wwPDB X-ray Structure Validation Summary Report (i)

Feb 28, 2022 – 10:19 AM EST

PDB ID	:	5SBC
Title	:	Tubulin-maytansinoid-5a-complex
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Deposited on	:	2021-07-20
Resolution	:	2.32 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 (i) symbol.

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

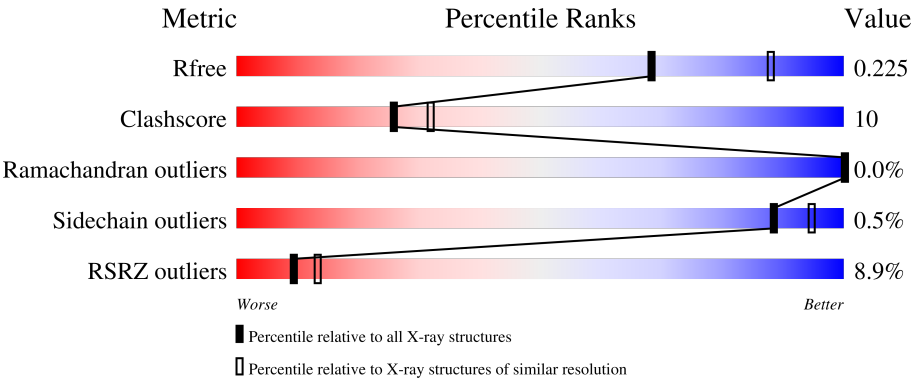
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.27
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.27

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.32 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	5974 (2.34-2.30)
Clashscore	141614	6604 (2.34-2.30)
Ramachandran outliers	138981	6523 (2.34-2.30)
Sidechain outliers	138945	6523 (2.34-2.30)
RSRZ outliers	127900	5855 (2.34-2.30)

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	451	5% 77% 20% .
1	C	451	% 79% 18% .
2	B	445	4% 71% 24% 5%
2	D	445	7% 71% 25% .
3	E	143	8% 73% 12% 15%

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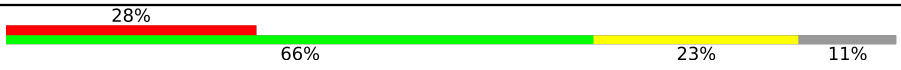
Mol	Chain	Length	Quality of chain
4	F	384	

2 Entry composition (i)

There are 14 unique types of molecules in this entry. The entry contains 18401 atoms, of which 13 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
1	A	438	Total	C	N	O	S	0	2	0
			3436	2173	584	655	24			
1	C	440	Total	C	N	O	S	0	6	0
			3476	2199	591	663	23			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	423	Total	C	N	O	S	0	1	0
			3345	2102	572	644	27			
2	D	426	Total	C	N	O	S	0	0	0
			3343	2098	570	648	27			

- Molecule 3 is a protein called Stathmin-4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	121	Total	C	N	O	S	0	0	0
			1000	617	181	197	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

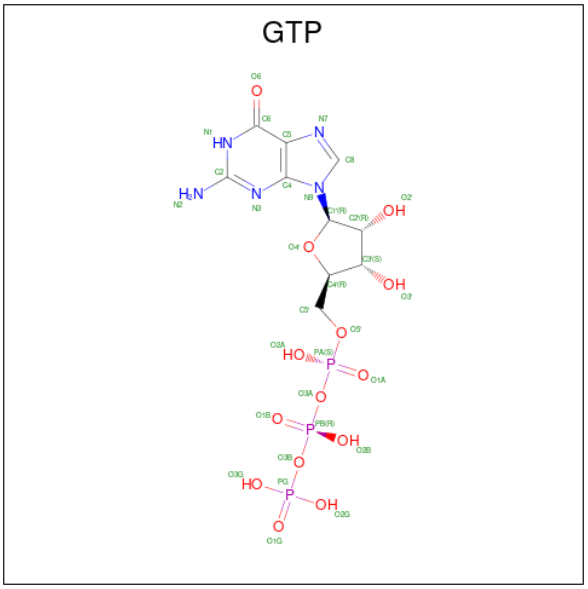
- Molecule 4 is a protein called Tubulin-Tyrosine Ligase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	F	341	Total	C	N	O	S	0	2	0
			2806	1801	480	510	15			

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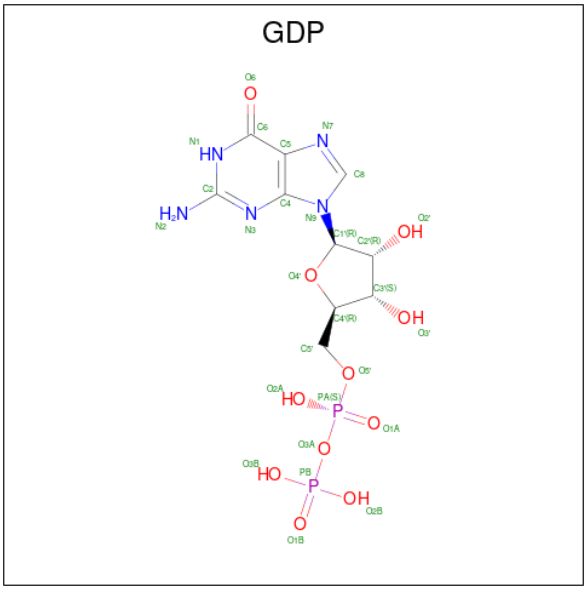
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	F	1	Total Mg 1 1	0	0

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

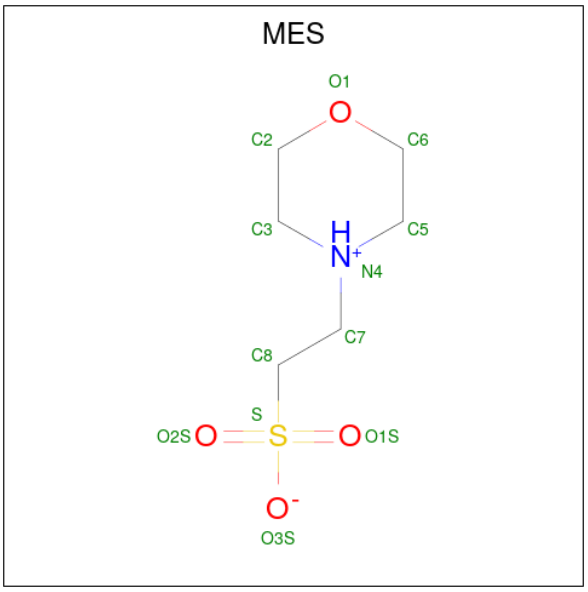
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total Ca 1 1	0	0
7	B	1	Total Ca 1 1	0	0
7	C	1	Total Ca 1 1	0	0
7	E	1	Total Ca 1 1	0	0

- Molecule 8 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: $C_{10}H_{15}N_5O_{11}P_2$).



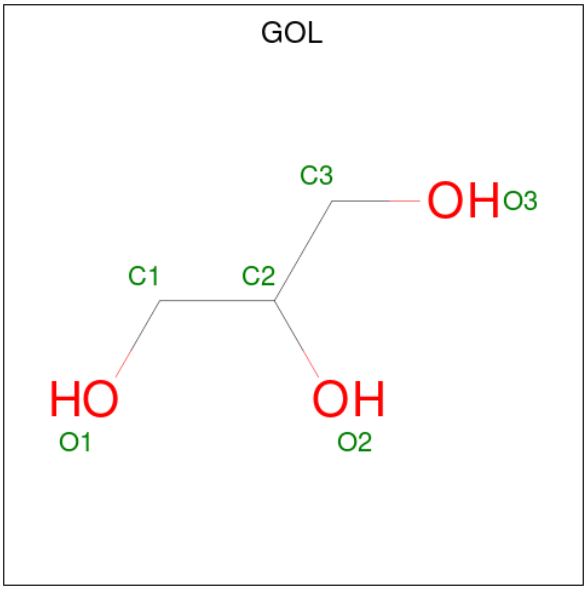
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	1	Total C N O P 28 10 5 11 2	0	0
8	D	1	Total C N O P 28 10 5 11 2	0	0

- Molecule 9 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: $C_6H_{13}NO_4S$).



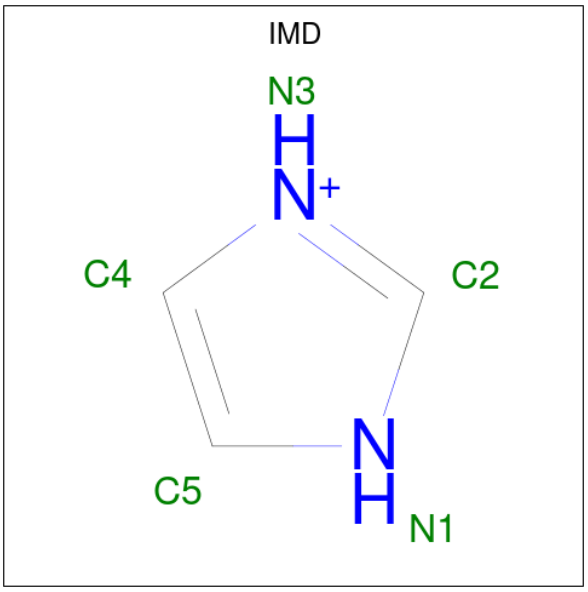
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
9	B	1	Total	C	N	O	S	0	0
			12	6	1	4	1		

- Molecule 10 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



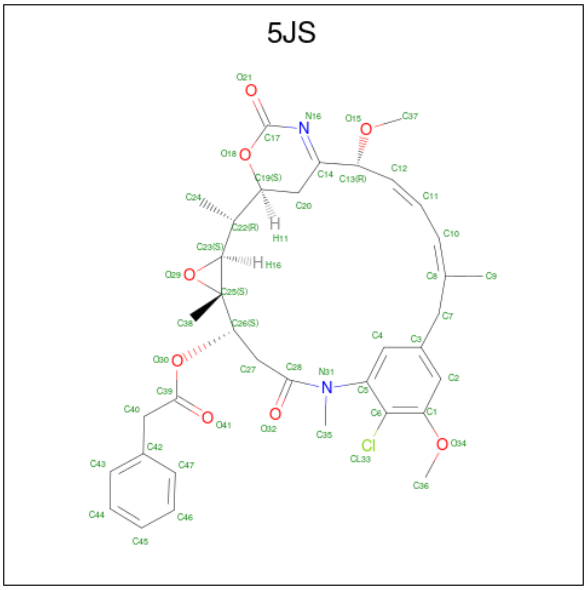
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
10	B	1	Total	C	H	O	0	0
			14	3	8	3		

- Molecule 11 is IMIDAZOLE (three-letter code: IMD) (formula: $C_3H_5N_2$).



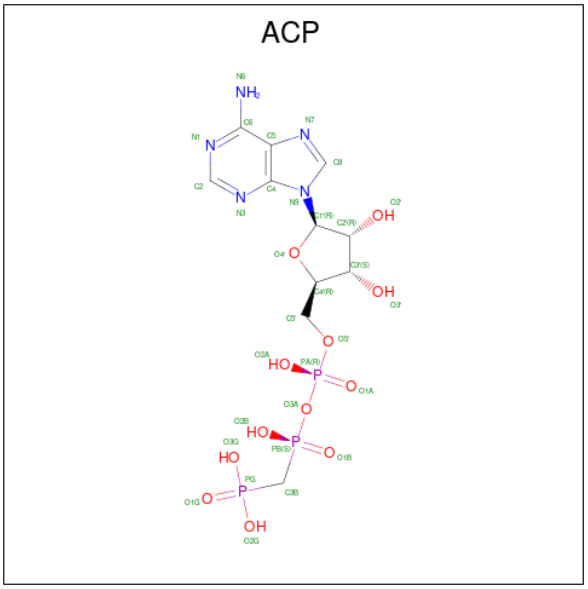
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	N		
11	C	1	10	3	5	2	0	0

- Molecule 12 is (1S,2R,3S,5S,6S,16E,18E,20R)-11-chloro-12,20-dimethoxy-2,5,9,16-tetramethyl-8,23-dioxo-4,24-dioxa-9,22-diazatetracyclo[19.3.1.1 10,14 .0 3,5]hexacosa-10(26),11,13,16,18,21-hexaen-6-yl phenylacetate (three-letter code: 5JS) (formula: $C_{36}H_{41}ClN_2O_8$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	Cl	N	O		
12	D	1	47	36	1	2	8	0	0

- Molecule 13 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
13	F	1	Total	C	N	O	P	0	0
			31	11	5	12	3		

- Molecule 14 is water.

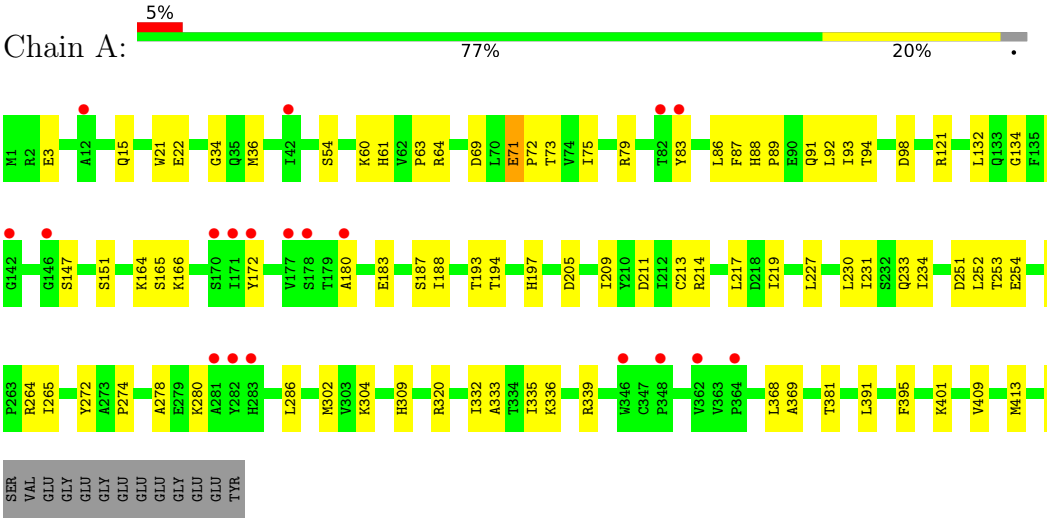
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
14	A	147	Total	O	0	0
			147	147		
14	B	169	Total	O	0	0
			169	169		
14	C	289	Total	O	0	0
			289	289		
14	D	79	Total	O	0	0
			79	79		
14	E	26	Total	O	0	0
			26	26		
14	F	42	Total	O	0	0
			42	42		

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.

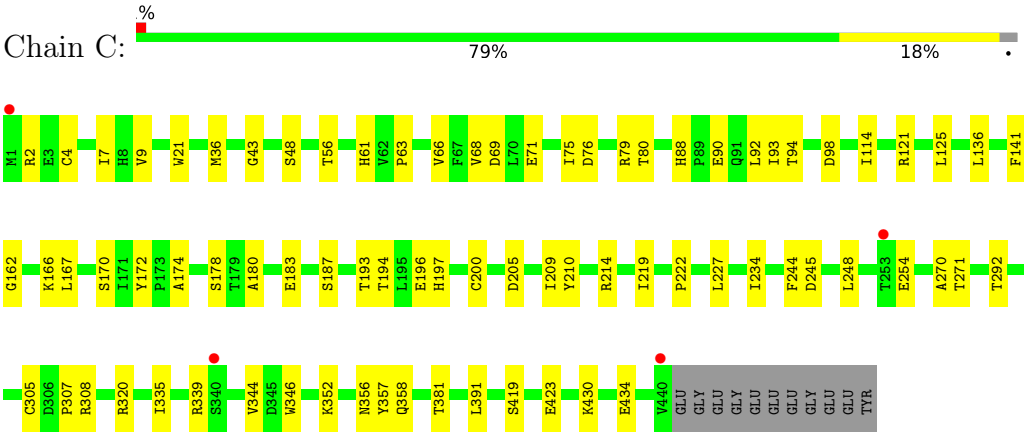
• Molecule 1: Tubulin alpha-1B chain

Chain A:



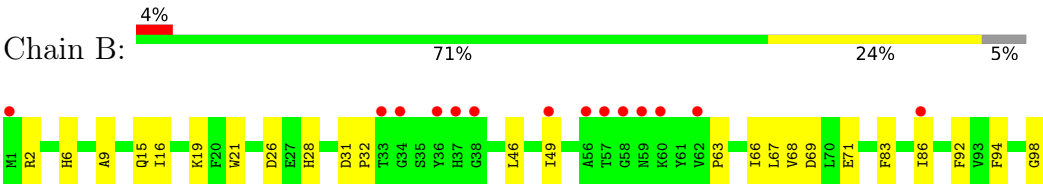
• Molecule 1: Tubulin alpha-1B chain

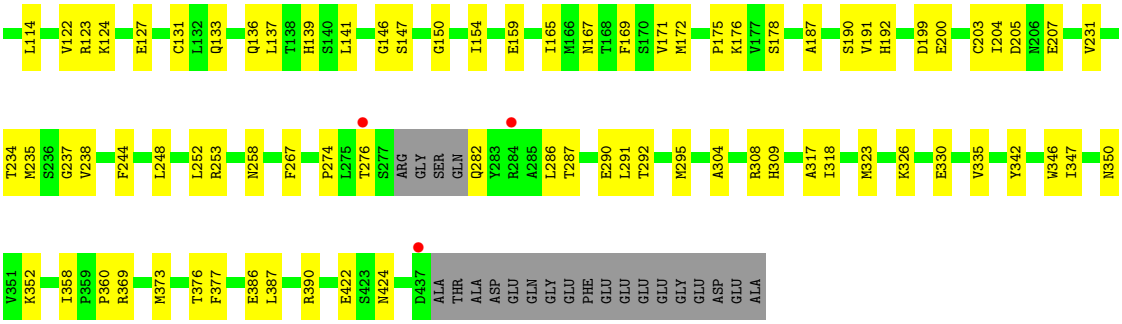
Chain C:



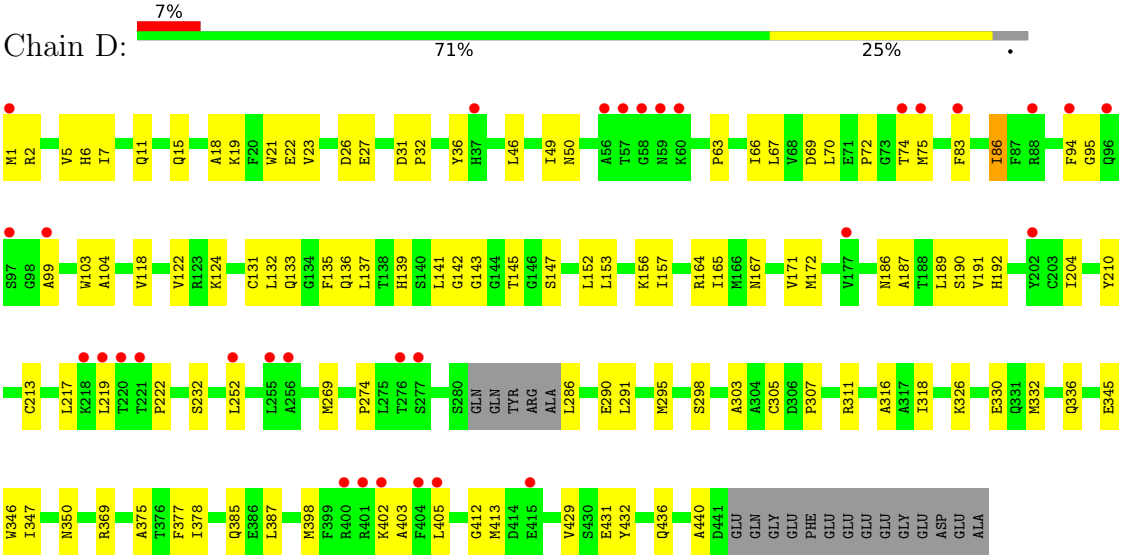
• Molecule 2: Tubulin beta-2B chain

Chain B:

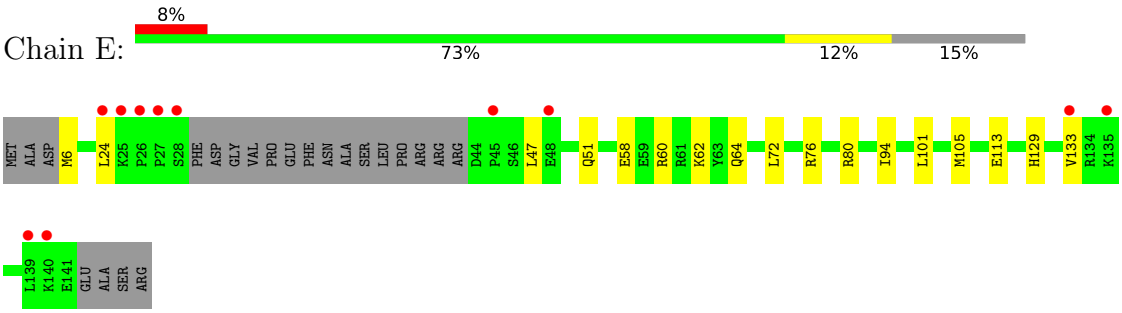




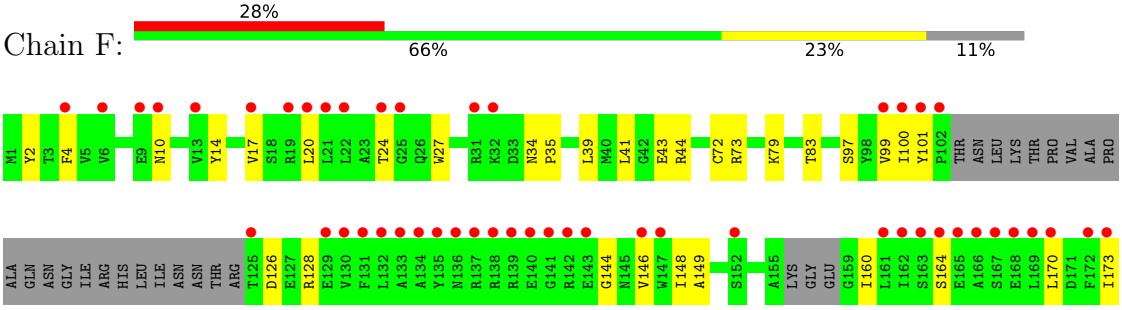
• Molecule 2: Tubulin beta-2B chain

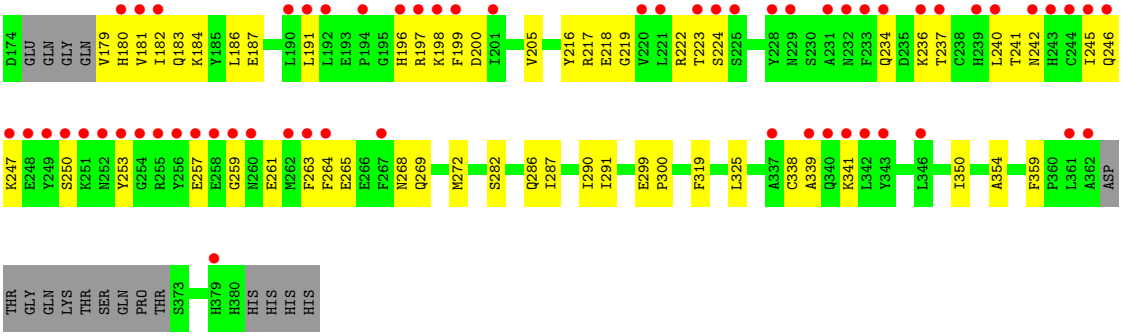


• Molecule 3: Stathmin-4



• Molecule 4: Tubulin-Tyrosine Ligase




D174 GLU GLN GLY GLN V179 H180 V181 I182 Q183 K184 Y185 L186 E187 L190 L191 L192 E193 P194 G195 H196 R197 K198 F199 D200 I201 V205 Y216 R217 E218 G219 V220 L221 R222 T223 S224 S225 Y228 N229 S230 A231 N232 F233 Q234 D235 K236 T237 C238 H239 L240 T241 N242 H243 C244 I245 Q246
K247 E248 Y249 S250 K251 N252 Y253 G254 R255 Y256 E257 E258 G259 N260 E261 M262 F263 F264 E265 E266 F267 N268 Q269 M272 S282 Q286 I287 I290 I291 E299 P300 F319 L325 A337 C338 A339 Q340 K341 L342 Y343 L346 I350 A354 F359 P360 L361 A362 ASP
THR GLY GLN LYS THR SER GLN PRO THR S373 H379 H380 HIS HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	104.91Å 157.91Å 181.46Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.02 – 2.32 48.02 – 2.32	Depositor EDS
% Data completeness (in resolution range)	100.0 (48.02-2.32) 100.0 (48.02-2.32)	Depositor EDS
R_{merge}	0.18	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.49 (at 2.32Å)	Xtriage
Refinement program	PHENIX 1.19.1_4122	Depositor
R, R_{free}	0.186 , 0.228 0.183 , 0.225	Depositor DCC
R_{free} test set	6548 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	51.8	Xtriage
Anisotropy	0.201	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 44.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	18401	wwPDB-VP
Average B, all atoms (Å^2)	67.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.58% 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: IMD, MG, GTP, ACP, CA, 5JS, MES, GDP, GOL

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	0.24	0/3514	0.46	0/4770
1	C	0.24	0/3564	0.45	0/4840
2	B	0.24	0/3419	0.46	0/4629
2	D	0.24	0/3416	0.45	0/4626
3	E	0.23	0/1008	0.41	0/1337
4	F	0.24	0/2869	0.45	0/3873
All	All	0.24	0/17790	0.45	0/24075

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	A	3436	0	3343	68	0
1	C	3476	0	3384	58	0
2	B	3345	0	3227	80	0
2	D	3343	0	3222	85	0
3	E	1000	0	1018	18	0
4	F	2806	0	2775	61	0
5	A	32	0	12	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	C	32	0	12	1	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	0	0
8	D	28	0	12	2	0
9	B	12	0	12	3	0
10	B	6	8	8	0	0
11	C	5	5	5	0	0
12	D	47	0	0	0	0
13	F	31	0	14	2	0
14	A	147	0	0	4	0
14	B	169	0	0	9	0
14	C	289	0	0	4	0
14	D	79	0	0	4	0
14	E	26	0	0	2	0
14	F	42	0	0	2	0
All	All	18388	13	17056	363	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 10.

The worst 5 of 363 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:10:ASN:HB2	4:F:44:ARG:HH22	1.40	0.84
2:D:172:MET:HG3	2:D:387:LEU:HD11	1.61	0.82
3:E:6:MET:HE2	3:E:24:LEU:HD21	1.61	0.81
1:A:71:GLU:OE2	1:A:73:THR:OG1	2.01	0.79
2:B:176:LYS:HD2	2:B:207:GLU:HG3	1.65	0.78

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	438/451 (97%)	424 (97%)	14 (3%)	0	100 100
1	C	444/451 (98%)	434 (98%)	10 (2%)	0	100 100
2	B	420/445 (94%)	411 (98%)	9 (2%)	0	100 100
2	D	422/445 (95%)	416 (99%)	6 (1%)	0	100 100
3	E	117/143 (82%)	117 (100%)	0	0	100 100
4	F	333/384 (87%)	326 (98%)	6 (2%)	1 (0%)	41 50
All	All	2174/2319 (94%)	2128 (98%)	45 (2%)	1 (0%)	100 100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	F	186	LEU

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	371/379 (98%)	368 (99%)	3 (1%)	81 90
1	C	377/379 (100%)	375 (100%)	2 (0%)	88 95
2	B	368/383 (96%)	367 (100%)	1 (0%)	92 96
2	D	368/383 (96%)	365 (99%)	3 (1%)	81 90
3	E	109/127 (86%)	109 (100%)	0	100 100
4	F	307/342 (90%)	306 (100%)	1 (0%)	92 96

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1900/1993 (95%)	1890 (100%)	10 (0%)	88 95

5 of 10 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	D	139	HIS
2	D	192	HIS
4	F	234	GLN
2	B	139	HIS
1	C	71	GLU

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

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 18 ligands modelled in this entry, 9 are monoatomic - leaving 9 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	$\#\|Z\|>2$
9	MES	B	504	-	12,12,12	2.23	1 (8%)	14,16,16	1.95	5 (35%)
13	ACP	F	401	6	27,33,33	1.99	7 (25%)	32,52,52	1.33	4 (12%)
11	IMD	C	504	-	3,5,5	0.39	0	4,5,5	0.59	0
5	GTP	C	501	6	26,34,34	0.97	1 (3%)	33,54,54	1.75	6 (18%)
5	GTP	A	501	6	26,34,34	0.99	1 (3%)	33,54,54	1.74	6 (18%)
8	GDP	B	501	6	24,30,30	1.17	2 (8%)	31,47,47	1.92	7 (22%)
8	GDP	D	501	6	24,30,30	1.17	2 (8%)	31,47,47	1.96	8 (25%)
12	5JS	D	503	-	50,51,51	2.63	7 (14%)	55,74,74	1.96	14 (25%)
10	GOL	B	505	-	5,5,5	0.84	0	5,5,5	0.87	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	MES	B	504	-	-	4/6/14/14	0/1/1/1
13	ACP	F	401	6	-	7/15/38/38	0/3/3/3
11	IMD	C	504	-	-	-	0/1/1/1
5	GTP	C	501	6	-	8/18/38/38	0/3/3/3
5	GTP	A	501	6	-	6/18/38/38	0/3/3/3
8	GDP	B	501	6	-	3/12/32/32	0/3/3/3
8	GDP	D	501	6	-	3/12/32/32	0/3/3/3
12	5JS	D	503	-	-	15/48/72/72	0/3/5/5
10	GOL	B	505	-	-	4/4/4/4	-

The worst 5 of 21 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
12	D	503	5JS	C20-C14	-13.29	1.34	1.50
12	D	503	5JS	C14-N16	9.68	1.44	1.28
9	B	504	MES	C8-S	-7.46	1.66	1.77
13	F	401	ACP	PG-O1G	5.43	1.61	1.50
8	B	501	GDP	C5-C6	4.19	1.48	1.41

The worst 5 of 50 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
12	D	503	5JS	C25-O29-C23	6.36	64.62	60.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	C	501	GTP	N3-C2-N1	-5.36	120.07	127.22
5	A	501	GTP	N3-C2-N1	-5.27	120.19	127.22
8	D	501	GDP	C2-N3-C4	4.83	120.87	115.36
8	B	501	GDP	C2-N3-C4	4.82	120.86	115.36

There are no chirality outliers.

5 of 50 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	501	GTP	PB-O3B-PG-O2G
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

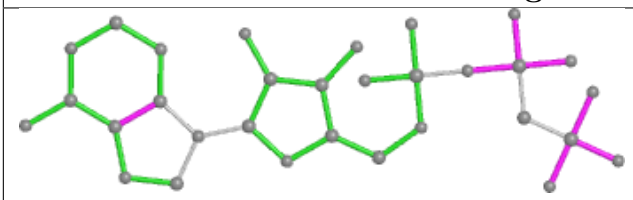
There are no ring outliers.

5 monomers are involved in 10 short contacts:

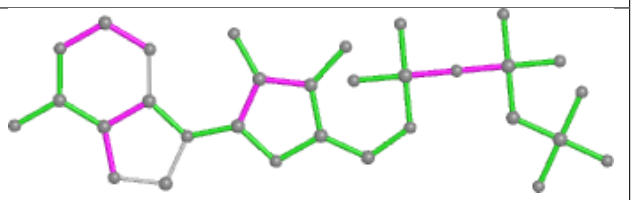
Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	B	504	MES	3	0
13	F	401	ACP	2	0
5	C	501	GTP	1	0
5	A	501	GTP	2	0
8	D	501	GDP	2	0

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.

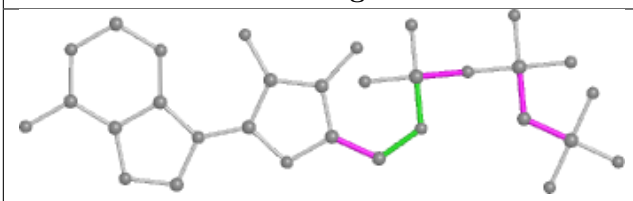
Ligand ACP F 401



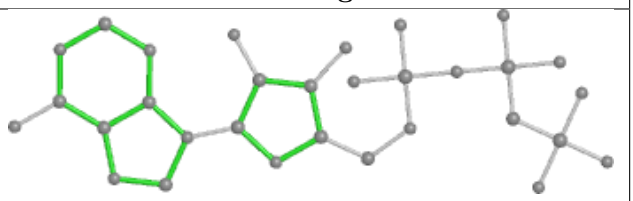
Bond lengths



Bond angles

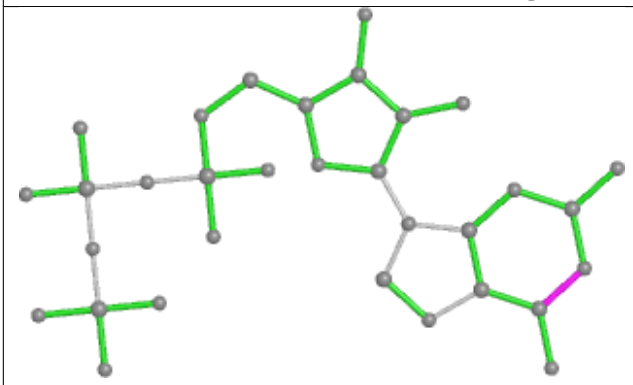


Torsions

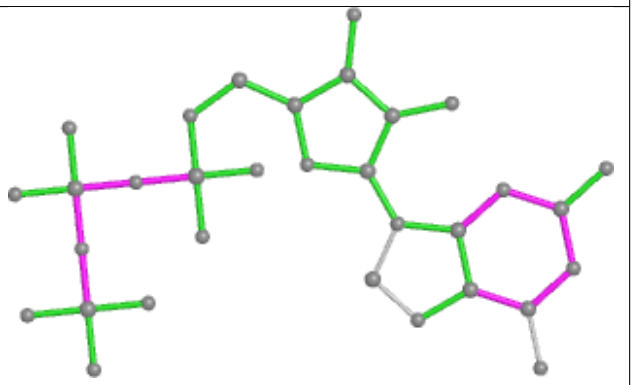


Rings

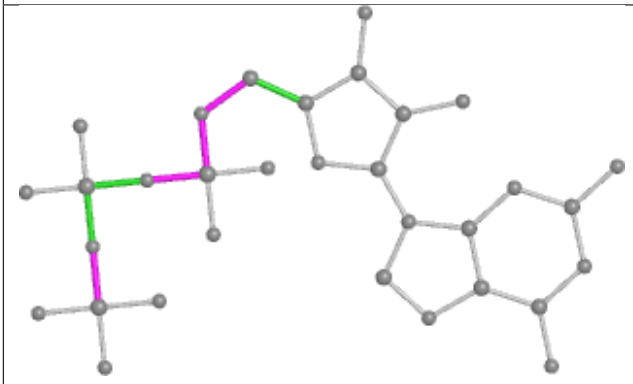
Ligand GTP C 501



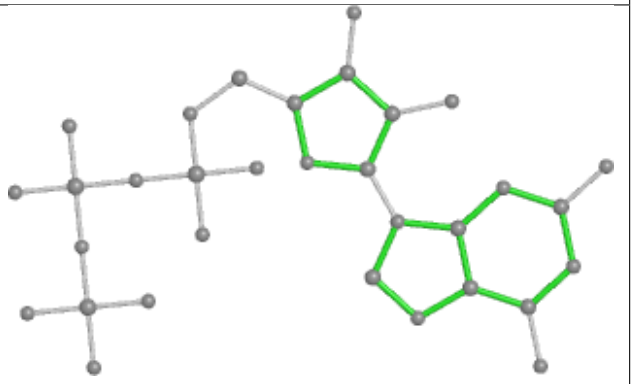
Bond lengths



Bond angles

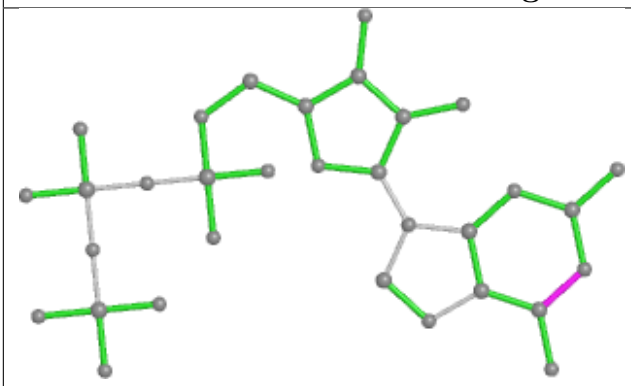


Torsions

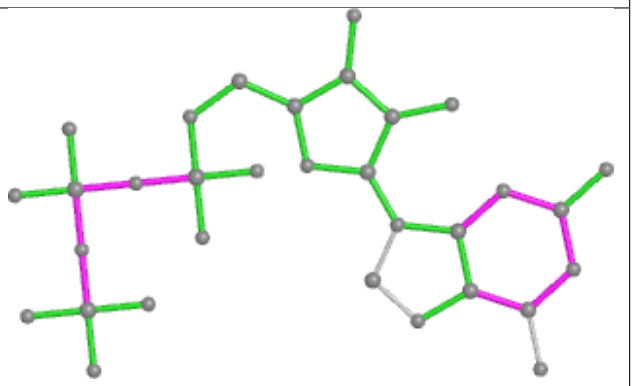


Rings

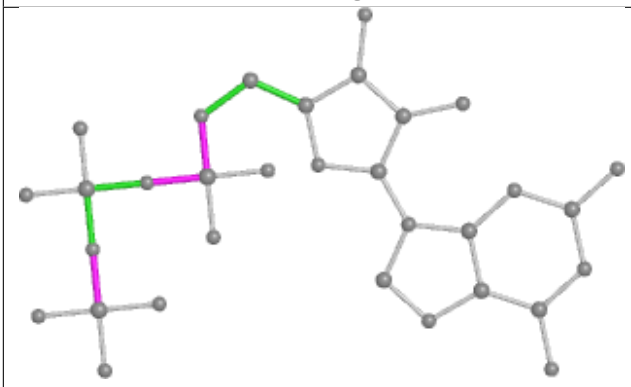
Ligand GTP A 501



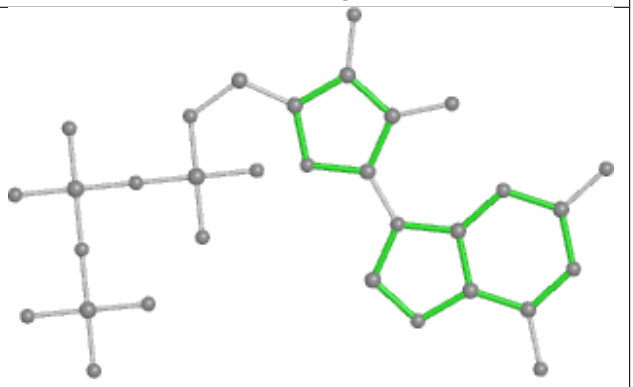
Bond lengths



Bond angles

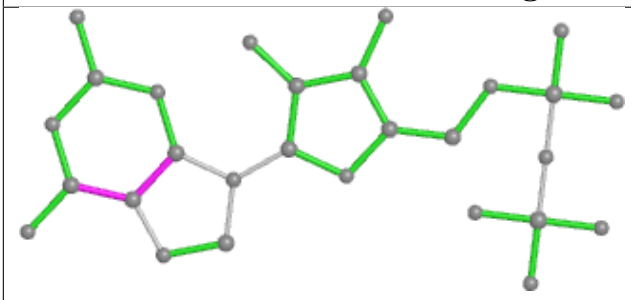


Torsions

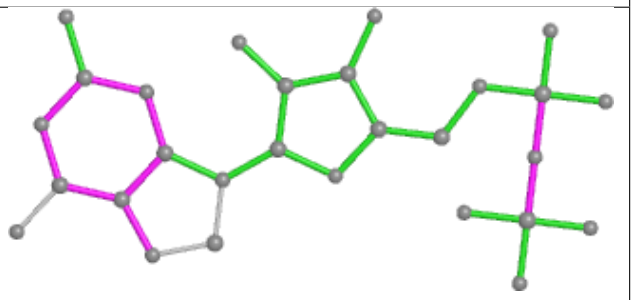


Rings

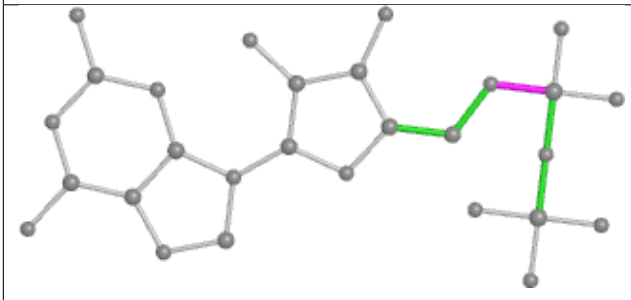
Ligand GDP B 501



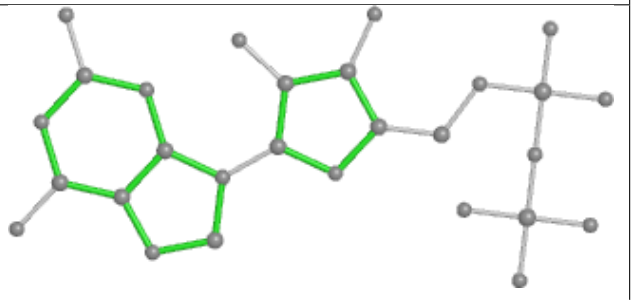
Bond lengths



Bond angles

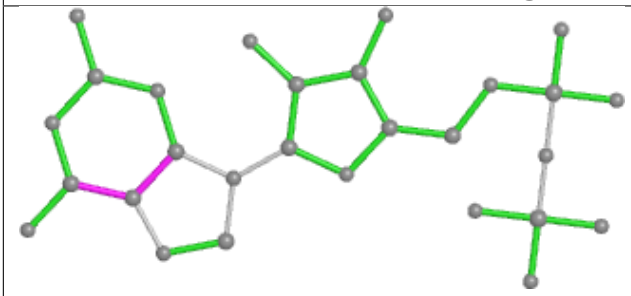


Torsions

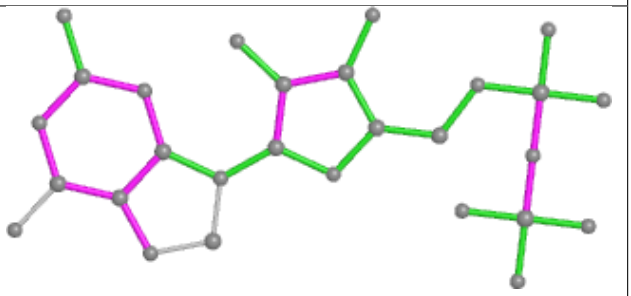


Rings

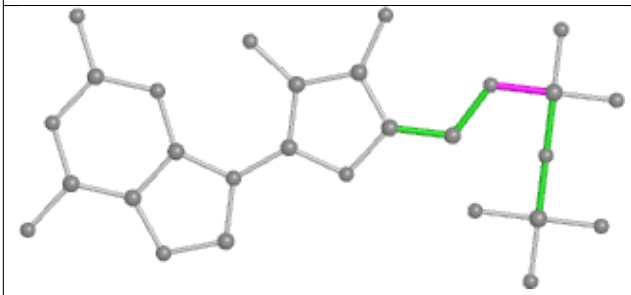
Ligand GDP D 501



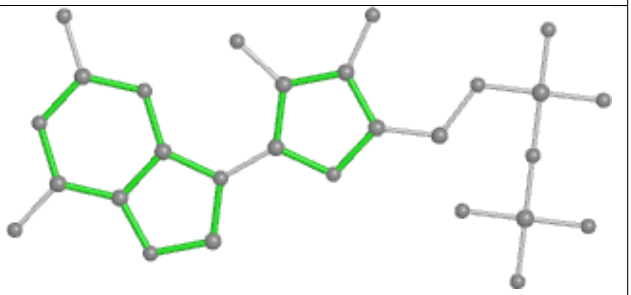
Bond lengths



Bond angles

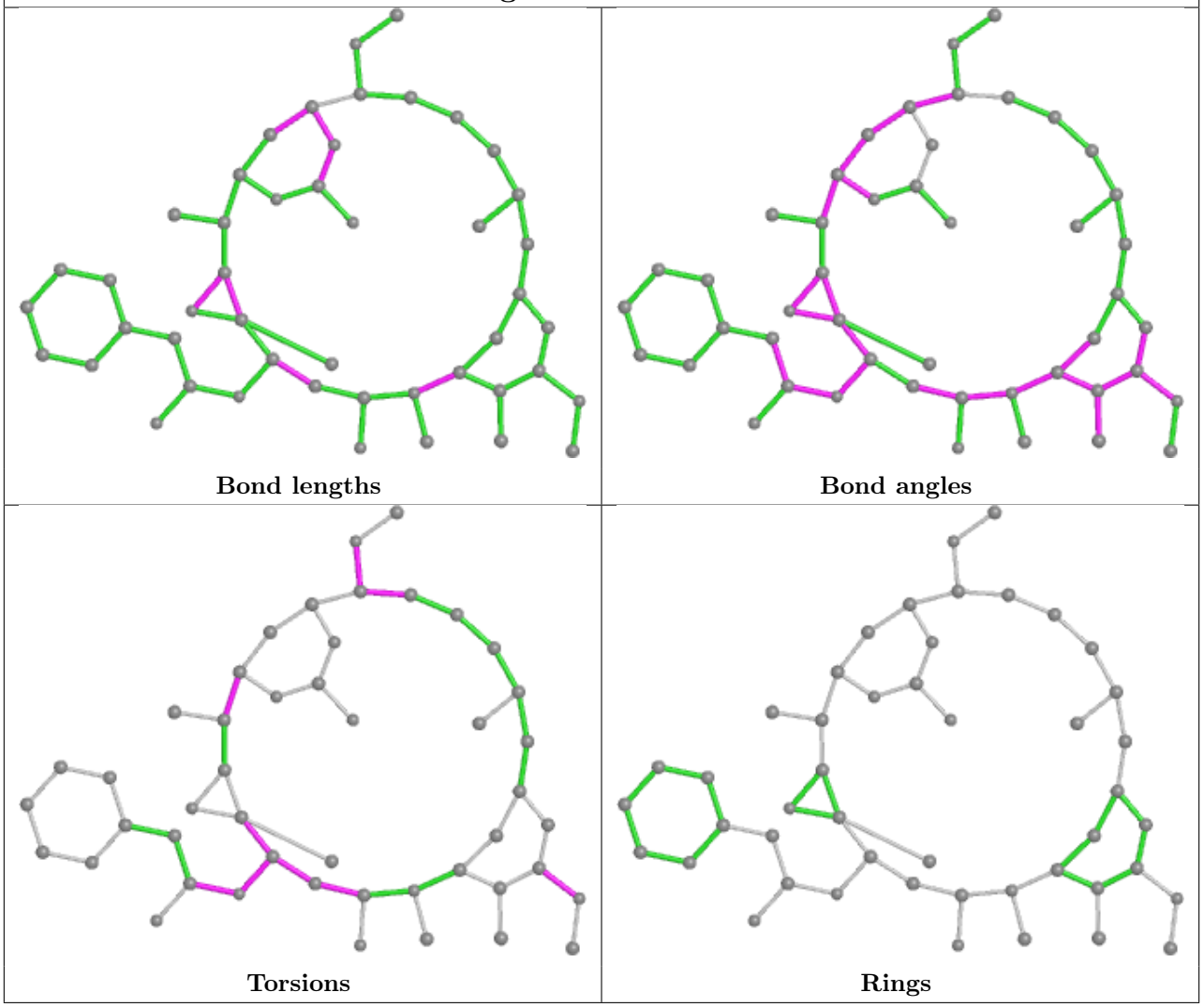


Torsions



Rings

Ligand 5JS D 503



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	438/451 (97%)	0.29	21 (4%) 30 38	42, 59, 93, 155	0
1	C	440/451 (97%)	0.06	4 (0%) 84 88	34, 46, 72, 118	0
2	B	423/445 (95%)	0.23	17 (4%) 38 45	34, 54, 90, 141	0
2	D	426/445 (95%)	0.40	32 (7%) 14 19	45, 71, 109, 139	0
3	E	121/143 (84%)	0.40	11 (9%) 9 12	51, 73, 112, 131	0
4	F	341/384 (88%)	1.40	109 (31%) 0 0	55, 87, 149, 178	0
All	All	2189/2319 (94%)	0.43	194 (8%) 9 13	34, 63, 115, 178	0

The worst 5 of 194 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	1	MET	8.7
1	A	282	TYR	8.7
4	F	132	LEU	8.3
4	F	251	LYS	8.2
4	F	161	LEU	8.1

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 monosaccharides in this entry.

6.4 Ligands (i)

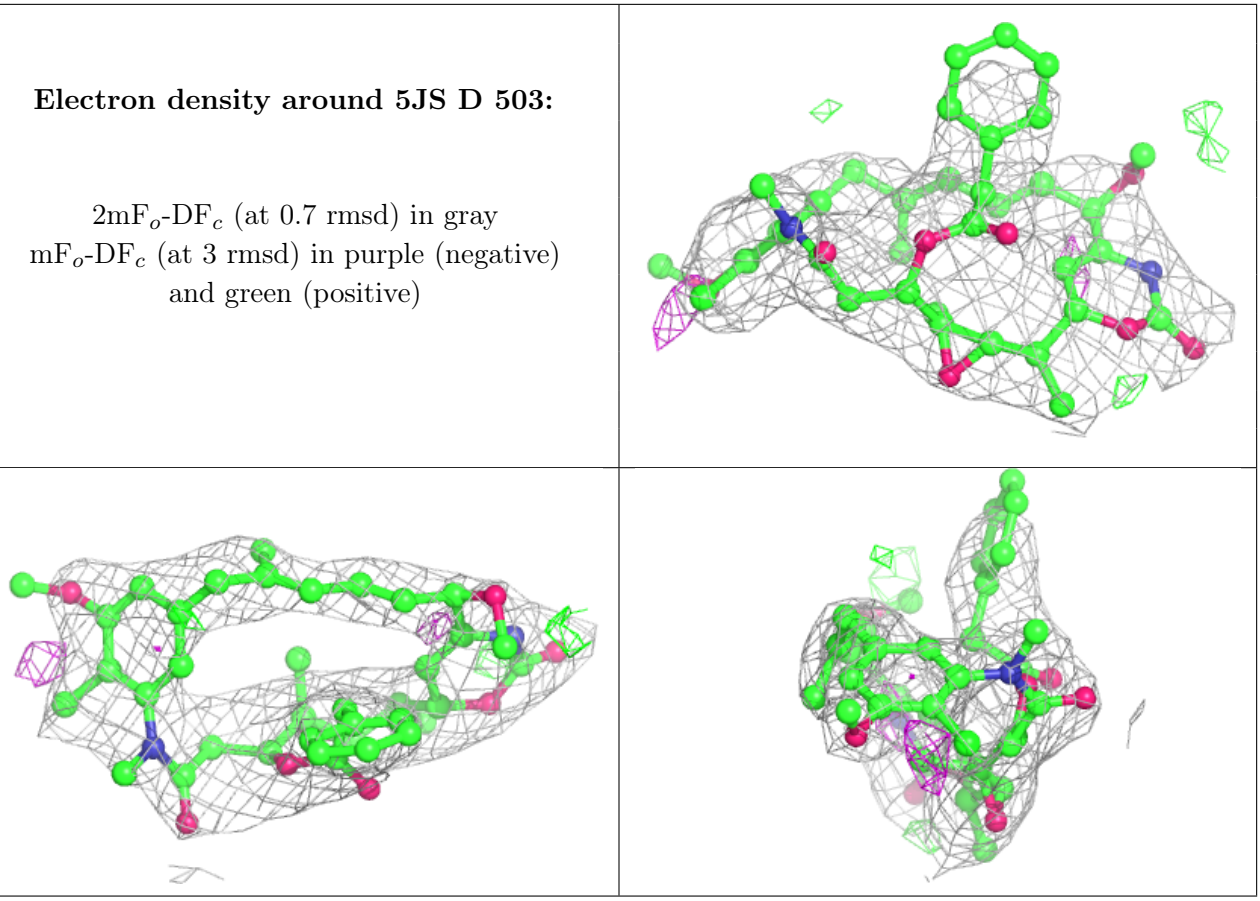
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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
10	GOL	B	505	6/6	0.80	0.25	68,90,103,108	0
12	5JS	D	503	47/47	0.84	0.31	79,94,105,112	0
7	CA	E	201	1/1	0.88	0.07	99,99,99,99	0
11	IMD	C	504	5/5	0.92	0.17	60,70,81,84	0
7	CA	B	503	1/1	0.92	0.24	99,99,99,99	0
13	ACP	F	401	31/31	0.92	0.15	85,100,114,124	0
6	MG	D	502	1/1	0.93	0.05	65,65,65,65	0
8	GDP	D	501	28/28	0.95	0.12	57,66,85,101	0
6	MG	F	402	1/1	0.96	0.08	85,85,85,85	0
6	MG	C	502	1/1	0.98	0.17	38,38,38,38	0
8	GDP	B	501	28/28	0.98	0.20	33,39,47,50	0
5	GTP	A	501	32/32	0.98	0.21	32,41,52,58	0
9	MES	B	504	12/12	0.98	0.12	38,50,67,74	0
6	MG	A	502	1/1	0.98	0.18	42,42,42,42	0
7	CA	A	503	1/1	0.98	0.03	75,75,75,75	0
6	MG	B	502	1/1	0.98	0.20	34,34,34,34	0
7	CA	C	503	1/1	0.98	0.09	62,62,62,62	0
5	GTP	C	501	32/32	0.99	0.17	33,37,46,49	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.

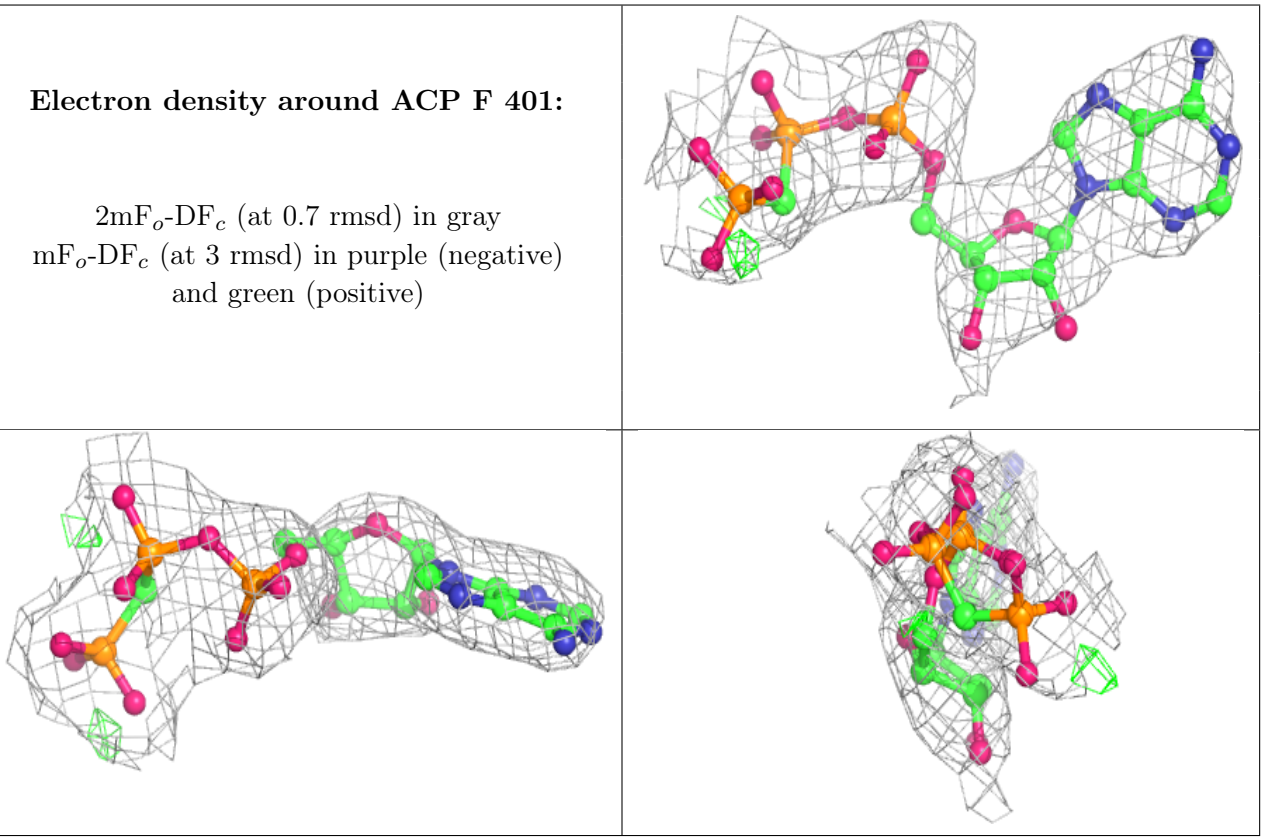
Electron density around 5JS D 503:

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



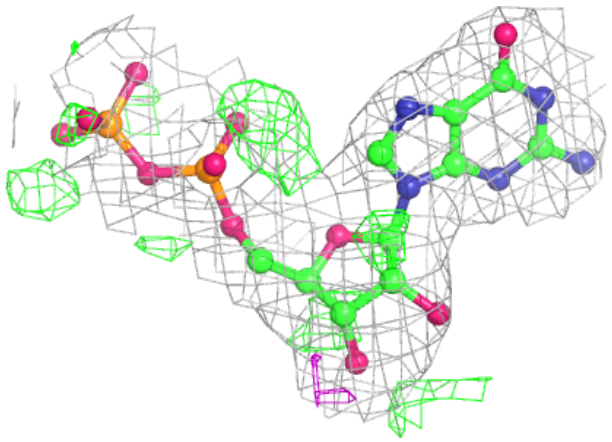
Electron density around ACP F 401:

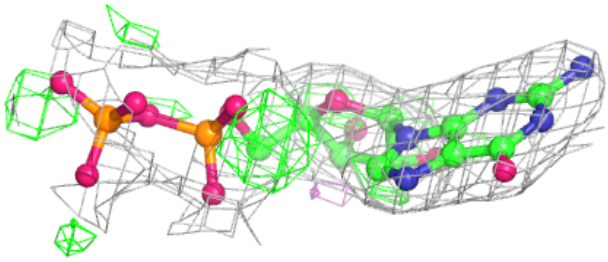
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

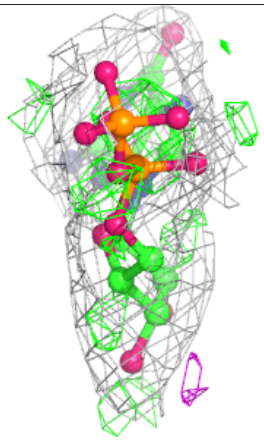


Electron density around GDP D 501:

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

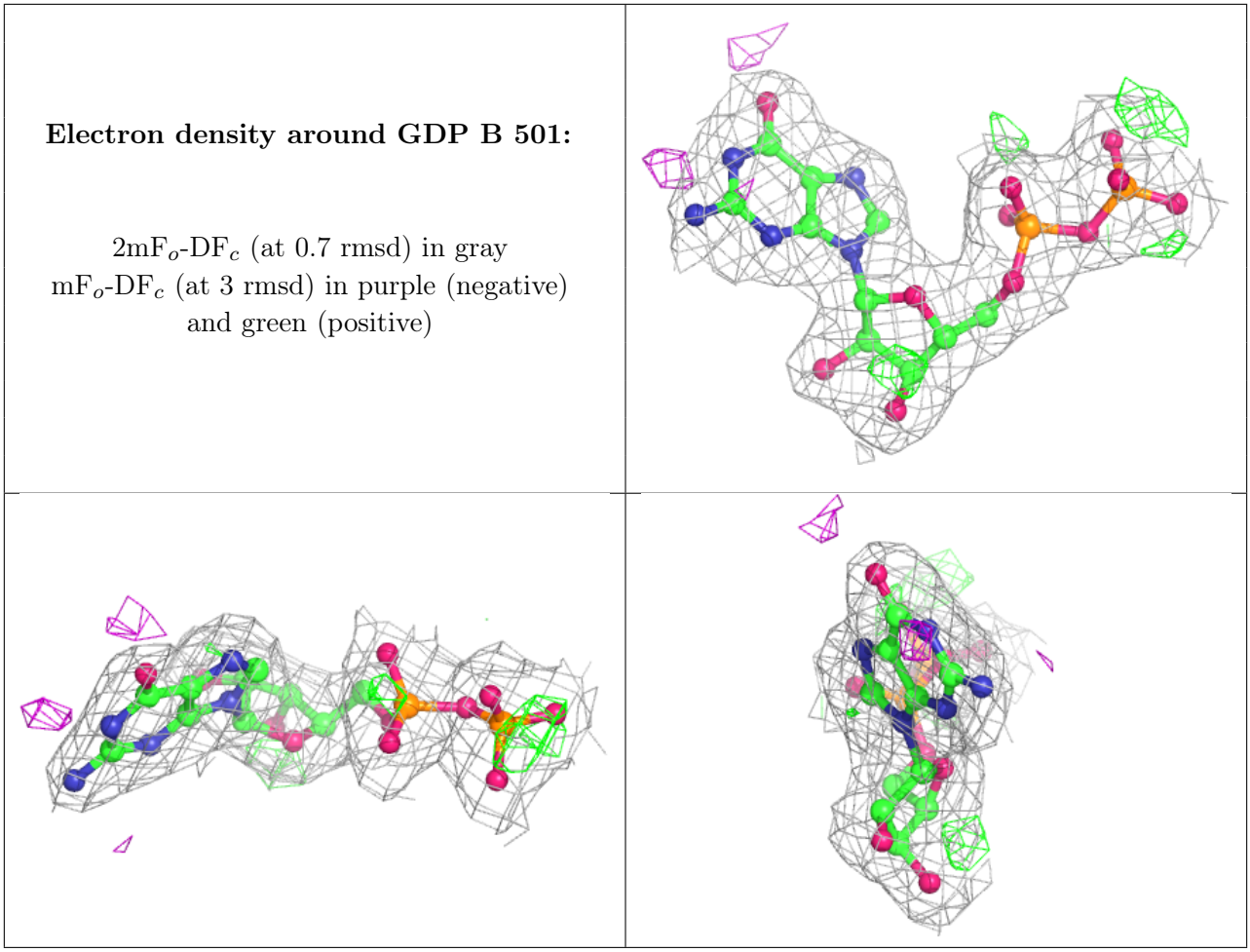






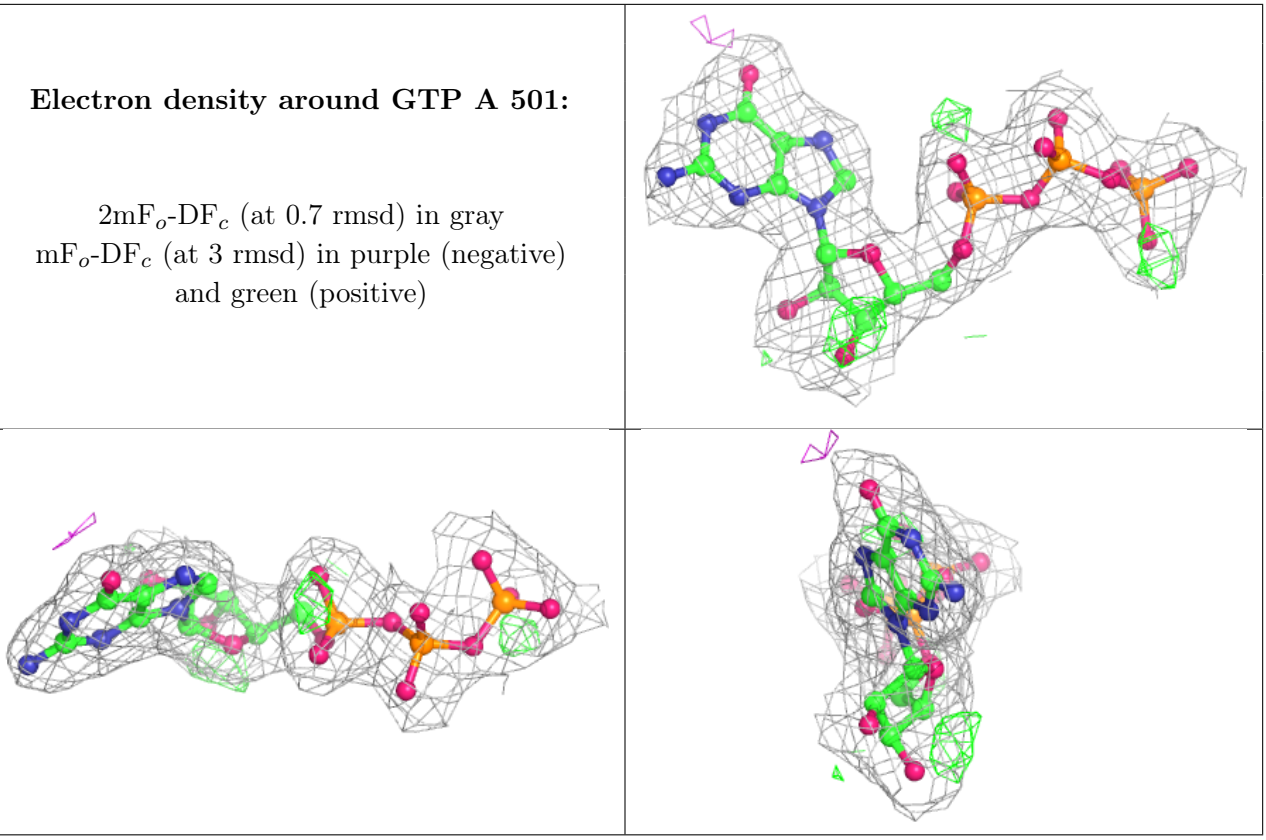
Electron density around GDP B 501:

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



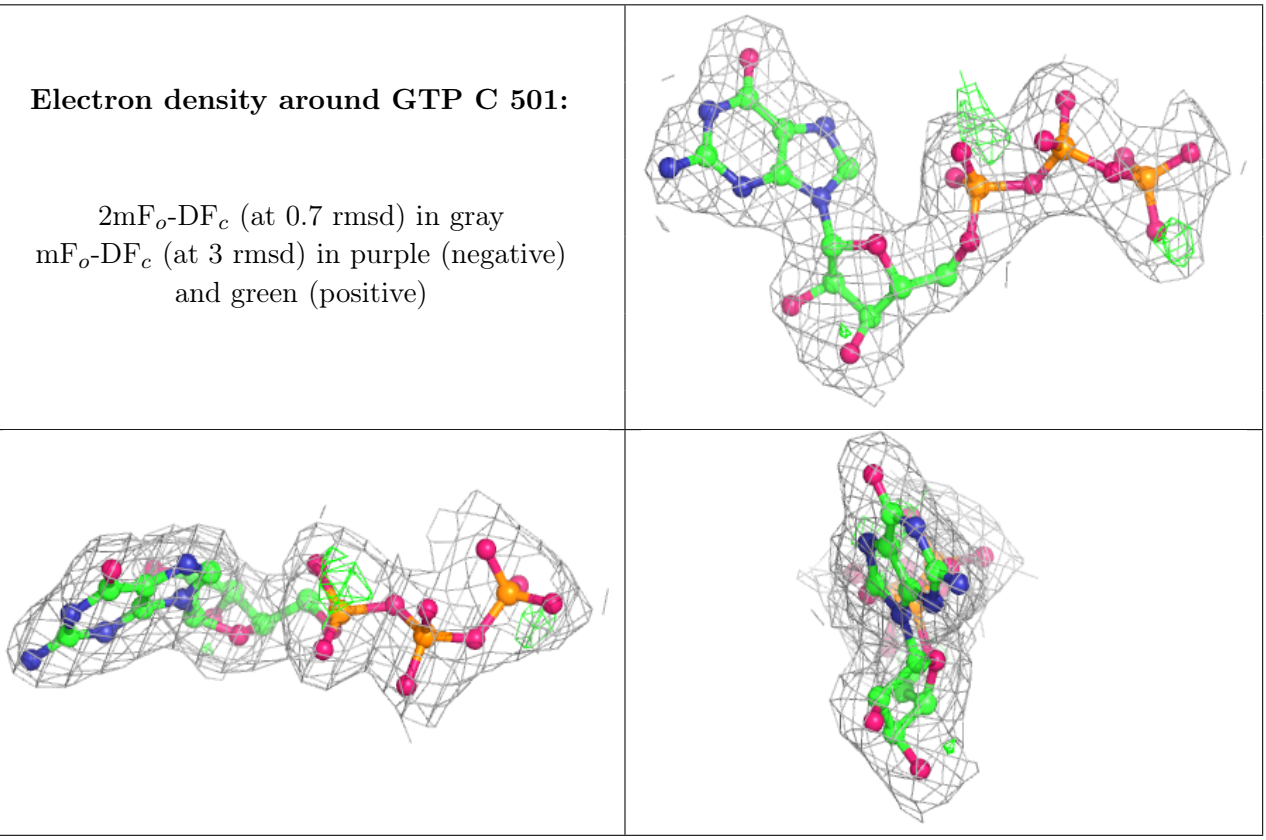
Electron density around GTP A 501:

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



Electron density around GTP C 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.