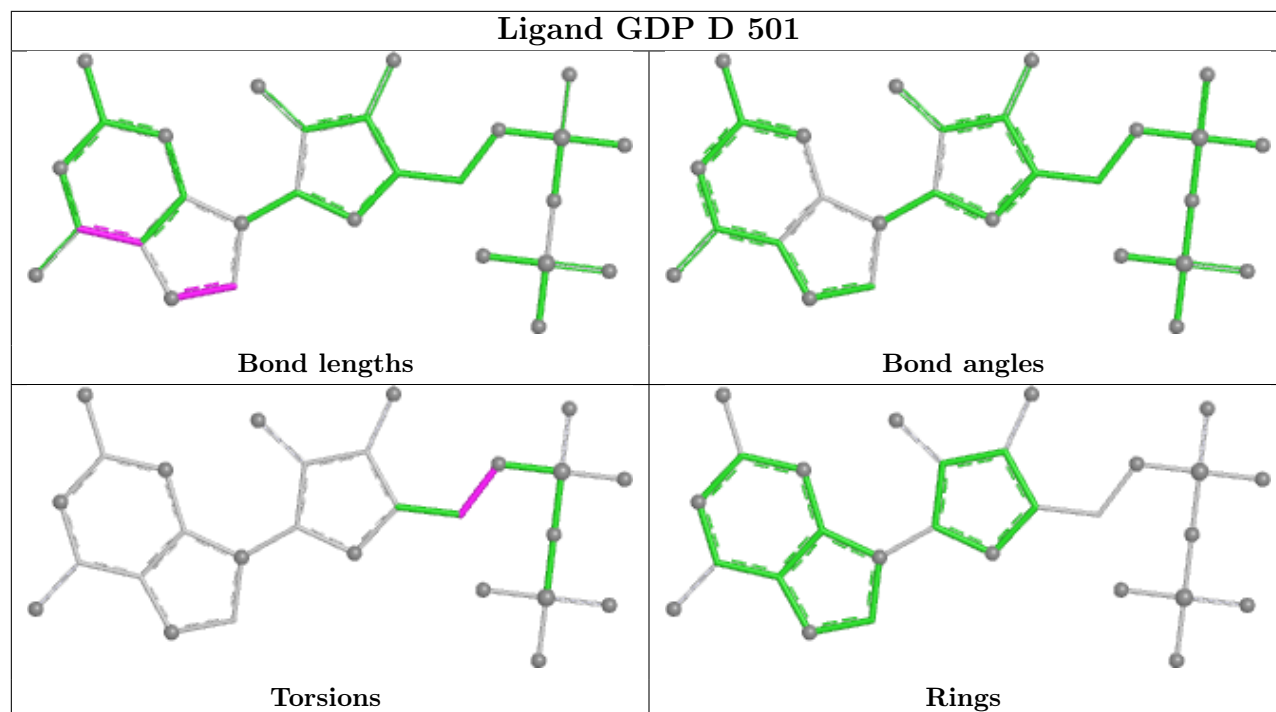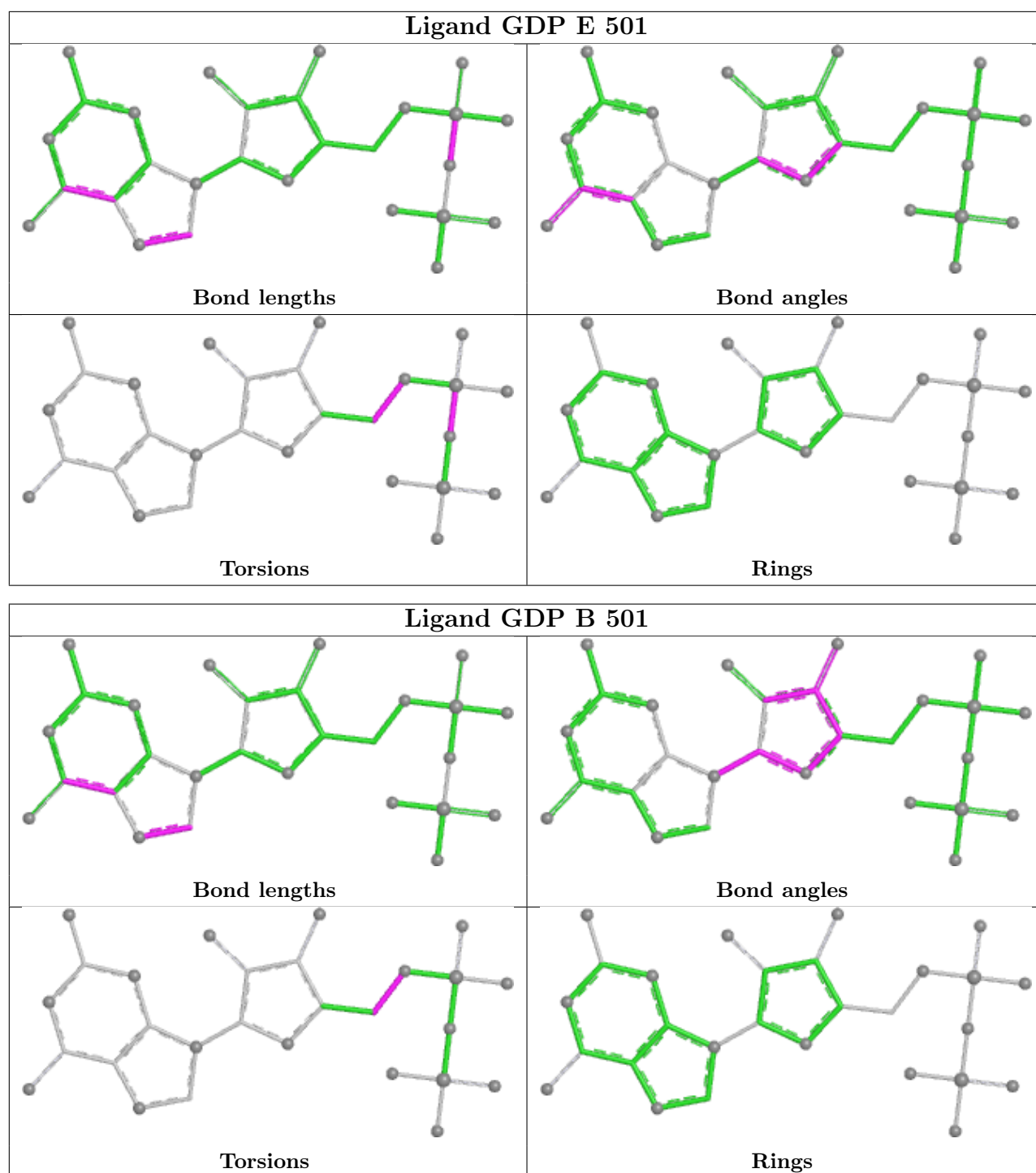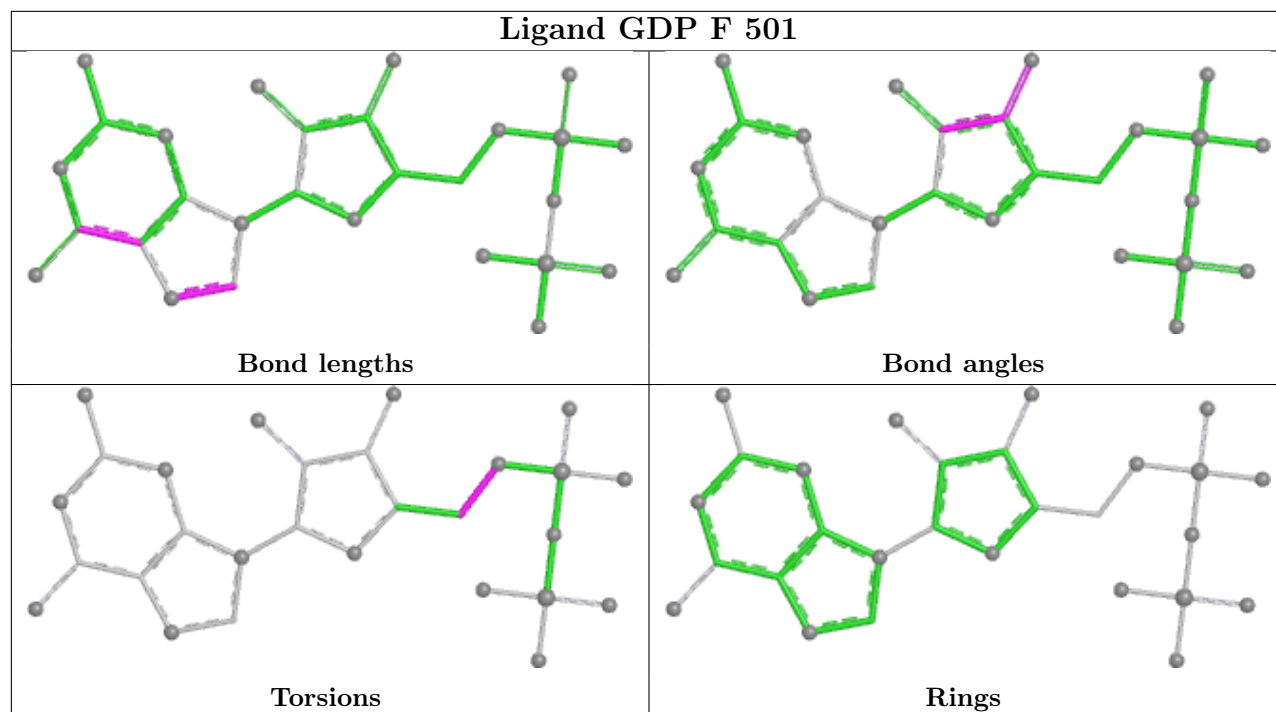
5.7 Other polymers ⓘ

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	A	393/416 (94%)	-1.15	0	100 | 100	40, 81, 132, 173	0
1	B	397/416 (95%)	-1.15	0	100 | 100	40, 80, 131, 171	0
1	C	393/416 (94%)	-1.15	0	100 | 100	41, 75, 126, 146	0
1	D	397/416 (95%)	-1.11	0	100 | 100	30, 69, 127, 174	0
1	E	397/416 (95%)	-1.11	0	100 | 100	35, 69, 129, 183	0
1	F	393/416 (94%)	-1.12	0	100 | 100	41, 76, 122, 164	0
All	All	2370/2496 (94%)	-1.13	0	100 | 100	30, 74, 129, 183	0

There are no RSRZ outliers to report.

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

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates ⓘ

There are no oligosaccharides 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(Å²)	Q<0.9
3	GOL	A	502	6/6	0.98	0.05	70,87,98,106	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	GOL	B	504	6/6	0.98	0.06	84,105,108,109	0
3	GOL	E	503	6/6	0.98	0.06	81,100,107,114	0
2	GDP	D	501	28/28	0.99	0.03	80,97,122,125	0
2	GDP	E	501	28/28	0.99	0.05	94,118,148,153	0
2	GDP	F	501	28/28	0.99	0.05	55,81,96,101	0
2	GDP	A	501	28/28	0.99	0.04	55,79,91,105	0
3	GOL	B	502	6/6	0.99	0.04	79,87,93,107	0
3	GOL	B	503	6/6	0.99	0.05	79,83,89,99	0
2	GDP	B	501	28/28	0.99	0.04	57,74,86,110	0
3	GOL	D	502	6/6	0.99	0.05	59,66,72,77	0
3	GOL	E	502	6/6	0.99	0.05	54,57,62,63	0
2	GDP	C	501	28/28	0.99	0.04	59,83,94,103	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.
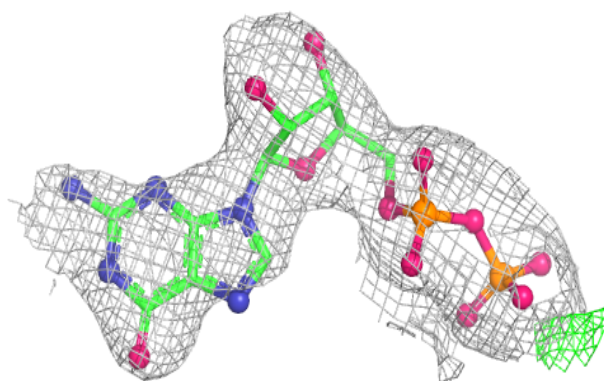

Electron density around GDP D 501:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative) and green (positive)
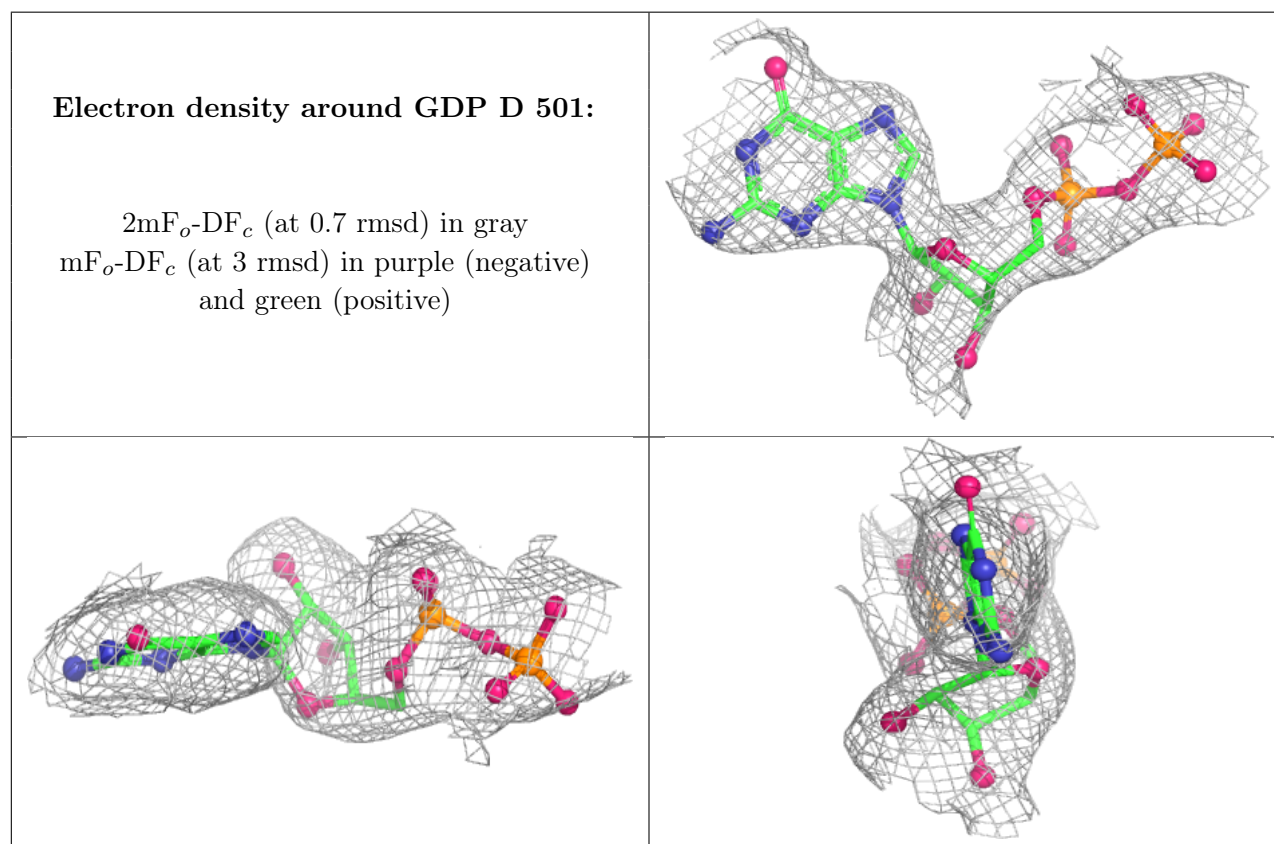
Electron density around GDP E 501:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
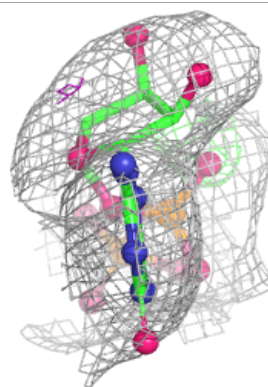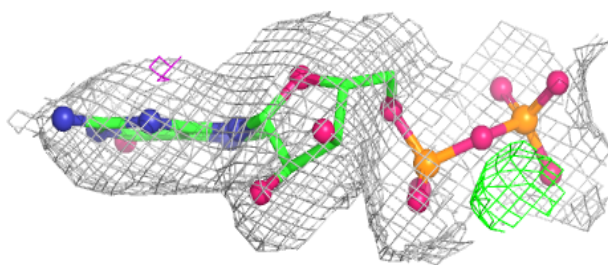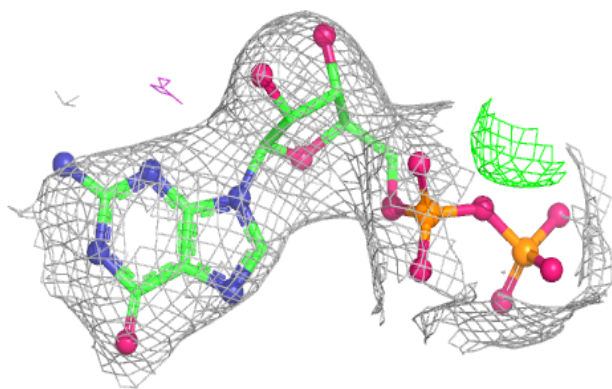and green (positive)
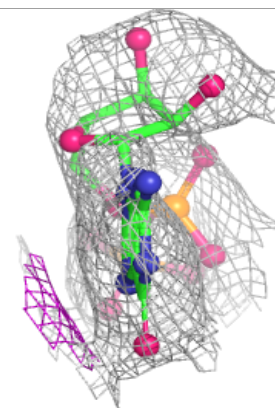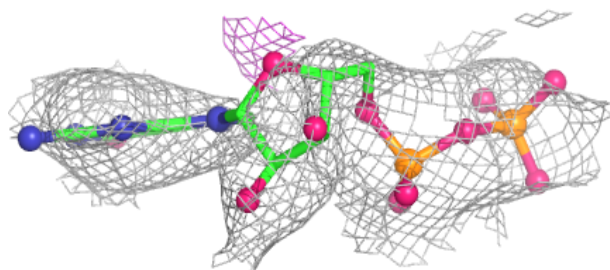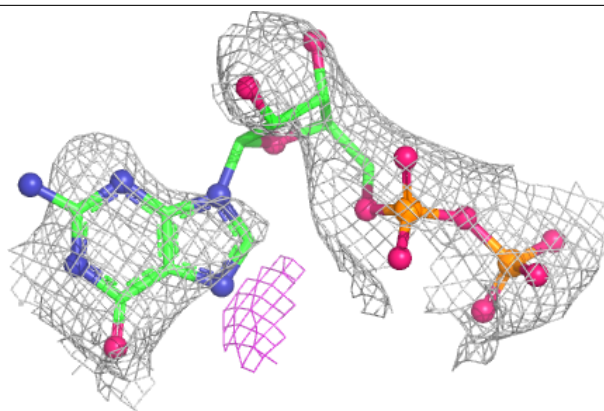
Electron density around GDP F 501:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
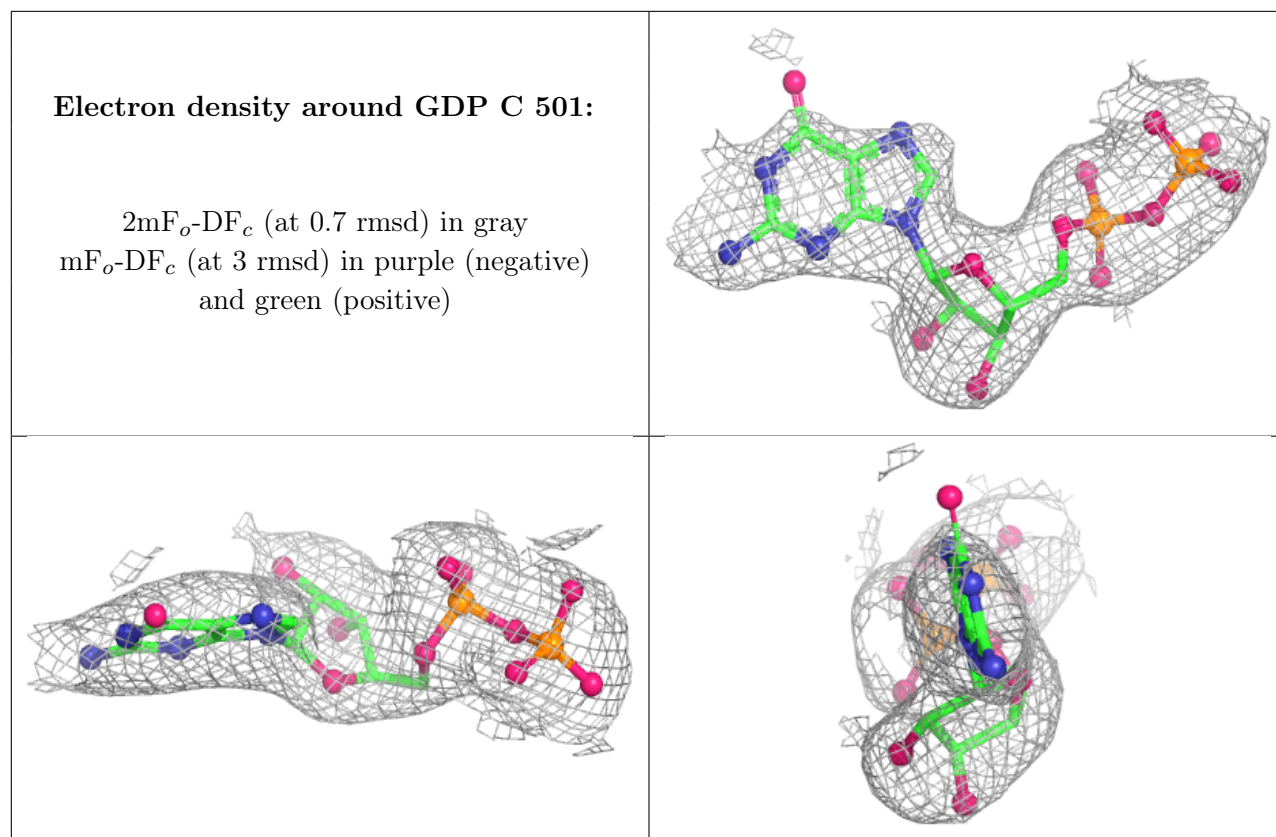and green (positive)
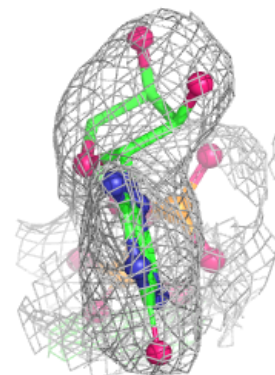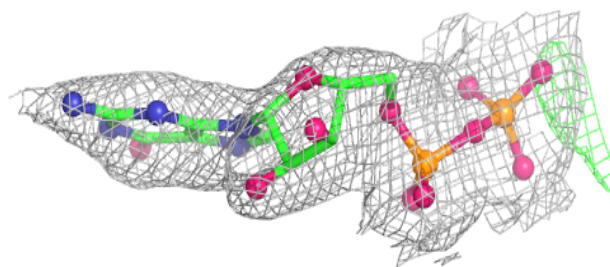
Electron density around GDP A 501:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around GDP B 501:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around GDP C 501:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
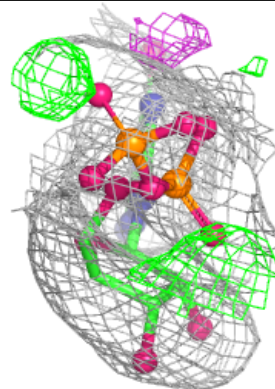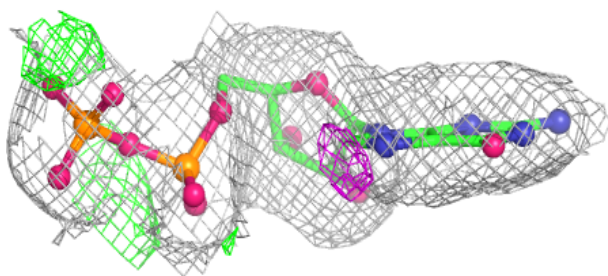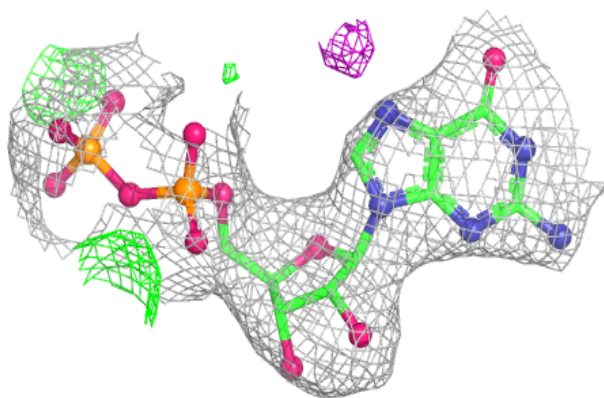
6.5   Other polymers (i)

There are no such residues in this entry.