



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 03:11 PM UTC

PDB ID : 7W15 / pdb\_00007w15  
Title : Crystal Structure of MPH-E in complex with GTP and Erythromycin  
Authors : Qi, Q.; Kuang, L.; Jiang, Y.  
Deposited on : 2021-11-19  
Resolution : 1.77 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](mailto: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>.

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

MolProbity : 4-5-2 with Phenix2.0  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 2.0  
EDS : 3.0  
Buster-report : wwPDB partial adaption of 1.1.7 (2018)  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

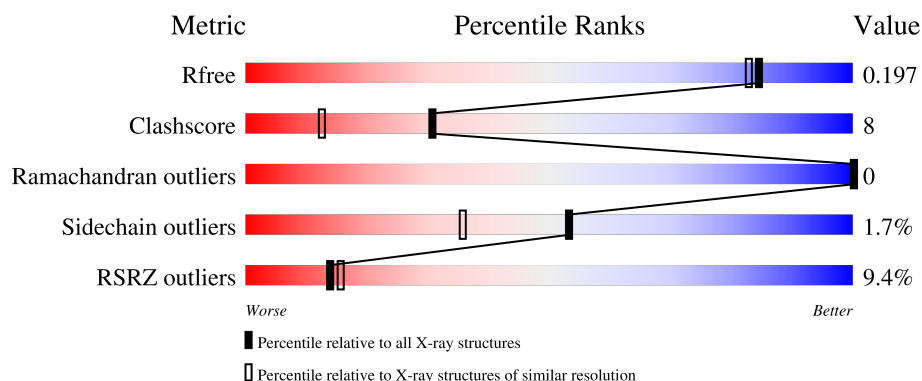
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.77 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))
$R_{free}$	180053	1365 (1.78-1.78)
Clashscore	190562	1395 (1.78-1.78)
Ramachandran outliers	187476	1382 (1.78-1.78)
Sidechain outliers	187428	1382 (1.78-1.78)
RSRZ outliers	180081	1365 (1.78-1.78)

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  $\geq 3$ , 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	302	<div> <div>16%</div> <div> <div></div> <div>76%</div> <div>20%</div> <div>..</div> </div> </div>
1	B	302	<div> <div>2%</div> <div> <div></div> <div>84%</div> <div>13%</div> <div>.</div> </div> </div>

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 5733 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.

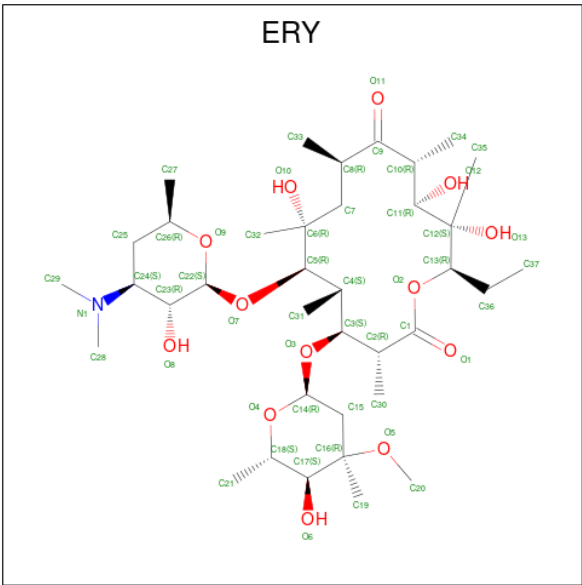
- Molecule 1 is a protein called Macrolide 2'-phosphotransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	293	Total	C	N	O	S	0	0	0
			2354	1510	392	445	7			
1	A	294	Total	C	N	O	S	0	0	0
			2362	1516	393	446	7			

There are 16 discrepancies between the modelled and reference sequences:

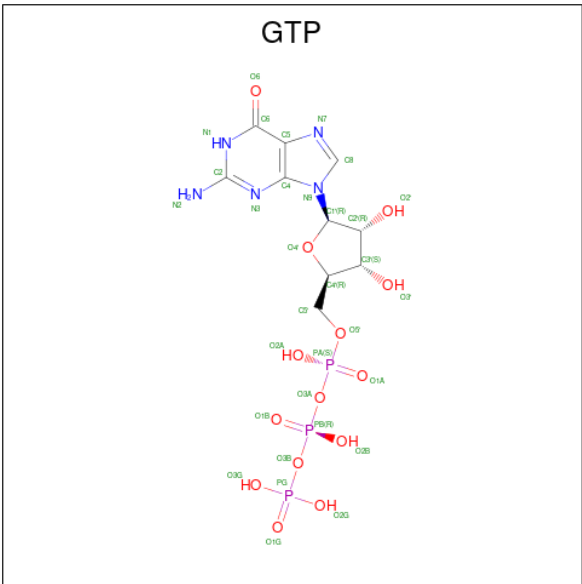
Chain	Residue	Modelled	Actual	Comment	Reference
B	295	LEU	-	expression tag	UNP A5Y459
B	296	GLU	-	expression tag	UNP A5Y459
B	297	HIS	-	expression tag	UNP A5Y459
B	298	HIS	-	expression tag	UNP A5Y459
B	299	HIS	-	expression tag	UNP A5Y459
B	300	HIS	-	expression tag	UNP A5Y459
B	301	HIS	-	expression tag	UNP A5Y459
B	302	HIS	-	expression tag	UNP A5Y459
A	295	LEU	-	expression tag	UNP A5Y459
A	296	GLU	-	expression tag	UNP A5Y459
A	297	HIS	-	expression tag	UNP A5Y459
A	298	HIS	-	expression tag	UNP A5Y459
A	299	HIS	-	expression tag	UNP A5Y459
A	300	HIS	-	expression tag	UNP A5Y459
A	301	HIS	-	expression tag	UNP A5Y459
A	302	HIS	-	expression tag	UNP A5Y459

- Molecule 2 is ERYTHROMYCIN A (CCD ID: ERY) (formula:  $C_{37}H_{67}NO_{13}$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	B	1	Total	C	N	O	0	0
			51	37	1	13		
2	A	1	Total	C	N	O	0	0
			51	37	1	13		

- Molecule 3 is GUANOSINE-5'-TRIPHOSPHATE (CCD ID: GTP) (formula: C<sub>10</sub>H<sub>16</sub>N<sub>5</sub>O<sub>14</sub>P<sub>3</sub>) (labeled as "Ligand of Interest" by depositor).



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

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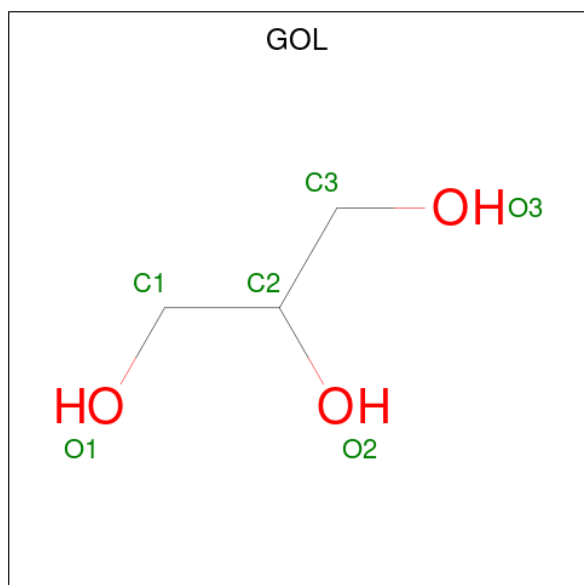
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			32	10	5	14	3		

- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	3	Total	Mg	0	0
			3	3		
4	A	3	Total	Mg	0	0
			3	3		

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



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

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	487	Total	O	0	0
			487	487		

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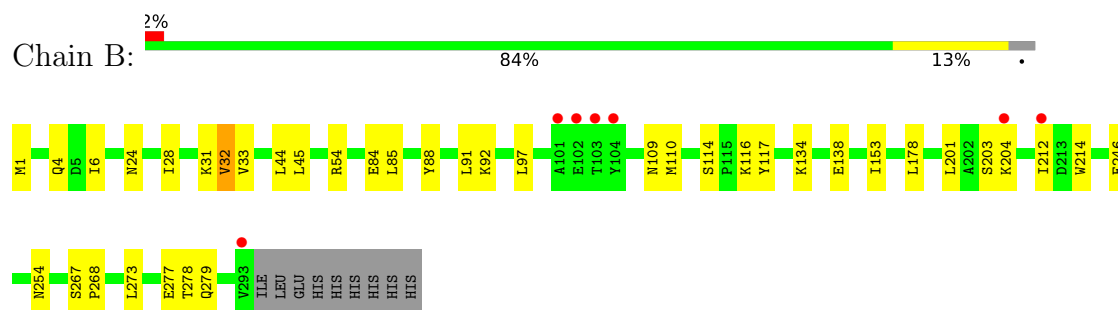
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	346	Total	O	0	0
			346	346		

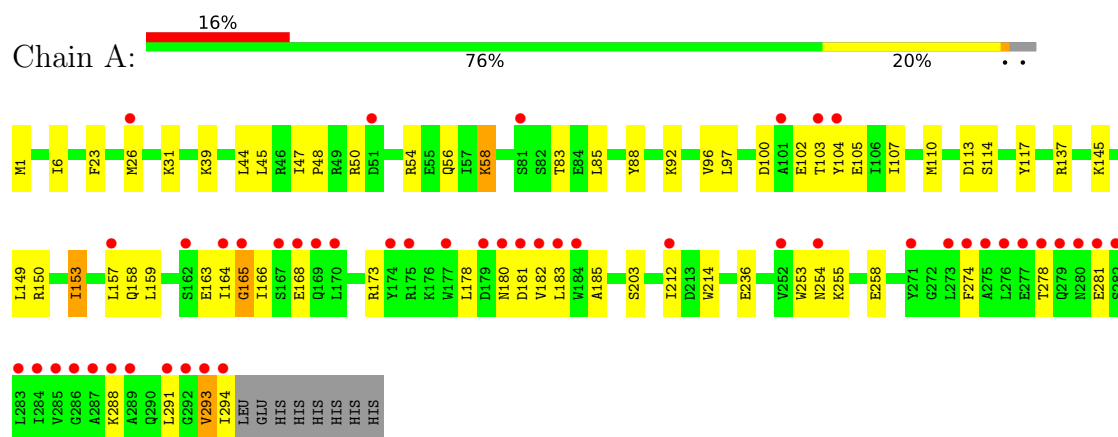
### 3 Residue-property plots

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: Macrolide 2'-phosphotransferase



#### • Molecule 1: Macrolide 2'-phosphotransferase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	84.62Å 50.28Å 97.40Å 90.00° 115.41° 90.00°	Depositor
Resolution (Å)	34.85 – 1.77 34.85 – 1.77	Depositor EDS
% Data completeness (in resolution range)	99.2 (34.85-1.77) 99.2 (34.85-1.77)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.69 (at 1.77Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, $R_{free}$	0.188 , 0.196 0.188 , 0.197	Depositor DCC
$R_{free}$ test set	2000 reflections (2.77%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	19.9	Xtriage
Anisotropy	0.248	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 43.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.014 for h,-k,-h-l	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	5733	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	26.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.45% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: MG, GOL, ERY, 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	0.56	0/2409	0.85	1/3261 (0.0%)
1	B	0.36	0/2401	0.63	0/3250
All	All	0.47	0/4810	0.75	1/6511 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	165	GLY	CA-C-O	-5.47	118.45	122.23

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	2362	0	2387	50	3
1	B	2354	0	2376	31	0
2	A	51	0	67	0	0
2	B	51	0	67	1	0
3	A	32	0	12	0	0
3	B	32	0	12	1	0
4	A	3	0	0	0	0
4	B	3	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	12	0	16	1	0
6	A	346	0	0	13	1
6	B	487	0	0	8	3
All	All	5733	0	4937	82	5

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 8.

All (82) 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)
1:A:150:ARG:NH2	6:A:502:HOH:O	1.99	0.94
1:B:116:LYS:NZ	6:B:501:HOH:O	1.76	0.94
1:B:24:ASN:HB3	1:B:32:VAL:HG22	1.55	0.87
1:A:294:ILE:HG22	1:A:294:ILE:O	1.75	0.86
1:A:258:GLU:OE1	6:A:501:HOH:O	1.98	0.81
1:A:39:LYS:HE3	6:A:744:HOH:O	1.82	0.79
1:B:4:GLN:OE1	6:B:502:HOH:O	2.03	0.77
1:A:153:ILE:HB	1:A:178:LEU:HD21	1.64	0.76
1:B:246:GLU:OE1	6:B:503:HOH:O	2.05	0.75
1:A:236:GLU:OE1	6:A:503:HOH:O	2.05	0.73
1:A:164:ILE:CG2	1:A:288:LYS:HG2	2.19	0.73
1:A:254:ASN:OD1	6:A:504:HOH:O	2.07	0.72
1:A:173:ARG:NE	6:A:507:HOH:O	2.24	0.71
1:A:110:MET:HE1	1:A:117:TYR:CG	2.26	0.70
1:B:44:LEU:HD22	1:B:88:TYR:OH	1.92	0.69
1:B:54:ARG:NH2	6:B:507:HOH:O	2.25	0.69
1:B:84:GLU:OE1	6:B:504:HOH:O	2.13	0.67
1:A:26:MET:HE1	6:A:557:HOH:O	1.95	0.67
1:A:100:ASP:OD1	1:A:103:THR:N	2.19	0.66
1:A:158:GLN:NE2	6:A:508:HOH:O	2.29	0.65
1:A:103:THR:HG22	1:A:105:GLU:HB2	1.78	0.64
1:B:44:LEU:HD22	1:B:88:TYR:CZ	2.33	0.64
1:A:294:ILE:O	1:A:294:ILE:CG2	2.45	0.64
1:B:28:ILE:HD11	2:B:401:ERY:H333	1.81	0.62
5:B:406:GOL:H2	6:B:589:HOH:O	1.99	0.61
1:B:1:MET:HE2	1:B:31:LYS:CD	2.33	0.59
1:A:44:LEU:HD22	1:A:88:TYR:OH	2.02	0.58
1:A:44:LEU:HD22	1:A:88:TYR:CZ	2.39	0.57
1:A:182:VAL:HG13	1:A:255:LYS:HG3	1.86	0.57
1:A:294:ILE:HG22	6:A:506:HOH:O	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:39:LYS:NZ	6:A:513:HOH:O	2.38	0.56
1:A:164:ILE:HG23	1:A:288:LYS:HG2	1.87	0.56
1:A:274:PHE:O	1:A:278:THR:HG23	2.06	0.56
1:A:164:ILE:HG22	1:A:288:LYS:HG2	1.88	0.54
1:B:267:SER:HB3	1:B:268:PRO:HD3	1.89	0.53
1:A:293:VAL:O	1:A:294:ILE:C	2.52	0.52
1:A:97:LEU:C	1:A:97:LEU:HD12	2.34	0.51
1:A:159:LEU:HD12	1:A:163:GLU:HG2	1.92	0.51
1:A:212:ILE:O	1:A:214:TRP:HD1	1.94	0.51
1:A:48:PRO:HG2	1:A:83:THR:O	2.11	0.50
1:A:180:ASN:OD1	1:A:182:VAL:HG12	2.12	0.50
1:B:1:MET:CE	1:B:31:LYS:HD3	2.43	0.49
1:A:50:ARG:HD3	6:A:546:HOH:O	2.11	0.49
1:A:164:ILE:HG23	1:A:288:LYS:CG	2.42	0.48
1:A:6:ILE:CD1	1:A:23:PHE:HE1	2.27	0.48
1:B:273:LEU:O	1:B:277:GLU:HG3	2.14	0.47
1:A:149:LEU:O	1:A:153:ILE:HG13	2.13	0.47
1:A:1:MET:CE	1:A:31:LYS:HD3	2.44	0.47
1:B:6:ILE:HD13	1:B:33:VAL:HG21	1.95	0.47
1:B:110:MET:HE1	1:B:117:TYR:CG	2.50	0.47
1:A:145:LYS:HA	1:A:145:LYS:HD2	1.65	0.46
1:A:96:VAL:HG13	1:A:110:MET:HG2	1.96	0.46
1:A:92:LYS:HB3	1:A:92:LYS:HE3	1.85	0.46
1:A:157:LEU:CD1	1:A:166:ILE:HD13	2.47	0.45
1:B:254:ASN:ND2	6:B:505:HOH:O	2.23	0.45
1:A:100:ASP:HB2	1:A:107:ILE:CD1	2.47	0.45
1:A:100:ASP:HB2	1:A:107:ILE:HD11	1.99	0.44
1:B:1:MET:CE	1:B:31:LYS:CD	2.96	0.44
1:B:92:LYS:HD3	6:B:897:HOH:O	2.17	0.44
1:A:1:MET:HE1	1:A:47:ILE:HD13	2.00	0.43
1:B:153:ILE:HB	1:B:178:LEU:HD21	2.00	0.43
1:B:109:ASN:HB3	1:B:204:LYS:NZ	2.34	0.43
1:A:164:ILE:CG2	1:A:288:LYS:CG	2.92	0.43
1:A:181:ASP:O	6:A:505:HOH:O	2.21	0.43
1:B:45:LEU:HG	1:B:85:LEU:HD11	2.00	0.42
1:B:44:LEU:CD2	1:B:88:TYR:CZ	3.02	0.42
1:A:183:LEU:HA	1:A:255:LYS:HB3	2.01	0.42
1:A:165:GLY:O	1:A:291:LEU:HD13	2.19	0.42
1:B:44:LEU:HD22	3:B:402:GTP:N7	2.35	0.42
1:A:56:GLN:HG2	6:A:611:HOH:O	2.20	0.42
1:B:97:LEU:C	1:B:97:LEU:HD12	2.44	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:134:LYS:HE2	1:B:138:GLU:OE2	2.20	0.42
1:B:204:LYS:HE2	1:B:204:LYS:HA	2.01	0.42
1:B:91:LEU:HD12	1:B:201:LEU:CD1	2.49	0.41
1:A:45:LEU:HG	1:A:85:LEU:HD11	2.00	0.41
1:B:212:ILE:O	1:B:214:TRP:HD1	2.04	0.41
1:B:91:LEU:HD12	1:B:201:LEU:HD11	2.03	0.41
1:B:278:THR:O	1:B:279:GLN:HB2	2.21	0.41
1:A:54:ARG:HG2	1:A:58:LYS:HD3	2.02	0.41
1:A:100:ASP:O	1:A:104:TYR:N	2.47	0.41
1:A:185:ALA:HB2	1:A:253:TRP:CD2	2.56	0.41
1:B:1:MET:HE1	1:B:31:LYS:HD3	2.04	0.40

All (5) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:168:GLU:OE2	6:B:658:HOH:O[2_546]	1.72	0.48
1:A:102:GLU:OE2	1:A:137:ARG:NH2[1_545]	1.79	0.41
1:A:113:ASP:OD1	1:A:254:ASN:ND2[2_546]	2.14	0.06
6:B:774:HOH:O	6:B:914:HOH:O[2_646]	2.16	0.04
6:B:834:HOH:O	6:A:762:HOH:O[2_556]	2.19	0.01

## 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	292/302 (97%)	288 (99%)	4 (1%)	0	100	100
1	B	291/302 (96%)	287 (99%)	4 (1%)	0	100	100
All	All	583/604 (96%)	575 (99%)	8 (1%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains

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	258/266 (97%)	252 (98%)	6 (2%)	44	25
1	B	257/266 (97%)	254 (99%)	3 (1%)	63	49
All	All	515/532 (97%)	506 (98%)	9 (2%)	53	36

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	32	VAL
1	B	114	SER
1	B	203	SER
1	A	58	LYS
1	A	114	SER
1	A	153	ILE
1	A	203	SER
1	A	281	GLU
1	A	293	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	42	GLN
1	B	169	GLN
1	A	42	GLN
1	A	109	ASN
1	A	156	ASN

### 5.3.3 RNA

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 6 are monoatomic - leaving 6 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	$\# Z  > 2$
2	ERY	B	401	-	53,53,53	0.44	0	82,82,82	0.83	2 (2%)
3	GTP	A	402	4	33,34,34	0.58	0	50,54,54	0.51	0
3	GTP	B	402	4	33,34,34	0.59	0	50,54,54	0.51	0
5	GOL	B	406	-	5,5,5	0.98	0	5,5,5	0.97	0
5	GOL	B	407	-	5,5,5	1.05	0	5,5,5	0.95	0
2	ERY	A	401	-	53,53,53	0.46	0	82,82,82	0.87	3 (3%)

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
2	ERY	B	401	-	-	1/72/107/107	0/3/3/3
3	GTP	A	402	4	-	0/22/38/38	0/3/3/3
3	GTP	B	402	4	-	1/22/38/38	0/3/3/3
5	GOL	B	406	-	-	2/4/4/4	-
5	GOL	B	407	-	-	2/4/4/4	-
2	ERY	A	401	-	-	1/72/107/107	0/3/3/3

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	401	ERY	C12-C11-C10	-3.59	112.20	116.40
2	B	401	ERY	C12-C11-C10	-2.96	112.93	116.40
2	B	401	ERY	O5-C16-C15	-2.55	109.02	112.95
2	A	401	ERY	O5-C16-C15	-2.14	109.65	112.95
2	A	401	ERY	O10-C6-C5	2.05	111.38	107.60

There are no chirality outliers.

All (7) torsion outliers are listed below:

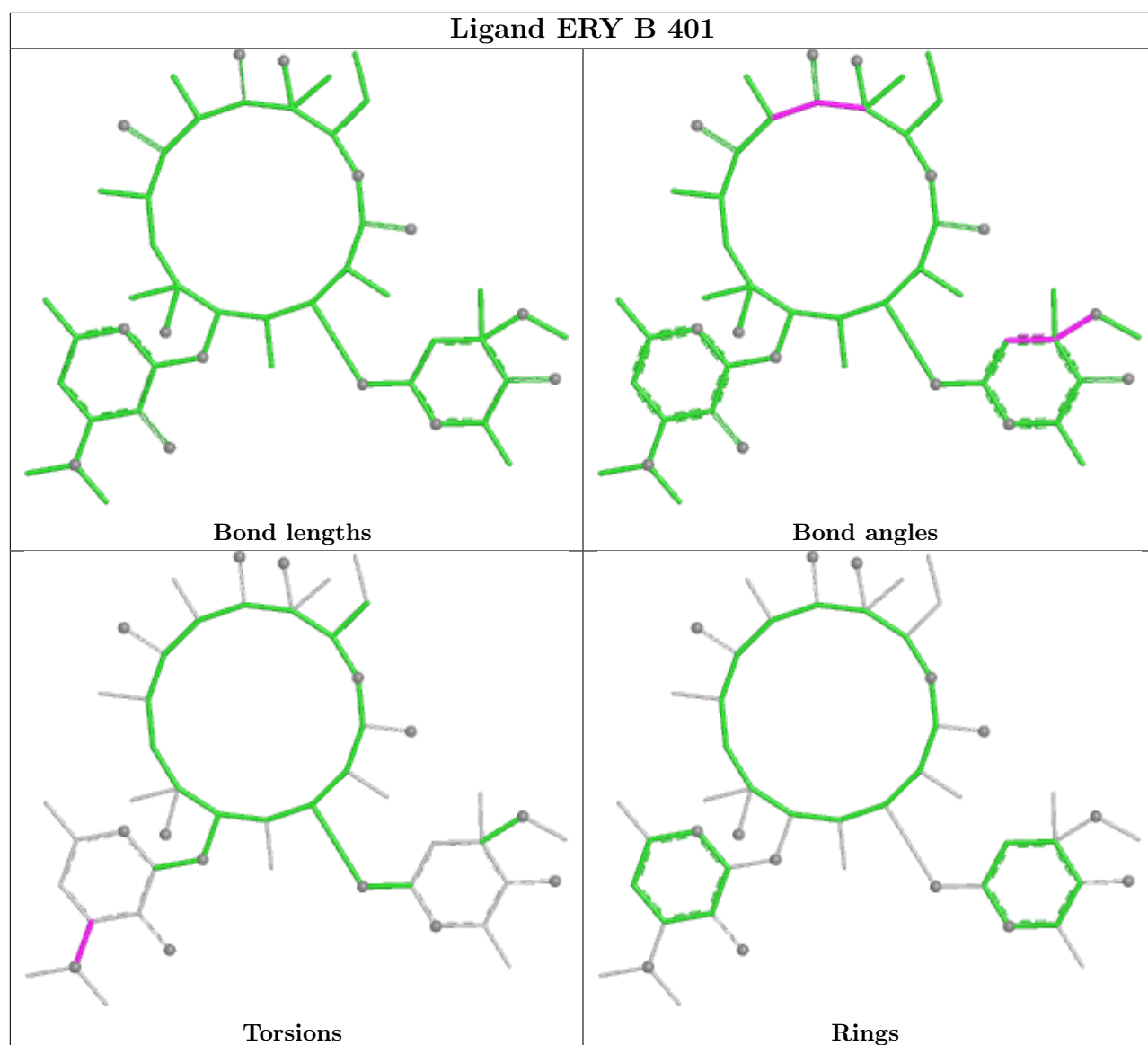
Mol	Chain	Res	Type	Atoms
5	B	406	GOL	C1-C2-C3-O3
5	B	407	GOL	O1-C1-C2-C3
5	B	406	GOL	O2-C2-C3-O3
5	B	407	GOL	O1-C1-C2-O2
3	B	402	GTP	PB-O3B-PG-O1G
2	A	401	ERY	O7-C5-C6-C7
2	B	401	ERY	C23-C24-N1-C28

There are no ring outliers.

3 monomers are involved in 3 short contacts:

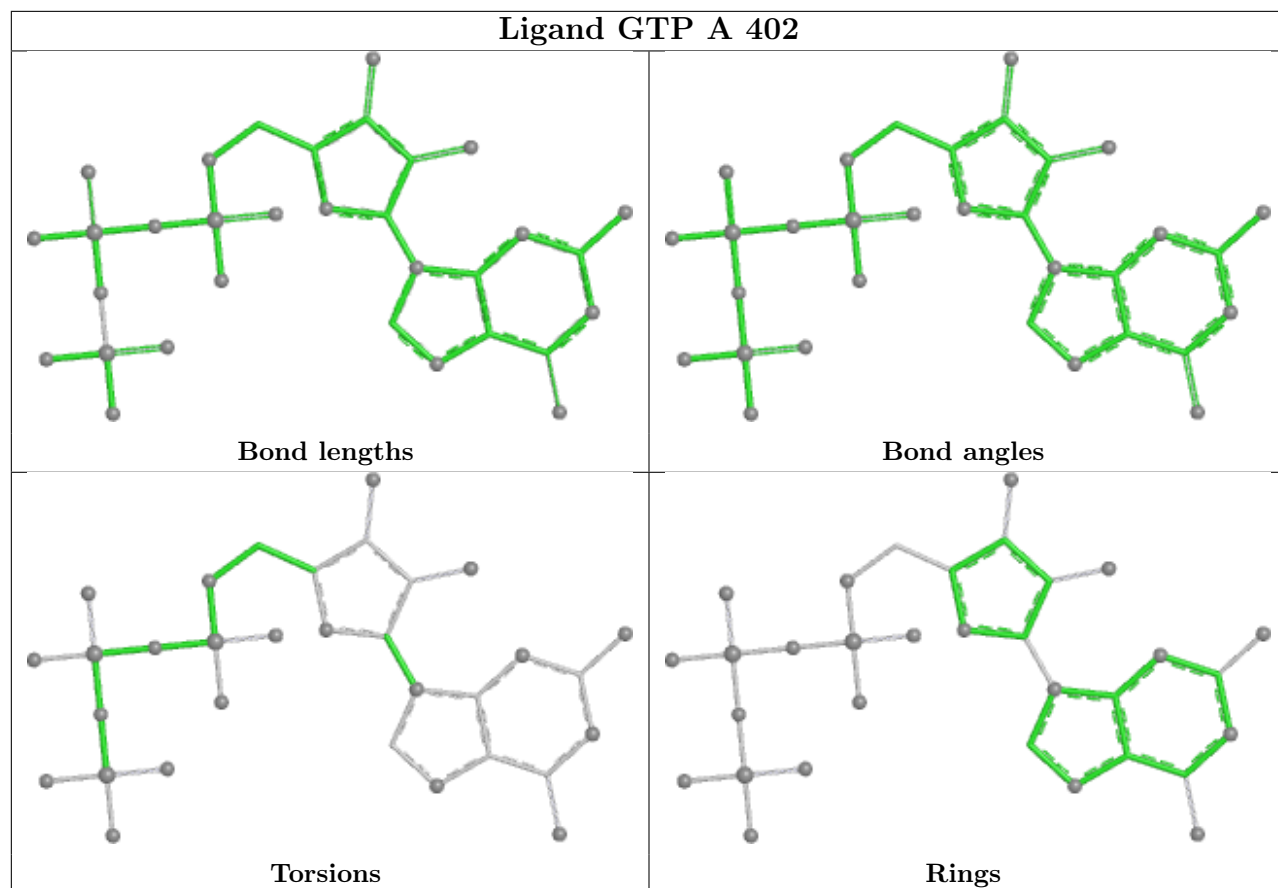
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	401	ERY	1	0
3	B	402	GTP	1	0
5	B	406	GOL	1	0

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.

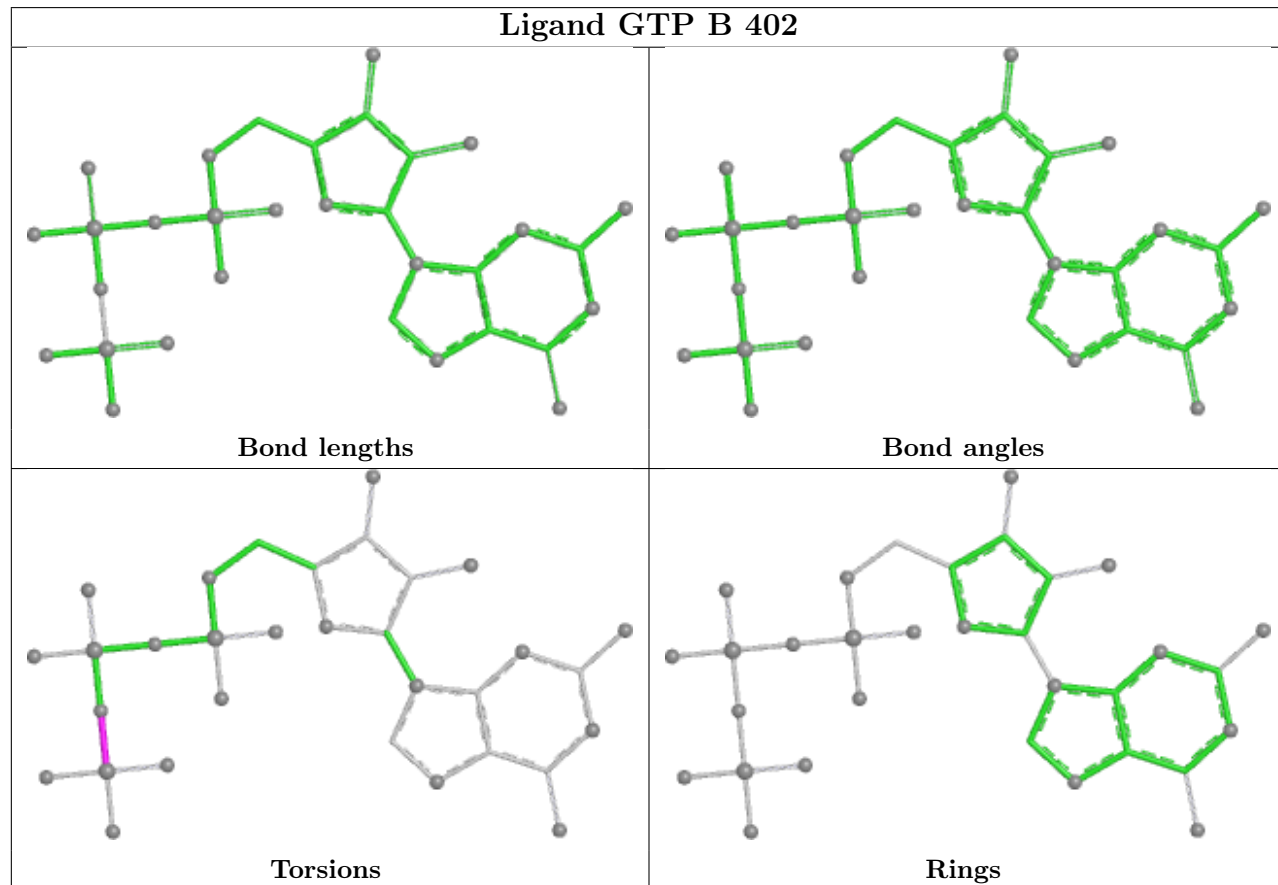


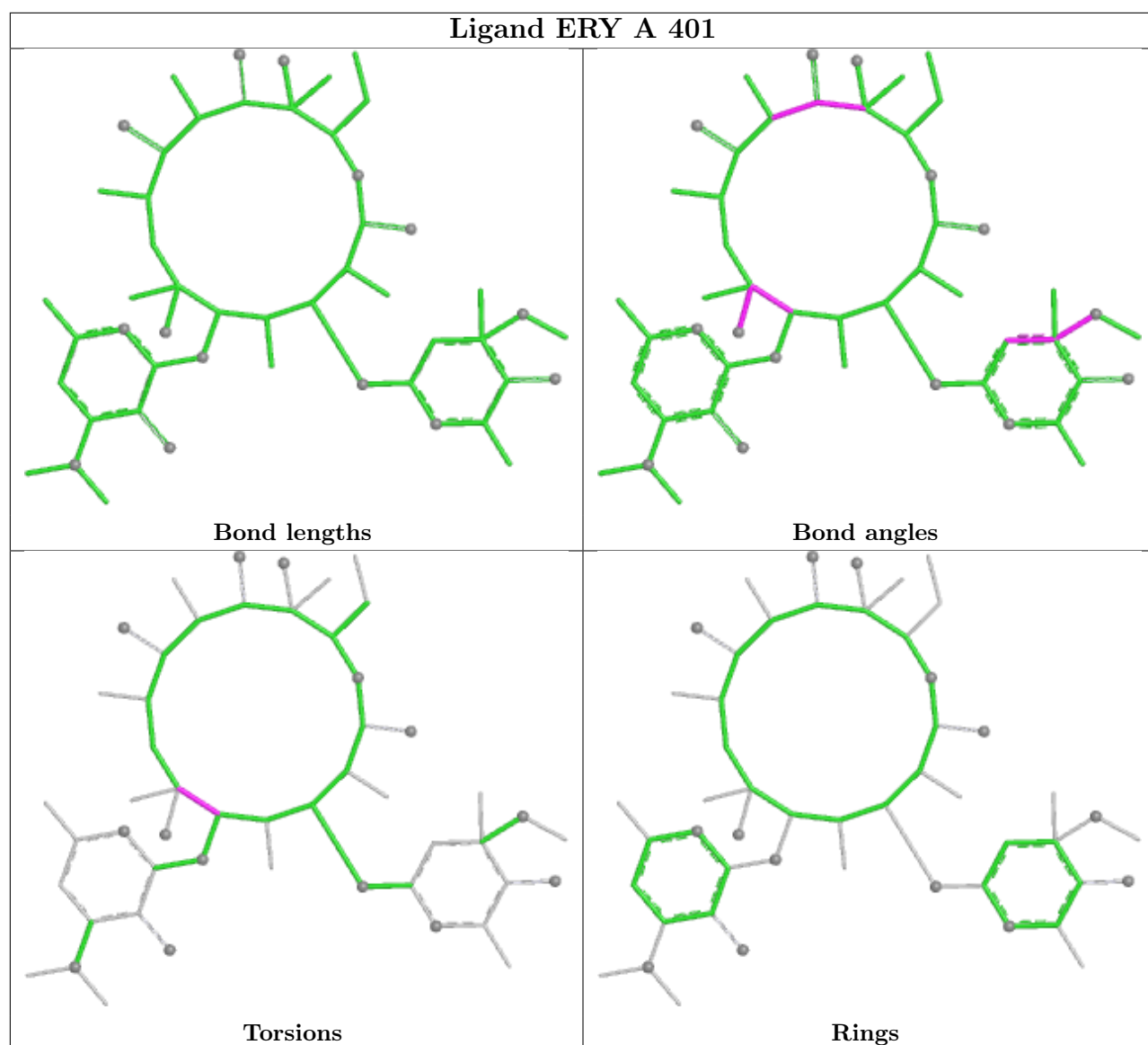


## Ligand GTP A 402



## Ligand GTP B 402





## 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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	294/302 (97%)	0.82	48 (16%) <b>4</b> <b>4</b>	13, 27, 57, 82	0
1	B	293/302 (97%)	-0.04	7 (2%) 59 68	12, 19, 35, 42	0
All	All	587/604 (97%)	0.39	55 (9%) <b>14</b> <b>16</b>	12, 22, 45, 82	0

All (55) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	293	VAL	8.1
1	A	294	ILE	5.4
1	A	104	TYR	4.8
1	A	182	VAL	4.6
1	A	170	LEU	4.3
1	B	293	VAL	4.3
1	B	212	ILE	4.1
1	A	285	VAL	4.0
1	A	289	ALA	3.8
1	B	101	ALA	3.8
1	A	157	LEU	3.6
1	A	284	ILE	3.5
1	A	278	THR	3.5
1	A	212	ILE	3.5
1	A	291	LEU	3.5
1	A	169	GLN	3.4
1	A	101	ALA	3.4
1	A	168	GLU	3.3
1	A	164	ILE	3.3
1	A	162	SER	3.1
1	A	292	GLY	3.0
1	A	283	LEU	2.8
1	A	288	LYS	2.7
1	A	277	GLU	2.7

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Mol	Chain	Res	Type	RSRZ
1	A	26	MET	2.7
1	A	175	ARG	2.6
1	A	287	ALA	2.6
1	A	279	GLN	2.5
1	A	274	PHE	2.5
1	A	273	LEU	2.5
1	A	254	ASN	2.4
1	A	280	ASN	2.4
1	B	204	LYS	2.4
1	A	286	GLY	2.4
1	A	174	TYR	2.4
1	A	103	THR	2.4
1	A	179	ASP	2.4
1	A	276	LEU	2.4
1	B	104	TYR	2.4
1	A	167	SER	2.3
1	A	180	ASN	2.3
1	A	81	SER	2.3
1	A	165	GLY	2.3
1	A	181	ASP	2.2
1	A	281	GLU	2.2
1	A	271	TYR	2.2
1	A	275	ALA	2.1
1	A	184	TRP	2.1
1	B	103	THR	2.1
1	A	51	ASP	2.1
1	B	102	GLU	2.1
1	A	183	LEU	2.1
1	A	177	TRP	2.0
1	A	282	SER	2.0
1	A	252	VAL	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 oligosaccharides in this entry.

## 6.4 Ligands

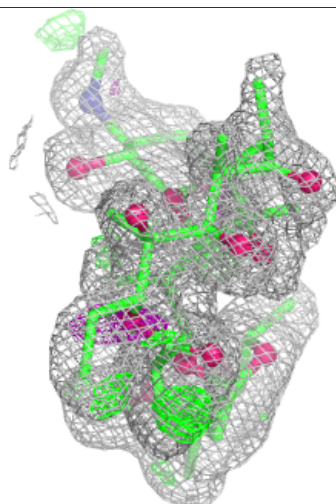
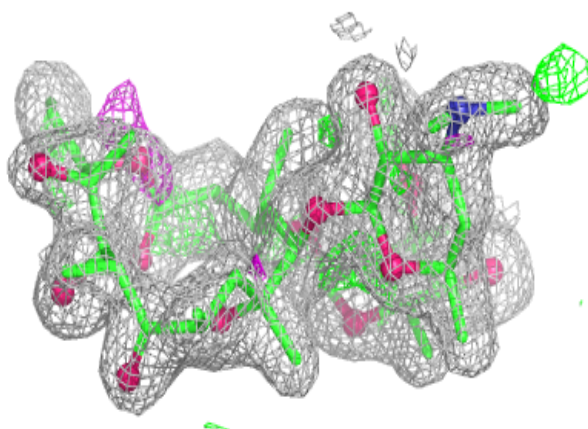
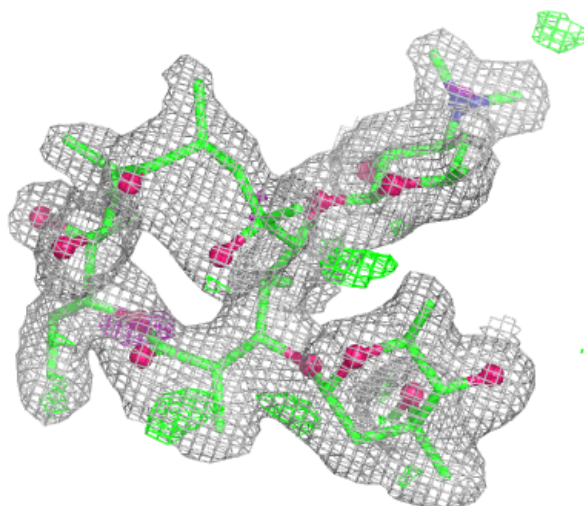
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
5	GOL	B	406	6/6	0.86	0.16	28,30,33,34	0
5	GOL	B	407	6/6	0.86	0.12	37,38,42,43	0
2	ERY	A	401	51/51	0.88	0.12	23,28,37,39	0
4	MG	B	405	1/1	0.95	0.09	30,30,30,30	0
2	ERY	B	401	51/51	0.96	0.07	13,18,23,26	0
3	GTP	A	402	32/32	0.97	0.05	14,18,23,27	0
4	MG	A	405	1/1	0.97	0.05	34,34,34,34	0
4	MG	A	404	1/1	0.99	0.04	21,21,21,21	0
4	MG	B	403	1/1	0.99	0.02	12,12,12,12	0
4	MG	B	404	1/1	0.99	0.01	16,16,16,16	0
3	GTP	B	402	32/32	0.99	0.04	12,14,16,17	0
4	MG	A	403	1/1	1.00	0.03	16,16,16,16	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.

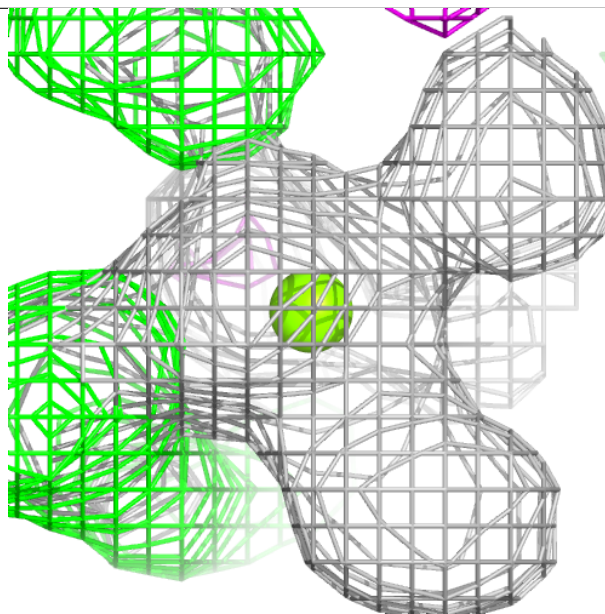
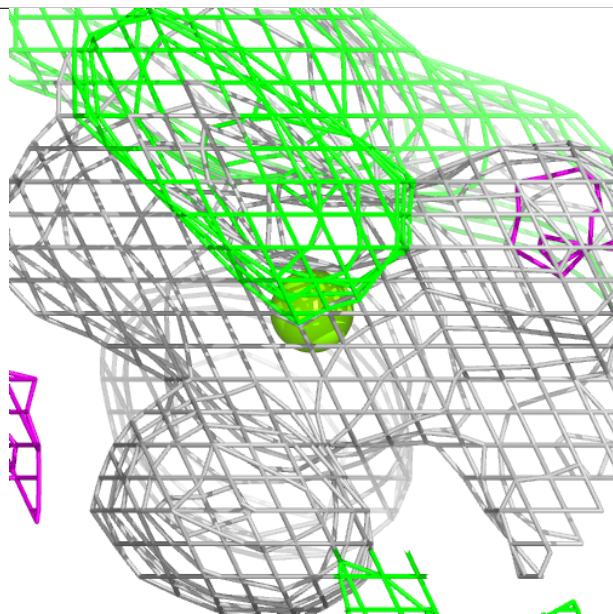
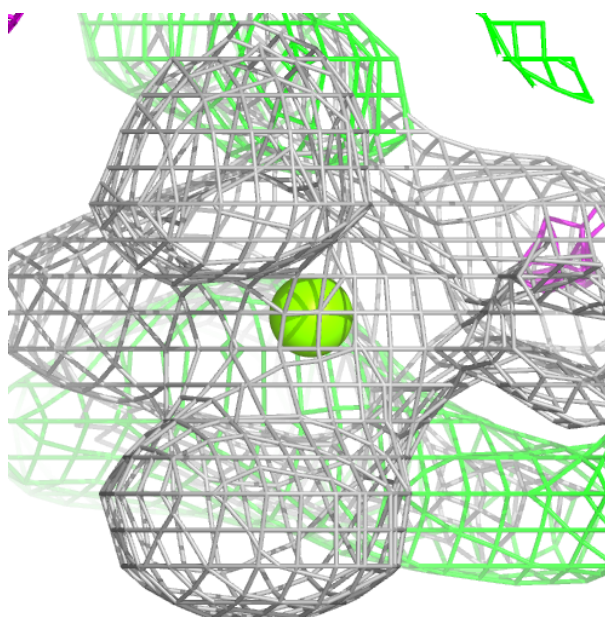
**Electron density around ERY A 401:**

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



**Electron density around MG B 405:**

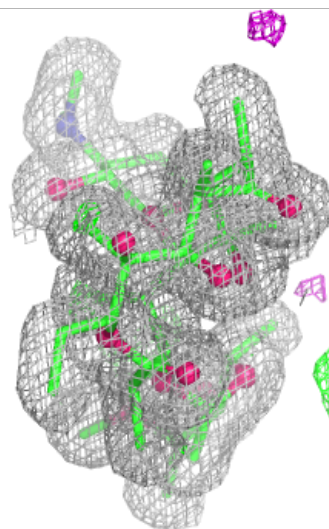
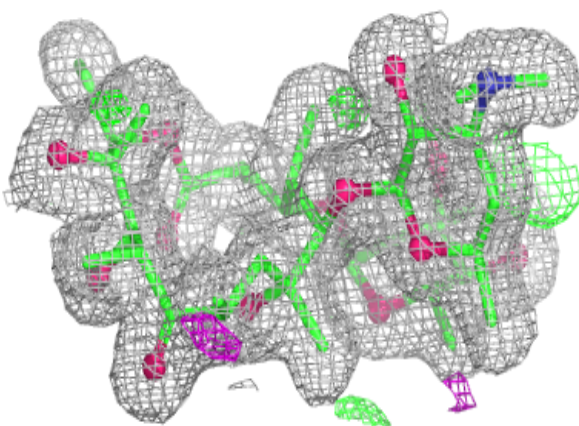
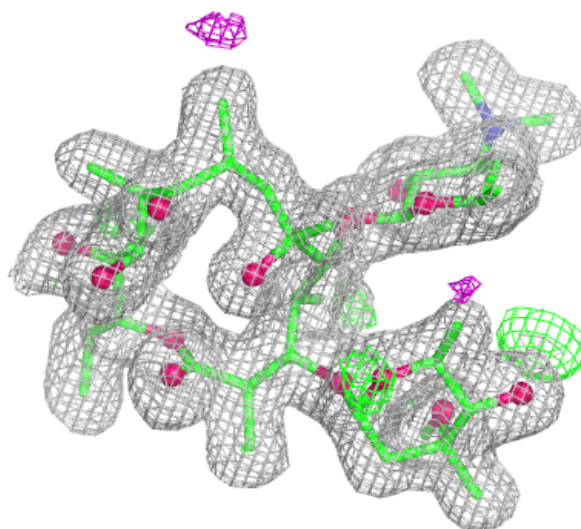
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





**Electron density around ERY B 401:**

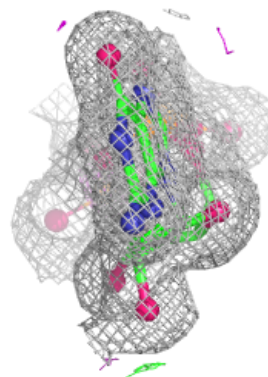
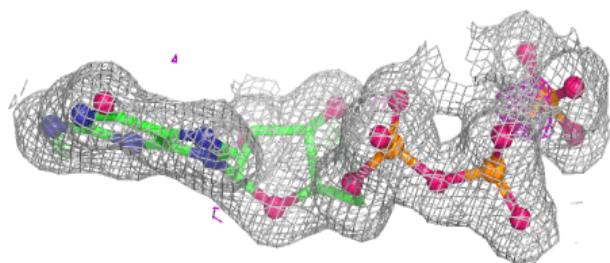
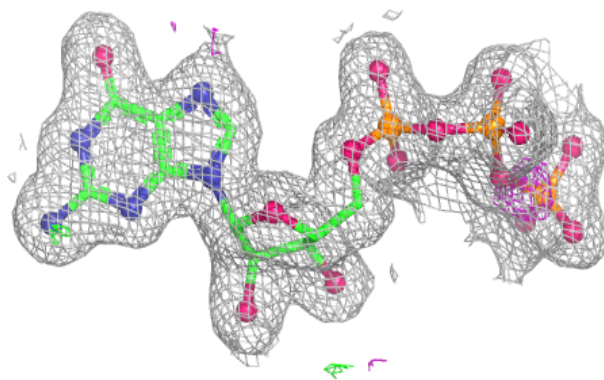
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





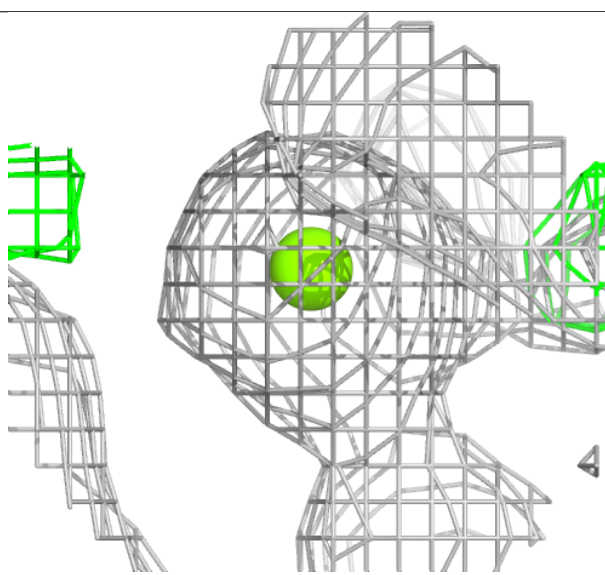
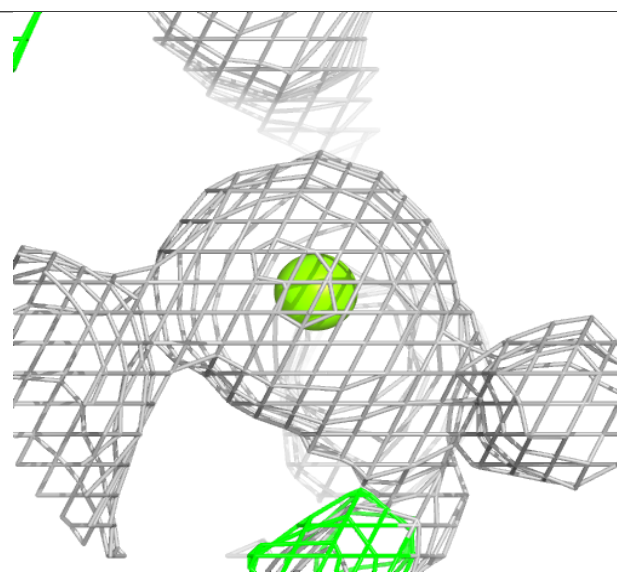
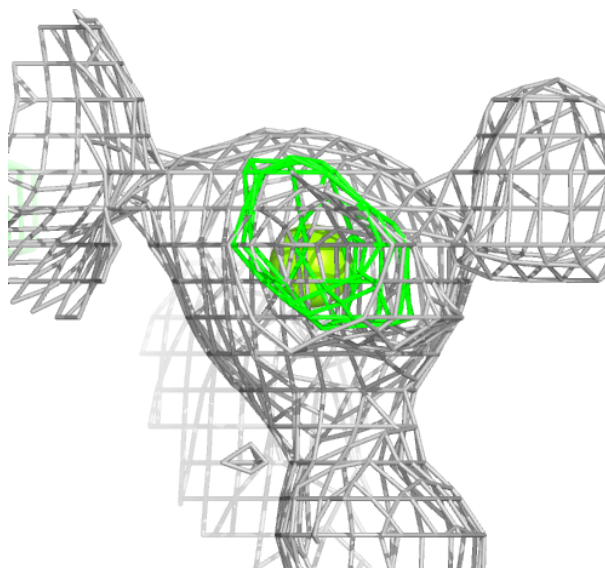
**Electron density around GTP A 402:**

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



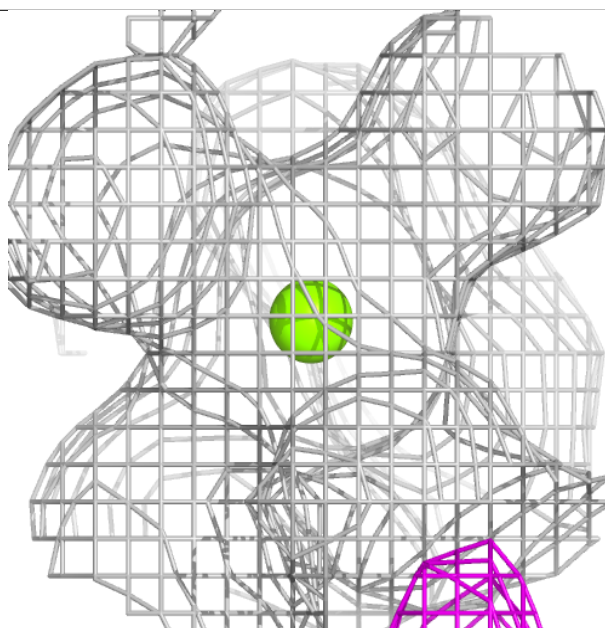
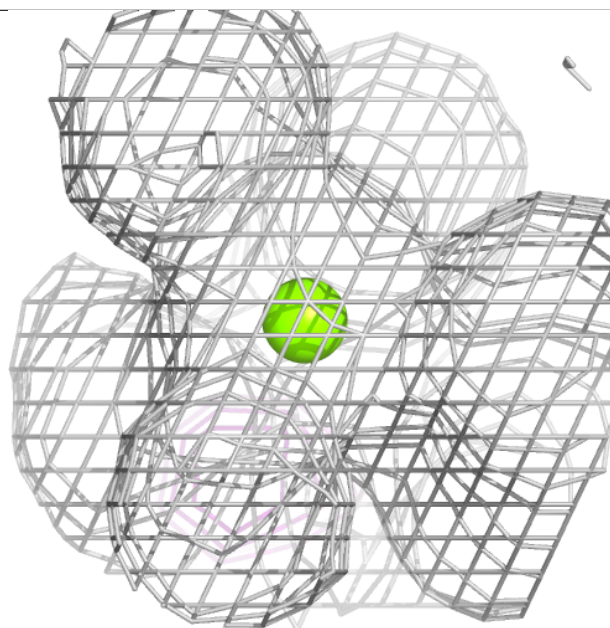
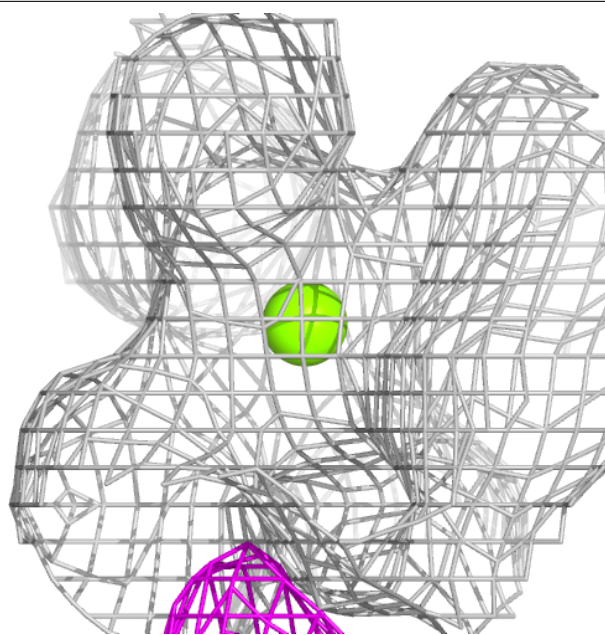
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and green (positive)



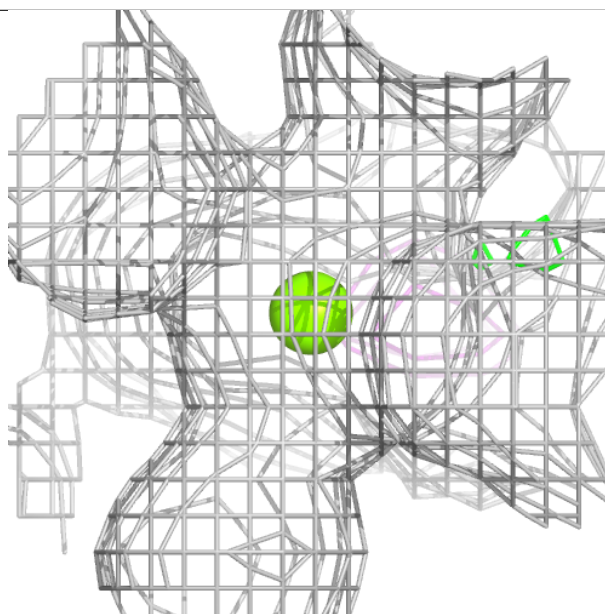
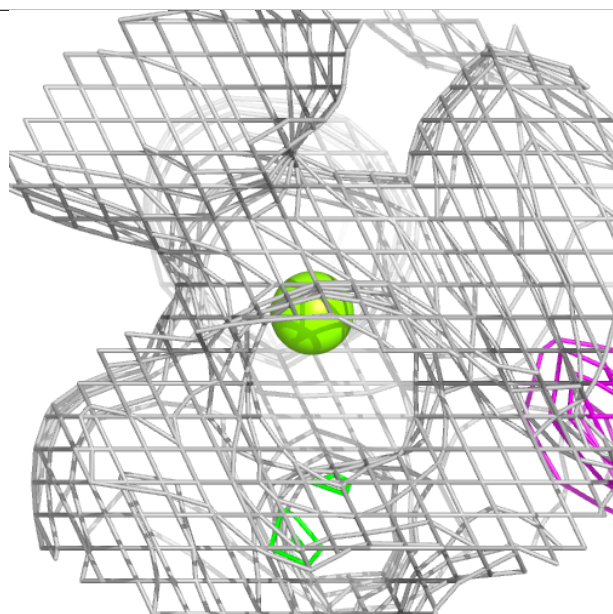
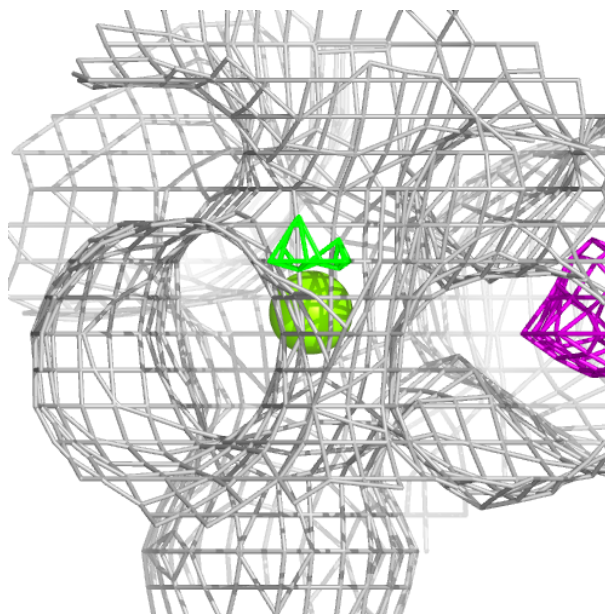
**Electron density around MG A 404:**

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and green (positive)



**Electron density around MG B 403:**

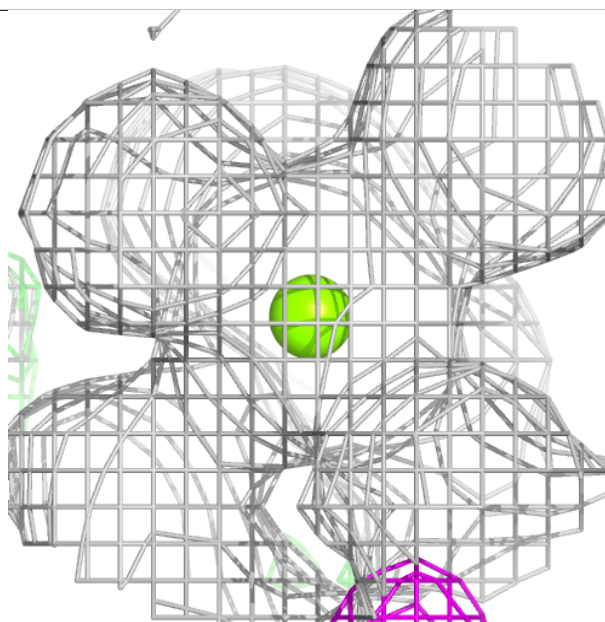
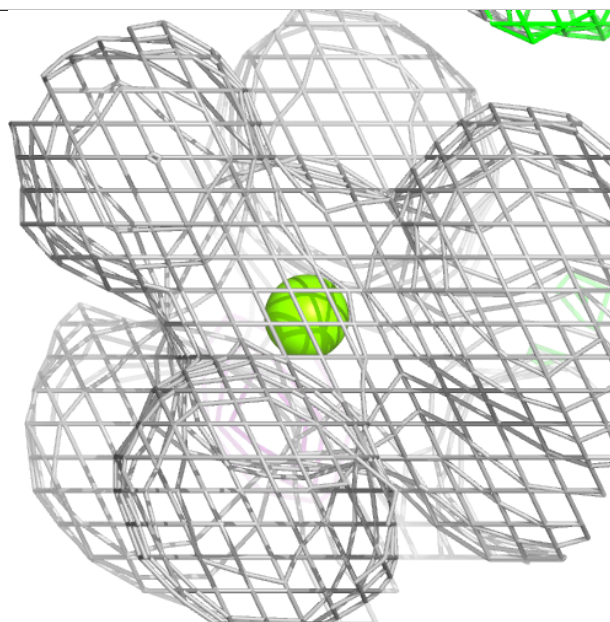
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 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





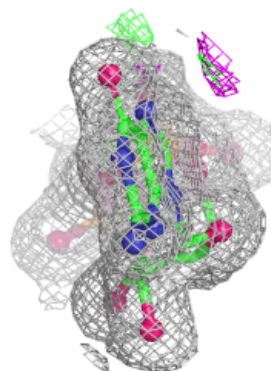
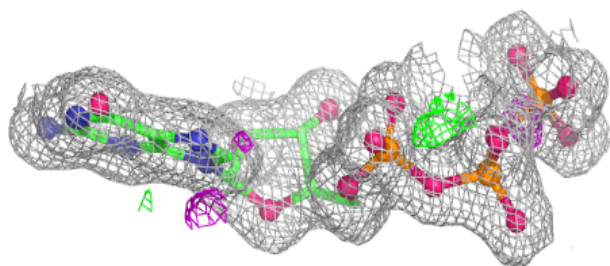
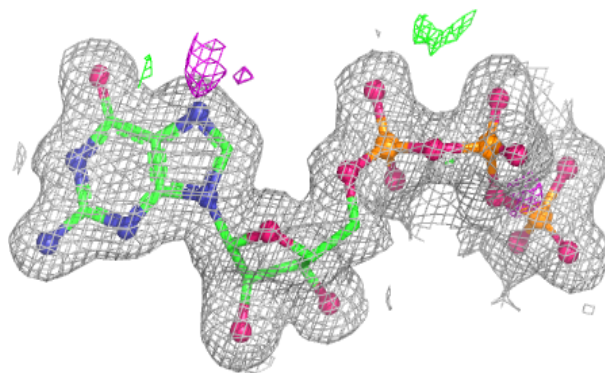
**Electron density around MG B 404:**

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and green (positive)



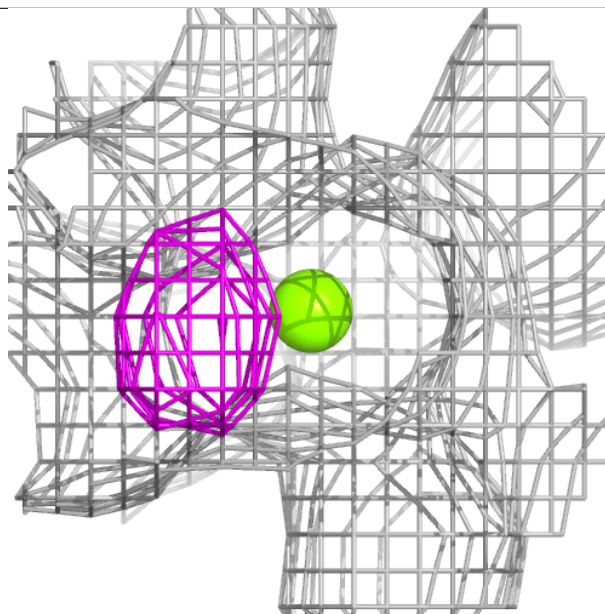
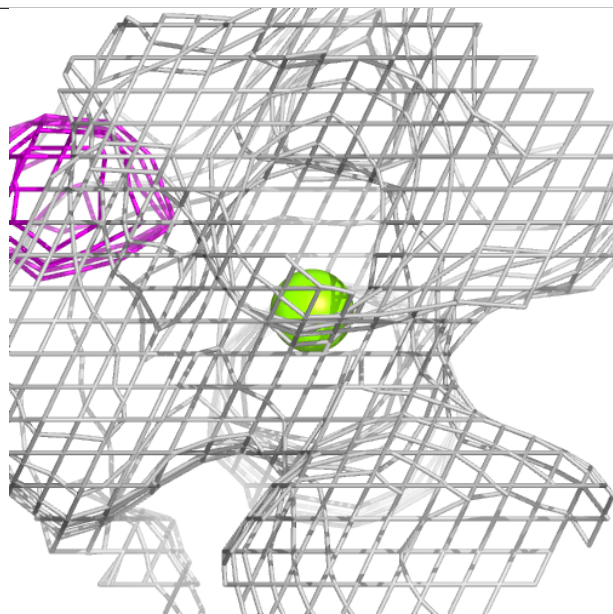
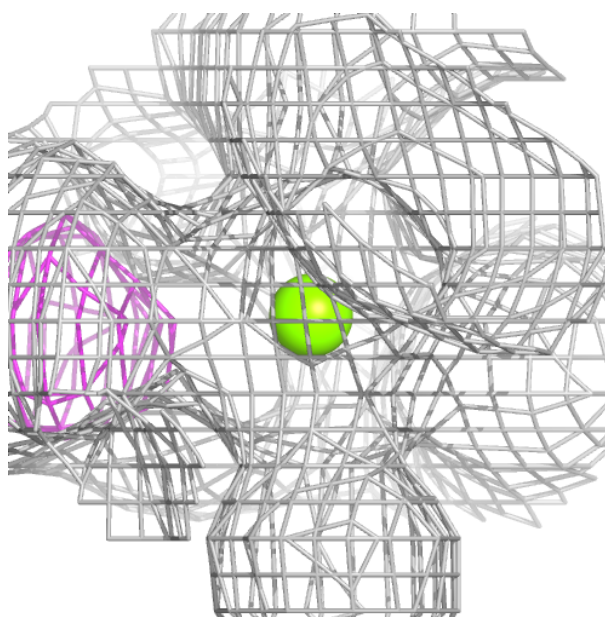
**Electron density around GTP B 402:**

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



**Electron density around MG A 403:**

$2mF_o-DF_c$  (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.