Full wwPDB X-ray Structure Validation Report ⓘ

Apr 21, 2022 – 04:06 PM EDT

PDB ID	:	5SB5
Title	:	Tubulin-todalam-9-complex
Authors	:	Muehlethaler, T.; Milanos, L.; Ortega, J.A.; Blum, T.B.; Gioia, D.; Prota, A.E.; Cavalli, A.; Steinmetz, M.O.
Deposited on	:	2021-07-08
Resolution	:	2.31 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:

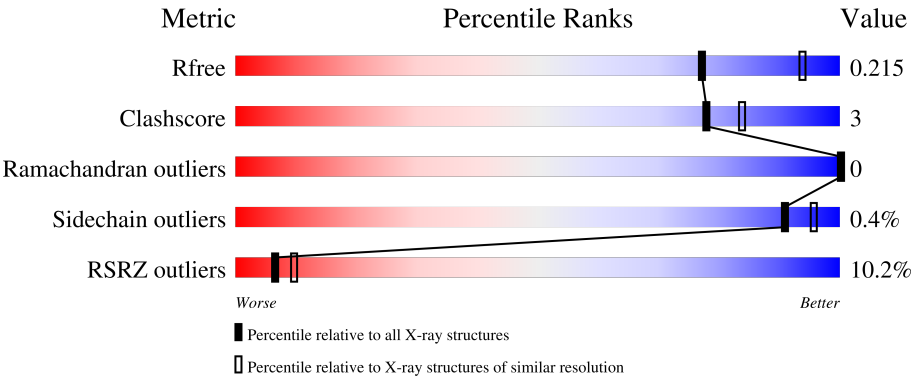
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.27
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber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

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.31 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5974 (2.34-2.30)
Clashscore	141614	6604 (2.34-2.30)
Ramachandran outliers	138981	6523 (2.34-2.30)
Sidechain outliers	138945	6523 (2.34-2.30)
RSRZ outliers	127900	5855 (2.34-2.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	451	5% 91% 6% ·
1	C	451	% 90% 8% ·
2	B	445	6% 87% 9% 5%
2	D	445	8% 87% 9% ·
3	E	143	10% 83% · 14%

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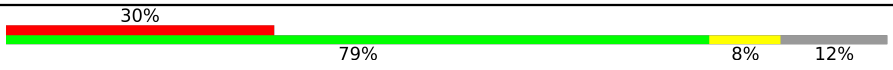
Mol	Chain	Length	Quality of chain
4	F	384	

2 Entry composition

There are 12 unique types of molecules in this entry. The entry contains 18255 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
1	A	438	Total	C	N	O	S	0	0	0
			3424	2167	582	653	22			
1	C	440	Total	C	N	O	S	0	1	0
			3443	2178	585	657	23			

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

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

- Molecule 3 is a protein called Stathmin-4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
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

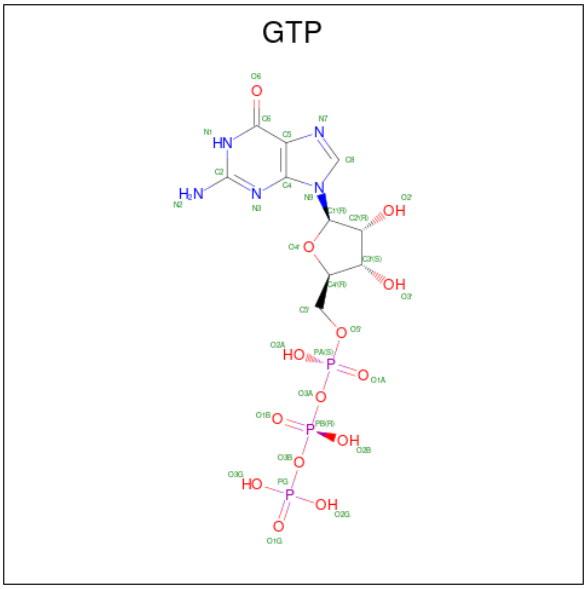
- Molecule 4 is a protein called Tubulin-Tyrosine Ligase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	F	337	Total	C	N	O	S	0	0	0
			2747	1767	464	502	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
5	A	1	Total	C	N	O	P	0	0
			32	10	5	14	3		
5	C	1	Total	C	N	O	P	0	0
			32	10	5	14	3		

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

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

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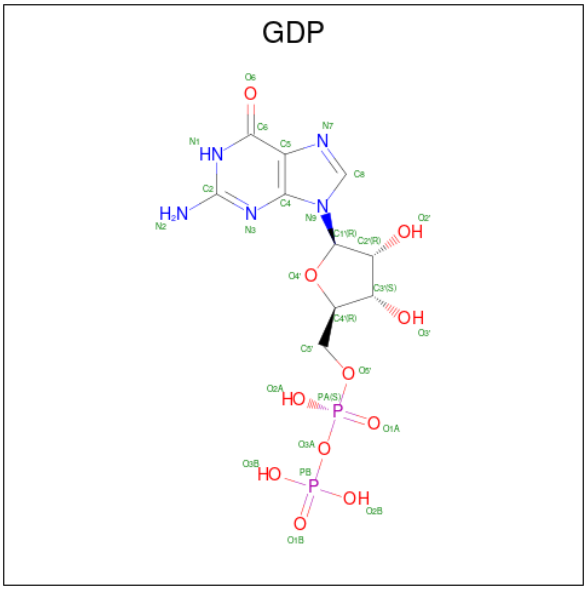
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	F	1	Total Mg 1 1	0	0

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

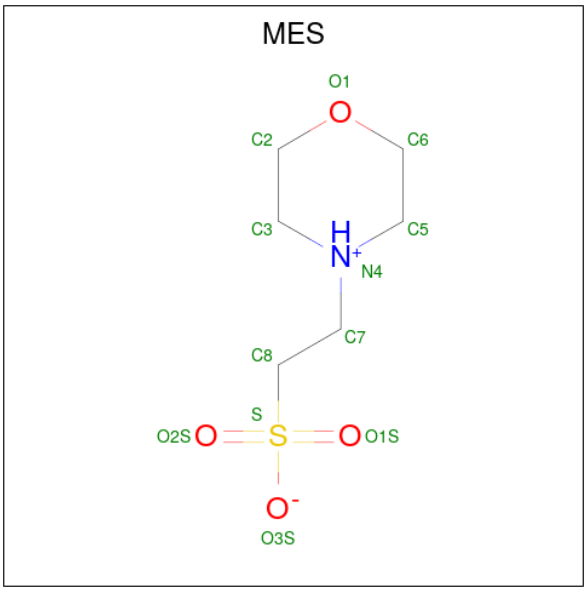
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total Ca 1 1	0	0
7	B	1	Total Ca 1 1	0	0
7	C	1	Total Ca 1 1	0	0
7	E	1	Total Ca 1 1	0	0

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



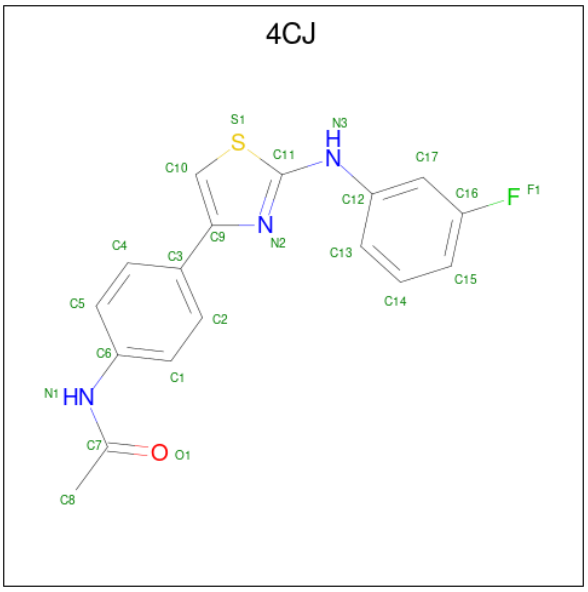
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	1	Total C N O P 28 10 5 11 2	0	0
8	D	1	Total C N O P 28 10 5 11 2	0	0

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



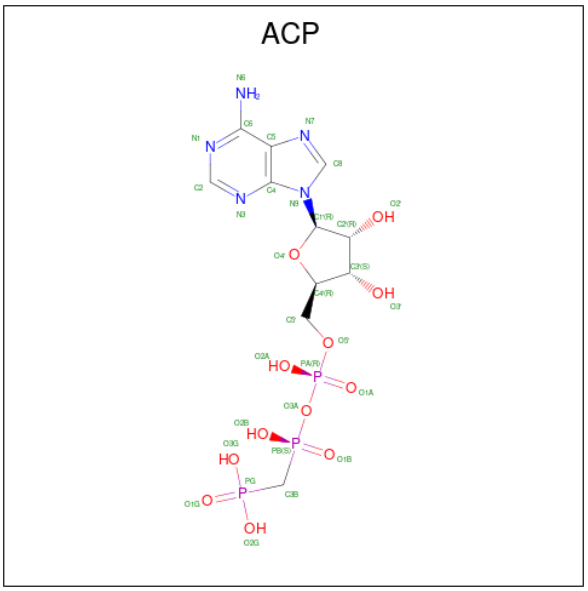
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
9	B	1	Total	C	N	O	S	0	0
			12	6	1	4	1		

- Molecule 10 is N-{4-[2-(3-fluoroanilino)-1,3-thiazol-4-yl]phenyl}acetamide (three-letter code: 4CJ) (formula: $C_{17}H_{14}FN_3OS$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
10	C	1	Total	C	F	N	O	S	0	0
			23	17	1	3	1	1		

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



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

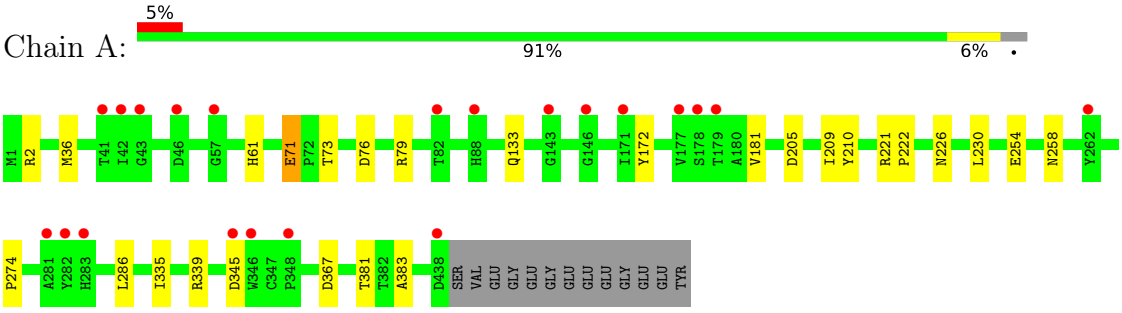
- Molecule 12 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
12	A	135	Total	O	0	0
			135	135		
12	B	164	Total	O	0	0
			164	164		
12	C	260	Total	O	0	0
			260	260		
12	D	100	Total	O	0	0
			100	100		
12	E	35	Total	O	0	0
			35	35		
12	F	50	Total	O	0	0
			50	50		

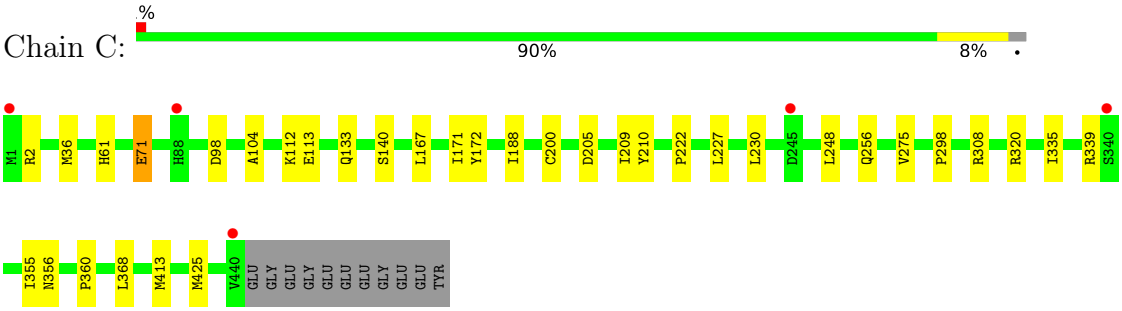
3 Residue-property plots (i)

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.

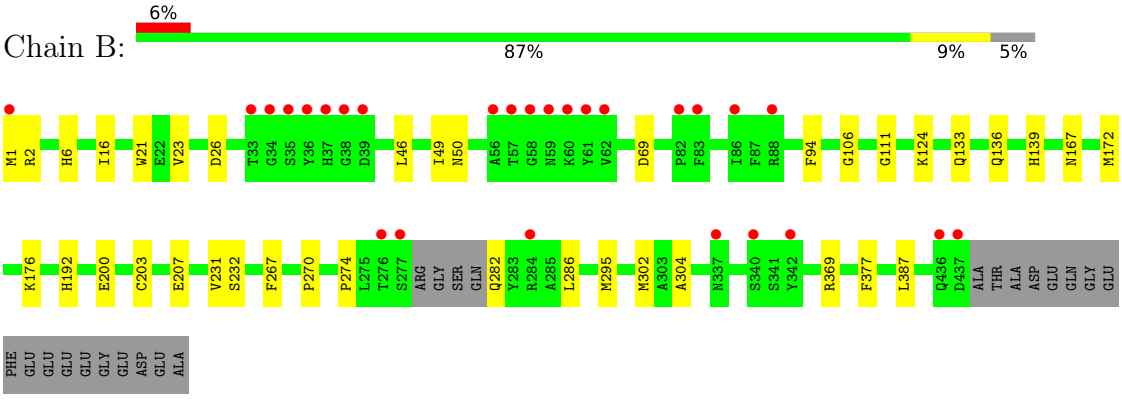
• Molecule 1: Tubulin alpha-1B chain



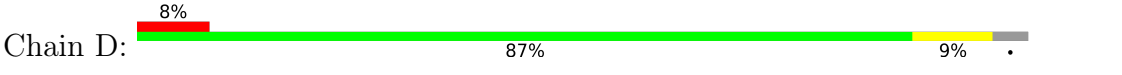
• Molecule 1: Tubulin alpha-1B chain

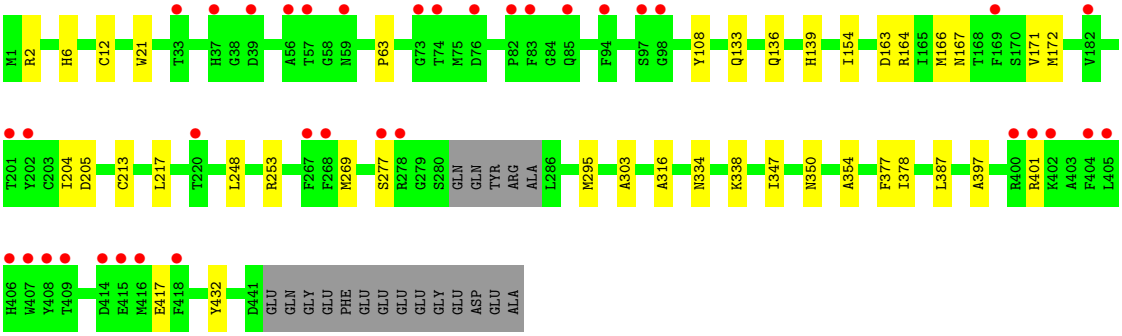


• Molecule 2: Tubulin beta-2B chain

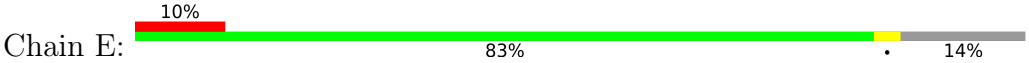


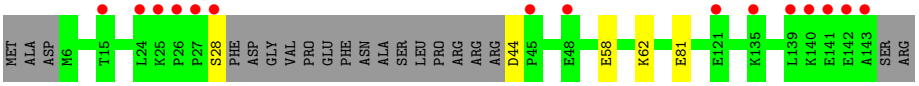
• Molecule 2: Tubulin beta-2B chain



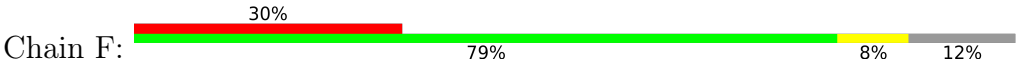


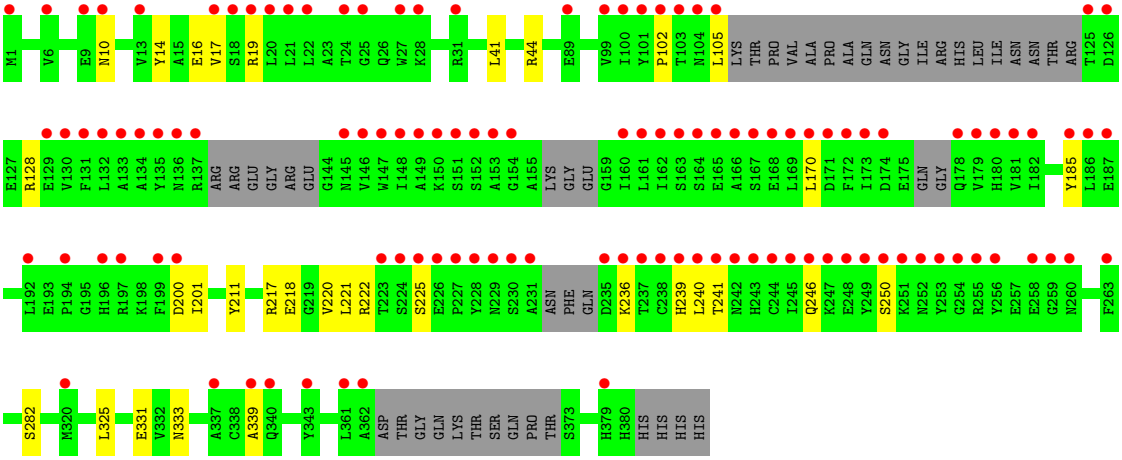
• Molecule 3: Stathmin-4





• Molecule 4: Tubulin-Tyrosine Ligase





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	104.81Å 157.71Å 180.54Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.55 – 2.31 49.73 – 2.31	Depositor EDS
% Data completeness (in resolution range)	99.9 (49.55-2.31) 100.0 (49.73-2.31)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.82 (at 2.32Å)	Xtriage
Refinement program	PHENIX 1.19.1_4122	Depositor
R, R_{free}	0.188 , 0.220 0.184 , 0.215	Depositor DCC
R_{free} test set	6596 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	42.5	Xtriage
Anisotropy	0.185	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 37.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	18255	wwPDB-VP
Average B, all atoms (Å^2)	55.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.45% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MES, CA, GTP, ACP, GDP, MG, 4CJ

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.25	0/3502	0.48	0/4754
1	C	0.27	0/3521	0.48	0/4780
2	B	0.26	0/3419	0.48	0/4629
2	D	0.25	0/3416	0.47	0/4626
3	E	0.24	0/1022	0.41	0/1356
4	F	0.24	0/2807	0.46	0/3791
All	All	0.25	0/17687	0.47	0/23936

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3424	0	3334	14	0
1	C	3443	0	3352	19	0
2	B	3345	0	3227	22	0
2	D	3343	0	3222	23	0
3	E	1014	0	1029	4	0
4	F	2747	0	2719	18	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	1	0
9	B	12	0	12	2	0
10	C	23	0	0	0	0
11	F	31	0	14	2	0
12	A	135	0	0	1	0
12	B	164	0	0	6	0
12	C	260	0	0	1	0
12	D	100	0	0	3	0
12	E	35	0	0	2	0
12	F	50	0	0	0	0
All	All	18255	0	16957	101	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 (101) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:102:PRO:HG2	4:F:105:LEU:HD13	1.76	0.68
3:E:44:ASP:N	12:E:303:HOH:O	2.32	0.62
4:F:236:LYS:HB3	4:F:240:LEU:HD13	1.83	0.61
1:A:335:ILE:HG23	1:A:339:ARG:HG3	1.84	0.59
1:A:71:GLU:OE2	1:A:73:THR:OG1	2.15	0.59
1:C:2:ARG:HH11	1:C:133:GLN:HG3	1.67	0.59
2:D:217:LEU:HA	2:D:277:SER:HB3	1.85	0.59
2:D:2:ARG:NH1	12:D:606:HOH:O	2.31	0.58
4:F:331:GLU:OE2	11:F:401:ACP:O3G	2.22	0.58
4:F:241:THR:OG1	11:F:401:ACP:O3'	2.23	0.57
2:D:269:MET:HG3	2:D:303:ALA:HB3	1.87	0.57
2:B:167:ASN:HD22	2:B:200:GLU:HB2	1.70	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:10:ASN:HB2	4:F:44:ARG:HH22	1.71	0.55
4:F:16:GLU:OE2	4:F:19:ARG:NH2	2.38	0.55
3:E:81:GLU:OE1	12:E:301:HOH:O	2.17	0.55
2:B:1:MET:HA	2:B:50:ASN:HD21	1.72	0.55
2:B:274:PRO:HB3	2:B:286:LEU:HD22	1.87	0.55
2:D:334:ASN:HD21	2:D:338:LYS:HE3	1.73	0.54
1:A:381:THR:HG22	1:A:383:ALA:H	1.73	0.54
2:B:16:ILE:HD13	2:B:231:VAL:HG11	1.89	0.54
2:B:270:PRO:HG2	2:B:302:MET:HB2	1.89	0.54
2:D:2:ARG:HB3	2:D:133:GLN:HG2	1.90	0.54
1:A:209:ILE:HG23	1:A:230:LEU:HD23	1.91	0.52
2:D:172:MET:HG3	2:D:387:LEU:HD11	1.91	0.52
2:B:23:VAL:HG21	2:B:232:SER:HB3	1.92	0.52
2:B:176:LYS:HD2	2:B:207:GLU:HG3	1.91	0.51
1:C:335:ILE:HG23	1:C:339:ARG:HG3	1.91	0.51
1:C:209:ILE:HG23	1:C:230:LEU:HD23	1.91	0.51
2:B:282:GLN:NE2	12:B:612:HOH:O	2.43	0.50
1:C:112:LYS:NZ	1:C:113:GLU:OE2	2.44	0.50
2:D:6:HIS:CD2	2:D:21:TRP:HE1	2.30	0.50
2:B:304:ALA:N	12:B:613:HOH:O	2.44	0.49
9:B:504:MES:O1S	12:B:601:HOH:O	2.18	0.49
2:B:136:GLN:HA	2:B:167:ASN:O	2.13	0.49
2:D:12:CYS:HB2	8:D:501:GDP:C8	2.47	0.49
9:B:504:MES:O2S	12:B:601:HOH:O	2.18	0.48
2:B:203:CYS:SG	2:B:267:PHE:HB3	2.54	0.48
2:D:295:MET:HE2	2:D:377:PHE:HB2	1.95	0.48
1:C:256:GLN:NE2	12:C:613:HOH:O	2.47	0.48
1:A:226:ASN:ND2	1:A:367:ASP:OD2	2.44	0.48
2:D:164:ARG:NH2	12:D:611:HOH:O	2.46	0.48
2:D:347:ILE:HG22	2:D:350:ASN:HB3	1.96	0.48
2:B:46:LEU:HA	2:B:49:ILE:HB	1.96	0.47
2:B:295:MET:HG2	2:B:377:PHE:HB2	1.96	0.47
2:B:6:HIS:CD2	2:B:21:TRP:HE1	2.32	0.47
2:B:192:HIS:ND1	12:B:608:HOH:O	2.35	0.47
1:C:275:VAL:HG13	1:C:368:LEU:HD21	1.97	0.47
4:F:14:TYR:HB3	4:F:41:LEU:HD13	1.95	0.47
1:C:210:TYR:CZ	1:C:222:PRO:HD2	2.50	0.47
1:A:274:PRO:HB3	1:A:286:LEU:HD12	1.96	0.47
1:C:140:SER:HA	1:C:171:ILE:HB	1.97	0.47
2:D:136:GLN:HA	2:D:167:ASN:O	2.15	0.46
2:B:2:ARG:HB2	2:B:133:GLN:HG3	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:331:GLU:OE2	4:F:333:ASN:ND2	2.48	0.46
1:A:76:ASP:OD1	1:A:79:ARG:NH1	2.43	0.46
1:A:2:ARG:HB3	1:A:133:GLN:HG3	1.97	0.46
4:F:225:SER:OG	4:F:250:SER:OG	2.32	0.46
1:A:172:TYR:HB3	1:A:205:ASP:HA	1.98	0.46
1:A:36:MET:HB3	1:A:61:HIS:CE1	2.51	0.46
1:C:320:ARG:HA	1:C:356:ASN:O	2.16	0.45
1:A:254:GLU:HG2	1:A:258:ASN:ND2	2.31	0.45
1:C:248:LEU:HD13	1:C:355:ILE:HD12	1.98	0.45
1:C:320:ARG:HG3	1:C:360:PRO:HG3	2.00	0.44
4:F:282:SER:HB2	4:F:325:LEU:HD13	1.98	0.44
1:C:71:GLU:HB3	1:C:98:ASP:HB3	1.99	0.44
4:F:14:TYR:HA	4:F:17:VAL:HB	1.99	0.44
2:D:108:TYR:OH	2:D:417:GLU:OE2	2.28	0.44
2:B:26:ASP:OD1	2:B:369:ARG:NH2	2.51	0.43
2:B:106:GLY:O	2:B:111:GLY:HA3	2.19	0.43
1:C:172:TYR:HB3	1:C:205:ASP:HA	2.00	0.43
4:F:220:VAL:HG11	4:F:339:ALA:HB2	2.01	0.43
1:C:36:MET:HB3	1:C:61:HIS:CE1	2.54	0.43
1:C:188:ILE:HG13	1:C:425:MET:HG3	2.00	0.42
2:B:124:LYS:NZ	12:B:611:HOH:O	2.39	0.42
1:C:167:LEU:HG	1:C:200:CYS:HB3	2.02	0.42
2:D:172:MET:HB2	2:D:205:ASP:HA	2.02	0.42
2:D:163:ASP:O	2:D:253:ARG:NH2	2.53	0.42
1:C:104:ALA:HB2	1:C:413:MET:SD	2.60	0.42
4:F:217:ARG:HG3	4:F:218:GLU:HG2	2.01	0.42
4:F:200:ASP:OD2	4:F:222:ARG:NH2	2.53	0.41
4:F:246:GLN:O	4:F:250:SER:HB3	2.19	0.41
2:B:295:MET:CG	2:B:377:PHE:HB2	2.49	0.41
2:D:171:VAL:HA	2:D:204:ILE:O	2.20	0.41
3:E:58:GLU:HG2	3:E:62:LYS:HE3	2.01	0.41
2:D:213:CYS:HA	2:D:217:LEU:HB2	2.01	0.41
2:D:316:ALA:HB3	2:D:378:ILE:HB	2.02	0.41
2:D:248:LEU:HD23	2:D:354:ALA:HB2	2.02	0.41
4:F:128:ARG:HH12	4:F:170:LEU:HB3	1.86	0.41
2:D:432:TYR:OH	12:D:601:HOH:O	2.16	0.41
1:A:71:GLU:O	12:A:601:HOH:O	2.22	0.40
2:B:69:ASP:O	2:B:94:PHE:HA	2.21	0.40
2:D:154:ILE:HG23	2:D:166:MET:HG2	2.03	0.40
4:F:185:TYR:OH	4:F:239:HIS:ND1	2.44	0.40
1:C:209:ILE:HG22	1:C:227:LEU:HD22	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:345:ASP:HB3	3:E:28:SER:HB2	2.03	0.40
2:B:172:MET:HG3	2:B:387:LEU:HD11	2.03	0.40
1:C:298:PRO:HG2	1:C:308:ARG:NH2	2.36	0.40
2:D:21:TRP:CZ3	2:D:63:PRO:HB3	2.56	0.40
1:A:210:TYR:CZ	1:A:222:PRO:HD2	2.57	0.40
2:D:397:ALA:O	2:D:401:ARG:NH1	2.54	0.40
4:F:201:ILE:HG12	4:F:221:LEU:HG	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	436/451 (97%)	426 (98%)	10 (2%)	0	100	100
1	C	439/451 (97%)	428 (98%)	11 (2%)	0	100	100
2	B	420/445 (94%)	410 (98%)	10 (2%)	0	100	100
2	D	422/445 (95%)	417 (99%)	5 (1%)	0	100	100
3	E	119/143 (83%)	119 (100%)	0	0	100	100
4	F	323/384 (84%)	313 (97%)	10 (3%)	0	100	100
All	All	2159/2319 (93%)	2113 (98%)	46 (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%)	366 (99%)	3 (1%)	81 90
1	C	372/379 (98%)	371 (100%)	1 (0%)	92 96
2	B	368/383 (96%)	367 (100%)	1 (0%)	92 96
2	D	368/383 (96%)	367 (100%)	1 (0%)	92 96
3	E	110/127 (87%)	110 (100%)	0	100 100
4	F	302/342 (88%)	301 (100%)	1 (0%)	92 96
All	All	1889/1993 (95%)	1882 (100%)	7 (0%)	91 96

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	71	GLU
1	A	181	VAL
1	A	221	ARG
2	B	139	HIS
1	C	71	GLU
2	D	139	HIS
4	F	211	TYR

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
2	B	167	ASN
2	B	282	GLN
1	C	285	GLN
1	C	356	ASN
4	F	180	HIS
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	C	501	6	26,34,34	0.96	1 (3%)	33,54,54	1.72	6 (18%)
8	GDP	D	501	6	24,30,30	1.19	2 (8%)	31,47,47	1.91	8 (25%)
5	GTP	A	501	6	26,34,34	0.95	1 (3%)	33,54,54	1.73	7 (21%)
9	MES	B	504	-	12,12,12	2.21	1 (8%)	14,16,16	1.85	4 (28%)
11	ACP	F	401	6	27,33,33	1.40	5 (18%)	32,52,52	1.41	4 (12%)
10	4CJ	C	504	-	22,25,25	1.46	3 (13%)	28,34,34	0.68	0
8	GDP	B	501	6	24,30,30	1.17	2 (8%)	31,47,47	1.82	7 (22%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	GTP	C	501	6	-	8/18/38/38	0/3/3/3
8	GDP	D	501	6	-	4/12/32/32	0/3/3/3
5	GTP	A	501	6	-	8/18/38/38	0/3/3/3
9	MES	B	504	-	-	4/6/14/14	0/1/1/1
11	ACP	F	401	6	-	5/15/38/38	0/3/3/3
10	4CJ	C	504	-	-	0/10/12/12	0/3/3/3
8	GDP	B	501	6	-	3/12/32/32	0/3/3/3

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	B	504	MES	C8-S	-7.43	1.67	1.77
8	D	501	GDP	C5-C6	4.19	1.48	1.41
8	B	501	GDP	C5-C6	4.04	1.48	1.41
10	C	504	4CJ	C10-S1	3.41	1.76	1.70
10	C	504	4CJ	C7-N1	3.26	1.42	1.36
5	A	501	GTP	C6-N1	3.02	1.38	1.33
5	C	501	GTP	C6-N1	2.99	1.38	1.33
11	F	401	ACP	PG-O2G	2.92	1.61	1.54
11	F	401	ACP	PG-O3G	2.90	1.61	1.54
11	F	401	ACP	PB-O3A	2.77	1.61	1.58
10	C	504	4CJ	C11-N3	2.62	1.41	1.36
11	F	401	ACP	C5-C4	2.51	1.47	1.40
8	B	501	GDP	C5-C4	2.40	1.47	1.40
8	D	501	GDP	C5-C4	2.40	1.47	1.40
11	F	401	ACP	PB-O2B	2.21	1.61	1.56

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	501	GTP	N3-C2-N1	-5.49	119.90	127.22
5	C	501	GTP	N3-C2-N1	-5.34	120.10	127.22
8	D	501	GDP	C2-N3-C4	4.86	120.91	115.36
8	B	501	GDP	C2-N3-C4	4.64	120.65	115.36
5	A	501	GTP	C2-N3-C4	4.21	120.16	115.36
8	D	501	GDP	C2-N1-C6	4.07	122.39	115.93
8	D	501	GDP	C5-C6-N1	-4.03	117.93	123.43
8	B	501	GDP	C2-N1-C6	4.02	122.32	115.93
8	B	501	GDP	C4-C5-C6	-3.96	117.02	120.80
8	B	501	GDP	C5-C6-N1	-3.83	118.20	123.43
8	D	501	GDP	C4-C5-C6	-3.81	117.16	120.80
5	C	501	GTP	C2-N3-C4	3.80	119.70	115.36
11	F	401	ACP	PB-O3A-PA	-3.69	120.86	132.56
9	B	504	MES	C5-N4-C3	3.64	117.02	108.83
8	D	501	GDP	N3-C2-N1	-3.33	122.78	127.22
8	B	501	GDP	N3-C2-N1	-3.30	122.83	127.22
11	F	401	ACP	C3'-C2'-C1'	3.28	105.92	100.98
11	F	401	ACP	N3-C2-N1	-3.16	123.74	128.68
5	C	501	GTP	C5-C6-N1	-3.13	119.14	123.43
5	A	501	GTP	C5-C6-N1	-2.99	119.34	123.43
5	C	501	GTP	C2-N1-C6	2.85	120.46	115.93
9	B	504	MES	O1S-S-C8	2.84	110.33	106.92
8	D	501	GDP	PA-O3A-PB	-2.82	123.15	132.83
5	C	501	GTP	PA-O3A-PB	-2.81	123.19	132.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	501	GTP	PA-O3A-PB	-2.78	123.30	132.83
5	C	501	GTP	PB-O3B-PG	-2.75	123.38	132.83
5	A	501	GTP	C2-N1-C6	2.74	120.29	115.93
8	D	501	GDP	C4-C5-N7	-2.74	106.54	109.40
11	F	401	ACP	C4-C5-N7	-2.66	106.63	109.40
8	B	501	GDP	C4-C5-N7	-2.54	106.76	109.40
9	B	504	MES	C6-C5-N4	-2.48	106.34	110.10
8	B	501	GDP	PA-O3A-PB	-2.43	124.50	132.83
9	B	504	MES	C7-N4-C5	2.42	117.43	111.23
5	A	501	GTP	N2-C2-N1	2.13	120.57	117.25
8	D	501	GDP	C3'-C2'-C1'	2.07	104.10	100.98
5	A	501	GTP	PB-O3B-PG	-2.06	125.77	132.83

There are no chirality outliers.

All (32) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	501	GTP	C5'-O5'-PA-O1A
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	PA-O3A-PB-O3B
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	PB-C3B-PG-O3G
11	F	401	ACP	O4'-C4'-C5'-O5'
11	F	401	ACP	C3'-C4'-C5'-O5'
9	B	504	MES	C7-C8-S-O3S
5	C	501	GTP	C5'-O5'-PA-O3A
5	A	501	GTP	C5'-O5'-PA-O2A
9	B	504	MES	C7-C8-S-O1S
9	B	504	MES	C7-C8-S-O2S
5	C	501	GTP	PB-O3A-PA-O2A
5	C	501	GTP	PB-O3B-PG-O1G
5	A	501	GTP	PB-O3A-PA-O2A
5	A	501	GTP	PB-O3B-PG-O1G
5	A	501	GTP	PB-O3B-PG-O2G
5	A	501	GTP	PB-O3B-PG-O3G

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Mol	Chain	Res	Type	Atoms
5	C	501	GTP	PB-O3B-PG-O2G
5	C	501	GTP	PB-O3B-PG-O3G
5	A	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
5	C	501	GTP	PB-O3A-PA-O1A

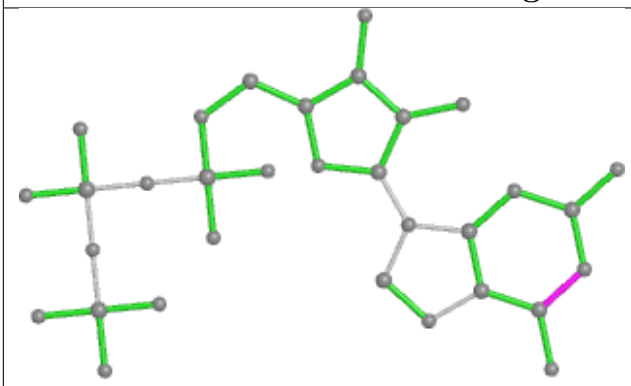
There are no ring outliers.

3 monomers are involved in 5 short contacts:

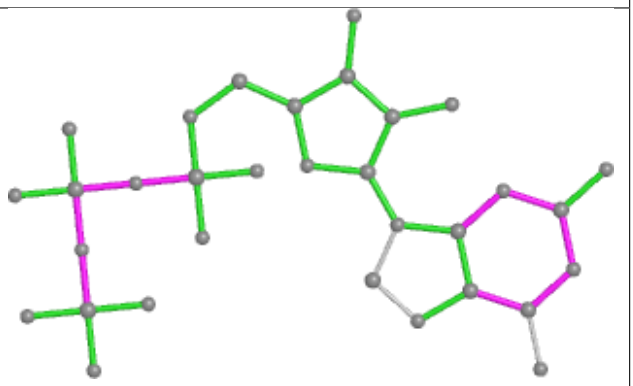
Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	D	501	GDP	1	0
9	B	504	MES	2	0
11	F	401	ACP	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

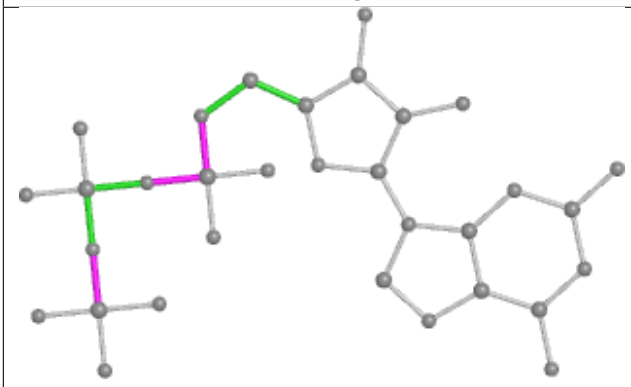
Ligand GTP C 501



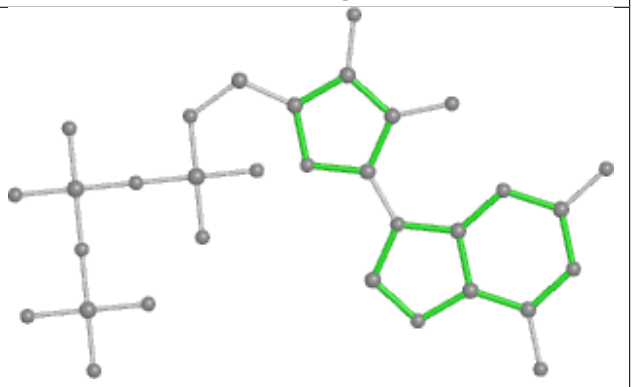
Bond lengths



Bond angles

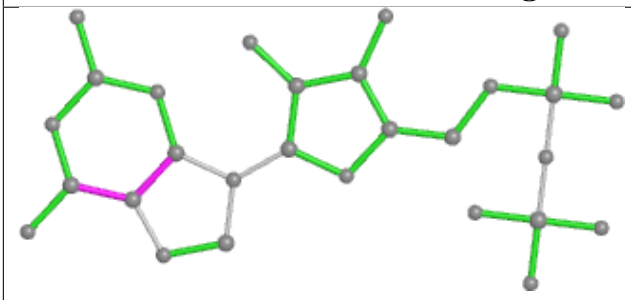


Torsions

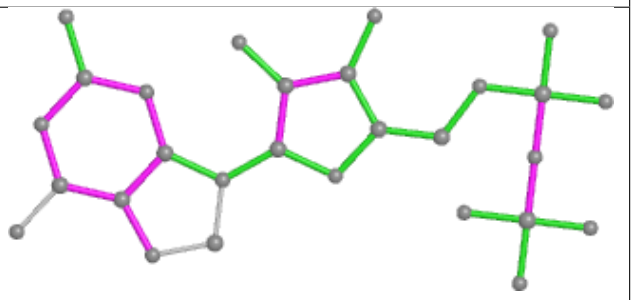


Rings

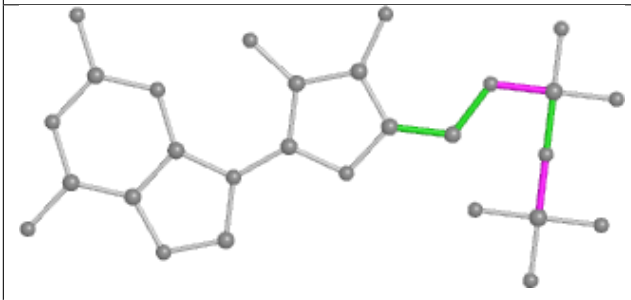
Ligand GDP D 501



Bond lengths



Bond angles



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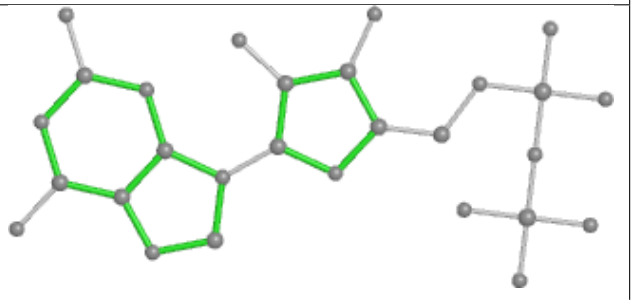
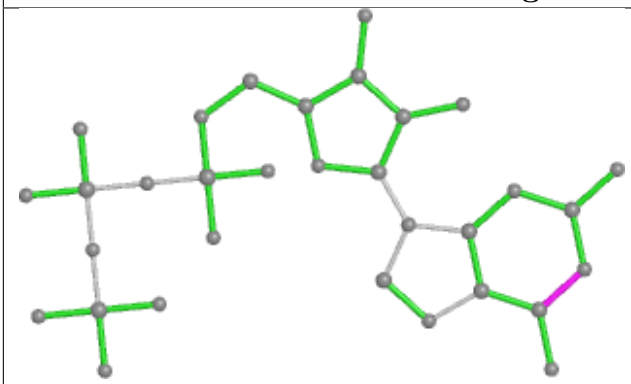
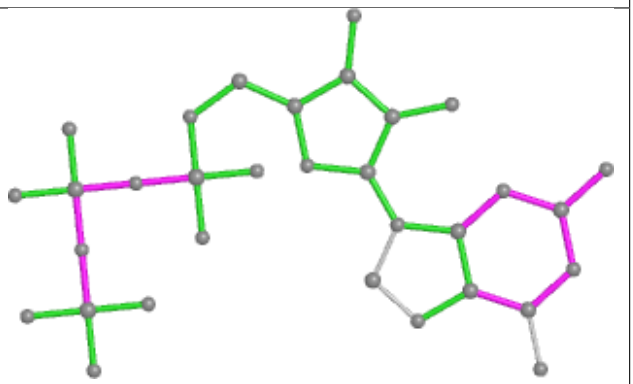


Rings

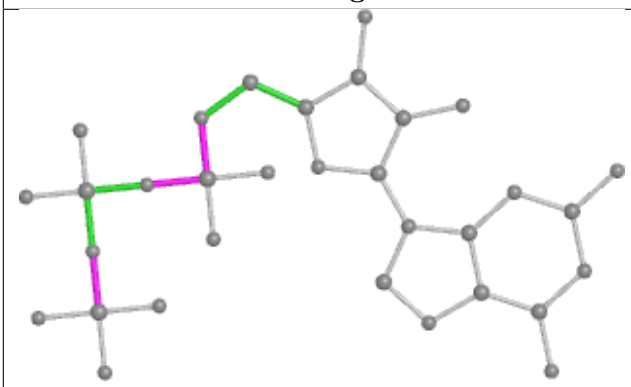
Ligand GTP A 501



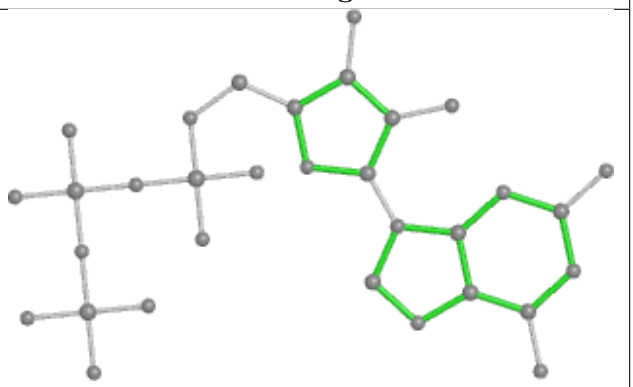
Bond lengths



Bond angles

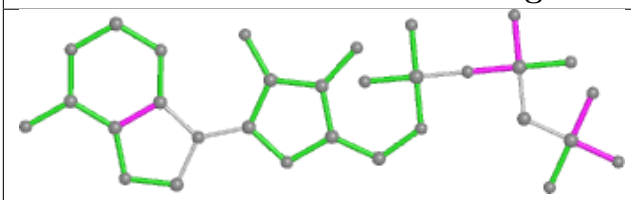


Torsions

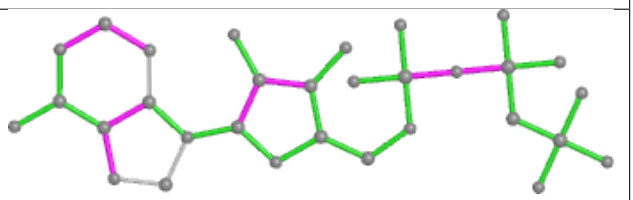


Rings

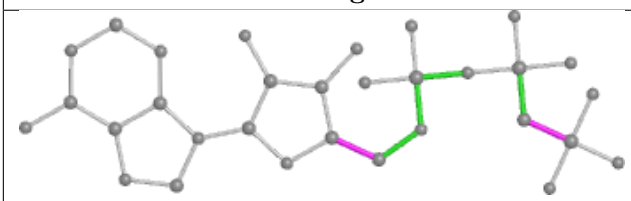
Ligand ACP F 401



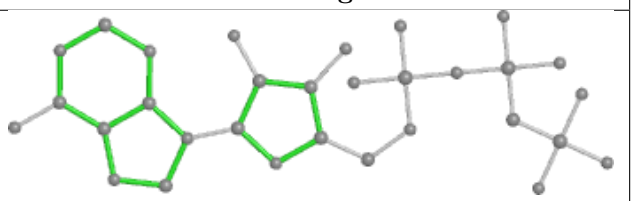
Bond lengths



Bond angles

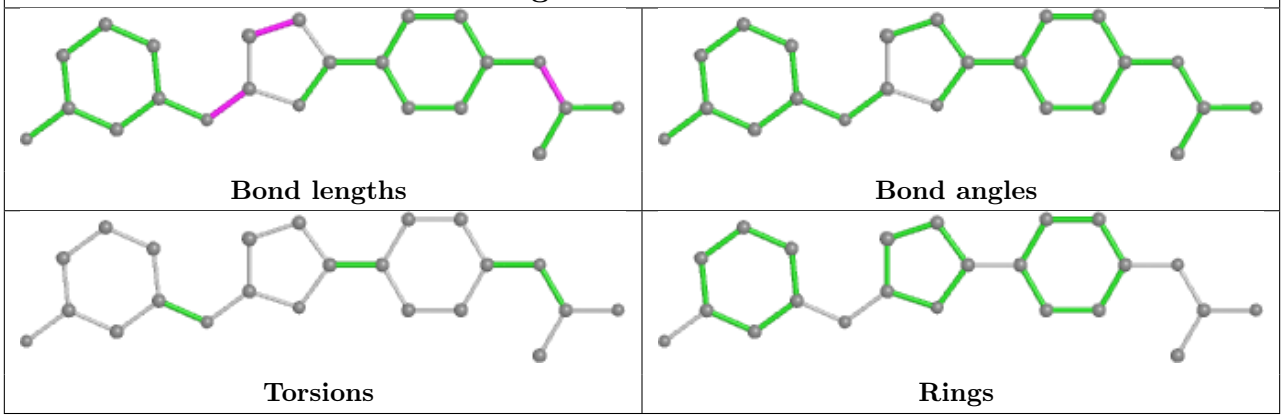


Torsions

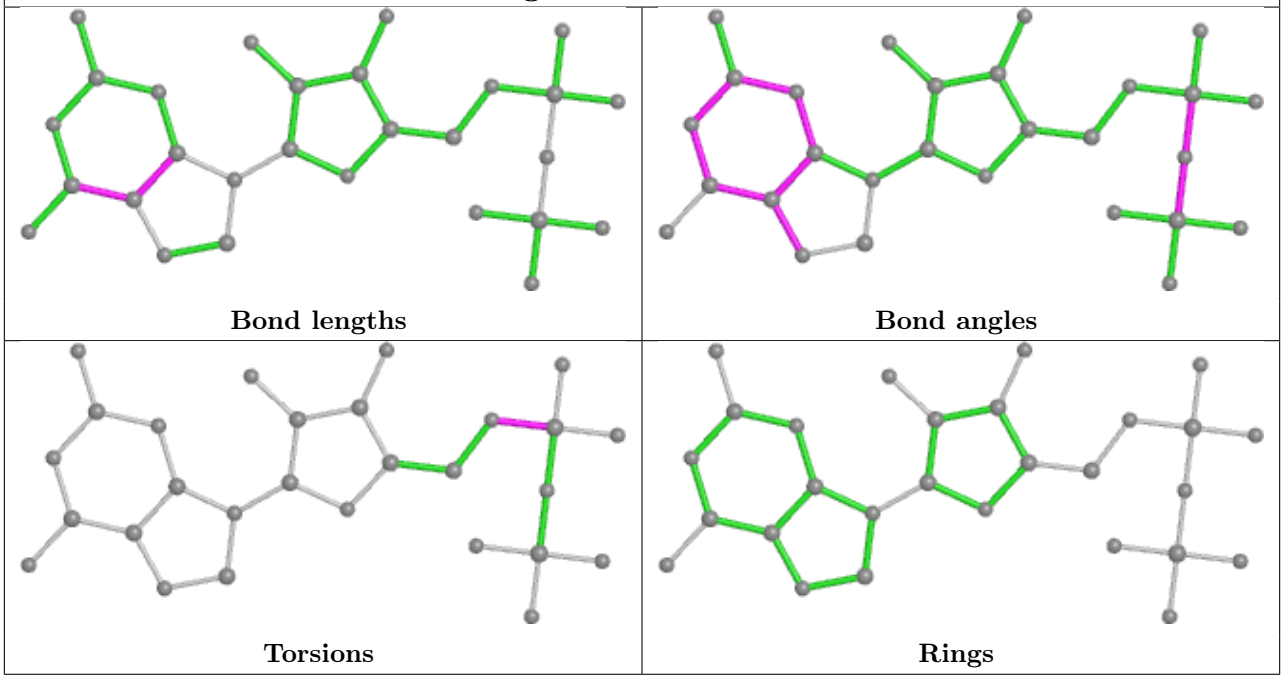


Rings

Ligand 4CJ C 504



Ligand GDP B 501



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	438/451 (97%)	0.40	21 (4%) 30 38	32, 50, 78, 138	0
1	C	440/451 (97%)	-0.04	5 (1%) 80 85	25, 37, 59, 92	0
2	B	423/445 (95%)	0.31	27 (6%) 19 25	26, 45, 79, 119	0
2	D	426/445 (95%)	0.51	37 (8%) 10 14	32, 55, 87, 118	2 (0%)
3	E	123/143 (86%)	0.60	15 (12%) 4 6	37, 58, 100, 127	0
4	F	337/384 (87%)	1.60	117 (34%) 0 0	44, 73, 133, 173	0
All	All	2187/2319 (94%)	0.51	222 (10%) 6 10	25, 50, 99, 173	2 (0%)

All (222) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	F	173	ILE	11.3
4	F	249	TYR	9.1
4	F	169	LEU	8.7
4	F	251	LYS	8.5
4	F	161	LEU	8.3
4	F	131	PHE	8.2
4	F	253	TYR	7.7
4	F	244	CYS	7.6
4	F	250	SER	7.5
4	F	103	THR	7.4
4	F	170	LEU	7.3
4	F	240	LEU	7.2
2	B	59	ASN	7.1
3	E	27	PRO	7.0
4	F	130	VAL	7.0
2	B	57	THR	7.0
4	F	166	ALA	6.9
4	F	104	ASN	6.7
4	F	135	TYR	6.4

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Mol	Chain	Res	Type	RSRZ
4	F	182	ILE	6.3
4	F	100	ILE	6.2
4	F	245	ILE	5.9
2	B	1	MET	5.9
3	E	26	PRO	5.8
4	F	134	ALA	5.7
1	A	282	TYR	5.7
4	F	132	LEU	5.7
4	F	133	ALA	5.6
4	F	105	LEU	5.6
4	F	248	GLU	5.6
2	D	57	THR	5.5
4	F	236	LYS	5.4
4	F	20	LEU	5.4
4	F	99	VAL	5.3
4	F	160	ILE	5.3
4	F	129	GLU	5.2
4	F	153	ALA	5.2
4	F	259	GLY	5.1
4	F	162	ILE	5.0
4	F	252	ASN	4.9
4	F	181	VAL	4.9
4	F	147	TRP	4.9
2	B	276	THR	4.8
4	F	165	GLU	4.8
4	F	223	THR	4.7
2	D	407	TRP	4.5
4	F	243	HIS	4.5
4	F	21	LEU	4.4
4	F	225	SER	4.4
4	F	102	PRO	4.4
4	F	178	GLN	4.3
1	A	262	TYR	4.3
4	F	179	VAL	4.3
4	F	125	THR	4.3
4	F	246	GLN	4.2
4	F	241	THR	4.2
4	F	137	ARG	4.1
2	D	404	PHE	4.1
4	F	89	GLU	4.1
2	B	37	HIS	4.0
4	F	361	LEU	4.0

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Mol	Chain	Res	Type	RSRZ
2	D	405	LEU	3.9
4	F	247	LYS	3.9
2	B	437	ASP	3.9
4	F	172	PHE	3.9
4	F	239	HIS	3.9
4	F	163	SER	3.8
2	B	56	ALA	3.8
3	E	45	PRO	3.8
4	F	362	ALA	3.8
4	F	254	GLY	3.8
4	F	224	SER	3.8
4	F	256	TYR	3.8
1	A	42	ILE	3.7
3	E	142	GLU	3.7
2	D	415	GLU	3.7
2	B	284	ARG	3.7
4	F	101	TYR	3.7
2	B	33	THR	3.7
4	F	167	SER	3.7
4	F	228	TYR	3.7
4	F	17	VAL	3.7
1	A	179	THR	3.7
2	D	402	LYS	3.6
4	F	238	CYS	3.6
3	E	28	SER	3.6
2	D	400	ARG	3.5
2	D	401	ARG	3.4
3	E	25	LYS	3.4
3	E	139	LEU	3.4
4	F	148	ILE	3.4
4	F	186	LEU	3.4
4	F	235	ASP	3.3
2	D	416	MET	3.3
4	F	231	ALA	3.3
1	C	440	VAL	3.3
4	F	242	ASN	3.3
3	E	24	LEU	3.3
2	B	58	GLY	3.3
3	E	48	GLU	3.2
2	D	37	HIS	3.2
4	F	227	PRO	3.2
2	D	277	SER	3.1

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Mol	Chain	Res	Type	RSRZ
4	F	230	SER	3.1
3	E	135	LYS	3.1
2	D	406	HIS	3.0
4	F	174	ASP	3.0
2	D	82	PRO	3.0
4	F	194	PRO	3.0
4	F	258	GLU	3.0
4	F	263	PHE	3.0
4	F	145	ASN	2.9
2	D	278	ARG	2.9
4	F	126	ASP	2.9
4	F	340	GLN	2.9
2	D	33	THR	2.9
4	F	196	HIS	2.9
4	F	255	ARG	2.9
4	F	25	GLY	2.9
1	A	281	ALA	2.9
4	F	320	MET	2.9
4	F	164	SER	2.9
4	F	199	PHE	2.9
4	F	136	ASN	2.9
4	F	22	LEU	2.9
2	B	36	TYR	2.9
4	F	226	GLU	2.8
2	B	60	LYS	2.8
4	F	229	ASN	2.8
1	C	340	SER	2.8
4	F	10	ASN	2.8
1	A	283	HIS	2.8
4	F	180	HIS	2.8
3	E	143	ALA	2.8
2	B	337	ASN	2.8
4	F	28	LYS	2.7
2	D	94	PHE	2.7
4	F	168	GLU	2.7
1	A	438	ASP	2.7
4	F	31	ARG	2.7
2	D	220	THR	2.7
2	D	418	PHE	2.7
1	A	57	GLY	2.7
1	A	146	GLY	2.7
2	B	38	GLY	2.6

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Mol	Chain	Res	Type	RSRZ
4	F	197	ARG	2.6
4	F	150	LYS	2.6
1	C	1	MET	2.6
2	D	59	ASN	2.6
4	F	149	ALA	2.6
1	A	346	TRP	2.6
2	D	39	ASP	2.6
3	E	141	GLU	2.6
4	F	339	ALA	2.6
3	E	15	THR	2.6
4	F	260	ASN	2.6
1	A	178	SER	2.5
4	F	152	SER	2.5
2	D	182	VAL	2.5
1	A	41	THR	2.5
2	D	74	THR	2.5
1	A	46	ASP	2.5
1	A	177	VAL	2.5
4	F	27	TRP	2.5
2	D	414	ASP	2.5
2	B	34	GLY	2.4
4	F	171	ASP	2.4
4	F	200	ASP	2.4
4	F	337	ALA	2.4
2	B	277	SER	2.4
4	F	13	VAL	2.4
4	F	379	HIS	2.4
2	B	86	ILE	2.4
4	F	237	THR	2.4
2	D	202	TYR	2.3
4	F	192	LEU	2.3
2	D	201	THR	2.3
3	E	121	GLU	2.3
1	A	43	GLY	2.3
1	A	143	GLY	2.3
2	D	268	PHE	2.3
2	B	82	PRO	2.3
4	F	146	VAL	2.3
1	A	348	PRO	2.3
3	E	140	LYS	2.3
4	F	343	TYR	2.2
1	C	88	HIS	2.2

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Mol	Chain	Res	Type	RSRZ
2	D	85	GLN	2.2
2	D	56	ALA	2.2
2	B	39	ASP	2.2
4	F	6	VAL	2.2
2	D	409	THR	2.2
2	B	342	TYR	2.2
4	F	18	SER	2.2
4	F	151	SER	2.2
1	C	245	ASP	2.2
2	D	267	PHE	2.2
4	F	154	GLY	2.2
2	D	76	ASP	2.1
1	A	171	ILE	2.1
2	B	436	GLN	2.1
2	D	97	SER	2.1
4	F	9	GLU	2.1
1	A	88	HIS	2.1
4	F	24	THR	2.1
2	D	83	PHE	2.1
4	F	19	ARG	2.1
2	B	35	SER	2.1
2	B	340	SER	2.1
2	D	169	PHE	2.1
1	A	345	ASP	2.1
1	A	82	THR	2.1
2	B	61	TYR	2.1
2	B	83	PHE	2.1
2	D	408	TYR	2.1
4	F	187	GLU	2.0
4	F	1	MET	2.0
2	D	73	GLY	2.0
2	B	88	ARG	2.0
2	B	62	VAL	2.0
4	F	185	TYR	2.0
2	D	98	GLY	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (i)

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

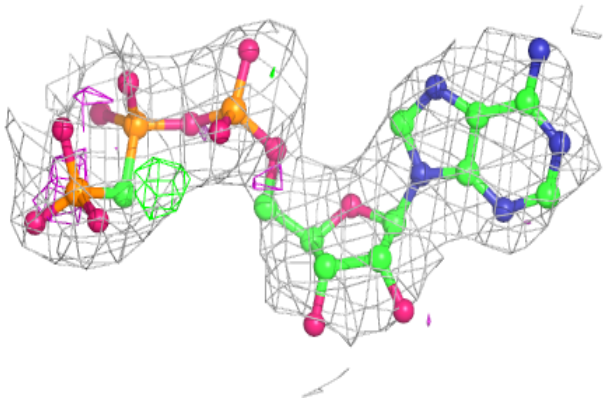
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

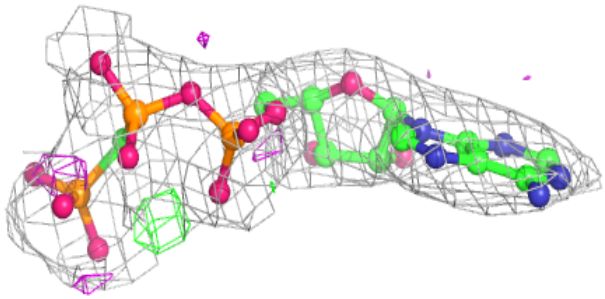
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	MG	D	502	1/1	0.81	0.14	62,62,62,62	0
7	CA	E	201	1/1	0.86	0.11	83,83,83,83	0
11	ACP	F	401	31/31	0.87	0.19	81,90,100,103	0
10	4CJ	C	504	23/23	0.93	0.17	26,38,47,53	0
7	CA	B	503	1/1	0.94	0.13	84,84,84,84	0
9	MES	B	504	12/12	0.94	0.13	40,45,55,64	0
7	CA	A	503	1/1	0.95	0.05	64,64,64,64	0
8	GDP	D	501	28/28	0.96	0.13	48,52,62,65	0
6	MG	F	402	1/1	0.97	0.08	83,83,83,83	0
6	MG	B	502	1/1	0.97	0.25	24,24,24,24	0
5	GTP	A	501	32/32	0.98	0.21	27,33,38,42	0
6	MG	A	502	1/1	0.98	0.19	33,33,33,33	0
6	MG	C	502	1/1	0.99	0.13	30,30,30,30	0
7	CA	C	503	1/1	0.99	0.05	52,52,52,52	0
5	GTP	C	501	32/32	0.99	0.15	24,27,31,34	0
8	GDP	B	501	28/28	0.99	0.18	26,30,35,36	0

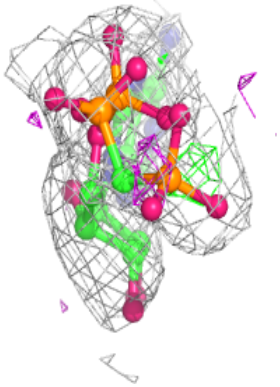
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

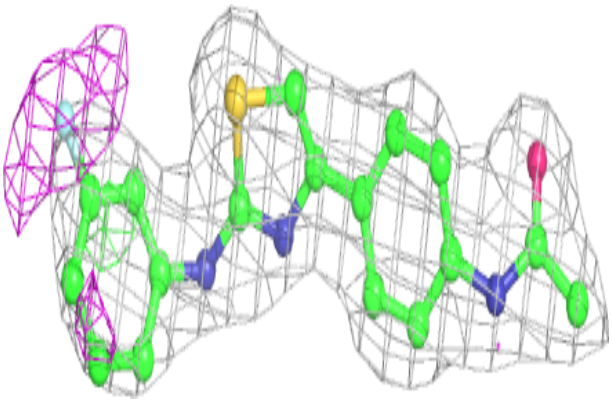


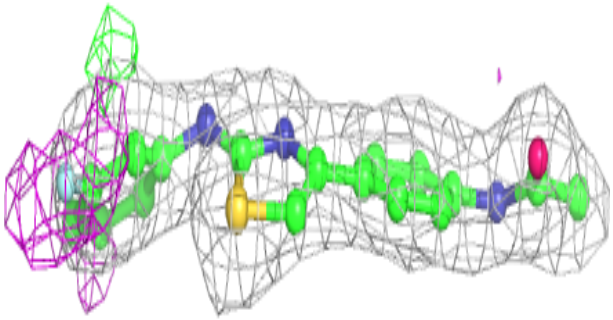


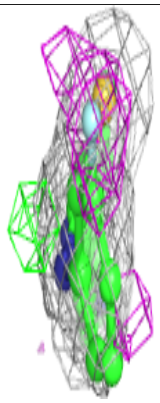


Electron density around 4CJ C 504:

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

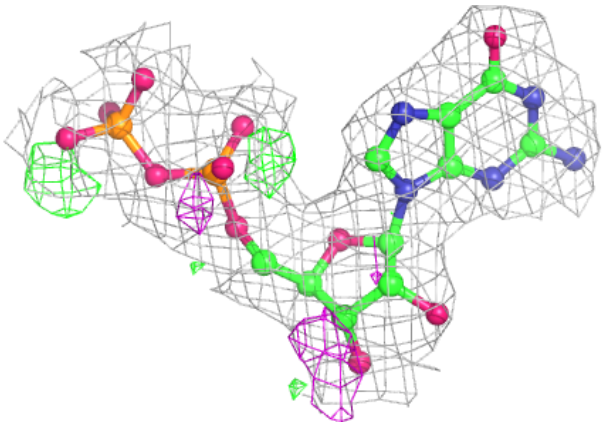


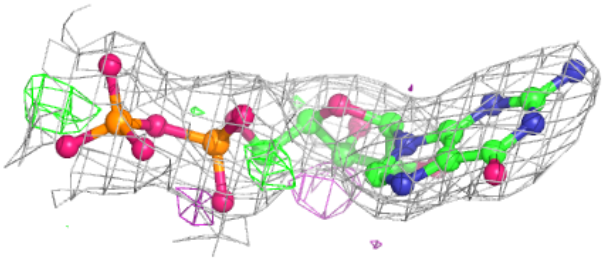


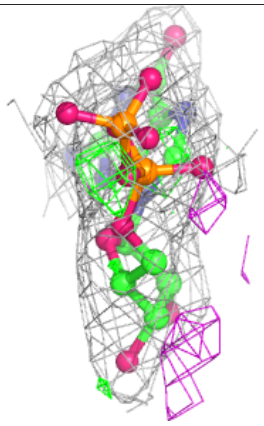


Electron density around GDP D 501:

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

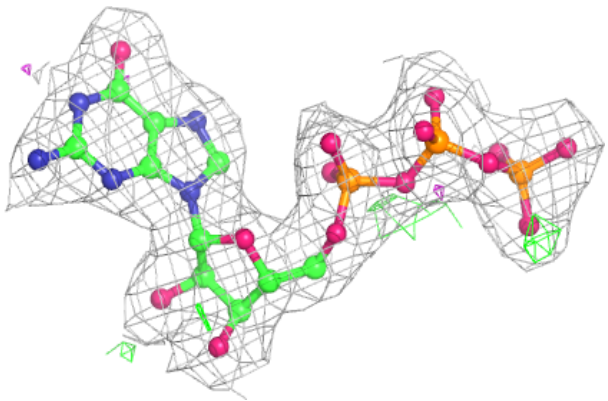


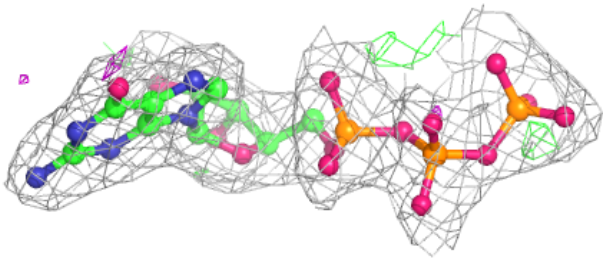


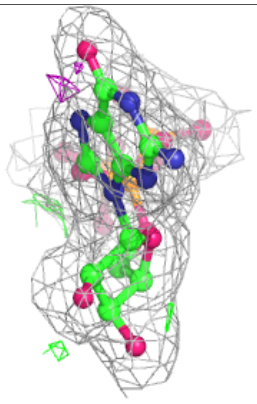


Electron density around GTP A 501:

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

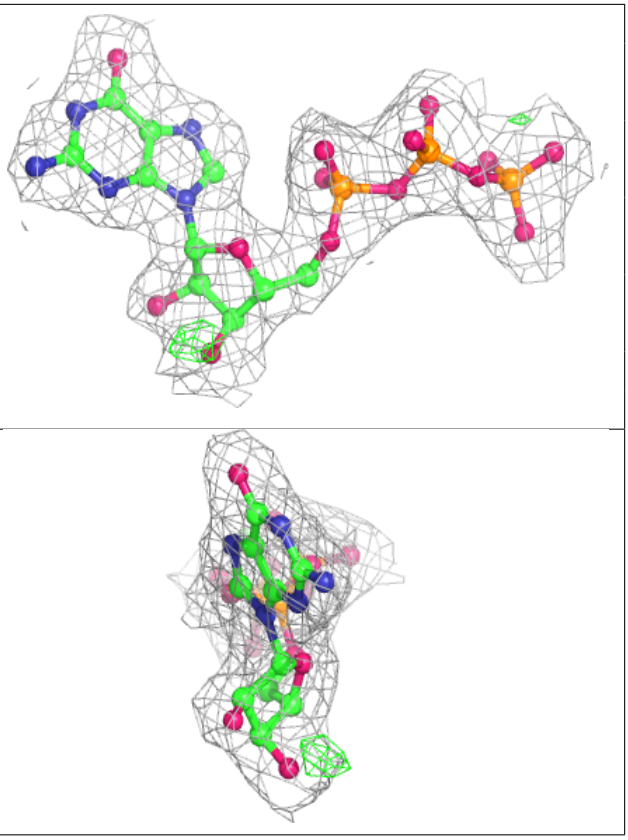


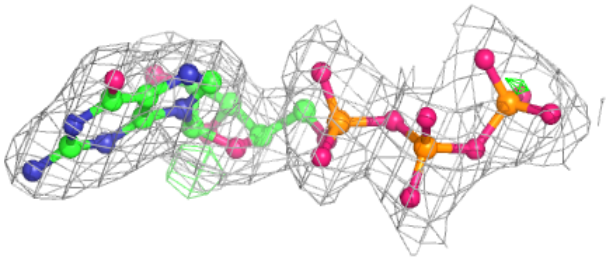




Electron density around GTP C 501:

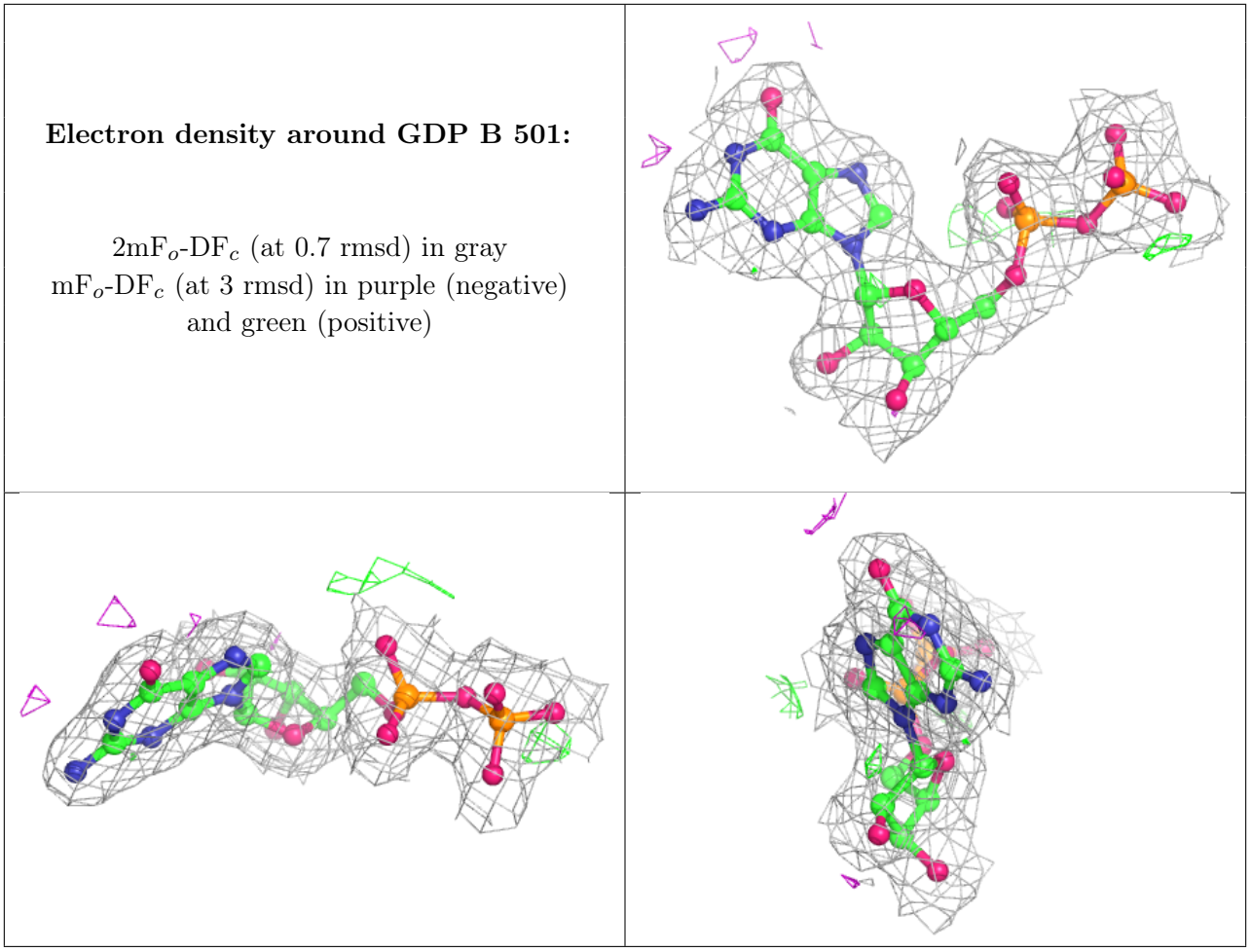
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





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

There are no such residues in this entry.