



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 24, 2022 – 12:18 pm GMT

PDB ID : 5LXS
Title : Tubulin-KS-1-199-32 complex
Authors : Prota, A.E.; Steinmetz, M.O.
Deposited on : 2016-09-22
Resolution : 2.20 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 : 1.8.4, 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

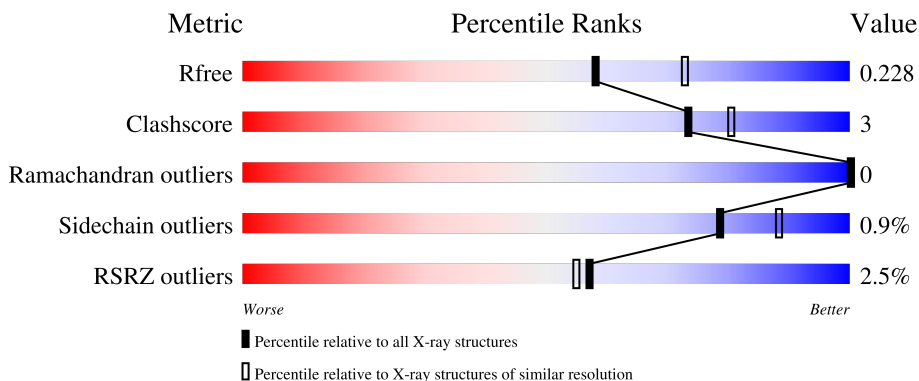
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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.



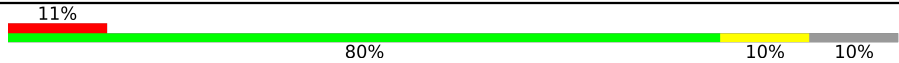
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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 $\leq 5\%$. 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	 88% 8% .
1	C	451	 90% 8% .
2	B	445	 88% 8% .
2	D	445	 88% 9% .
3	E	143	 81% 5% 14% .

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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 '11%', a large green segment labeled '80%', a yellow segment labeled '10%', and a grey segment on the far right labeled '10%'.</p>

2 Entry composition i

There are 12 unique types of molecules in this entry. The entry contains 18850 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	434	Total	C	N	O	S	0	11	0
			3436	2184	580	647	25			
1	C	440	Total	C	N	O	S	0	16	0
			3507	2224	587	671	25			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	428	Total	C	N	O	S	0	9	0
			3403	2139	577	659	28			
2	D	431	Total	C	N	O	S	0	4	0
			3404	2138	580	658	28			

- Molecule 3 is a protein called Stathmin-4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	E	123	Total	C	N	O	S	0	4	0
			1034	639	186	204	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
			Total	C	N	O	S			
4	F	345	Total	C	N	O	S	0	7	0
			2869	1847	489	518	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
			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	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	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		

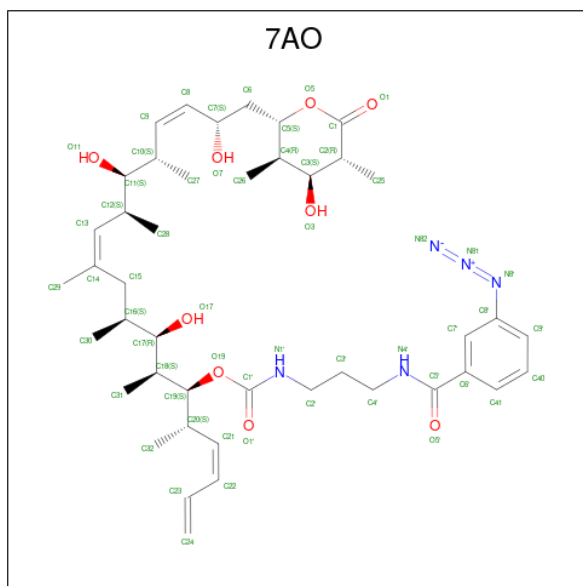
- Molecule 8 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: C₁₀H₁₅N₅O₁₁P₂).



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		

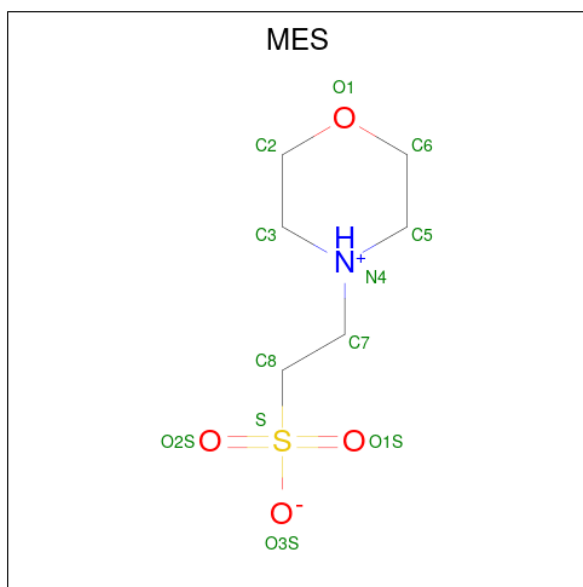
- Molecule 9 is [(3 {Z},5 {S},6 {S},7 {S},8 {R},9 {S},11 {Z},13 {S},14 {S},15 {S},16 {Z},18 {S})-19-[(2 {S},3 {R},4 {S},5 {R})-3,5-dimethyl-4-oxidanyl-6-oxidanylidene-oxan-2-yl]-5,7,9,11,13,15-hexamethyl-8,14,18-tris(oxidanyl)nonadeca-1,3,11,16-tetraen-6-yl] {N}-[3-(3-azid

ophenyl)carbonylamino]propyl]carbamate (three-letter code: 7AO) (formula: C₄₃H₆₅N₅O₉).



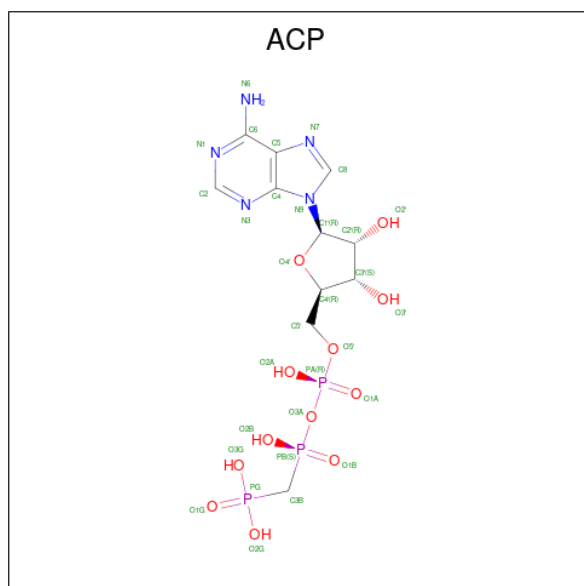
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
9	B	1	Total	C	N	O	0	0
			57	43	5	9		
9	D	1	Total	C	N	O	0	0
			57	43	5	9		

- Molecule 10 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C₆H₁₃NO₄S).



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

- Molecule 11 is PHOSPHOMETHYLPHOSPHONIC ACID ADENYLATE ESTER (three-letter code: ACP) (formula: C₁₁H₁₈N₅O₁₂P₃).



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

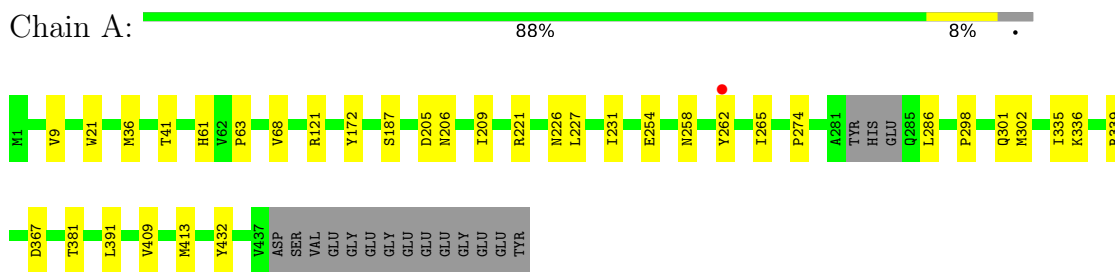
- Molecule 12 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
12	A	181	Total	O	0	0
			181	181		
12	B	154	Total	O	0	0
			154	154		
12	C	256	Total	O	0	0
			256	256		
12	D	161	Total	O	0	0
			161	161		
12	E	61	Total	O	0	0
			61	61		
12	F	98	Total	O	0	0
			98	98		

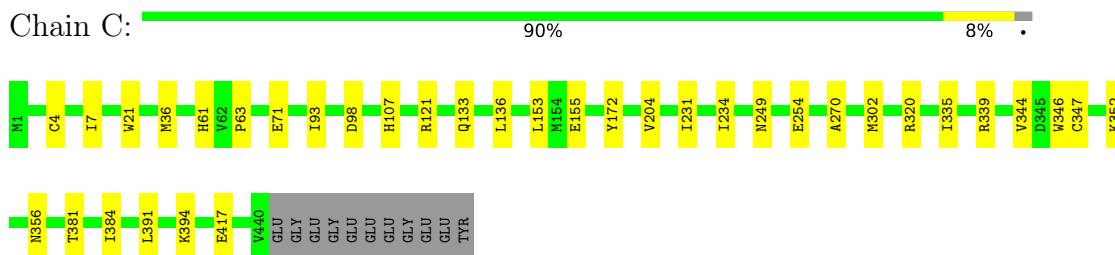
3 Residue-property plots

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

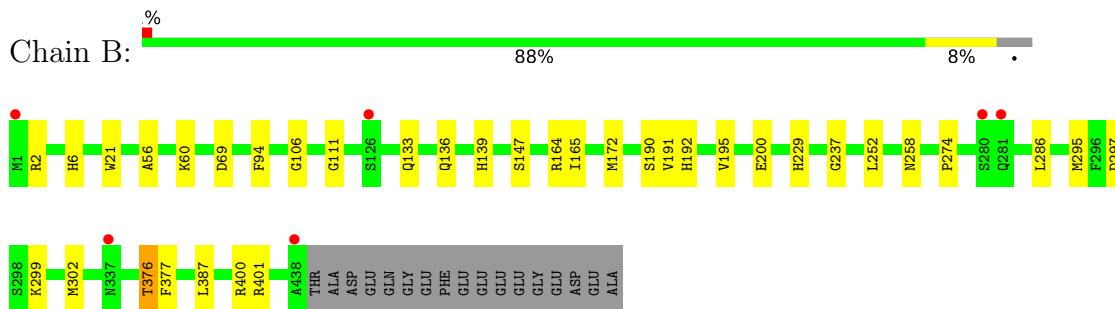
- Molecule 1: Tubulin alpha-1B chain



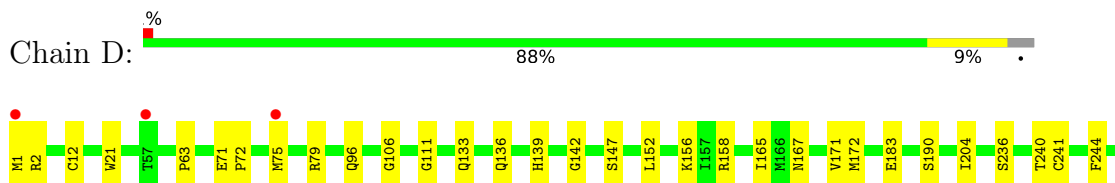
- Molecule 1: Tubulin alpha-1B chain



- Molecule 2: Tubulin beta-2B chain

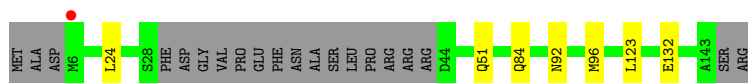
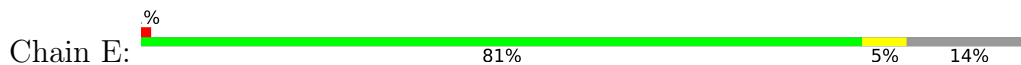


- Molecule 2: Tubulin beta-2B chain

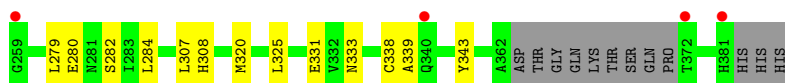
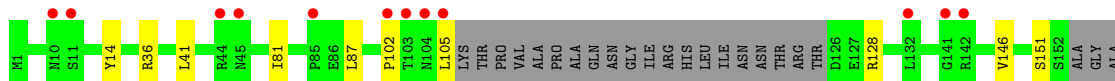
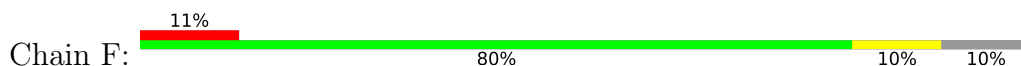




● Molecule 3: Stathmin-4



● Molecule 4: Tubulin tyrosine ligase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	104.58Å 157.80Å 179.44Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	72.23 – 2.20 72.23 – 2.20	Depositor EDS
% Data completeness (in resolution range)	100.0 (72.23-2.20) 100.0 (72.23-2.20)	Depositor EDS
R_{merge}	0.23	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.46 (at 2.20Å)	Xtriage
Refinement program	PHENIX (dev_2875: ???)	Depositor
R, R_{free}	0.186 , 0.227 0.187 , 0.228	Depositor DCC
R_{free} test set	7568 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	36.7	Xtriage
Anisotropy	0.210	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	18850	wwPDB-VP
Average B, all atoms (Å ²)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.38% 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: CA, ACP, 7AO, GDP, MG, MES, GTP

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	0.26	0/3544	0.44	0/4809
1	C	0.28	0/3633	0.46	0/4934
2	B	0.26	0/3505	0.44	0/4747
2	D	0.26	0/3491	0.44	0/4729
3	E	0.25	0/1055	0.36	0/1401
4	F	0.25	0/2955	0.42	0/3992
All	All	0.26	0/18183	0.44	0/24612

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	3436	0	3402	21	0
1	C	3507	0	3447	19	0
2	B	3403	0	3301	21	0
2	D	3404	0	3294	27	0
3	E	1034	0	1056	5	0
4	F	2869	0	2868	20	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	B	28	0	12	1	0
8	D	28	0	12	4	0
9	B	57	0	0	0	0
9	D	57	0	0	1	0
10	B	12	0	13	1	0
11	F	31	0	14	2	0
12	A	181	0	0	0	0
12	B	154	0	0	3	0
12	C	256	0	0	2	0
12	D	161	0	0	7	0
12	E	61	0	0	2	0
12	F	98	0	0	1	0
All	All	18850	0	17443	115	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 3.

All (115) 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)
11:F:401:ACP:H8	11:F:401:ACP:H5'1	1.67	0.76
8:D:501:GDP:O3B	12:D:601:HOH:O	2.10	0.67
2:D:147[B]:SER:HG	2:D:190:SER:HG	1.42	0.67
2:D:147[B]:SER:OG	2:D:190:SER:OG	2.10	0.65
4:F:242:ASN:OD1	11:F:401:ACP:H3B2	1.97	0.65
2:D:172:MET:HG3	2:D:387:LEU:HD11	1.80	0.64
2:B:274:PRO:HB3	2:B:286:LEU:HD11	1.82	0.62
1:A:209[B]:ILE:HD12	1:A:227:LEU:HB3	1.83	0.59
4:F:331:GLU:OE2	4:F:333:ASN:ND2	2.36	0.59
8:D:501:GDP:O3B	12:D:602:HOH:O	2.17	0.58
1:A:226:ASN:ND2	1:A:367:ASP:OD2	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:158:ARG:HG2	3:E:123:LEU:HD11	1.87	0.57
2:D:281:GLN:HG3	9:D:503:7AO:C41	2.34	0.56
1:A:335:ILE:HG23	1:A:339:ARG:HG3	1.88	0.56
1:C:270:ALA:HB3	1:C:302:MET:HE2	1.87	0.56
4:F:198:LYS:HE3	4:F:320:MET:HE1	1.87	0.56
2:D:167:ASN:ND2	12:D:609:HOH:O	2.39	0.56
4:F:128:ARG:NH2	4:F:174:ASP:OD1	2.38	0.56
4:F:102:PRO:HG2	4:F:105:LEU:HD13	1.88	0.55
2:B:165:ILE:HG21	2:B:252:LEU:HB3	1.89	0.55
3:E:84[B]:GLN:OE1	12:E:301:HOH:O	2.18	0.54
2:D:136:GLN:HA	2:D:167:ASN:O	2.07	0.54
2:B:237:GLY:HA3	2:B:376:THR:HG21	1.90	0.54
1:C:335:ILE:HG23	1:C:339:ARG:HG3	1.89	0.54
1:C:4[A]:CYS:SG	1:C:136:LEU:HG	2.47	0.54
1:C:417:GLU:OE1	12:C:601:HOH:O	2.19	0.52
2:D:2:ARG:NH1	12:D:610:HOH:O	2.39	0.52
2:B:56:ALA:HB3	2:B:60:LYS:HB2	1.92	0.52
2:D:75:MET:HG3	2:D:79:ARG:HH12	1.75	0.51
2:B:147[A]:SER:OG	2:B:190:SER:OG	2.20	0.51
1:C:254:GLU:HG2	1:C:352:LYS:HE2	1.91	0.51
4:F:36:ARG:NH2	12:F:504:HOH:O	2.40	0.51
2:B:297:ASP:OD2	2:B:299:LYS:NZ	2.44	0.51
2:B:2:ARG:HB3	2:B:133:GLN:CG	2.41	0.51
2:D:241[B]:CYS:SG	12:D:718:HOH:O	2.59	0.51
2:B:172:MET:HG3	2:B:387:LEU:HD11	1.92	0.51
8:B:501:GDP:O1A	12:B:601:HOH:O	2.20	0.51
1:C:71:GLU:HB2	1:C:98:ASP:HB3	1.92	0.51
4:F:280:GLU:HA	4:F:284[B]:LEU:HB2	1.92	0.50
1:C:249:ASN:OD1	1:C:356[A]:ASN:ND2	2.45	0.50
3:E:51:GLN:NE2	12:E:302:HOH:O	2.32	0.50
1:A:209[B]:ILE:HD13	1:A:231:ILE:HD11	1.93	0.50
1:A:209[A]:ILE:HG22	1:A:227:LEU:HD22	1.94	0.50
2:D:236:SER:O	2:D:240[B]:THR:HG23	2.13	0.49
2:D:171:VAL:HA	2:D:204:ILE:O	2.12	0.49
2:B:191:VAL:O	2:B:195[B]:VAL:HG13	2.12	0.49
1:C:93:ILE:HD11	1:C:121:ARG:HG3	1.94	0.49
2:B:192:HIS:O	2:B:195[B]:VAL:HG22	2.13	0.48
2:B:400:ARG:HG3	2:B:401:ARG:HG2	1.96	0.48
1:C:107:HIS:HE1	1:C:155:GLU:OE1	1.97	0.48
1:A:36:MET:HB3	1:A:61:HIS:CE1	2.49	0.48
1:A:209[A]:ILE:HD11	1:A:302[A]:MET:SD	2.54	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:69:ASP:O	2:B:94:PHE:HA	2.14	0.47
2:D:142:GLY:O	2:D:183:GLU:HG2	2.14	0.47
4:F:197:ARG:NH1	4:F:257:GLU:OE2	2.40	0.47
4:F:282:SER:HB2	4:F:325:LEU:HD13	1.96	0.47
1:A:254:GLU:HG2	1:A:258:ASN:ND2	2.30	0.47
2:B:6:HIS:CD2	2:B:21:TRP:HE1	2.33	0.47
1:A:274:PRO:HB3	1:A:286:LEU:HD12	1.96	0.46
1:A:206:ASN:OD1	1:A:209[B]:ILE:HD11	2.16	0.46
1:A:187:SER:HB3	1:A:391:LEU:HD21	1.96	0.46
1:C:172:TYR:CE2	1:C:391:LEU:HD22	2.51	0.46
2:B:295:MET:HG2	2:B:377:PHE:HB2	1.98	0.46
2:D:165:ILE:HG21	2:D:252:LEU:HB3	1.96	0.46
4:F:220[A]:VAL:HG11	4:F:339:ALA:HB2	1.97	0.46
1:C:7:ILE:HG21	1:C:153:LEU:HD21	1.98	0.45
1:A:172:TYR:HB3	1:A:205:ASP:HA	1.98	0.45
2:D:21:TRP:CZ3	2:D:63:PRO:HB3	2.51	0.45
4:F:146:VAL:HG22	4:F:164:SER:HB3	1.99	0.45
2:D:334:ASN:HD21	2:D:338:LYS:HE3	1.82	0.45
3:E:92:ASN:O	3:E:96:MET:HG2	2.16	0.45
2:B:258:ASN:OD1	12:B:602:HOH:O	2.21	0.44
2:D:248:LEU:HD23	2:D:354:ALA:HB2	1.99	0.44
1:C:204:VAL:HG11	1:C:231:ILE:HG12	1.99	0.44
4:F:81:ILE:HG12	4:F:87:LEU:HD13	1.98	0.44
1:A:121:ARG:HA	1:A:121:ARG:HD3	1.80	0.44
1:A:265:ILE:HG23	1:A:432:TYR:CZ	2.53	0.44
1:A:409:VAL:HA	1:A:413:MET:O	2.18	0.44
2:D:2:ARG:HB3	2:D:133:GLN:CG	2.48	0.43
2:D:158:ARG:NH1	12:D:626:HOH:O	2.51	0.43
2:D:72:PRO:HG3	2:D:96:GLN:HA	2.01	0.43
4:F:237:THR:O	4:F:246:GLN:NE2	2.46	0.43
1:C:133:GLN:NE2	12:C:629:HOH:O	2.52	0.43
1:C:234:ILE:HG21	1:C:302:MET:SD	2.59	0.43
1:C:344:VAL:HG21	1:C:346:TRP:CE2	2.53	0.43
1:C:394:LYS:HE3	12:D:743:HOH:O	2.18	0.43
2:D:12:CYS:HB2	8:D:501:GDP:C8	2.53	0.42
2:B:164:ARG:O	10:B:505:MES:H31	2.19	0.42
1:A:21:TRP:CZ3	1:A:63:PRO:HB3	2.55	0.42
4:F:151:SER:HB2	4:F:179:VAL:O	2.18	0.42
4:F:338:CYS:HB3	4:F:343:TYR:CE1	2.55	0.42
1:A:336:LYS:HG3	3:E:24:LEU:HD13	2.02	0.42
2:D:1:MET:HB3	2:D:1:MET:HE2	1.89	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:106:GLY:O	2:B:111:GLY:HA3	2.21	0.41
2:D:106:GLY:O	2:D:111:GLY:HA3	2.20	0.41
1:C:21:TRP:CZ3	1:C:63:PRO:HB3	2.56	0.41
2:B:2:ARG:HB3	2:B:133:GLN:HG3	2.03	0.41
2:B:2:ARG:NE	2:B:133:GLN:HG2	2.36	0.41
2:B:274:PRO:CB	2:B:286:LEU:HD11	2.49	0.41
2:D:347:ILE:HG22	2:D:350:ASN:HB3	2.03	0.41
4:F:14:TYR:HB3	4:F:41:LEU:HD13	2.02	0.41
4:F:151:SER:HB3	4:F:180:HIS:CG	2.56	0.41
1:A:9:VAL:HA	1:A:68[B]:VAL:HG13	2.03	0.41
1:A:265:ILE:HG23	1:A:432:TYR:CE1	2.56	0.41
1:A:298:PRO:HA	1:A:301:GLN:CD	2.41	0.41
1:A:336:LYS:HD2	1:A:336:LYS:HA	1.87	0.41
1:C:36:MET:HB3	1:C:61:HIS:CE1	2.55	0.41
2:B:136:GLN:NE2	12:B:610:HOH:O	2.34	0.40
4:F:307:LEU:HD22	4:F:308:HIS:CE1	2.56	0.40
2:D:152:LEU:O	2:D:156:LYS:HG2	2.22	0.40
2:D:244:PHE:CE1	2:D:358:ILE:HD12	2.57	0.40
4:F:236:LYS:HE3	4:F:236:LYS:HB2	1.90	0.40
4:F:279:LEU:HG	4:F:284[B]:LEU:HG	2.03	0.40
2:D:183:GLU:OE2	8:D:501:GDP:O3'	2.34	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	441/451 (98%)	432 (98%)	9 (2%)	0	100	100
1	C	454/451 (101%)	445 (98%)	9 (2%)	0	100	100
2	B	435/445 (98%)	426 (98%)	9 (2%)	0	100	100
2	D	433/445 (97%)	422 (98%)	11 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	E	123/143 (86%)	122 (99%)	1 (1%)	0	100	100
4	F	344/384 (90%)	334 (97%)	10 (3%)	0	100	100
All	All	2230/2319 (96%)	2181 (98%)	49 (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	376/379 (99%)	372 (99%)	4 (1%)	73	85
1	C	387/379 (102%)	384 (99%)	3 (1%)	81	90
2	B	379/383 (99%)	374 (99%)	5 (1%)	69	81
2	D	376/383 (98%)	373 (99%)	3 (1%)	81	90
3	E	114/127 (90%)	113 (99%)	1 (1%)	78	88
4	F	319/342 (93%)	317 (99%)	2 (1%)	86	93
All	All	1951/1993 (98%)	1933 (99%)	18 (1%)	78	88

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	41	THR
1	A	221	ARG
1	A	262	TYR
1	A	381	THR
2	B	139	HIS
2	B	200	GLU
2	B	229	HIS
2	B	302	MET
2	B	376	THR
1	C	347	CYS
1	C	381	THR
1	C	384	ILE

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Mol	Chain	Res	Type
2	D	71	GLU
2	D	139	HIS
2	D	281	GLN
3	E	132	GLU
4	F	211	TYR
4	F	225	SER

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 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
5	GTP	A	501	6	26,34,34	1.17	2 (7%)	33,54,54	1.96	7 (21%)
9	7AO	B	504	-	57,58,58	1.53	6 (10%)	69,78,78	1.55	16 (23%)
10	MES	B	505	-	12,12,12	2.24	1 (8%)	14,16,16	1.24	2 (14%)
9	7AO	D	503	-	57,58,58	1.50	6 (10%)	69,78,78	1.57	18 (26%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
11	ACP	F	401	6	27,33,33	1.84	8 (29%)	32,52,52	1.43	3 (9%)
8	GDP	B	501	6	24,30,30	1.16	2 (8%)	31,47,47	1.94	7 (22%)
8	GDP	D	501	6	24,30,30	1.19	2 (8%)	31,47,47	1.89	7 (22%)
5	GTP	C	501	6	26,34,34	1.16	2 (7%)	33,54,54	1.91	8 (24%)

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
5	GTP	A	501	6	-	6/18/38/38	0/3/3/3
9	7AO	B	504	-	-	7/64/84/84	0/2/2/2
10	MES	B	505	-	-	2/6/14/14	0/1/1/1
9	7AO	D	503	-	-	7/64/84/84	0/2/2/2
11	ACP	F	401	6	-	8/15/38/38	0/3/3/3
8	GDP	B	501	6	-	4/12/32/32	0/3/3/3
8	GDP	D	501	6	-	3/12/32/32	0/3/3/3
5	GTP	C	501	6	-	5/18/38/38	0/3/3/3

All (29) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	B	505	MES	C8-S	-7.49	1.66	1.77
9	B	504	7AO	N81-N8'	-6.16	1.07	1.24
9	D	503	7AO	N81-N8'	-6.11	1.07	1.24
9	B	504	7AO	C6'-C5'	-5.10	1.39	1.50
9	D	503	7AO	C2-C1	-5.09	1.39	1.51
9	B	504	7AO	C2-C1	-5.01	1.40	1.51
9	D	503	7AO	C6'-C5'	-4.76	1.40	1.50
5	A	501	GTP	C5-C6	4.16	1.48	1.41
8	D	501	GDP	C5-C6	4.07	1.48	1.41
5	C	501	GTP	C5-C6	4.05	1.48	1.41
11	F	401	ACP	C2'-C1'	-3.96	1.47	1.53
8	B	501	GDP	C5-C6	3.95	1.48	1.41
11	F	401	ACP	C6-N6	3.85	1.48	1.34
9	B	504	7AO	C8'-N8'	-3.35	1.34	1.43
9	D	503	7AO	C8'-N8'	-3.32	1.34	1.43
9	B	504	7AO	C22-C23	3.24	1.52	1.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	D	503	7AO	C22-C23	3.23	1.52	1.44
11	F	401	ACP	C2'-C3'	-3.09	1.44	1.53
11	F	401	ACP	PB-O1B	3.00	1.58	1.51
11	F	401	ACP	PG-O2G	2.90	1.61	1.54
8	D	501	GDP	C5-C4	2.44	1.47	1.40
5	C	501	GTP	C5-C4	2.41	1.47	1.40
5	A	501	GTP	C5-C4	2.40	1.47	1.40
8	B	501	GDP	C5-C4	2.31	1.47	1.40
11	F	401	ACP	O5'-C5'	-2.29	1.36	1.44
11	F	401	ACP	O3'-C3'	-2.23	1.37	1.43
9	B	504	7AO	O5-C5	-2.21	1.43	1.46
11	F	401	ACP	PG-O3G	2.21	1.60	1.54
9	D	503	7AO	O5-C5	-2.14	1.43	1.46

All (68) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	501	GTP	C2-N3-C4	4.93	120.99	115.36
8	B	501	GDP	C2-N3-C4	4.84	120.88	115.36
8	D	501	GDP	C2-N3-C4	4.76	120.80	115.36
5	C	501	GTP	C2-N3-C4	4.68	120.70	115.36
11	F	401	ACP	N3-C2-N1	-4.66	121.39	128.68
8	B	501	GDP	C2-N1-C6	4.30	122.76	115.93
5	C	501	GTP	C2-N1-C6	4.28	122.74	115.93
5	C	501	GTP	C4-C5-C6	-4.24	116.75	120.80
8	B	501	GDP	C4-C5-C6	-4.22	116.77	120.80
5	A	501	GTP	C2-N1-C6	4.20	122.59	115.93
9	D	503	7AO	O19-C1'-N1'	4.16	118.40	111.11
5	A	501	GTP	C4-C5-C6	-4.12	116.87	120.80
8	D	501	GDP	C2-N1-C6	4.04	122.35	115.93
5	A	501	GTP	C5-C6-N1	-4.03	117.92	123.43
5	C	501	GTP	C5-C6-N1	-4.02	117.93	123.43
8	D	501	GDP	C5-C6-N1	-3.99	117.98	123.43
8	B	501	GDP	C5-C6-N1	-3.98	117.99	123.43
9	B	504	7AO	O19-C1'-N1'	3.93	118.01	111.11
8	D	501	GDP	C4-C5-C6	-3.92	117.06	120.80
9	B	504	7AO	C20-C21-C22	-3.74	118.28	126.16
9	D	503	7AO	C29-C14-C13	-3.64	116.58	123.78
5	C	501	GTP	N3-C2-N1	-3.51	122.54	127.22
9	B	504	7AO	C23-C22-C21	-3.51	118.05	126.33
8	B	501	GDP	N3-C2-N1	-3.50	122.56	127.22
5	A	501	GTP	N3-C2-N1	-3.49	122.57	127.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	F	401	ACP	O5'-C5'-C4'	3.47	120.92	108.99
9	B	504	7AO	C29-C14-C13	-3.40	117.06	123.78
9	B	504	7AO	O1'-C1'-N1'	-3.30	119.91	124.96
11	F	401	ACP	PB-O3A-PA	-3.26	122.22	132.56
8	D	501	GDP	N3-C2-N1	-3.25	122.88	127.22
9	D	503	7AO	C26-C4-C3	-3.05	108.05	112.15
9	D	503	7AO	O1-C1-C2	-3.02	118.67	124.27
9	D	503	7AO	O1'-C1'-N1'	-2.97	120.41	124.96
5	A	501	GTP	C4-C5-N7	-2.85	106.43	109.40
9	D	503	7AO	C28-C12-C13	-2.85	105.31	110.05
8	D	501	GDP	C4-C5-N7	-2.82	106.46	109.40
9	B	504	7AO	O1-C1-C2	-2.79	119.08	124.27
9	D	503	7AO	C20-C21-C22	-2.75	120.37	126.16
9	D	503	7AO	C25-C2-C3	-2.70	107.95	112.93
9	D	503	7AO	C23-C22-C21	-2.70	119.96	126.33
9	D	503	7AO	C12-C13-C14	-2.65	120.88	127.66
9	D	503	7AO	C28-C12-C11	-2.62	105.81	111.31
5	A	501	GTP	PA-O3A-PB	-2.59	123.95	132.83
9	B	504	7AO	C12-C13-C14	-2.58	121.06	127.66
9	B	504	7AO	C26-C4-C3	-2.58	108.68	112.15
10	B	505	MES	O1S-S-C8	2.55	109.98	106.92
5	C	501	GTP	C4-C5-N7	-2.54	106.75	109.40
8	B	501	GDP	C4-C5-N7	-2.52	106.77	109.40
5	C	501	GTP	PA-O3A-PB	-2.52	124.19	132.83
9	B	504	7AO	C25-C2-C3	-2.48	108.36	112.93
9	B	504	7AO	O5-C1-O1	2.45	122.04	118.47
9	B	504	7AO	C16-C17-C18	-2.42	112.52	116.27
8	B	501	GDP	PA-O3A-PB	-2.37	124.68	132.83
10	B	505	MES	O3S-S-C8	2.32	109.52	105.77
9	D	503	7AO	C16-C17-C18	-2.24	112.81	116.27
9	D	503	7AO	C30-C16-C17	-2.23	107.40	111.54
9	D	503	7AO	O19-C1'-O1'	-2.21	121.19	124.53
9	B	504	7AO	C28-C12-C11	-2.19	106.71	111.31
9	B	504	7AO	O5-C5-C6	2.16	110.38	106.50
8	D	501	GDP	PA-O3A-PB	-2.11	125.58	132.83
9	B	504	7AO	C28-C12-C13	-2.11	106.54	110.05
9	D	503	7AO	O5-C1-O1	2.10	121.54	118.47
9	B	504	7AO	C29-C14-C15	2.07	120.34	115.27
5	C	501	GTP	PB-O3B-PG	-2.06	125.75	132.83
9	D	503	7AO	C7-C8-C9	-2.06	119.72	125.09
9	D	503	7AO	C10-C9-C8	-2.05	119.30	125.67
9	D	503	7AO	C29-C14-C15	2.05	120.31	115.27

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	B	504	7AO	C30-C16-C17	-2.03	107.77	111.54

There are no chirality outliers.

All (42) 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	PB-O3B-PG-O3G
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-O1A
8	D	501	GDP	C5'-O5'-PA-O2A
11	F	401	ACP	PG-C3B-PB-O2B
11	F	401	ACP	C5'-O5'-PA-O2A
11	F	401	ACP	C5'-O5'-PA-O3A
9	D	503	7AO	C9'-C8'-N8'-N81
9	D	503	7AO	N1'-C2'-C3'-C4'
9	B	504	7AO	C7'-C8'-N8'-N81
9	D	503	7AO	C7'-C8'-N8'-N81
11	F	401	ACP	PB-O3A-PA-O1A
9	B	504	7AO	C9'-C8'-N8'-N81
11	F	401	ACP	O4'-C4'-C5'-O5'
9	B	504	7AO	C8'-N8'-N81-N82
10	B	505	MES	C8-C7-N4-C5
11	F	401	ACP	PB-O3A-PA-O5'
9	D	503	7AO	C11-C10-C9-C8
11	F	401	ACP	C5'-O5'-PA-O1A
9	D	503	7AO	C8'-N8'-N81-N82
9	B	504	7AO	C17-C18-C19-C20
9	D	503	7AO	C17-C18-C19-C20
10	B	505	MES	C8-C7-N4-C3
9	B	504	7AO	C31-C18-C19-C20
9	B	504	7AO	O7-C7-C8-C9
11	F	401	ACP	PG-C3B-PB-O1B
9	D	503	7AO	C31-C18-C19-C20
5	A	501	GTP	PB-O3B-PG-O3G
5	A	501	GTP	C5'-O5'-PA-O3A
5	C	501	GTP	C5'-O5'-PA-O3A

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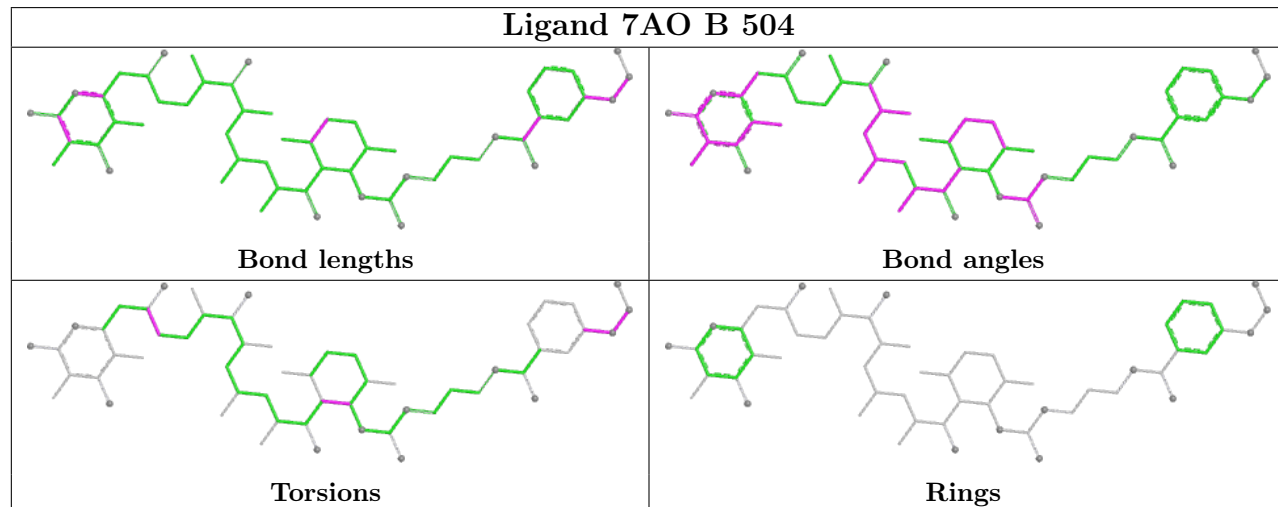
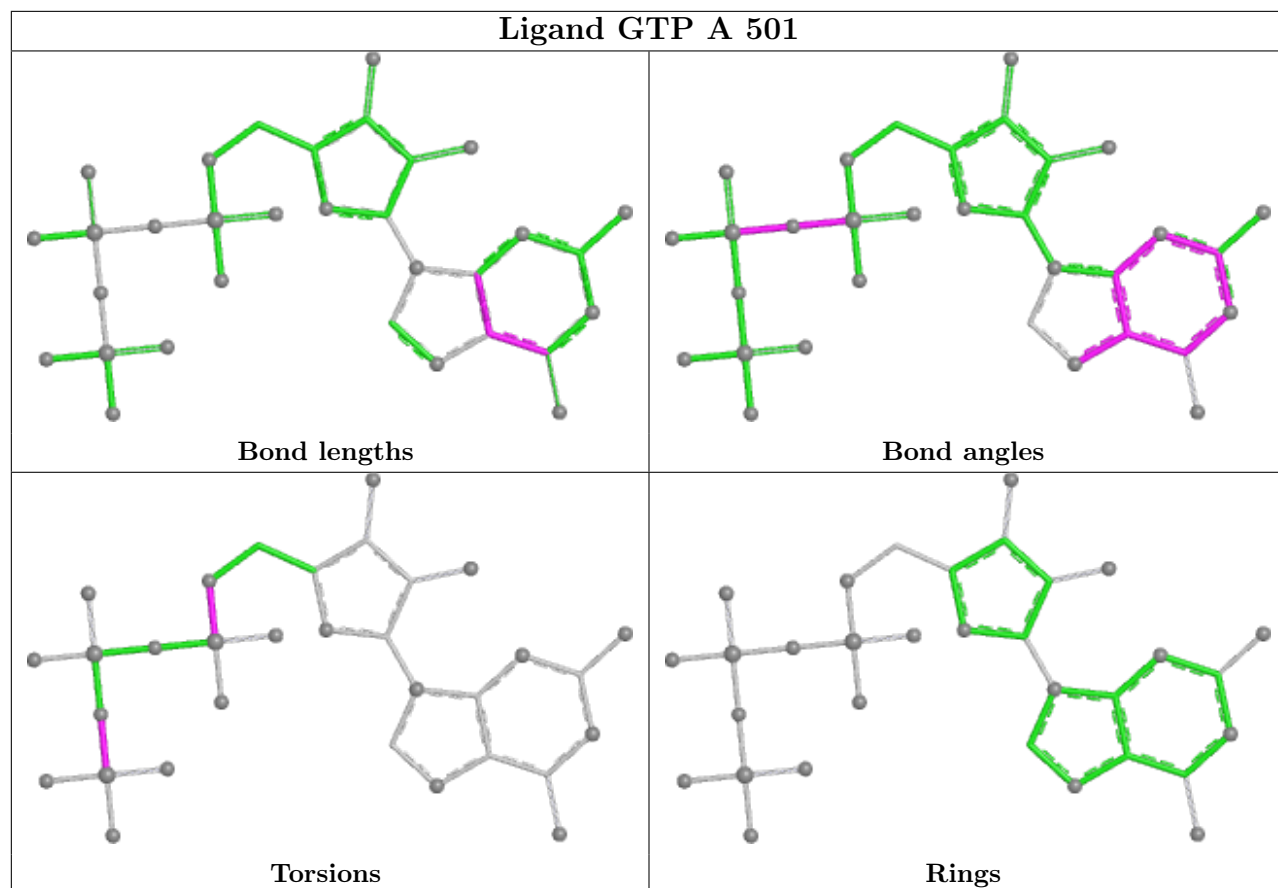
Mol	Chain	Res	Type	Atoms
8	B	501	GDP	C5'-O5'-PA-O3A
8	D	501	GDP	C5'-O5'-PA-O3A
5	C	501	GTP	PB-O3A-PA-O1A
8	B	501	GDP	PB-O3A-PA-O2A
5	A	501	GTP	PB-O3B-PG-O1G
9	B	504	7AO	C6-C7-C8-C9

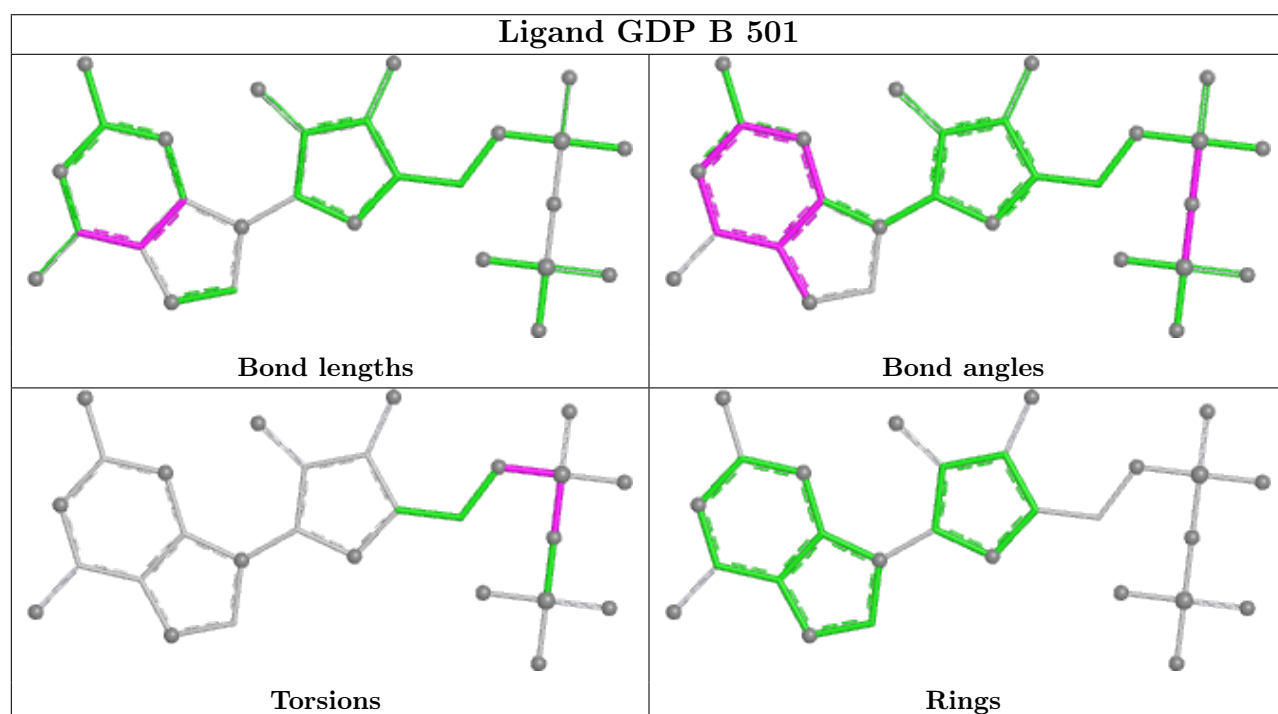
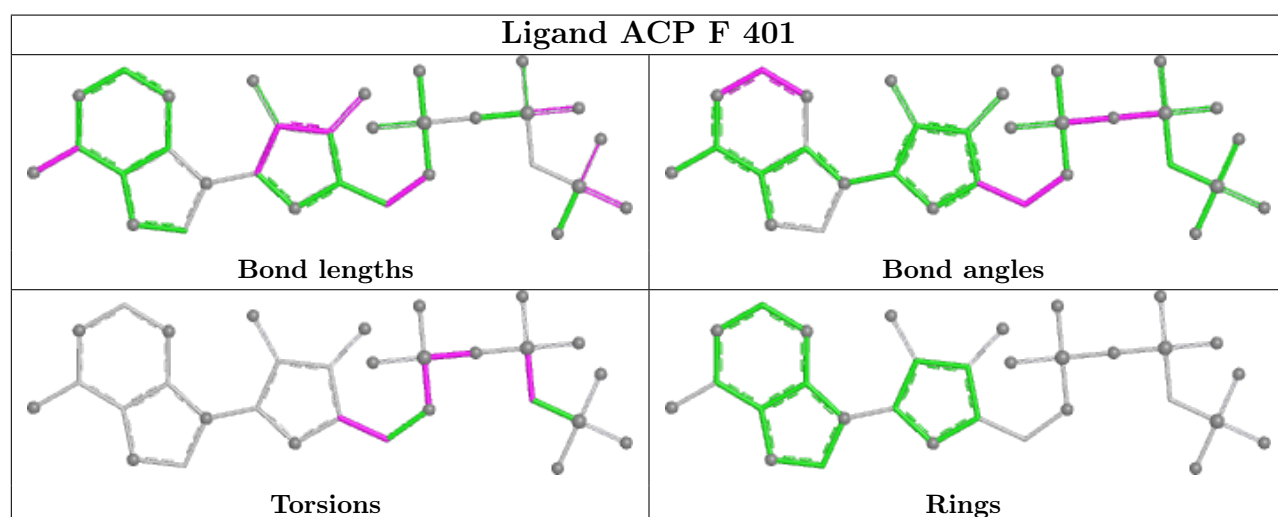
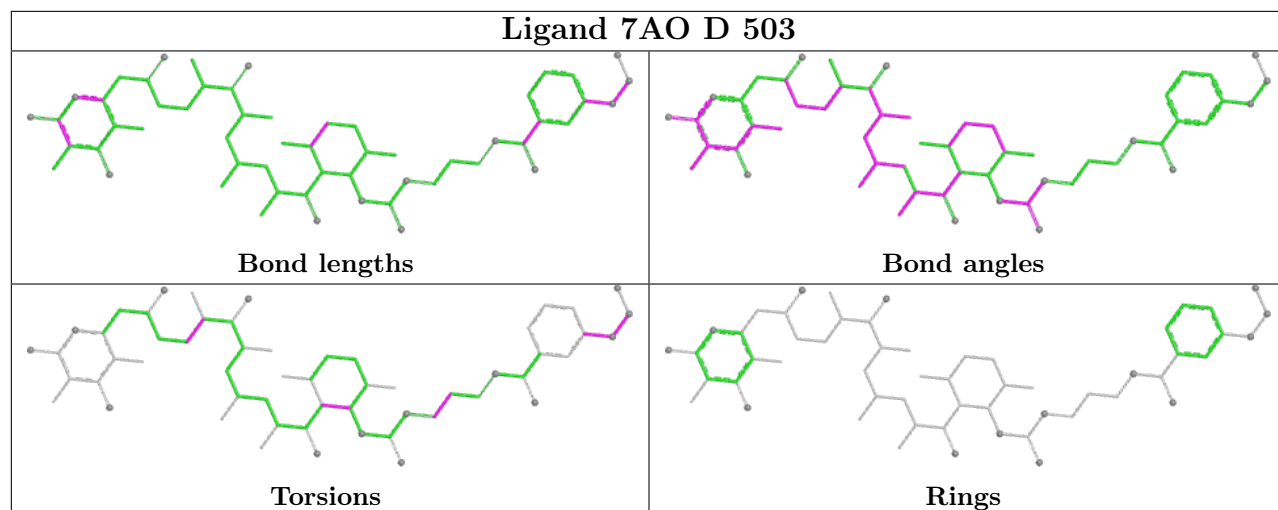
There are no ring outliers.

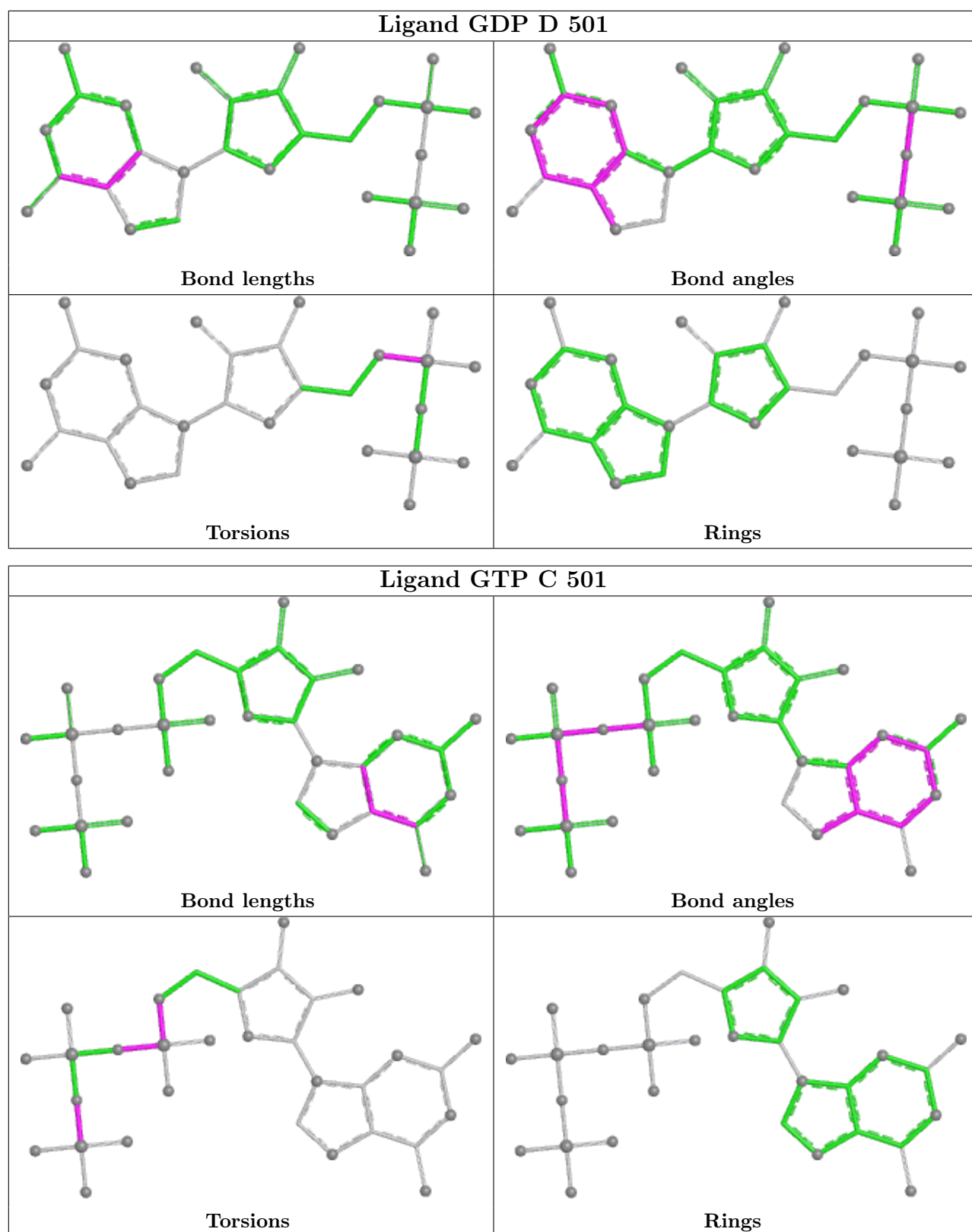
5 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	B	505	MES	1	0
9	D	503	7AO	1	0
11	F	401	ACP	2	0
8	B	501	GDP	1	0
8	D	501	GDP	4	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	434/451 (96%)	-0.37	1 (0%) 95 94	27, 45, 76, 121	0
1	C	440/451 (97%)	-0.36	0 100 100	23, 36, 65, 114	0
2	B	428/445 (96%)	-0.10	6 (1%) 75 73	27, 48, 89, 128	0
2	D	431/445 (96%)	-0.24	5 (1%) 79 77	28, 46, 85, 145	0
3	E	123/143 (86%)	-0.00	1 (0%) 86 85	32, 58, 102, 120	0
4	F	345/384 (89%)	0.51	43 (12%) 3 3	34, 67, 117, 170	0
All	All	2201/2319 (94%)	-0.13	56 (2%) 57 55	23, 47, 93, 170	0

All (56) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	F	173	ILE	6.8
4	F	177	GLY	6.2
4	F	103	THR	6.1
4	F	249	TYR	5.2
4	F	105	LEU	4.9
4	F	251	LYS	4.8
4	F	240	LEU	4.7
2	D	75	MET	4.7
4	F	236	LYS	4.3
4	F	234	GLN	4.3
4	F	244	CYS	4.2
4	F	372	THR	4.1
4	F	161	LEU	3.9
4	F	178	GLN	3.8
4	F	142	ARG	3.7
4	F	169	LEU	3.6
4	F	104	ASN	3.5
2	D	57	THR	3.4
4	F	132	LEU	3.4

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Mol	Chain	Res	Type	RSRZ
4	F	250	SER	3.3
4	F	233	PHE	3.3
4	F	245	ILE	3.2
2	B	280	SER	3.2
2	D	1	MET	3.1
4	F	253	TYR	3.1
4	F	170	LEU	3.1
4	F	172	PHE	3.1
4	F	176	GLN	3.0
4	F	180	HIS	3.0
4	F	231	ALA	3.0
2	B	1	MET	3.0
2	B	281	GLN	2.9
4	F	44	ARG	2.8
4	F	259	GLY	2.6
4	F	102	PRO	2.6
4	F	252	ASN	2.6
4	F	232	ASN	2.6
2	B	438	ALA	2.5
2	B	126	SER	2.5
4	F	248	GLU	2.5
4	F	45	ASN	2.4
4	F	168	GLU	2.3
4	F	179	VAL	2.3
2	B	337	ASN	2.3
4	F	10	ASN	2.2
1	A	262	TYR	2.2
4	F	381	HIS	2.1
2	D	325	MET	2.1
4	F	141	GLY	2.1
4	F	85	PRO	2.1
2	D	286	LEU	2.1
4	F	162	ILE	2.1
4	F	340	GLN	2.1
4	F	166	ALA	2.0
4	F	11	SER	2.0
3	E	6	MET	2.0

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 [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

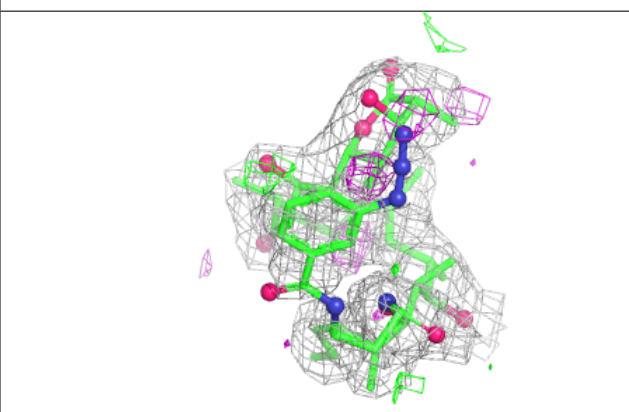
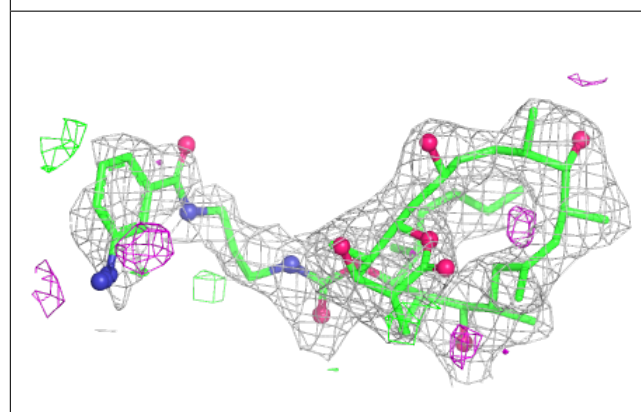
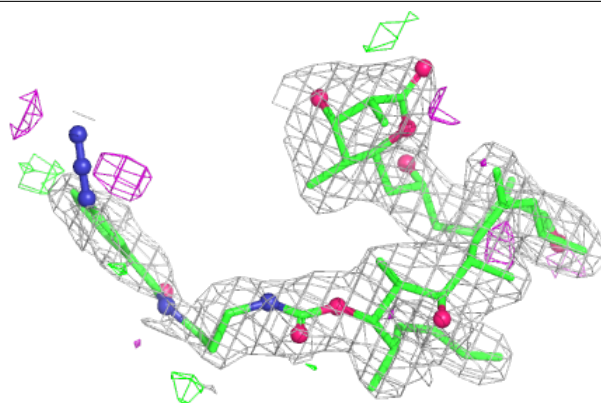
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	MG	D	502	1/1	0.78	0.12	65,65,65,65	0
6	MG	F	402	1/1	0.90	0.15	79,79,79,79	0
9	7AO	B	504	57/57	0.91	0.20	34,56,129,132	0
7	CA	E	201	1/1	0.94	0.05	82,82,82,82	0
7	CA	B	503	1/1	0.94	0.07	84,84,84,84	0
7	CA	C	503	1/1	0.95	0.06	52,52,52,52	0
9	7AO	D	503	57/57	0.95	0.14	27,45,103,106	0
10	MES	B	505	12/12	0.95	0.13	38,50,64,66	0
11	ACP	F	401	31/31	0.95	0.12	56,66,104,117	0
6	MG	B	502	1/1	0.96	0.09	51,51,51,51	0
7	CA	A	503	1/1	0.98	0.07	59,59,59,59	0
6	MG	A	502	1/1	0.98	0.08	27,27,27,27	0
8	GDP	B	501	28/28	0.98	0.12	23,31,38,41	0
8	GDP	D	501	28/28	0.98	0.11	28,39,43,53	0
5	GTP	A	501	32/32	0.99	0.12	22,31,36,45	0
5	GTP	C	501	32/32	0.99	0.13	22,27,33,48	0
6	MG	C	502	1/1	0.99	0.12	27,27,27,27	0

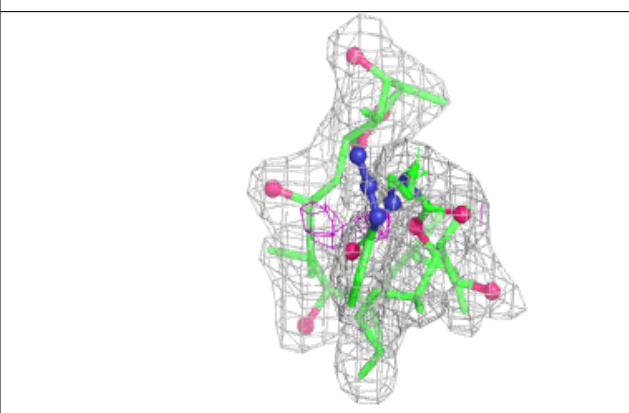
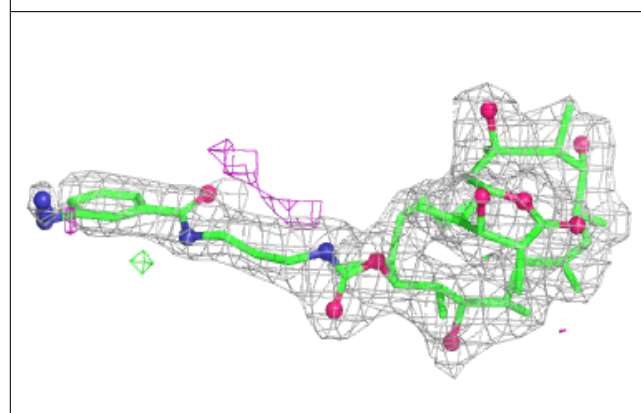
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around 7AO B 504:

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

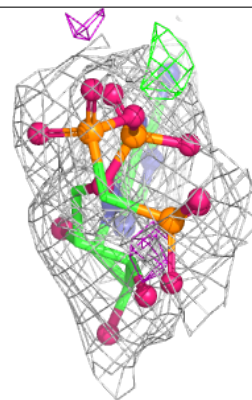
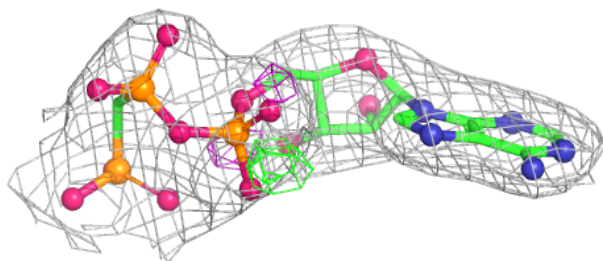
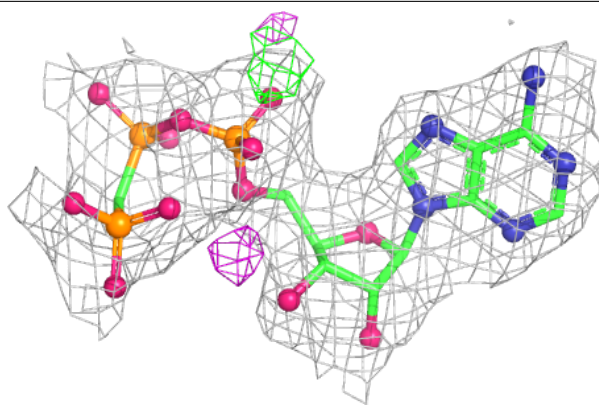
**Electron density around 7AO D 503:**

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

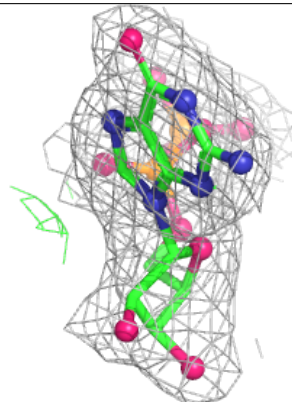
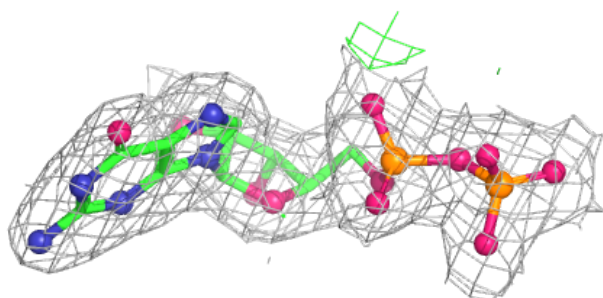
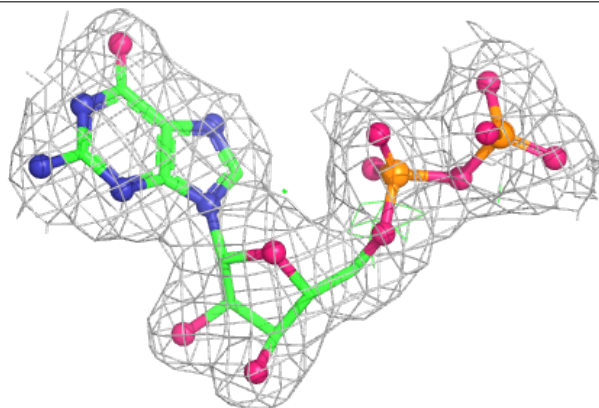


Electron density around ACP F 401:

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

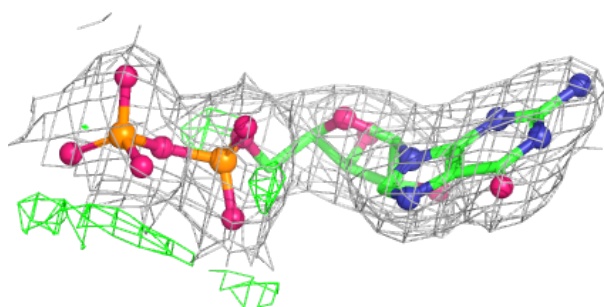
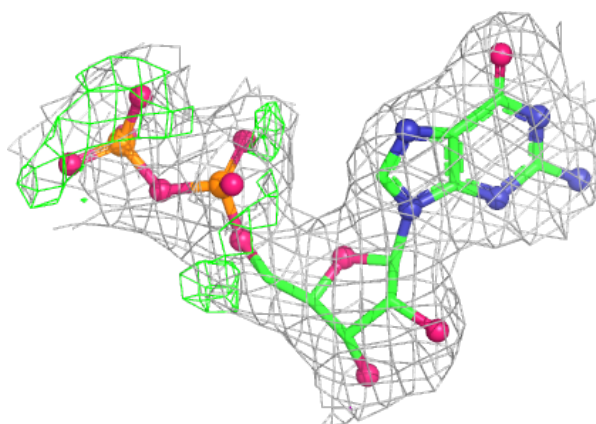
**Electron density around GDP B 501:**

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

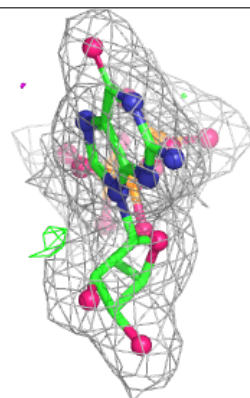
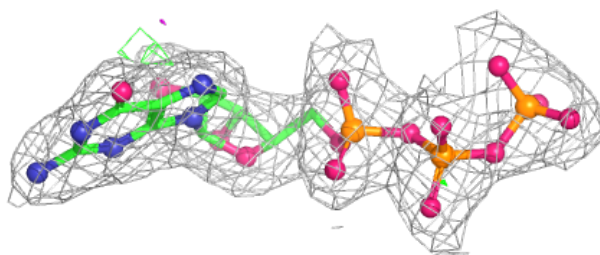
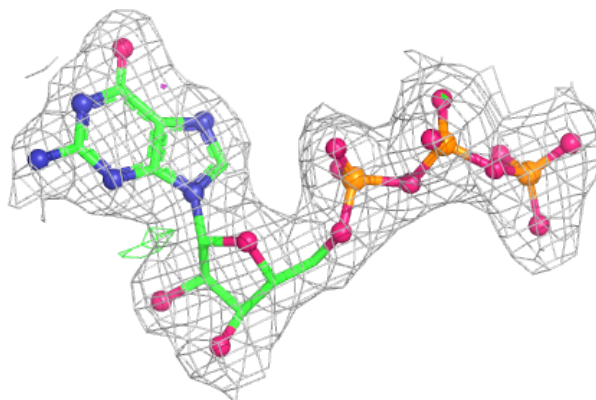


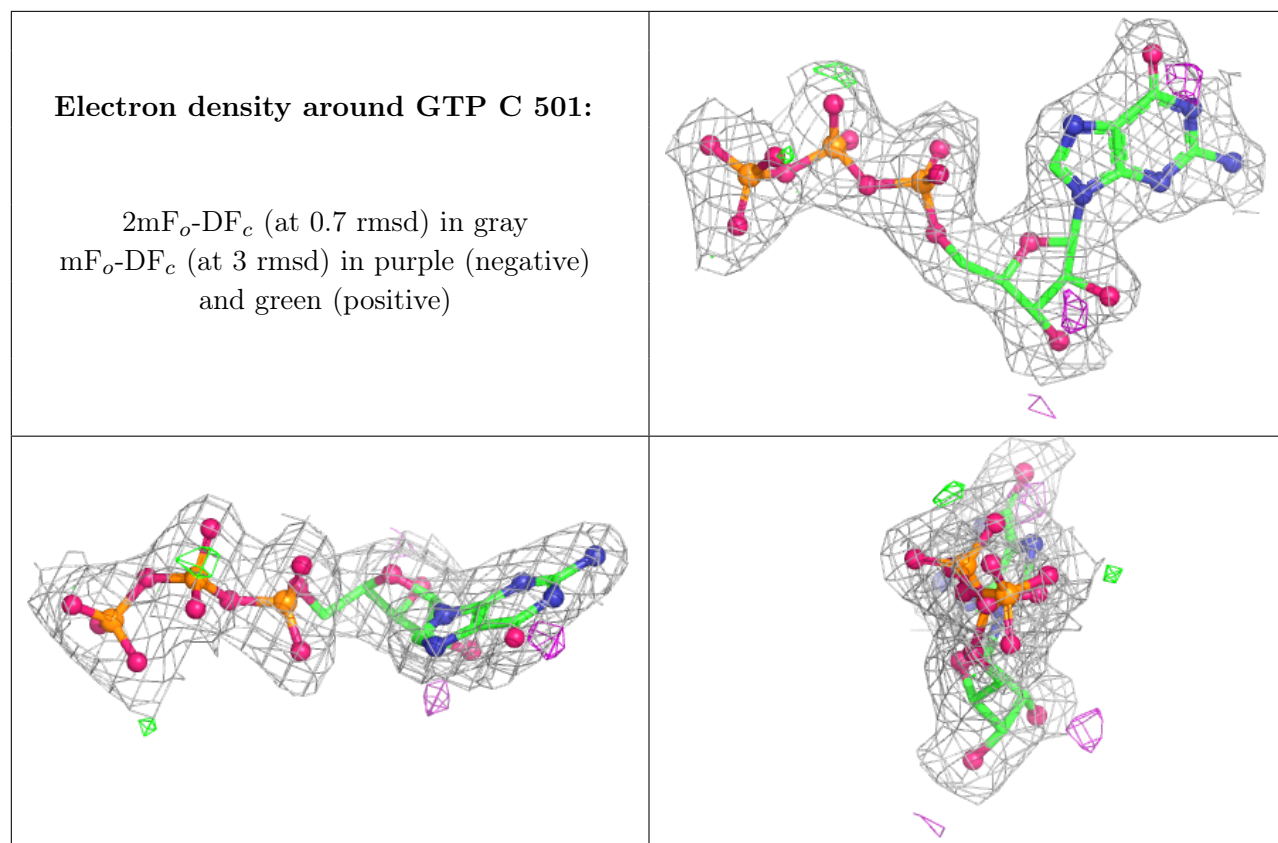
Electron density around GDP D 501:

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

**Electron density around 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)





6.5 Other polymers [i](#)

There are no such residues in this entry.