



Full wwPDB X-ray Structure Validation Report ⓘ

May 13, 2020 – 05:03 am BST

PDB ID : 5JVD
Title : Tubulin-TUB092 complex
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Deposited on : 2016-05-11
Resolution : 2.39 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
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) : 2.11

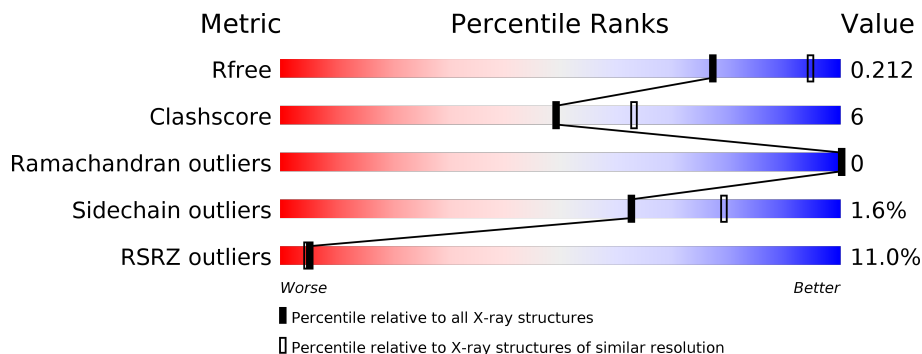
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.39 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	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria 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	 6% 84% 13% ••
1	C	451	 % 84% 13% •
2	B	445	 4% 82% 13% •
2	D	445	 11% 83% 11% • 5%
3	E	143	 14% 78% 8% 15%
4	F	384	 31% 76% 13% • 9%

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
7	CA	B	506	-	-	-	X

2 Entry composition [i](#)

There are 13 unique types of molecules in this entry. The entry contains 17853 atoms, of which 36 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	438	Total	C	N	O	S	0	0	0
			3422	2165	582	654	21			
1	C	439	Total	C	N	O	S	0	0	0
			3429	2170	583	655	21			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	425	Total	C	N	O	S	0	1	0
			3346	2103	570	647	26			
2	D	422	Total	C	N	O	S	0	0	0
			3313	2082	563	642	26			

- 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	0	0
			1008	622	182	199	5			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	3	MET	ILE	conflict	UNP P63043
E	4	ALA	SER	conflict	UNP P63043

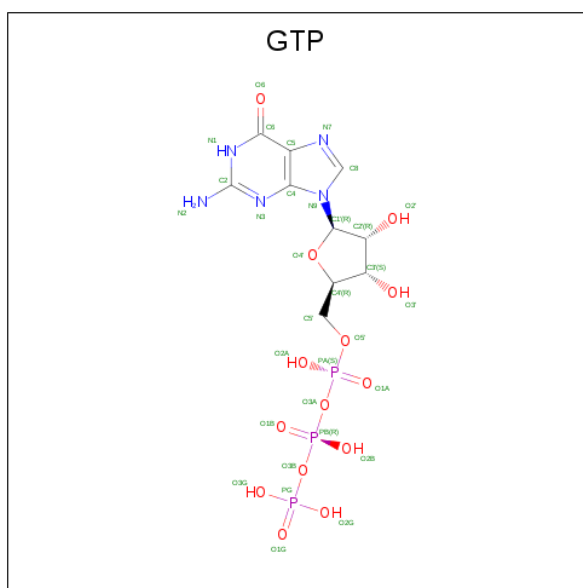
- Molecule 4 is a protein called Tubulin beta-2B chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	F	348	Total	C	N	O	S	0	0	0
			2842	1821	487	520	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
			Total	Mg		
6	B	1	Total	Mg	0	0
			1	1		
6	A	1	Total	Mg	0	0
			1	1		
6	D	1	Total	Mg	0	0
			1	1		
6	C	1	Total	Mg	0	0
			1	1		

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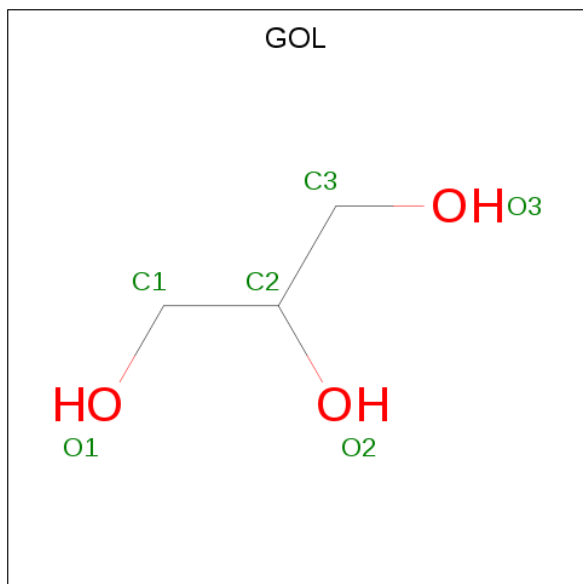
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	F	1	Total	Mg	0	0
			1	1		

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

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

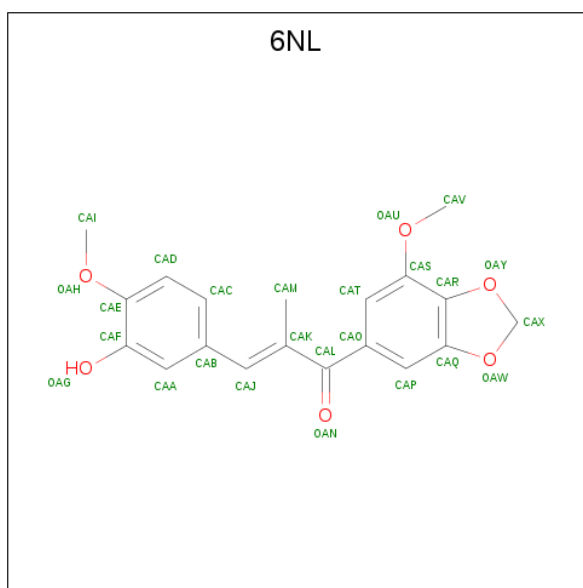
- Molecule 8 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



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

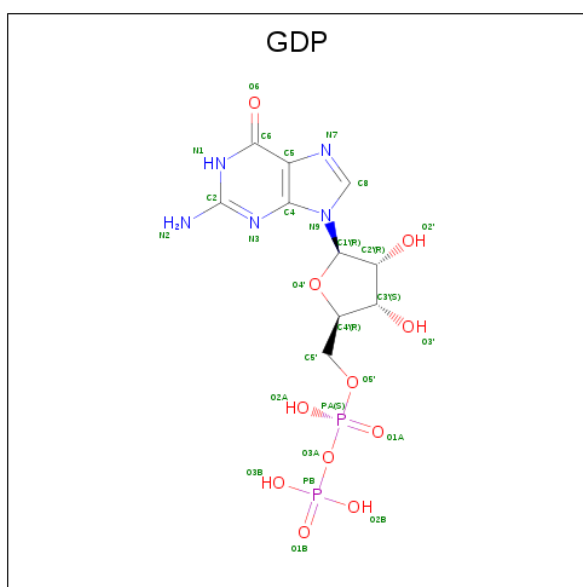
- Molecule 9 is (2E)-3-(3-hydroxy-4-methoxyphenyl)-1-(7-methoxy-2H-1,3-benzodioxol-5-yl)-

2-methylprop-2-en-1-one (three-letter code: 6NL) (formula: $C_{19}H_{18}O_6$).



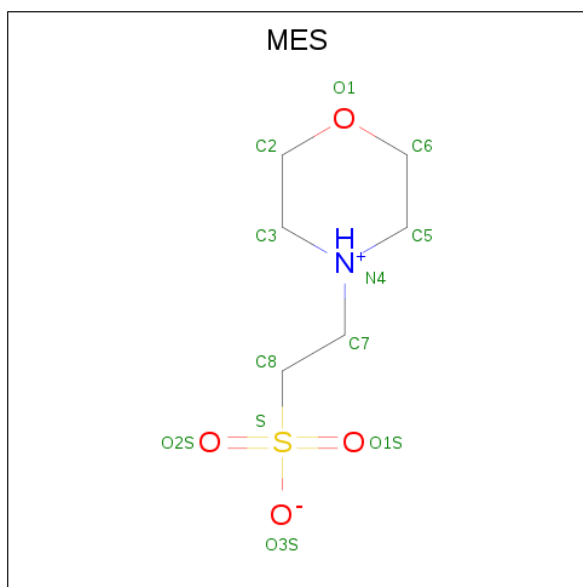
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
9	B	1	Total	C	H	O	0	0
			43	19	18	6		
9	D	1	Total	C	H	O	0	0
			43	19	18	6		

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



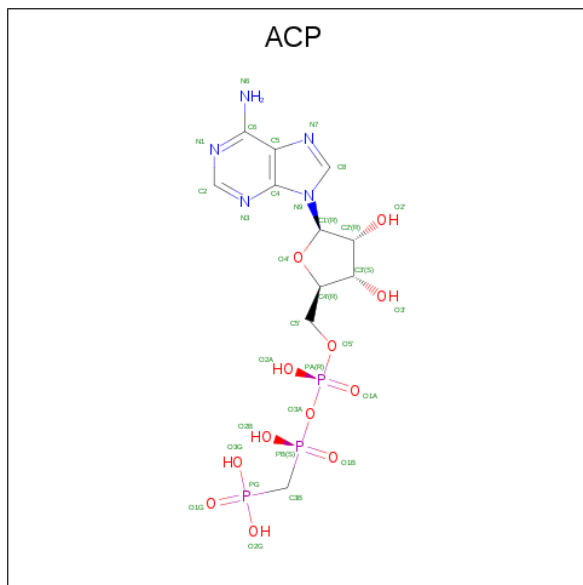
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
10	B	1	28	10	5	11	2	0	0
10	D	1	28	10	5	11	2	0	0

- Molecule 11 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C₆H₁₃NO₄S).



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

- Molecule 12 is PHOSPHOMETHYLPHOSPHONIC ACID ADENYLATE ESTER (three-letter code: ACP) (formula: C₁₁H₁₈N₅O₁₂P₃).



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

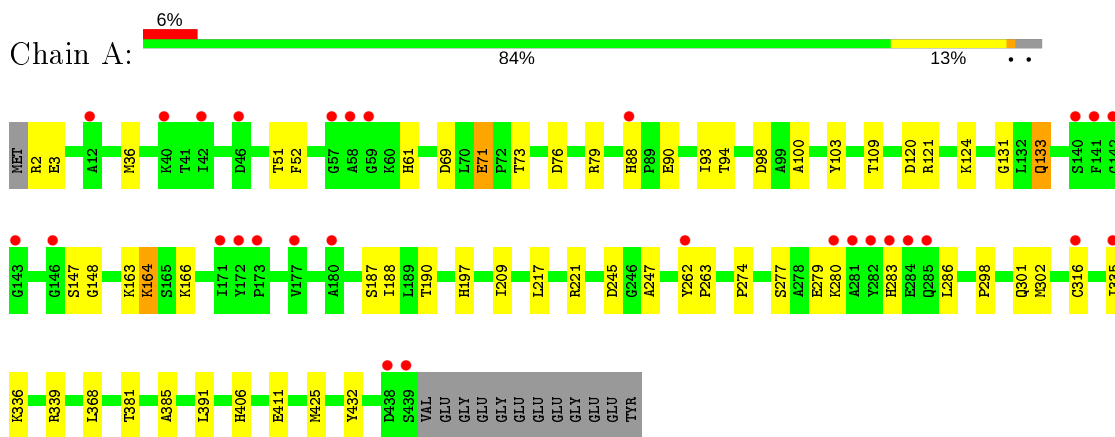
- Molecule 13 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
13	A	43	Total	O	0	0
			43	43		
13	B	43	Total	O	0	0
			43	43		
13	C	95	Total	O	0	0
			95	95		
13	D	18	Total	O	0	0
			18	18		
13	E	9	Total	O	0	0
			9	9		
13	F	9	Total	O	0	0
			9	9		

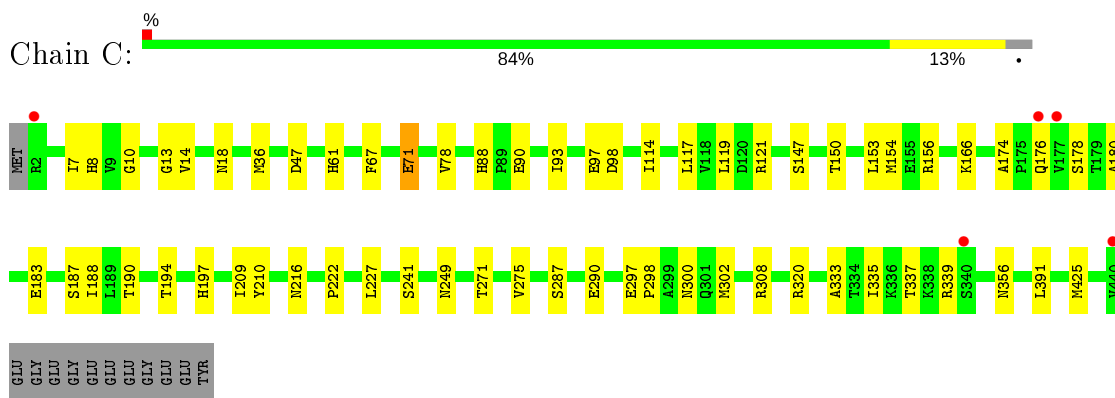
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

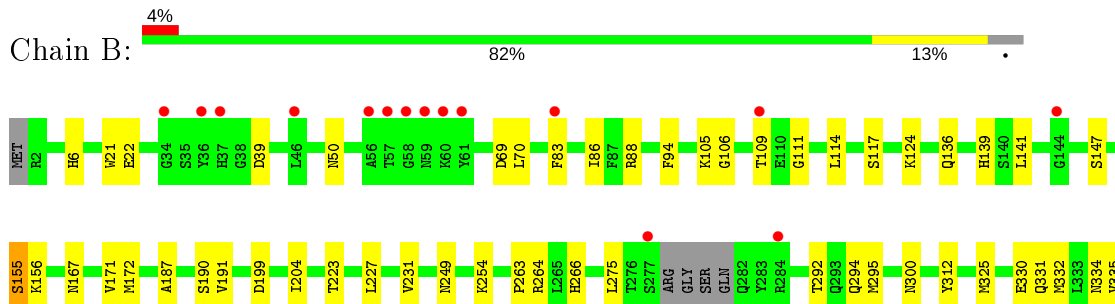
- Molecule 1: Tubulin alpha-1B chain

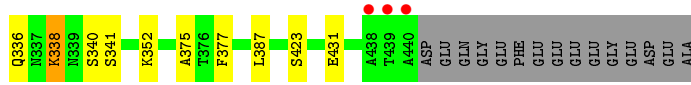


- Molecule 1: Tubulin alpha-1B chain

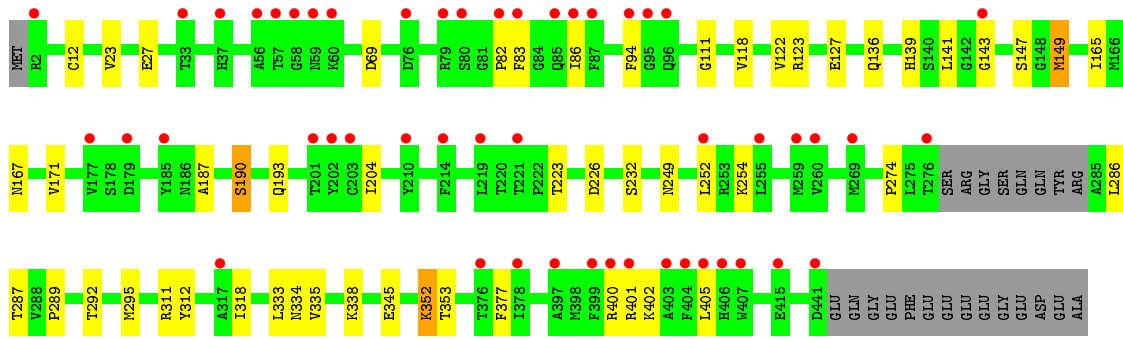
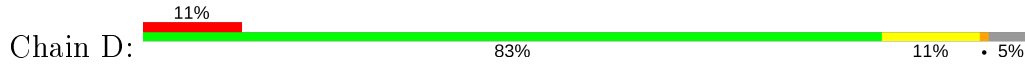


- Molecule 2: Tubulin beta-2B chain

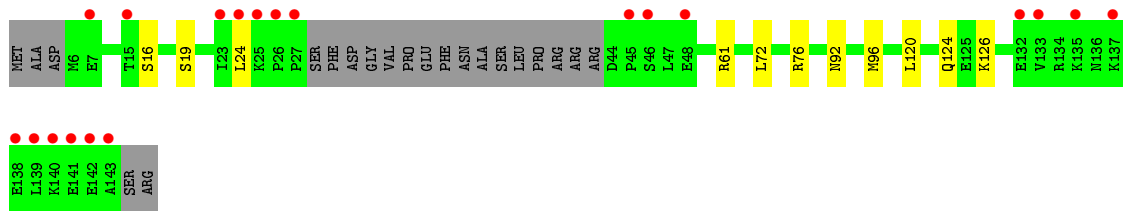
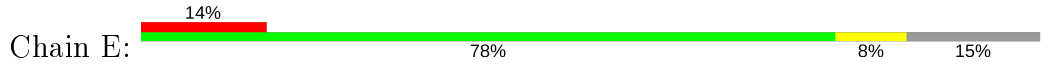




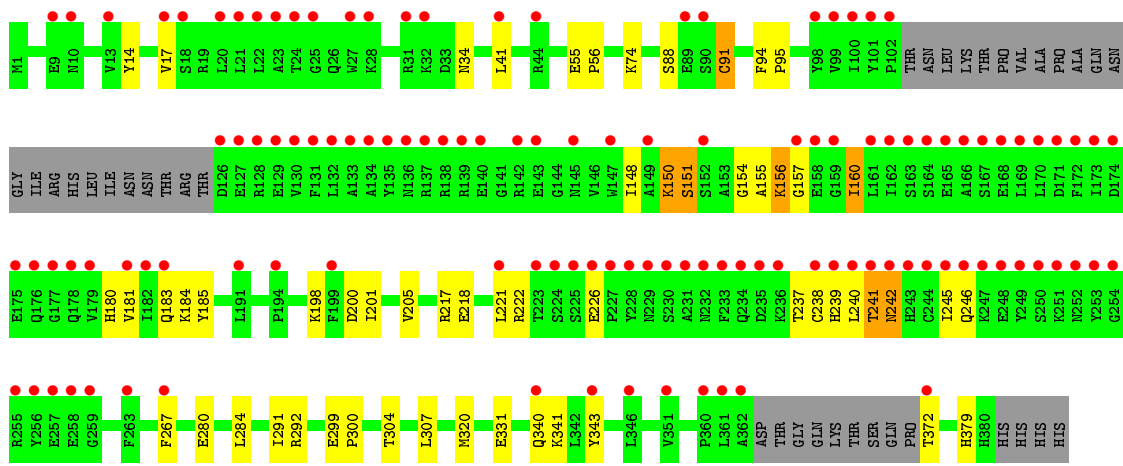
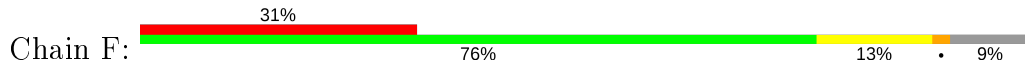
• Molecule 2: Tubulin beta-2B chain



• 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, α , β , γ	104.25Å 156.32Å 180.61Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.46 – 2.39 49.46 – 2.39	Depositor EDS
% Data completeness (in resolution range)	99.7 (49.46-2.39) 99.7 (49.46-2.39)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.51 (at 2.39Å)	Xtrriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.169 , 0.208 0.176 , 0.212	Depositor DCC
R_{free} test set	5816 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	58.4	Xtrriage
Anisotropy	0.129	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 46.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	17853	wwPDB-VP
Average B, all atoms (Å ²)	74.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.73% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GDP, GOL, MG, CA, 6NL, GTP, ACP, MES

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	0.28	0/3500	0.45	0/4752
1	C	0.34	0/3507	0.48	0/4762
2	B	0.31	0/3423	0.46	0/4637
2	D	0.27	0/3386	0.44	0/4588
3	E	0.27	0/1016	0.38	0/1348
4	F	0.24	0/2907	0.44	0/3926
All	All	0.29	0/17739	0.45	0/24013

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	3422	0	3327	38	0
1	C	3429	0	3337	36	0
2	B	3346	0	3225	45	0
2	D	3313	0	3189	36	0
3	E	1008	0	1024	10	0
4	F	2842	0	2809	50	0
5	A	32	0	12	0	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	A	12	0	16	2	0
8	B	6	0	8	0	0
9	B	25	18	0	0	0
9	D	25	18	0	2	0
10	B	28	0	12	0	0
10	D	28	0	12	2	0
11	B	12	0	12	1	0
12	F	31	0	14	5	0
13	A	43	0	0	0	0
13	B	43	0	0	1	0
13	C	95	0	0	1	0
13	D	18	0	0	1	0
13	E	9	0	0	0	0
13	F	9	0	0	0	0
All	All	17817	36	17009	205	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 6.

All (205) 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:B:334:ASN:ND2	2:B:338:LYS:HE3	1.73	1.02
1:A:120:ASP:OD2	1:A:124:LYS:NZ	2.03	0.91
4:F:241:THR:HG1	12:F:402:ACP:HO3'	1.12	0.90
4:F:74:LYS:NZ	4:F:331:GLU:OE1	2.08	0.86
4:F:151:SER:HB2	4:F:154:GLY:H	1.39	0.86
2:B:334:ASN:HD21	2:B:338:LYS:HE3	1.38	0.83
4:F:150:LYS:NZ	12:F:402:ACP:O2A	2.11	0.83
4:F:155:ALA:HB1	4:F:156:LYS:HD3	1.64	0.80
2:D:223:THR:N	2:D:226:ASP:OD2	2.15	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:185:TYR:OH	4:F:198:LYS:NZ	2.18	0.76
2:B:147[A]:SER:HG	2:B:190:SER:HG	1.32	0.74
2:B:334:ASN:CG	2:B:338:LYS:HE3	2.09	0.73
1:A:164:LYS:HD2	1:A:164:LYS:N	2.04	0.72
1:A:221:ARG:HD3	2:B:325:MET:HB3	1.71	0.72
4:F:241:THR:OG1	12:F:402:ACP:O3'	2.00	0.69
1:A:280:LYS:O	1:A:283:HIS:NE2	2.29	0.66
1:A:71:GLU:OE1	1:A:73:THR:OG1	2.12	0.65
1:A:280:LYS:HB2	1:A:283:HIS:HE2	1.62	0.64
2:B:334:ASN:O	2:B:338:LYS:HD2	1.97	0.64
4:F:155:ALA:C	4:F:156:LYS:HE3	2.18	0.64
2:D:274:PRO:HB3	2:D:286:LEU:HD21	1.81	0.63
4:F:157:GLY:HA2	4:F:160:ILE:HD11	1.81	0.63
4:F:221:LEU:HD11	4:F:267:PHE:CG	2.34	0.63
4:F:156:LYS:HB2	4:F:156:LYS:NZ	2.14	0.62
4:F:151:SER:HG	4:F:180:HIS:CE1	2.17	0.62
2:B:249:ASN:O	2:B:254:LYS:NZ	2.33	0.62
2:D:352:LYS:HG3	9:D:500:6NL:CAF	2.32	0.60
4:F:292:ARG:NH1	4:F:379:HIS:O	2.34	0.59
1:A:335:ILE:HG23	1:A:339:ARG:HG3	1.84	0.59
3:E:92:ASN:O	3:E:96:MET:HG2	2.02	0.59
4:F:340:GLN:HA	4:F:343:TYR:HD2	1.67	0.59
4:F:156:LYS:HB2	4:F:156:LYS:HZ2	1.68	0.59
1:A:71:GLU:HG2	1:A:98:ASP:HB3	1.85	0.58
2:D:292:THR:HG22	2:D:335:VAL:HG21	1.84	0.58
2:B:294:GLN:OE1	13:B:601:HOH:O	2.17	0.58
1:C:190:THR:O	1:C:194:THR:HG23	2.04	0.58
1:C:7:ILE:HG21	1:C:153:LEU:HD21	1.86	0.58
1:C:241:SER:HA	1:C:249:ASN:HD21	1.69	0.57
4:F:148:ILE:HG22	4:F:183:GLN:O	2.04	0.57
2:B:332:MET:O	2:B:336:GLN:HG3	2.04	0.57
4:F:201:ILE:HG12	4:F:221:LEU:CD2	2.34	0.57
1:C:71:GLU:HG2	1:C:98:ASP:HB3	1.87	0.57
1:C:176:GLN:NE2	2:D:333:LEU:HD21	2.20	0.57
1:A:280:LYS:HB2	1:A:283:HIS:NE2	2.20	0.56
8:A:504:GOL:O3	8:A:504:GOL:O1	2.19	0.56
1:A:166:LYS:HE2	1:A:197:HIS:O	2.06	0.55
2:B:50:ASN:ND2	2:B:50:ASN:H	2.04	0.55
4:F:200:ASP:N	4:F:241:THR:HG21	2.21	0.55
1:A:3:GLU:O	1:A:133:GLN:HG3	2.07	0.55
2:B:136:GLN:HA	2:B:167:ASN:O	2.06	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:119:LEU:HD11	1:C:156:ARG:HB3	1.89	0.54
1:C:93:ILE:HD11	1:C:121:ARG:HG3	1.89	0.54
1:C:98:ASP:OD2	2:D:254:LYS:NZ	2.41	0.54
4:F:304:THR:HG22	4:F:307:LEU:HD12	1.89	0.54
3:E:72:LEU:O	3:E:76:ARG:HG2	2.07	0.54
1:C:47:ASP:OD2	13:C:601:HOH:O	2.18	0.54
1:C:320:ARG:HA	1:C:356:ASN:O	2.07	0.54
1:A:274:PRO:HB3	1:A:286:LEU:HD12	1.88	0.54
2:B:83:PHE:O	2:B:86:ILE:HG22	2.07	0.54
2:D:171:VAL:HA	2:D:204:ILE:O	2.08	0.54
4:F:157:GLY:HA3	4:F:245:ILE:HD11	1.90	0.54
4:F:160:ILE:HD12	4:F:240:LEU:CD1	2.38	0.54
2:D:402:LYS:HB3	2:D:405:LEU:HD12	1.91	0.53
4:F:237:THR:O	4:F:246:GLN:NE2	2.35	0.53
2:B:172:MET:HG3	2:B:387:LEU:HD11	1.91	0.53
2:D:136:GLN:HA	2:D:167:ASN:O	2.09	0.52
2:B:22:GLU:HG2	2:B:83:PHE:CD1	2.44	0.52
2:D:334:ASN:HD21	2:D:338:LYS:HE3	1.74	0.52
4:F:155:ALA:O	4:F:156:LYS:HE3	2.09	0.52
2:D:83:PHE:O	2:D:86:ILE:HG22	2.09	0.52
1:C:88:HIS:CE1	1:C:90:GLU:HG3	2.45	0.52
1:A:2:ARG:HA	1:A:131:GLY:O	2.10	0.51
4:F:150:LYS:HG3	4:F:181:VAL:HG23	1.93	0.51
2:B:292:THR:HG22	2:B:335:VAL:HG21	1.93	0.51
1:C:88:HIS:HE1	1:C:90:GLU:HG3	1.76	0.51
1:A:221:ARG:NH1	2:B:325:MET:SD	2.84	0.50
1:C:209:ILE:HD11	1:C:302:MET:SD	2.51	0.50
2:D:143:GLY:HA3	10:D:501:GDP:O5'	2.10	0.50
2:D:165:ILE:HG21	2:D:252:LEU:HB3	1.92	0.50
4:F:88:SER:O	4:F:91:CYS:HB3	2.11	0.50
1:A:298:PRO:HA	1:A:301:GLN:CD	2.33	0.50
4:F:280:GLU:HA	4:F:284:LEU:HB2	1.94	0.50
2:B:141:LEU:HD12	2:B:172:MET:SD	2.52	0.49
2:D:82:PRO:O	2:D:83:PHE:HB2	2.12	0.49
4:F:160:ILE:HD12	4:F:240:LEU:HD11	1.94	0.49
4:F:320:MET:HE2	12:F:402:ACP:C2	2.42	0.49
1:A:109:THR:OG1	1:A:411:GLU:OE2	2.19	0.49
1:C:187:SER:HB3	1:C:391:LEU:HD21	1.94	0.49
2:D:147:SER:HB2	2:D:190:SER:OG	2.13	0.49
2:D:318:ILE:N	2:D:318:ILE:HD12	2.28	0.49
4:F:222:ARG:O	4:F:241:THR:HG22	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:311:ARG:NH2	2:D:345:GLU:OE2	2.45	0.48
4:F:14:TYR:HA	4:F:17:VAL:HB	1.95	0.48
1:C:209:ILE:HG22	1:C:227:LEU:HD22	1.95	0.48
4:F:239:HIS:C	4:F:240:LEU:HD23	2.34	0.48
2:D:193:GLN:OE1	3:E:126:LYS:NZ	2.46	0.48
4:F:95:PRO:HB2	4:F:183:GLN:HG3	1.96	0.48
2:B:6:HIS:CD2	2:B:21:TRP:HE1	2.31	0.48
1:A:76:ASP:OD1	1:A:79:ARG:NH1	2.46	0.47
4:F:340:GLN:HA	4:F:343:TYR:CD2	2.48	0.47
1:C:333:ALA:O	1:C:337:THR:HG23	2.15	0.47
4:F:226:GLU:HB2	4:F:238:CYS:HB3	1.96	0.47
1:A:188:ILE:HG13	1:A:425:MET:HG3	1.97	0.47
1:C:18:ASN:OD1	1:C:78:VAL:HG22	2.15	0.47
1:A:93:ILE:HD11	1:A:121:ARG:HG3	1.96	0.47
4:F:299:GLU:HB3	4:F:300:PRO:HD3	1.96	0.47
2:D:141:LEU:HB3	2:D:187:ALA:HA	1.96	0.47
2:B:106:GLY:O	2:B:111:GLY:HA3	2.16	0.46
1:C:117:LEU:HD11	1:C:121:ARG:NH2	2.30	0.46
2:D:111:GLY:HA3	2:D:149:MET:HG3	1.97	0.46
2:B:264:ARG:HE	2:B:431:GLU:CD	2.18	0.46
2:D:295:MET:HG2	2:D:377:PHE:HB2	1.97	0.46
1:C:10:GLY:O	1:C:14:VAL:HG23	2.16	0.46
4:F:155:ALA:HB1	4:F:156:LYS:CD	2.38	0.46
2:D:400:ARG:HG3	2:D:401:ARG:HG2	1.98	0.46
2:B:295:MET:CE	2:B:375:ALA:HB1	2.45	0.46
4:F:242:ASN:N	4:F:242:ASN:OD1	2.37	0.45
2:B:114:LEU:O	2:B:114:LEU:HG	2.16	0.45
2:B:105:LYS:HA	2:B:109:THR:OG1	2.17	0.45
2:D:223:THR:OG1	2:D:226:ASP:OD2	2.27	0.45
4:F:201:ILE:HG12	4:F:221:LEU:HD23	1.98	0.45
2:B:50:ASN:H	2:B:50:ASN:HD22	1.64	0.45
2:B:171:VAL:HA	2:B:204:ILE:O	2.17	0.45
1:C:147:SER:HB2	1:C:190:THR:HB	1.98	0.45
2:B:331:GLN:O	2:B:335:VAL:HG23	2.16	0.45
1:C:180:ALA:HB3	1:C:183:GLU:HG3	1.98	0.45
2:D:12:CYS:HB2	10:D:501:GDP:C8	2.52	0.45
1:C:14:VAL:HG13	1:C:67:PHE:HD2	1.81	0.45
2:B:155:SER:HB3	3:E:76:ARG:HH22	1.81	0.45
1:C:150:THR:O	1:C:154:MET:HG2	2.17	0.45
1:C:210:TYR:CZ	1:C:222:PRO:HD2	2.52	0.45
2:D:312:TYR:CE1	2:D:377:PHE:HZ	2.34	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:292:THR:CG2	2:D:335:VAL:HG21	2.47	0.44
1:A:36:MET:HB3	1:A:61:HIS:CE1	2.53	0.44
1:A:98:ASP:OD1	1:A:100:ALA:N	2.40	0.44
2:B:334:ASN:OD1	2:B:338:LYS:HE3	2.17	0.44
4:F:155:ALA:CB	4:F:156:LYS:HD3	2.43	0.44
1:A:103:TYR:CE2	1:A:148:GLY:HA2	2.52	0.44
2:D:69:ASP:O	2:D:94:PHE:HA	2.18	0.44
1:C:216:ASN:HB3	1:C:275:VAL:O	2.17	0.43
1:A:406:HIS:CG	2:B:263:PRO:HD3	2.53	0.43
1:C:297:GLU:OE2	1:C:339:ARG:NH2	2.51	0.43
2:D:141:LEU:HA	2:D:147:SER:HB3	1.98	0.43
1:C:287:SER:OG	1:C:290:GLU:HG3	2.19	0.43
2:B:227:LEU:O	2:B:231:VAL:HG23	2.19	0.43
1:C:298:PRO:HG2	1:C:308:ARG:CZ	2.49	0.43
2:D:118:VAL:O	2:D:122:VAL:HG23	2.19	0.43
1:A:147:SER:HB2	1:A:190:THR:HB	2.00	0.43
8:A:504:GOL:H31	3:E:61:ARG:HD2	2.00	0.42
1:A:69:ASP:O	1:A:94:THR:HA	2.18	0.42
2:B:199:ASP:O	2:B:266:HIS:HB2	2.19	0.42
2:B:69:ASP:O	2:B:94:PHE:HA	2.19	0.42
1:C:166:LYS:HE2	1:C:197:HIS:O	2.19	0.42
1:C:188:ILE:HG13	1:C:425:MET:HG3	2.01	0.42
2:D:352:LYS:HG3	9:D:500:6NL:CAA	2.49	0.42
1:A:88:HIS:CE1	1:A:90:GLU:HG3	2.54	0.42
2:B:295:MET:HG2	2:B:377:PHE:HB2	2.01	0.42
2:B:223:THR:O	2:B:227:LEU:HD13	2.20	0.42
2:B:88:ARG:HH12	2:B:124:LYS:HZ3	1.67	0.42
1:C:36:MET:HB3	1:C:61:HIS:CE1	2.54	0.42
2:D:167:ASN:ND2	13:D:603:HOH:O	2.52	0.42
2:D:287:THR:HB	2:D:289:PRO:HD2	2.00	0.42
1:A:262:TYR:HA	1:A:263:PRO:HD3	1.81	0.42
1:A:187:SER:HB3	1:A:391:LEU:HD21	2.00	0.42
2:B:340:SER:OG	4:F:34:ASN:ND2	2.48	0.42
2:D:123:ARG:O	2:D:127:GLU:HG2	2.19	0.42
3:E:120:LEU:O	3:E:124:GLN:HG3	2.20	0.42
1:A:385:ALA:HB2	1:A:432:TYR:CG	2.55	0.42
2:D:23:VAL:O	2:D:27:GLU:HG3	2.19	0.42
2:B:39:ASP:OD1	2:B:39:ASP:N	2.53	0.41
1:C:93:ILE:HG22	1:C:114:ILE:HD11	2.02	0.41
1:C:335:ILE:HG23	1:C:339:ARG:HG3	2.02	0.41
1:A:209:ILE:HD11	1:A:302:MET:SD	2.61	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:55:GLU:HA	4:F:56:PRO:HD2	1.82	0.41
1:A:187:SER:CB	1:A:391:LEU:HD21	2.50	0.41
2:B:312:TYR:CE1	2:B:377:PHE:HZ	2.38	0.41
2:B:330:GLU:O	2:B:334:ASN:HB2	2.21	0.41
1:C:271:THR:HG23	1:C:300:ASN:O	2.19	0.41
2:D:295:MET:CG	2:D:377:PHE:HB2	2.50	0.41
2:B:275:LEU:HG	2:B:300:ASN:ND2	2.36	0.41
2:B:292:THR:CG2	2:B:335:VAL:HG21	2.51	0.41
1:C:8:HIS:HB3	1:C:13:GLY:O	2.20	0.41
4:F:184:LYS:HE2	4:F:185:TYR:O	2.20	0.41
1:A:51:THR:HG22	1:A:52:PHE:CD1	2.54	0.41
2:B:156:LYS:NZ	3:E:76:ARG:NE	2.68	0.41
4:F:14:TYR:HB3	4:F:41:LEU:HD13	2.02	0.41
4:F:217:ARG:HG3	4:F:218:GLU:HG2	2.02	0.41
4:F:205:VAL:HG21	4:F:291:ILE:HD13	2.02	0.41
1:A:391:LEU:HA	1:A:391:LEU:HD12	1.80	0.41
11:B:505:MES:H81	11:B:505:MES:H51	1.81	0.41
4:F:239:HIS:O	4:F:240:LEU:HD23	2.20	0.41
1:A:247:ALA:HB3	3:E:19:SER:OG	2.21	0.41
1:A:336:LYS:HG3	3:E:24:LEU:HD13	2.03	0.41
1:C:174:ALA:O	1:C:178:SER:HB3	2.21	0.41
4:F:240:LEU:HD12	4:F:245:ILE:HD13	2.03	0.41
4:F:94:PHE:HA	4:F:95:PRO:HD3	1.84	0.41
1:A:245:ASP:HB3	3:E:16:SER:OG	2.22	0.40
1:A:217:LEU:HD21	1:A:368:LEU:HD23	2.03	0.40
1:A:277:SER:OG	1:A:279:GLU:OE1	2.39	0.40
2:B:187:ALA:O	2:B:191:VAL:HG23	2.22	0.40
2:B:295:MET:HE3	2:B:375:ALA:HB1	2.04	0.40
2:B:70:LEU:HA	2:B:70:LEU:HD23	1.86	0.40
4:F:155:ALA:CB	4:F:156:LYS:CE	2.99	0.40
2:D:352:LYS:HD3	2:D:353:THR:N	2.36	0.40
4:F:320:MET:CE	12:F:402:ACP:C2	3.00	0.40

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	436/451 (97%)	428 (98%)	8 (2%)	0	100	100
1	C	437/451 (97%)	429 (98%)	8 (2%)	0	100	100
2	B	422/445 (95%)	414 (98%)	8 (2%)	0	100	100
2	D	418/445 (94%)	414 (99%)	4 (1%)	0	100	100
3	E	118/143 (82%)	116 (98%)	2 (2%)	0	100	100
4	F	342/384 (89%)	335 (98%)	7 (2%)	0	100	100
All	All	2173/2319 (94%)	2136 (98%)	37 (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	369/379 (97%)	363 (98%)	6 (2%)	62	79
1	C	370/379 (98%)	368 (100%)	2 (0%)	88	95
2	B	368/383 (96%)	361 (98%)	7 (2%)	57	75
2	D	364/383 (95%)	358 (98%)	6 (2%)	62	79
3	E	109/127 (86%)	109 (100%)	0	100	100
4	F	310/342 (91%)	301 (97%)	9 (3%)	42	62
All	All	1890/1993 (95%)	1860 (98%)	30 (2%)	62	79

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	71	GLU
1	A	133	GLN
1	A	163	LYS

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Mol	Chain	Res	Type
1	A	164	LYS
1	A	316	CYS
1	A	381	THR
2	B	117	SER
2	B	139	HIS
2	B	155	SER
2	B	338	LYS
2	B	341	SER
2	B	352	LYS
2	B	423	SER
1	C	71	GLU
1	C	97	GLU
2	D	139	HIS
2	D	149	MET
2	D	190	SER
2	D	232	SER
2	D	249	ASN
2	D	352	LYS
4	F	91	CYS
4	F	150	LYS
4	F	151	SER
4	F	156	LYS
4	F	160	ILE
4	F	241	THR
4	F	242	ASN
4	F	341	LYS
4	F	372	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	50	ASN
2	B	167	ASN
1	C	249	ASN
2	D	406	HIS

5.3.3 RNA

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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 20 ligands modelled in this entry, 9 are monoatomic - leaving 11 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
10	GDP	B	502	6	24,30,30	1.20	2 (8%)	31,47,47	1.97	8 (25%)
9	6NL	B	501	-	27,27,27	1.04	1 (3%)	37,38,38	1.50	6 (16%)
8	GOL	A	504	-	5,5,5	0.36	0	5,5,5	0.34	0
12	ACP	F	402	6	27,33,33	1.53	3 (11%)	32,52,52	1.37	6 (18%)
9	6NL	D	500	-	27,27,27	0.98	1 (3%)	37,38,38	1.63	6 (16%)
8	GOL	A	505	-	5,5,5	0.33	0	5,5,5	0.43	0
11	MES	B	505	-	12,12,12	2.27	1 (8%)	14,16,16	1.86	4 (28%)
5	GTP	A	501	6	26,34,34	1.03	1 (3%)	33,54,54	1.74	7 (21%)
5	GTP	C	501	6	26,34,34	0.99	1 (3%)	33,54,54	1.81	7 (21%)
10	GDP	D	501	6	24,30,30	1.19	2 (8%)	31,47,47	2.04	8 (25%)
8	GOL	B	504	-	5,5,5	0.37	0	5,5,5	0.34	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
10	GDP	B	502	6	-	4/12/32/32	0/3/3/3
9	6NL	B	501	-	-	0/16/22/22	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	GOL	A	504	-	-	0/4/4/4	-
12	ACP	F	402	6	-	4/15/38/38	0/3/3/3
9	6NL	D	500	-	-	0/16/22/22	0/3/3/3
8	GOL	A	505	-	-	2/4/4/4	-
11	MES	B	505	-	-	0/6/14/14	0/1/1/1
5	GTP	A	501	6	-	7/18/38/38	0/3/3/3
5	GTP	C	501	6	-	8/18/38/38	0/3/3/3
10	GDP	D	501	6	-	5/12/32/32	0/3/3/3
8	GOL	B	504	-	-	2/4/4/4	-

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	B	505	MES	C8-S	-7.61	1.66	1.77
12	F	402	ACP	PB-O3A	5.99	1.65	1.58
10	B	502	GDP	C6-C5	4.26	1.48	1.41
10	D	501	GDP	C6-C5	4.18	1.48	1.41
9	B	501	6NL	CAJ-CAK	3.73	1.38	1.34
9	D	500	6NL	CAJ-CAK	3.32	1.37	1.34
5	A	501	GTP	C6-N1	3.14	1.38	1.33
5	C	501	GTP	C6-N1	3.06	1.38	1.33
10	D	501	GDP	C5-C4	2.37	1.47	1.40
10	B	502	GDP	C5-C4	2.25	1.46	1.40
12	F	402	ACP	C8-N7	-2.22	1.30	1.34
12	F	402	ACP	O4'-C1'	2.02	1.43	1.41

All (52) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	501	GTP	N3-C2-N1	-5.69	119.63	127.22
5	A	501	GTP	N3-C2-N1	-5.47	119.92	127.22
10	D	501	GDP	C2-N3-C4	5.05	121.12	115.36
10	B	502	GDP	C6-C5-C4	-4.94	116.08	120.80
10	B	502	GDP	C2-N3-C4	4.82	120.86	115.36
9	D	500	6NL	CAX-OAY-CAR	-4.63	99.27	105.04
9	D	500	6NL	CAX-OAW-CAQ	-4.59	99.38	105.34
11	B	505	MES	C5-N4-C3	4.43	118.81	108.83
5	C	501	GTP	C2-N3-C4	4.42	120.41	115.36
10	D	501	GDP	C6-N1-C2	4.17	122.56	115.93
5	A	501	GTP	C2-N3-C4	4.15	120.09	115.36
10	D	501	GDP	C5-C6-N1	-4.14	117.77	123.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	B	502	GDP	C6-N1-C2	4.04	122.35	115.93
9	D	500	6NL	OAH-CAE-CAF	3.77	120.03	114.57
10	D	501	GDP	C6-C5-C4	-3.77	117.20	120.80
10	D	501	GDP	PA-O3A-PB	-3.71	120.08	132.83
9	B	501	6NL	OAH-CAE-CAF	3.63	119.83	114.57
10	B	502	GDP	N3-C2-N1	-3.60	122.42	127.22
10	B	502	GDP	C5-C6-N1	-3.51	118.63	123.43
12	F	402	ACP	O1G-PG-C3B	-3.49	103.72	111.24
9	B	501	6NL	CAX-OAY-CAR	-3.45	100.73	105.04
12	F	402	ACP	C4-C5-N7	3.45	113.00	109.40
10	D	501	GDP	N3-C2-N1	-3.35	122.75	127.22
9	B	501	6NL	CAX-OAW-CAQ	-3.10	101.31	105.34
5	C	501	GTP	PB-O3B-PG	-3.05	122.37	132.83
10	D	501	GDP	C4-C5-N7	-3.01	106.26	109.40
5	A	501	GTP	C5-C6-N1	-2.99	119.34	123.43
5	C	501	GTP	C5-C6-N1	-2.96	119.38	123.43
5	C	501	GTP	C6-N1-C2	2.88	120.50	115.93
11	B	505	MES	O1S-S-C8	2.85	110.34	106.92
10	B	502	GDP	C4-C5-N7	-2.76	106.53	109.40
5	A	501	GTP	C6-N1-C2	2.76	120.31	115.93
9	B	501	6NL	OAH-CAE-CAD	-2.60	119.92	124.37
12	F	402	ACP	PA-O3A-PB	-2.56	124.43	132.56
9	D	500	6NL	OAH-CAE-CAD	-2.55	120.00	124.37
5	C	501	GTP	PA-O3A-PB	-2.51	124.20	132.83
9	D	500	6NL	CAT-CAS-CAR	-2.50	117.40	120.22
9	B	501	6NL	CAT-CAS-CAR	-2.44	117.45	120.22
10	B	502	GDP	C1'-N9-C4	-2.42	122.38	126.64
10	B	502	GDP	PA-O3A-PB	-2.38	124.66	132.83
9	B	501	6NL	CAB-CAA-CAF	-2.38	119.06	120.76
10	D	501	GDP	C3'-C2'-C1'	2.37	104.54	100.98
5	A	501	GTP	PB-O3B-PG	-2.36	124.74	132.83
5	A	501	GTP	PA-O3A-PB	-2.33	124.83	132.83
12	F	402	ACP	N3-C2-N1	-2.24	125.17	128.68
12	F	402	ACP	O2B-PB-O1B	2.24	117.54	110.07
5	C	501	GTP	N2-C2-N1	2.20	120.67	117.25
5	A	501	GTP	O2G-PG-O3B	2.10	111.69	104.64
11	B	505	MES	C6-C5-N4	-2.10	106.92	110.10
11	B	505	MES	O3S-S-C8	2.09	109.15	105.77
12	F	402	ACP	O2G-PG-C3B	-2.06	101.41	106.40
9	D	500	6NL	CAB-CAA-CAF	-2.01	119.32	120.76

There are no chirality outliers.

All (32) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	B	502	GDP	C5'-O5'-PA-O1A
10	B	502	GDP	C5'-O5'-PA-O2A
10	D	501	GDP	C5'-O5'-PA-O1A
12	F	402	ACP	PG-C3B-PB-O1B
12	F	402	ACP	PG-C3B-PB-O2B
12	F	402	ACP	PG-C3B-PB-O3A
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
8	B	504	GOL	O1-C1-C2-C3
8	A	505	GOL	O1-C1-C2-C3
8	A	505	GOL	O1-C1-C2-O2
8	B	504	GOL	O1-C1-C2-O2
5	C	501	GTP	PB-O3B-PG-O1G
10	D	501	GDP	C5'-O5'-PA-O3A
10	B	502	GDP	PB-O3A-PA-O2A
10	D	501	GDP	C5'-O5'-PA-O2A
5	A	501	GTP	PB-O3A-PA-O2A
12	F	402	ACP	O4'-C4'-C5'-O5'
5	A	501	GTP	PB-O3B-PG-O3G
5	C	501	GTP	PB-O3B-PG-O2G
5	C	501	GTP	PB-O3B-PG-O3G
10	B	502	GDP	C5'-O5'-PA-O3A
5	A	501	GTP	C5'-O5'-PA-O3A
5	C	501	GTP	C5'-O5'-PA-O3A
5	A	501	GTP	C4'-C5'-O5'-PA
10	D	501	GDP	PB-O3A-PA-O1A
10	D	501	GDP	PB-O3A-PA-O2A
5	C	501	GTP	PB-O3A-PA-O1A
5	C	501	GTP	PB-O3A-PA-O2A

There are no ring outliers.

5 monomers are involved in 12 short contacts:

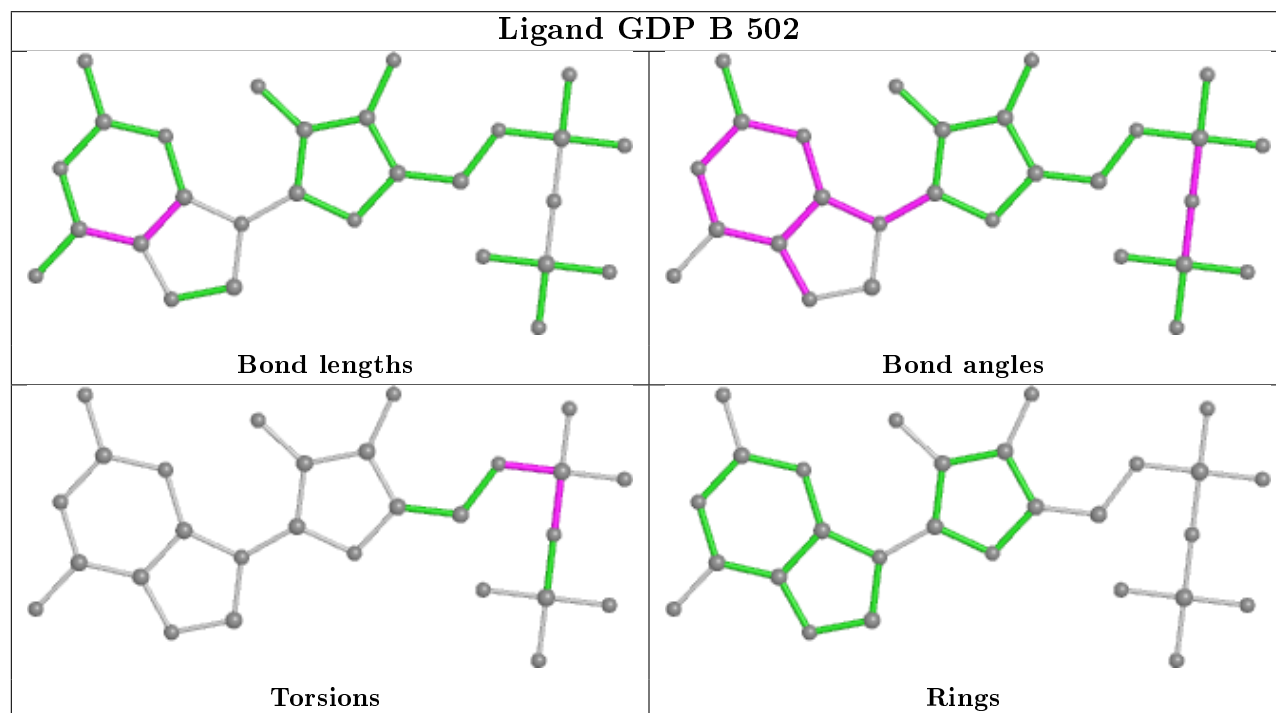
Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	A	504	GOL	2	0
12	F	402	ACP	5	0
9	D	500	6NL	2	0
11	B	505	MES	1	0

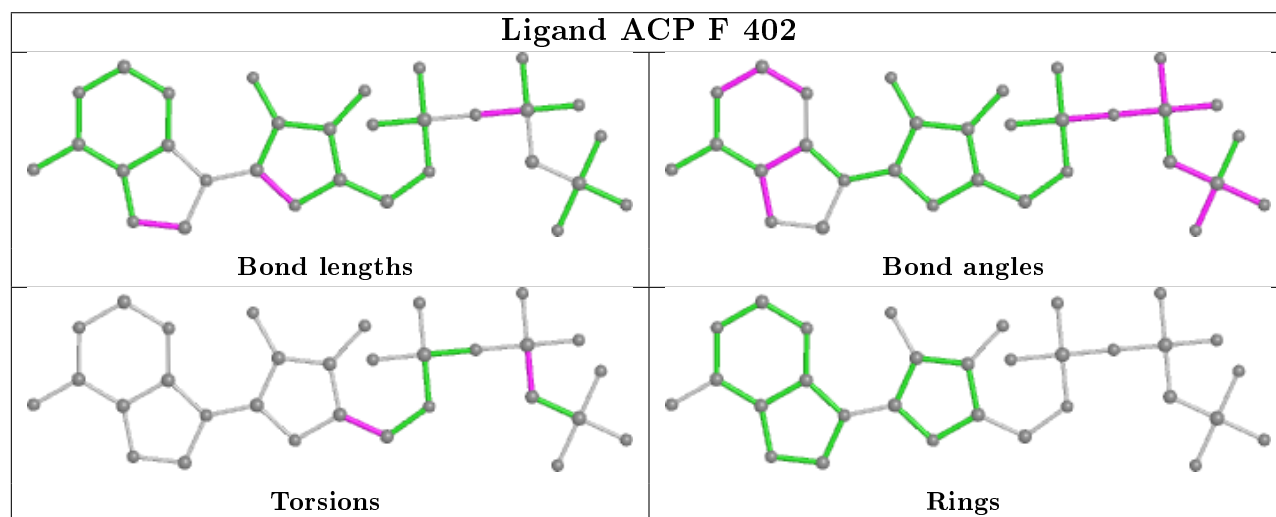
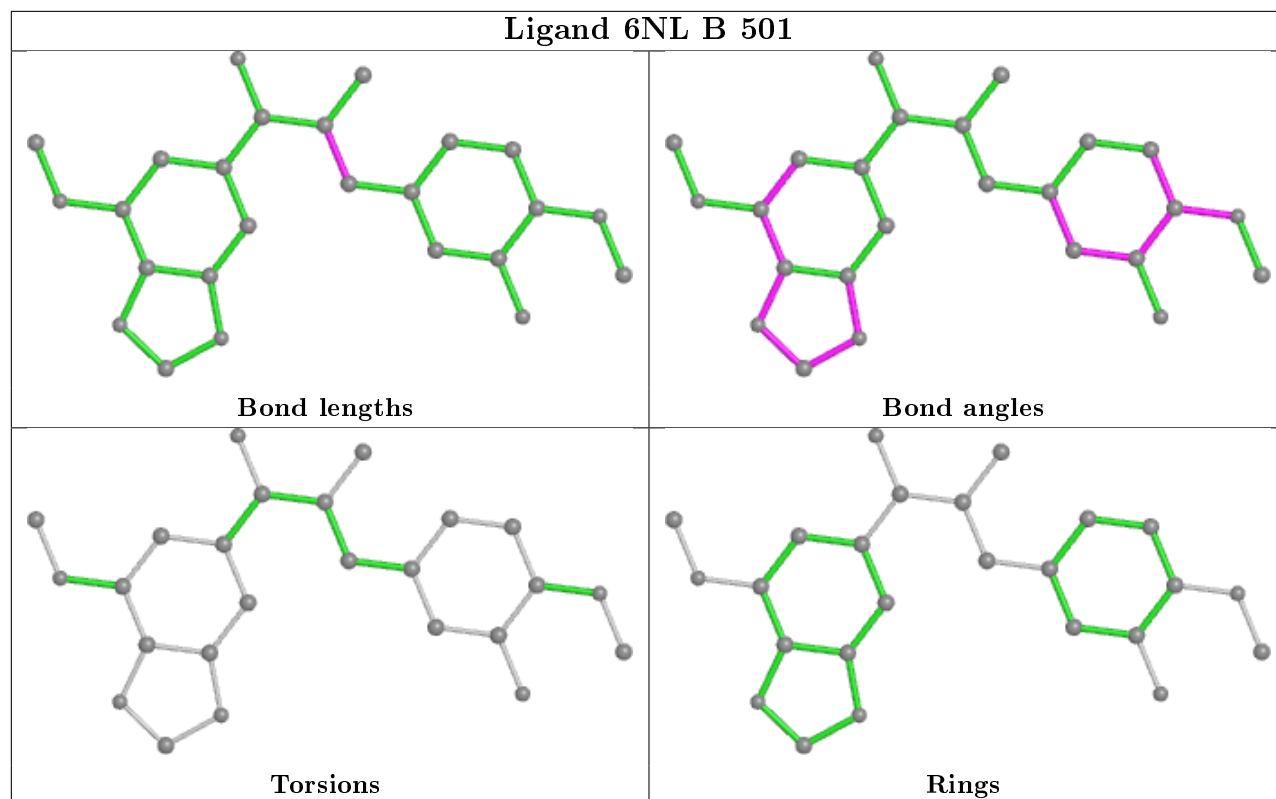
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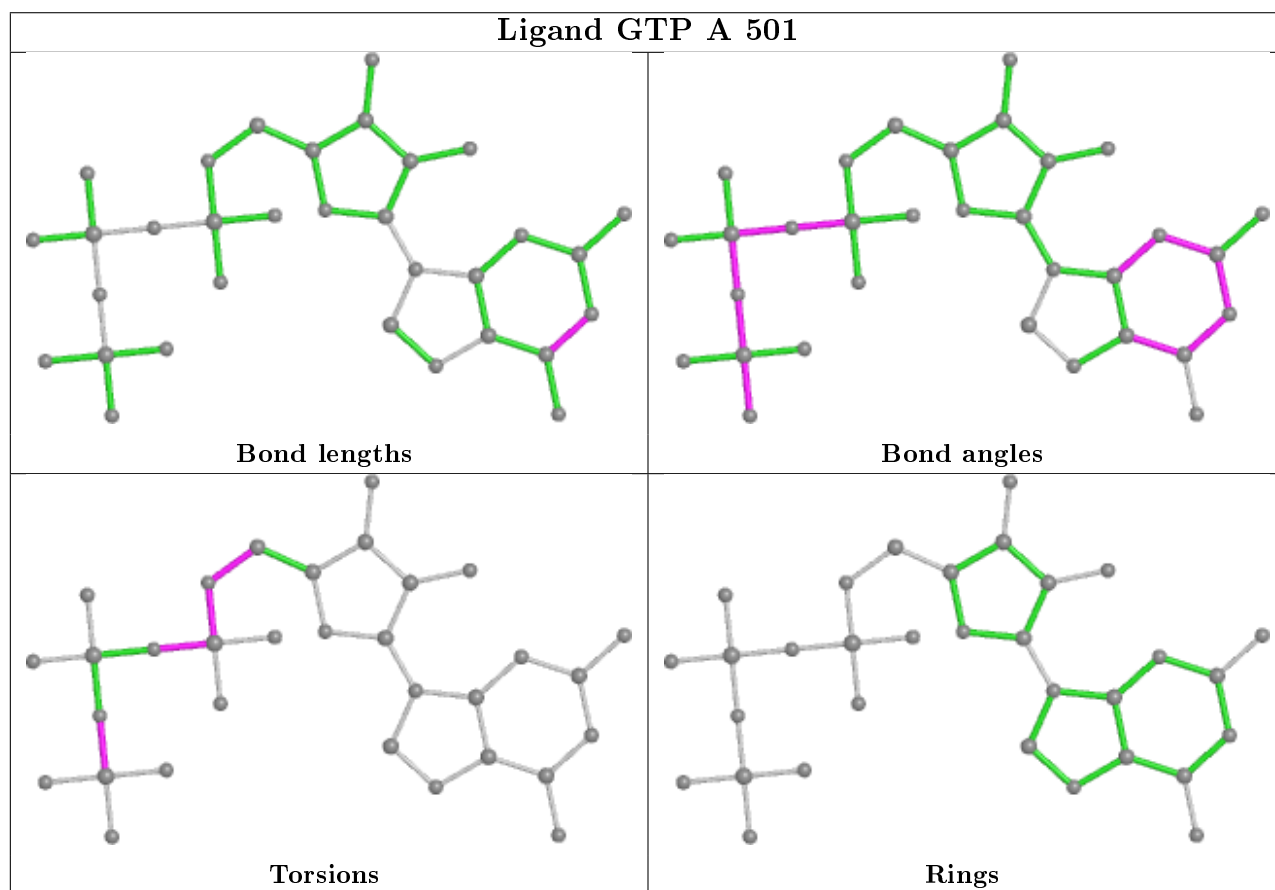
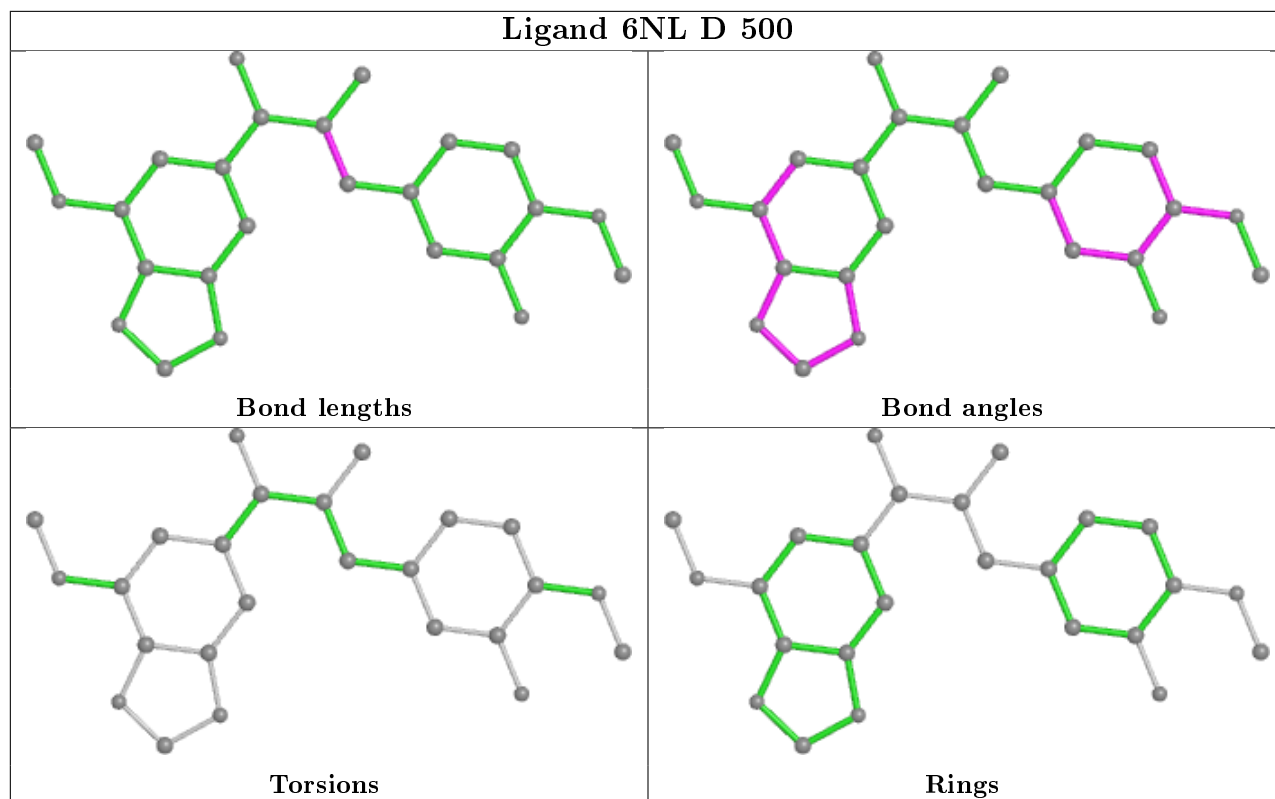
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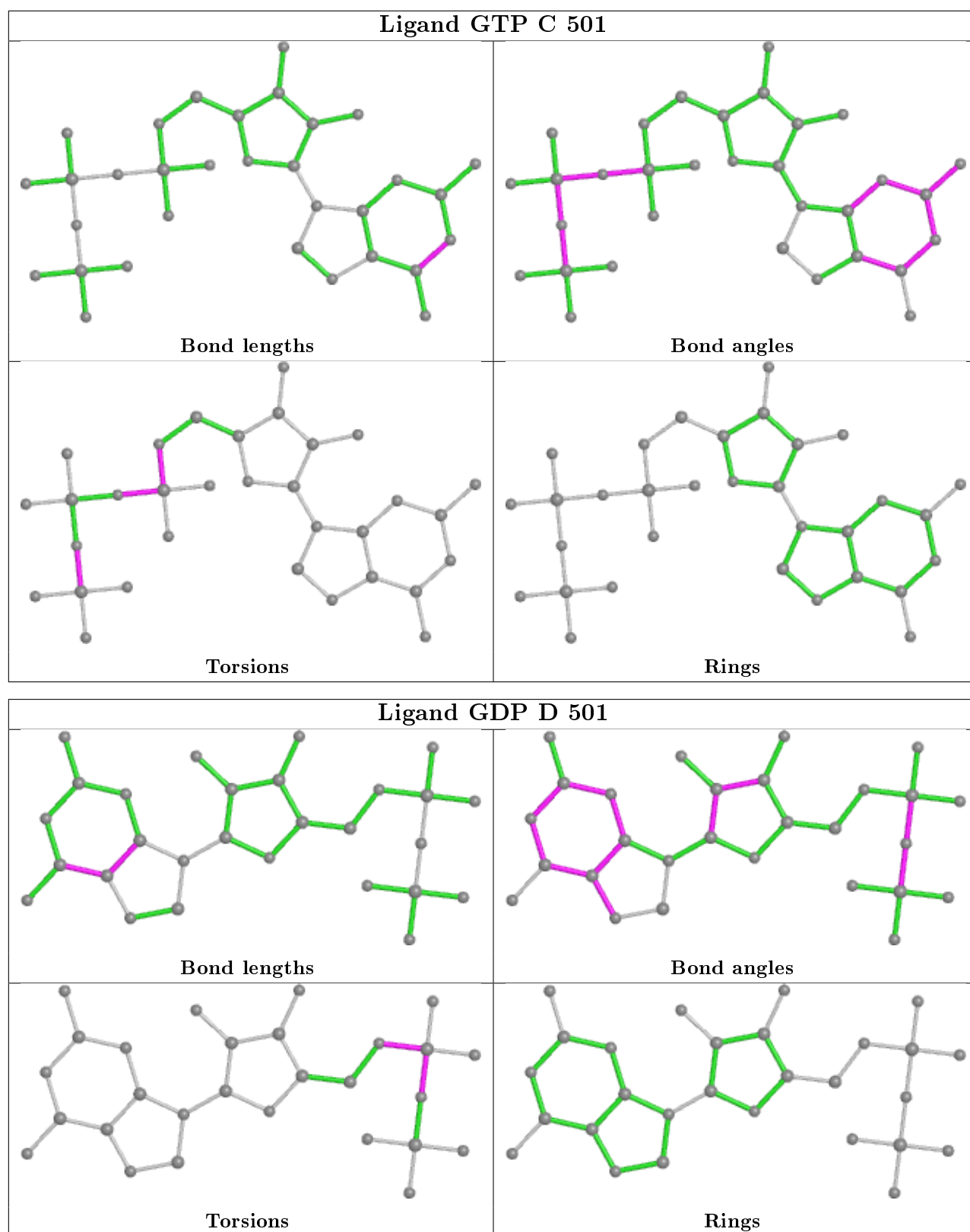
Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	D	501	GDP	2	0

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 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

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	438/451 (97%)	0.56	29 (6%) 18 17	45, 66, 105, 177	0
1	C	439/451 (97%)	0.15	5 (1%) 80 79	38, 53, 84, 110	0
2	B	425/445 (95%)	0.36	18 (4%) 36 35	40, 58, 96, 134	1 (0%)
2	D	422/445 (94%)	0.73	50 (11%) 4 4	45, 77, 113, 144	5 (1%)
3	E	122/143 (85%)	0.82	20 (16%) 1 1	50, 80, 116, 130	0
4	F	348/384 (90%)	1.59	120 (34%) 0 0	56, 95, 165, 186	0
All	All	2194/2319 (94%)	0.65	242 (11%) 5 5	38, 69, 128, 186	6 (0%)

All (242) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	F	233	PHE	9.1
1	A	282	TYR	8.5
4	F	132	LEU	7.7
4	F	173	ILE	7.7
4	F	231	ALA	7.6
2	B	59	ASN	7.5
4	F	249	TYR	7.3
4	F	100	ILE	7.2
4	F	134	ALA	7.1
1	A	439	SER	7.0
4	F	251	LYS	6.7
4	F	166	ALA	6.6
4	F	253	TYR	6.6
4	F	130	VAL	6.3
3	E	143	ALA	6.2
4	F	250	SER	6.1
4	F	177	GLY	5.9
2	D	58	GLY	5.9
4	F	182	ILE	5.9

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Mol	Chain	Res	Type	RSRZ
2	D	57	THR	5.8
3	E	139	LEU	5.8
4	F	248	GLU	5.5
4	F	101	TYR	5.4
4	F	245	ILE	5.4
4	F	167	SER	5.3
1	A	283	HIS	5.3
4	F	225	SER	5.2
4	F	255	ARG	5.2
4	F	133	ALA	5.2
4	F	131	PHE	5.1
4	F	362	ALA	5.1
4	F	135	TYR	5.0
4	F	179	VAL	5.0
1	A	281	ALA	5.0
2	B	57	THR	4.9
4	F	172	PHE	4.8
4	F	238	CYS	4.8
2	D	405	LEU	4.8
4	F	169	LEU	4.7
1	A	42	ILE	4.7
4	F	199	PHE	4.6
3	E	140	LYS	4.6
4	F	178	GLN	4.5
2	D	401	ARG	4.5
4	F	20	LEU	4.5
4	F	129	GLU	4.5
4	F	244	CYS	4.4
4	F	128	ARG	4.4
2	D	400	ARG	4.3
4	F	89	GLU	4.3
4	F	21	LEU	4.2
4	F	157	GLY	4.2
2	D	82	PRO	4.2
4	F	247	LYS	4.2
4	F	170	LEU	4.1
3	E	24	LEU	4.1
4	F	252	ASN	4.1
4	F	256	TYR	4.1
4	F	232	ASN	4.1
4	F	234	GLN	4.0
4	F	90	SER	4.0

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Mol	Chain	Res	Type	RSRZ
2	D	404	PHE	4.0
4	F	136	ASN	4.0
4	F	164	SER	4.0
4	F	137	ARG	3.9
2	B	439	THR	3.9
3	E	26	PRO	3.9
4	F	240	LEU	3.8
2	D	59	ASN	3.8
4	F	17	VAL	3.7
3	E	142	GLU	3.7
4	F	127	GLU	3.7
2	B	440	ALA	3.7
4	F	176	GLN	3.7
2	D	94	PHE	3.7
2	B	284	ARG	3.6
2	B	58	GLY	3.6
1	C	340	SER	3.6
4	F	143	GLU	3.6
4	F	174	ASP	3.6
4	F	149	ALA	3.6
2	B	37	HIS	3.6
4	F	228	TYR	3.5
4	F	24	THR	3.5
4	F	28	LYS	3.5
4	F	372	THR	3.5
4	F	139	ARG	3.5
4	F	162	ILE	3.5
2	D	96	GLN	3.5
4	F	246	GLN	3.5
4	F	98	TYR	3.4
3	E	133	VAL	3.4
4	F	147	TRP	3.3
4	F	165	GLU	3.3
4	F	229	ASN	3.3
2	B	438	ALA	3.3
3	E	141	GLU	3.3
4	F	254	GLY	3.3
4	F	13	VAL	3.3
4	F	99	VAL	3.3
2	B	36	TYR	3.2
2	D	219	LEU	3.2
4	F	152	SER	3.2

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Mol	Chain	Res	Type	RSRZ
2	D	85	GLN	3.2
3	E	48	GLU	3.2
1	C	440	VAL	3.2
4	F	159	GLY	3.2
2	D	80	SER	3.2
2	D	56	ALA	3.2
2	D	179	ASP	3.2
2	D	415	GLU	3.2
3	E	138	GLU	3.2
2	B	83	PHE	3.1
4	F	138	ARG	3.1
4	F	9	GLU	3.1
4	F	259	GLY	3.1
4	F	142	ARG	3.1
2	D	203	CYS	3.1
4	F	44	ARG	3.1
2	D	276	THR	3.1
2	D	79	ARG	3.1
1	A	88	HIS	3.0
3	E	45	PRO	3.0
4	F	102	PRO	3.0
4	F	223	THR	3.0
4	F	236	LYS	3.0
4	F	31	ARG	2.9
4	F	161	LEU	2.9
4	F	226	GLU	2.9
4	F	145	ASN	2.9
2	D	441	ASP	2.9
4	F	140	GLU	2.9
2	D	83	PHE	2.9
4	F	263	PHE	2.9
1	A	280	LYS	2.9
4	F	343	TYR	2.9
1	A	57	GLY	2.8
2	B	56	ALA	2.8
4	F	163	SER	2.8
4	F	22	LEU	2.8
4	F	227	PRO	2.8
2	B	34	GLY	2.8
1	A	12	ALA	2.8
3	E	7	GLU	2.8
2	D	397	ALA	2.7

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Mol	Chain	Res	Type	RSRZ
2	D	406	HIS	2.7
2	D	37	HIS	2.7
1	A	171	ILE	2.7
4	F	340	GLN	2.7
2	B	277	SER	2.7
1	A	177	VAL	2.7
1	A	146	GLY	2.7
3	E	25	LYS	2.7
1	A	143	GLY	2.7
2	D	255	LEU	2.7
2	D	407	TRP	2.6
4	F	32	LYS	2.6
4	F	181	VAL	2.6
4	F	171	ASP	2.6
2	D	60	LYS	2.6
2	D	76	ASP	2.6
2	D	210	TYR	2.6
2	D	252	LEU	2.6
4	F	168	GLU	2.6
4	F	239	HIS	2.6
3	E	132	GLU	2.6
4	F	224	SER	2.6
4	F	230	SER	2.6
1	C	2	ARG	2.6
2	D	95	GLY	2.6
4	F	257	GLU	2.6
1	A	335	ILE	2.6
1	A	262	TYR	2.5
1	A	142	GLY	2.5
2	D	399	PHE	2.5
4	F	235	ASP	2.5
4	F	221	LEU	2.5
4	F	346	LEU	2.5
1	A	285	GLN	2.5
4	F	175	GLU	2.4
3	E	137	LYS	2.4
4	F	361	LEU	2.4
1	A	173	PRO	2.4
2	D	201	THR	2.4
2	D	221	THR	2.4
2	B	61	TYR	2.4
4	F	242	ASN	2.4

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Mol	Chain	Res	Type	RSRZ
2	D	143	GLY	2.4
2	B	60	LYS	2.4
4	F	10	ASN	2.4
4	F	41	LEU	2.4
4	F	158	GLU	2.4
1	A	46	ASP	2.4
3	E	27	PRO	2.4
2	D	403	ALA	2.4
1	A	40	LYS	2.3
1	A	438	ASP	2.3
4	F	126	ASP	2.3
3	E	23	ILE	2.3
3	E	15	THR	2.3
2	B	144	GLY	2.3
1	A	59	GLY	2.3
2	D	202	TYR	2.3
2	D	269	MET	2.3
4	F	27	TRP	2.3
1	A	141	PHE	2.2
2	D	378	ILE	2.2
4	F	25	GLY	2.2
2	D	185	TYR	2.2
4	F	241	THR	2.2
4	F	243	HIS	2.2
3	E	46	SER	2.2
2	D	259	MET	2.2
2	D	260	VAL	2.2
4	F	194	PRO	2.2
2	D	214	PHE	2.1
4	F	23	ALA	2.1
4	F	183	GLN	2.1
4	F	258	GLU	2.1
4	F	18	SER	2.1
1	A	58	ALA	2.1
1	A	284	GLU	2.1
4	F	360	PRO	2.1
2	B	109	THR	2.1
2	D	87	PHE	2.1
4	F	351	VAL	2.1
1	A	140	SER	2.1
3	E	135	LYS	2.1
2	D	376	THR	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	177	VAL	2.1
2	D	177	VAL	2.1
2	D	33	THR	2.0
2	D	317	ALA	2.0
1	C	176	GLN	2.0
2	D	2	ARG	2.0
4	F	267	PHE	2.0
2	B	46	LEU	2.0
2	D	86	ILE	2.0
4	F	191	LEU	2.0
1	A	172	TYR	2.0
1	A	316	CYS	2.0
1	A	180	ALA	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 carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

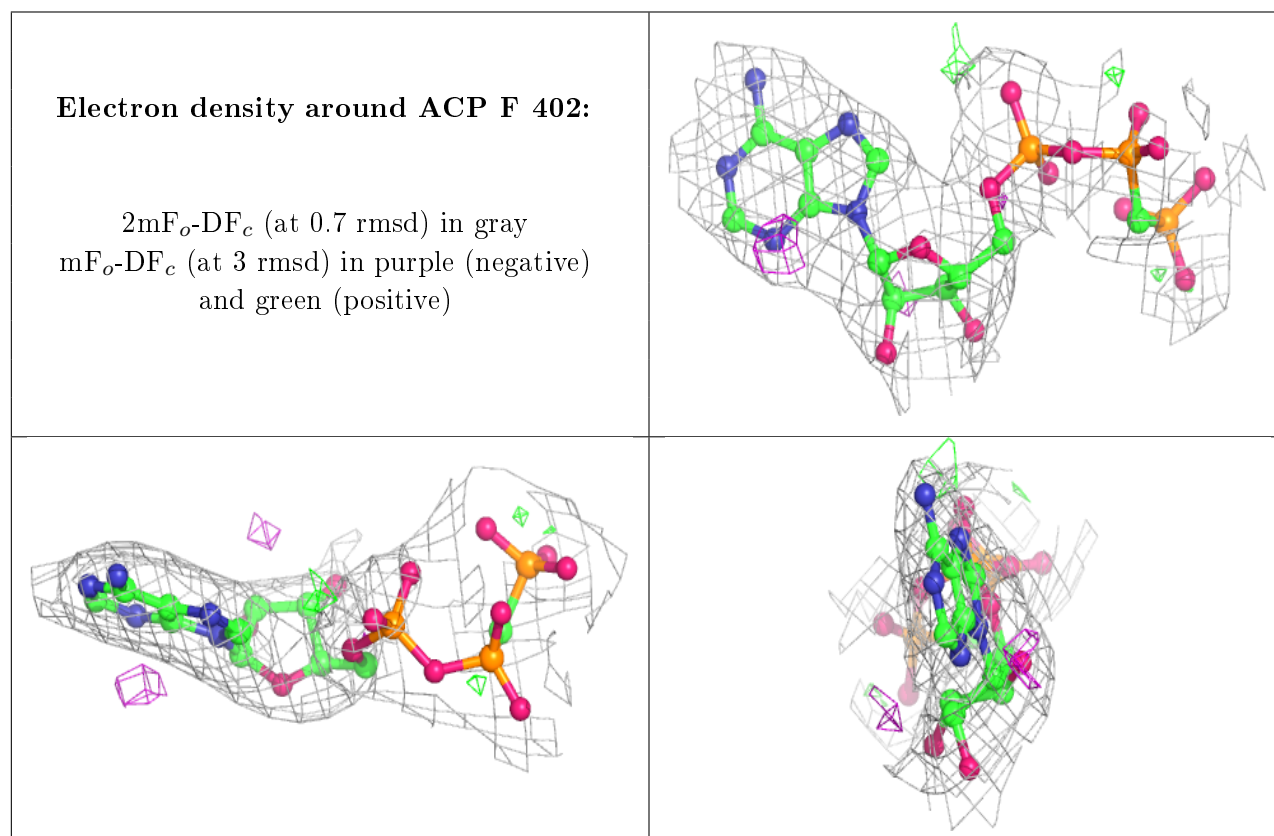
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
7	CA	B	506	1/1	0.63	0.57	163,163,163,163	0
7	CA	E	201	1/1	0.76	0.16	111,111,111,111	0
6	MG	A	502	1/1	0.77	0.28	74,74,74,74	0
12	ACP	F	402	31/31	0.86	0.12	86,105,139,156	0
8	GOL	B	504	6/6	0.88	0.21	103,106,108,110	0
8	GOL	A	505	6/6	0.90	0.19	83,85,91,94	0
7	CA	A	503	1/1	0.93	0.04	89,89,89,89	0
8	GOL	A	504	6/6	0.94	0.16	87,89,94,97	0
6	MG	F	401	1/1	0.95	0.07	104,104,104,104	0
6	MG	D	502	1/1	0.95	0.10	75,75,75,75	0

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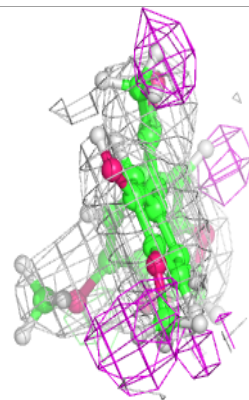
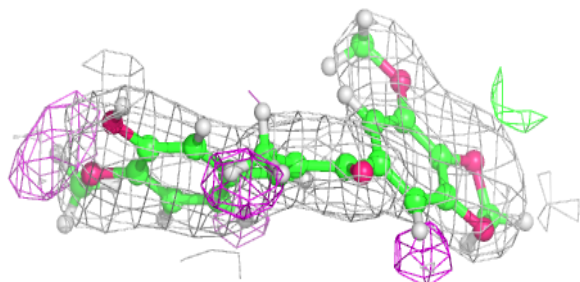
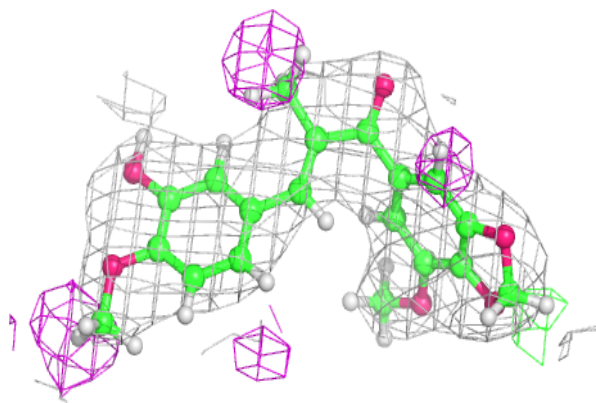
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
9	6NL	D	500	25/25	0.96	0.22	42,59,84,85	0
10	GDP	D	501	28/28	0.96	0.13	56,68,83,92	0
11	MES	B	505	12/12	0.97	0.14	49,63,77,78	0
10	GDP	B	502	28/28	0.98	0.19	35,43,50,61	0
6	MG	B	503	1/1	0.98	0.22	45,45,45,45	0
7	CA	C	503	1/1	0.98	0.08	78,78,78,78	0
9	6NL	B	501	25/25	0.98	0.16	36,50,60,67	0
5	GTP	C	501	32/32	0.99	0.16	31,40,53,68	0
5	GTP	A	501	32/32	0.99	0.24	39,48,55,73	0
6	MG	C	502	1/1	0.99	0.18	39,39,39,39	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.

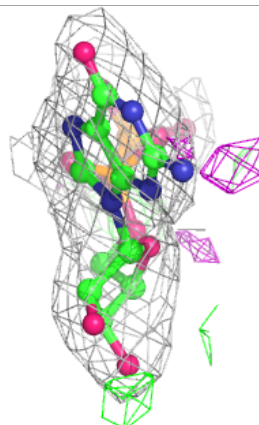
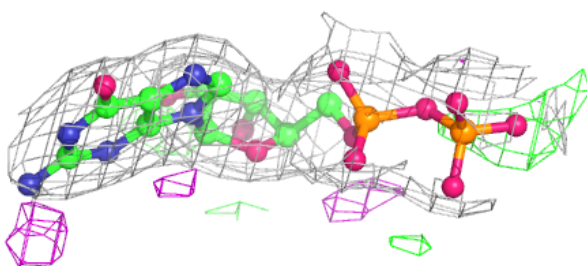
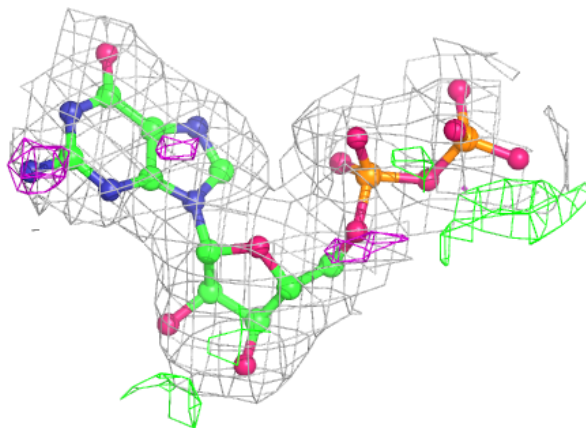


Electron density around 6NL D 500:

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

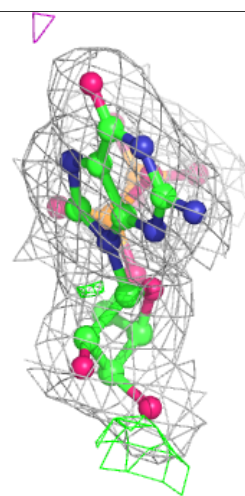
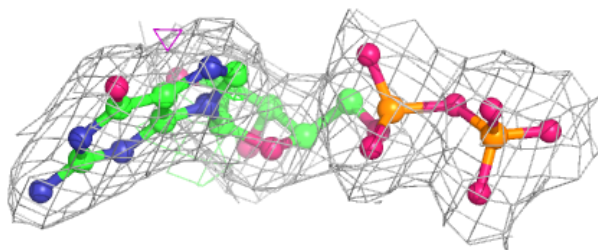
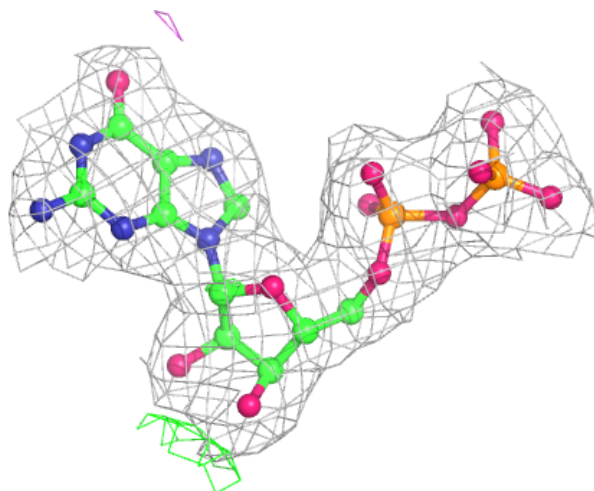
**Electron density around GDP D 501:**

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



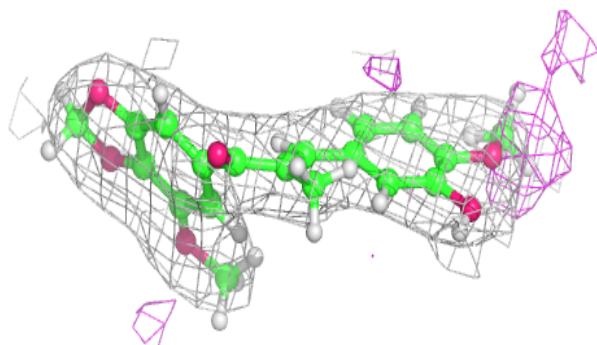
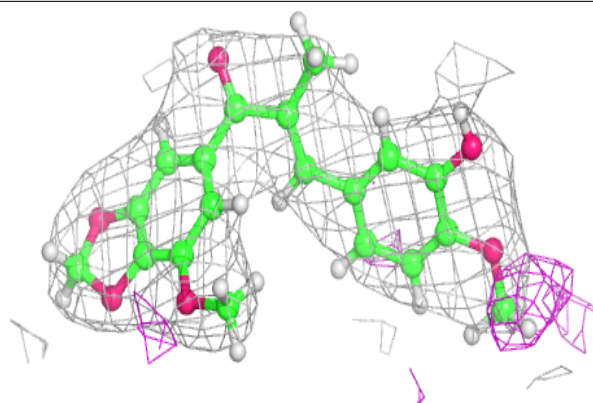
Electron density around GDP B 502:

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

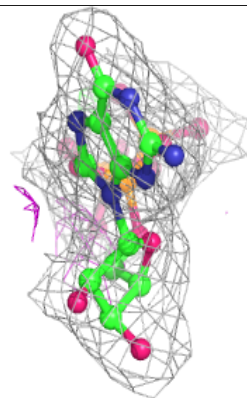
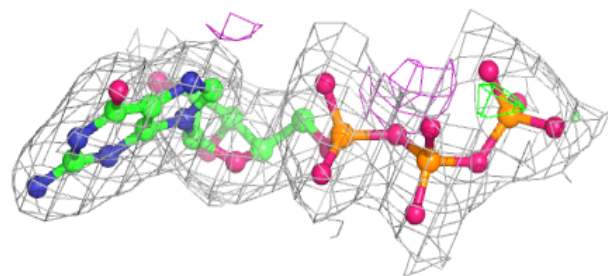
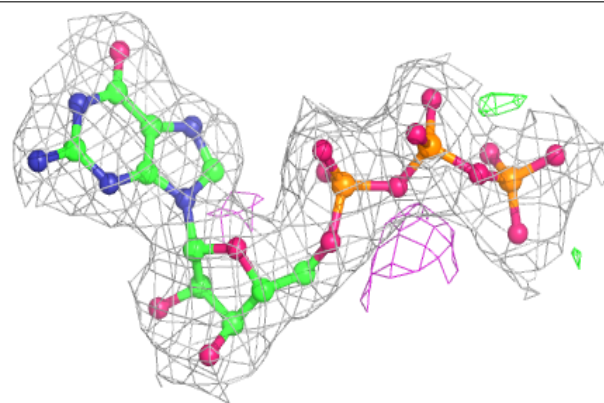


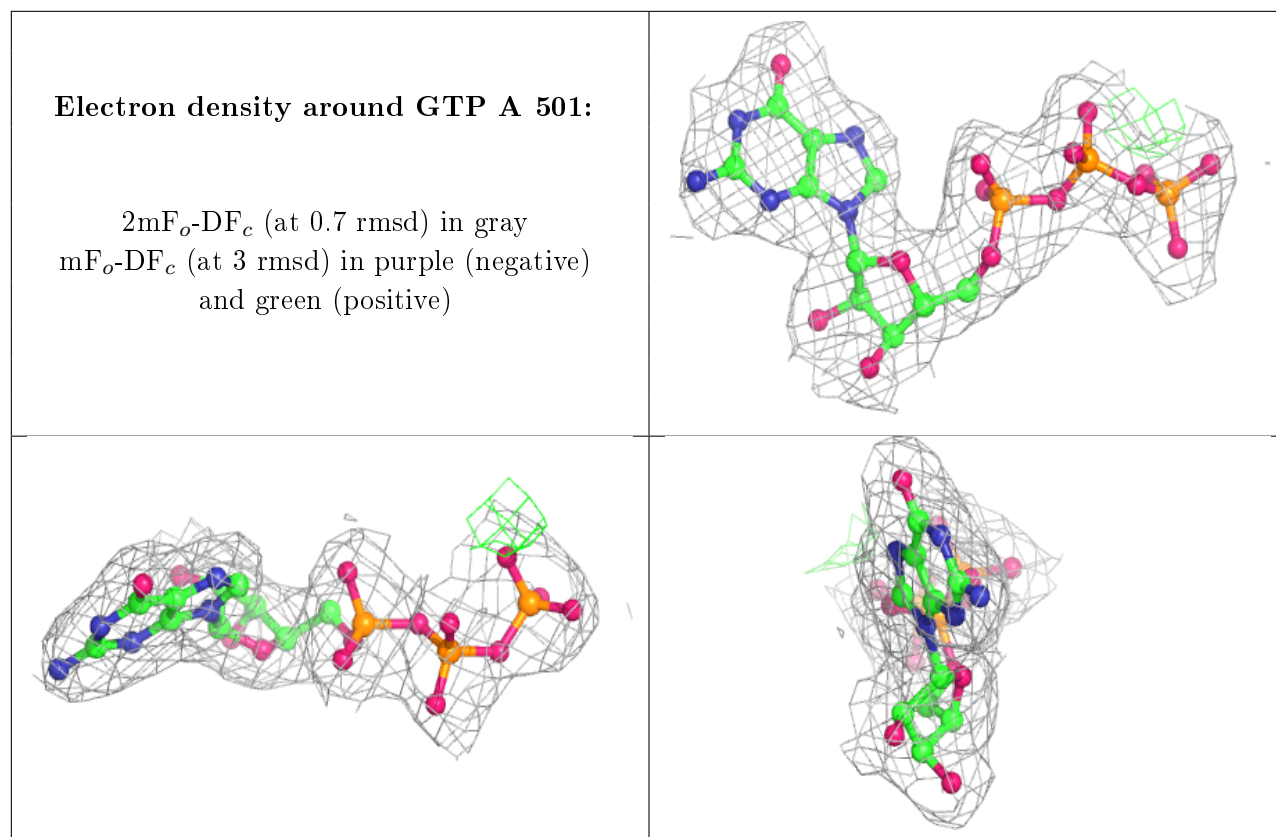
Electron density around 6NL B 501:

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

**Electron density around GTP 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.