



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 23, 2022 – 08:25 pm BST

PDB ID : 7Z2N
Title : Tubulin-18-complex
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Deposited on : 2022-02-28
Resolution : 2.17 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 types of validation reports are described at <http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.30
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) : 2.30

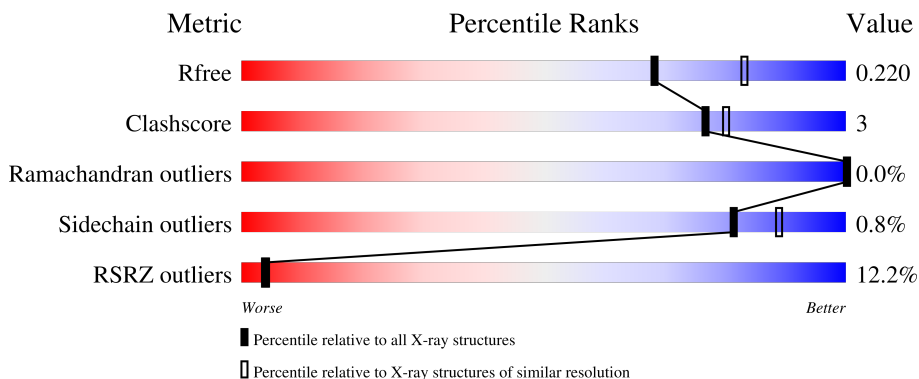
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.17 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	6864 (2.20-2.16)
Clashscore	141614	7689 (2.20-2.16)
Ramachandran outliers	138981	7564 (2.20-2.16)
Sidechain outliers	138945	7564 (2.20-2.16)
RSRZ outliers	127900	6738 (2.20-2.16)

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	
1	C	451	
2	B	445	
2	D	445	
3	E	143	

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Mol	Chain	Length	Quality of chain
4	F	384	 <p>A horizontal bar chart showing the quality distribution of chain F. The bar is divided into four segments: a red segment representing 29%, a green segment representing 81%, a yellow segment representing 9%, and a grey segment representing 11%.</p>

2 Entry composition i

There are 12 unique types of molecules in this entry. The entry contains 18229 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	438	Total	C	N	O	S	0	3	0
			3433	2173	582	654	24			
1	C	440	Total	C	N	O	S	0	5	0
			3466	2193	589	661	23			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	424	Total	C	N	O	S	0	4	0
			3365	2119	575	644	27			
2	D	425	Total	C	N	O	S	1	0	0
			3337	2095	569	646	27			

- 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	0	0
			1014	625	183	201	5			

There are 2 discrepancies between the modelled and reference sequences:

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

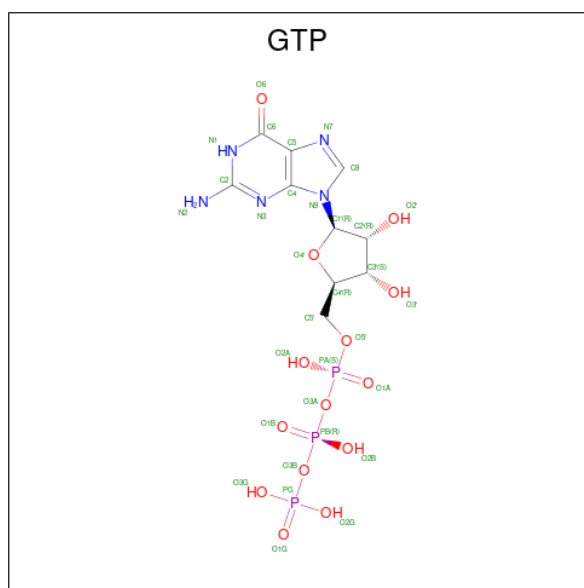
- Molecule 4 is a protein called Tubulin beta-2B chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	F	343	Total	C	N	O	S	0	0	0
			2806	1800	482	510	14			

There are 6 discrepancies between the modelled and reference sequences:

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

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



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

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

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

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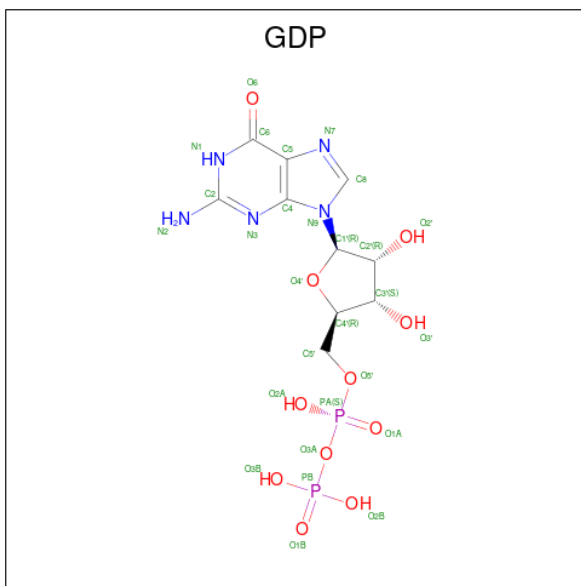
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	F	1	Total	Mg	0	0
			1	1		

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

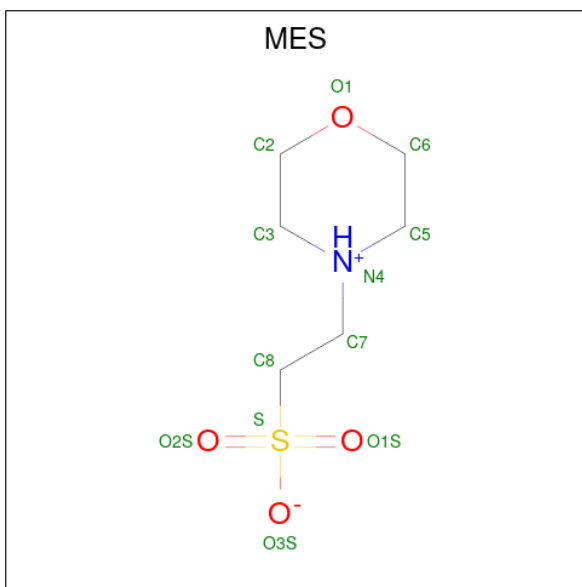
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total	Ca	0	0
			1	1		
7	B	1	Total	Ca	0	0
			1	1		
7	C	1	Total	Ca	0	0
			1	1		
7	E	1	Total	Ca	0	0
			1	1		

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



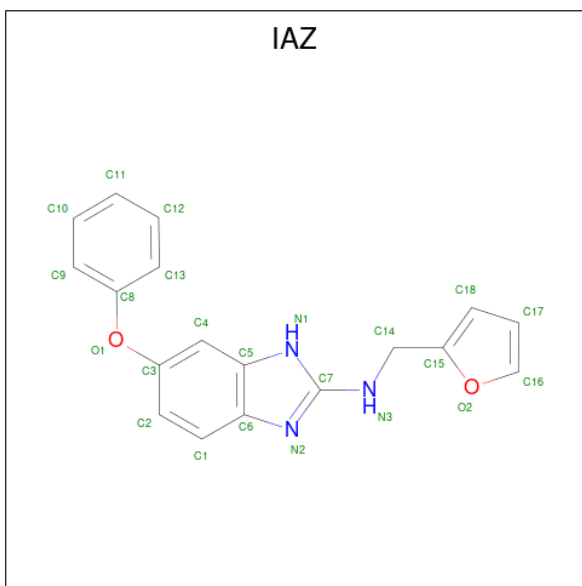
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
8	B	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
8	D	1	Total	C	N	O	P	0	0
			28	10	5	11	2		

- Molecule 9 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C₆H₁₃NO₄S).



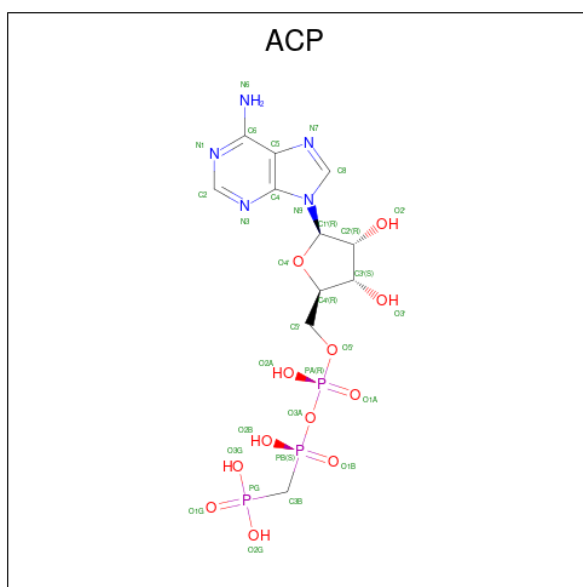
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
9	B	1	12	6	1	4	1	0	0

- Molecule 10 is {N}-(furan-2-ylmethyl)-6-phenoxy-1 {H}-benzimidazol-2-amine (three-letter code: IAZ) (formula: C₁₈H₁₅N₃O₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O			
10	B	1	23	18	3	2		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

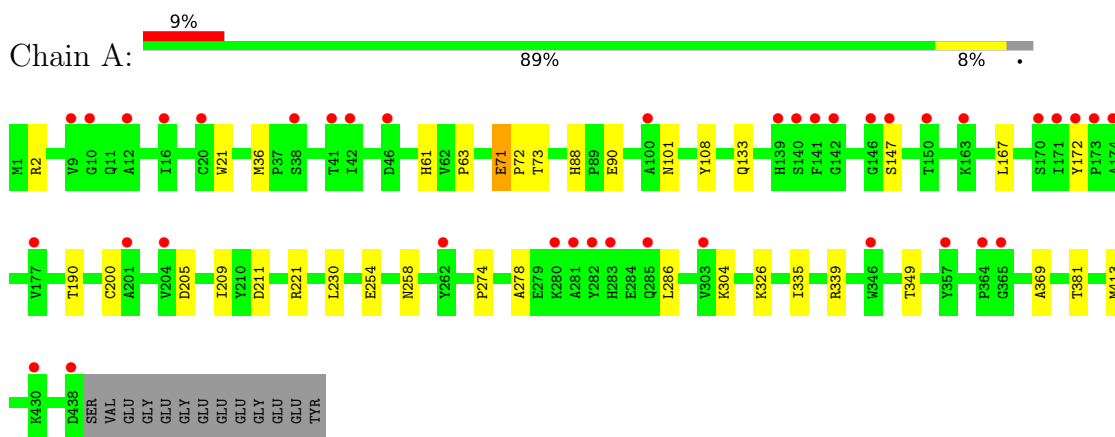
- Molecule 12 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
12	A	129	Total	O	0	0
			129	129		
12	B	134	Total	O	0	0
			134	134		
12	C	209	Total	O	0	0
			209	209		
12	D	61	Total	O	0	0
			61	61		
12	E	30	Total	O	0	0
			30	30		
12	F	50	Total	O	0	0
			50	50		

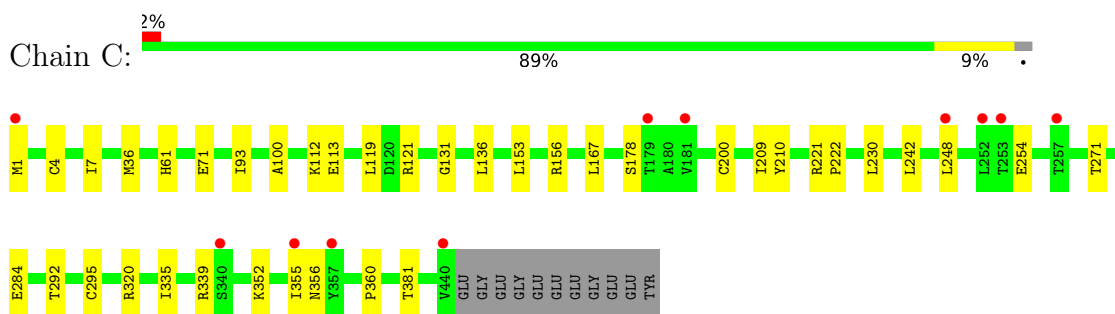
3 Residue-property plots [i](#)

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

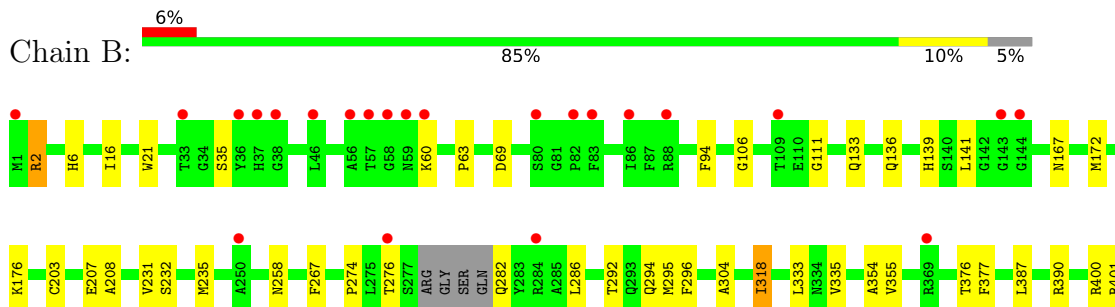
- Molecule 1: Tubulin alpha-1B chain

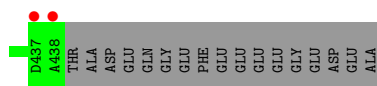


- Molecule 1: Tubulin alpha-1B chain

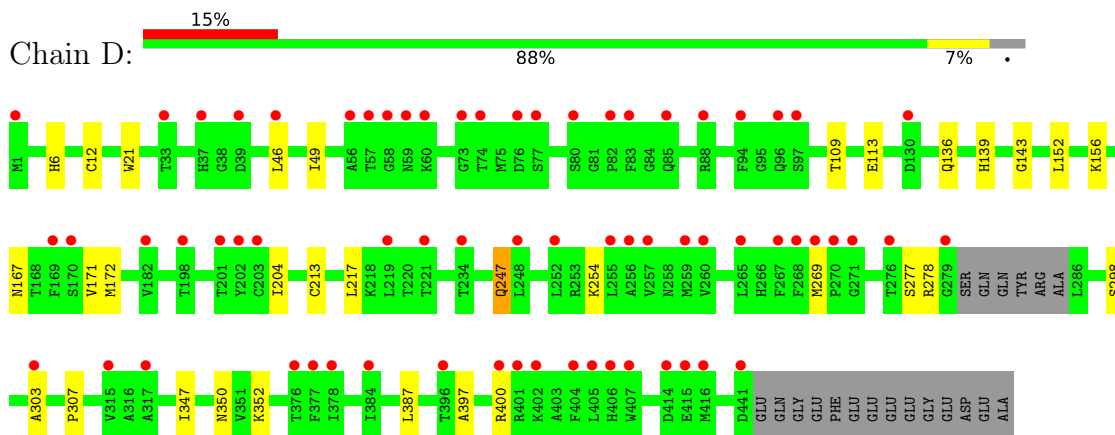


- Molecule 2: Tubulin beta-2B chain

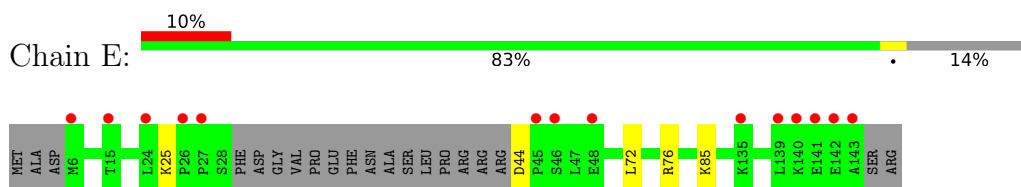




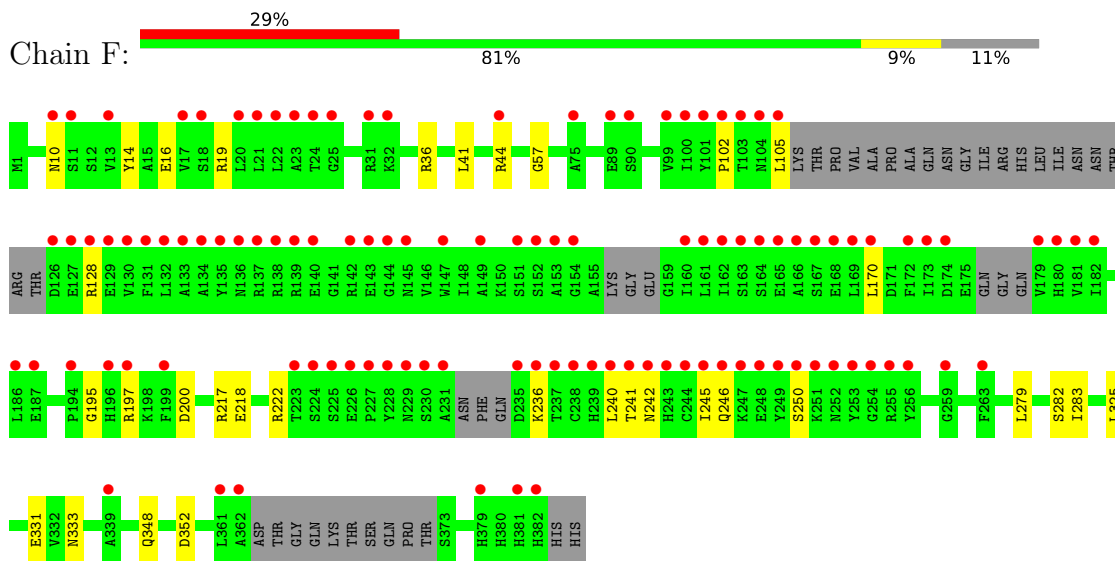
• Molecule 2: Tubulin beta-2B chain



• Molecule 3: Stathmin-4



• Molecule 4: Tubulin beta-2B chain



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	105.02Å 157.70Å 180.15Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.82 – 2.17 49.82 – 2.17	Depositor EDS
% Data completeness (in resolution range)	99.9 (49.82-2.17) 99.9 (49.82-2.17)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.71 (at 2.18Å)	Xtriage
Refinement program	PHENIX 1.19.1_4122	Depositor
R, R_{free}	0.189 , 0.224 0.186 , 0.220	Depositor DCC
R_{free} test set	7889 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	47.6	Xtriage
Anisotropy	0.078	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	18229	wwPDB-VP
Average B, all atoms (Å ²)	63.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.53% 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: MES, IAZ, MG, GTP, CA, ACP, GDP

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.26	0/3520	0.48	0/4778
1	C	0.27	0/3557	0.50	0/4830
2	B	0.26	0/3451	0.49	0/4672
2	D	0.25	0/3410	0.47	0/4618
3	E	0.24	0/1022	0.41	0/1356
4	F	0.24	0/2869	0.47	0/3873
All	All	0.26	0/17829	0.48	0/24127

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	3433	0	3349	19	0
1	C	3466	0	3377	20	0
2	B	3365	0	3268	28	0
2	D	3337	0	3217	18	0
3	E	1014	0	1029	4	0
4	F	2806	0	2773	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	0	0
8	D	28	0	12	2	0
9	B	12	0	12	1	0
10	B	23	0	0	0	0
11	F	31	0	14	3	0
12	A	129	0	0	0	0
12	B	134	0	0	3	0
12	C	209	0	0	0	0
12	D	61	0	0	0	0
12	E	30	0	0	2	0
12	F	50	0	0	1	0
All	All	18229	0	17087	105	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 (105) 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:274:PRO:HB3	2:B:286:LEU:HD22	1.71	0.72
2:B:318[A]:ILE:HG23	2:B:376:THR:HB	1.76	0.67
2:B:318[B]:ILE:HD13	2:B:354:ALA:HB3	1.76	0.66
2:B:176:LYS:HD2	2:B:207:GLU:HG3	1.77	0.65
4:F:102:PRO:HG2	4:F:105:LEU:HD13	1.78	0.64
1:A:335:ILE:HG23	1:A:339:ARG:HG3	1.82	0.61
4:F:10:ASN:HB2	4:F:44:ARG:HH22	1.65	0.60
4:F:331:GLU:OE2	11:F:401:ACP:O3G	2.19	0.59
4:F:16:GLU:OE2	4:F:19:ARG:NH2	2.35	0.59
4:F:236:LYS:HB3	4:F:240:LEU:HD13	1.85	0.59
2:D:172:MET:HG3	2:D:387:LEU:HD11	1.85	0.58
4:F:331:GLU:OE2	4:F:333:ASN:ND2	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:217:LEU:HA	2:D:277:SER:HB3	1.87	0.56
1:A:71:GLU:OE2	1:A:73:THR:OG1	2.17	0.56
1:C:209:ILE:HG23	1:C:230:LEU:HD23	1.86	0.56
4:F:348:GLN:NE2	4:F:352:ASP:OD1	2.38	0.56
4:F:241:THR:OG1	11:F:401:ACP:O3'	2.23	0.55
1:A:101:ASN:HD22	2:B:258:ASN:HD21	1.55	0.55
3:E:44:ASP:N	12:E:303:HOH:O	2.39	0.55
4:F:217:ARG:HG3	4:F:218:GLU:HG2	1.89	0.55
4:F:36:ARG:NH1	12:F:502:HOH:O	2.40	0.54
4:F:14:TYR:HB3	4:F:41:LEU:HD13	1.89	0.54
2:B:294:GLN:OE1	12:B:601:HOH:O	2.18	0.53
2:D:269:MET:HG3	2:D:303:ALA:HB3	1.90	0.53
2:D:46:LEU:HA	2:D:49:ILE:HB	1.91	0.53
1:C:100:ALA:HA	2:D:254:LYS:HG3	1.91	0.53
4:F:241:THR:HG1	11:F:401:ACP:HO3'	1.58	0.52
2:D:6:HIS:CD2	2:D:21:TRP:HE1	2.28	0.51
4:F:128:ARG:HH12	4:F:170:LEU:HB3	1.76	0.51
2:B:282:GLN:N	12:B:608:HOH:O	2.43	0.51
1:C:335:ILE:HG23	1:C:339:ARG:HG3	1.91	0.51
1:C:112:LYS:NZ	1:C:113:GLU:OE2	2.44	0.51
1:C:1:MET:HE3	1:C:131:GLY:HA3	1.93	0.49
2:D:213:CYS:HA	2:D:217:LEU:HB2	1.93	0.49
1:A:71:GLU:HG2	1:A:72:PRO:HD2	1.94	0.49
2:B:390[A]:ARG:NE	12:B:610:HOH:O	2.44	0.49
4:F:242:ASN:HD22	4:F:245:ILE:HD12	1.77	0.49
1:C:136:LEU:HD23	1:C:167:LEU:HB2	1.95	0.49
2:B:16[A]:ILE:HD13	2:B:231:VAL:HG11	1.94	0.49
2:D:136:GLN:HA	2:D:167:ASN:O	2.13	0.48
1:C:292:THR:HG22	1:C:335:ILE:HD12	1.96	0.48
1:A:211:ASP:OD2	1:A:304:LYS:NZ	2.36	0.48
1:C:167:LEU:HG	1:C:200:CYS:HB3	1.95	0.48
1:C:248:LEU:HD13	1:C:355:ILE:HD12	1.96	0.48
1:A:274:PRO:HB3	1:A:286:LEU:HD12	1.97	0.47
2:B:106:GLY:O	2:B:111:GLY:HA3	2.15	0.47
1:C:254:GLU:HG2	1:C:352:LYS:HE2	1.97	0.47
1:C:320:ARG:HA	1:C:356:ASN:O	2.15	0.46
4:F:282:SER:HB2	4:F:325:LEU:HD13	1.97	0.46
3:E:85:LYS:NZ	12:E:304:HOH:O	2.48	0.45
1:C:36:MET:HB3	1:C:61:HIS:CE1	2.51	0.45
1:A:278:ALA:HA	1:A:369:ALA:HB2	1.96	0.45
1:C:93:ILE:HD11	1:C:121:ARG:HG3	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:292:THR:HG22	2:B:335:VAL:HG21	1.99	0.45
1:C:178:SER:OG	2:D:352:LYS:NZ	2.50	0.45
2:D:12:CYS:HB2	8:D:501:GDP:C8	2.51	0.45
2:B:2:ARG:HB2	2:B:133:GLN:HG3	1.98	0.45
2:B:136:GLN:HA	2:B:167:ASN:O	2.17	0.45
2:B:276:THR:HG21	2:B:282:GLN:HA	1.99	0.45
1:A:108:TYR:CE2	1:A:413:MET:HG3	2.52	0.45
1:A:209:ILE:HG23	1:A:230:LEU:HD23	1.98	0.45
2:B:296:PHE:CD1	2:B:335:VAL:HG11	2.52	0.44
1:A:254:GLU:HG2	1:A:258:ASN:ND2	2.31	0.44
2:B:333:LEU:HD11	4:F:57:GLY:HA3	1.98	0.44
1:A:349:THR:HB	3:E:25:LYS:HB3	2.00	0.44
1:C:4[A]:CYS:SG	1:C:136:LEU:HG	2.57	0.44
4:F:246:GLN:O	4:F:250:SER:HB3	2.17	0.44
2:D:397:ALA:HA	2:D:400:ARG:NH1	2.33	0.44
2:D:171:VAL:HA	2:D:204:ILE:O	2.17	0.44
1:A:2:ARG:HB3	1:A:133:GLN:HG3	2.00	0.43
2:B:35:SER:HG	2:B:60:LYS:HZ3	1.64	0.43
1:C:7:ILE:HG21	1:C:153:LEU:HD21	2.01	0.43
4:F:195:GLY:HA3	4:F:197:ARG:HD3	2.01	0.43
2:B:6:HIS:CD2	2:B:21:TRP:HE1	2.37	0.43
1:A:36:MET:HB3	1:A:61:HIS:CE1	2.54	0.43
2:B:203:CYS:SG	2:B:267:PHE:HB3	2.58	0.43
9:B:504:MES:H81	9:B:504:MES:H51	1.78	0.43
3:E:72:LEU:O	3:E:76:ARG:HG2	2.18	0.43
2:B:69:ASP:O	2:B:94:PHE:HA	2.19	0.43
2:B:295:MET:HG2	2:B:377:PHE:HB2	2.01	0.43
1:C:119:LEU:HD11	1:C:156:ARG:HB3	2.00	0.43
1:C:271:THR:HG21	1:C:295:CYS:O	2.18	0.43
2:B:235:MET:HB3	2:B:235:MET:HE2	1.88	0.42
1:A:88:HIS:HD2	1:A:90:GLU:HB2	1.83	0.42
2:B:141:LEU:HD12	2:B:172:MET:SD	2.60	0.42
2:D:109:THR:O	2:D:113:GLU:HG2	2.19	0.42
1:A:326:LYS:HB3	1:A:326:LYS:HE2	1.80	0.42
2:D:143:GLY:HA3	8:D:501:GDP:O3A	2.19	0.42
4:F:200:ASP:OD1	4:F:222:ARG:HB2	2.20	0.42
2:B:172:MET:HG3	2:B:387:LEU:HD11	2.02	0.41
2:B:295:MET:CG	2:B:377:PHE:HB2	2.50	0.41
2:D:152:LEU:O	2:D:156:LYS:HG2	2.20	0.41
1:A:147:SER:HB2	1:A:190:THR:HB	2.02	0.41
2:B:21:TRP:CZ3	2:B:63:PRO:HB3	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:210:TYR:CZ	1:C:222:PRO:HD2	2.56	0.41
2:D:247:GLN:HE21	2:D:247:GLN:HB3	1.56	0.41
1:A:167:LEU:HG	1:A:200:CYS:HB3	2.03	0.41
1:A:172:TYR:HB3	1:A:205:ASP:HA	2.03	0.41
2:D:347:ILE:HG22	2:D:350:ASN:HB3	2.02	0.41
2:B:208:ALA:HB2	2:B:304:ALA:HB2	2.02	0.41
1:C:320:ARG:HG3	1:C:360:PRO:HG3	2.02	0.41
1:A:21:TRP:CZ3	1:A:63:PRO:HB3	2.55	0.40
2:B:400:ARG:HG3	2:B:401:ARG:HG2	2.03	0.40
2:D:298:SER:HB3	2:D:307:PRO:HD2	2.04	0.40
4:F:279:LEU:HD12	4:F:283:ILE:HB	2.03	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	439/451 (97%)	433 (99%)	6 (1%)	0	100	100
1	C	443/451 (98%)	434 (98%)	9 (2%)	0	100	100
2	B	424/445 (95%)	416 (98%)	8 (2%)	0	100	100
2	D	421/445 (95%)	416 (99%)	4 (1%)	1 (0%)	47	52
3	E	119/143 (83%)	119 (100%)	0	0	100	100
4	F	331/384 (86%)	322 (97%)	9 (3%)	0	100	100
All	All	2177/2319 (94%)	2140 (98%)	36 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	D	278	ARG

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	372/379 (98%)	369 (99%)	3 (1%)	81	89
1	C	376/379 (99%)	371 (99%)	5 (1%)	69	79
2	B	371/383 (97%)	365 (98%)	6 (2%)	62	74
2	D	367/383 (96%)	365 (100%)	2 (0%)	88	94
3	E	110/127 (87%)	110 (100%)	0	100	100
4	F	307/342 (90%)	307 (100%)	0	100	100
All	All	1903/1993 (96%)	1887 (99%)	16 (1%)	81	89

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	71	GLU
1	A	221	ARG
1	A	381	THR
2	B	2	ARG
2	B	139	HIS
2	B	232	SER
2	B	318[A]	ILE
2	B	318[B]	ILE
2	B	355	VAL
1	C	71	GLU
1	C	221	ARG
1	C	242	LEU
1	C	284	GLU
1	C	381	THR
2	D	139	HIS
2	D	247	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	88	HIS

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Mol	Chain	Res	Type
1	A	101	ASN
2	B	282	GLN
1	C	11	GLN
1	C	85	GLN
2	D	247	GLN
4	F	348	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 16 ligands modelled in this entry, 9 are monoatomic - leaving 7 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	1.12	2 (7%)	32,54,54	1.36	5 (15%)
9	MES	B	504	-	12,12,12	2.09	1 (8%)	14,16,16	1.95	5 (35%)
5	GTP	C	501	6	26,34,34	1.13	2 (7%)	32,54,54	1.35	5 (15%)
10	IAZ	B	505	-	23,26,26	1.22	2 (8%)	24,35,35	1.39	5 (20%)
11	ACP	F	401	6	27,33,33	1.39	5 (18%)	32,52,52	1.41	4 (12%)
8	GDP	D	501	6	24,30,30	0.93	1 (4%)	30,47,47	1.18	3 (10%)
8	GDP	B	501	6	24,30,30	0.92	1 (4%)	30,47,47	1.05	3 (10%)

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

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	B	504	MES	C8-S	-6.96	1.67	1.77
10	B	505	IAZ	C18-C15	-4.07	1.34	1.39
5	C	501	GTP	C5-C6	-4.02	1.39	1.47
5	A	501	GTP	C5-C6	-3.91	1.39	1.47
11	F	401	ACP	PG-O2G	2.89	1.61	1.54
11	F	401	ACP	PG-O3G	2.87	1.61	1.54
10	B	505	IAZ	C14-C15	-2.74	1.48	1.51
11	F	401	ACP	PB-O3A	2.68	1.61	1.58
11	F	401	ACP	C5-C4	2.51	1.47	1.40
8	B	501	GDP	C6-N1	-2.26	1.34	1.37
8	D	501	GDP	C6-N1	-2.25	1.34	1.37
11	F	401	ACP	PB-O2B	2.25	1.61	1.56
5	A	501	GTP	C2-N3	2.07	1.38	1.33
5	C	501	GTP	C2-N3	2.06	1.38	1.33

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	B	504	MES	C5-N4-C3	3.71	117.18	108.83
9	B	504	MES	O1S-S-C8	3.67	111.34	106.92
11	F	401	ACP	PB-O3A-PA	-3.67	120.92	132.56
11	F	401	ACP	C3'-C2'-C1'	3.20	105.79	100.98
11	F	401	ACP	N3-C2-N1	-3.13	123.79	128.68
5	A	501	GTP	C5-C6-N1	3.10	119.43	113.95
5	C	501	GTP	C8-N7-C5	3.10	108.89	102.99
10	B	505	IAZ	C3-O1-C8	3.09	126.03	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	501	GTP	C8-N7-C5	3.05	108.81	102.99
5	C	501	GTP	C5-C6-N1	3.05	119.33	113.95
8	D	501	GDP	PA-O3A-PB	-3.03	122.42	132.83
10	B	505	IAZ	C2-C1-C6	-2.98	117.09	120.84
11	F	401	ACP	C4-C5-N7	-2.71	106.58	109.40
5	C	501	GTP	C2-N1-C6	-2.68	120.16	125.10
9	B	504	MES	C6-C5-N4	-2.68	106.04	110.10
5	A	501	GTP	PB-O3B-PG	-2.67	123.68	132.83
5	C	501	GTP	PB-O3B-PG	-2.55	124.07	132.83
5	A	501	GTP	C2-N1-C6	-2.55	120.40	125.10
8	B	501	GDP	C5-C6-N1	2.52	118.40	113.95
9	B	504	MES	O3S-S-C8	2.48	109.78	105.77
10	B	505	IAZ	C14-C15-C18	2.48	133.12	129.01
9	B	504	MES	C7-N4-C5	2.45	117.50	111.23
5	A	501	GTP	PA-O3A-PB	-2.41	124.55	132.83
8	D	501	GDP	C8-N7-C5	2.40	107.56	102.99
10	B	505	IAZ	C14-N3-C7	-2.31	120.04	123.28
8	B	501	GDP	C8-N7-C5	2.30	107.37	102.99
5	C	501	GTP	PA-O3A-PB	-2.29	124.97	132.83
8	D	501	GDP	C5-C6-N1	2.27	117.96	113.95
8	B	501	GDP	PA-O3A-PB	-2.20	125.29	132.83
10	B	505	IAZ	C7-N1-C5	-2.08	103.86	106.73

There are no chirality outliers.

All (31) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	501	GTP	C5'-O5'-PA-O1A
5	A	501	GTP	C5'-O5'-PA-O2A
5	C	501	GTP	C5'-O5'-PA-O1A
5	C	501	GTP	C5'-O5'-PA-O2A
8	B	501	GDP	C5'-O5'-PA-O1A
8	B	501	GDP	C5'-O5'-PA-O2A
8	D	501	GDP	C5'-O5'-PA-O1A
8	D	501	GDP	C5'-O5'-PA-O2A
9	B	504	MES	C8-C7-N4-C5
11	F	401	ACP	PB-C3B-PG-O1G
11	F	401	ACP	PB-C3B-PG-O2G
11	F	401	ACP	O4'-C4'-C5'-O5'
11	F	401	ACP	C3'-C4'-C5'-O5'
8	D	501	GDP	PA-O3A-PB-O3B
9	B	504	MES	C7-C8-S-O2S

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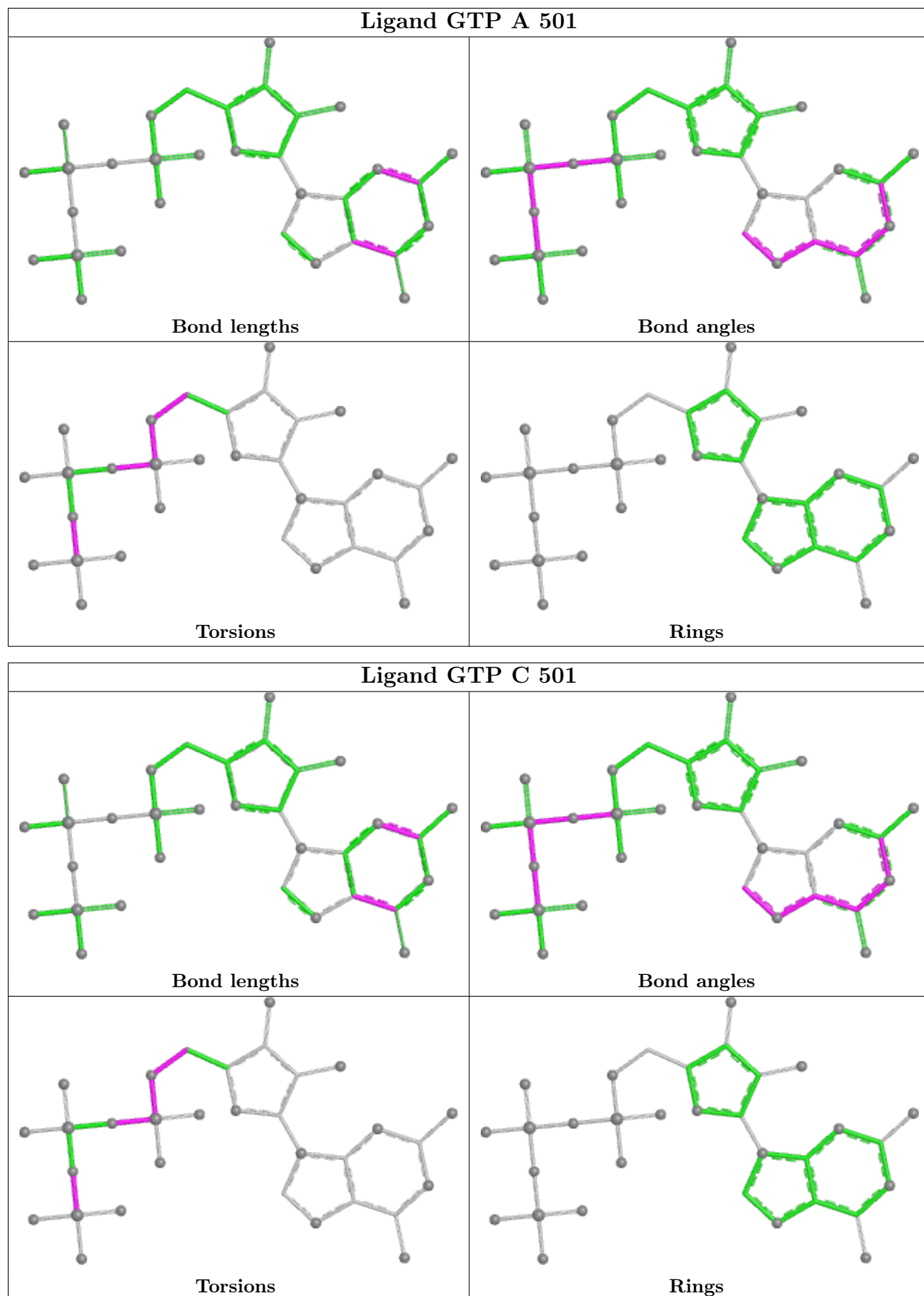
Mol	Chain	Res	Type	Atoms
11	F	401	ACP	PB-C3B-PG-O3G
5	A	501	GTP	PB-O3A-PA-O2A
5	C	501	GTP	PB-O3A-PA-O2A
5	A	501	GTP	C4'-C5'-O5'-PA
5	C	501	GTP	C4'-C5'-O5'-PA
5	A	501	GTP	PB-O3B-PG-O1G
5	C	501	GTP	PB-O3B-PG-O1G
5	A	501	GTP	PB-O3B-PG-O2G
5	A	501	GTP	PB-O3B-PG-O3G
5	C	501	GTP	PB-O3B-PG-O3G
5	A	501	GTP	C5'-O5'-PA-O3A
5	C	501	GTP	C5'-O5'-PA-O3A
8	B	501	GDP	C5'-O5'-PA-O3A
8	D	501	GDP	C5'-O5'-PA-O3A
5	A	501	GTP	PB-O3A-PA-O1A
9	B	504	MES	C7-C8-S-O3S

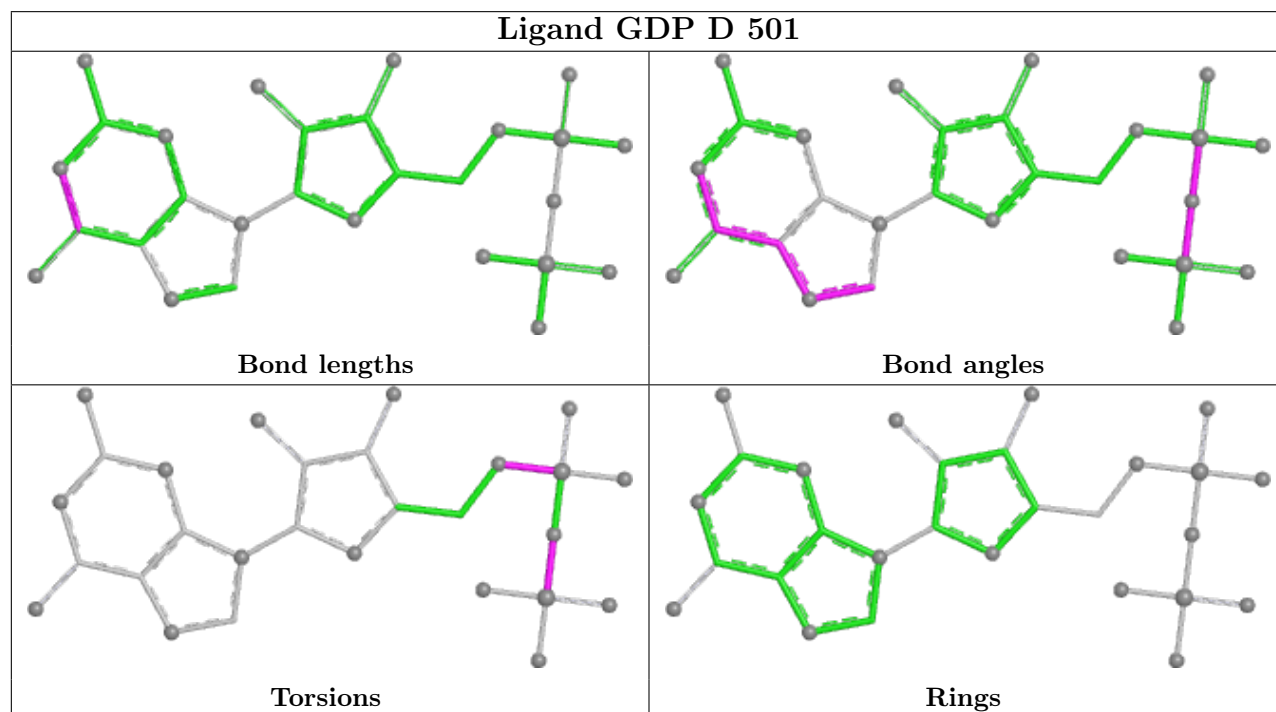
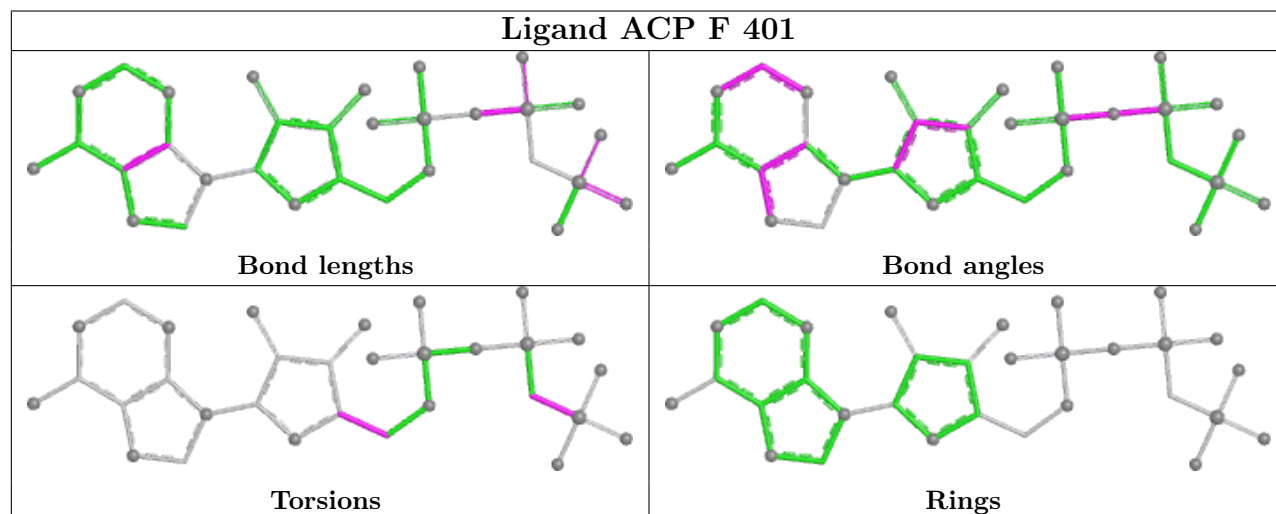
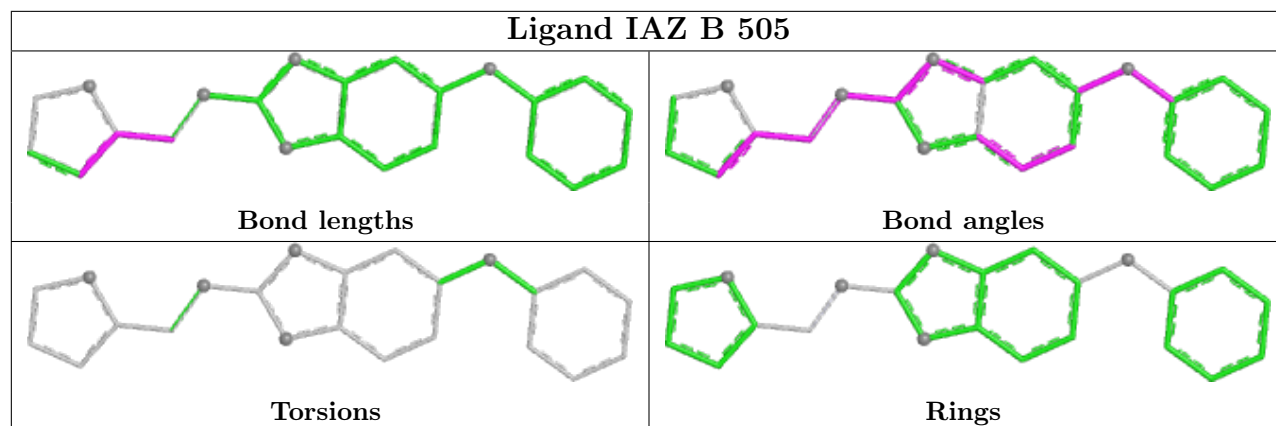
There are no ring outliers.

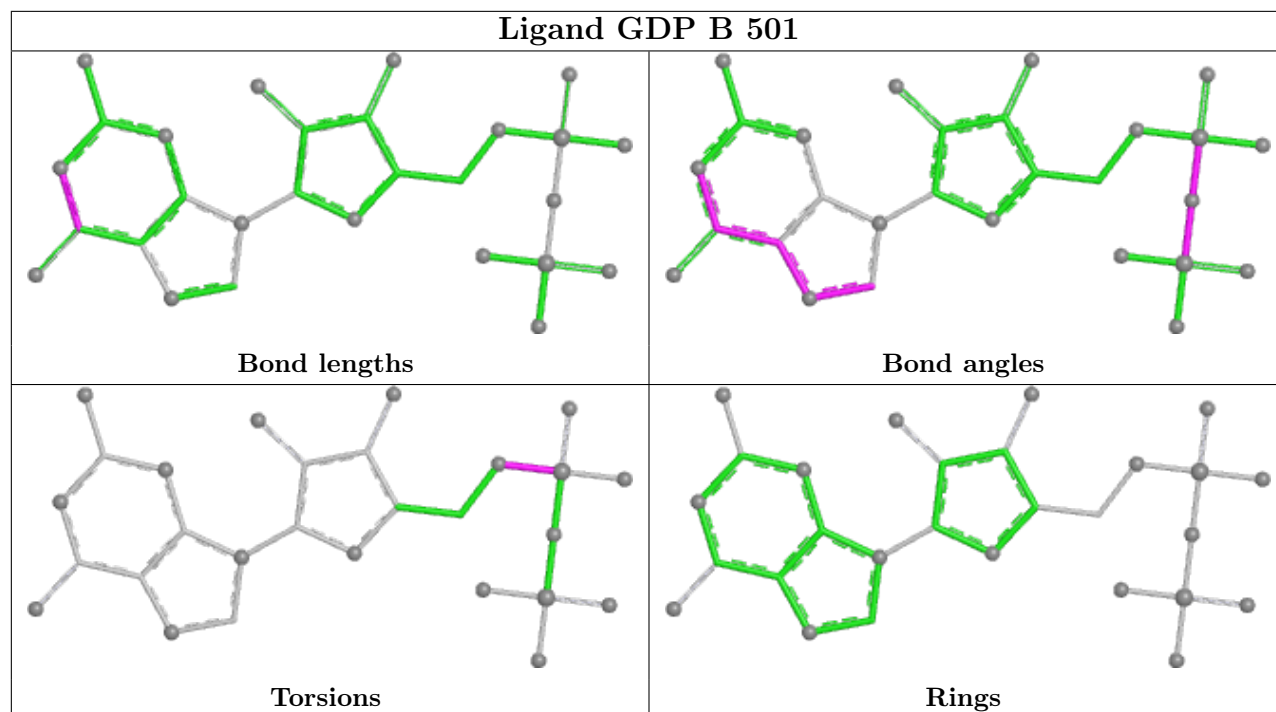
3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	B	504	MES	1	0
11	F	401	ACP	3	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 than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

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%)	0.59	39 (8%) 9 10	38, 55, 83, 141	0
1	C	440/451 (97%)	0.29	11 (2%) 57 58	33, 45, 69, 116	0
2	B	424/445 (95%)	0.54	25 (5%) 22 23	36, 53, 86, 132	0
2	D	425/445 (95%)	0.83	67 (15%) 2 2	41, 65, 100, 129	2 (0%)
3	E	123/143 (86%)	0.78	14 (11%) 5 5	44, 69, 109, 143	0
4	F	343/384 (89%)	1.55	112 (32%) 0 0	49, 79, 143, 165	0
All	All	2193/2319 (94%)	0.73	268 (12%) 4 4	33, 58, 107, 165	2 (0%)

All (268) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	F	130	VAL	10.8
4	F	103	THR	9.9
4	F	249	TYR	9.7
4	F	173	ILE	9.0
4	F	169	LEU	8.4
4	F	251	LYS	8.2
4	F	170	LEU	7.4
4	F	182	ILE	7.3
4	F	253	TYR	7.2
2	B	59	ASN	7.1
3	E	26	PRO	7.0
4	F	161	LEU	7.0
4	F	129	GLU	7.0
1	A	282	TYR	6.9
4	F	134	ALA	6.6
3	E	27	PRO	6.6
4	F	104	ASN	6.4
4	F	250	SER	6.4
4	F	240	LEU	6.1

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Mol	Chain	Res	Type	RSRZ
3	E	139	LEU	6.0
2	D	57	THR	6.0
1	C	340	SER	5.9
4	F	99	VAL	5.9
4	F	100	ILE	5.7
2	D	94	PHE	5.6
2	B	1	MET	5.6
1	C	440	VAL	5.5
4	F	20	LEU	5.4
4	F	105	LEU	5.4
4	F	135	TYR	5.4
1	A	262	TYR	5.4
4	F	132	LEU	5.3
4	F	89	GLU	5.2
4	F	244	CYS	5.2
4	F	248	GLU	5.1
4	F	131	PHE	5.1
4	F	142	ARG	5.0
2	B	57	THR	5.0
4	F	181	VAL	5.0
4	F	382	HIS	5.0
4	F	231	ALA	4.9
4	F	238	CYS	4.8
4	F	167	SER	4.8
4	F	243	HIS	4.7
2	D	37	HIS	4.7
4	F	166	ALA	4.6
4	F	252	ASN	4.6
4	F	151	SER	4.6
3	E	143	ALA	4.6
4	F	101	TYR	4.6
3	E	142	GLU	4.5
2	D	56	ALA	4.5
4	F	22	LEU	4.4
2	B	58	GLY	4.3
4	F	259	GLY	4.3
2	B	438	ALA	4.3
4	F	228	TYR	4.2
4	F	242	ASN	4.2
2	D	82	PRO	4.2
4	F	17	VAL	4.2
4	F	362	ALA	4.1

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Mol	Chain	Res	Type	RSRZ
2	D	33	THR	4.1
4	F	256	TYR	4.1
2	D	400	ARG	4.1
4	F	136	ASN	4.1
4	F	223	THR	4.0
4	F	245	ILE	4.0
2	B	37	HIS	4.0
4	F	239	HIS	4.0
2	D	59	ASN	3.9
4	F	361	LEU	3.9
4	F	236	LYS	3.9
3	E	6	MET	3.8
4	F	152	SER	3.8
4	F	133	ALA	3.8
4	F	254	GLY	3.8
4	F	153	ALA	3.8
4	F	246	GLN	3.7
2	D	415	GLU	3.7
2	D	401	ARG	3.7
4	F	241	THR	3.6
4	F	179	VAL	3.6
4	F	186	LEU	3.6
4	F	230	SER	3.6
4	F	172	PHE	3.5
2	B	437	ASP	3.5
4	F	21	LEU	3.5
2	B	276	THR	3.5
4	F	227	PRO	3.5
1	A	346	TRP	3.5
2	B	82	PRO	3.4
4	F	165	GLU	3.4
2	D	405	LEU	3.4
4	F	138	ARG	3.4
4	F	143	GLU	3.4
4	F	247	LYS	3.3
2	D	202	TYR	3.3
2	D	404	PHE	3.3
2	B	369	ARG	3.3
4	F	126	ASP	3.3
2	B	83	PHE	3.2
2	D	268	PHE	3.2
1	A	177	VAL	3.2

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Mol	Chain	Res	Type	RSRZ
4	F	137	ARG	3.2
3	E	140	LYS	3.2
1	C	357	TYR	3.2
4	F	24	THR	3.1
3	E	135	LYS	3.1
4	F	140	GLU	3.1
1	A	42	ILE	3.1
2	B	88	ARG	3.1
2	D	407	TRP	3.1
2	D	276	THR	3.1
4	F	224	SER	3.1
1	A	438	ASP	3.1
2	D	76	ASP	3.1
4	F	10	ASN	3.0
4	F	31	ARG	3.0
4	F	199	PHE	3.0
2	D	58	GLY	3.0
1	C	253	THR	3.0
1	A	364	PRO	3.0
2	D	97	SER	3.0
2	D	74	THR	3.0
1	A	283	HIS	3.0
1	A	171	ILE	3.0
2	D	267	PHE	3.0
2	D	279	GLY	3.0
1	A	9	VAL	2.9
4	F	196	HIS	2.9
2	D	384	ILE	2.9
2	D	77	SER	2.9
2	D	85	GLN	2.9
4	F	18	SER	2.9
4	F	163	SER	2.9
2	D	317	ALA	2.9
2	D	182	VAL	2.9
3	E	15	THR	2.9
2	D	255	LEU	2.9
2	D	406	HIS	2.9
1	C	1	MET	2.9
4	F	379	HIS	2.8
4	F	149	ALA	2.8
1	C	179	THR	2.8
1	C	248	LEU	2.8

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Mol	Chain	Res	Type	RSRZ
4	F	162	ILE	2.8
4	F	197	ARG	2.8
2	D	269	MET	2.8
2	D	83	PHE	2.8
2	B	33	THR	2.8
4	F	147	TRP	2.8
4	F	145	ASN	2.8
4	F	225	SER	2.8
2	D	315	VAL	2.7
4	F	102	PRO	2.7
2	D	252	LEU	2.7
1	A	281	ALA	2.7
4	F	381	HIS	2.7
4	F	32	LYS	2.7
4	F	263	PHE	2.7
2	D	378	ILE	2.7
2	D	257	VAL	2.7
4	F	11	SER	2.7
1	A	280	LYS	2.7
2	D	402	LYS	2.6
1	A	146	GLY	2.6
1	A	16	ILE	2.6
2	D	248	LEU	2.6
2	D	260	VAL	2.6
2	D	201	THR	2.6
2	D	60	LYS	2.6
2	B	36	TYR	2.6
2	D	441	ASP	2.6
2	B	144	GLY	2.6
4	F	154	GLY	2.6
4	F	174	ASP	2.6
4	F	229	ASN	2.5
4	F	194	PRO	2.5
3	E	46	SER	2.5
4	F	75	ALA	2.5
2	D	1	MET	2.5
1	C	252	LEU	2.5
1	A	303	VAL	2.5
4	F	160	ILE	2.5
2	D	73	GLY	2.5
1	A	285	GLN	2.5
4	F	235	ASP	2.4

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Mol	Chain	Res	Type	RSRZ
2	B	284	ARG	2.4
4	F	255	ARG	2.4
3	E	141	GLU	2.4
1	A	46	ASP	2.4
2	B	38	GLY	2.4
2	D	271	GLY	2.4
1	A	201	ALA	2.4
4	F	23	ALA	2.4
4	F	339	ALA	2.4
2	D	96	GLN	2.4
1	A	12	ALA	2.4
2	D	221	THR	2.4
2	D	169	PHE	2.4
4	F	237	THR	2.4
2	D	46	LEU	2.3
2	B	109	THR	2.3
3	E	48	GLU	2.3
2	B	80	SER	2.3
2	D	88	ARG	2.3
1	A	170	SER	2.3
1	A	204	VAL	2.3
2	B	46	LEU	2.3
4	F	164	SER	2.3
1	A	174	ALA	2.3
4	F	13	VAL	2.3
4	F	180	HIS	2.3
1	A	173	PRO	2.3
1	A	41	THR	2.3
2	D	234	THR	2.3
4	F	144	GLY	2.3
2	D	256	ALA	2.2
2	D	414	ASP	2.2
1	A	139	HIS	2.2
1	A	147	SER	2.2
4	F	90	SER	2.2
2	D	203	CYS	2.2
3	E	24	LEU	2.2
4	F	127	GLU	2.2
4	F	226	GLU	2.2
4	F	44	ARG	2.2
2	D	259	MET	2.2
4	F	139	ARG	2.2

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Mol	Chain	Res	Type	RSRZ
2	D	80	SER	2.2
2	D	198	THR	2.2
1	A	141	PHE	2.2
1	A	142	GLY	2.2
4	F	187	GLU	2.2
2	B	86	ILE	2.2
2	D	265	LEU	2.2
2	B	56	ALA	2.2
1	A	163	LYS	2.2
1	C	355	ILE	2.1
2	D	376	THR	2.1
4	F	128	ARG	2.1
2	D	270	PRO	2.1
2	D	219	LEU	2.1
1	A	430	LYS	2.1
1	A	357	TYR	2.1
2	B	143	GLY	2.1
4	F	25	GLY	2.1
1	A	140	SER	2.1
2	D	396	THR	2.1
3	E	45	PRO	2.1
4	F	168	GLU	2.1
1	A	172	TYR	2.1
2	D	130	ASP	2.1
2	D	39	ASP	2.1
1	A	100	ALA	2.1
1	A	150	THR	2.1
2	B	250	ALA	2.1
1	A	10	GLY	2.1
1	A	365	GLY	2.1
1	A	20	CYS	2.1
2	D	416	MET	2.0
1	C	181	VAL	2.0
1	A	38	SER	2.0
2	D	377	PHE	2.0
2	B	60	LYS	2.0
2	D	170	SER	2.0
1	C	257	THR	2.0
2	D	303	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 monosaccharides in this entry.

6.4 Ligands [i](#)

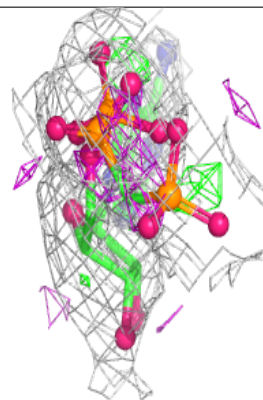
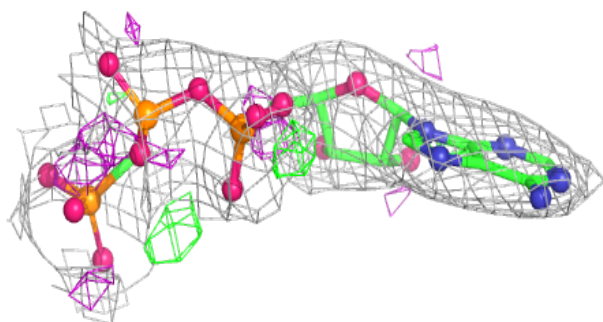
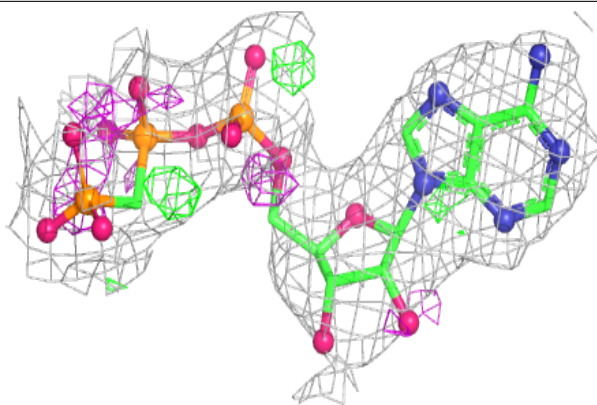
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
11	ACP	F	401	31/31	0.85	0.20	85,93,104,106	0
7	CA	E	201	1/1	0.88	0.10	95,95,95,95	0
7	CA	B	503	1/1	0.88	0.06	93,93,93,93	0
6	MG	F	402	1/1	0.91	0.06	85,85,85,85	0
6	MG	A	502	1/1	0.93	0.17	39,39,39,39	0
9	MES	B	504	12/12	0.94	0.17	41,48,57,61	0
8	GDP	D	501	28/28	0.94	0.12	56,61,70,76	0
6	MG	B	502	1/1	0.95	0.14	37,37,37,37	0
6	MG	C	502	1/1	0.95	0.13	35,35,35,35	0
10	IAZ	B	505	23/23	0.96	0.11	40,45,56,62	0
5	GTP	A	501	32/32	0.97	0.20	32,41,44,45	0
8	GDP	B	501	28/28	0.97	0.17	38,41,46,48	0
6	MG	D	502	1/1	0.97	0.25	77,77,77,77	0
7	CA	A	503	1/1	0.98	0.05	71,71,71,71	0
5	GTP	C	501	32/32	0.98	0.15	31,35,39,41	0
7	CA	C	503	1/1	0.98	0.04	61,61,61,61	0

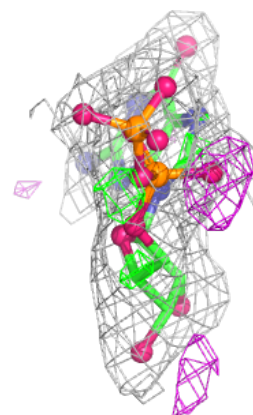
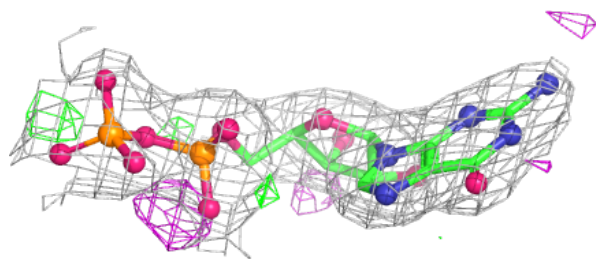
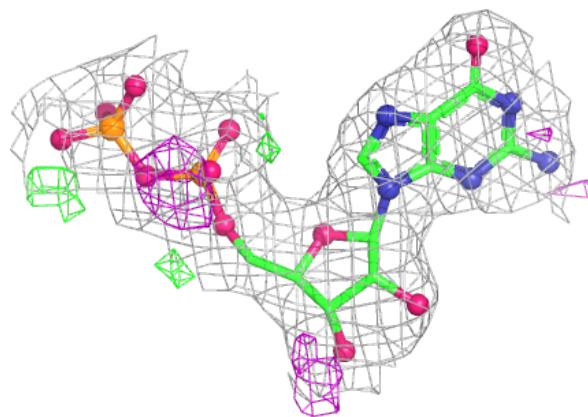
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around ACP F 401:

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

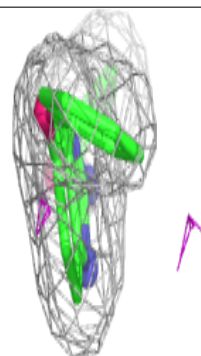
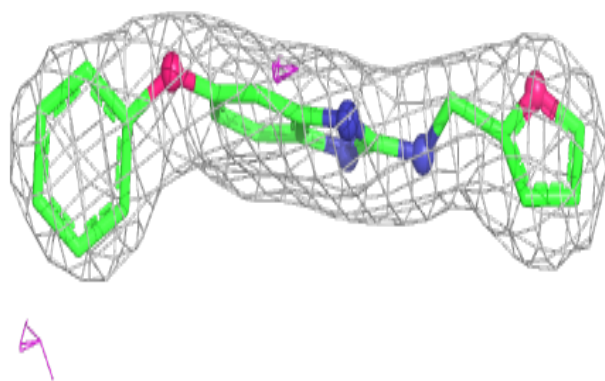
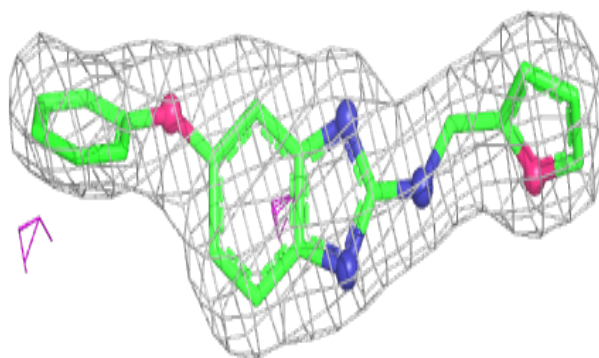
**Electron density around GDP D 501:**

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

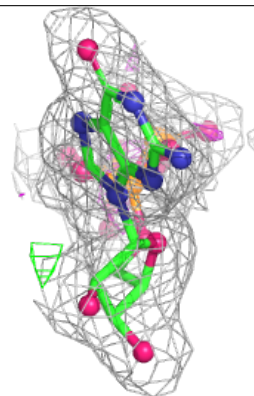
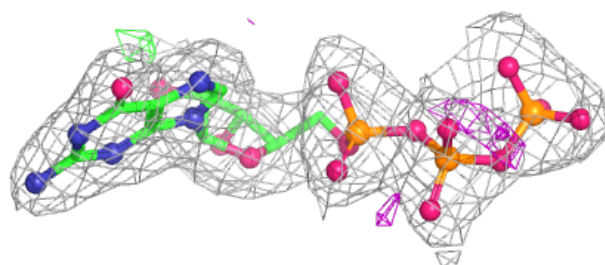
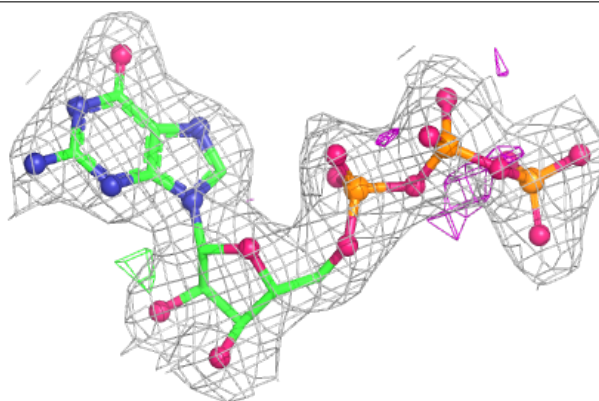


Electron density around IAZ B 505:

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

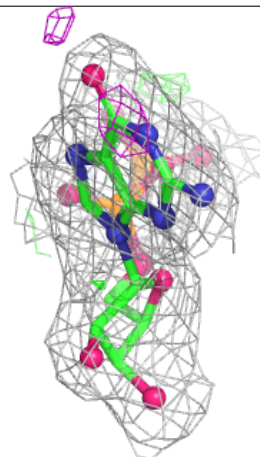
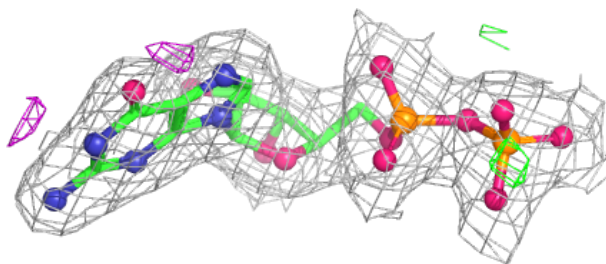
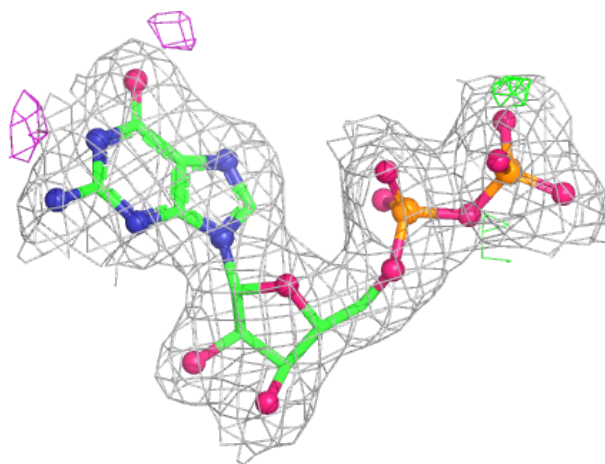
**Electron density around GTP A 501:**

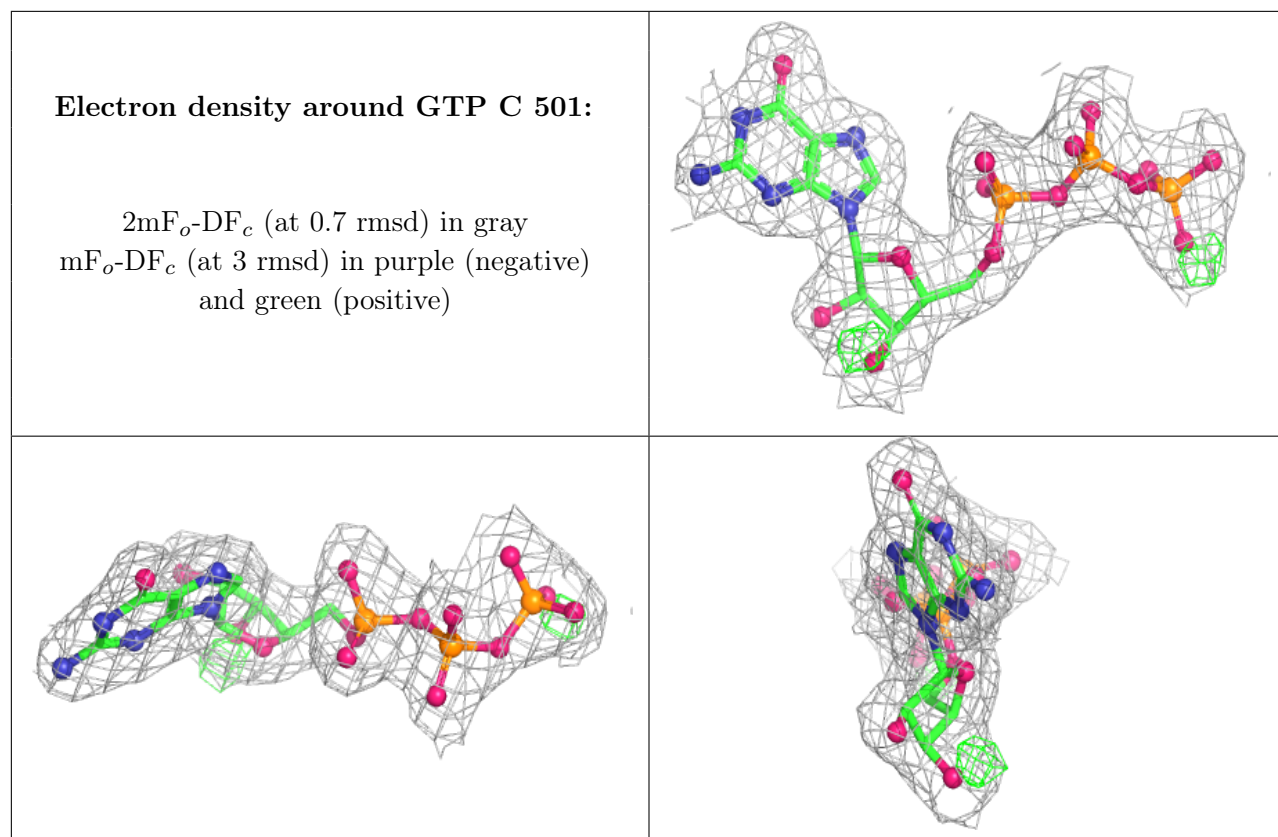
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around GDP B 501:

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





6.5 Other polymers [i](#)

There are no such residues in this entry.