



# Full wwPDB X-ray Structure Validation Report ⓘ

Apr 21, 2022 – 04:24 am BST

PDB ID : 7Z7D  
Title : Tubulin-Todalam-Vinblastine-complex  
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Deposited on : 2022-03-15  
Resolution : 2.00 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](mailto: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.

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

MolProbity : 4.02b-467  
Mogul : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.27  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0267  
CCP4 : 7.1.010 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.27

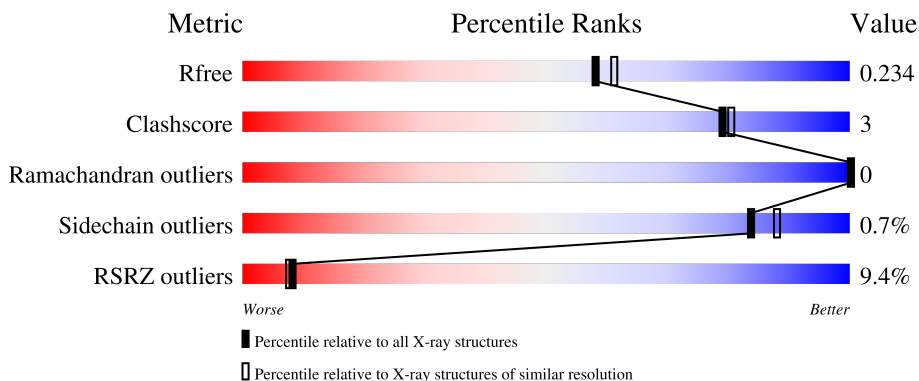
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.00 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.



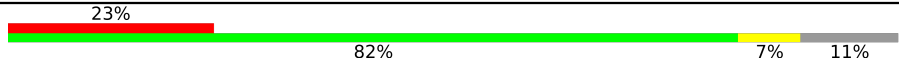
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (2.00-2.00)

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  $\geq 3$ , 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	A	451	 5% 90% 7%
1	C	451	 4% 90% 8%
2	B	445	 5% 88% 8%
2	D	445	 10% 84% 10% 5%
3	E	143	 7% 83% 15%

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Mol	Chain	Length	Quality of chain
4	F	384	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into four segments: a red segment on the left labeled '23%', a large green segment labeled '82%', a small yellow segment labeled '7%', and a grey segment on the far right labeled '11%'.</p>

## 2 Entry composition [i](#)

There are 13 unique types of molecules in this entry. The entry contains 18556 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 Tubulin alpha-1B chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	437	Total	C	N	O	S	0	2	0
			3428	2169	583	652	24			
1	C	440	Total	C	N	O	S	0	7	0
			3493	2206	597	666	24			

- Molecule 2 is a protein called Tubulin beta-2B chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	429	Total	C	N	O	S	0	4	0
			3408	2136	588	657	27			
2	D	421	Total	C	N	O	S	0	0	0
			3309	2080	562	640	27			

- Molecule 3 is a protein called Stathmin-4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	E	122	Total	C	N	O	S	0	1	0
			1019	628	185	201	5			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	3	MET	-	initiating methionine	UNP P63043
E	4	ALA	-	expression tag	UNP P63043

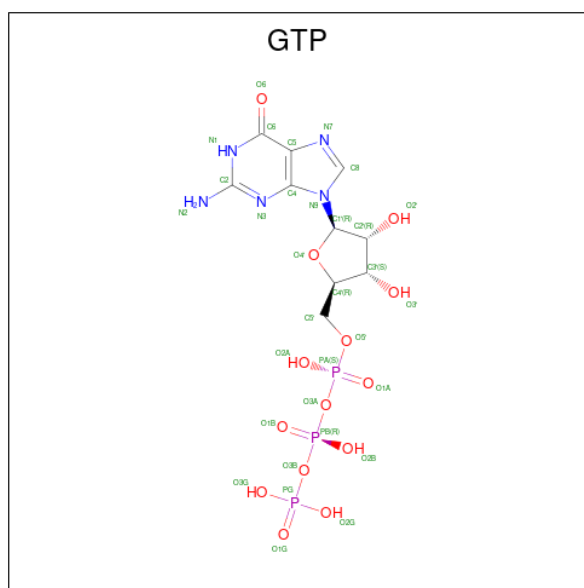
- Molecule 4 is a protein called Tubulin beta-2B chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	F	341	Total	C	N	O	S	0	0	0
			2786	1788	476	508	14			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	379	HIS	-	expression tag	UNP E1BQ43
F	380	HIS	-	expression tag	UNP E1BQ43
F	381	HIS	-	expression tag	UNP E1BQ43
F	382	HIS	-	expression tag	UNP E1BQ43
F	383	HIS	-	expression tag	UNP E1BQ43
F	384	HIS	-	expression tag	UNP E1BQ43

- Molecule 5 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula:  $C_{10}H_{16}N_5O_{14}P_3$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
5	A	1	Total	C	N	O	P	0	0
			32	10	5	14	3		
5	C	1	Total	C	N	O	P	0	0
			32	10	5	14	3		

- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	Mg	0	0
			1	1		
6	B	1	Total	Mg	0	0
			1	1		
6	C	1	Total	Mg	0	0
			1	1		
6	D	1	Total	Mg	0	0
			1	1		

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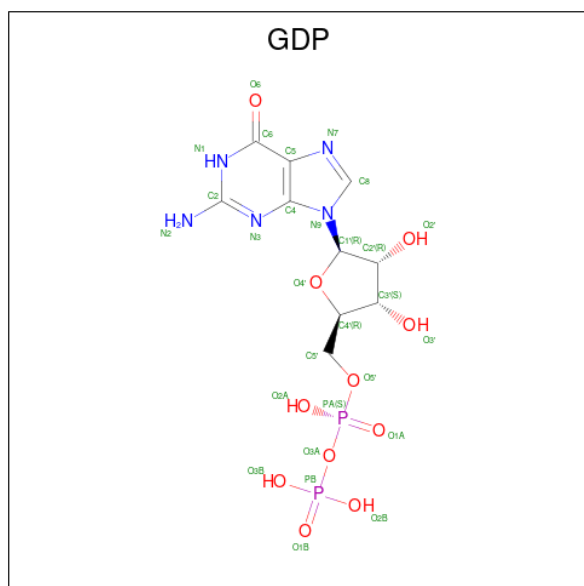
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	F	1	Total	Mg	0	0
			1	1		

- Molecule 7 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total	Ca	0	0
			1	1		
7	B	1	Total	Ca	0	0
			1	1		
7	C	1	Total	Ca	0	0
			1	1		
7	E	1	Total	Ca	0	0
			1	1		

- Molecule 8 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: C<sub>10</sub>H<sub>15</sub>N<sub>5</sub>O<sub>11</sub>P<sub>2</sub>).



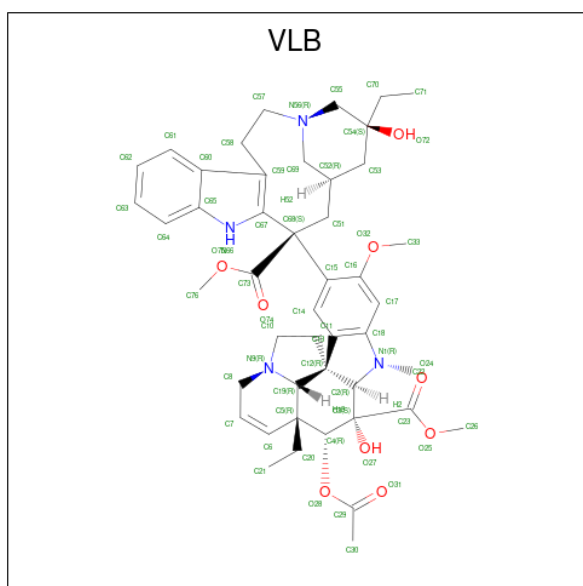
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
8	B	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
8	D	1	Total	C	N	O	P	0	0
			28	10	5	11	2		

- Molecule 9 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C<sub>6</sub>H<sub>13</sub>NO<sub>4</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
9	B	1	12	6	1	4	1	0	0

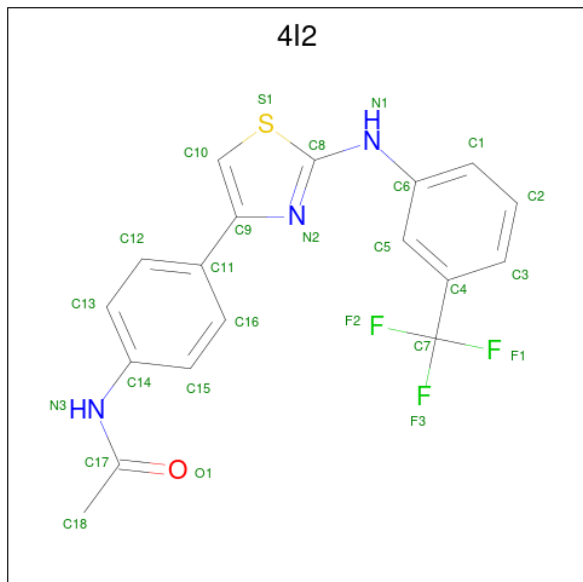
- Molecule 10 is (2ALPHA,2'BETA,3BETA,4ALPHA,5BETA)-VINCALEUKOBLASTINE (three-letter code: VLB) (formula:  $C_{46}H_{58}N_4O_9$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
10	B	1	59	46	4	9	0	0

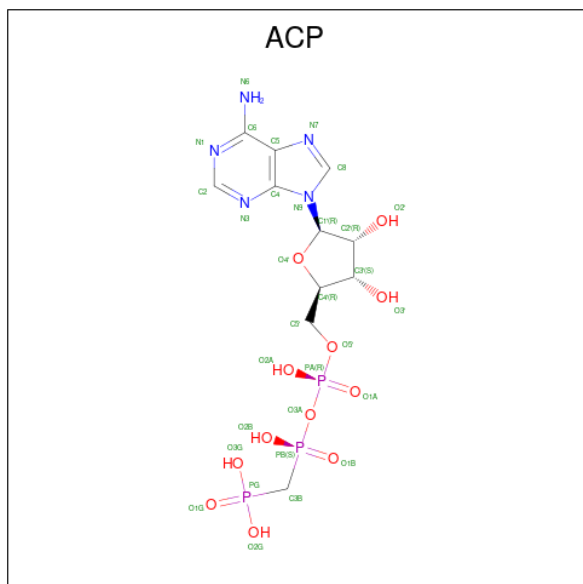
- Molecule 11 is N-(4-{2-[3-(trifluoromethyl)anilino]-1,3-thiazol-4-yl}phenyl)acetami

de (three-letter code: 4I2) (formula:  $C_{18}H_{14}F_3N_3OS$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	F	N	O			S
11	C	1	26	18	3	3	1	1	0	0

- Molecule 12 is PHOSPHOMETHYLPHOSPHONIC ACID ADENYLATE ESTER (three-letter code: ACP) (formula:  $C_{11}H_{18}N_5O_{12}P_3$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
12	F	1	31	11	5	12	3	0	0



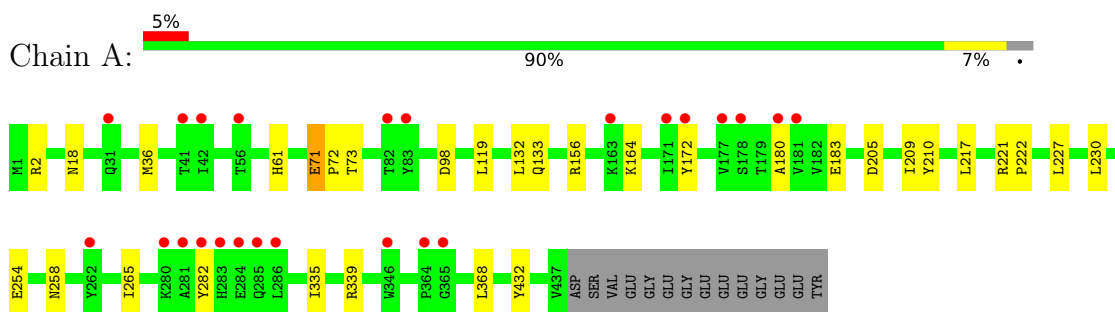
- Molecule 13 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
13	A	141	Total O 141 141	0	0
13	B	214	Total O 214 214	0	0
13	C	317	Total O 317 317	0	0
13	D	86	Total O 86 86	0	0
13	E	42	Total O 42 42	0	0
13	F	56	Total O 56 56	0	0

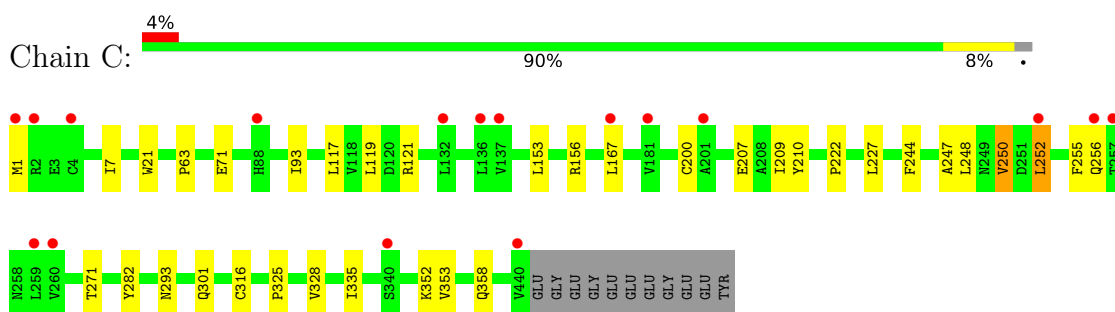
### 3 Residue-property plots [i](#)

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.

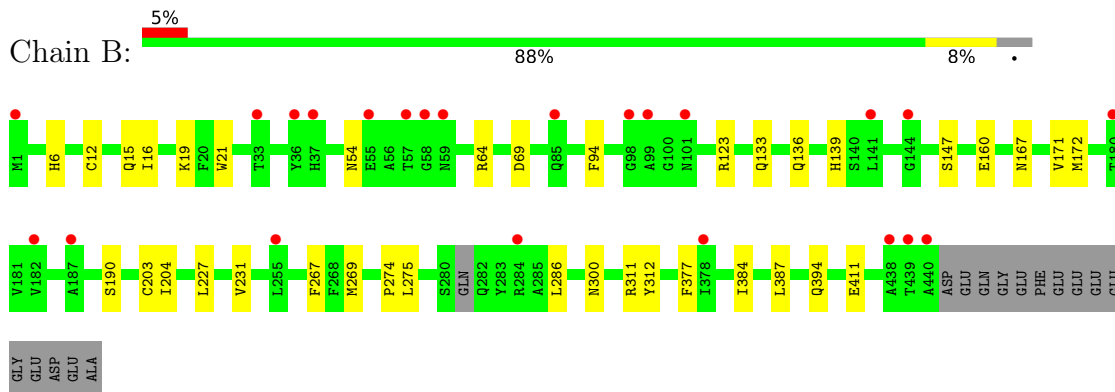
- Molecule 1: Tubulin alpha-1B chain



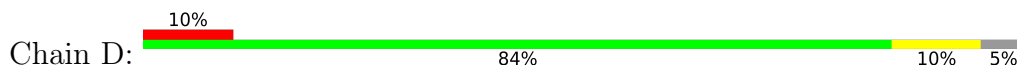
- Molecule 1: Tubulin alpha-1B chain

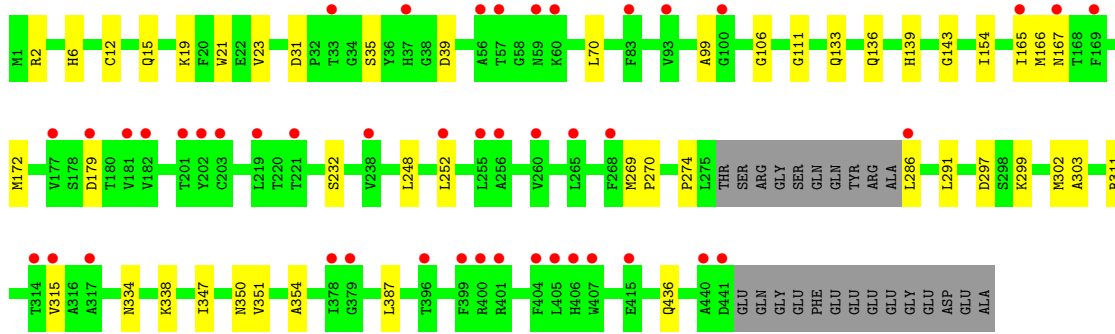


- Molecule 2: Tubulin beta-2B chain

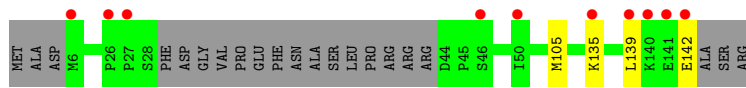
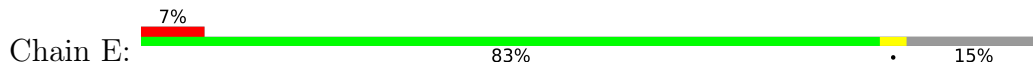


- Molecule 2: Tubulin beta-2B chain

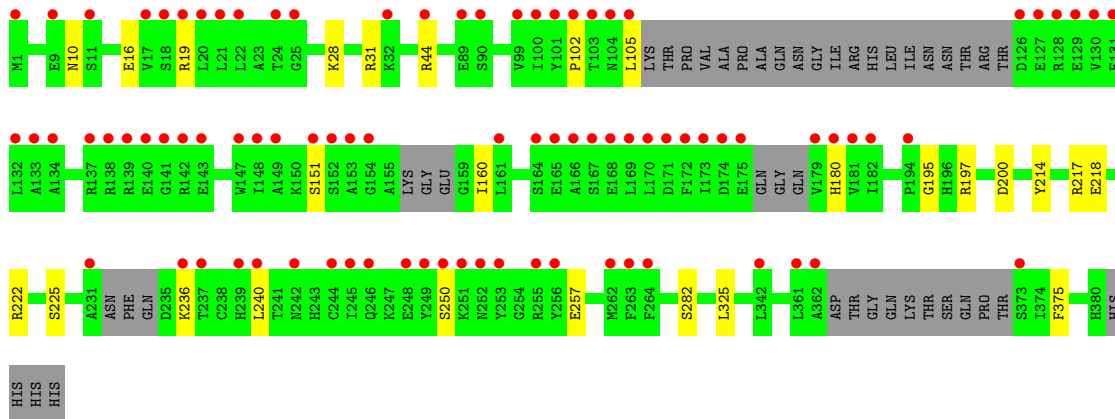
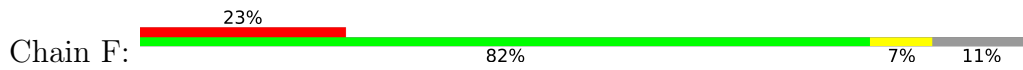




• Molecule 3: Stathmin-4



• Molecule 4: Tubulin beta-2B chain



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	105.29Å 157.30Å 182.53Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.60 – 2.00 45.60 – 1.96	Depositor EDS
% Data completeness (in resolution range)	96.3 (45.60-2.00) 98.2 (45.60-1.96)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.27 (at 1.95Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, $R_{free}$	0.204 , 0.236 0.202 , 0.234	Depositor DCC
$R_{free}$ test set	10682 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	41.2	Xtrriage
Anisotropy	0.203	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	(Not available) , (Not available)	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	18556	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	54.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.26% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: MES, VLB, ACP, 4I2, CA, GDP, GTP, 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	0.25	0/3506	0.48	0/4759
1	C	0.27	0/3571	0.49	0/4847
2	B	0.26	0/3481	0.49	0/4710
2	D	0.25	0/3382	0.46	0/4581
3	E	0.24	0/1028	0.41	0/1364
4	F	0.24	0/2847	0.46	0/3843
All	All	0.25	0/17815	0.47	0/24104

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 [i](#)

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	3428	0	3339	16	0
1	C	3493	0	3395	21	1
2	B	3408	0	3285	19	1
2	D	3309	0	3189	24	0
3	E	1019	0	1030	1	0
4	F	2786	0	2759	15	0
5	A	32	0	12	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	C	32	0	12	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
6	C	1	0	0	0	0
6	D	1	0	0	0	0
6	F	1	0	0	0	0
7	A	1	0	0	0	0
7	B	1	0	0	0	0
7	C	1	0	0	0	0
7	E	1	0	0	0	0
8	B	28	0	12	1	0
8	D	28	0	12	2	0
9	B	12	0	12	0	0
10	B	59	0	58	5	0
11	C	26	0	0	0	0
12	F	31	0	14	0	0
13	A	141	0	0	0	0
13	B	214	0	0	1	0
13	C	317	0	0	3	0
13	D	86	0	0	0	0
13	E	42	0	0	0	0
13	F	56	0	0	1	0
All	All	18556	0	17129	98	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 (98) 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:D:270:PRO:HG2	2:D:302:MET:HB2	1.72	0.71
3:E:135:LYS:HE3	3:E:139:LEU:HD11	1.75	0.69
4:F:217:ARG:HG3	4:F:218:GLU:HG2	1.82	0.62
4:F:10:ASN:HB2	4:F:44:ARG:HH22	1.68	0.59
2:B:6:HIS:CD2	2:B:21:TRP:HE1	2.21	0.59
2:D:274:PRO:HB3	2:D:286:LEU:HD22	1.84	0.58
1:A:71:GLU:OE2	1:A:73:THR:OG1	2.19	0.58
4:F:102:PRO:HG2	4:F:105:LEU:HD13	1.84	0.58
1:C:209:ILE:HD12	1:C:227:LEU:HB3	1.87	0.57
2:D:6:HIS:CD2	2:D:21:TRP:HE1	2.22	0.57
1:C:167:LEU:HG	1:C:200:CYS:HB3	1.87	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:328:VAL:HG11	1:C:353[A]:VAL:HG11	1.87	0.55
10:B:505:VLB:C59	10:B:505:VLB:H691	2.37	0.55
4:F:28:LYS:NZ	13:F:507:HOH:O	2.41	0.54
1:C:293[A]:ASN:HA	1:C:335:ILE:HD11	1.89	0.53
10:B:505:VLB:H691	10:B:505:VLB:C67	2.38	0.53
1:C:293[B]:ASN:HA	1:C:335:ILE:HD11	1.89	0.53
2:D:23:VAL:HG21	2:D:232:SER:HB2	1.90	0.52
1:C:1:MET:N	13:C:619:HOH:O	2.43	0.51
1:A:209:ILE:HG23	1:A:230:LEU:HD23	1.93	0.51
1:C:271:THR:OG1	1:C:301[B]:GLN:OE1	2.28	0.51
1:A:217:LEU:HD21	1:A:368:LEU:HD23	1.93	0.51
2:D:311:ARG:NH1	2:D:436:GLN:O	2.43	0.50
1:C:207:GLU:OE1	13:C:601:HOH:O	2.20	0.50
2:B:274:PRO:HB3	2:B:286:LEU:HD22	1.93	0.50
2:B:136:GLN:HA	2:B:167:ASN:O	2.11	0.49
1:A:172:TYR:HB3	1:A:205:ASP:HA	1.93	0.49
1:A:132:LEU:O	1:A:164:LYS:NZ	2.45	0.49
1:A:209:ILE:HG22	1:A:227:LEU:HD22	1.95	0.48
1:A:335:ILE:HG23	1:A:339:ARG:HG3	1.94	0.48
4:F:236:LYS:HB3	4:F:240:LEU:HD13	1.95	0.48
4:F:282:SER:HB2	4:F:325:LEU:HD13	1.95	0.48
2:D:172:MET:HG3	2:D:387:LEU:HD11	1.94	0.48
4:F:200:ASP:OD2	4:F:222:ARG:NH2	2.47	0.48
1:A:36:MET:HB3	1:A:61:HIS:CE1	2.49	0.48
2:D:334:ASN:HD21	2:D:338:LYS:HE3	1.78	0.48
2:D:248:LEU:HD23	2:D:354:ALA:HB2	1.96	0.47
1:C:250:VAL:HA	1:C:255:PHE:HE1	1.78	0.47
2:D:70:LEU:HD12	2:D:99:ALA:HB2	1.97	0.47
2:B:147[A]:SER:OG	2:B:190:SER:OG	2.18	0.47
2:B:172:MET:HG3	2:B:387:LEU:HD11	1.95	0.47
10:B:505:VLB:C65	1:C:325:PRO:HB3	2.45	0.46
2:D:143:GLY:HA3	8:D:501:GDP:O3A	2.15	0.46
2:B:12:CYS:HB2	8:B:501:GDP:C8	2.50	0.46
2:B:16:ILE:HD13	2:B:231:VAL:HG11	1.97	0.46
1:C:210:TYR:CZ	1:C:222:PRO:HD2	2.51	0.46
2:D:106:GLY:O	2:D:111:GLY:HA3	2.17	0.45
1:C:7:ILE:HG21	1:C:153:LEU:HD21	1.98	0.45
2:D:269:MET:HG3	2:D:303:ALA:HB3	1.97	0.45
2:B:69:ASP:O	2:B:94:PHE:HA	2.17	0.45
2:D:136:GLN:HA	2:D:167:ASN:O	2.17	0.45
1:C:93:ILE:HD11	1:C:121:ARG:HG3	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:244:PHE:CD1	1:C:358:GLN:HG3	2.51	0.45
2:D:2:ARG:HB3	2:D:133:GLN:HG3	1.98	0.45
2:B:54:ASN:OD1	2:B:64:ARG:NH2	2.48	0.44
1:A:98:ASP:HB2	5:A:501:GTP:O2G	2.17	0.44
2:D:347:ILE:HG22	2:D:350:ASN:HB3	2.00	0.44
1:A:210:TYR:CZ	1:A:222:PRO:HD2	2.52	0.44
2:D:31:ASP:OD1	2:D:35:SER:N	2.46	0.44
2:B:311:ARG:NH2	4:F:31:ARG:HH12	2.16	0.44
1:A:119:LEU:HD11	1:A:156:ARG:HB3	2.00	0.44
1:C:119:LEU:HD11	1:C:156:ARG:HB3	1.98	0.44
1:C:252:LEU:HD12	1:C:256[A]:GLN:HG2	1.99	0.43
2:B:227:LEU:HD22	10:B:505:VLB:H711	2.00	0.43
4:F:151:SER:HB3	4:F:180:HIS:CG	2.53	0.43
2:D:315:VAL:HB	2:D:351:VAL:HG22	2.00	0.43
2:B:171:VAL:HA	2:B:204:ILE:O	2.19	0.43
2:D:12:CYS:HB2	8:D:501:GDP:C8	2.53	0.43
1:A:254:GLU:HG2	1:A:258:ASN:ND2	2.34	0.43
1:C:252:LEU:HD22	13:C:800:HOH:O	2.18	0.43
2:D:154:ILE:HG23	2:D:166:MET:HG2	2.01	0.43
1:C:247:ALA:HB1	1:C:250:VAL:CG1	2.49	0.43
2:B:15:GLN:O	2:B:19:LYS:HG2	2.19	0.43
4:F:16:GLU:OE2	4:F:19:ARG:NH2	2.44	0.43
4:F:214:TYR:HB3	4:F:375:PHE:HB3	2.01	0.42
2:B:275:LEU:HD11	2:B:300:ASN:HA	2.01	0.42
1:C:316:CYS:HA	1:C:352:LYS:O	2.20	0.42
2:D:165:ILE:HG21	2:D:252:LEU:HB3	2.00	0.42
4:F:160:ILE:O	4:F:236:LYS:NZ	2.40	0.42
2:B:394:GLN:NE2	13:B:601:HOH:O	2.26	0.42
1:A:180:ALA:HB3	1:A:183:GLU:HG3	2.01	0.42
1:C:117:LEU:HD11	1:C:121:ARG:NH2	2.35	0.42
2:B:269:MET:HG2	2:B:384:ILE:HD13	2.02	0.41
10:B:505:VLB:H213	10:B:505:VLB:H19	1.81	0.41
4:F:195:GLY:HA3	4:F:197:ARG:HD3	2.02	0.41
1:A:2:ARG:HB3	1:A:133:GLN:HG2	2.02	0.41
1:A:71:GLU:HG2	1:A:72:PRO:HD2	2.02	0.41
2:B:203:CYS:SG	2:B:267:PHE:HB3	2.60	0.41
1:C:21:TRP:CZ3	1:C:63:PRO:HB3	2.56	0.41
2:D:286:LEU:HD23	2:D:291:LEU:HD13	2.02	0.41
1:A:265:ILE:HG23	1:A:432:TYR:CZ	2.55	0.41
2:D:15:GLN:O	2:D:19:LYS:HG2	2.20	0.41
2:B:312:TYR:CE1	2:B:377:PHE:HZ	2.39	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:225:SER:OG	4:F:250:SER:OG	2.35	0.41
2:D:39:ASP:OD1	2:D:39:ASP:N	2.54	0.41
2:B:123:ARG:NE	2:B:160:GLU:OE2	2.48	0.40
4:F:197:ARG:NH2	4:F:257:GLU:OE1	2.45	0.40
2:D:297:ASP:OD2	2:D:299:LYS:HE2	2.21	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)
2:B:411:GLU:OE1	1:C:282:TYR:OH[4_555]	2.14	0.06

## 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	437/451 (97%)	422 (97%)	15 (3%)	0	100	100
1	C	445/451 (99%)	439 (99%)	6 (1%)	0	100	100
2	B	427/445 (96%)	422 (99%)	5 (1%)	0	100	100
2	D	417/445 (94%)	412 (99%)	5 (1%)	0	100	100
3	E	119/143 (83%)	119 (100%)	0	0	100	100
4	F	329/384 (86%)	317 (96%)	12 (4%)	0	100	100
All	All	2174/2319 (94%)	2131 (98%)	43 (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	370/379 (98%)	366 (99%)	4 (1%)	73	78
1	C	378/379 (100%)	374 (99%)	4 (1%)	73	78
2	B	374/383 (98%)	372 (100%)	2 (0%)	88	92
2	D	364/383 (95%)	362 (100%)	2 (0%)	88	92
3	E	111/127 (87%)	109 (98%)	2 (2%)	59	63
4	F	305/342 (89%)	305 (100%)	0	100	100
All	All	1902/1993 (95%)	1888 (99%)	14 (1%)	84	88

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	18	ASN
1	A	71	GLU
1	A	221	ARG
1	A	282	TYR
2	B	133	GLN
2	B	139	HIS
1	C	71	GLU
1	C	248	LEU
1	C	250	VAL
1	C	252	LEU
2	D	139	HIS
2	D	179	ASP
3	E	105	MET
3	E	142	GLU

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

Mol	Chain	Res	Type
2	B	282	GLN
3	E	103	GLN
4	F	348	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](#)

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 17 ligands modelled in this entry, 9 are monoatomic - leaving 8 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
12	ACP	F	401	6	27,33,33	0.86	1 (3%)	32,52,52	1.36	2 (6%)
5	GTP	A	501	6	26,34,34	0.97	1 (3%)	33,54,54	1.70	6 (18%)
5	GTP	C	501	6	26,34,34	0.99	1 (3%)	33,54,54	1.77	7 (21%)
10	VLB	B	505	-	63,67,67	2.33	12 (19%)	79,108,108	2.63	27 (34%)
8	GDP	D	501	6	24,30,30	1.19	2 (8%)	31,47,47	1.94	8 (25%)
11	4I2	C	504	-	25,28,28	1.41	4 (16%)	34,40,40	0.78	1 (2%)
9	MES	B	504	-	12,12,12	2.20	1 (8%)	14,16,16	1.83	3 (21%)
8	GDP	B	501	6	24,30,30	1.13	2 (8%)	31,47,47	1.84	7 (22%)

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
12	ACP	F	401	6	-	6/15/38/38	0/3/3/3
5	GTP	A	501	6	-	8/18/38/38	0/3/3/3
5	GTP	C	501	6	-	8/18/38/38	0/3/3/3
10	VLB	B	505	-	-	8/38/131/131	0/7/9/9
8	GDP	D	501	6	-	5/12/32/32	0/3/3/3
11	4I2	C	504	-	-	2/16/18/18	0/3/3/3
9	MES	B	504	-	-	0/6/14/14	0/1/1/1
8	GDP	B	501	6	-	4/12/32/32	0/3/3/3

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	B	505	VLB	C59-C67	10.23	1.54	1.39
9	B	504	MES	C8-S	-7.35	1.67	1.77
10	B	505	VLB	C16-C15	6.83	1.51	1.39
10	B	505	VLB	O75-C73	5.99	1.44	1.33
10	B	505	VLB	O25-C23	5.59	1.43	1.33
10	B	505	VLB	C18-C13	4.44	1.44	1.39
10	B	505	VLB	O28-C29	4.42	1.45	1.35
8	D	501	GDP	C5-C6	4.21	1.48	1.41
8	B	501	GDP	C5-C6	3.94	1.48	1.41
10	B	505	VLB	C68-C67	3.74	1.57	1.53
11	C	504	4I2	C17-N3	3.40	1.42	1.36
12	F	401	ACP	PB-O3A	3.38	1.62	1.58
5	C	501	GTP	C6-N1	3.15	1.38	1.33
5	A	501	GTP	C6-N1	3.01	1.38	1.33
11	C	504	4I2	C10-S1	2.86	1.75	1.70
11	C	504	4I2	C8-N1	2.85	1.41	1.36
10	B	505	VLB	C57-N56	2.64	1.53	1.47
10	B	505	VLB	C51-C52	2.53	1.60	1.53
10	B	505	VLB	C51-C68	2.44	1.59	1.56
8	D	501	GDP	C5-C4	2.40	1.47	1.40
8	B	501	GDP	C5-C4	2.26	1.46	1.40
11	C	504	4I2	C6-N1	2.20	1.45	1.40
10	B	505	VLB	C57-C58	2.20	1.58	1.52
10	B	505	VLB	C58-C59	2.13	1.56	1.52

All (61) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	B	505	VLB	C52-C69-N56	12.06	130.17	111.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
12	F	401	ACP	PB-O3A-PA	-6.95	110.51	132.56
10	B	505	VLB	O32-C16-C15	6.11	122.83	116.58
10	B	505	VLB	O75-C73-C68	5.59	119.72	111.32
5	C	501	GTP	N3-C2-N1	-5.57	119.79	127.22
5	A	501	GTP	N3-C2-N1	-5.49	119.90	127.22
8	D	501	GDP	C2-N3-C4	5.07	121.14	115.36
10	B	505	VLB	C33-O32-C16	4.97	125.03	117.53
10	B	505	VLB	C58-C57-N56	4.95	124.49	113.44
8	B	501	GDP	C2-N3-C4	4.57	120.57	115.36
10	B	505	VLB	C19-C5-C6	4.43	112.82	108.28
10	B	505	VLB	O25-C23-C3	4.28	119.42	112.22
9	B	504	MES	C5-N4-C3	4.25	118.39	108.83
5	A	501	GTP	C2-N3-C4	4.22	120.17	115.36
8	B	501	GDP	C4-C5-C6	-4.21	116.78	120.80
5	C	501	GTP	C2-N3-C4	4.15	120.09	115.36
10	B	505	VLB	C12-C19-C5	-4.11	115.16	118.20
10	B	505	VLB	O32-C16-C17	-4.10	117.06	124.12
8	B	501	GDP	C2-N1-C6	4.08	122.41	115.93
8	D	501	GDP	C2-N1-C6	4.01	122.30	115.93
10	B	505	VLB	C2-C12-C19	3.94	120.73	114.07
8	D	501	GDP	C5-C6-N1	-3.94	118.04	123.43
8	D	501	GDP	C4-C5-C6	-3.88	117.10	120.80
8	B	501	GDP	C5-C6-N1	-3.83	118.19	123.43
10	B	505	VLB	O28-C29-C30	3.62	117.75	111.09
10	B	505	VLB	C22-N1-C2	3.57	127.93	119.21
8	D	501	GDP	N3-C2-N1	-3.38	122.72	127.22
8	B	501	GDP	N3-C2-N1	-3.36	122.75	127.22
10	B	505	VLB	C3-C2-N1	3.36	117.43	112.81
10	B	505	VLB	C5-C19-N9	3.26	118.59	111.72
5	C	501	GTP	C5-C6-N1	-3.25	118.98	123.43
10	B	505	VLB	O75-C73-O74	-3.23	118.28	123.93
10	B	505	VLB	C8-N9-C19	3.20	120.87	112.50
10	B	505	VLB	C54-C53-C52	3.16	119.29	110.02
10	B	505	VLB	C20-C5-C6	-3.09	104.31	107.99
10	B	505	VLB	O25-C23-O24	-3.03	118.61	123.93
10	B	505	VLB	C61-C60-C65	2.99	122.14	118.17
5	A	501	GTP	C5-C6-N1	-2.98	119.36	123.43
5	C	501	GTP	C2-N1-C6	2.96	120.64	115.93
10	B	505	VLB	C69-N56-C55	2.87	114.44	111.01
8	D	501	GDP	C4-C5-N7	-2.87	106.41	109.40
9	B	504	MES	O2S-S-C8	2.87	110.37	106.92
8	D	501	GDP	PA-O3A-PB	-2.86	123.01	132.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	501	GTP	PB-O3B-PG	-2.80	123.22	132.83
5	A	501	GTP	C2-N1-C6	2.80	120.37	115.93
5	A	501	GTP	PA-O3A-PB	-2.75	123.39	132.83
5	C	501	GTP	PA-O3A-PB	-2.72	123.48	132.83
10	B	505	VLB	C11-C12-C13	-2.65	107.52	112.35
8	B	501	GDP	C4-C5-N7	-2.59	106.70	109.40
5	A	501	GTP	PB-O3B-PG	-2.54	124.09	132.83
10	B	505	VLB	C61-C60-C59	-2.54	129.79	134.17
9	B	504	MES	O1S-S-C8	2.41	109.81	106.92
12	F	401	ACP	C5-C6-N6	2.34	123.91	120.35
10	B	505	VLB	C17-C16-C15	-2.27	120.11	122.20
8	B	501	GDP	PA-O3A-PB	-2.25	125.11	132.83
8	D	501	GDP	C3'-C2'-C1'	2.24	104.34	100.98
10	B	505	VLB	C11-C12-C2	-2.23	108.15	112.34
10	B	505	VLB	C76-O75-C73	2.07	119.42	115.94
5	C	501	GTP	N2-C2-N1	2.01	120.38	117.25
10	B	505	VLB	C64-C65-C60	-2.00	117.10	120.76
11	C	504	4I2	F3-C7-C4	-2.00	108.53	112.93

There are no chirality outliers.

All (41) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	501	GTP	C5'-O5'-PA-O1A
5	A	501	GTP	C5'-O5'-PA-O2A
5	C	501	GTP	C5'-O5'-PA-O1A
5	C	501	GTP	C5'-O5'-PA-O2A
8	B	501	GDP	C5'-O5'-PA-O1A
8	B	501	GDP	C5'-O5'-PA-O2A
8	D	501	GDP	C5'-O5'-PA-O3A
8	D	501	GDP	C5'-O5'-PA-O2A
10	B	505	VLB	C53-C54-C70-C71
10	B	505	VLB	C51-C68-C73-O74
10	B	505	VLB	C51-C68-C73-O75
12	F	401	ACP	PG-C3B-PB-O1B
12	F	401	ACP	PG-C3B-PB-O2B
12	F	401	ACP	PG-C3B-PB-O3A
12	F	401	ACP	C5'-O5'-PA-O1A
10	B	505	VLB	C17-C16-O32-C33
10	B	505	VLB	O72-C54-C70-C71
10	B	505	VLB	C15-C16-O32-C33
5	A	501	GTP	PB-O3B-PG-O1G

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Mol	Chain	Res	Type	Atoms
8	D	501	GDP	PA-O3A-PB-O1B
5	A	501	GTP	C5'-O5'-PA-O3A
11	C	504	4I2	C5-C6-N1-C8
5	A	501	GTP	PB-O3A-PA-O2A
11	C	504	4I2	C1-C6-N1-C8
5	C	501	GTP	PB-O3A-PA-O2A
8	B	501	GDP	PB-O3A-PA-O2A
10	B	505	VLB	C67-C68-C73-O74
5	C	501	GTP	PB-O3B-PG-O1G
12	F	401	ACP	PB-C3B-PG-O1G
5	A	501	GTP	PB-O3B-PG-O2G
5	A	501	GTP	PB-O3B-PG-O3G
5	C	501	GTP	PB-O3B-PG-O3G
8	D	501	GDP	PA-O3A-PB-O2B
8	D	501	GDP	PA-O3A-PB-O3B
5	C	501	GTP	C5'-O5'-PA-O3A
8	B	501	GDP	C5'-O5'-PA-O3A
12	F	401	ACP	C5'-O5'-PA-O3A
5	A	501	GTP	PB-O3A-PA-O1A
5	C	501	GTP	PB-O3A-PA-O1A
10	B	505	VLB	C58-C57-N56-C69
5	C	501	GTP	C4'-C5'-O5'-PA

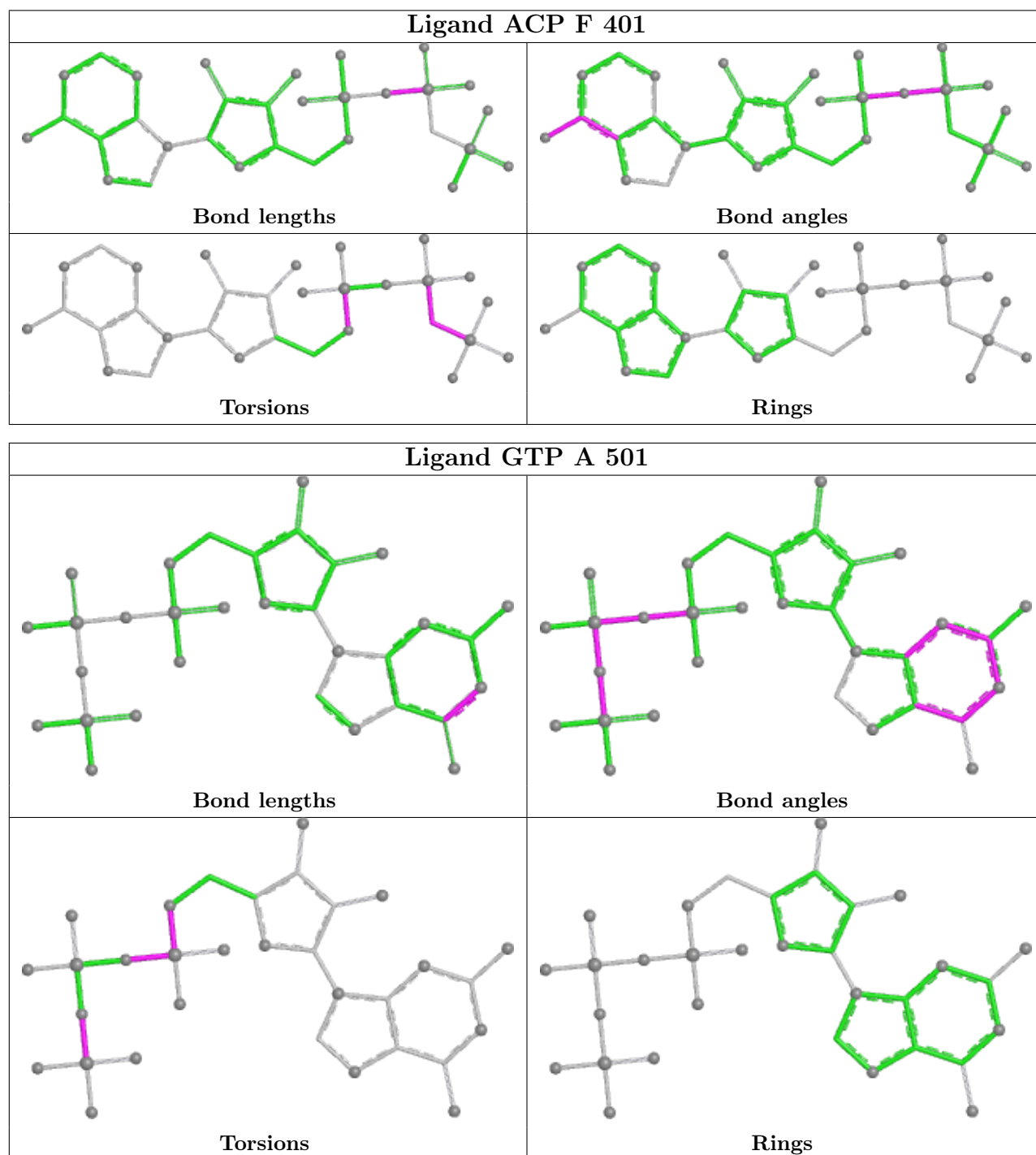
There are no ring outliers.

4 monomers are involved in 9 short contacts:

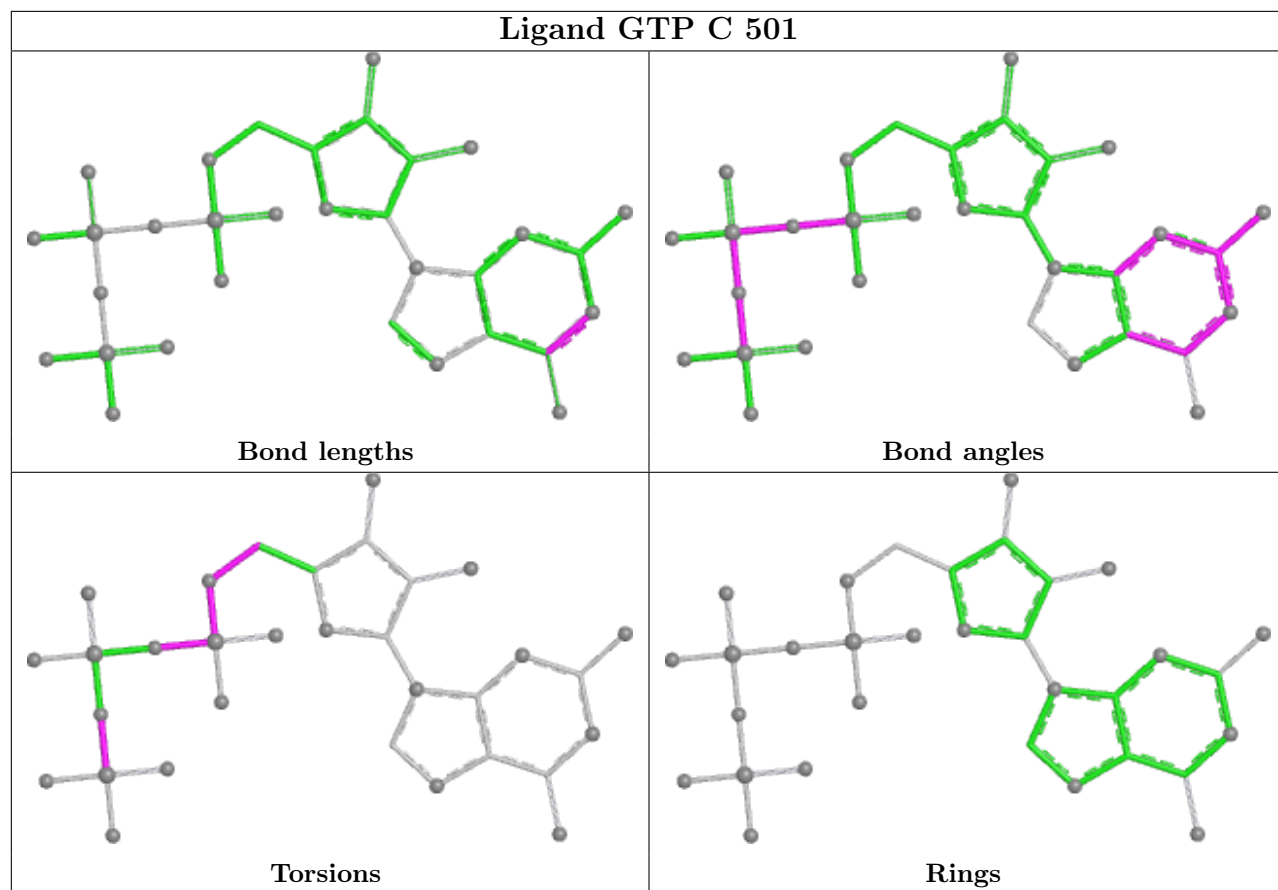
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	501	GTP	1	0
10	B	505	VLB	5	0
8	D	501	GDP	2	0
8	B	501	GDP	1	0

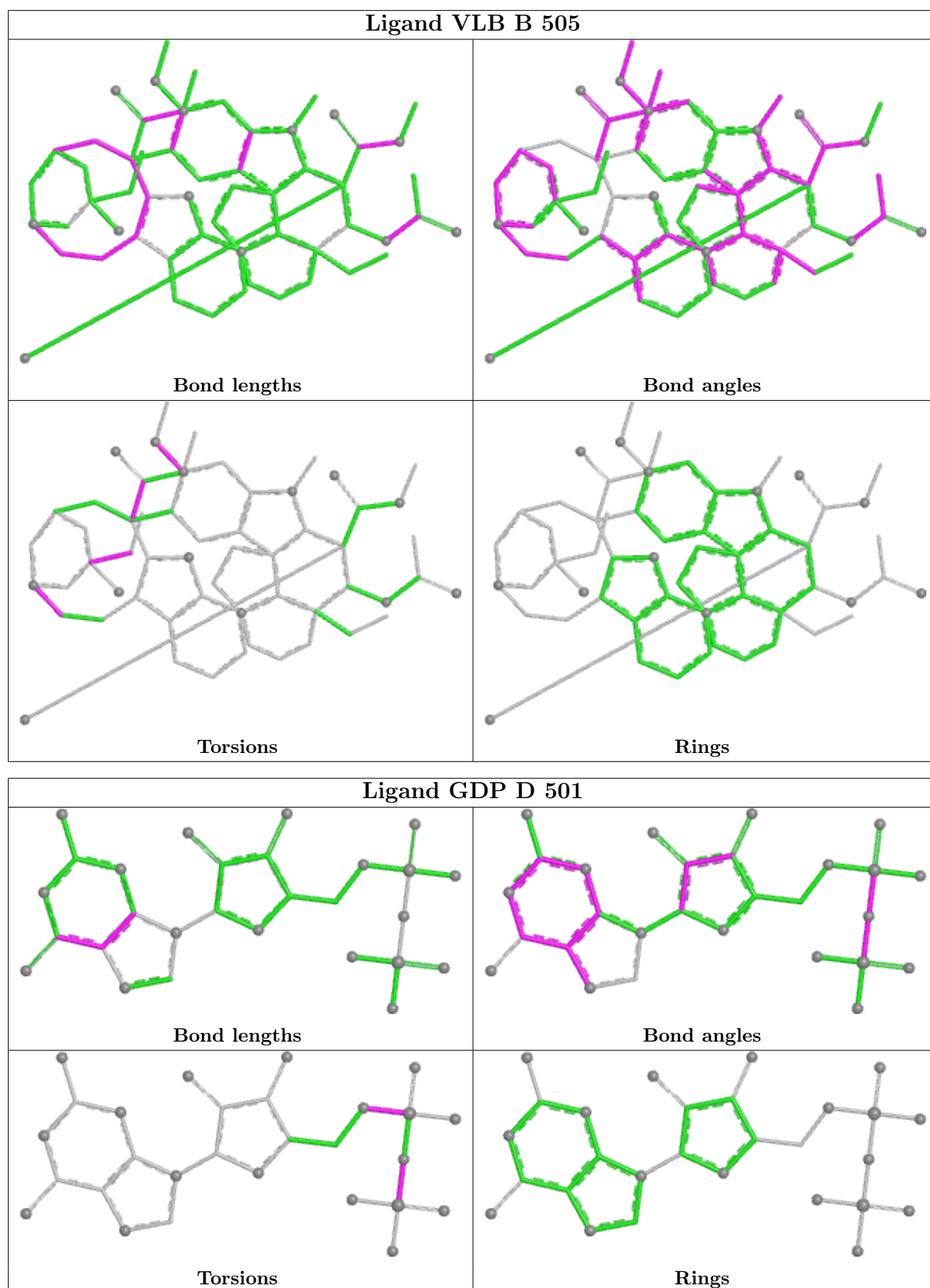
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 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.

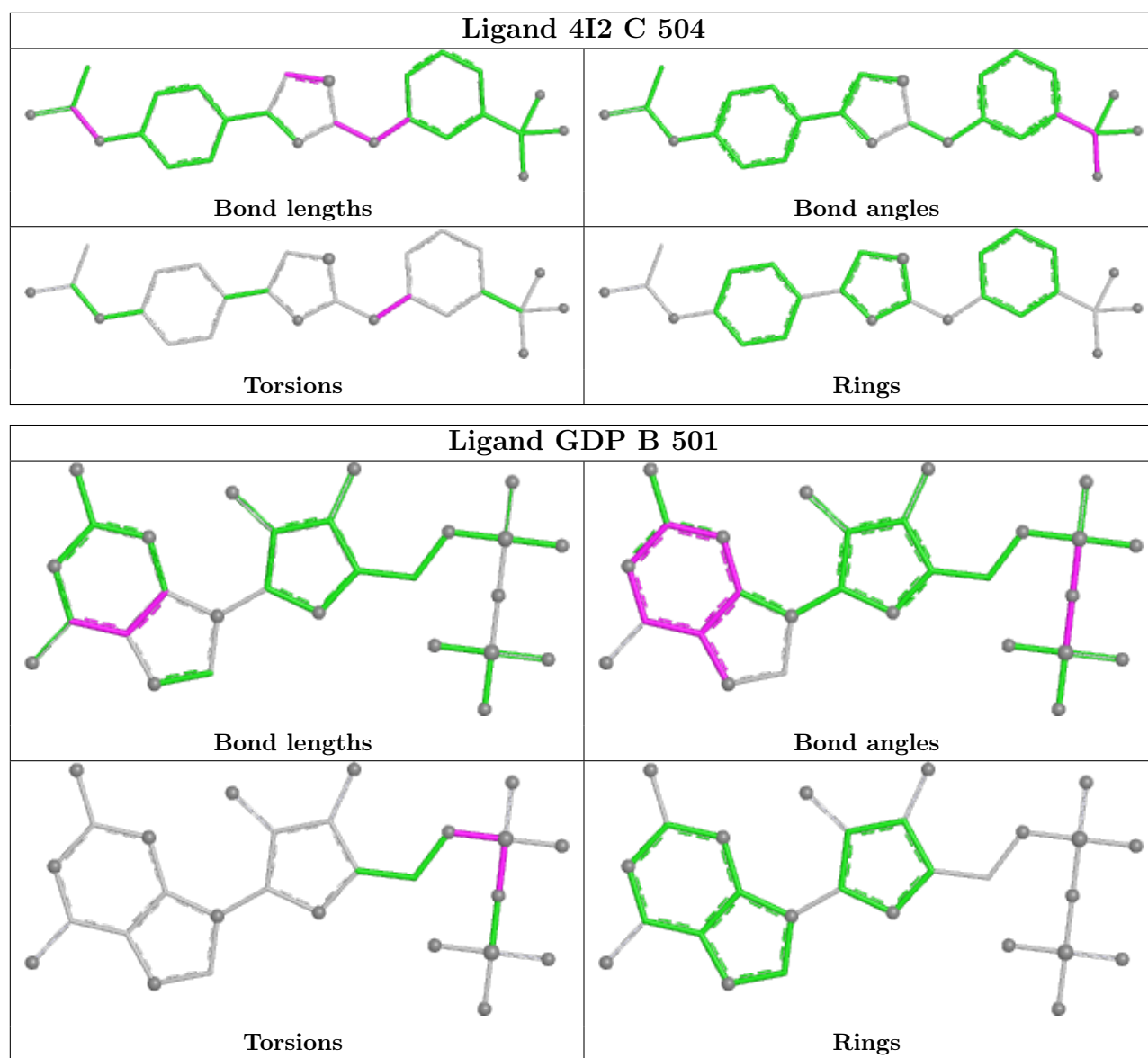
The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.











## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	B	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B	437:ASP	C	438:ALA	N	2.96

## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	437/451 (96%)	0.41	24 (5%) 25 24	31, 50, 75, 123	0
1	C	440/451 (97%)	0.20	17 (3%) 39 38	26, 39, 63, 76	0
2	B	429/445 (96%)	0.47	23 (5%) 25 24	26, 42, 75, 121	0
2	D	421/445 (94%)	0.66	45 (10%) 6 5	34, 56, 81, 109	0
3	E	122/143 (85%)	0.60	10 (8%) 11 11	33, 61, 94, 114	0
4	F	341/384 (88%)	1.23	87 (25%) 0 0	41, 71, 123, 141	0
All	All	2190/2319 (94%)	0.56	206 (9%) 8 8	26, 51, 92, 141	0

All (206) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	F	173	ILE	10.4
1	A	281	ALA	9.2
4	F	130	VAL	9.0
4	F	161	LEU	8.0
4	F	362	ALA	7.9
4	F	105	LEU	7.2
1	A	282	TYR	6.9
2	B	57	THR	6.9
4	F	142	ARG	6.9
4	F	166	ALA	6.6
4	F	182	ILE	6.4
4	F	249	TYR	6.3
2	D	57	THR	6.2
4	F	169	LEU	6.1
4	F	103	THR	6.1
4	F	133	ALA	5.9
4	F	231	ALA	5.8
4	F	251	LYS	5.8
4	F	89	GLU	5.7

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
4	F	167	SER	5.6
4	F	245	ILE	5.6
2	D	405	LEU	5.5
4	F	151	SER	5.5
4	F	179	VAL	5.3
4	F	244	CYS	5.3
4	F	174	ASP	5.1
3	E	27	PRO	5.1
4	F	101	TYR	5.0
2	D	407	TRP	4.9
4	F	256	TYR	4.8
4	F	140	GLU	4.8
4	F	104	ASN	4.7
4	F	141	GLY	4.7
2	B	438	ALA	4.6
1	A	283	HIS	4.6
4	F	250	SER	4.4
2	B	1	MET	4.4
2	D	177	VAL	4.4
4	F	168	GLU	4.4
4	F	170	LEU	4.4
4	F	100	ILE	4.3
2	D	400	ARG	4.3
1	A	42	ILE	4.2
4	F	361	LEU	4.2
2	D	404	PHE	4.2
4	F	143	GLU	4.2
2	B	59	ASN	4.2
3	E	140	LYS	4.2
4	F	172	PHE	4.1
3	E	6	MET	4.0
4	F	253	TYR	4.0
4	F	20	LEU	4.0
4	F	137	ARG	3.9
1	A	262	TYR	3.8
4	F	248	GLU	3.7
4	F	252	ASN	3.7
1	C	340	SER	3.7
3	E	139	LEU	3.7
4	F	240	LEU	3.7
2	B	439	THR	3.7
4	F	134	ALA	3.6

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Mol	Chain	Res	Type	RSRZ
4	F	90	SER	3.6
4	F	255	ARG	3.6
4	F	153	ALA	3.6
1	A	346	TRP	3.5
2	D	33	THR	3.4
4	F	152	SER	3.4
2	D	37	HIS	3.4
4	F	17	VAL	3.4
2	D	238	VAL	3.3
2	B	284	ARG	3.3
4	F	236	LYS	3.3
2	D	406	HIS	3.2
2	B	33	THR	3.2
1	C	1	MET	3.2
2	D	179	ASP	3.2
4	F	264	PHE	3.2
2	D	201	THR	3.2
4	F	129	GLU	3.1
2	D	401	ARG	3.1
2	D	441	ASP	3.1
4	F	132	LEU	3.1
4	F	181	VAL	3.1
4	F	138	ARG	3.1
3	E	26	PRO	3.1
1	C	256[A]	GLN	3.1
2	B	378	ILE	3.0
1	C	181	VAL	3.0
4	F	128	ARG	3.0
4	F	99	VAL	2.9
4	F	24	THR	2.9
3	E	141	GLU	2.9
4	F	246	GLN	2.9
2	D	181	VAL	2.9
2	D	256	ALA	2.9
4	F	171	ASP	2.9
4	F	154	GLY	2.9
4	F	194	PRO	2.9
4	F	22	LEU	2.8
4	F	342	LEU	2.8
2	D	59	ASN	2.8
2	D	221	THR	2.8
1	A	82	THR	2.7

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
4	F	139	ARG	2.7
1	A	178	SER	2.7
3	E	135	LYS	2.7
4	F	242	ASN	2.7
4	F	239	HIS	2.7
2	D	286	LEU	2.7
1	A	285	GLN	2.7
2	D	399	PHE	2.7
4	F	102	PRO	2.7
4	F	149	ALA	2.7
2	D	203	CYS	2.6
1	C	257	THR	2.6
3	E	142	GLU	2.6
4	F	164	SER	2.6
4	F	25	GLY	2.6
2	B	255	LEU	2.6
2	D	379	GLY	2.6
1	C	137	VAL	2.6
2	B	36	TYR	2.6
4	F	237	THR	2.6
4	F	9	GLU	2.6
1	C	132	LEU	2.6
1	C	260	VAL	2.5
2	D	260	VAL	2.5
2	D	378	ILE	2.5
4	F	148	ILE	2.5
2	D	268	PHE	2.5
4	F	32	LYS	2.5
2	B	180	THR	2.5
2	D	202	TYR	2.5
1	A	171	ILE	2.5
2	D	265	LEU	2.5
4	F	44	ARG	2.5
1	C	252	LEU	2.5
4	F	21	LEU	2.5
2	B	58	GLY	2.5
2	D	255	LEU	2.4
3	E	46	SER	2.4
2	B	141	LEU	2.4
1	C	440	VAL	2.4
4	F	175	GLU	2.4
4	F	147	TRP	2.4

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Mol	Chain	Res	Type	RSRZ
2	D	317	ALA	2.4
1	C	167	LEU	2.4
2	D	415	GLU	2.4
2	B	37	HIS	2.4
1	A	180	ALA	2.4
1	A	41	THR	2.4
1	C	2	ARG	2.4
1	A	365	GLY	2.4
2	D	165	ILE	2.4
4	F	263	PHE	2.3
4	F	127	GLU	2.3
1	A	163	LYS	2.3
4	F	180	HIS	2.3
1	A	181	VAL	2.3
2	D	100	GLY	2.3
2	D	169	PHE	2.3
4	F	262	MET	2.3
1	A	83	TYR	2.3
1	C	136	LEU	2.3
2	D	182	VAL	2.3
1	A	364	PRO	2.3
4	F	126	ASP	2.2
4	F	131	PHE	2.2
1	A	284	GLU	2.2
4	F	19	ARG	2.2
4	F	18	SER	2.2
4	F	1	MET	2.2
2	D	83	PHE	2.2
2	D	219	LEU	2.2
1	C	4[A]	CYS	2.2
4	F	373	SER	2.2
1	C	259	LEU	2.1
2	B	101	ASN	2.1
1	A	280	LYS	2.1
1	C	88	HIS	2.1
1	A	172	TYR	2.1
2	B	98	GLY	2.1
2	B	440	ALA	2.1
1	A	286	LEU	2.1
2	B	144	GLY	2.1
2	D	93	VAL	2.1
1	C	201	ALA	2.1

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Mol	Chain	Res	Type	RSRZ
2	B	99	ALA	2.1
4	F	165	GLU	2.1
2	D	252	LEU	2.1
1	A	177	VAL	2.1
2	B	55	GLU	2.1
2	B	85	GLN	2.1
2	D	167	ASN	2.0
1	A	56	THR	2.0
1	A	31	GLN	2.0
3	E	50	ILE	2.0
2	D	56	ALA	2.0
2	D	314	THR	2.0
2	D	396	THR	2.0
2	D	60	LYS	2.0
4	F	11	SER	2.0
2	B	187	ALA	2.0
2	D	440	ALA	2.0
2	B	182	VAL	2.0
2	D	315	VAL	2.0

## 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, 95<sup>th</sup> 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.

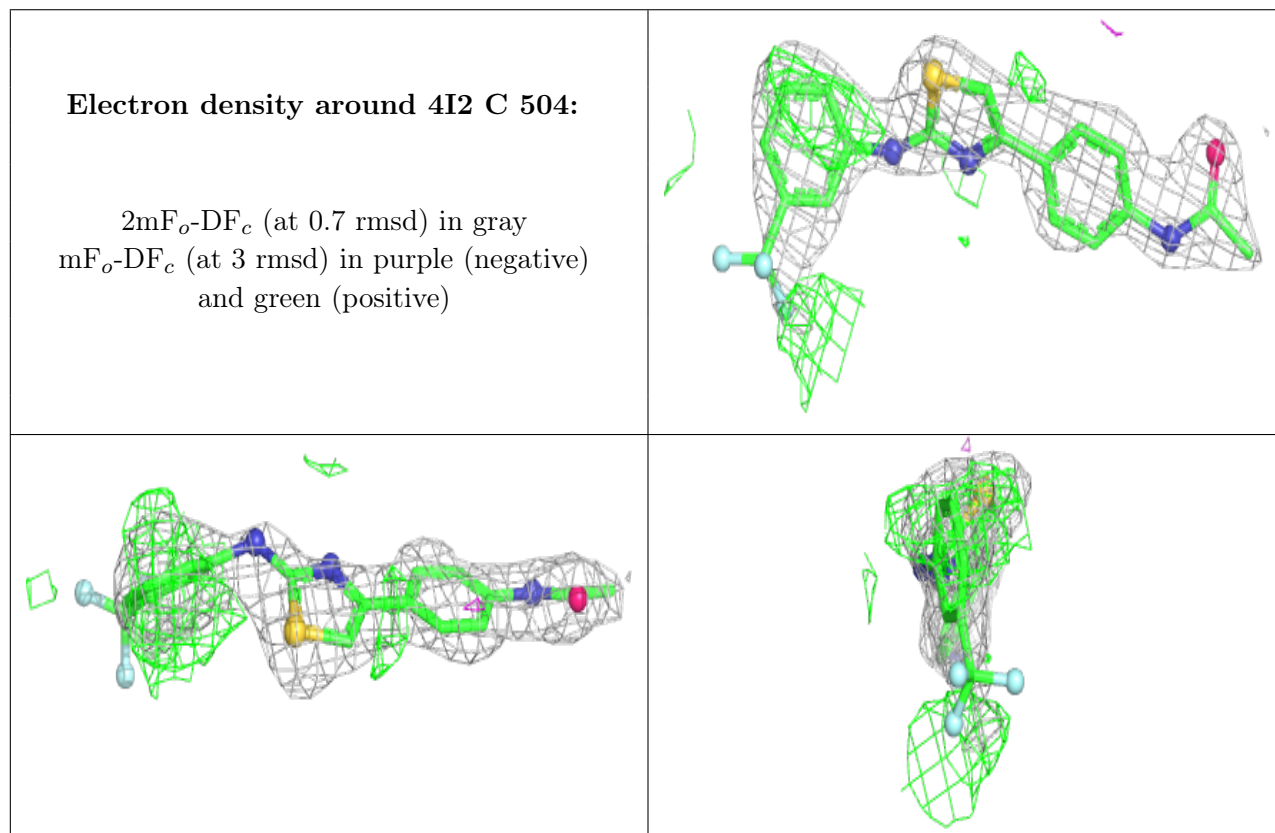
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
7	CA	E	201	1/1	0.70	0.09	98,98,98,98	0
7	CA	B	503	1/1	0.80	0.12	93,93,93,93	0
11	4I2	C	504	26/26	0.83	0.46	29,48,58,69	26
6	MG	D	502	1/1	0.84	0.11	61,61,61,61	0

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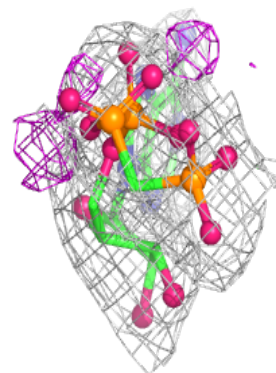
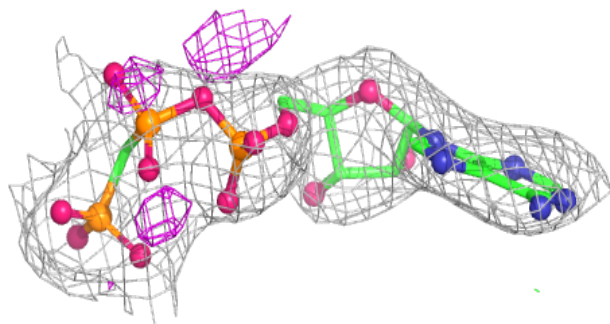
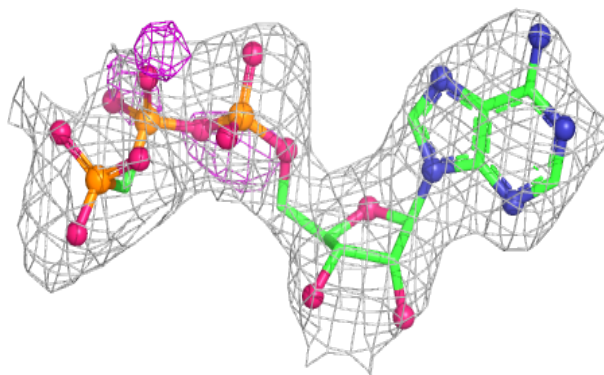
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
6	MG	F	402	1/1	0.89	0.08	70,70,70,70	0
12	ACP	F	401	31/31	0.91	0.11	60,80,101,112	0
7	CA	A	503	1/1	0.92	0.10	66,66,66,66	0
8	GDP	D	501	28/28	0.92	0.12	38,52,72,93	0
9	MES	B	504	12/12	0.95	0.12	39,52,61,62	0
10	VLB	B	505	59/59	0.95	0.11	28,34,44,54	0
5	GTP	A	501	32/32	0.97	0.15	27,34,42,44	0
6	MG	A	502	1/1	0.97	0.10	34,34,34,34	0
8	GDP	B	501	28/28	0.98	0.18	26,29,31,36	0
7	CA	C	503	1/1	0.98	0.07	58,58,58,58	0
5	GTP	C	501	32/32	0.98	0.15	24,29,32,33	0
6	MG	B	502	1/1	0.99	0.17	37,37,37,37	0
6	MG	C	502	1/1	0.99	0.14	27,27,27,27	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.



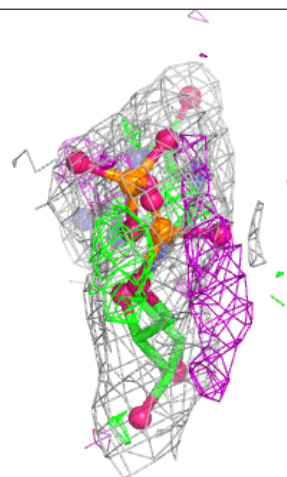
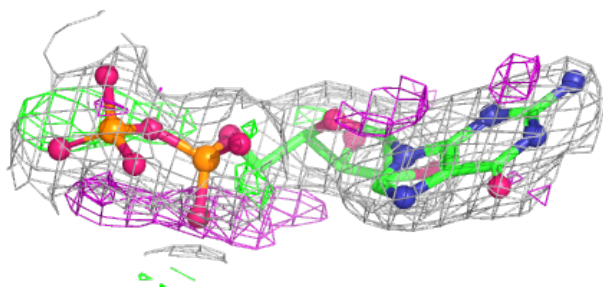
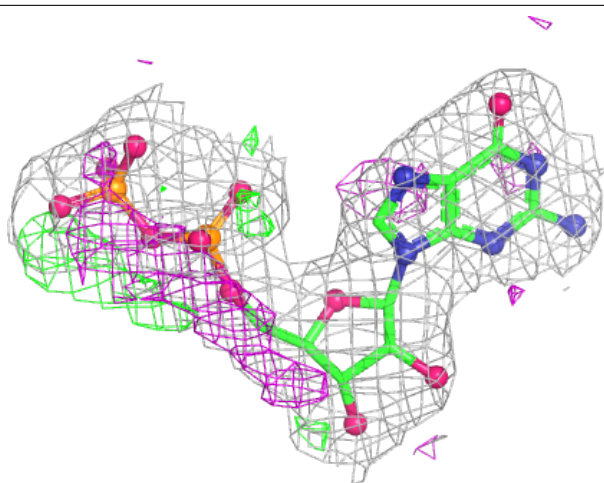
**Electron density around ACP F 401:**

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



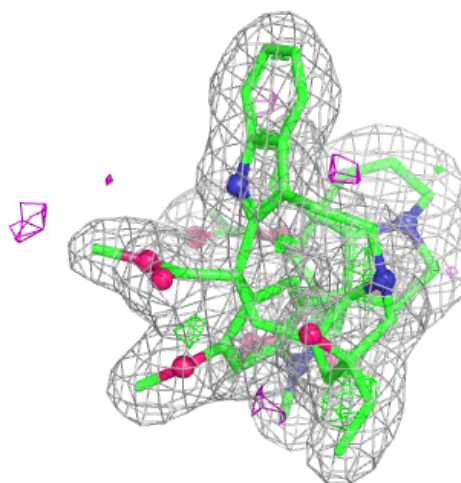
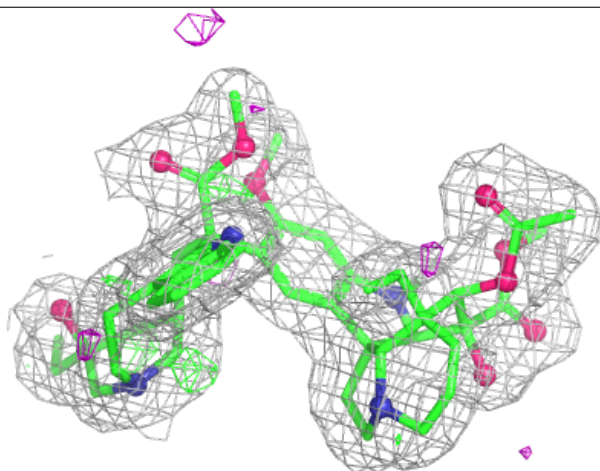
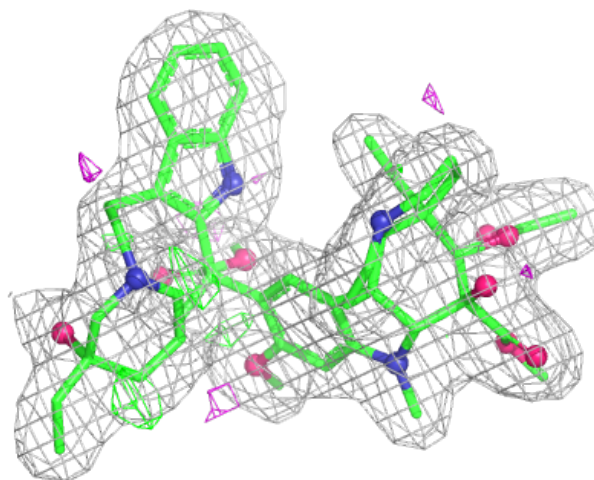
**Electron density around GDP D 501:**

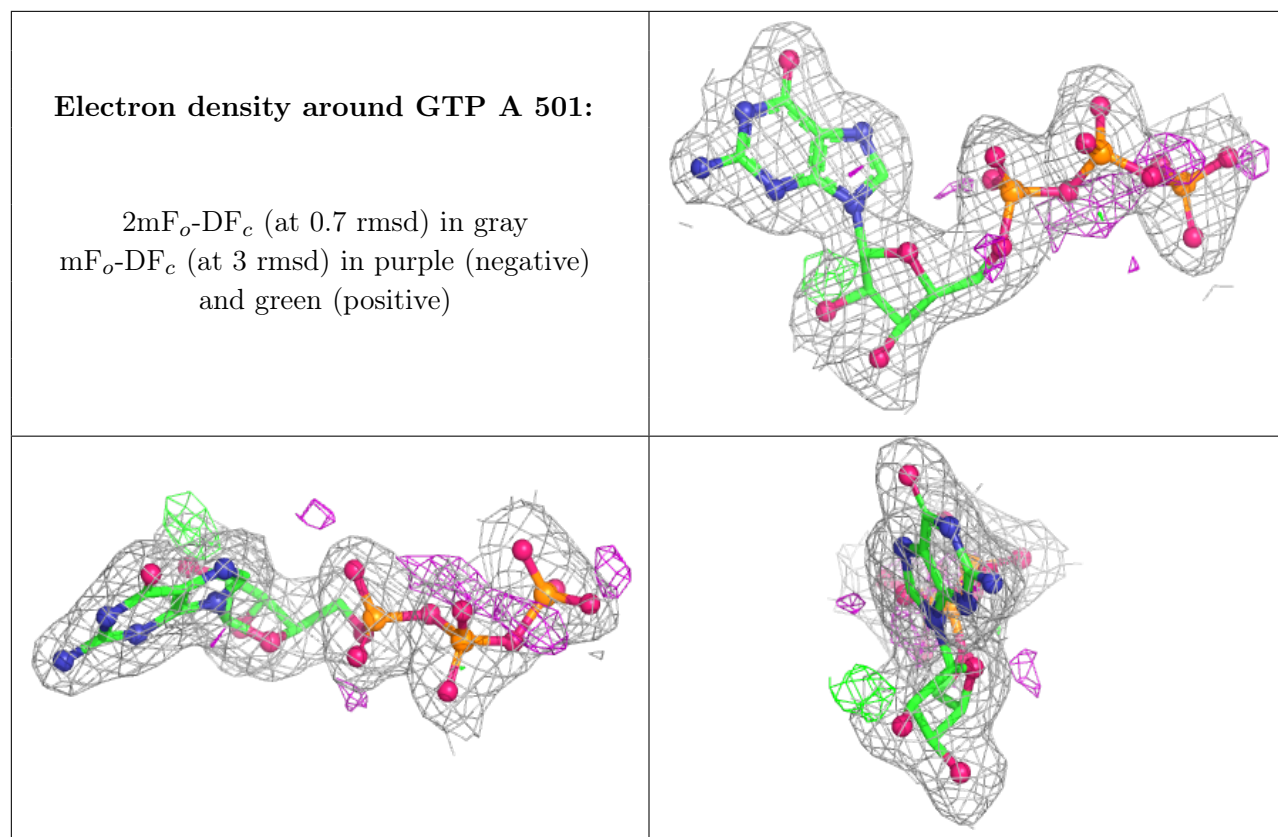
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around VLB B 505:**

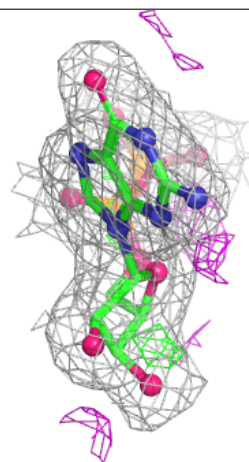
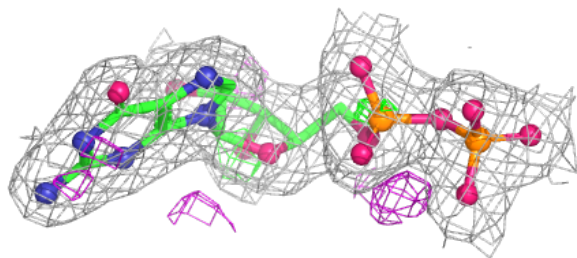
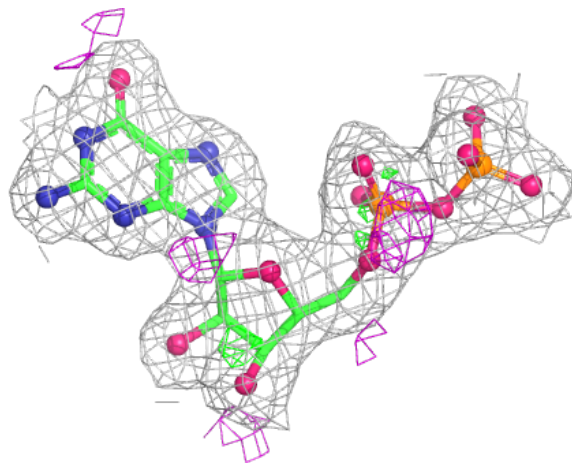
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



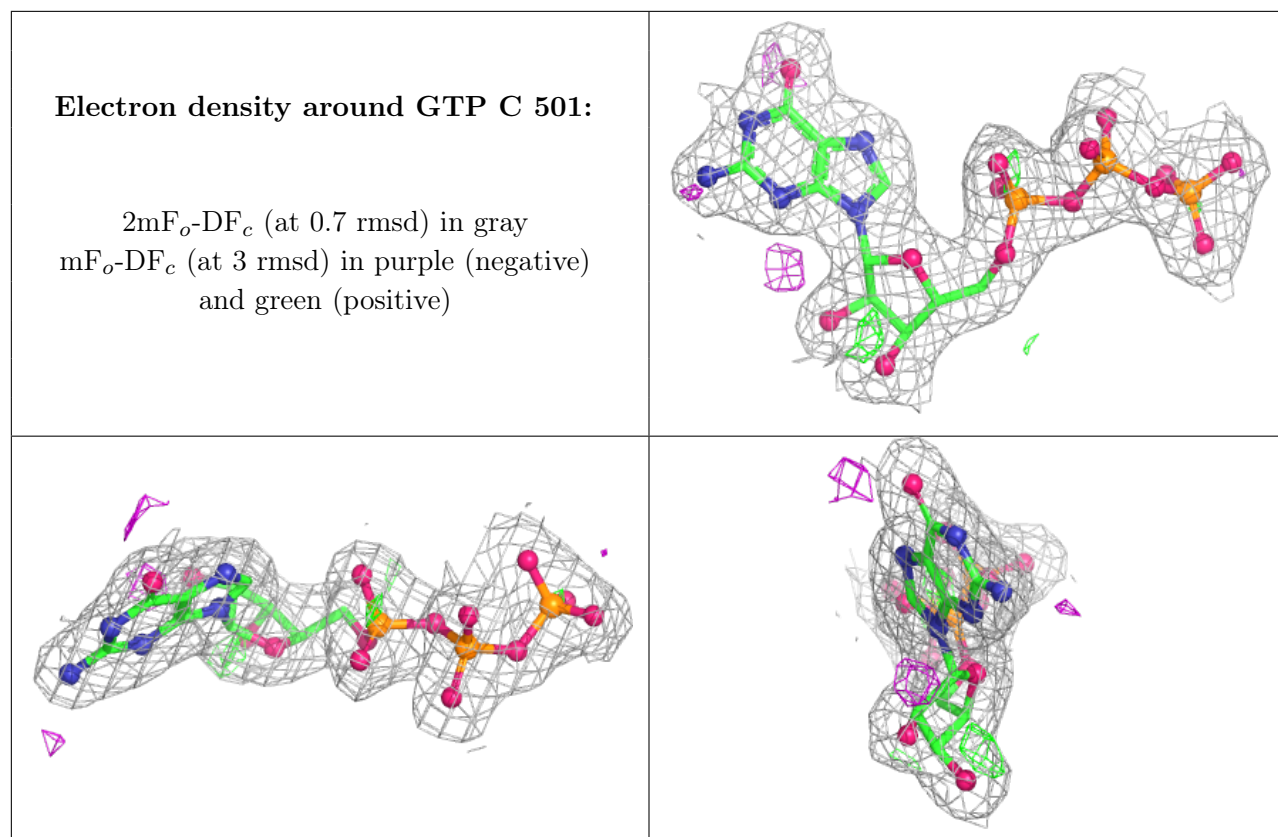


**Electron density around GDP B 501:**

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







## 6.5 Other polymers [i](#)

There are no such residues in this entry.